

Numerical Control (CNC)  
DRIVE SYSTEM

# DATA BOOK

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**MDS-E Series**

**MDS-EH Series**

**MDS-EM Series**

**MDS-EMH Series**

**MDS-EJ Series**

**MDS-EJH Series**

## 本製品の取扱いについて

(日本語 /Japanese)

本製品は工業用(クラス A)電磁環境適合機器です。販売者あるいは使用者はこの点に注意し、住商業環境以外での使用をお願いいたします。

## Handling of our product

(English)

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

## 본 제품의 취급에 대해서

(한국어 /Korean)

이 기기는 업무용(A급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 가정외의 지역에서 사용하는 것을 목적으로 합니다.



# Contents

<b>200V System Servo/spindle Drive System .....</b>	<b>1</b>
System Configuration .....	2
Explanation of Type .....	6
1. Servo motor type .....	6
2. Direct-drive motor type .....	7
3. Linear servo motor type .....	8
4. Servo drive unit type .....	9
5. Multi Axis Unit .....	12
6. Spindle motor type .....	13
7. Built-in spindle motor type .....	14
8. Tool spindle motor type .....	15
9. Spindle drive unit type .....	17
10. Power supply unit type .....	18
11. AC reactor type .....	18
Servo Motor .....	19
HG46 .....	20
HG56 .....	22
HG96 .....	24
HG75 .....	26
HG105 .....	30
HG54 .....	34
HG104 .....	36
HG154 .....	38
HG224 .....	40
HG204 .....	42
HG354 .....	44
HG123 .....	46
HG223 .....	48
HG303 .....	50
HG453 .....	52
HG603 .....	54
HG702 .....	56
HG703 .....	58
HG903 .....	60
HG1103 .....	62
HG142 .....	64
HG302 .....	66
HK76 .....	68
HK105 .....	70
HK55 .....	72
HK104 .....	74
HK123 .....	76
HK142 .....	78
HK154 .....	80
HK223 .....	82
HK224 .....	84
HK204 .....	86
HK302 .....	88
HK303 .....	90
HK354 .....	92
HK453 .....	94

HK603 .....	96
HK702 .....	98
HK703 .....	100
<b>Direct Drive Motor .....</b>	<b>103</b>
TM-RBP012C20 .....	104
TM-RBP036E20 .....	106
TM-RBP048G20 .....	108
TM-RBP105G10 .....	110
TM-RBP105G20 .....	112
TM-RBP150G20 .....	114
TM-RBP340J20 .....	116
TM-RBP500J20 .....	118
<b>Linear Motor .....</b>	<b>121</b>
LM-FP2A-03M .....	122
LM-FP2B-06M .....	124
LM-FP2D-12M .....	126
LM-FP2F-18M .....	128
LM-FP4B-12M .....	130
LM-FP4D-24M .....	132
LM-FP4F-36M .....	134
LM-FP4H-48M .....	136
<b>Spindle Motor .....</b>	<b>139</b>
SJ-D3.7/100-01 .....	140
SJ-D5.5/100-01 .....	141
SJ-D5.5/120-01 .....	142
SJ-D5.5/120-02 .....	143
SJ-D7.5/100-01 .....	144
SJ-D7.5/120-01 .....	145
SJ-D11/100-01 .....	146
SJ-D15/80-01 .....	147
SJ-D18.5/80-01 .....	148
SJ-D22/80-01 .....	149
SJ-D26/80-01 .....	150
SJ-D5.5/120-02T-S .....	151
SJ-DG3.7/120-03T .....	152
SJ-DG5.5/120-04T .....	153
SJ-DG7.5/120-05T .....	154
SJ-DG11/100-03T .....	155
SJ-DG11/120-03T .....	156
SJ-DG11/120-12T-K .....	157
SJ-DG11/150-06T .....	158
SJ-DG11/150-15T-K .....	159
SJ-DG15/120-02T-K .....	160
SJ-DG11/120-03T-S .....	161
SJ-DG11/120-12T-KS .....	162
SJ-DG11/150-06T-S .....	163
SJ-DG11/150-15T-KS .....	164
SJ-DG15/120-02T-KS .....	165
SJ-DJ5.5/100-01 .....	166
SJ-DJ5.5/120-01 .....	167
SJ-DJ7.5/100-01 .....	168

SJ-DJ7.5/120-01 .....	169
SJ-DJ11/100-01 .....	170
SJ-DJ15/80-01 .....	171
SJ-DL0.75/100-01 .....	172
SJ-DL1.5/100-01 .....	173
SJ-DL3.7/240-01T .....	174
SJ-DL5.5/150-01T .....	175
SJ-DL5.5/200-01T .....	176
SJ-DL5.5/240-05T .....	177
SJ-DL7.5/150-01T .....	178
SJ-DL5.5/200-01T-S .....	179
SJ-DM11/120-01T .....	180
SJ-DN7.5/80-01 .....	181
SJ-DN11/80-01 .....	182
SJ-DN15/80-01 .....	183
SJ-DN18.5/80-01 .....	184
SJ-V2.2-01T .....	185
SJ-V3.7-02ZT .....	186
SJ-V15-09ZT .....	187
SJ-V18.5-01ZT .....	188
SJ-V18.5-04ZT .....	189
SJ-V22-01ZT .....	190
SJ-V22-04ZT .....	191
SJ-V22-06ZT .....	192
SJ-V26-01ZT .....	193
SJ-V37-01ZT .....	194
SJ-V45-01ZT .....	195
SJ-V55-01ZT .....	196
SJ-V11-01T .....	197
SJ-V11-09T .....	198
SJ-V15-03T .....	199
SJ-V18.5-03T .....	200
SJ-V22-05T .....	201
SJ-V22-09T .....	202
SJ-VK22-19ZT .....	203
SJ-VL2.2-02ZT .....	204
SJ-VL11-02FZT .....	205
SJ-VL11-05FZT-S01 .....	206
<b>Built-in Spindle Motor .....</b>	<b>207</b>
SJ-BG090A/300-01 .....	208
SJ-BG090A/300-01R .....	209
SJ-BG090B/300-03 .....	210
SJ-BG090D/300-03 .....	211
SJ-BG110F/240-01 .....	212
SJ-BG120A/200-01 .....	213
SJ-BG120A/200-01R .....	214
SJ-BG120C/200-01 .....	215
SJ-BG120C/200-01R .....	216
SJ-BG135B/200-01 .....	217
SJ-BG135D/200-01 .....	218
SJ-BG150D/150-01 .....	219
SJ-BG160B/150-01 .....	220

SJ-BG160B/150-01R .....	221
SJ-BG160D/150-01 .....	222
SJ-BG160D/150-01R .....	223
SJ-BG160D/150-02 .....	224
SJ-BG160D/150-02R .....	225
SJ-BG180B/150-01 .....	226
SJ-BG180D/150-01 .....	227
SJ-BG180F/150-01 .....	228
SJ-BG180H/150-01 .....	229
SJ-BG240H/100-01 .....	230
SJ-BG300L/080-01 .....	231
SJ-BG135D/200-01 .....	232
SJ-BG160D/200-03 .....	233
SJ-BG180F/200-01 .....	234
SJ-BG240H/130-01 .....	235
SJ-2B4A01T .....	236
SJ-2B4002T .....	237
SJ-2B4004T .....	238
SJ-2B4003T .....	239
SJ-2B4B01T .....	240
SJ-2B4201T .....	241
SJ-2B4218T .....	242
SJ-2B4202T .....	243
SJ-2B4215T .....	244
SJ-2B4203T .....	245
SJ-2B4219T .....	246
SJ-2B4311TK .....	247
SJ-2B4501TK .....	248
SJ-2B6611TK .....	249
SJ-2B4502TK .....	250
SJ-2B6602TK .....	251
SJ-2B4601TK .....	252
SJ-2B6605TK .....	253
SJ-2B4503TK .....	254
SJ-2B6603TK .....	255
SJ-2B4602TK .....	256
SJ-2B6720TK .....	257
SJ-2B6705TK .....	258
SJ-2B6711TK .....	259
SJ-2B6706TK .....	260
SJ-2B6721TK .....	261
SJ-2B6704TK .....	262
SJ-2B6709TK .....	263
SJ-2B6802TK .....	264
SJ-2B6905TK .....	265
SJ-2B6908TK .....	266
SJ-2B6906TK .....	267
SJ-2B6914TK .....	268
SJ-PMB02215T-02 .....	269
SJ-PMB04412T-B0 .....	270
SJ-PMB14007T-01 .....	271

Tool Spindle Motor .....	273
HG46.....	274
HG56.....	275
HG96.....	276
HG75.....	277
HG105.....	278
HG54.....	279
HG104.....	280
HG154.....	281
HG224.....	282
HG204.....	283
HG354.....	284
HG453.....	285
HG703.....	286
HG903.....	287
HG-JR73.....	288
HG-JR153.....	289
Servo Drive Unit .....	291
MDS-E-V1-20.....	292
MDS-E-V1-40.....	293
MDS-E-V1-80.....	294
MDS-E-V1-160.....	295
MDS-E-V1-160W .....	296
MDS-E-V1-320.....	297
MDS-E-V1-320W .....	298
MDS-E-V2-20.....	299
MDS-E-V2-40.....	300
MDS-E-V2-80.....	301
MDS-E-V2-160.....	302
MDS-E-V2-160W .....	303
MDS-E-V3-20.....	304
MDS-E-V3-40.....	305
MDS-E-V3-80.....	306
MDS-EJ-V1-10.....	307
MDS-EJ-V1-15.....	308
MDS-EJ-V1-30.....	309
MDS-EJ-V1-40.....	310
MDS-EJ-V1-80.....	311
MDS-EJ-V1-100.....	312
MDS-EJ-V2-30.....	313
MDS-EJ-V2-40.....	314
Multi Axis Unit .....	315
MDS-EM-SPV3-16040S .....	316
MDS-EM-SPV3-10040.....	317
MDS-EM-SPV3-10080.....	318
MDS-EM-SPV3-16040.....	319
MDS-EM-SPV3-16080.....	320
MDS-EM-SPV3-20080.....	321
MDS-EM-SPV3-200120.....	322
MDS-EM-SPV3-320120.....	323

Spindle Drive Unit .....	325
MDS-E-SP-20 .....	326
MDS-E-SP-40 .....	327
MDS-E-SP-80 .....	328
MDS-E-SP-160 .....	329
MDS-E-SP-200 .....	330
MDS-E-SP-240 .....	331
MDS-E-SP-320 .....	332
MDS-E-SP-400 .....	333
MDS-E-SP-640 .....	334
MDS-E-SP2-20 .....	335
MDS-E-SP2-40 .....	336
MDS-E-SP2-80 .....	337
MDS-E-SP2-16080 .....	338
MDS-EJ-SP-20 .....	339
MDS-EJ-SP-40 .....	340
MDS-EJ-SP-80 .....	341
MDS-EJ-SP-100 .....	342
MDS-EJ-SP-120 .....	343
MDS-EJ-SP-160 .....	344
MDS-EJ-SP2-20 .....	345
Power Supply Unit.....	347
MDS-E-CV-37 .....	348
MDS-E-CV-75 .....	349
MDS-E-CV-110 .....	350
MDS-E-CV-185 .....	351
MDS-E-CV-300 .....	352
MDS-E-CV-370 .....	353
MDS-E-CV-450 .....	354
MDS-E-CV-550 .....	355
Dynamic Brake Unit (MDS-D-DBU) .....	356
Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060).....	358
Ball Screw Side Encoder (OSA405ET2AS, OSA676ET2AS) .....	367
Regenerative Option for MDS-EJ.....	369
Encoder for Spindle Motor .....	378
Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series) .....	379
Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series).....	381
Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR.....	404
Serial Signal Division Unit MDS-B-SD .....	409
DC Connection Bar .....	411
Power Backup Unit (MDS-D-PFU).....	412
Regenerative Resistor for Power Backup Unit (R-UNIT-7).....	416
Capacitor Unit for Power Backup Unit (MDS-D-CU).....	418

## **400V System Servo/spindle Drive System ..... 421**

System Configuration.....	422
Explanation of Type .....	425

1. Servo motor type.....	425
2. Linear servo motor type .....	426
3. Servo drive unit type .....	427
4. Multi Axis Unit .....	430
5. Spindle motor type .....	431
6. Built-in spindle motor type.....	432
7. Tool spindle motor type.....	432
8. Spindle drive unit type.....	433
9. Power supply unit type.....	433
10. AC reactor type .....	433
<b>Servo Motor.....</b>	<b>435</b>
HG-H75 .....	436
HG-H105.....	440
HG-H54 .....	444
HG-H104 .....	446
HG-H154.....	448
HG-H224.....	450
HG-H204.....	452
HG-H354 .....	454
HG-H453.....	456
HG-H703.....	458
HG-H903.....	460
HG-H1502.....	462
HQ-H903.....	464
HQ-H1103.....	466
HK-H76 .....	468
HK-H105 .....	470
HK-H55 .....	472
HK-H104 .....	474
HK-H123 .....	476
HK-H154 .....	478
HK-H223 .....	480
HK-H224 .....	482
HK-H204 .....	484
HK-H302 .....	486
HK-H303 .....	488
HK-H354 .....	490
HK-H453 .....	492
HK-H603 .....	494
HK-H702 .....	496
HK-H703 .....	498
<b>Linear Motor .....</b>	<b>501</b>
LM-FP5H-60M .....	502
<b>Spindle Motor .....</b>	<b>505</b>
SJ-4-V2.2-03T.....	506
SJ-4-V3.7-03T.....	507
SJ-4-V5.5-07T.....	508
SJ-4-V7.5-12T.....	509
SJ-4-V7.5-13ZT .....	510
SJ-4-V11-18T.....	511
SJ-4-V18.5-14T.....	512

SJ-4-V22-18ZT .....	513
SJ-4-V22-15T.....	514
SJ-4-V26-08ZT .....	515
SJ-4-V37-04ZT .....	516
SJ-4-V45-02T.....	517
SJ-4-V55-03T.....	518
SJ-4-V15-20T.....	519
SJ-4-V22-16T.....	520
<b>Built-in Spindle Motor .....</b>	<b>521</b>
SJ-4BG160D/150-01.....	522
SJ-4BG180F/150-01 .....	523
SJ-4BG300C/080-02.....	524
SJ-4BGS160B/300-01 .....	525
SJ-4BGS210B/120-01 .....	526
SJ-4BGS240B/120-01 .....	527
<b>Tool Spindle Motor .....</b>	<b>529</b>
HG-JR734 .....	530
HG-JR1534 .....	531
<b>Servo Drive Unit .....</b>	<b>533</b>
MDS-EH-V1-10 .....	534
MDS-EH-V1-20 .....	535
MDS-EH-V1-40 .....	536
MDS-EH-V1-80 .....	537
MDS-EH-V1-80W.....	538
MDS-EH-V1-160 .....	539
MDS-EH-V1-160W.....	540
MDS-EH-V1-200 .....	541
MDS-EH-V2-10 .....	542
MDS-EH-V2-20 .....	543
MDS-EH-V2-40 .....	544
MDS-EH-V2-80 .....	545
MDS-EH-V2-80W.....	546
MDS-EH-V2-160 .....	547
MDS-EH-V3-40 .....	548
MDS-EJH-V1-10 .....	549
MDS-EJH-V1-15 .....	550
MDS-EJH-V1-20 .....	551
MDS-EJH-V1-40 .....	552
<b>Multi Axis Unit .....</b>	<b>553</b>
MDS-EMH-SPV3-8040 .....	554
MDS-EMH-SPV3-10040 .....	555
MDS-EMH-SPV3-10060 .....	556
<b>Spindle Drive Unit .....</b>	<b>557</b>
MDS-EH-SP-20.....	558
MDS-EH-SP-40.....	559
MDS-EH-SP-80.....	560
MDS-EH-SP-100.....	561
MDS-EH-SP-160.....	562
MDS-EH-SP-200.....	563
MDS-EH-SP-320.....	564
MDS-EH-SP-480.....	565



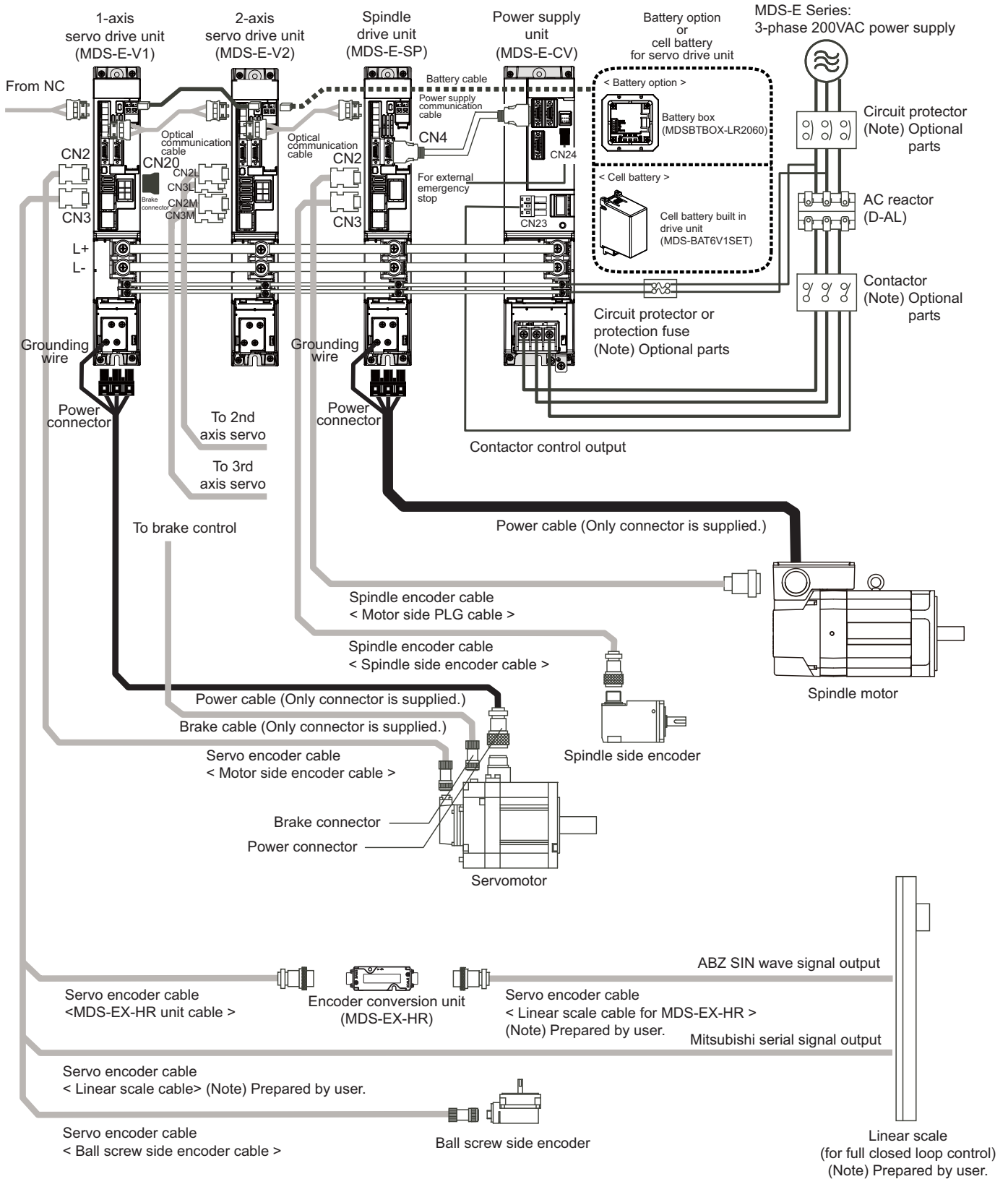
MDS-EH-SP-600.....	566
Power Supply Unit.....	567
MDS-EH-CV-37 .....	568
MDS-EH-CV-75 .....	569
MDS-EH-CV-110 .....	570
MDS-EH-CV-185 .....	571
MDS-EH-CV-300 .....	572
MDS-EH-CV-370 .....	573
MDS-EH-CV-450 .....	574
MDS-EH-CV-550 .....	575
MDS-EH-CV-750 .....	576
Dynamic Brake Unit (MDS-D-DBU) .....	577
Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060).....	579
Ball Screw Side Encoder (OSA405ET2AS, OSA676ET2AS) .....	588
Regenerative Option for MDS-EJH .....	590
Encoder for Spindle Motor .....	593
Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series) .....	594
Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series).....	596
Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR.....	619
Serial Signal Division Unit MDS-B-SD .....	624
DC Connection Bar .....	626
Power Backup Unit (MDS-DH-PFU) .....	627
Regenerative Resistor for Power Backup Unit (R-UNIT-6).....	631
Capacitor Unit for Power Backup Unit (MDS-DH-CU) .....	633

(Note) The characteristic values and numerical values without tolerances mentioned in this manual are representative values.

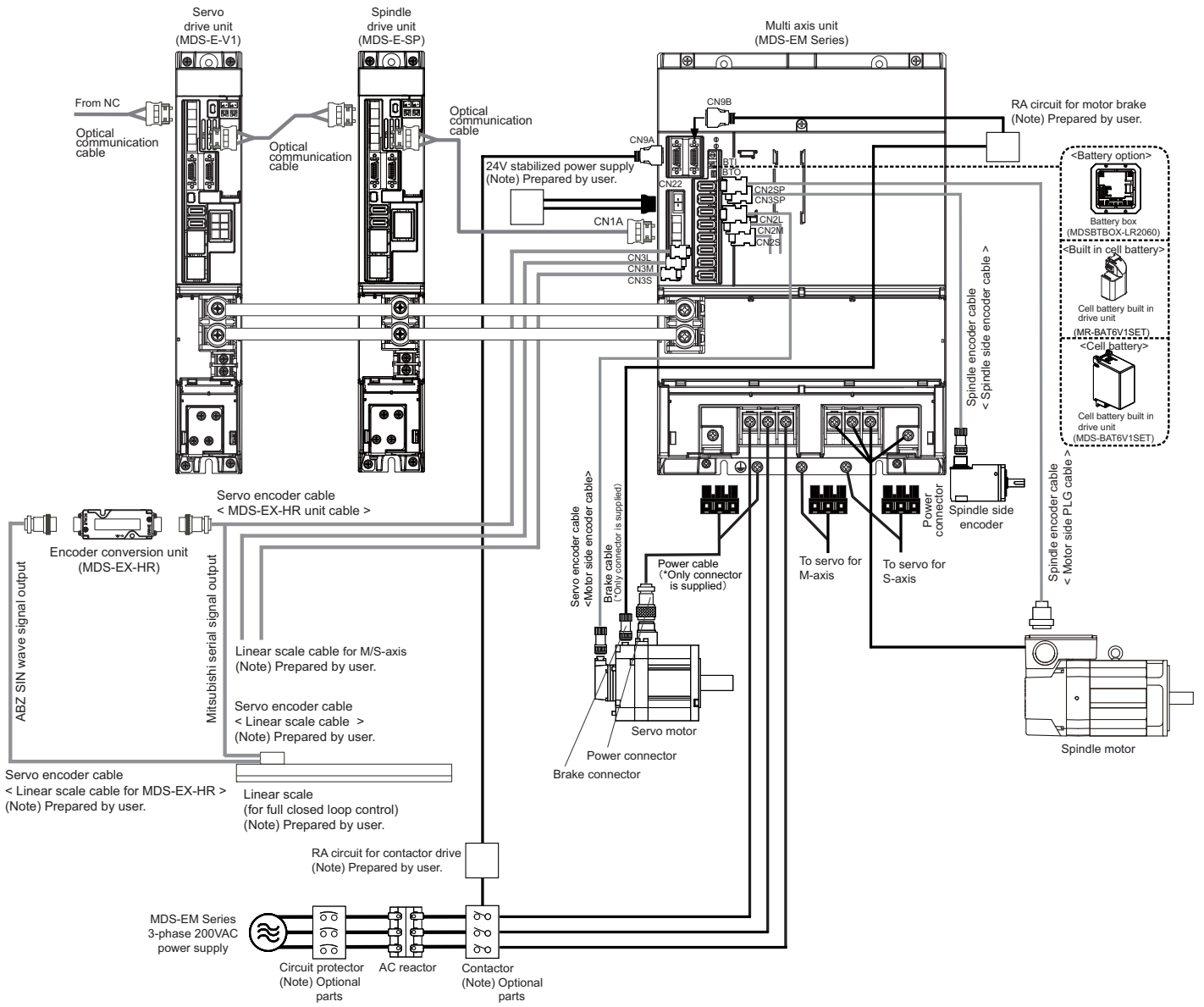
# **200V System Servo/spindle Drive System**

System Configuration

< MDS-E Series >

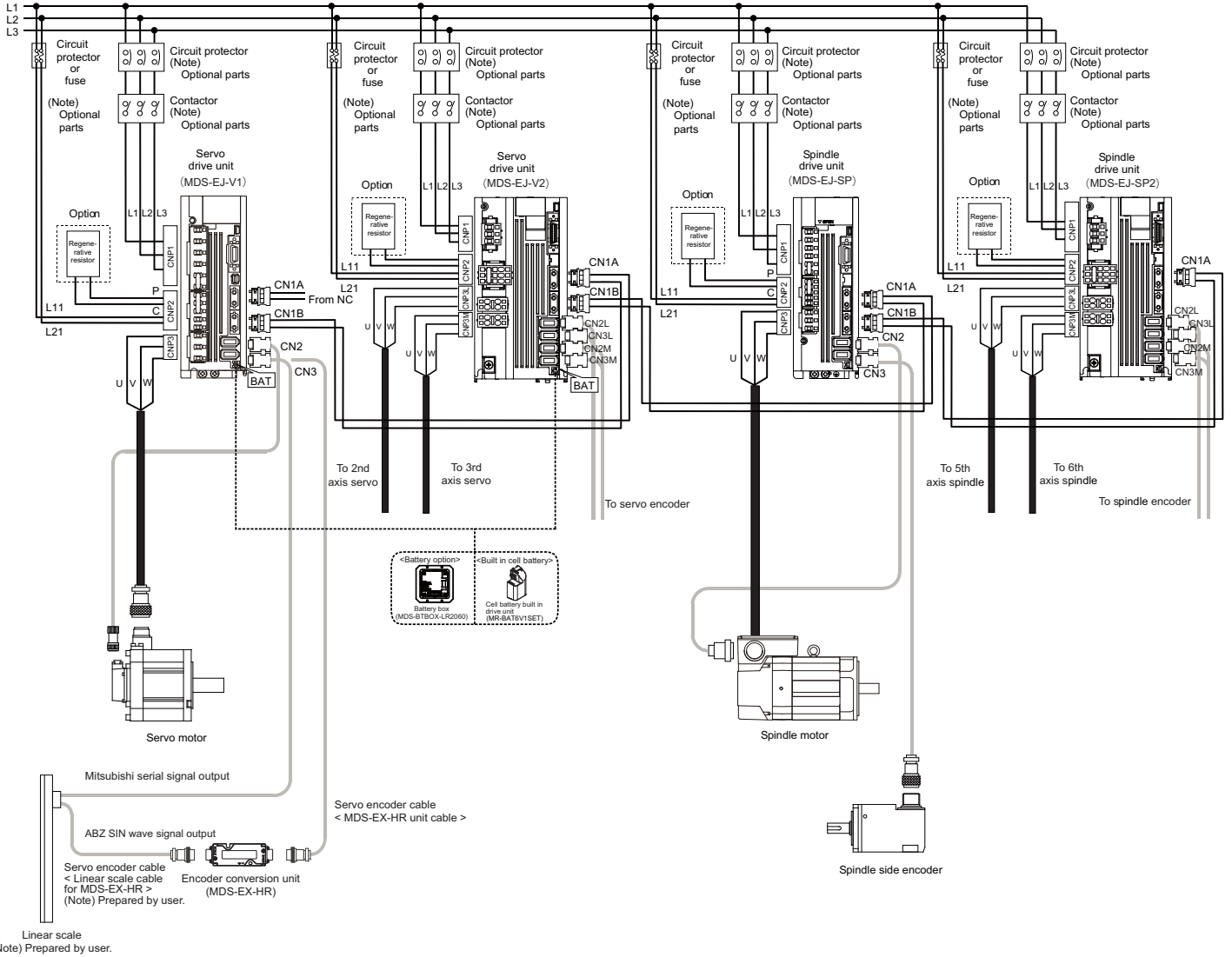


< MDS-EM Series >

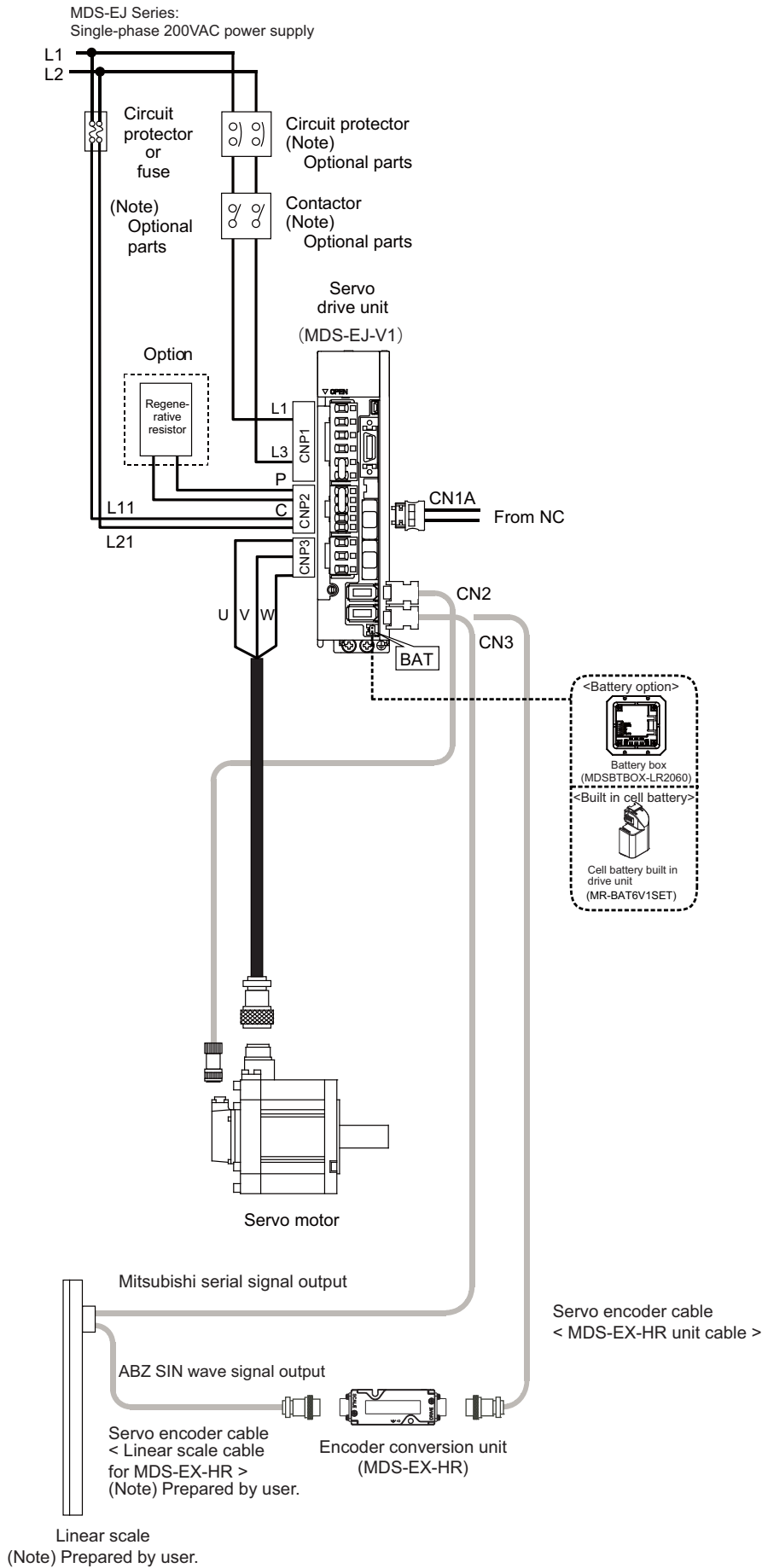


< MDS-EJ Series >

MDS-EJ Series:  
3-phase 200VAC power supply



< For single-phase power supply >



Explanation of Type

1. Servo motor type

< HG Series >

HG (1) (2) (3) - (4) - (5)

(1) Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
46	0.2 kW	6000 r/min	60 SQ.
56	0.4 kW	6000 r/min	60 SQ.
96	0.75 kW	6000 r/min	80 SQ.
75	0.75 kW	5000 r/min	90 SQ.
105	1.0 kW	5000 r/min	90 SQ.
54	0.5 kW	4000 r/min	130 SQ.
104	1.0 kW	4000 r/min	130 SQ.
154	1.5 kW	4000 r/min	130 SQ.
224	2.2 kW	4000 r/min	130 SQ.
204	2.0 kW	4000 r/min	176 SQ.
354	3.5 kW	4000 r/min	176 SQ.
123	1.2 kW	3000 r/min	130 SQ.
223	2.2 kW	3000 r/min	130 SQ.
303	3.0 kW	3000 r/min	176 SQ.
453	4.5 kW	3500 r/min	176 SQ.
603	6.0 kW	3000 r/min	176 SQ.
702	7.0 kW	2000 r/min	176 SQ.
703	7.0 kW	3000 r/min	176 SQ.
903	9.0 kW	3000 r/min	204 SQ.
1103	11.0 kW	3000 r/min	220 SQ.
142	1.4 kW	2000 r/min	130 SQ.
302	3.0 kW	2000 r/min	176 SQ.

(3) Shaft end structure

Symbol	Shaft end structure
K	With keyway (with key)
S	Straight
T	Taper

(Note 1) "Taper" is available for the motor whose flange size is 90 SQ. mm or 130 SQ. mm.  
 (Note 2) "K: With keyway (with key)" is only available for HG46/56/96.

(2) Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brakes

(5) Encoder

Symbol	Type	Detection method	Resolution
D47	OSA24RS-120	Absolute position	1,048,576 p/rev
D48	OSA24RS		1,048,576 p/rev
D51	OSA40S5AS		4,194,304 p/rev
D74	OSA676S5AS		67,108,864 p/rev

(Note) Encoder D47 can only be used with HG46/56/96.

(4) Power connector

Symbol	Connector
None	Normal
S105010	Compact (horizontal direction)

(Note) S105010 can only be used with HG75/105.

< HK Series >

HK (1) (2) (3) - (4)

(1) Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
76	0.75 kW	6700 r/min	90 SQ.
105	1.0 kW	5000 r/min	90 SQ.
55	0.5 kW	5000 r/min	130 SQ.
104	1.0 kW	4500 r/min	130 SQ.
123	1.2 kW	3500 r/min	130 SQ.
142	1.4 kW	2000 r/min	130 SQ.
154	1.5 kW	4500 r/min 4000 r/min (MDS-E-V3-40)	130 SQ.
223	2.2 kW	3000 r/min	130 SQ.
224	2.2 kW	4500 r/min	130 SQ.
204	2.0 kW	4000 r/min	176 SQ.
302	3.0 kW	2000 r/min	176 SQ.
303	3.0 kW	3000 r/min	176 SQ.
354	3.5 kW	4000 r/min 3500 r/min (MDS-EJ)	176 SQ.
453	4.5 kW	3500 r/min	176 SQ.
603	6.0 kW	3000 r/min	176 SQ.
702	7.0 kW	2000 r/min	176 SQ.
703	7.0 kW	3000 r/min	176 SQ.

(3) Shaft end structure

Symbol	Shaft end structure
K	With keyway (with key)
S	Straight
T	Taper

(Note 1) "Taper" is available for the motor whose flange size is 90 SQ. mm or 130 SQ. mm.

(2) Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brakes

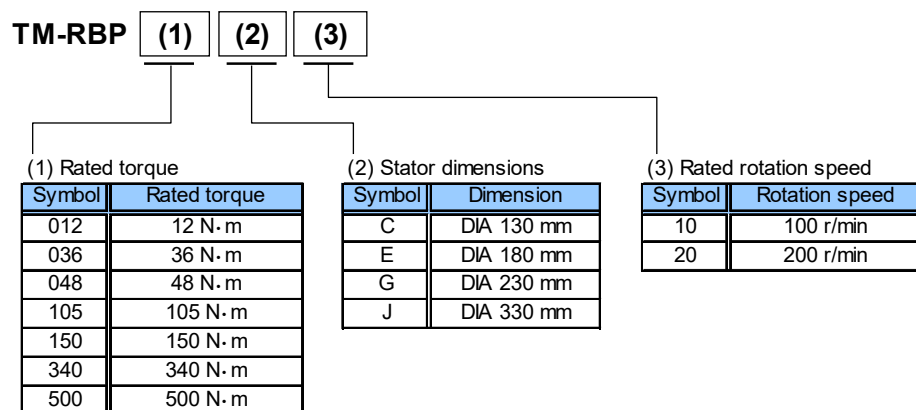
(4) Encoder

Symbol	Type	Detection method	Resolution
G48	CSW26KS	Batteryless absolute position	1,048,576 p/rev

2. Direct-drive motor type

TM-RB Series

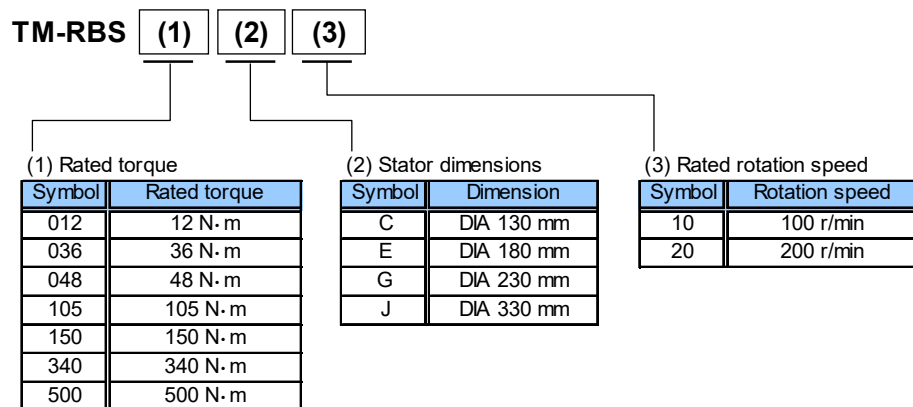
< Primary side (coil side) >



(Note 1) This explains the model name system of direct-drive motors, but does not mean all the combinations are available.

(Note 2) The primary and secondary sides having the same variable part of the name are combined to form a direct-drive motor.

< Secondary side (magnet side) >



(Note 1) This explains the model name system of direct-drive motors, but does not mean all the combinations are available.

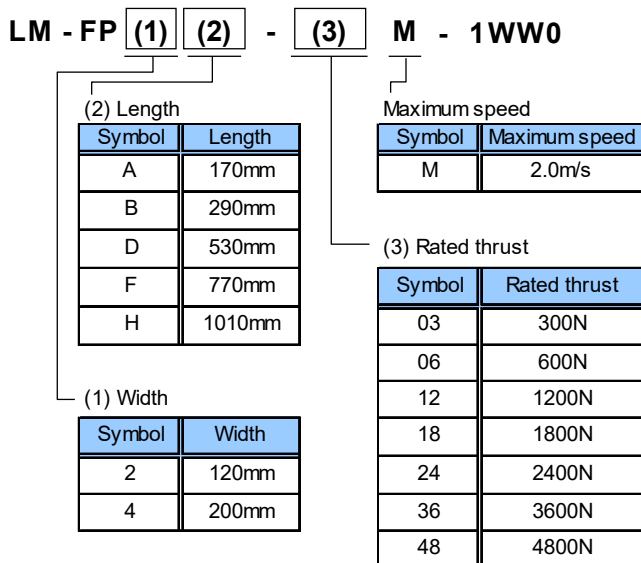
(Note 2) The primary and secondary sides having the same variable part of the name are combined to form a direct-drive motor.



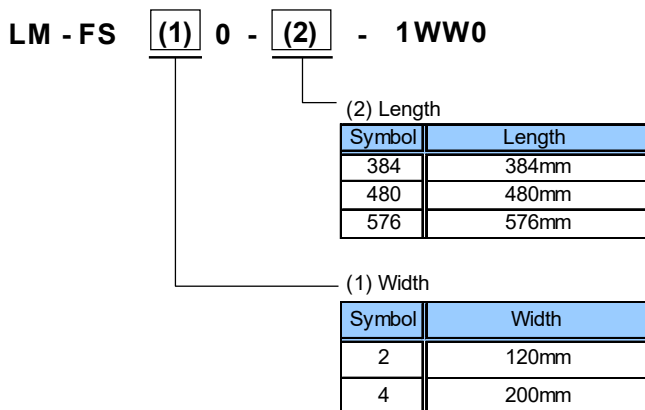
3. Linear servo motor type

LM-F Series

< Primary side: Coil >



< Secondary side: Magnet >



(Note 1) The linear dimension of 384mm is available for LM-FS20 only.

(Note 2) This explains the model name system of a linear servo motor, and all combinations of motor types listed above do not exist.

4. Servo drive unit type

< 1-axis servo drive unit >

MDS-E-V1- (1)

(1) Unit Type MDS-E-V1-		Compatible motor type	HG□																						
Unit width	Unit nominal maximum current		46	56	96	75	105	54	104	154	224	204	354	123	223	303	453	603	702	703	903	1103	142	302	
20	60mm	20A	●	●	●	●	●							●										●	
40		40A						●	●						●										●
80		80A								●	●	●				●									
160		160A											●					●	●	●					
160W	90mm	160A																		●					
320	120mm	320A																				●			
320W	150mm	320A																					●		

● Indicates the compatible motor for each servo drive unit.

MDS-E-V1- (1)

(1) Unit Type MDS-E-V1-		Compatible motor type	HK□																
Unit width	Unit nominal maximum current		76	105	55	104	123	142	154	223	224	204	302	303	354	453	603	702	703
20	60mm	20A	●	●			●	●											
40		40A			●	●			●				●						
80		80A							●		●	●		●					
160		160A									●				●	●	●	●	
160W	90mm	160A																●	
320	120mm	320A																	
320W	150mm	320A																	

● Indicates the compatible motor for each servo drive unit.

**CAUTION**

The dynamic brake unit (MDS-D-DBU) is required for the MDS-E-V1-320W.

MDS-EJ-V1- (1)

(1) Unit Type MDS-EJ-V1-		Compatible motor type	HG□															
Unit width	Unit nominal maximum current		46	56	96	75	105	54	104	154	224	204	354	123	223	303	142	302
10	40mm	10A	●															
15	40mm	15A		●														
30	60mm	30A			●	●	●	●										
40	90mm	40A							●				●	●		●	●	
80	90mm	80A								●	●	●			●			
100	90mm	100A										●						

● Indicates the compatible motor for each servo drive unit.

MDS-EJ-V1- (1)

(1) Unit Type MDS-EJ-V1-		Compatible motor type	HK□											
Unit width	Unit nominal maximum current		76	55	104	123	142	154	223	224	204	302	303	354
10	40mm	10A												
15	40mm	15A												
30	60mm	30A	●	●										
40	90mm	40A			●	●	●		●			●		
80	90mm	80A						●		●	●		●	
100	90mm	100A											●	

● Indicates the compatible motor for each servo drive unit.

< 2-axis servo drive unit >

MDS-E-V2- (1)

(1) Unit Type MDS-E-V2-		Compatible motor type	HG□																					
Unit width	Unit nominal maximum current		46	56	96	75	105	54	104	154	224	204	354	123	223	303	453	603	702	703	903	142	302	
20	60mm	20A+20A (L+M axis)	●	●	●	●	●							●									●	
40		40A+40A (L+M axis)			●	●	●	●	●					●	●								●	●
80		80A+80A (L+M axis)						●	●	●	●	●			●	●								●
160	90mm	160A+160A (L+M axis)							●	●	●	●			●	●	●	●	●					
160W	120mm	160A+160A (L+M axis)											●				●			●				

● Indicates the compatible motor for each servo drive unit.

MDS-E-V2- (1)

(1) Unit Type MDS-E-V2-		Compatible motor type	HK□																
Unit width	Unit nominal maximum current		76	105	55	104	123	142	154	223	224	204	302	303	354	453	603	702	703
20	60mm	20A+20A (L+M axis)	●	●			●	●											
40		40A+40A (L+M axis)	●	●	●	●	●	●		●			●						
80		80A+80A (L+M axis)			●	●			●	●	●	●	●	●					
160	90mm	160A+160A (L+M axis)						●	●	●	●		●	●	●	●	●		
160W	120mm	160A+160A (L+M axis)												●	●			●	

● Indicates the compatible motor for each servo drive unit.

MDS-EJ-V2- (1)

(1) Unit Type MDS-EJ-V2-		Compatible motor type	HG□																	
Unit width	Unit nominal maximum current		46	56	96	75	105	54	104	154	224	204	354	123	223	303	453	603	702	703
30	85mm	30A+30A (L+M axis)			●	●	●	●												
40	105mm	40A+40A (L+M axis)							●					●	●				●	●

● Indicates the compatible motor for each servo drive unit.

MDS-EJ-V2- (1)

(1) Unit Type MDS-EJ-V2-		Compatible motor type	HK□											
Unit width	Unit nominal maximum current		76	55	104	123	142	154	223	224	204	302	303	354
30	85mm	30A+30A (L+M axis)	●	●										
40	105mm	40A+40A (L+M axis)			●	●			●			●		

● Indicates the compatible motor for each servo drive unit.

< 3-axis servo drive unit >

MDS-E-V3- (1)

(1) Unit Type MDS-E-V3-	Compatible motor type	HG□														
		46	56	96	75	105	54	104	154	224	204	123	223	303	142	302
Unit width	Stall torque (N·m) Unit nominal maximum current	0.64	1.3	2.4	2.0	3.0	2.9	5.9	9.0	12.0	13.7	7.0	12.0	22.5	11.0	20.0
20	60mm	20A+20A+20A (L+M+S axis)	●	●	●	●	●						●			●
40		40A+40A+40A (L+M+S axis)			●	●	●	●	●	□			●	●		●
80	90mm	80A+80A+80A (L+M+S axis)						●	●	●	●	●	●	●		●

● Indicates the compatible motor for each servo drive unit.  
 □ Indicates the motor that can be combined with the drive unit although the stall torque and maximum torque are limited.  
 When combining MDS-E-V3-40 with HG154, stall torque is 7.0N·m.

MDS-E-V3- (1)

(1) Unit Type MDS-E-V3-	Compatible motor type	HK□											
		76	105	55	104	123	142	154	223	224	204	302	303
Unit width	Stall torque (N·m) Unit nominal maximum current	3.0	4.8	3.5	8.6	7.5	11.0	9.5	15.0	14.0	15.0	20.0	22.5
20	60mm	20A+20A+20A (L+M+S axis)	●	●			●	●					
40		40A+40A+40A (L+M+S axis)	●	●	●	●	●	●	●			●	
80	90mm	80A+80A+80A (L+M+S axis)			●	●		□	●	●	●	●	

● Indicates the compatible motor for each servo drive unit.  
 □ Indicates the motor that can be combined with the drive unit although the stall torque and maximum torque are limited.  
 When combining MDS-E-V3-80 with HK154, stall torque is 9.0N·m.

5. Multi Axis Unit

MDS-EM-SPV3- (1)

(1) Drive unit capacity	Spindle nominal maximum current	Servo nominal maximum current	Unit width	Power supply capacity
16040S	160A	40A	180mm	15kW
10040	100A	40A	260mm	20kW
10080	100A	80A		
16040	160A	40A		
16080	160A	80A		
20080	200A	80A		
200120	200A	120A		
320120	320A	120A	300mm	37kW

S indicates the slim type.

Servo capacity	Compatible servo motor type Stall torque (N·m) Servo axis configuration	HG□														
		96	75	105	54	104	154	224	204	354	123	223	303	453	702	142
40	40A+40A+40A (L+M+S axis)	●	●	●	●	●					●	●			●	●
80	80A+80A+80A (L+M+S axis)				●	●	●	●	●			●	●			●
120	120A+120A+120A (L+M+S axis)								●	●	●	●			●	●

● Indicates the compatible motor for each servo drive unit.

Servo capacity	Compatible servo motor type Stall torque (N·m) Servo axis configuration	HK□														
		76	105	55	104	123	142	154	223	224	204	302	303	354	453	702
40	40A+40A+40A (L+M+S axis)	●	●	●	●	●	●		●			●				
80	80A+80A+80A (L+M+S axis)			●	●				●	●	●	●	●			
120	120A+120A+120A (L+M+S axis)								●		●	●		●	●	●

● Indicates the compatible motor for each servo drive unit.

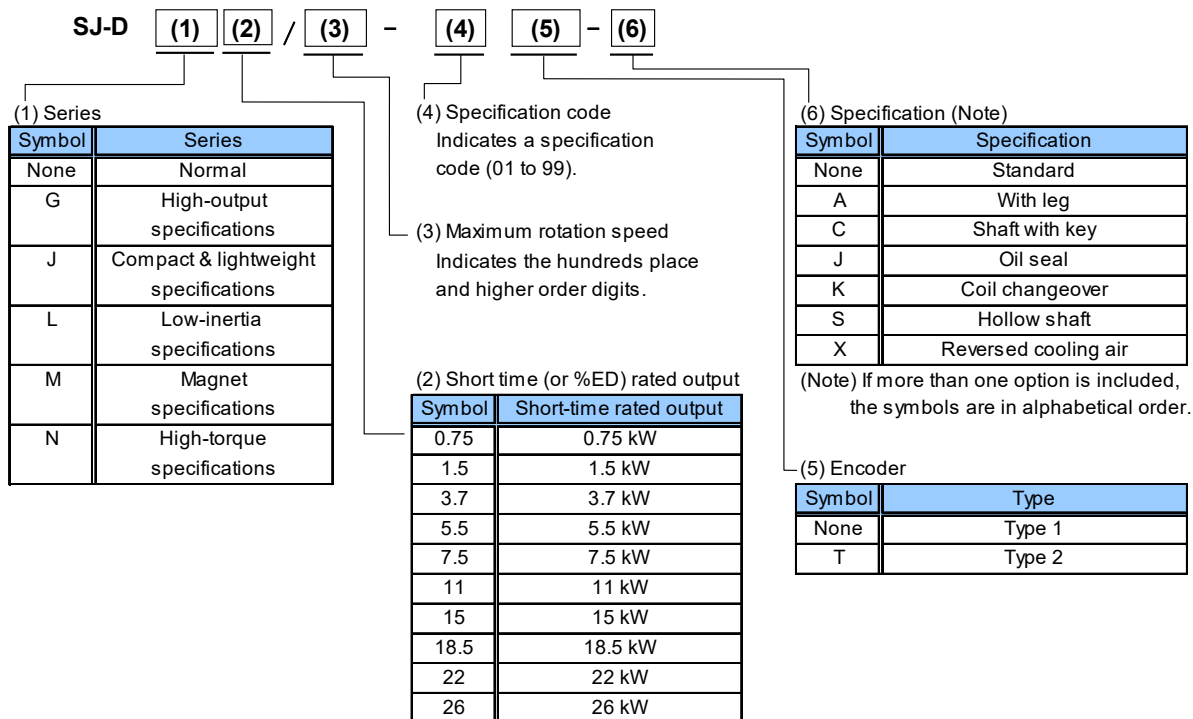


**POINT**

When the rotary switch is set to "4 to 7", driving by two servo motor axes (L axis + M axis) is available. Refer to "4.1.1 Setting the Rotary Switch" in "MDS-EM/EMH Series Instruction Manual" (IB-1501241(ENG)) for details.

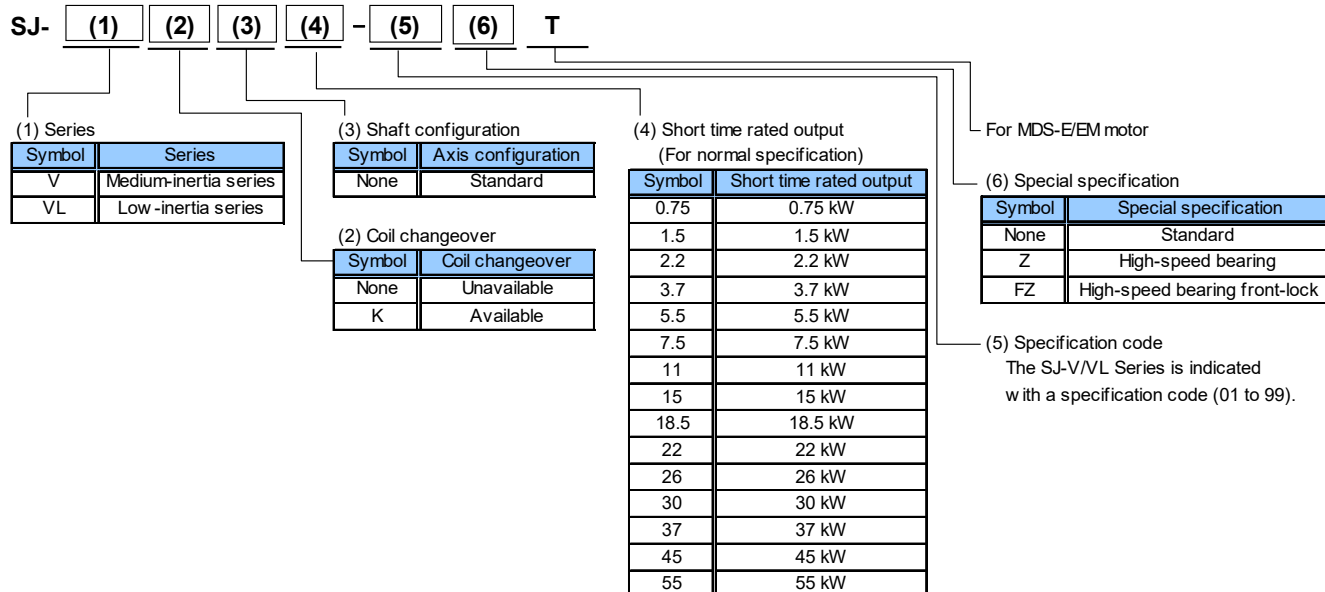
6. Spindle motor type

< SJ-D/DG/DJ/DL/DM/DN Series >



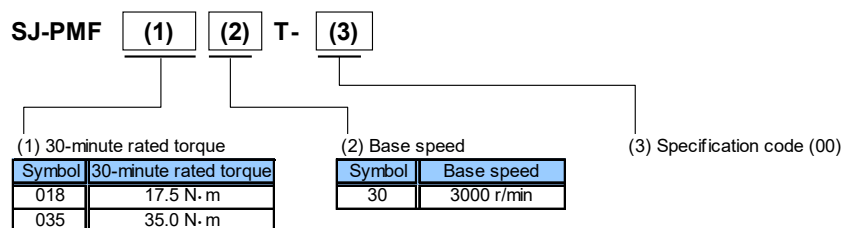
(Note) This explains the model name system of spindle motors, but does not mean all the combinations are available.

< SJ-V/VL Series >



(Note) This explains the model name system of spindle motors, but does not mean all the combinations are available.

< IPM spindle motor Series >

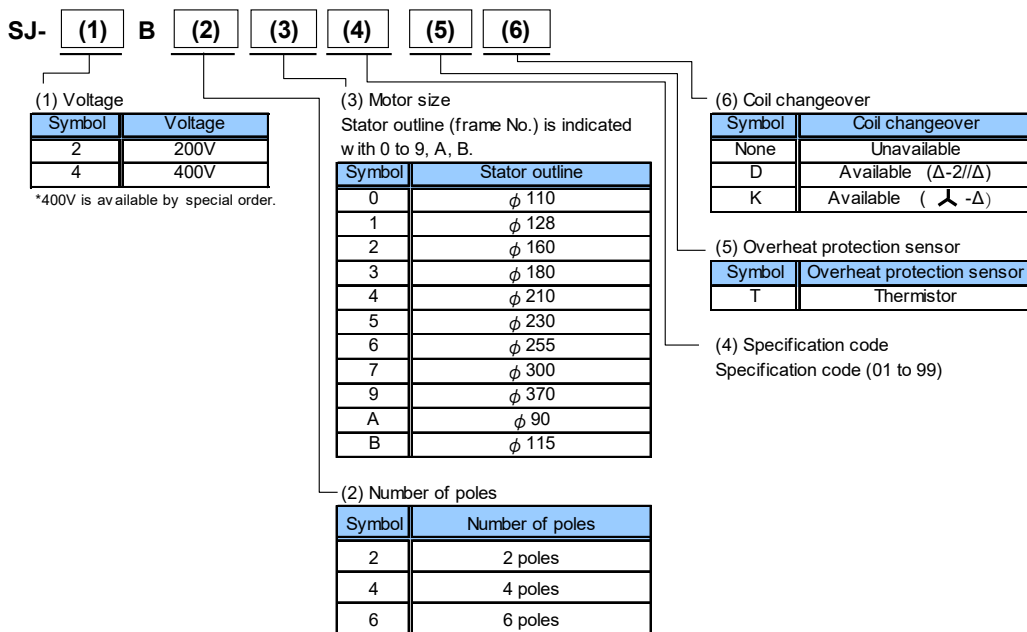


(Note 1) The built-in IPM spindle motor is available by special order.

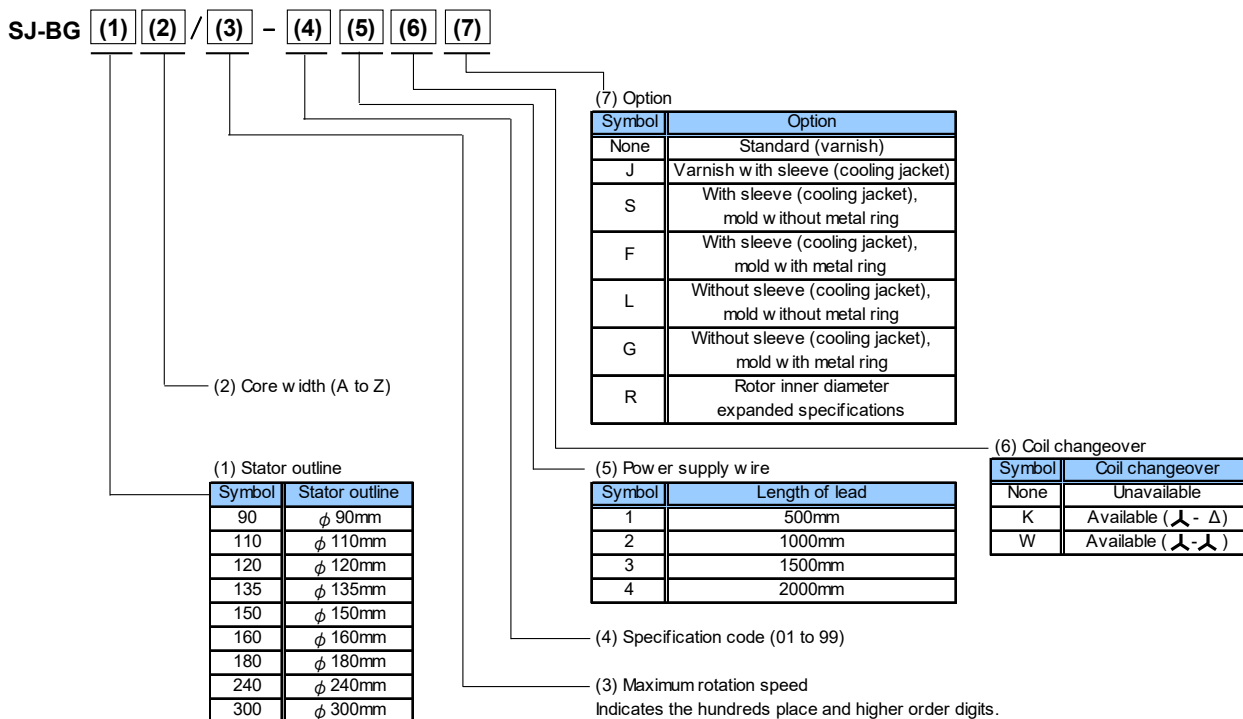
(Note 2) This explains the model name system of a spindle motor, and all combinations of motor types listed above do not exist.

7. Built-in spindle motor type

- (1) Built-in IM spindle motor < SJ-B Series >



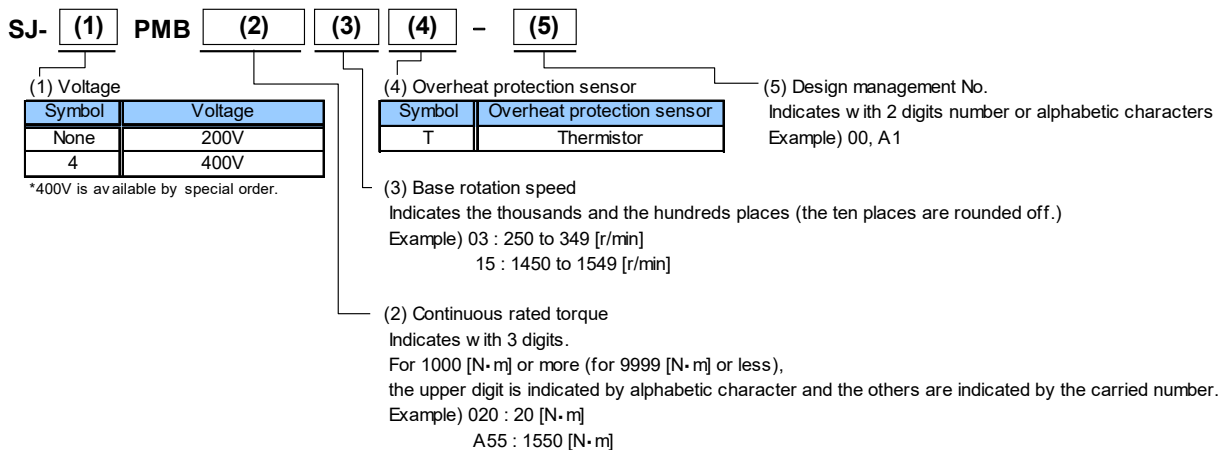
- < SJ-BG Series >



**CAUTION**

1. Check the rating table to see whether the coil changeover specification (Y-Y connection, Y-Δconnection) is included or not.
2. This explains the model name system of spindle motors, but does not mean all the combinations are available.

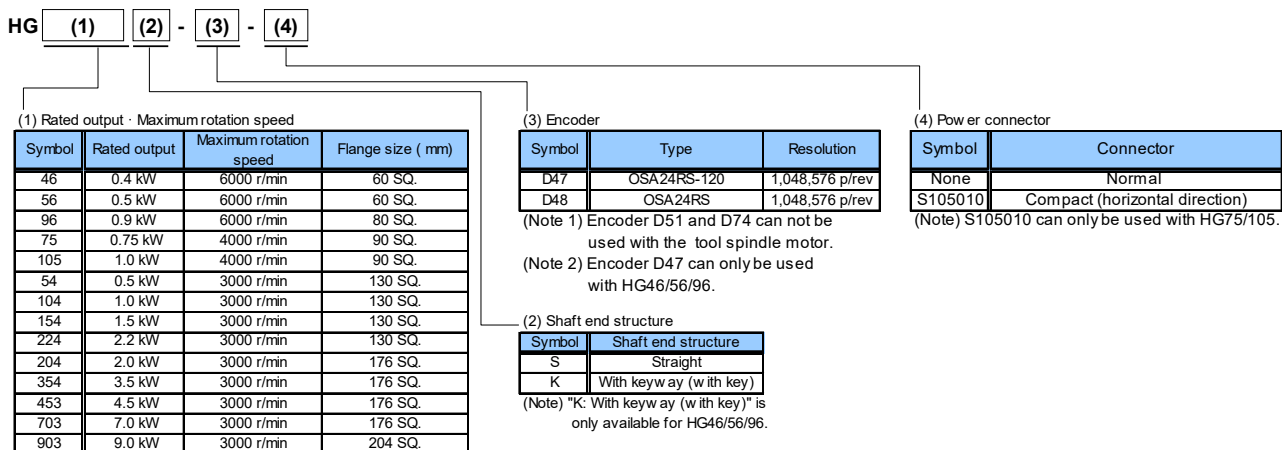
(2) Built-in IPM spindle motor  
< SJ-PMB Series >



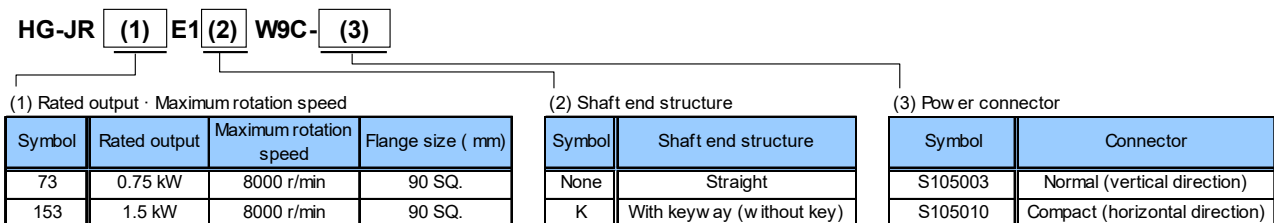
**CAUTION**

This explains the model name system of spindle motors, but does not mean all the combinations are available.

8. Tool spindle motor type  
< HG Series >



< HG-JR Series >





< Combination with spindle drive unit >

(a) 1-axis spindle drive unit

Unit Type MDS-E-SP-		Compatible motor type	HG□													
			46	56	96	75	105	54	104	154	224	204	354	453	703	903
Unit width		Rated torque (N·m) Unit nominal maximum current	0.64	0.8	1.43	1.8	2.4	1.6	3.2	4.8	7.0	6.4	11.1	14.3	22.3	28.7
20	60mm	20 A	●	●	●	●	●									
40		40 A						●	●							
80		80 A									●	●	●			
160	90mm	160 A											●	●	●	
200	120mm	200 A														
240	150mm	240 A														
320		320 A														
400	240mm	400 A														
640	300mm	640 A														

● Indicates the compatible motor for each spindle drive unit.

Unit Type MDS-EJ-SP-		Compatible motor type	HG□									
			46	56	96	75	105	54	104	154	224	204
Unit width		Rated torque (N·m) Unit nominal maximum current	0.64	0.8	1.43	1.8	2.4	1.6	3.2	4.8	7.0	6.4
20	60mm	20A	●	●	●	●	●	●				
40	90mm	40A							●			
80		80A								●	●	●
100	105mm	100A										
120		120A										
160	172mm	160A										

● Indicates the compatible motor for each spindle drive unit.

(b) 2-axis spindle drive unit

Unit Type MDS-E-SP2-		Compatible motor type	HG□												
			46	56	96	75	105	54	104	154	224	204	354	453	703
Unit width		Rated torque (N·m) Unit nominal maximum current	0.64	0.8	1.43	1.8	2.4	1.6	3.2	4.8	7.0	6.4	11.1	14.3	22.3
20	60mm	20A+20A (L+M axis)	●	●	●	●	●								
40		40A+40A (L+M axis)			●	●	●	●	●						
80	90mm	80A+80A (L+M axis)						●	●	●	●	●			
16080		160A+80A (L+M axis)								●	●	●	●	●	●

● Indicates the compatible motor for each spindle drive unit.

Unit Type MDS-EJ-SP2-		Compatible motor type	HG□									
			46	56	96	75	105	54	104	154	224	204
Unit width		Rated torque (N·m) Unit nominal maximum current	0.64	0.8	1.43	1.8	2.4	1.6	3.2	4.8	7.0	6.4
20	85mm	20A+20A (L+M axis)	●	●	●	●	●	●				

● Indicates the compatible motor for each spindle drive unit.

9. Spindle drive unit type

< 1-axis spindle drive unit >

MDS-E-SP- (1)

(1) Capacity

Symbol	Unit nominal maximum current	Unit width
20	20 A	60mm
40	40 A	
80	80 A	
160	160 A	90mm
200	200 A	120mm
240	240 A	150mm
320	320 A	
400	400 A	240mm (Note)
640	640 A	300mm (Note)

(Note) DC connection bar is required. Always install a large capacity drive unit (MDS-E-SP-400,640) in the left side of power supply unit, and connect with DC connection bar.

MDS-EJ-SP- (1)

(1) Capacity

Symbol	Unit nominal maximum current	Unit width
20	20A	60mm
40	40A	90mm
80	80A	
100	100A	105mm
120	120A	
160	160A	172mm

< 2-axis spindle drive unit >

MDS-E-SP2- (1)

(1) Capacity

Symbol	Unit nominal maximum current	Unit width
20	20 A+20 A (L+M axis)	60mm
40	40 A+40 A (L+M axis)	
80	80 A+80 A (L+M axis)	90mm
16080	160 A+80 A (L+M axis)	

MDS-EJ-SP2- (1)

(1) Capacity

Symbol	Unit nominal maximum current	Unit width
20	20A+20A (L+M axis)	85mm

10. Power supply unit type

MDS-E-CV- (1)

Power supply unit				Compatible AC reactor	Compatible contactor (Mitsubishi) (Note 1)	Compatible circuit protector (Mitsubishi) (Note 1)
(1) Type MDS-E-CV-	30-minute rated output	Continuous rated output	Unit width			
37	3.7kW	2.2kW	60mm	D-AL-7.5K	S-T12-AC200V	NF63-CW3P-20A
75	7.5kW	5.5kW			S-T35-AC200V	NF63-CW3P-40A
110	11.0kW	7.5kW	90mm	D-AL-11K	S-T65-AC200V	NF63-CW3P-50A
185	18.5kW	15.0kW				
300	30.0kW	26.0kW	150mm (Note 2)	D-AL-30K	S-T80-AC200V	NF250-CW3P-125A
370	37.0kW	30.0kW		D-AL-37K	S-N150-AC200V	NF250-CW3P-175A
450	45.0kW	37.0kW		D-AL-45K		NF250-CW3P-200A
550	55.0kW	45.0kW	300mm (Note 2)	D-AL-55K	S-N180-AC200V	NF250-CW3P-225A

(Note 1) This is an optional part that is not included with the parts provided in the NC system.

(Note 2) When connecting with a large capacity drive unit, DC connection bar is required.

Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

11. AC reactor type

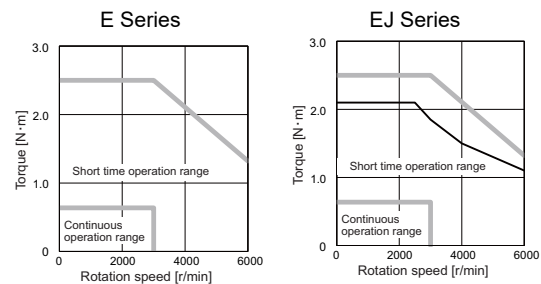
D-AL- (1)

AC reactor		Compatible power supply unit
(1) Type D-AL-	Capacity	
7.5K	7.5kW	MDS-E-CV-37
		MDS-E-CV-75
11K	11.0kW	MDS-E-CV-110
18.5K	18.5kW	MDS-E-CV-185
30K	30.0kW	MDS-E-CV-300
37K	37.0kW	MDS-E-CV-370
45K	45.0kW	MDS-E-CV-450
55K	55.0kW	MDS-E-CV-550

# Servo Motor

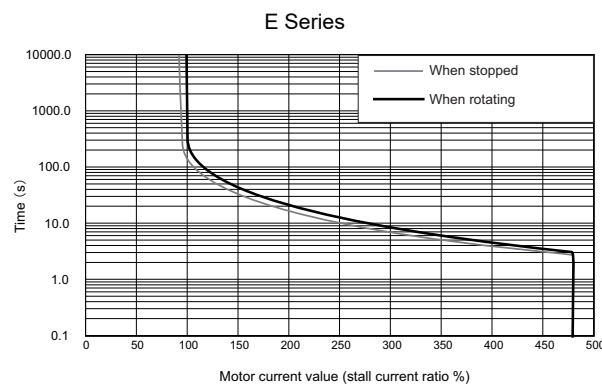
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
0.64N·m	3000r/min	HG46 □□-D47	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			S Straight (without keyway)
			K With keyway (with key)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 200V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of single-phase 200V input.  
 (\*3) When using single-phase 200 to 240VAC power supply use the servo drive unit with an effective load rate of 75% or lower.

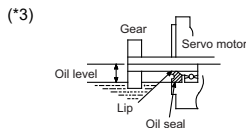
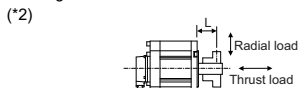
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1-
		MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	0.2
	Rated current[A]	1.3
	Rated torque[N·m]	0.64
	Stall current[A]	1.4
	Stall torque[N·m]	0.64
Maximum momentary output (For power supply selection) [kW]	0.85	-
Rated rotation speed[r/min]	3000	3000
Maximum rotation speed[r/min]	6000	6000
Maximum current[A]	5.3	5.3
Maximum torque[N·m]	2.5	2.5
Power rate at continuous rated torque[kW/s]	17.6	17.6
Max. deceleration torque of dynamic brake(Tdp) [N·m]	1.61	0.80
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.234	0.234
(Brake inertia) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.261	0.261
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	3.45	3.45
Mass	(Without) [kg]	1.2
	(With brake) [kg]	1.6
Heat-resistant class	130(B)	130(B)
Degree of protection	IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)
Cooling method	Totally enclosed natural-cooling	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:49(5), Y:49(5)	X:49(5), Y:49(5)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))	245 (L=30)
	Thrust load[N]	98
Oil level (*3) [mm]	12.5	12.5
Absolute position encoder	1,048,576 p/rev (D47)	MDS-E-V1/V2/V3
		MDS-EJ-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]  
 (\*4) Using on a non-interpolation axis is recommended.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

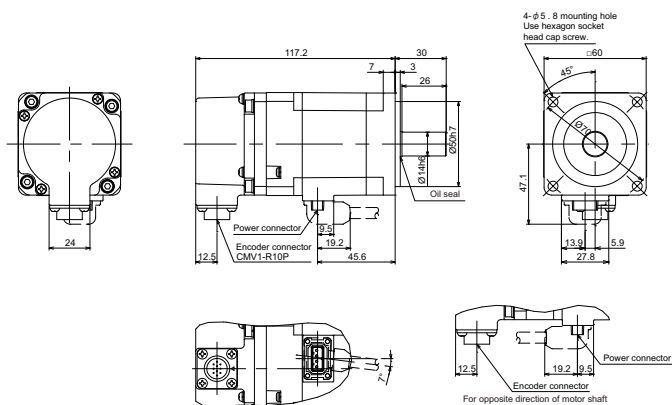
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	7.9
Static friction torque[N·m]	1.3 or more
Release delay time (*1) [s]	0.03
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

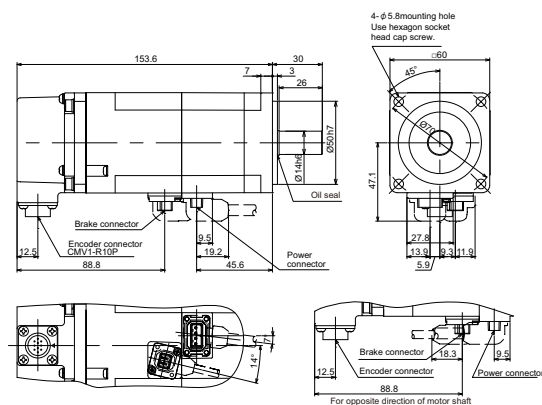
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

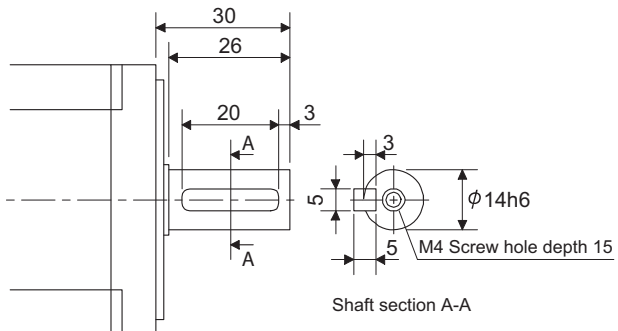
HG46S-D47



HG46BS-D47



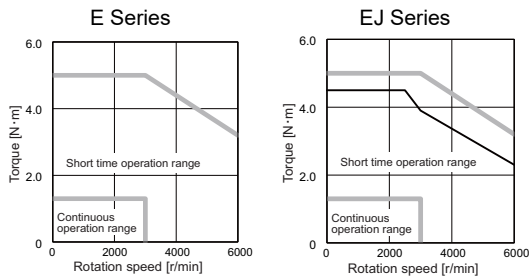
Shaft with keyway (HG46K/HG46BK-D47)



The appearance is the same as the straight (without keyway) except the shaft shape.

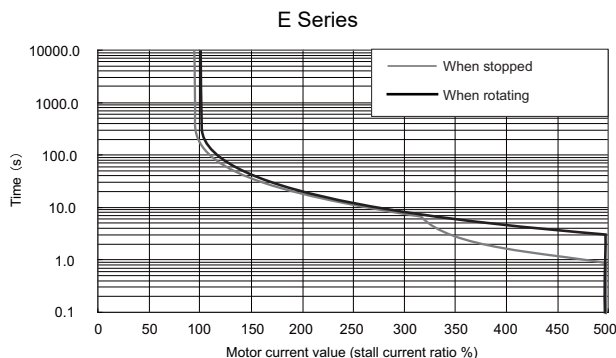
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
1.3N·m	3000r/min	HG56 □□-D47	(1) Magnetic brake
			B with brake
			None without brake
			(2) Shaft end
			S Straight (without keyway)
			K With keyway (with key)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 200V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of single-phase 200V input.  
 (\*3) When using single-phase 200 to 240VAC power supply use the servo drive unit with an effective load rate of 75% or lower.

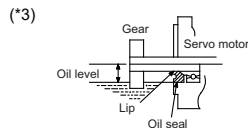
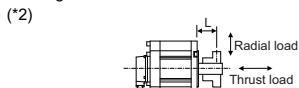
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-20
	2-axis type	MDS-E-V2-20
	3-axis type	MDS-E-V3-20
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1-15
Continuous characteristics	Rated output[kW]	0.4
	Rated current[A]	2.6
	Rated torque[N·m]	1.3
	Stall current[A]	2.6
	Stall torque[N·m]	1.3
Maximum momentary output (For power supply selection) [kW]	1.7	-
Rated rotation speed[r/min]	3000	3000
Maximum rotation speed[r/min]	6000	6000
Maximum current[A]	11.2	11.2
Maximum torque[N·m]	5.0	5.0
Power rate at continuous rated torque[kW/s]	42.7	42.7
Max. deceleration torque of dynamic brake(Tdp) [N·m]	3.09	1.55
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.379	0.379
(Brake inertia) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.407	0.407
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.64	5.64
Mass	(Without) [kg]	1.6
	(With brake) [kg]	2.0
Heat-resistant class	130(B)	130(B)
Degree of protection	IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)
Cooling method	Totally enclosed natural-cooling	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:49(5), Y:49(5)	X:49(5), Y:49(5)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))	245 (L=30)
	Thrust load[N]	98
Oil level (*3) [mm]	12.5	12.5
Absolute position encoder	1,048,576 p/rev (D47)	MDS-E-V1/V2/V3
		MDS-EJ-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) Using on a non-interpolation axis is recommended.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

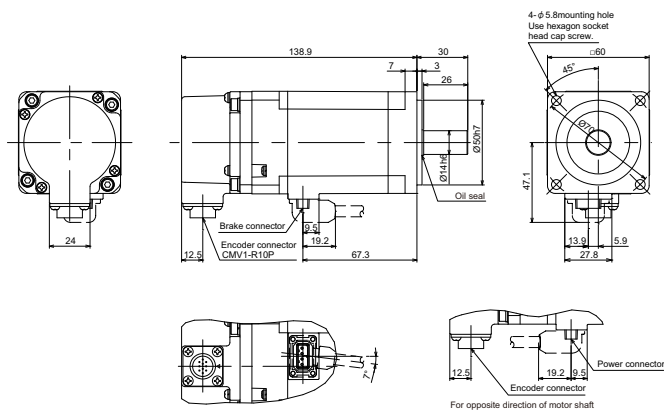
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	7.9
Static friction torque[N·m]	1.3 or more
Release delay time (*1) [s]	0.03
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

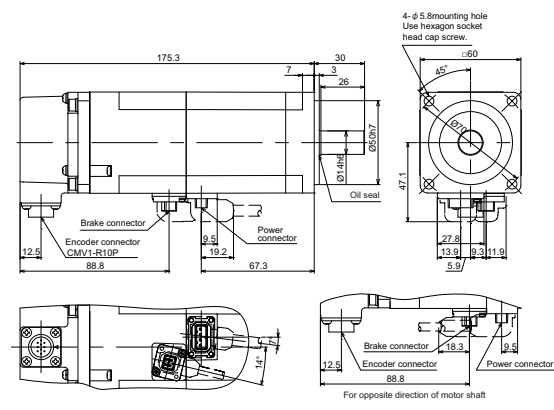
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

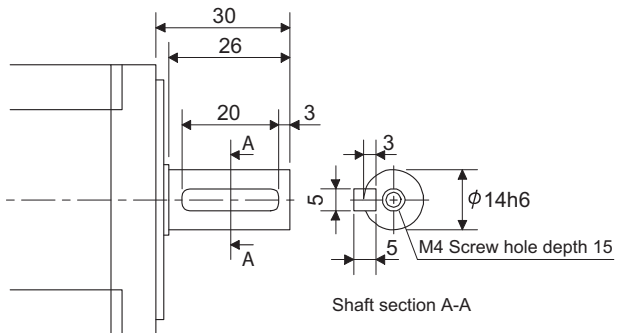
HG56S-D47



HG56BS-D47



Shaft with keyway (HG56K/HG56BK-D47)

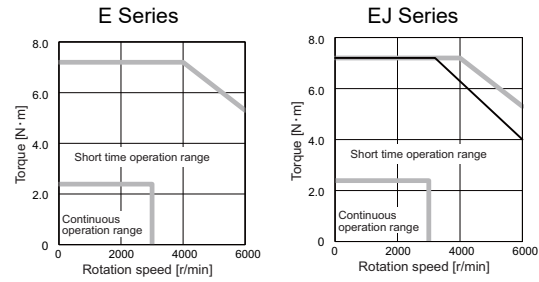


The appearance is the same as the straight (without keyway) except the shaft shape.



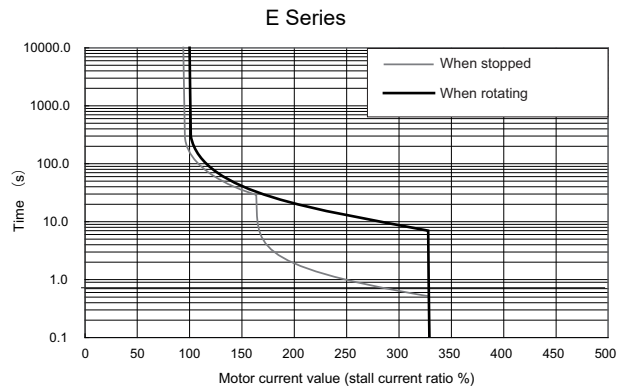
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
<b>2.4N·m</b>	<b>3000r/min</b>	<b>HG96 □□-D47</b> (1)(2)	(1) Magnetic brake B with brake None without brake (2) Shaft end S Straight (without keyway) K With keyway (with key)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 200V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of single-phase 200V input.  
 (\*3) When using single-phase 200 to 240VAC power supply use the servo drive unit with an effective load rate of 75% or lower.

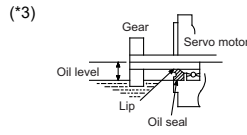
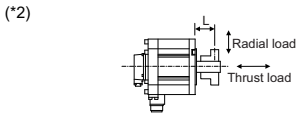
Servo overload protection characteristics



Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	20	-
	2-axis type	MDS-E-V2-	20, 40	-
	3-axis type	MDS-E-V3-	20, 40	-
	Multi axis type	MDS-EM-SPV3-	10040, 16040, 16040S	-
	Regenerative resistor type	MDS-EJ-V1-	-	30
	MDS-EJ-V2-	-	30	
Continuous characteristics	Rated output[kW]		0.75	0.75
	Rated current[A]		4.8	4.8
	Rated torque[N·m]		2.4	2.4
	Stall current[A]		4.8	4.8
	Stall torque[N·m]		2.4	2.4
Maximum momentary output (For power supply selection) [kW]		3.2	-	
Rated rotation speed[r/min]		3000	3000	
Maximum rotation speed[r/min]		6000	6000	
Maximum current[A]		15.0	15.0	
Maximum torque[N·m]		7.2	7.2	
Power rate at continuous rated torque[kW/s]		45.2	45.2	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		5.66	2.83	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		1.27	1.27	
(Brake inertia) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		1.37	1.37	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		18.9	18.9	
Mass	(Without) [kg]		2.9	2.9
	(With brake) [kg]		3.7	3.7
Heat-resistant class		130(B)	130(B)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:49(5), Y:49(5)	X:49(5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		-	-
	Thrust load[N]		-	-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		392 (L=40)	392 (L=40)
	Thrust load[N]		147	147
Oil level (*3) [mm]		15	15	
Absolute position encoder	1,048,576 p/rev (D47)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) Using on a non-interpolation axis is recommended.

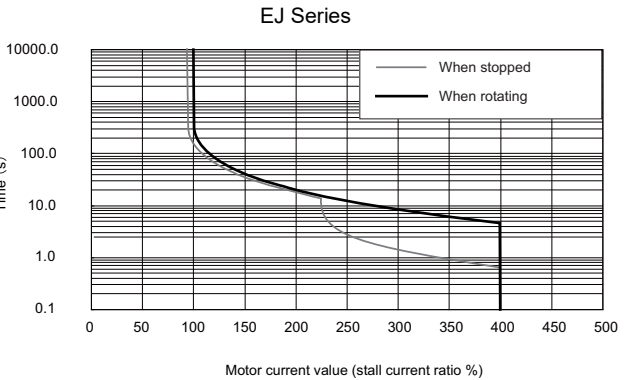
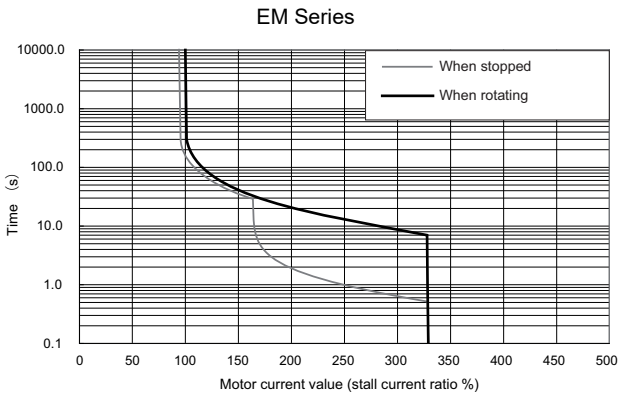
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

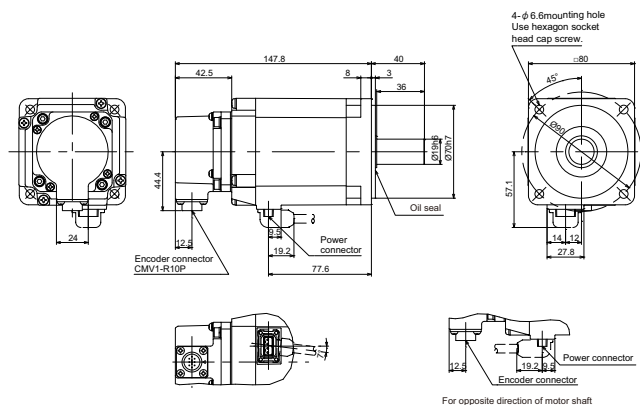
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	10
Static friction torque[N·m]	2.4 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

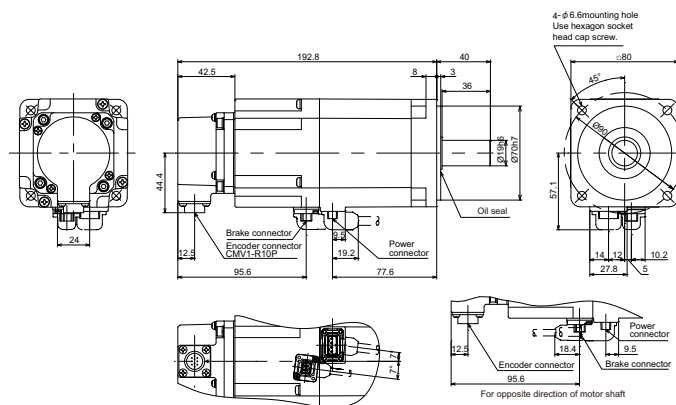


Outline dimension drawings [Unit : mm]

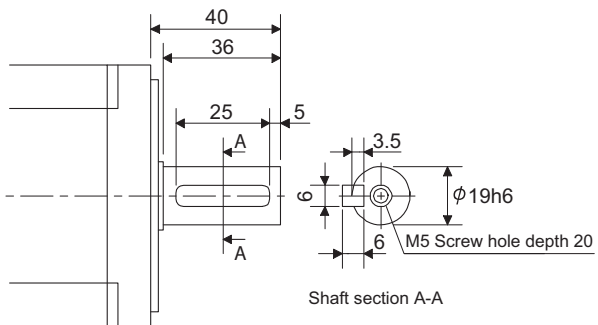
HG96S-D47



HG96BS-D47



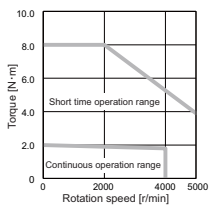
Shaft with keyway (HG96K/HG96BK-D47)



The appearance is the same as the straight (without keyway) except the shaft shape.

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
<b>2.0N·m</b>	<b>4000r/min</b>	<b>HG75</b> □□-□-XXX (1)(2) (3) (4)	(1) Magnetic brake	B with brake None without brake
			(2) Shaft end	S Straight T Taper
			(3) Power connector	S105010 Compact None Normal
			(4) Encoder	XXX Type

Torque characteristics

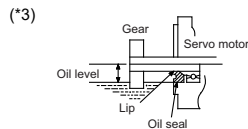
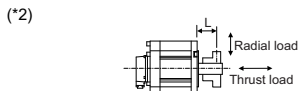


Servo overload protection characteristics

Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 20	-
	2-axis type	MDS-E-V2- 20, 40	-
	3-axis type	MDS-E-V3- 20, 40	-
	Multi axis type	MDS-EM-SPV3- 10040, 16040, 16040S	-
	Regenerative resistor type	MDS-EJ-V1- -	30
Continuous characteristics	Rated output[kW]	0.75	0.75
	Rated current[A]	3.1	3.1
	Rated torque[N·m]	1.8	1.8
	Stall current[A]	3.2	3.2
	Stall torque[N·m]	2.0	2.0
Maximum momentary output (For power supply selection)[kW]	2.2		-
Rated rotation speed[r/min]	4000	4000	
Maximum rotation speed[r/min]	5000	5000	
Maximum current[A]	14.0	14.0	
Maximum torque[N·m]	8.0	8.0	
Power rate at continuous rated torque[kW/s]	12.3	12.3	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	5.43	1.71	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.62	2.62	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.70	2.70	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	18.3	18.3	
Mass	(Without) [kg]	2.6	2.6
	(With brake)[kg]	3.6	3.6
Heat-resistant class	155(F)	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] (lmm)	245 (L=33)	245 (L=33)
	Thrust load[N]	147	147
Axis tolerable load (Straight shaft)	Radial load (*2)[N] (lmm)	245 (L=33)	245 (L=33)
	Thrust load[N]	147	147
Oil level (*3)[mm]	15	15	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3	-
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]  
 (\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

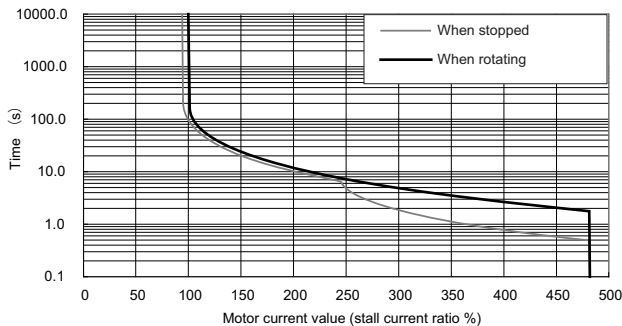
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

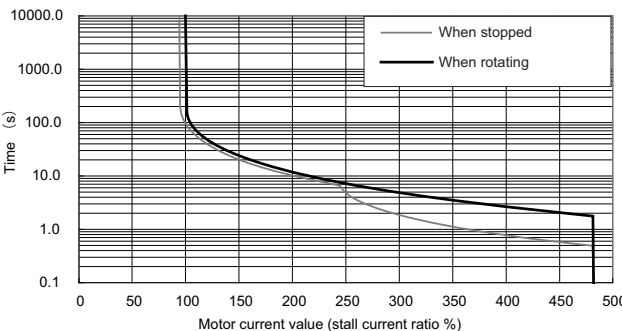
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	9
Static friction torque[N·m]	2.4 or more
Release delay time (*1)[s]	0.03
Braking delay time (DC OFF) (*1)[s]	0.03
Brake life (*2)[times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

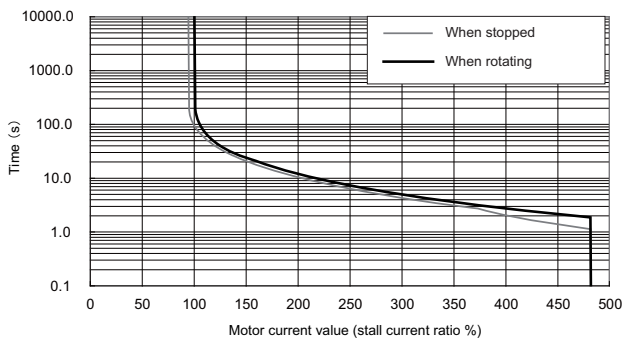
E Series



EM Series

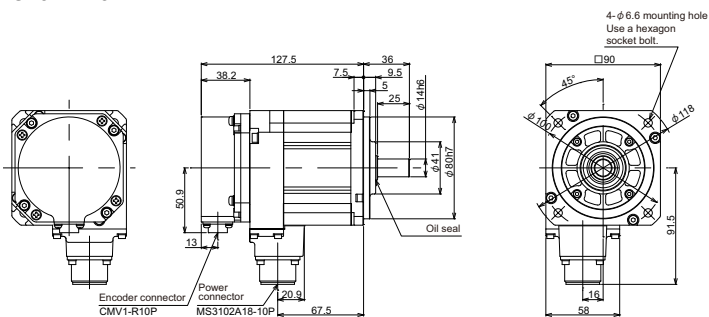


EJ Series

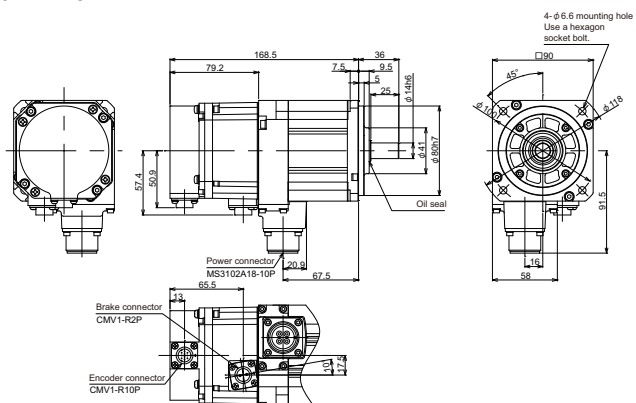


Outline dimension drawings [Unit : mm]

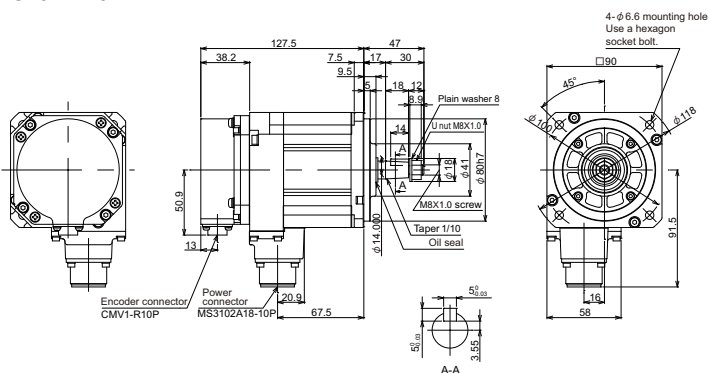
HG75S-D48



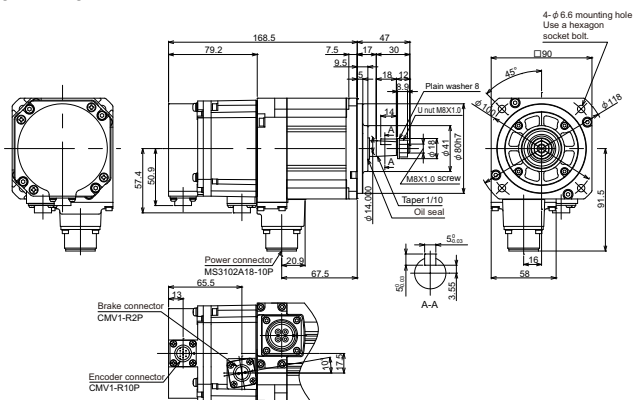
HG75BS-D48



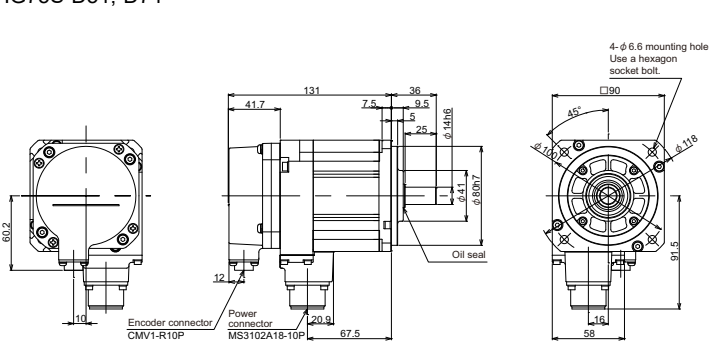
HG75T-D48



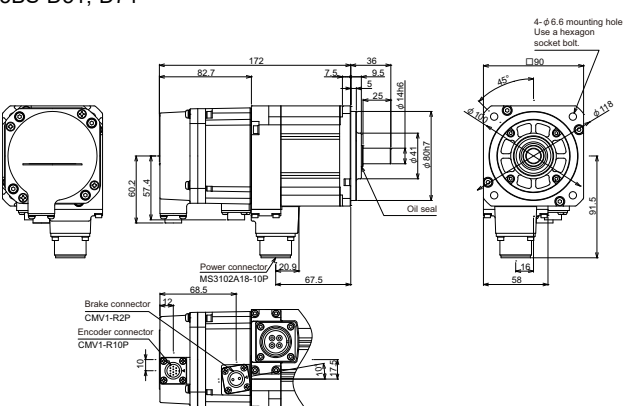
HG75BT-D48



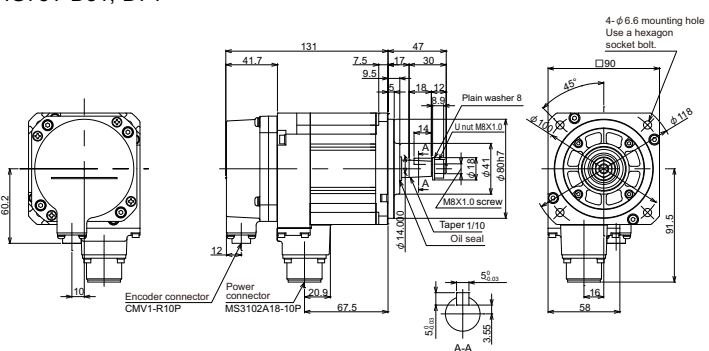
HG75S-D51,-D74



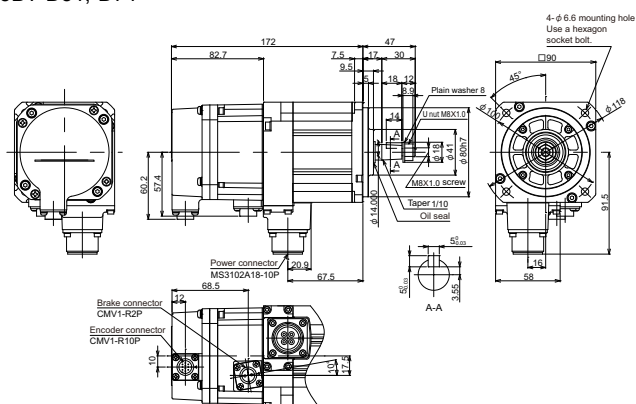
HG75BS-D51,-D74



HG75T-D51,-D74



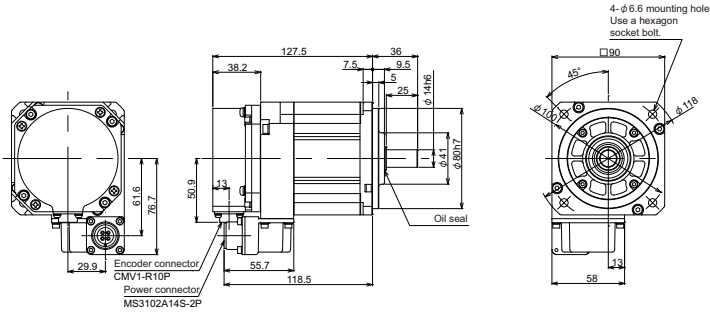
HG75BT-D51,-D74



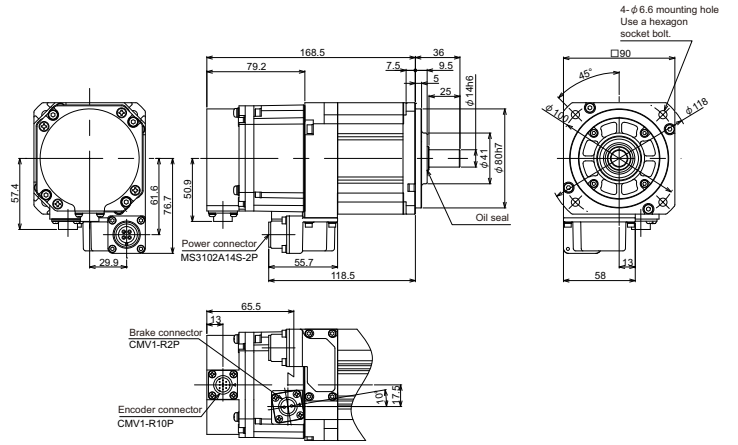
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

Outline dimension drawings [Unit : mm]

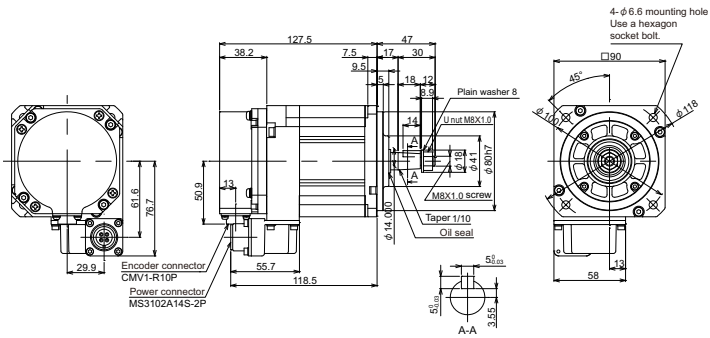
HG75S-S105010-D48



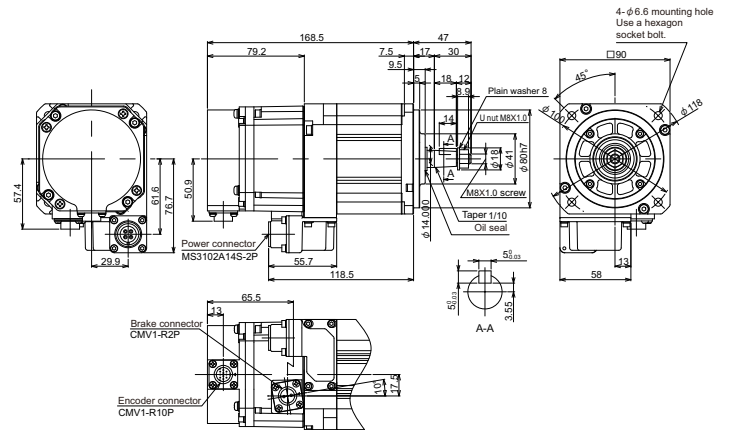
HG75BS-S105010-D48



HG75T-S105010-D48

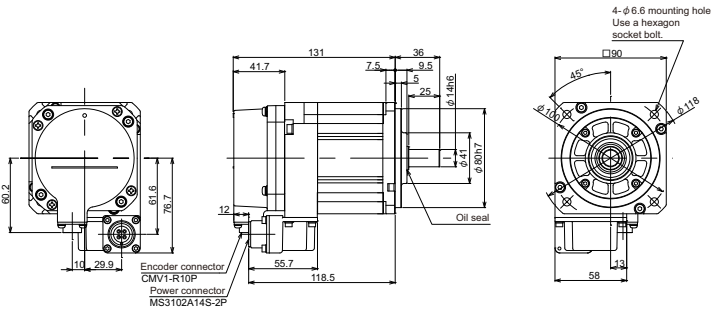


HG75BT-S105010-D48

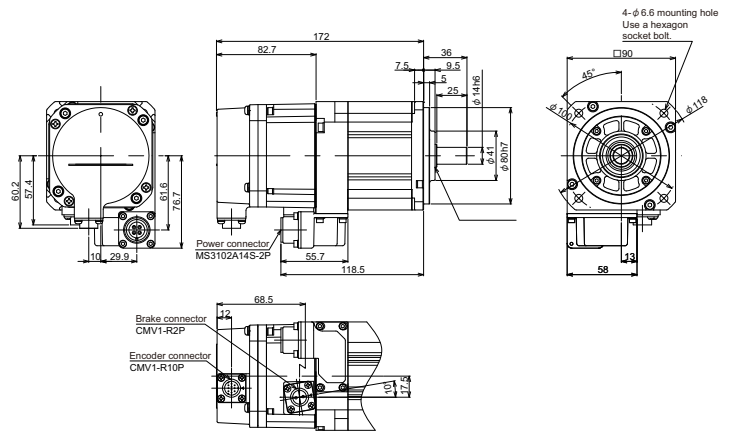


Outline dimension drawings [Unit : mm]

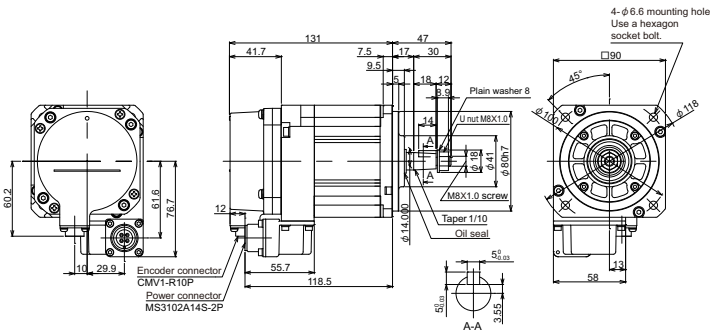
HG75S-S105010-D51,-D74



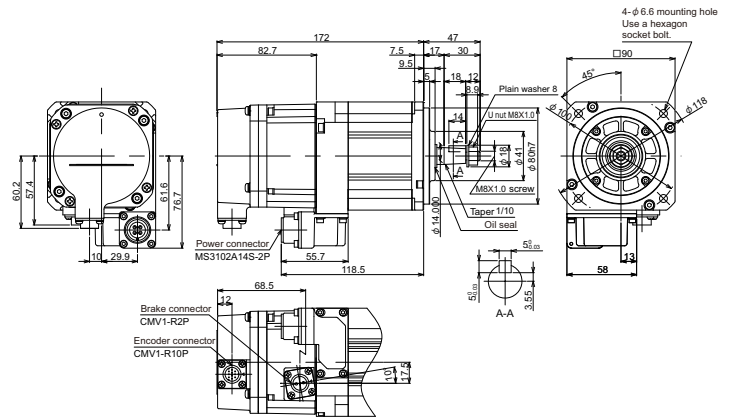
HG75BS-S105010-D51,-D74



HG75T-S105010-D51,-D74

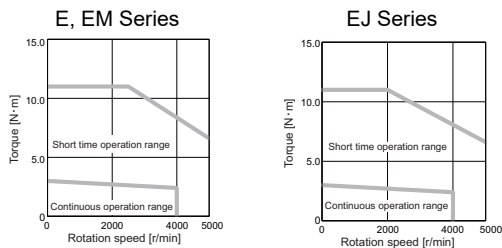


HG75BT-S105010-D51,-D74

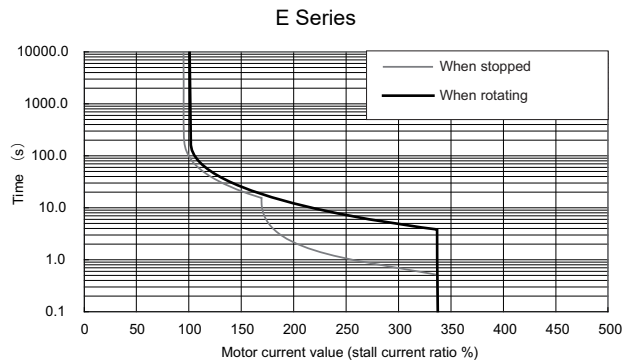


Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
<b>3.0N·m</b>	<b>4000r/min</b>	<b>HG105</b> □□-□-XXX	(1) Magnetic brake	B with brake None without brake
			(2) Shaft end	S Straight T Taper
			(3) Power connector	S105010 Compact None Normal
			(4) Encoder	XXX Type

Torque characteristics



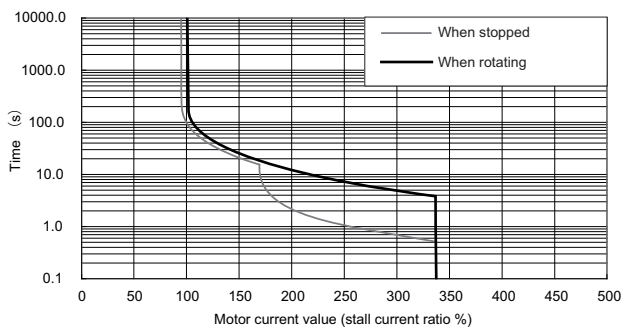
Servo overload protection characteristics



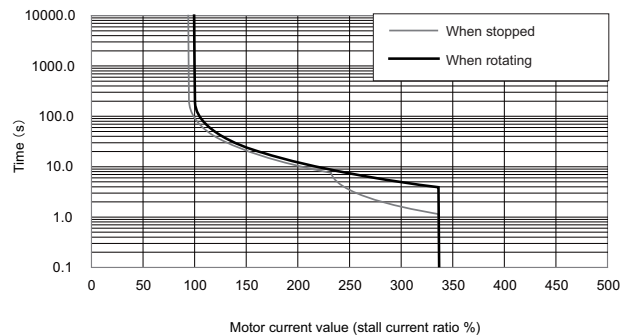
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 20
	2-axis type	MDS-E-V2- 20, 40
	3-axis type	MDS-E-V3- 20, 40
	Multi axis type	MDS-EM-SPV3- 10040, 16040, 16040S
	Regenerative resistor type	MDS-EJ-V1- 30 MDS-EJ-V2- 30
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	3.7
	Rated torque[N·m]	2.4
	Stall current[A]	4.6
	Stall torque[N·m]	3.0
Maximum momentary output (For power supply selection)[kW]	3.5	-
Rated rotation speed[r/min]	4000	4000
Maximum rotation speed[r/min]	5000	5000
Maximum current[A]	15.5	15.5
Maximum torque[N·m]	11.0	11.0
Power rate at continuous rated torque[kW/s]	11.2	11.2
Max. deceleration torque of dynamic brake(Tdp)[N·m]	10.21	5.10
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.12	5.12
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.20	5.20
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	35.7	35.7
Mass	(Without) [kg]	4.4
	(With brake)[kg]	5.3
Heat-resistant class	155(F)	155(F)
Degree of protection	IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)
Cooling method	Totally enclosed natural-cooling	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	X:24.5(2.5),Y:24.5(2.5)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	245 (L=33)
	Thrust load[N]	147
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	245 (L=33)
	Thrust load[N]	147
Oil level (*3)[mm]	15	15
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3 MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3 MDS-EM-SPV3
		MDS-EJ-V1/V2

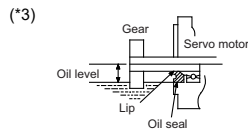
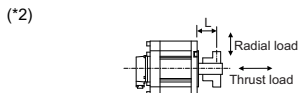
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	9
Static friction torque[N·m]	2.4 or more
Release delay time (*1)[s]	0.03
Braking delay time (DC OFF) (*1)[s]	0.03
Brake life (*2)[times]	20,000

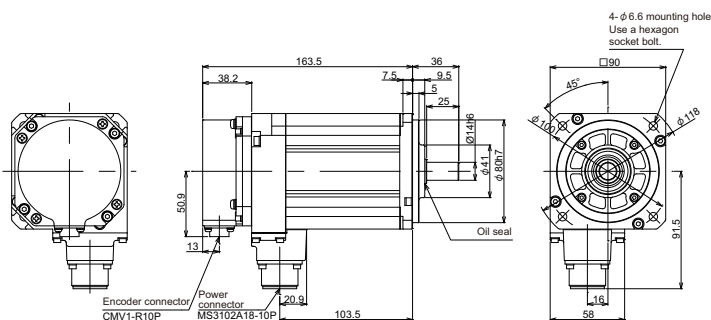
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

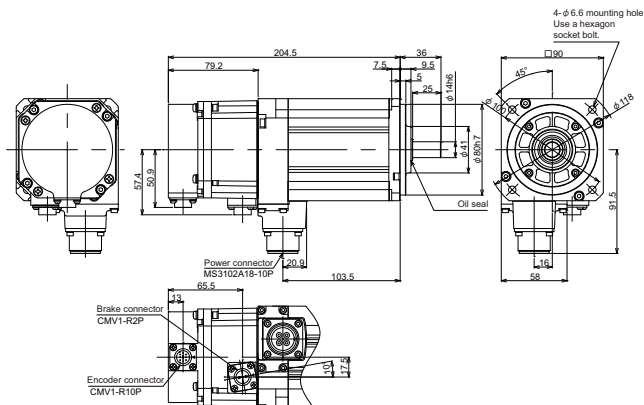


Outline dimension drawings [Unit : mm]

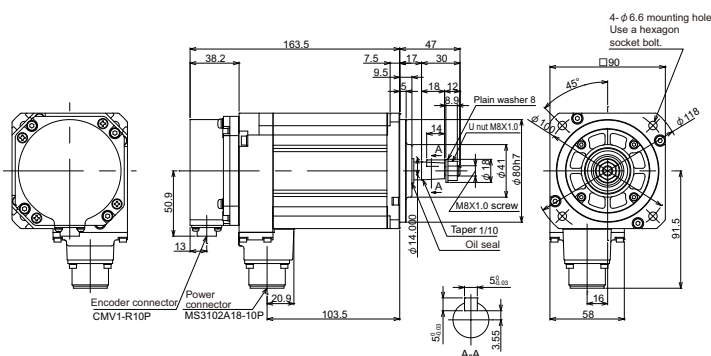
HG105S-D48



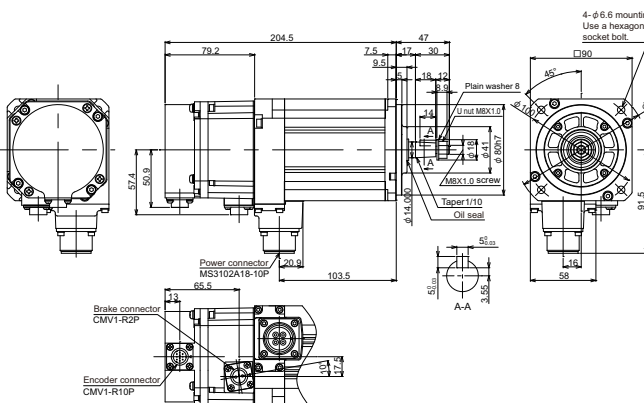
HG105BS-D48



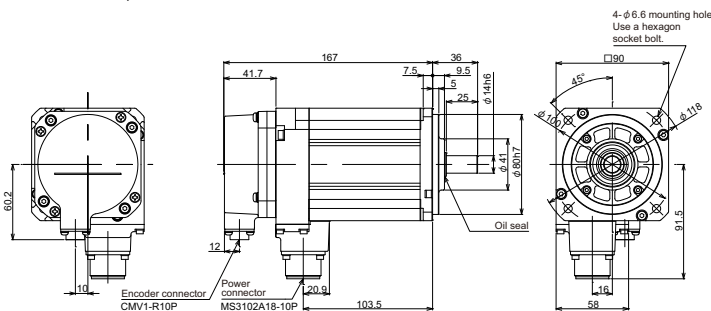
HG105T-D48



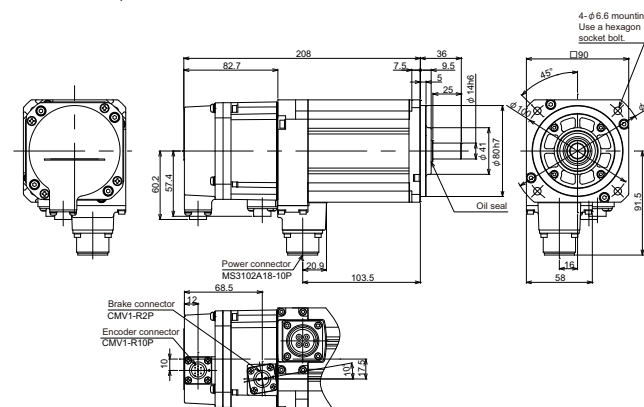
HG105BT-D48



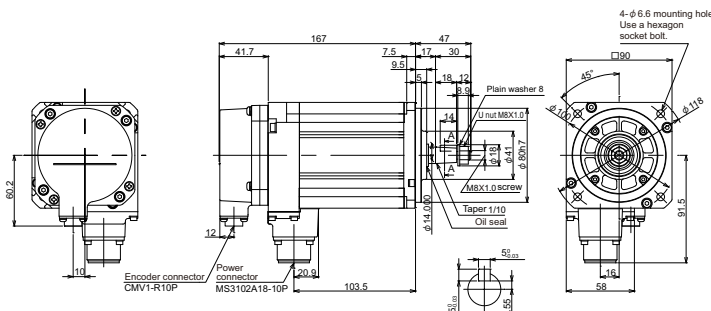
HG105S-D51,-D74



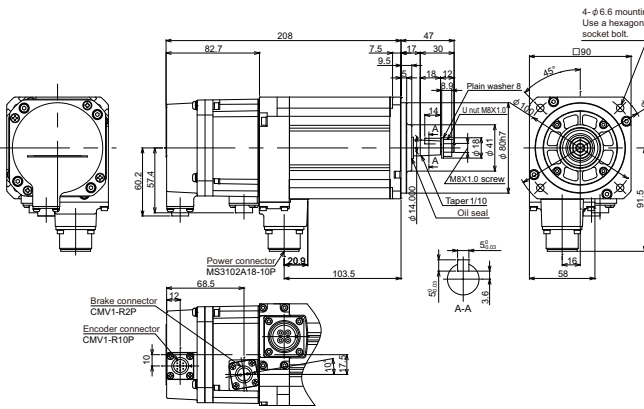
HG105BS-D51,-D74



HG105T-D51,-D74



HG105BT-D51,-D74

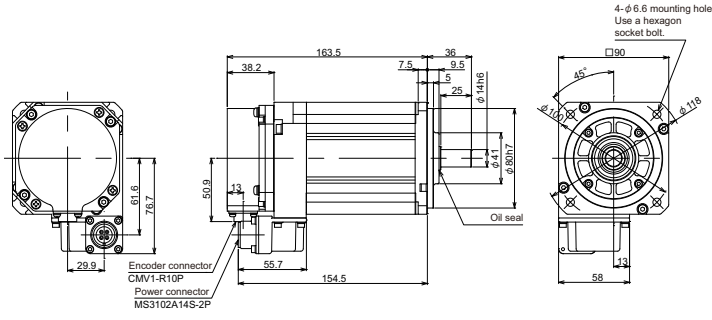


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(148) (94)	(146) (76) (33) (50)	(148) (100) (94)	(146) (92) (76) (33) (33) (50)	(148) (103)	(146) (86) (33) (50)	(148) (103) (100)	(146) (86) (82) (33) (33) (50)

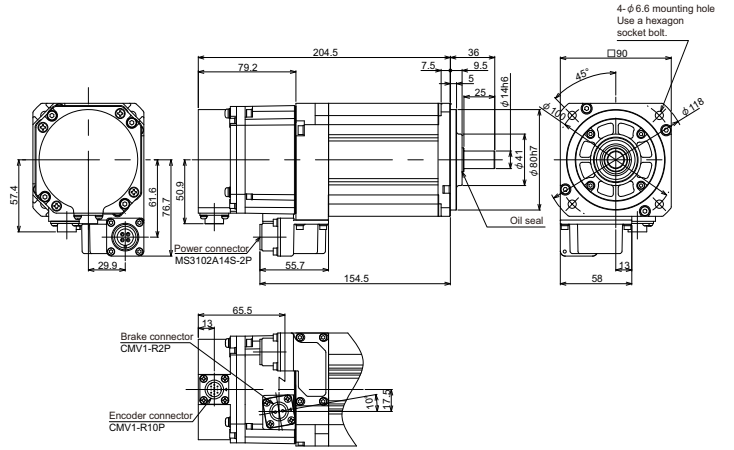


Outline dimension drawings [Unit : mm]

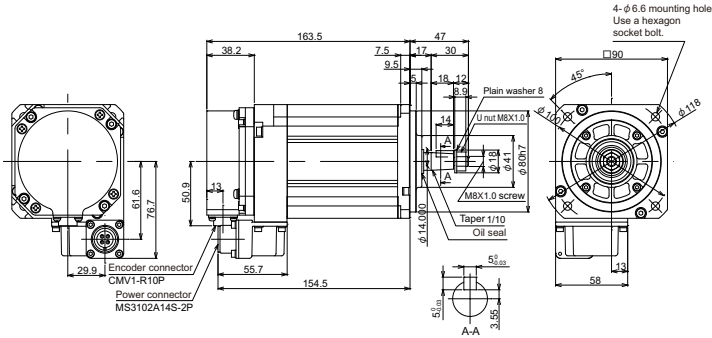
HG105S-S105010-D48



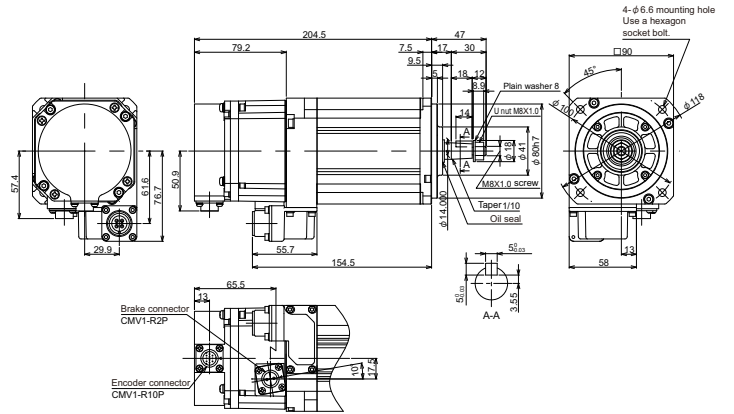
HG105BS-S105010-D48



HG105T-S105010-D48

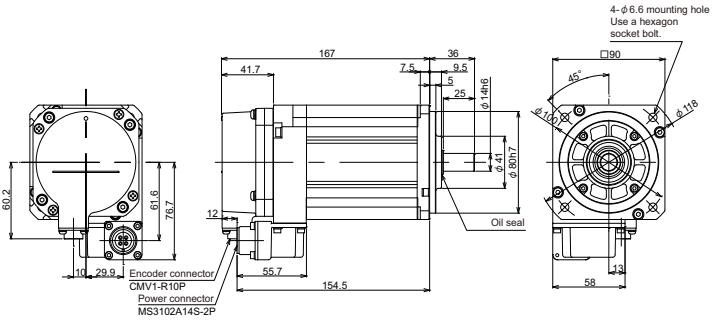


HG105BT-S105010-D48

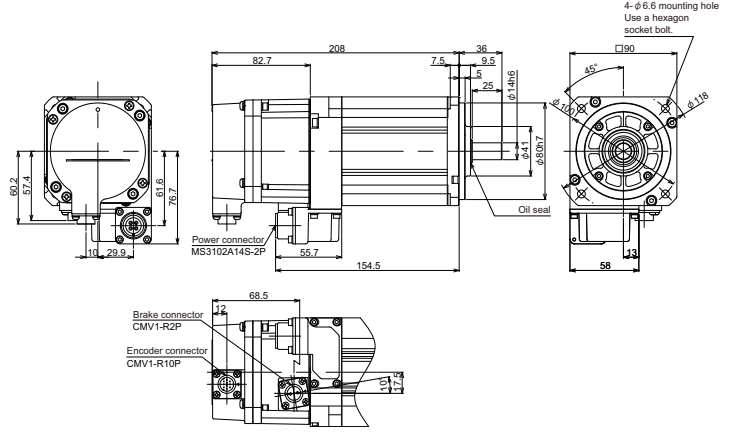


Outline dimension drawings [Unit : mm]

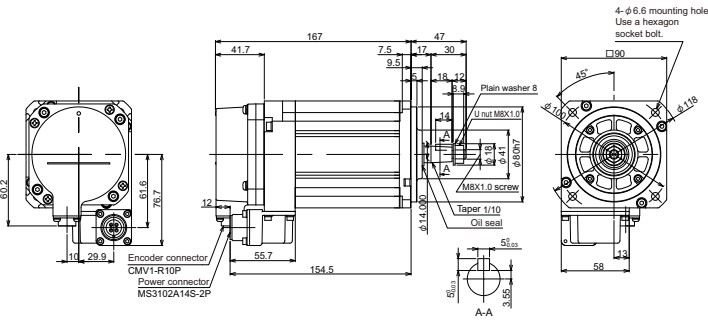
HG105S-S105010-D51,-D74



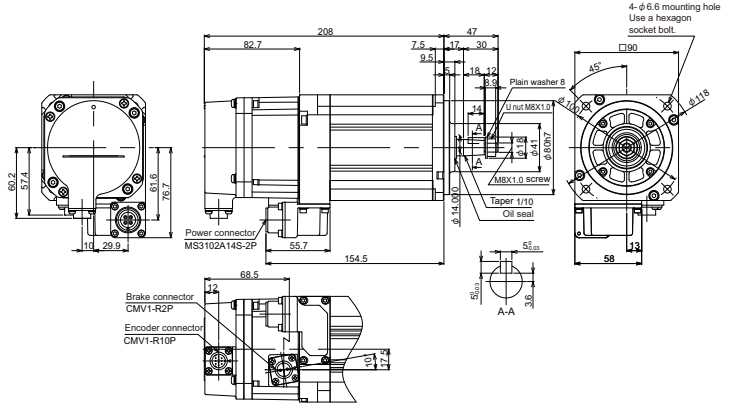
HG105BS-S105010-D51,-D74



HG105T-S105010-D51,-D74

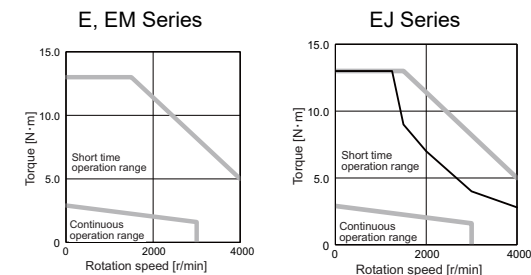


HG105BT-S105010-D51,-D74



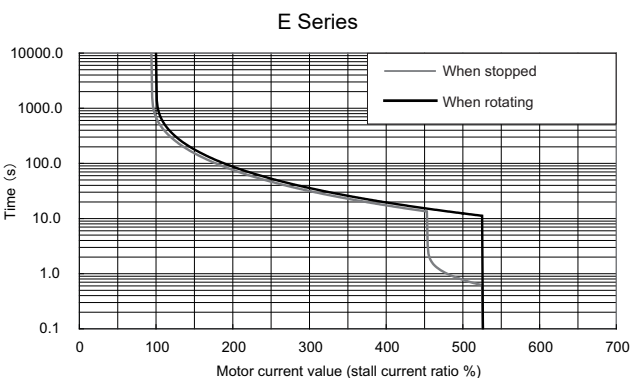
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
2.9N·m	3000r/min	HG54 □□-XXX	(1) Magnetic brake
			B with brake
			None without brake
(2) Shaft end			
S Straight			
T Taper			
(3) Encoder			
XXX Type			

Torque characteristics



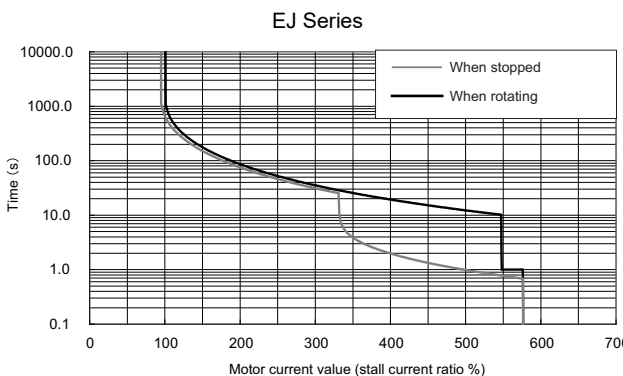
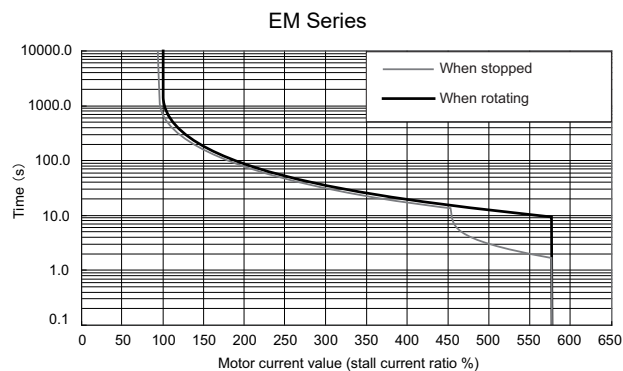
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 200V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of single-phase 200V input.  
 (\*3) When using single-phase 200 to 240VAC power supply use the servo drive unit with an effective load rate of 75% or lower.

Servo overload protection characteristics

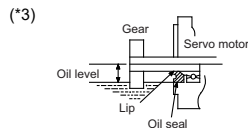
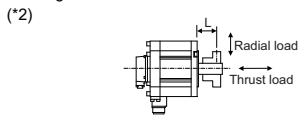


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	40
	2-axis type	MDS-E-V2-	40, 80
	3-axis type	MDS-E-V3-	40, 80
	Multi axis type	MDS-EM-SPV3-	10040, 16040, 16040S, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1-	-
Continuous characteristics	Rated output[kW]	-	0.5
	Rated current[A]	-	2.0
	Rated torque[N·m]	-	1.6
	Stall current[A]	-	3.2
	Stall torque[N·m]	-	2.9
Maximum momentary output (For power supply selection)[kW]	-	2.3	-
Rated rotation speed[r/min]	-	3000	3000
Maximum rotation speed[r/min]	-	4000	4000
Maximum current[A]	-	17.0	17.0
Maximum torque[N·m]	-	13.0	13.0
Power rate at continuous rated torque[kW/s]	-	4.1	4.1
Max. deceleration torque of dynamic brake(Tdp)[N·m]	-	3.97	1.98
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	-	6.13	6.13
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	-	8.26	8.26
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	-	42.7	42.7
Mass	(Without) [kg]	4.8	4.8
	(With brake)[kg]	6.7	6.7
Heat-resistant class	-	155(F)	155(F)
Degree of protection	-	IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)
Cooling method	-	Totally enclosed natural-cooling	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	-	X:24.5(2.5),Y:24.5(2.5)	X:24.5(2.5),Y:24.5(2.5)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=58)	392 (L=58)
	Thrust load[N]	490	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)	980 (L=55)
	Thrust load[N]	490	490
Oil level (*3)[mm]	-	22.5	22.5
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3	-
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3	MDS-EJ-V1/V2
	1,048,576 p/rev (D48)	MDS-EM-SPV3	-
		MDS-E-V1/V2/V3	MDS-EJ-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

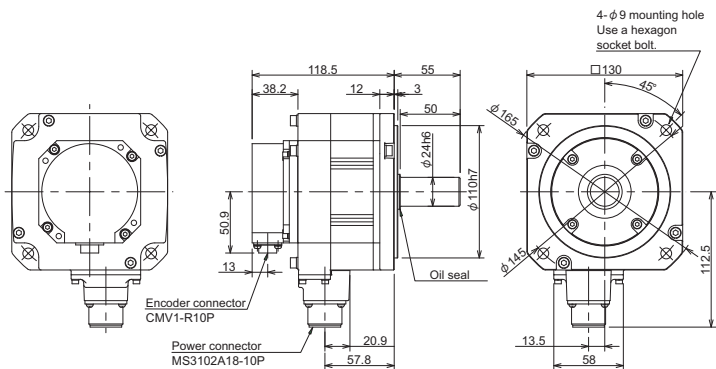
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

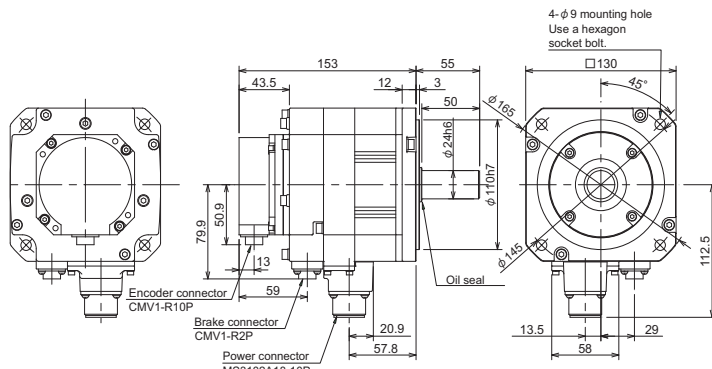
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

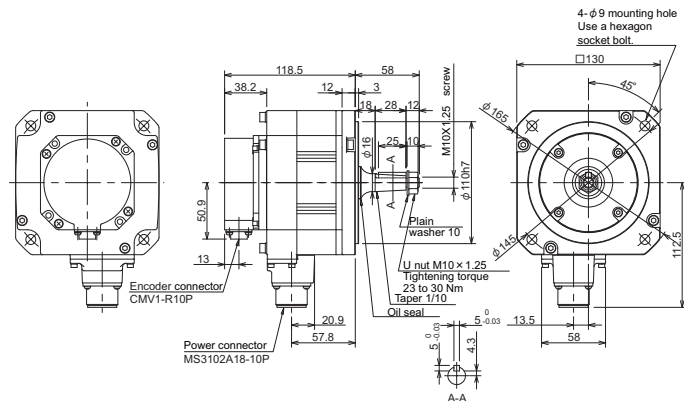
HG54S-D48



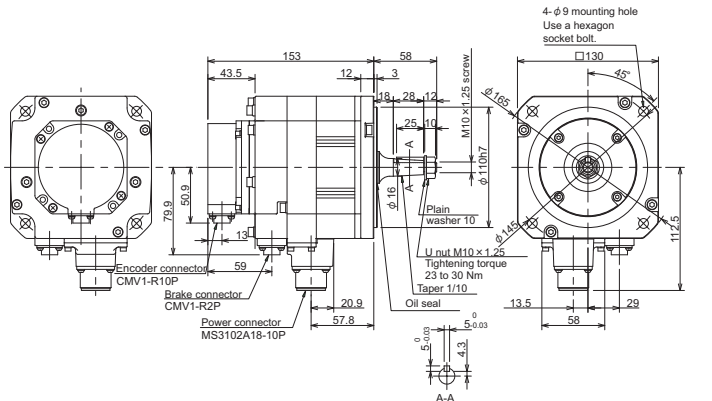
HG54BS-D48



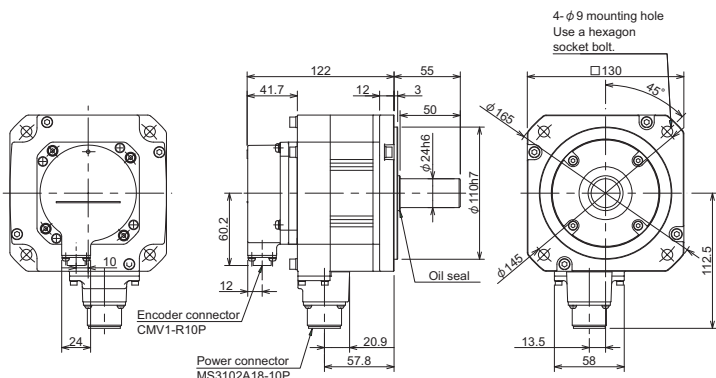
HG54T-D48



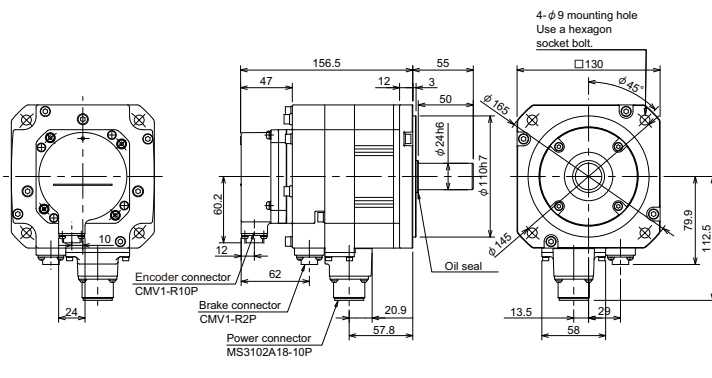
HG54BT-D48



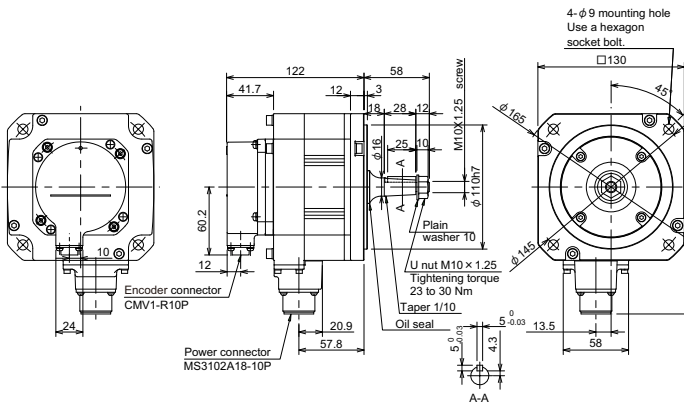
HG54S-D51,-D74



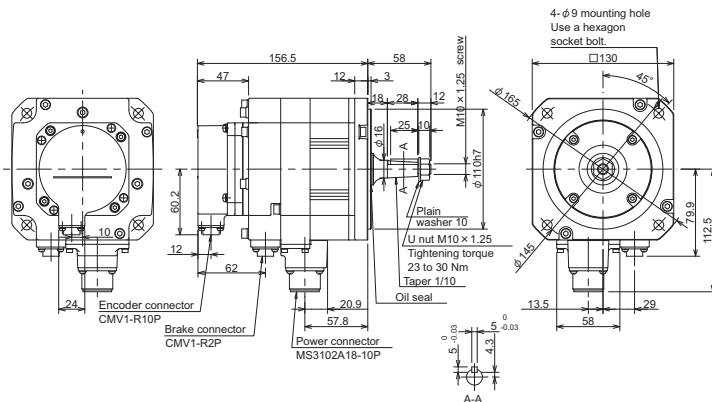
HG54BS-D51,-D74



HG54T-D51,-D74



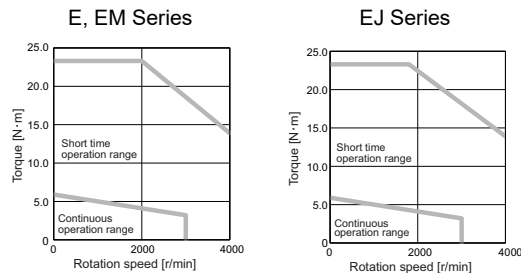
HG54BT-D51,-D74



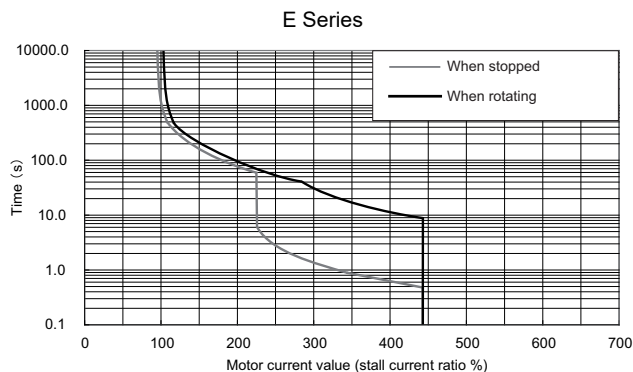
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(169)	(64)	(169)	(64)	(169)	(103)	(169)	(103)
	(76)		(76)		(86)		(86)
	(33)		(33)		(33)		(33)
	(50)		(50)		(50)		(50)

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
5.9N·m	3000r/min	HG104 □□-XXX	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
			T Taper	
			(3) Encoder	XXX Type

Torque characteristics

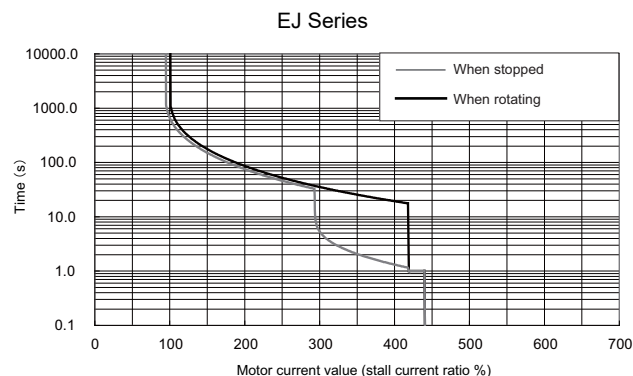
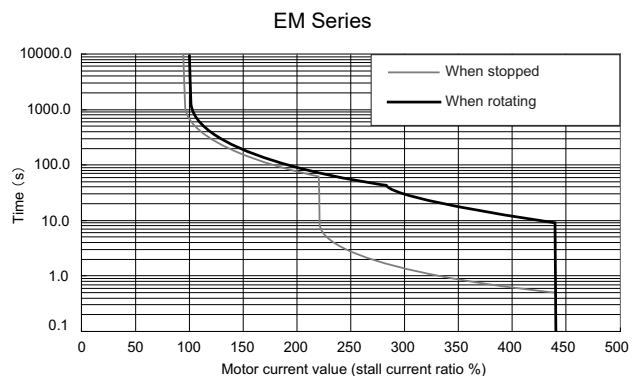


Servo overload protection characteristics

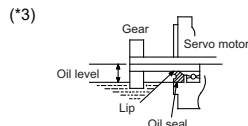
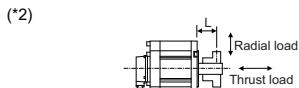


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 40
	2-axis type	MDS-E-V2- 40, 80
	3-axis type	MDS-E-V3- 40, 80
	Multi axis type	MDS-EM-SPV3- 10040, 16040, 16040S, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1- 40 MDS-EJ-V2- 40
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	3.9
	Rated torque[N·m]	3.2
	Stall current[A]	6.6
	Stall torque[N·m]	5.9
Maximum momentary output (For power supply selection)[kW]	5.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	29.0	
Maximum torque[N·m]	23.3	
Power rate at continuous rated torque[kW/s]	8.4	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	10.02	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	11.9	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	14.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	83.3	
Mass	(Without) [kg]	6.5
	(With brake)[kg]	8.5
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=58)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

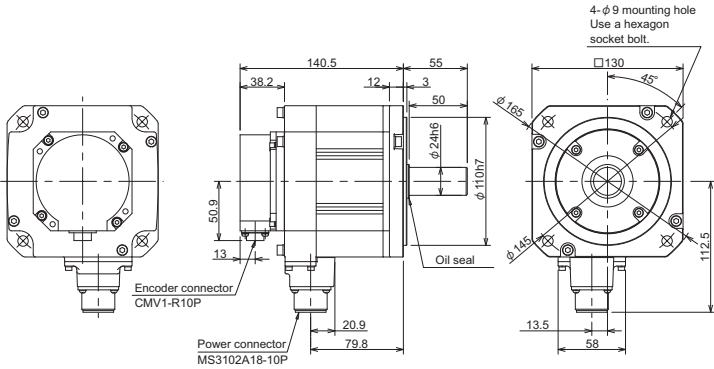
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

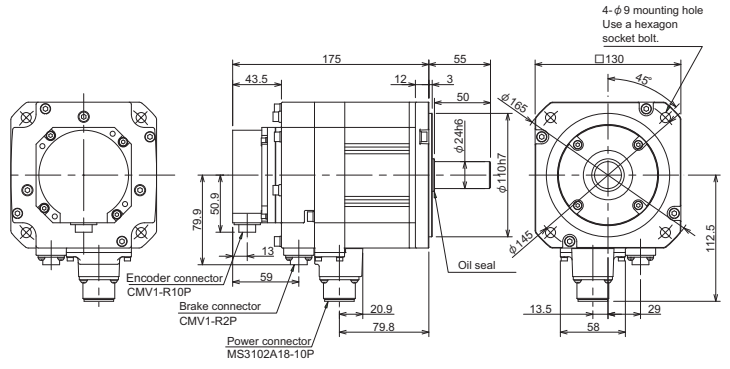
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

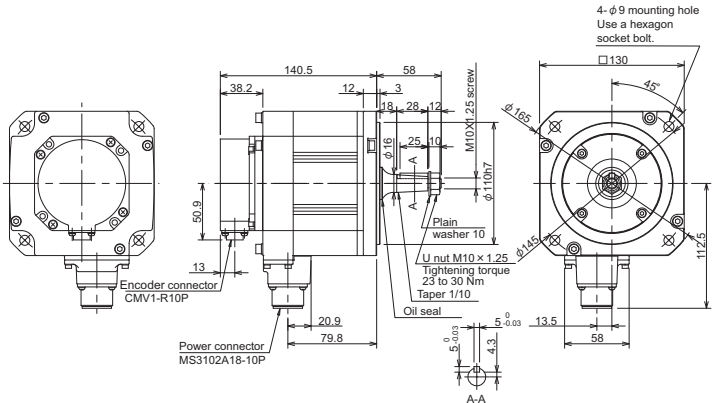
HG104S-D48



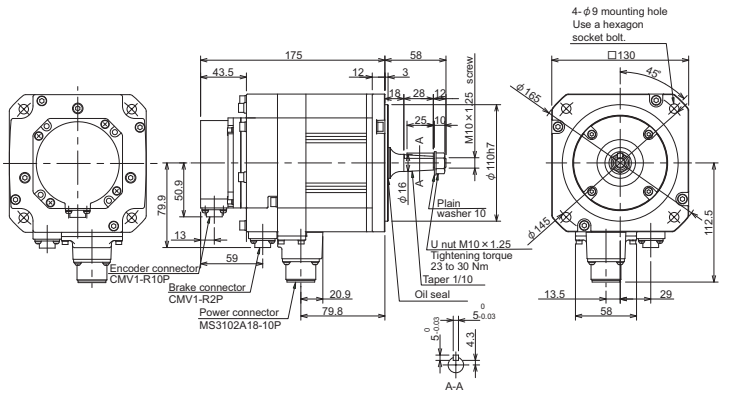
HG104BS-D48



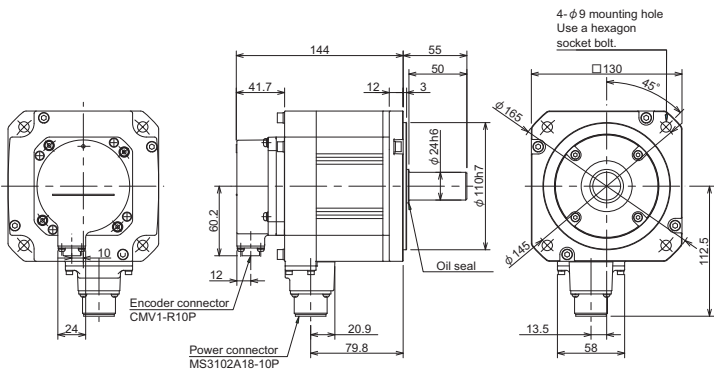
HG104T-D48



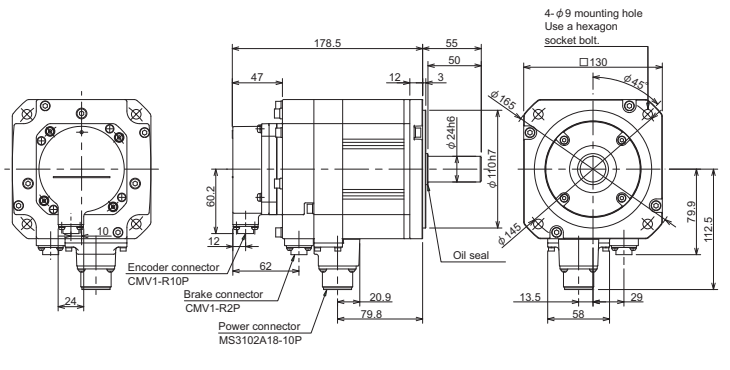
HG104BT-D48



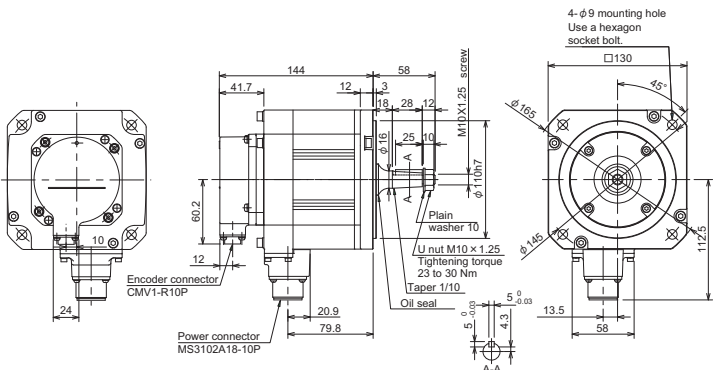
HG104S-AD1,-D74



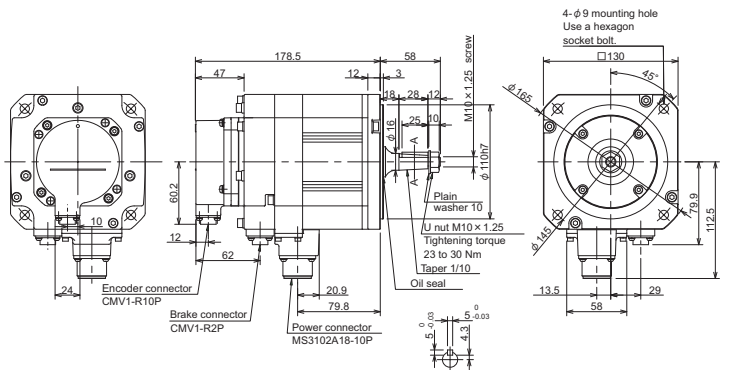
HG104BS-D51,-D74



HG104T-D51,-D74



HG104BT-D51,-D74

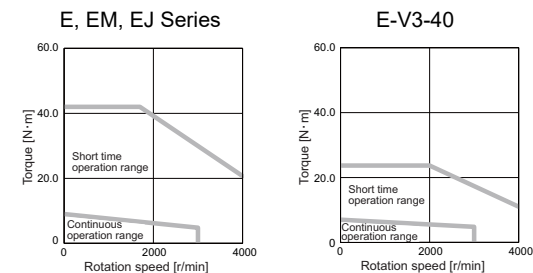


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

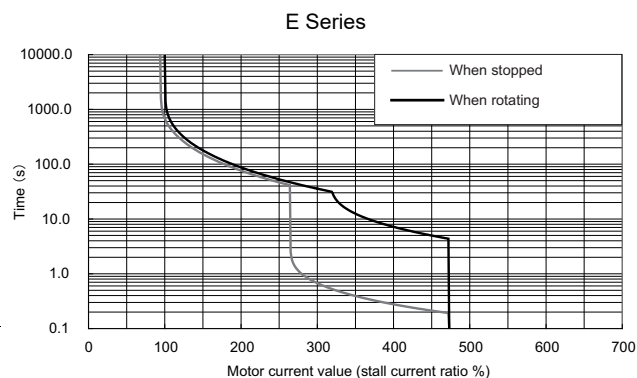


Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
<b>9.0N·m</b>	<b>3000r/min</b>	<b>HG154 □□-XXX</b> (1)(2) (3)	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
				T Taper
		(3) Encoder	XXX Type	

Torque characteristics

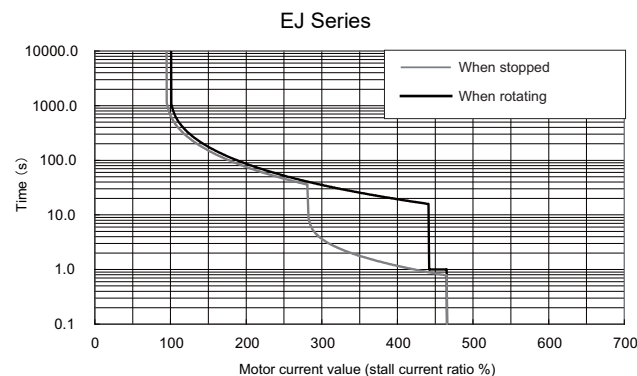
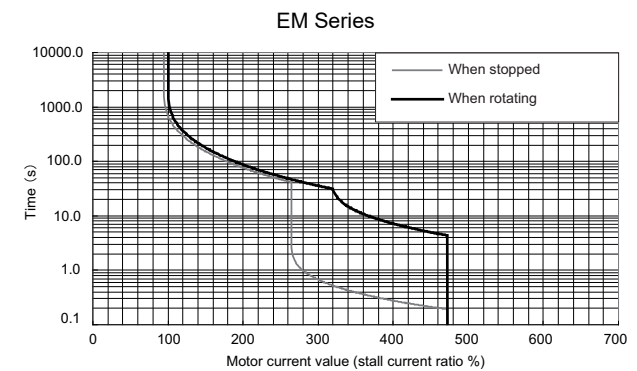


Servo overload protection characteristics

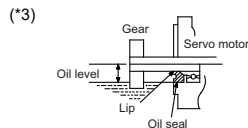
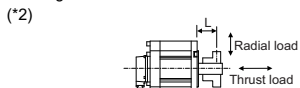


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80
	2-axis type	MDS-E-V2-	80, 160
	3-axis type	MDS-E-V3-	80
	Multi axis type	MDS-EM-SPV3-	10080, 16080, 20080, 200120, 320120
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	80 -
Continuous characteristics	Rated output[kW]		1.5
	Rated current[A]		5.6
	Rated torque[N·m]		4.8
	Stall current[A]		11
	Stall torque[N·m]		9.0
Maximum momentary output (For power supply selection)[kW]			9.0
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			4000
Maximum current[A]			52.0
Maximum torque[N·m]			42.0
Power rate at continuous rated torque[kW/s]			12.7
Max. deceleration torque of dynamic brake(Tdp)[N·m]			15.64
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			17.8
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			20.0
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]			125
Mass	(Without) [kg]		8.3
	(With brake)[kg]		11.0
Heat-resistant class			155(F)
Degree of protection		IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)
Cooling method		Totally enclosed natural-cooling	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5) Y:24.5(2.5)	X:24.5(2.5) Y:24.5(2.5)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		392 (L=58)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3)[mm]			22.5
Absolute position encoder	67,108,864 p/rev (D74)		MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)		MDS-E-V1/V2/V3, MDS-EJ-V1 MDS-EM-SPV3
	1,048,576 p/rev (D48)		MDS-E-V1/V2/V3, MDS-EJ-V1 MDS-EM-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

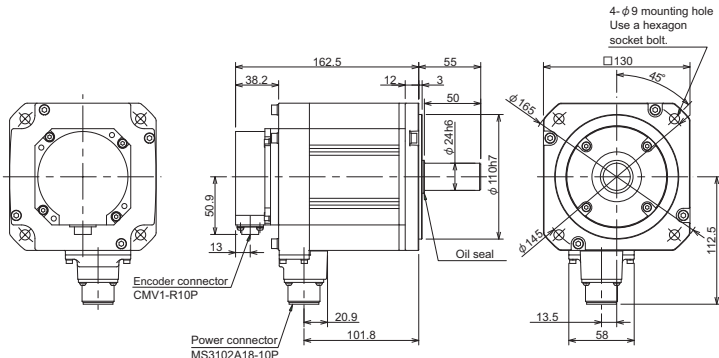
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

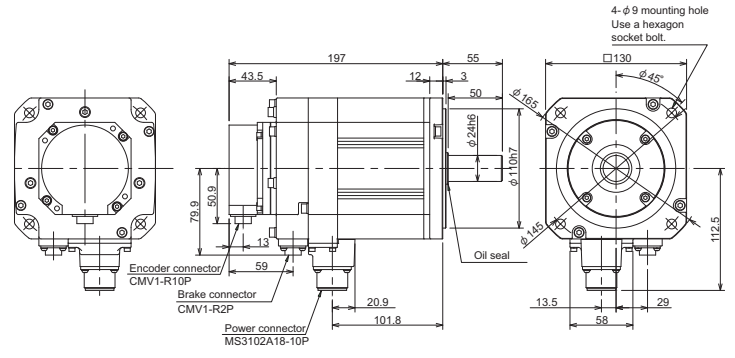
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

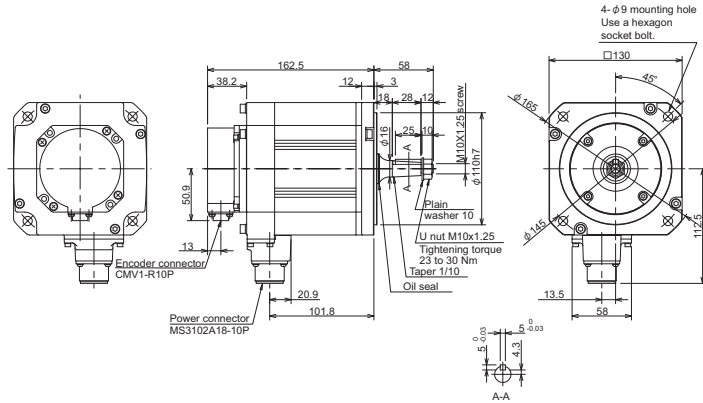
HG154S-D48



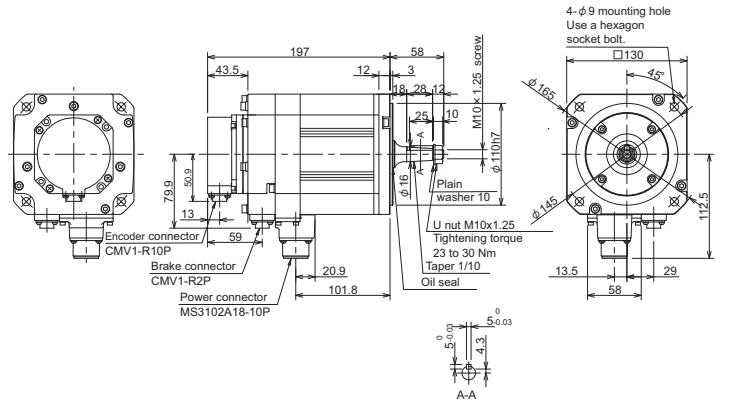
HG154BS-D48



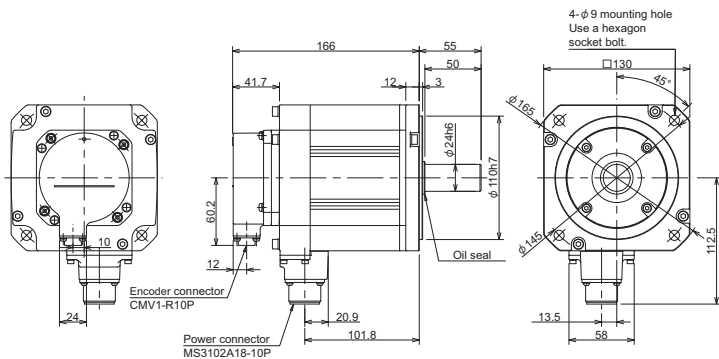
HG154T-D48



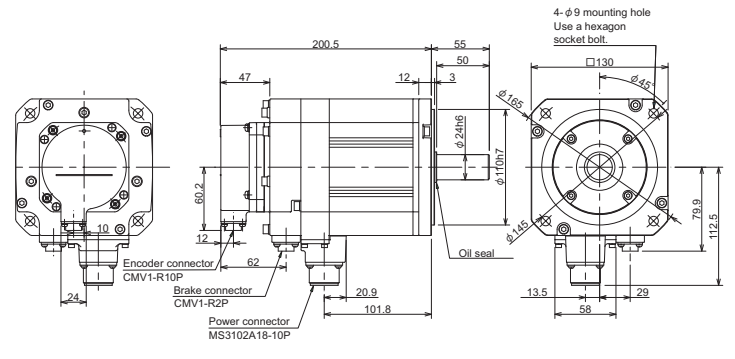
HG154BT-D48



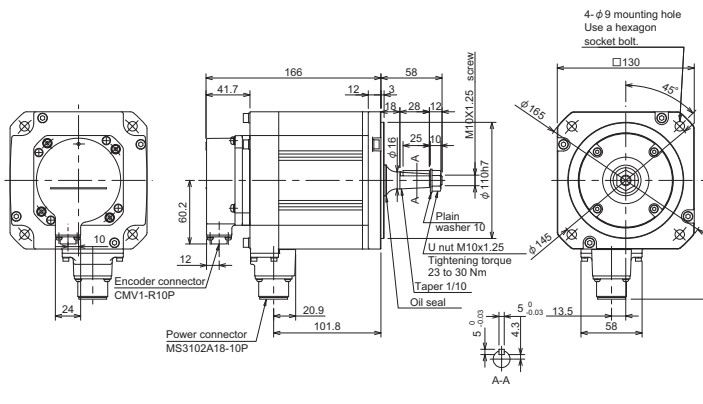
HG154S-D51,-D74



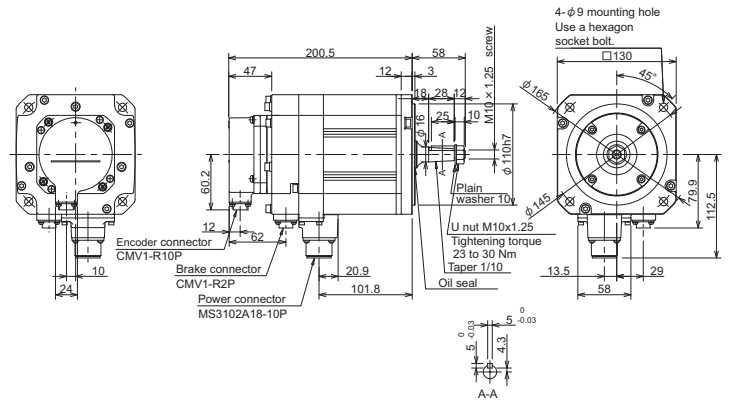
HG154BS-D51,-D74



HG154T-D51,-D74



HG154BT-D51,-D74

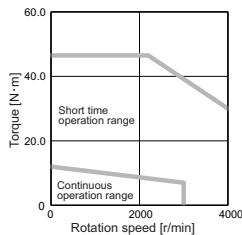


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug



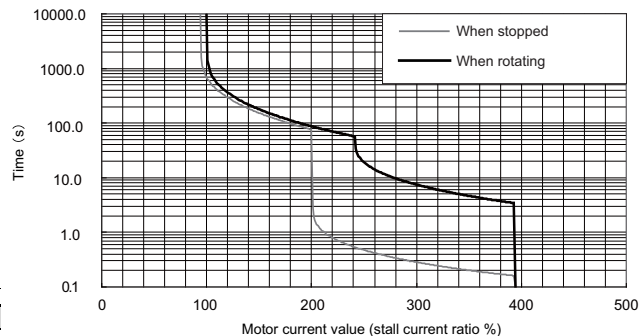
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
12.0N·m	3000r/min	HG224 □□-XXX (1)(2) (3)	(1) Magnetic brake
			B with brake
			None without brake
(2) Shaft end	S Straight		
	T Taper		
(3) Encoder	XXX Type		

Torque characteristics



Servo overload protection characteristics

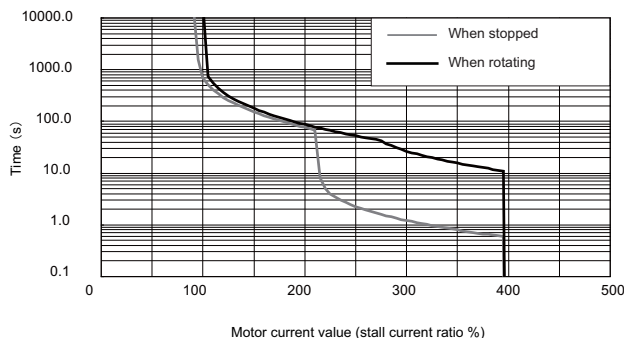
E Series



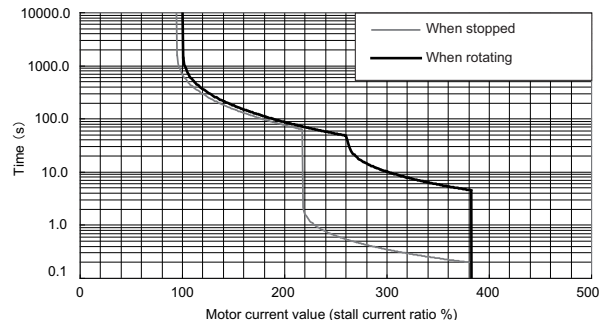
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 80
	2-axis type	MDS-E-V2- 80, 160
	3-axis type	MDS-E-V3- 80
	Multi axis type	MDS-EM-SPV3- 10080, 16080, 20080, 200120, 320120
	Regenerative resistor type	MDS-EJ-V1- 80
Continuous characteristics	Rated output[kW]	2.2
	Rated current[A]	8.6
	Rated torque[N·m]	7.0
	Stall current[A]	15
	Stall torque[N·m]	12.0
Maximum momentary output (For power supply selection)[kW]	12.3	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	57.0	
Maximum torque[N·m]	46.5	
Power rate at continuous rated torque[kW/s]	20.7	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	20.07	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	23.7	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	25.9	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	166	
Mass	(Without) [kg]	10.0
	(With brake)[kg]	12.0
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] (G)	X:24.5(2.5), Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] (lmm)	392 (L=58)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] (lmm)	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1, MDS-EM-SPV3

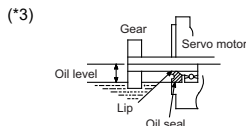
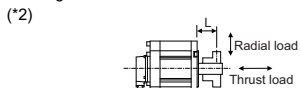
EJ Series



EM Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

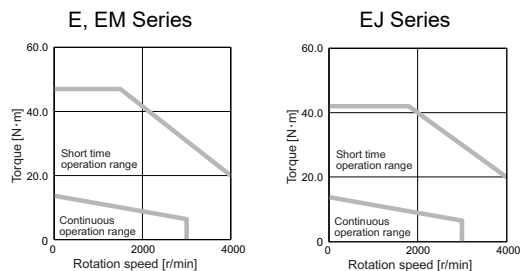
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

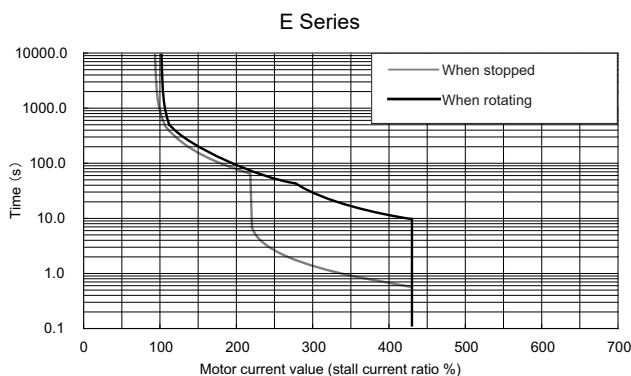


Stall torque	Rated rotation speed	Servo motor type	Explanation of type
13.7N·m	3000r/min	HG204 □S-xxx	(1) Magnetic brake
			B with brake None without brake
		(2) Encoder	XXX Type

Torque characteristics

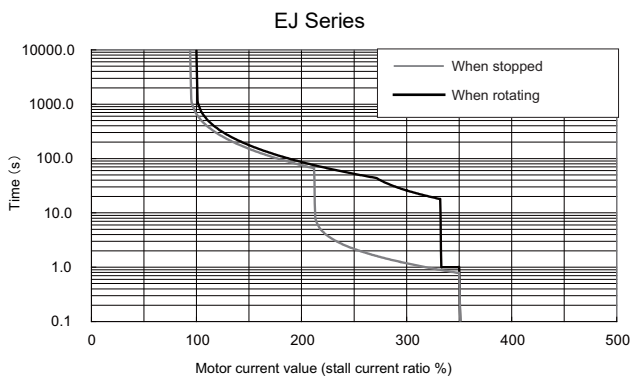
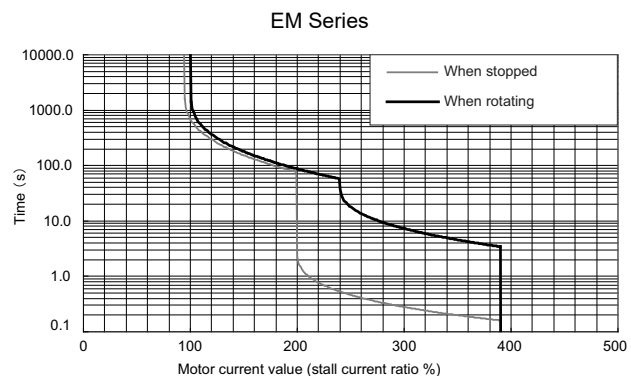


Servo overload protection characteristics

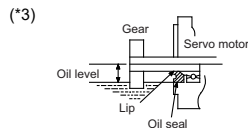
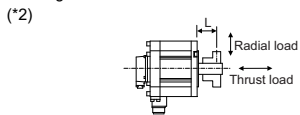


Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80	-
	2-axis type	MDS-E-V2-	80, 160	-
	3-axis type	MDS-E-V3-	80	-
	Multi axis type	MDS-EM-SPV3-	10080, 16080, 20080, 200120, 320120	-
	Regenerative resistor type	MDS-EJ-V1-	-	80
Continuous characteristics	Rated output[kW]		2.0	2.0
	Rated current[A]		6.8	6.8
	Rated torque[N·m]		6.4	6.4
	Stall current[A]		15	15
	Stall torque[N·m]		13.7	13.7
Maximum momentary output (For power supply selection)[kW]		8.0	-	
Rated rotation speed[r/min]		3000	3000	
Maximum rotation speed[r/min]		4000	4000	
Maximum current[A]		57.0	52.0	
Maximum torque[N·m]		47.0	42.0	
Power rate at continuous rated torque[kW/s]		10.6	10.6	
Max. deceleration torque of dynamic brake(Tdp)[N·m]		15.95	15.95	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		38.3	38.3	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		47.9	47.9	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		268	268	
Mass	(Without) [kg]		12.0	12.0
	(With brake)[kg]		18	18
Heat-resistant class		155(F)	155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5), Y:29.4(3)	X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		-	-
	Thrust load[N]		-	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		2058 (L=79)	2058 (L=79)
	Thrust load[N]		980	980
Oil level (*3)[mm]		30	30	
Absolute position encoder	67,108,864 p/rev (D74)		MDS-E-V1/V2/V3	-
	4,194,304 p/rev (D51)		MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1
	1,048,576 p/rev (D48)		MDS-E-V1/V2/V3	
			MDS-EM-SPV3	MDS-EJ-V1



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

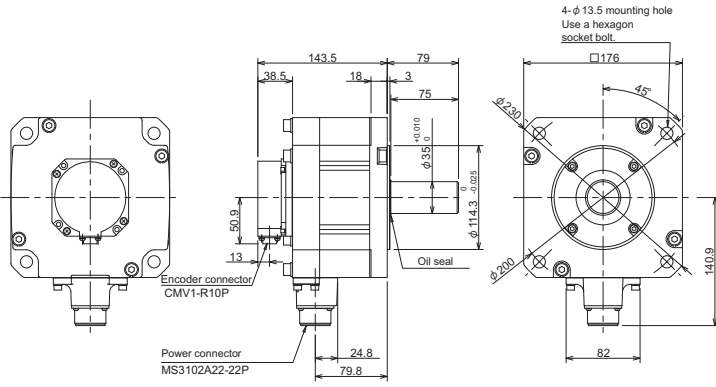
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

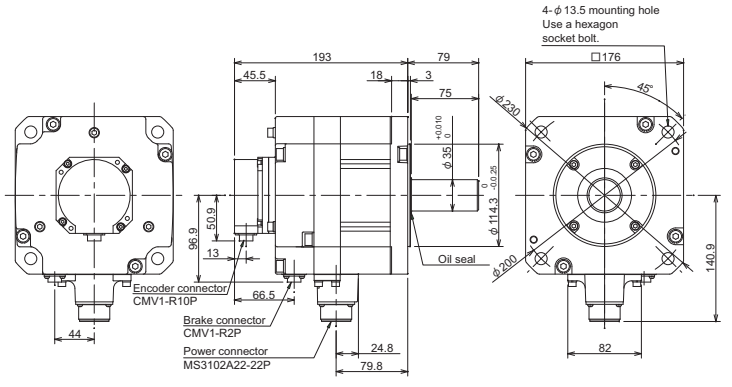
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

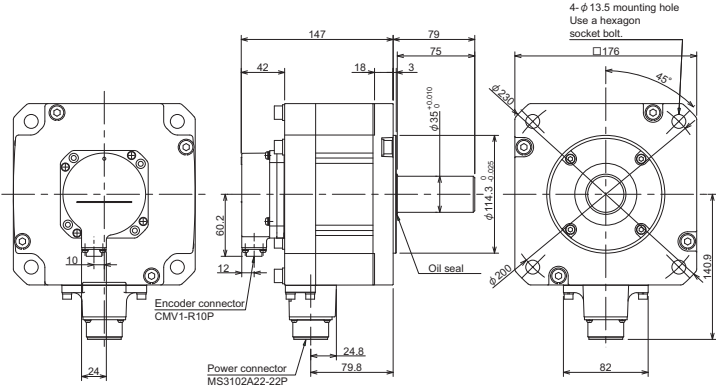
HG204S-D48



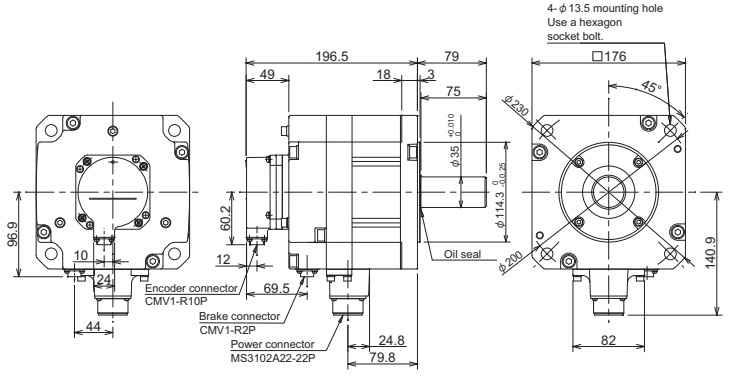
HG204BS-D48



HG204S-D51,-D74



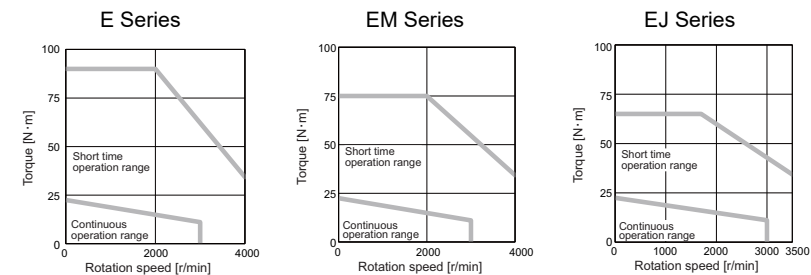
HG204BS-D51,-D74



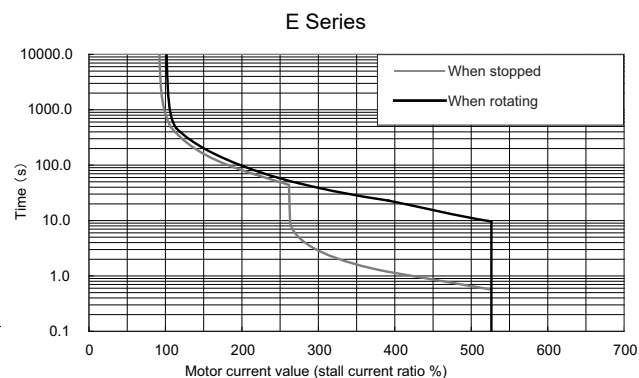
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(201)	(94)	(140)	(94)	(201)	(103)	(140)	(103)
	(76)	(122)	(76)		(86)	(122)	(86)
	(33)		(33)		(33)		(33)
	(52)		(52)		(52)		(52)

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
22.5N·m	3000r/min	HG354 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics

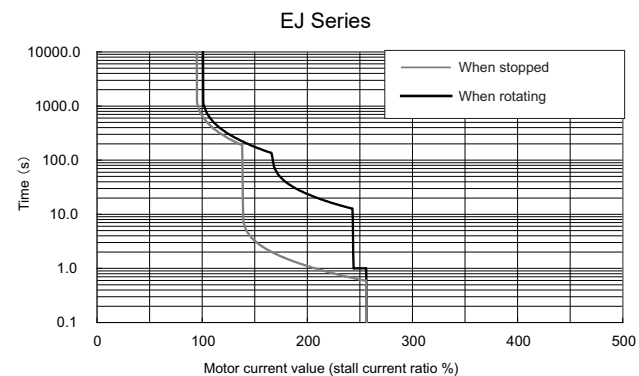
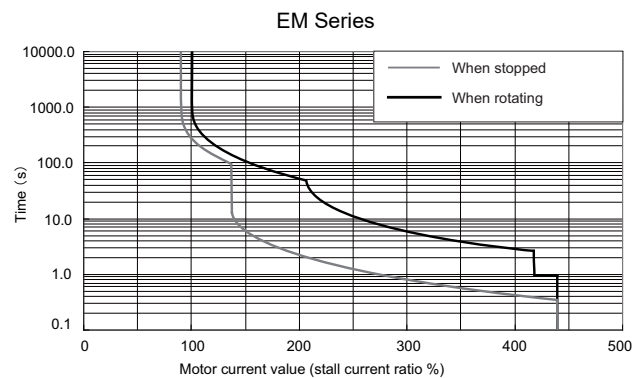


Servo overload protection characteristics

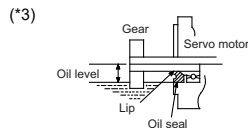
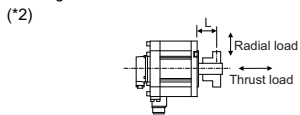


Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	160	-
	2-axis type	MDS-E-V2-	160, 160W	-
	3-axis type	MDS-E-V3-	-	-
	Multi axis type	MDS-EM-SPV3-	-	200120, 320120
	Regenerative resistor type	MDS-EJ-V1-	-	-
		MDS-EJ-V2-	-	100
Continuous characteristics	Rated output[kW]		3.5	3.5
	Rated current[A]		12	12
	Rated torque[N·m]		11.1	11.1
	Stall current[A]		22	22
	Stall torque[N·m]		22.5	22.5
				22.5
Maximum momentary output (For power supply selection)[kW]			18.0	15.0
Rated rotation speed[r/min]			3000	3000
Maximum rotation speed[r/min]			4000	3500
Maximum current[A]			116.0	79.6
Maximum torque[N·m]			90.0	75.0
Power rate at continuous rated torque[kW/s]			16.5	16.5
Max. deceleration torque of dynamic brake(Tdp)[N·m]			35.25	35.25
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			75.0	75.0
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			84.7	84.7
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]			525	525
Mass	(Without) [kg]		19.0	19.0
	(With brake)[kg]		25	25
Heat-resistant class			155(F)	155(F)
Degree of protection			IP67	
Cooling method			(The shaft-through portion is excluded.) Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))			X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		-	-
	Thrust load[N]		-	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		2058 (L=79)	2058 (L=79)
	Thrust load[N]		980	980
Oil level (*3)[mm]			30	30
Absolute position encoder	67,108,864 p/rev (D74)		MDS-E-V1/V2	-
	4,194,304 p/rev (D51)		MDS-E-V1/V2	MDS-EM-SPV3
	1,048,576 p/rev (D48)		MDS-E-V1/V2	MDS-EM-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

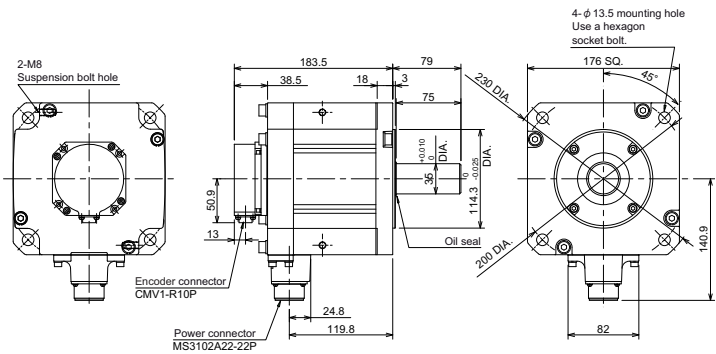
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

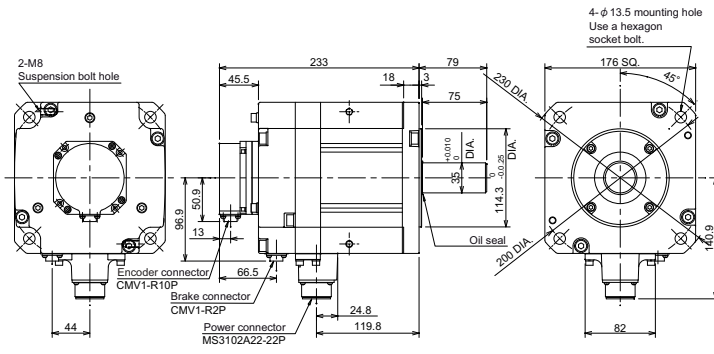
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

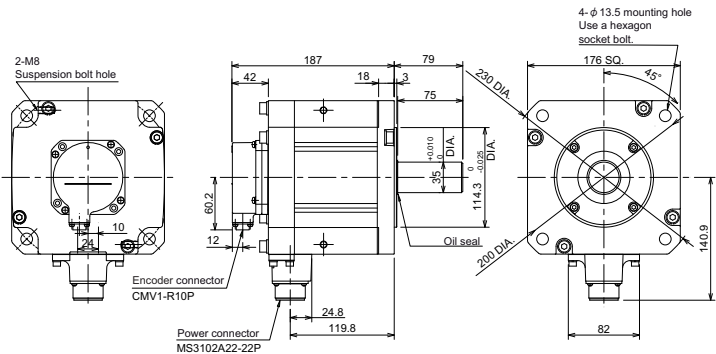
HG354S-D48



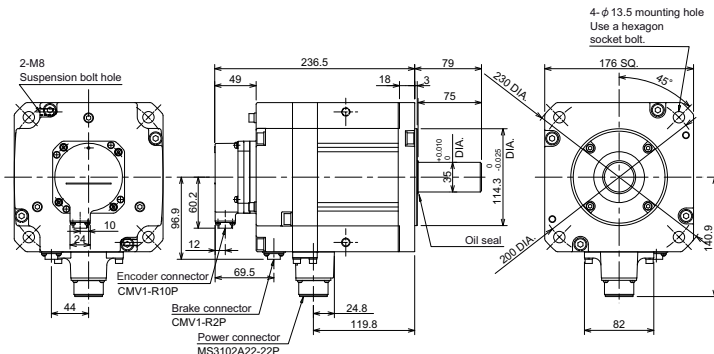
HG354BS-D48



HG354S-D51,-D74



HG354BS-D51,-D74

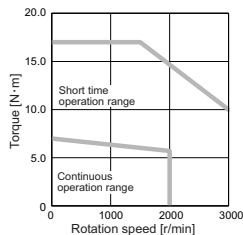


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug



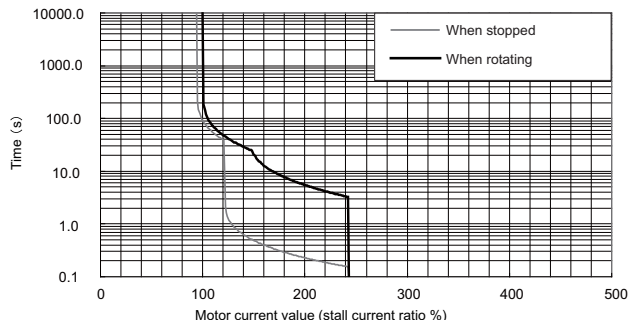
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
7.0N·m	2000r/min	HG123 □□-XXX (1)(2) (3)	(1) Magnetic brake
			B with brake
			None without brake
(2) Shaft end			
S Straight			
T Taper			
(3) Encoder			
XXX Type			

Torque characteristics



Servo overload protection characteristics

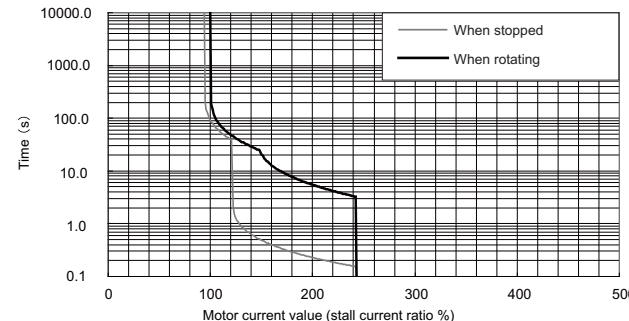
E Series



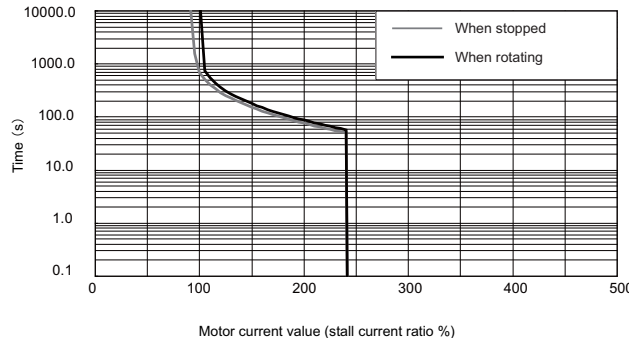
Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-E-V1- 20
	2-axis type MDS-E-V2- 20, 40
	3-axis type MDS-E-V3- 20, 40
	Multi axis type MDS-EM-SPV3- 10040, 16040, 16040S
	Regenerative resistor type MDS-EJ-V1- 40
	MDS-EJ-V2- 40
Continuous characteristics	Rated output[kW] 1.2
	Rated current[A] 5.2
	Rated torque[N·m] 5.7
	Stall current[A] 6.4
	Stall torque[N·m] 7.0
Maximum momentary output (For power supply selection)[kW] 3.2	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 16.0	
Maximum torque[N·m] 17.0	
Power rate at continuous rated torque[kW/s] 27.3	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 9.80	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 11.9	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 14.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 83.3	
Mass	(Without) [kg] 6.5
	(With brake)[kg] 8.5
Heat-resistant class 155(F)	
Degree of protection IP67	
(The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) 392 (L=58)
	Thrust load[N] 490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 980 (L=55)
	Thrust load[N] 490
Oil level (*3)[mm] 22.5	
Absolute position encoder	67,108,864 p/rev (D74) MDS-E-V1/V2/V3
	4,194,304 p/rev (D51) MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3
	1,048,576 p/rev (D48) MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3

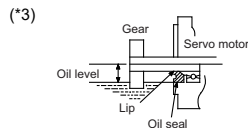
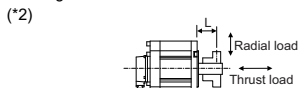
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

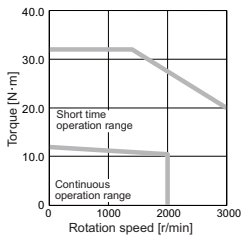
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.





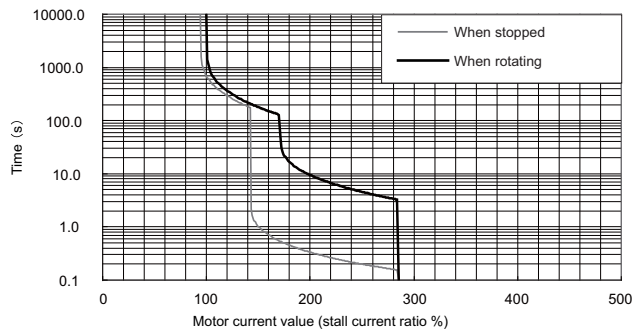
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
12.0N·m	2000r/min	HG223 □□-XXX	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
			T Taper	
			(3) Encoder	XXX Type

Torque characteristics



Servo overload protection characteristics

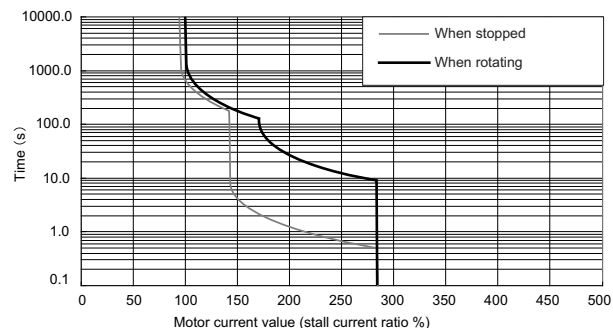
E Series



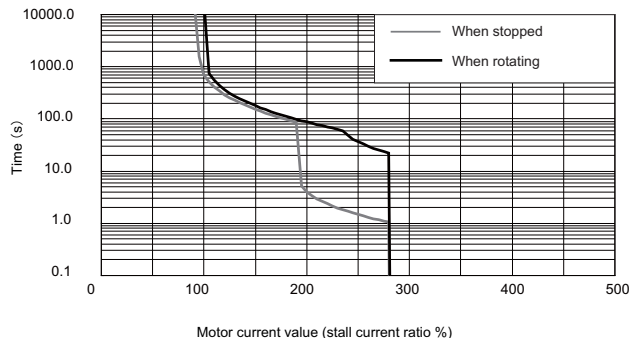
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-40
	2-axis type	MDS-E-V2-40, 80
	3-axis type	MDS-E-V3-40, 80
	Multi axis type	MDS-EM-SPV3-10040, 16040, 16040S, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1-40, MDS-EJ-V2-40
Continuous characteristics	Rated output[kW]	2.2
	Rated current[A]	9.0
	Rated torque[N·m]	10.5
	Stall current[A]	11
	Stall torque[N·m]	12.0
Maximum momentary output (For power supply selection)[kW]	6.3	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	29.0	
Maximum torque[N·m]	32.0	
Power rate at continuous rated torque[kW/s]	46.5	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	19.93	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	23.7	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	25.9	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	166	
Mass	(Without) [kg]	10.0
	(With brake)[kg]	12.0
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=58)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3

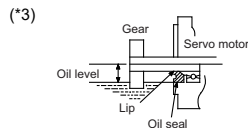
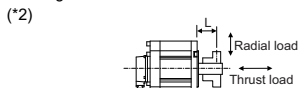
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

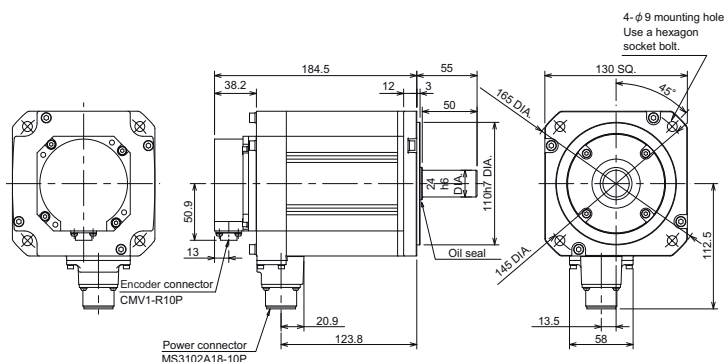
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

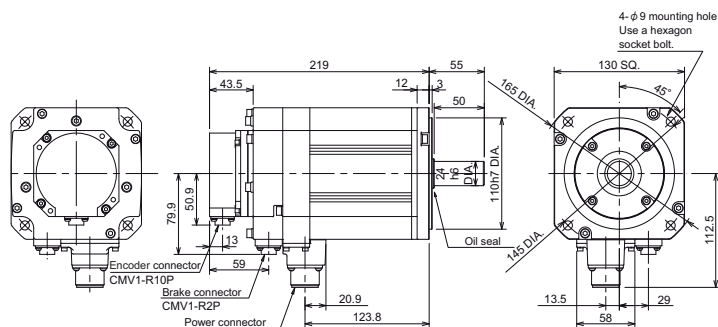
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

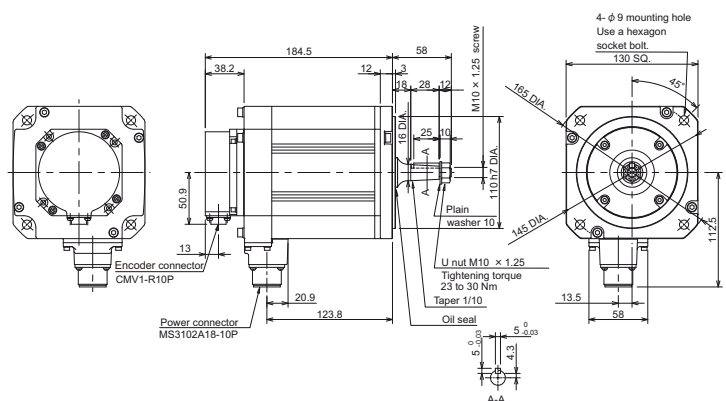
HG223S-D48



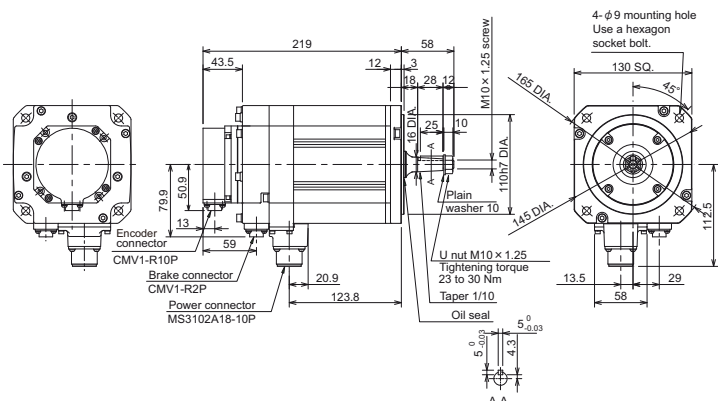
HG223BS-D48



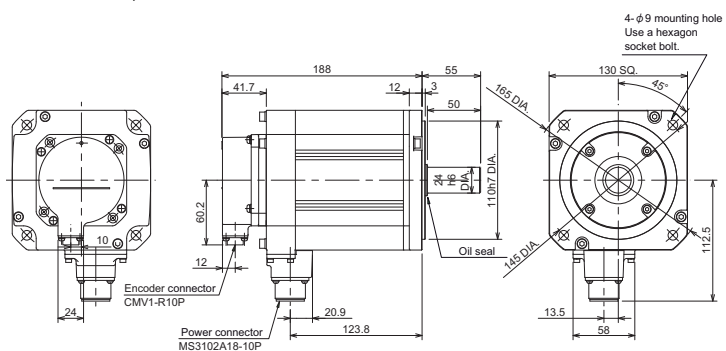
HG223T-D48



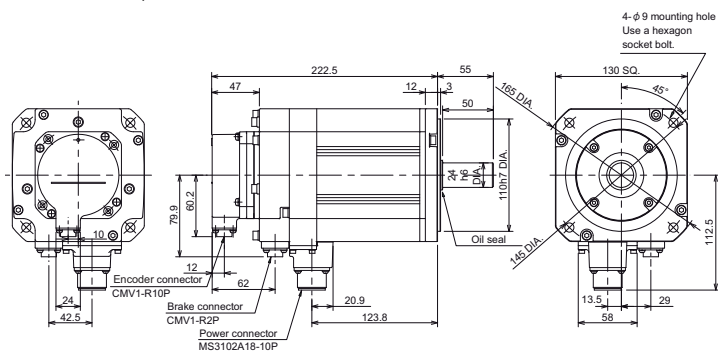
HG223BT-D48



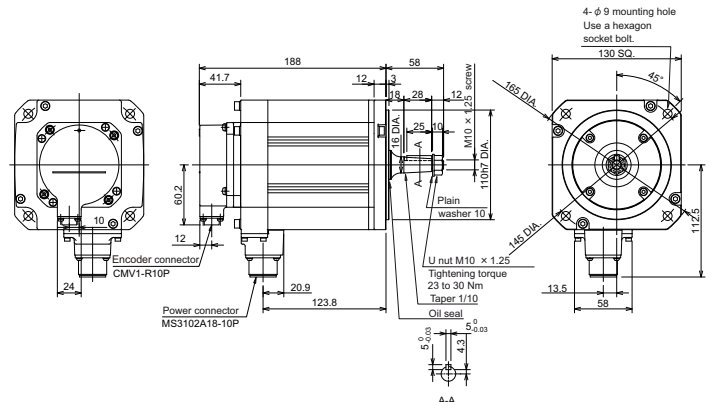
HG223S-D51,-D74



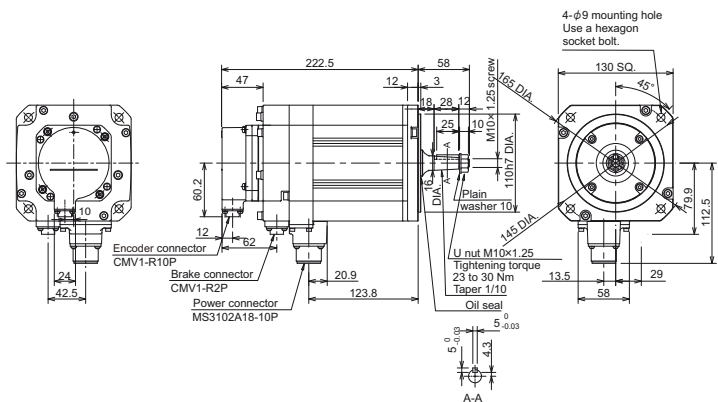
HG223BS-D51,-D74



HG223T-D51,-D74



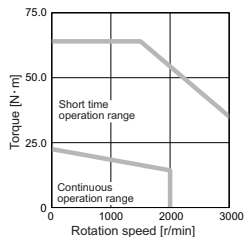
HG223BT-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
22.5N·m	2000r/min	HG303 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics

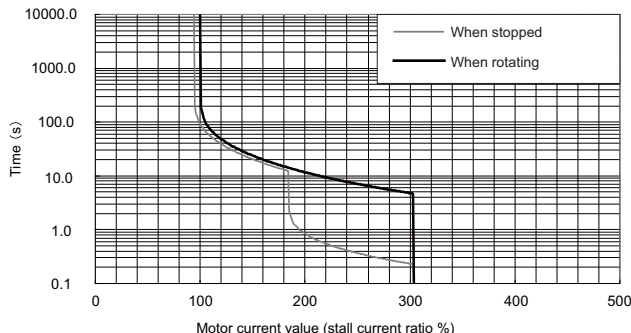


Servo overload protection characteristics

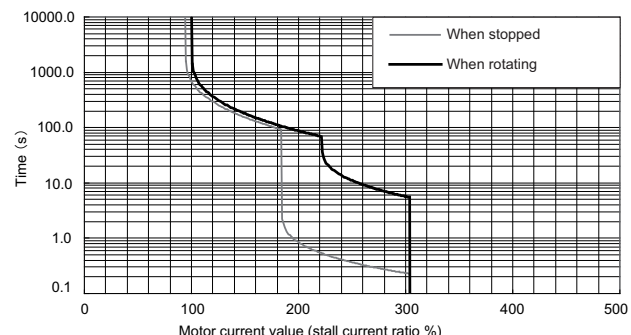
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 80
	2-axis type	MDS-E-V2- 80, 160
	3-axis type	MDS-E-V3- 80
	Multi axis type	MDS-EM-SPV3- 10080, 16080, 20080, 200120, 320120
	Regenerative resistor type	MDS-EJ-V1- 80 MDS-EJ-V2- -
Continuous characteristics	Rated output[kW]	3.0
	Rated current[A]	11
	Rated torque[N·m]	14.3
	Stall current[A]	16
	Stall torque[N·m]	22.5
Maximum momentary output (For power supply selection)[kW]	12.0	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	48.0	
Maximum torque[N·m]	64.0	
Power rate at continuous rated torque[kW/s]	27.3	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	30.40	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	75.0	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	84.7	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	525	
Mass	(Without) [kg]	19.0
	(With brake)[kg]	25.0
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1, MDS-EM-SPV3

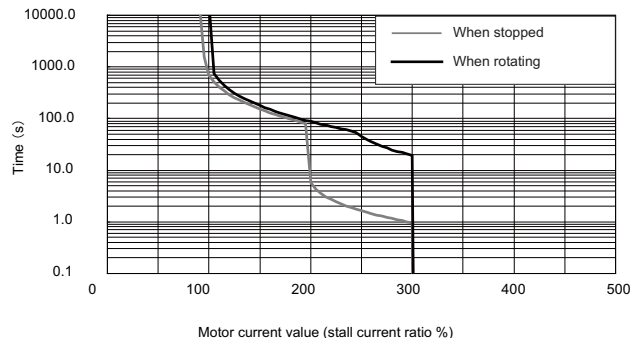
E Series



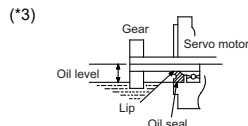
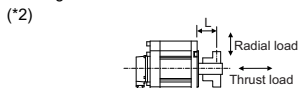
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

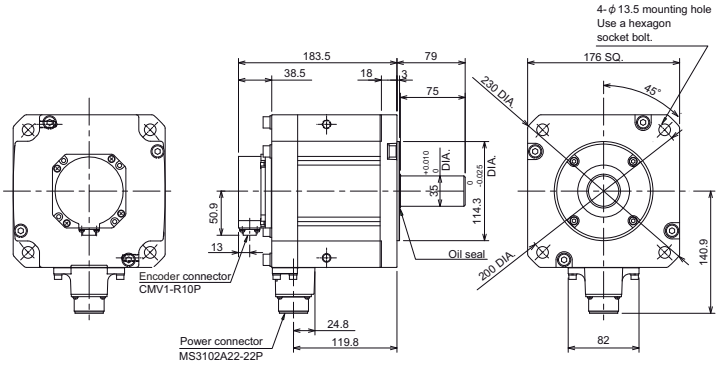
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

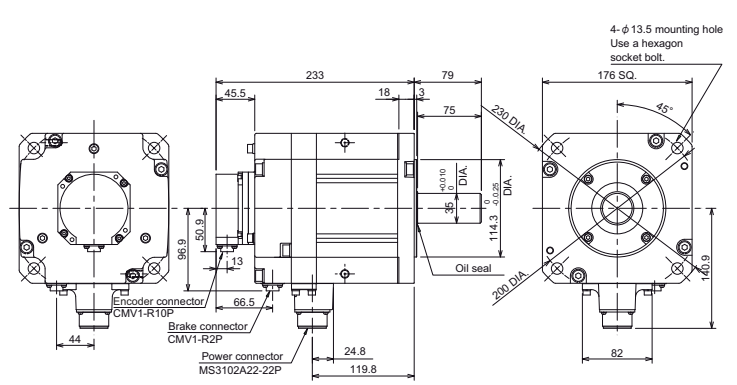
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

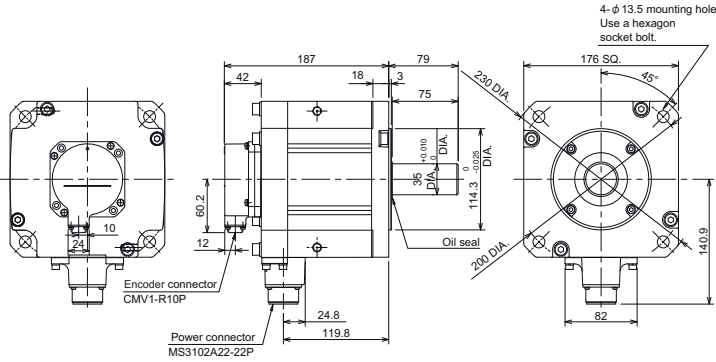
HG303S-D48



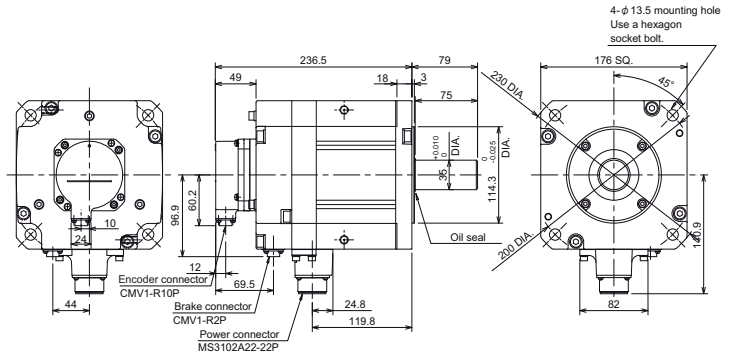
HG303BS-D48



HG303S-D51,-D74



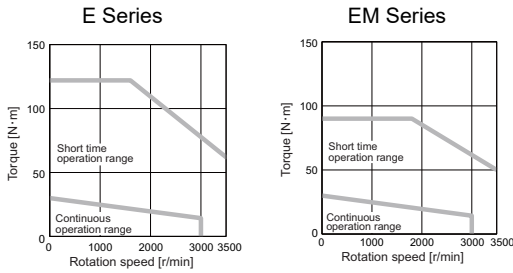
HG303BS-D51,-D74



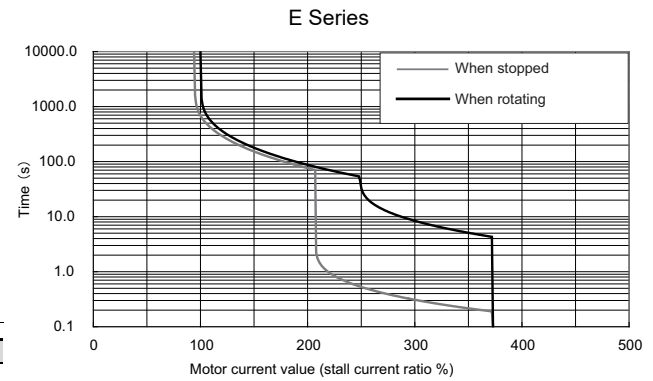
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
30.0N·m	3000r/min	HG453 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics

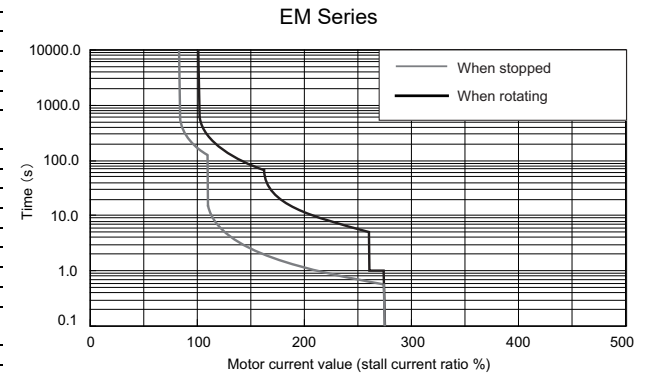


Servo overload protection characteristics

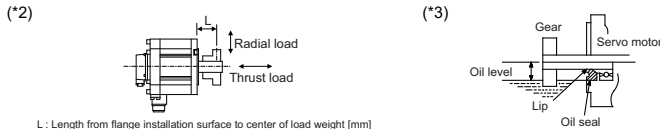


Specifications

Item	Specification			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	160	
	2-axis type	MDS-E-V2-	160, 160W	
	3-axis type	MDS-E-V3-	-	
	Multi axis type	MDS-EM-SPV3-	-	200120, 320120
	Regenerative resistor type	MDS-EJ-V1-	-	-
		MDS-EJ-V2-	-	-
Continuous characteristics	Rated output[kW]	4.5	4.5	
	Rated current[A]	19	19	
	Rated torque[N·m]	14.3	14.3	
	Stall current[A]	28	28	
	Stall torque[N·m]	30.0	30.0	
Maximum momentary output (For power supply selection)[kW]	22.0	16.5		
Rated rotation speed[r/min]	3000	3000		
Maximum rotation speed[r/min]	3500	3500		
Maximum current[A]	105.0	79.6		
Maximum torque[N·m]	122.0	90.0		
Power rate at continuous rated torque[kW/s]	18.3	18.3		
Max. deceleration torque of dynamic brake(Tdp)[N·m]	52.94	52.94		
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	112.0	112.0		
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	122.0	122.0		
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	784	784		
Mass	(Without) [kg]	25.0	25.0	
	(With brake)[kg]	31.0	31.0	
Heat-resistant class	155(F)	155(F)		
Degree of protection	IP67 (The shaft-through portion is excluded.)			
Cooling method	Totally enclosed natural-cooling	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:29.4(3)			
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-	-	
	Thrust load[N]	-	-	
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)	2058 (L=79)	
	Thrust load[N]	980	980	
Oil level (*3)[mm]	30	30		
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2	-	
	4,194,304 p/rev (D51)	MDS-E-V1/V2	MDS-EM-SPV3	
	1,048,576 p/rev (D48)	MDS-E-V1/V2	MDS-EM-SPV3	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

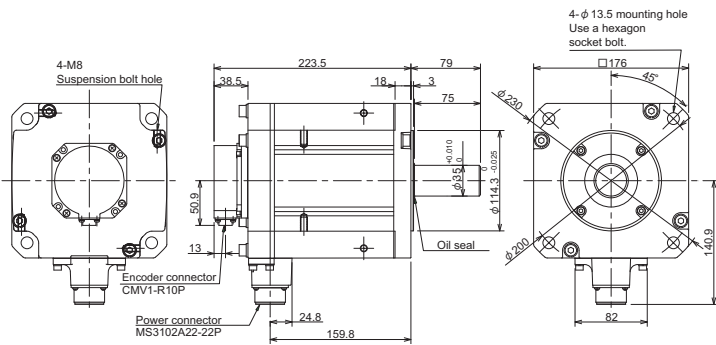
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

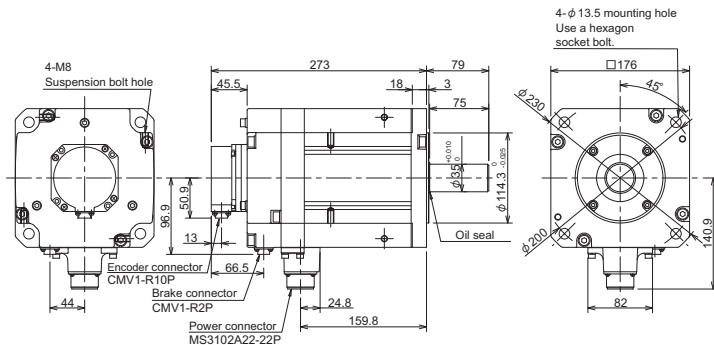
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

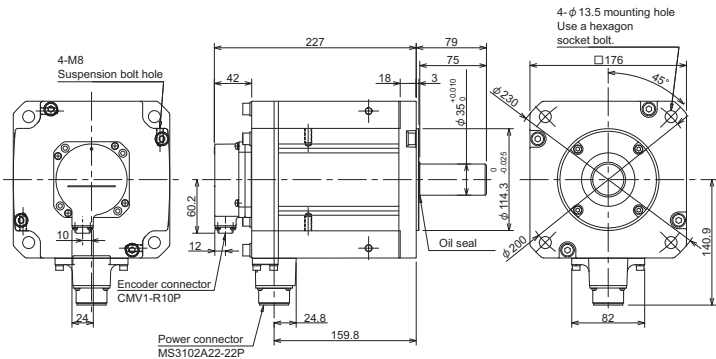
HG453S-D48



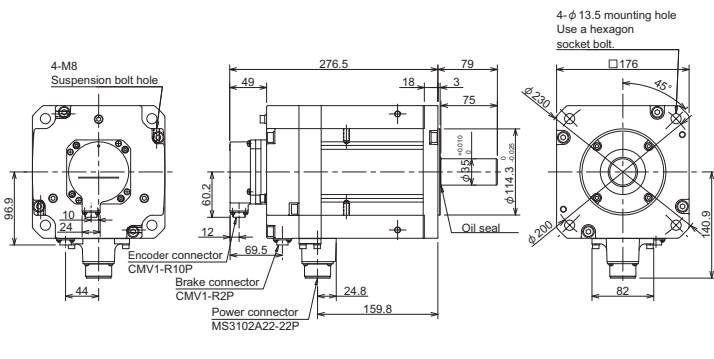
HG453BS-D48



HG453S-D51,-D74



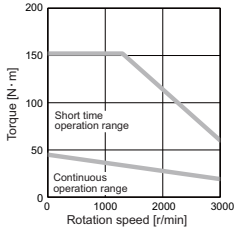
HG453BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

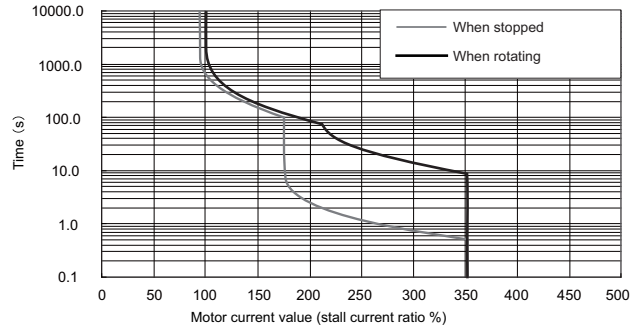
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
45.0N·m	3000r/min	HG603 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



Servo overload protection characteristics

E Series

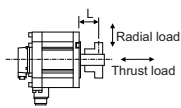


Specifications

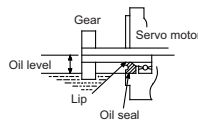
Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-E-V1- 160
	2-axis type MDS-E-V2- 160
	3-axis type MDS-E-V3- -
	Multi axis type MDS-EM-SPV3- -
	Regenerative resistor type MDS-EJ-V1- - MDS-EJ-V2- -
Continuous characteristics	Rated output[kW] 6.0
	Rated current[A] 33
	Rated torque[N·m] 19.1
	Stall current[A] 33
	Stall torque[N·m] 45.0
Maximum momentary output (For power supply selection)[kW] 26.9	
Rated rotation speed[r/min] 3000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 109.0	
Maximum torque[N·m] 152.0	
Power rate at continuous rated torque[kW/s] 23.7	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 71.34	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 154.0	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 164.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 1078	
Mass	(Without) [kg] 32
	(With brake)[kg] 38
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder	67,108,864 p/rev (D74) MDS-E-V1/V2
	4,194,304 p/rev (D51) MDS-E-V1/V2
	1,048,576 p/rev (D48) MDS-E-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(\*3)



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

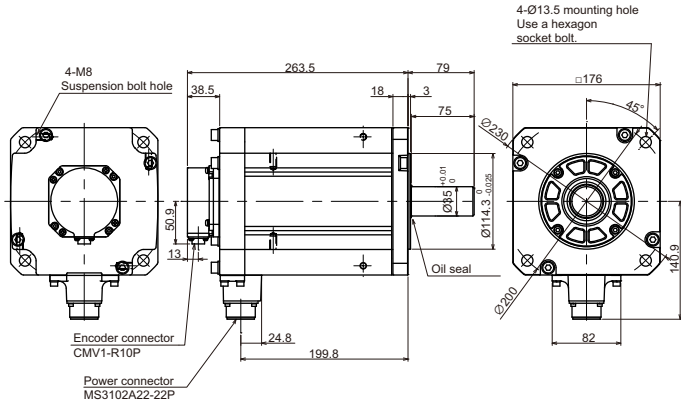
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

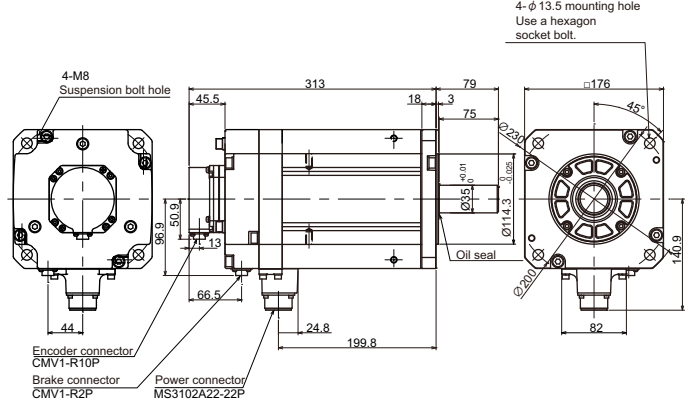


Outline dimension drawings [Unit : mm]

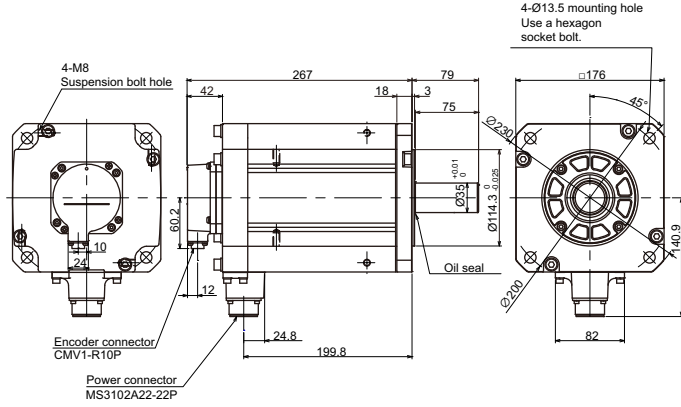
HG603S-D48



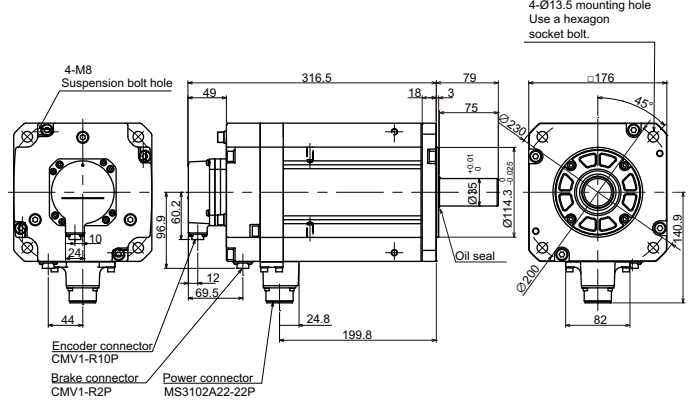
HG603BS-D48



HG603S-D51,-D74



HG603BS-D51,-D74

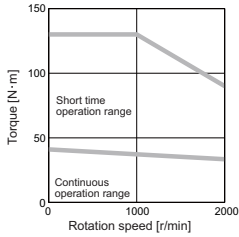


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

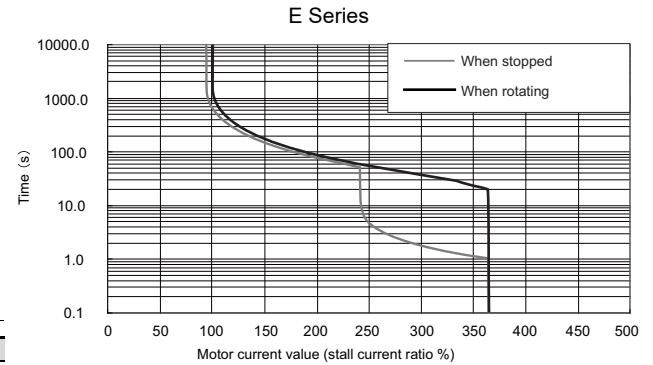


Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
41.0N•m	2000r/min	HG702 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics

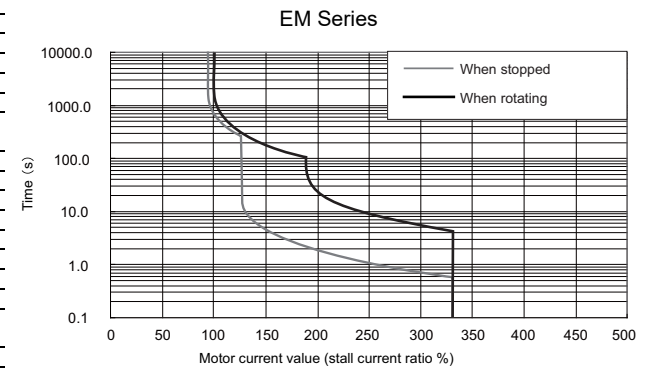


Servo overload protection characteristics

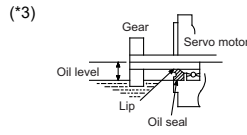
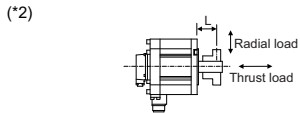


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-160
	2-axis type	MDS-E-V2-160
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-200120, 320120
	Regenerative resistor type	MDS-EJ-V1-
		MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	7.0
	Rated current[A]	24
	Rated torque[N•m]	33.4
	Stall current[A]	24
	Stall torque[N•m]	41.0
	Maximum momentary output (For power supply selection)[kW]	21.2
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	2000	
Maximum current[A]	79.5	
Maximum torque[N•m]	130.0	
Power rate at continuous rated torque[kW/s]	72.5	
Max. deceleration torque of dynamic brake(Tdp)[N•m]	76.88	
Motor inertia[×10 <sup>-4</sup> kg•m <sup>2</sup> ]	154.0	
(Brake inertia)[×10 <sup>-4</sup> kg•m <sup>2</sup> ]	164.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg•m <sup>2</sup> ]	1078	
Mass	(Without) [kg]	32
	(With brake)[kg]	38
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ](G)	X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2
	4,194,304 p/rev (D51)	MDS-E-V1/V2
		MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2 MDS-EM-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

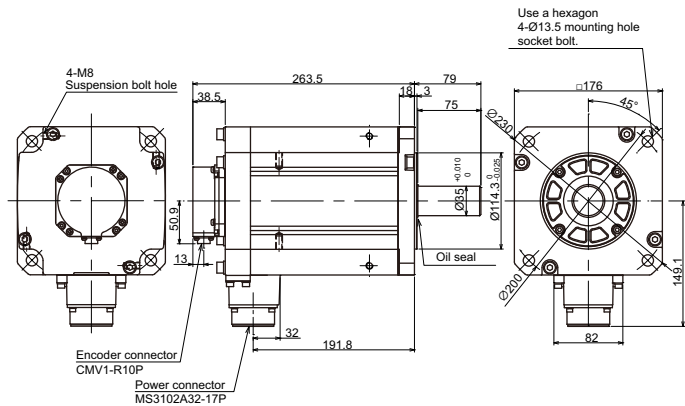
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N•m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

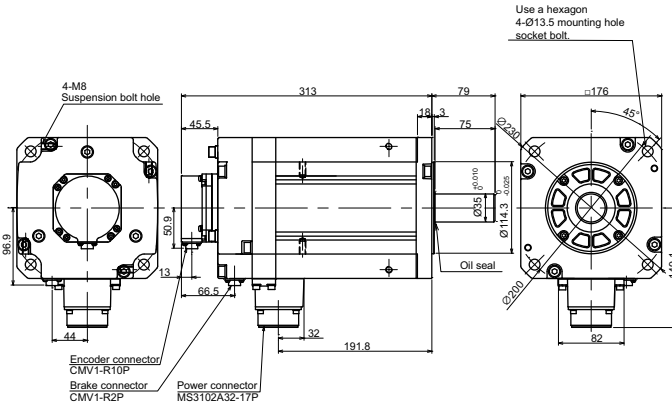
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

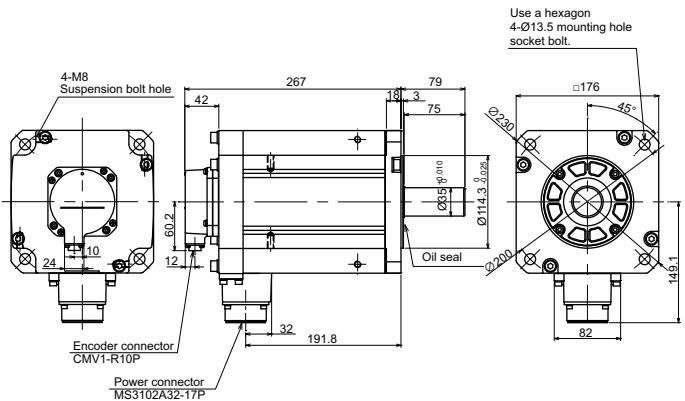
HG702S-D48



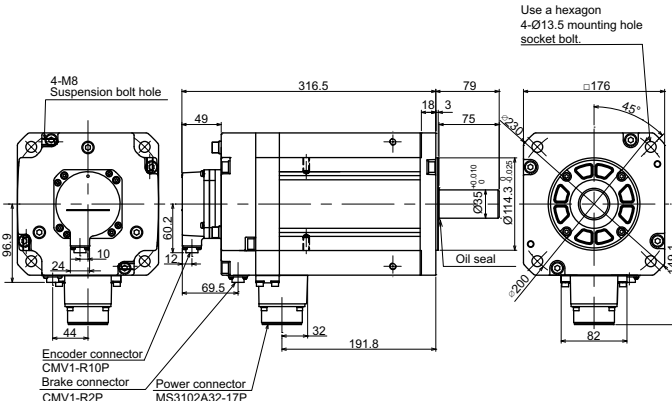
HG702BS-D48



HG702S-D51,-D74



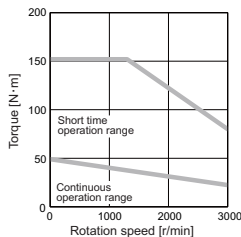
HG702BS-D51,-D74



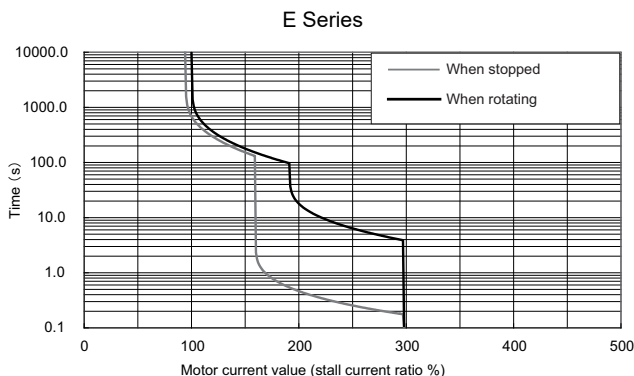
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(227)	(76)	(140)	(122)	(227)	(76)	(140)	(122)
(94)	(33)	(94)	(33)	(103)	(86)	(103)	(86)
	(70)		(70)		(70)		(70)

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
49.0N·m	3000r/min	HG703 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics



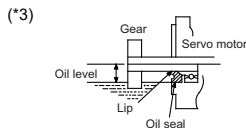
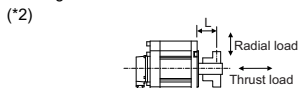
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-160W
	2-axis type	MDS-E-V2-160W
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	7.0
	Rated current[A]	34
	Rated torque[N·m]	22.3
	Stall current[A]	37
	Stall torque[N·m]	49.0
Maximum momentary output (For power supply selection)[kW]	27.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	109.0	
Maximum torque[N·m]	152.0	
Power rate at continuous rated torque[kW/s]	32.2	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	71.90	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	154.0	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	164.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	1078	
Mass	(Without) [kg]	32.0
	(With brake)[kg]	38
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ](G)	X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2
	4,194,304 p/rev (D51)	MDS-E-V1/V2
	1,048,576 p/rev (D48)	MDS-E-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

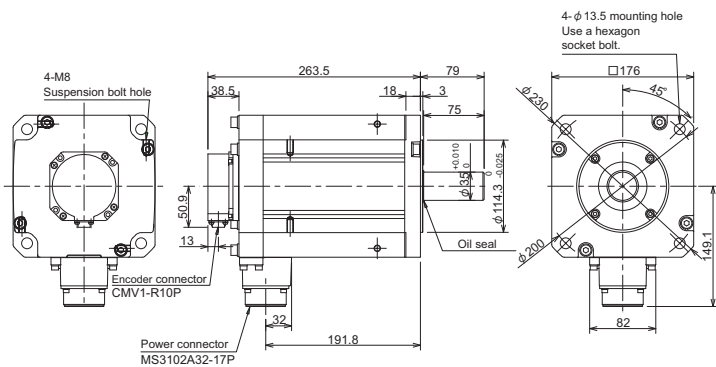
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

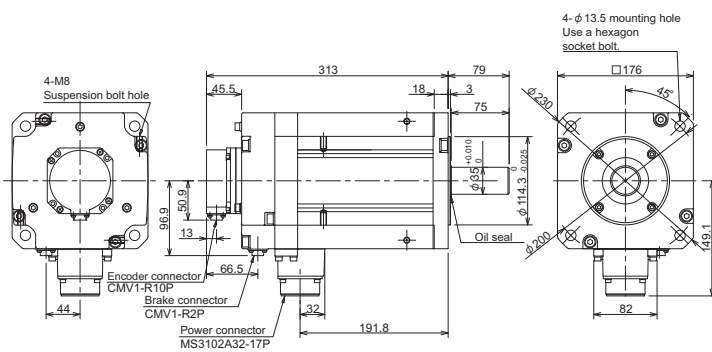
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

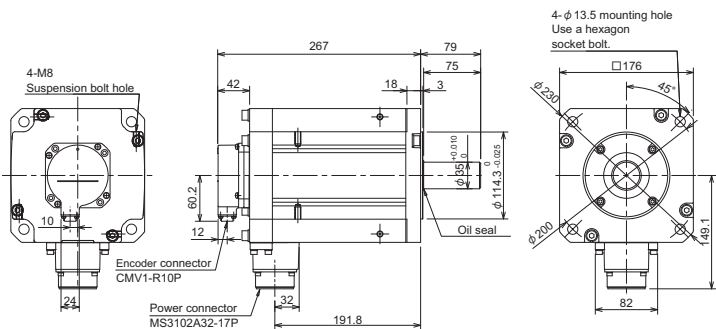
HG703S-D48



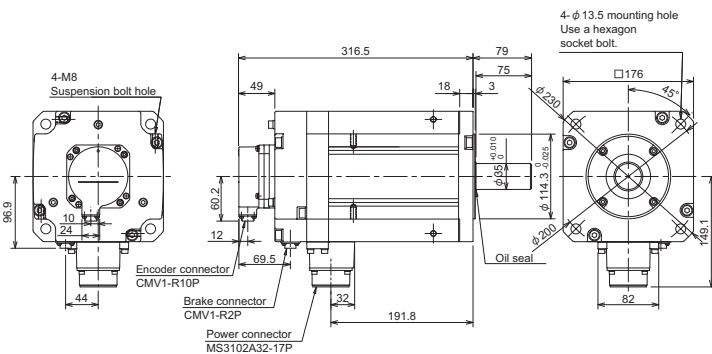
HG703BS-D48



HG703S-D51,-D74



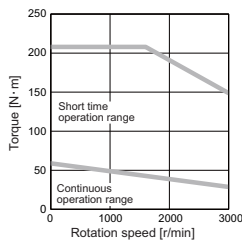
HG703BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

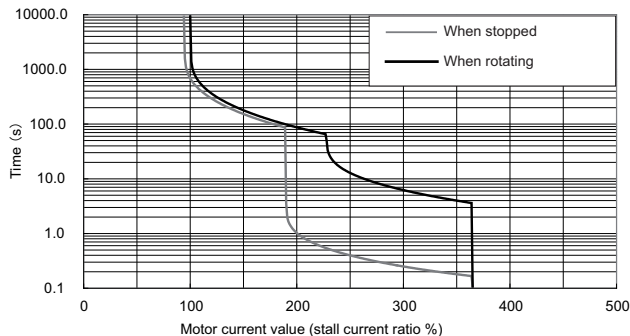
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
58.8N·m	3000r/min	HG903 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics



Servo overload protection characteristics

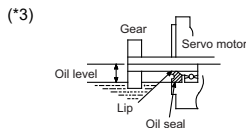
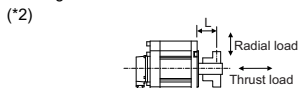
E Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	9.0
	Rated current[A]	30
	Rated torque[N·m]	28.6
	Stall current[A]	56
	Stall torque[N·m]	58.8
Maximum momentary output (For power supply selection)[kW]	41.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	204.0	
Maximum torque[N·m]	208.0	
Power rate at continuous rated torque[kW/s]	42.1	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	89.29	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	196.0	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	206.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	1372	
Mass	(Without) [kg]	43
	(With brake)[kg]	49
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:9.8(1), Y:9.8(1)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2450 (L=85)
	Thrust load[N]	980
Oil level (*3)[mm]	34	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1
	4,194,304 p/rev (D51)	MDS-E-V1
	1,048,576 p/rev (D48)	MDS-E-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

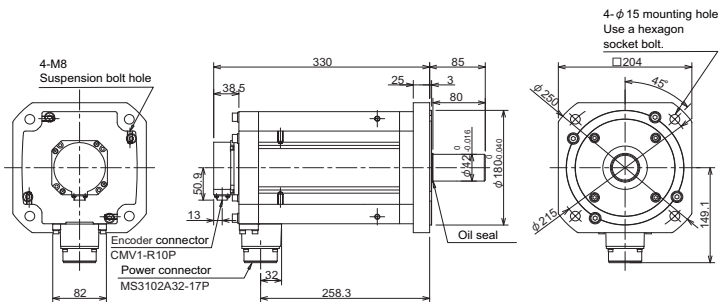
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

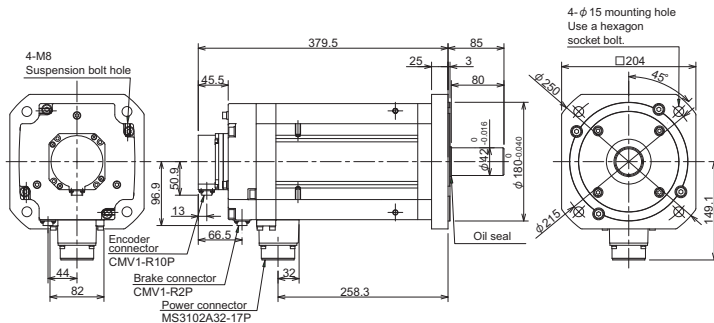
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

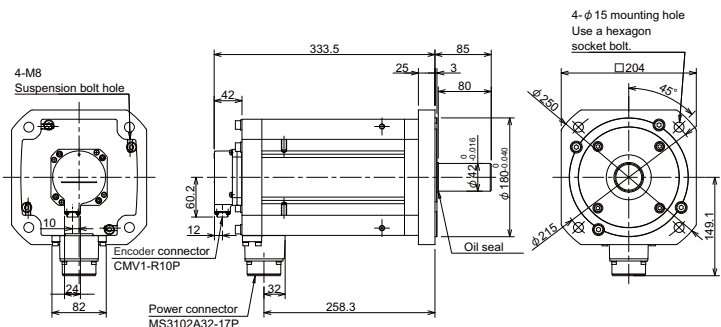
HG903S-D48



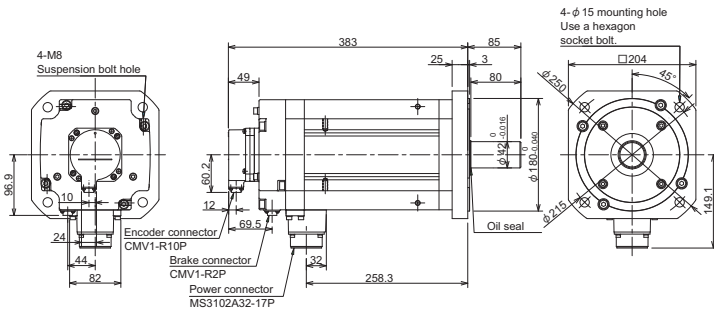
HG903BS-D48



HG903S-D51,-D74



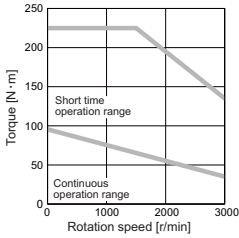
HG903BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(227)	(94)	(227)	(140)	(227)	(103)	(227)	(140)
	(76)		(76)		(86)		(76)
	(33)		(33)		(33)		(33)
	(70)		(70)		(70)		(70)

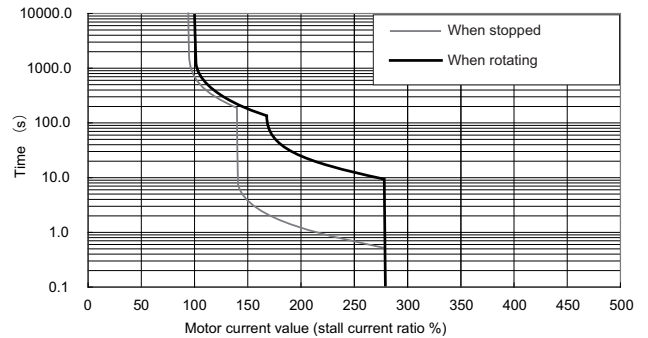
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
95.5N·m	3000r/min	HG1103 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics



Servo overload protection characteristics

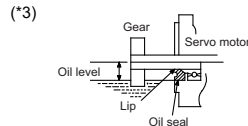
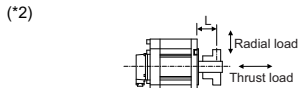
E Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-320W
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	11.0
	Rated current[A]	43
	Rated torque[N·m]	35.0
	Stall current[A]	76
	Stall torque[N·m]	95.5
Maximum momentary output (For power supply selection)[kW]	50.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	212	
Maximum torque[N·m]	225	
Power rate at continuous rated torque[kW/s]	38.9	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	137.68	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	315	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	336	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2205	
Mass	(Without) [kg]	86
	(With brake)[kg]	97
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2940(L=116)
	Thrust load[N]	980
Oil level (*3)[mm]	40	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1
	4,194,304 p/rev (D51)	MDS-E-V1
	1,048,576 p/rev (D48)	MDS-E-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

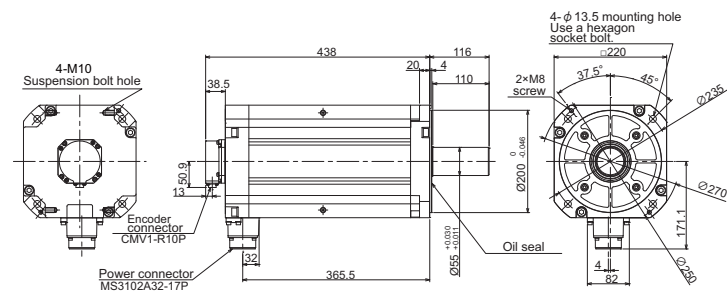
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	32
Static friction torque[N·m]	126 or more
Release delay time (*1) [s]	0.5
Braking delay time (DC OFF) (*1) [s]	0.2
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

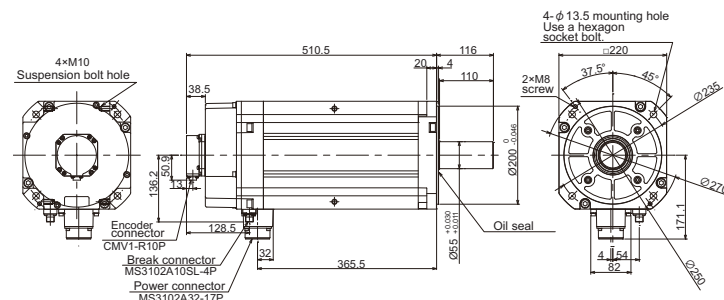
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

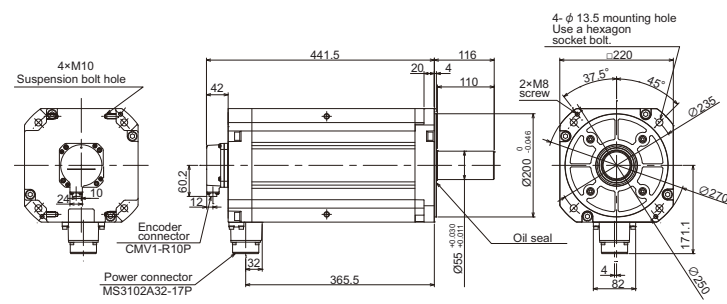
HG1103S-D48



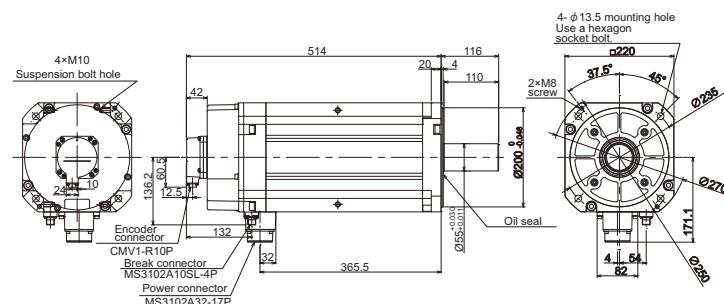
HG1103BS-D48



HG1103S-D51,-D74



HG1103BS-D51,-D74

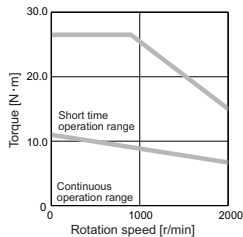


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(227)	(76)	(140)	(122)	(227)	(76)	(140)	(122)
(94)	(33)	(94)	(33)	(103)	(86)	(103)	(86)
	(70)		(70)		(70)		(70)



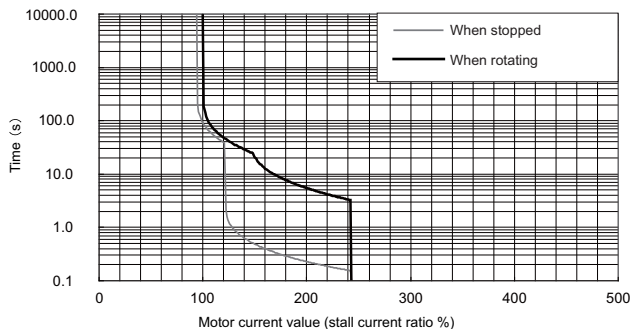
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
11.0N·m	2000r/min	HG142 □□-XXX	(1) Magnetic brake
			B with brake
			None without brake
(2) Shaft end			
S Straight			
T Taper			
(3) Encoder			
XXX Type			

Torque characteristics



Servo overload protection characteristics

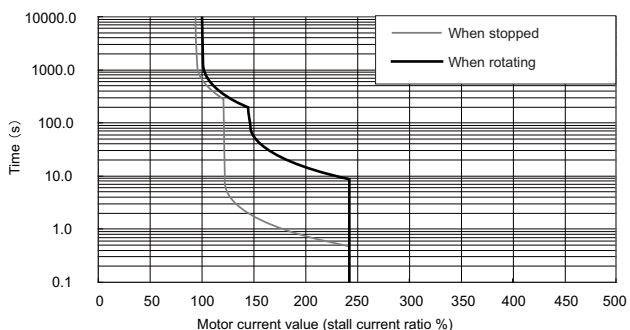
E Series



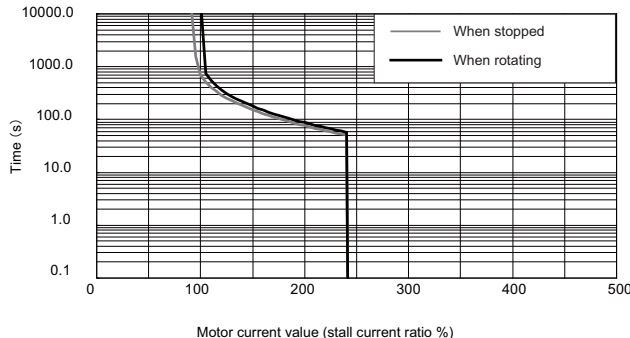
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1-
		MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	1.4
	Rated current[A]	5.2
	Rated torque[N·m]	6.7
	Stall current[A]	6.4
	Stall torque[N·m]	11.0
	Maximum momentary output (For power supply selection)[kW]	3.2
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	2000	
Maximum current[A]	16.0	
Maximum torque[N·m]	26.5	
Power rate at continuous rated torque[kW/s]	25.2	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	14.43	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	17.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	20.0	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	125	
Mass	(Without) [kg]	8.3
	(With brake)[kg]	11
Heat-resistant class	155(F)	
Degree of protection	IP67	
(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=58)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3

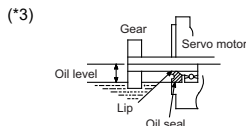
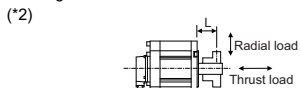
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

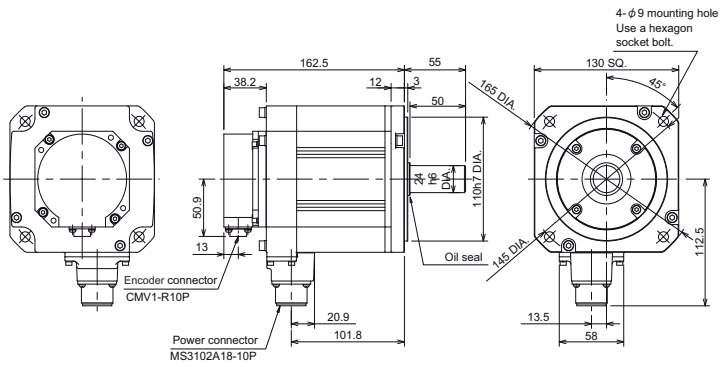
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

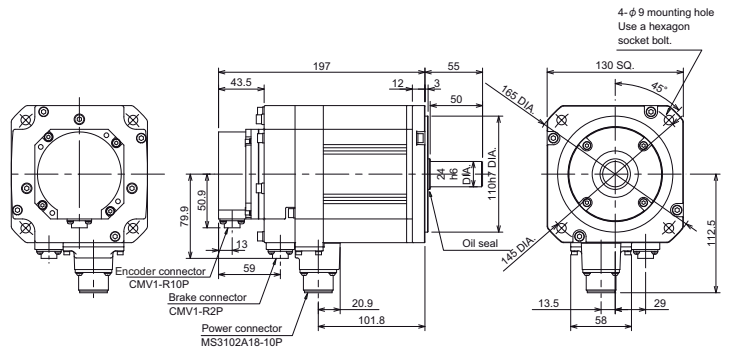
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

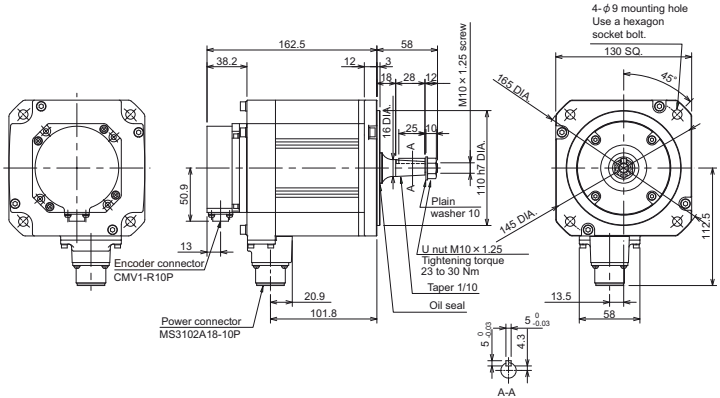
HG142S-D48



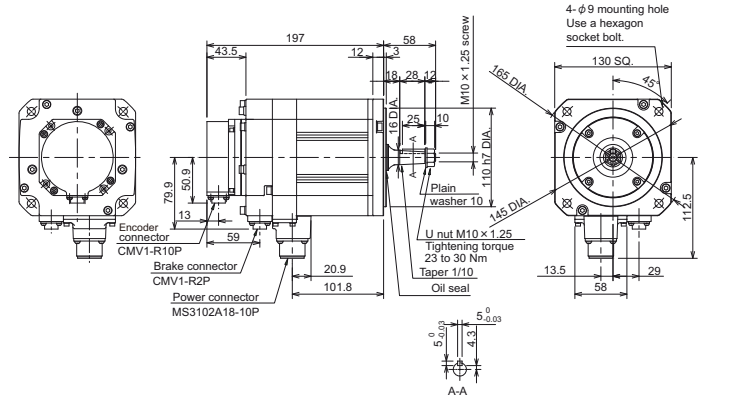
HG142BS-D48



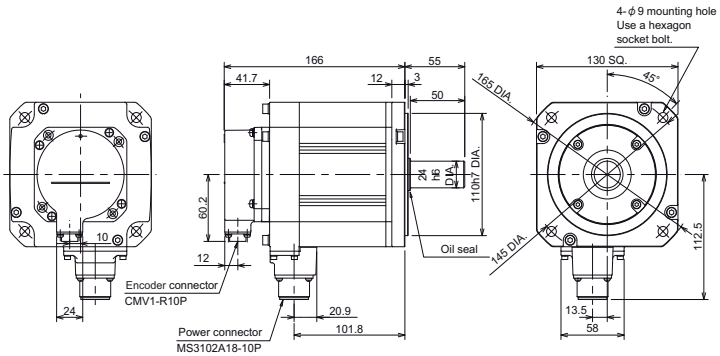
HG142T-D48



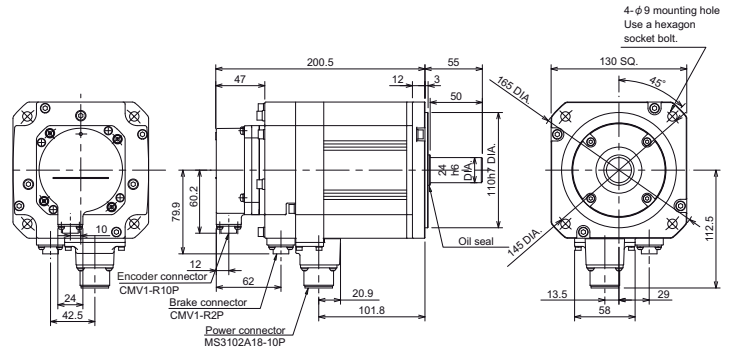
HG142BT-D48



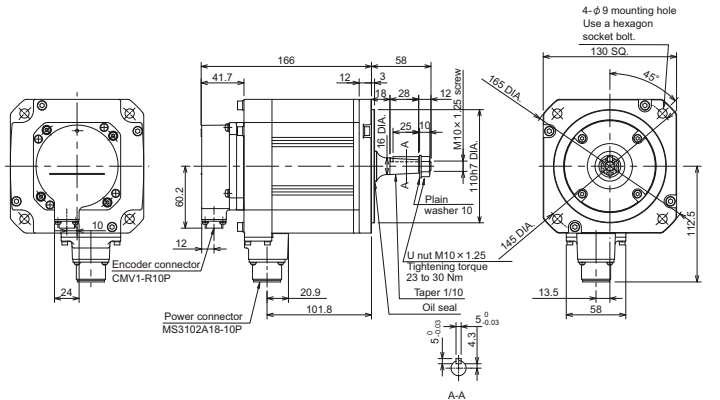
HG142S-D51,-D74



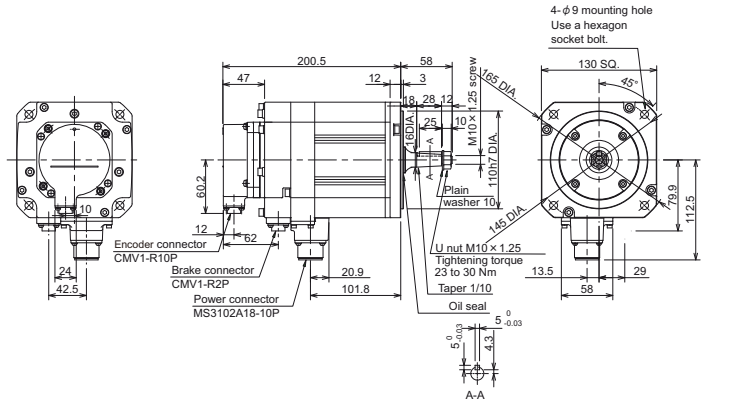
HG142BS-D51,-D74



HG142T-D51,-D74



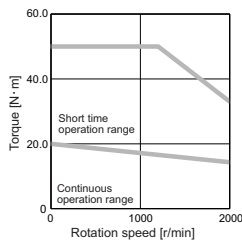
HG142BT-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(169) (64)	(167) (76) (33) (50)	(169) (123) (64)	(167) (105) (76) (33) (33) (50)	(169) (103)	(167) (86) (33) (50)	(169) (123) (103)	(167) (105) (86) (33) (33) (50)

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
20.0N·m	2000r/min	HG302 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics

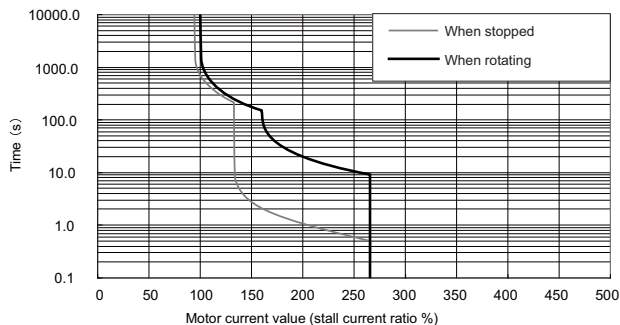


Servo overload protection characteristics

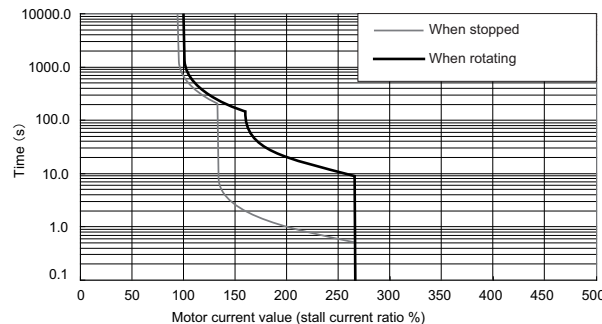
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 40
	2-axis type	MDS-E-V2- 40, 80
	3-axis type	MDS-E-V3- 40, 80
	Multi axis type	MDS-EM-SPV3- 10040, 16040, 16040S, 10080, 16080, 20080
Continuous characteristics	Regenerative resistor type	MDS-EJ-V1- 40 MDS-EJ-V2- 40
	Rated output[kW]	3.0
	Rated current[A]	11
	Rated torque[N·m]	14.3
Maximum momentary output (For power supply selection)[kW]	Rated current[A]	11
	Stall torque[N·m]	20.0
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	2000	
Maximum current[A]	29.0	
Maximum torque[N·m]	50.0	
Power rate at continuous rated torque[kW/s]	27.3	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	29.42	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	75.0	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	84.7	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	525	
Mass	(Without) [kg]	19.0
	(With brake)[kg]	25.0
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-E-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3
	1,048,576 p/rev (D48)	MDS-E-V1/V2/V3, MDS-EJ-V1/V2, MDS-EM-SPV3

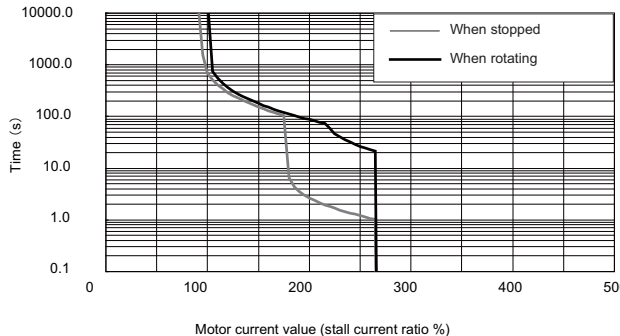
E Series



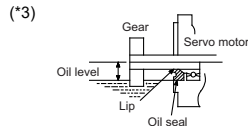
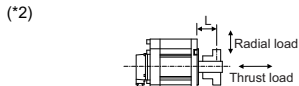
EM Series



EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

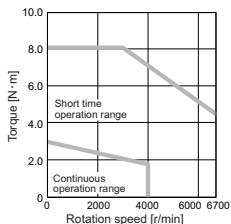
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



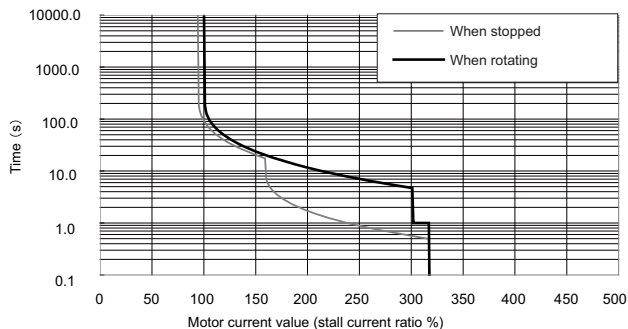
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
3.0N·m	4000r/min	HK76 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics



Servo overload protection characteristics

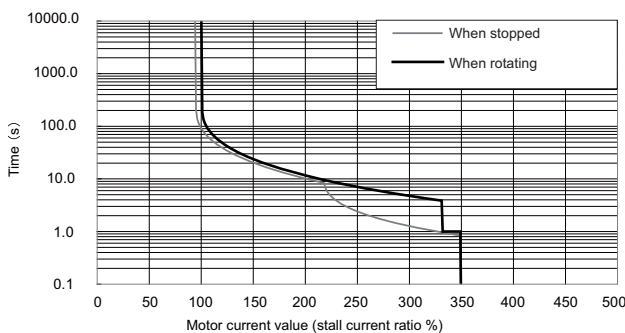
E, EM Series



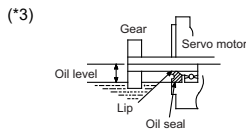
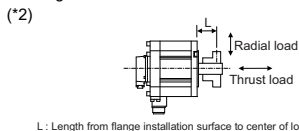
Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	20
	2-axis type	MDS-E-V2-	20, 40
	3-axis type	MDS-E-V3-	20, 40
	Multi axis type	MDS-EM-SPV3-	10040, 16040
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	- -
Continuous characteristics	Rated output[kW]		0.75
	Rated current[A]		3.0
	Rated torque[N·m]		1.8
	Stall current[A]		4.9
	Stall torque[N·m]		3.0
	Maximum momentary output (For power supply selection)[kW]		3.3
Rated rotation speed[r/min]		4000	
Maximum rotation speed[r/min]		6700	
Maximum current[A]		16	
Maximum torque[N·m]		8.1	
Power rate at continuous rated torque[kW/s]		15.4	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	5.74		2.87
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		2.08	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		2.23	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		18.3	
Mass	(Without) [kg]		2.7
	(With brake)[kg]		3.6
Heat-resistant class		155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X: 24.5(2.5), Y: 49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		245 (L=35)
	Thrust load[N]		147
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		392 (L=36)
	Thrust load[N]		147
Oil level (*3)[mm]			16
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2

EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

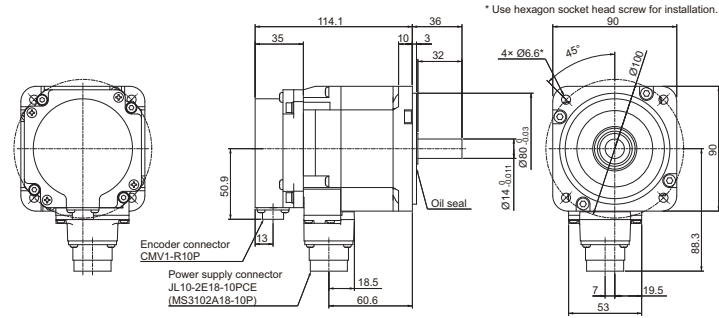
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	10
Static friction torque[N·m]	3.2 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

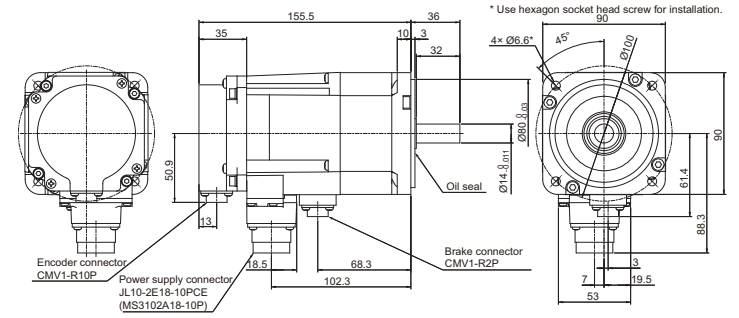
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

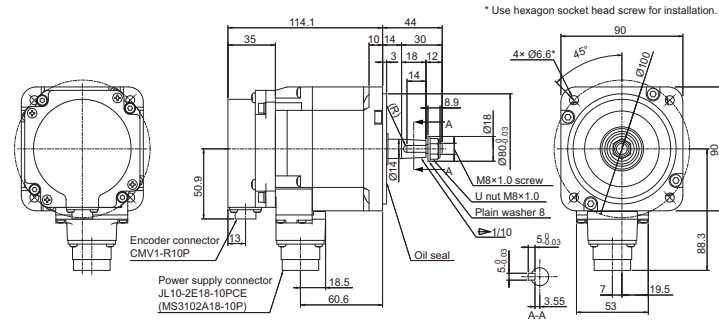
HK76S-G48



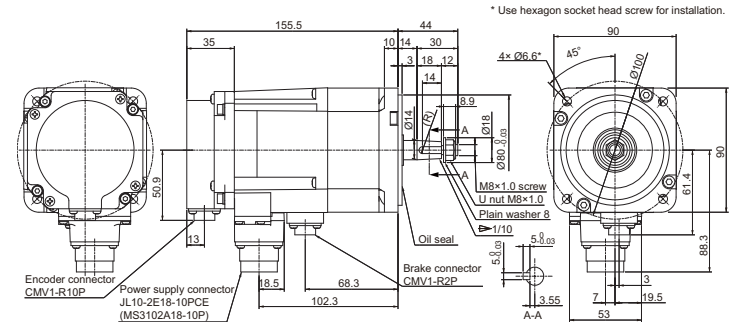
HK76BS-G48



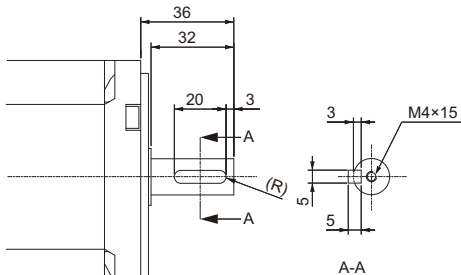
HK76T-G48



HK76BT-G48



Shaft with keyway (HK76K/HK76BK-G48)

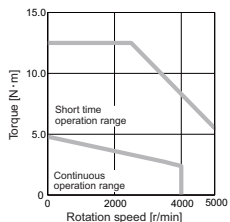


The appearance is the same as the straight (without keyway) except the shaft shape.

G48		G48	
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

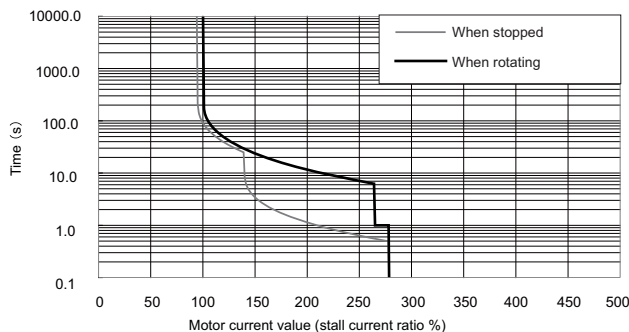
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
4.8N·m	3500r/min	HK105 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics



Servo overload protection characteristics

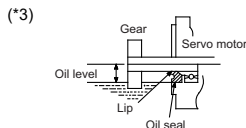
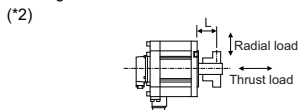
E, EM Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 20
	2-axis type	MDS-E-V2- 20, 40
	3-axis type	MDS-E-V3- 20, 40
	Multi axis type	MDS-EM-SPV3- 10040, 16040
	Regenerative resistor type	MDS-EJ-V1- -
		MDS-EJ-V2- -
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	3.3
	Rated torque[N·m]	2.7
	Stall current[A]	5.6
	Stall torque[N·m]	4.8
Maximum momentary output (For power supply selection)[kW]	3.6	
Rated rotation speed[r/min]	3500	
Maximum rotation speed[r/min]	5000	
Maximum current[A]	16	
Maximum torque[N·m]	12.5	
Power rate at continuous rated torque[kW/s]	17.1	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	12.35	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	4.36	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	4.51	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	35.7	
Mass	(Without) [kg]	4.1
	(With brake)[kg]	5.0
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X: 24.5(2.5), Y: 24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	245 (L=35)
	Thrust load[N]	147
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	392 (L=36)
	Thrust load[N]	147
Oil level (*3)[mm]	16	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3, MDS-EM-SPV3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

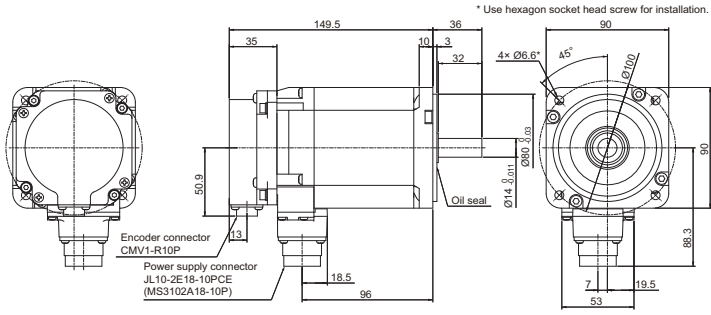
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	10
Static friction torque[N·m]	3.2 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

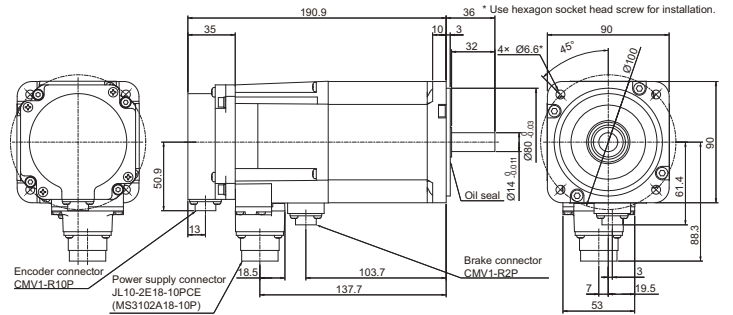


Outline dimension drawings [Unit : mm]

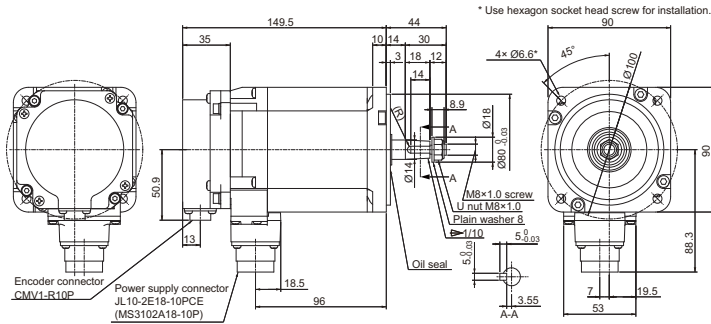
HK105S-G48



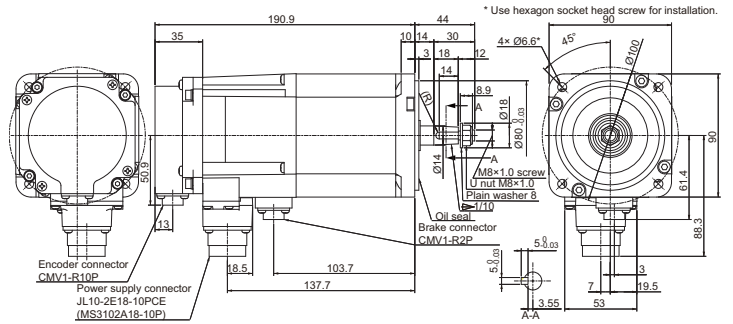
HK105BS-G48



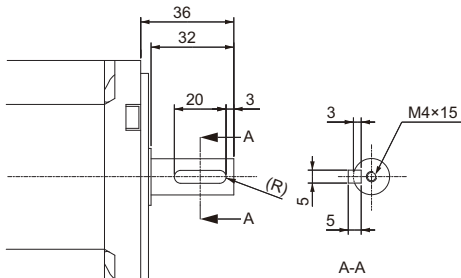
HK105T-G48



HK105BT-G48



Shaft with keyway (HK105K/HK105BK-G48)



The appearance is the same as the straight (without keyway) except the shaft shape.

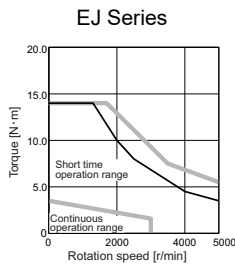
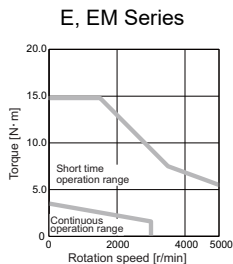
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug



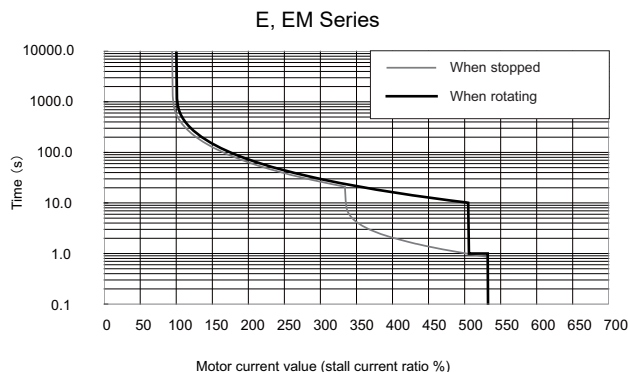
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
3.5N·m	3000r/min	HK55 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics

Servo overload protection characteristics

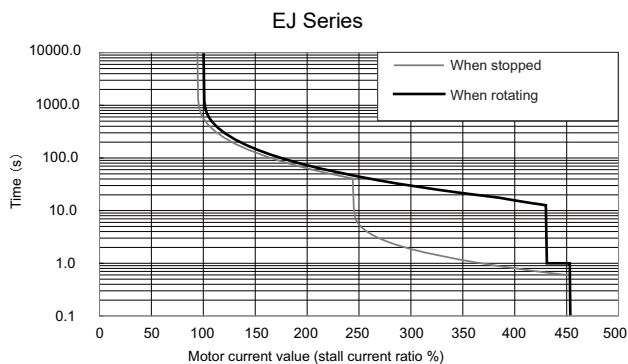


(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 200V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of single-phase 200V input.  
 (\*3) When using single-phase 200 to 240VAC power supply use the servo drive unit with an effective load rate of 75% or lower.

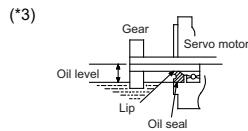
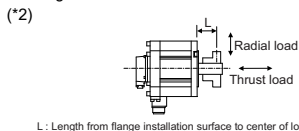


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	40
	2-axis type	MDS-E-V2-	40, 80
	3-axis type	MDS-E-V3-	40, 80
	Multi axis type	MDS-EM-SPV3-	10040, 16040, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1-	-
	MDS-EJ-V2-	-	30
Continuous characteristics	Rated output[kW]	0.5	
	Rated current[A]	2.1	
	Rated torque[N·m]	1.6	
	Stall current[A]	4.4	
	Stall torque[N·m]	3.5	
	Maximum momentary output (For power supply selection)[kW]	2.9	-
Rated rotation speed[r/min]	3000		
Maximum rotation speed[r/min]	5000		
Maximum current[A]	21	20	
Maximum torque[N·m]	14.8	14.0	
Power rate at continuous rated torque[kW/s]	4.3		
Max. deceleration torque of dynamic brake(Tdp)[N·m]	4.92		
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.90		
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	7.75		
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	42.7		
Mass	(Without) [kg]	5.0	
	(With brake)[kg]	6.8	
Heat-resistant class	155(F)		
Degree of protection	IP67 (The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)		
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)	
	Thrust load[N]	490	
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)	
	Thrust load[N]	490	
Oil level (*3)[mm]	22.5		
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

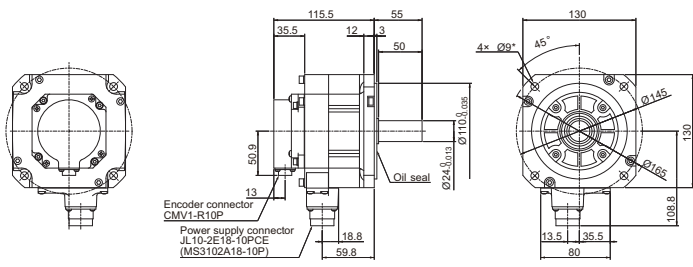
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

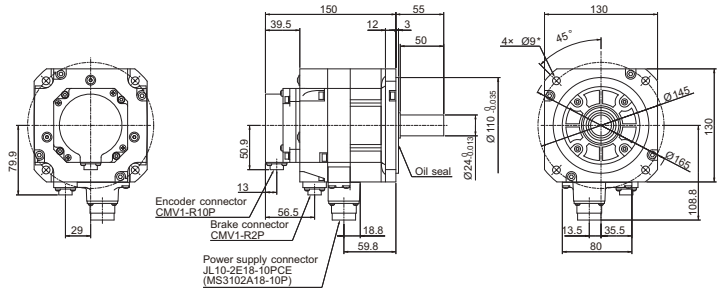
HK55S-G48

\* Use hexagon socket head screw for installation.



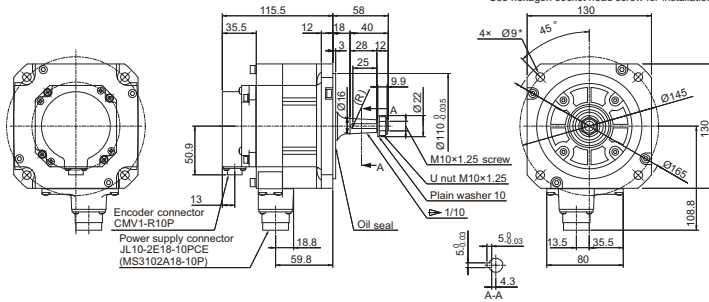
HK55BS-G48

\* Use hexagon socket head screw for installation.



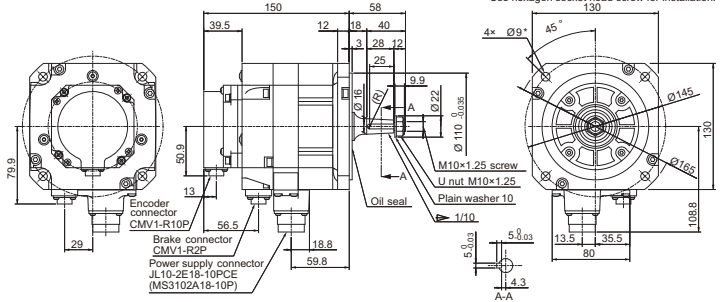
HK55T-G48

\* Use hexagon socket head screw for installation.

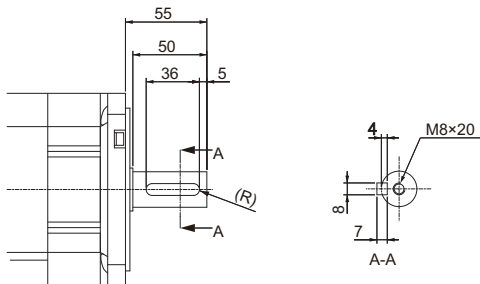


HK55BT-G48

\* Use hexagon socket head screw for installation.



Shaft with keyway (HK55K/HK55BK-G48)

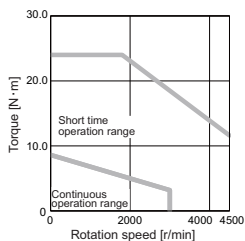


The appearance is the same as the straight (without keyway) except the shaft shape.

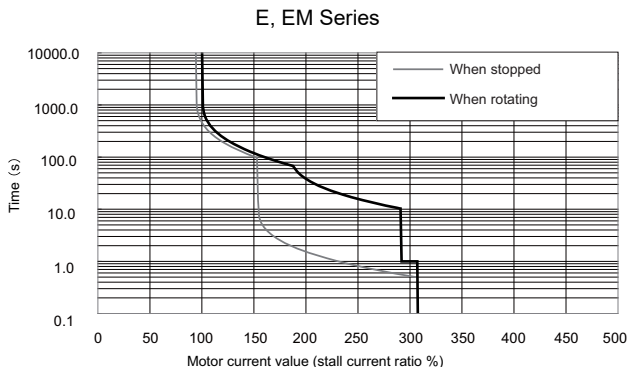
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
8.6N·m	3000r/min	HK104 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics

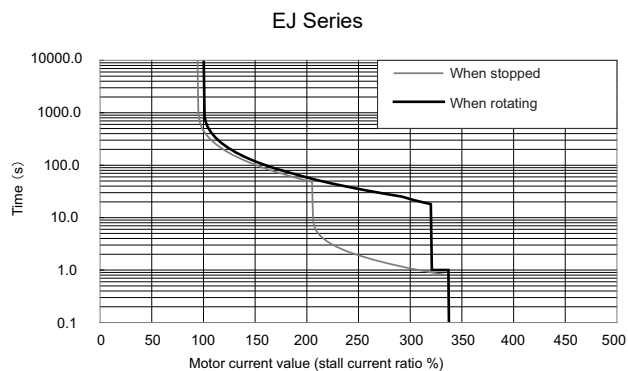


Servo overload protection characteristics

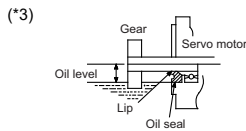
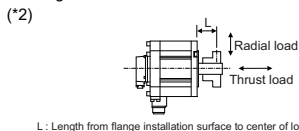


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	40
	2-axis type	MDS-E-V2-	40, 80
	3-axis type	MDS-E-V3-	40, 80
	Multi axis type	MDS-EM-SPV3-	10040, 16040, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	- -
Continuous characteristics	Rated output[kW]		1.0
	Rated current[A]		3.7
	Rated torque[N·m]		3.2
	Stall current[A]		9.5
	Stall torque[N·m]		8.6
Maximum momentary output (For power supply selection)[kW]		5.9	-
Rated rotation speed[r/min]		3000	
Maximum rotation speed[r/min]		4500	
Maximum current[A]		29	
Maximum torque[N·m]		24.0	
Power rate at continuous rated torque[kW/s]		8.9	
Max. deceleration torque of dynamic brake(Tdp)[N·m]		10.72	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		11.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		13.3	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		83.3	
Mass	(Without) [kg]		7.1
	(With brake)[kg]		8.8
Heat-resistant class		155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		392 (L=46)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3)[mm]			22.5
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

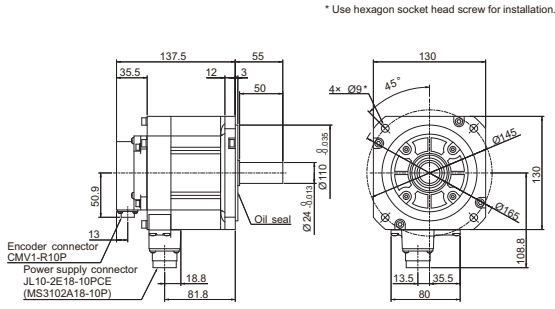
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

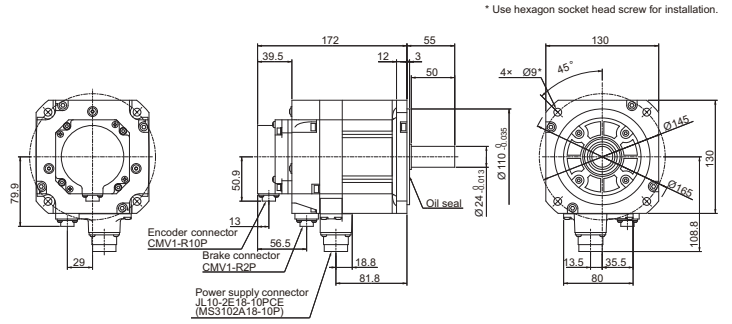
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

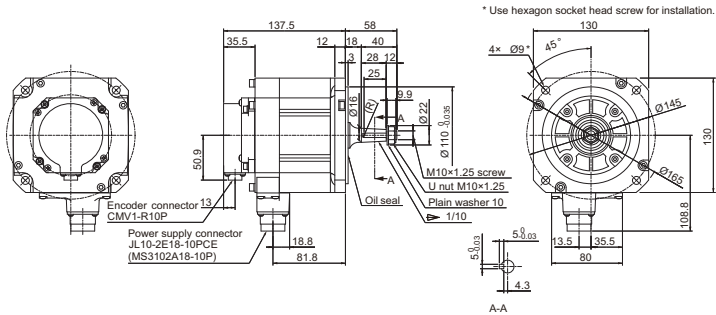
HK104S-G48



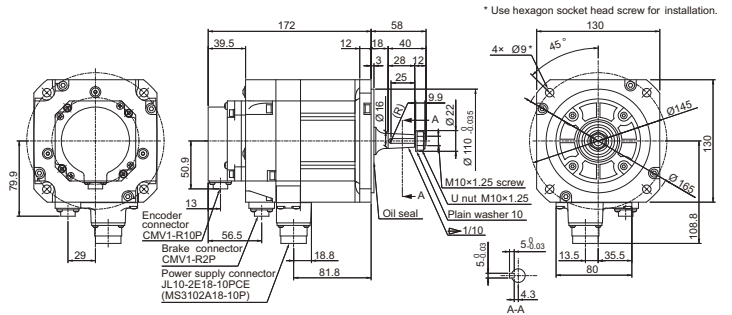
HK104BS-G48



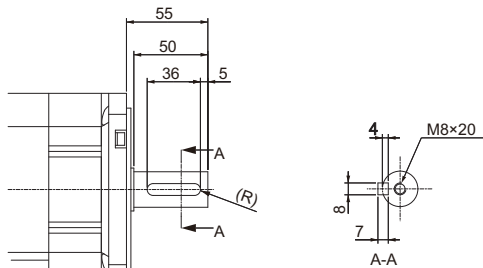
HK104T-G48



HK104BT-G48



Shaft with keyway (HK104K/HK104BK-G48)

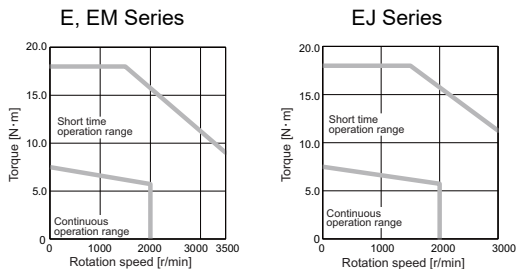


The appearance is the same as the straight (without keyway) except the shaft shape.

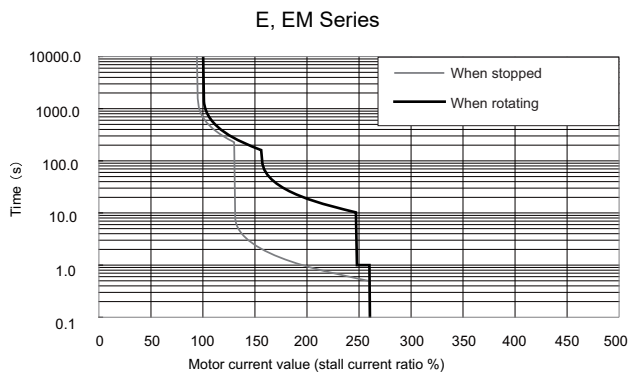
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
7.5N·m	2000r/min	HK123 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics

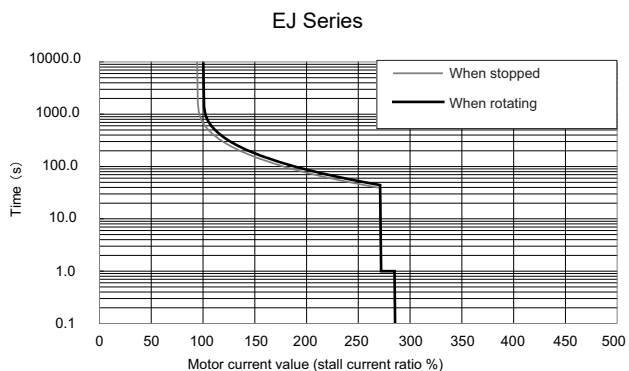


Servo overload protection characteristics

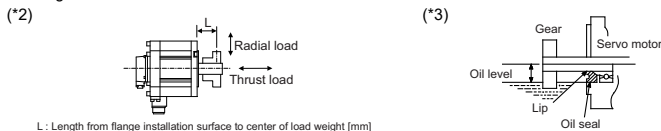


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	20
	2-axis type	MDS-E-V2-	20, 40
	3-axis type	MDS-E-V3-	20, 40
	Multi axis type	MDS-EM-SPV3-	10040, 16040
	Regenerative resistor type	MDS-EJ-V1-	-
		MDS-EJ-V2-	-
Continuous characteristics	Rated output[kW]		1.2
	Rated current[A]		4.6
	Rated torque[N·m]		5.7
	Stall current[A]		6.0
	Stall torque[N·m]		7.5
	Maximum momentary output (For power supply selection)[kW]		3.6
Rated rotation speed[r/min]		2000	
Maximum rotation speed[r/min]		3500	
Maximum current[A]		16	
Maximum torque[N·m]		18.0	
Power rate at continuous rated torque[kW/s]		28.8	
Max. deceleration torque of dynamic brake(Tdp)[N·m]		10.74	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		11.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		13.3	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		83.3	
Mass	(Without) [kg]		7.1
	(With brake)[kg]		8.8
Heat-resistant class		155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		392 (L=46)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3)[mm]		22.5	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3	MDS-EJ-V1/V2
		MDS-EM-SPV3	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

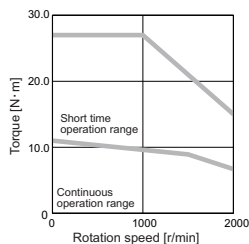
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



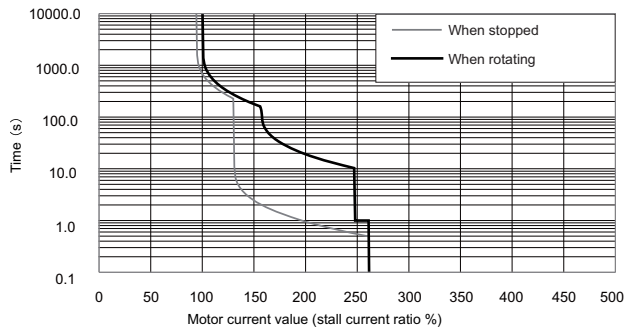
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
11.0N·m	1500r/min	HK142 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics



Servo overload protection characteristics

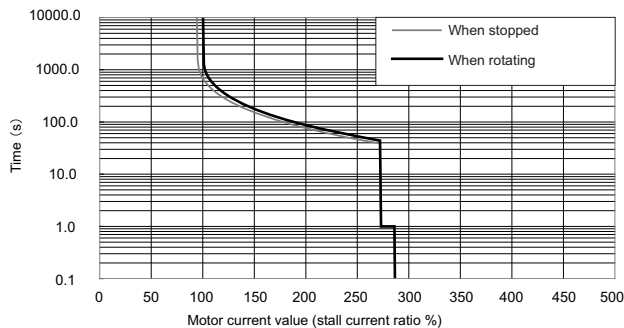
E, EM Series



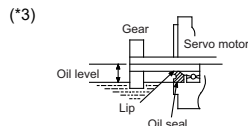
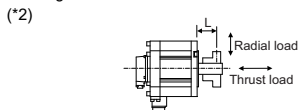
Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	20
	2-axis type	MDS-E-V2-	20, 40
	3-axis type	MDS-E-V3-	20, 40
	Multi axis type	MDS-EM-SPV3-	10040, 16040
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	- -
Continuous characteristics	Rated output[kW]		1.4
	Rated current[A]		4.9
	Rated torque[N·m]		8.9
	Stall current[A]		6.0
	Stall torque[N·m]		11.0
Maximum momentary output (For power supply selection)[kW]		3.3	-
Rated rotation speed[r/min]			1500
Maximum rotation speed[r/min]			2000
Maximum current[A]			16
Maximum torque[N·m]			27.0
Power rate at continuous rated torque[kW/s]			47.0
Max. deceleration torque of dynamic brake(Tdp)[N·m]			16.62
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			16.9
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			18.8
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]			125
Mass	(Without) [kg]		9.1
	(With brake)[kg]		11
Heat-resistant class			155(F)
Degree of protection			IP67 (The shaft-through portion is excluded.)
Cooling method			Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))			X:24.5(2.5), Y:49(5)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		392 (L=46)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3)[mm]			22.5
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3 MDS-EM-SPV3	MDS-EJ-V1/V2

EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

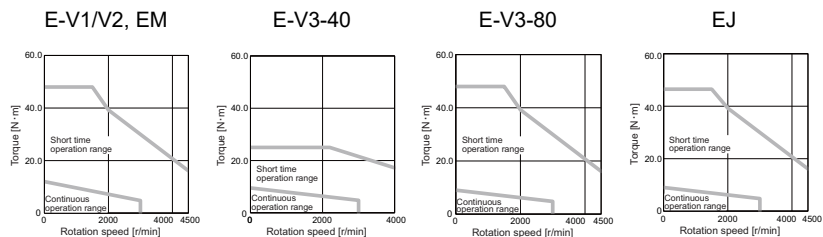




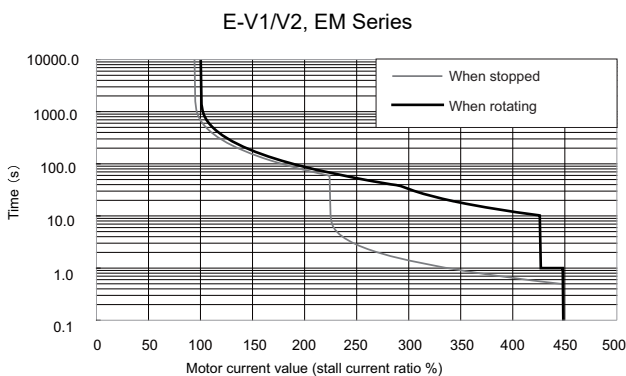


Stall torque	Rated rotation speed	Servo motor type	Explanation of type		
12.0N·m	3000r/min	HK154 □□-G48 (1)(2)	(1) Magnetic brake	B	with brake
				None	without brake
			(2) Shaft end	K	With keyway (with key)
				S	Straight (without keyway)
				T	Taper (without keyway)

Torque characteristics



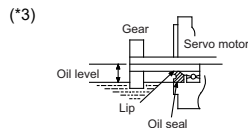
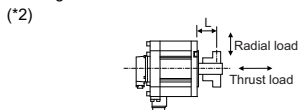
Servo overload protection characteristics



Specifications

Item	Specifications				
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80	-	-
	2-axis type	MDS-E-V2-	80, 160	-	-
	3-axis type	MDS-E-V3-	-	40	80
	Multi axis type	MDS-EM-SPV3-	10080, 16080, 20080, 200120, 320120	-	-
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	-	-	-
Continuous characteristics	Rated output[kW]	1.5			
	Rated current[A]	5.4			
	Rated torque[N·m]	4.8			
	Stall current[A]	13	11	9.8	
	Stall torque[N·m]	12.0	9.5	9.0	
Maximum momentary output (For power supply selection)[kW]	9.4	7.2	9.4		
Rated rotation speed[r/min]	3000				
Maximum rotation speed[r/min]	4500	4000	4500		
Maximum current[A]	58	29	58	57	
Maximum torque[N·m]	48.0	25.0	48.0	46.5	
Power rate at continuous rated torque[kW/s]	13.5				
Max. deceleration torque of dynamic brake(Tdp)[N·m]	16.62				
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	16.9				
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	18.8				
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	125	120		125	
Mass	(Without) [kg]	9.1			
	(With brake)[kg]	11			
Heat-resistant class	155(F)				
Degree of protection	IP67 (The shaft-through portion is excluded.)				
Cooling method	Totally enclosed natural-cooling				
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)				
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)			
	Thrust load[N]	490			
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)			
	Thrust load[N]	490			
Oil level (*3)[mm]	22.5				
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2 MDS-EM-SPV3	MDS-E-V3	MDS-E-V3	MDS-EJ-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*2) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

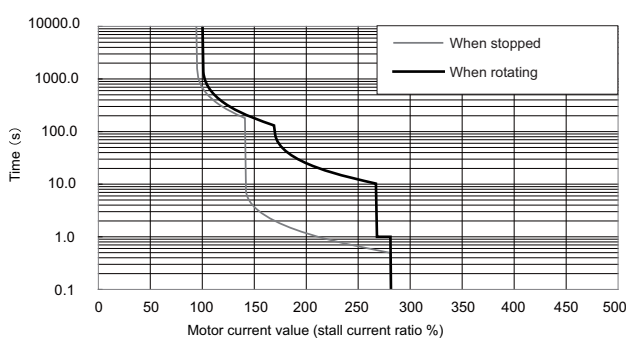
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less (with no dew condensation) Storage: 10 to 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

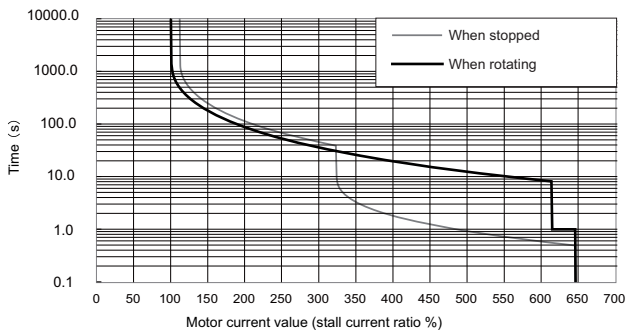
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

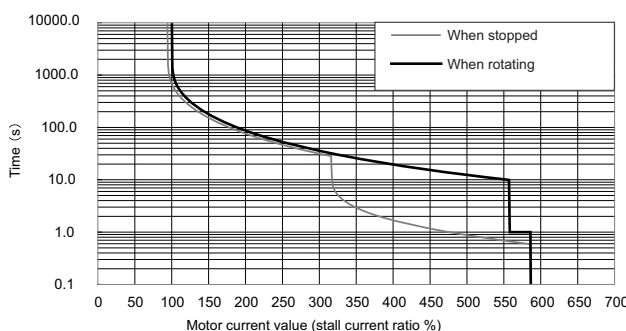
E-V3-40



E-V3-80

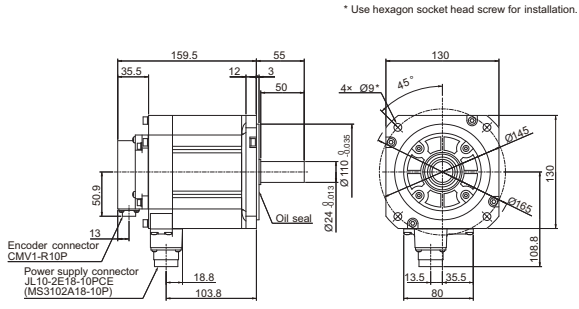


EJ Series

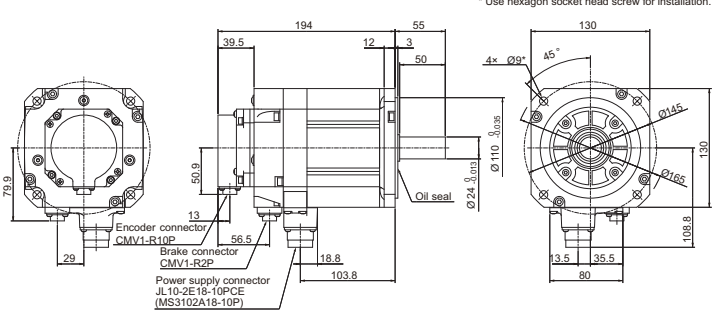


Outline dimension drawings [Unit : mm]

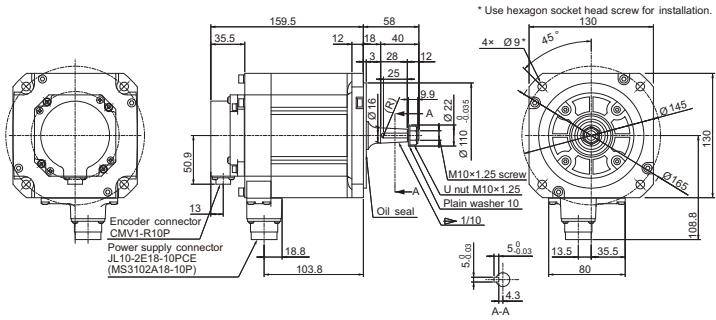
HK154S-G48



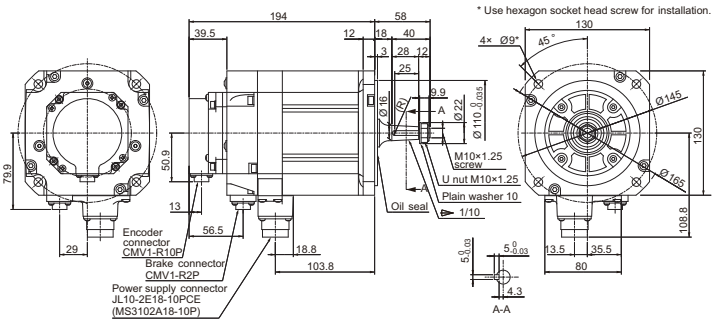
HK154BS-G48



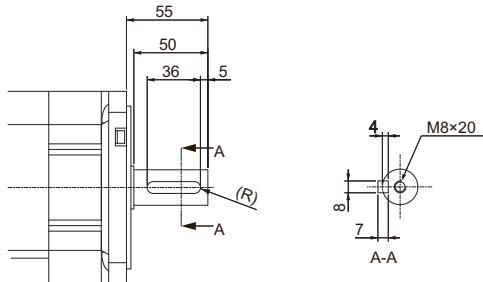
HK154T-G48



HK154BT-G48



Shaft with keyway (HK154K/HK154BK-G48)

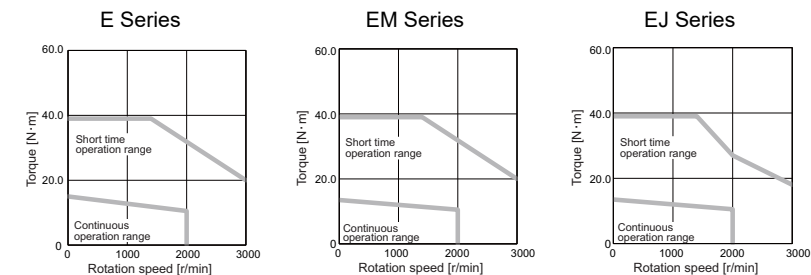


The appearance is the same as the straight (without keyway) except the shaft shape.

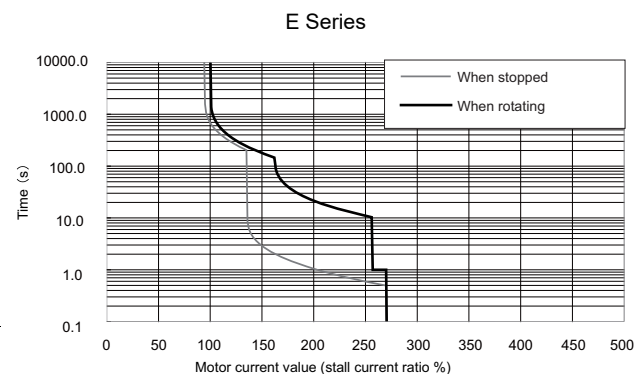
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
15.0N·m	2000r/min	HK223 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)
				T Taper (without keyway)

Torque characteristics

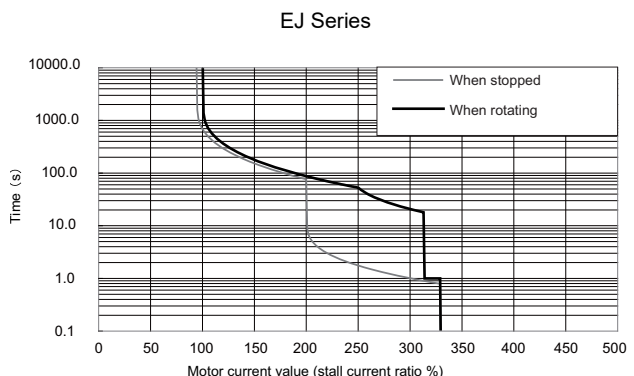
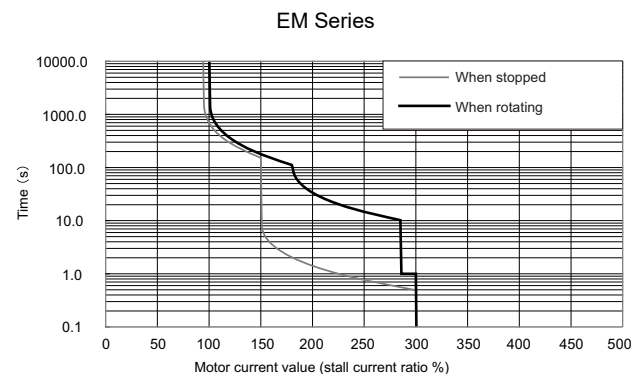


Servo overload protection characteristics

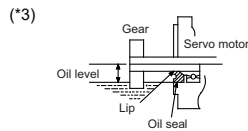
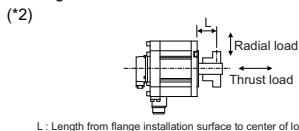


Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	40	-
	2-axis type	MDS-E-V2-	40, 80	-
	3-axis type	MDS-E-V3-	40, 80	-
	Multi axis type	MDS-EM-SPV3-	-	10040, 16040, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	- -	- -
Continuous characteristics	Rated output[kW]	2.2		
	Rated current[A]	7.6		
	Rated torque[N·m]	10.5		
	Stall current[A]	11	9.7	
	Stall torque[N·m]	15.0	13.5	
Maximum momentary output (For power supply selection)[kW]	6.8			-
Rated rotation speed[r/min]	2000			
Maximum rotation speed[r/min]	3000			
Maximum current[A]	29			
Maximum torque[N·m]	39.0			
Power rate at continuous rated torque[kW/s]	49.3			
Max. deceleration torque of dynamic brake(Tdp)[N·m]	22.46			
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	22.4			
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	24.2			
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	166			
Mass	(Without) [kg]	11		
	(With brake)[kg]	13		
Heat-resistant class	155(F)			
Degree of protection	IP67 (The shaft-through portion is excluded.)			
Cooling method	Totally enclosed natural-cooling			
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5) Y:49(5)			
Axis tolerable load (Taper shaft)	Radial load (*2)[N] (lmm)	392 (L=46)		
	Thrust load[N]	490		
Axis tolerable load (Straight shaft)	Radial load (*2)[N] (lmm)	980 (L=55)		
	Thrust load[N]	490		
Oil level (*3)[mm]	22.5			
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3	MDS-EM-SPV3	MDS-EJ-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

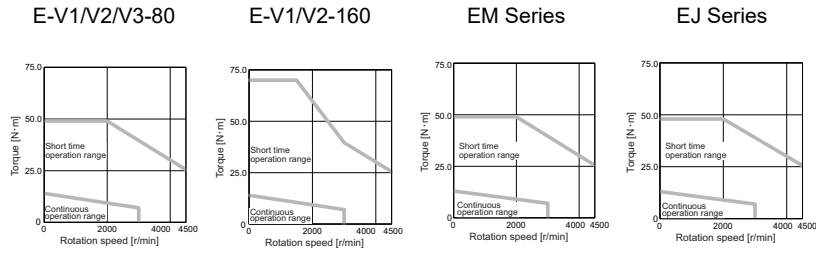
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

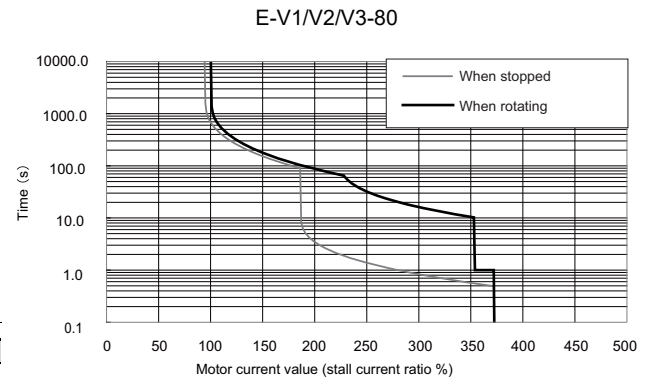


Stall torque	Rated rotation speed	Servo motor type	Explanation of type
14.0N·m	3000r/min	HK224 □□-G48 (1)(2)	(1) Magnetic brake
			B with brake None without brake
			(2) Shaft end
			K With keyway (with key) S Straight (without keyway) T Taper (without keyway)

Torque characteristics



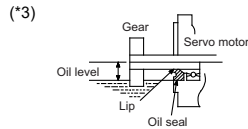
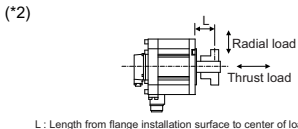
Servo overload protection characteristics



Specifications

Item	Specifications					
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80	160	-	-
	2-axis type	MDS-E-V2-	80	160	-	-
	3-axis type	MDS-E-V3-	80	-	-	-
	Multi axis type	MDS-EM-SPV3-	-	-	10080, 16080, 20080, 200120, 320120	-
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	-	-	-	80
Continuous characteristics	Rated output[kW]	2.2				
	Rated current[A]	8.0				
	Rated torque[N·m]	7.0				
	Stall current[A]	16		15		
	Stall torque[N·m]	14.0		13.0		
Maximum momentary output (For power supply selection)[kW]	12.8		13.0		-	
Rated rotation speed[r/min]	3000					
Maximum rotation speed[r/min]	4500					
Maximum current[A]	58		82		58, 57	
Maximum torque[N·m]	49.0		70.0		49.0, 48.0	
Power rate at continuous rated torque[kW/s]	21.9					
Max. deceleration torque of dynamic brake(Tdp)[N·m]	22.47					
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	22.4					
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	24.2					
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	166					
Mass	(Without) [kg]	11				
	(With brake)[kg]	13				
Heat-resistant class	155(F)					
Degree of protection	IP67 (The shaft-through portion is excluded.)					
Cooling method	Totally enclosed natural-cooling					
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)					
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)				
	Thrust load[N]	490				
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)				
	Thrust load[N]	490				
Oil level (*3)[mm]	22.5					
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/ V2/V3	MDS-E-V1/ V2	MDS-EM- SPV3	MDS-EJ-V1	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*2) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

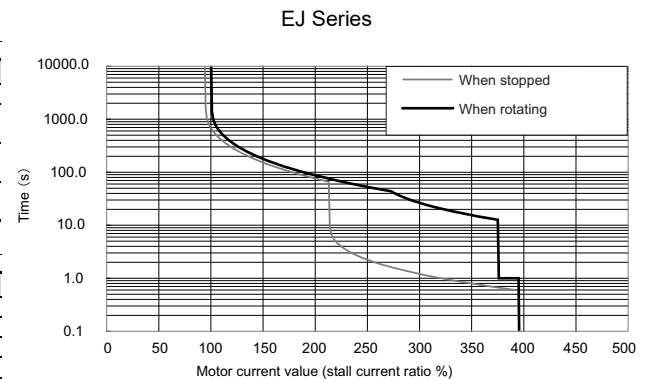
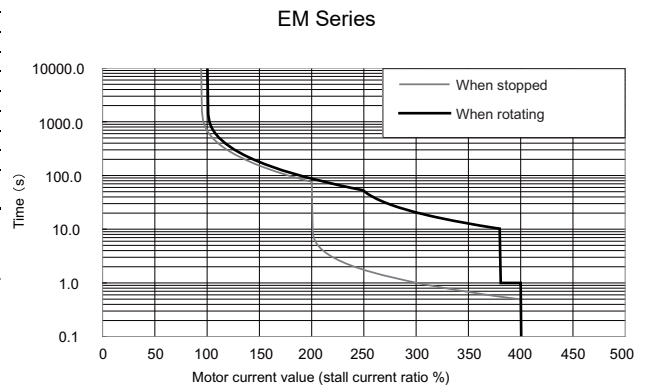
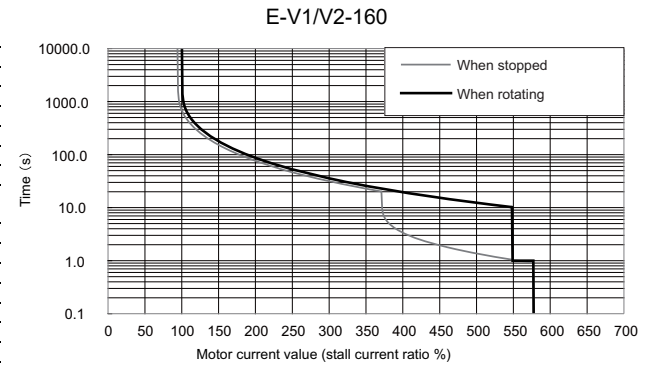
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

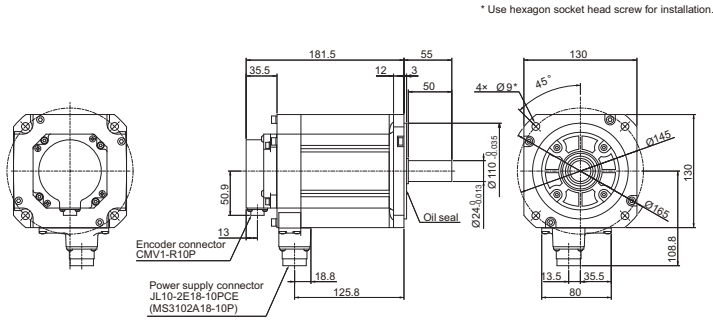
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

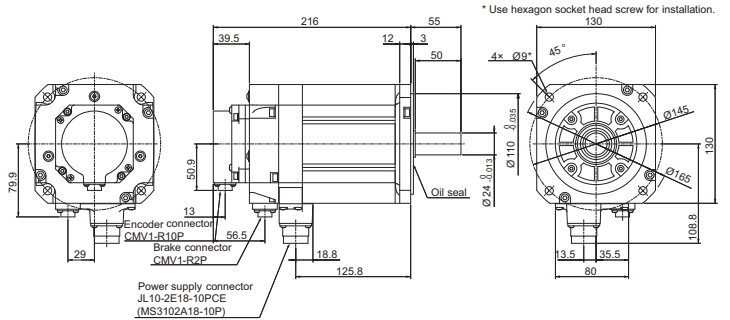


Outline dimension drawings [Unit : mm]

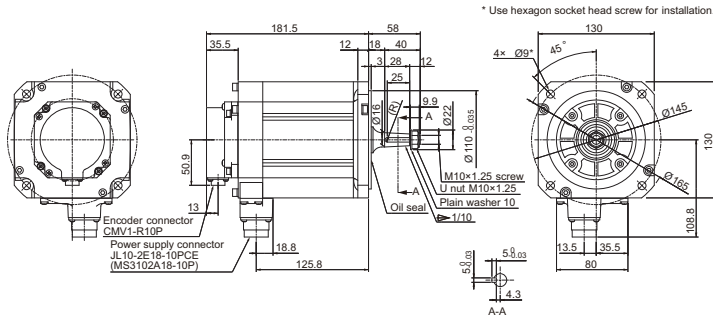
HK224S-G48



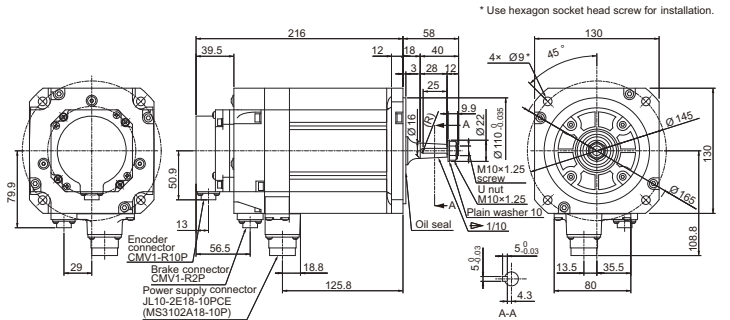
HK224BS-G48



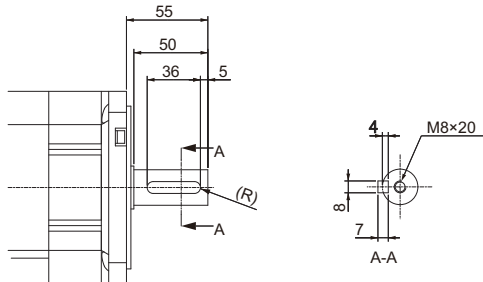
HK224T-G48



HK224BT-G48



Shaft with keyway (HK224K/HK224BK-G48)



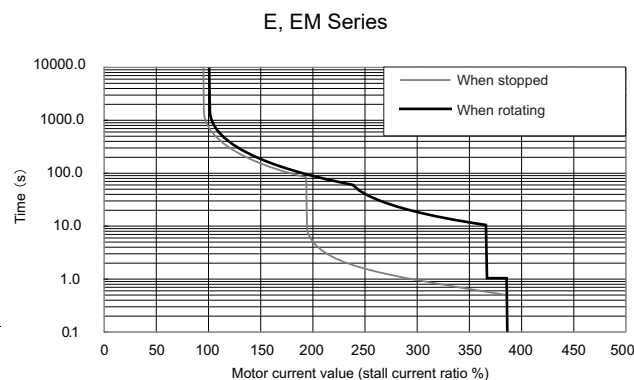
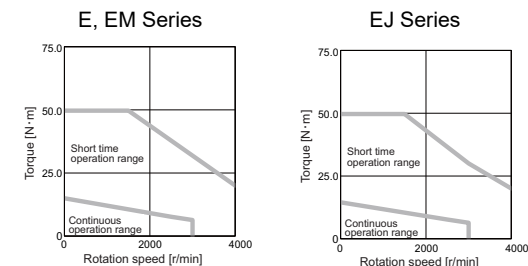
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
15.0N·m	2500r/min	HK204 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)

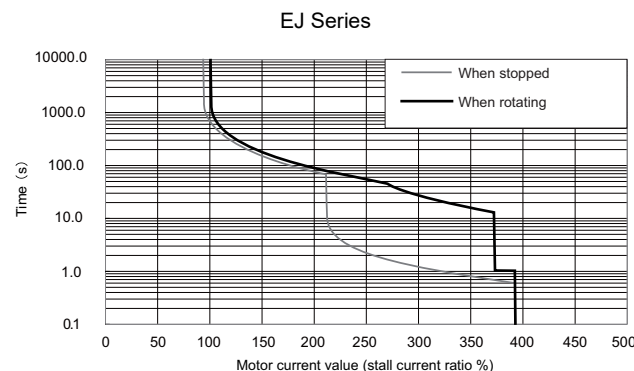
Torque characteristics

Servo overload protection characteristics

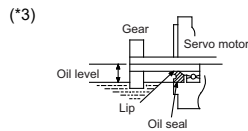
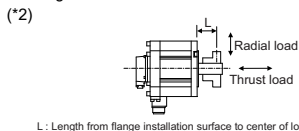


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80
	2-axis type	MDS-E-V2-	80, 160
	3-axis type	MDS-E-V3-	80
	Multi axis type	MDS-EM-SPV3-	10080, 16080, 20080, 200120, 320120
	Regenerative resistor type	MDS-EJ-V1-	-
Continuous characteristics	Rated output[kW]		2.0
	Rated current[A]		7.8
	Rated torque[N·m]		7.6
	Stall current[A]	16	15
	Stall torque[N·m]	15.0	14.5
Maximum momentary output (For power supply selection)[kW]		10.0	-
Rated rotation speed[r/min]		2500	
Maximum rotation speed[r/min]		4000	
Maximum current[A]		57	
Maximum torque[N·m]		49.7	
Power rate at continuous rated torque[kW/s]		16.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m]		18.70	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		36.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		41.4	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		268	
Mass	(Without) [kg]		13
	(With brake)[kg]		18
Heat-resistant class		155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5),Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		2058 (L=79)
	Thrust load[N]		980
Oil level (*3)[mm]			30
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3	MDS-EJ-V1
		MDS-EM-SPV3	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

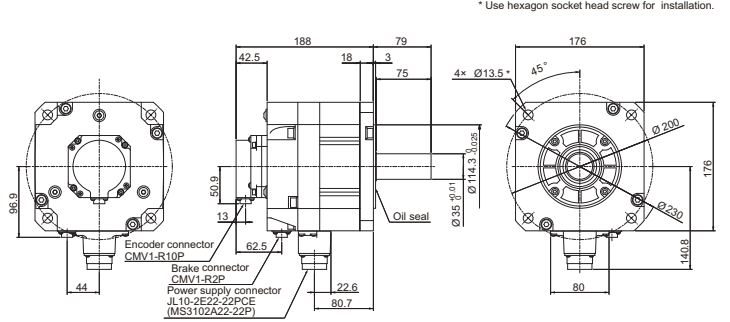
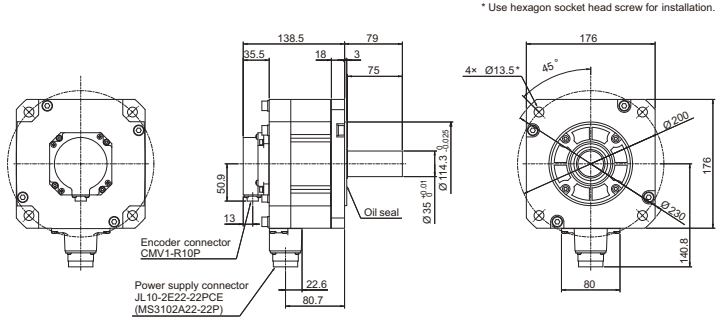
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



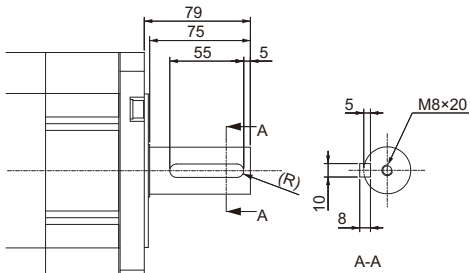
Outline dimension drawings [Unit : mm]

HK204S-G48

HK204BS-G48



Shaft with keyway (HK204K/HK204BK-G48)



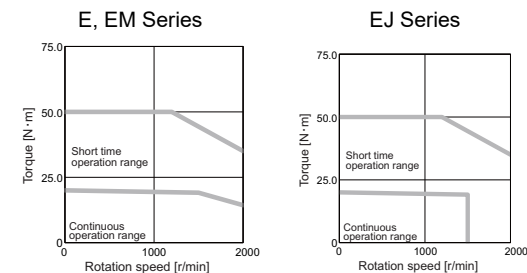
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

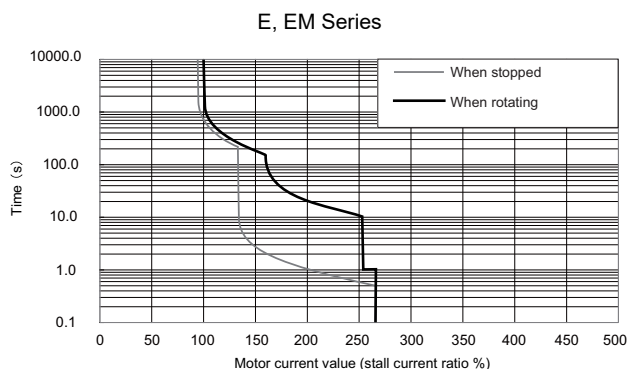


Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
20.0N·m	1500r/min	HK302 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)

Torque characteristics

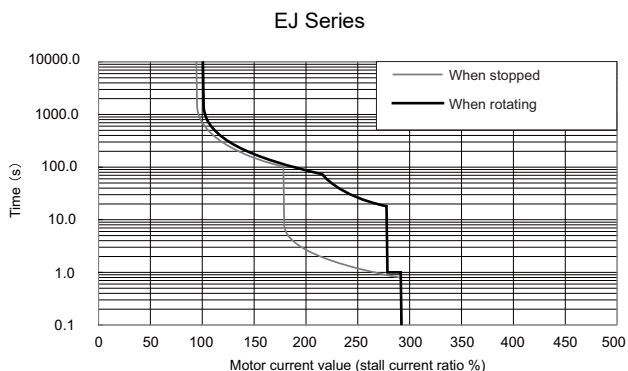


Servo overload protection characteristics

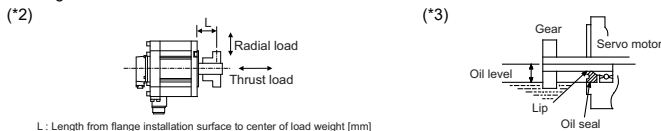


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1- 40
	2-axis type	MDS-E-V2- 40, 80
	3-axis type	MDS-E-V3- 40, 80
	Multi axis type	MDS-EM-SPV3- 10040, 16040, 10080, 16080, 20080
	Regenerative resistor type	MDS-EJ-V1- 40
		MDS-EJ-V2- 40
Continuous characteristics	Rated output[kW]	3.0
	Rated current[A]	11
	Rated torque[N·m]	19.1
	Stall current[A]	11
	Stall torque[N·m]	20.0
Maximum momentary output (For power supply selection)[kW]	7.3	
Rated rotation speed[r/min]	1500	
Maximum rotation speed[r/min]	2000	
Maximum current[A]	29	
Maximum torque[N·m]	50.0	
Power rate at continuous rated torque[kW/s]	51.5	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	39.67	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	70.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	75.8	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	422	
Mass	(Without) [kg]	20
	(With brake)[kg]	25
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3, MDS-EM-SPV3, MDS-EJ-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

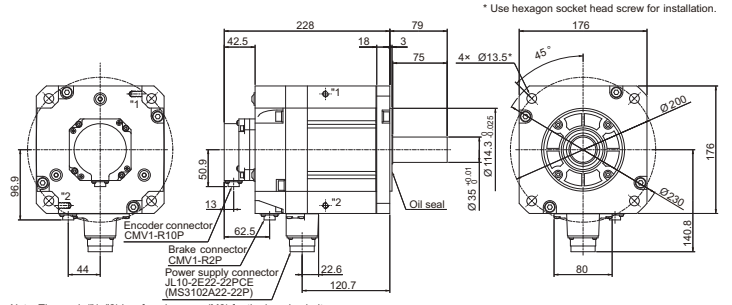
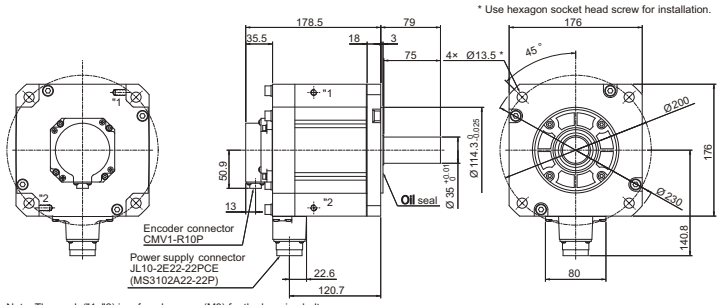
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

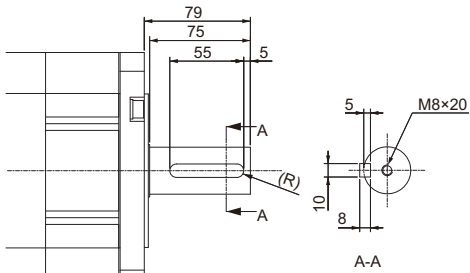
Outline dimension drawings [Unit : mm]

HK302S-G48

HK302BS-G48



Shaft with keyway (HK302K/HK302BK-G48)

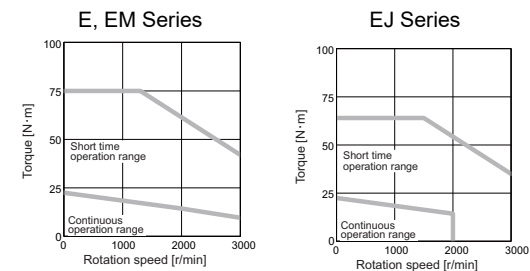


The appearance is the same as the straight (without keyway) except the shaft shape.

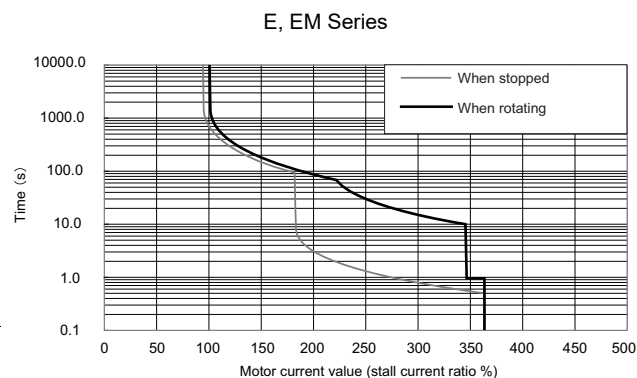
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type		
22.5N·m	2000r/min	HK303 □□-G48	(1) Magnetic brake	B	with brake
				None	without brake
			(2) Shaft end	K	With keyway (with key)
				S	Straight (without keyway)

Torque characteristics

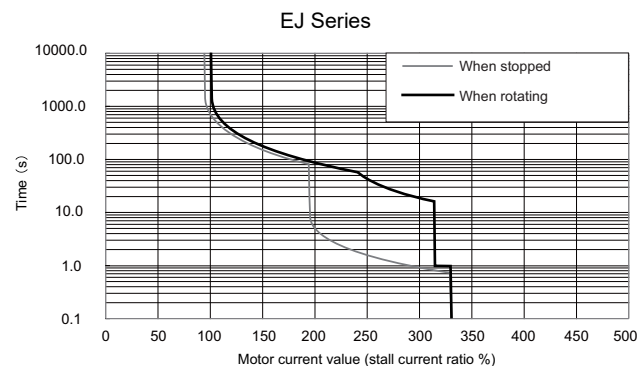


Servo overload protection characteristics

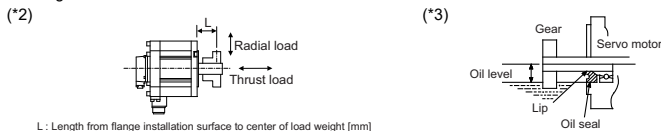


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	80
	2-axis type	MDS-E-V2-	80, 160
	3-axis type	MDS-E-V3-	80
	Multi axis type	MDS-EM-SPV3-	10080, 16080, 20080, 200120, 320120
	Regenerative resistor type	MDS-EJ-V1-	-
Continuous characteristics	Rated output[kW]		3.0
	Rated current[A]		11
	Rated torque[N·m]		14.3
	Stall current[A]		16
	Stall torque[N·m]		22.5
Maximum momentary output (For power supply selection)[kW]		13.5	-
Rated rotation speed[r/min]		2000	
Maximum rotation speed[r/min]		3000	
Maximum current[A]	58		48
Maximum torque[N·m]	75.0		64.0
Power rate at continuous rated torque[kW/s]		29.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m]		39.65	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		70.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		75.8	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		372	
Mass	(Without) [kg]		20
	(With brake)[kg]		25
Heat-resistant class		155(F)	
Degree of protection		IP67 (The shaft-through portion is excluded.)	
Cooling method		Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		2058 (L=79)
	Thrust load[N]		980
Oil level (*3)[mm]			30
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2/V3	MDS-EJ-V1
		MDS-EM-SPV3	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

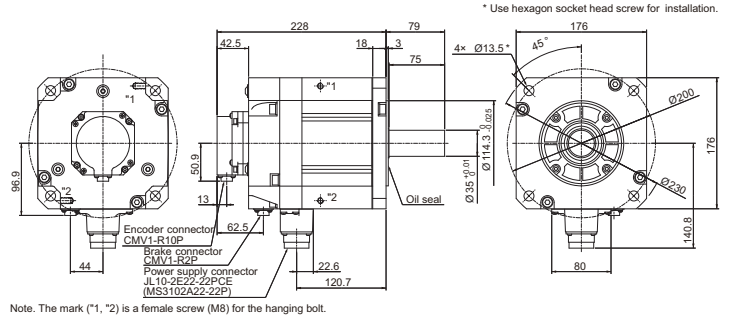
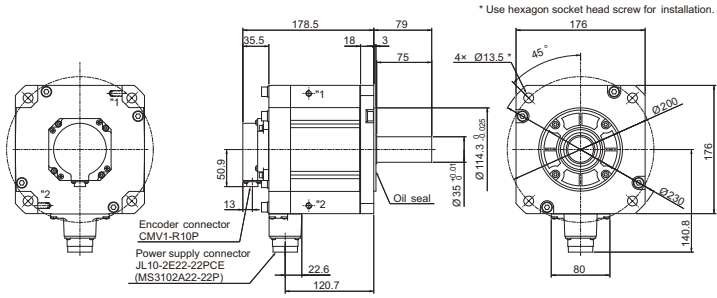
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

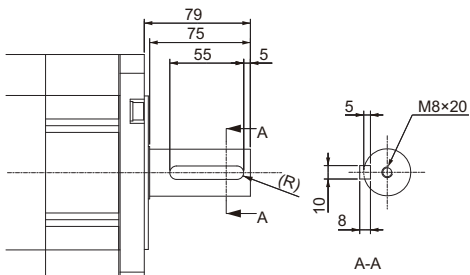
Outline dimension drawings [Unit : mm]

HK303S-G48

HK303BS-G48



Shaft with keyway (HK303K/HK303BK-G48)

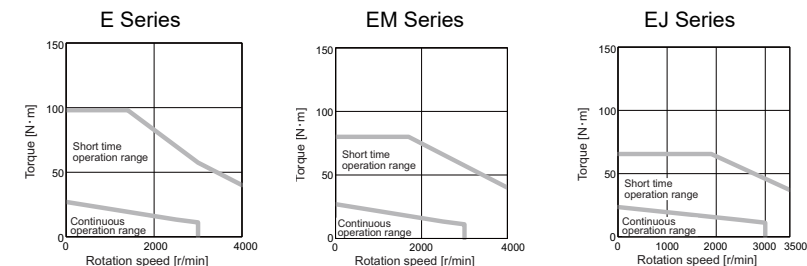


The appearance is the same as the straight (without keyway) except the shaft shape.

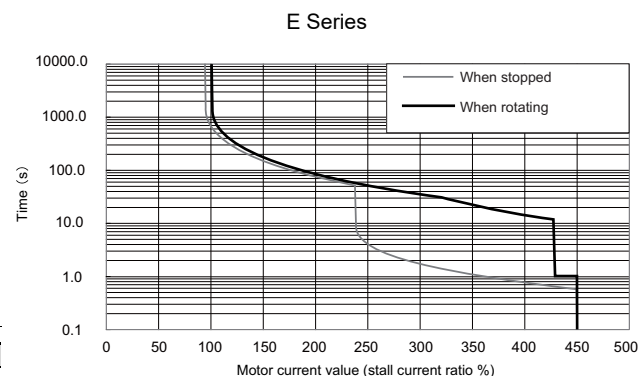
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
27.0N·m	2500r/min	HK354 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)

Torque characteristics

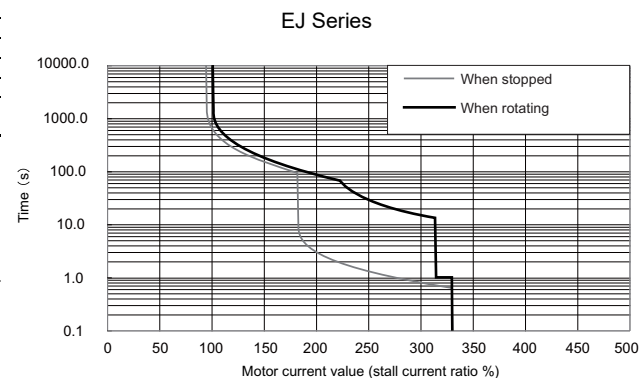
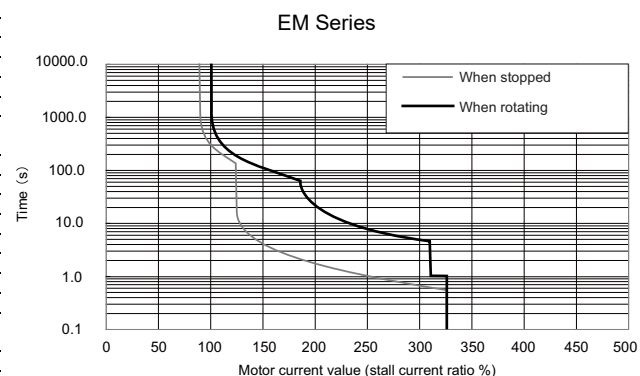


Servo overload protection characteristics



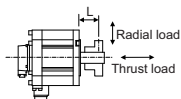
Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	160	-
	2-axis type	MDS-E-V2-	160, 160W	-
	3-axis type	MDS-E-V3-	-	-
	Multi axis type	MDS-EM-SPV3-	-	200120, 320120
	Regenerative resistor type	MDS-EJ-V1-	-	-
		MDS-EJ-V2-	-	100
Continuous characteristics	Rated output[kW]			3.5
	Rated current[A]			13
	Rated torque[N·m]			13.4
	Stall current[A]		25	22
	Stall torque[N·m]		27.0	23.5
	Maximum momentary output (For power supply selection)[kW]		18.4	18.1
Rated rotation speed[r/min]				2500
Maximum rotation speed[r/min]				4000
Maximum current[A]		100	80	64
Maximum torque[N·m]		98.0	80.0	65.5
Power rate at continuous rated torque[kW/s]				25.2
Max. deceleration torque of dynamic brake(Tdp)[N·m]				39.77
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]				70.8
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]				75.8
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]				525
Mass	(Without) [kg]			20
	(With brake)[kg]			25
Heat-resistant class				155(F)
Degree of protection				IP67 (The shaft-through portion is excluded.)
Cooling method				Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))				X:24.5(2.5), Y:29.4(3)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))			-
	Thrust load[N]			-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))			2058 (L=79)
	Thrust load[N]			980
Oil level (*3)[mm]				30
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2	MDS-EM-SPV3	MDS-EJ-V1

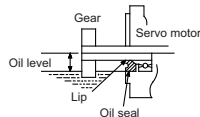


(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(\*3)



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

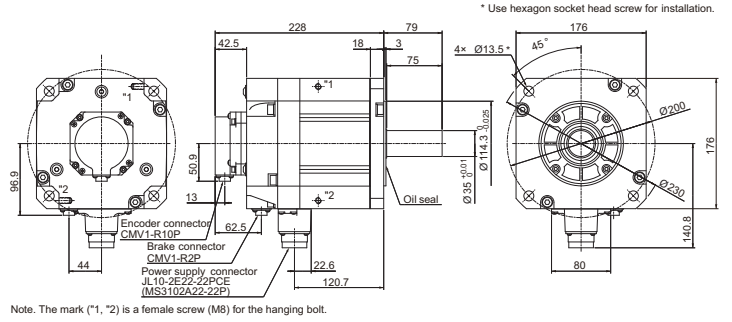
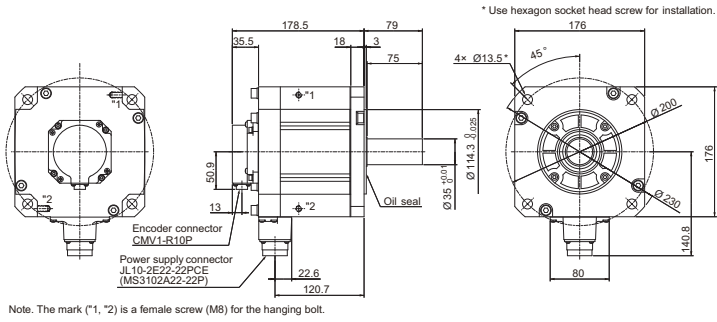
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

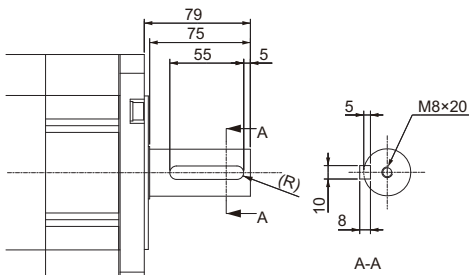
Outline dimension drawings [Unit : mm]

HK354S-G48

HK354BS-G48



Shaft with keyway (HK354K/HK354BK-G48)

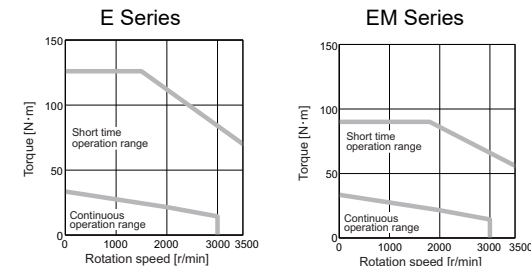


The appearance is the same as the straight (without keyway) except the shaft shape.

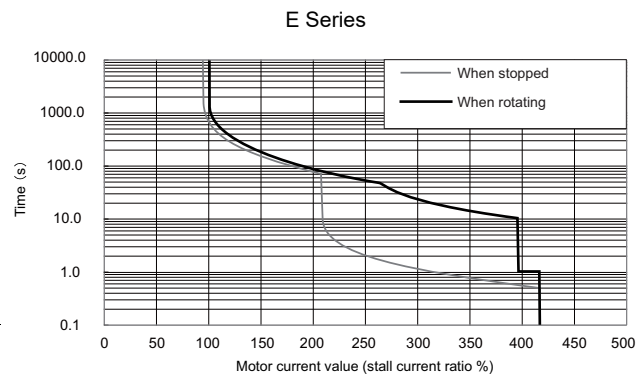
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
33.5N·m	2000r/min	HK453 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)

Torque characteristics

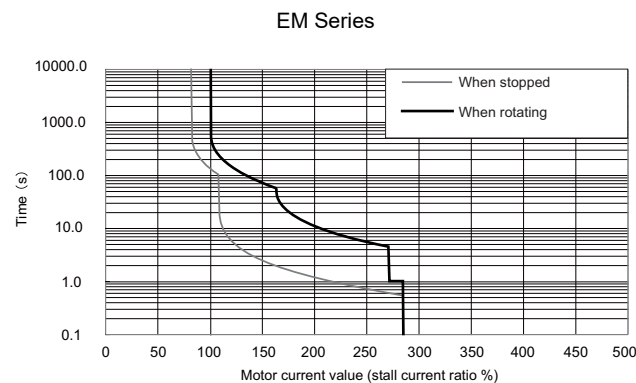


Servo overload protection characteristics

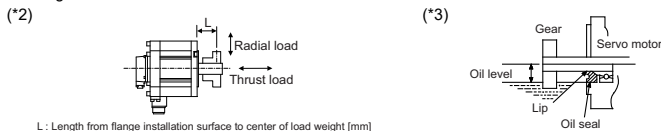


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-160
	2-axis type	MDS-E-V2-160, 160W
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-200120, 320120
	Regenerative resistor type	MDS-EJ-V1-, MDS-EJ-V2-
	Continuous characteristics	Rated output[kW]
	Rated current[A]	19
	Rated torque[N·m]	21.5
	Stall current[A]	28
	Stall torque[N·m]	33.5
Maximum momentary output (For power supply selection)[kW]	26.4	20.8
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3500	
Maximum current[A]	116	80
Maximum torque[N·m]	126	90.0
Power rate at continuous rated torque[kW/s]	44.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	60.62	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	105	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	110	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	672	
Mass	(Without) [kg]	27
	(With brake)[kg]	31
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2 MDS-EM-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

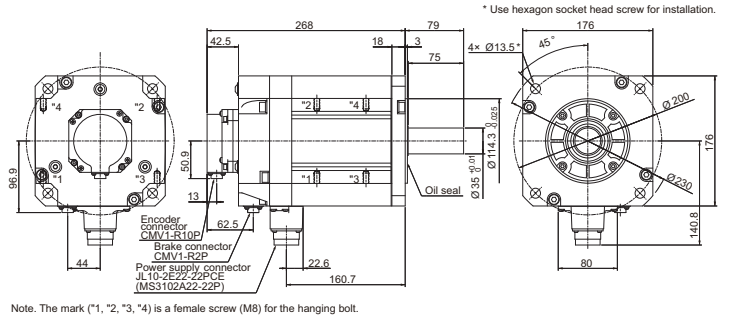
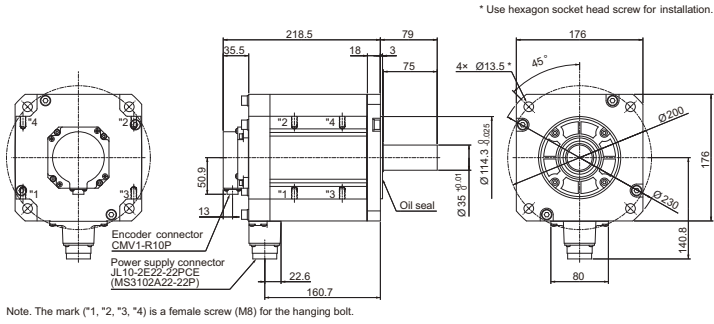
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

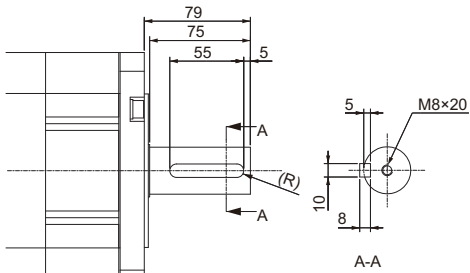
Outline dimension drawings [Unit : mm]

HK453S-G48

HK453BS-G48



Shaft with keyway (HK453K/HK453BK-G48)



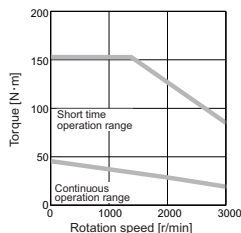
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug



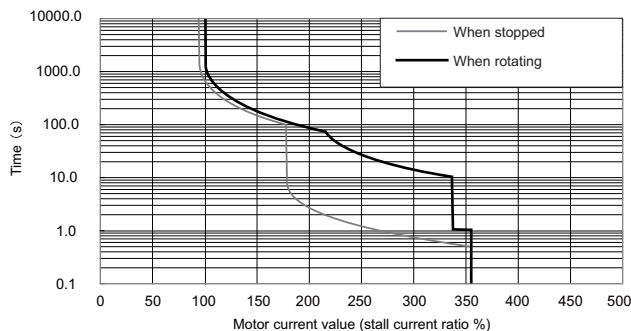
Stall torque	Rated rotation speed	Servo motor type	Explanation of type		
45.5N·m	2000r/min	HK603 □□-G48	(1) Magnetic brake	B	with brake
				None	without brake
			(2) Shaft end	K	With keyway (with key)
				S	Straight (without keyway)

Torque characteristics



Servo overload protection characteristics

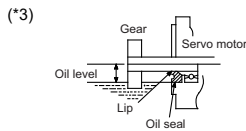
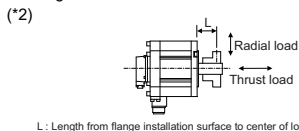
E Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1-
		MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	6.0
	Rated current[A]	21
	Rated torque[N·m]	28.6
	Stall current[A]	33
	Stall torque[N·m]	45.5
Maximum momentary output (For power supply selection)[kW]	27.7	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	116	
Maximum torque[N·m]	152	
Power rate at continuous rated torque[kW/s]	58.6	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	82.30	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	140	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	145	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	858	
Mass	(Without) [kg]	33
	(With brake)[kg]	38
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

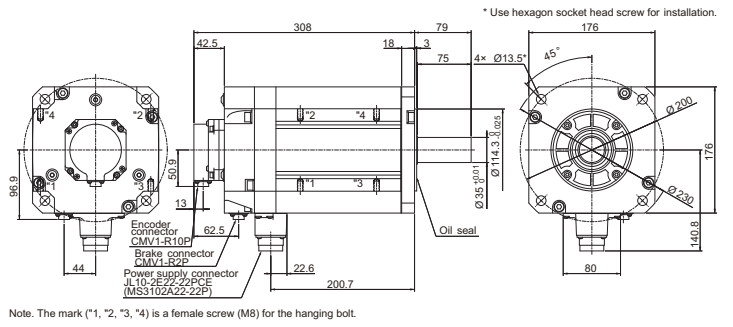
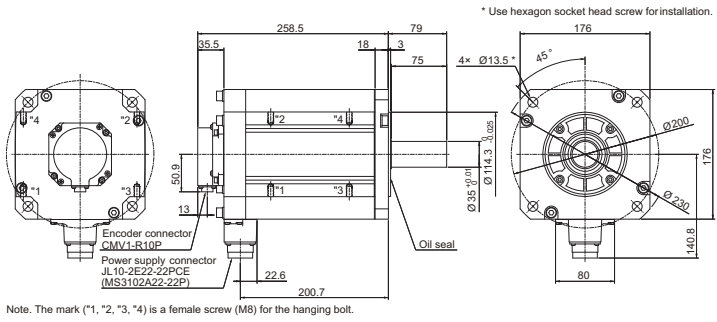
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

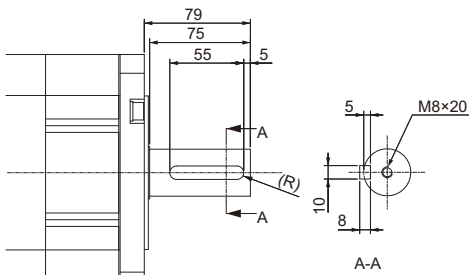
Outline dimension drawings [Unit : mm]

HK603S-G48

HK603BS-G48



Shaft with keyway (HK603K/HK603BK-G48)

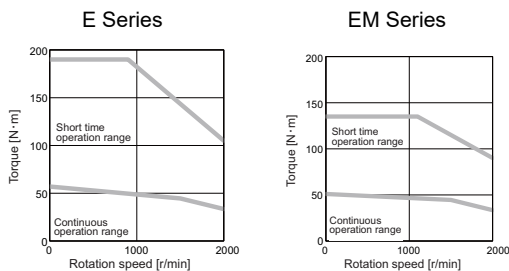


The appearance is the same as the straight (without keyway) except the shaft shape.

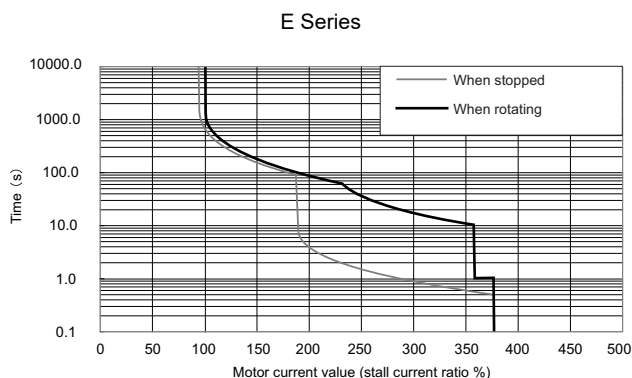
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
57.0N·m	1500r/min	HK702 □□-G48	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	K With keyway (with key)
				S Straight (without keyway)

Torque characteristics

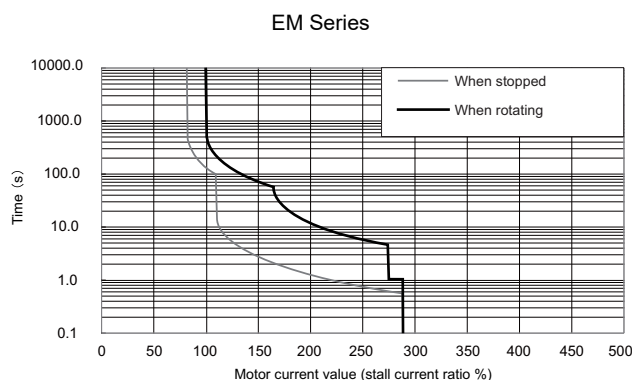


Servo overload protection characteristics

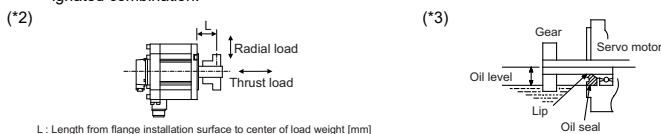


Specifications

Item	Specifications			
Compatible drive unit (*1)	1-axis type	MDS-E-V1-	160	
	2-axis type	MDS-E-V2-	160	
	3-axis type	MDS-E-V3-	-	
	Multi axis type	MDS-EM-SPV3-	-	200120, 320120
	Regenerative resistor type	MDS-EJ-V1- MDS-EJ-V2-	- -	- -
Continuous characteristics	Rated output[kW]		7.0	
	Rated current[A]		25	
	Rated torque[N·m]		44.6	
	Stall current[A]	31	28	
	Stall torque[N·m]	57.0	51.0	
Maximum momentary output (For power supply selection)[kW]		22.8	18.9	
Rated rotation speed[r/min]		1500		
Maximum rotation speed[r/min]		2000		
Maximum current[A]	116		80	
Maximum torque[N·m]	190		135	
Power rate at continuous rated torque[kW/s]		142.0		
Max. deceleration torque of dynamic brake(Tdp)[N·m]		82.11		
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		140		
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		145		
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]		1078		
Mass	(Without) [kg]		33	
	(With brake)[kg]		38	
Heat-resistant class		155(F)		
Degree of protection		IP67 (The shaft-through portion is excluded.)		
Cooling method		Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:24.5(2.5), Y:29.4(3)		
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		-	
	Thrust load[N]		-	
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		2058 (L=79)	
	Thrust load[N]		980	
Oil level (*3)[mm]			30	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EJ-V1/V2	MDS-EM-SPV3	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

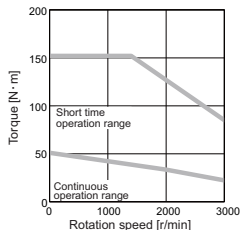
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



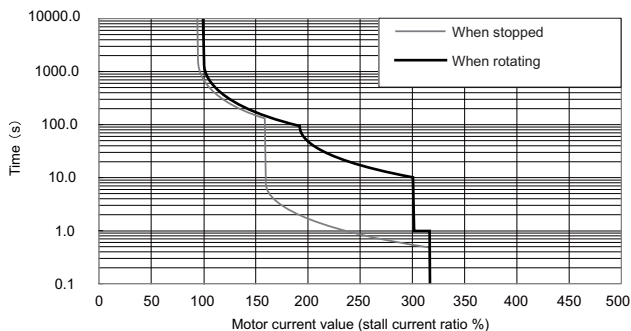
Stall torque	Rated rotation speed	Servo motor type	Explanation of type		
51.0N·m	2000r/min	HK703 □□-G48	(1) Magnetic brake	B	with brake
				None	without brake
			(2) Shaft end	K	With keyway (with key)
				S	Straight (without keyway)

Torque characteristics



Servo overload protection characteristics

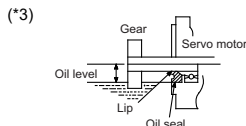
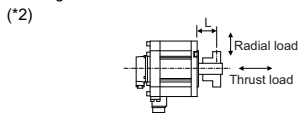
E Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-V1-
	2-axis type	MDS-E-V2-
	3-axis type	MDS-E-V3-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-V1-
		MDS-EJ-V2-
Continuous characteristics	Rated output[kW]	7.0
	Rated current[A]	25
	Rated torque[N·m]	33.4
	Stall current[A]	37
	Stall torque[N·m]	51.0
Maximum momentary output (For power supply selection)[kW]	27.7	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	116	
Maximum torque[N·m]	152	
Power rate at continuous rated torque[kW/s]	79.8	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	82.30	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	140	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	145	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	858	
Mass	(Without) [kg]	33
	(With brake)[kg]	38
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-E-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

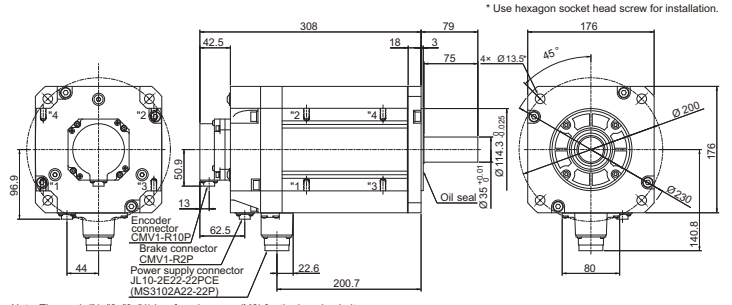
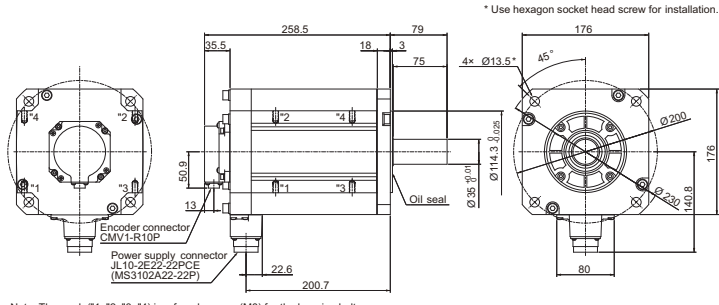
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

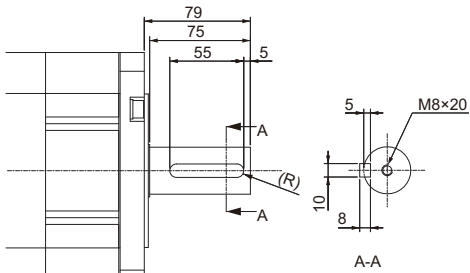
Outline dimension drawings [Unit : mm]

HK703S-G48

HK703BS-G48



Shaft with keyway (HK703K/HK703BK-G48)



The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

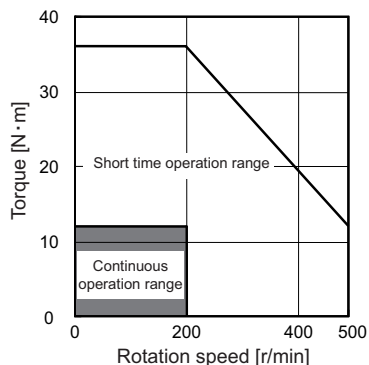


# Direct Drive Motor



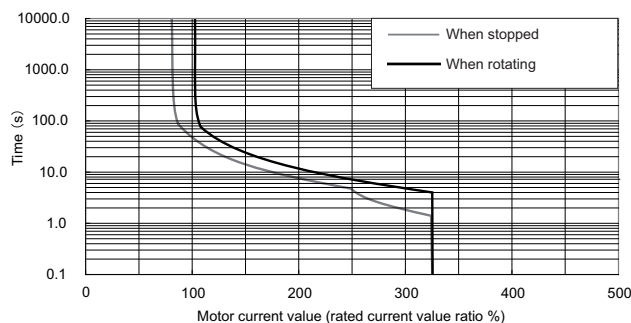
Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>12N·m</b>	<b>200r/min</b>	<b>TM-RBP012C20</b>	

Torque characteristics



Servo overload protection characteristics

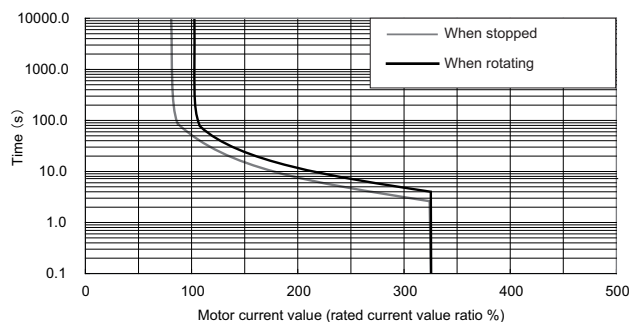
E Series



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-40
	2-axis type	MDS-E-V2-40
	Regenerative resistor type	MDS-EJ-V1-40
Continuous characteristics	Rated output [W]	252
	Rated current [A]	6.1
	Rated torque [N·m]	12
Power facility capacity [kVA]	1.07	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	500	
Maximum current [A]	18	
Maximum torque [N·m]	36	
Power rate at continuous rated torque [kW/s]	65.4	
Rotor inertia [kg·cm <sup>2</sup> ]	22	
Degree of protection	IP00	
Required cooling capacity [kW]	0.5	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 130
	Secondary side inner diameter	DIA 56
	Height	76
Mass [kg]	Primary side (coil)	3.9
	Secondary side (magnet)	1.7
Heat-resistant class	155(F)	

EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

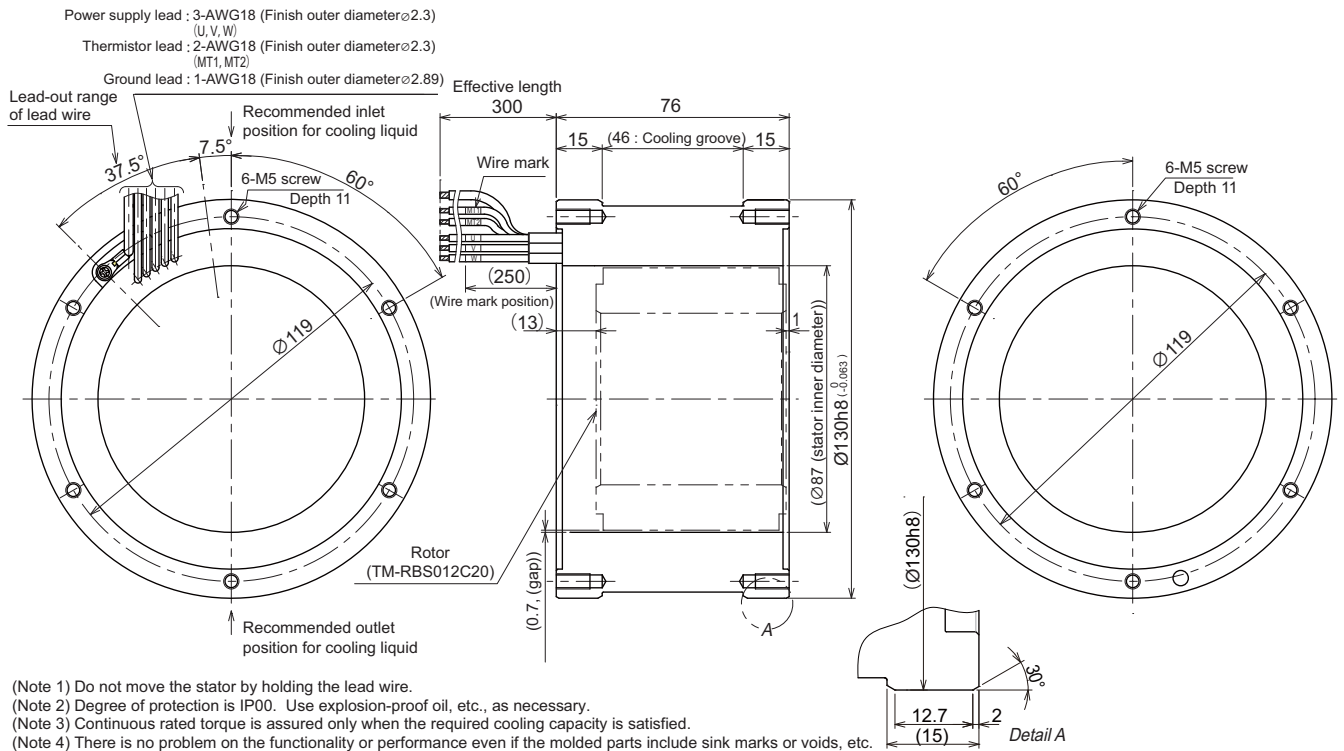
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

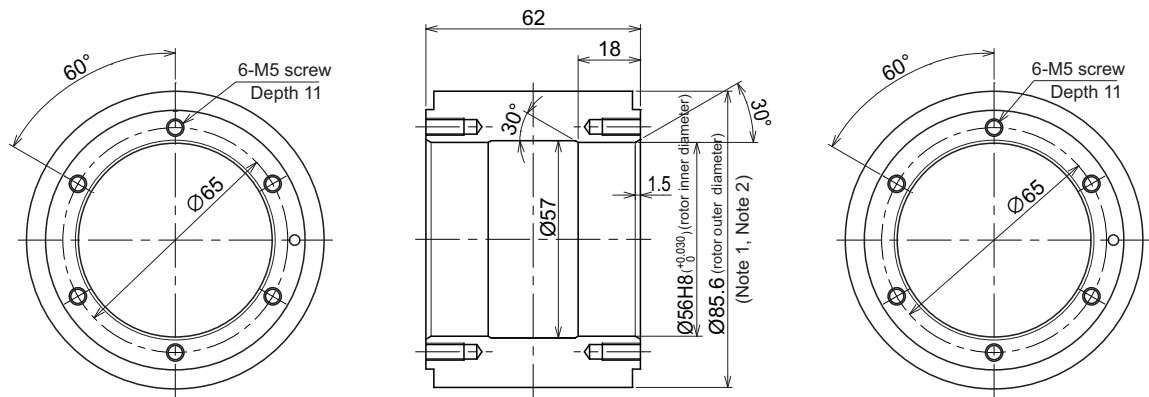
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

Outline dimension drawings [Unit : mm]

TM-RBP012C20



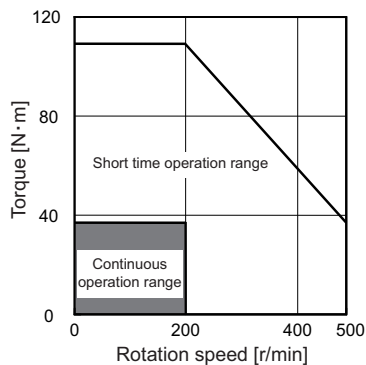
TM-RBS012C20



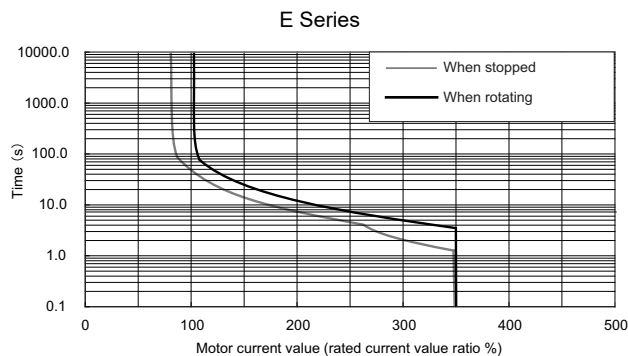
- (Note 1) Deliverable rotors are magnetized. Please note the magnetic attraction.  
(Note 2) Take special care for the magnet part not to hit against a thing (A crack or chip may occur).  
(Note 3) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.  
(Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>36N•m</b>	<b>200r/min</b>	<b>TM-RBP036E20</b>	

Torque characteristics

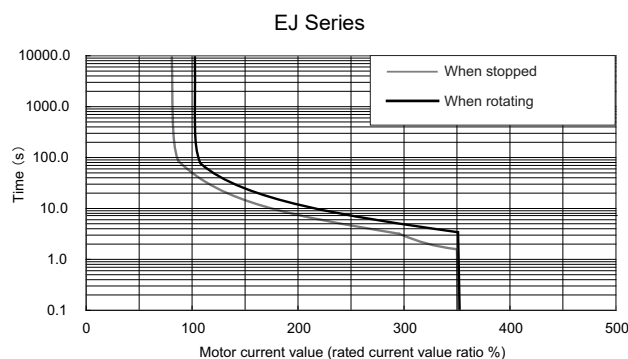


Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-80
	2-axis type	MDS-E-V2-80
	Regenerative resistor type	MDS-EJ-V1-80
Continuous characteristics	Rated output [W]	754
	Rated current [A]	12
	Rated torque [N•m]	36
Power facility capacity [kVA]	2.08	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	500	
Maximum current [A]	36	
Maximum torque [N•m]	108	
Power rate at continuous rated torque [kW/s]	102	
Rotor inertia [kg•cm <sup>2</sup> ]	127	
Degree of protection	IP00	
Required cooling capacity [kW]	0.7	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 180
	Secondary side inner diameter	DIA 100
	Height	91
Mass [kg]	Primary side (coil)	7.1
	Secondary side (magnet)	3.7
Heat-resistant class	155(F)	



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

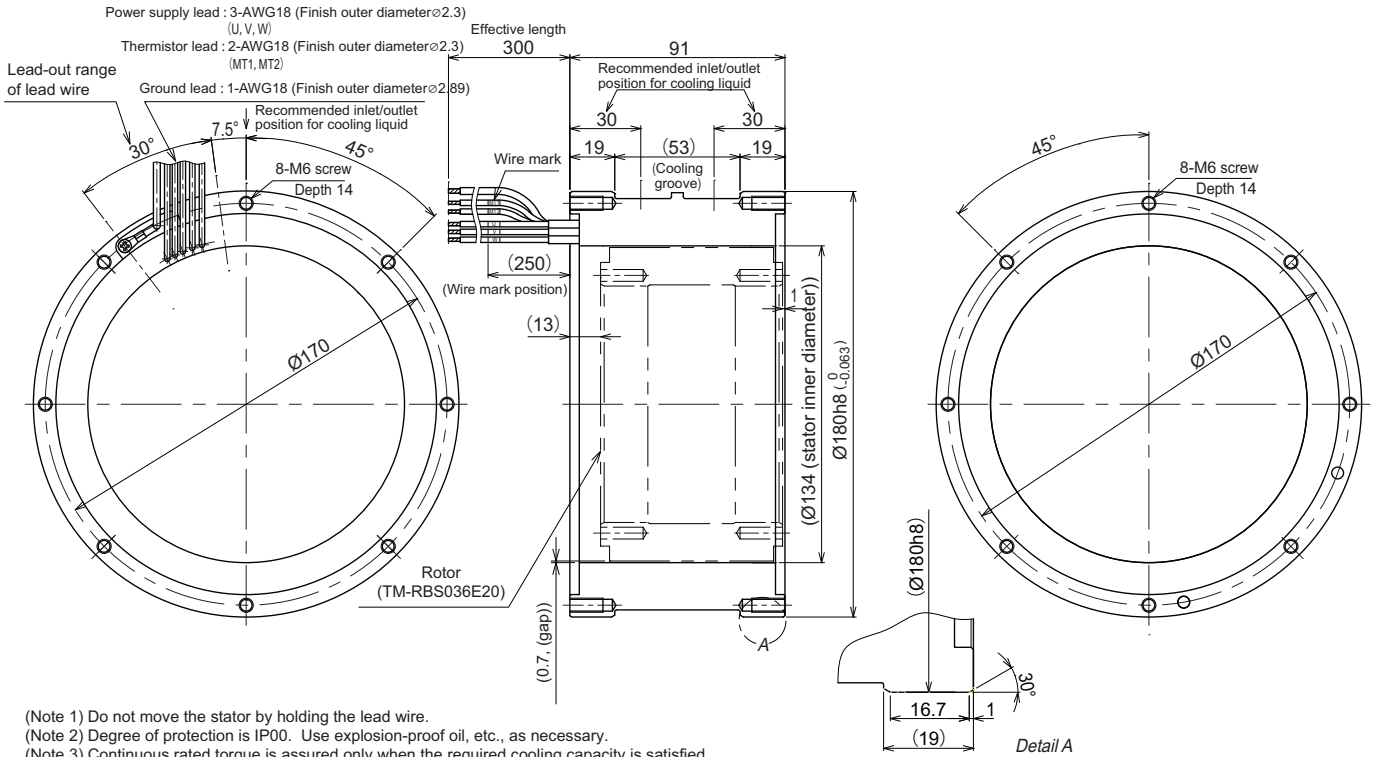
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

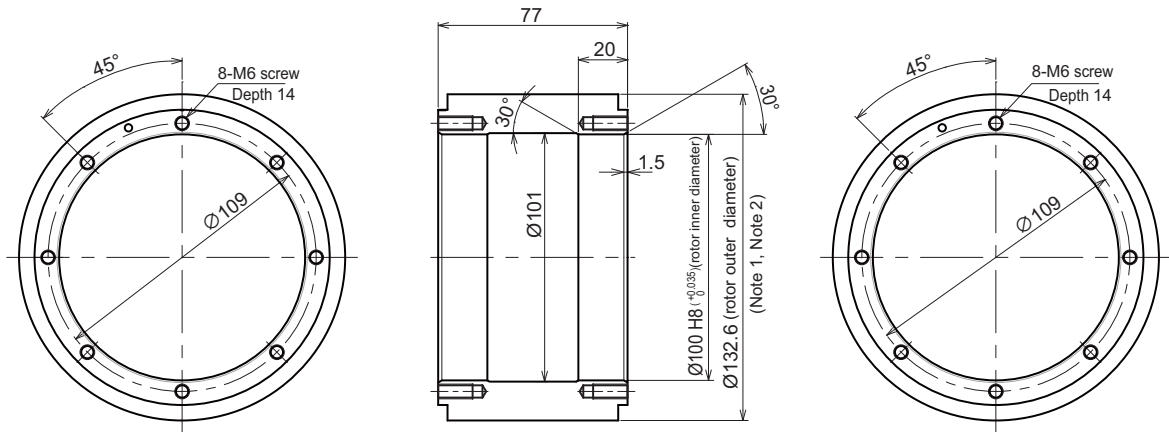
Outline dimension drawings [Unit : mm]

TM-RBP036E20



- (Note 1) Do not move the stator by holding the lead wire.
- (Note 2) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 3) Continuous rated torque is assured only when the required cooling capacity is satisfied.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

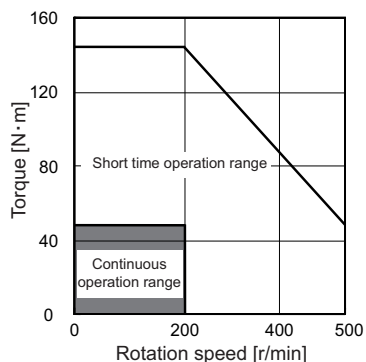
TM-RBS036E20



- (Note 1) Deliverable rotors are magnetized. Please note the magnetic attraction.
- (Note 2) Take special care for the magnet part not to hit against a thing (A crack or chip may occur).
- (Note 3) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

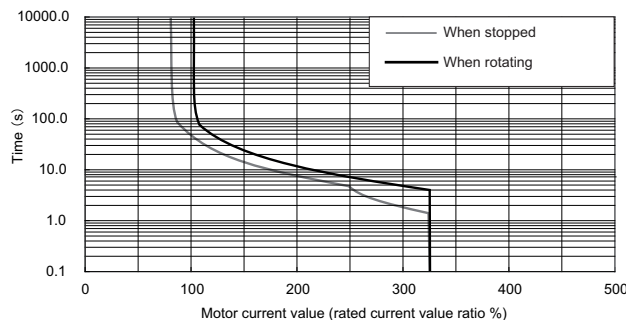
Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>48N•m</b>	<b>200r/min</b>	<b>TM-RBP048G20</b>	

Torque characteristics



Servo overload protection characteristics

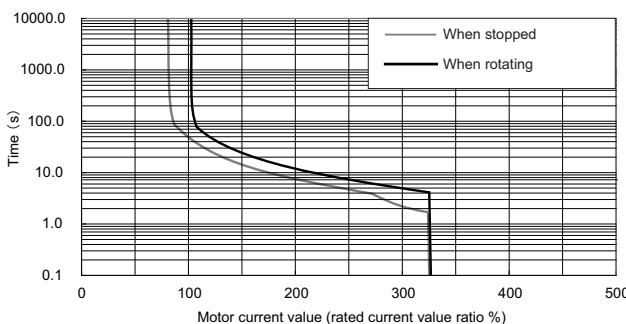
E Series



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-80
	2-axis type	MDS-E-V2-80
	Regenerative resistor type	MDS-EJ-V1-80
Continuous characteristics	Rated output [W]	1005
	Rated current [A]	12
	Rated torque [N•m]	48
Power facility capacity [kVA]	2.01	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	500	
Maximum current [A]	36	
Maximum torque [N•m]	144	
Power rate at continuous rated torque [kW/s]	82.2	
Rotor inertia [kg•cm <sup>2</sup> ]	280	
Degree of protection	IP00	
Required cooling capacity [kW]	0.4	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 230
	Secondary side inner diameter	DIA 130
	Height	80
Mass [kg]	Primary side (coil)	10
	Secondary side (magnet)	5
Heat-resistant class	155(F)	

EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

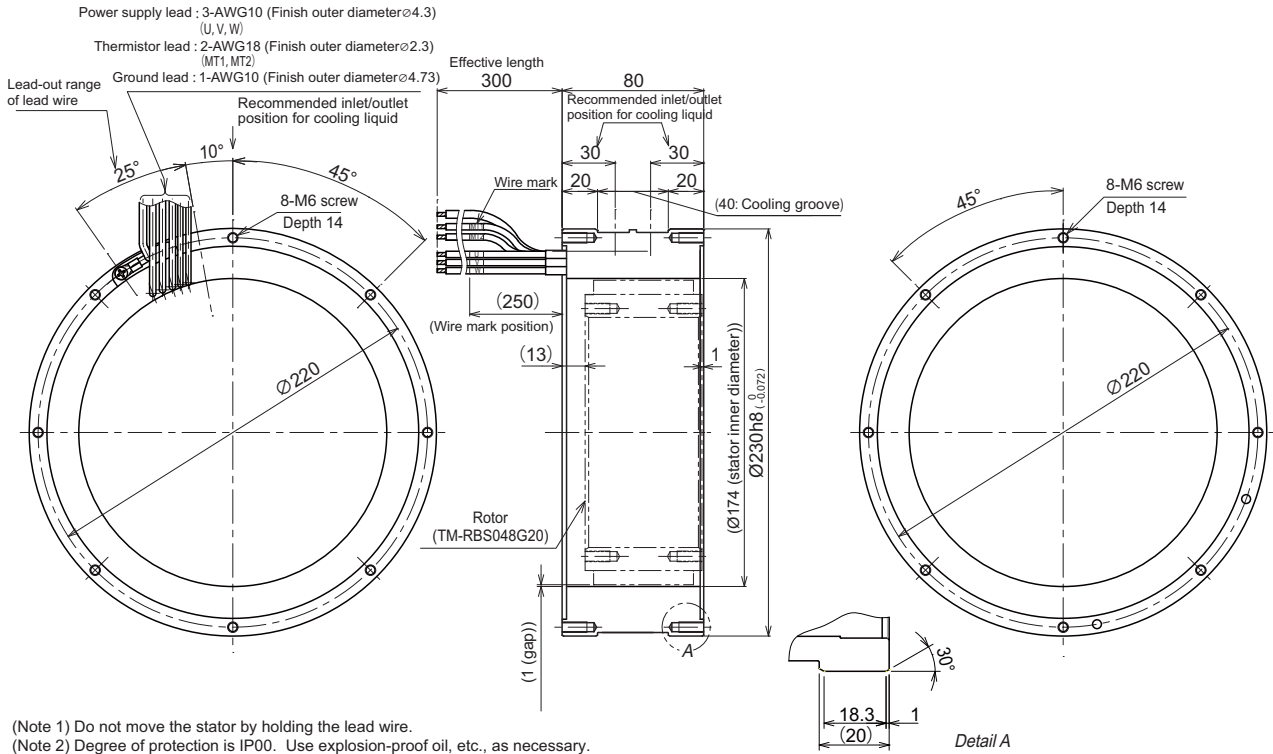
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

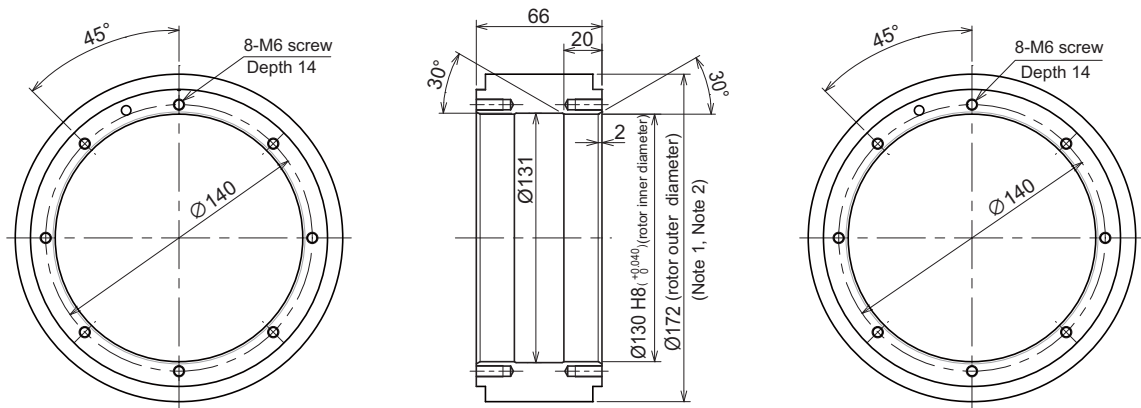
Outline dimension drawings [Unit : mm]

TM-RBP048G20



- (Note 1) Do not move the stator by holding the lead wire.
- (Note 2) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 3) Continuous rated torque is assured only when the required cooling capacity is satisfied.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

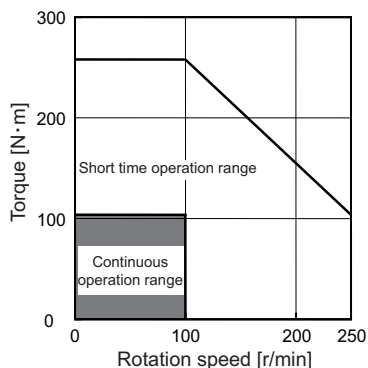
TM-RBS048G20



- (Note 1) Deliverable rotors are magnetized. Please note the magnetic attraction.
- (Note 2) Take special care for the magnet part not to hit against a thing (A crack or chip may occur).
- (Note 3) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

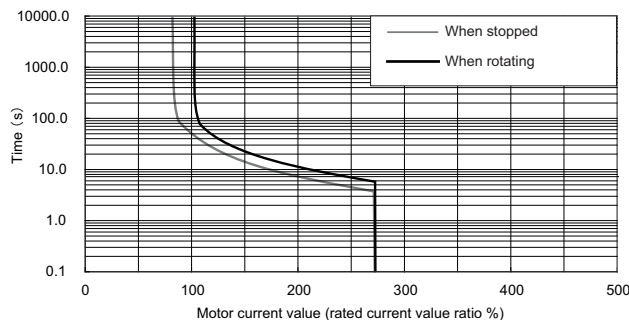
Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>105N·m</b>	<b>100r/min</b>	<b>TM-RBP105G10</b>	

Torque characteristics



Servo overload protection characteristics

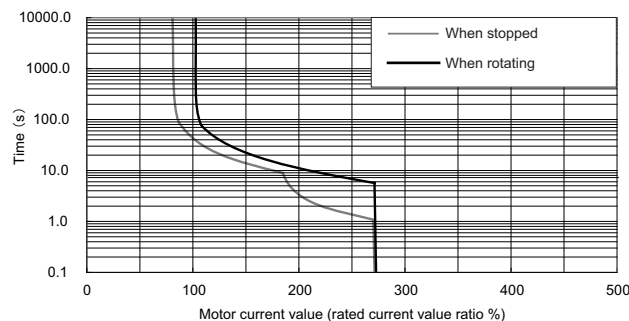
E Series



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-160
	2-axis type	MDS-E-V2-160
	Regenerative resistor type	MDS-EJ-V1-100
Continuous characteristics	Rated output [W]	1100
	Rated current [A]	21
	Rated torque [N·m]	105
Power facility capacity [kVA]	3.86	
Rated rotation speed [r/min]	100	
Maximum rotation speed [r/min]	250	
Maximum current [A]	52	
Maximum torque [N·m]	260	
Power rate at continuous rated torque [kW/s]	279	
Rotor inertia [kg·cm <sup>2</sup> ]	395	
Degree of protection	IP00	
Required cooling capacity [kW]	1.6	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 230
	Secondary side inner diameter	DIA 130
	Height	105
Mass [kg]	Primary side (coil)	13
	Secondary side (magnet)	7
Heat-resistant class	155(F)	

EJ Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

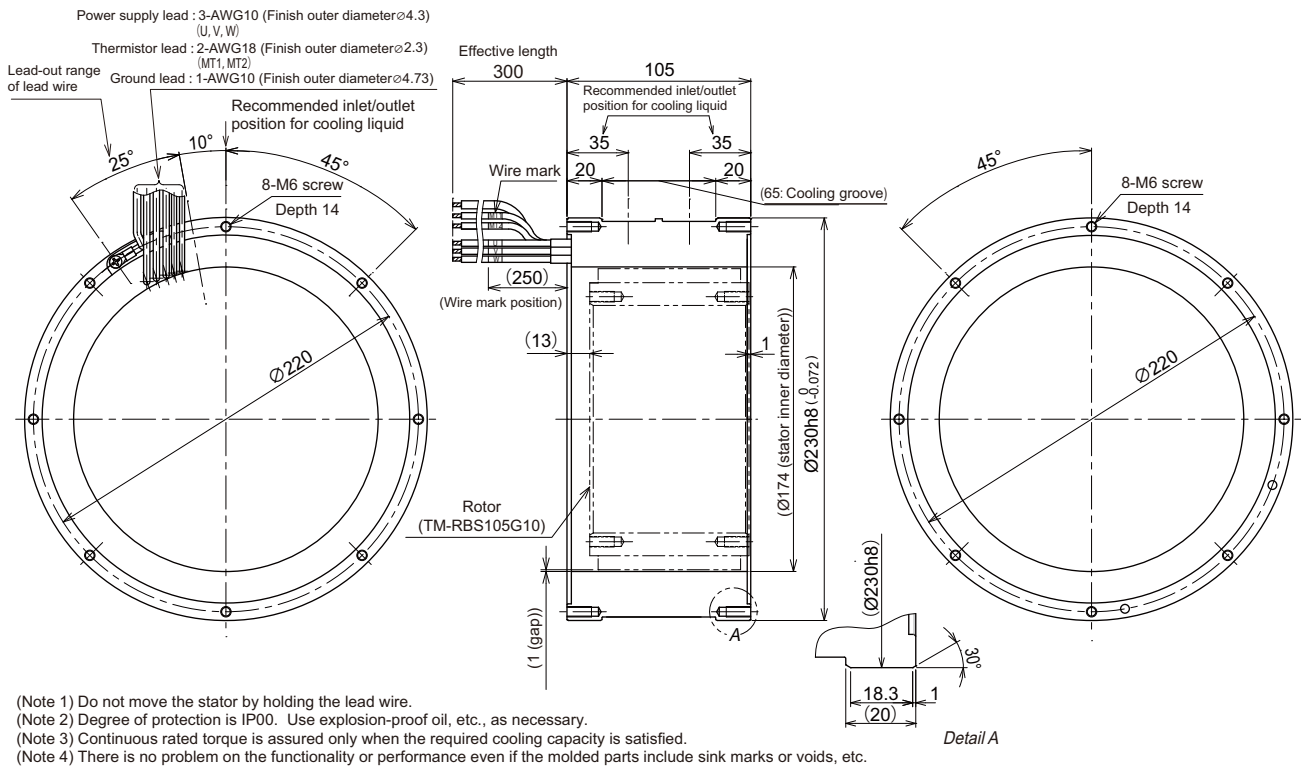
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

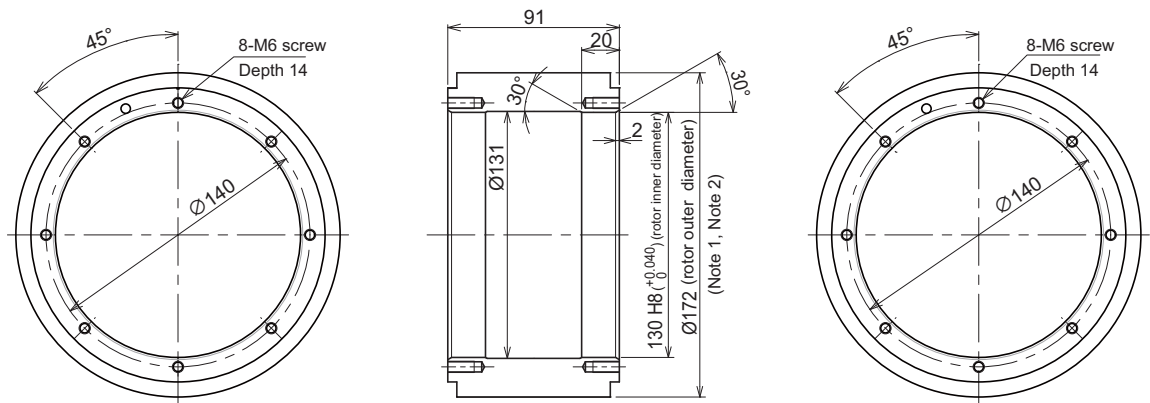
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

Outline dimension drawings [Unit : mm]

TM-RBP105G10



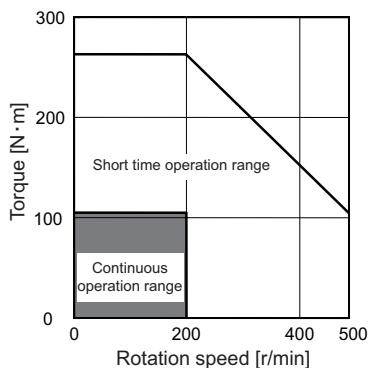
TM-RBS105G10



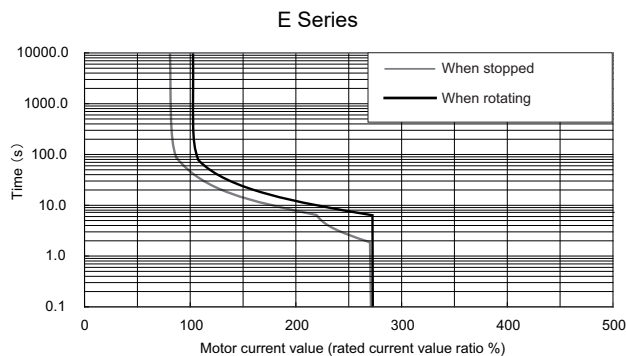


Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>105N·m</b>	<b>200r/min</b>	<b>TM-RBP105G20</b>	

Torque characteristics



Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-160
	2-axis type	MDS-E-V2-160
	Regenerative resistor type	-
Continuous characteristics	Rated output [W]	2199
	Rated current [A]	25
	Rated torque [N·m]	105
Power facility capacity [kVA]	5.00	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	500	
Maximum current [A]	63	
Maximum torque [N·m]	260	
Power rate at continuous rated torque [kW/s]	279	
Rotor inertia [kg·cm <sup>2</sup> ]	395	
Degree of protection	IP00	
Required cooling capacity [kW]	1.3	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 230
	Secondary side inner diameter	DIA 130
	Height	105
Mass [kg]	Primary side (coil)	13
	Secondary side (magnet)	7
Heat-resistant class	155(F)	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

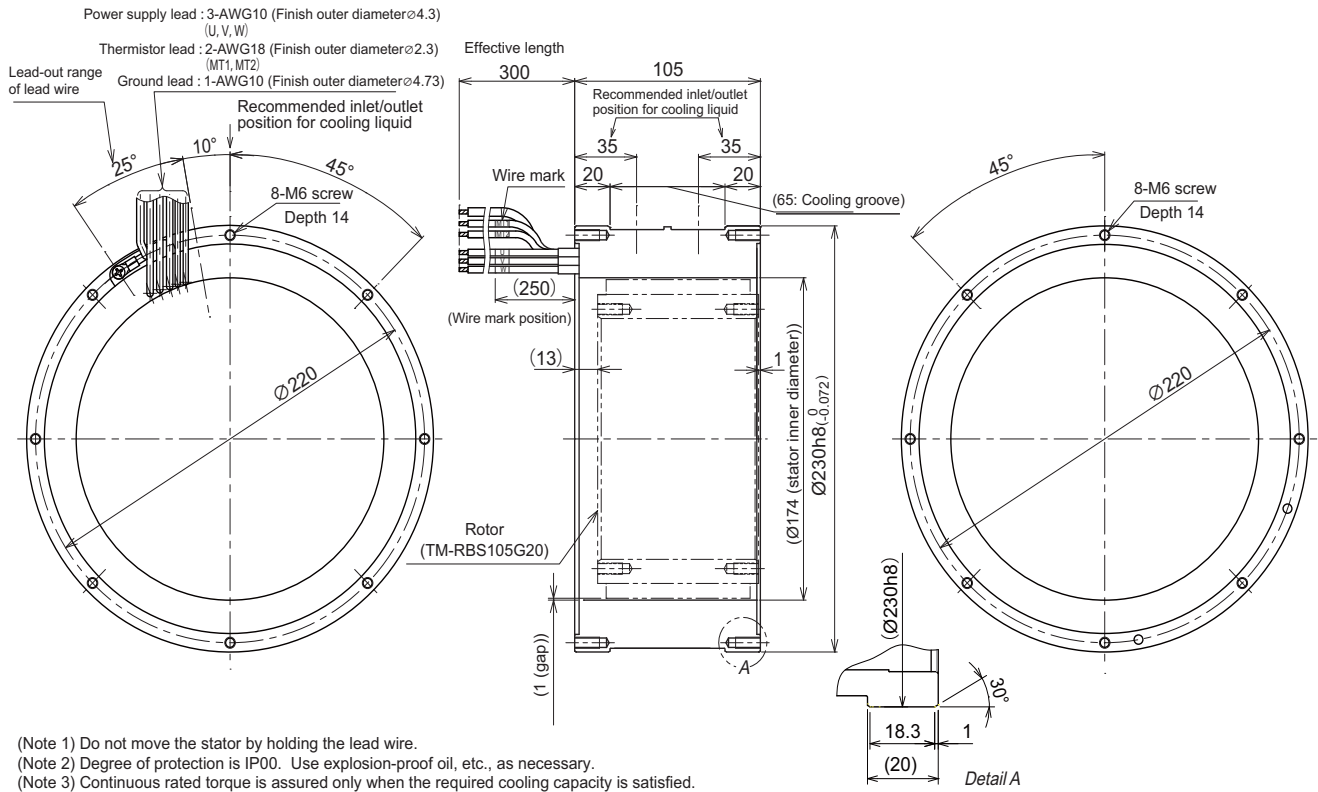
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

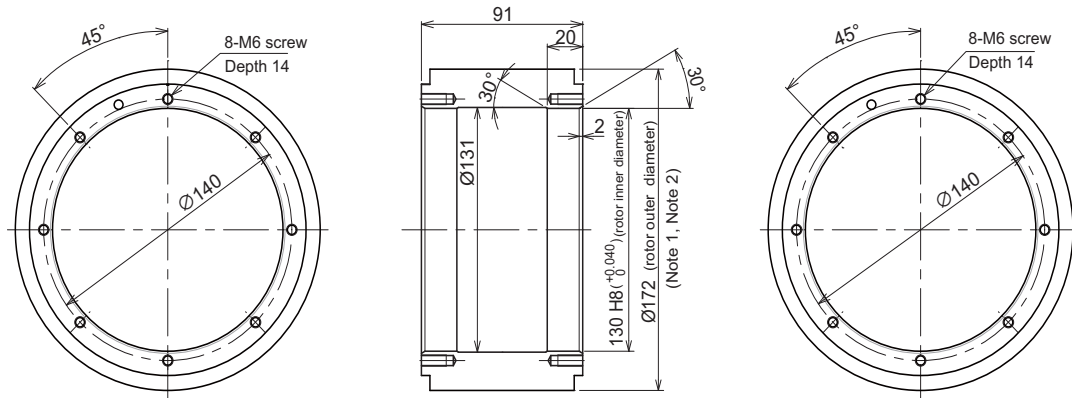
Outline dimension drawings [Unit : mm]

TM-RBP105G20



- (Note 1) Do not move the stator by holding the lead wire.
- (Note 2) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 3) Continuous rated torque is assured only when the required cooling capacity is satisfied.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

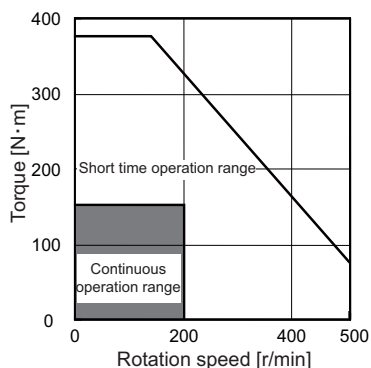
TM-RBS105G20



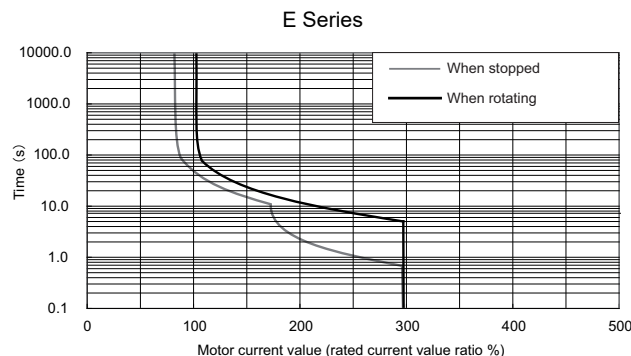
- (Note 1) Deliverable rotors are magnetized. Please note the magnetic attraction.
- (Note 2) Take special care for the magnet part not to hit against a thing (A crack or chip may occur).
- (Note 3) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>150N·m</b>	<b>200r/min</b>	<b>TM-RBP150G20</b>	

Torque characteristics



Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-160
	2-axis type	MDS-E-V2-160
	Regenerative resistor type	-
Continuous characteristics	Rated output [W]	3141
	Rated current [A]	33
	Rated torque [N·m]	150
Power facility capacity [kVA]	7.20	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	500	
Maximum current [A]	83	
Maximum torque [N·m]	375	
Power rate at continuous rated torque [kW/s]	441	
Rotor inertia [kg·cm <sup>2</sup> ]	510	
Degree of protection	IP00	
Required cooling capacity [kW]	1.9	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 230
	Secondary side inner diameter	DIA 130
	Height	130
Mass [kg]	Primary side (coil)	16
	Secondary side (magnet)	9
Heat-resistant class	155(F)	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

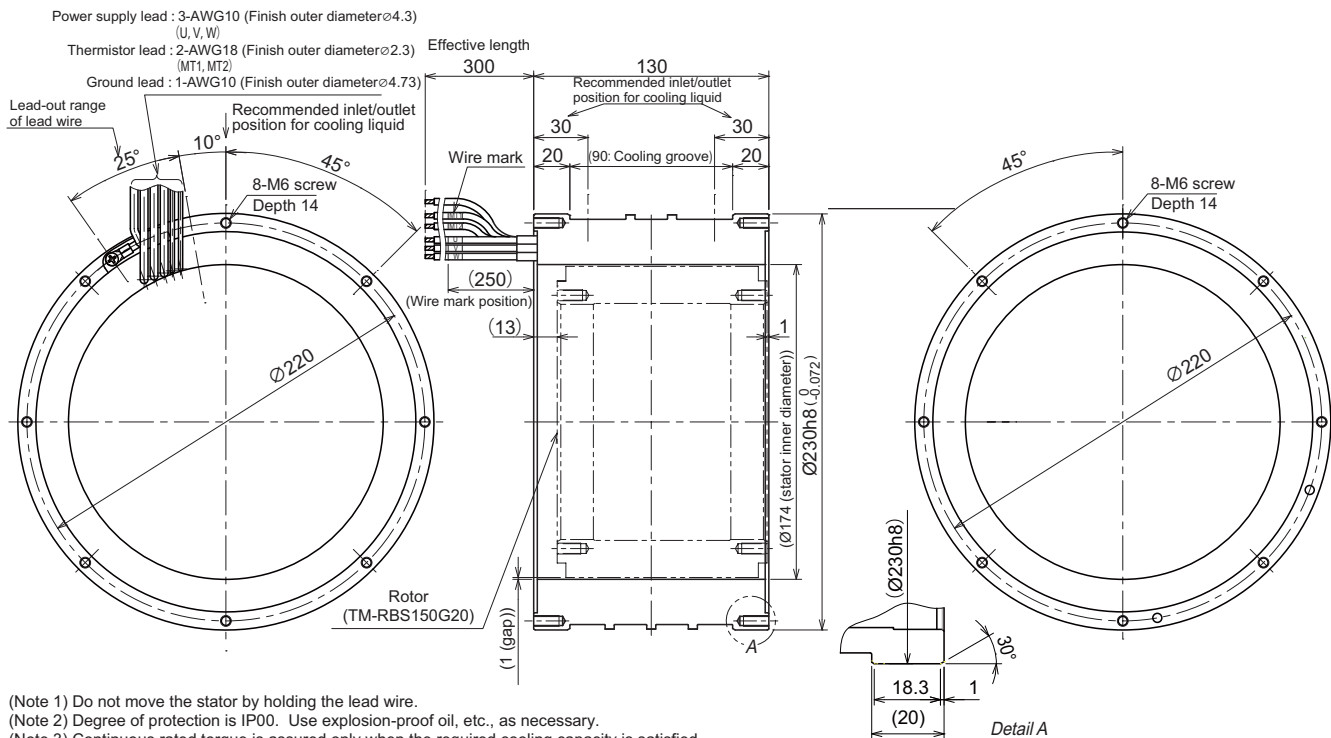
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

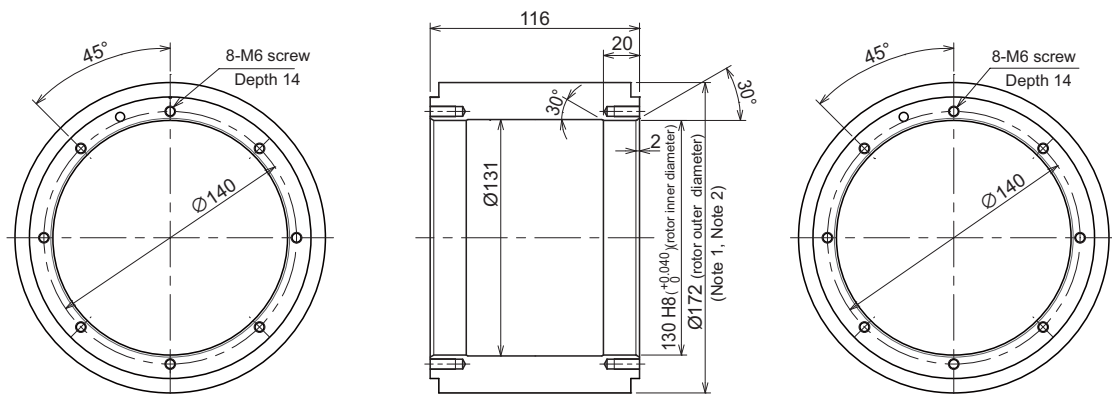
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	5G or less
Altitude	1000m or less above sea level

Outline dimension drawings [Unit : mm]

TM-RBP150G20

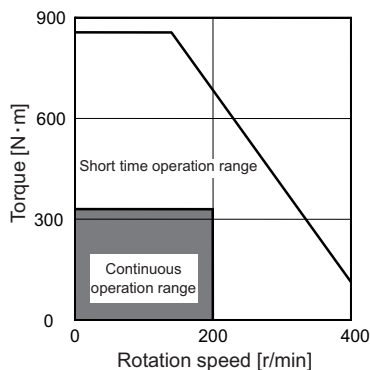


TM-RBS150G20

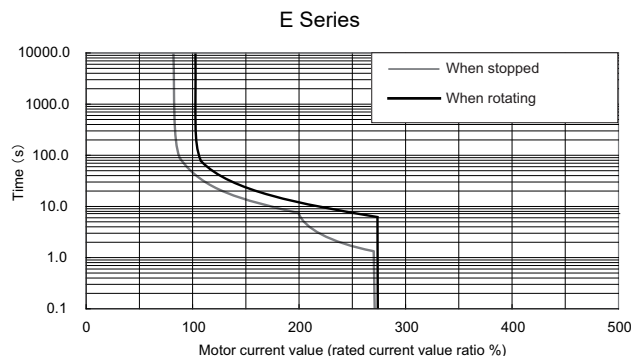


Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>340N·m</b>	<b>200r/min</b>	<b>TM-RBP340J20</b>	

Torque characteristics



Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-320
	2-axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output [W]	7120
	Rated current [A]	54
	Rated torque [N·m]	340
Power facility capacity [kVA]	14.03	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	400	
Maximum current [A]	135	
Maximum torque [N·m]	850	
Power rate at continuous rated torque [kW/s]	416	
Rotor inertia [kg·cm <sup>2</sup> ]	2778	
Degree of protection	IP00	
Required cooling capacity [kW]	2.7	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 330
	Secondary side inner diameter	DIA 205
	Height	154
Mass [kg]	Primary side (coil)	33
	Secondary side (magnet)	20
Heat-resistant class	155(F)	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

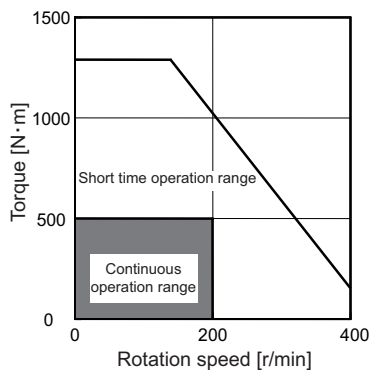
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	2.5G or less
Altitude	1000m or less above sea level

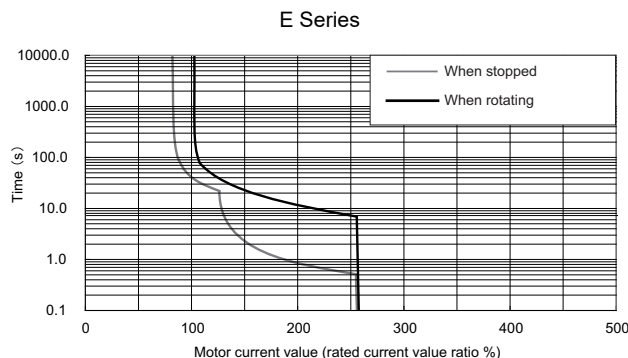


Rated torque	Rated rotation speed	Direct-drive motor type for primary side	
<b>500N•m</b>	<b>200r/min</b>	<b>TM-RBP500J20</b>	

Torque characteristics



Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible servo drive unit type (*1)	1-axis type	MDS-E-V1-320W
	2-axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output [W]	10471
	Rated current [A]	82
	Rated torque [N·m]	500
Power facility capacity [kVA]	20.82	
Rated rotation speed [r/min]	200	
Maximum rotation speed [r/min]	400	
Maximum current [A]	210	
Maximum torque [N·m]	1280	
Power rate at continuous rated torque [kW/s]	707	
Rotor inertia [kg·cm <sup>2</sup> ]	3538	
Degree of protection	IP00	
Required cooling capacity [kW]	4.1	
Cooling water volume	Min: 5 l/min Max: 6 l/min at 20°C	
Dimensions [mm]	Primary side outer diameter	DIA 330
	Secondary side inner diameter	DIA 205
	Height	191
Mass [kg]	Primary side (coil)	41
	Secondary side (magnet)	26
Heat-resistant class	155(F)	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

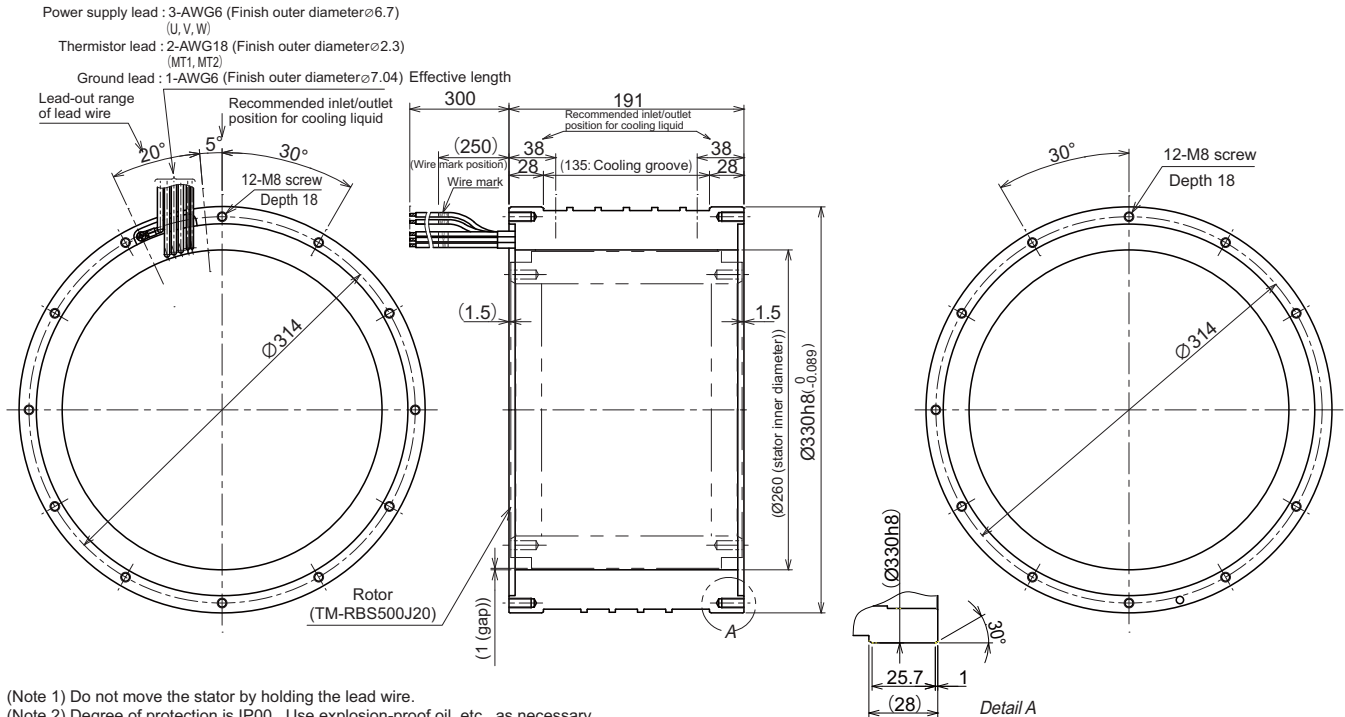
(\*2) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas or dust No oil or water splash
Vibration	2.5G or less
Altitude	1000m or less above sea level

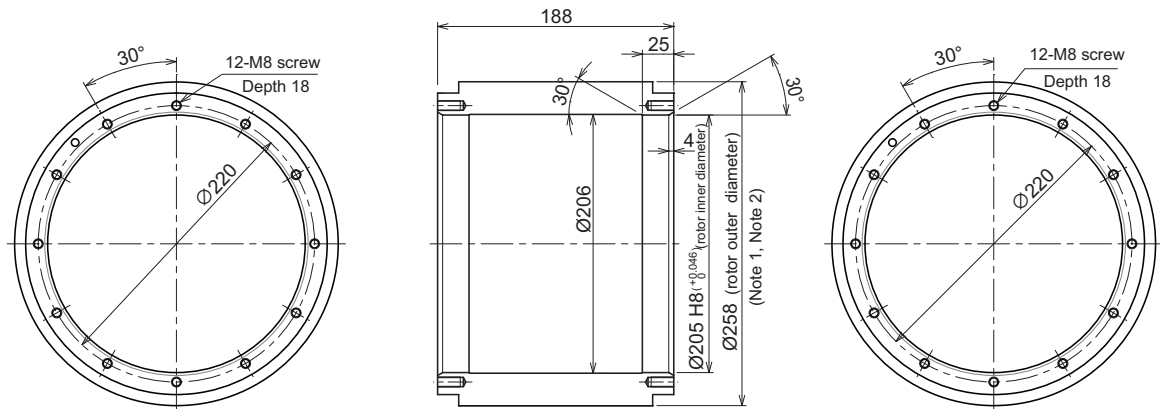
Outline dimension drawings [Unit : mm]

TM-RBP500J20



- (Note 1) Do not move the stator by holding the lead wire.
- (Note 2) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 3) Continuous rated torque is assured only when the required cooling capacity is satisfied.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

TM-RBS500J20



- (Note 1) Deliverable rotors are magnetized. Please note the magnetic attraction.
- (Note 2) Take special care for the magnet part not to hit against a thing (A crack or chip may occur).
- (Note 3) Degree of protection is IP00. Use explosion-proof oil, etc., as necessary.
- (Note 4) There is no problem on the functionality or performance even if the molded parts include sink marks or voids, etc.

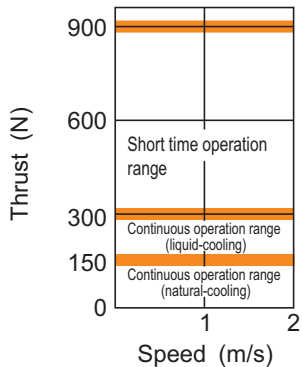




# Linear Motor

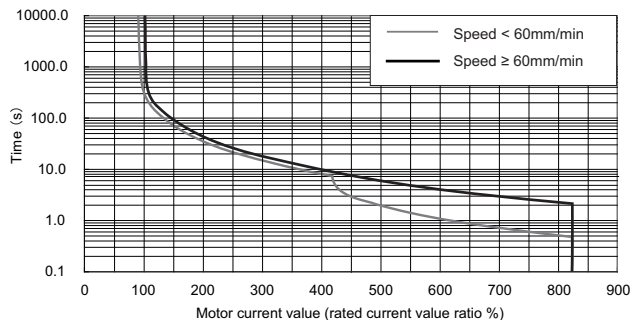
Thrust		Linear servo motor type		Explanation of type		
Rated (natural-cooling)	150N	Primary side (coil)	LM-FP2A-03M -1WW0			
Rated (liquid-cooling)	300N	Secondary side (magnet)				
Maximum	900N					(1) LM-FS20 -□-1WW0
			(1) Length [mm]	384	480	576

Thrust Characteristics



Servo overload protection characteristics

E Series (For natural-cooling)



Specifications

Item		Specifications	
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-40	MDS-E-V1-80
	2-axis type	MDS-E-V2-40	MDS-E-V2-80
	3-axis type	MDS-E-V3-40	-
	Regenerative resistor type	MDS-EJ-V1-40	MDS-EJ-V1-80
Power facility capacity [kVA]		2.0	4.0
Current	Rated (natural-cooling) [Arms]	3.5	6.9
	Rated (liquid-cooling) [Arms]	6.9	13.8
	Maximum [Arms]	26.1	52.2
Cooling method		Natural-cooling, liquid-cooling	
Thrust	Rated (natural-cooling) [N]	150	300
	Rated (liquid-cooling) [N]	300	600
	Maximum [N]	900	1800
Maximum speed [m/s] (*2)		2.0	
Magnetic attraction force [N]		2500	
Mass	Primary side [kg]	5	5×2
	Secondary side [kg]	5.8 (384mm) 7.1 (480mm) 9.0 (576mm)	
Recommended load mass ratio		15 times linear servo motor primary side mass maximum	
Structure		Open (Degree of protection IP00)	

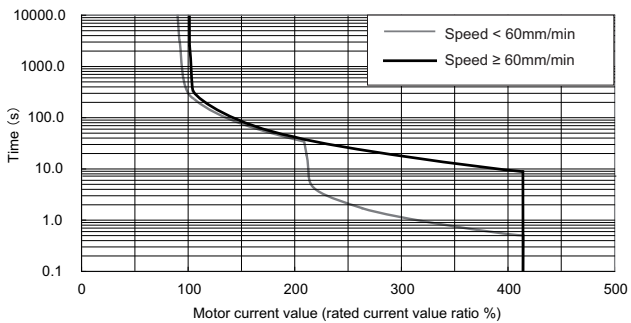
(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

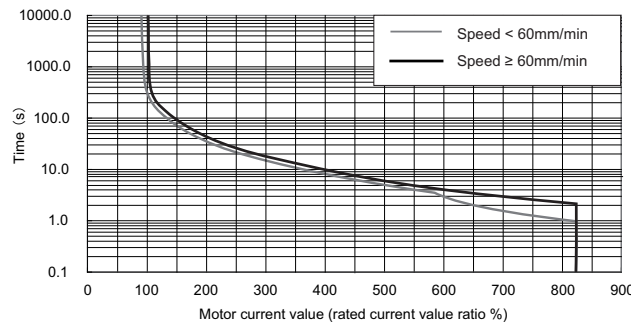
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

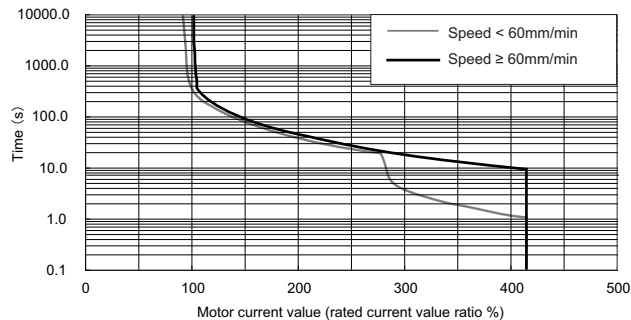
E Series (For liquid-cooling)



EJ Series (For natural-cooling)



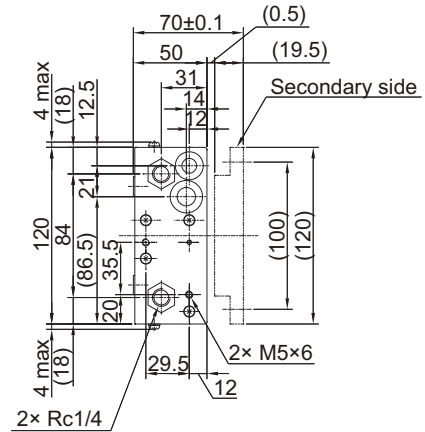
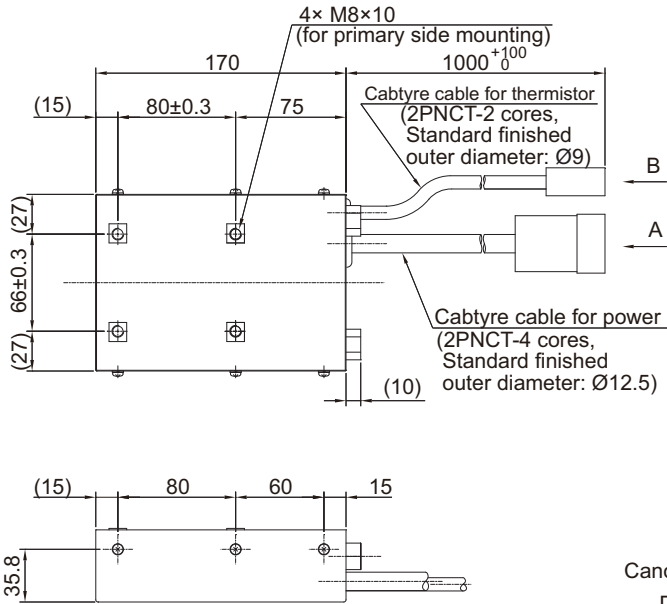
EJ Series (For liquid-cooling)



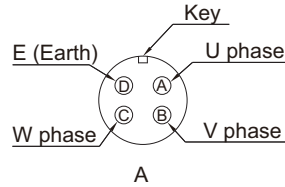
Outline dimension drawings [Unit : mm]

< Primary side >

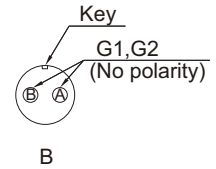
LM-FP2A-03M-1WW0



Canon connector for motor  
D/MS3106A18-10P

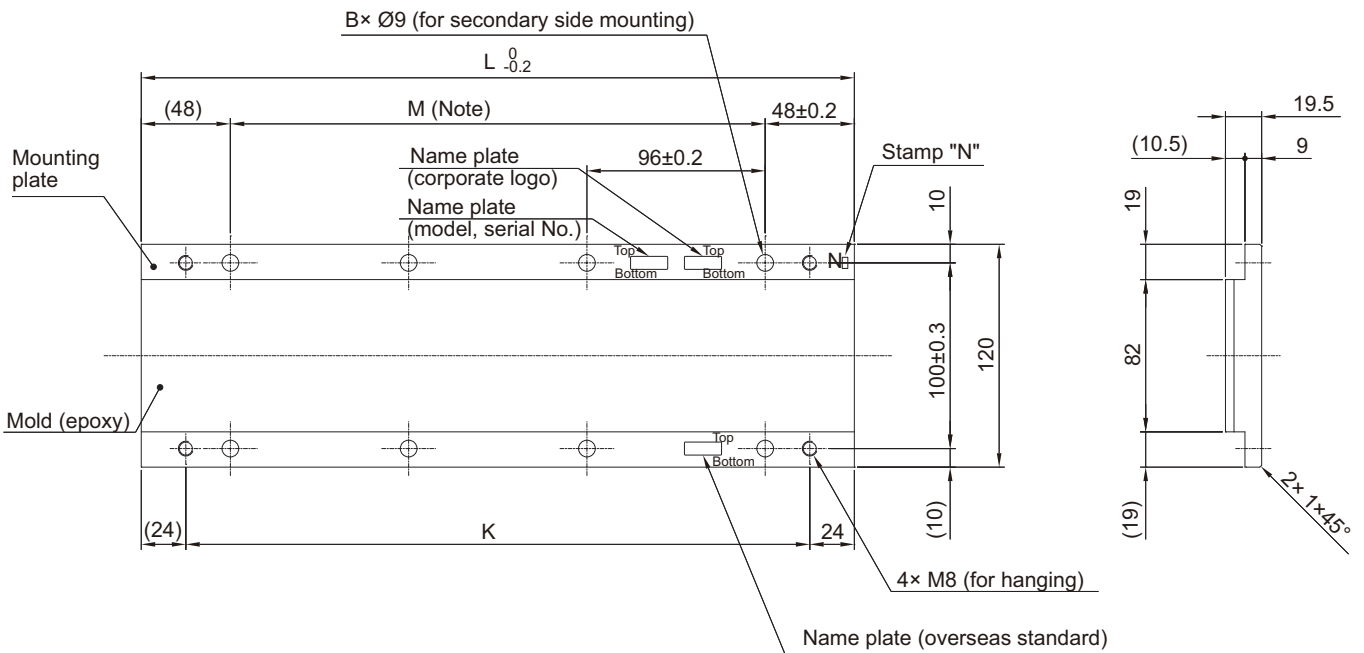


Canon connector for thermistor  
D/MS3106A14S-9P



< Secondary side >

LM-FS20-□-1WW0

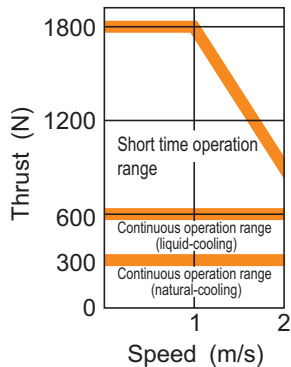


Model	Variable dimensions		
	L	M	B
LM-FS20-384-1WW0	384	3X 96 (=288)	336
LM-FS20-480-1WW0	480	4X 96 (=384)	432
LM-FS20-576-1WW0	576	5X 96 (=480)	528

(Note) Pitch tolerance between holes at both ends: ±0.2

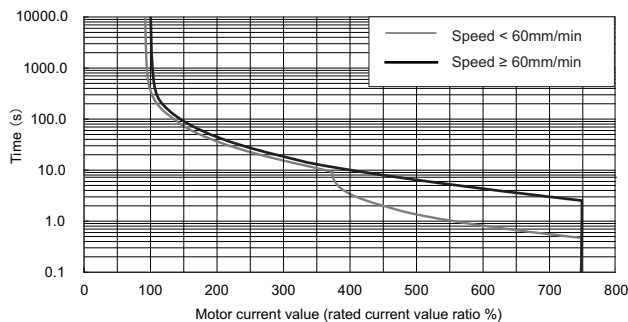
Thrust		Linear servo motor type		Explanation of type		
Rated (natural-cooling)	300N	Primary side (coil)	LM-FP2B-06M -1WW0	(1) Length [mm]	384	
Rated (liquid-cooling)	600N	Secondary side (magnet)				
Maximum	1800N					(1) LM-FS20 -□-1WW0
						576

Thrust Characteristics



Servo overload protection characteristics

E Series (For natural-cooling)



Specifications

Item		Specifications	
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-40	MDS-E-V1-80
	2-axis type	MDS-E-V2-40	MDS-E-V2-80
	3-axis type	MDS-E-V3-40	-
	Regenerative resistor type	MDS-EJ-V1-40	MDS-EJ-V1-80
Power facility capacity [kVA]		3.5	7.0
Current	Rated (natural-cooling) [Arms]	3.9	7.8
	Rated (liquid-cooling) [Arms]	7.8	15.6
	Maximum [Arms]	28.1	56.2
Cooling method		Natural-cooling, liquid-cooling	
Thrust	Rated (natural-cooling) [N]	300	600
	Rated (liquid-cooling) [N]	600	1200
	Maximum [N]	1800	3600
Maximum speed [m/s] (*2)		2.0	
Magnetic attraction force [N]		4500	
Mass	Primary side [kg]	9	9×2
	Secondary side [kg]	5.8 (384mm) 7.1 (480mm) 9.0 (576mm)	
Recommended load mass ratio		15 times linear servo motor primary side mass maximum	
Structure		Open (Degree of protection IP00)	

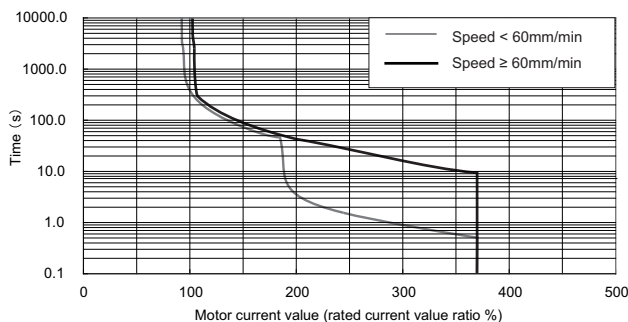
(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

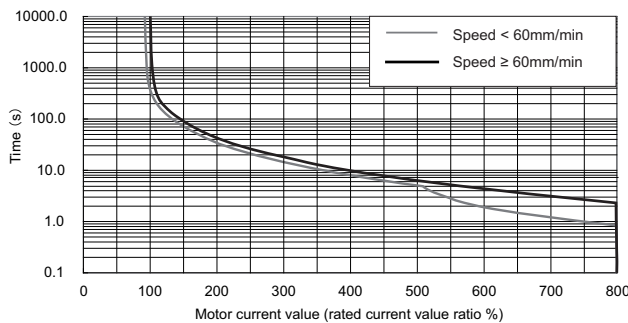
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

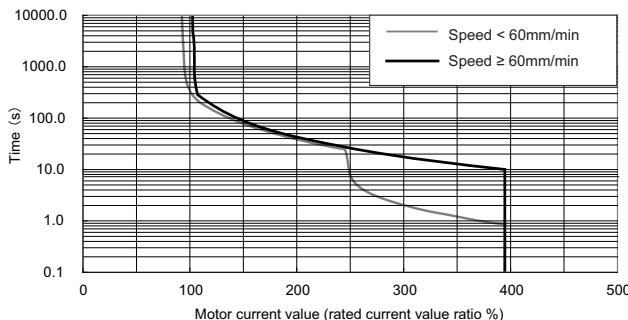
E Series (For liquid-cooling)



EJ Series (For natural-cooling)



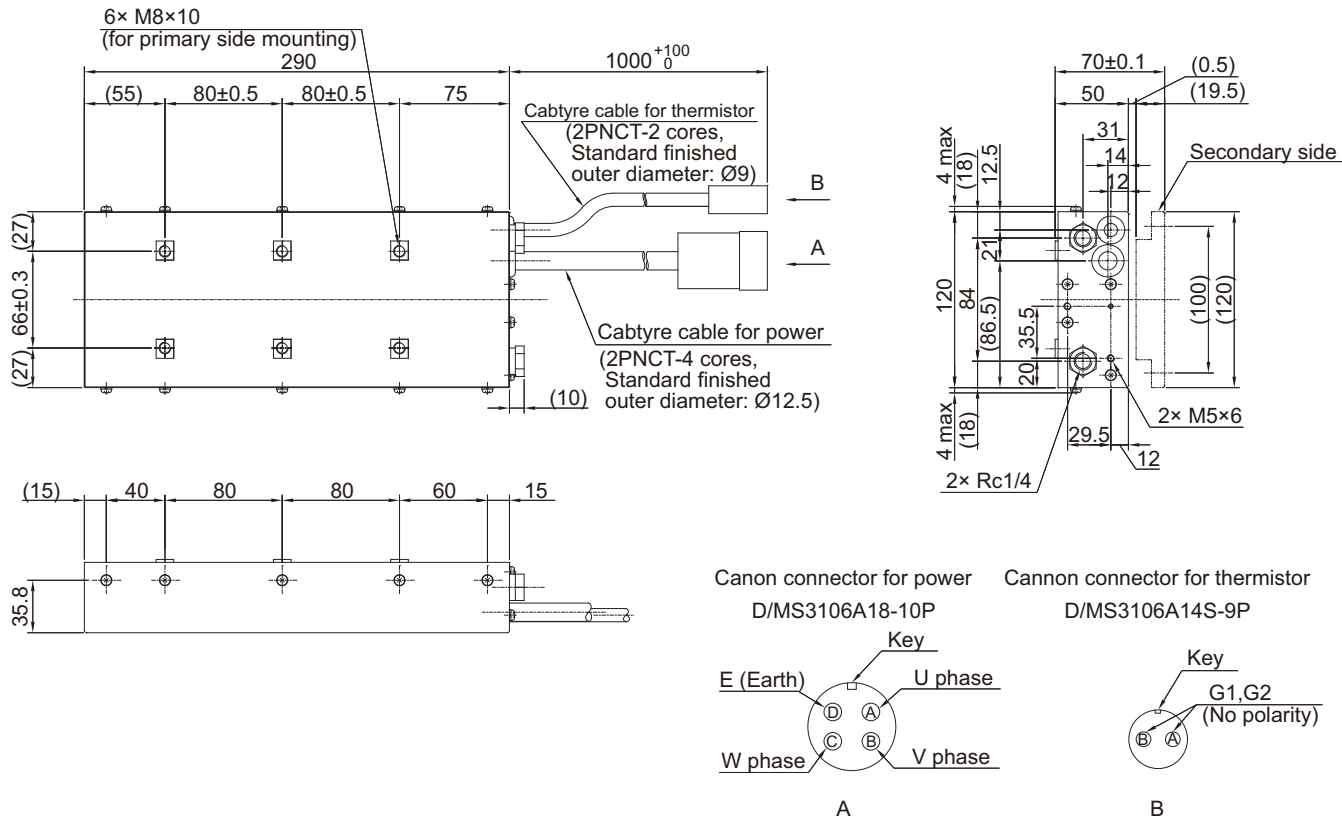
EJ Series (For liquid-cooling)



Outline dimension drawings [Unit : mm]

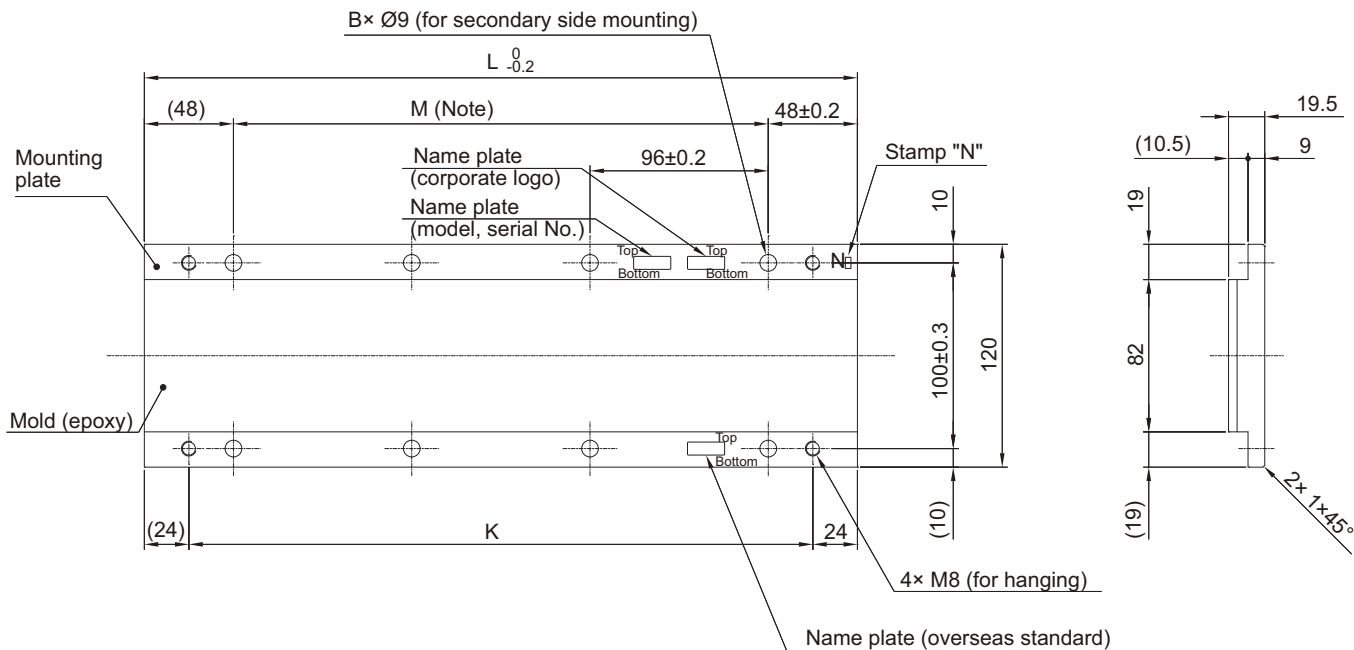
< Primary side >

LM-FP2B-06M-1WW0



< Secondary side >

LM-FS20-□-1WW0

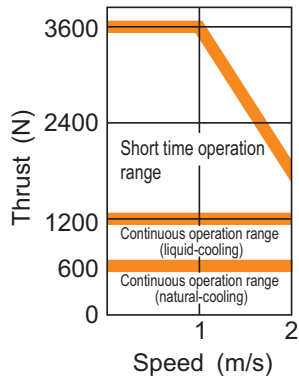


(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS20-384-1WW0	384	3X 96 (=288)	336	8
LM-FS20-480-1WW0	480	4X 96 (=384)	432	10
LM-FS20-576-1WW0	576	5X 96 (=480)	528	12

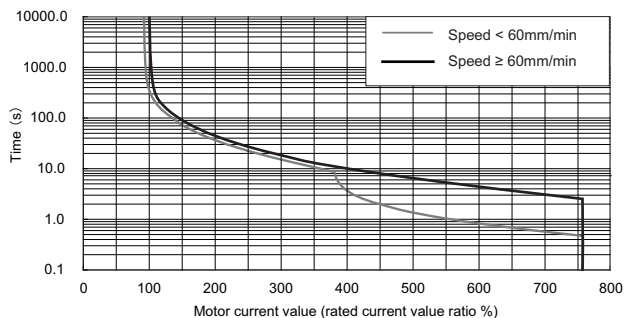
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	600N	Primary side (coil)	LM-FP2D-12M -1WW0	(1) Length [mm]	384
Rated (liquid-cooling)	1200N	Secondary side (magnet)			
Maximum	3600N				
			LM-FS20 -□-1WW0		576

Thrust Characteristics



Servo overload protection characteristics

E Series (For natural-cooling)



Specifications

Item	Specifications		
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-80	MDS-E-V1-160, 160W
	2-axis type	MDS-E-V2-80	MDS-E-V2-160, 160W
	3-axis type	MDS-E-V3-80	-
	Regenerative resistor type	MDS-EJ-V1-80	-
Power facility capacity [kVA]	5.5	11.0	
Current	Rated (natural-cooling) [A rms]	7.7	15.3
	Rated (liquid-cooling) [A rms]	15.3	30.5
	Maximum [A rms]	57.8	115.7
Cooling method	Natural-cooling, liquid-cooling		
Thrust	Rated (natural-cooling) [N]	600	1200
	Rated (liquid-cooling) [N]	1200	2400
	Maximum [N]	3600	7200
Maximum speed [m/s] (*2)	2.0		
Magnetic attraction force [N]	9000		
Mass	Primary side [kg]	18	18×2
	Secondary side [kg]	5.8 (384mm) 7.1 (480mm) 9.0 (576mm)	
Recommended load mass ratio	15 times linear servo motor primary side mass maximum		
Structure	Open (Degree of protection IP00)		

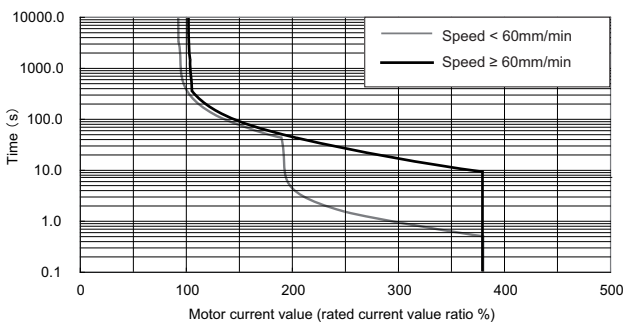
(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

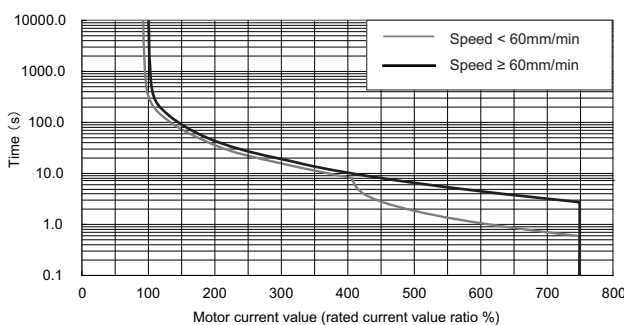
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

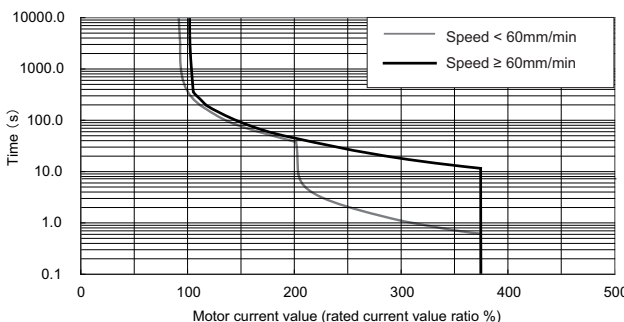
E Series (For liquid-cooling)



EJ Series (For natural-cooling)



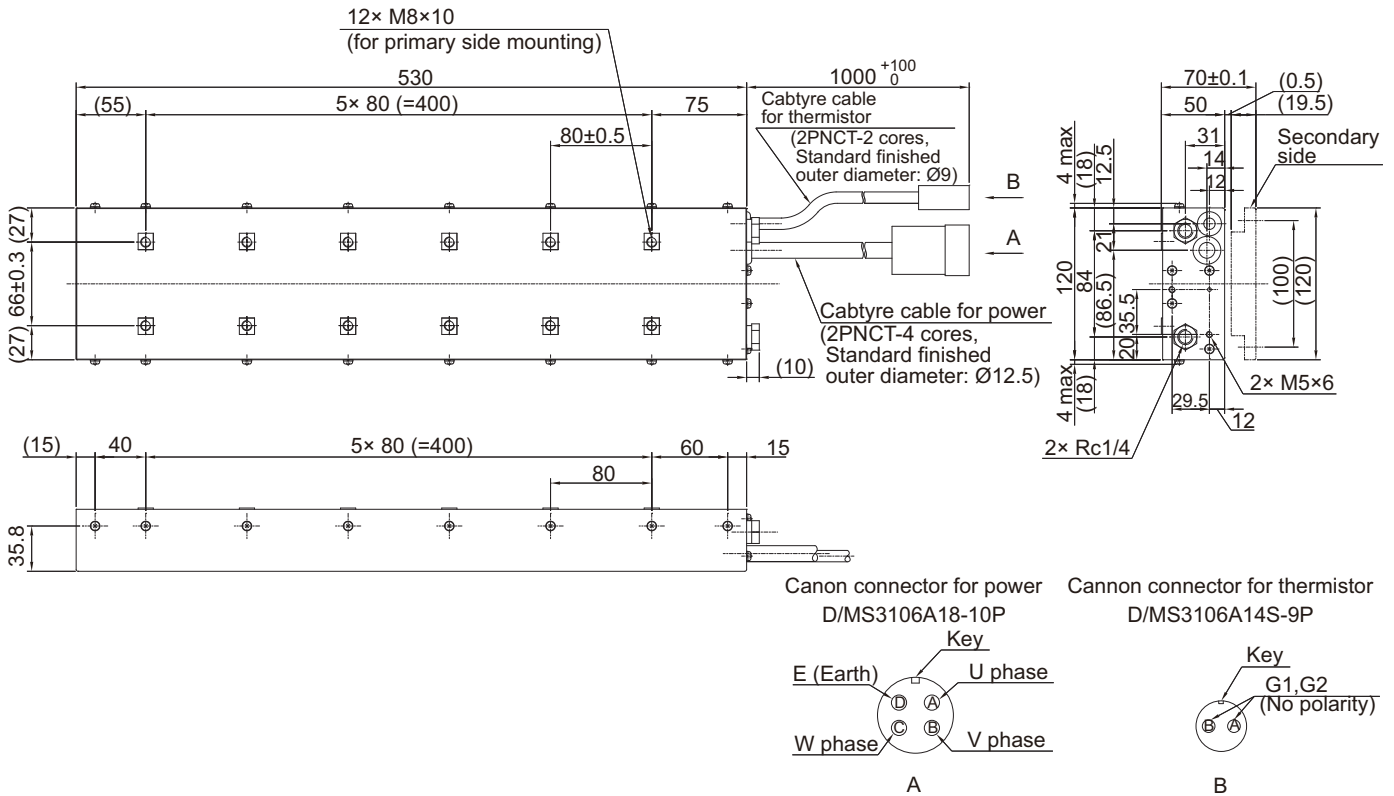
EJ Series (For liquid-cooling)



Outline dimension drawings [Unit : mm]

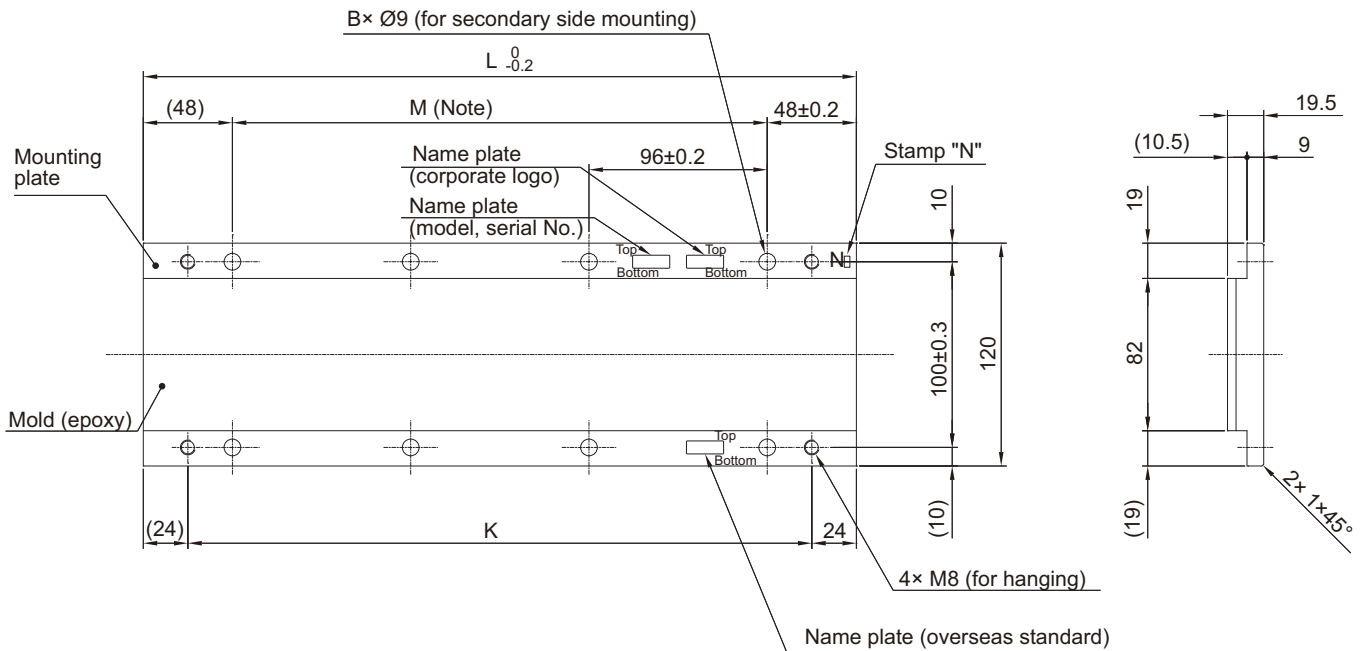
< Primary side >

LM-FP2D-12M-1WW0



< Secondary side >

LM-FS20-□-1WW0



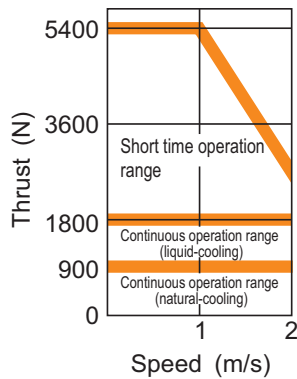
(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS20-384-1WW0	384	3X 96 (=288)	336	8
LM-FS20-480-1WW0	480	4X 96 (=384)	432	10
LM-FS20-576-1WW0	576	5X 96 (=480)	528	12



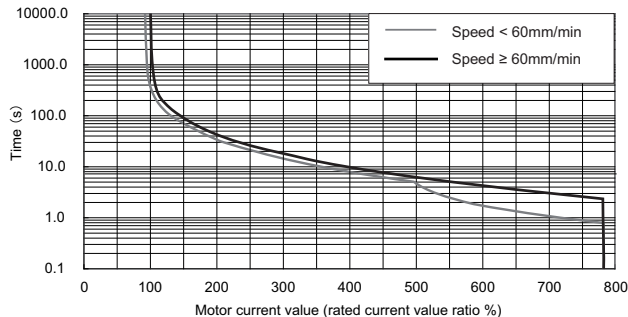
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	900N	Primary side (coil)	LM-FP2F-18M -1WW0		
Rated (liquid-cooling)	1800N	Secondary side (magnet)			
Maximum	5400N				
			LM-FS20 -□-1WW0		480
					576

Thrust Characteristics



Servo overload protection characteristics

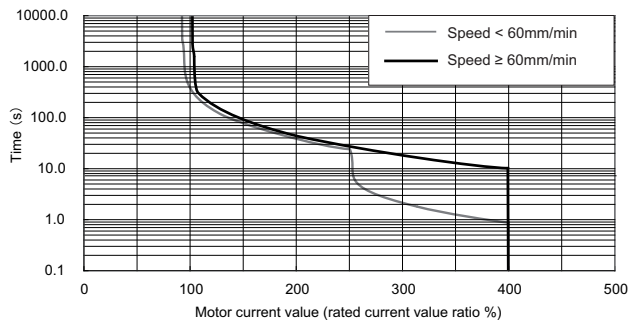
E Series (For natural-cooling)



Specifications

Item	Specifications		
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-160, 160W	MDS-E-V1-320, 320W
	2-axis type	MDS-E-V2-160, 160W	-
	3-axis type	-	-
	Regenerative resistor type	-	-
Power facility capacity [kVA]	10	20.0	
Current	Rated (natural-cooling) [Arms]	11.9	23.8
	Rated (liquid-cooling) [Arms]	23.2	46.4
	Maximum [Arms]	84.7	169.4
Cooling method	Natural-cooling, liquid-cooling		
Thrust	Rated (natural-cooling) [N]	900	1800
	Rated (liquid-cooling) [N]	1800	3600
	Maximum [N]	5400	10800
Maximum speed [m/s] (*2)	2.0		
Magnetic attraction force [N]	13500		
Mass	Primary side [kg]	27	27*2
	Secondary side [kg]	5.8 (384mm) 7.1 (480mm) 9.0 (576mm)	
Recommended load mass ratio	15 times linear servo motor primary side mass maximum		
Structure	Open (Degree of protection IP00)		

E Series (For liquid-cooling)



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

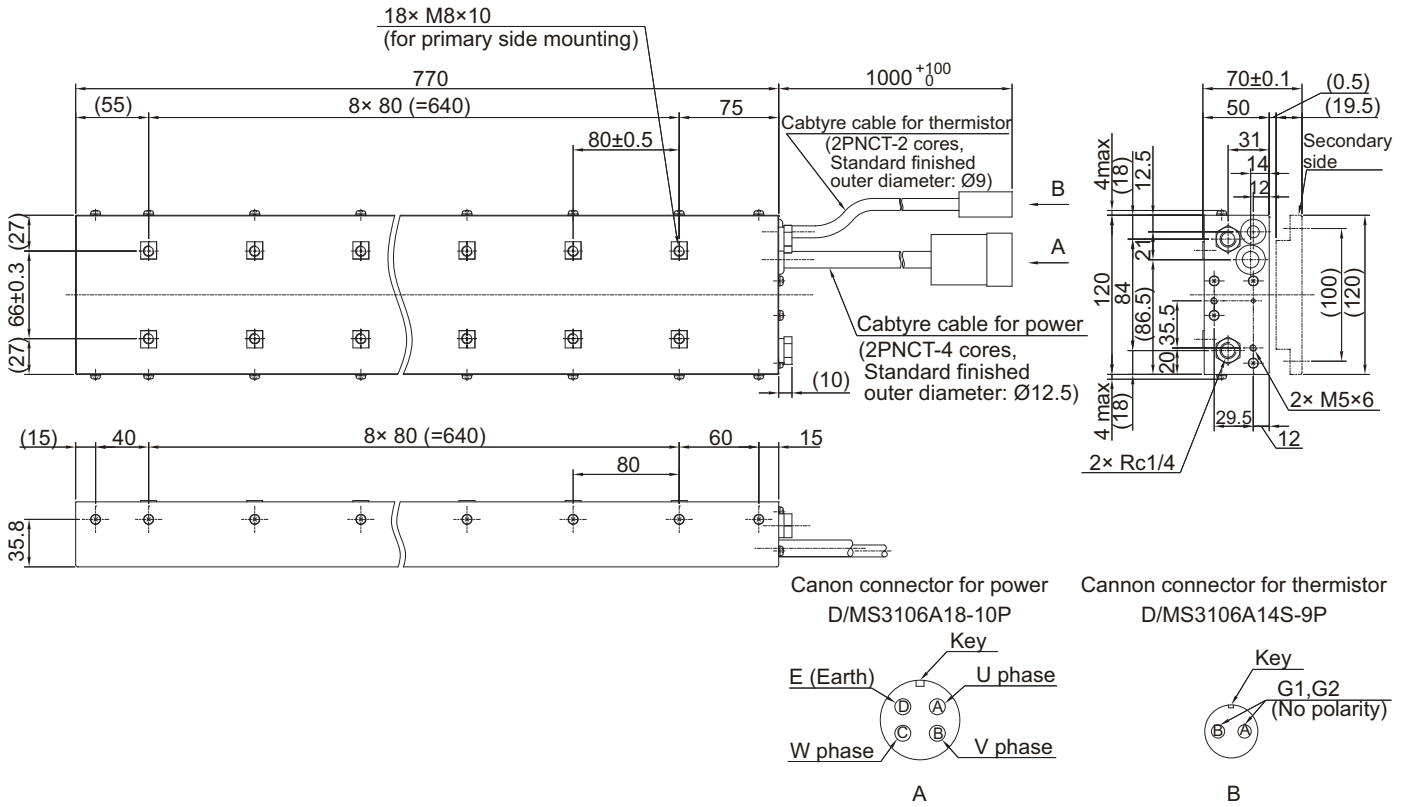
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

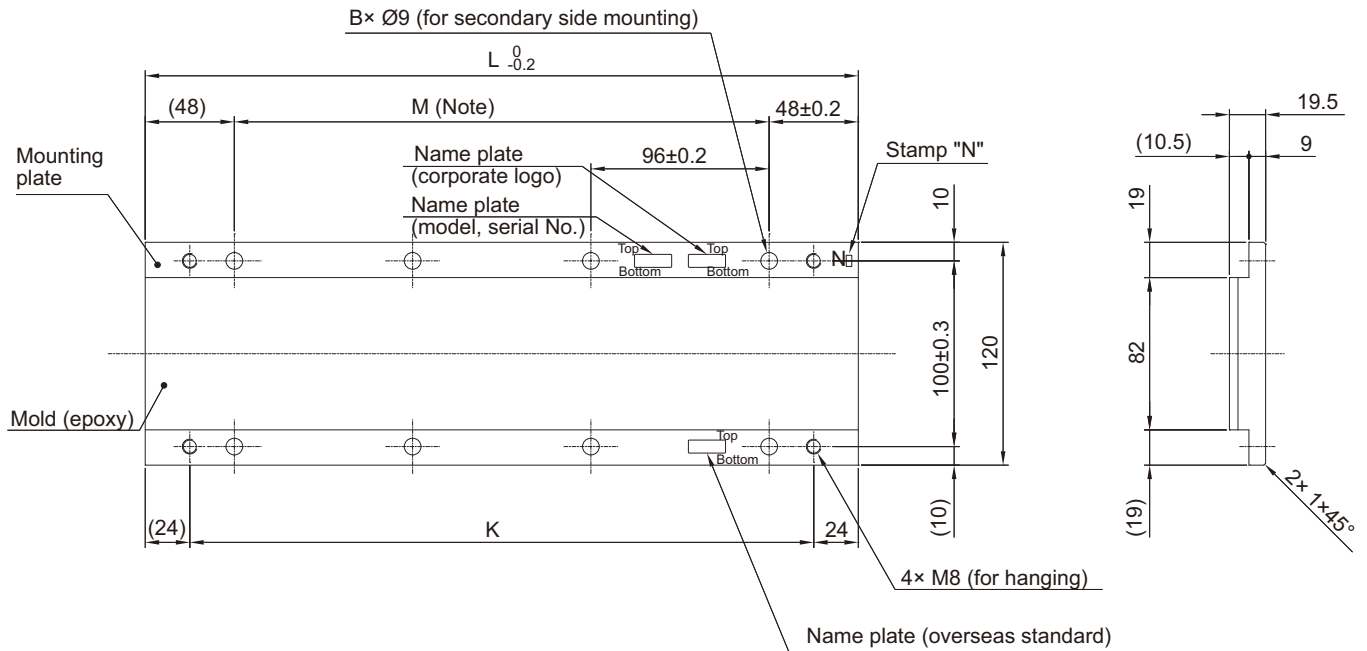
< Primary side >

LM-FP2F-18M-1WW0



< Secondary side >

LM-FS20-□-1WW0

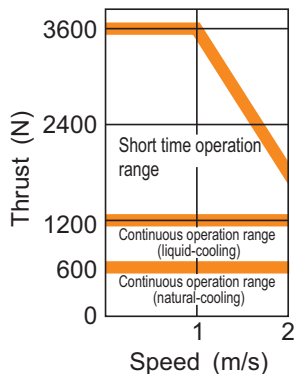


(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS20-384-1WW0	384	3X 96 (=288)	336	8
LM-FS20-480-1WW0	480	4X 96 (=384)	432	10
LM-FS20-576-1WW0	576	5X 96 (=480)	528	12

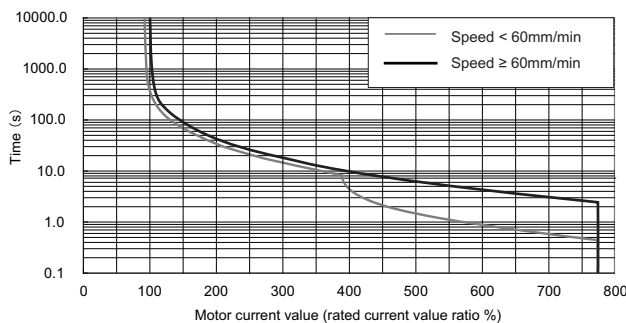
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	600N	Primary side (coil)	LM-FP4B-12M -1WW0	(1) Length [mm]	480
Rated (liquid-cooling)	1200N	Secondary side (magnet)			
Maximum	3600N				

Thrust Characteristics

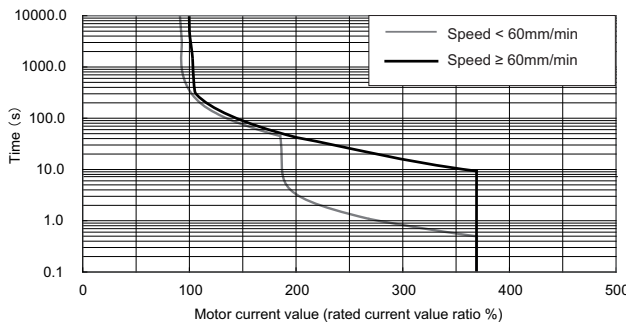


Servo overload protection characteristics

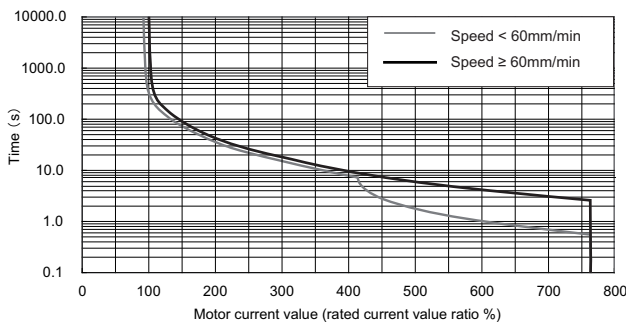
E Series (For natural-cooling)



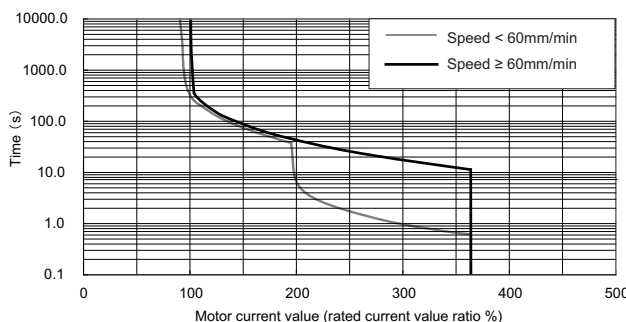
E Series (For liquid-cooling)



EJ Series (For natural-cooling)



EJ Series (For liquid-cooling)



Specifications

Item	Specifications		
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-80	MDS-E-V1-160, 160W
	2-axis type	MDS-E-V2-80	MDS-E-V1-160, 160W
	3-axis type	MDS-E-V3-80	-
	Regenerative resistor type	MDS-EJ-V1-80	-
Power facility capacity [kVA]	7.5	15.0	
Current	Rated (natural-cooling) [Arms]	7.5	15.1
	Rated (liquid-cooling) [Arms]	15.7	31.4
	Maximum [Arms]	55.7	111.4
Cooling method	Natural-cooling, liquid-cooling		
Thrust	Rated (natural-cooling) [N]	600	1200
	Rated (liquid-cooling) [N]	1200	2400
	Maximum [N]	3600	7200
Maximum speed [m/s] (*2)	2.0		
Magnetic attraction force [N]	9000		
Mass	Primary side [kg]	14	14×2
	Secondary side [kg]	13.5 (480mm) 16.0 (576mm)	
Recommended load mass ratio	15 times linear servo motor primary side mass maximum		
Structure	Open (Degree of protection IP00)		

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

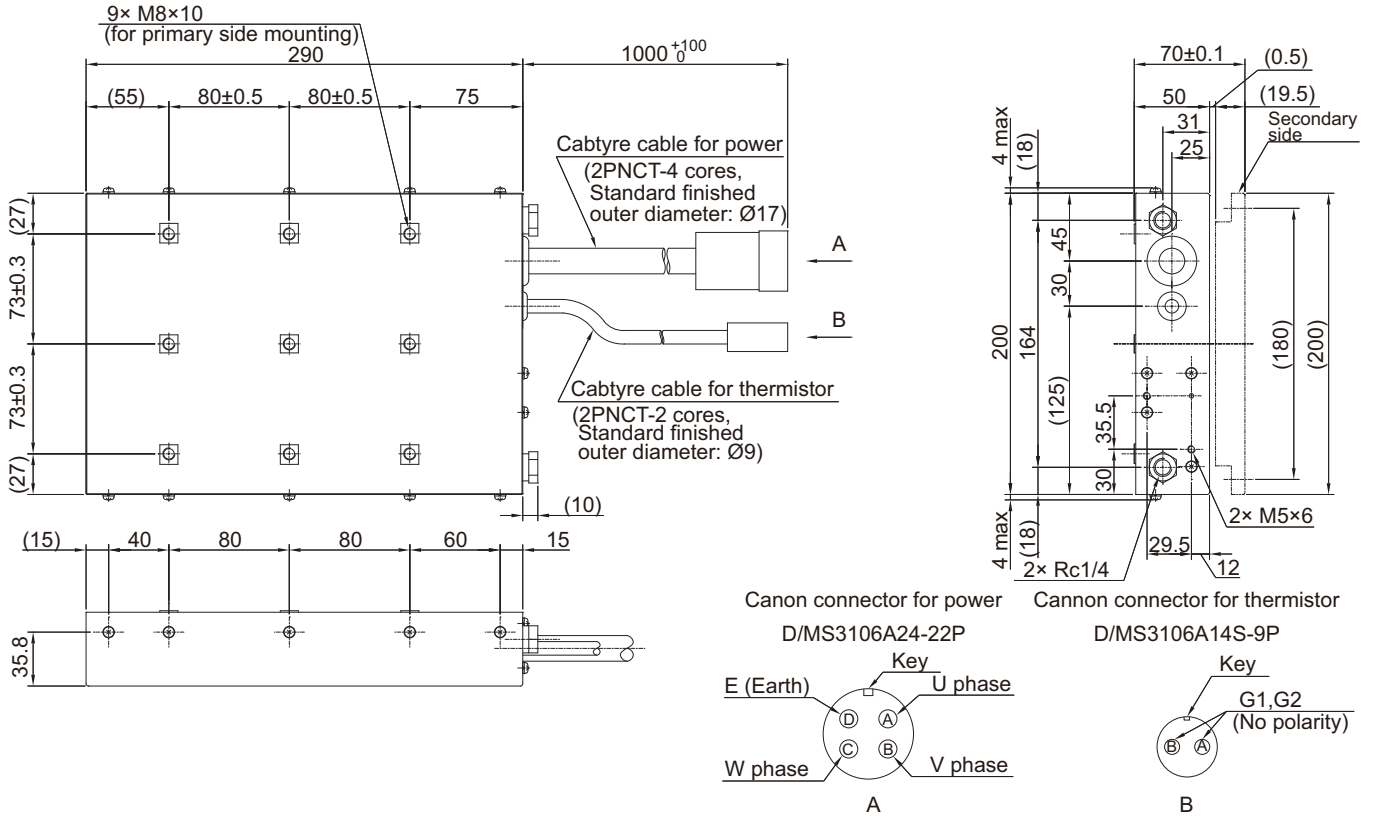
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

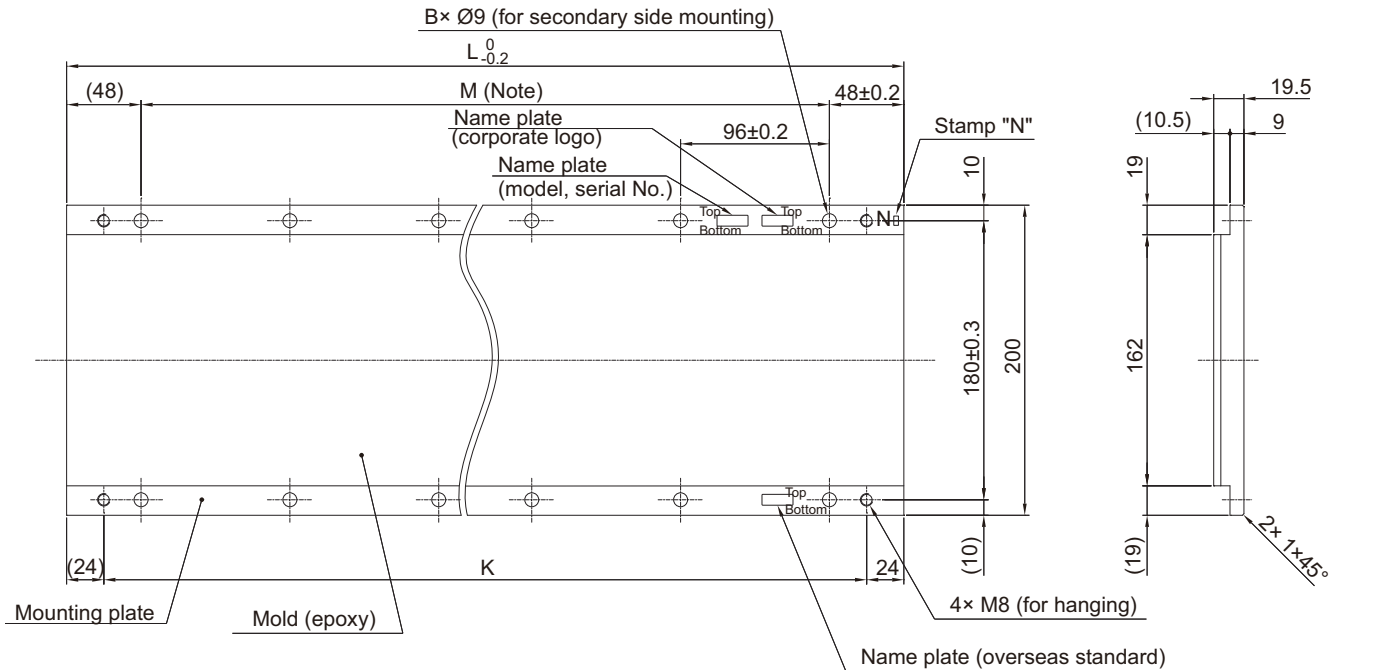
< Primary side >

LM-FP4B-12M-1WW0



< Secondary side >

LM-FS40-□-1WW0

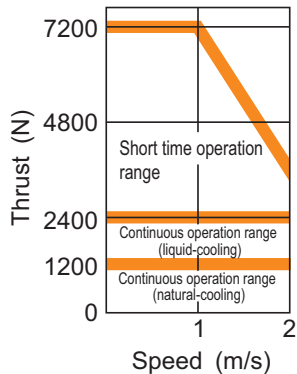


(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS40-384-1WW0	384	3X 96 (=288)	336	8
LM-FS40-480-1WW0	480	4X 96 (=384)	432	10
LM-FS40-576-1WW0	576	5X 96 (=480)	528	12

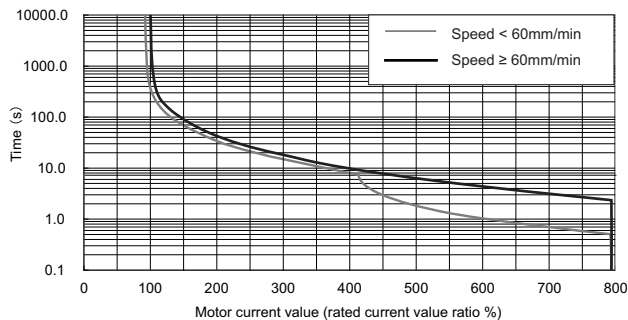
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	1200N	Primary side (coil)	LM-FP4D-24M -1WW0	(1) Length [mm]	480
Rated (liquid-cooling)	2400N	Secondary side (magnet)			
Maximum	7200N		(1)		
		LM-FS40 -□-1WW0			

Thrust Characteristics

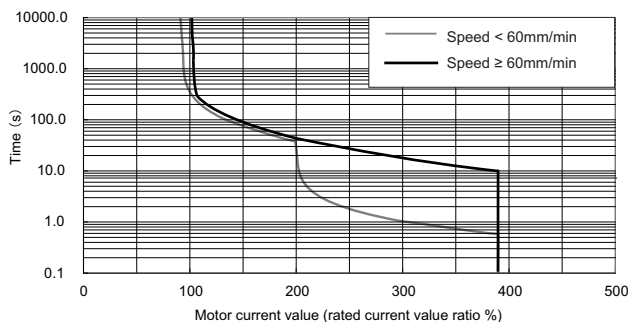


Servo overload protection characteristics

E Series (For natural-cooling)



E Series (For liquid-cooling)



Specifications

Item	Specifications		
		Standard	Drive with one unit and two motors
Compatible drive unit (*1)	1-axis type	MDS-E-V1-160, 160W	MDS-E-V1-320, 320W
	2-axis type	MDS-E-V2-160, 160W	-
	3-axis type	-	-
	Regenerative resistor type	-	-
Power facility capacity [kVA]	18	36.0	
Current	Rated (natural-cooling) [Arms]	14.1	28.3
	Rated (liquid-cooling) [Arms]	28.6	57.3
	Maximum [Arms]	101.9	203.9
Cooling method	Natural-cooling, liquid-cooling		
Thrust	Rated (natural-cooling) [N]	1200	2400
	Rated (liquid-cooling) [N]	2400	4800
	Maximum [N]	7200	14400
Maximum speed [m/s] (*2)	2.0		
Magnetic attraction force [N]	18000		
Mass	Primary side [kg]	28	28×2
	Secondary side [kg]	13.5 (480mm) 16.0 (576mm)	
Recommended load mass ratio	15 times linear servo motor primary side mass maximum		
Structure	Open (Degree of protection IP00)		

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

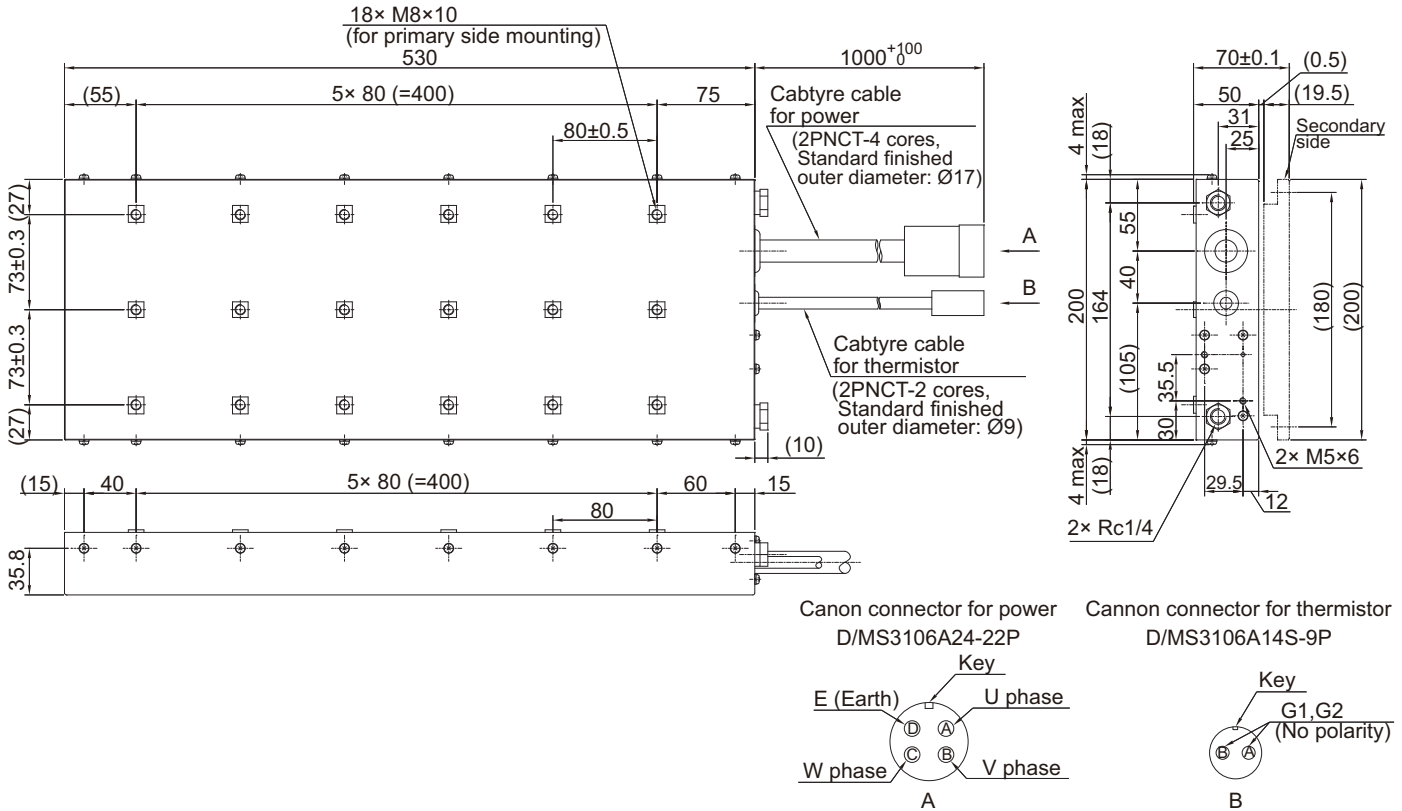
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

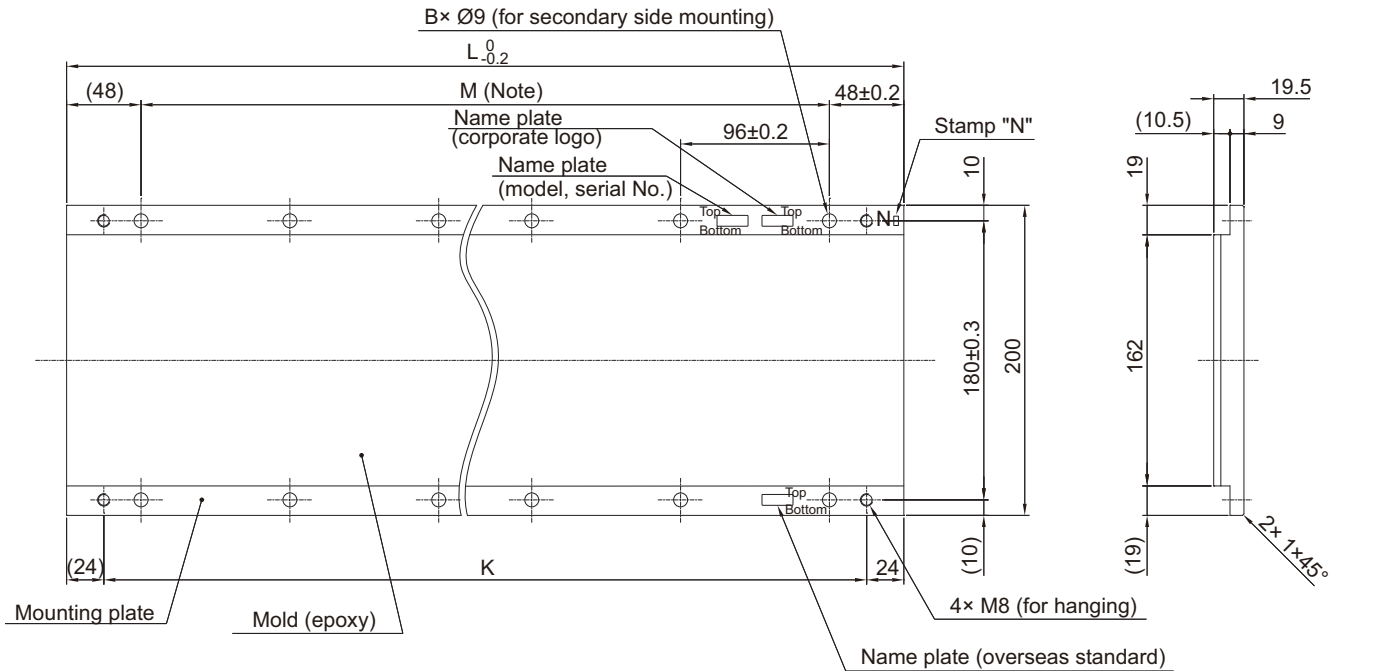
< Primary side >

LM-FP4D-24M-1WW0



< Secondary side >

LM-FS40-□-1WW0

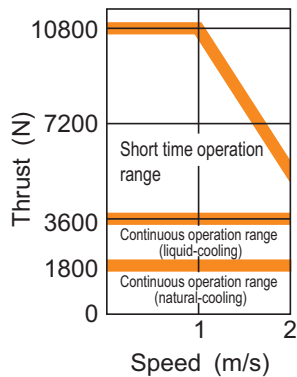


(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS40-384-1WW0	384	3X 96 (=288)	336	8
LM-FS40-480-1WW0	480	4X 96 (=384)	432	10
LM-FS40-576-1WW0	576	5X 96 (=480)	528	12

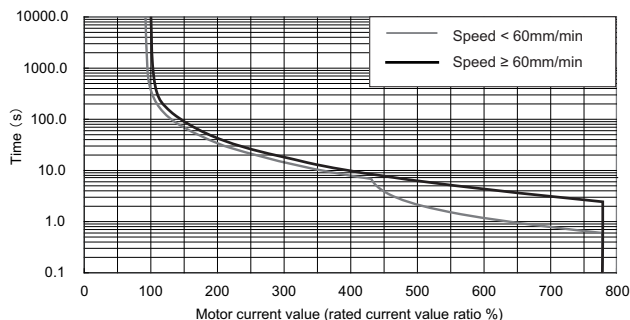
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	1800N	Primary side (coil)	LM-FP4F-36M -1WW0	(1) Length [mm]	480
Rated (liquid-cooling)	3600N	Secondary side (magnet)			
Maximum	10800N				
		LM-FS40 -□-1WW0			

Thrust Characteristics



Servo overload protection characteristics

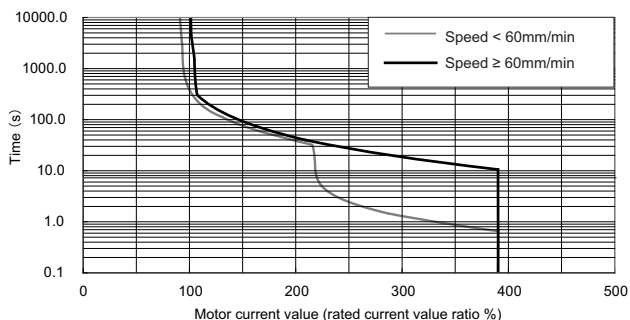
E Series (For natural-cooling)



Specifications

Item		Specifications
		Standard
Compatible drive unit (*1)	1-axis type	MDS-E-V1-320, 320W
	2-axis type	-
	3-axis type	-
	Regenerative resistor type	-
Power facility capacity [kVA]		18
Current	Rated (natural-cooling) [Arms]	24.7
	Rated (liquid-cooling) [Arms]	49.2
	Maximum [Arms]	174.9
Cooling method		Natural-cooling, liquid-cooling
Thrust	Rated (natural-cooling) [N]	1800
	Rated (liquid-cooling) [N]	3600
	Maximum [N]	10800
Maximum speed [m/s] (*2)		2.0
Magnetic attraction force [N]		27000
Mass	Primary side [kg]	42
	Secondary side [kg]	13.5 (480mm) 16.0 (576mm)
Recommended load mass ratio		15 times linear servo motor primary side mass maximum
Structure		Open (Degree of protection IP00)

E Series (For liquid-cooling)



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

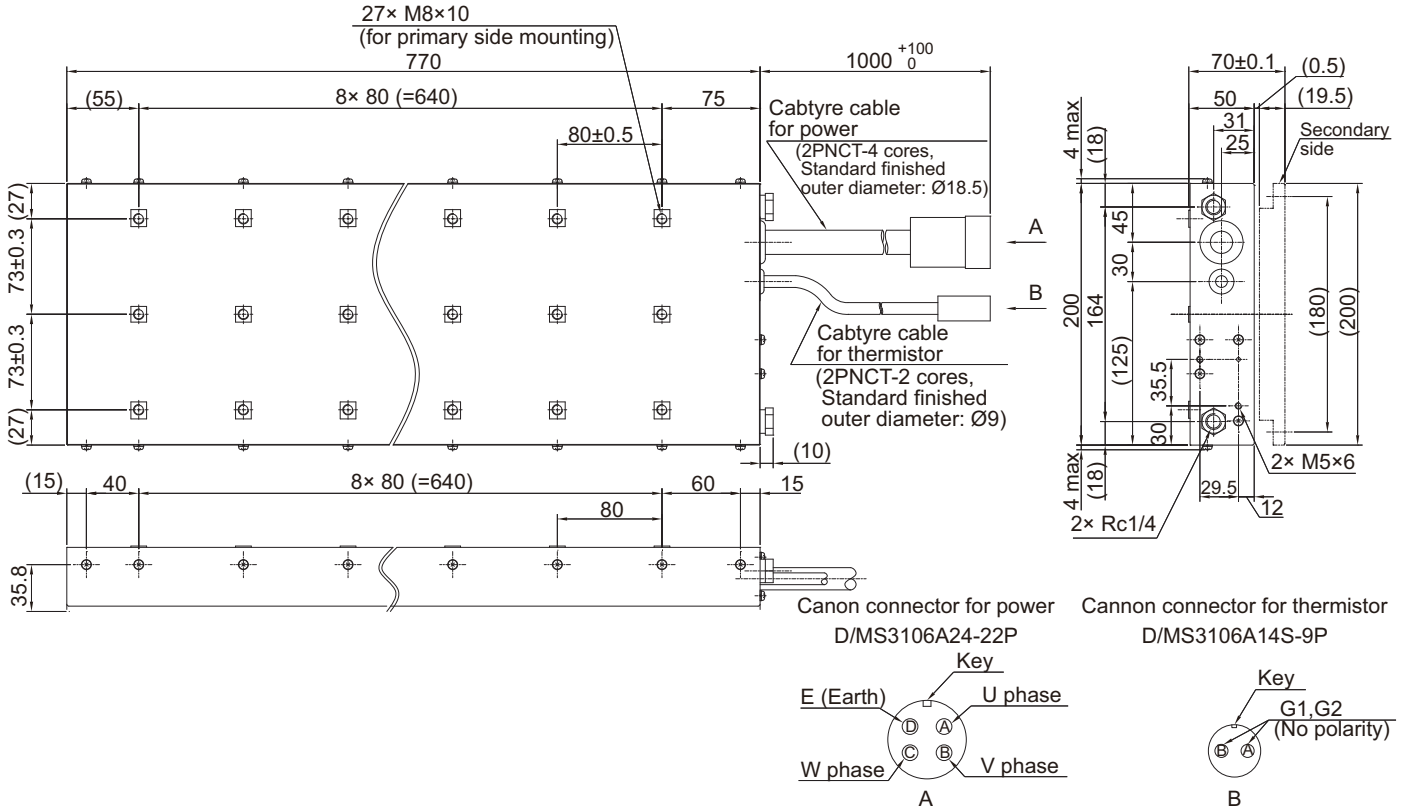
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

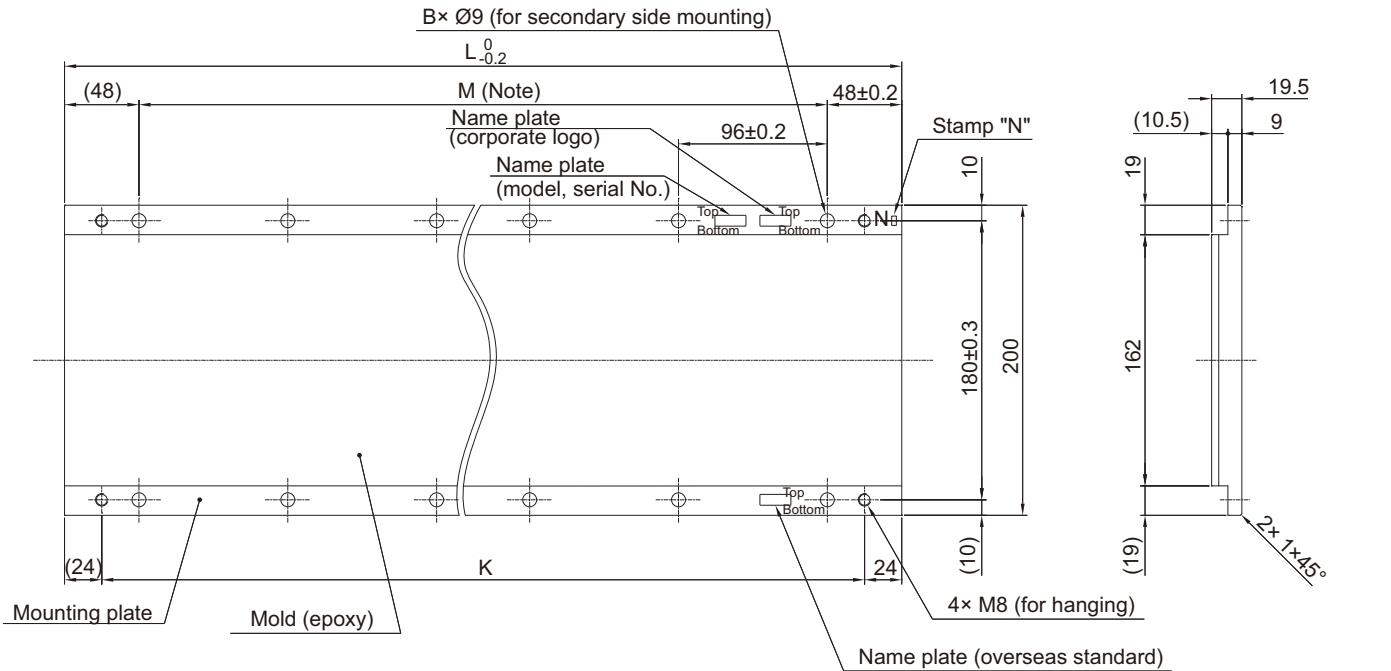
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LM-FP4F-36M-1WW0



< Secondary side >

LM-FS40-□-1WW0



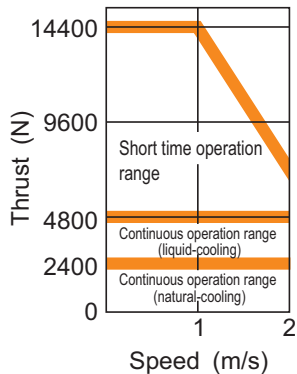
(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS40-384-1WW0	384	3X 96 (=288)	336	8
LM-FS40-480-1WW0	480	4X 96 (=384)	432	10
LM-FS40-576-1WW0	576	5X 96 (=480)	528	12



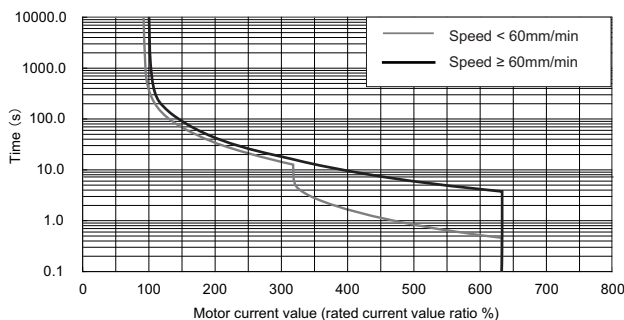
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	2400N	Primary side (coil)	LM-FP4H-48M -1WW0		
Rated (liquid-cooling)	4800N	Secondary side (magnet)			
Maximum	14400N				
			LM-FS40 -□-1WW0		576

Thrust Characteristics



Servo overload protection characteristics

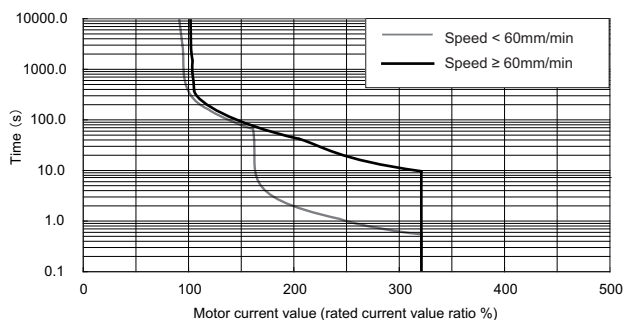
E Series (For natural-cooling)



Specifications

Item		Specifications
		Standard
Compatible drive unit (*1)	1-axis type	MDS-E-V1-320, 320W
	2-axis type	-
	3-axis type	-
	Regenerative resistor type	-
Power facility capacity [kVA]		18
Current	Rated (natural-cooling) [Arms]	33.6
	Rated (liquid-cooling) [Arms]	65.8
	Maximum [Arms]	237.4
Cooling method		Natural-cooling, liquid-cooling
Thrust	Rated (natural-cooling) [N]	2400
	Rated (liquid-cooling) [N]	4800
	Maximum [N]	14400
Maximum speed [m/s] (*2)		2.0
Magnetic attraction force [N]		36000
Mass	Primary side [kg]	56
	Secondary side [kg]	13.5 (480mm) 16.0 (576mm)
Recommended load mass ratio		15 times linear servo motor primary side mass maximum
Structure		Open (Degree of protection IP00)

E Series (For liquid-cooling)



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

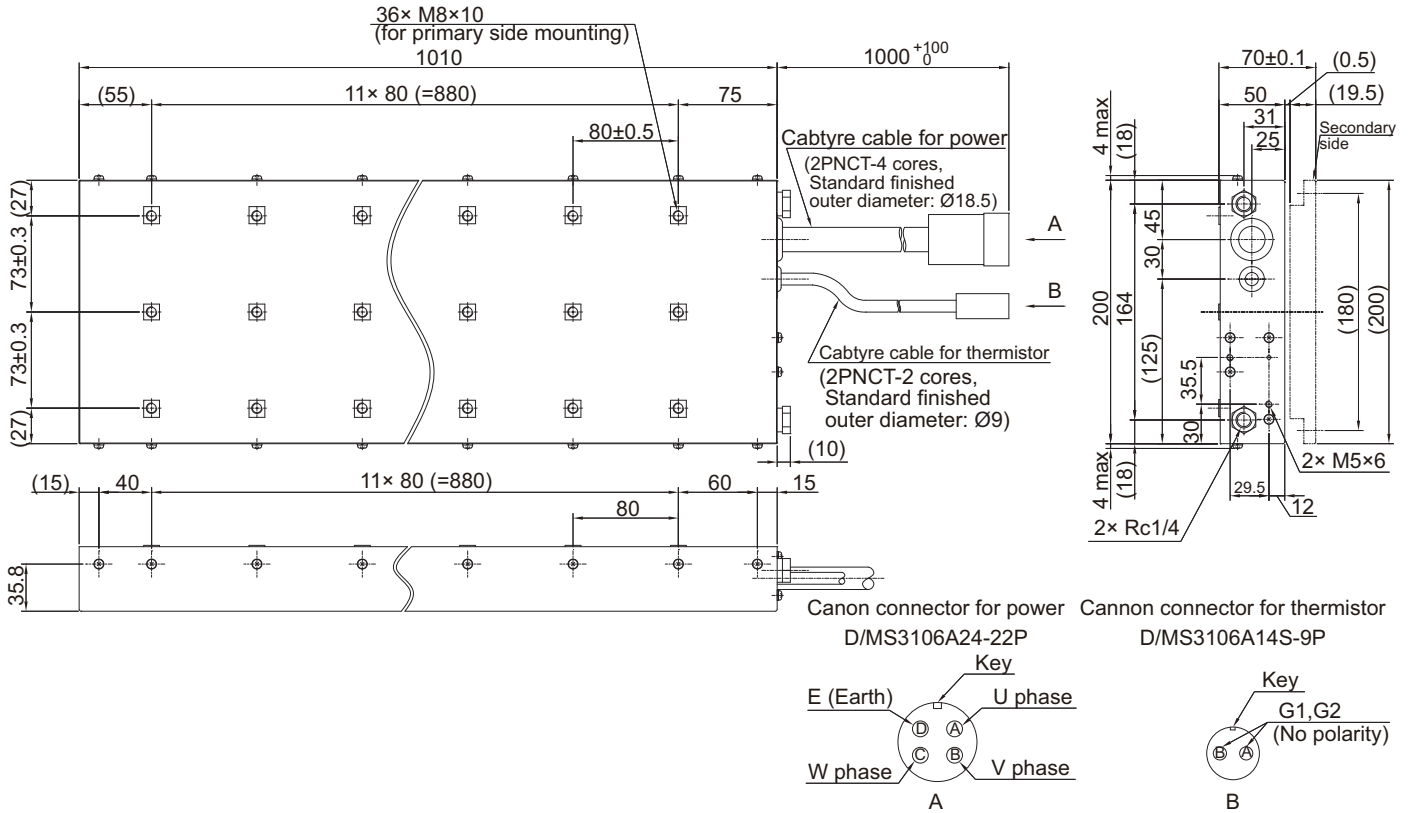
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

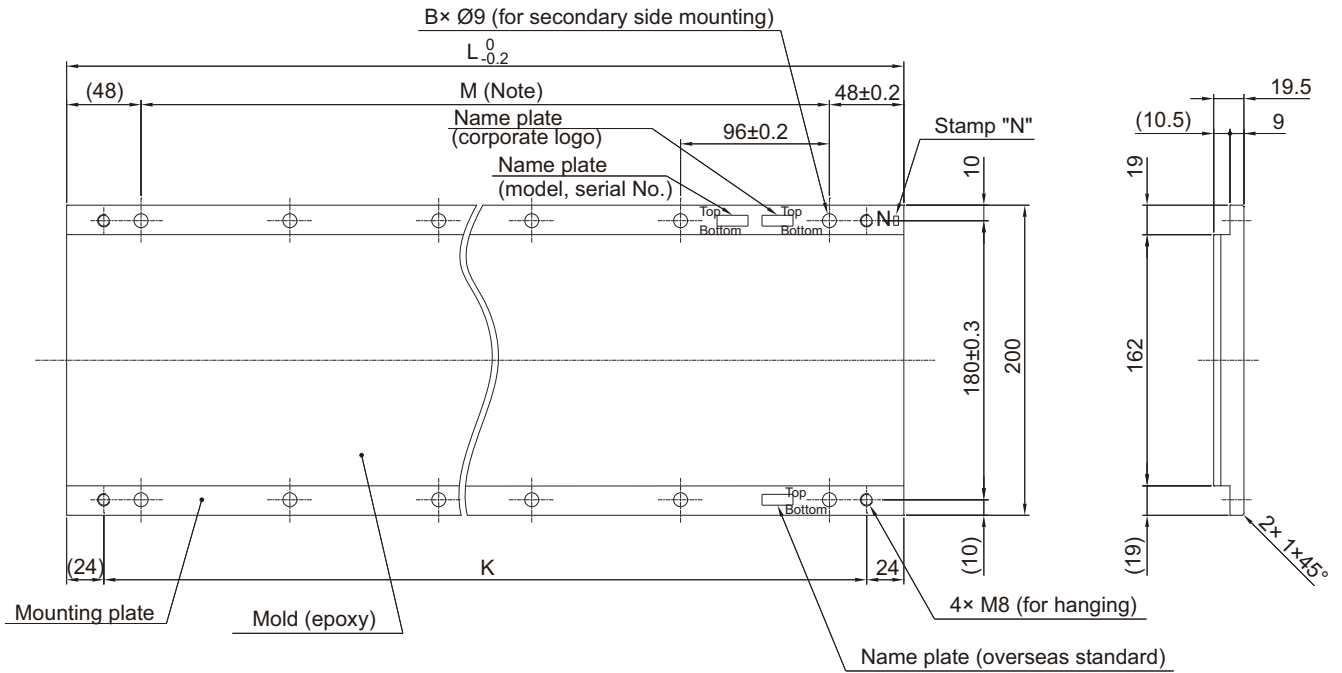
< Primary side >

LM-FP4H-48M-1WW0



< Secondary side >

LM-FS40-□-1WW0



(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS40-384-1WW0	384	3X 96 (=288)	336	8
LM-FS40-480-1WW0	480	4X 96 (=384)	432	10
LM-FS40-576-1WW0	576	5X 96 (=480)	528	12



# Spindle Motor

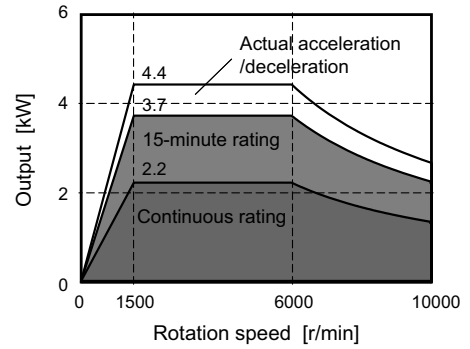
Normal specifications

# SJ-D3.7/100-01

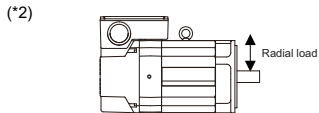
## Specifications

Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	80
	2-axis type	MDS-E-SP2-	80, 16080(M)
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	80
Output capacity[kW]	Continuous rated output		2.2
	Short time rated output		3.7 (15-minute rating)
	Standard output during acceleration/deceleration		3.7
	Actual acceleration/deceleration output(*3)		4.4
Base rotation speed[r/min]		1500	
Maximum rotation speed[r/min]		10000	
Frame No.		B90	
Continuous rated current[A]		15	
Continuous rated torque[N·m]		14.0	
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.030	
Inertia[kg·m <sup>2</sup> ]		0.0074	
Tolerable radial load(*2) [N]		980	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion is excluded.)	
Mass[kg]		26	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

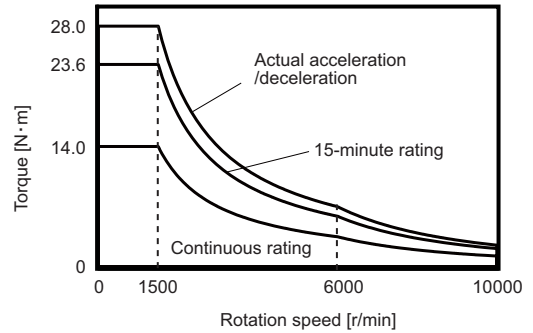


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

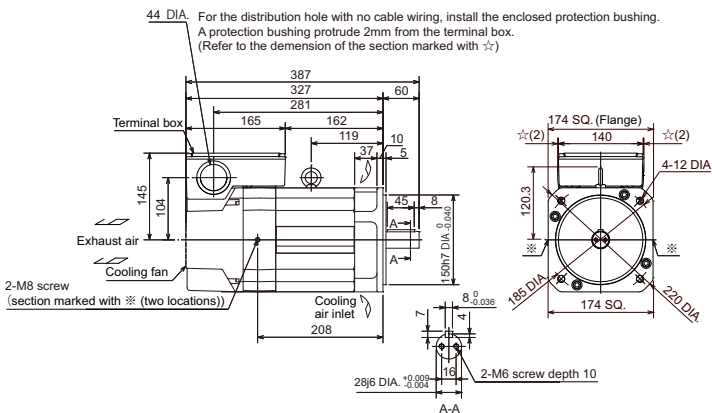


## Environmental conditions

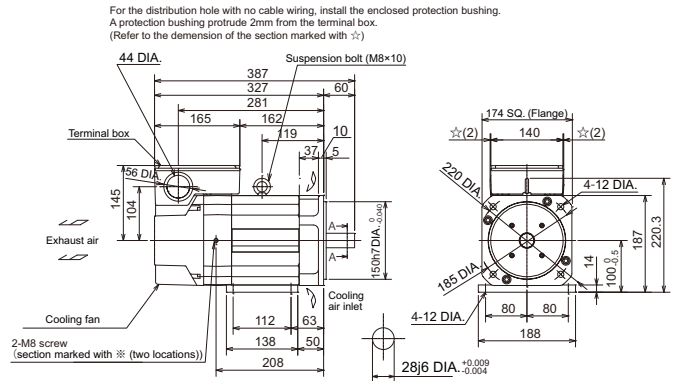
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D3.7/100-01-C with standard flange (with key)



### SJ-D3.7/100-01-A with standard legs



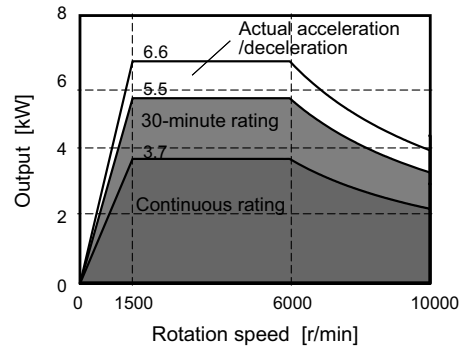
Normal specifications

# SJ-D5.5/100-01

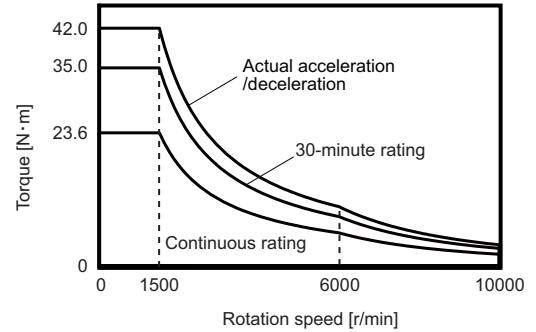
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 80
	2-axis type	MDS-E-SP2- 80, 16080(M)
	Multi axis type	MDS-EM-SPV3- 10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP- 100
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (30-minute rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		D90
Continuous rated current[A]		24
Continuous rated torque[N·m]		23.6
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.053
Inertia[kg·m <sup>2</sup> ]		0.013
Tolerable radial load(*2) [N]		1470
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		39
Heat-resistant class		155(F)

## Output characteristics

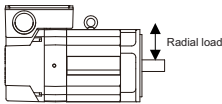


## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

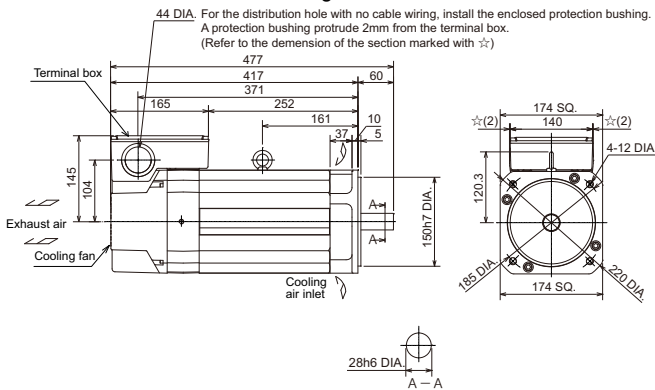
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

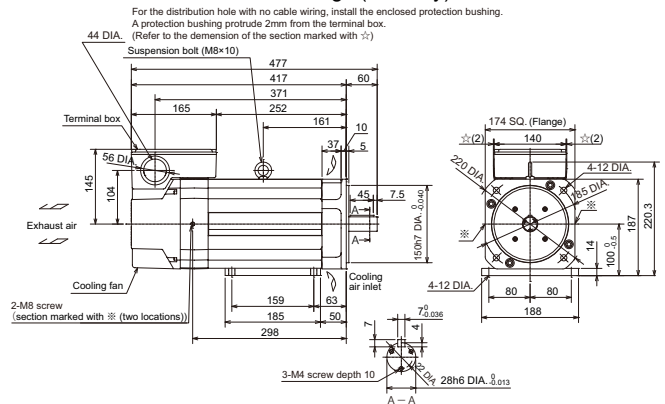
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D5.5/100-01 with standard flange



### SJ-D5.5/100-01-AC with standard legs (with key)



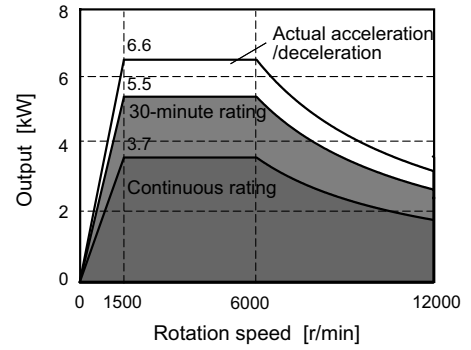
Normal specifications

# SJ-D5.5/120-01

## Specifications

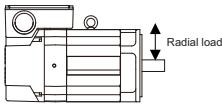
Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	80
	2-axis type	MDS-E-SP2-	80, 16080(M)
	Multi axis type	MDS-EM-SPV3-	10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	100
Output capacity[kW]	Continuous rated output		3.7
	Short time rated output		5.5 (30-minute rating)
	Standard output during acceleration/deceleration		5.5
	Actual acceleration/deceleration output(*3)		6.6
Base rotation speed[r/min]			1500
Maximum rotation speed[r/min]			12000
Frame No.			D90
Continuous rated current[A]			24
Continuous rated torque[N·m]			23.6
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.053
Inertia[kg·m <sup>2</sup> ]			0.013
Tolerable radial load(*2) [N]			1470
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			39
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

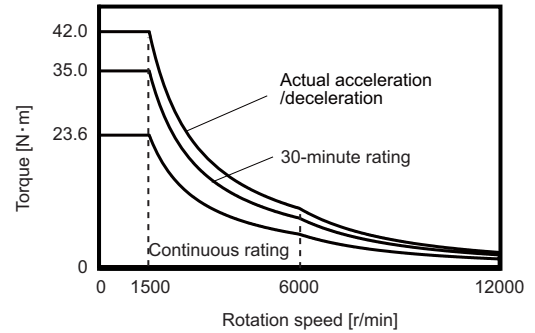


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

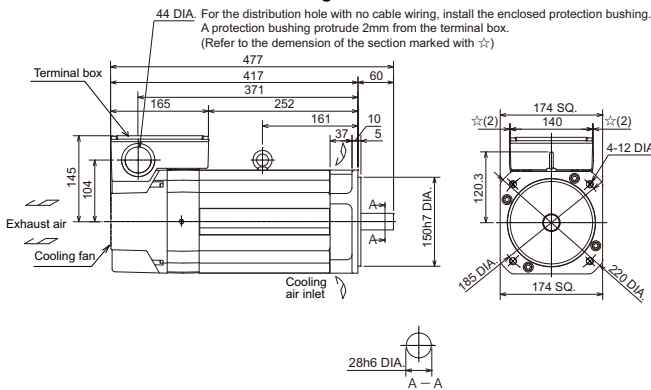


## Environmental conditions

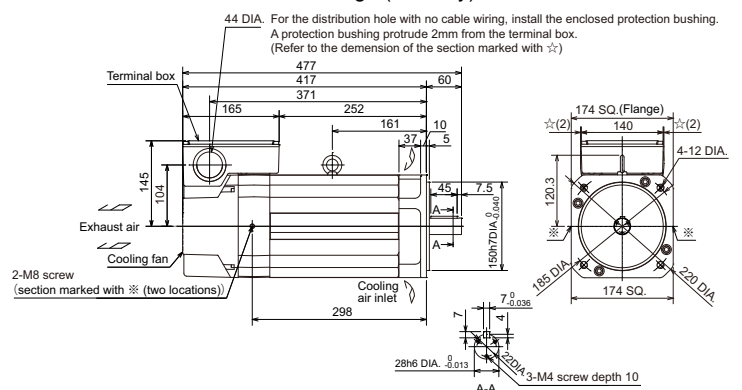
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D5.5/120-01 with standard flange



### SJ-D5.5/120-01-C with standard flange (with key)



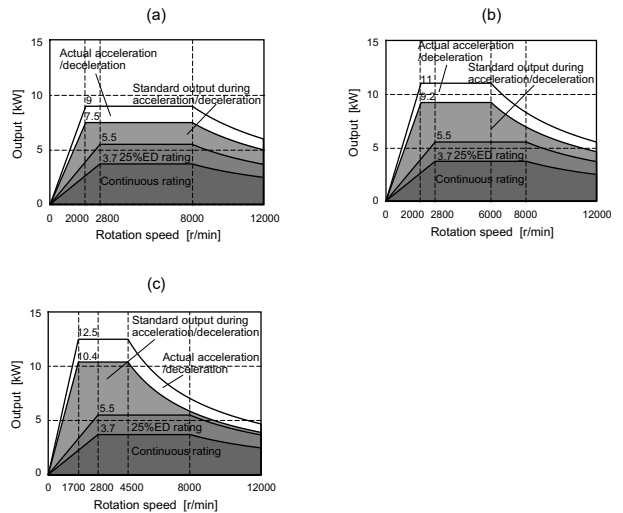
Normal specifications

# SJ-D5.5/120-02

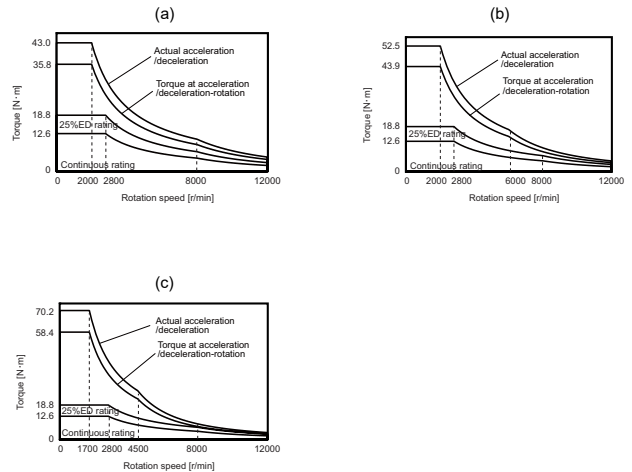
## Specifications

Item	Specifications(a)	Specifications(b)	Specifications(c)	
Compatible drive unit (*1)	1-axis type MDS-E-SP-	-	160	
	2-axis type MDS-E-SP2-	-	16080(L)	
	Multi axis type MDS-EM-SPV3-	10040	16040	20080
		10080	16080	200120
Regenerative resistor type MDS-EJ-SP-	-	-	-	
Output capacity[kW]	Continuous rated output	3.7		
	Short time rated output	5.5 (25%ED rating)		
	Standard output during acceleration/deceleration	7.5	9.2	10.4
	Actual acceleration/deceleration output(*3)	9	11.0	12.5
Base rotation speed[r/min]	2800			
Maximum rotation speed[r/min]	12000			
Frame No.	B90			
Continuous rated current[A]	24			
Continuous rated torque[N·m]	12.6			
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.030			
Inertia[kg·m <sup>2</sup> ]	0.0074			
Tolerable radial load(*2) [N]	980			
Cooling fan	Input voltage 3-phase 200V			
Degree of protection	IP54 (The shaft-through portion is excluded.)			
Mass[kg]	26			
Heat-resistant class	155(F)			

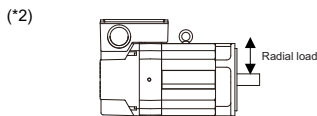
## Output characteristics



## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

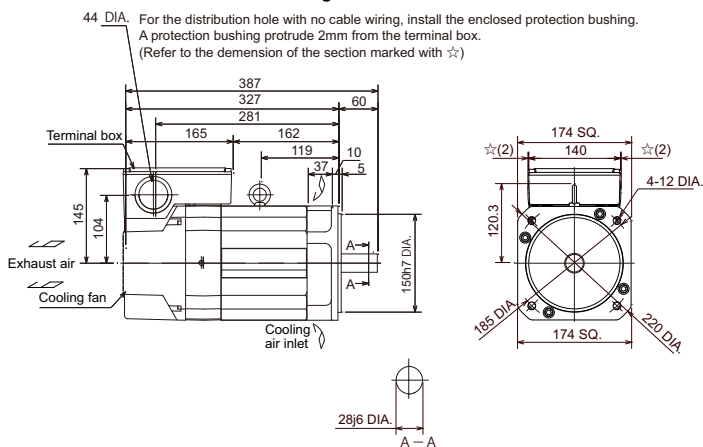
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

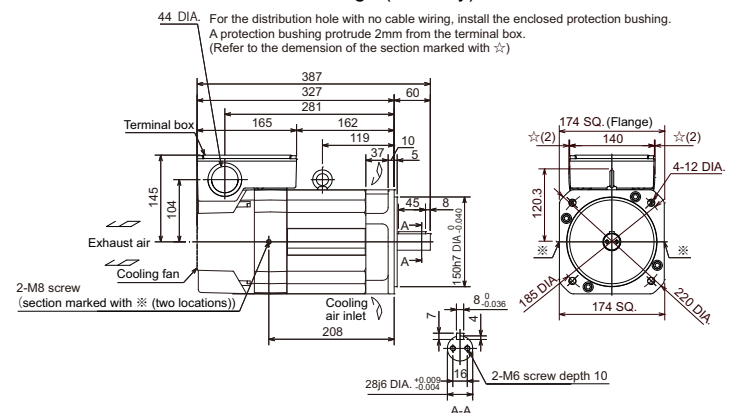
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D5.5/120-02 with standard flange



### SJ-D5.5/120-02-C with standard flange (with key)





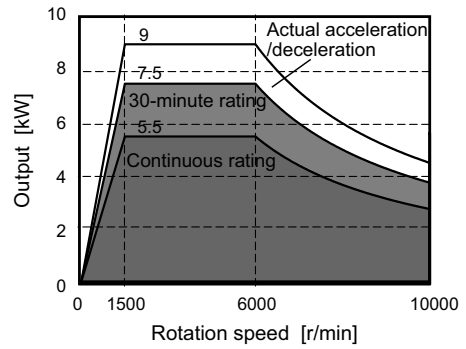
Normal specifications

# SJ-D7.5/100-01

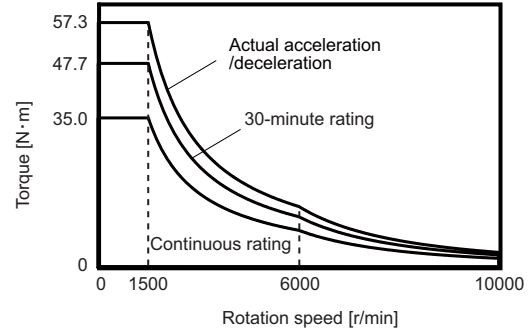
## Specifications

Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	120
Output capacity[kW]	Continuous rated output		5.5
	Short time rated output		7.5 (30-minute rating)
	Standard output during acceleration/deceleration		7.5
	Actual acceleration/deceleration output(*3)		9
Base rotation speed[r/min]			1500
Maximum rotation speed[r/min]			10000
Frame No.			A112
Continuous rated current[A]			35
Continuous rated torque[N·m]			35.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.094
Inertia[kg·m <sup>2</sup> ]			0.023
Tolerable radial load(*2) [N]			1960
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			53
Heat-resistant class			155(F)

## Output characteristics

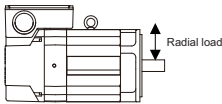


## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

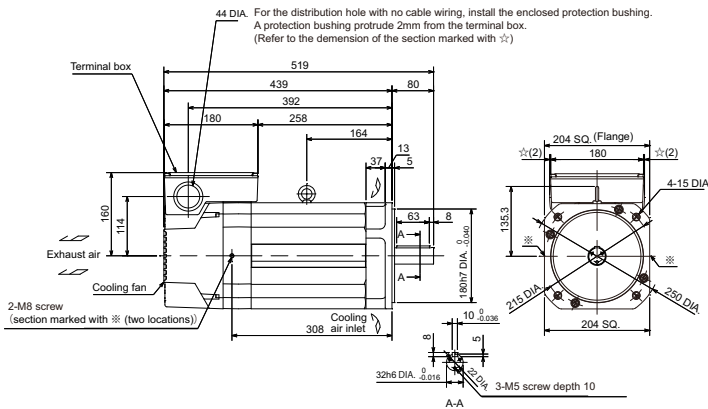
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

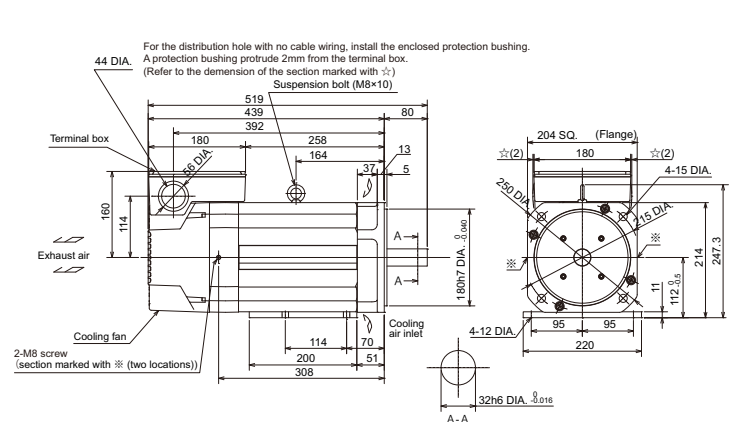
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D7.5/100-01-C with standard flange (with key)



### SJ-D7.5/100-01-A with standard legs





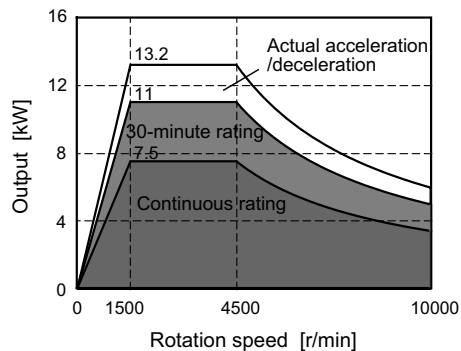
Normal specifications

# SJ-D11/100-01

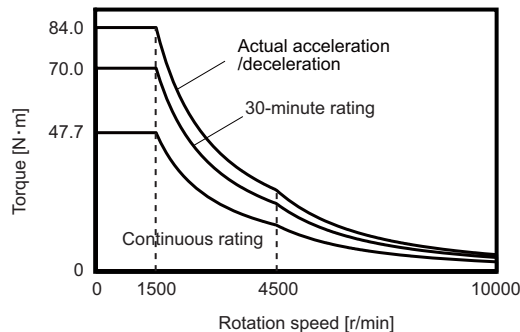
## Specifications

Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	160
Output capacity[kW]	Continuous rated output		7.5
	Short time rated output		11 (30-minute rating)
	Standard output during acceleration/deceleration		11
	Actual acceleration/deceleration output(*3)		13.2
Base rotation speed[r/min]			1500
Maximum rotation speed[r/min]			10000
Frame No.			B112
Continuous rated current[A]			44
Continuous rated torque[N·m]			47.7
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.122
Inertia[kg·m <sup>2</sup> ]			0.031
Tolerable radial load(*2) [N]			1960
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			64
Heat-resistant class			155(F)

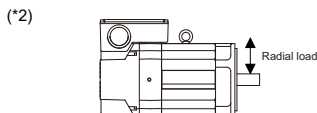
## Output characteristics



## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

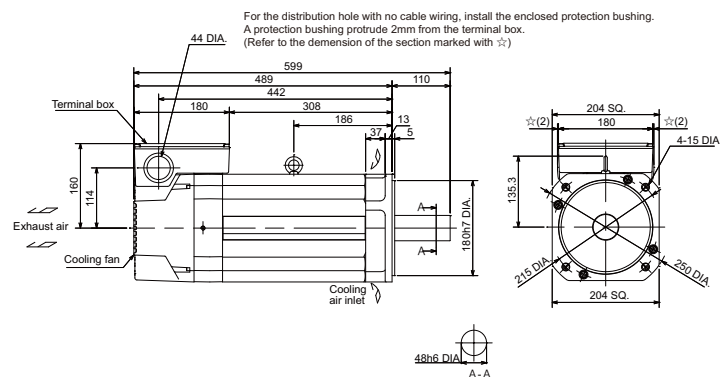
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

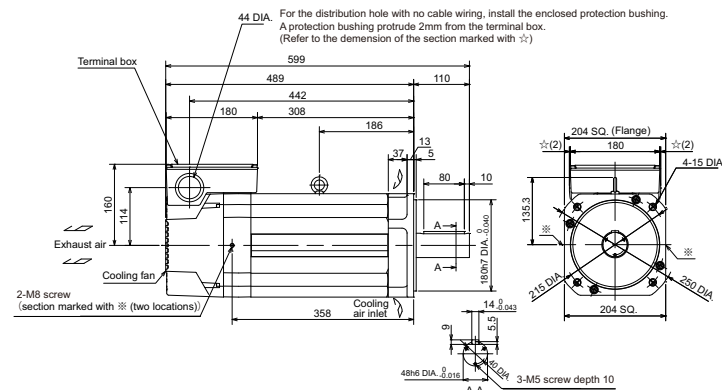
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D11/100-01 with standard flange



### SJ-D11/100-01-C with standard flange (with key)



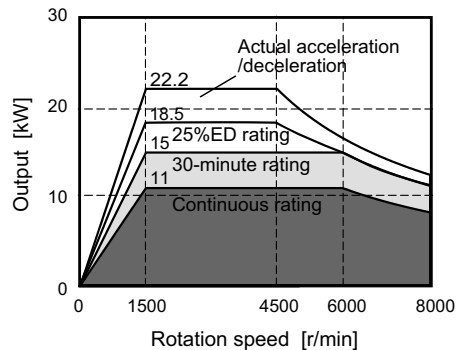
Normal specifications

# SJ-D15/80-01

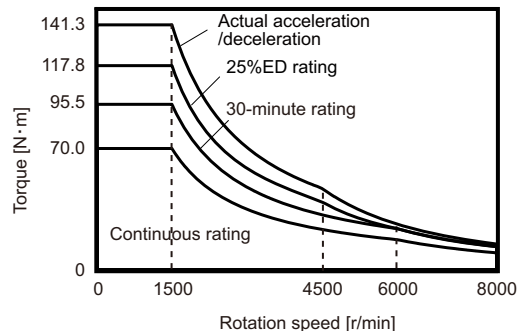
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-200
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-20080, 200120
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	18.5 (25%ED rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		A160
Continuous rated current[A]		58
Continuous rated torque[N·m]		70.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.35
Inertia[kg·m <sup>2</sup> ]		0.086
Tolerable radial load(*2) [N]		3430
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		93
Heat-resistant class		155(F)

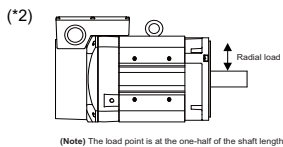
## Output characteristics



## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*2) The load point is at the one-half of the shaft length.

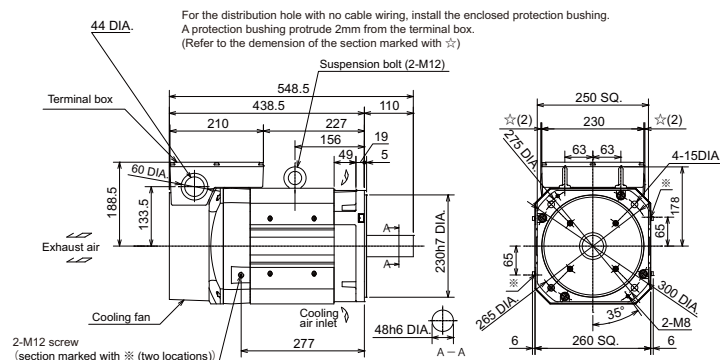
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

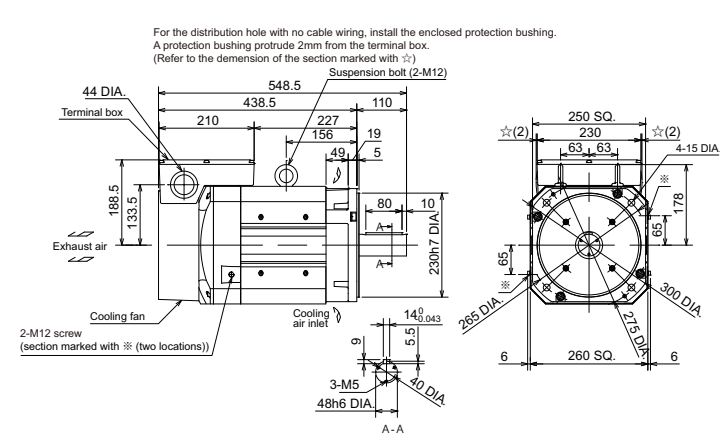
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D15/80-01 with standard flange



### SJ-D15/80-01-C with standard flange (with key)



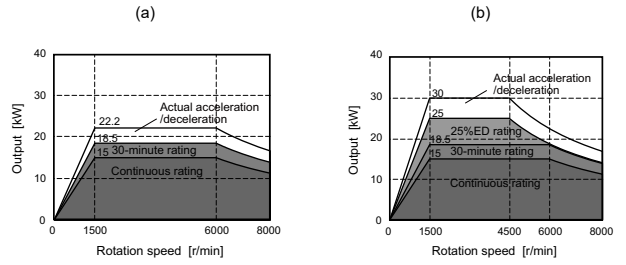
Normal specifications

# SJ-D18.5/80-01

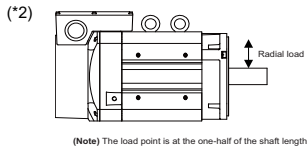
## Specifications

Item		Specifications(a)	Specifications(b)
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	240
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	320120
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output	15	15
	Short time rated output	18.5 (30-minute rating)	25 (25%ED rating)
	Standard output during acceleration/deceleration	18.5	25.0
	Actual acceleration/deceleration output(*3)	22.2	30.0
Base rotation speed[r/min]		1500	
Maximum rotation speed[r/min]		8000	
Frame No.		B160	
Continuous rated current[A]		79	
Continuous rated torque[N·m]		95.5	
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.41	
Inertia[kg·m <sup>2</sup> ]		0.10	
Tolerable radial load(*2) [N]		3430	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion is excluded.)	
Mass[kg]		103	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

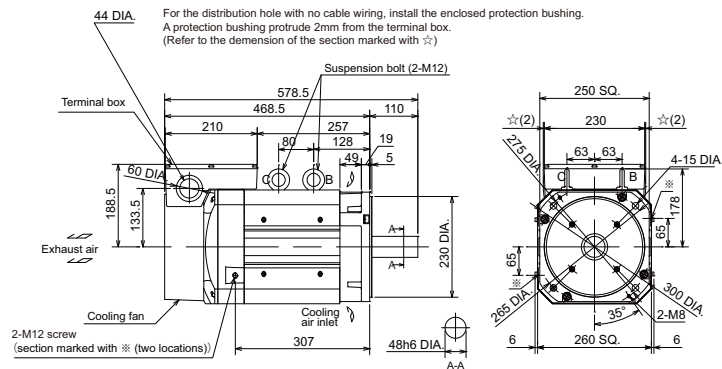
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

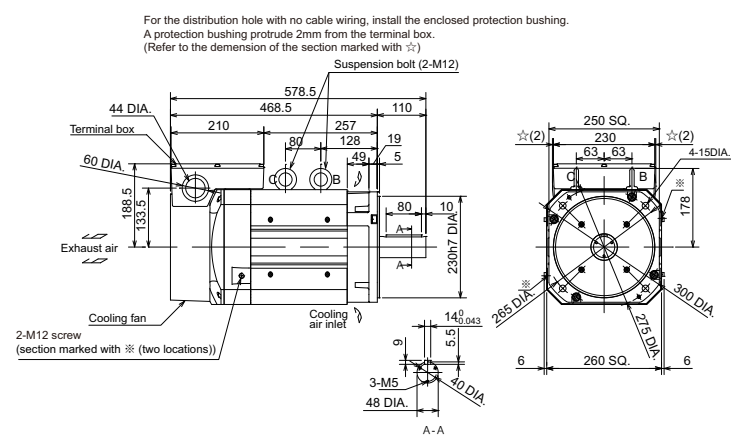
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D18.5/80-01 with standard flange



### SJ-D18.5/80-01-C with standard flange (with key)



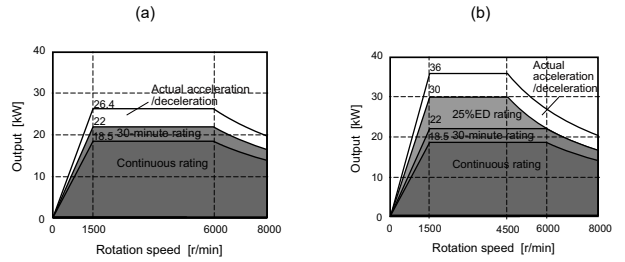
Normal specifications

# SJ-D22/80-01

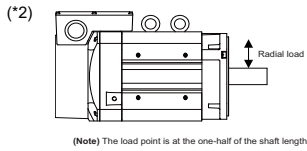
## Specifications

Item		Specifications(a)	Specifications(b)
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	240
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	320120
Output capacity[kW]	Continuous rated output	18.5	18.5
	Short time rated output	22 (30-minute rating)	30 (25%ED rating)
	Standard output during acceleration/deceleration	22.0	30.0
	Actual acceleration/deceleration output(*3)	26.4	36.0
Base rotation speed[r/min]		1500	
Maximum rotation speed[r/min]		8000	
Frame No.		C160	
Continuous rated current[A]		87	
Continuous rated torque[N·m]		118	
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.55	
Inertia[kg·m <sup>2</sup> ]		0.14	
Tolerable radial load(*2) [N]		3920	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion is excluded.)	
Mass[kg]		131	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

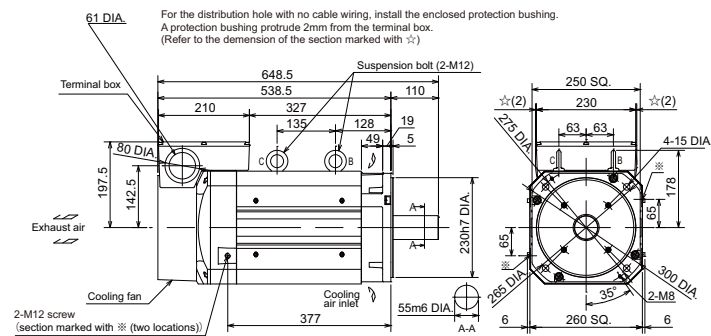
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

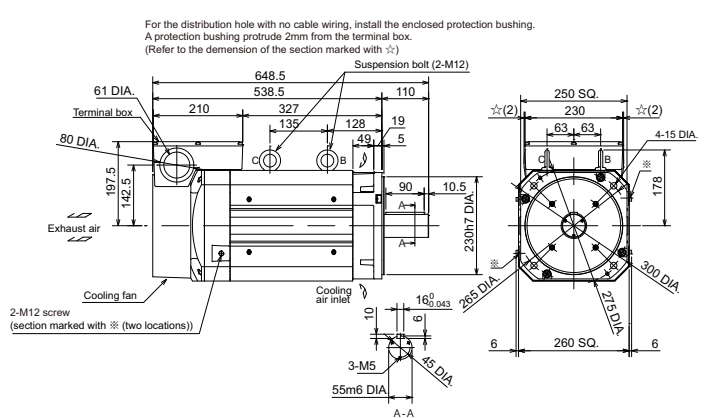
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-D22/80-01 with standard flange



### SJ-D22/80-01-C with standard flange (with key)











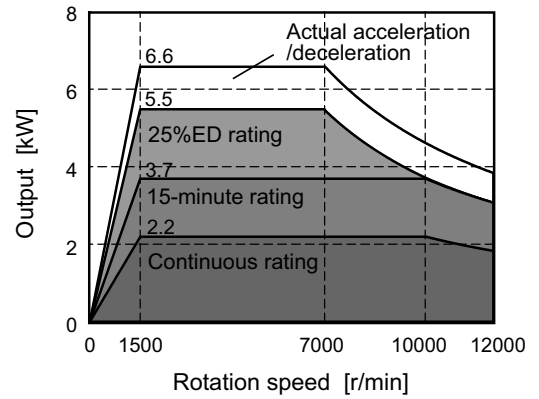
High-output specifications

# SJ-DG3.7/120-03T

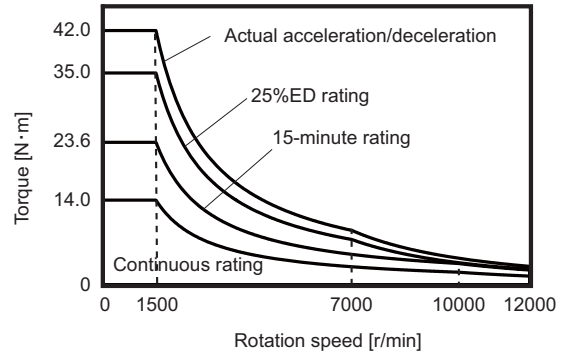
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	5.5 (25%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		12000
Frame No.		B90
Continuous rated current[A]		22
Continuous rated torque[N·m]		14.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.026
Inertia[kg·m <sup>2</sup> ]		0.0066
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)
Mass[kg]		24
Heat-resistant class		155(F)

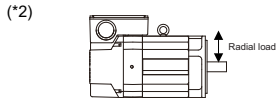
## Output characteristics



## Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

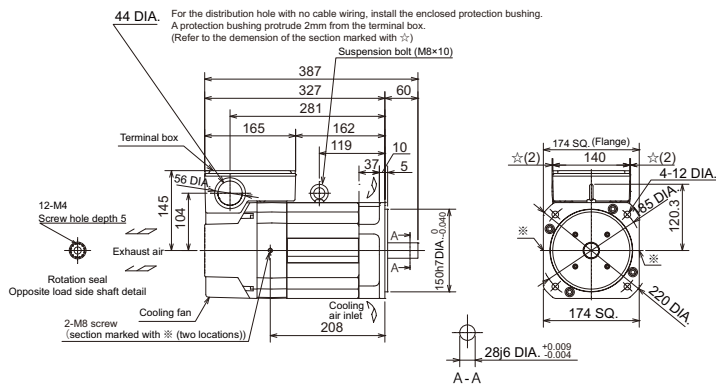
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

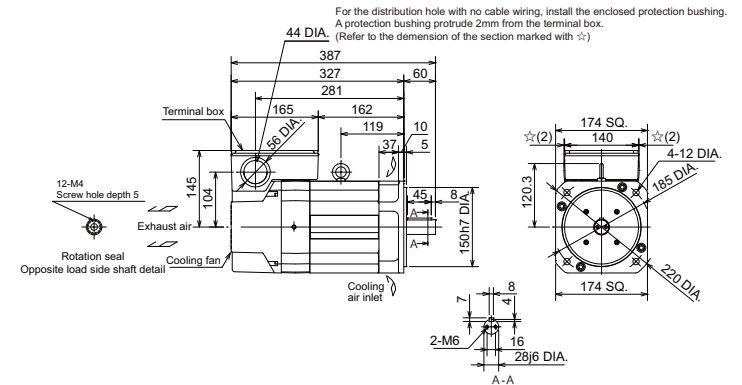
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG3.7/120-03T with standard flange



### SJ-DG3.7/120-03T-C with standard flange (with key)



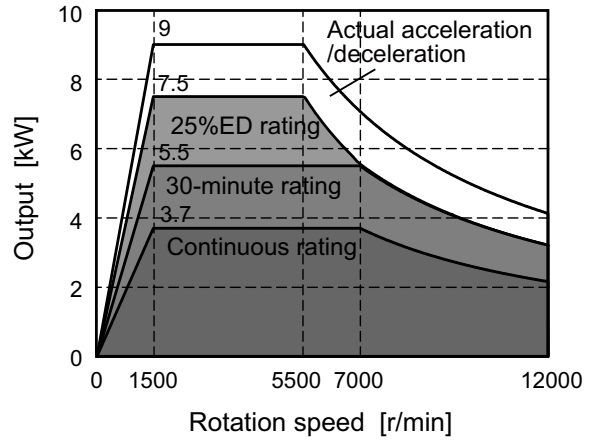
High-output specifications

# SJ-DG5.5/120-04T

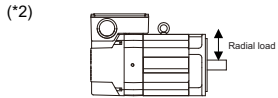
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	7.5 (25%ED rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9.0
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		12000
Frame No.		D90
Continuous rated current[A]		27
Continuous rated torque[N·m]		23.6
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.049
Inertia[kg·m <sup>2</sup> ]		0.012
Tolerable radial load(*2) [N]		1470
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)
Mass[kg]		37
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

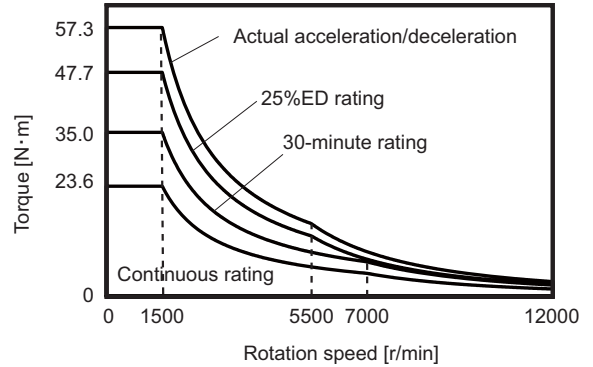
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

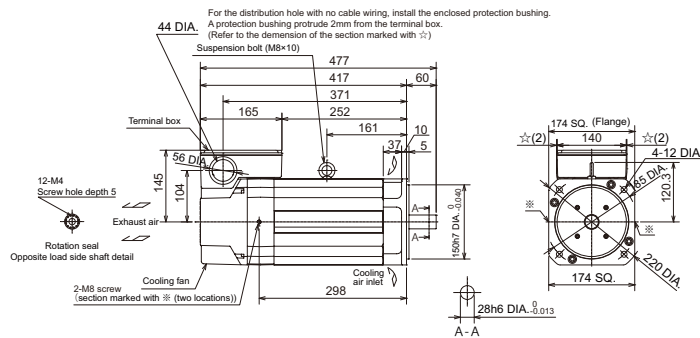
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

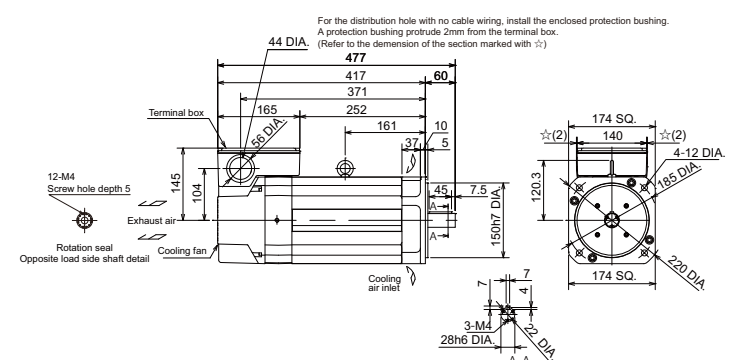


## Outline dimension drawings [Unit : mm]

### SJ-DG5.5/120-04T with standard flange



### SJ-DG5.5/120-04T-C with standard flange (with key)



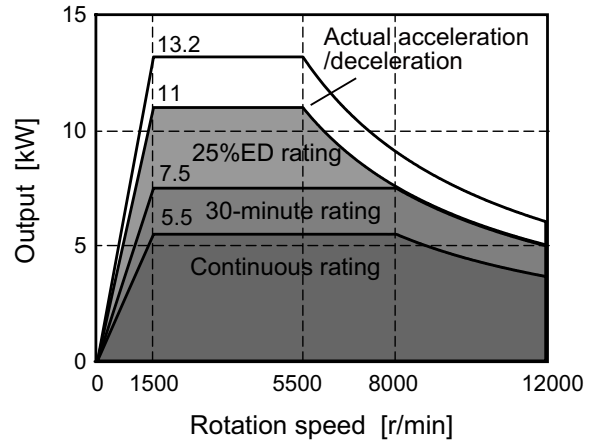
High-output specifications

# SJ-DG7.5/120-05T

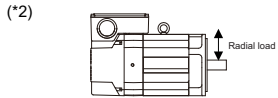
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	11 (25%ED rating)
	Standard output during acceleration/deceleration	11.0
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		12000
Frame No.		A112
Continuous rated current[A]		38
Continuous rated torque[N·m]		35.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.088
Inertia[kg·m <sup>2</sup> ]		0.022
Tolerable radial load(*2) [N]		1960
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)
Mass[kg]		50
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

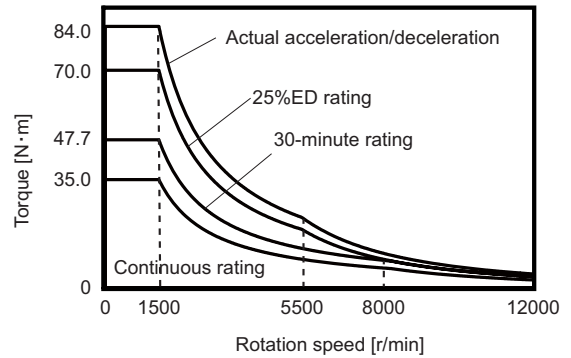
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

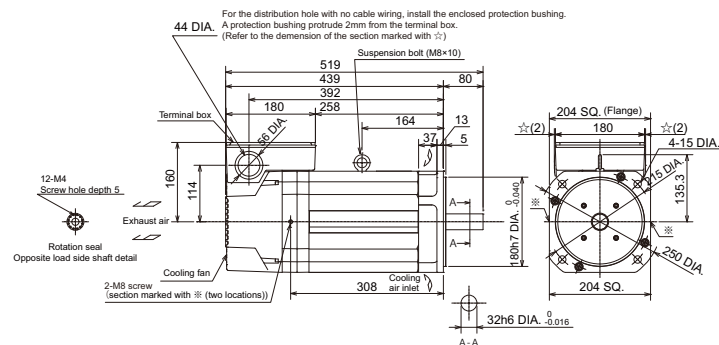
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

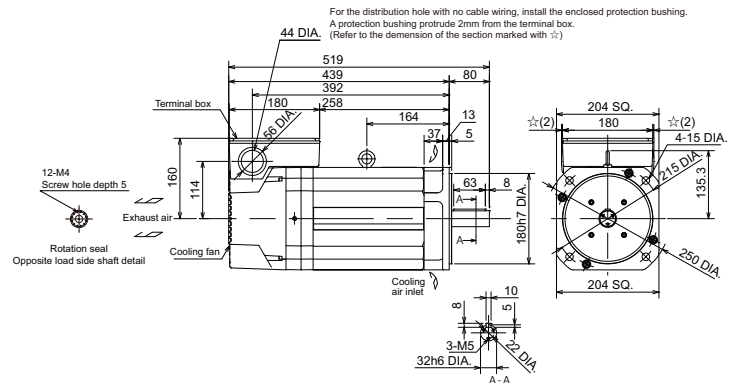


## Outline dimension drawings [Unit : mm]

### SJ-DG7.5/120-05T with standard flange



### SJ-DG7.5/120-05T-C with standard flange (with key)



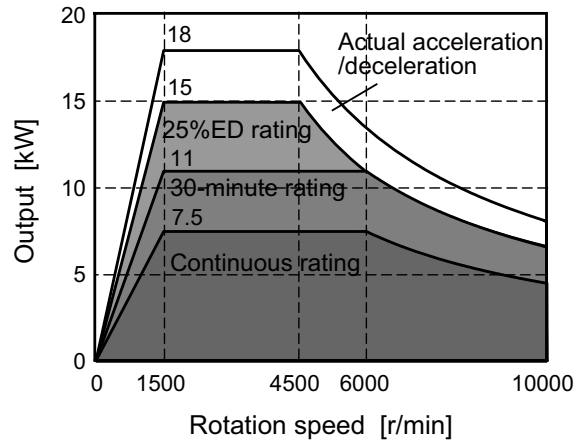
High-output specifications

# SJ-DG11/100-03T

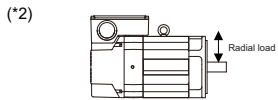
Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 200
	2-axis type	MDS-E-SP2- -
	Multi axis type	MDS-EM-SPV3- 20080, 200120
	Regenerative resistor type	MDS-EJ-SP- -
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	15 (25%ED rating)
	Standard output during acceleration/deceleration	15.0
	Actual acceleration/deceleration output(*3)	18.0
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		B112
Continuous rated current[A]		47
Continuous rated torque[N·m]		47.7
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12
Inertia[kg·m <sup>2</sup> ]		0.029
Tolerable radial load(*2) [N]		1960
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)
Mass[kg]		61
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

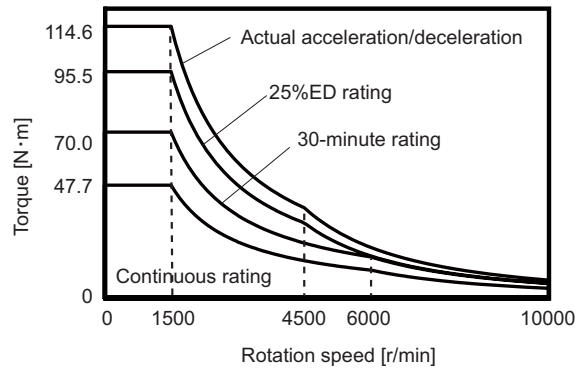
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

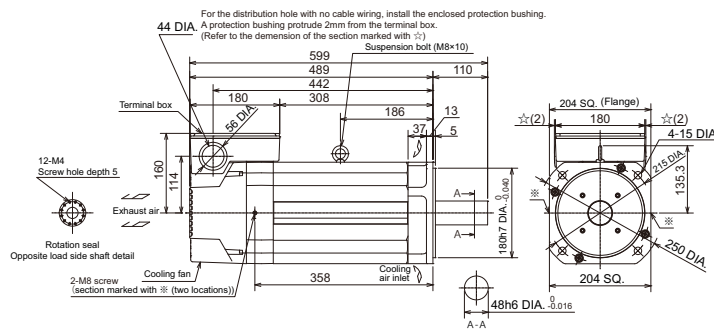
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

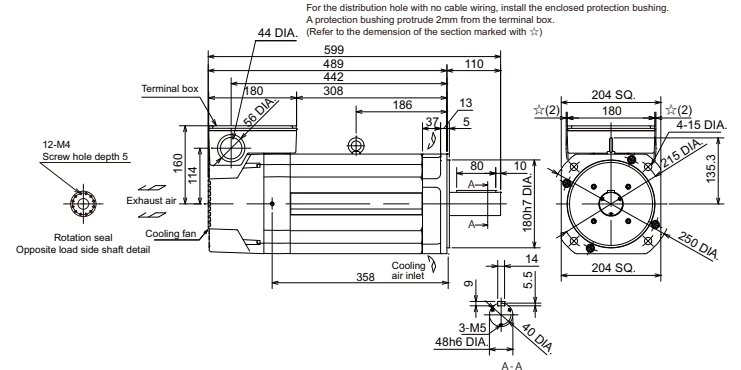


Outline dimension drawings [Unit : mm]

SJ-DG11/100-03T with standard flange



SJ-DG11/100-03T-C with standard flange (with key)



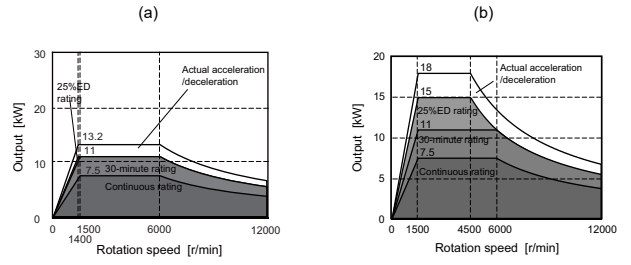
High-output specifications

# SJ-DG11/120-03T

## Specifications

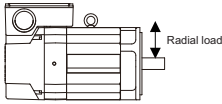
Item		Specifications(a)	Specifications(b)
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080 (L)
	Multi axis type	MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	20080, 200120
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11 (30-minute rating)	15 (25%ED rating)
	Standard output during acceleration/deceleration	11.0	15.0
	Actual acceleration/deceleration output(*3)	13.2	18.0
Base rotation speed[r/min]		1500	
Maximum rotation speed[r/min]		12000	
Frame No.		B112	
Continuous rated current[A]		47	
Continuous rated torque[N·m]		47.7	
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12	
Inertia[kg·m <sup>2</sup> ]		0.029	
Tolerable radial load(*2) [N]		1960	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]		61	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

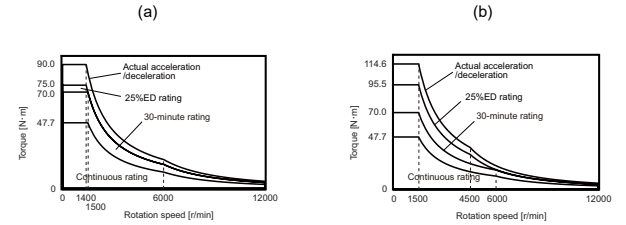
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

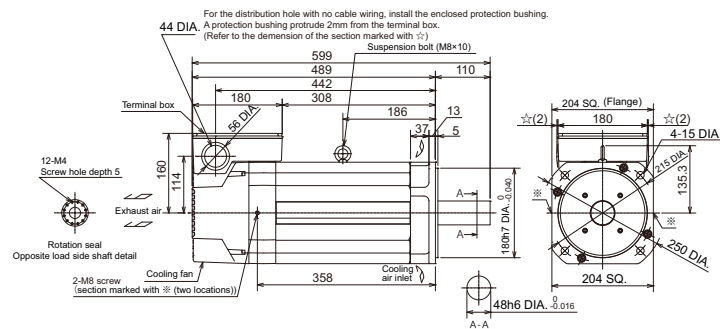
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DG11/120-03T with standard flange



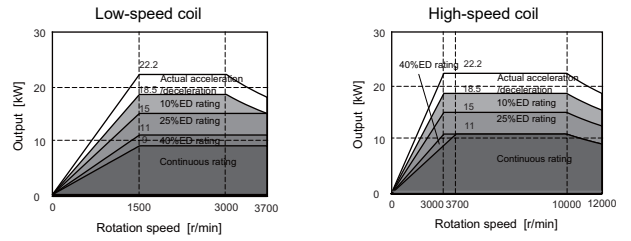
High-output specifications

# SJ-DG11/120-12T-K

## Specifications

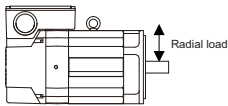
Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	9	11
	Short time rated output	18.5 (10%ED rating)	
	Standard output during acceleration/deceleration	18.5	
	Actual acceleration/deceleration output(*3)	22.2	
Base rotation speed	Continuous rating[r/min]	1500	3700
	Short time rating[r/min]	1500	3000
Maximum rotation speed[r/min]		3700	12000
Frame No.		B112	
Continuous rated current[A]		62	
Continuous rated torque[N·m]		57.3	28.4
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12	
Inertia[kg·m <sup>2</sup> ]		0.029	
Tolerable radial load(*2) [N]		1960	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]		61	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

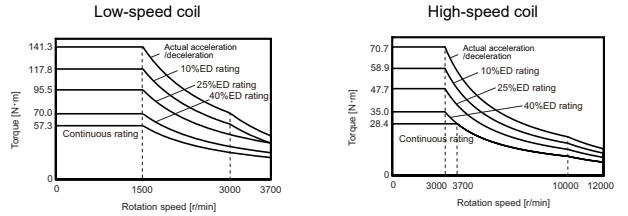
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

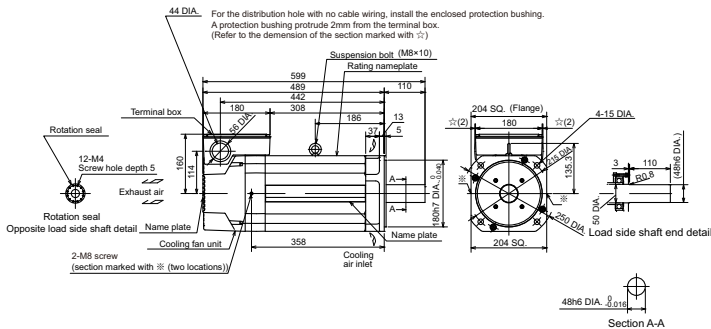
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DG11/120-12T-K with standard flange



High-output specifications

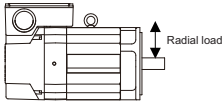
# SJ-DG11/150-06T

## Specifications

Item		Specifications(a)	Specifications(b)	Specifications(c)
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160	200
	2-axis type	MDS-E-SP2-	16080 (L)	-
	Multi axis type	MDS-EM-SPV3-	16040, 16080, 16040S	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-	-
Output capacity[kW]	Continuous rated output	7.5	7.5	7.5
	Short time rated output	11 (25%ED rating)	15 (25%ED rating)	15 (10%ED rating)
	Standard output during acceleration/deceleration	11.0	15.0	15.0
	Actual acceleration/deceleration output(*3)	13.2	18.0	18.0
Base rotation speed	Continuous rating[r/min]	1500	1500	1500
	Short time rating[r/min]	1400	-	-
Maximum rotation speed[r/min]		15000		
Frame No.		B112		
Continuous rated current[A]		47		
Continuous rated torque[N·m]		47.7		
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.11		
Inertia[kg·m <sup>2</sup> ]		0.028		
Tolerable radial load(*2) [N]		980		
Cooling fan	Input voltage	3-phase 200V		
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)		
Mass[kg]		60		
Heat-resistant class		155(F)		

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

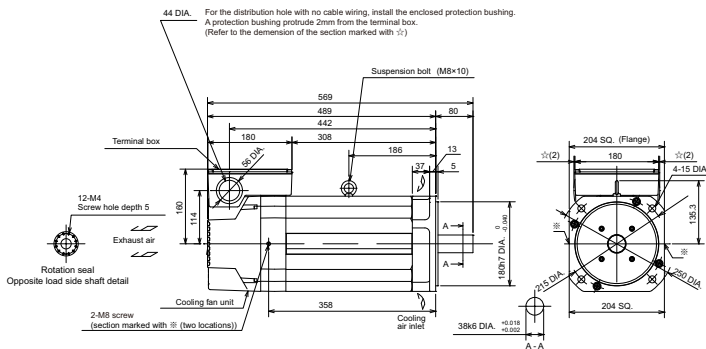
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

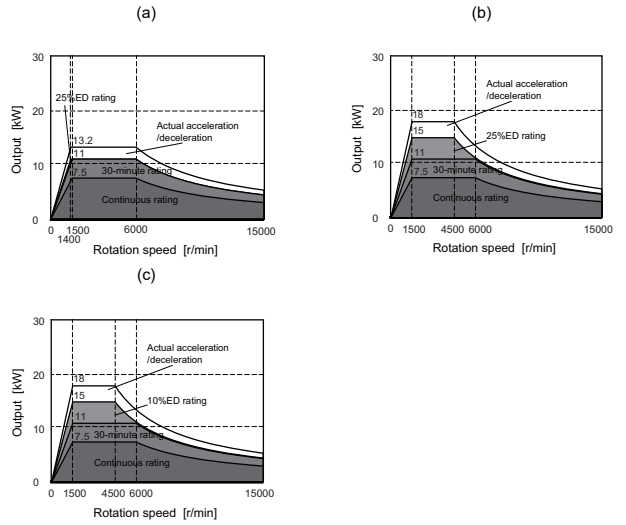
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

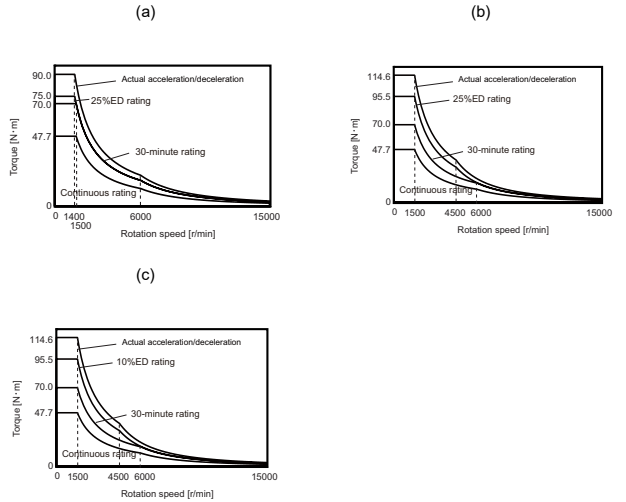
### SJ-DG11/150-06T with standard flange



## Output characteristics



## Torque - rotation speed characteristics





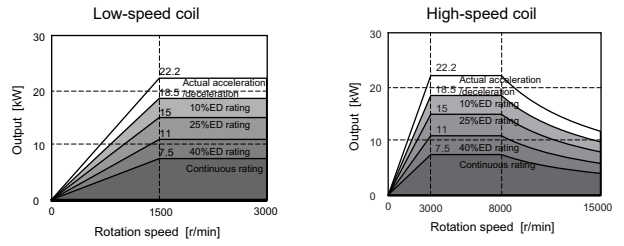
High-output specifications

# SJ-DG11/150-15T-K

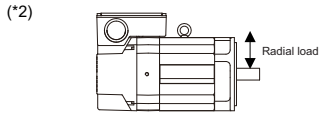
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-200
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-20080, 200120
	Regenerative resistor type	MDS-EJ-SP-
Coil changeover		Low-speed coil / High-speed coil
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	18.5 (10%ED rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed[r/min]	1500	3000
Maximum rotation speed[r/min]	3000	15000
Frame No.	B112	
Continuous rated current[A]	55	
Continuous rated torque[N·m]	47.7	23.9
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.11	
Inertia[kg·m <sup>2</sup> ]	0.028	
Tolerable radial load(*2) [N]	980	
Cooling fan	3-phase 200V	
Degree of protection	IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]	60	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

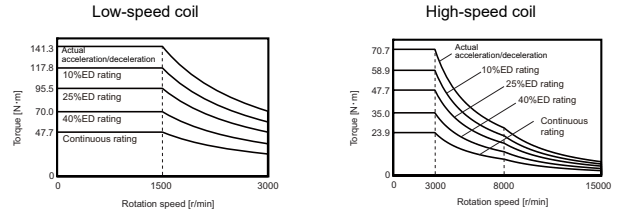


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

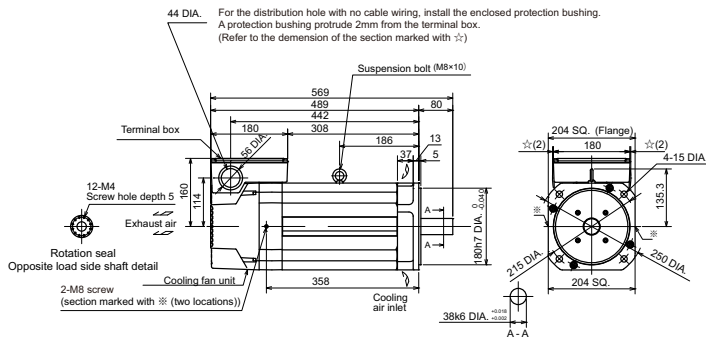


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG11/150-15T-K with standard flange





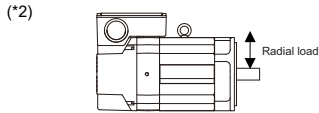
High-output specifications

# SJ-DG15/120-02T-K

Specifications

Item		Specifications(a)		Specifications(b)	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200	240	
	2-axis type	MDS-E-SP2-	-	-	
	Multi axis type	MDS-EM-SPV3-	20080, 200120	-	
	Regenerative resistor type	MDS-EJ-SP-	-	-	
Coil changeover		Low-speed coil	High-speed coil	Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11		11	
	Short time rated output	18.5 (25% ED rating)	25 (15% ED rating)	28 (15% ED rating)	
	Standard output during acceleration/deceleration	18.5	25	28	
	Actual acceleration/deceleration output(*3)	22.2	30	33.6	
Base rotation speed[r/min]	1350	3550	1350	3550	
Maximum rotation speed[r/min]	12000				
Frame No.	A160				
Continuous rated current[A]	60				
Continuous rated torque[N·m]	77.8	29.6	77.8	29.6	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.35				
Inertia[kg·m <sup>2</sup> ]	0.086				
Tolerable radial load(*2) [N]	1960				
Cooling fan	Input voltage				
Degree of protection	IP54 (The shaft-through portion and rotation seal portion are excluded.)				
Mass[kg]	93				
Heat-resistant class	155(F)				

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

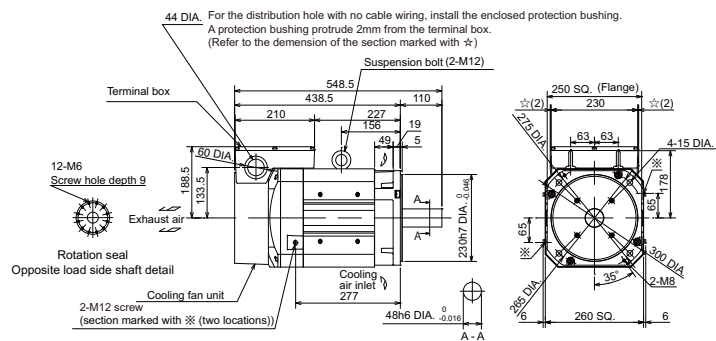
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

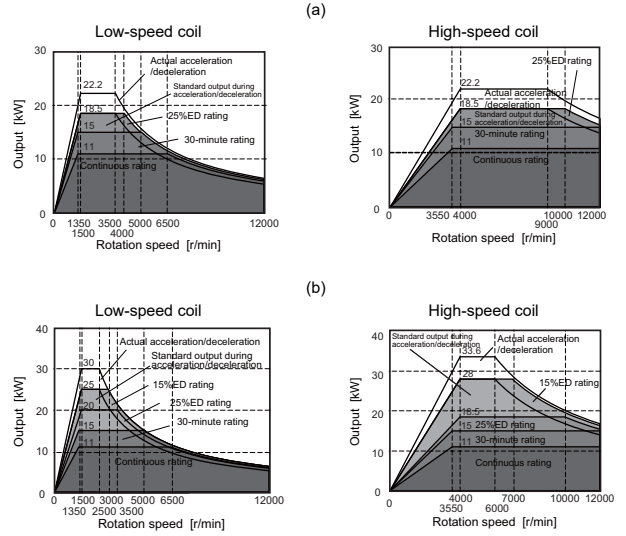
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]

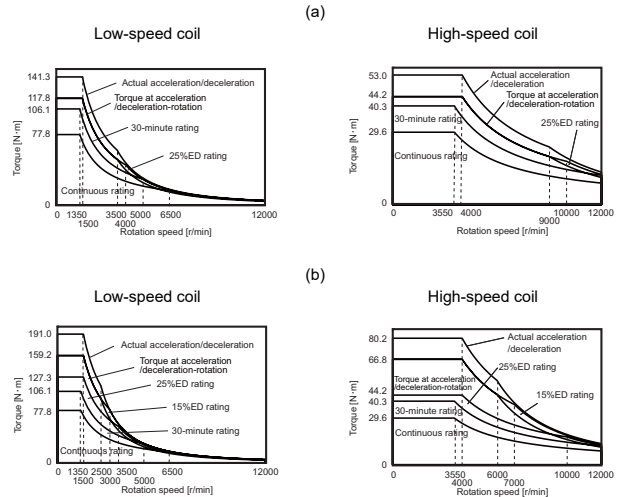
SJ-DG15/120-02T-K with standard flange



Output characteristics



Torque - rotation speed characteristics



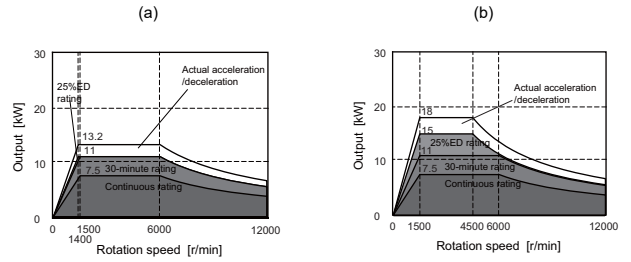
Hollow shaft specifications

# SJ-DG11/120-03T-S

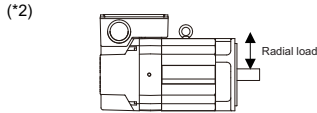
## Specifications

Item	Specifications(a)	Specifications(b)
Compatible drive unit (*1)	1-axis type MDS-E-SP-	160
	2-axis type MDS-E-SP2-	16080 (L)
	Multi axis type MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type MDS-EJ-SP-	20080, 200120
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	11 (30-minute rating)
	Standard output during acceleration/deceleration	11.0
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed[r/min]	1400	1500
Maximum rotation speed[r/min]		12000
Frame No.		B112
Continuous rated current[A]		47
Continuous rated torque[N·m]		47.7
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12
Inertia[kg·m <sup>2</sup> ]		0.030
Tolerable radial load(*2) [N]		Not permitted(*4)
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)
Mass[kg]		58
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



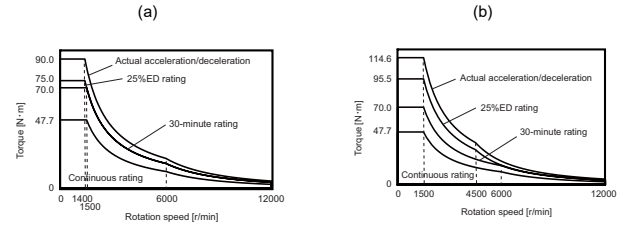
(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

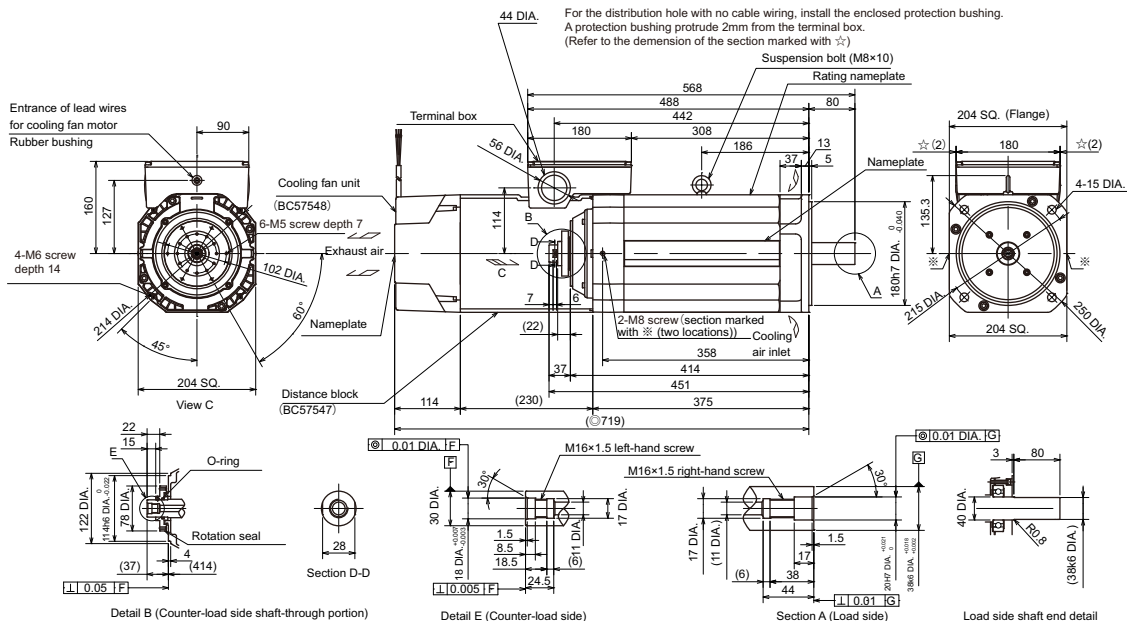


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG11/120-03T-S with standard flange



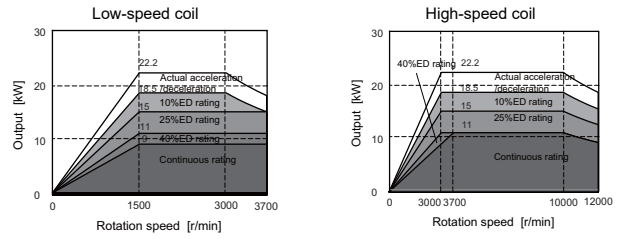
Hollow shaft specifications

# SJ-DG11/120-12T-KS

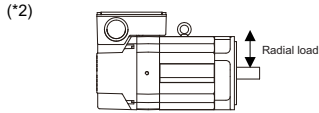
## Specifications

Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	9	11
	Short time rated output	18.5 (10%ED rating)	
	Standard output during acceleration/deceleration	18.5	
	Actual acceleration/deceleration output(*3)	22.2	
Base rotation speed	Continuous rating[r/min]	1500	3700
	Short time rating[r/min]	1500	3000
Maximum rotation speed[r/min]		3700	12000
Frame No.		B112	
Continuous rated current[A]		62	
Continuous rated torque[N·m]		57.3	28.4
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12	
Inertia[kg·m <sup>2</sup> ]		0.030	
Tolerable radial load(*2) [N]		Not permitted(*4)	
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]		61	
Heat-resistant class		155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



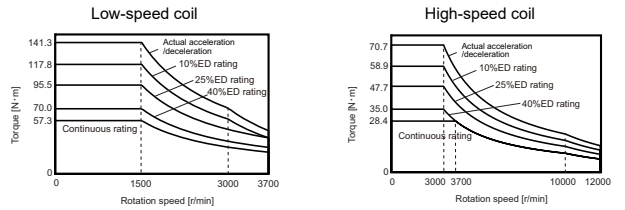
(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

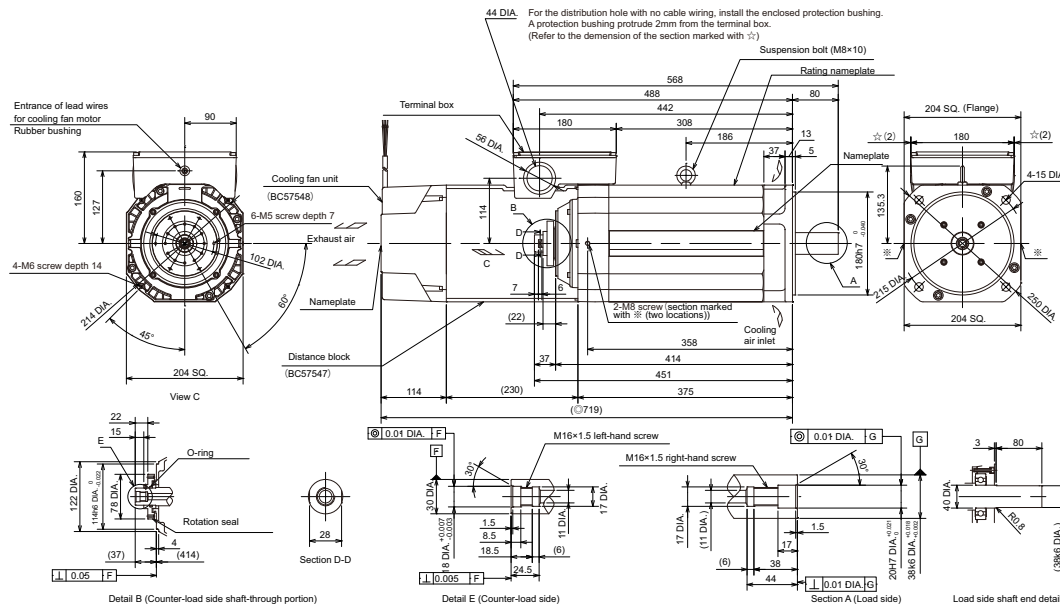


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG11/120-12T-KS with standard flange



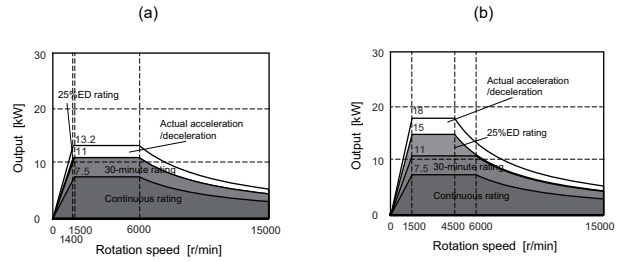
Hollow shaft specifications

# SJ-DG11/150-06T-S

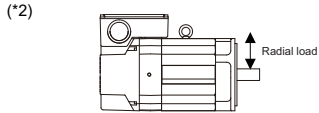
## Specifications

Item	Specifications(a)	Specifications(b)
Compatible drive unit (*1)	1-axis type MDS-E-SP-	160
	2-axis type MDS-E-SP2-	16080 (L)
	Multi axis type MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type MDS-EJ-SP-	20080, 200120
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	11 (25%ED rating)
	Standard output during acceleration/deceleration	11.0
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed	Continuous rating[r/min]	1500
	Short time rating[r/min]	1400
Maximum rotation speed[r/min]	15000	
Frame No.	B112	
Continuous rated current[A]	47	
Continuous rated torque[N·m]	47.7	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.12	
Inertia[kg·m <sup>2</sup> ]	0.030	
Tolerable radial load(*2) [N]	Not permitted(*4)	
Cooling fan	3-phase 200V	
Degree of protection	IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]	61	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*3) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

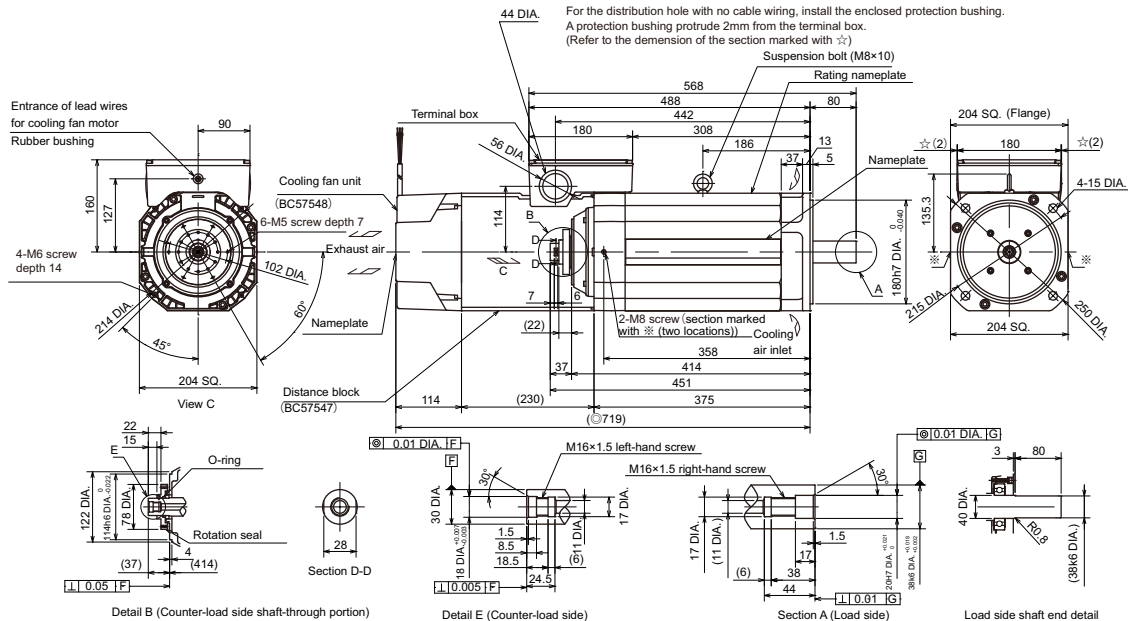
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG11/150-06T-S with standard flange



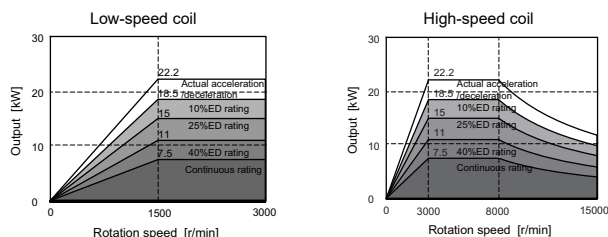
Hollow shaft specifications

# SJ-DG11/150-15T-KS

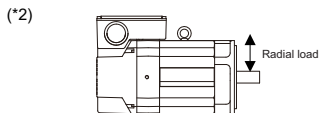
## Specifications

Item		Specifications(a)	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	
	Short time rated output	18.5 (10% ED rating)	
	Standard output during acceleration/deceleration	18.5	
	Actual acceleration/deceleration output(*3)	22.2	
Base rotation speed[r/min]	1500	3000	
Maximum rotation speed[r/min]	3000	15000	
Frame No.	B112		
Continuous rated current[A]	55		
Continuous rated torque[N·m]	47.7	23.9	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.12		
Inertia[kg·m <sup>2</sup> ]	0.030		
Tolerable radial load(*2) [N]	Not permitted(*4)		
Cooling fan	Input voltage	3-phase 200V	
Degree of protection		IP54 (The shaft-through portion and rotation seal portion are excluded.)	
Mass[kg]	61		
Heat-resistant class	155(F)		

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



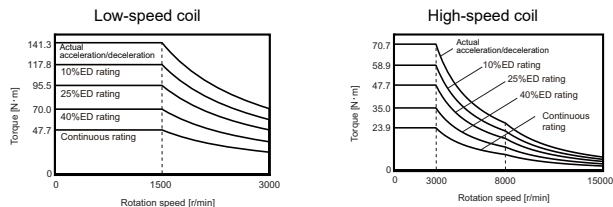
(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

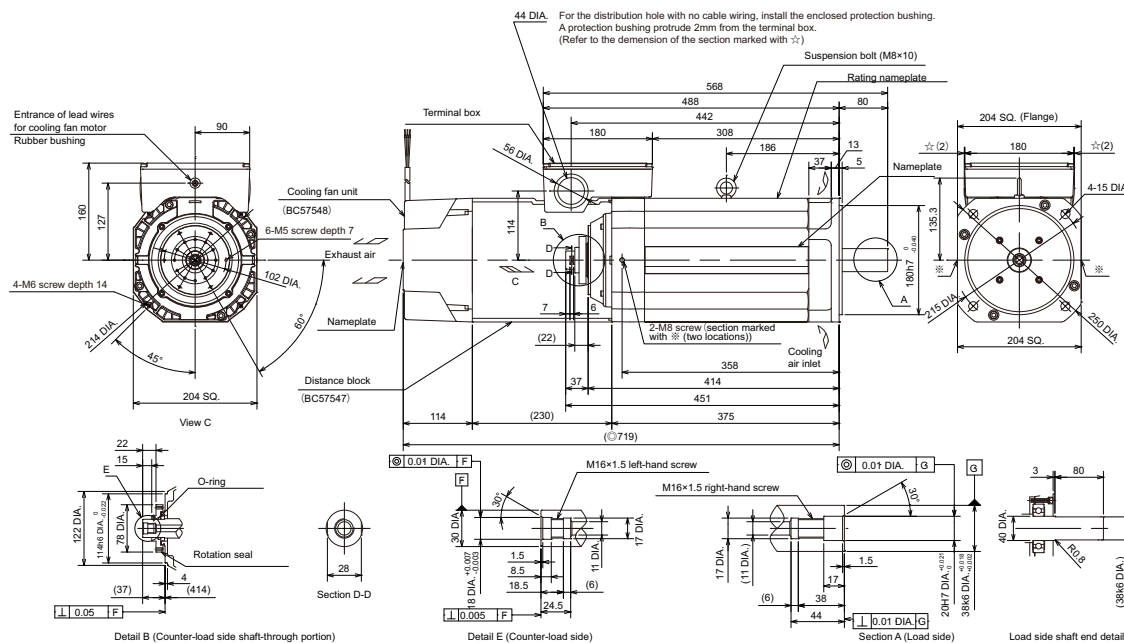


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DG11/150-15T-KS with standard flange



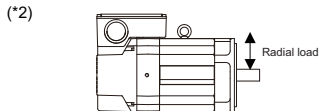
Hollow shaft specifications

# SJ-DG15/120-02T-KS

## Specifications

Item		Specifications(a)		Specifications(b)	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200	240	
	2-axis type	MDS-E-SP2-	-	-	
	Multi axis type	MDS-EM-SPV3-	20080, 200120	-	
	Regenerative resistor type	MDS-EJ-SP-	-	-	
Coil changeover		Low-speed coil	High-speed coil	Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11		11	
	Short time rated output	18.5 (25% ED rating)	25 (15% ED rating)	28 (15% ED rating)	
	Standard output during acceleration/deceleration	18.5	25	28	
	Actual acceleration/deceleration output(*3)	22.2	30	33.6	
Base rotation speed[r/min]	1350	3550	1350	3550	
Maximum rotation speed[r/min]	12000				
Frame No.	A160				
Continuous rated current[A]	60				
Continuous rated torque[N·m]	77.8	29.6	77.8	29.6	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.35				
Inertia[kg·m <sup>2</sup> ]	0.086				
Tolerable radial load(*2) [N]	Not permitted(*4)				
Cooling fan	Input voltage		3-phase 200V		
Degree of protection	IP54 (The shaft-through portion and rotation seal portion are excluded.)				
Mass[kg]	88				
Heat-resistant class	155(F)				

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

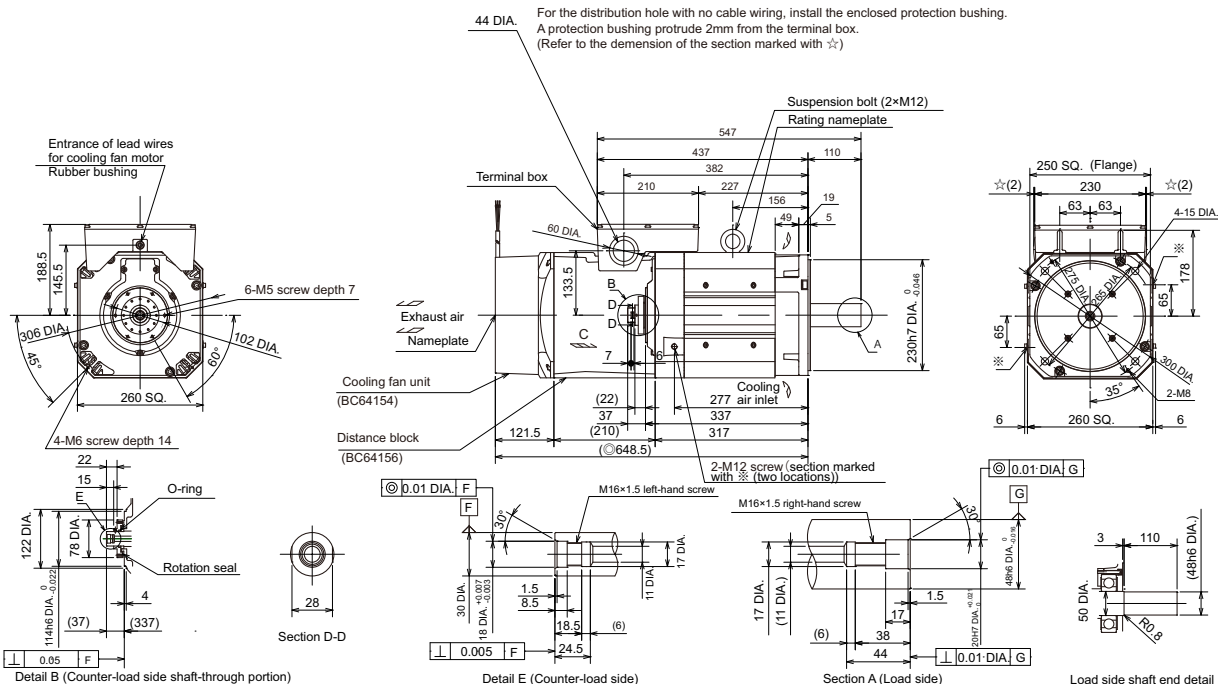
(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

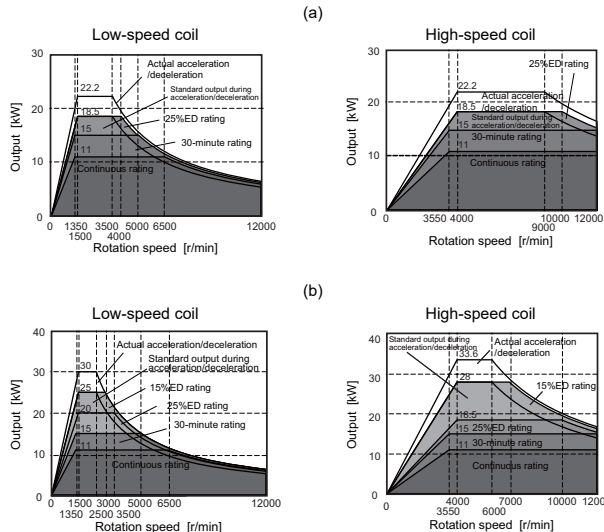
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

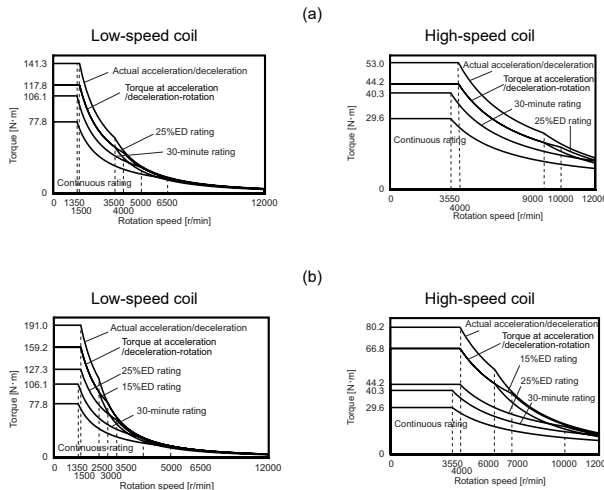
### SJ-DG15/120-02T-KS with standard flange



## Output characteristics



## Torque - rotation speed characteristics



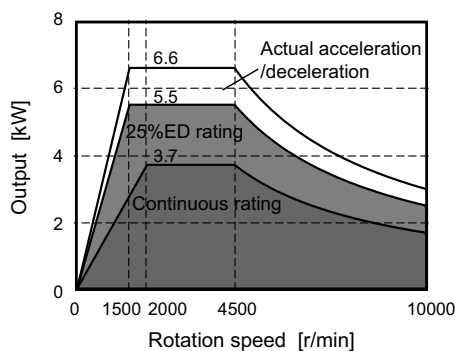


Compact & lightweight specifications  
**SJ-DJ5.5/100-01**

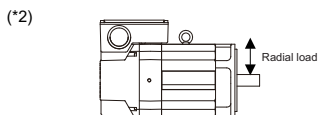
Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	80
	2-axis type	MDS-E-SP2-	80, 16080(M)
	Multi axis type	MDS-EM-SPV3-	10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	100
Output capacity[kW]	Continuous rated output		3.7
	Short time rated output		5.5 (25%ED rating)
	Standard output during acceleration/deceleration		5.5
	Actual acceleration/deceleration output(*3)		6.6
Base rotation speed	Continuous rating[r/min]		2000
	Short time rating[r/min]		1500
Maximum rotation speed[r/min]			10000
Frame No.			B90
Continuous rated current[A]			21
Continuous rated torque[N·m]			17.7
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.030
Inertia[kg·m <sup>2</sup> ]			0.0074
Tolerable radial load(*2) [N]			980
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			26
Heat-resistant class			155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

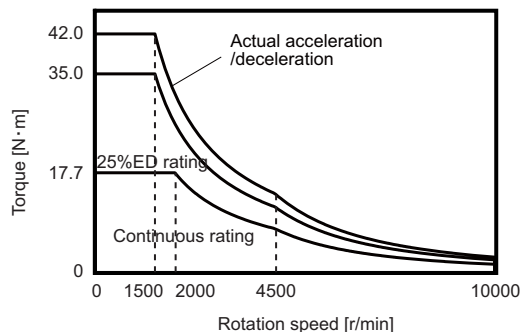


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Torque - rotation speed characteristics

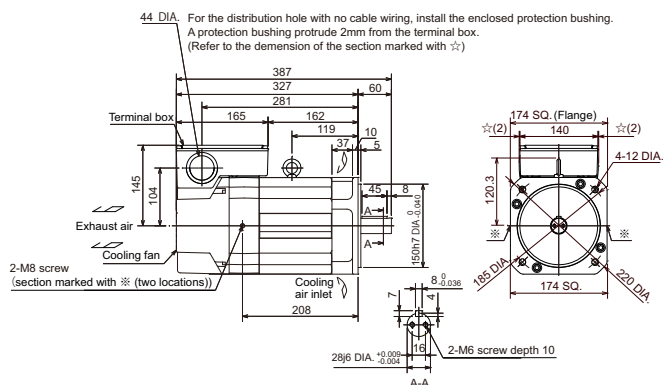


Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

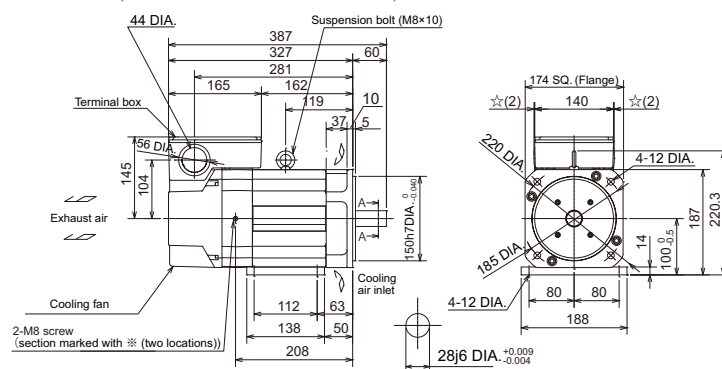
Outline dimension drawings [Unit : mm]

SJ-DJ5.5/100-01-C with standard flange (with key)



SJ-DJ5.5/100-01-A with standard legs

For the distribution hole with no cable wiring, install the enclosed protection bushing. A protection bushing protrude 2mm from the terminal box. (Refer to the dimension of the section marked with ☆)

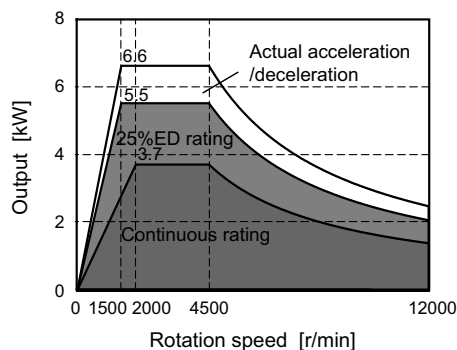


Compact & lightweight specifications  
**SJ-DJ5.5/120-01**

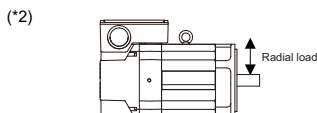
Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 80
	2-axis type	MDS-E-SP2- 80, 16080(M)
	Multi axis type	MDS-EM-SPV3- 10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP- 100
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (25%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous rating[r/min]	2000
	Short time rating[r/min]	1500
Maximum rotation speed[r/min]		12000
Frame No.		B90
Continuous rated current[A]		21
Continuous rated torque[N·m]		17.7
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.030
Inertia[kg·m <sup>2</sup> ]		0.0074
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		26
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

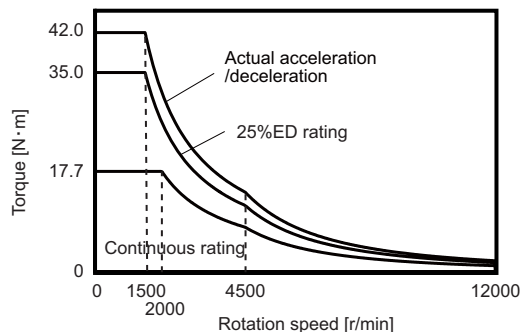


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Torque - rotation speed characteristics

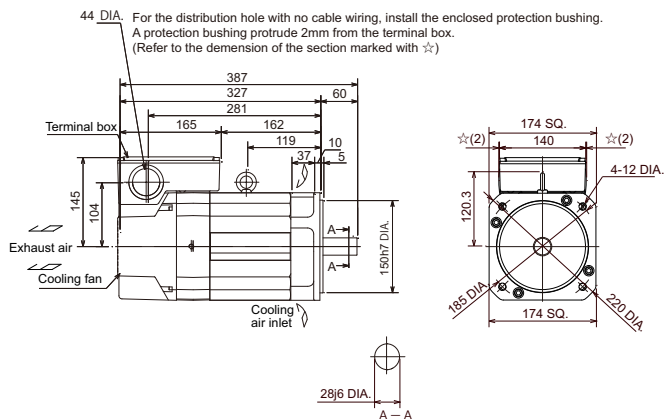


Environmental conditions

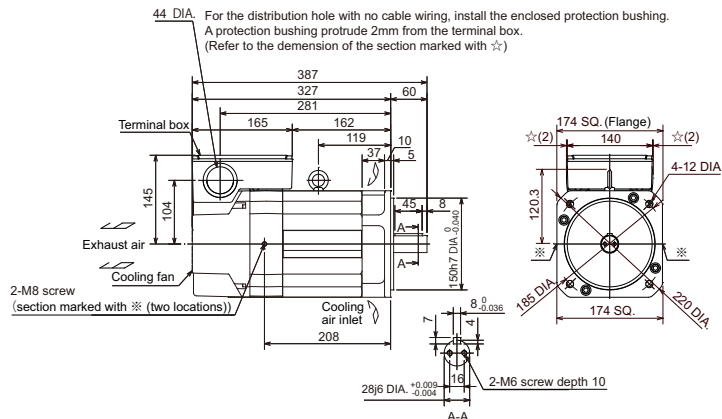
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]

SJ-DJ5.5/120-01 with standard flange



SJ-DJ5.5/120-01-C with standard flange (with key)



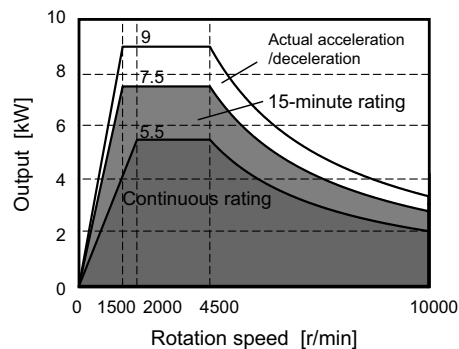


Compact & lightweight specifications  
**SJ-DJ7.5/100-01**

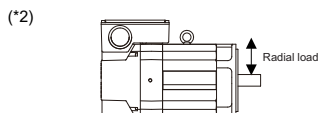
Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	120
Output capacity[kW]	Continuous rated output	5.5	
	Short time rated output	7.5 (15-minute rating)	
	Standard output during acceleration/deceleration	7.5	
	Actual acceleration/deceleration output(*3)	9	
Base rotation speed	Continuous rating[r/min]	2000	
	Short time rating[r/min]	1500	
Maximum rotation speed[r/min]	10000		
Frame No.	D90		
Continuous rated current[A]	26		
Continuous rated torque[N·m]	26.3		
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.053		
Inertia[kg·m <sup>2</sup> ]	0.013		
Tolerable radial load(*2) [N]	1470		
Cooling fan	Input voltage	3-phase 200V	
Degree of protection	IP54 (The shaft-through portion is excluded.)		
Mass[kg]	39		
Heat-resistant class	155(F)		

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



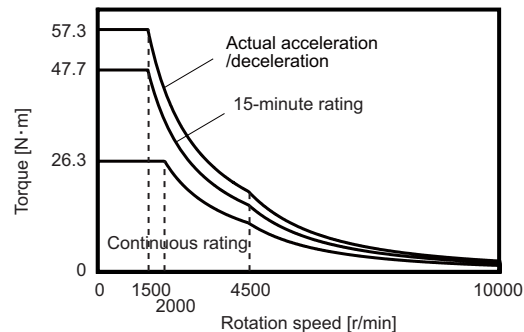
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

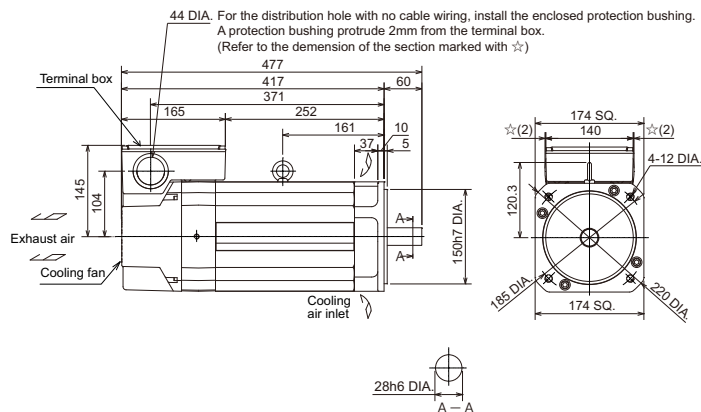
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

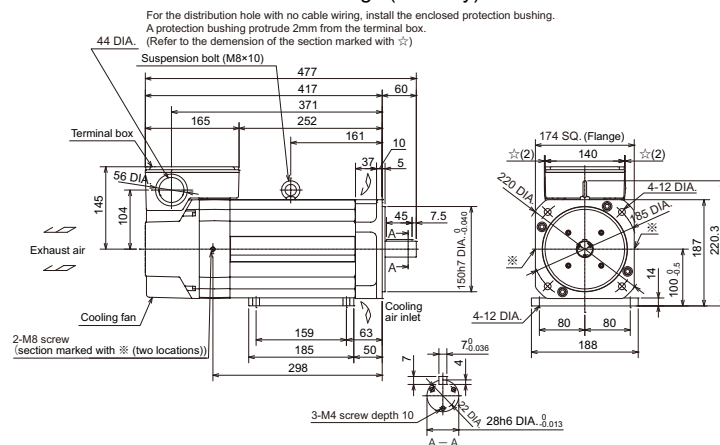


Outline dimension drawings [Unit : mm]

SJ-DJ7.5/100-01 with standard flange



SJ-DJ7.5/100-01-AC with standard legs (with key)

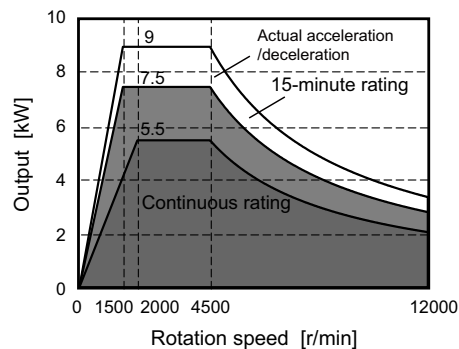


Compact & lightweight specifications  
**SJ-DJ7.5/120-01**

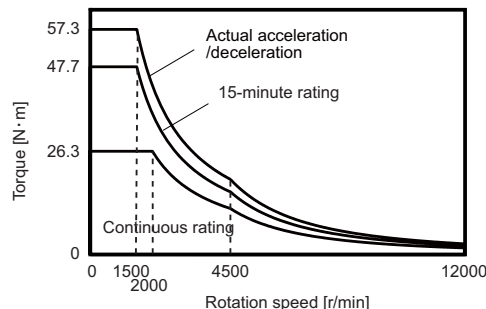
Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-E-SP- 160
	2-axis type MDS-E-SP2- 16080(L)
	Multi axis type MDS-EM-SPV3- 10040, 10080, 16040S
	Regenerative resistor type MDS-EJ-SP- 120
Output capacity[kW]	Continuous rated output 5.5
	Short time rated output 7.5 (15-minute rating)
	Standard output during acceleration/deceleration 7.5
	Actual acceleration/deceleration output(*3) 9
Base rotation speed	Continuous rating[r/min] 2000
	Short time rating[r/min] 1500
Maximum rotation speed[r/min]	10000
Frame No.	D90
Continuous rated current[A]	26
Continuous rated torque[N·m]	26.3
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.053
Inertia[kg·m <sup>2</sup> ]	0.013
Tolerable radial load(*2) [N]	1470
Cooling fan	Input voltage 3-phase 200V
Degree of protection	IP54 (The shaft-through portion is excluded.)
Mass[kg]	39
Heat-resistant class	155(F)

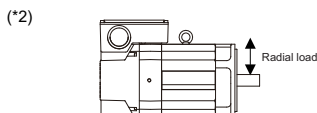
Output characteristics



Torque - rotation speed characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

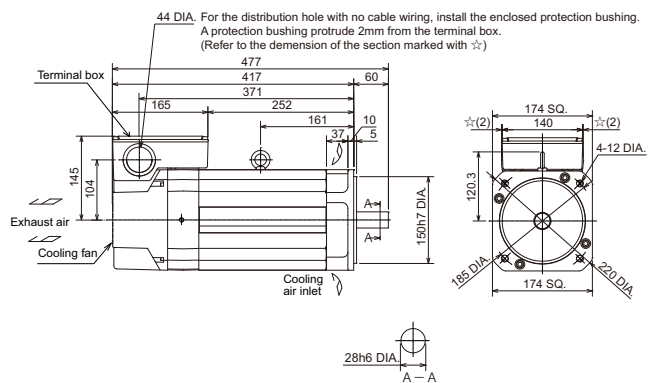
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

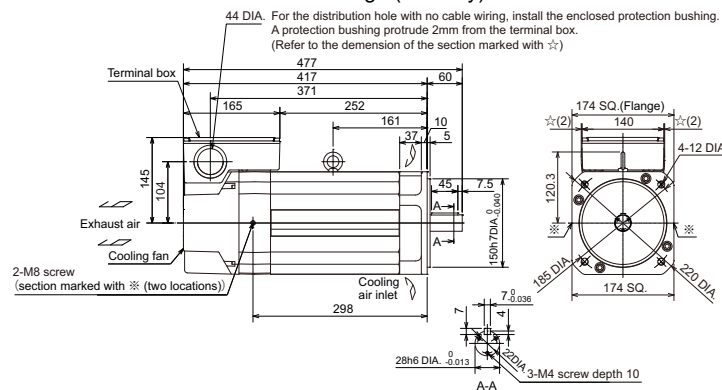
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000 meters or less above sea level, Storage: 1000 meters or less above sea level, Transportation: 10000 meters or less above sea level

Outline dimension drawings [Unit : mm]

SJ-DJ7.5/120-01 with standard flange



SJ-DJ7.5/120-01-C with standard flange (with key)

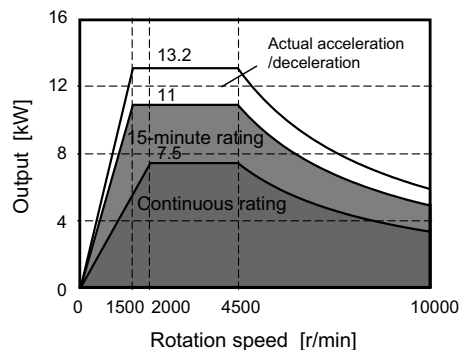


Compact & lightweight specifications  
**SJ-DJ11/100-01**

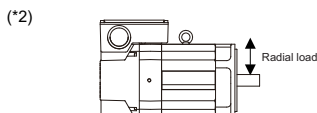
Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	160
Output capacity[kW]	Continuous rated output		7.5
	Short time rated output		11 (15-minute rating)
	Standard output during acceleration/deceleration		11
	Actual acceleration/deceleration output(*3)		13.2
Base rotation speed	Continuous rating[r/min]		2000
	Short time rating[r/min]		1500
Maximum rotation speed[r/min]			10000
Frame No.			A112
Continuous rated current[A]			35
Continuous rated torque[N·m]			35.8
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.094
Inertia[kg·m <sup>2</sup> ]			0.023
Tolerable radial load(*2) [N]			1960
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			53
Heat-resistant class			155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

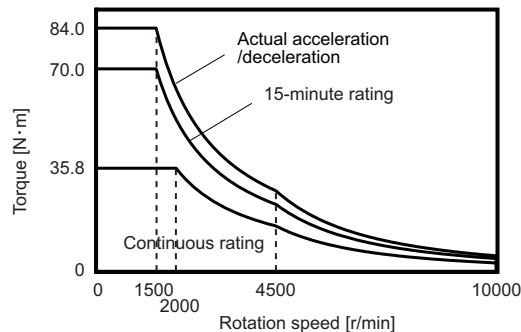


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Torque - rotation speed characteristics

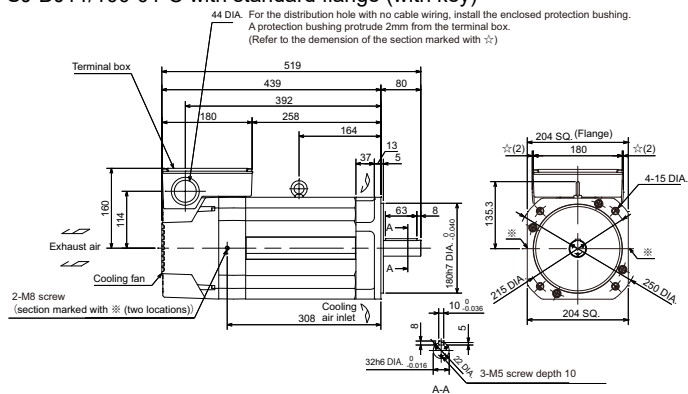


Environmental conditions

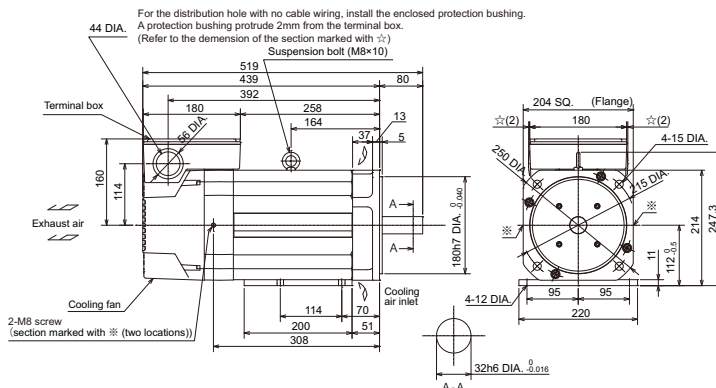
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]

SJ-DJ11/100-01-C with standard flange (with key)



SJ-DJ11/100-01-A with standard legs



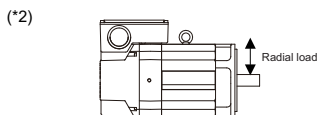
Compact & lightweight specifications

# SJ-DJ15/80-01

## Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output	11	
	Short time rated output	15 (15-minute rating) (15%ED rating)	
	Standard output during acceleration/deceleration	15	
	Actual acceleration/deceleration output(*3)	18	
Base rotation speed	Continuous rating[r/min]	2000	
	Short time rating[r/min]	1500	
Maximum rotation speed[r/min]	8000		
Frame No.	B112		
Continuous rated current[A]	51		
Continuous rated torque[N·m]	52.5		
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.122		
Inertia[kg·m <sup>2</sup> ]	0.031		
Tolerable radial load(*2) [N]	1960		
Cooling fan	Input voltage	3-phase 200V	
Degree of protection	IP54 (The shaft-through portion is excluded.)		
Mass[kg]	64		
Heat-resistant class	155(F)		

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

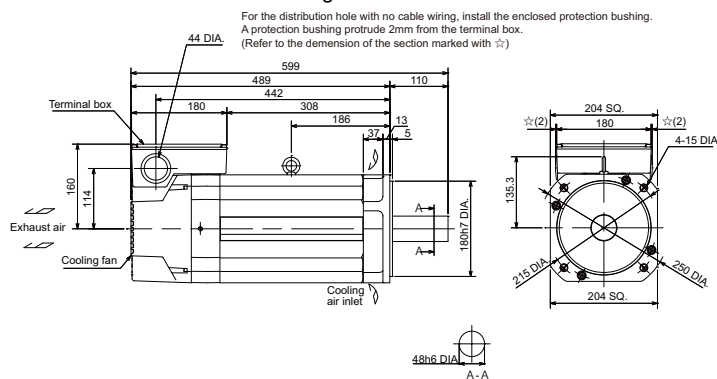
(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

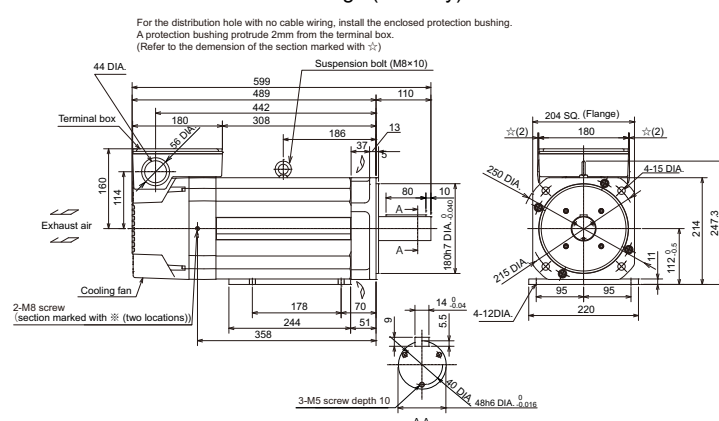
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

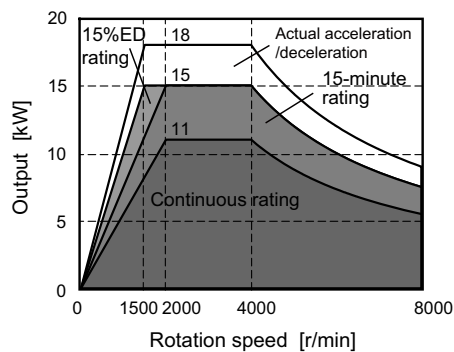
### SJ-DJ15/80-01 with standard flange



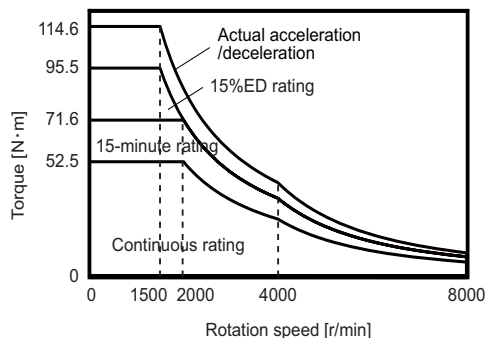
### SJ-DJ15/80-01-AC with standard legs (with key)



## Output characteristics



## Torque - rotation speed characteristics



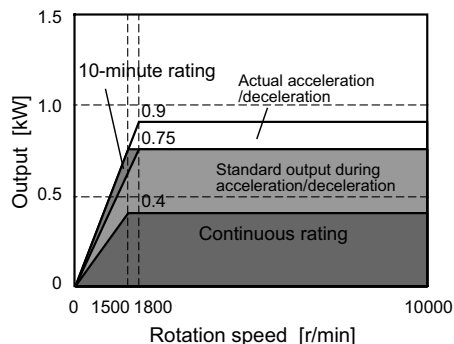
Low-inertia specifications

# SJ-DL0.75/100-01

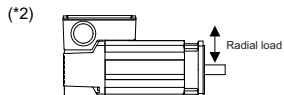
## Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	20
	2-axis type	MDS-E-SP2-	20
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output		0.4
	Short time rated output		0.75 (10-minute rating)
	Standard output during acceleration/deceleration		0.75
	Actual acceleration/deceleration output(*3)		0.9
Base rotation speed	Continuous rating[r/min]		1500
	Short time rating[r/min]		1500
Maximum rotation speed[r/min]			10000
Frame No.			A71
Continuous rated current[A]			6
Continuous rated torque[N·m]			2.55
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.0044
Inertia[kg·m <sup>2</sup> ]			0.0011
Tolerable radial load(*2) [N]			490
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			10
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

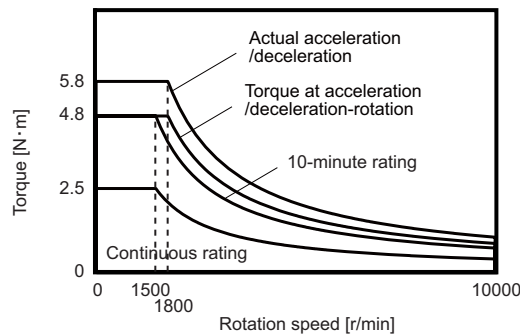
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

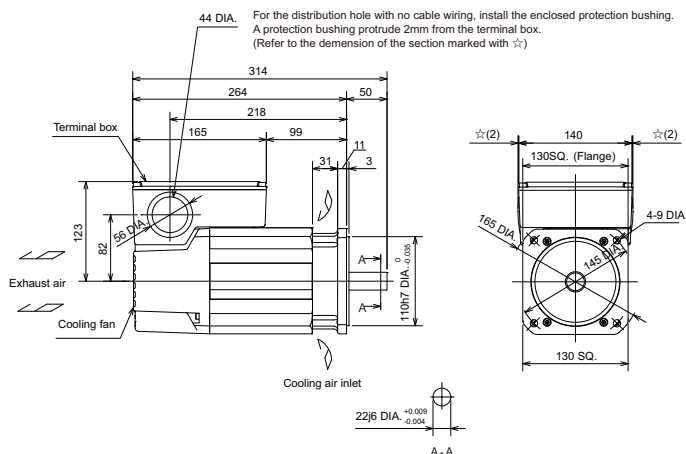
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

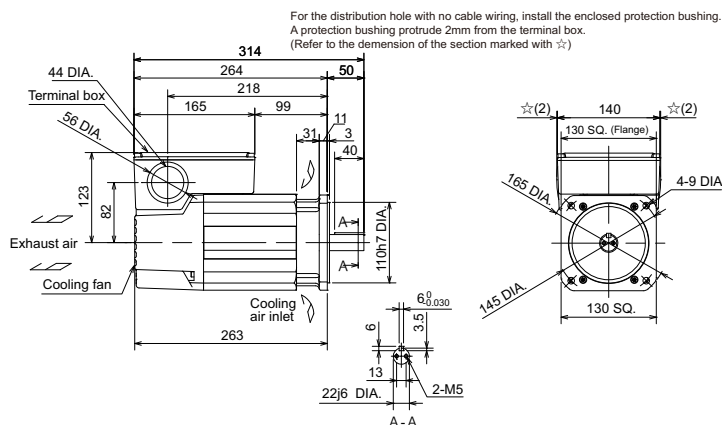


## Outline dimension drawings [Unit : mm]

### SJ-DL0.75/100-01 with standard flange



### SJ-DL0.75/100-01-C with standard flange (with key)



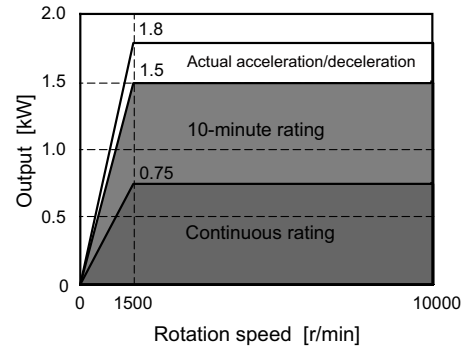
Low-inertia specifications

# SJ-DL1.5/100-01

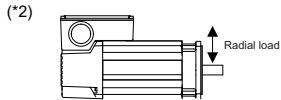
## Specifications

Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	40
	2-axis type	MDS-E-SP2-	40
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output		0.75
	Short time rated output		1.5 (10-minute rating)
	Standard output during acceleration/deceleration		1.5
	Actual acceleration/deceleration output(*3)		1.8
Base rotation speed	Continuous rating[r/min]		1500
	Short time rating[r/min]		1500
Maximum rotation speed[r/min]			10000
Frame No.			B71
Continuous rated current[A]			9
Continuous rated torque[N·m]			4.8
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.0077
Inertia[kg·m <sup>2</sup> ]			0.0019
Tolerable radial load(*2) [N]			490
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			14
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

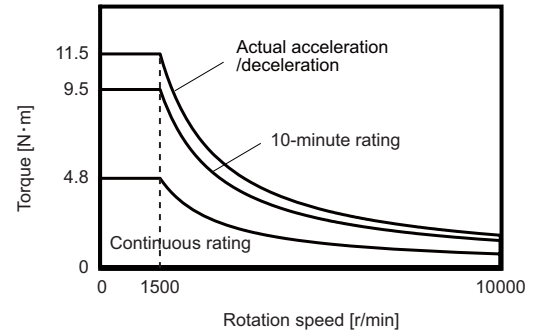


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

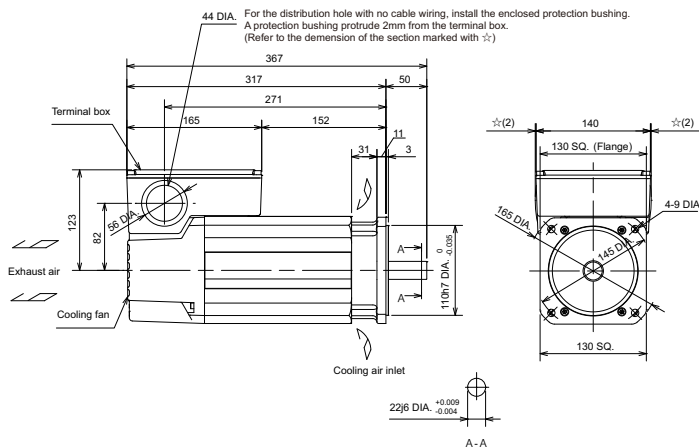


## Environmental conditions

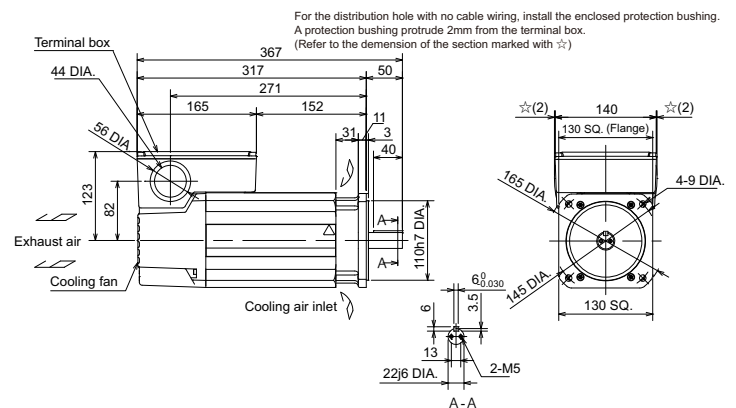
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DL1.5/100-01 with standard flange



### SJ-DL1.5/100-01-C with standard flange (with key)



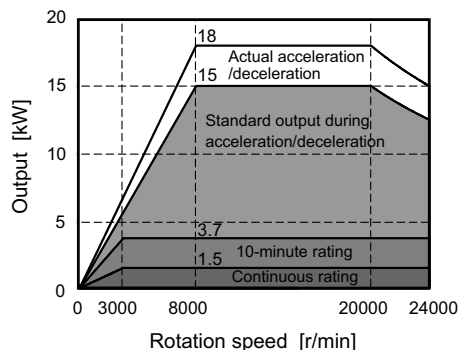
Low-inertia specifications

# SJ-DL3.7/240-01T

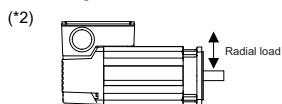
## Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	200
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	20080, 200120
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output		1.5
	Short time rated output		3.7 (10-minute rating)
	Standard output during acceleration/deceleration		15.0
	Actual acceleration/deceleration output(*3)		18.0
Base rotation speed	Continuous rating[r/min]		3000
	Short time rating[r/min]		3000
Maximum rotation speed[r/min]			24000
Frame No.			C71
Continuous rated current[A]			42
Continuous rated torque[N·m]			4.8
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.0097
Inertia[kg·m <sup>2</sup> ]			0.0024
Tolerable radial load(*2) [N]			Not permitted(*4)
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			17
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

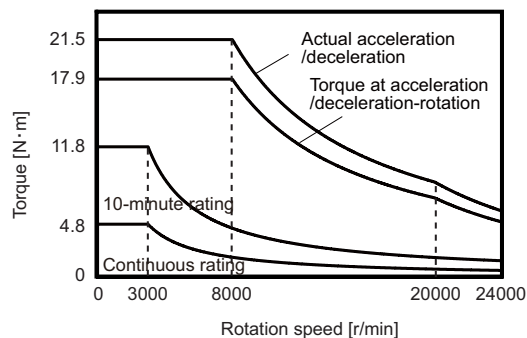
(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

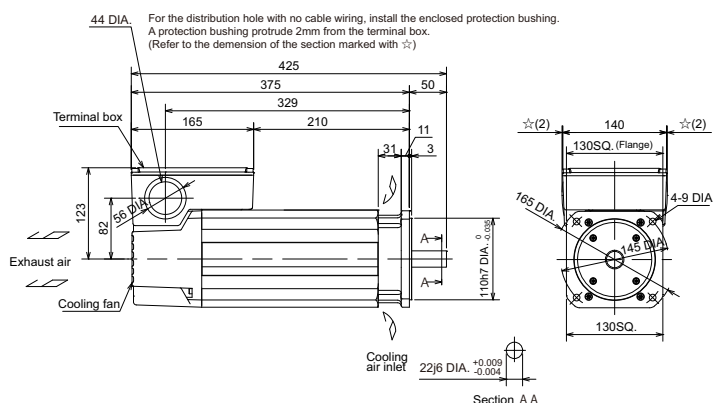
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DL3.7/240-01T with standard flange





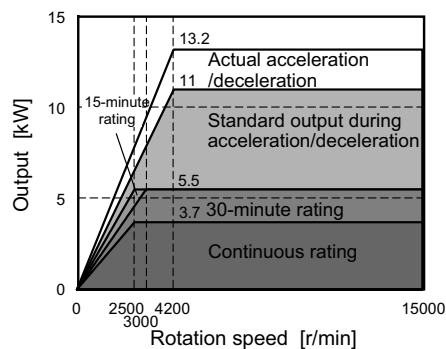
Low-inertia specifications

# SJ-DL5.5/150-01T

## Specifications

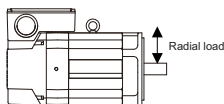
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (15-minute rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed	Continuous rating[r/min]	2500
	Short time rating[r/min]	2500
Maximum rotation speed[r/min]		15000
Frame No.		C90
Continuous rated current[A]		42
Continuous rated torque[N·m]		14.1
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.018
Inertia[kg·m <sup>2</sup> ]		0.0046
Tolerable radial load(*2) [N]		245
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		30
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

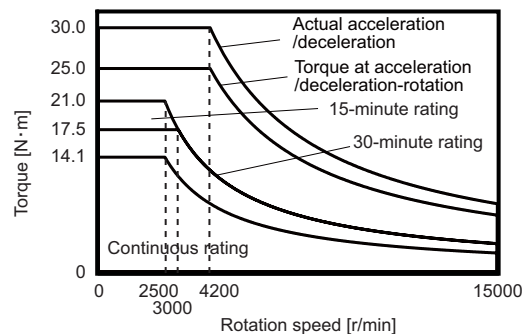
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

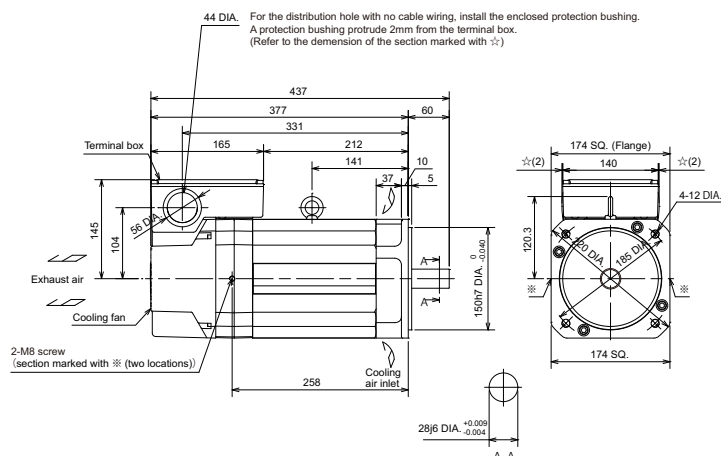
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DL5.5/150-01T with standard flange





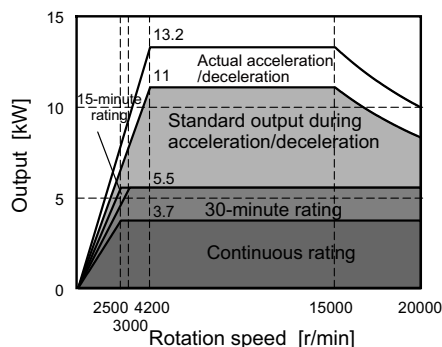
Low-inertia specifications

# SJ-DL5.5/200-01T

## Specifications

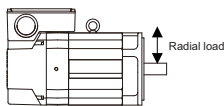
Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output		3.7
	Short time rated output		5.5 (15-minute rating)
	Standard output during acceleration/deceleration		11
	Actual acceleration/deceleration output(*3)		13.2
Base rotation speed	Continuous rating[r/min]		2500
	Short time rating[r/min]		2500
Maximum rotation speed[r/min]			20000
Frame No.			C90
Continuous rated current[A]			42
Continuous rated torque[N·m]			14.1
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.018
Inertia[kg·m <sup>2</sup> ]			0.0046
Tolerable radial load(*2) [N]			245
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			30
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

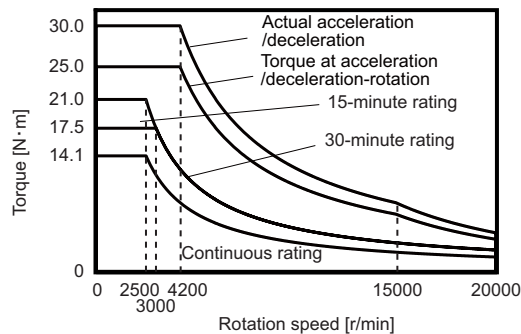
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

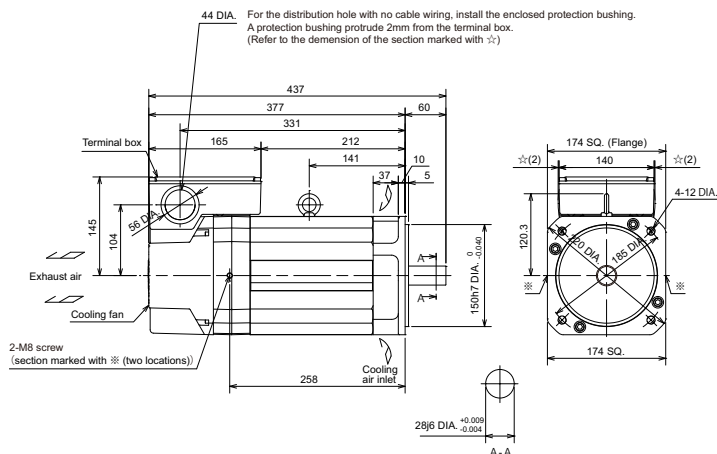
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DL5.5/200-01T with standard flange



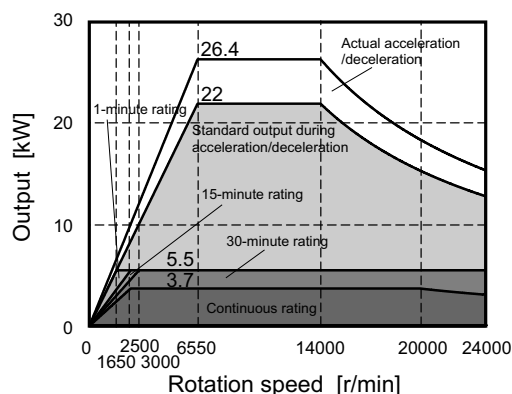
Low-inertia specifications

# SJ-DL5.5/240-05T

## Specifications

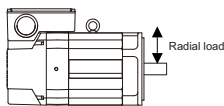
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (15-minute rating)
	Standard output during acceleration/deceleration	22
	Actual acceleration/deceleration output(*3)	26.4
Base rotation speed	Continuous rating[r/min]	2500
	Short time rating[r/min]	1650
Maximum rotation speed[r/min]		24000
Frame No.		C90
Continuous rated current[A]		57
Continuous rated torque[N·m]		14.1
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.017
Inertia[kg·m <sup>2</sup> ]		0.0042
Tolerable radial load(*2) [N]		245
Cooling fan	Input voltage	3-phase 200V
	Degree of protection	IP54
		(The shaft-through portion is excluded.)
Mass[kg]		27
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

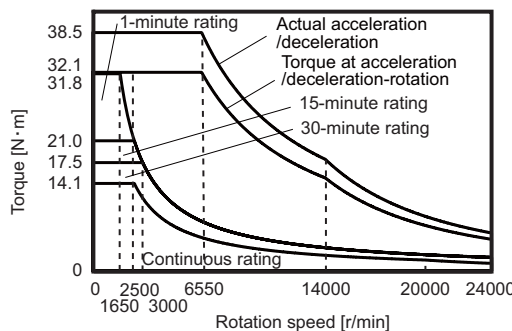
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

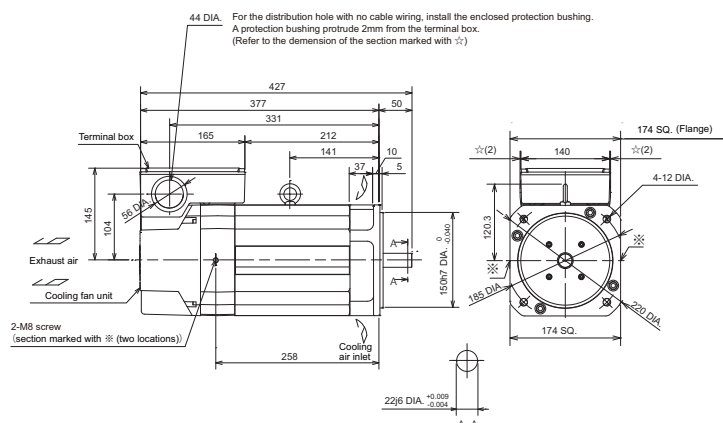
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DL5.5/240-05T with standard flange



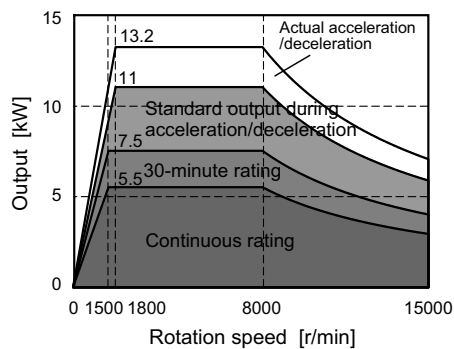
Low-inertia specifications

# SJ-DL7.5/150-01T

## Specifications

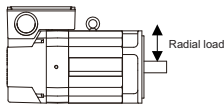
Item		Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	160
	2-axis type	MDS-E-SP2-	16080(L)
	Multi axis type	MDS-EM-SPV3-	16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output		5.5
	Short time rated output		7.5 (30-minute rating)
	Standard output during acceleration/deceleration		11
	Actual acceleration/deceleration output(*3)		13.2
Base rotation speed	Continuous rating[r/min]		1500
	Short time rating[r/min]		1500
Maximum rotation speed[r/min]			15000
Frame No.			B112
Continuous rated current[A]			46
Continuous rated torque[N·m]			35.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]			0.063
Inertia[kg·m <sup>2</sup> ]			0.016
Tolerable radial load(*2) [N]			980
Cooling fan	Input voltage		3-phase 200V
Degree of protection			IP54 (The shaft-through portion is excluded.)
Mass[kg]			56
Heat-resistant class			155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

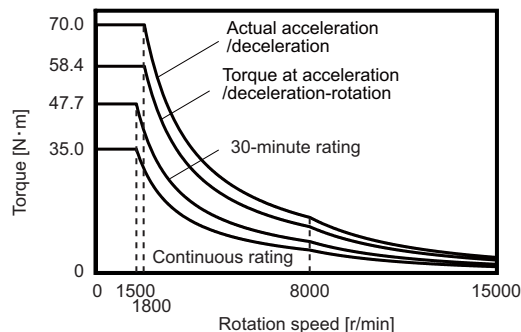
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

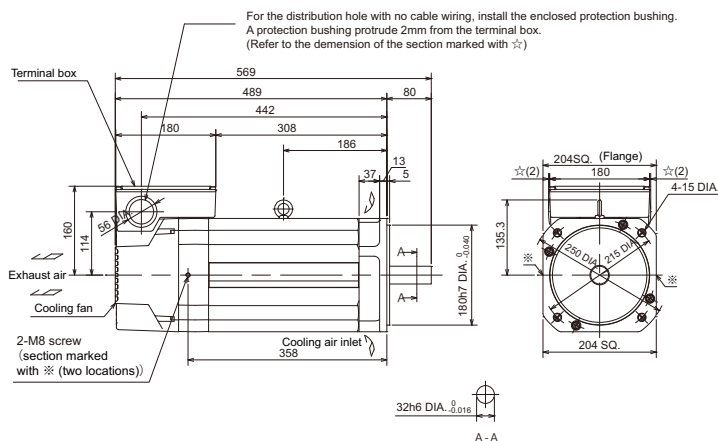
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-DL7.5/150-01T with standard flange



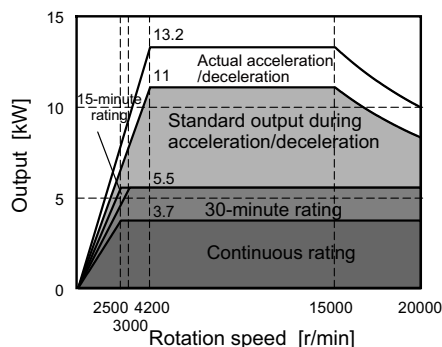
Hollow shaft specifications

# SJ-DL5.5/200-01T-S

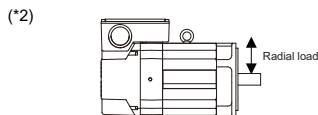
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5
	(15-minute rating)(30-minute rating)	
	Standard output during acceleration/deceleration	11
Base rotation speed	Continuous rating[r/min]	2500
	Short time rating[r/min]	2500
Maximum rotation speed[r/min]		20000
Frame No.		C90
Continuous rated current[A]		42
Continuous rated torque[N·m]		14.1
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.019
Inertia[kg·m <sup>2</sup> ]		0.0046
Tolerable radial load(*2) [N]		Not permitted(*4)
Cooling fan	Input voltage	3-phase 200V
	Degree of protection	IP54 (The shaft-through portion is excluded.)
Mass[kg]		28
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



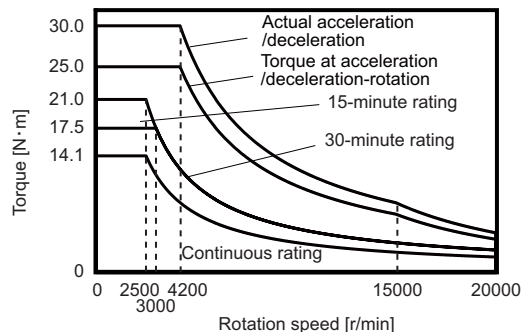
(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The motor cannot be driven when a pulley or gear is directly installed on the shaft.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

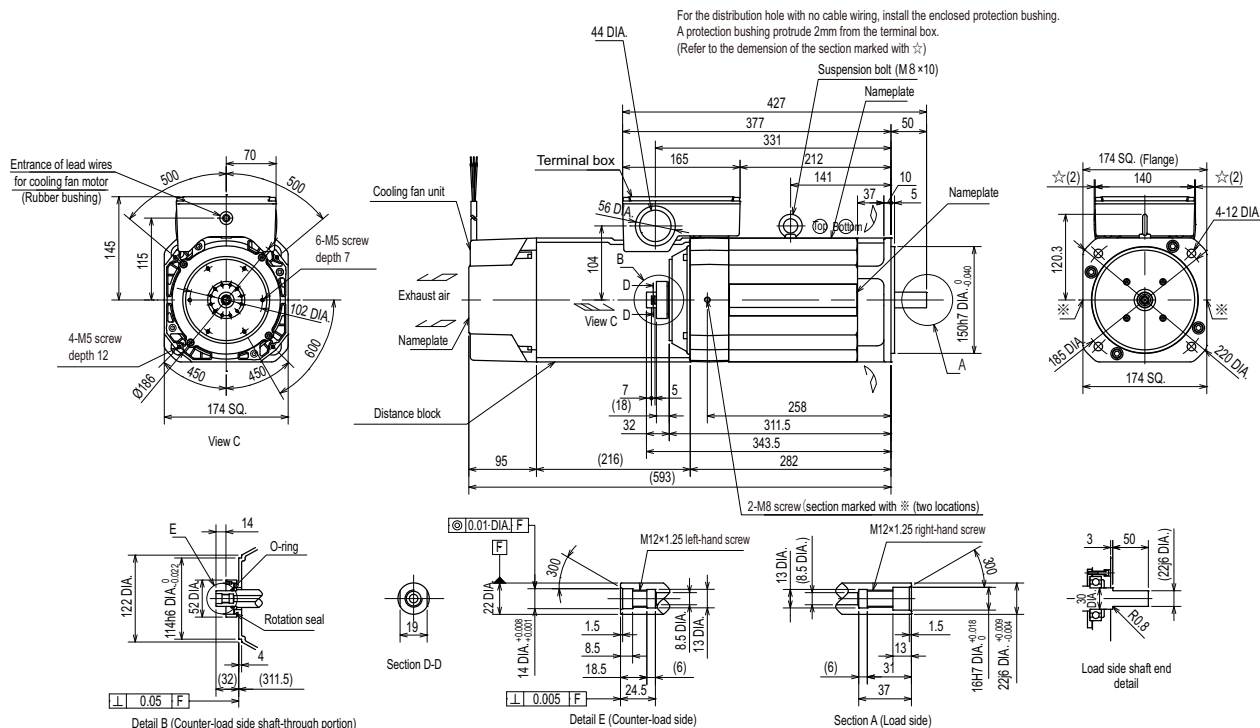


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000 meters or less above sea level, Storage: 1000 meters or less above sea level, Transportation: 10000 meters or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DL5.5/200-01T-S with standard flange





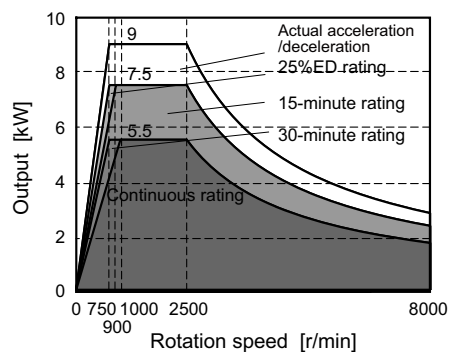
High-torque specifications

# SJ-DN7.5/80-01

## Specifications

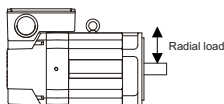
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-10040, 10080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	7.5 (15-minute rating)(25%ED rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed	Continuous rating[r/min]	1000
	Short time rating[r/min]	750
Maximum rotation speed[r/min]		8000
Frame No.		B112
Continuous rated current[A]		30
Continuous rated torque[N·m]		52.5
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.122
Inertia[kg·m <sup>2</sup> ]		0.031
Tolerable radial load(*2) [N]		1960
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		86
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

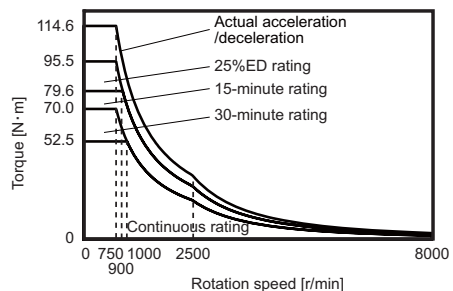
(\*2)



(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

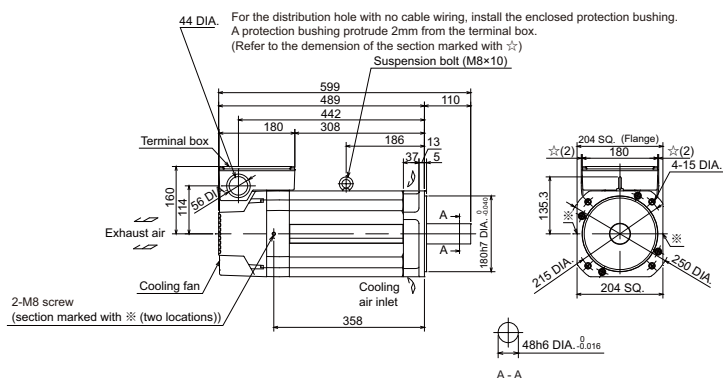


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DN7.5/80-01 with standard flange



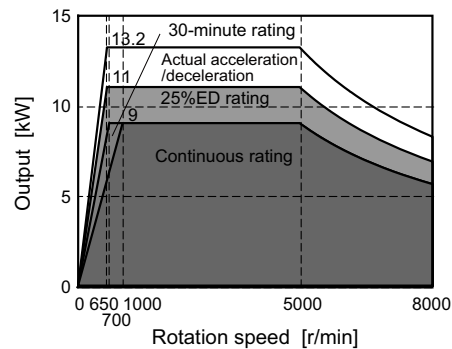
High-torque specifications

# SJ-DN11/80-01

## Specifications

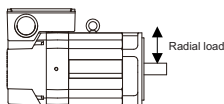
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	9
	Short time rated output	11 (25%ED rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed	Continuous rating[r/min]	1000
	Short time rating[r/min]	650
Maximum rotation speed[r/min]	8000	
Frame No.	B160	
Continuous rated current[A]	51	
Continuous rated torque[N·m]	85.9	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.41	
Inertia[kg·m <sup>2</sup> ]	0.10	
Tolerable radial load(*2) [N]	3430	
Cooling fan	Input voltage	
Degree of protection	IP54 (The shaft-through portion is excluded.)	
Mass[kg]	103	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

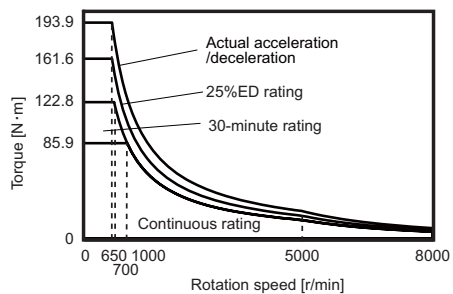


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

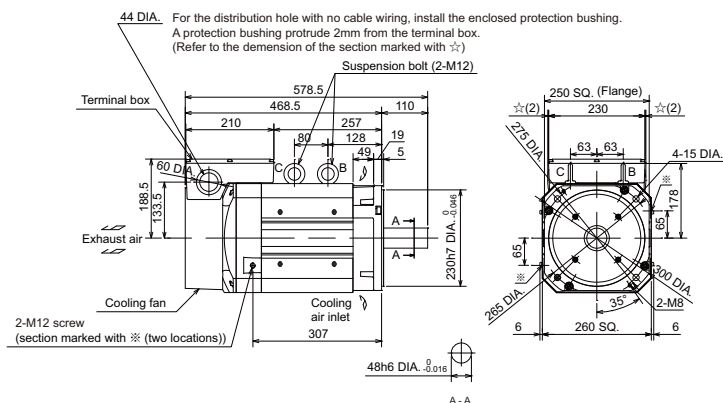


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DN11/80-01 with standard flange



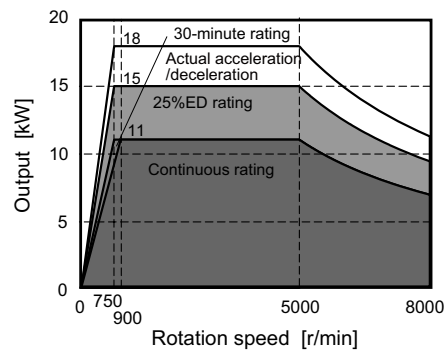
High-torque specifications

# SJ-DN15/80-01

## Specifications

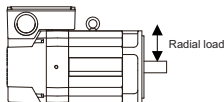
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (25%ED rating)
	Standard output during acceleration/deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed	Continuous rating[r/min]	900
	Short time rating[r/min]	750
Maximum rotation speed[r/min]	8000	
Frame No.	C160	
Continuous rated current[A]	62	
Continuous rated torque[N·m]	117	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.55	
Inertia[kg·m <sup>2</sup> ]	0.14	
Tolerable radial load(*2) [N]	3920	
Cooling fan	Input voltage	
Degree of protection	3-phase 200V	
	IP54	
	(The shaft-through portion is excluded.)	
Mass[kg]	131	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

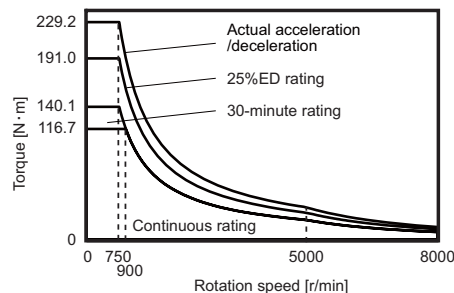


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

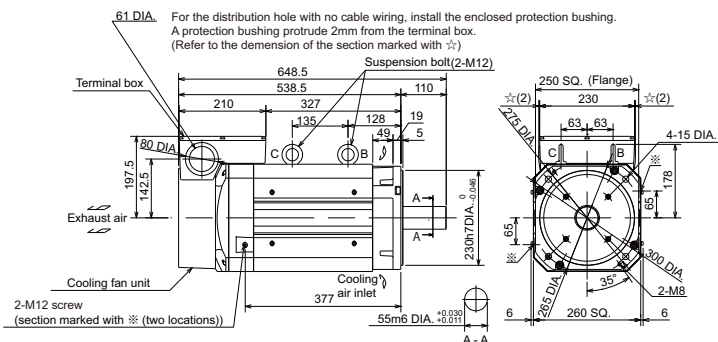


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DN15/80-01 with standard flange





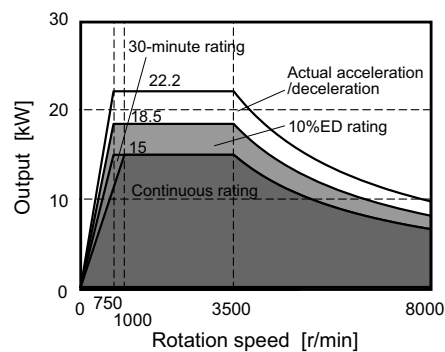
High-torque specifications

# SJ-DN18.5/80-01

## Specifications

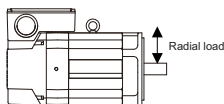
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	15
	Short time rated output	18.5 (10%ED rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed	Continuous rating[r/min]	1000
	Short time rating[r/min]	750
Maximum rotation speed[r/min]		8000
Frame No.		D160
Continuous rated current[A]		68
Continuous rated torque[N·m]		143
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.65
Inertia[kg·m <sup>2</sup> ]		0.16
Tolerable radial load(*2) [N]		3920
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP54 (The shaft-through portion is excluded.)
Mass[kg]		147
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

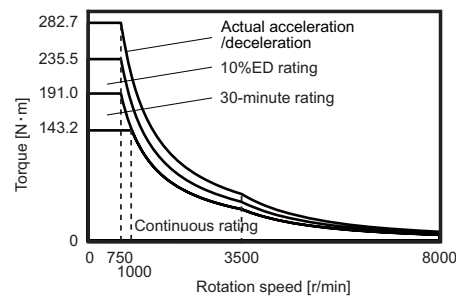


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

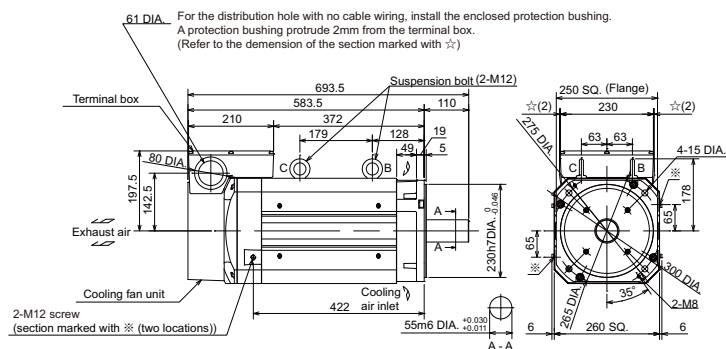


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-DN18.5/80-01 with standard flange



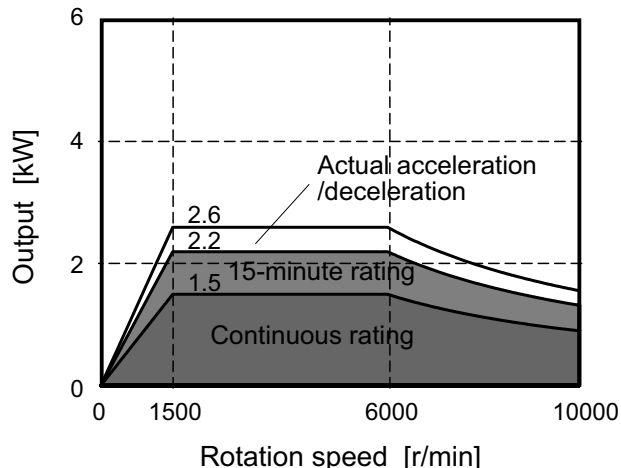
Normal specifications

# SJ-V2.2-01T

## Specifications

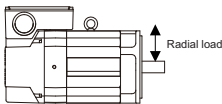
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 40
	2-axis type	MDS-E-SP2- 40
	Multi axis type	MDS-EM-SPV3- -
	Regenerative resistor type	MDS-EJ-SP- -
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	2.2 (15-minute rating)
	Standard output during acceleration/deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.6
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		A90
Continuous rated current[A]		11.5
Continuous rated torque[N·m]		9.5
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.027
Inertia[kg·m <sup>2</sup> ]		0.00675
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	Single-phase 200V
Degree of protection		IP44
Mass[kg]		25
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

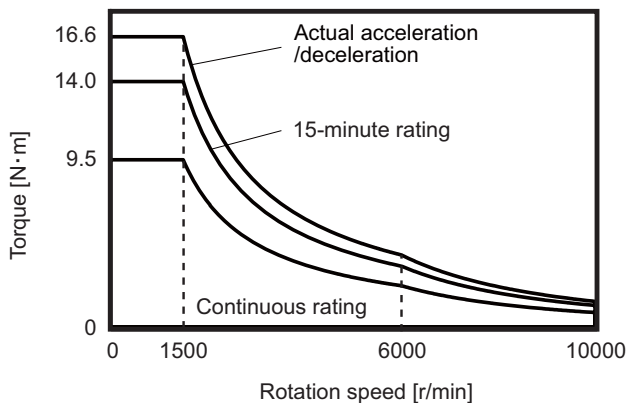


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

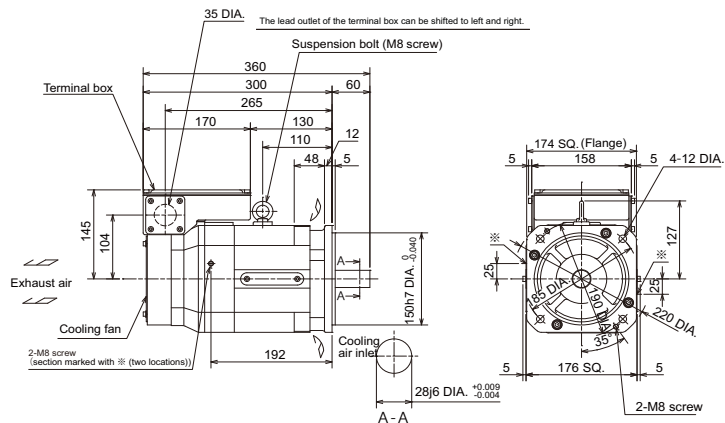


## Environmental conditions

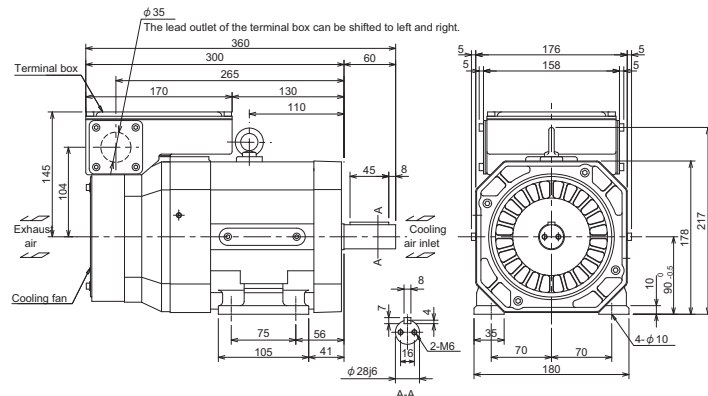
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-V2.2-01T with standard flange



### SJ-V2.2-01T with standard legs (with key)



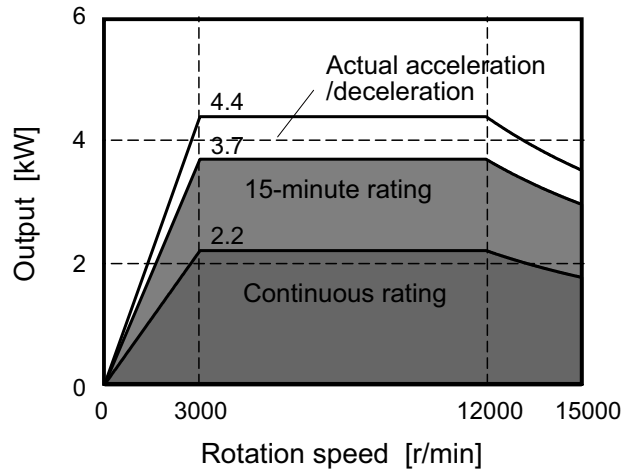
Normal specifications

# SJ-V3.7-02ZT

## Specifications

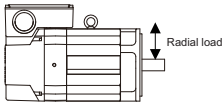
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 80
	2-axis type	MDS-E-SP2- 80, 16080(M)
	Multi axis type	MDS-EM-SPV3- -
	Regenerative resistor type	MDS-EJ-SP- -
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7 (15-minute rating)
	Standard output during acceleration/deceleration	3.7
	Actual acceleration/deceleration output(*3)	4.4
Base rotation speed[r/min]		3000
Maximum rotation speed[r/min]		15000
Frame No.		A90
Continuous rated current[A]		15
Continuous rated torque[N·m]		7.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.027
Inertia[kg·m <sup>2</sup> ]		0.00675
Tolerable radial load(*2) [N]		245
Cooling fan	Input voltage	Single-phase 200V
Degree of protection		IP44
Mass[kg]		25
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

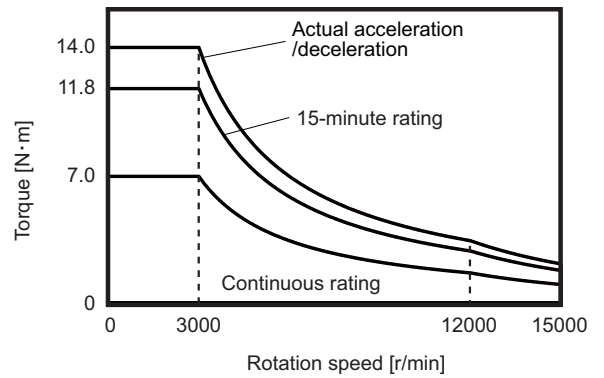


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

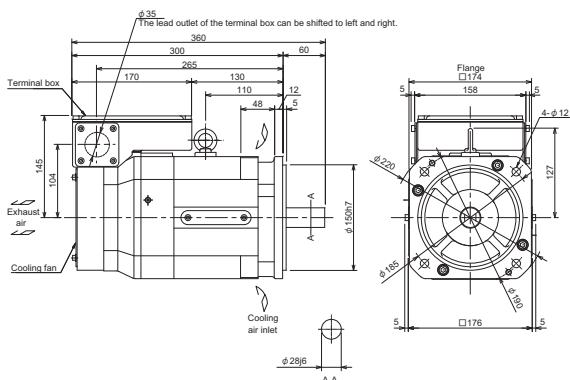


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

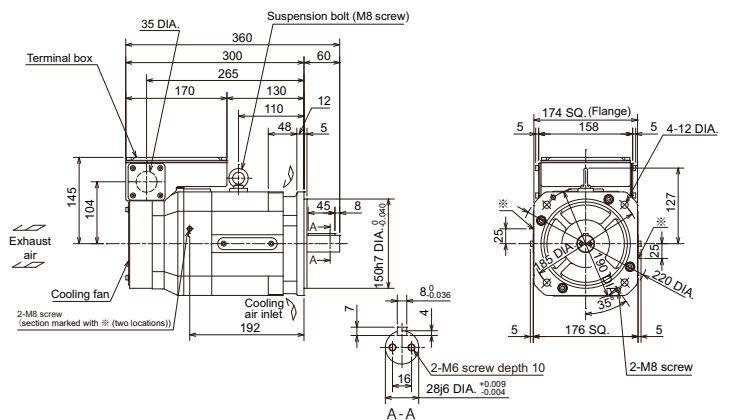
## Outline dimension drawings [Unit : mm]

### SJ-V3.7-02ZT with standard flange



### SJ-V3.7-02ZT with standard flange (with key)

The lead outlet of the terminal box can be shifted to left and right.



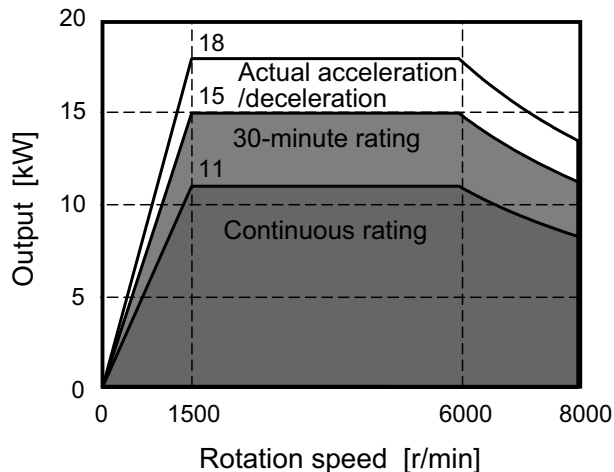
Normal specifications

# SJ-V15-09ZT

Specifications

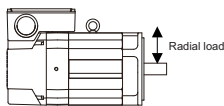
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 200
	2-axis type	MDS-E-SP2- -
	Multi axis type	MDS-EM-SPV3- 20080, 200120
	Regenerative resistor type	MDS-EJ-SP- -
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (30-minute rating)
	Standard output during acceleration/ deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		A160
Continuous rated current[A]		69
Continuous rated torque[N·m]		70.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.23
Inertia[kg·m <sup>2</sup> ]		0.0575
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		110
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

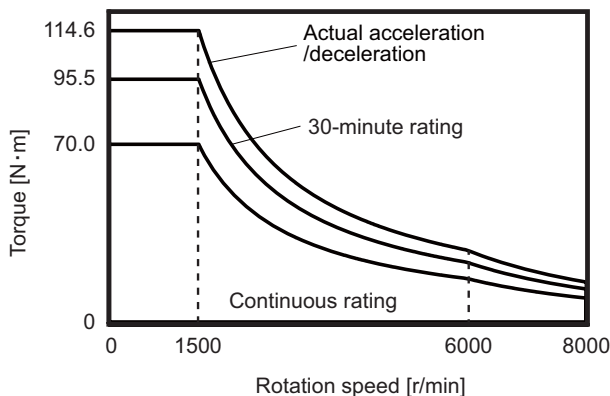
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

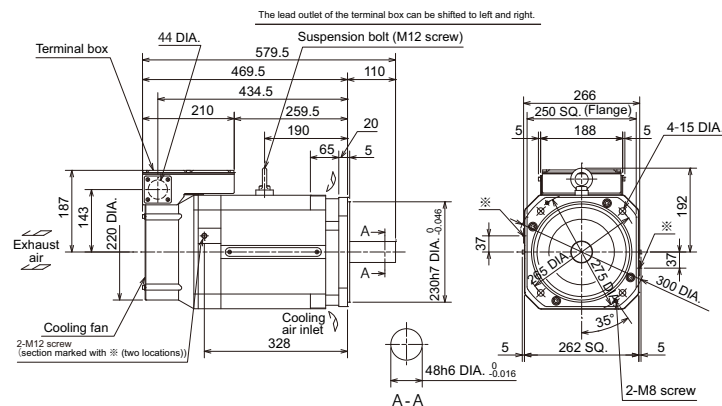
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

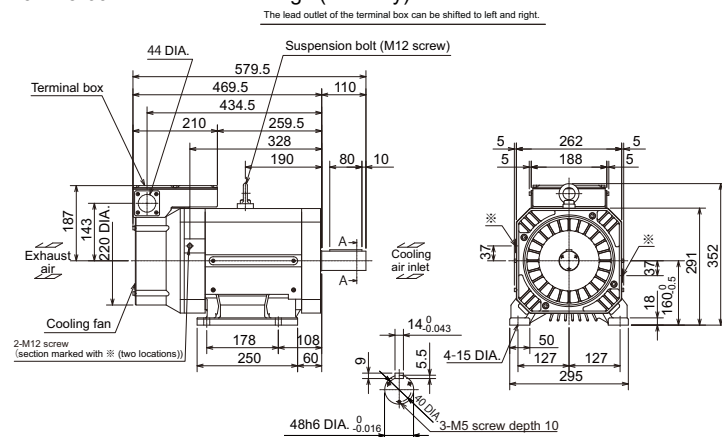


Outline dimension drawings [Unit : mm]

SJ-V15-09ZT with standard flange



SJ-V15-09ZT with standard legs (with key)





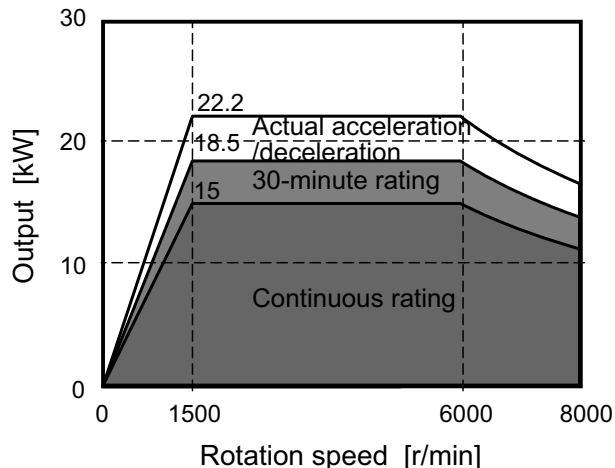
Normal specifications

# SJ-V18.5-04ZT

Specifications

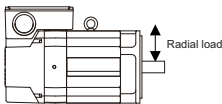
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-240
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	15
	Short time rated output	18.5 (30-minute rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		A160
Continuous rated current[A]		94
Continuous rated torque[N·m]		95.5
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.23
Inertia[kg·m <sup>2</sup> ]		0.0575
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		110
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

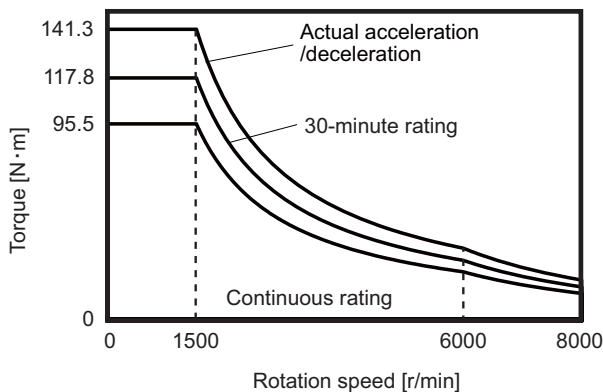
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

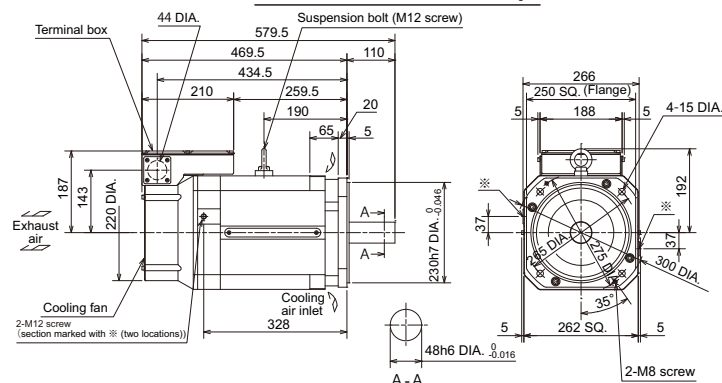
Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]

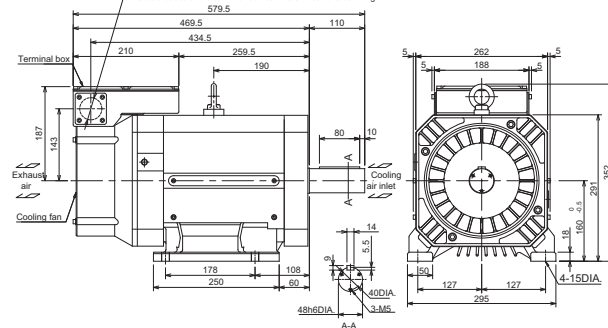
SJ-V18.5-04ZT with standard flange

The lead outlet of the terminal box can be shifted to left and right.



SJ-V18.5-04ZT with standard legs (with key)

The lead outlet of the terminal box can be shifted to left and right.



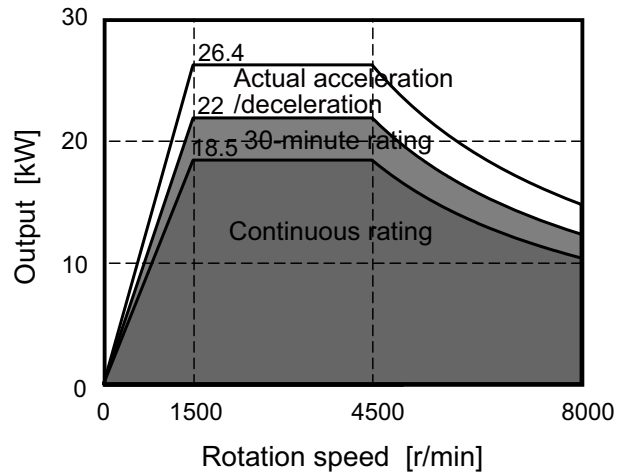
Normal specifications

# SJ-V22-01ZT

Specifications

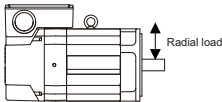
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-240
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	18.5
	Short time rated output	22 (30-minute rating)
	Standard output during acceleration/deceleration	22
	Actual acceleration/deceleration output(*3)	26.4
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		B160
Continuous rated current[A]		101
Continuous rated torque[N·m]		118
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.319
Inertia[kg·m <sup>2</sup> ]		0.08
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		135
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

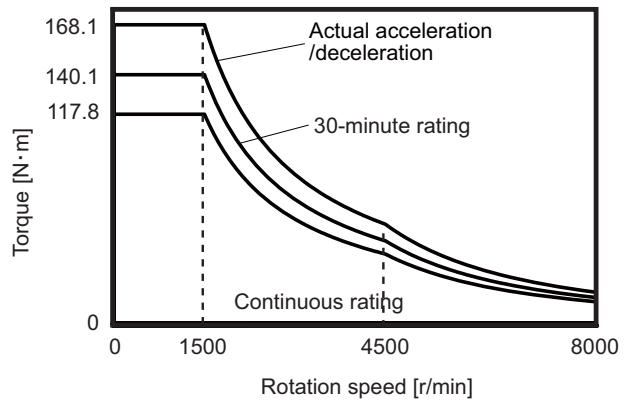
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

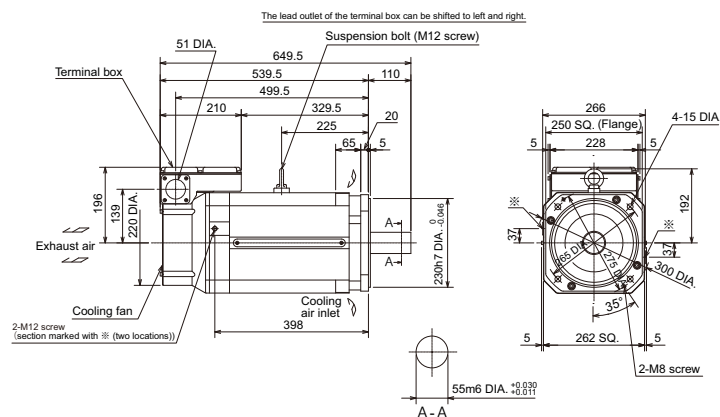
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

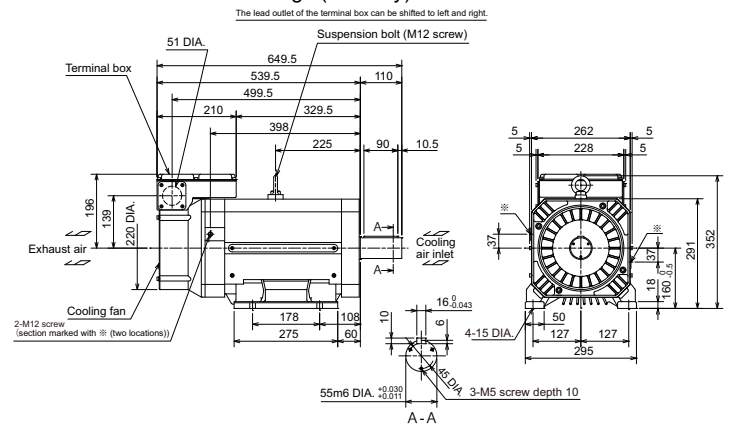


Outline dimension drawings [Unit : mm]

SJ-V22-01ZT with standard flange



SJ-V22-01ZT with standard legs (with key)









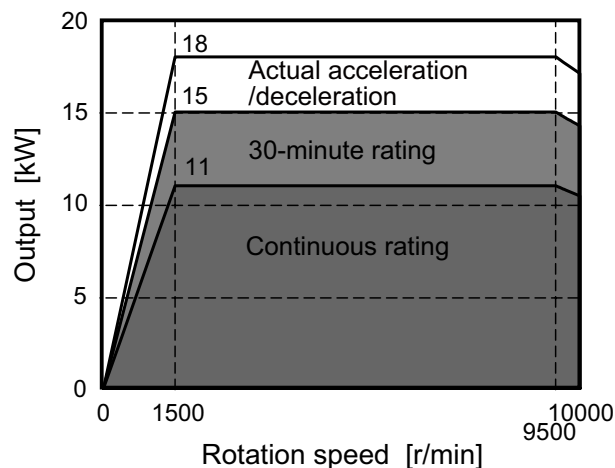
Normal specifications

# SJ-V22-06ZT

## Specifications

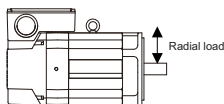
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-240
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (30-minute rating)
	Standard output during acceleration/deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		A160
Continuous rated current[A]		89
Continuous rated torque[N·m]		70.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.23
Inertia[kg·m <sup>2</sup> ]		0.0575
Tolerable radial load(*2) [N]		2450
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		110
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

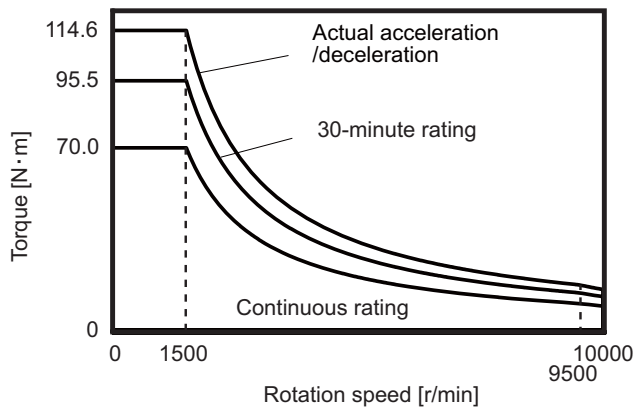
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

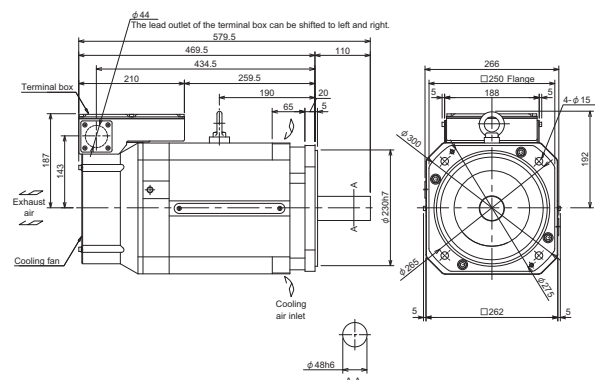
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

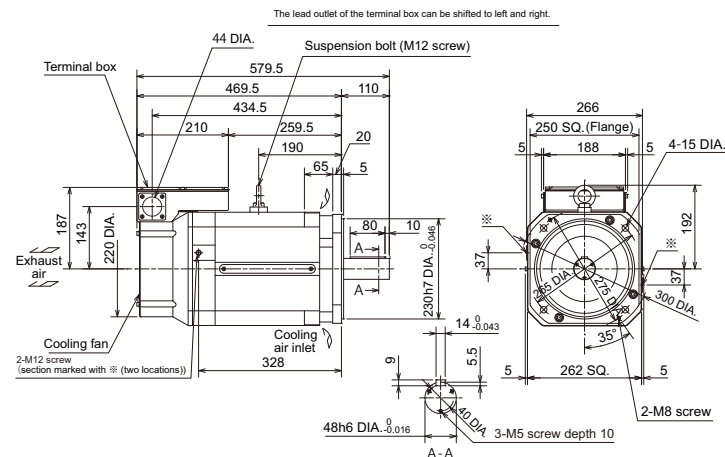


## Outline dimension drawings [Unit : mm]

### SJ-V22-06ZT with standard flange



### SJ-V22-06ZT with standard flange (with key)



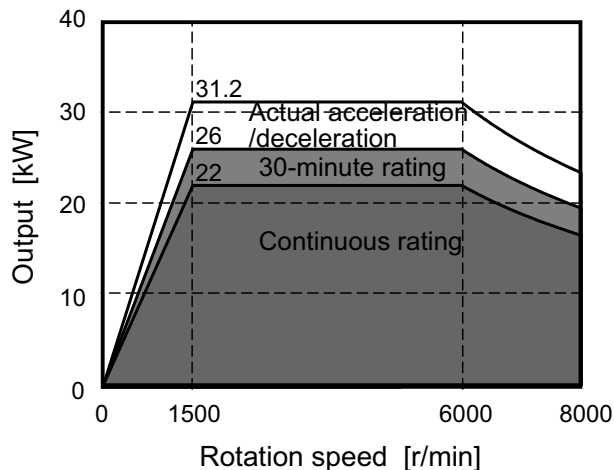
Normal specifications

# SJ-V26-01ZT

## Specifications

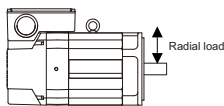
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-320
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	22
	Short time rated output	26 (30-minute rating)
	Standard output during acceleration/deceleration	26
	Actual acceleration/deceleration output(*3)	31.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		C160
Continuous rated current[A]		140
Continuous rated torque[N·m]		140
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.37
Inertia[kg·m <sup>2</sup> ]		0.0925
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		155
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

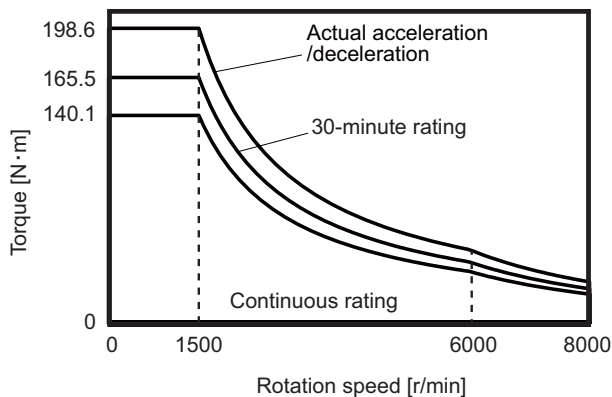
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

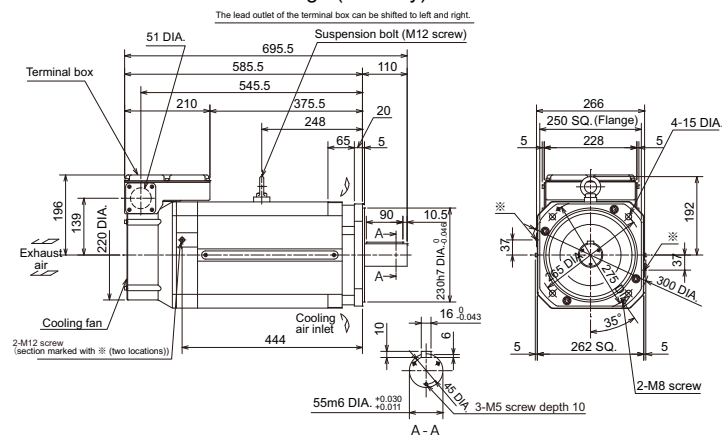
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

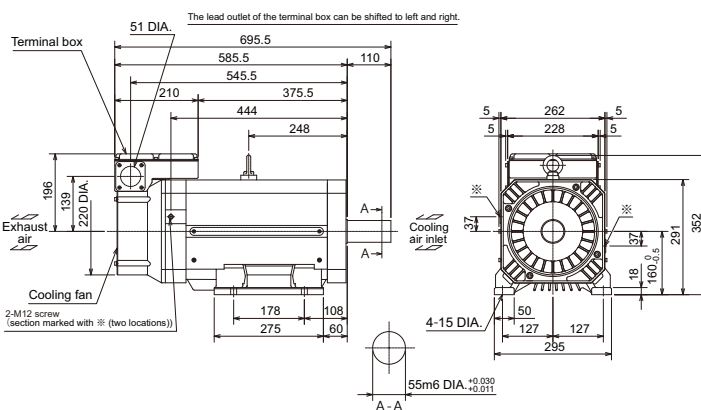


## Outline dimension drawings [Unit : mm]

### SJ-V26-01ZT with standard flange (with key)



### SJ-V26-01ZT with standard legs



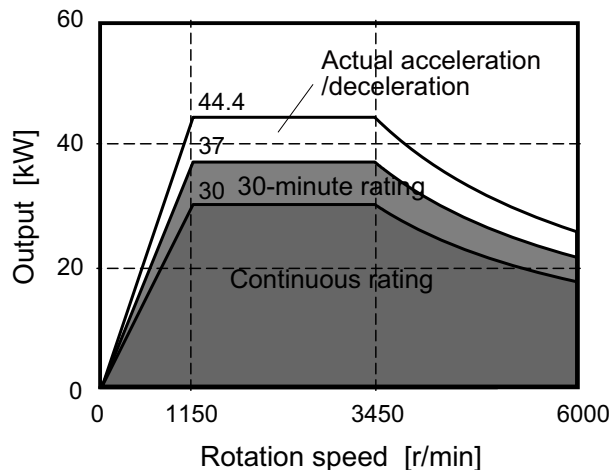
Normal specifications

# SJ-V37-01ZT

Specifications

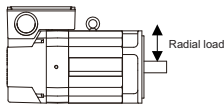
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-400
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	30
	Short time rated output	37 (30-minute rating)
	Standard output during acceleration/deceleration	37
	Actual acceleration/deceleration output(*3)	44.4
Base rotation speed[r/min]		1150
Maximum rotation speed[r/min]		6000
Frame No.		B180
Continuous rated current[A]		179
Continuous rated torque[N·m]		249
GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.36
Inertia[kg·m <sup>2</sup> ]		0.34
Tolerable radial load(*2) [N]		3920
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		300
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

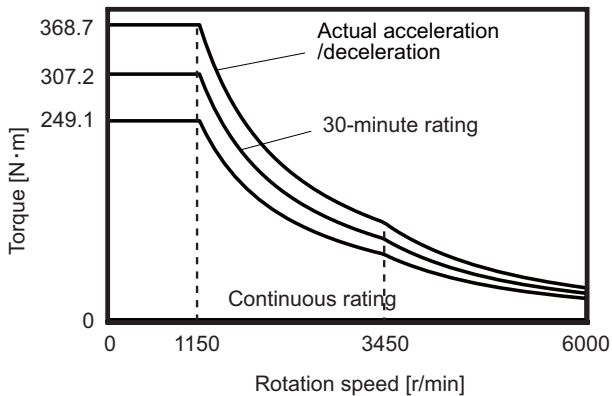
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

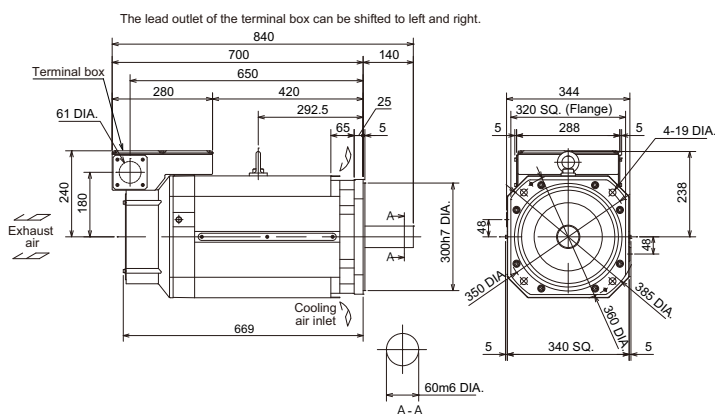
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

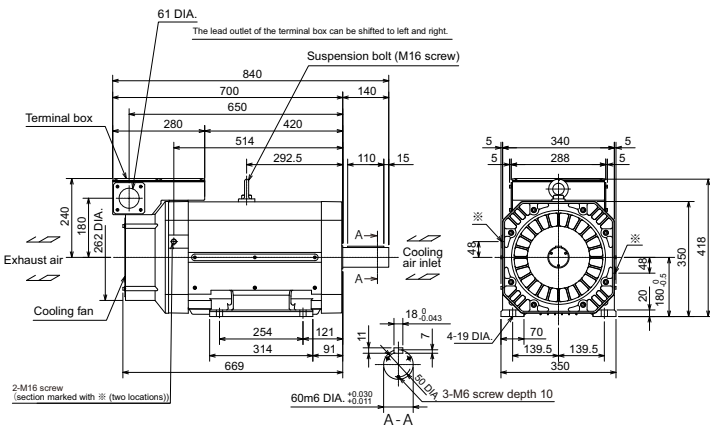


Outline dimension drawings [Unit : mm]

SJ-V37-01ZT with standard flange



SJ-V37-01ZT with standard legs (with key)







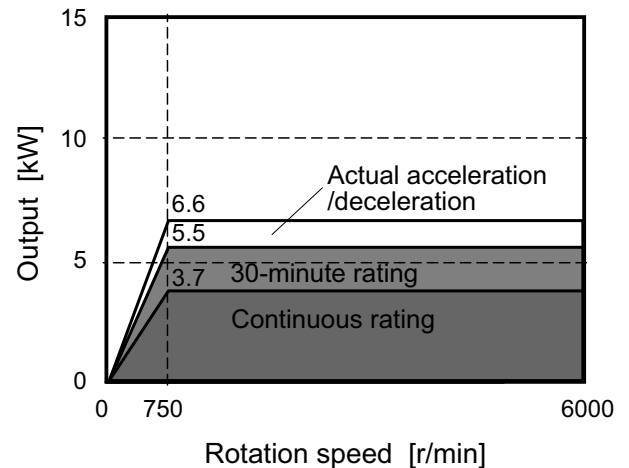
Wide range constant output specifications

# SJ-V11-01T

## Specifications

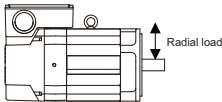
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (30-minute rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed[r/min]		750
Maximum rotation speed[r/min]		6000
Frame No.		B112
Continuous rated current[A]		46
Continuous rated torque[N·m]		47.1
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.12
Inertia[kg·m <sup>2</sup> ]		0.03
Tolerable radial load(*2) [N]		1960
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		70
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

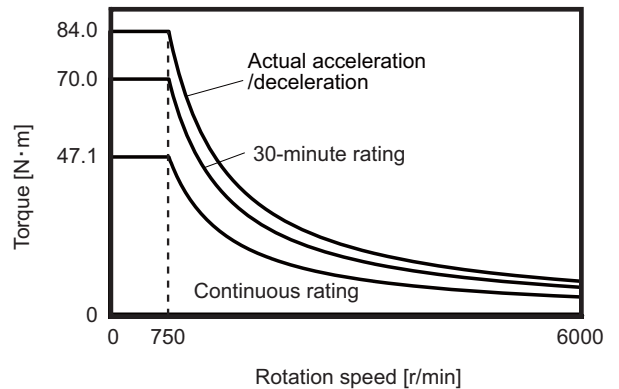
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

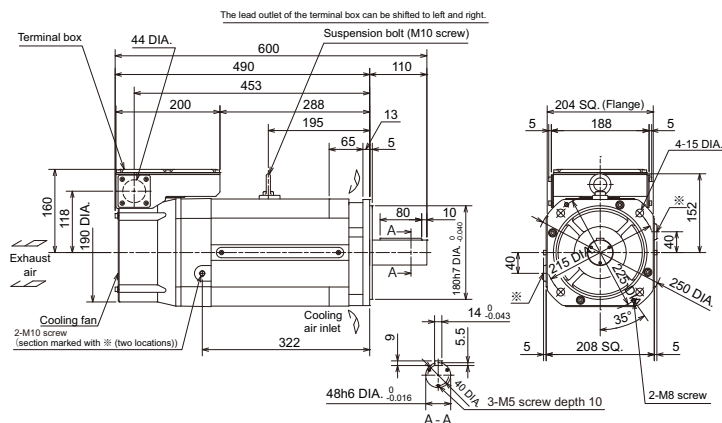
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

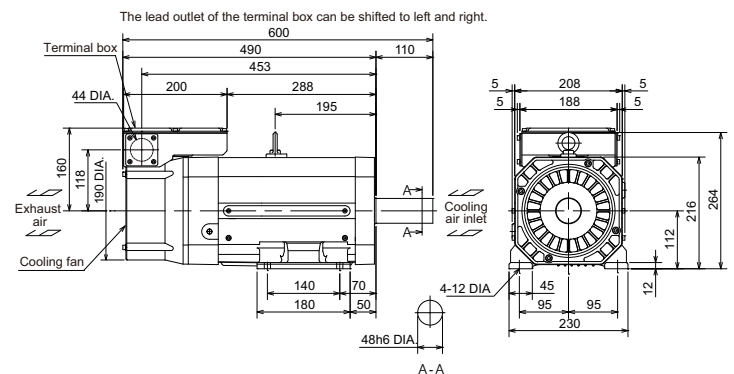


## Outline dimension drawings [Unit : mm]

### SJ-V11-01T with standard flange (with key)



### SJ-V11-01T with standard legs



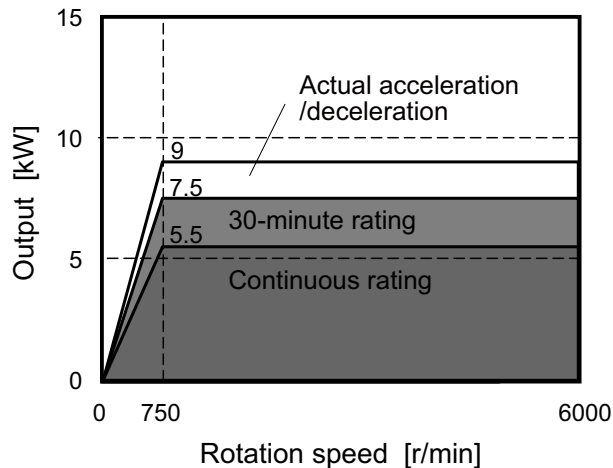
Wide range constant output specifications

# SJ-V11-09T

## Specifications

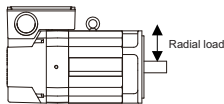
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	7.5 (30-minute rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed[r/min]	750	
Maximum rotation speed[r/min]	6000	
Frame No.	A160	
Continuous rated current[A]	49	
Continuous rated torque[N·m]	70.0	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.23	
Inertia[kg·m <sup>2</sup> ]	0.0575	
Tolerable radial load(*2) [N]	2940	
Cooling fan	Input voltage	3-phase 200V
Degree of protection	IP44	
Mass[kg]	110	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

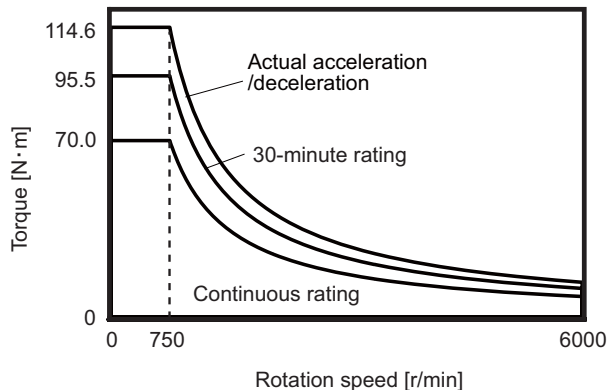
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

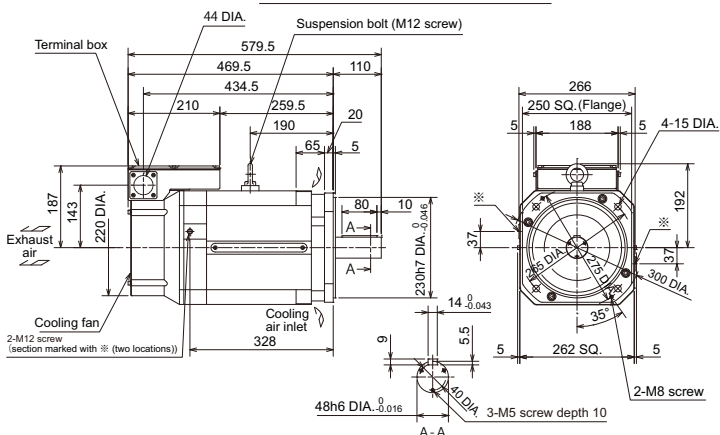
## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

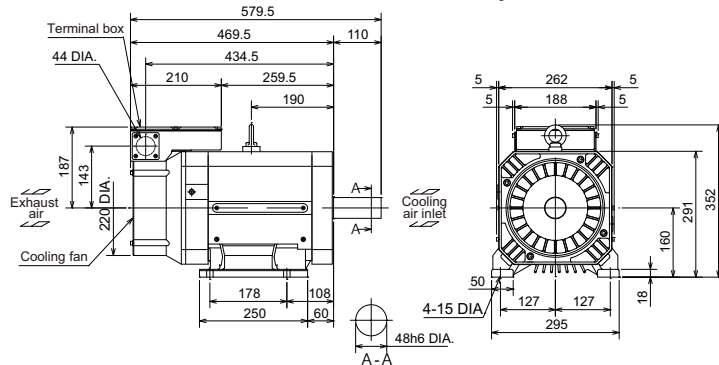
### SJ-V11-09T with standard flange (with key)

The lead outlet of the terminal box can be shifted to left and right.



### SJ-V11-09T with standard legs

The lead outlet of the terminal box can be shifted to left and right.







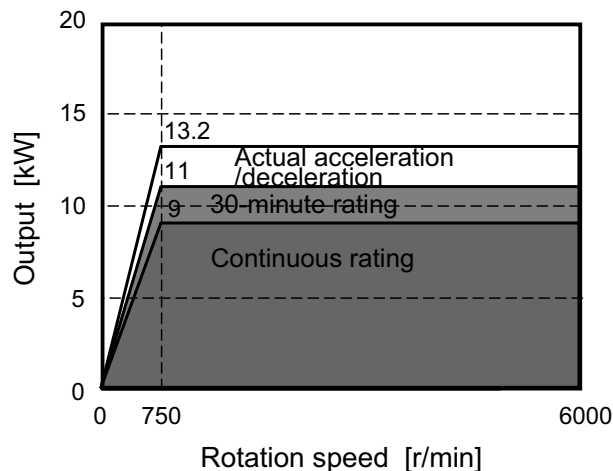


Wide range constant output specifications  
**SJ-V18.5-03T**

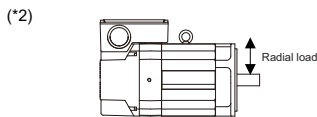
Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-240
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	9
	Short time rated output	11 (30-minute rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed[r/min]		750
Maximum rotation speed[r/min]		6000
Frame No.		B160
Continuous rated current[A]		84
Continuous rated torque[N·m]		115
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.319
Inertia[kg·m <sup>2</sup> ]		0.08
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		135
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

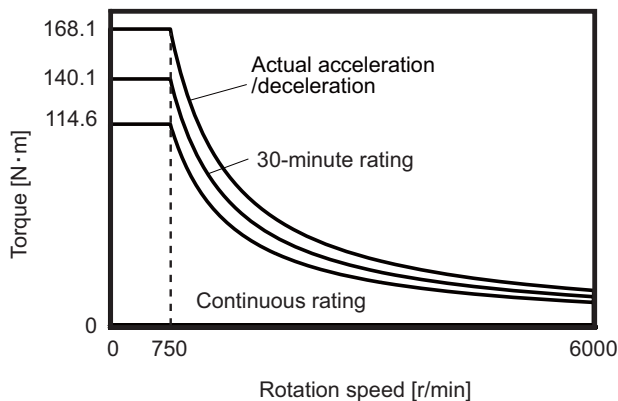
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

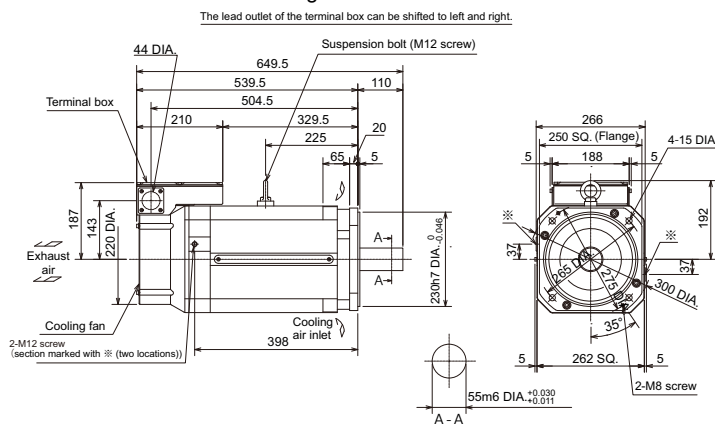
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

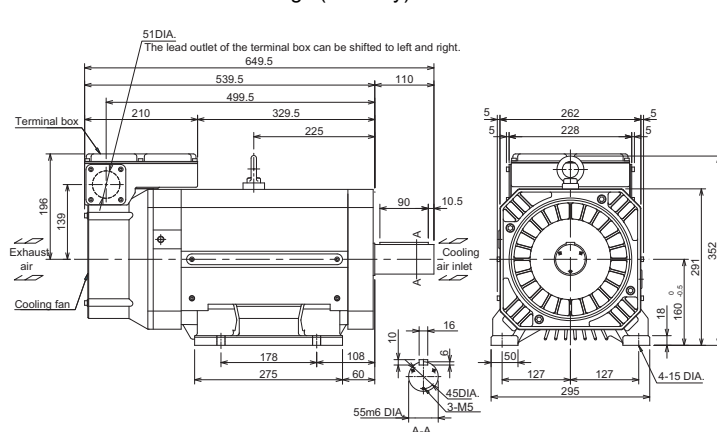


Outline dimension drawings [Unit : mm]

SJ-V18.5-03T with standard flange



SJ-V18.5-03T with standard legs (with key)



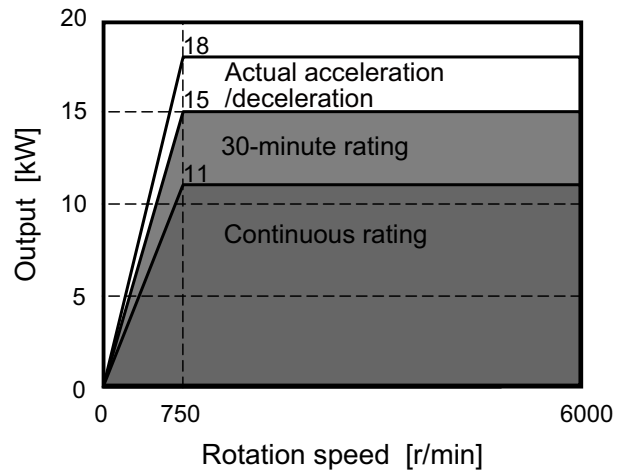
Wide range constant output specifications

# SJ-V22-05T

## Specifications

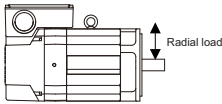
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-320
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (30-minute rating)
	Standard output during acceleration/deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed[r/min]		750
Maximum rotation speed[r/min]		6000
Frame No.		B160
Continuous rated current[A]		107
Continuous rated torque[N·m]		140
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.319
Inertia[kg·m <sup>2</sup> ]		0.08
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		135
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

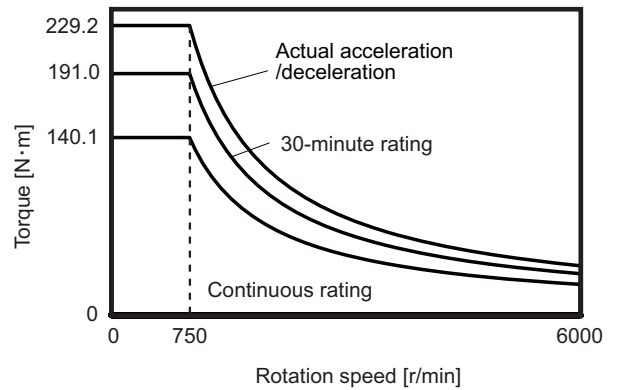
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

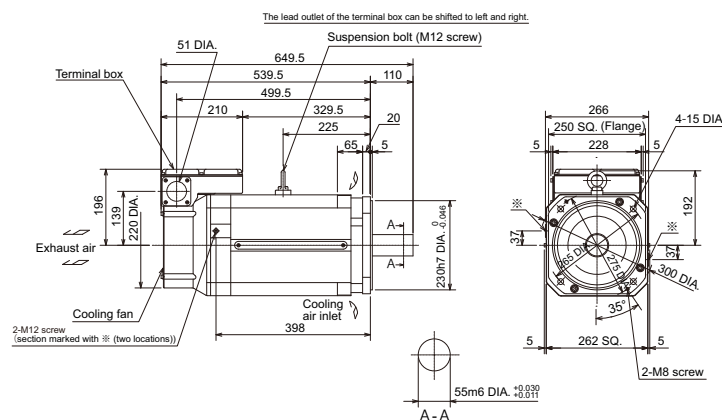
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

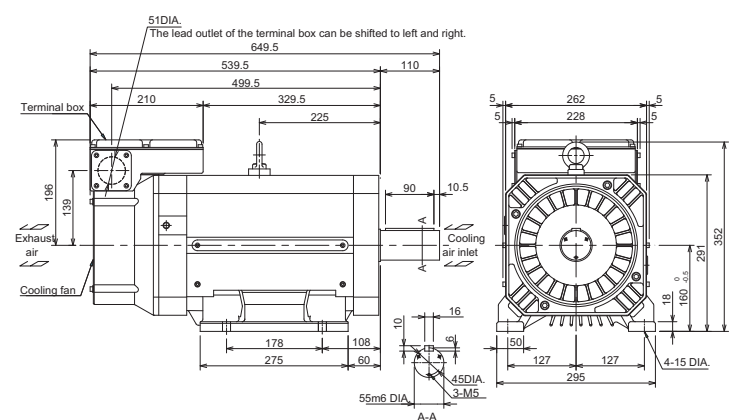


## Outline dimension drawings [Unit : mm]

### SJ-V22-05T with standard flange



### SJ-V22-05T with standard legs (with key)



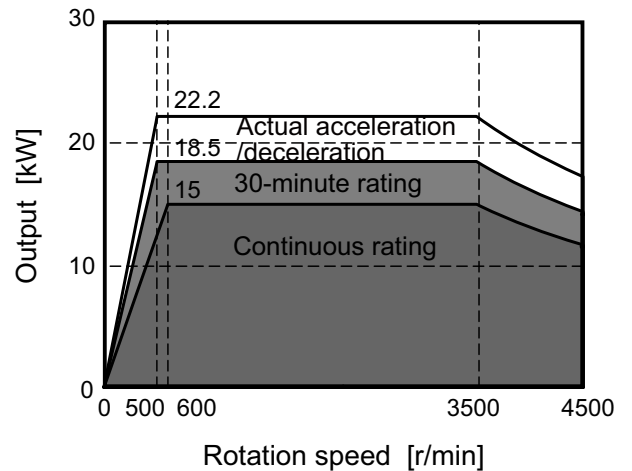
Wide range constant output specifications

# SJ-V22-09T

## Specifications

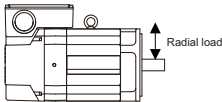
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-320
	2-axis type	MDS-E-SP2-
	Multi axis type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	15
	Short time rated output	18.5 (30-minute rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed	Continuous rating[r/min]	600
	Short time rating[r/min]	500
Maximum rotation speed[r/min]		4500
Frame No.		A180
Continuous rated current[A]		106
Continuous rated torque[N·m]		239
GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.23
Inertia[kg·m <sup>2</sup> ]		0.308
Tolerable radial load(*2) [N]		3920
Cooling fan	Input voltage	3-phase 200V
Degree of protection		IP44
Mass[kg]		280
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

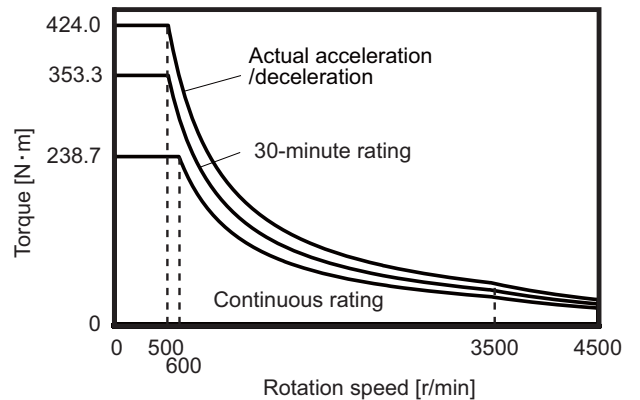
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

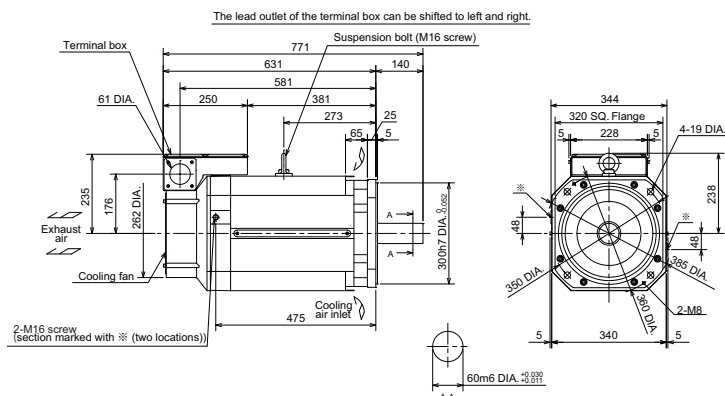
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

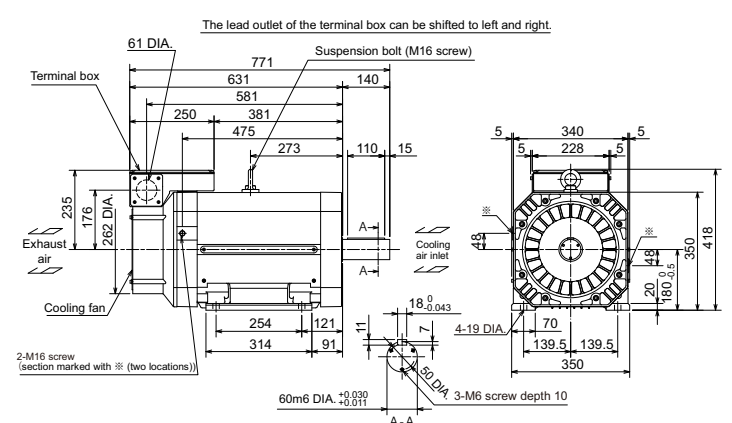


## Outline dimension drawings [Unit : mm]

### SJ-V22-09T with standard flange



### SJ-V22-09T with standard legs (with key)

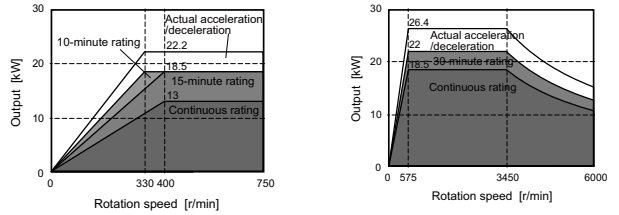


Wide range constant output specifications  
**SJ-VK22-19ZT**

Specifications

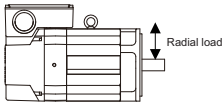
Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-E-SP-	320
	2-axis type	MDS-E-SP2-	-
	Multi axis type	MDS-EM-SPV3-	-
	Regenerative resistor type	MDS-EJ-SP-	-
Output capacity[kW]	Continuous rated output	13	18.5
	Short time rated output	18.5	22
		(10-minute rating)	(30-minute rating)
	Standard output during acceleration/deceleration	18.5	22
	Actual acceleration/deceleration output(*3)	22.2	26.4
Base rotation speed	Continuous rating[r/min]	400	575
	Short time rating[r/min]	330	575
Maximum rotation speed[r/min]		750	6000
Frame No.			B180
Continuous rated current[A]			133
Continuous rated torque[N·m]	310		307
GD <sup>2</sup> [kg·m <sup>2</sup> ]			1.36
Inertia[kg·m <sup>2</sup> ]			0.34
Tolerable radial load(*2) [N]			3920
Cooling fan	Input voltage	3-phase 200V	
Degree of protection			IP44
Mass[kg]			300
Heat-resistant class			155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)

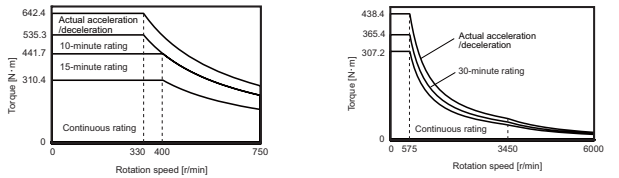


(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Torque - rotation speed characteristics

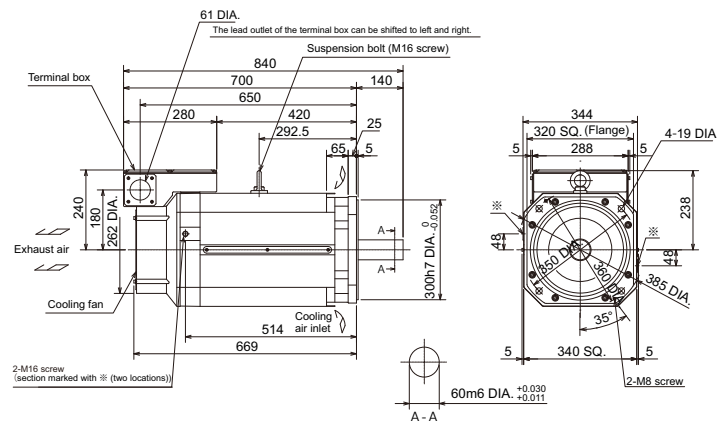


Environmental conditions

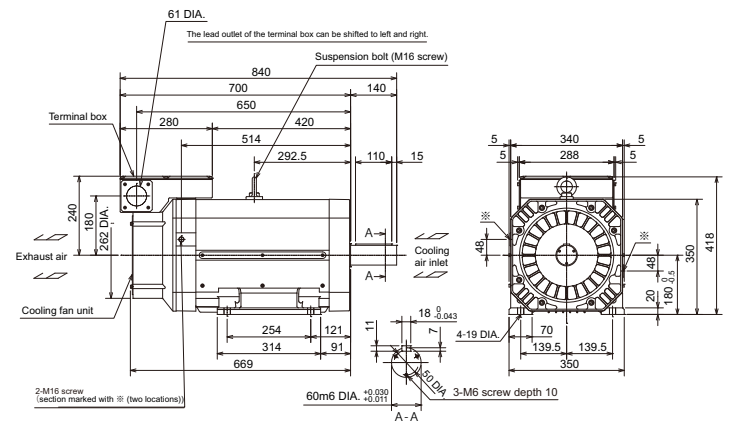
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]

SJ-VK22-19ZT with standard flange



SJ-VK22-19ZT with standard legs (with key)



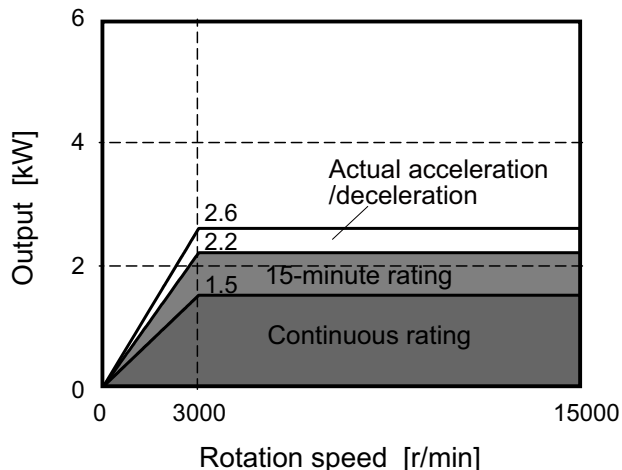
Low-inertia specifications

# SJ-VL2.2-02ZT

## Specifications

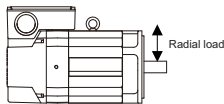
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP- 40
	2-axis type	MDS-E-SP2- 40
	Multi axis type	MDS-EM-SPV3- -
	Regenerative resistor type	MDS-EJ-SP- -
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	2.2 (15-minute rating)
	Standard output during acceleration/deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.6
Base rotation speed[r/min]		3000
Maximum rotation speed[r/min]		15000
Frame No.		B71
Continuous rated current[A]		10
Continuous rated torque[N·m]		4.8
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0096
Inertia[kg·m <sup>2</sup> ]		0.0024
Tolerable radial load(*2) [N]		196
Cooling fan	Input voltage	Single-phase 200V
Degree of protection		IP44
Mass[kg]		20
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

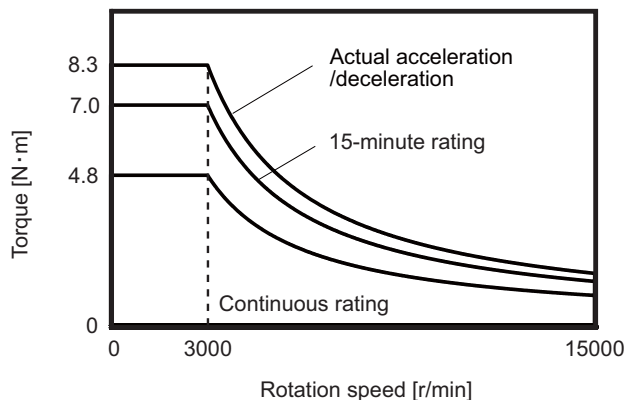
(\*4) The acceleration/deceleration frequency is limited by the regenerative resistor.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

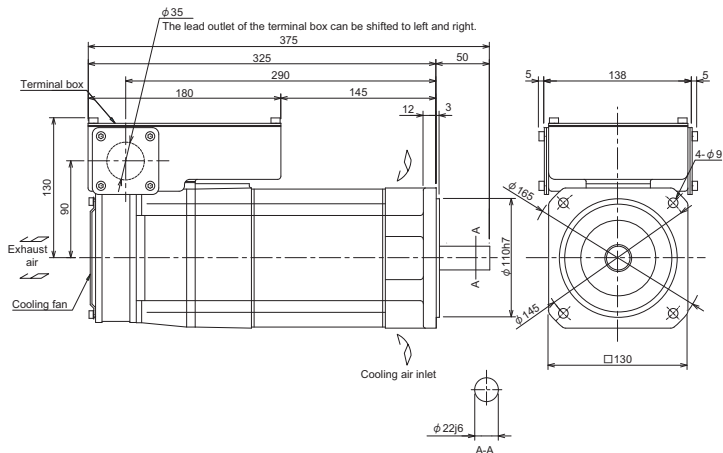
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Output characteristics

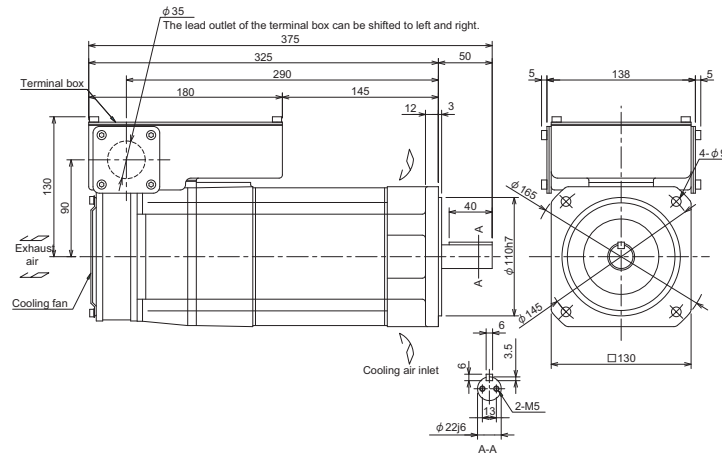


## Outline dimension drawings [Unit : mm]

### SJ-VL2.2-02ZT with standard flange



### SJ-VL2.2-02ZT with standard flange (with key)



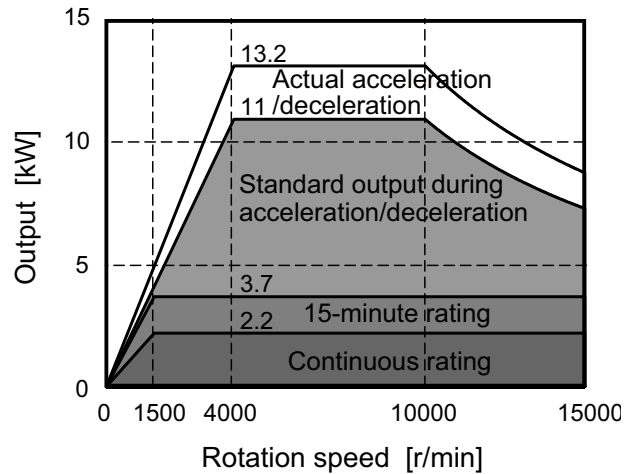
Low-inertia specifications

# SJ-VL11-02FZT

## Specifications

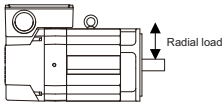
Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7 (15-minute rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		15000
Frame No.		D90
Continuous rated current[A]		35
Continuous rated torque[N·m]		14.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.012
Inertia[kg·m <sup>2</sup> ]		0.003
Tolerable radial load(*2) [N]		245
Cooling fan	Input voltage	Single-phase 200V
Degree of protection		IP44
Mass[kg]		42
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(Note) The load point is at the one-half of the shaft length.

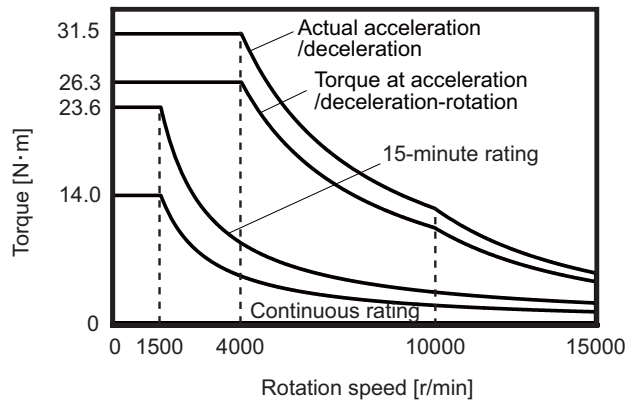
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

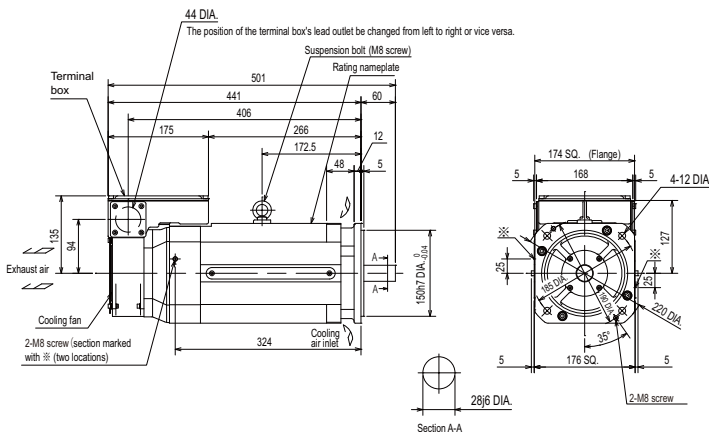
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000 meters or less above sea level, Storage: 1000 meters or less above sea level, Transportation: 10000 meters or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-VL11-02FZT with standard flange



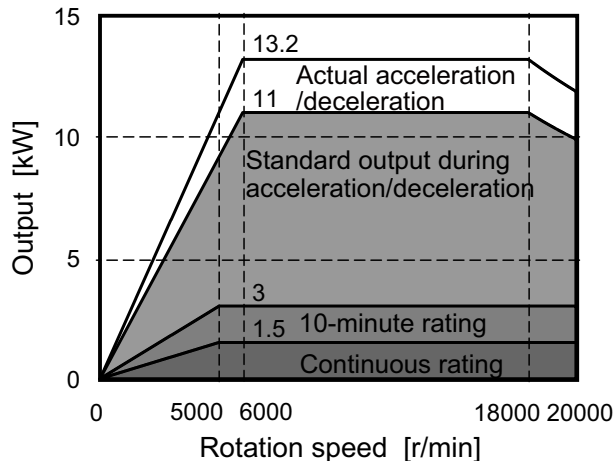
Low-inertia specifications

# SJ-VL11-05FZT-S01

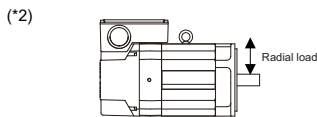
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi axis type	MDS-EM-SPV3-16040, 16080, 16040S
	Regenerative resistor type	MDS-EJ-SP-
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	3 (10-minute rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed[r/min]		5000
Maximum rotation speed[r/min]		20000
Frame No.		B71
Continuous rated current[A]		19
Continuous rated torque[N·m]		2.86
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0096
Inertia[kg·m <sup>2</sup> ]		0.0024
Tolerable radial load(*2) [N]		98
Cooling fan	Input voltage	Single-phase 200V
Degree of protection		IP44
Mass[kg]		20
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



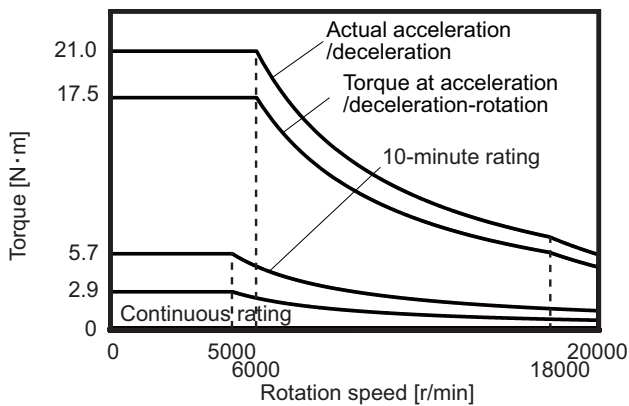
(Note) The load point is at the one-half of the shaft length.

(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) The acceleration/deceleration frequency is limited by the regenerative resistor.

(\*5) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Torque - rotation speed characteristics

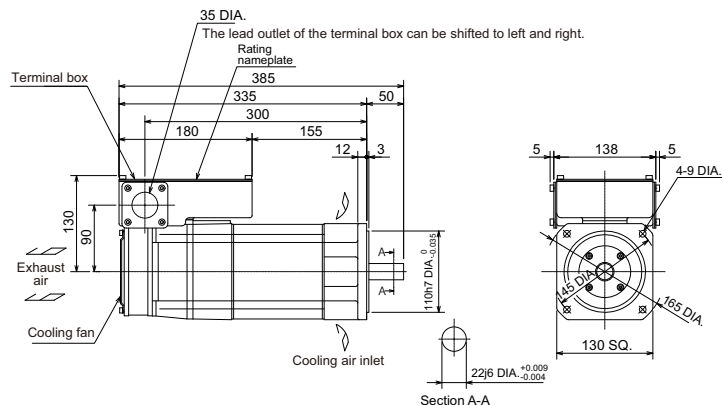


## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### SJ-VL11-05FZT-S01 with standard flange



# Built-in Spindle Motor



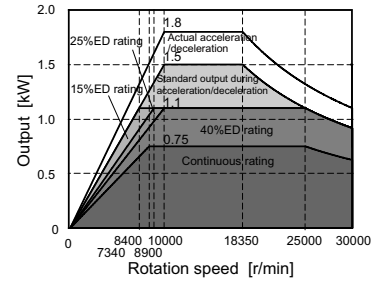
Normal specifications

# SJ-BG090A/300-01

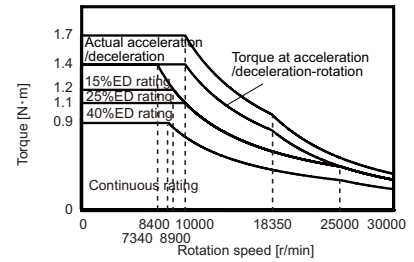
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
Coil changeover		
Output capacity[kW]	Continuous rated output	0.75
	Short time rated output	1.1 (15%ED rating)
	Standard output during acceleration/deceleration	1.5
	Actual acceleration/deceleration output(*3)	1.8
Base rotation speed	Continuous[r/min]	8400
	Short time[r/min]	7340
Maximum rotation speed[r/min]		30000
Frame No. - Core width		50-25
Torque (Base rotation speed)	Continuous[N·m]	0.85
	Short time[N·m]	1.4
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.00086
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00021
Mass	Stator[kg]	0.7
	Rotor[kg]	0.4
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		230
Cooling oil amount[l/min (20°C)]		5

## Output characteristics



## Torque - rotation speed characteristics

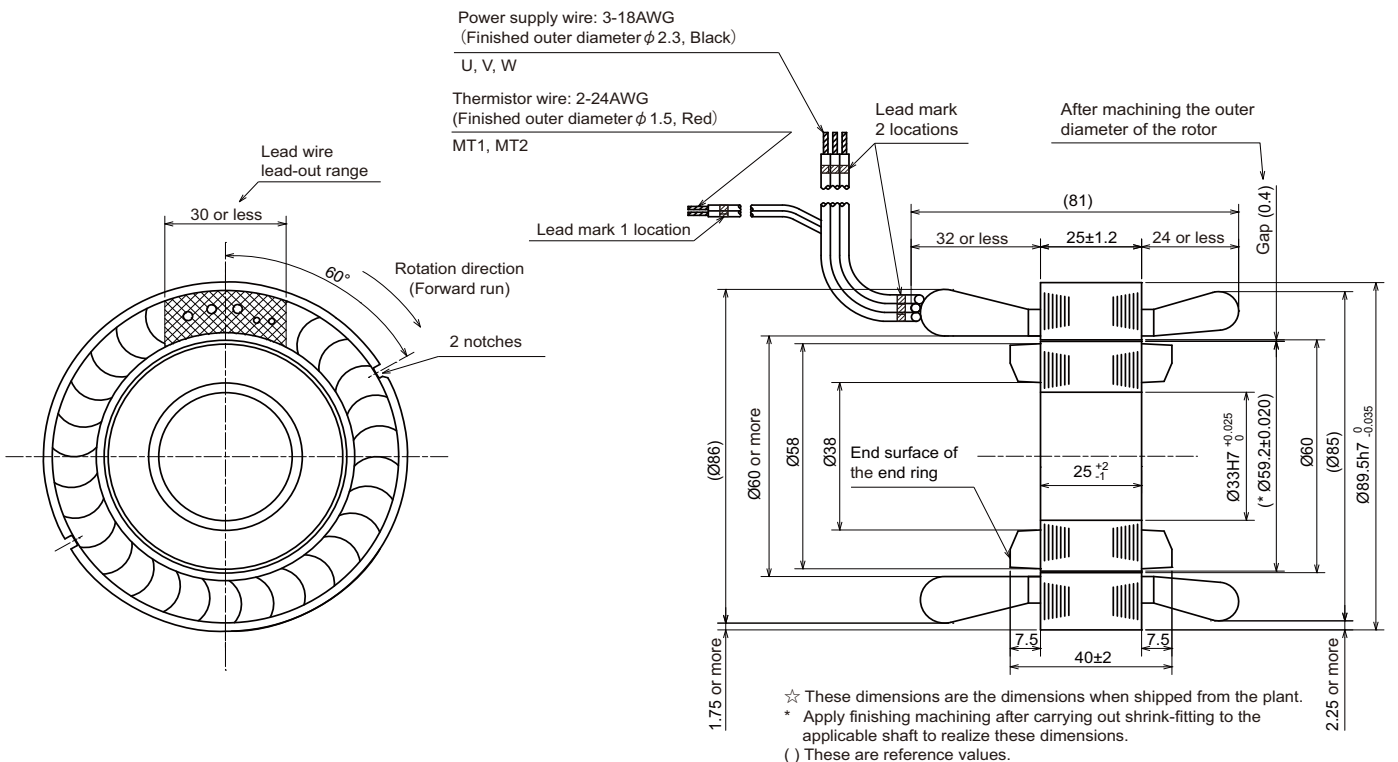


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



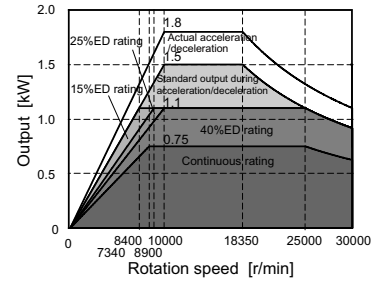
Normal specifications

# SJ-BG090A/300-01R

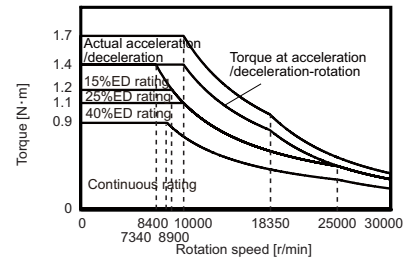
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
Coil changeover		
Output capacity[kW]	Continuous rated output	0.75
	Short time rated output	1.1 (15%ED rating)
	Standard output during acceleration/deceleration	1.5
	Actual acceleration/deceleration output(*3)	1.8
Base rotation speed	Continuous[r/min]	8400
	Short time[r/min]	7340
Maximum rotation speed[r/min]		30000
Frame No. - Core width		50-25
Torque (Base rotation speed)	Continuous[N·m]	0.85
	Short time[N·m]	1.4
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.00083
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00021
Mass	Stator[kg]	0.7
	Rotor[kg]	0.4
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		230
Cooling oil amount[l/min (20°C)]		5

## Output characteristics



## Torque - rotation speed characteristics

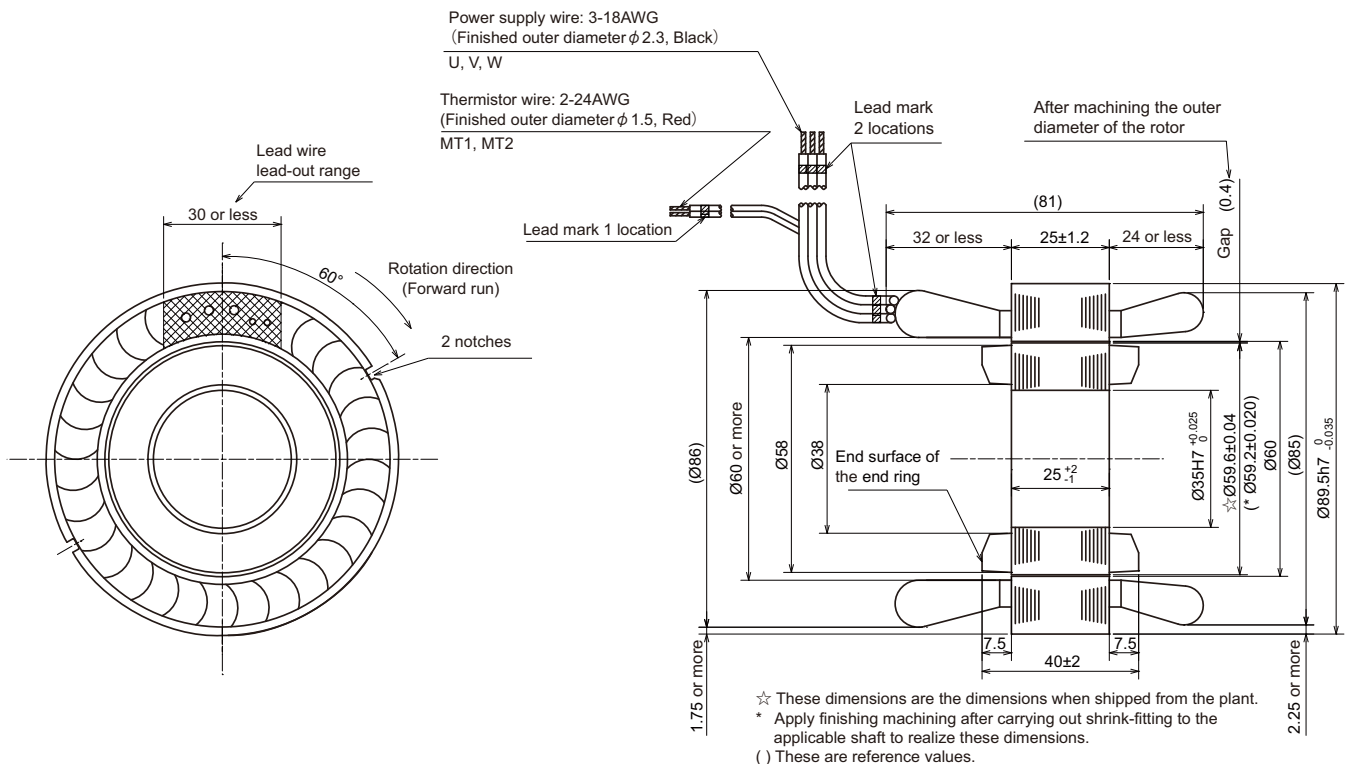


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



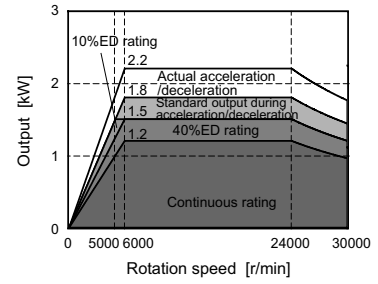
Normal specifications

# SJ-BG090B/300-03

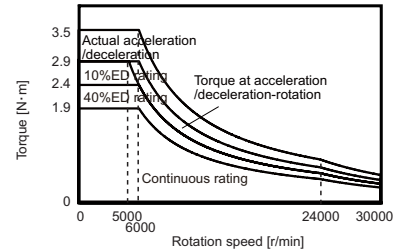
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
Coil changeover		-
Output capacity[kW]	Continuous rated output	1.2
	Short time rated output	1.5 (10%ED rating)
	Standard output during acceleration/deceleration	1.5
	Actual acceleration/deceleration output(*3)	1.8
Base rotation speed	Continuous[r/min]	6000
	Short time[r/min]	5000
Maximum rotation speed[r/min]		30000
Frame No. - Core width		50-45
Torque (Base rotation speed)	Continuous[N·m]	1.91
	Short time[N·m]	2.86
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0015
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0004
Mass	Stator[kg]	1.2
	Rotor[kg]	0.7
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		360
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

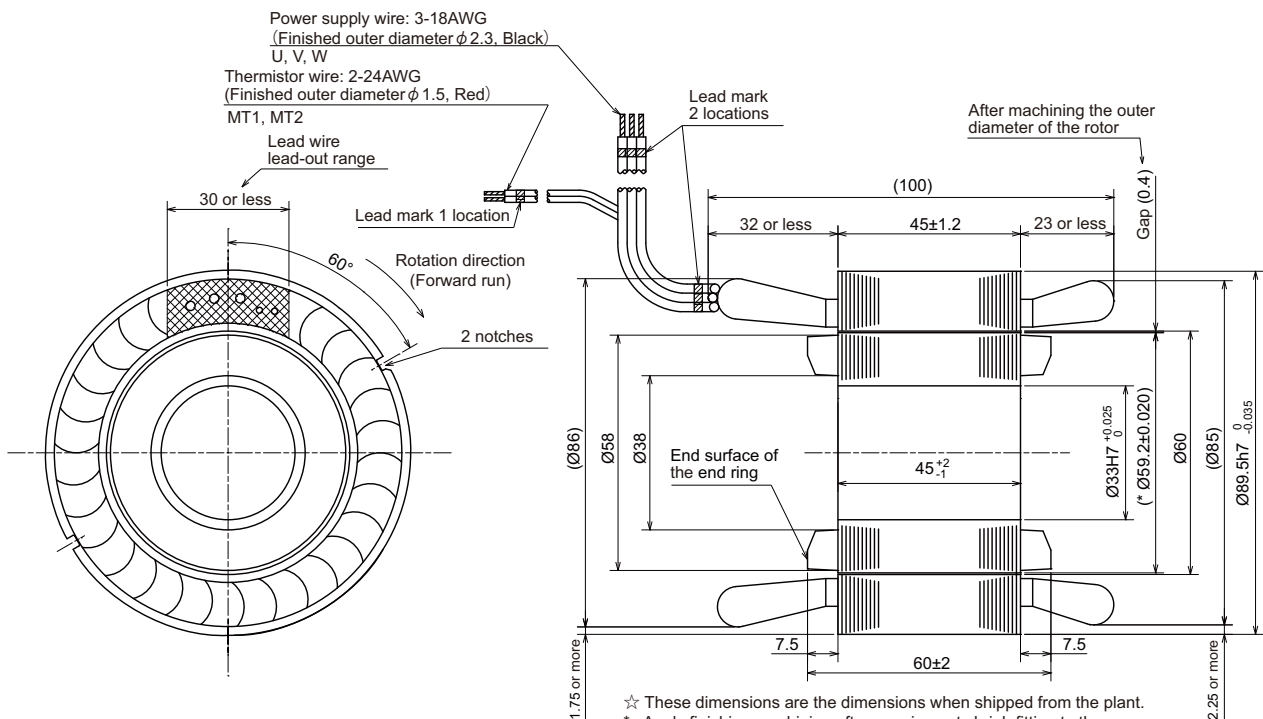


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

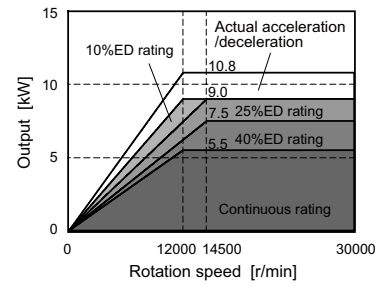
Normal specifications

# SJ-BG090D/300-03

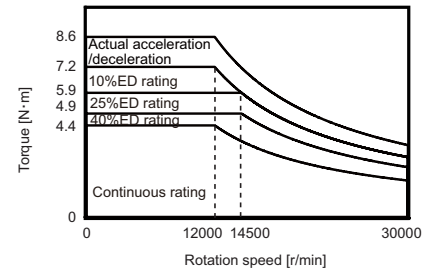
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
Coil changeover		
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	9.0 (10%ED rating)
	Standard output during acceleration/deceleration	9.0
	Actual acceleration/deceleration output(*3)	10.8
Base rotation speed	Continuous[r/min]	12000
	Short time[r/min]	12000
Maximum rotation speed[r/min]		30000
Frame No. - Core width		50-95
Torque (Base rotation speed)	Continuous[N·m]	4.38
	Short time[N·m]	7.16
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0032
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0008
Mass	Stator[kg]	2.6
	Rotor[kg]	1.4
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		1060
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

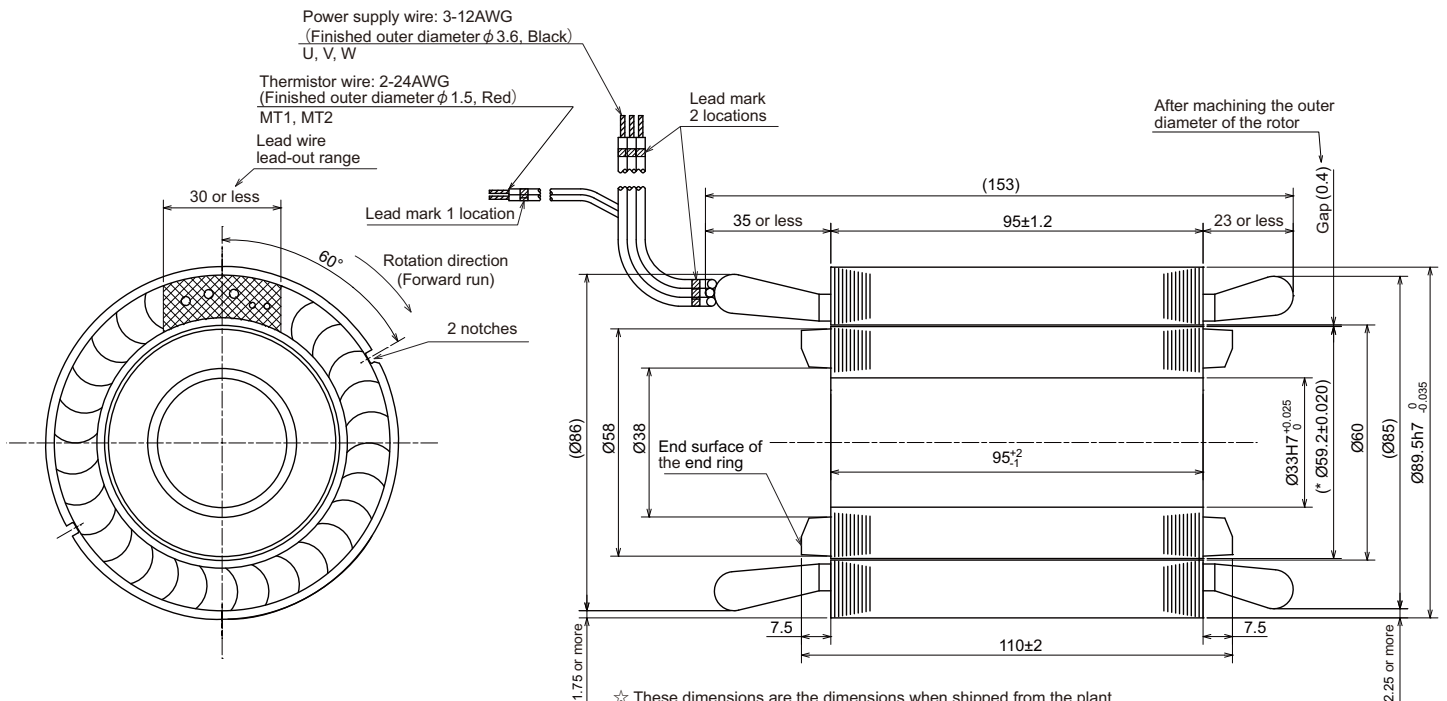


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.

\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.

( ) These are reference values.

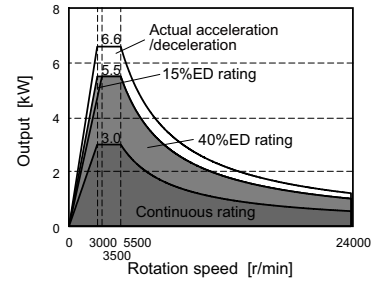
Normal specifications

# SJ-BG110F/240-01

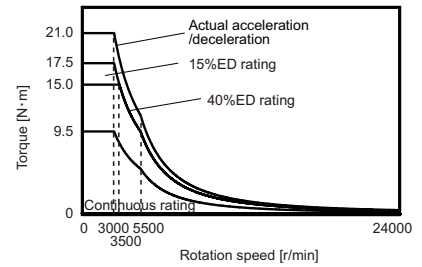
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.0
	Short time rated output	5.5 (15%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	3000
	Short time[r/min]	3000
Maximum rotation speed[r/min]		24000
Frame No. - Core width		63-170
Torque (Base rotation speed)	Continuous[N·m]	9.5
	Short time[N·m]	17.5
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.010
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0026
Mass	Stator[kg]	7.4
	Rotor[kg]	3.2
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		740
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

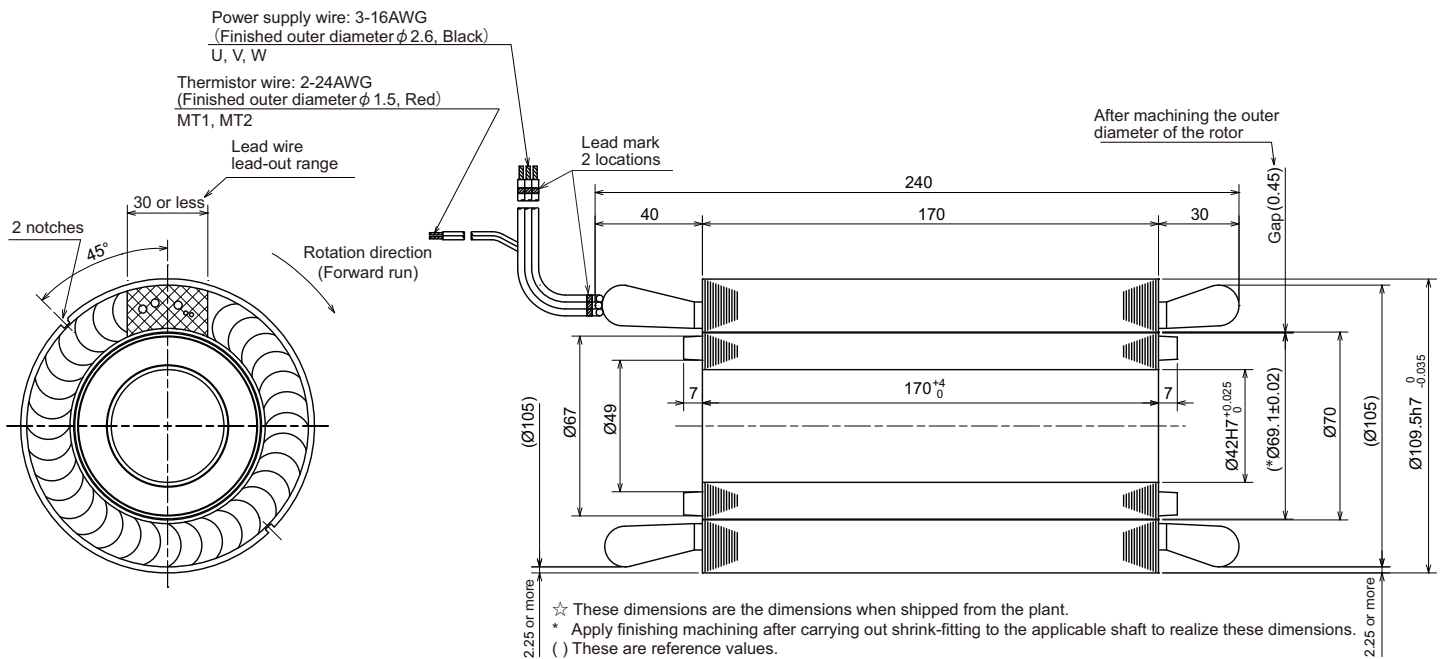


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



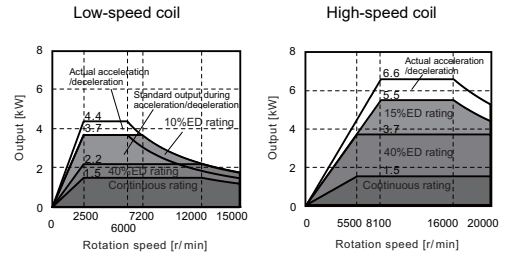
Normal specifications

# SJ-BG120A/200-01

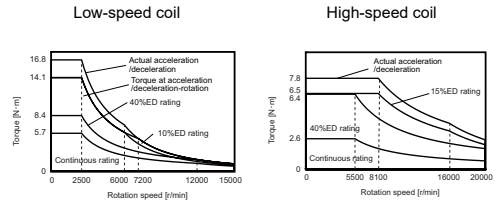
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80	
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	1.5	1.5
	Short time rated output	3.7 (10%ED rating)	5.5 (15%ED rating)
	Standard output during acceleration/deceleration	3.7	5.5
	Actual acceleration/deceleration output(*3)	4.4	6.6
Base rotation speed	Continuous[r/min]	2500	5500
	Short time[r/min]	2500	8100
Maximum rotation speed[r/min]		15000	20000
Frame No. - Core width		71-60	
Torque (Base rotation speed)	Continuous[N·m]	5.7	2.6
	Short time[N·m]	14.1	6.5
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0063	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0016	
Mass	Stator[kg]	3.0	
	Rotor[kg]	1.6	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		510	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics



## Torque - rotation speed characteristics

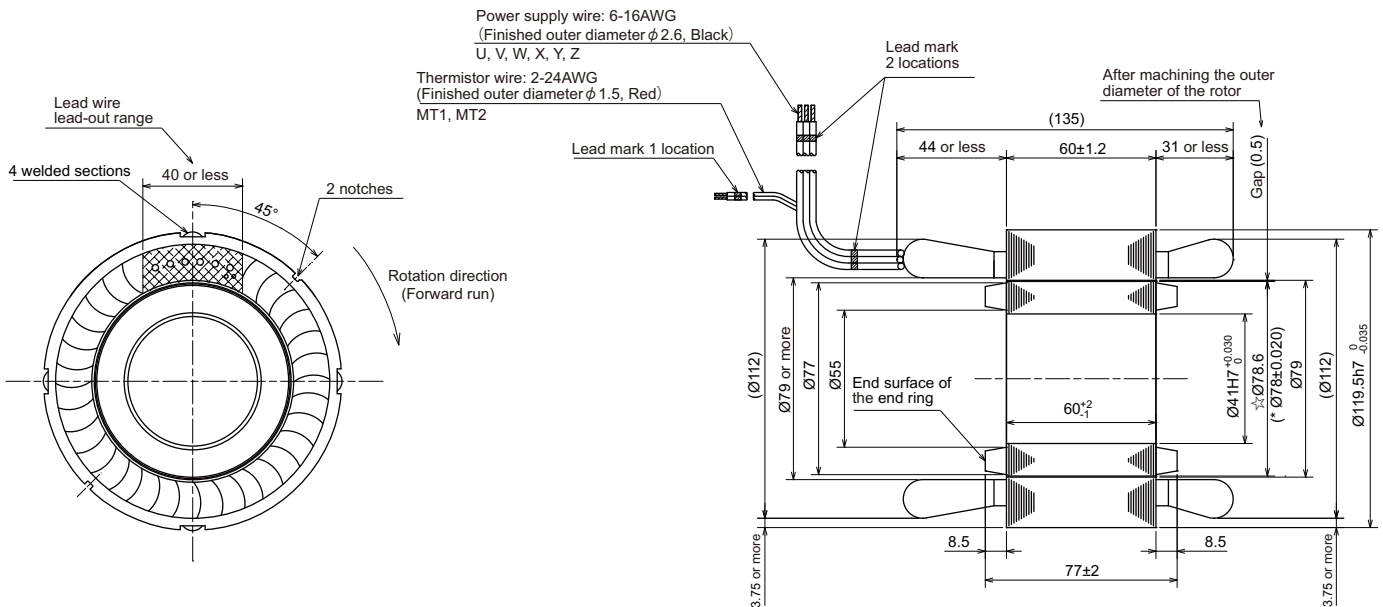


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions after when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.



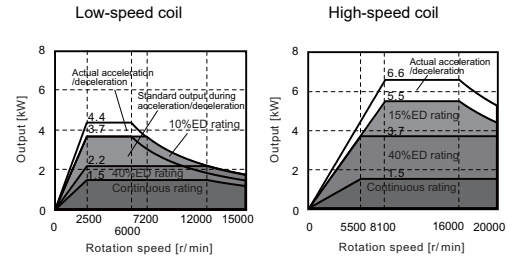
Normal specifications

# SJ-BG120A/200-01R

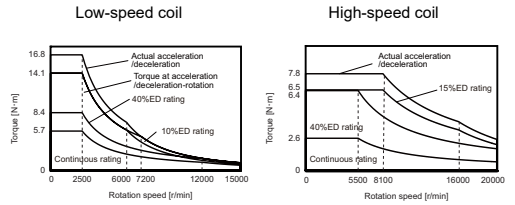
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80	
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	1.5	1.5
	Short time rated output	3.7 (10%ED rating)	5.5 (15%ED rating)
	Standard output during acceleration/deceleration	3.7	5.5
	Actual acceleration/deceleration output(*3)	4.4	6.6
Base rotation speed	Continuous[r/min]	2500	5500
	Short time[r/min]	2500	8100
Maximum rotation speed[r/min]		15000	20000
Frame No. - Core width		71-60	
Torque (Base rotation speed)	Continuous[N·m]	5.7	2.6
	Short time[N·m]	14.1	6.5
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0055	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0014	
Mass	Stator[kg]	3.0	
	Rotor[kg]	1.3	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		510	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics



## Torque - rotation speed characteristics

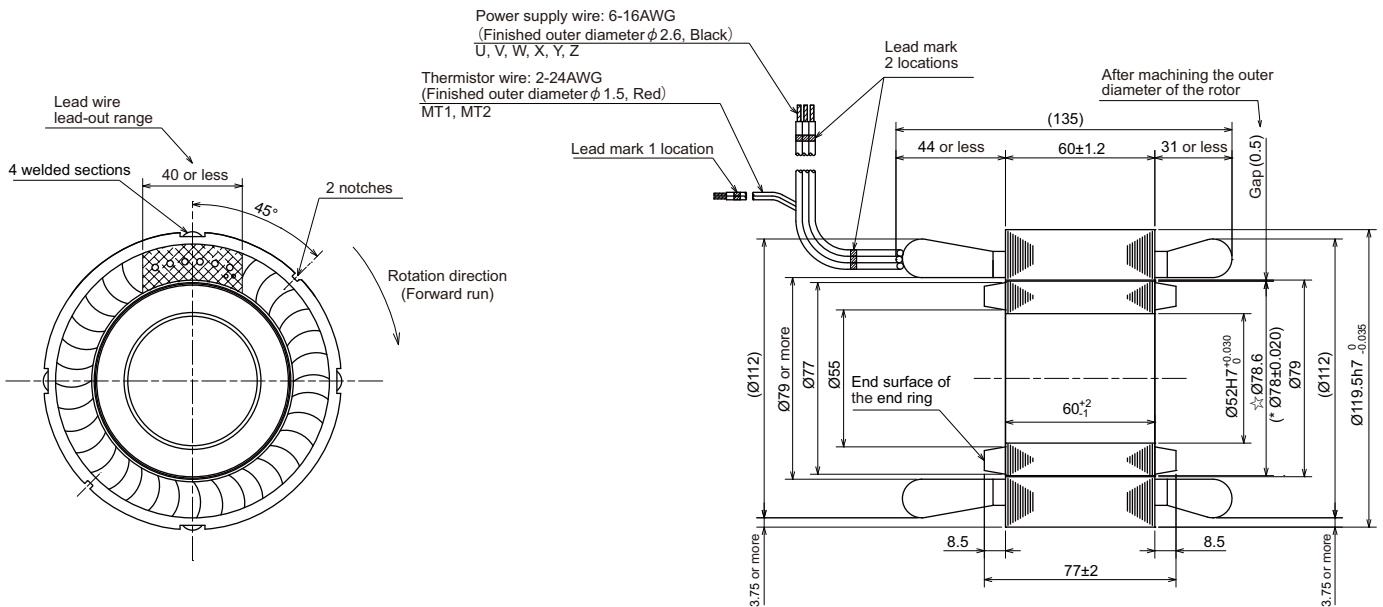


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

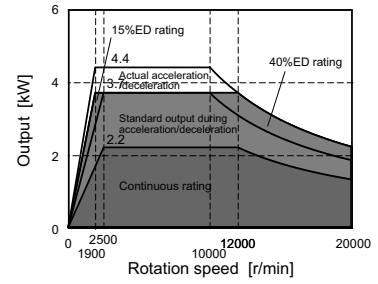
Normal specifications

# SJ-BG120C/200-01

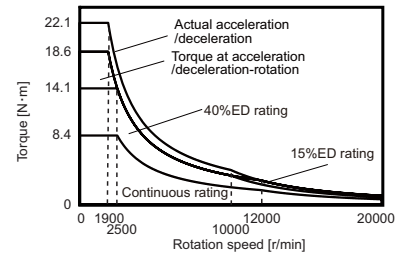
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover		
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7 (15%ED rating)
	Standard output during acceleration/deceleration	3.7
	Actual acceleration/deceleration output(*3)	4.4
Base rotation speed	Continuous[r/min]	2500
	Short time[r/min]	1900
Maximum rotation speed[r/min]		20000
Frame No. - Core width		71-120
Torque (Base rotation speed)	Continuous[N·m]	8.4
	Short time[N·m]	18.6
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.013
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0032
Mass	Stator[kg]	5.9
	Rotor[kg]	3.3
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		570
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

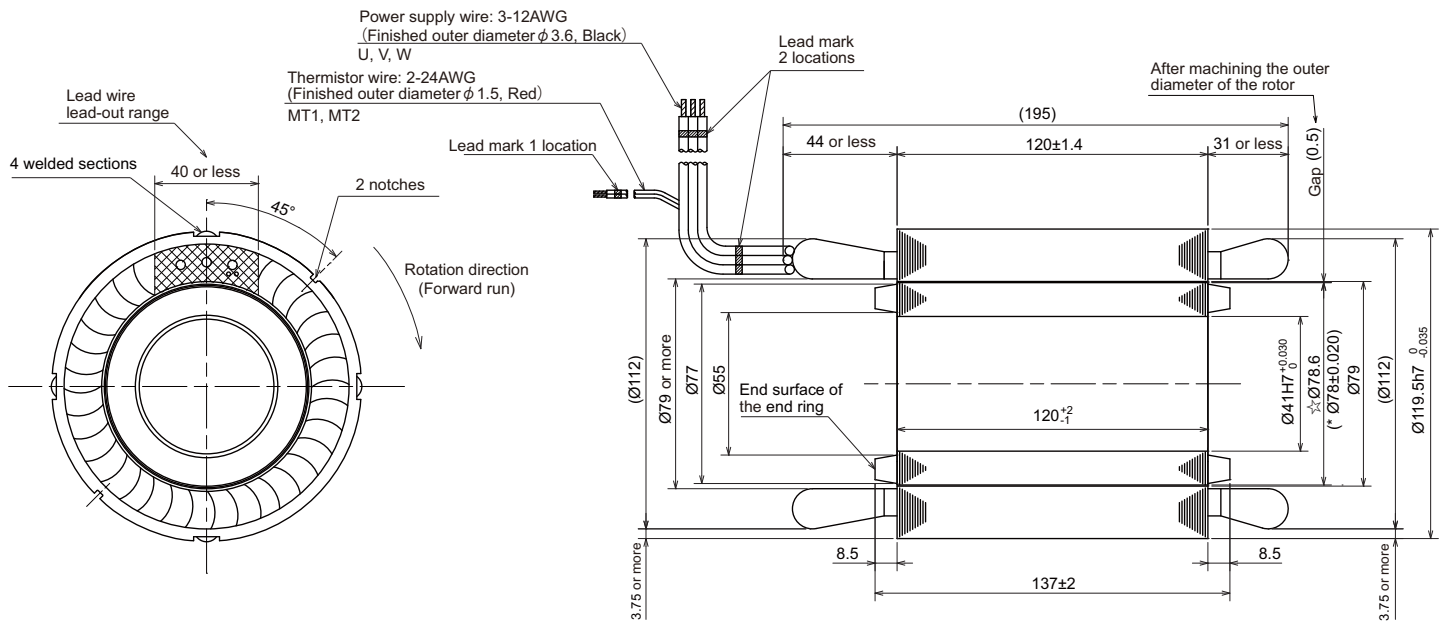


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.



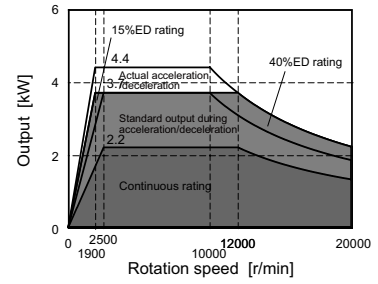
Normal specifications

# SJ-BG120C/200-01R

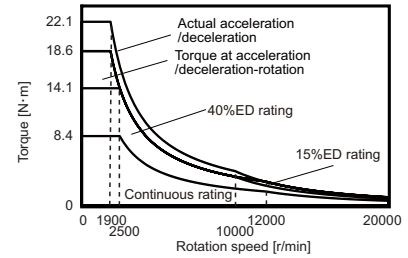
## Specifications

Item	Specifications
Compatible spindle drive unit (*1)	1-axis type MDS-E-SP-80 2-axis type MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover	-
Output capacity[kW]	Continuous rated output 2.2 Short time rated output 3.7 (15%ED rating) Standard output during acceleration/deceleration 3.7 Actual acceleration/deceleration output(*3) 4.4
Base rotation speed	Continuous[r/min] 2500 Short time[r/min] 1900
Maximum rotation speed[r/min]	20000
Frame No. - Core width	71-120
Torque (Base rotation speed)	Continuous[N·m] 8.4 Short time[N·m] 18.6
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.011
Rotor inertia moment[kg·m <sup>2</sup> ]	0.0027
Mass	Stator[kg] 5.9 Rotor[kg] 2.5
Overload capacity (for one minute)	120% of short-time rated output
Ambient temperature[°C]	0 to 40
Heat-resistant class	155(F)
Tolerable vibration	Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]	570
Cooling oil amount[l/min (20°C)]	10

## Output characteristics



## Torque - rotation speed characteristics

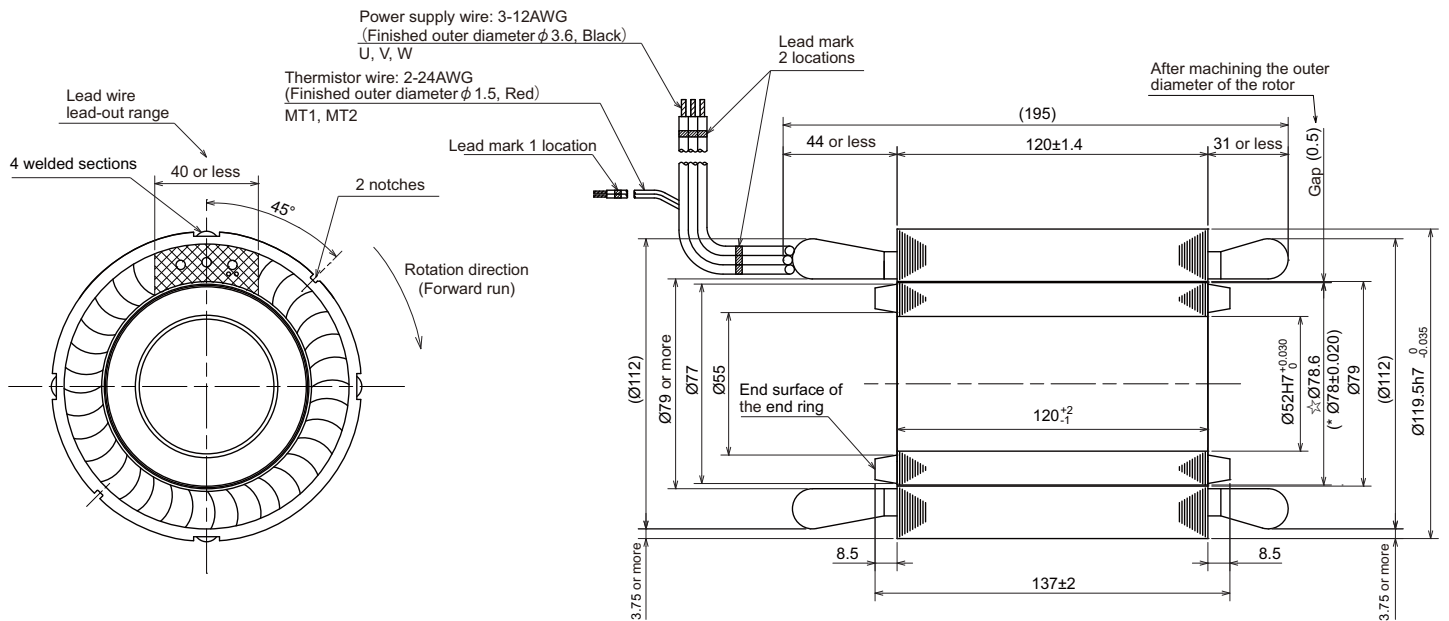


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

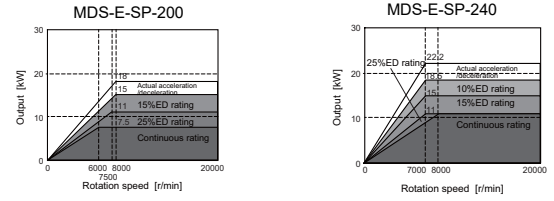
Normal specifications

# SJ-BG135B/200-01

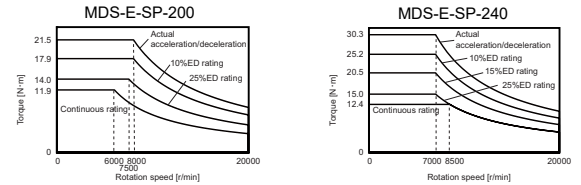
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200	MDS-E-SP-240
	2-axis type	-	-
	Multi axis type	MDS-EM-SPV3-20080, 200120	320120
Coil changeover			
Output capacity[kW]	Continuous rated output	7.5	11
	Short time rated output	15 (15%ED rating)	18.5 (10%ED rating)
	Standard output during acceleration/deceleration	15	18.5
	Actual acceleration/deceleration output(*3)	18	22.2
	Base rotation speed	Continuous[r/min]	6000
	Short time[r/min]	7500	7000
Maximum rotation speed[r/min]		20000	20000
Frame No. - Core width		80-90	80-90
Torque (Base rotation speed)	Continuous[N·m]	11.9	12.4
	Short time[N·m]	14.0	15.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.010	0.010
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0026	0.0026
Mass	Stator[kg]	6.0	6.0
	Rotor[kg]	1.9	1.9
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		1710	
Cooling oil amount[l/min (20°C)]		10	10

## Output characteristics



## Torque - rotation speed characteristics

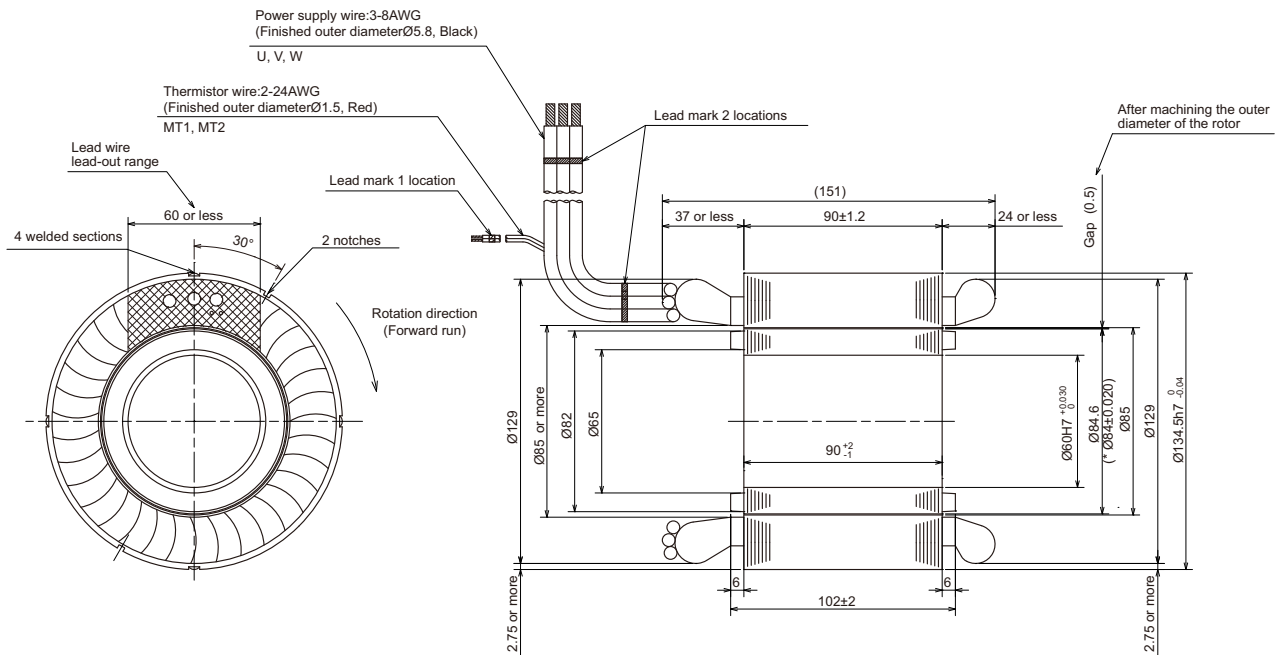


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
△ and the shaded areas indicate the lead wire lead-out ranges from the molded parts.  
( ) These are reference values.

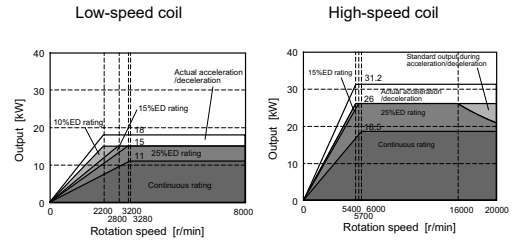
Normal specifications

# SJ-BG135D/200-01

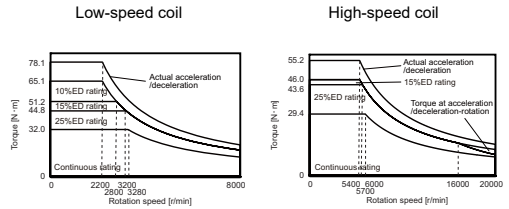
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	18.5
	Short time rated output	15 (10%ED rating)	26 (15%ED rating)
	Standard output during acceleration/deceleration	15	26
	Actual acceleration/deceleration output(*3)	18	31.2
Base rotation speed	Continuous[r/min]	3280	6000
	Short time[r/min]	2200	5400
Maximum rotation speed[r/min]		8000	20000
Frame No. - Core width		80-155	
Torque (Base rotation speed)	Continuous[N·m]	32	29.4
	Short time[N·m]	65.1	46
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.018	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0044	
Mass	Stator[kg]	12	
	Rotor[kg]	3.3	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		2990	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics



## Torque - rotation speed characteristics

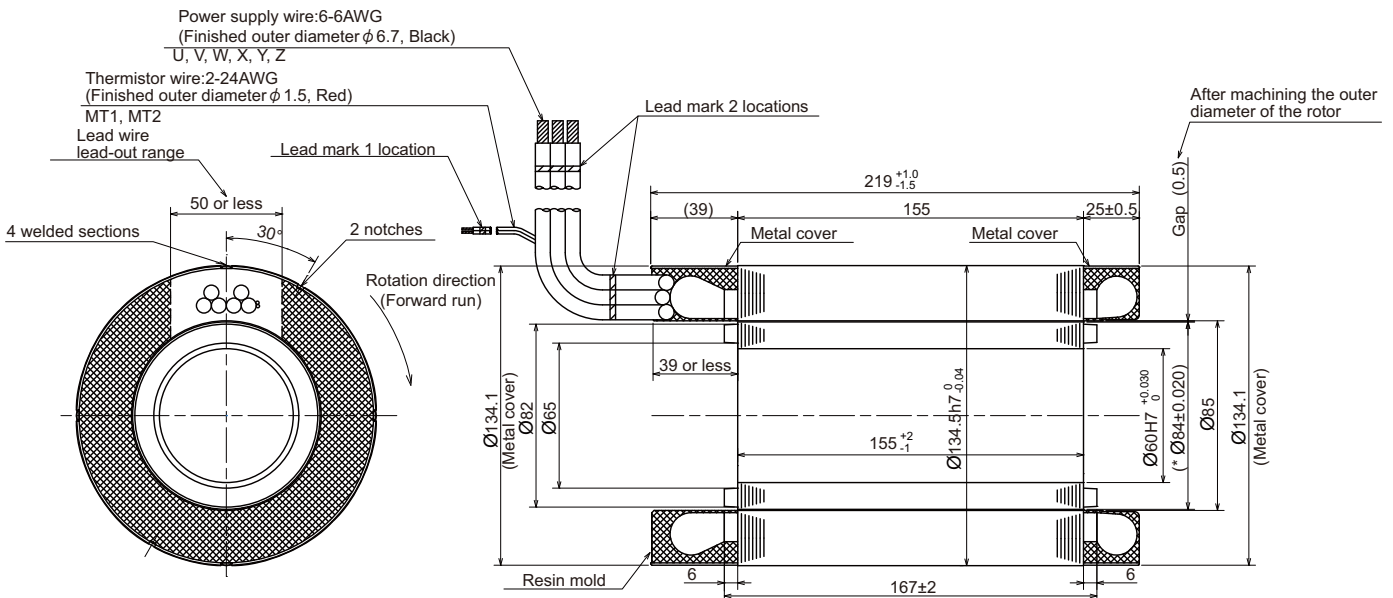


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

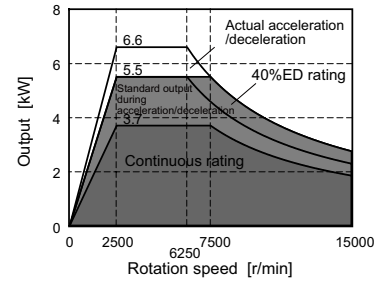
Normal specifications

# SJ-BG150D/150-01

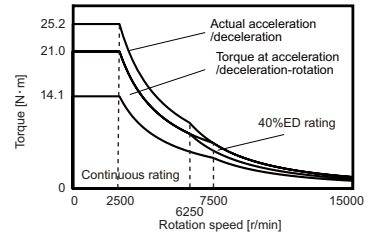
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover		
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (40%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	2500
	Short time[r/min]	2500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		90-100
Torque (Base rotation speed)	Continuous[N·m]	14.1
	Short time[N·m]	21.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.023
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0057
Mass	Stator[kg]	8.1
	Rotor[kg]	3.7
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		900
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

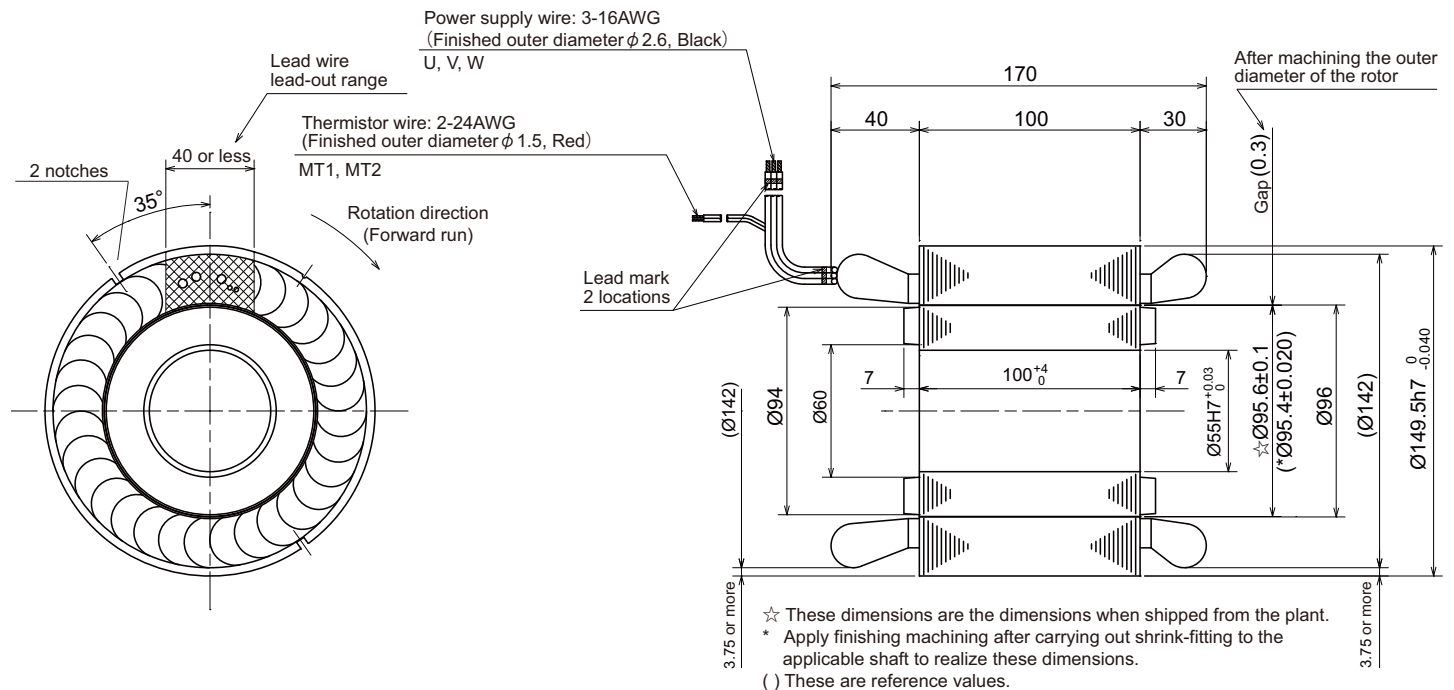


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



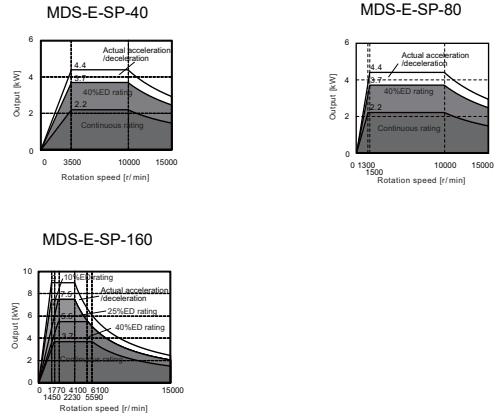
Normal specifications

# SJ-BG160B/150-01

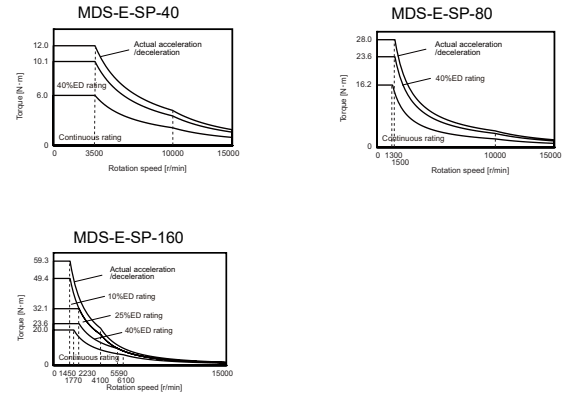
## Specifications

Item		Specifications		
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40	MDS-E-SP-80	MDS-E-SP-160
	2-axis type	MDS-E-SP2-40	MDS-E-SP2-80, MDS-E-SP2-16080(M)	MDS-E-SP2-16080(L)
Coil changeover		-	-	-
Output capacity[kW]	Continuous rated output	2.2	2.2	3.7
	Short time rated output	3.7(40%ED rating)	3.7(40%ED rating)	7.5(10%ED rating)
	Standard output during acceleration/deceleration	3.7	3.7	7.5
	Actual acceleration/deceleration output(*3)	4.44	4.44	9.0
Base rotation speed	Continuous[r/min]	3500	1300	1770
	Short time[r/min]	3500	1500	1450
Maximum rotation speed[r/min]		15000	15000	15000
Frame No. - Core width		100-75	100-75	100-75
Torque (Base rotation speed)	Continuous[N·m]	6.0	16.2	20.0
	Short time[N·m]	10.1	23.6	49.4
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.019	0.019	0.019
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0048	0.0048	0.0048
Mass	Stator[kg]	7.1	7.1	7.1
	Rotor[kg]	2.9	2.9	2.9
Overload capacity (for one minute)		120% of short-time rated output		
Ambient temperature[°C]		0 to 40		
Heat-resistant class		155(F)		
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)		
Required cooling capacity (*2) [W]		410	920	1300
Cooling oil amount[l/min (20°C)]		10	10	10

## Output characteristics



## Torque - rotation speed characteristics

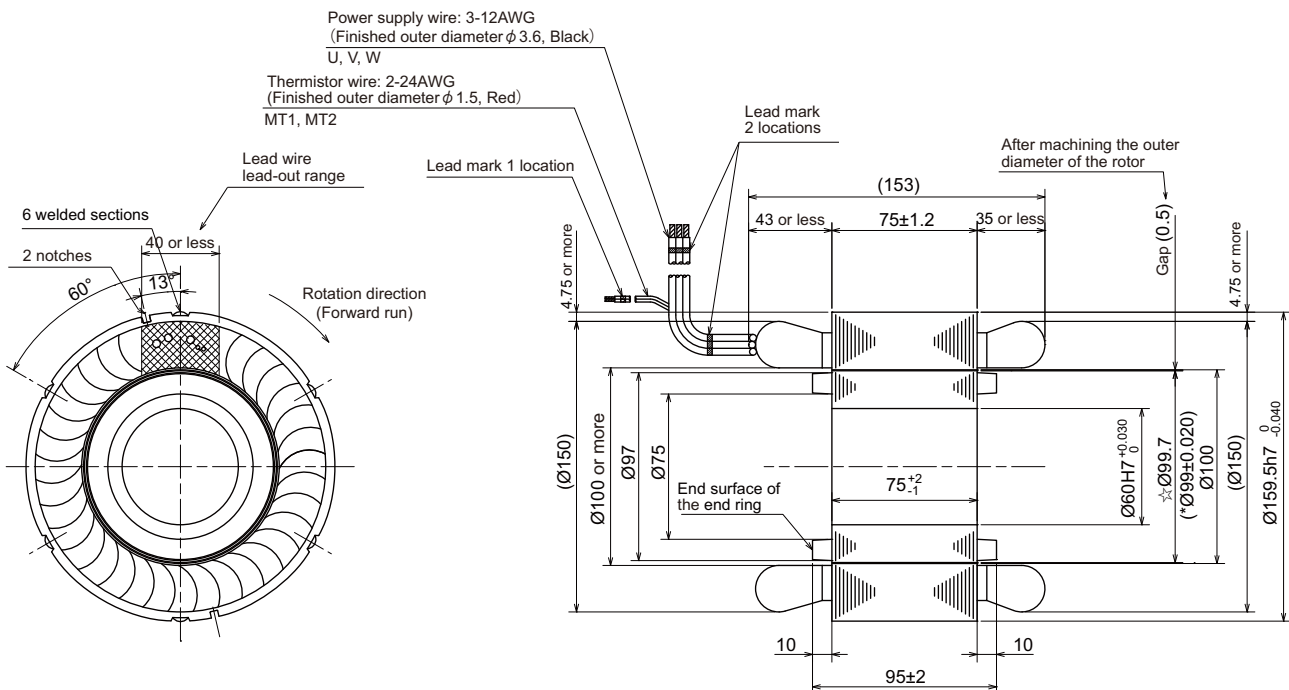


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

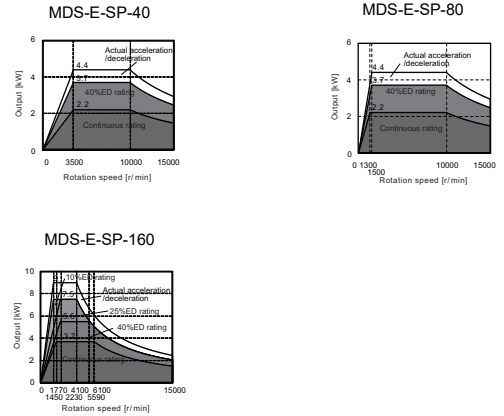
Normal specifications

# SJ-BG160B/150-01R

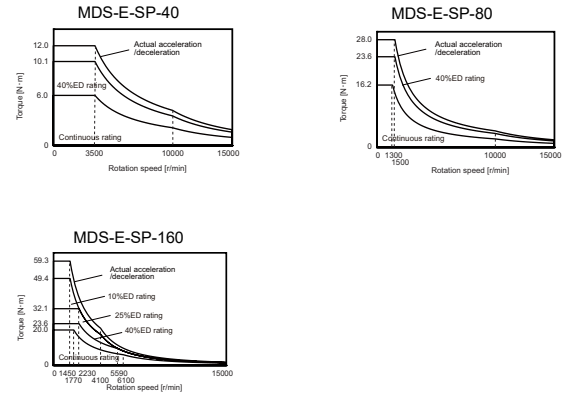
## Specifications

Item		Specifications		
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40	MDS-E-SP-80	MDS-E-SP-160
	2-axis type	MDS-E-SP2-40	MDS-E-SP2-80, MDS-E-SP2-16080(M)	MDS-E-SP2-16080(L)
Coil changeover		-	-	-
Output capacity[kW]	Continuous rated output	2.2	2.2	3.7
	Short time rated output	3.7(40%ED rating)	3.7(40%ED rating)	7.5(10%ED rating)
	Standard output during acceleration/deceleration	3.7	3.7	7.5
	Actual acceleration/deceleration output(*3)	4.44	4.44	9.0
Base rotation speed	Continuous[r/min]	3500	1300	1770
	Short time[r/min]	3500	1500	1450
Maximum rotation speed[r/min]		15000	15000	15000
Frame No. - Core width		100-75	100-75	100-75
Torque (Base rotation speed)	Continuous[N·m]	6.0	16.2	20.0
	Short time[N·m]	10.1	23.6	49.4
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.02	0.02	0.02
Rotor inertia moment[kg·m <sup>2</sup> ]		0.005	0.005	0.005
Mass	Stator[kg]	7.1	7.1	7.1
	Rotor[kg]	2.3	2.3	2.3
Overload capacity (for one minute)		120% of short-time rated output		
Ambient temperature[°C]		0 to 40		
Heat-resistant class		155(F)		
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)		
Required cooling capacity (*2) [W]		410	920	1300
Cooling oil amount[l/min (20°C)]		10	10	10

## Output characteristics



## Torque - rotation speed characteristics

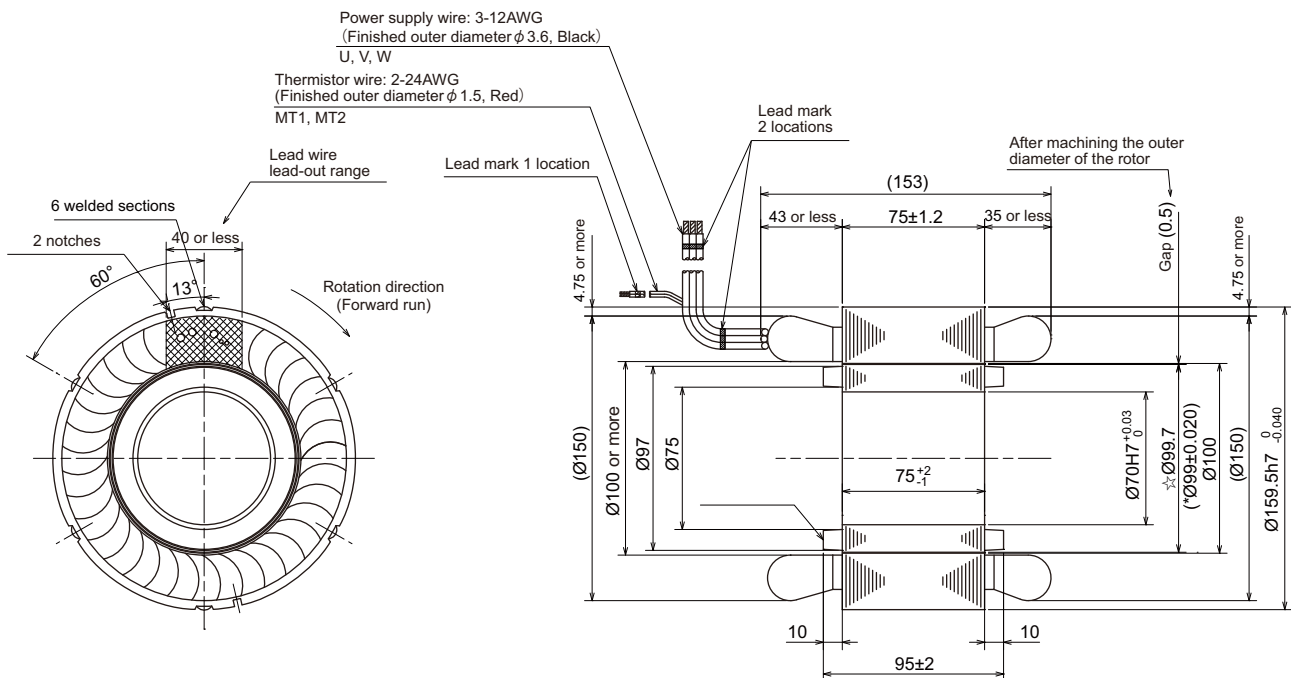


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



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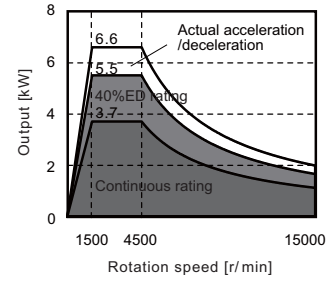
Normal specifications

# SJ-BG160D/150-01

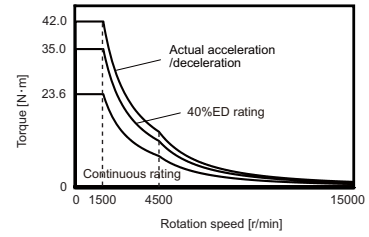
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5(40%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-110
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	35.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.028
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0070
Mass	Stator[kg]	11
	Rotor[kg]	4.2
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		1160
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

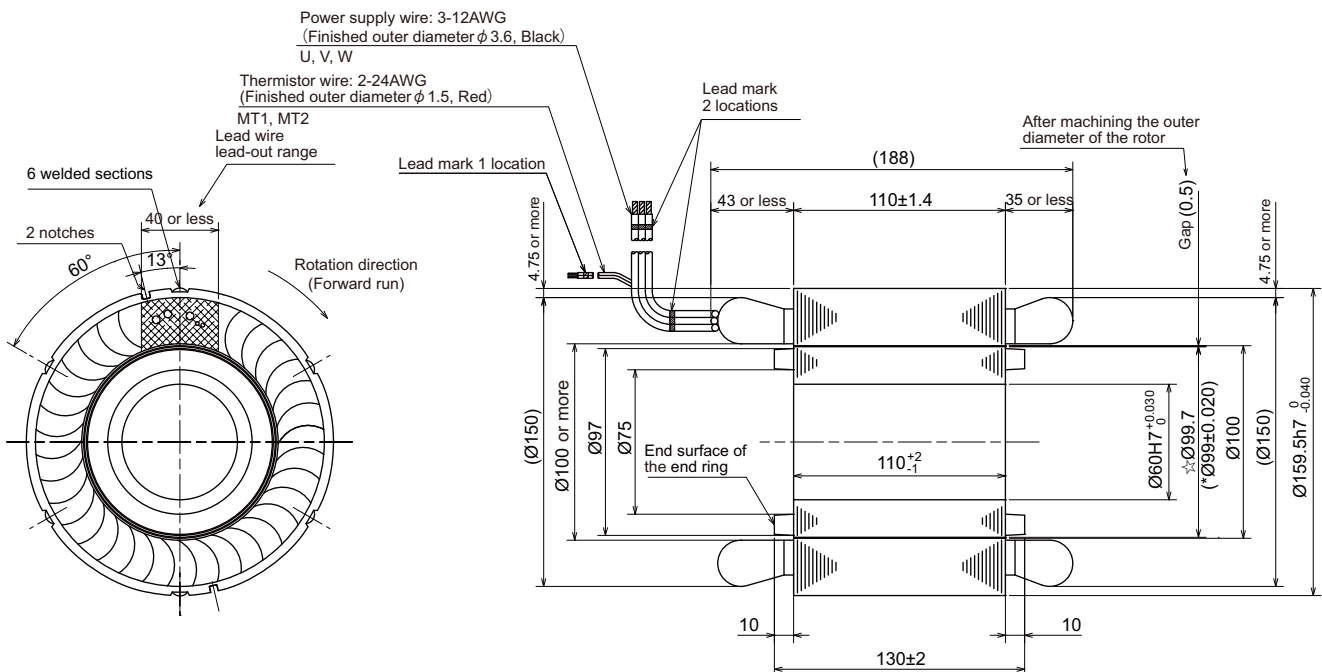


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

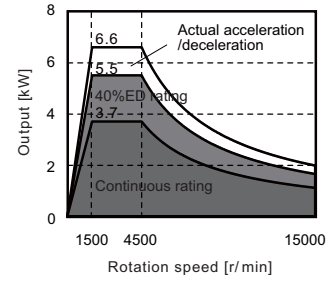
Normal specifications

# SJ-BG160D/150-01R

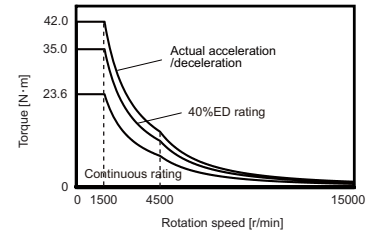
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5(40%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-110
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	35.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.024
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0061
Mass	Stator[kg]	11
	Rotor[kg]	3.3
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		1160
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

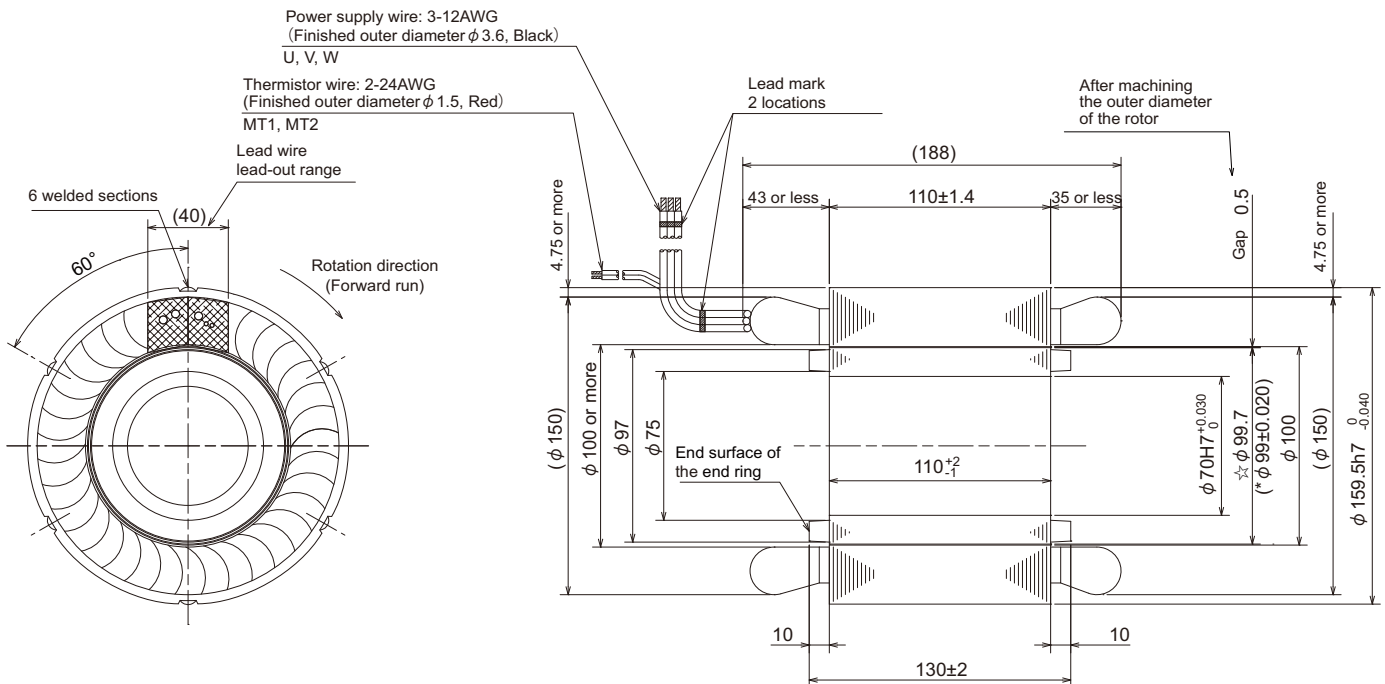


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



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\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.



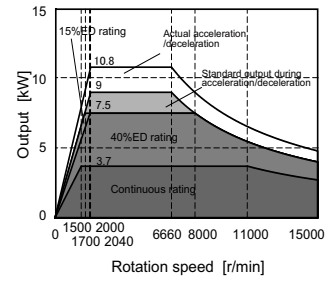
Normal specifications

# SJ-BG160D/150-02

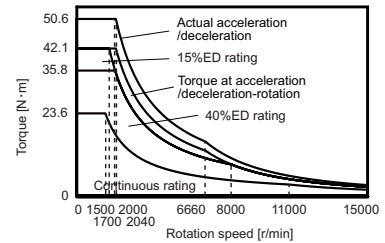
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	7.5(15%ED rating)
	Standard output during acceleration/deceleration	9.0
	Actual acceleration/deceleration output(*3)	10.8
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1700
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-110
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	42.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.028
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0070
Mass	Stator[kg]	11
	Rotor[kg]	4.2
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		1200
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

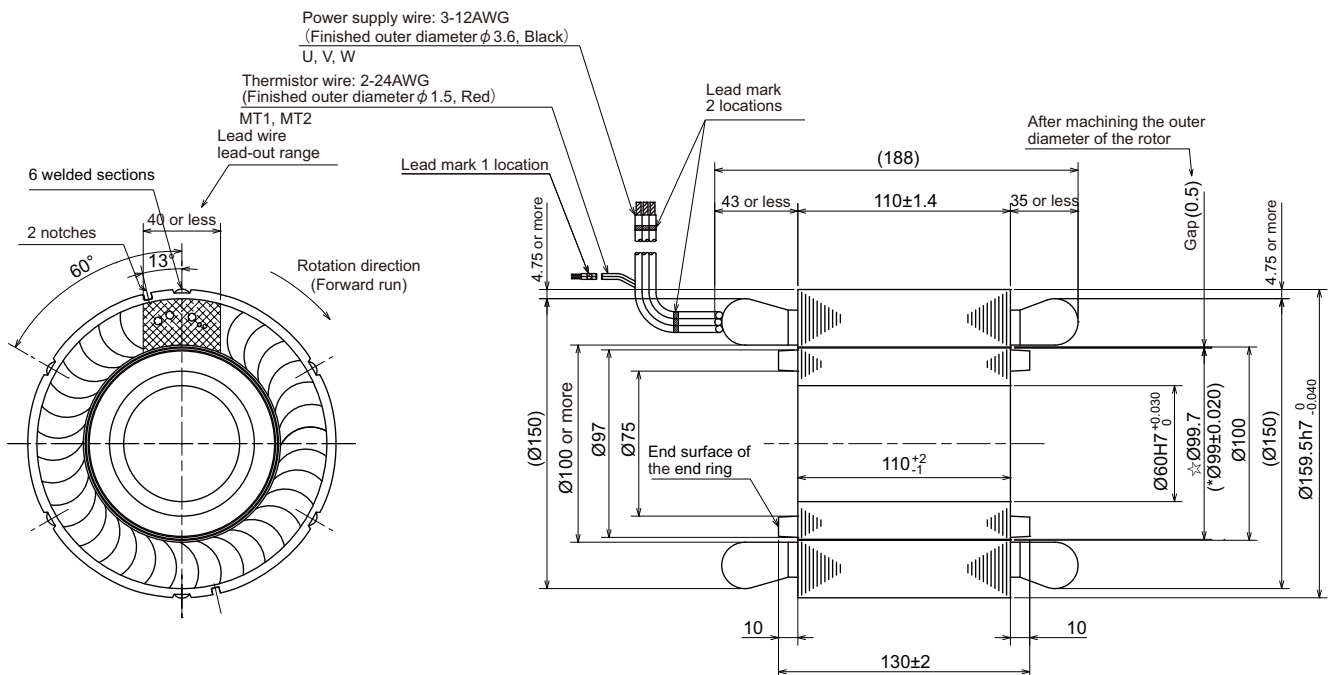


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



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( ) These are reference values.

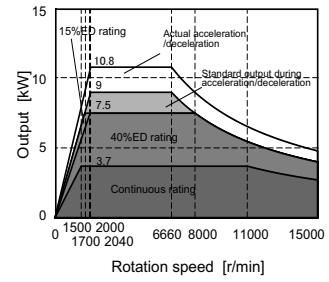
Normal specifications

# SJ-BG160D/150-02R

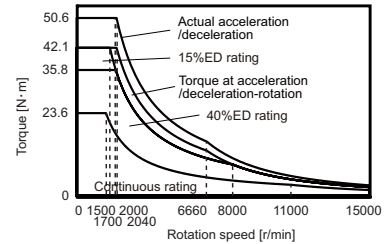
## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	7.5(15%ED rating)
	Standard output during acceleration/deceleration	9.0
	Actual acceleration/deceleration output(*3)	10.8
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1700
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-110
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	42.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.024
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0061
Mass	Stator[kg]	11
	Rotor[kg]	3.3
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)
Required cooling capacity (*2) [W]		1200
Cooling oil amount[l/min (20°C)]		10

## Output characteristics



## Torque - rotation speed characteristics

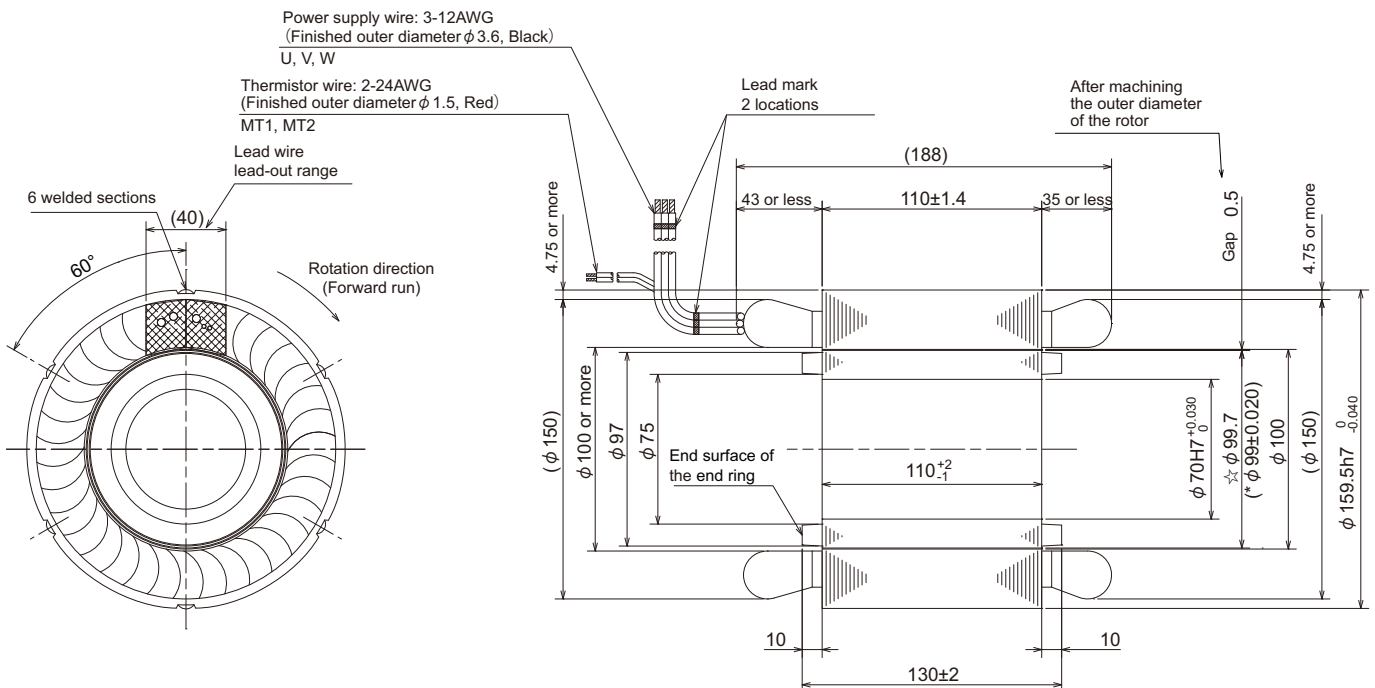


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



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( ) These are reference values.

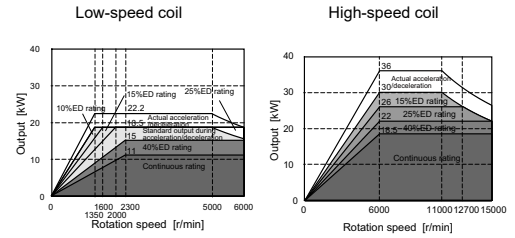
Normal specifications

# SJ-BG180B/150-01

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	18.5
	Short time rated output	18.5 (10%ED rating)	30 (15%ED rating)
	Standard output during acceleration/deceleration	18.5	30
	Actual acceleration/deceleration output(*3)	22.2	36
Base rotation speed	Continuous[r/min]	2300	6000
	Short time[r/min]	1350	6000
Maximum rotation speed[r/min]		6000	15000
Frame No. - Core width		112-115	
Torque (Base rotation speed)	Continuous[N·m]	45.7	29.4
	Short time[N·m]	131	47.7
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.047	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.012	
Mass	Stator[kg]	14	
	Rotor[kg]	5.1	
Overload capacity (for one minute)		-	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		2370	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



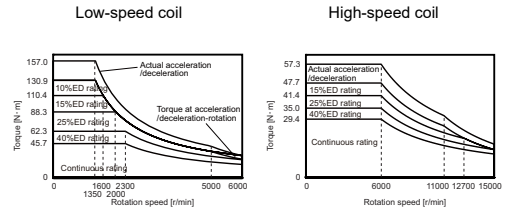
\* The cycle times for 10%ED rating, 15%ED rating, and 25%ED rating (Low-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

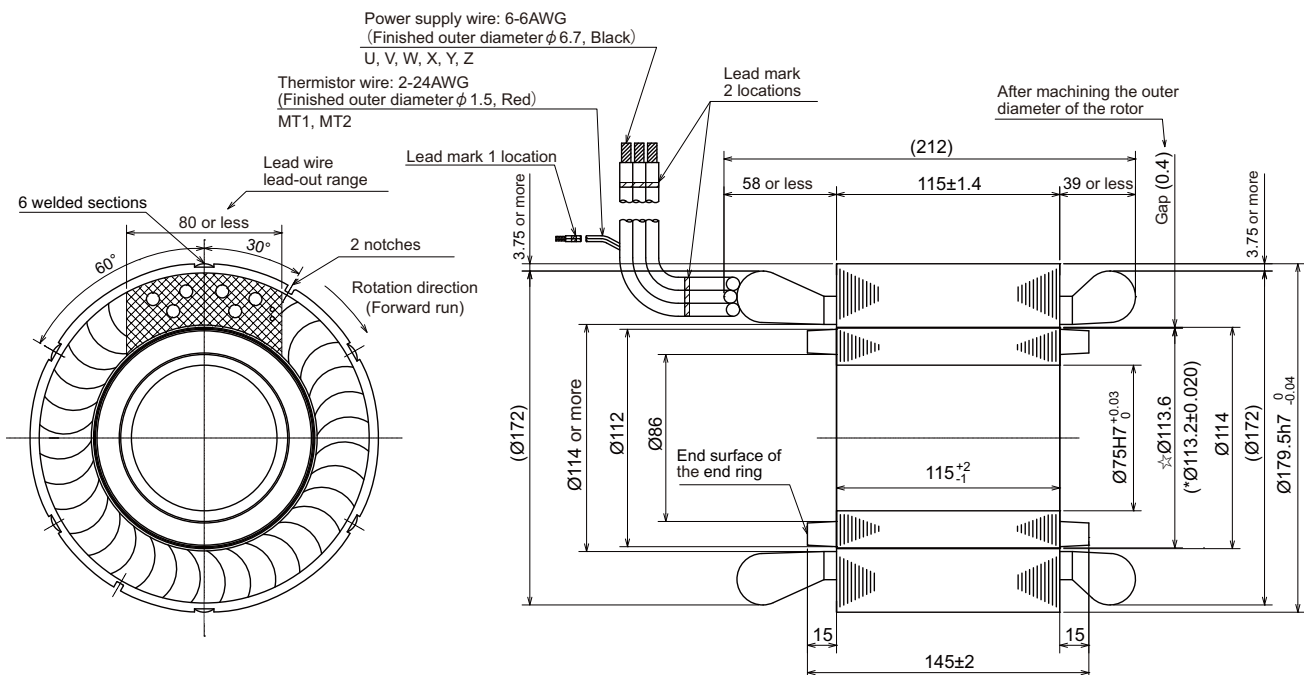
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



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( ) These are reference values.

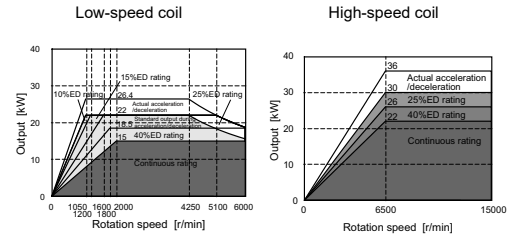
Normal specifications

# SJ-BG180D/150-01

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22 (10%ED rating)	30 (25%ED rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	2000	6500
	Short time[r/min]	1050	6500
Maximum rotation speed[r/min]		6000	15000
Frame No. - Core width		112-180	
Torque (Base rotation speed)	Continuous[N·m]	71.6	32.3
	Short time[N·m]	200	44.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.074	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.018	
Mass	Stator[kg]	21	
	Rotor[kg]	8.0	
Overload capacity (for one minute)		-	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		3270	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



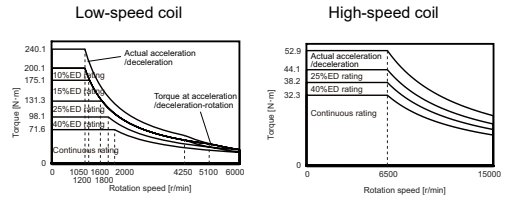
\* The cycle times for 10%ED rating, 15%ED rating, and 25%ED rating (Low-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

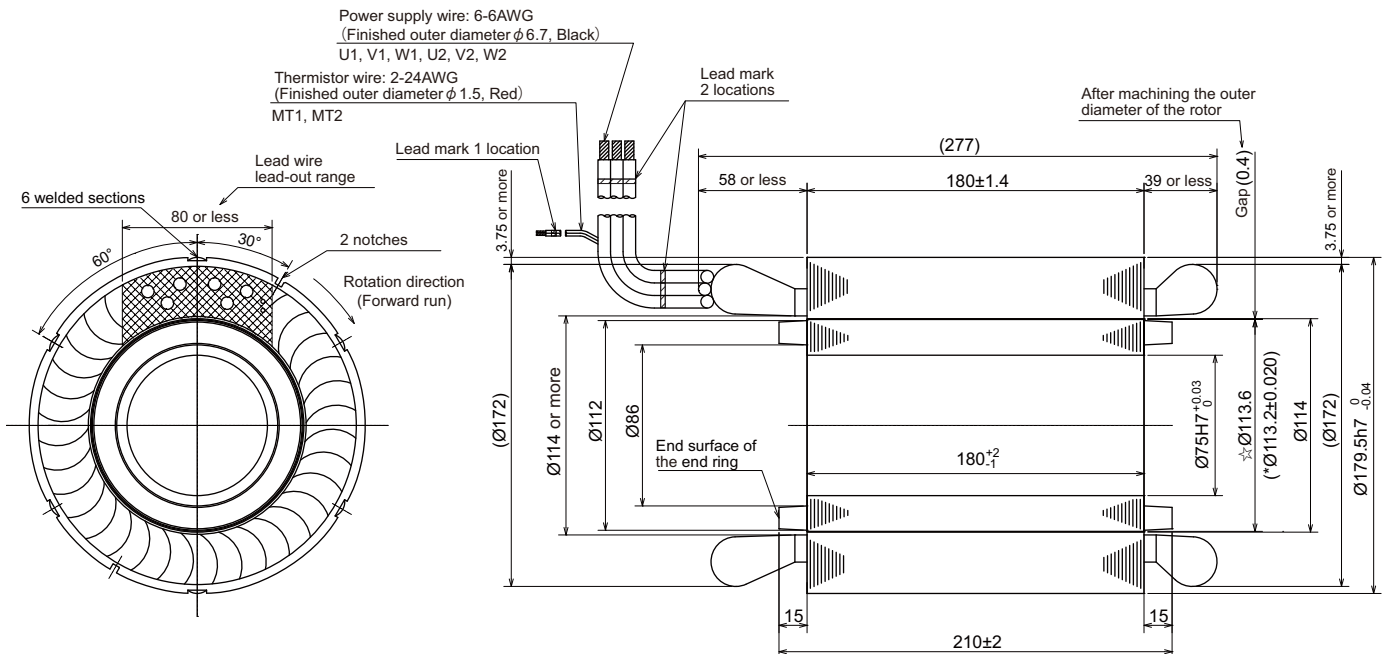
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

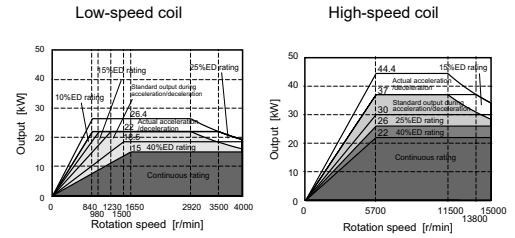
Normal specifications

# SJ-BG180F/150-01

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22 (10%ED rating)	37 (15%ED rating)
	Standard output during acceleration/deceleration	22	37
	Actual acceleration/deceleration output(*3)	26.4	44.4
Base rotation speed	Continuous[r/min]	1650	5700
	Short time[r/min]	840	5700
Maximum rotation speed[r/min]		4000	15000
Frame No. - Core width		112-225	
Torque (Base rotation speed)	Continuous[N·m]	86.8	36.9
	Short time[N·m]	250	62.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.092	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.023	
Mass	Stator[kg]	27	
	Rotor[kg]	10	
Overload capacity (for one minute)		-	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		3220	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



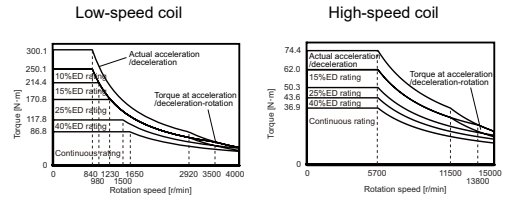
\* The cycle times for 10%ED rating, 15%ED rating, and 25%ED rating (Low-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

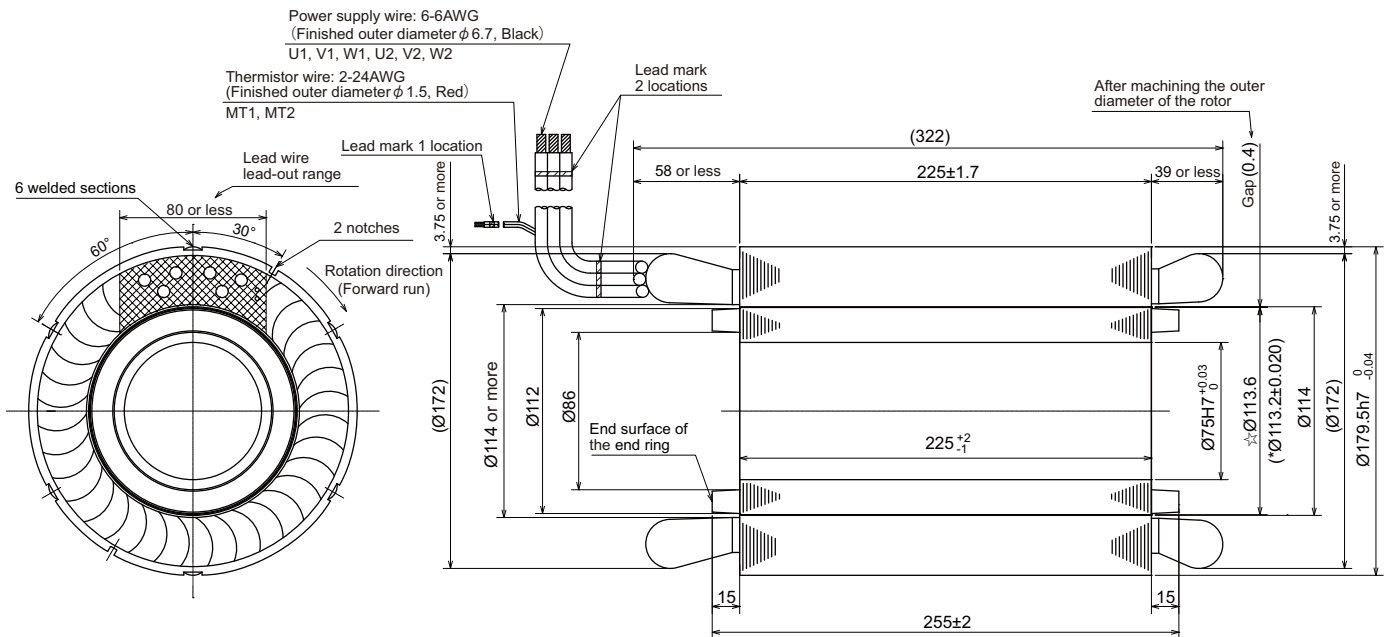
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

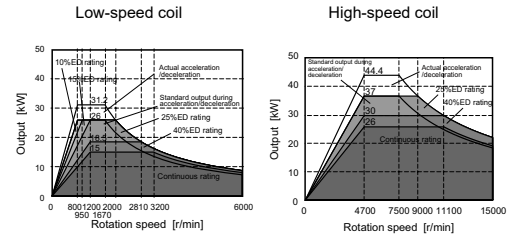
Normal specifications

# SJ-BG180H/150-01

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	26
	Short time rated output	26 (10%ED rating)	37 (25%ED rating)
	Standard output during acceleration/deceleration	26	37
	Actual acceleration/deceleration output(*3)	31.2	44.4
Base rotation speed	Continuous[r/min]	1200	4700
	Short time[r/min]	800	4700
Maximum rotation speed[r/min]		6000	15000
Frame No. - Core width		112-280	
Torque (Base rotation speed)	Continuous[N·m]	119	52.8
	Short time[N·m]	310	75.2
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.11	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.029	
Mass	Stator[kg]	33	
	Rotor[kg]	12	
Overload capacity (for one minute)		-	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		4060	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



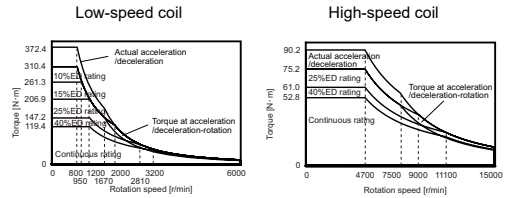
\* The cycle times for 10%ED rating, 15%ED rating, 25%ED rating (Low-speed coil), and 25%ED rating (High-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

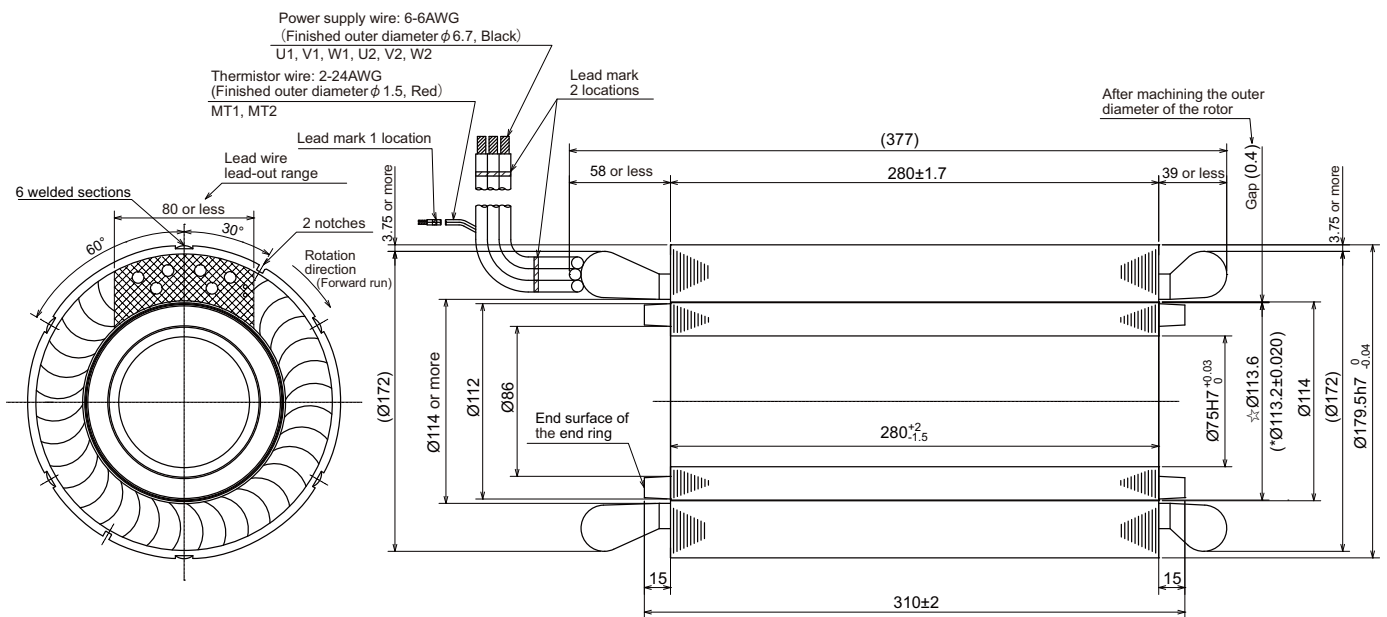
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.



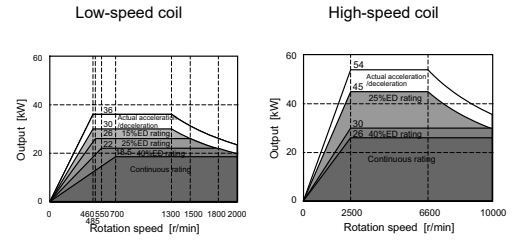
Normal specifications

# SJ-BG240H/100-01

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	18.5	26
	Short time rated output	30 (15%ED rating)	45 (25%ED rating)
	Standard output during acceleration/deceleration	30	45
	Actual acceleration/deceleration output(*3)	36	54
Base rotation speed	Continuous[r/min]	700	2500
	Short time[r/min]	460	2500
Maximum rotation speed[r/min]		2000	10000
Frame No. - Core width		160-330	
Torque (Base rotation speed)	Continuous[N·m]	252	99.3
	Short time[N·m]	623	172
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.57	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.14	
Mass	Stator[kg]	63	
	Rotor[kg]	32	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		4660	
Cooling oil amount[l/min (20°C)]		20	

## Output characteristics



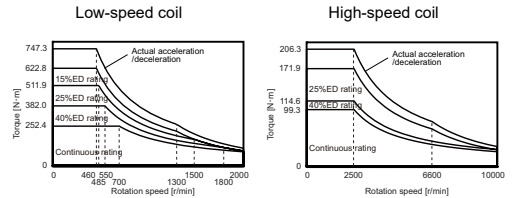
\* The cycle times for 15%ED rating, 25%ED rating (Low-speed coil), and 25%ED rating (High-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

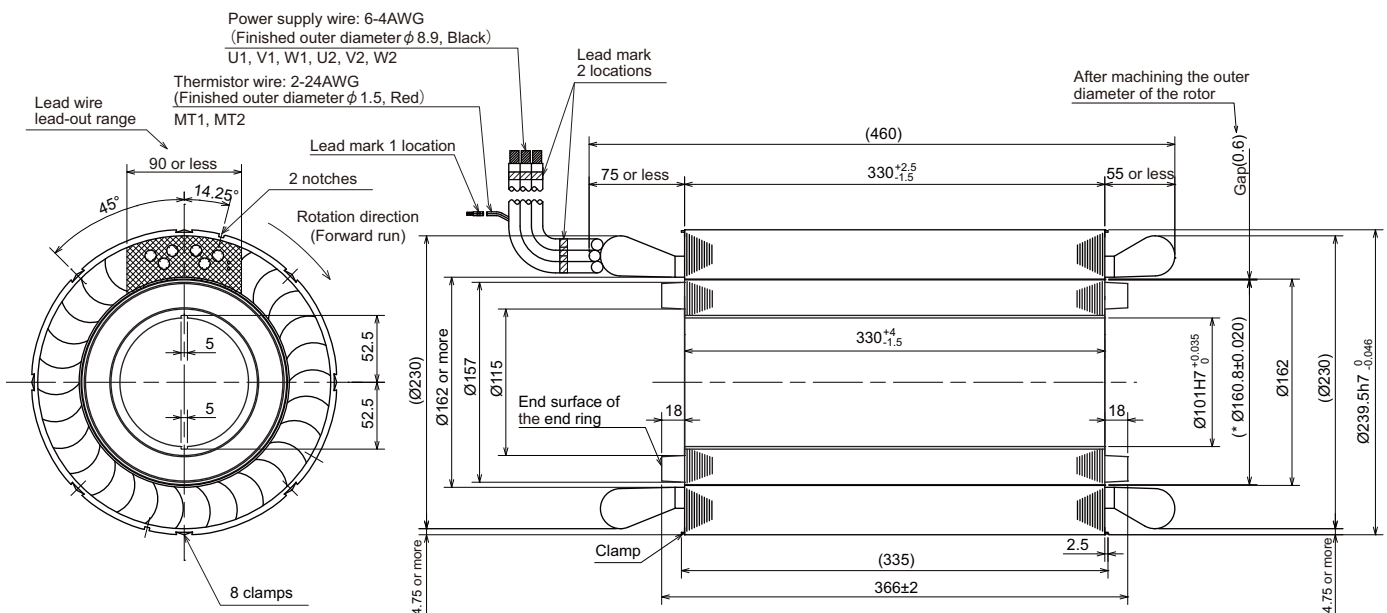
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 () These are reference values.

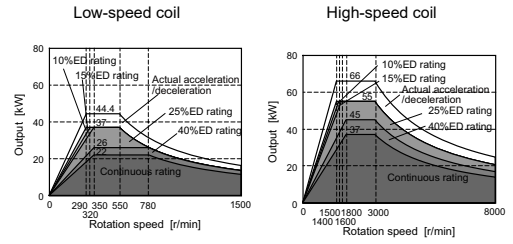
Normal specifications

# SJ-BG300L/080-01

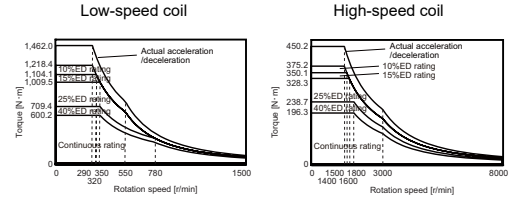
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-640	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	22	37
	Short time rated output	37 (10%ED rating)	55 (10%ED rating)
	Standard output during acceleration/deceleration	37	55
	Actual acceleration/deceleration output(*3)	44.4	66
Base rotation speed	Continuous[r/min]	350	1800
	Short time[r/min]	290	1400
Maximum rotation speed[r/min]		1500	8000
Frame No. - Core width		180-380	
Torque (Base rotation speed)	Continuous[N·m]	600	196
	Short time[N·m]	1218	375
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.9	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.48	
Mass	Stator[kg]	107	
	Rotor[kg]	63	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		7590	
Cooling oil amount[l/min (20°C)]		20	

## Output characteristics



## Torque - rotation speed characteristics

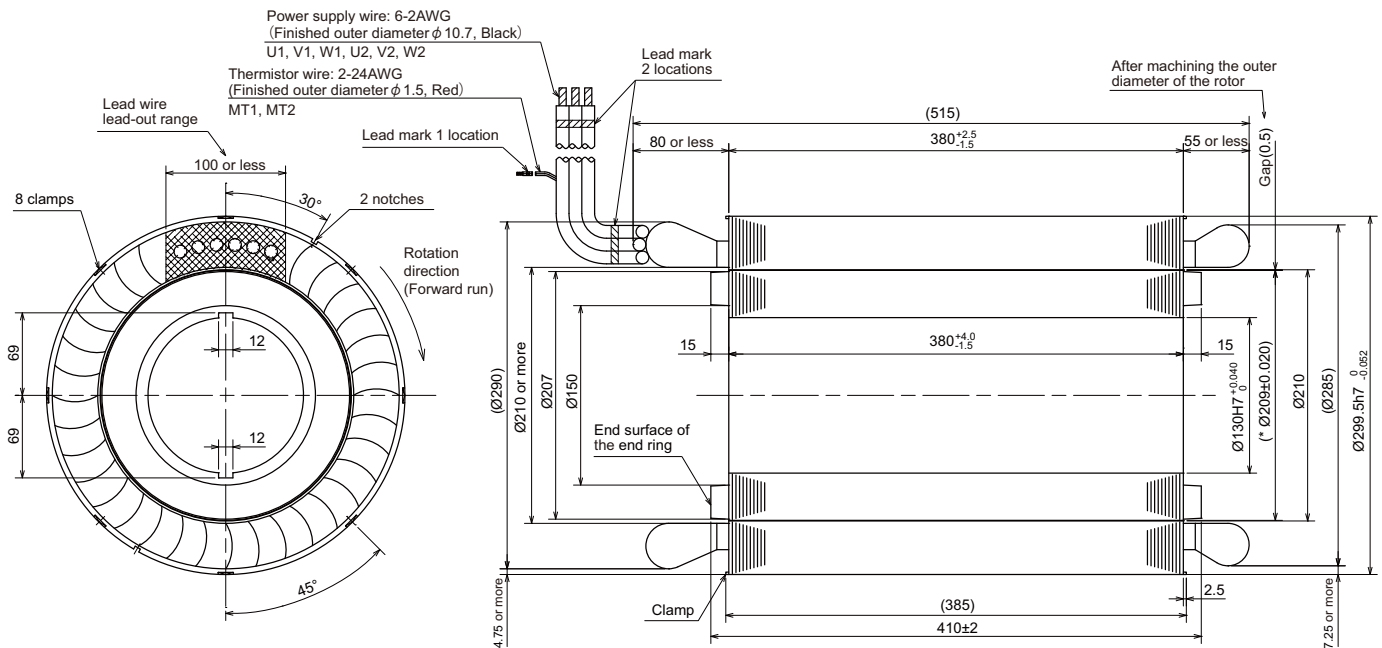


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.



High-speed specifications

# SJ-BG135D/200-01

Specifications

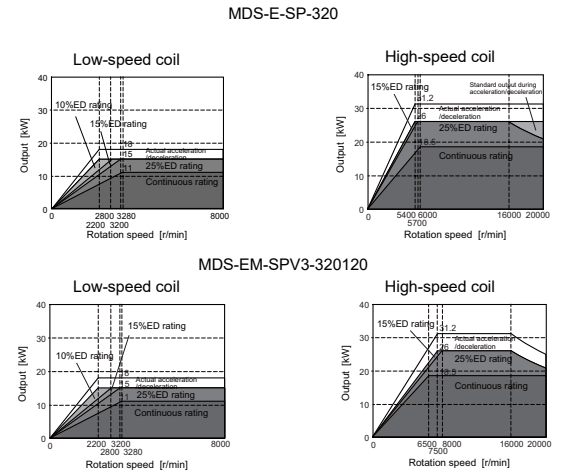
Item	Specifications				
	MDS-E-SP-320	MDS-E-SP-320	MDS-EM-SPV3-320120	MDS-EM-SPV3-320120	
Compatible spindle drive unit (*1)	1-axis type	-	-	-	
	2-axis type	-	-	-	
	Multi axis type	-	-	MDS-EM-SPV3-320120	
Coil changeover	Low-speed coil	High-speed coil	Low-speed coil	High-speed coil	
Output capacity[kW]	Continuous rated output	11	18.5	11	18.5
	Short time rated output	15 (10%ED rating)	26 (15%ED rating)	15 (10%ED rating)	26 (15%ED rating)
	Standard output during acceleration/deceleration	15	26	15	26
	Actual acceleration/deceleration output(*3)	18	31.2	18	31.2
Base rotation speed	Continuous[r/min]	3280	6000	3280	6500
	Short time[r/min]	2200	5400	2200	7500
Maximum rotation speed[r/min]	8000	20000	8000	20000	
Frame No. - Core width	80-155	80-155	80-155	80-155	
Torque (Base rotation speed)	Continuous[N·m]	32.0	29.4	32.0	27.2
	Short time[N·m]	65.1	46.0	65.1	33.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.018	0.018	0.018	0.018	
Rotor inertia moment[kg·m <sup>2</sup> ]	0.0044	0.0044	0.0044	0.0044	
Mass	Stator[kg]	12	12	12	12
	Rotor[kg]	3.3	3.3	3.3	3.3
Overload capacity (for one minute)	120% of short-time rated output				
Ambient temperature[°C]	0 to 40				
Heat-resistant class	155(F)				
Tolerable vibration	Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)				
Required cooling capacity (*2) [W]	2990		2830		
Cooling oil amount[l/min (20°C)]	10	10	10	10	

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

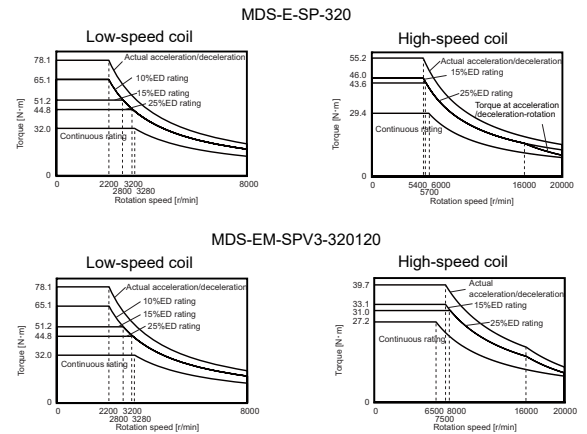
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

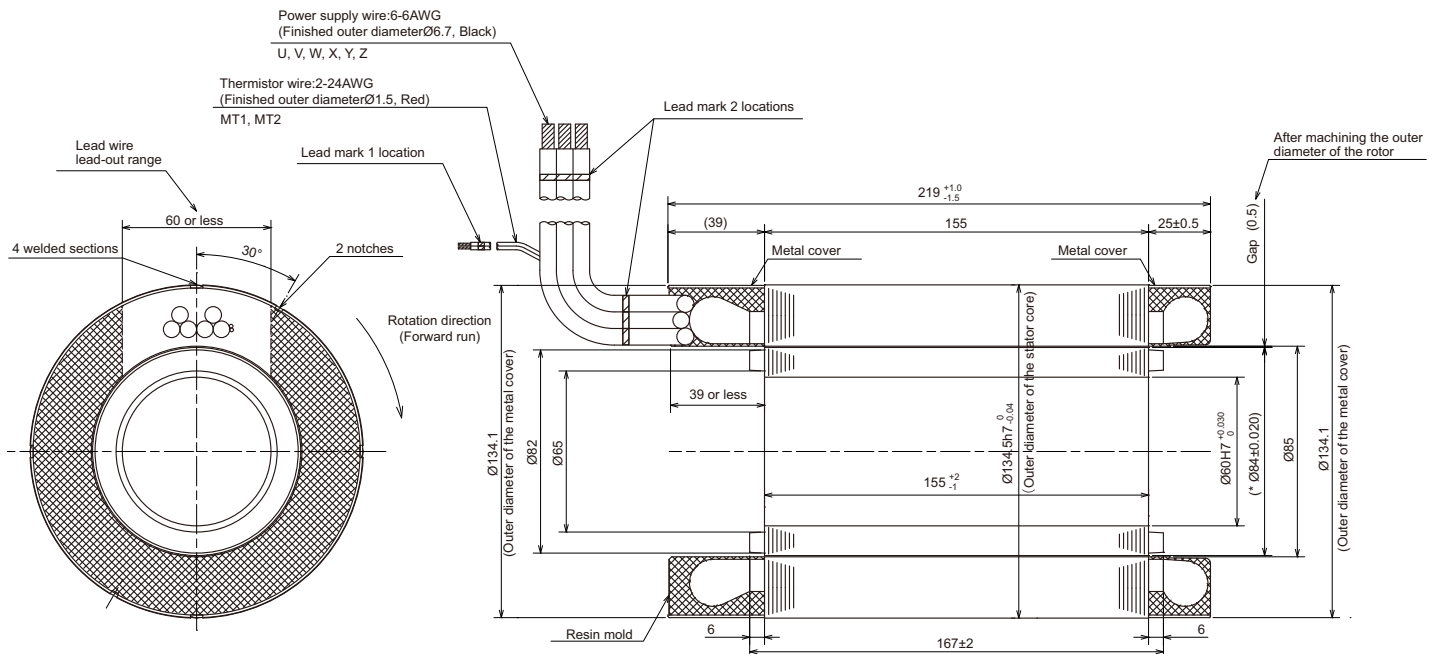
Output characteristics



Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 △ and the shaded areas indicate the lead wire lead-out ranges from the molded parts.  
 ( ) These are reference values.



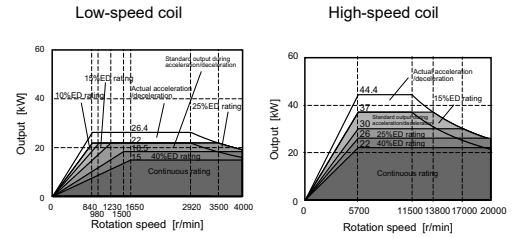
High-speed specifications

# SJ-BG180F/200-01

Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22 (10%ED rating)	37 (15%ED rating)
	Standard output during acceleration/deceleration	22	37
	Actual acceleration/deceleration output(*3)	26.4	44.4
Base rotation speed	Continuous[r/min]	1650	5700
	Short time[r/min]	840	5700
Maximum rotation speed[r/min]		4000	20000
Frame No. - Core width		112-225	
Torque (Base rotation speed)	Continuous[N·m]	86.8	36.9
	Short time[N·m]	250	62.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.092	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.023	
Mass	Stator[kg]	27	
	Rotor[kg]	10	
Overload capacity (for one minute)		-	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		3380	
Cooling oil amount[l/min (20°C)]		15	

Output characteristics



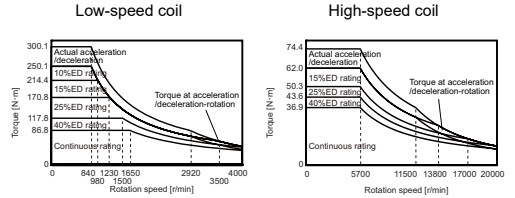
\* The cycle times for 10%ED rating, 15%ED rating, and 25%ED rating (Low-speed coil) are 5 minutes.

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

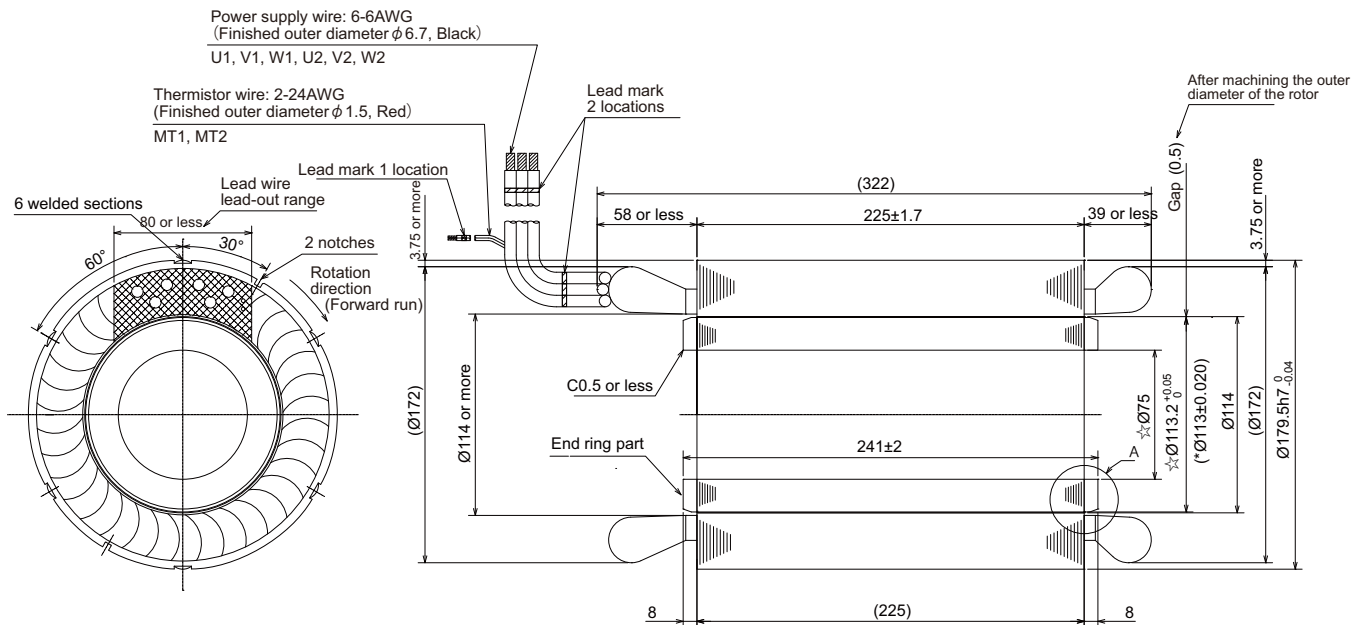
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

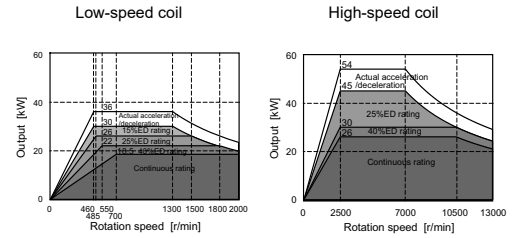
High-speed specifications

# SJ-BG240H/130-01

Specifications

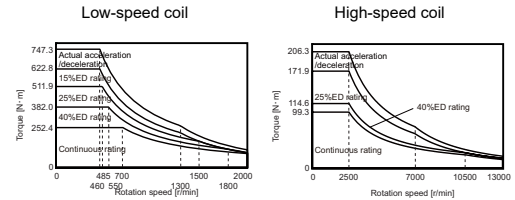
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	18.5	26
	Short time rated output	30 (15%ED rating)	45 (25%ED rating)
	Standard output during acceleration/deceleration	30	45
	Actual acceleration/deceleration output(*3)	36	54
Base rotation speed	Continuous[r/min]	700	2500
	Short time[r/min]	460	2500
Maximum rotation speed[r/min]		2000	13000
Frame No. - Core width		160-330	
Torque (Base rotation speed)	Continuous[N·m]	252	99.3
	Short time[N·m]	623	172
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.58	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.14	
Mass	Stator[kg]	63	
	Rotor[kg]	32	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		4740	
Cooling oil amount[l/min (20°C)]		20	

Output characteristics



\* The cycle times for 15%ED rating, 25%ED rating (Low-speed coil), and 25%ED rating (High-speed coil) are 5 minutes.

Torque - rotation speed characteristics

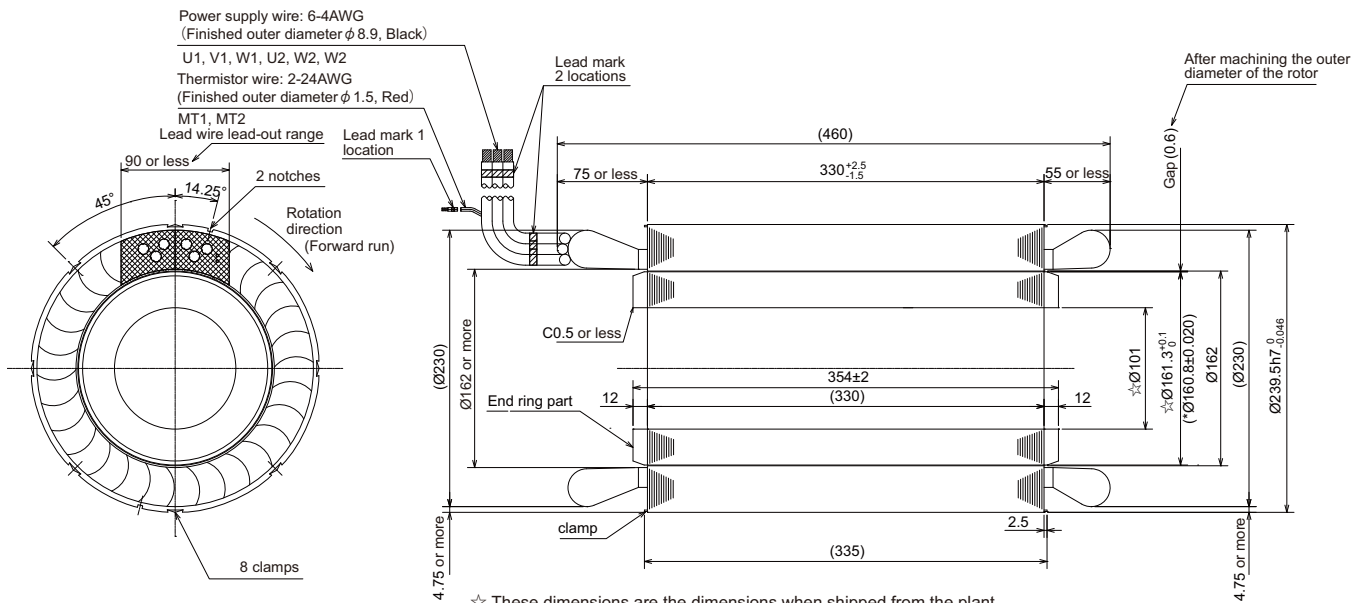


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]



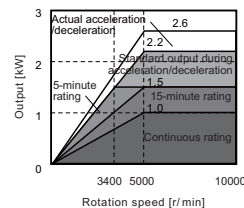
☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

Built-in IM spindle motor  
**SJ-2B4A01T**

Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	1.0
	Short time rated output	1.5(15-minute rating)
	Standard output during acceleration/deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.64
Base rotation speed	Continuous[r/min]	5000
	Short time[r/min]	5000
Maximum rotation speed[r/min]		10000
Frame No. - Core width		50-55
Torque (Base rotation speed)	Continuous[N·m]	1.91
	Short time[N·m]	2.86
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.00081
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00020
Mass	Stator[kg]	1.9
	Rotor[kg]	0.5
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		540
Cooling oil amount[l/min (20°C)]		5

Output characteristics

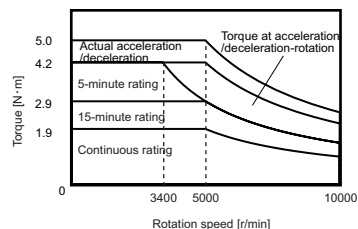


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

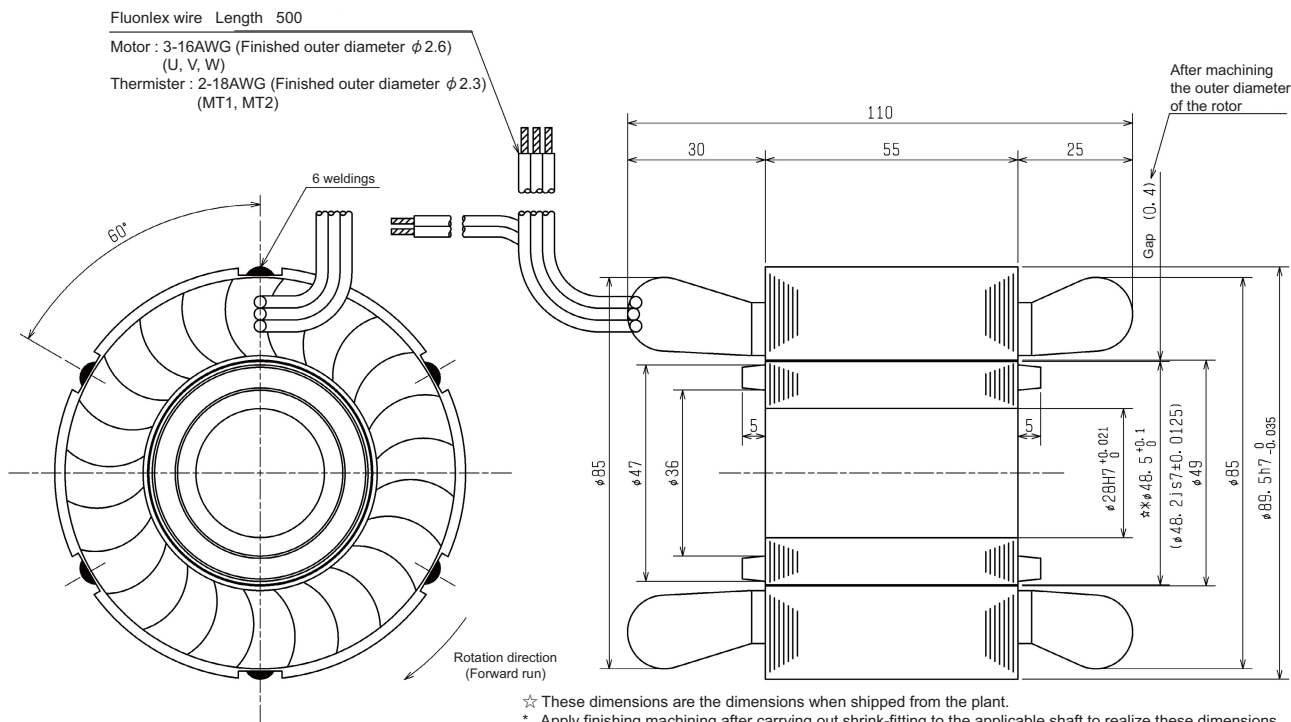
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



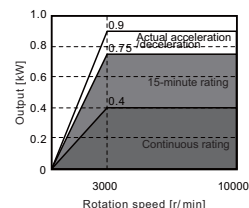
Built-in IM spindle motor

# SJ-2B4002T

## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	0.4
	Short time rated output	0.75(15-minute rating)
	Standard output during acceleration/deceleration	0.75
	Actual acceleration/deceleration output(*3)	0.9
Base rotation speed	Continuous[r/min]	3000
	Short time[r/min]	3000
Maximum rotation speed[r/min]		10000
Frame No. - Core width		63-50
Torque (Base rotation speed)	Continuous[N·m]	1.27
	Short time[N·m]	2.39
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0031
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00078
Mass	Stator[kg]	2.2
	Rotor[kg]	0.9
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		240
Cooling oil amount[l/min (20°C)]		5

## Output characteristics

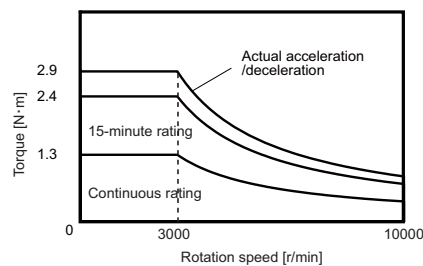


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

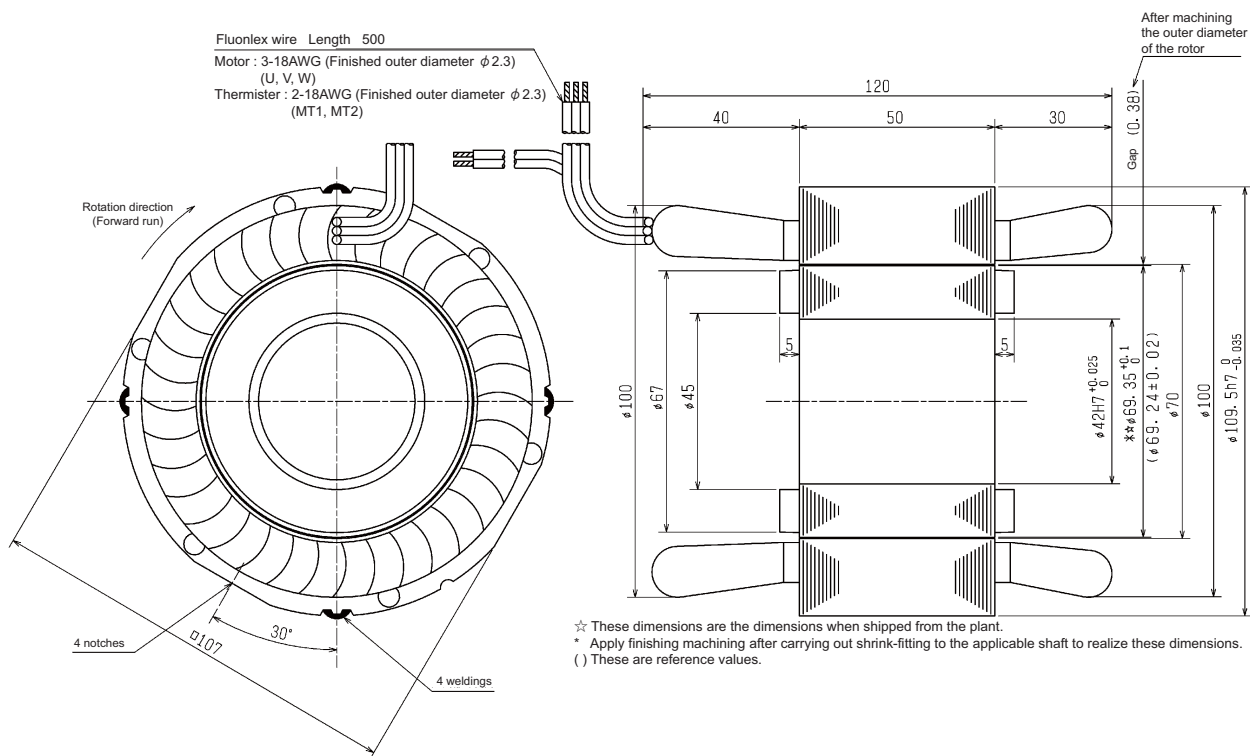
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]





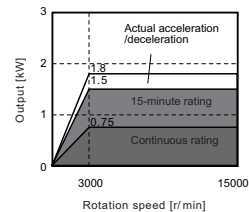
Built-in IM spindle motor

# SJ-2B4004T

## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	0.75
	Short time rated output	1.5(15-minute rating)
	Standard output during acceleration/deceleration	1.5
	Actual acceleration/deceleration output(*3)	1.8
Base rotation speed	Continuous[r/min]	3000
	Short time[r/min]	3000
Maximum rotation speed[r/min]		15000
Frame No. - Core width		63-50
Torque (Base rotation speed)	Continuous[N·m]	2.39
	Short time[N·m]	4.77
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0031
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00078
Mass	Stator[kg]	2.2
	Rotor[kg]	0.9
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		530
Cooling oil amount[l/min (20°C)]		5

## Output characteristics

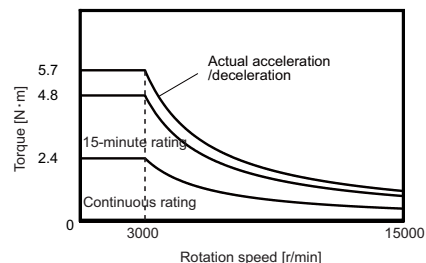


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

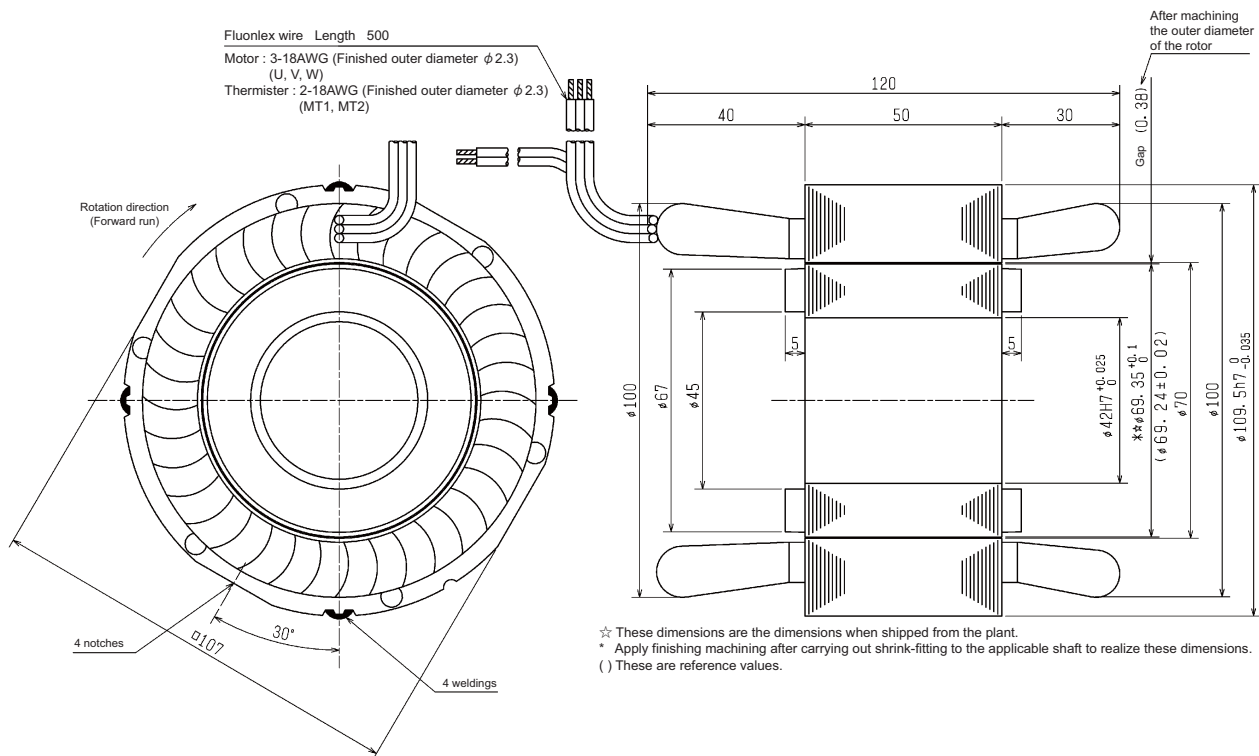
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

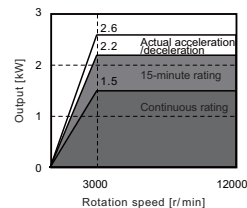


Built-in IM spindle motor  
**SJ-2B4003T**

Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	2.2(15-minute rating)
	Standard output during acceleration/deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.64
Base rotation speed	Continuous[r/min]	3000
	Short time[r/min]	3000
Maximum rotation speed[r/min]		12000
Frame No. - Core width		63-90
Torque (Base rotation speed)	Continuous[N·m]	4.77
	Short time[N·m]	7.00
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0055
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00138
Mass	Stator[kg]	3.9
	Rotor[kg]	1.7
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		570
Cooling oil amount[l/min (20°C)]		5

Output characteristics

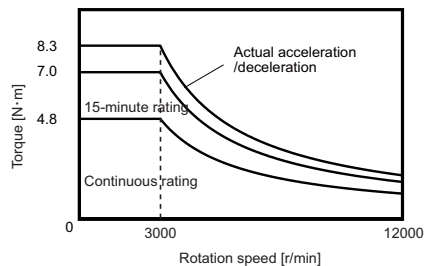


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

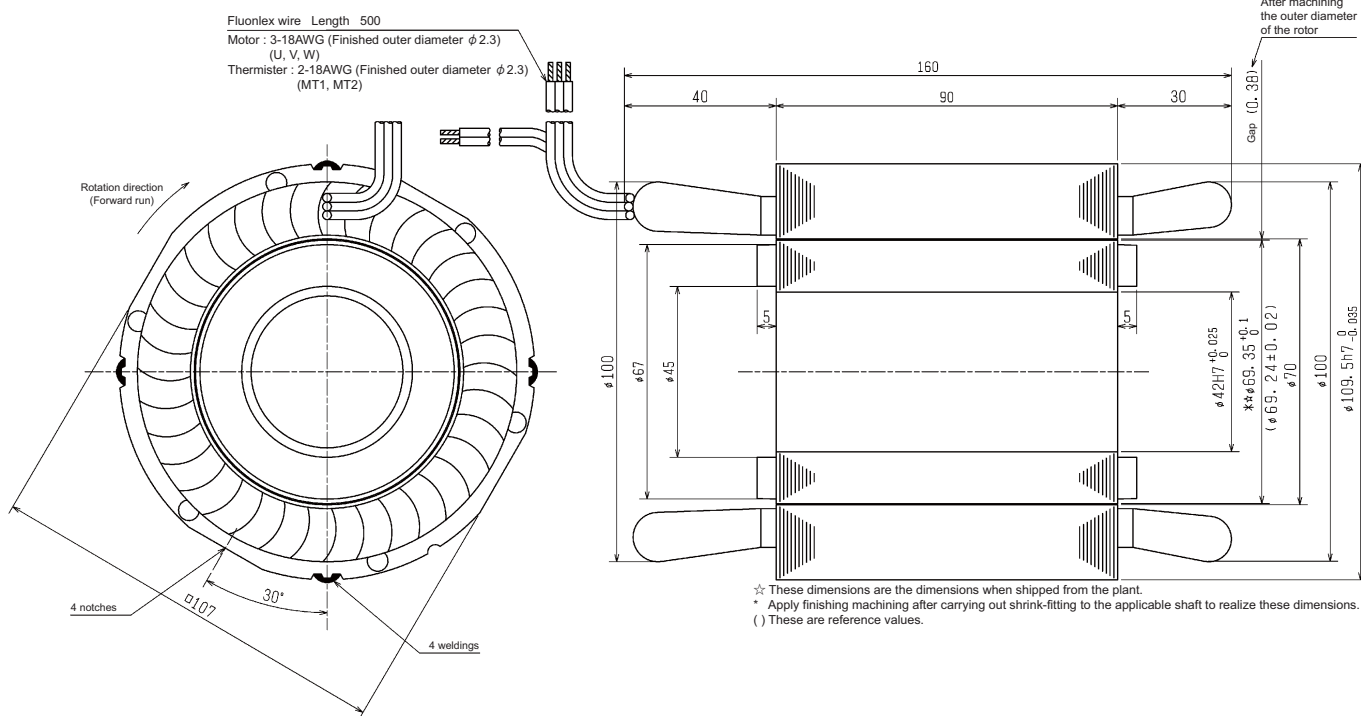
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]





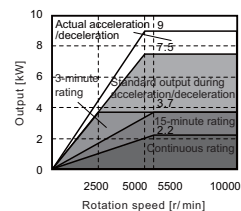
Built-in IM spindle motor

# SJ-2B4B01T

## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7(15-minute rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed	Continuous[r/min]	5500
	Short time[r/min]	5500
Maximum rotation speed[r/min]		10000
Frame No. - Core width		70-70
Torque (Base rotation speed)	Continuous[N·m]	3.82
	Short time[N·m]	6.42
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0065
Rotor inertia moment[kg·m <sup>2</sup> ]		0.00163
Mass	Stator[kg]	3.0
	Rotor[kg]	1.5
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		720
Cooling oil amount[l/min (20°C)]		5

## Output characteristics

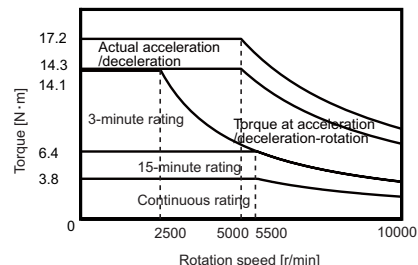


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

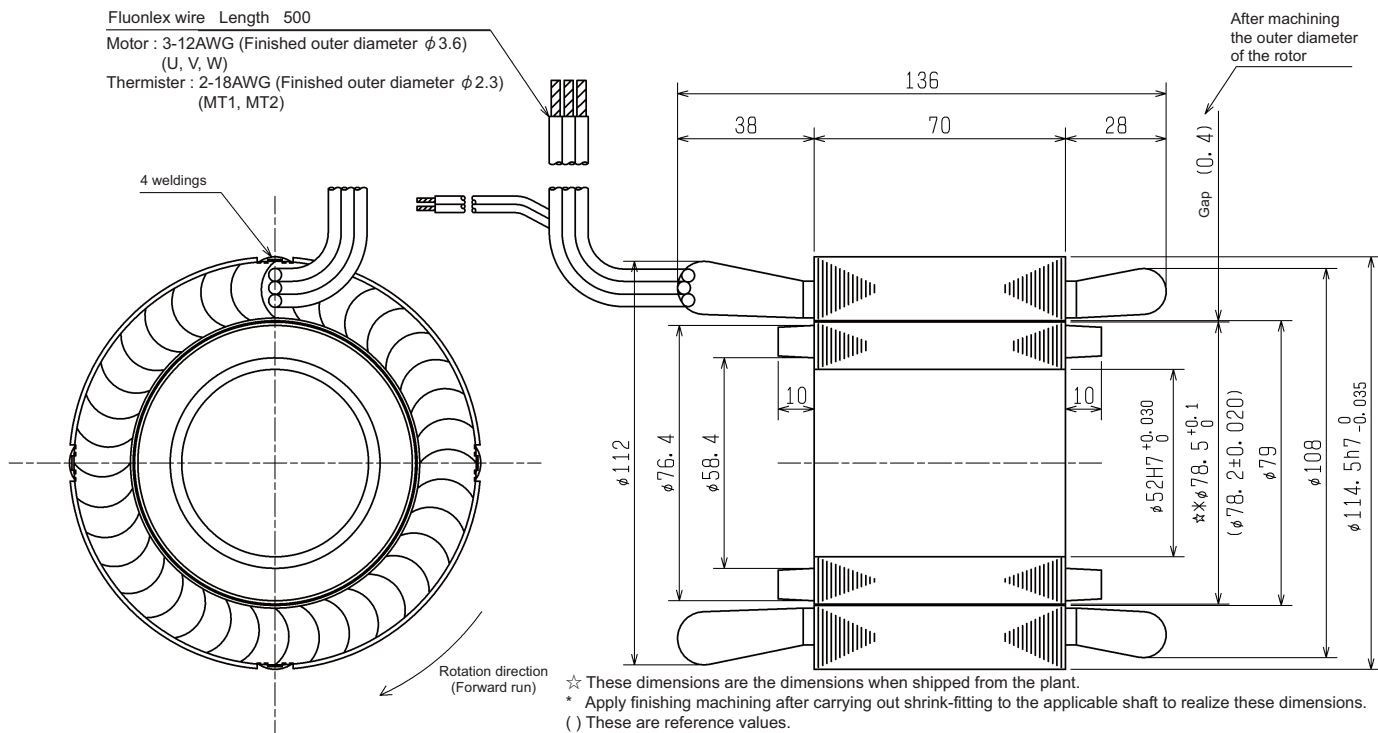
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

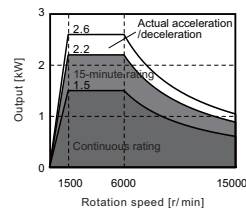


Built-in IM spindle motor  
**SJ-2B4201T**

Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	2.2(15-minute rating)
	Standard output during acceleration/deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.64
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-75
Torque (Base rotation speed)	Continuous[N·m]	9.55
	Short time[N·m]	14.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.020
Rotor inertia moment[kg·m <sup>2</sup> ]		0.005
Mass	Stator[kg]	7.1
	Rotor[kg]	2.9
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		510
Cooling oil amount[l/min (20°C)]		5

Output characteristics

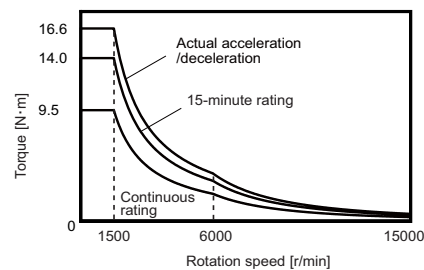


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

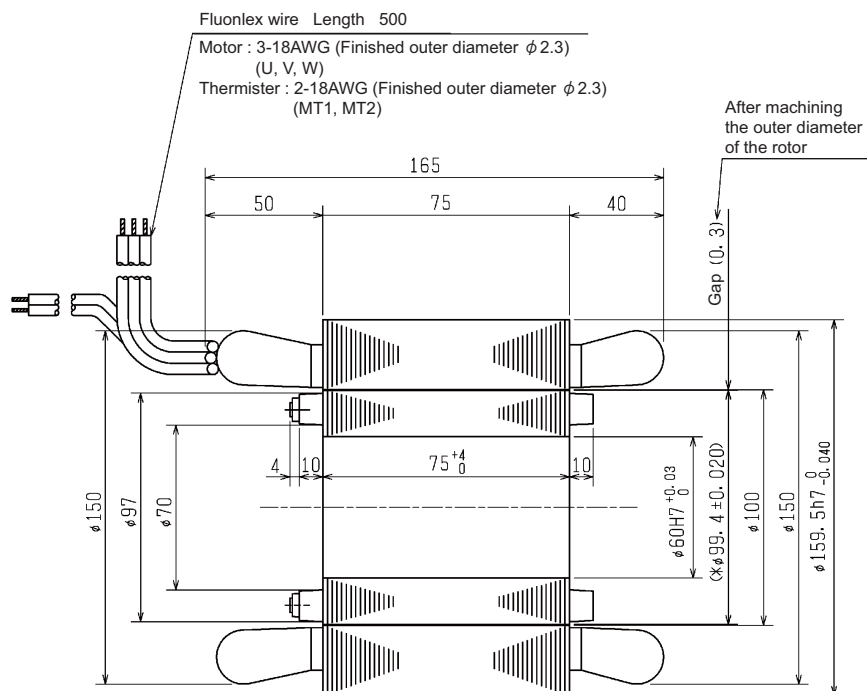
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 10000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

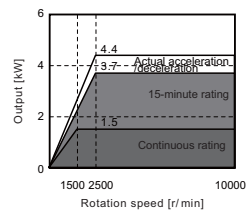
Built-in IM spindle motor

# SJ-2B4218T

## Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	3.7(15-minute rating)
	Standard output during acceleration/deceleration	3.7
	Actual acceleration/deceleration output(*3)	4.44
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	2500
Maximum rotation speed[r/min]		10000
Frame No. - Core width		100-75
Torque (Base rotation speed)	Continuous[N·m]	9.55
	Short time[N·m]	14.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.020
Rotor inertia moment[kg·m <sup>2</sup> ]		0.005
Mass	Stator[kg]	7.1
	Rotor[kg]	2.9
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		650
Cooling oil amount[l/min (20°C)]		5

## Output characteristics

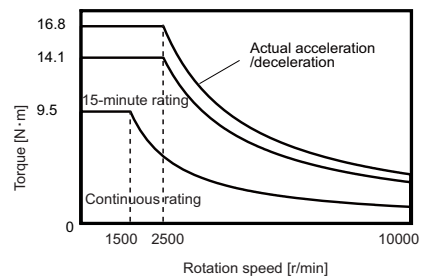


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

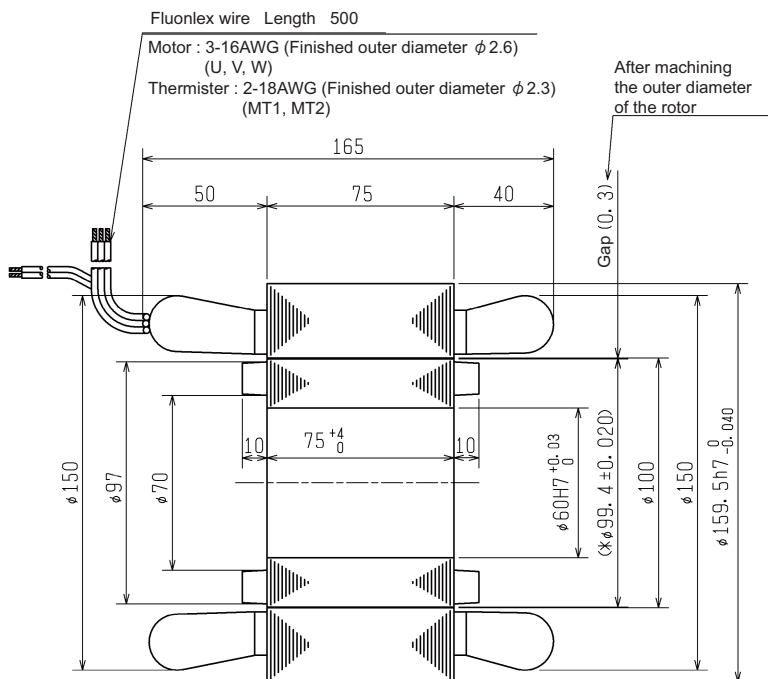
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



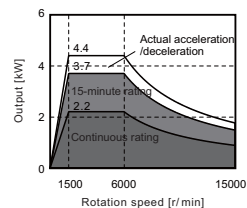
- ☆ These dimensions are the dimensions when shipped from the plant.
- \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.
- () These are reference values.

Built-in IM spindle motor  
**SJ-2B4202T**

Specifications

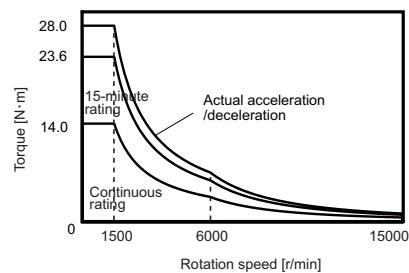
Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7(15-minute rating)
	Standard output during acceleration/deceleration	3.7
	Actual acceleration/deceleration output(*3)	4.44
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-105
Torque (Base rotation speed)	Continuous[N·m]	14.0
	Short time[N·m]	23.6
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.027
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0068
Mass	Stator[kg]	10
	Rotor[kg]	4.1
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		830
Cooling oil amount[l/min (20°C)]		5

Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

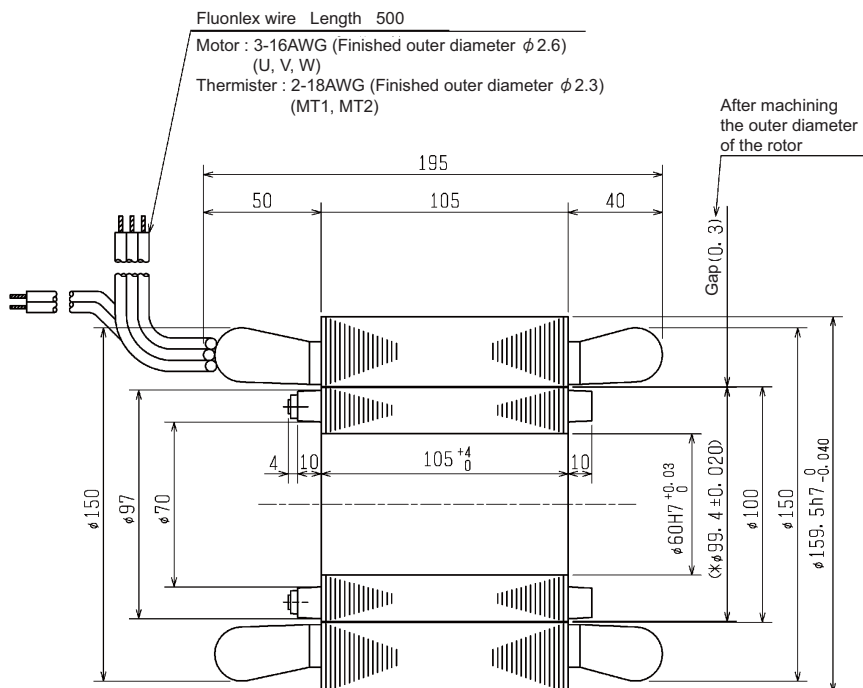
Torque - rotation speed characteristics



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]



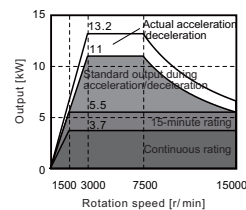
- ☆ These dimensions are the dimensions when shipped from the plant.
- \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.
- () These are reference values.

Built-in IM spindle motor  
**SJ-2B4215T**

Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200
	2-axis type	-
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5(15-minute rating)
	Standard output during acceleration/deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-135
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	35.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.034
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0085
Mass	Stator[kg]	13
	Rotor[kg]	5.1
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		1240
Cooling oil amount[l/min (20°C)]		5

Output characteristics

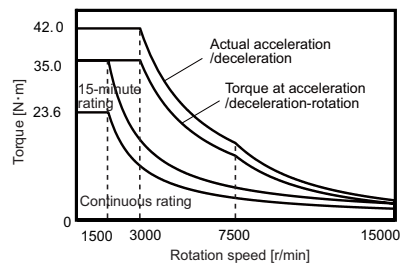


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

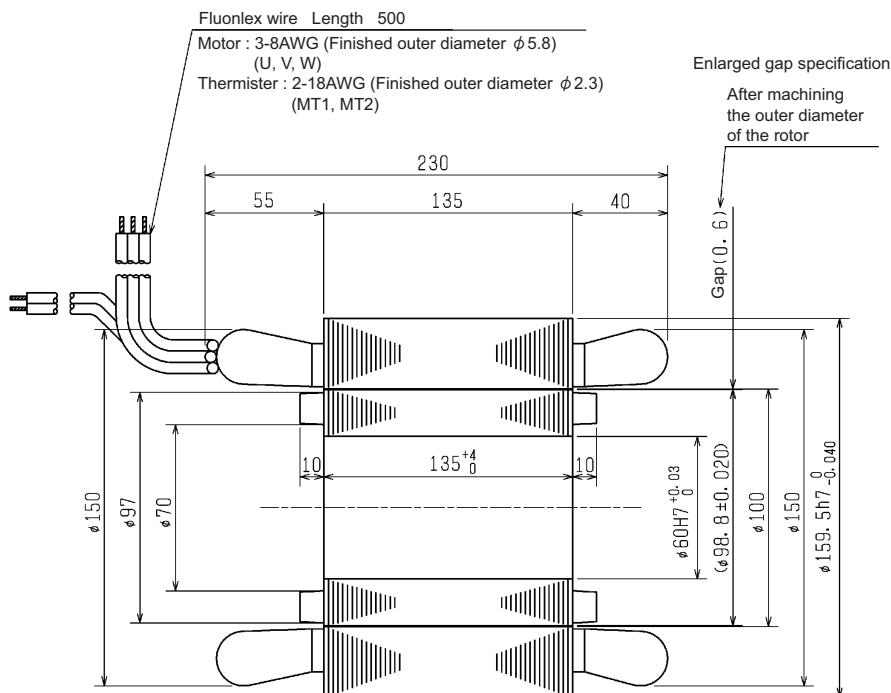
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



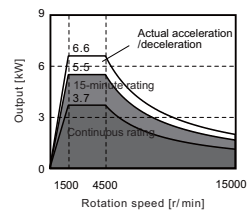
☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

Built-in IM spindle motor  
**SJ-2B4203T**

Specifications

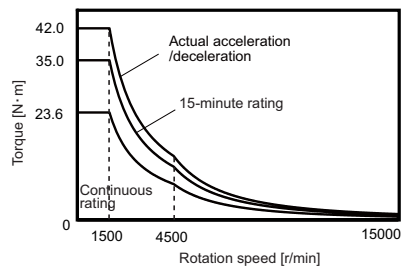
Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80, MDS-E-SP2-16080(M)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5(15-minute rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-135
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	35.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.035
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0088
Mass	Stator[kg]	13
	Rotor[kg]	5.2
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		1180
Cooling oil amount[l/min (20°C)]		5

Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

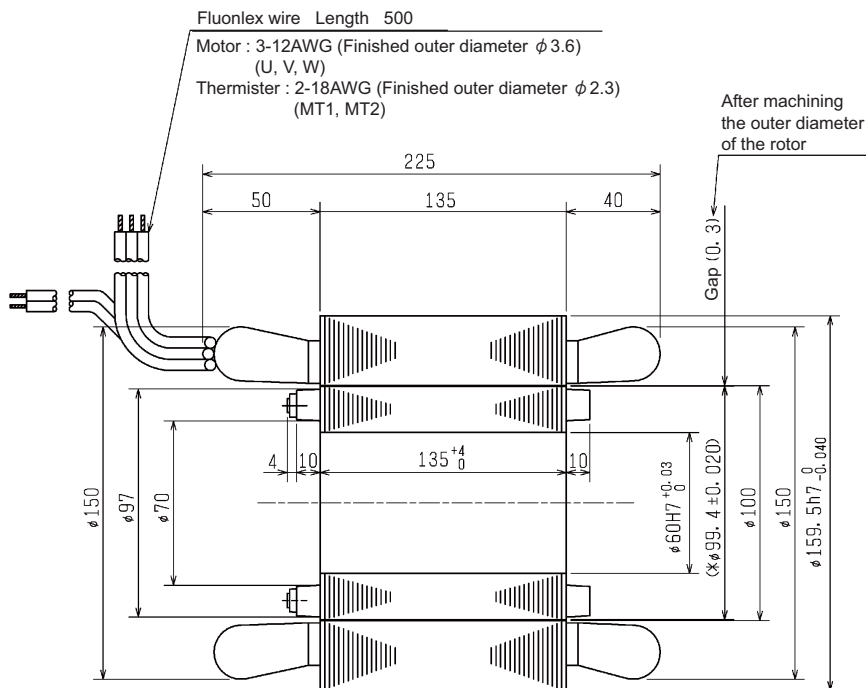
Torque - rotation speed characteristics



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Outline dimension drawings [Unit : mm]



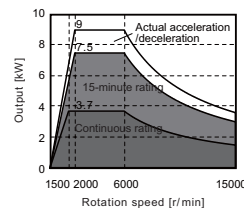
- ☆ These dimensions are the dimensions when shipped from the plant.
- \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.
- ( ) These are reference values.

Built-in IM spindle motor  
**SJ-2B4219T**

Specifications

Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	7.5(15-minute rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	2000
Maximum rotation speed[r/min]		15000
Frame No. - Core width		100-135
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	35.8
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.035
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0088
Mass	Stator[kg]	13
	Rotor[kg]	5.2
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		1340
Cooling oil amount[l/min (20°C)]		5

Output characteristics

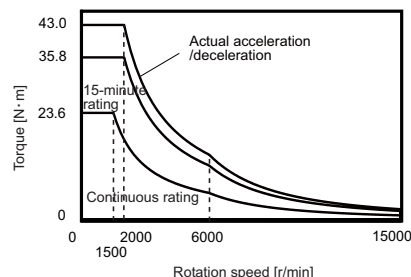


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

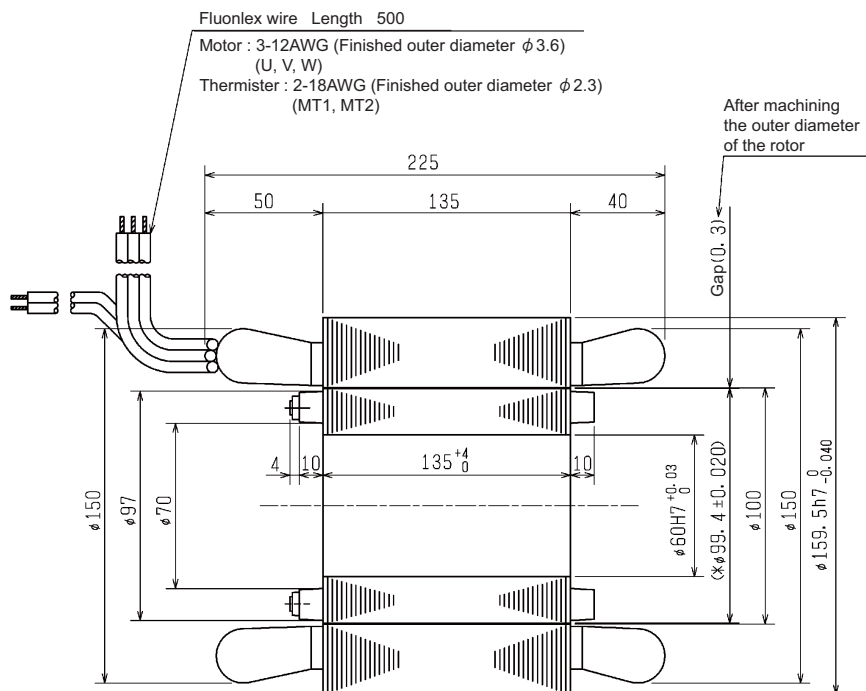
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

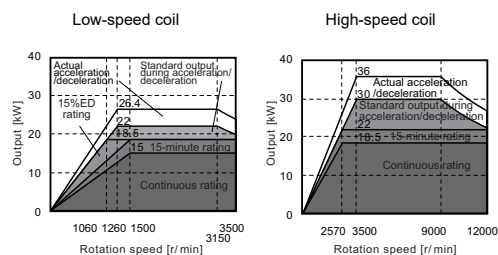
Built-in IM spindle motor

# SJ-2B4311TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	18.5
	Short time rated output	18.5(15-minute rating)	22(15-minute rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	1500	2570
	Short time[r/min]	1500	2570
Maximum rotation speed[r/min]		3500	12000
Frame No. - Core width		112-220	
Torque (Base rotation speed)	Continuous[N·m]	95.5	68.7
	Short time[N·m]	118	81.7
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.090	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0225	
Mass	Stator[kg]	26	
	Rotor[kg]	9.8	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4120	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

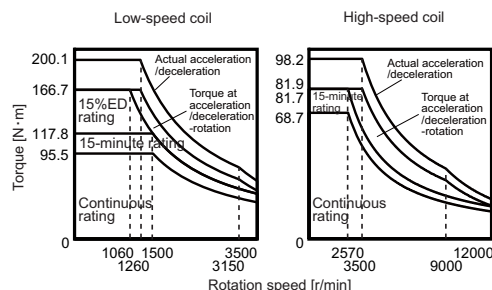


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

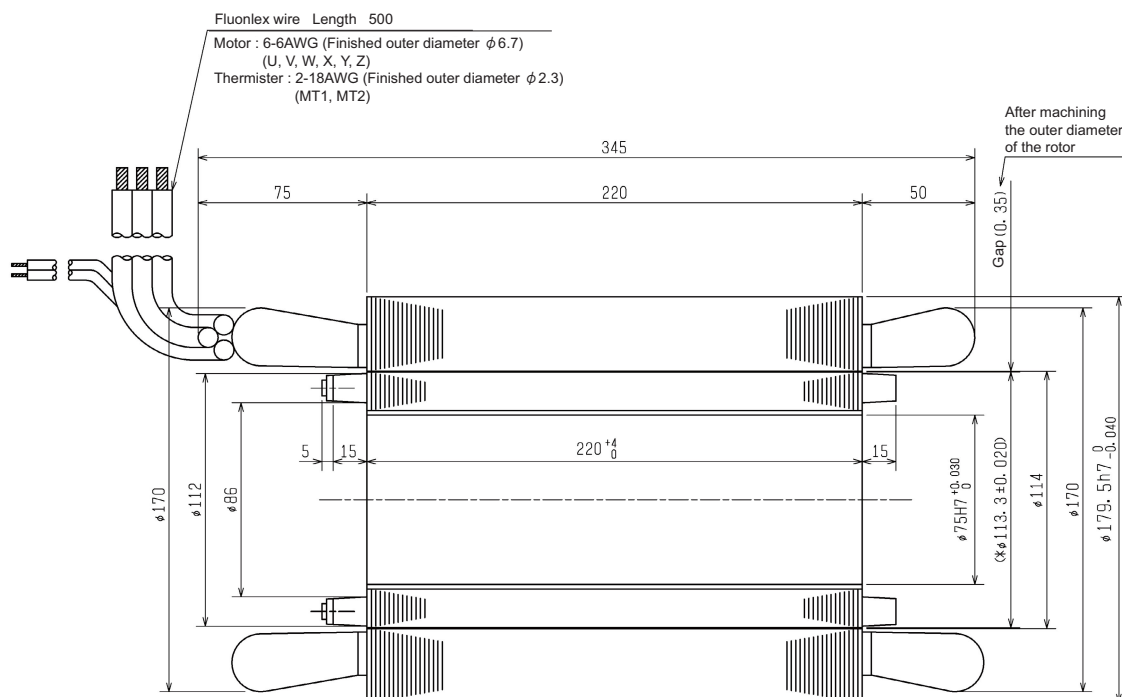
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 () These are reference values.



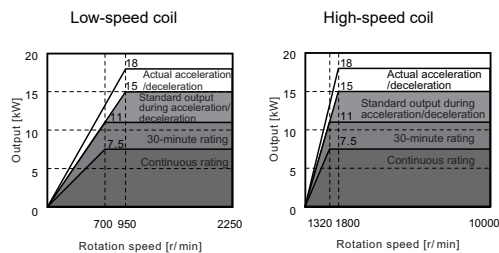
Built-in IM spindle motor

# SJ-2B4501TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11(30-minute rating)	11(30-minute rating)
	Standard output during acceleration/deceleration	15	
	Actual acceleration/deceleration output(*3)	18	
Base rotation speed	Continuous[r/min]	700	1320
	Short time[r/min]	700	1320
Maximum rotation speed[r/min]		2250	10000
Frame No. - Core width		160-175	
Torque (Base rotation speed)	Continuous[N·m]	102	54.3
	Short time[N·m]	150	79.6
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.32	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.08	
Mass	Stator[kg]	29	
	Rotor[kg]	18	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		3850	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

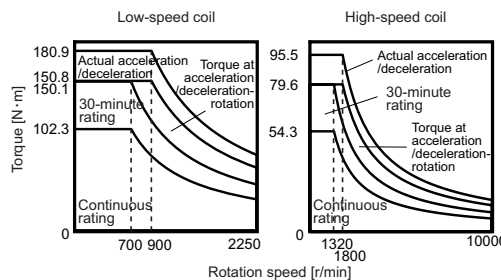


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

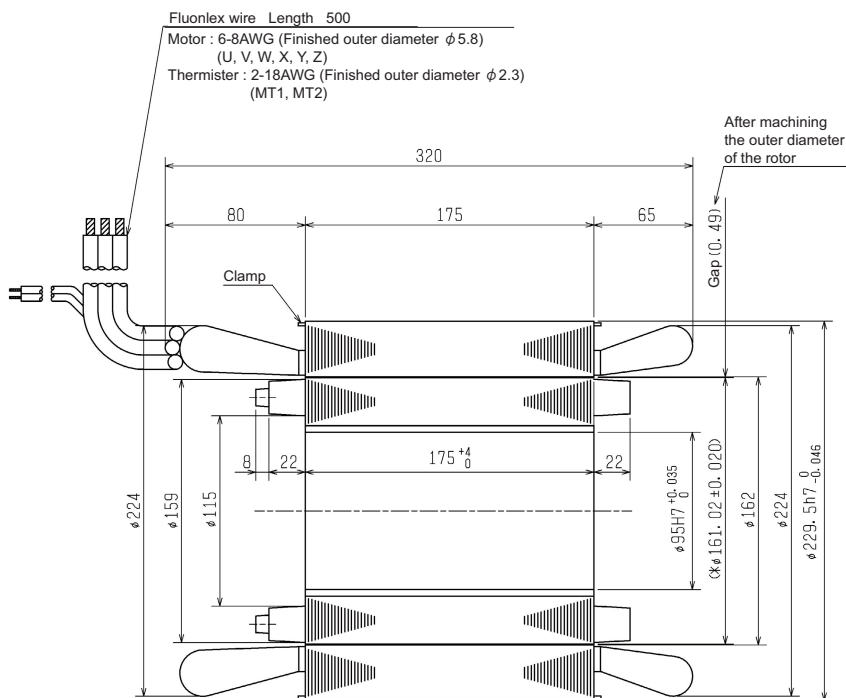
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



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 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
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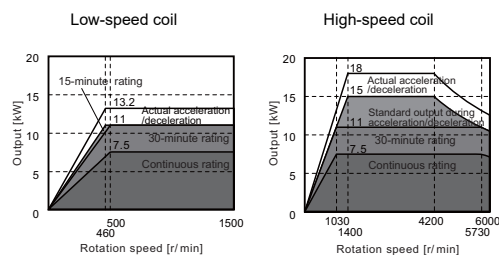
Built-in IM spindle motor

# SJ-2B6611TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11(30-minute rating)	11(30-minute rating)
	Standard output during acceleration/deceleration	11	15
	Actual acceleration/deceleration output(*3)	13.2	18
Base rotation speed	Continuous[r/min]	500	1030
	Short time[r/min]	500	1030
Maximum rotation speed[r/min]		1500	6000
Frame No. - Core width		160-175	
Torque (Base rotation speed)	Continuous[N·m]	143	69.5
	Short time[N·m]	210	102
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.41	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.102	
Mass	Stator[kg]	37	
	Rotor[kg]	19	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		3520	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

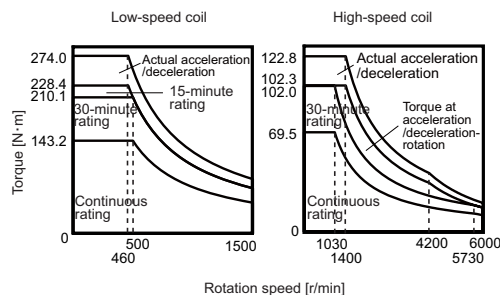


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

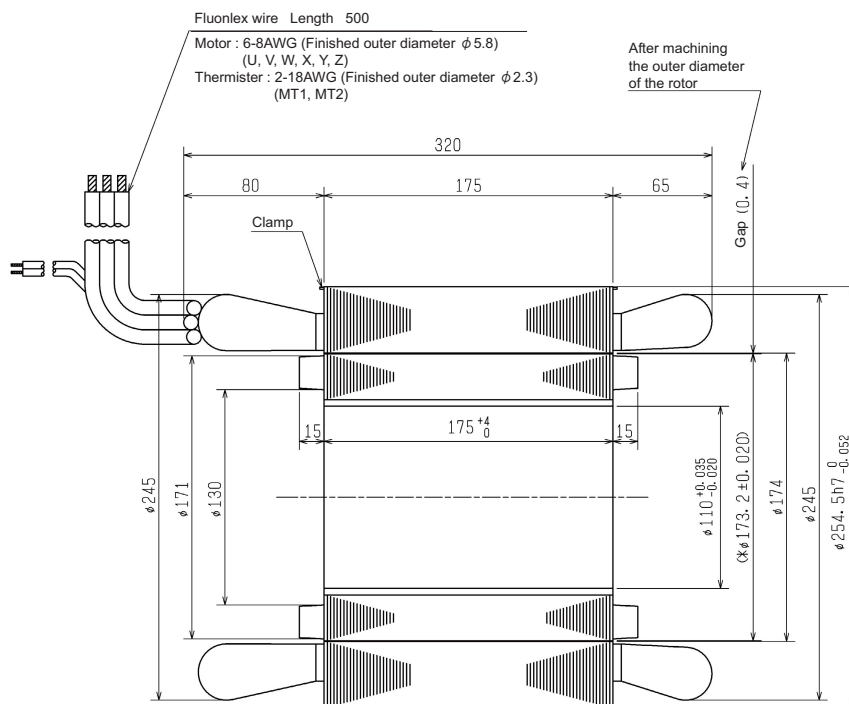
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



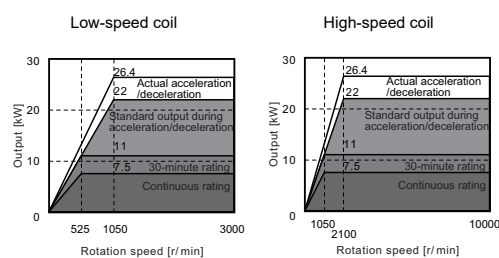
☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

Built-in IM spindle motor  
**SJ-2B4502TK**

Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor		-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11(30-minute rating)	11(30-minute rating)
	Standard output during acceleration/deceleration	22	
	Actual acceleration/deceleration output(*3)	26.4	
Base rotation speed	Continuous[r/min]	525	1050
	Short time[r/min]	525	1050
Maximum rotation speed[r/min]		3000	10000
Frame No. - Core width		160-230	
Torque (Base rotation speed)	Continuous[N·m]	136	68.2
	Short time[N·m]	200	100
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.42	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.105	
Mass	Stator[kg]	37	
	Rotor[kg]	24	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4730	
Cooling oil amount[l/min (20°C)]		10	

Output characteristics

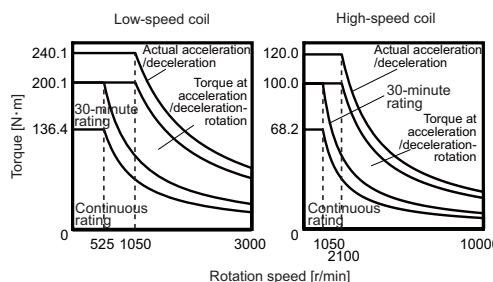


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

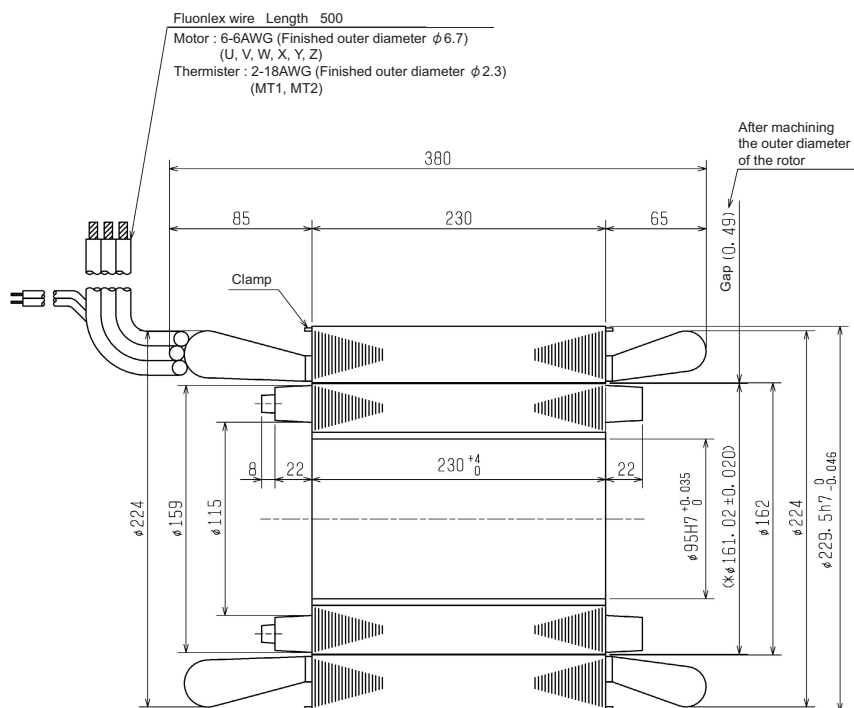
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics



Outline dimension drawings [Unit : mm]



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\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

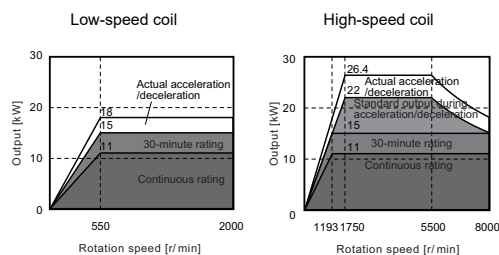
Built-in IM spindle motor

# SJ-2B6602TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	11
	Short time rated output	15(30-minute rating)	15(30-minute rating)
	Standard output during acceleration/deceleration	15	22
	Actual acceleration/deceleration output(*3)	18	26.4
Base rotation speed	Continuous[r/min]	550	1193
	Short time[r/min]	550	1193
Maximum rotation speed[r/min]		2000	8000
Frame No. - Core width		160-230	
Torque (Base rotation speed)	Continuous[N·m]	191	88.0
	Short time[N·m]	260	120
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.53	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.133	
Mass	Stator[kg]	49	
	Rotor[kg]	25	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		3810	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

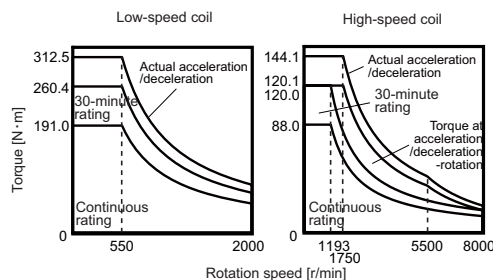


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

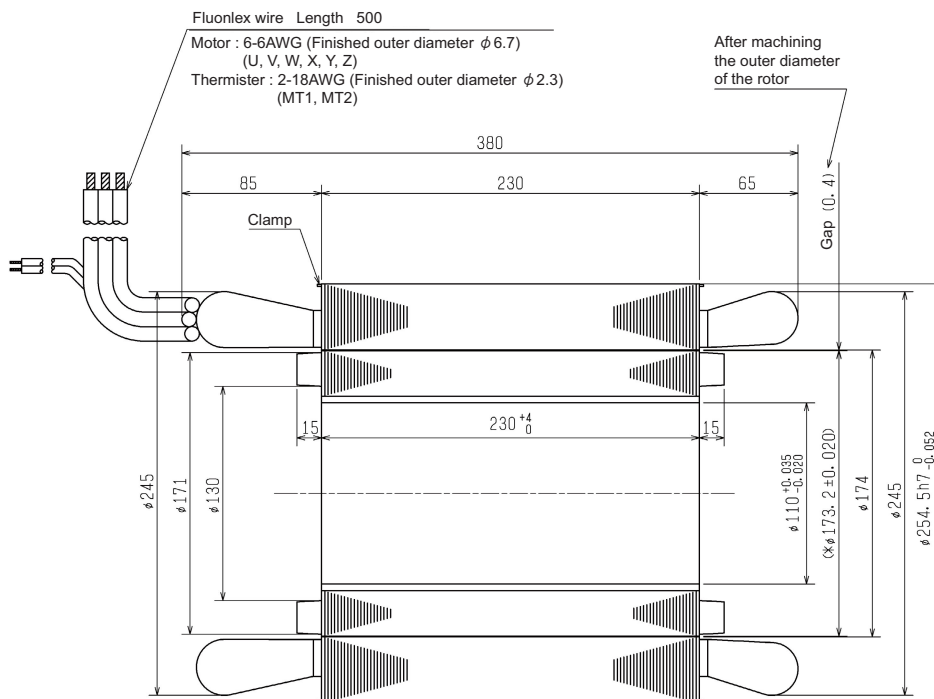
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



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\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

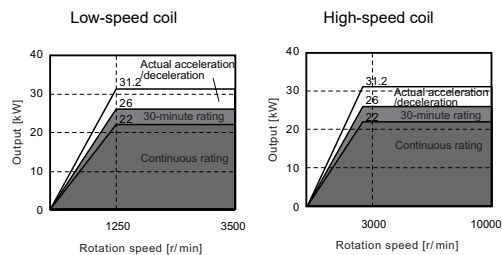
Built-in IM spindle motor

# SJ-2B4601TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	22	22
	Short time rated output	26(30-minute rating)	26(30-minute rating)
	Standard output during acceleration/deceleration	26	
	Actual acceleration/deceleration output(*3)	31.2	
Base rotation speed	Continuous[r/min]	1250	3000
	Short time[r/min]	1250	3000
Maximum rotation speed[r/min]		3500	10000
Frame No. - Core width		160-230	
Torque (Base rotation speed)	Continuous[N·m]	168	70.0
	Short time[N·m]	199	82.8
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.42	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.105	
Mass	Stator[kg]	55	
	Rotor[kg]	24	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		3270	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

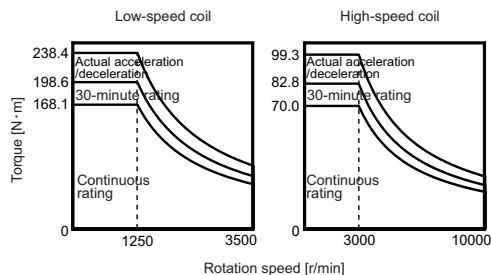


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

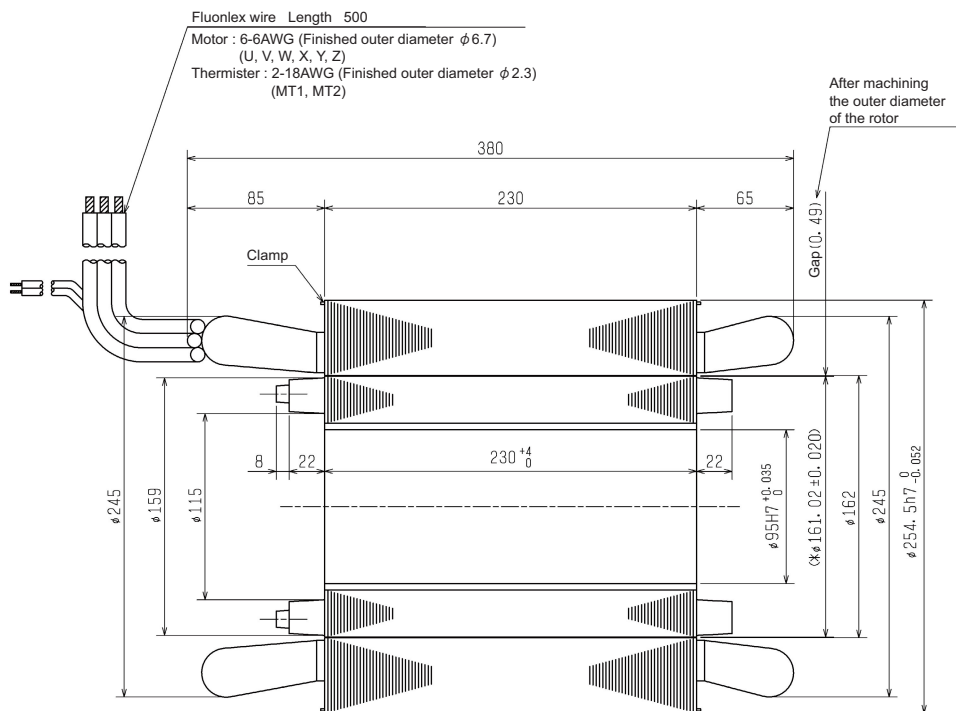
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

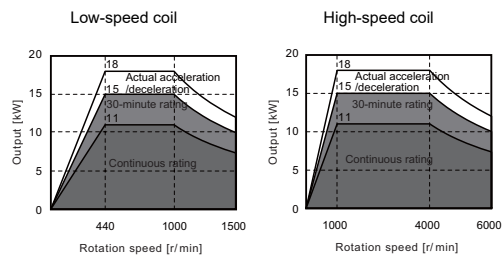
Built-in IM spindle motor

# SJ-2B6605TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-240	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	11
	Short time rated output	15(30-minute rating)	15(30-minute rating)
	Standard output during acceleration/deceleration	15	
	Actual acceleration/deceleration output(*3)	18	
Base rotation speed	Continuous[r/min]	440	1000
	Short time[r/min]	440	1000
Maximum rotation speed[r/min]		1500	6000
Frame No. - Core width			
		160-295	
Torque (Base rotation speed)	Continuous[N·m]	239	105
	Short time[N·m]	326	143
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.69	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.173	
Mass	Stator[kg]	63	
	Rotor[kg]	33	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4450	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

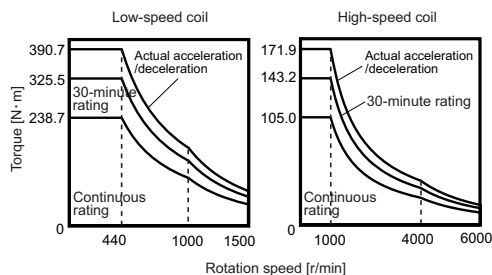


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

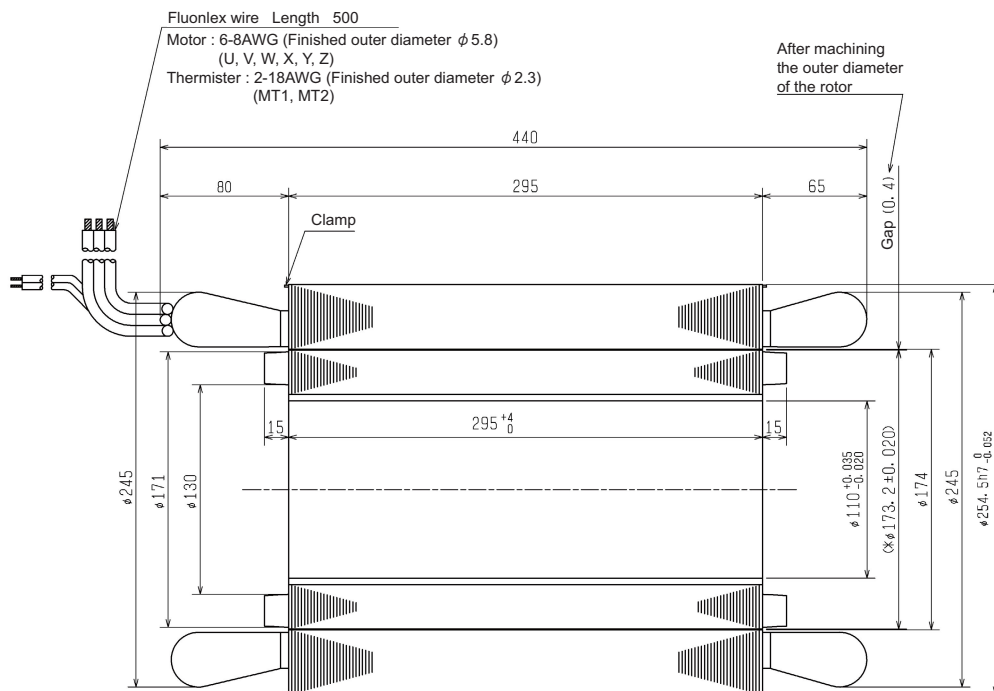
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



- ☆ These dimensions are the dimensions when shipped from the plant.
- \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.
- ( ) These are reference values.

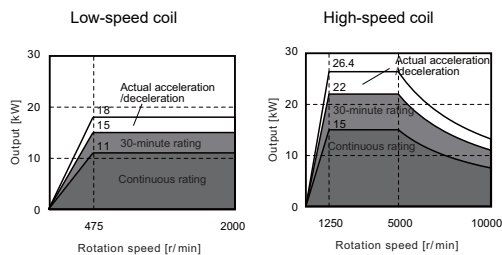
Built-in IM spindle motor

# SJ-2B4503TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	15
	Short time rated output	15(30-minute rating)	22(30-minute rating)
	Standard output during acceleration/deceleration	15	22
	Actual acceleration/deceleration output(*3)	18	26.4
Base rotation speed	Continuous[r/min]	475	1250
	Short time[r/min]	475	1250
Maximum rotation speed[r/min]		2000	10000
Frame No. - Core width		160-295	
Torque (Base rotation speed)	Continuous[N·m]	221	115
	Short time[N·m]	302	168
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.54	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.135	
Mass	Stator[kg]	48	
	Rotor[kg]	31	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		7220	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

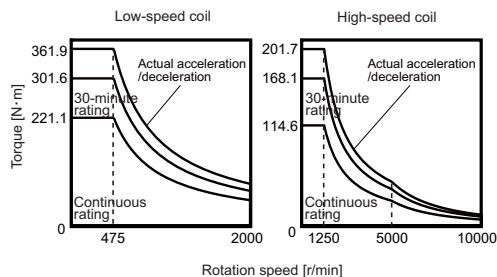


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

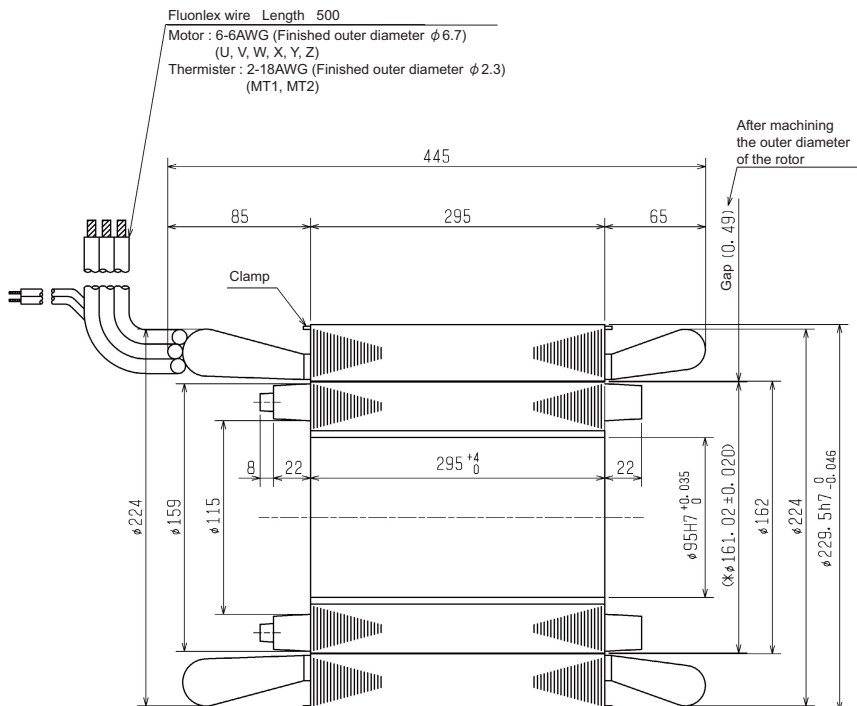
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.



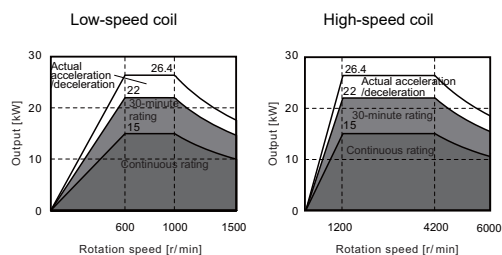
Built-in IM spindle motor

# SJ-2B6603TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	15
	Short time rated output	22(30-minute rating)	22(30-minute rating)
	Standard output during acceleration/deceleration	22	
	Actual acceleration/deceleration output(*3)	26.4	
Base rotation speed	Continuous[r/min]	600	1200
	Short time[r/min]	600	1200
Maximum rotation speed[r/min]		1500	6000
Frame No. - Core width			
		160-295	
Torque (Base rotation speed)	Continuous[N·m]	239	119
	Short time[N·m]	350	175
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.69	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.173	
Mass	Stator[kg]	63	
	Rotor[kg]	33	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		5160	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

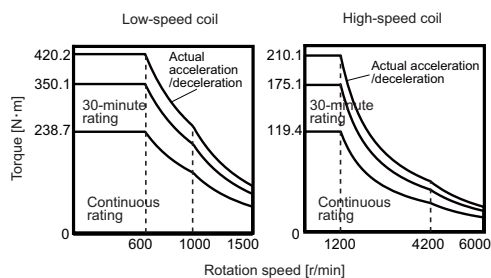


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

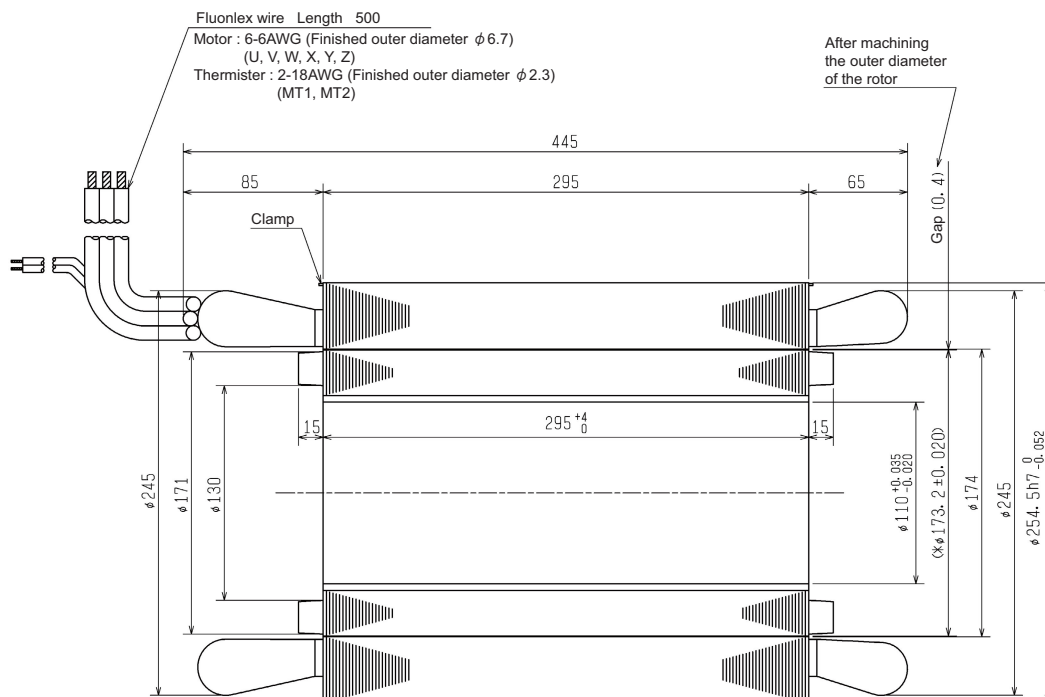
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.



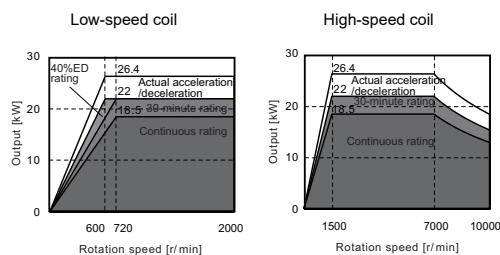
Built-in IM spindle motor

# SJ-2B4602TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	18.5	18.5
	Short time rated output	22(30-minute rating)	22(30-minute rating)
	Standard output during acceleration/deceleration	22	
	Actual acceleration/deceleration output(*3)	26.4	
Base rotation speed	Continuous[r/min]	720	1500
	Short time[r/min]	720	1500
Maximum rotation speed[r/min]		2000	10000
Frame No. - Core width		160-295	
Torque (Base rotation speed)	Continuous[N·m]	245	118
	Short time[N·m]	292	140
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.54	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.135	
Mass	Stator[kg]	71	
	Rotor[kg]	31	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4500	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

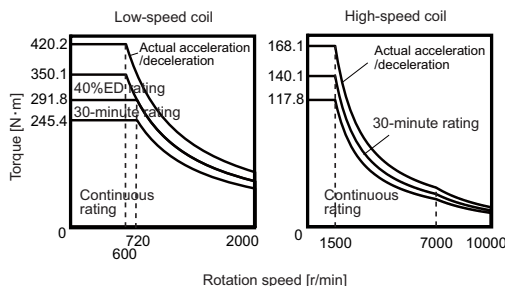


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

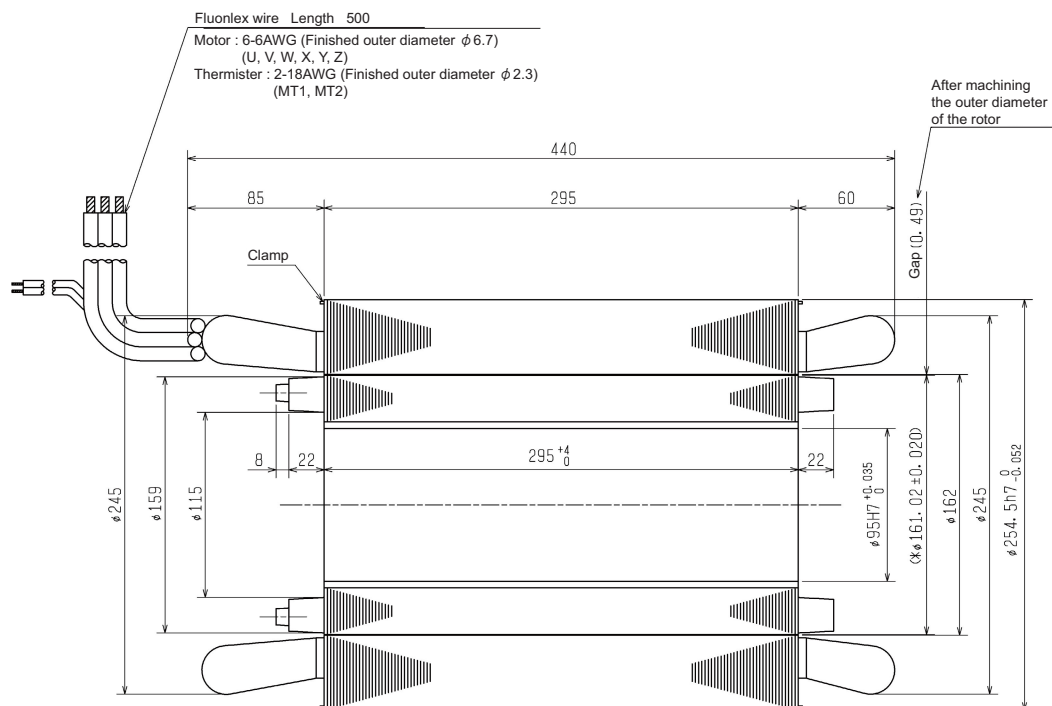
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

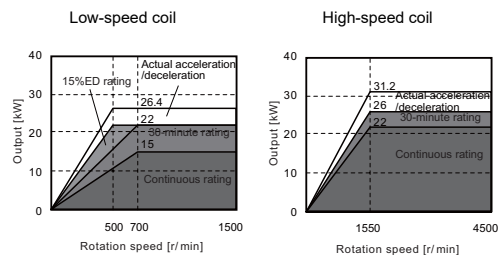
Built-in IM spindle motor

# SJ-2B6720TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor		-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22(30-minute rating)	26(30-minute rating)
	Standard output during acceleration/deceleration	22	26
	Actual acceleration/deceleration output(*3)	26.4	31.2
Base rotation speed	Continuous[r/min]	700	1550
	Short time[r/min]	700	1550
Maximum rotation speed[r/min]		1500	4500
Frame No. - Core width		180-160	
Torque (Base rotation speed)	Continuous[N·m]	205	136
	Short time[N·m]	300	160
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.80	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.20	
Mass	Stator[kg]	45	
	Rotor[kg]	26	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		5200	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

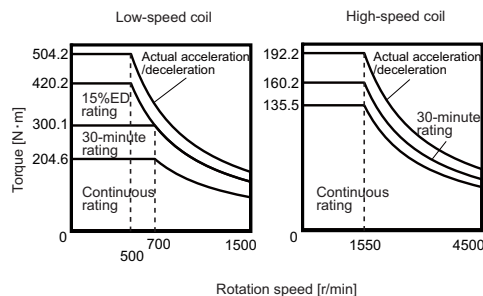


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

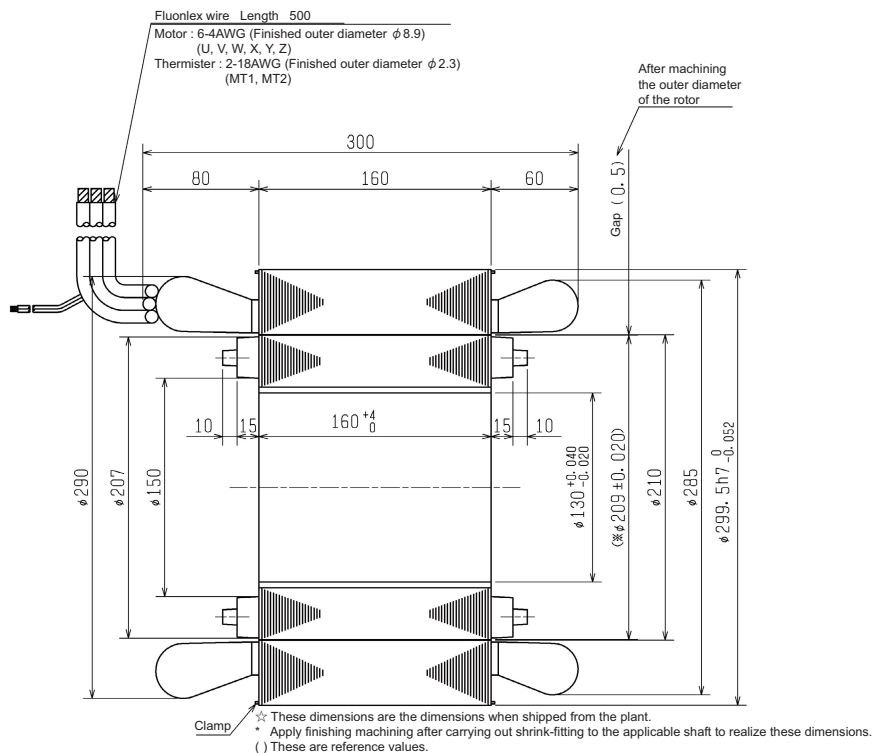
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



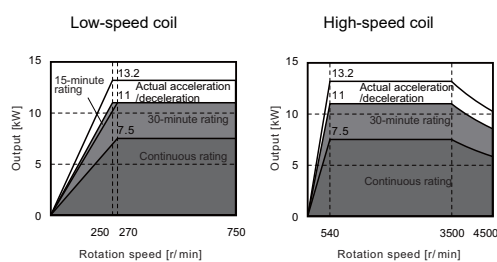
Built-in IM spindle motor

# SJ-2B6705TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11(30-minute rating)	11(30-minute rating)
	Standard output during acceleration/deceleration	11	
	Actual acceleration/deceleration output(*3)	13.2	
Base rotation speed	Continuous[r/min]	270	540
	Short time[r/min]	270	540
Maximum rotation speed[r/min]		750	4500
Frame No. - Core width		180-230	
Torque (Base rotation speed)	Continuous[N·m]	265	133
	Short time[N·m]	389	195
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.15	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.288	
Mass	Stator[kg]	65	
	Rotor[kg]	38	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4440	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

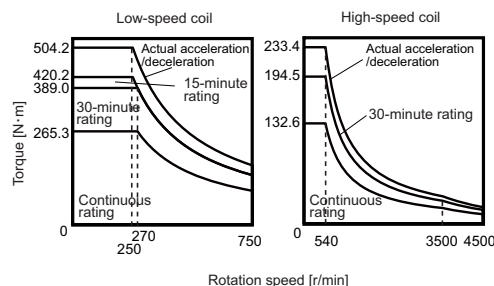


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

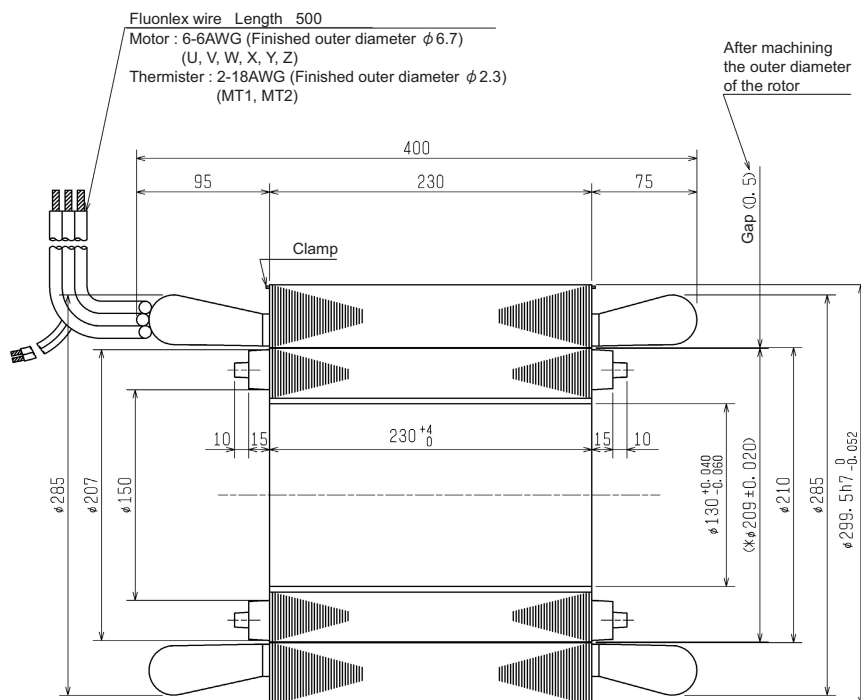
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

Built-in IM spindle motor

# SJ-2B6711TK

## Specifications

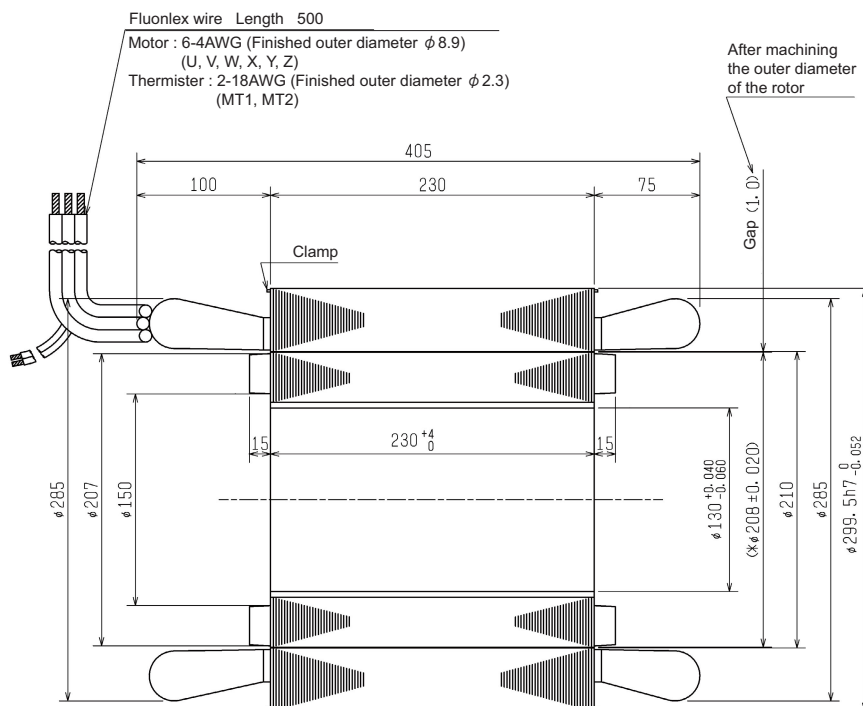
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor		-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	11
	Short time rated output	15(30-minute rating)	15(30-minute rating)
	Standard output during acceleration/deceleration	22	
	Actual acceleration/deceleration output(*3)	26.4	
Base rotation speed	Continuous[r/min]	400	920
	Short time[r/min]	500	920
Maximum rotation speed[r/min]		1700	5000
Frame No. - Core width		180-230	
Torque (Base rotation speed)	Continuous[N·m]	263	114
	Short time[N·m]	286	156
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.12	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.280	
Mass	Stator[kg]	65	
	Rotor[kg]	37	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		3270	
Cooling oil amount[l/min (20°C)]		10	

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

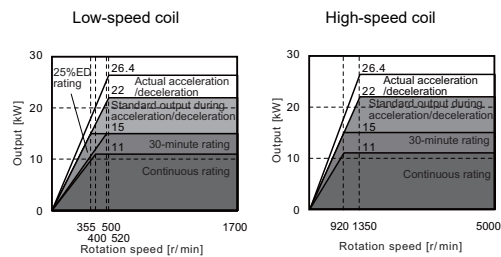
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

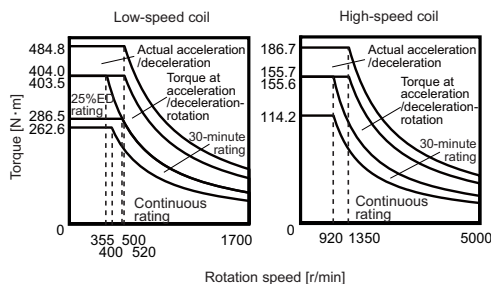


☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

## Output characteristics



## Torque - rotation speed characteristics



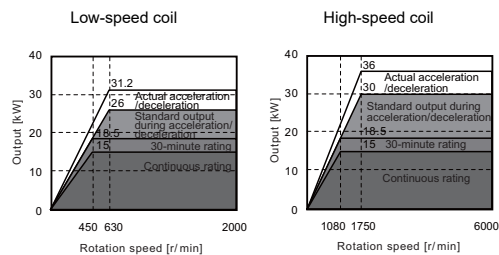
Built-in IM spindle motor

# SJ-2B6706TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	15
	Short time rated output	18.5(30-minute rating)	18.5(30-minute rating)
	Standard output during acceleration/deceleration	26	30
	Actual acceleration/deceleration output(*3)	31.2	36
Base rotation speed	Continuous[r/min]	450	1080
	Short time[r/min]	450	1080
Maximum rotation speed[r/min]		2000	6000
Frame No. - Core width		180-230	
Torque (Base rotation speed)	Continuous[N·m]	318	133
	Short time[N·m]	393	164
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.15	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.288	
Mass	Stator[kg]	65	
	Rotor[kg]	38	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4620	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics

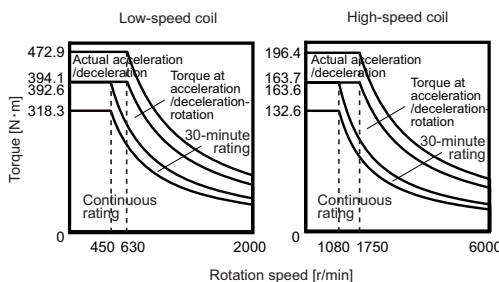


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

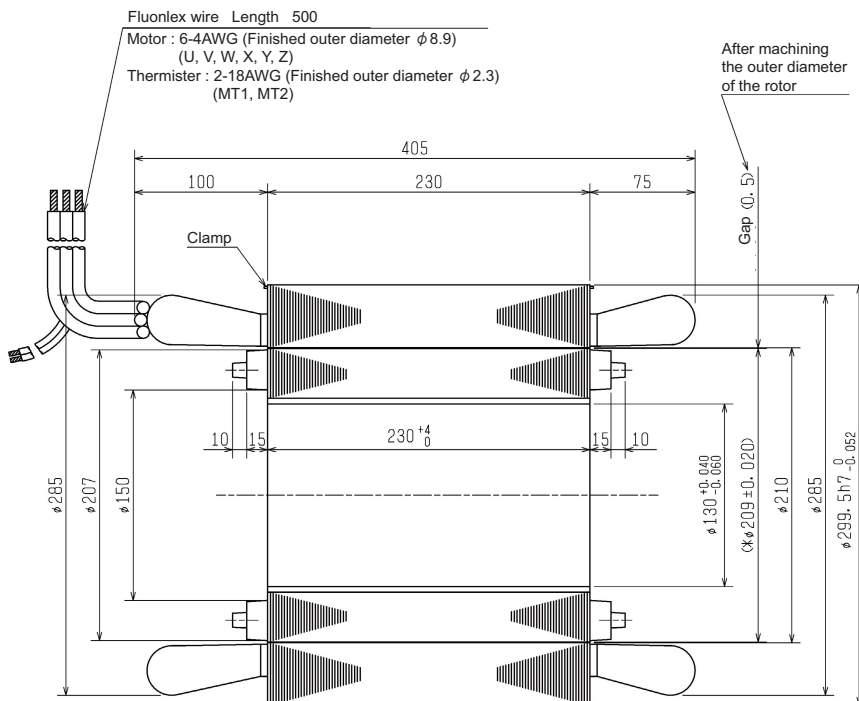
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

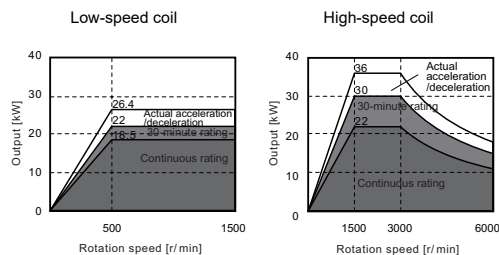
Built-in IM spindle motor

# SJ-2B6721TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	18.5	22
	Short time rated output	22(30-minute rating)	30(30-minute rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	500	1500
	Short time[r/min]	500	1500
Maximum rotation speed[r/min]		1500	6000
Frame No. - Core width		180-250	
Torque (Base rotation speed)	Continuous[N·m]	353	140
	Short time[N·m]	420	191
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.13	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.283	
Mass	Stator[kg]	70	
	Rotor[kg]	35	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		5230	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

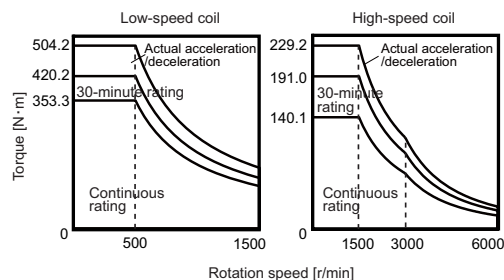


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

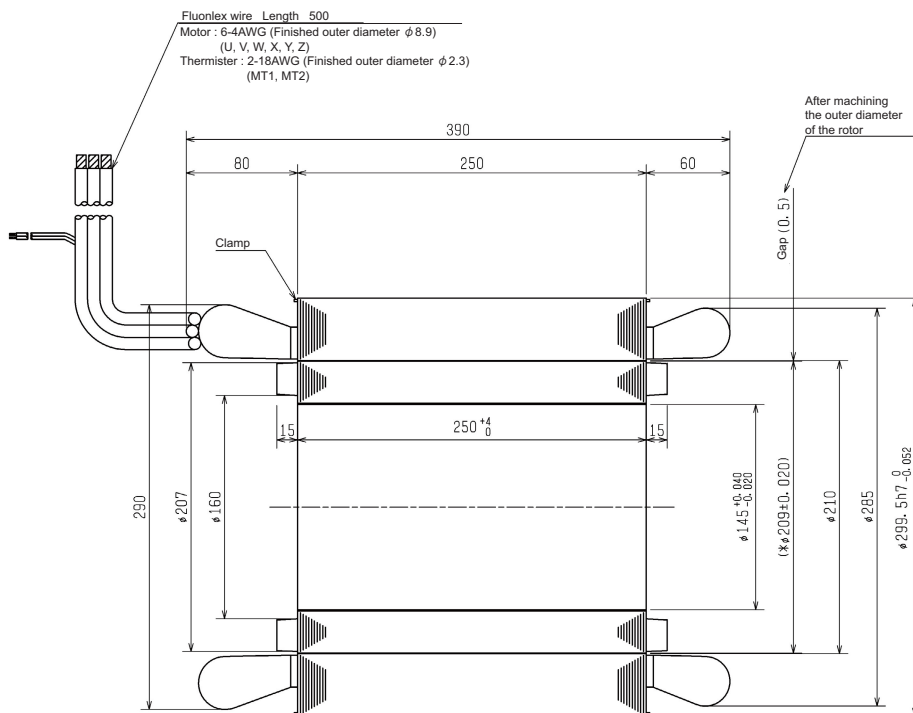
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

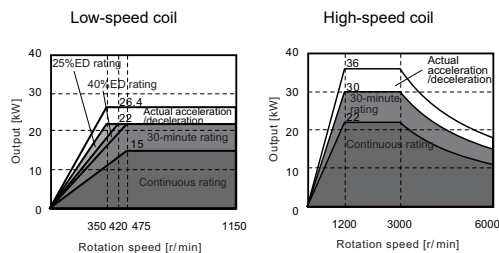
Built-in IM spindle motor

# SJ-2B6704TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor		-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22(30-minute rating)	30(30-minute rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	475	1200
	Short time[r/min]	475	1200
Maximum rotation speed[r/min]		1150	6000
Frame No. - Core width		180-295	
Torque (Base rotation speed)	Continuous[N·m]	302	175
	Short time[N·m]	442	239
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.48	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.37	
Mass	Stator[kg]	83	
	Rotor[kg]	49	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		5210	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

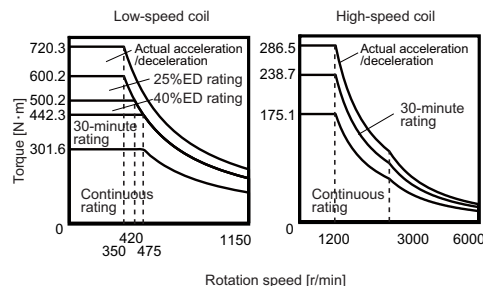


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

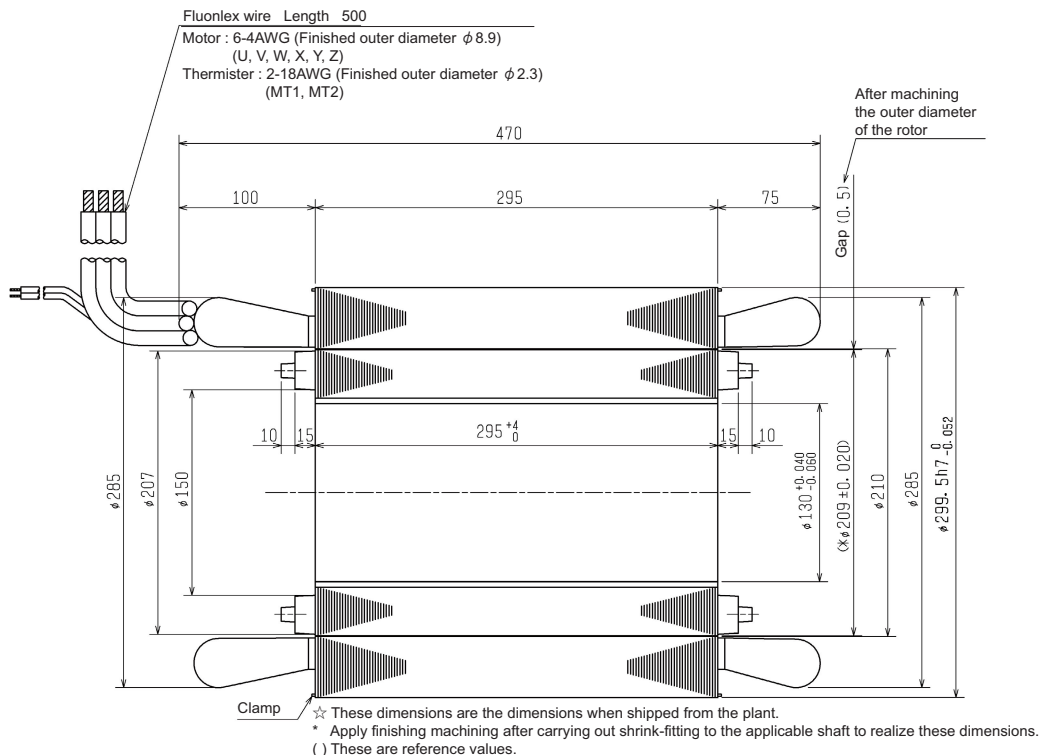
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]





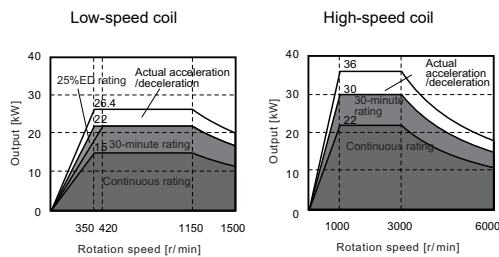
Built-in IM spindle motor

# SJ-2B6709TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
AC reactor for spindle motor		-	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22(30-minute rating)	30(30-minute rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	350	1000
	Short time[r/min]	420	1000
Maximum rotation speed[r/min]		1500	6000
Frame No. - Core width		180-295	
Torque (Base rotation speed)	Continuous[N·m]	409	210
	Short time[N·m]	500	286
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.48	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.37	
Mass	Stator[kg]	83	
	Rotor[kg]	49	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		6180	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

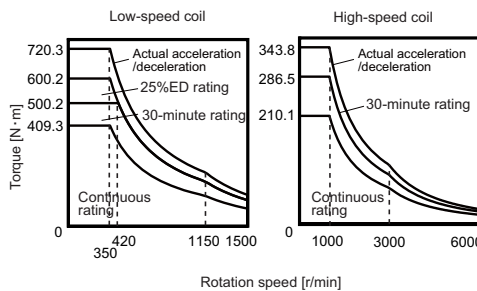


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

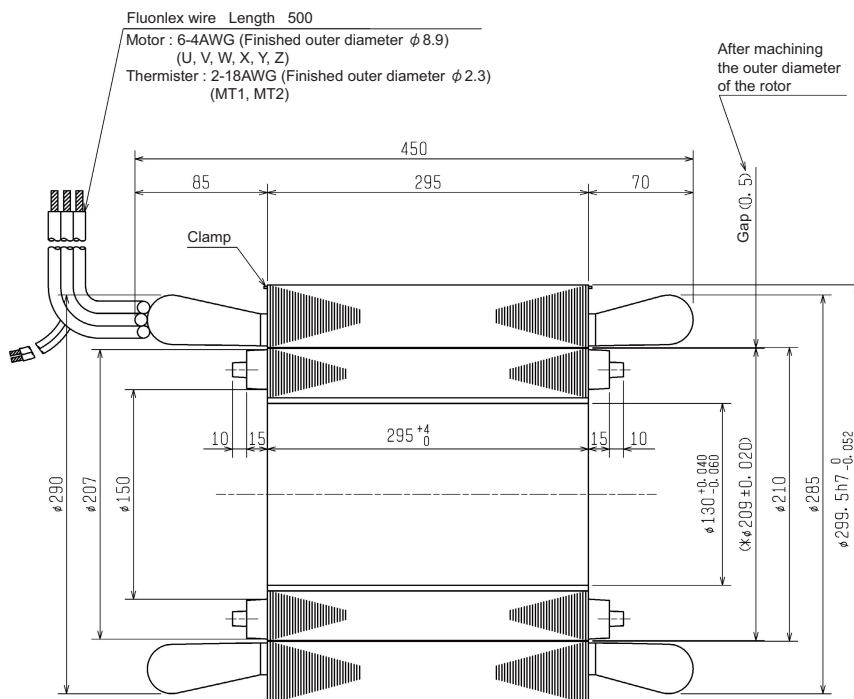
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.



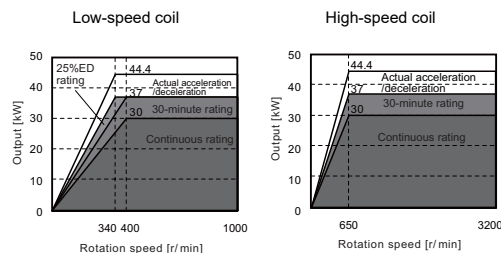
Built-in IM spindle motor

# SJ-2B6802TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-640	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	30	30
	Short time rated output	37(30-minute rating)	37(30-minute rating)
	Standard output during acceleration/deceleration	37	
	Actual acceleration/deceleration output(*3)	44.4	
Base rotation speed	Continuous[r/min]	400	650
	Short time[r/min]	400	650
Maximum rotation speed[r/min]		1000	3200
Frame No. - Core width		200-350	
Torque (Base rotation speed)	Continuous[N·m]	716	441
	Short time[N·m]	883	544
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		2.70	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.675	
Mass	Stator[kg]	116	
	Rotor[kg]	72	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		8450	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

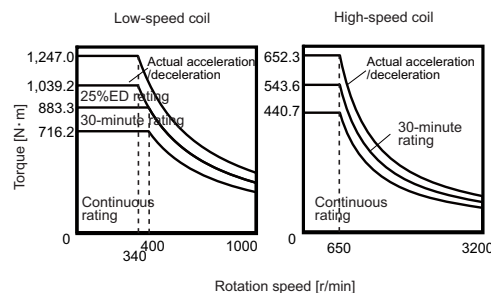


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

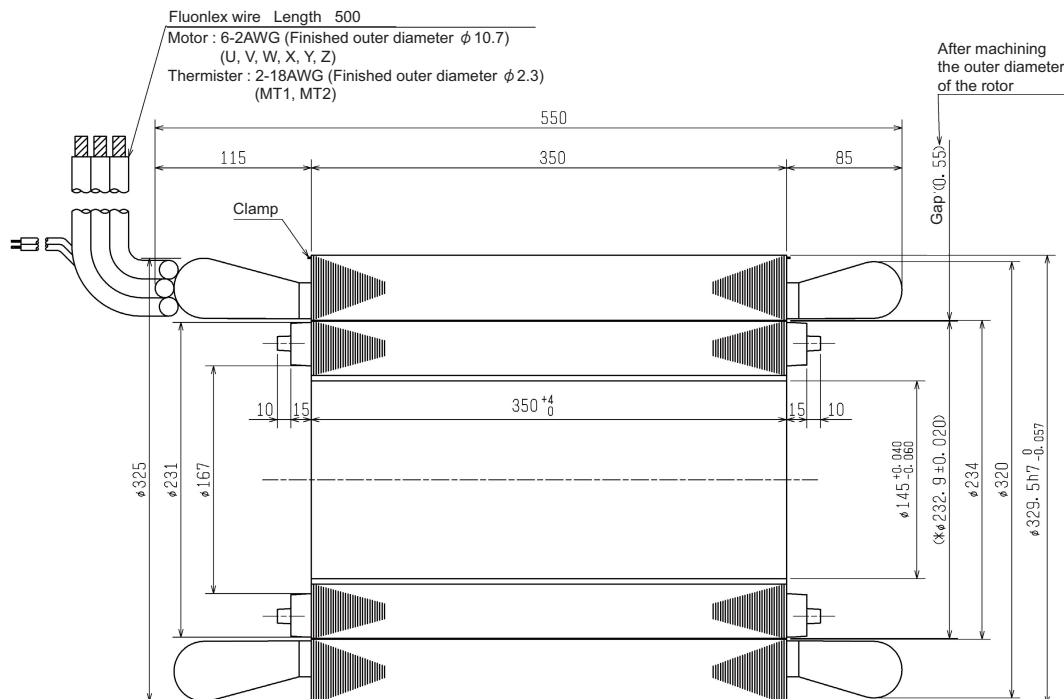
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

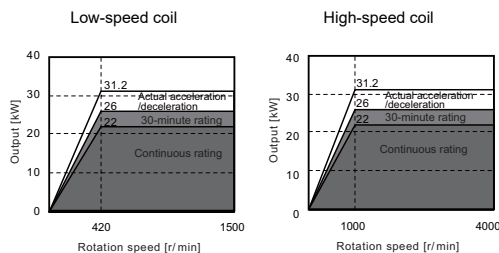
Built-in IM spindle motor

# SJ-2B6905TK

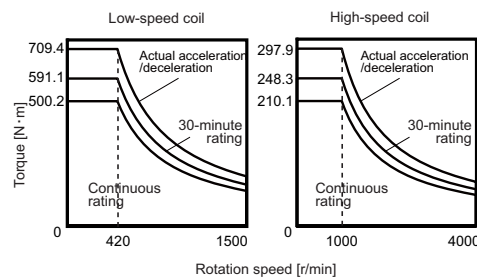
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	22	22
	Short time rated output	26(30-minute rating)	26(30-minute rating)
	Standard output during acceleration/deceleration	26	
	Actual acceleration/deceleration output(*3)	31.2	
Base rotation speed	Continuous[r/min]	420	1000
	Short time[r/min]	420	1000
Maximum rotation speed[r/min]		1500	4000
Frame No. - Core width		225-270	
Torque (Base rotation speed)	Continuous[N·m]	500	210
	Short time[N·m]	591	248
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		3.41	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.853	
Mass	Stator[kg]	110	
	Rotor[kg]	70	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		4040	
Cooling oil amount[l/min (20°C)]		10	

## Output characteristics



## Torque - rotation speed characteristics

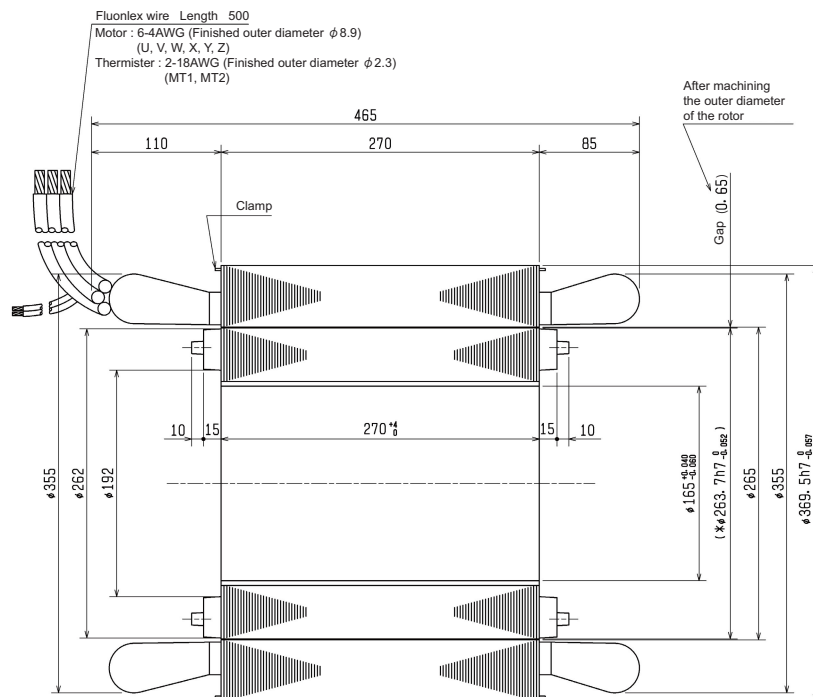


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

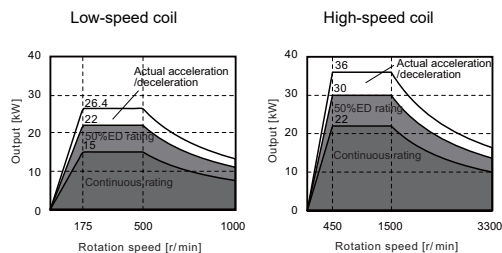
Built-in IM spindle motor

# SJ-2B6908TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	22
	Short time rated output	22(50%ED rating)	30(50%ED rating)
	Standard output during acceleration/deceleration	22	30
	Actual acceleration/deceleration output(*3)	26.4	36
Base rotation speed	Continuous[r/min]	175	450
	Short time[r/min]	175	450
Maximum rotation speed[r/min]		1000	3300
Frame No. - Core width		225-350	
Torque (Base rotation speed)	Continuous[N·m]	819	467
	Short time[N·m]	1200	637
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		4.42	
Rotor inertia moment[kg·m <sup>2</sup> ]		1.105	
Mass	Stator[kg]	143	
	Rotor[kg]	91	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		9920	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

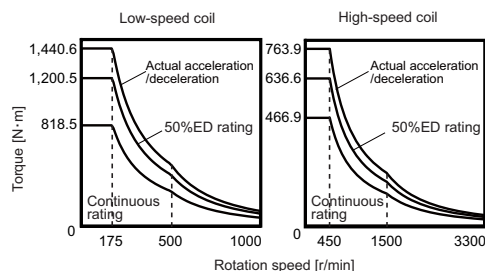


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

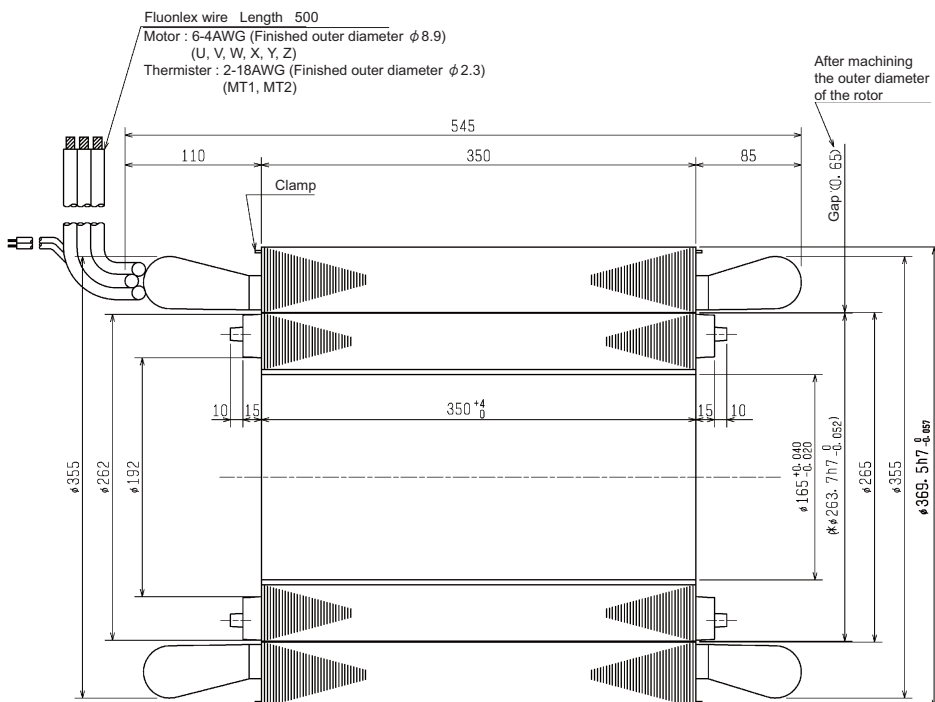
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

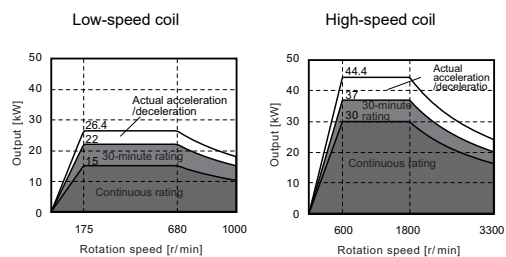
Built-in IM spindle motor

# SJ-2B6906TK

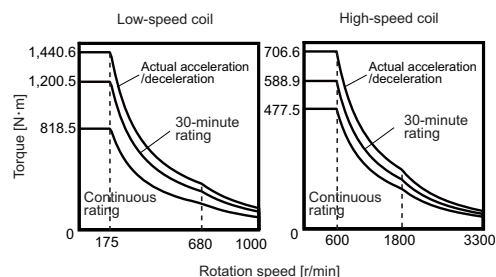
## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-400	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	15	30
	Short time rated output	22(30-minute rating)	37(30-minute rating)
	Standard output during acceleration/deceleration	22	37
	Actual acceleration/deceleration output(*3)	26.4	44.4
Base rotation speed	Continuous[r/min]	175	600
	Short time[r/min]	175	600
Maximum rotation speed[r/min]		1000	3300
Frame No. - Core width		225-350	
Torque (Base rotation speed)	Continuous[N·m]	819	477
	Short time[N·m]	1200	589
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		4.42	
Rotor inertia moment[kg·m <sup>2</sup> ]		1.105	
Mass	Stator[kg]	143	
	Rotor[kg]	91	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		9820	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



## Torque - rotation speed characteristics

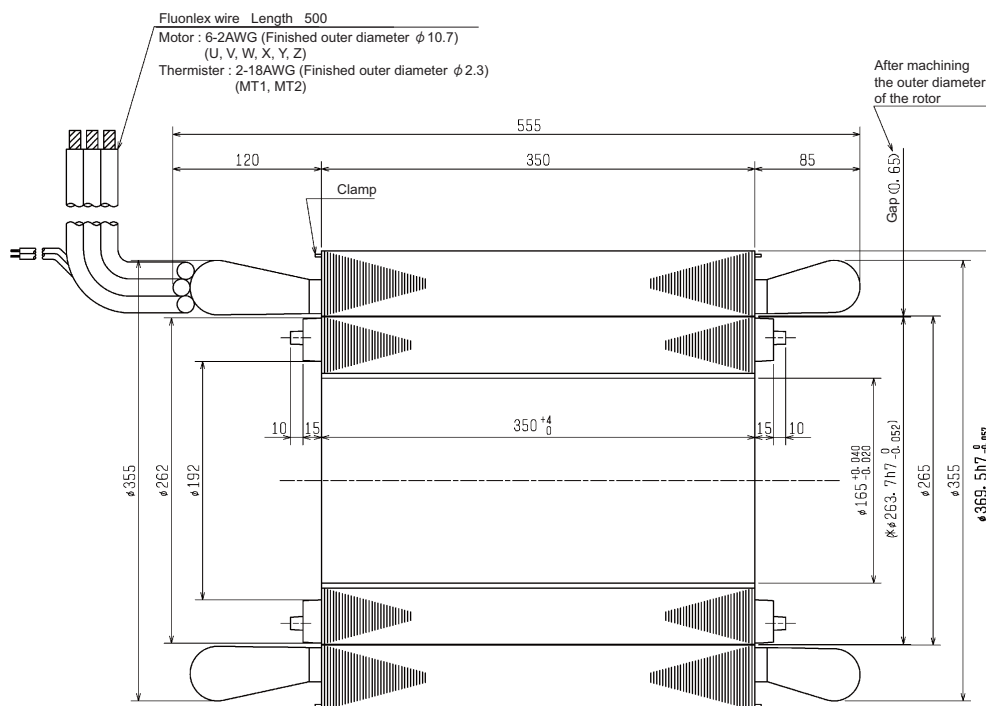


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

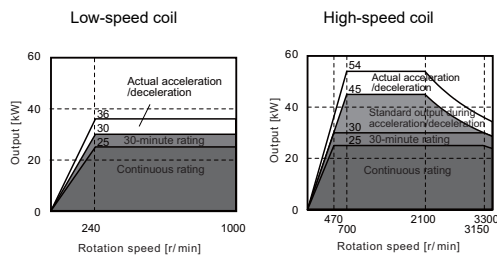
Built-in IM spindle motor

# SJ-2B6914TK

## Specifications

Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-640	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	25	25
	Short time rated output	30(30-minute rating)	30(30-minute rating)
	Standard output during acceleration/deceleration	30	45
	Actual acceleration/deceleration output(*3)	36	54
Base rotation speed	Continuous[r/min]	240	470
	Short time[r/min]	240	470
Maximum rotation speed[r/min]		1000	3300
Frame No. - Core width			
Torque (Base rotation speed)		995	508
Short time[N·m]		1194	610
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		4.42	
Rotor inertia moment[kg·m <sup>2</sup> ]		1.105	
Mass	Stator[kg]	143	
	Rotor[kg]	91	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		9480	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics

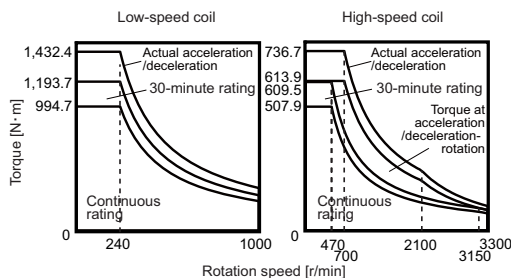


- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

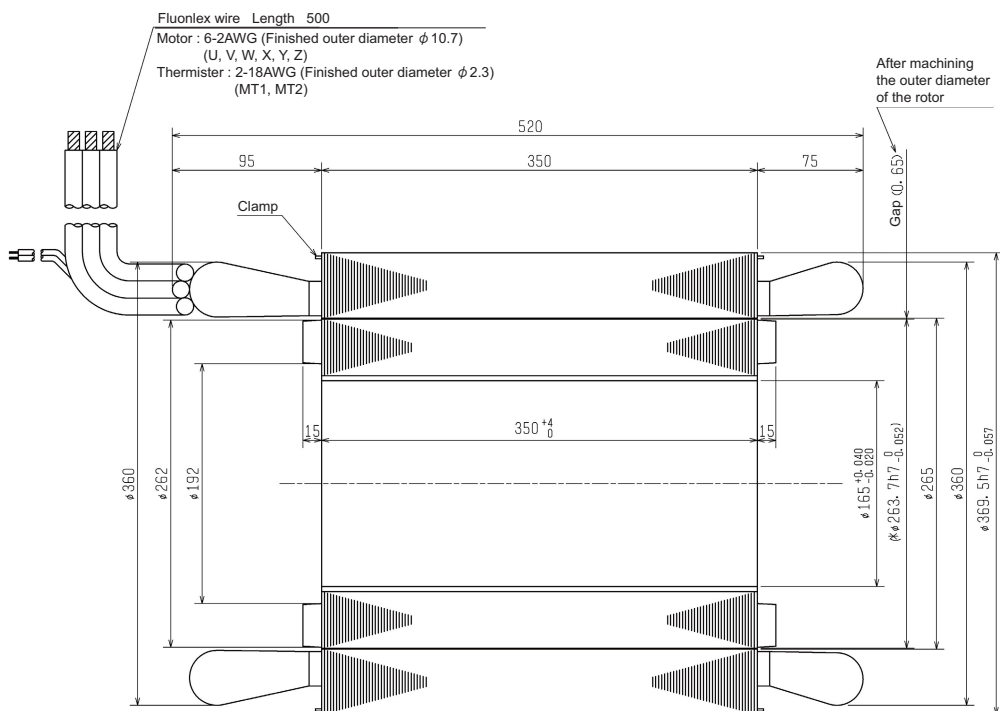
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

Built-in IM spindle motor

# SJ-PMB02215T-02

## Specifications

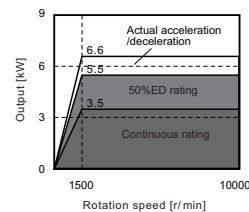
Item		Specifications
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-240
	2-axis type	-
AC reactor for spindle motor		-
Coil changeover		-
Output capacity[kW]	Continuous rated output	3.5
	Short time rated output	5.5(50%ED rating)
	Standard output during acceleration/deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1500
Maximum rotation speed[r/min]		10000
Frame No. - Core width		80
Torque (Base rotation speed)	Continuous[N·m]	22.3
	Short time[N·m]	35.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.024
Rotor inertia moment[kg·m <sup>2</sup> ]		0.006
Mass	Stator[kg]	4.4
	Rotor[kg]	3.7
Overload capacity (for one minute)		120% of short-time rated output
Ambient temperature[°C]		0 to 40
Heat-resistant class		155(F)
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)
Required cooling capacity (*2) [W]		1400
Cooling oil amount[l/min (20°C)]		5

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

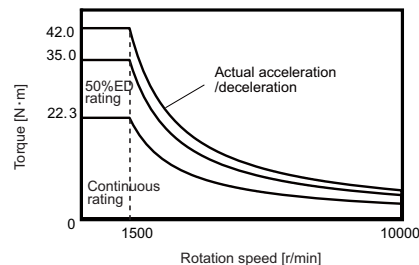
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

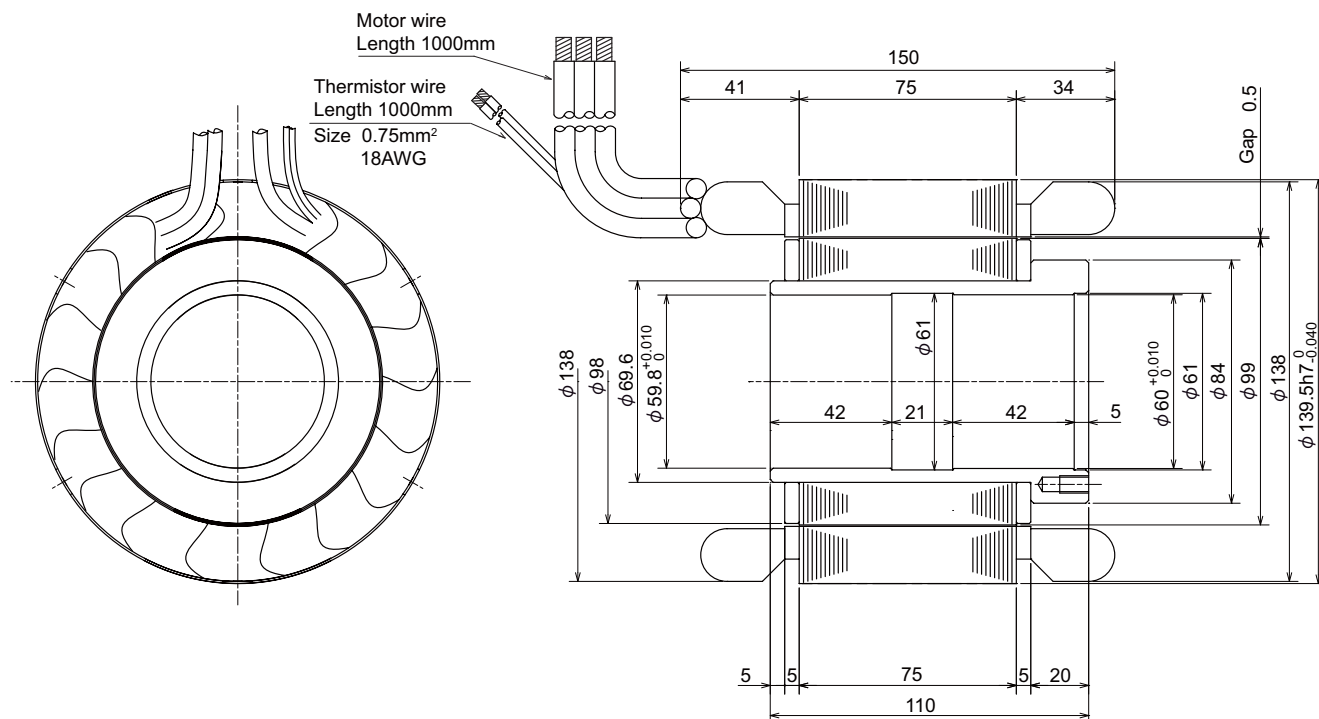
## Output characteristics



## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]



Built-in IM spindle motor

# SJ-PMB04412T-B0

## Specifications

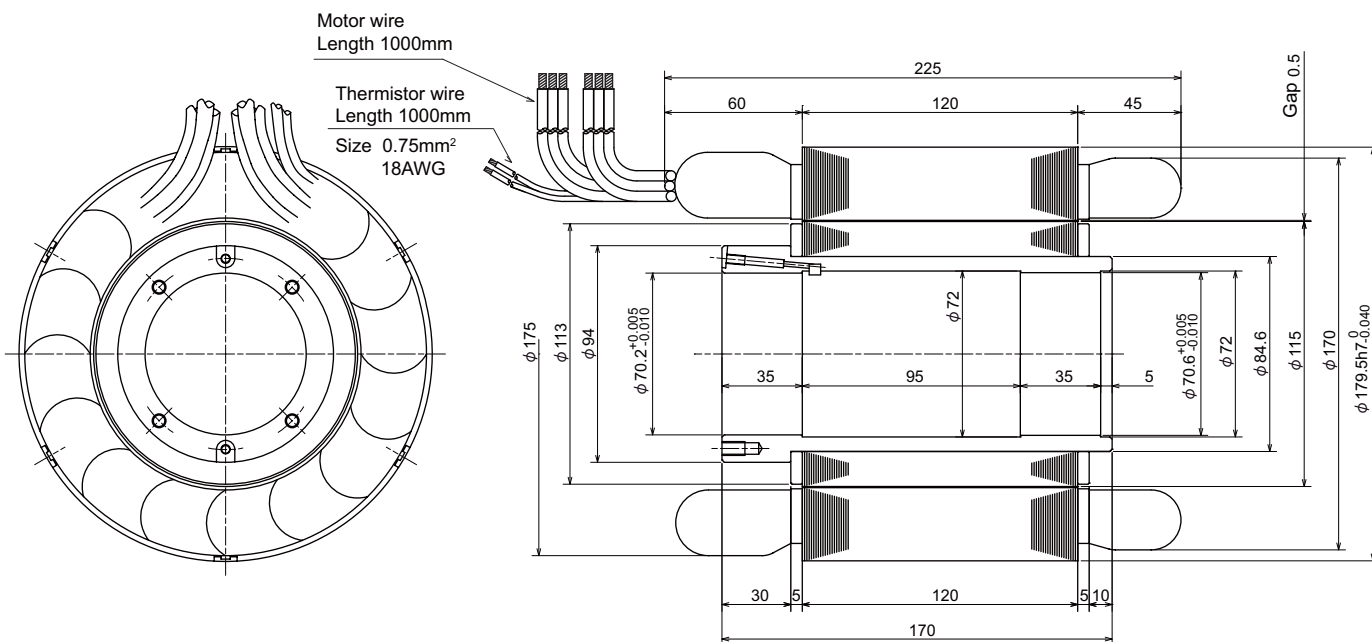
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-200	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	5.5	5.5
	Short time rated output	7.5(25%ED rating)	7.5(25%ED rating)
	Standard output during acceleration/deceleration	7.5	
	Actual acceleration/deceleration output(*3)	9	
Base rotation speed	Continuous[r/min]	1200	3000
	Short time[r/min]	1200	3000
Maximum rotation speed[r/min]		3000	8000
Frame No. - Core width		112	
Torque (Base rotation speed)	Continuous[N·m]	43.8	17.5
	Short time[N·m]	59.7	23.9
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.0649	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0162	
Mass	Stator[kg]	14.0	
	Rotor[kg]	8.0	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		1200	
Cooling oil amount[l/min (20°C)]		5	

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

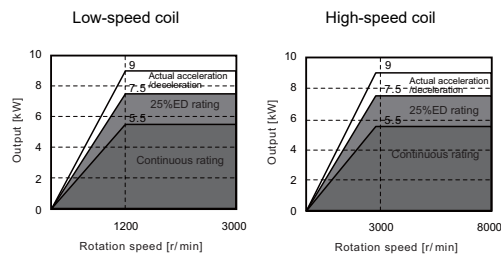
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

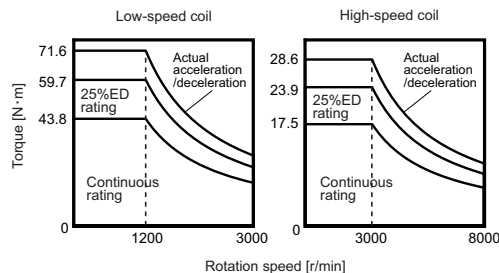
## Outline dimension drawings [Unit : mm]



## Output characteristics



## Torque - rotation speed characteristics





Built-in IM spindle motor

# SJ-PMB14007T-01

## Specifications

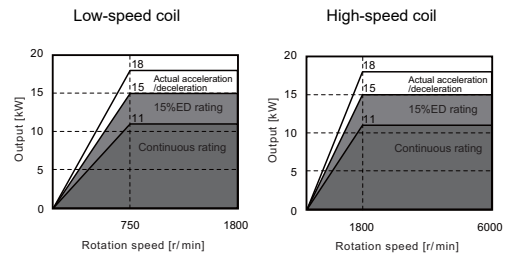
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-E-SP-320	
	2-axis type	-	
AC reactor for spindle motor			
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	11
	Short time rated output	15(15%ED rating)	15(15%ED rating)
	Standard output during acceleration/deceleration	15	
	Actual acceleration/deceleration output(*3)	18	
Base rotation speed	Continuous[r/min]	750	1800
	Short time[r/min]	750	1800
Maximum rotation speed[r/min]		1800	6000
Frame No. - Core width		160	
Torque (Base rotation speed)	Continuous[N·m]	140	58.4
	Short time[N·m]	191(15%ED rating)	79.6(15%ED rating)
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.253	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.0633	
Mass	Stator[kg]	30	
	Rotor[kg]	15	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 29.4m/s <sup>2</sup> (3G)	
Required cooling capacity (*2) [W]		1500	
Cooling oil amount[l/min (20°C)]		5	

- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

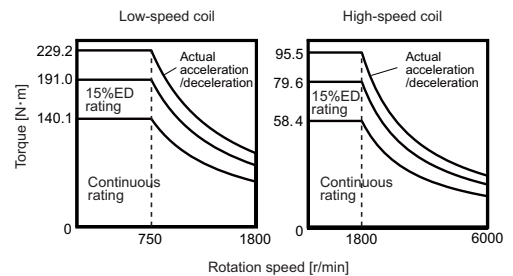
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

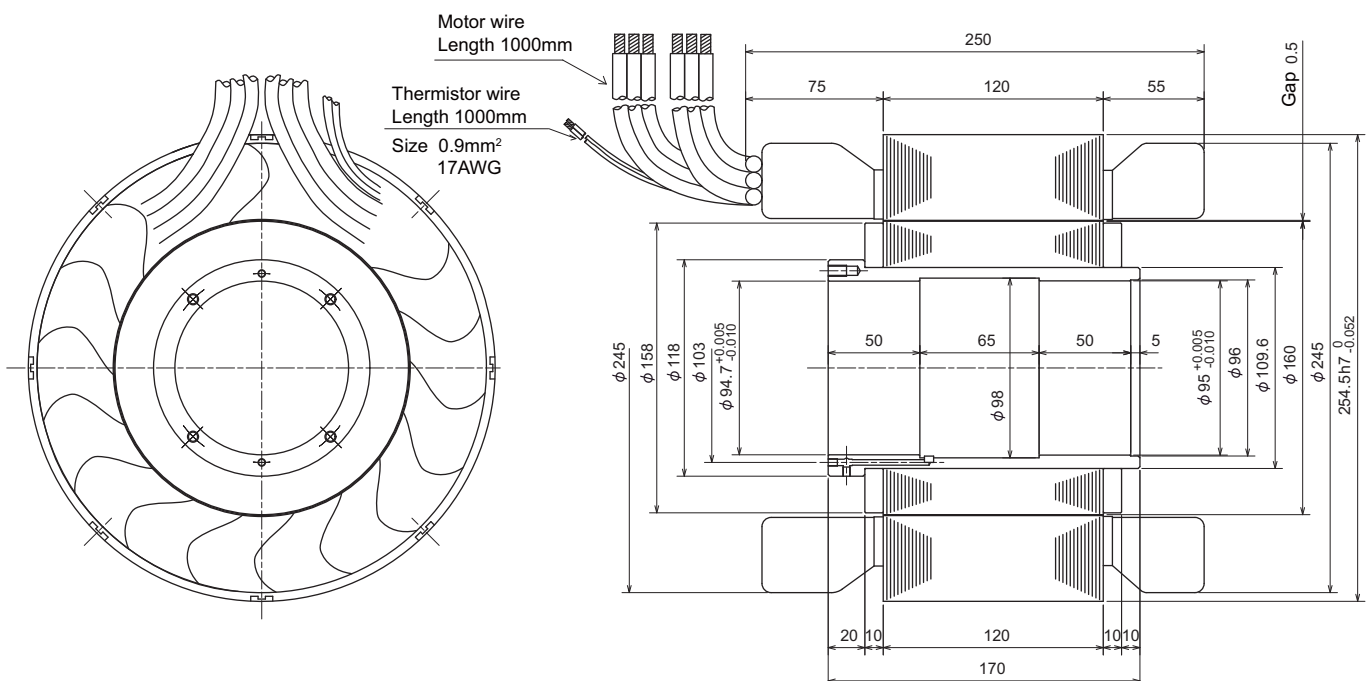
## Output characteristics



## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]







# Tool Spindle Motor

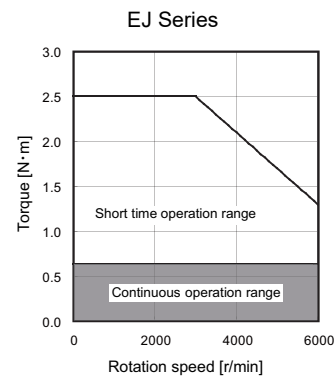
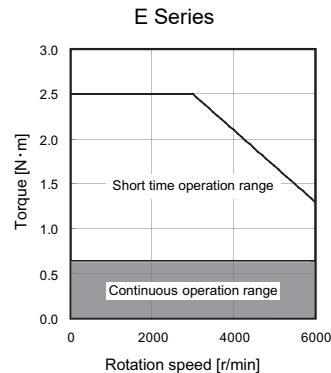
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>0.64N·m</b>	<b>6000r/min</b>	<b>HG46 □-D47</b>	(1) Keyway	S Straight (without keyway) K With keyway (with key)

### Specifications

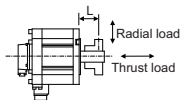
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-E-J-SP-20 MDS-E-J-SP2-20
Continuous characteristics	Rated output[kW]	0.4
	Rated current[A]	1.4
	Rated torque[N·m]	0.64
Maximum momentary output (For power supply selection) [kW]	0.85	
Rated rotation speed[r/min]	6000	
Maximum rotation speed[r/min]	6000	
Maximum current[A]	5.3	
Maximum torque[N·m]	2.5	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.234	
Mass[kg]	1.2	
Heat-resistant class	130(B)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:49(5), Y:49(5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	245 (L=30)
	Thrust load[N]	98
Encoder	1,048,576 p/rev (D47)	MDS-E-SP/SP2 MDS-E-J-SP/SP2

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



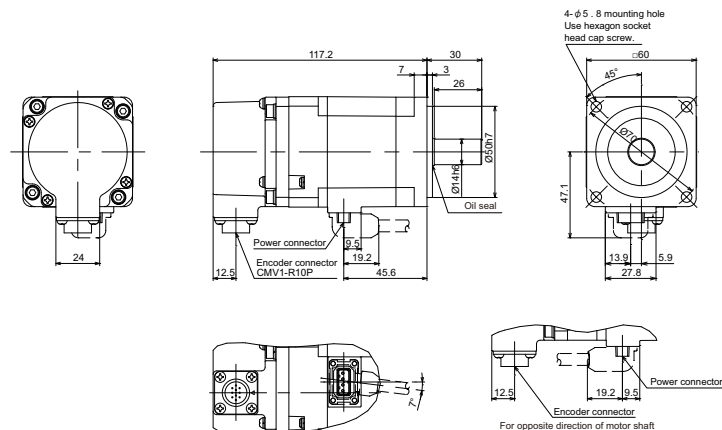
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

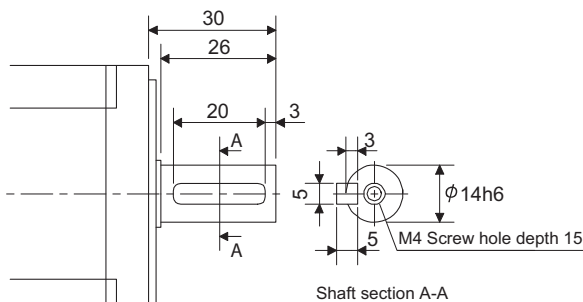
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG46S-D47



#### Shaft with keyway (HG46K-D47)



The appearance is the same as the straight (without keyway) except the shaft shape.

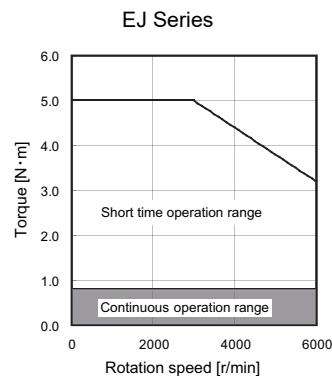
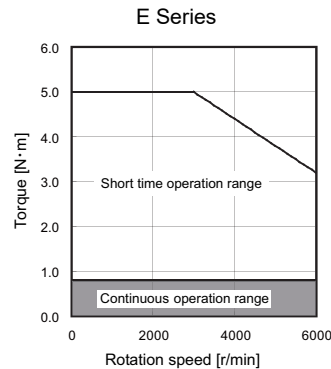
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>0.80N·m</b>	<b>6000r/min</b>	<b>HG56 □-D47</b>	(1) Keyway	S Straight (without keyway) K With keyway (with key)

### Specifications

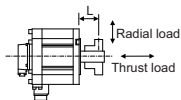
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-E-J-SP-20 MDS-E-J-SP2-20
Continuous characteristics	Rated output[kW]	0.5
	Rated current[A]	1.8
	Rated torque[N·m]	0.80
Maximum momentary output (For power supply selection) [kW]	1.7	
Rated rotation speed[r/min]	6000	
Maximum rotation speed[r/min]	6000	
Maximum current[A]	11.2	
Maximum torque[N·m]	5.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	0.379	
Mass[kg]	1.6	
Heat-resistant class	130(B)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:49(5), Y:49(5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	245 (L=30)
	Thrust load[N]	98
Encoder	1,048,576 p/rev (D47) MDS-E-SP/SP2 MDS-E-J-SP/SP2	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



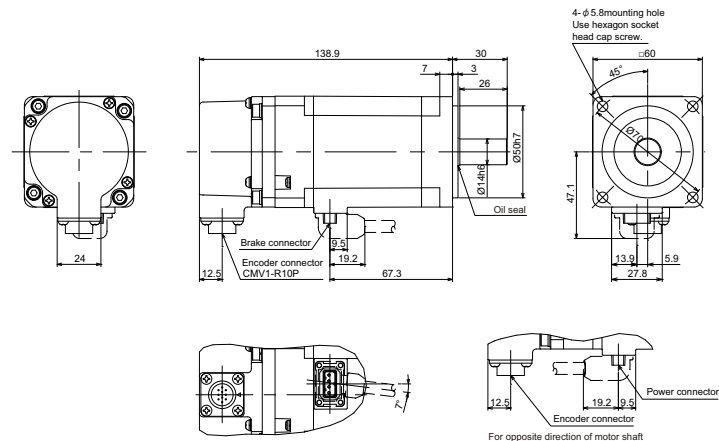
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

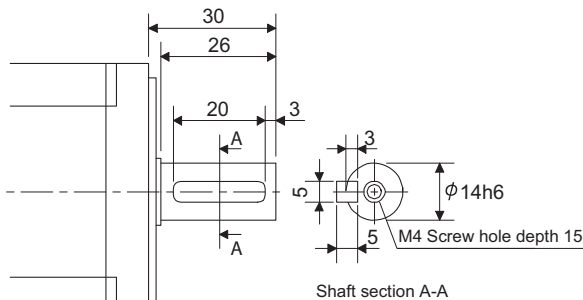
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG56S-D47



#### Shaft with keyway (HG56K-D47)



The appearance is the same as the straight (without keyway) except the shaft shape.

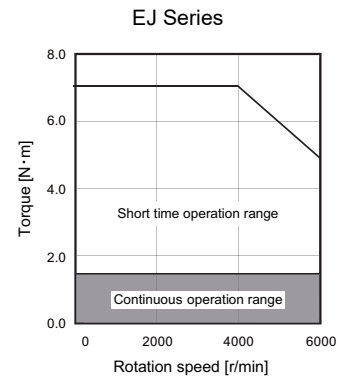
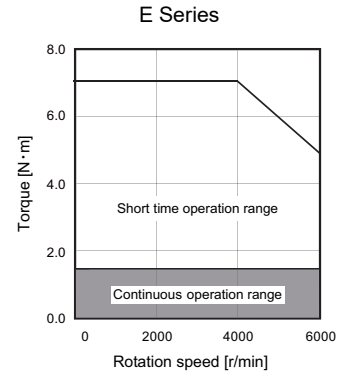
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>1.43N·m</b>	<b>6000r/min</b>	<b>HG96 □-D47</b>	(1) Keyway	S Straight (without keyway) K With keyway (with key)

### Specifications

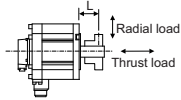
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
	3-axis type	MDS-E-SP2-40
	Multi axis type	-
Regenerative resistor type	MDS-EJ-SP-20	MDS-EJ-SP2-20
	MDS-EJ-SP2-20	MDS-EJ-SP2-20
Continuous characteristics	Rated output[kW]	0.9
	Rated current[A]	3.3
	Rated torque[N·m]	1.43
Maximum momentary output (For power supply selection) [kW]		3.2
Rated rotation speed[r/min]		6000
Maximum rotation speed[r/min]		6000
Maximum current[A]		15.0
Maximum torque[N·m]		7.2
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]		1.27
Mass[kg]		2.9
Heat-resistant class		130(B)
Degree of protection		IP67 (The shaft-through portion is excluded.)
Cooling method		Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))		X:49(5), Y:49(5)
Axis tolerable load	Radial load (*2) [N] (lmm)	392 (L=40)
	Thrust load[N]	147
Encoder	1,048,576 p/rev (D47)	MDS-E-SP/SP2 MDS-EJ-SP/SP2

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



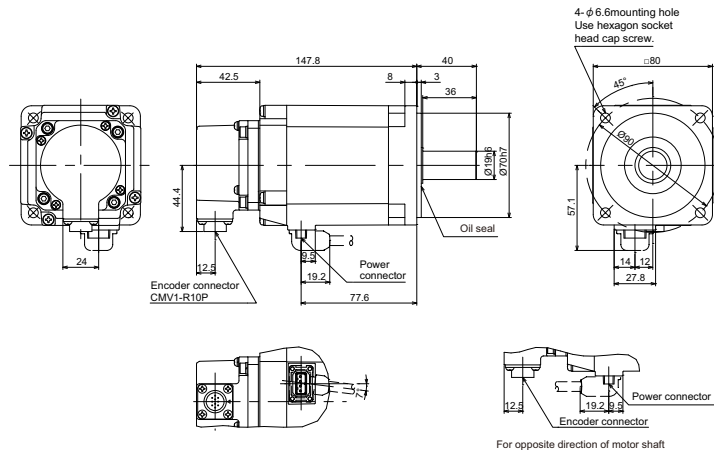
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

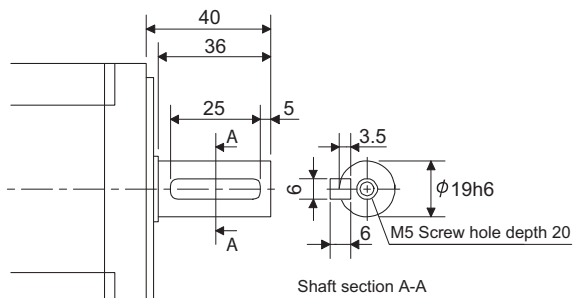
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG96S-D47



#### Shaft with keyway (HG96K-D47)



The appearance is the same as the straight (without keyway) except the shaft shape.

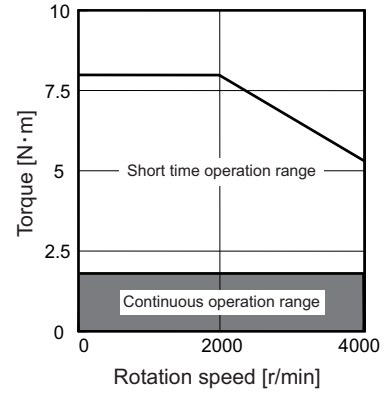
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>1.8N·m</b>	<b>4000r/min</b>	<b>HG75</b> (1) (2) □-□- <b>D48</b>	(1) Shaft end	S Straight
			(2) Power connector	S105010 Compact (horizontal direction) None Normal

### Specifications

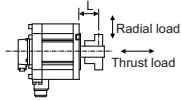
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-20 MDS-EJ-SP2-20
Continuous characteristics	Rated output[kW]	0.75
	Rated current[A]	3.1
	Rated torque[N·m]	1.8
Maximum momentary output (For power supply selection) [kW]	2.2	
Rated rotation speed[r/min]	4000	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	14.0	
Maximum torque[N·m]	8.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.62	
Mass[kg]	2.6	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	245 (L=33)
	Thrust load[N]	147
Encoder	1,048,576 p/rev (D48)	MDS-E-SP/SP2 MDS-EJ-SP/SP2

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



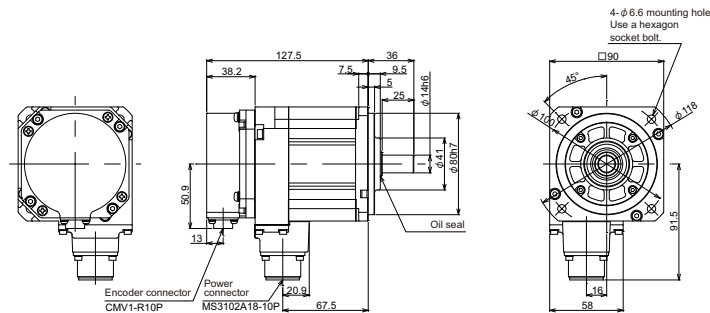
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG75S-D48



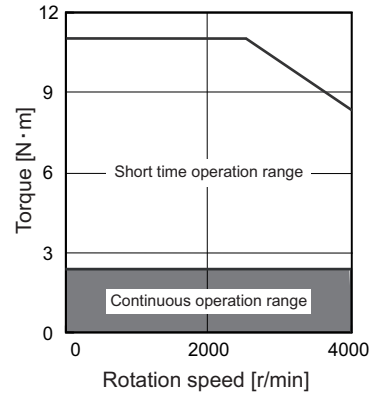
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>2.4N·m</b>	<b>4000r/min</b>	<b>HG105</b> (1) (2) □-□- <b>D48</b>	(1) Shaft end	S Straight
			(2) Power connector	S105010 Compact (horizontal direction) None Normal

### Specifications

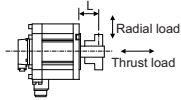
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-20
	2-axis type	MDS-E-SP2-20
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-20 MDS-EJ-SP2-20
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	3.7
	Rated torque[N·m]	2.4
Maximum momentary output (For power supply selection) [kW]	3.5	
Rated rotation speed[r/min]	4000	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	15.5	
Maximum torque[N·m]	11.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.12	
Mass[kg]	4.4	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] (lmm)	245 (L=33)
	Thrust load[N]	147
Encoder	1,048,576 p/rev (D48)	MDS-E-SP/SP2 MDS-EJ-SP/SP2

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



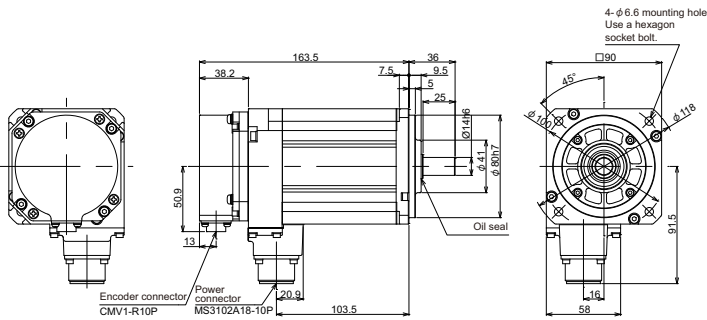
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG105S-D48



# 200V System Tool Spindle Motor HG Series

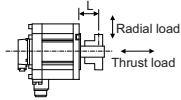
Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>1.6N·m</b>	<b>3000r/min</b>	<b>HG54 □-D48</b>	(1) Shaft end	S Straight
		(1)		

## Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
	3-axis type	MDS-E-SP2-80
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-20 MDS-EJ-SP2-20
Continuous characteristics	Rated output[kW]	0.5
	Rated current[A]	2.0
	Rated torque[N·m]	1.6
Maximum momentary output (For power supply selection) [kW]	2.3	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	17.0	
Maximum torque[N·m]	13.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	6.13	
Mass[kg]	4.8	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] (mm)	980 (L=55)
	Thrust load[N]	490
Encoder	1,048,576 p/rev (D48)	MDS-E-SP/SP2 MDS-EJ-SP/SP2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



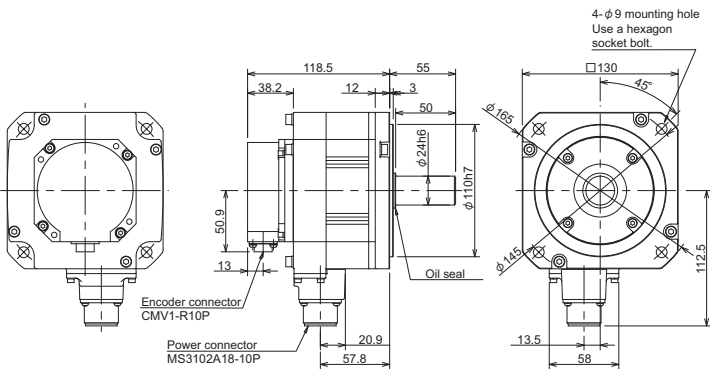
L: Length from flange installation surface to center of load weight [mm]

## Environmental conditions

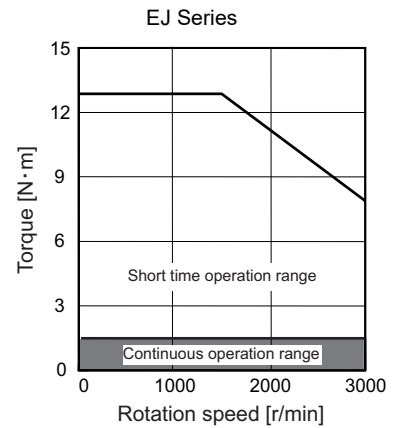
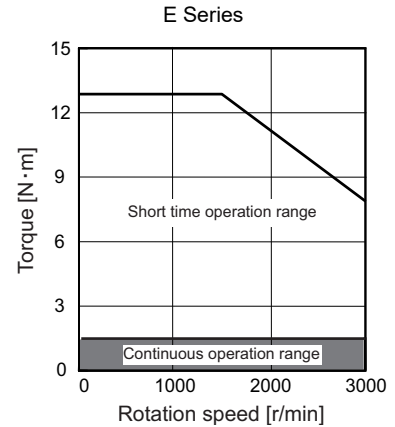
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

HG54S-D48



## Torque characteristics





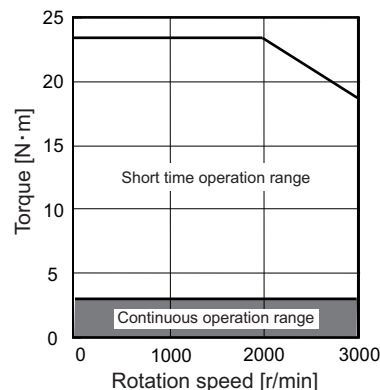
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>3.2N·m</b>	<b>3000r/min</b>	<b>HG104 □-D48</b>	(1) Shaft end	S Straight

### Specifications

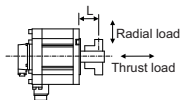
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP2-40
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-40
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	3.9
	Rated torque[N·m]	3.2
Maximum momentary output (For power supply selection) [kW]	5.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	29.0	
Maximum torque[N·m]	23.3	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	11.9	
Mass[kg]	6.5	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] (G)	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] (mm)	980 (L=55)
	Thrust load[N]	490
Encoder	1,048,576 p/rev (D48) MDS-E-SP/SP2 MDS-EJ-SP	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



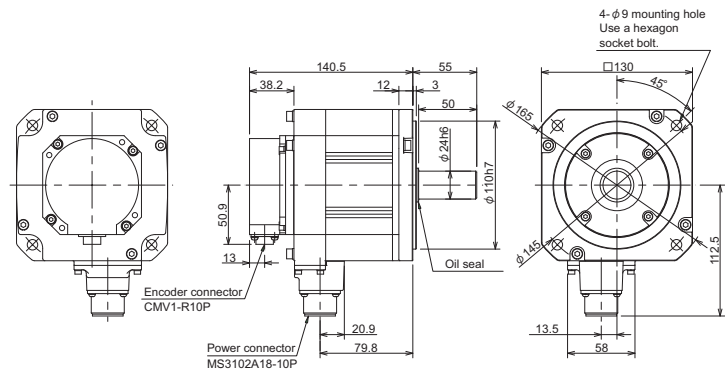
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG104S-D48



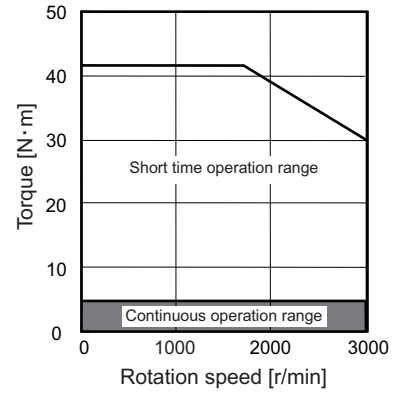
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>4.8N·m</b>	<b>3000r/min</b>	<b>HG154 □-D48</b>	(1) Shaft end	S Straight

### Specifications

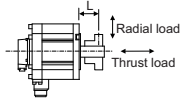
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80
	3-axis type	MDS-E-SP2-16080(M)
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-80
Continuous characteristics	Rated output[kW]	1.5
	Rated current[A]	5.6
	Rated torque[N·m]	4.8
Maximum momentary output (For power supply selection) [kW]	9.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	52.0	
Maximum torque[N·m]	42.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	17.8	
Mass[kg]	8.3	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5);Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] (lmm)	980 (L=55)
	Thrust load[N]	490
Encoder	1,048,576 p/rev (D48)	MDS-E-SP/SP2
		MDS-EJ-SP

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



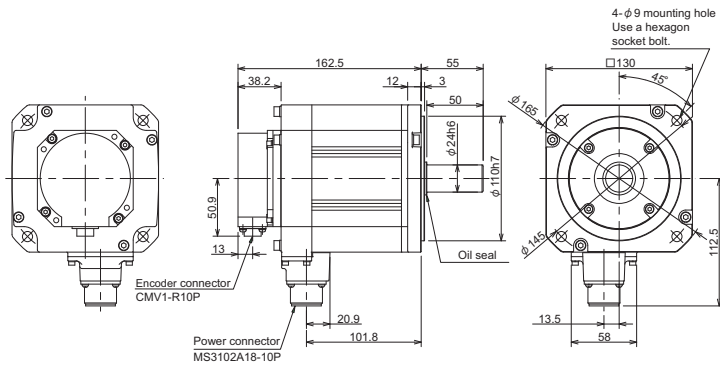
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG154S-D48



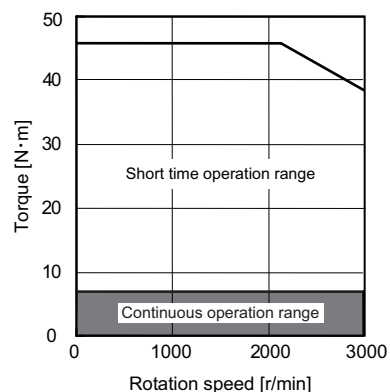
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>7.0N·m</b>	<b>3000r/min</b>	<b>HG224 □-D48</b>	(1) Shaft end	S Straight
		(1)		

### Specifications

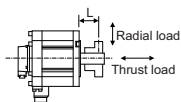
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80
	3-axis type	MDS-E-SP2-16080(M)
	Multi axis type	-
	Regenerative resistor type	MDS-E-J-SP-80
Continuous characteristics	Rated output[kW]	2.2
	Rated current[A]	8.6
	Rated torque[N·m]	7.0
Maximum momentary output (For power supply selection) [kW]	12.3	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	57.0	
Maximum torque[N·m]	46.5	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	23.7	
Mass[kg]	10.0	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] (G)	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] (mm)	980 (L=55)
	Thrust load[N]	490
Encoder	1,048,576 p/rev (D48) MDS-E-SP/SP2 MDS-E-J-SP	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



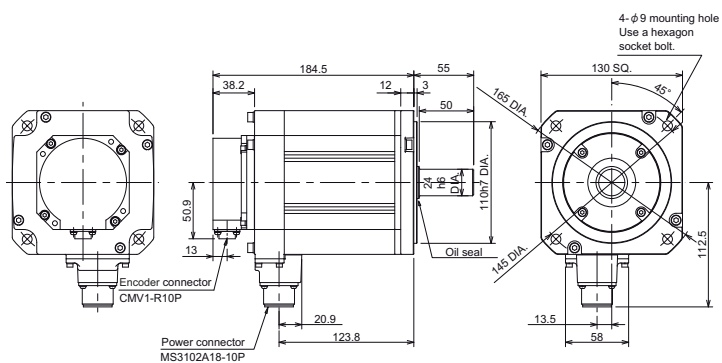
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG224S-D48



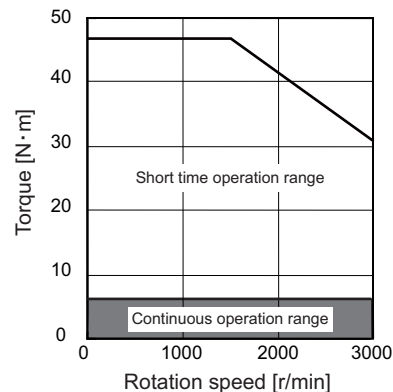
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>6.4N·m</b>	<b>3000r/min</b>	<b>HG204 □-D48</b>	(1) Shaft end	S Straight
		(1)		

### Specifications

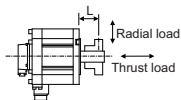
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-80
	2-axis type	MDS-E-SP2-80
	3-axis type	MDS-E-SP2-16080(M)
	Multi axis type	-
	Regenerative resistor type	MDS-EJ-SP-80
Continuous characteristics	Rated output[kW]	2.0
	Rated current[A]	6.8
	Rated torque[N·m]	6.4
Maximum momentary output (For power supply selection) [kW]	8.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	57.0	
Maximum torque[N·m]	47.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	38.3	
Mass[kg]	12.0	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] (G)	X:24.5(2.5), Y:29.4(3.0)	
Axis tolerable load	Radial load (*2) [N] (mm)	2058 (L=79)
	Thrust load[N]	980
Encoder	1,048,576 p/rev (D48)	MDS-E-SP/SP2
		MDS-EJ-SP

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



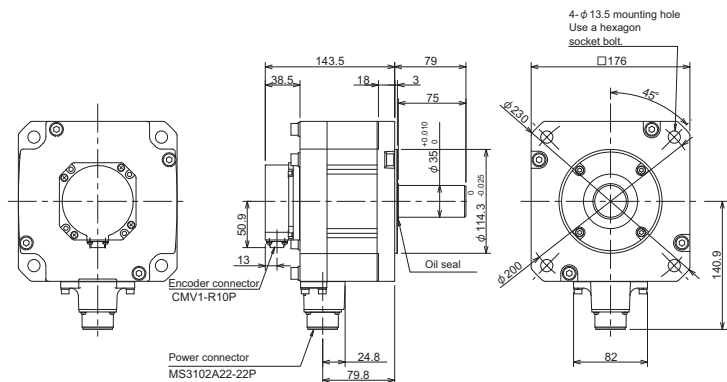
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG204S-D48



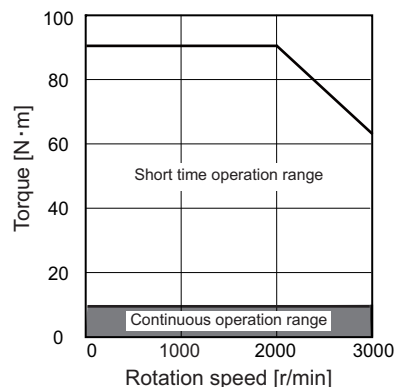
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>11.1N·m</b>	<b>3000r/min</b>	<b>HG354 □-D48</b>	(1) Shaft end	S Straight
		(1)		

### Specifications

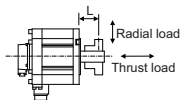
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output[kW]	3.5
	Rated current[A]	12
	Rated torque[N·m]	11.1
Maximum momentary output (For power supply selection) [kW]	18.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	116.0	
Maximum torque[N·m]	90.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	75.0	
Mass[kg]	19.0	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:29.4(3.0)	
Axis tolerable load	Radial load (*2) [N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Encoder	1,048,576 p/rev (D48) MDS-E-SP/SP2	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



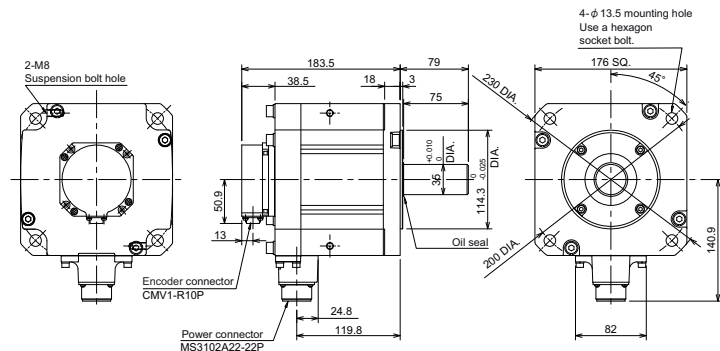
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG354S-D48



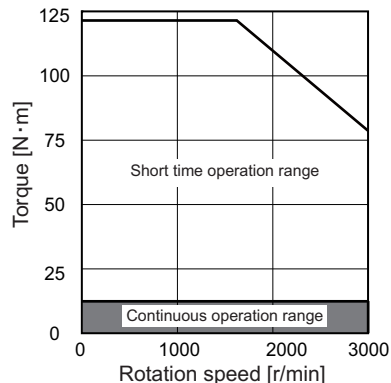
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
			(1) Shaft end	S Straight
<b>14.3N·m</b>	<b>3000r/min</b>	<b>HG453 □-D48</b>		

### Specifications

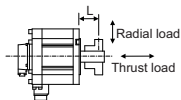
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output[kW]	4.5
	Rated current[A]	19
	Rated torque[N·m]	14.3
Maximum momentary output (For power supply selection) [kW]	22.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	105.0	
Maximum torque[N·m]	122.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	112.0	
Mass[kg]	25	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Encoder	1,048,576 p/rev (D48) MDS-E-SP/SP2	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



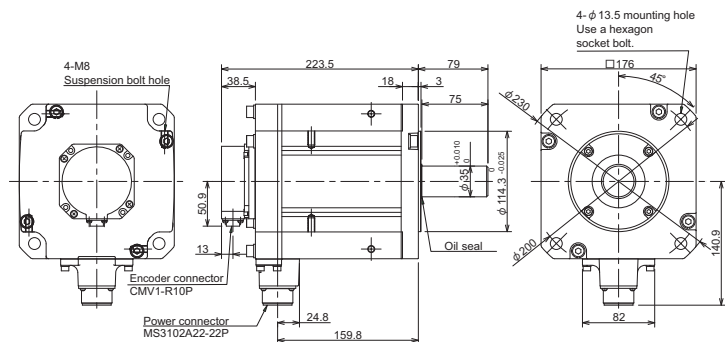
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG453S-D48



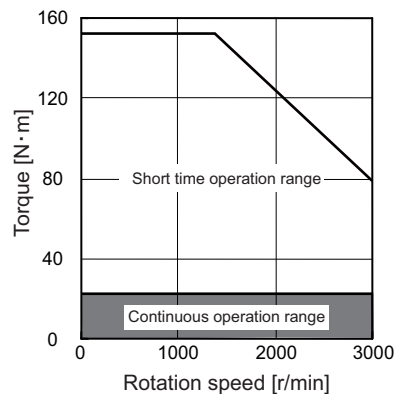
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>22.3N·m</b>	<b>3000r/min</b>	<b>HG703 □-D48</b>	(1) Shaft end	S Straight
		(1)		

### Specifications

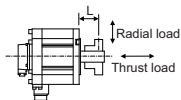
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output[kW]	7.0
	Rated current[A]	34
	Rated torque[N·m]	22.3
Maximum momentary output (For power supply selection) [kW]	27.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	109.0	
Maximum torque[N·m]	152.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	154.0	
Mass[kg]	32.0	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Encoder	1,048,576 p/rev (D48) MDS-E-SP/SP2	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



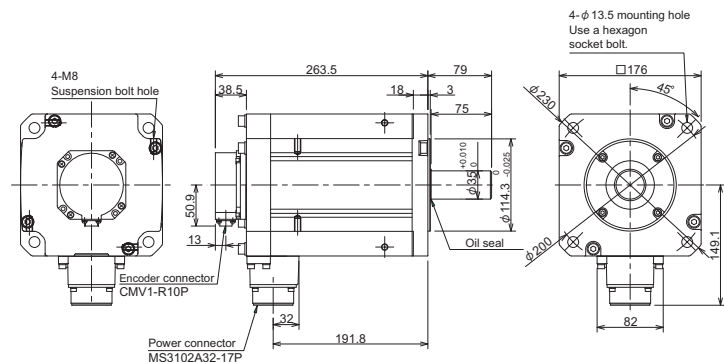
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG703S-D48



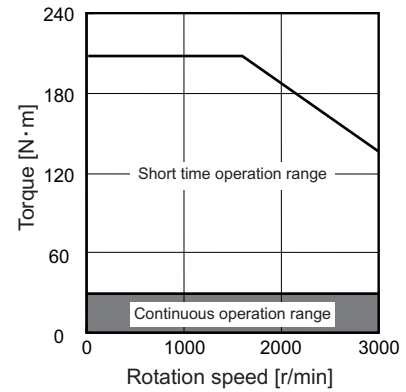
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Option	
<b>28.7N·m</b>	<b>3000r/min</b>	<b>HG903 □-D48</b>	(1) Shaft end	S Straight

### Specifications

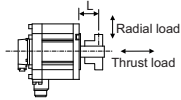
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-320
	2-axis type	-
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output[kW]	9.0
	Rated current[A]	30
	Rated torque[N·m]	28.7
Maximum momentary output (For power supply selection) [kW]	41.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	204.0	
Maximum torque[N·m]	208.0	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	196.0	
Mass[kg]	43	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:9.8(1), Y:9.8(1)	
Axis tolerable load	Radial load (*2) [N] ((mm))	2450 (L=85)
	Thrust load[N]	980
Encoder	1,048,576 p/rev (D48) MDS-E-SP	

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



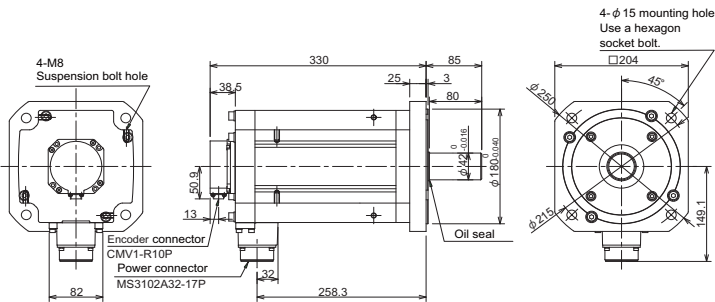
L: Length from flange installation surface to center of load weight [mm]

### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG903S-D48





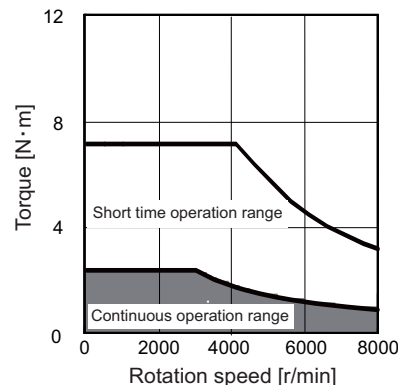
## 200V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Explanation of type	
<b>2.4N·m</b>	<b>3000r/min</b>	<b>HG-JR73 E1□W9C-□</b>	(1) Shaft end	(2) Power connector
			None	Straight
			K	With keyway (without key)
			S105003	Normal (vertical direction)
			S105010	Compact (horizontal direction)

### Specifications

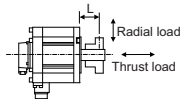
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-E-SP-40
	2-axis type	MDS-E-SP-240
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	MDS-E-J-SP-80
Continuous characteristics	Rated output[kW]	0.75
	Rated current[A]	5.6
	Rated torque[N·m]	2.4
Maximum momentary output (For power supply selection) [kW]	3.2	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	8000	
Maximum current[A]	17	
Maximum torque[N·m]	7.2	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.09	
Mass[kg]	3.7	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	323 (L=40)
	Thrust load[N]	284
Encoder	1,048,576 p/rev (D48)	MDS-E-SP MDS-EJ-SP

### Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



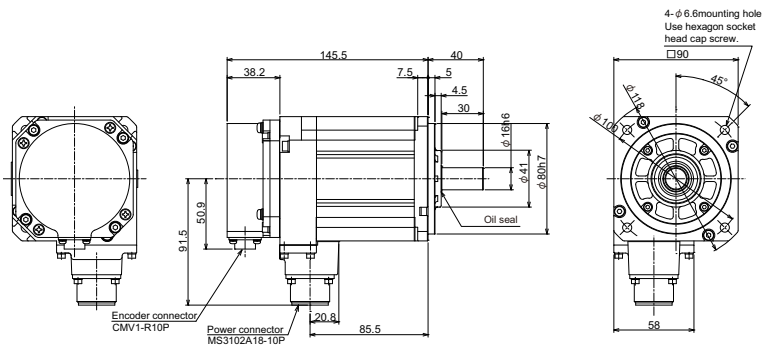
L : Length from flange installation surface to center of load weight [mm]

### Environmental conditions

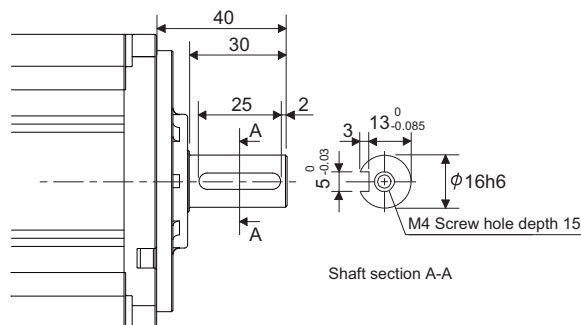
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

### Outline dimension drawings [Unit : mm]

#### HG-JR73E1W9C-S105003

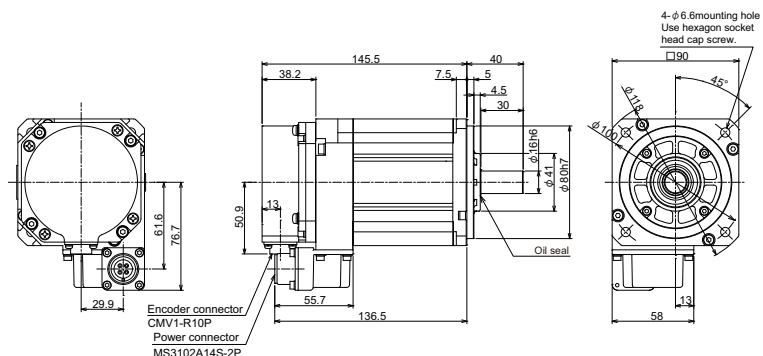


#### Shaft with keyway



The appearance is the same as the straight (without keyway) except the shaft shape.

#### HG-JR73E1W9C-S105010



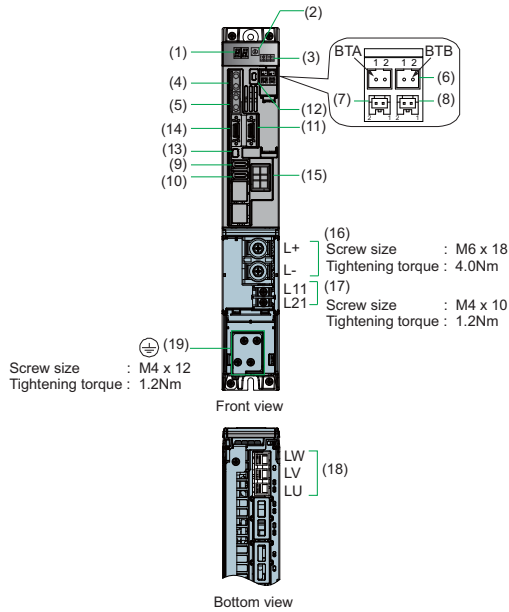




# Servo Drive Unit

Servo drive unit

# MDS-E-V1-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	20
Output	
Rated voltage[V]	170AC
Rated current[A]	6.4
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	7.0
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Heating value	
Dynamic brakes	Built-in
Inside panel[W]	18
Outside panel[W]	22
Cooling method	Forced air cooling
Mass[kg]	3.8

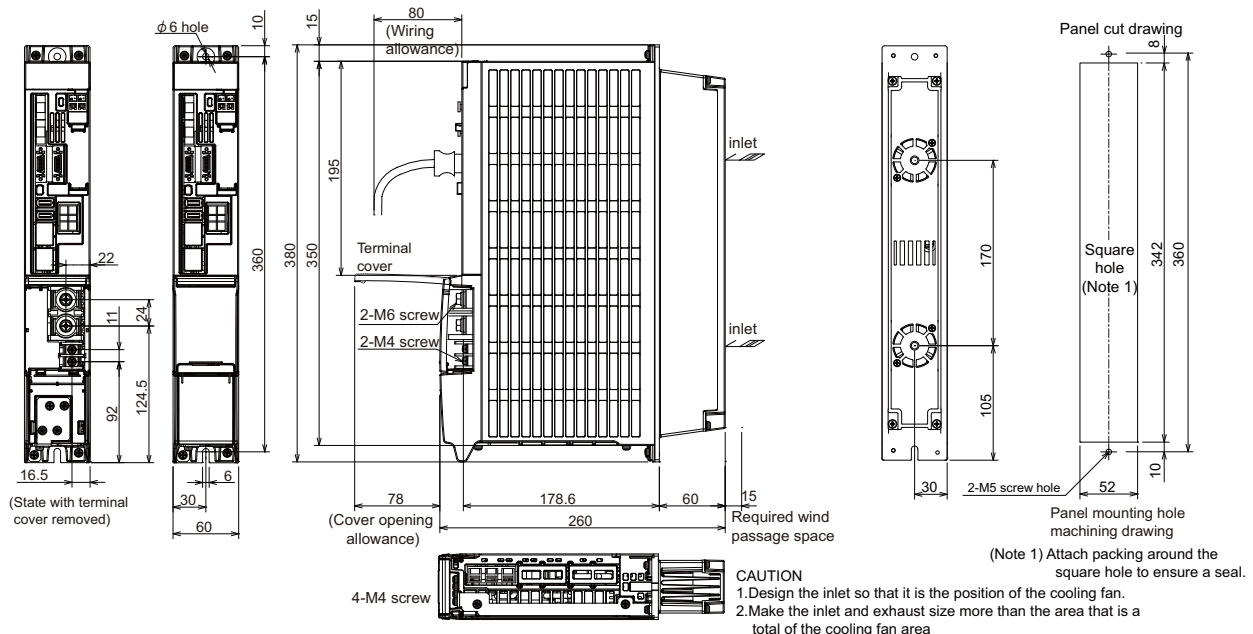
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

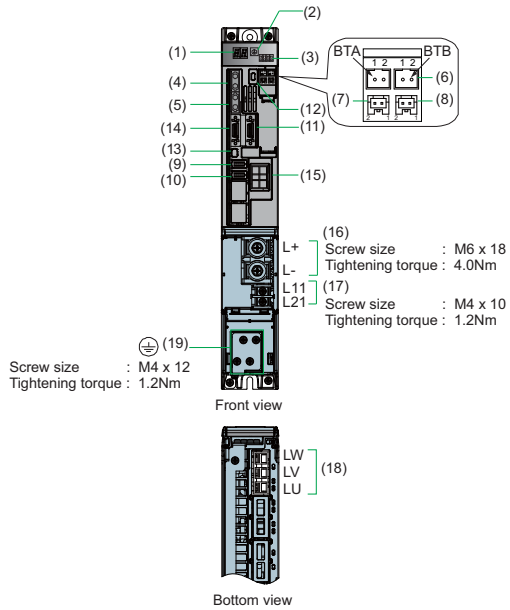
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V1-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	40
Output	
Rated voltage[V]	170AC
Rated current[A]	10.9
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	7.0
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
	Built-in
Heating value	
Inside panel[W]	20
Outside panel[W]	38
Cooling method	Forced air cooling
Mass[kg]	3.8

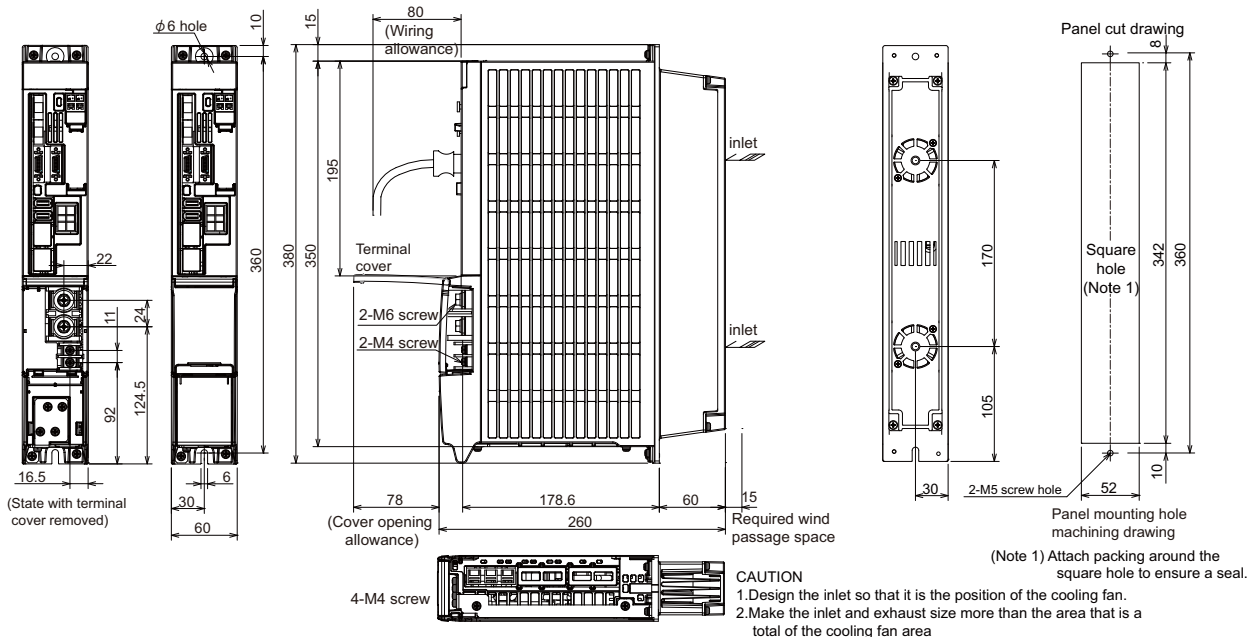
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

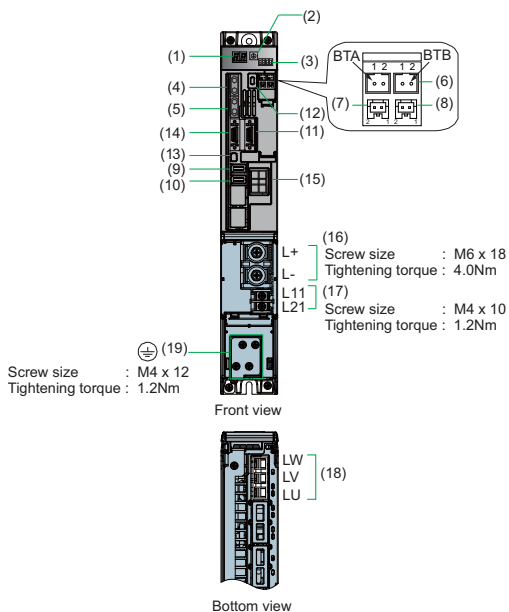
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V1-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	80
Output	
Rated voltage[V]	170AC
Rated current[A]	16
Input	
Rated voltage[V]	270 to 324AC
Rated current[A]	14
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	25
Outside panel[W]	71
Cooling method	Forced air cooling
Mass[kg]	3.8

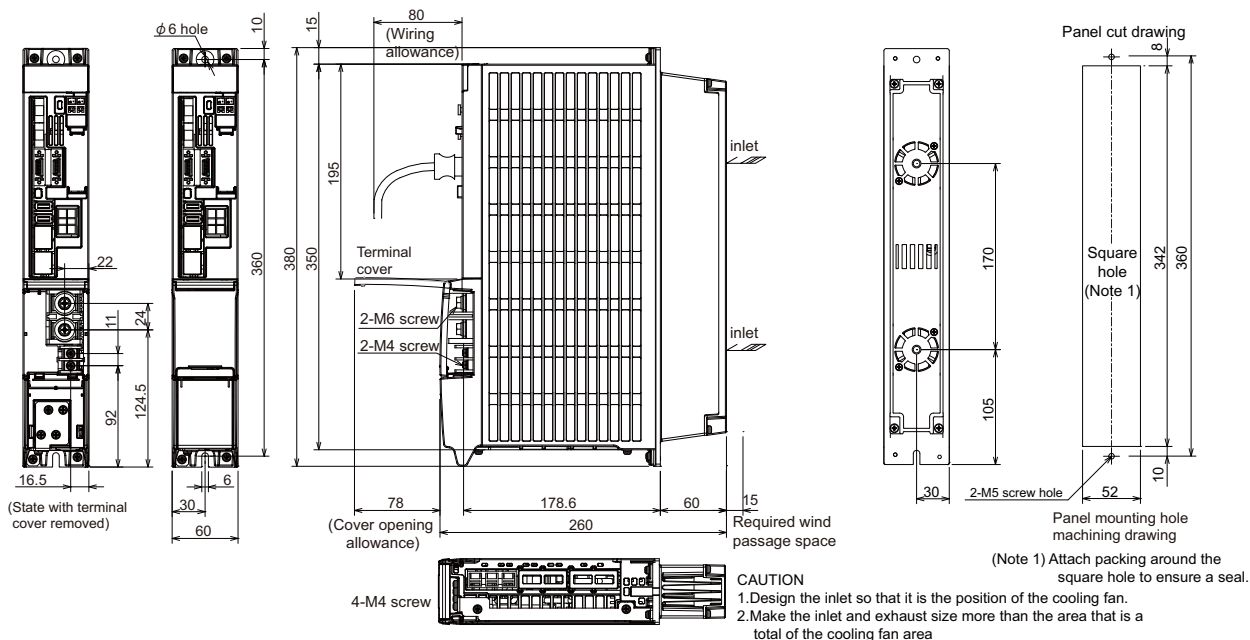
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

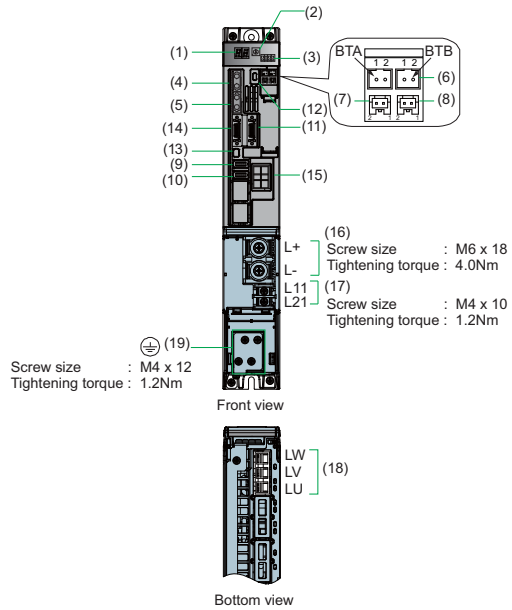
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V1-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	160
Output	
Rated voltage[V]	170AC
Rated current[A]	33
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	30
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	36
Outside panel[W]	148
Cooling method	Forced air cooling
Mass[kg]	3.8

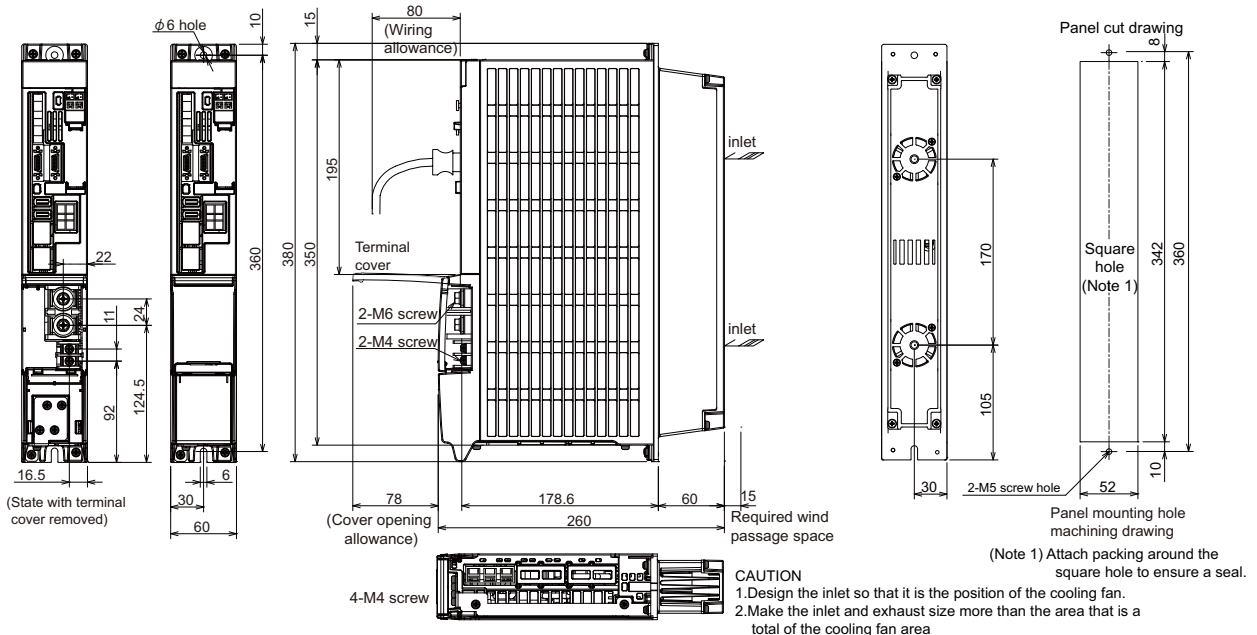
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

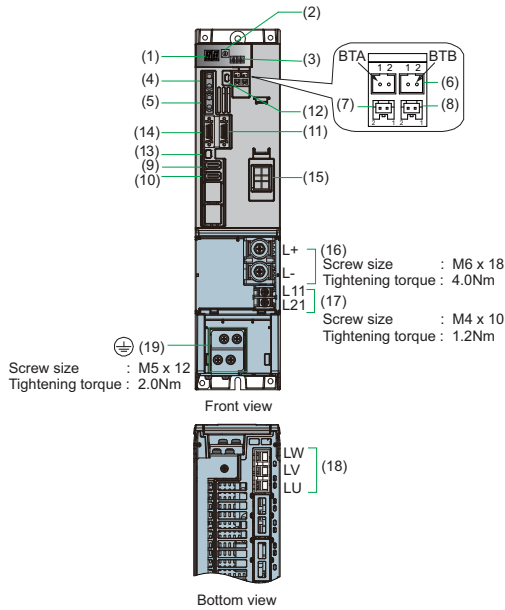
## Outline dimension drawings [Unit : mm]





Servo drive unit

# MDS-E-V1-160W



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	160
Output	
Rated voltage[V]	170AC
Rated current[A]	42
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	35
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	44
Outside panel[W]	201
Cooling method	Forced air cooling
Mass[kg]	4.5

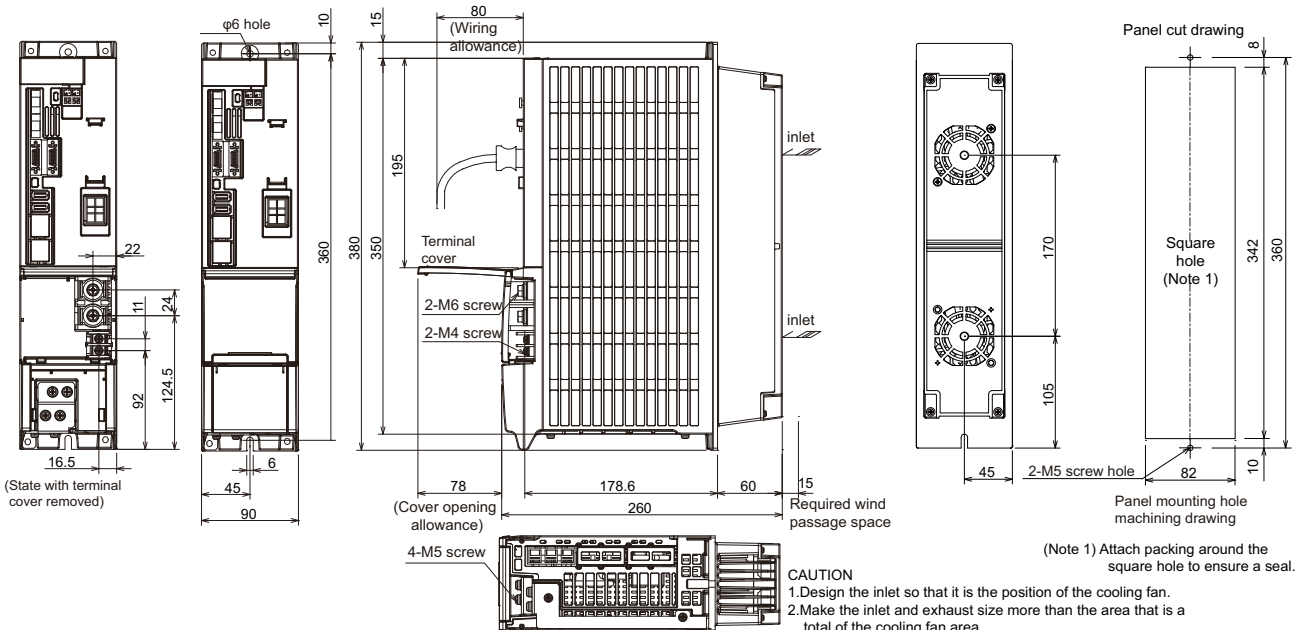
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

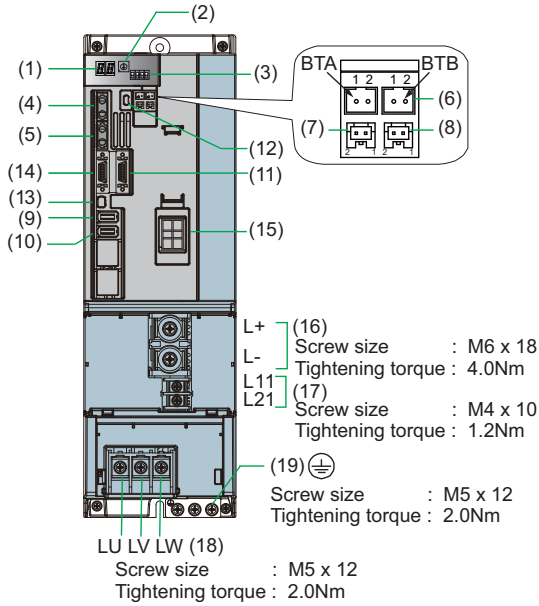
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V1-320



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output terminal (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications
Nominal maximum current(peak) [A]	320
Output	
Rated voltage[V]	170AC
Rated current[A]	65.8
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	45
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	59
Outside panel[W]	307
Cooling method	Forced air cooling
Mass[kg]	5.8

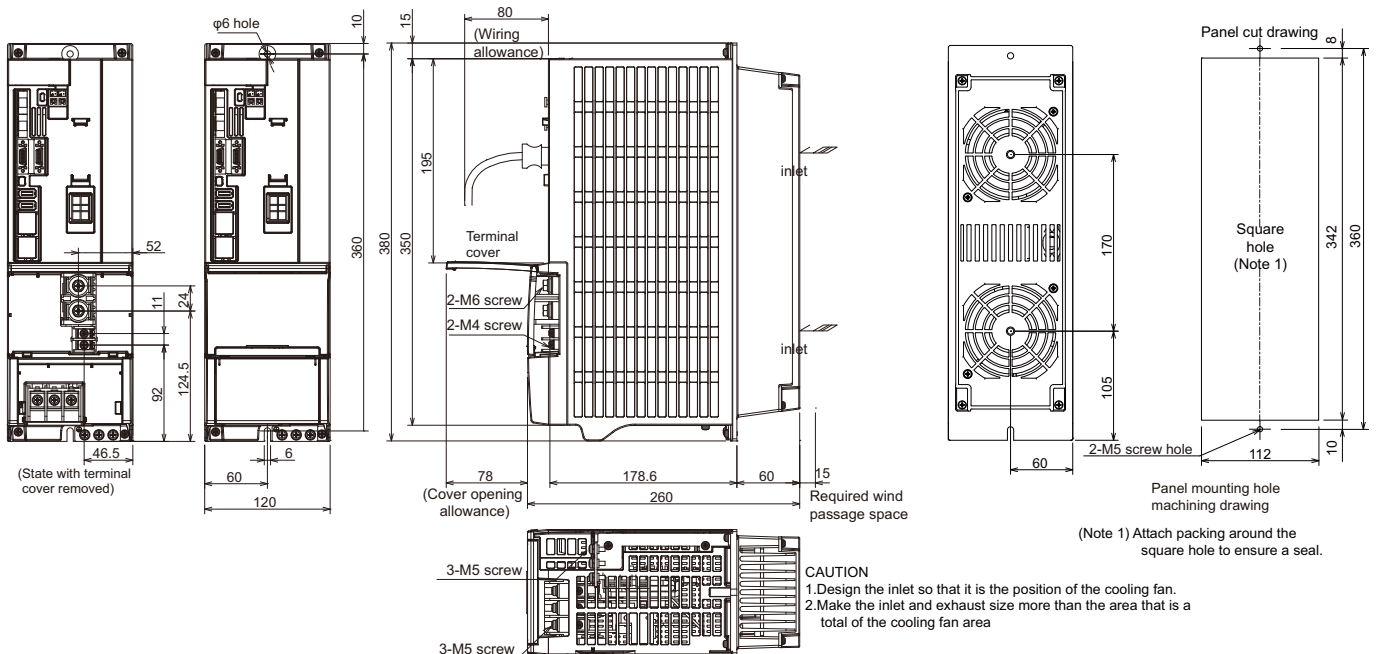
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

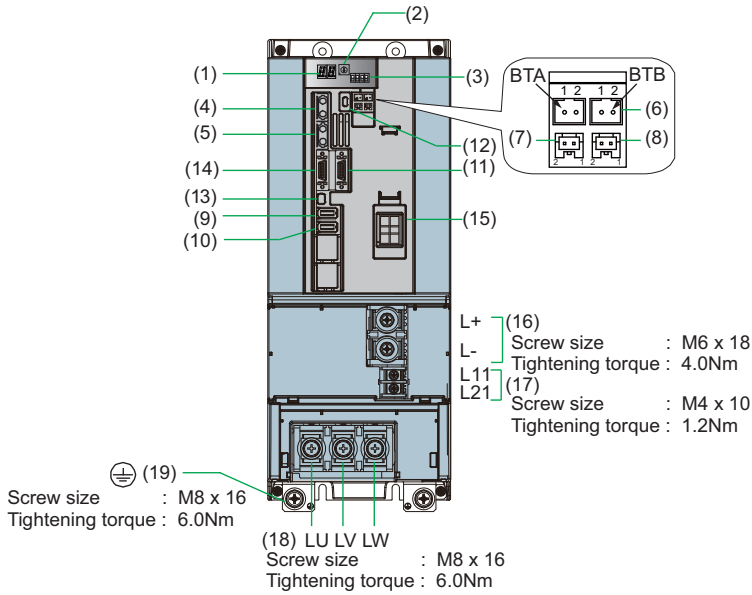
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6			1.25 to 2	16 to 14

### Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V1-320W



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake/dynamic brake unit control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output terminal (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	320
Output	
Rated voltage[V]	170AC
Rated current[A]	97
Input	
Rated voltage[V]	270 to 324DC
Rated current[A]	55
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.6
Max. rush current[A]	30
Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
	External (MDS-D-DBU)
Heating value	
Inside panel[W]	72
Outside panel[W]	399
Cooling method	Forced air cooling
Mass[kg]	7.5

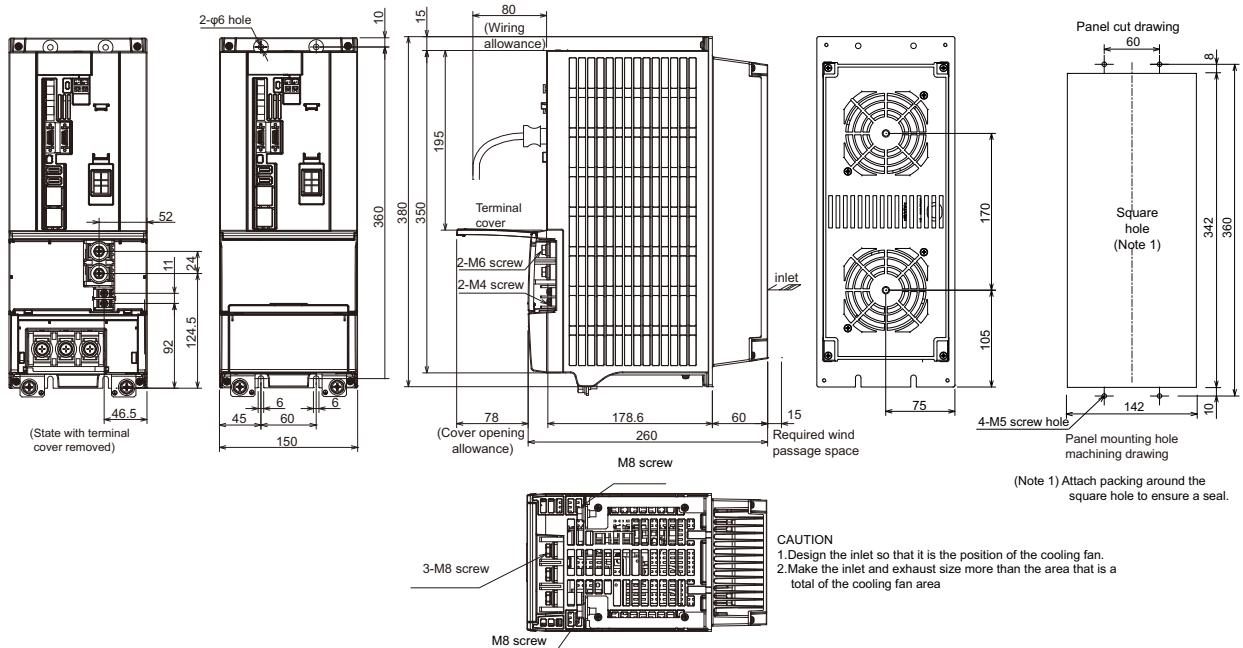
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

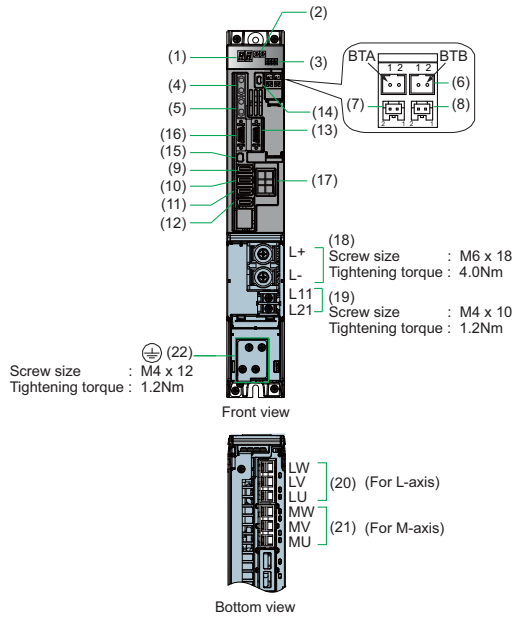
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	38	2	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	22	4			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V2-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	20	20
Output	Rated voltage[V]	170AC
	Rated current[A]	6.4 6.4
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	14
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	Inside panel[W]	26
	Outside panel[W]	44
Cooling method	Forced air cooling	
Mass[kg]	4.5	

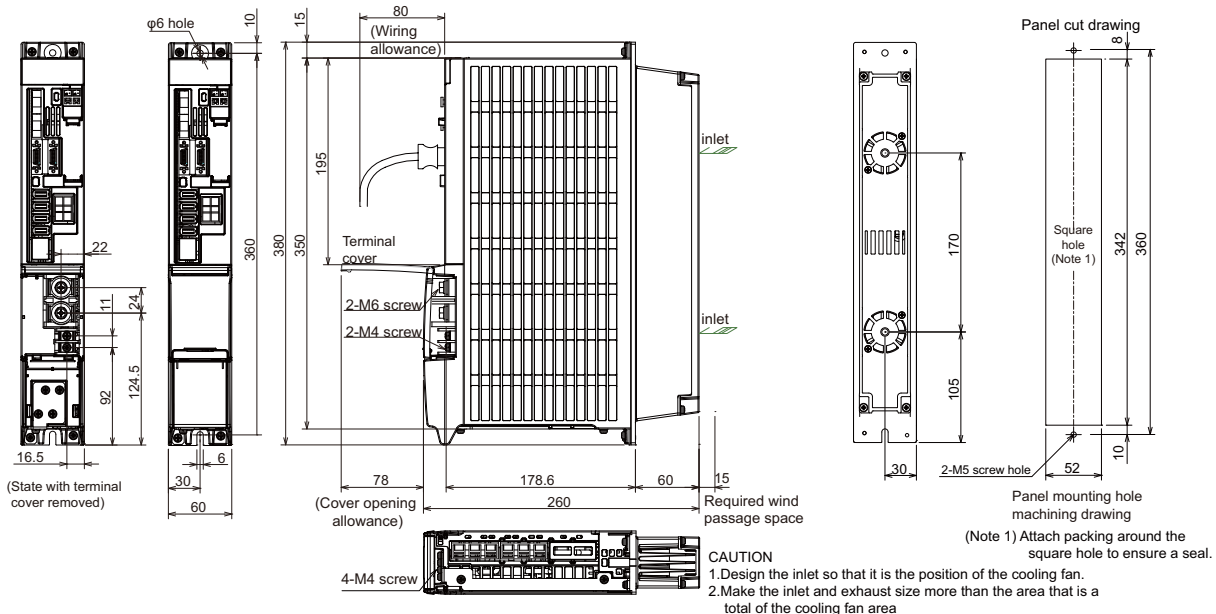
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

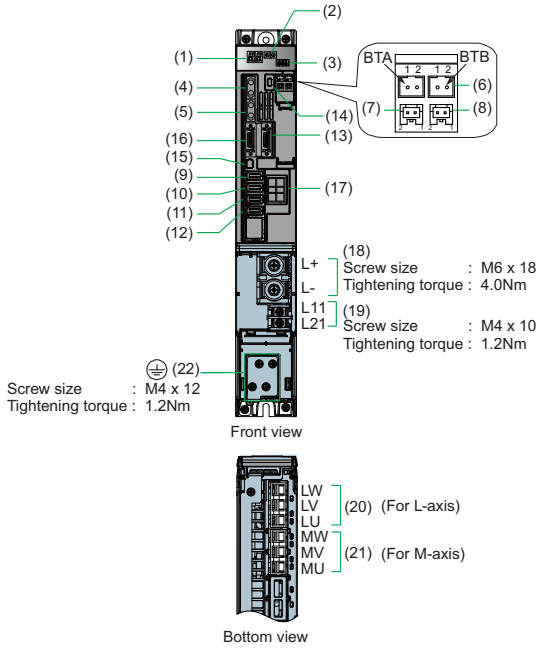
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (1V wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V2-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BT1	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	40	40
Output	170AC	
	Rated voltage[V]	170AC
Input	Rated current[A]	10.9
	Rated voltage[V]	270 to 324DC
Control power	Rated current[A]	14
	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
	Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes	
	Dynamic brakes	Built-in
Heating value	Inside panel[W]	31
	Outside panel[W]	75
Cooling method	Forced air cooling	
Mass[kg]	4.5	

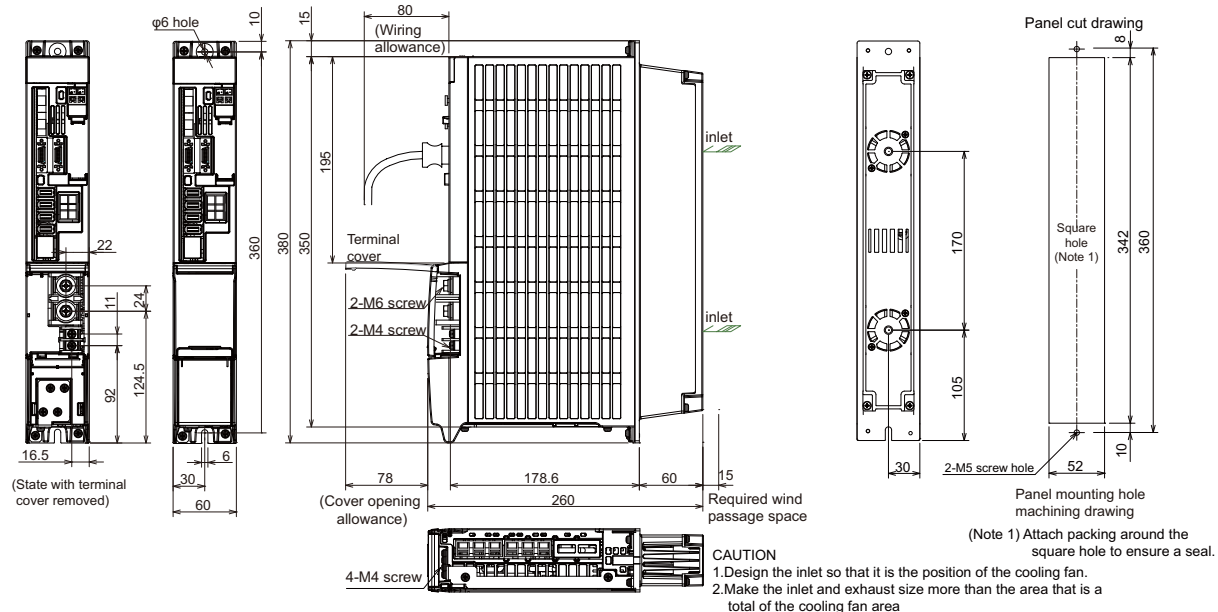
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (V wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

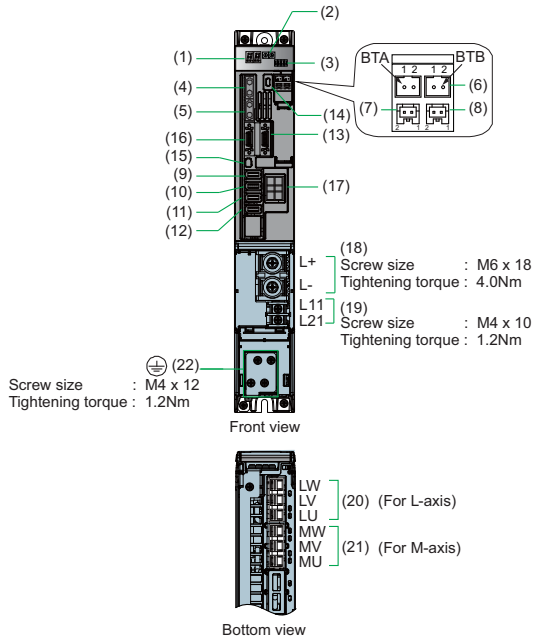
## Outline dimension drawings [Unit : mm]





Servo drive unit

# MDS-E-V2-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	80	80
Output	Rated voltage[V]	170AC
	Rated current[A]	16 / 16
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	28
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 tp 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	Inside panel[W]	40
	Outside panel[W]	142
Cooling method	Forced air cooling	
Mass[kg]	4.6	

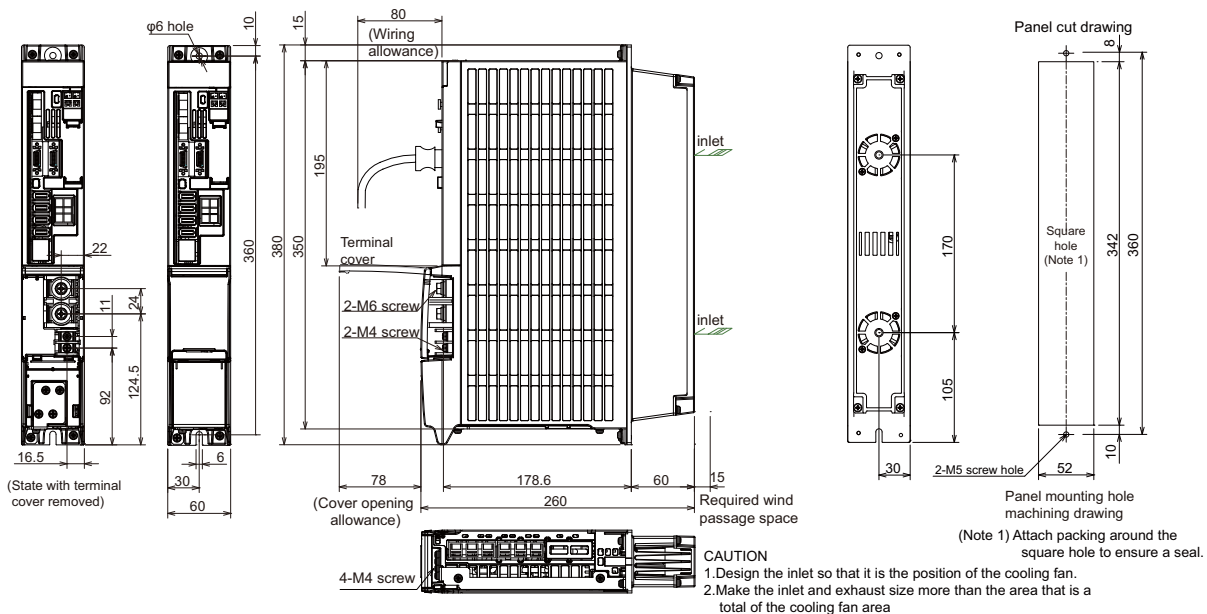
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

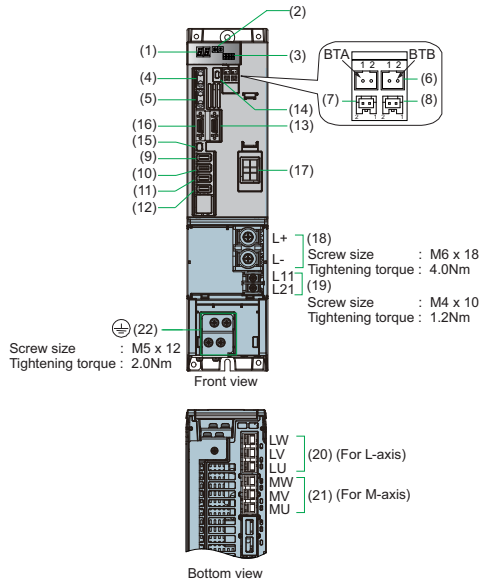
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (V wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V2-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications		
	L	M	
Nominal maximum current(peak) [A]	160	160	
Output	170AC		
	Rated voltage[V]	33	33
Input	270 to 324DC		
	Rated current[A]	60	
Control power	50 / 60		
	Tolerable frequency fluctuation[%]	±5% max	
	Voltage(50Hz) [V]	200 to 240AC	
	Voltage(60Hz) [V]	200 to 240AC	
	Tolerable voltage fluctuation[%]	+10%, -15%	
	Max. current[A]	0.6	
	Max. rush current[A]	30	
	Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	2	2	
Braking	Regenerative braking and dynamic brakes		
	Dynamic brakes	Built-in	
Heating value	Inside panel[W]	62	
	Outside panel[W]	296	
Cooling method	Forced air cooling		
Mass[kg]	5.2		

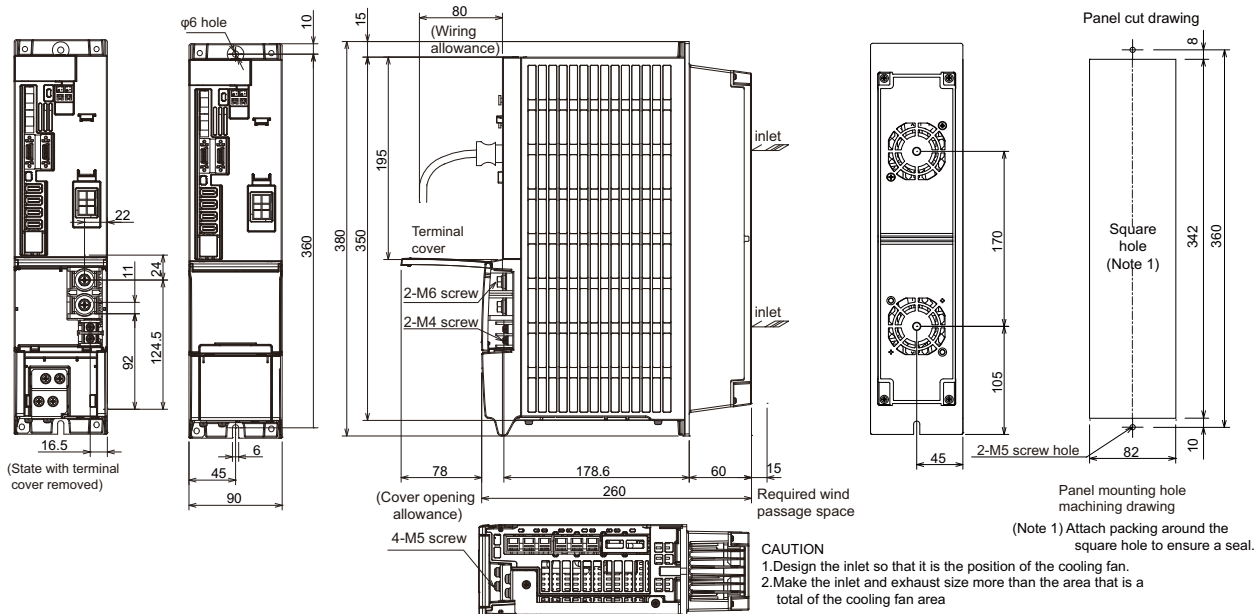
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

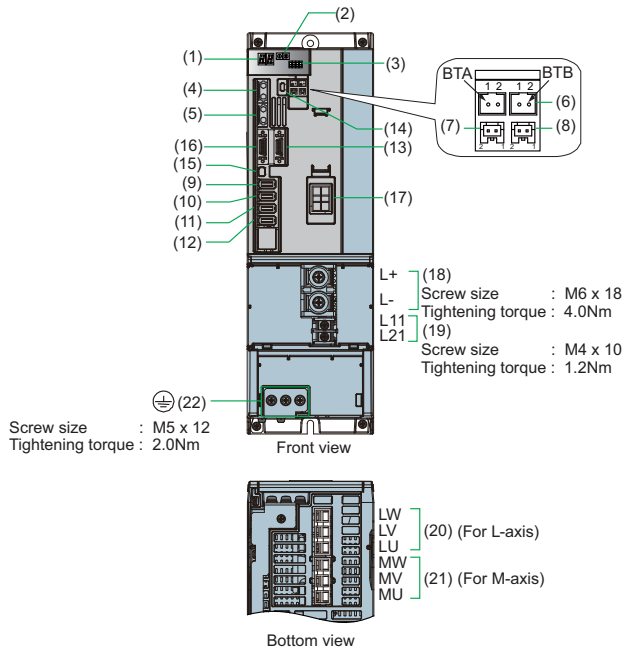
## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit  
**MDS-E-V2-160W**



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

Specifications

Item	Specifications		
	L	M	
Nominal maximum current(peak) [A]	160	160	
Output	170AC		
	Rated voltage[V]	42	42
Input	270 to 324DC		
	Rated current[A]	70	70
Control power	50 / 60		
	Tolerable frequency fluctuation[%]	±5% max	
	Voltage(50Hz) [V]	200 to 240AC	
	Voltage(60Hz) [V]	200 to 240AC	
	Tolerable voltage fluctuation[%]	+10%, -15%	
	Max. current[A]	0.6	
	Max. rush current[A]	30	
	Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	2	2	
Braking	Regenerative braking and dynamic brakes		
	Built-in		
Heating value	Inside panel[W]	77	
	Outside panel[W]	403	
Cooling method	Forced air cooling		
Mass[kg]	6.3		

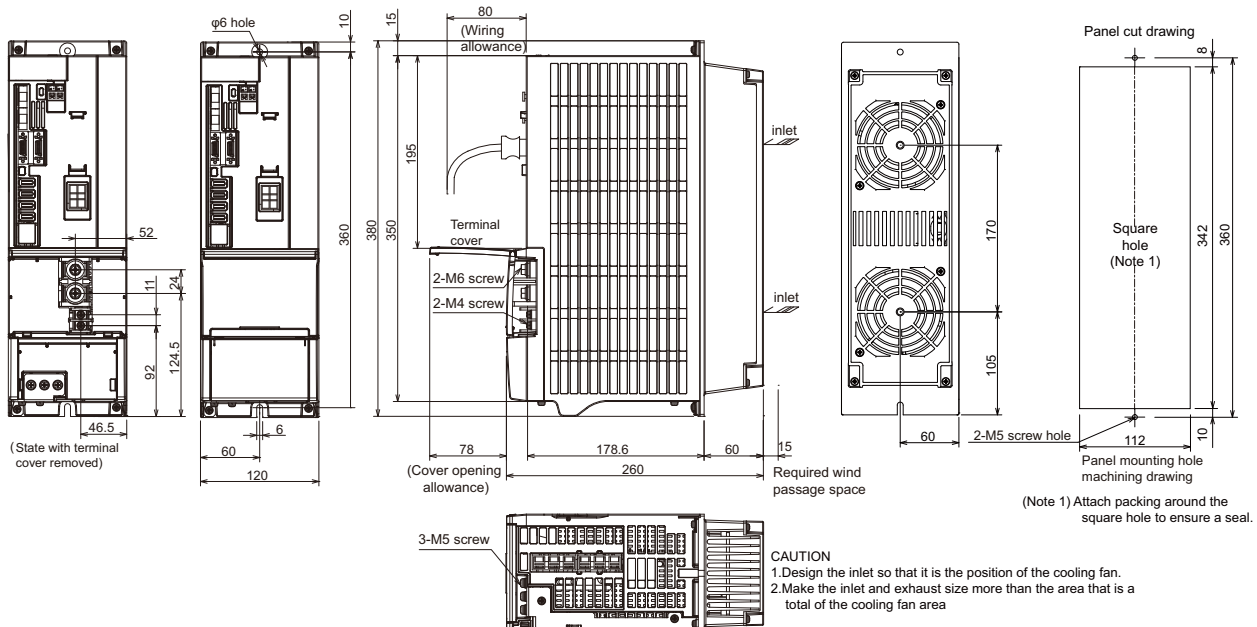
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

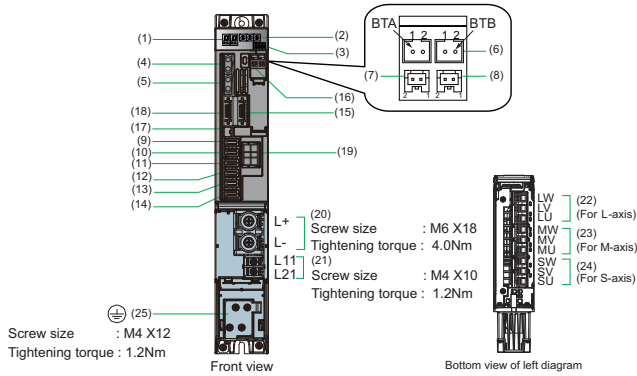
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (V wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10			1.25 to 2	16 to 14

Outline dimension drawings [Unit : mm]





Servo drive unit  
**MDS-E-V3-20**



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM SWS	Axis No. setting switch (L,M,S-axis)
(3)	SW1	Unused axis setting switch (L,M,S-axis)
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN2S	Motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN4	Power supply communication connector
(16)	CN5	USB maintenance connector (usually not used)
(17)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(18)	CN9	DIO/analog output connector
(19)	CN20	Motor brake control connector (Key way: X type)
(20)	TE2	Converter voltage input terminal (DC input)
(21)	TE3	Control power input terminal (single-phase AC input)
(22)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(23)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(24)	TE1	Motor power supply output connector (S-axis, 3-phase AC output)
(25)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.5A or less with a motor side encoder set to 0.25A.

Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	20/20/20	
Output	Rated voltage[V]	170AC
	Rated current[A]	6.4/6.4/6.4
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	21
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
	Max. earth leakage current[mA]	6
	Braking	Regenerative braking and dynamic brakes
Dynamic brakes		Built-in
Heating value	Inside panel[W]	60
	Outside panel[W]	71
Cooling method	Forced air cooling	
Mass[kg]	4.3	

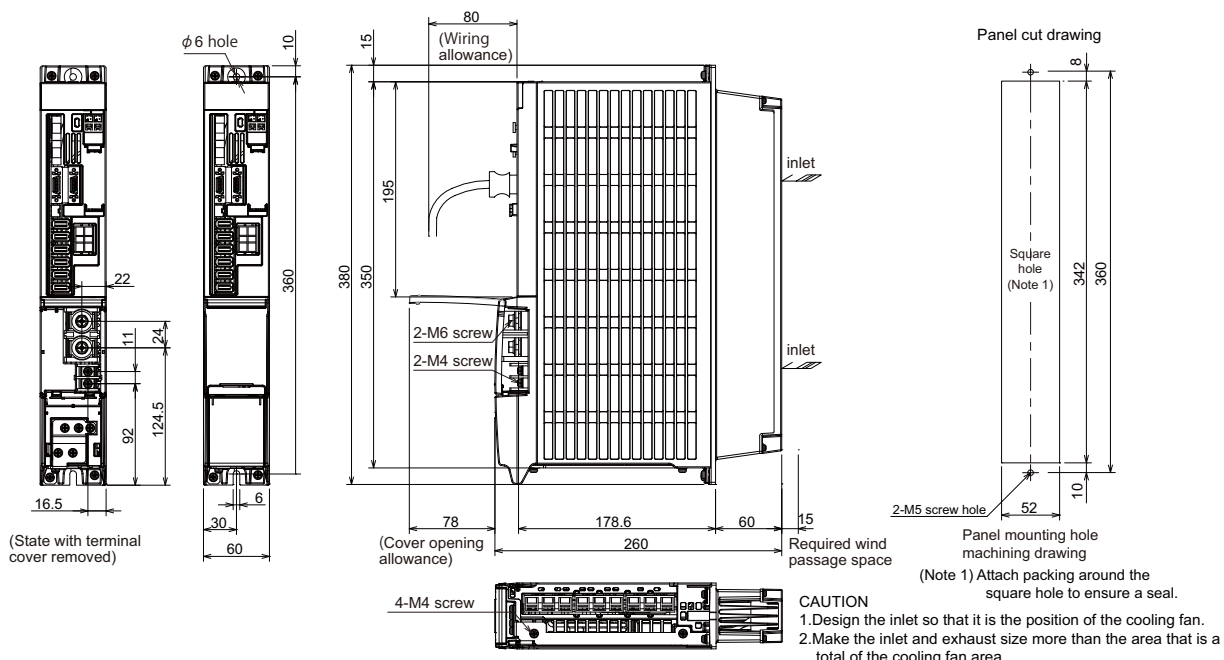
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

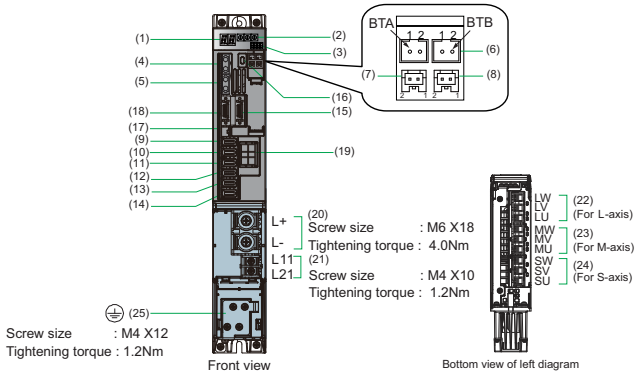
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			2	14

Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V3-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM SWS	Axis No. setting switch (L,M,S-axis)
(3)	SW1	Unused axis setting switch (L,M,S-axis)
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN2S	Motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN4	Power supply communication connector
(16)	CN5	USB maintenance connector (usually not used)
(17)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(18)	CN9	DIO/analog output connector
(19)	CN20	Motor brake control connector (Key way: X type)
(20)	TE2	Converter voltage input terminal (DC input)
(21)	TE3	Control power input terminal (single-phase AC input)
(22)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(23)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(24)	TE1	Motor power supply output connector (S-axis, 3-phase AC output)
(25)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.5A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	40/40/40	
Output	Rated voltage[V]	170AC
	Rated current[A]	10.9/10.9/10.9
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	21
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
	Max. earth leakage current[mA]	6
	Braking	Regenerative braking and dynamic brakes
Dynamic brakes		Built-in
Heating value	Inside panel[W]	102
	Outside panel[W]	123
Cooling method	Forced air cooling	
Mass[kg]	4.3	

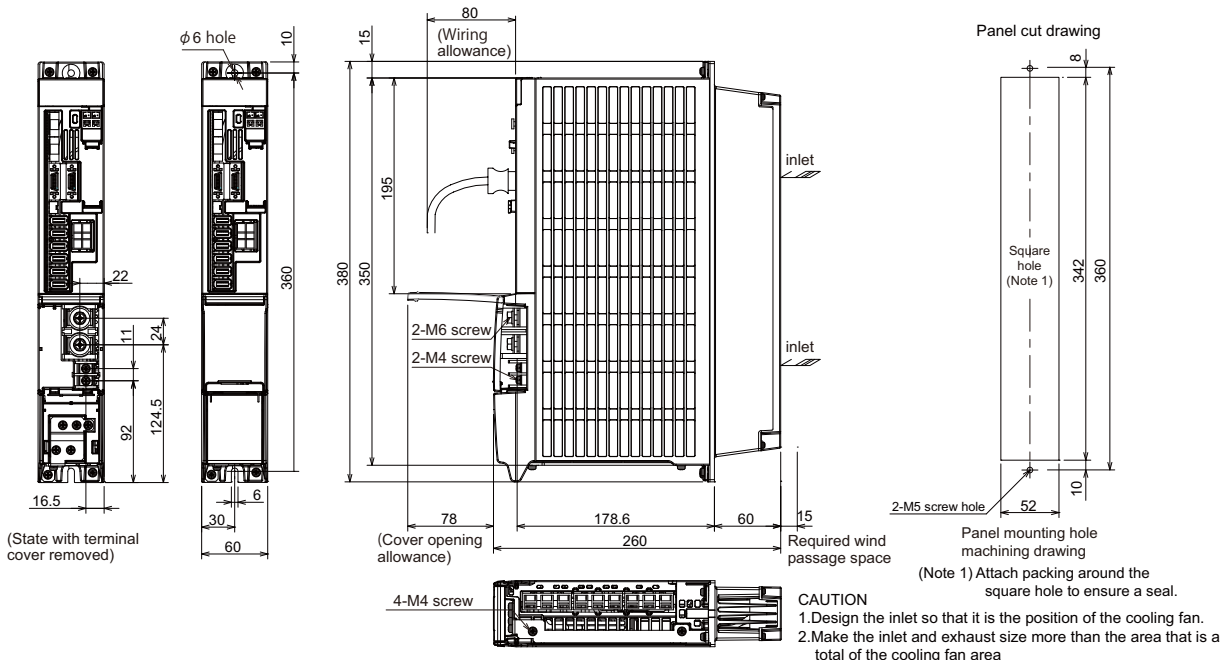
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

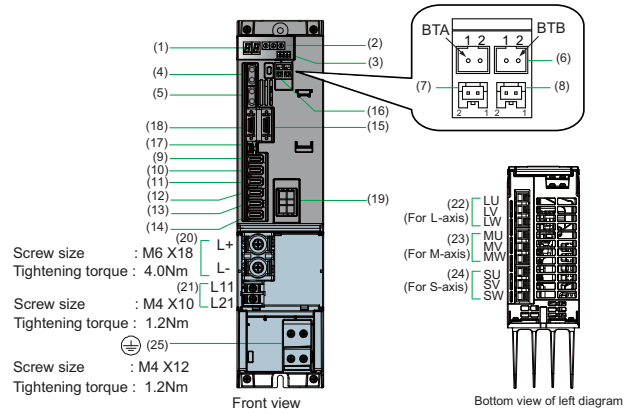
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			2	14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-E-V3-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM SWS	Axis No. setting switch (L,M,S-axis)
(3)	SW1	Unused axis setting switch (L,M,S-axis)
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN2S	Motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN4	Power supply communication connector
(16)	CN5	USB maintenance connector (usually not used)
(17)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(18)	CN9	DIO/analog output connector
(19)	CN20	Motor brake control connector (Key way: X type)
(20)	TE2	Converter voltage input terminal (DC input)
(21)	TE3	Control power input terminal (single-phase AC input)
(22)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(23)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(24)	TE1	Motor power supply output connector (S-axis, 3-phase AC output)
(25)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.5A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	80/80/80	
Output	Rated voltage[V]	170AC
	Rated current[A]	16/16/16
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	42
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	6	
Braking	Regenerative braking and dynamic brakes	
	Dynamic brakes	Built-in
Heating value	Inside panel[W]	139
	Outside panel[W]	111
Cooling method	Natural-cooling	
Mass[kg]	6.2	

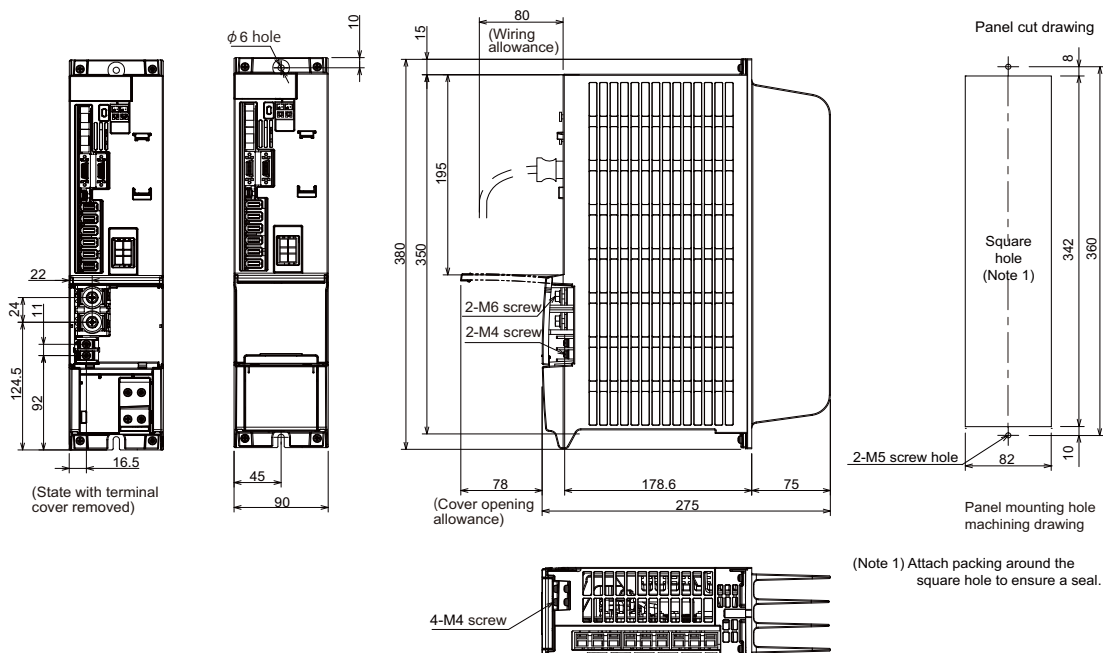
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]

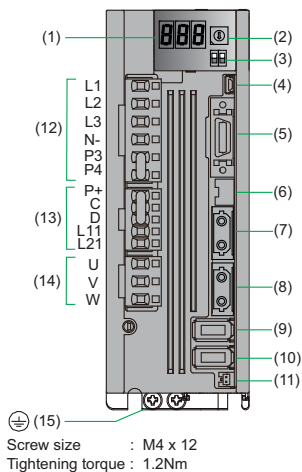








Servo drive unit  
**MDS-EJ-V1-30**



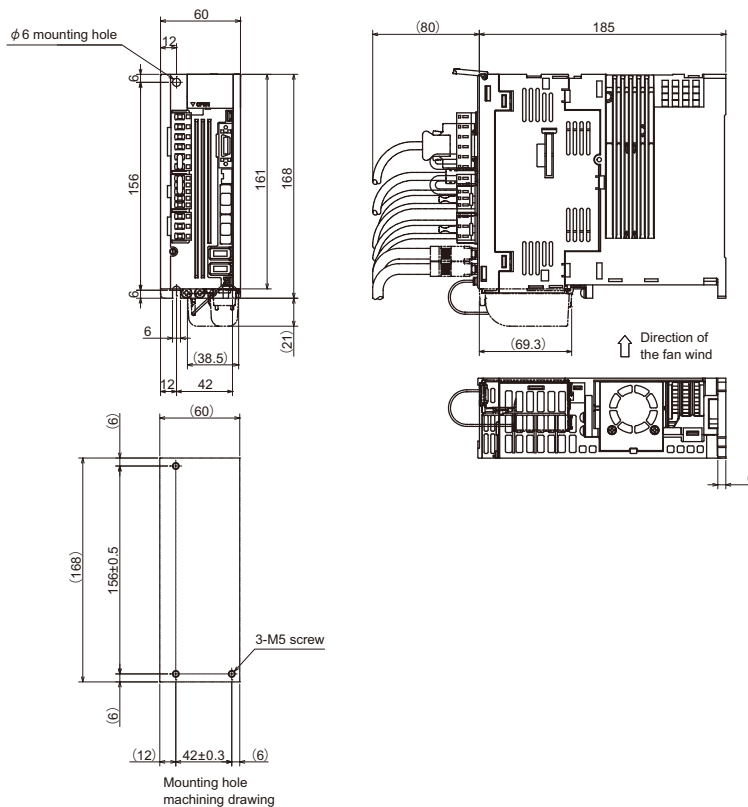
No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	P+,C,D: Regenerative resistor connection connector L11,L12: Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

Specifications

Item	Specifications
Nominal maximum current (peak) [A]	30
Rated output[kW]	0.75
Power facility capacity[kVA]	1.3
Output	Rated voltage[V] 170AC Rated current[A] 5.8
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase or single-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase or single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 3.8 (Note)
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 30 Max. Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 50
Cooling method	Forced air cooling
Mass[kg]	1.4
Selection example of contactor (option part)	S-T12-AC200V
Free-air thermal current[A]	20
Selection current (for 200V input) [A]	7
Selection example of circuit protector (option part)	NF30-SW3P-15A
Rated current[A]	15
Selection current (for 200V input) [A]	7
Regenerative option	Refer to "Regenerative option".

(Note) The current value when a three-phase power supply is used.

Outline dimension drawings [Unit : mm]



Environmental conditions

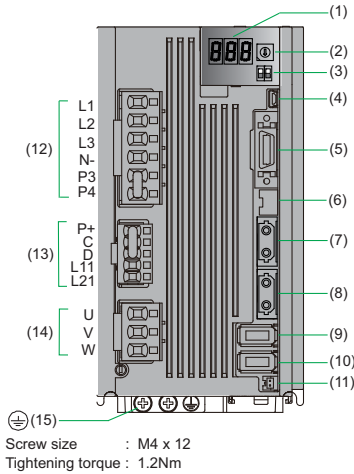
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight),no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16

Servo drive unit

# MDS-EJ-V1-40

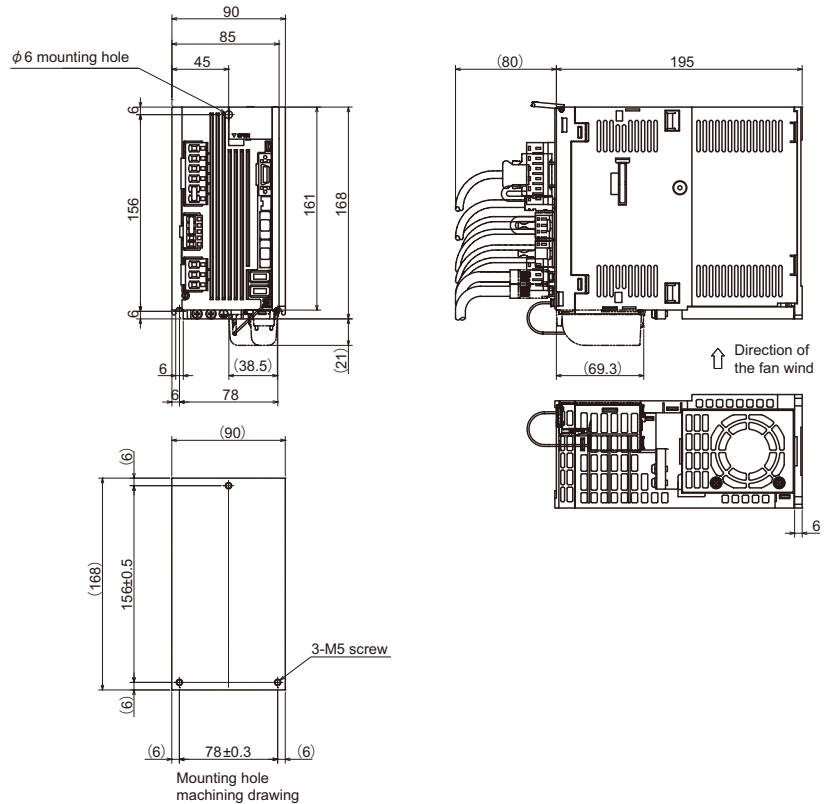


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	P+,C,D: Regenerative resistor connection connector L11,L12: Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	40
Rated output[kW]	1.0
Power facility capacity[kVA]	1.7
Output	Rated voltage[V] 170AC Rated current[A] 11
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 8.0
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 30 Max. Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes Dynamic brakes Built-in Main circuit method Converter with resistor regeneration circuit
Heating value	Inside panel[W] 90
Cooling method	Forced air cooling
Mass[kg]	2.1
Selection example of contactor (option part)	S-T12-AC200V
Free-air thermal current[A]	20
Selection current (for 200V input) [A]	8
Selection example of circuit protector (option part)	NF30-SW3P-15A
Rated current[A]	15
Selection current (for 200V input) [A]	8
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

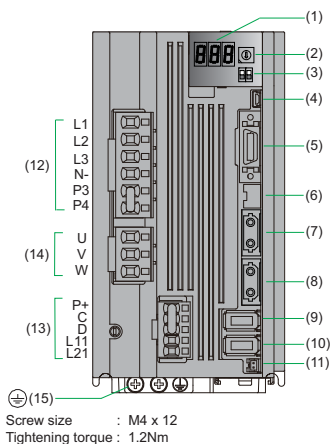
## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16





Servo drive unit  
**MDS-EJ-V1-100**

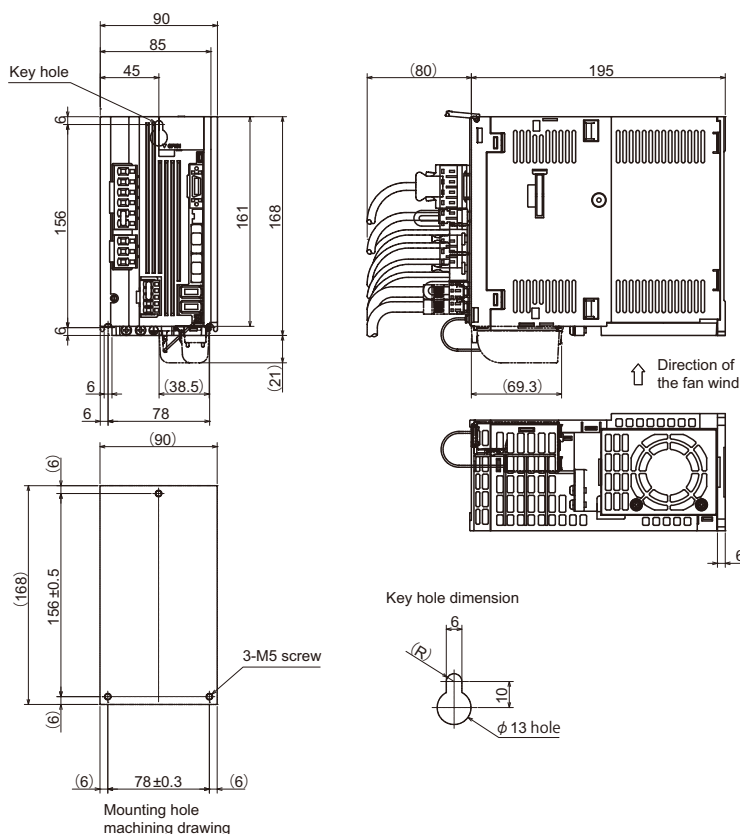


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	P+,C,D: Regenerative resistor connection connector L11,L12: Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

Specifications

Item	Specifications
Nominal maximum current (peak) [A]	100
Rated output[kW]	3.5
Power facility capacity[kVA]	5.5
Output	Rated voltage[V] AC170 Rated current[A] 22
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 16
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 30 Max.Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes Dynamic brakes Built-in Main circuit method Converter with resistor regeneration circuit
Heating value	Inside panel[W] 195
Cooling method	Forced air cooling
Mass[kg]	2.3
Selection example of contactor (option part)	S-T21-AC200V
Free-air thermal current[A]	32
Selection current (for 200V input) [A]	15
Selection example of circuit protector (option part)	NF30-SW3P-30A
Rated current[A]	30
Selection current (for 200V input) [A]	15
Regenerative option	Refer to "Regenerative option".

Outline dimension drawings [Unit : mm]



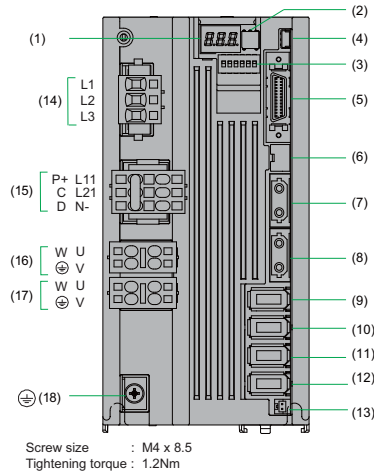
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight),no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	5.5	10	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	5.5	10	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	3.5	12	2	14	1.25	16

Servo drive unit  
**MDS-EJ-V2-30**



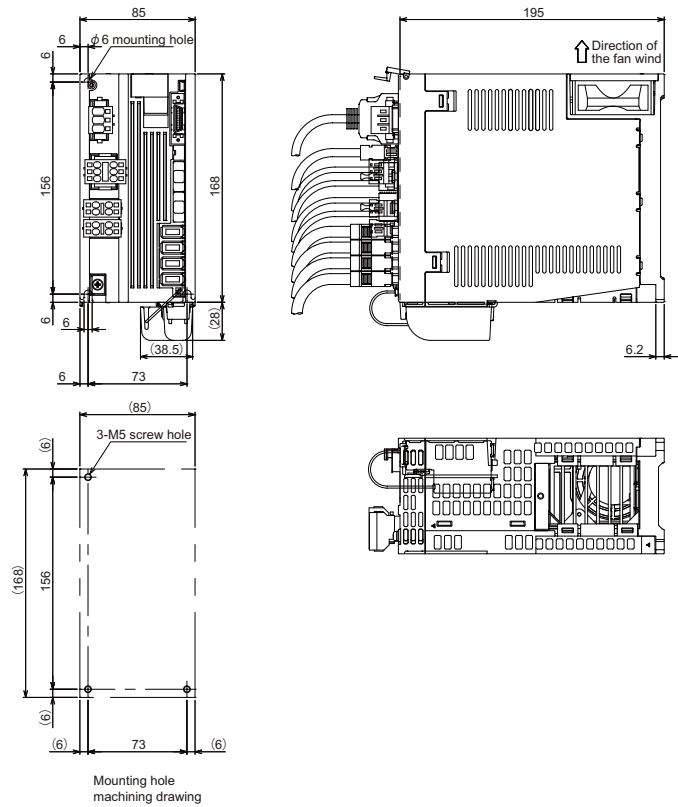
No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch (L,M-axis)
(3)	SW2	Unused axis setting switch (L,M-axis)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	BAT	Battery connection connector
(14)	CNP1	L1,L2,L3: Power supply input terminal (3-phase AC input)
(15)	CNP2	P+,C,D: Regenerative resistor connection terminal L11,L21: Control power input terminal (single-phase AC input) N-: Test terminal for the manufacturer (Do not connect.)
(16)	CNP3L	Motor power output terminal (3-phase AC output) (L-axis)
(17)	CNP3M	Motor power output terminal (3-phase AC output) (M-axis)
(18)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak)[A]	30	30
Rated output[kW]	0.75	0.75
Power facility capacity[kVA]	2.6	
Output	170AC	
Rated voltage[V]	5.8	
Rated current[A]	5.8	
Input	50 / 60	
Tolerable frequency fluctuation[%]	±5% max	
Rated voltage(50Hz) [V]	3-phase 200 to 240AC	
Rated voltage(60Hz) [V]	3-phase 200 to 240AC	
Tolerable voltage fluctuation[%]	+10%, -15%	
Rated current[A]	7.6	
Control power	50 / 60	
Tolerable frequency fluctuation[%]	±5% max	
Voltage(50Hz)[V]	Single-phase 200 to 240AC	
Voltage(60Hz)[V]	Single-phase 200 to 240AC	
Tolerable voltage fluctuation[%]	+10%, -15%	
Max. Current[A]	0.4	
Max. Rush current[A]	30	
Max.Rush conductivity time[ms]	6	
Maximum earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
Dynamic brakes	Built-in	
Main circuit method	Converter with resistor regeneration circuit	
Heating value	Inside panel[W]	90
Cooling method	Forced air cooling	
Mass[kg]	1.9	
Selection example of contactor (option part)	S-T12-AC200V	
Free-air thermal current[A]	20	
Selection current (for 200V input)[A]	9	
Selection example of circuit protector (option part)	NF30-SW3P-20A	
Rated current[A]	20	
Selection current (for 200V input)[A]	9	
Regenerative option	Refer to "Regenerative option".	

Outline dimension drawings [Unit : mm]



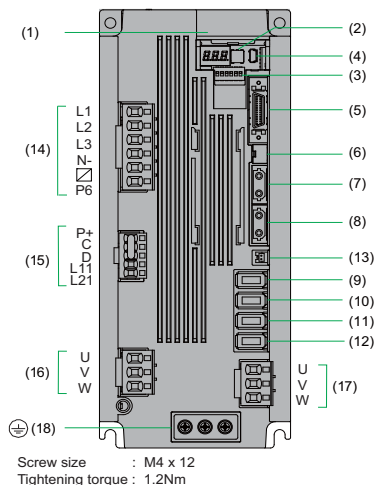
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	2	14	2	14	2	14

Servo drive unit  
**MDS-EJ-V2-40**



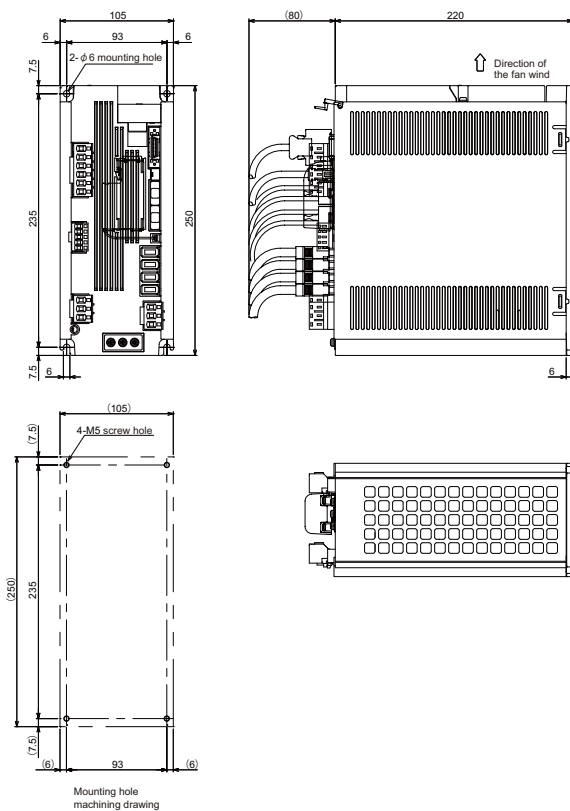
No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch (L,M-axis)
(3)	SW2	Unused axis setting switch (L,M-axis)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	BAT	Battery connection connector
(14)	CNP1	L1,L2,L3: 3-phase AC power input N-: Test terminal for the manufacturer (Do not connect.) /, P6: Not used
(15)	CNP2	P+,C,D: Regenerative resistor connection terminal L11,L21: Control power input terminal (single-phase AC input)
(16)	CNP3L	Motor power output terminal (3-phase AC output) (L-axis)
(17)	CNP3M	Motor power output terminal (3-phase AC output) (M-axis)
(18)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak)[A]	40	40
Rated output[kW]	1.0	1.0
Power facility capacity[kVA]	3.4	
Output	170AC	
Rated voltage[V]	11	
Rated current[A]	11	
Input	50 / 60	
Frequency[Hz]	±5% max	
Tolerable frequency fluctuation[%]	3-phase 200 to 240AC	
Rated voltage(50Hz) [V]	3-phase 200 to 240AC	
Rated voltage(60Hz) [V]	+10%, -15%	
Tolerable voltage fluctuation[%]	16.0	
Rated current[A]	50 / 60	
Frequency[Hz]	±5% max	
Tolerable frequency fluctuation[%]	Single-phase 200 to 240AC	
Voltage(50Hz)[V]	Single-phase 200 to 240AC	
Voltage(60Hz)[V]	+10%, -15%	
Tolerable voltage fluctuation[%]	0.4	
Max. Current[A]	30	
Max. Rush current[A]	6	
Max.Rush conductivity time[ms]	2	
Maximum earth leakage current[mA]	2	
Braking	Regenerative braking and dynamic brakes	
Dynamic brakes	Built-in	
Main circuit method	Converter with resistor regeneration circuit	
Heating value	Inside panel[W]	162
Cooling method	Forced air cooling	
Mass[kg]	4.6	
Selection example of contactor (option part)	S-T21-AC200V	
Free-air thermal current[A]	32	
Selection current (for 200V input)[A]	20	
Selection example of circuit protector (option part)	NF30-SW3P-30A	
Rated current[A]	30	
Selection current (for 200V input)[A]	20	
Regenerative option	Refer to "Regenerative option".	

Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

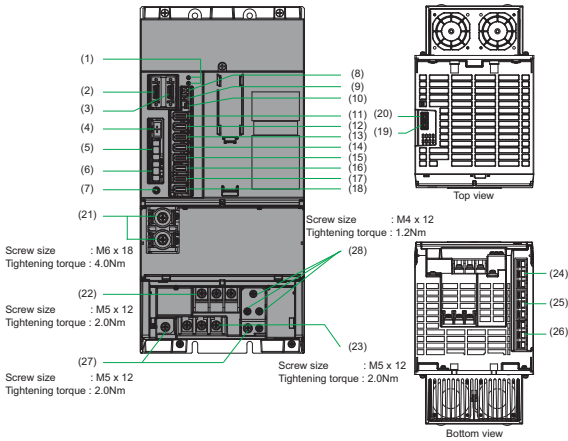
Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	2	14	2	14	2	14

# Multi Axis Unit

Multi axis unit

# MDS-EM-SPV3-16040S



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		Grounding terminal (also including grounding of the spindle motor)
(28)	PE	

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	160
Nominal maximum current (at peak of servo) [A]	40x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	10.9x3
Rated current [spindle][A]	58
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	45
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	255
Outside panel[W]	485
Cooling method	Forced air cooling
Mass[kg]	14.5

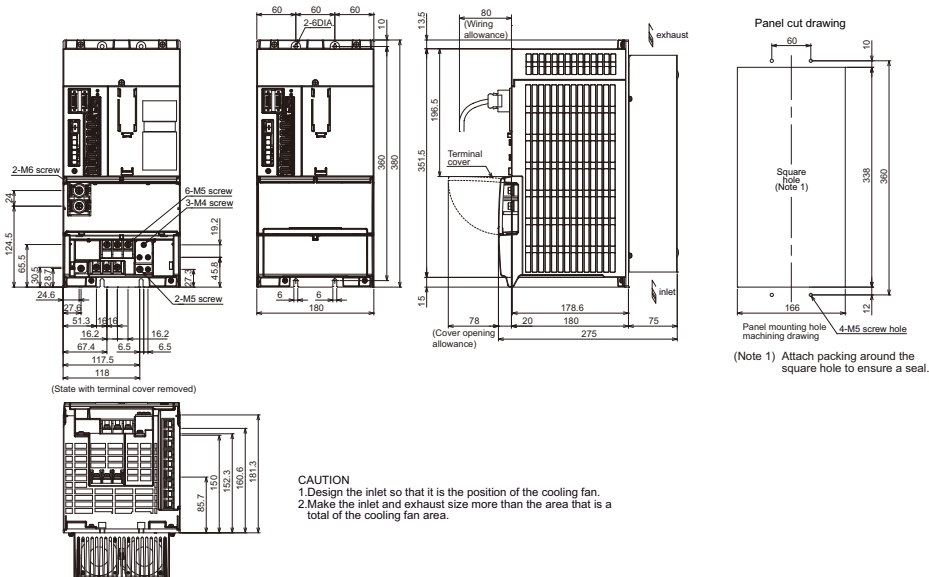
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

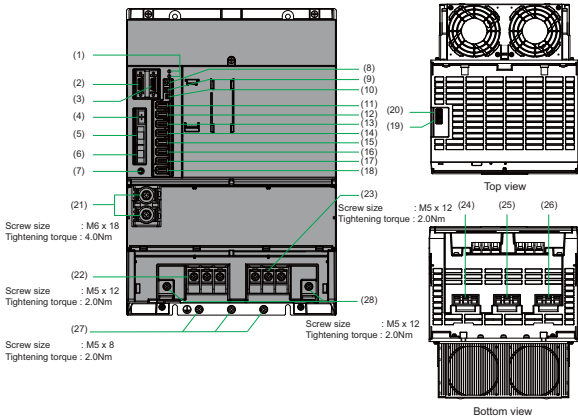
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	14	6	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	14	6	8	8	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8	8	8	8	8	8	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EM-SPV3-10040



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		Grounding terminal (also including grounding of the spindle motor)
(28)	PE	

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	100
Nominal maximum current (at peak of servo) [A]	40x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	10.9x3
Rated current [spindle][A]	43
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	36
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[ma]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	130
Outside panel[W]	560
Cooling method	Forced air cooling
Mass[kg]	14

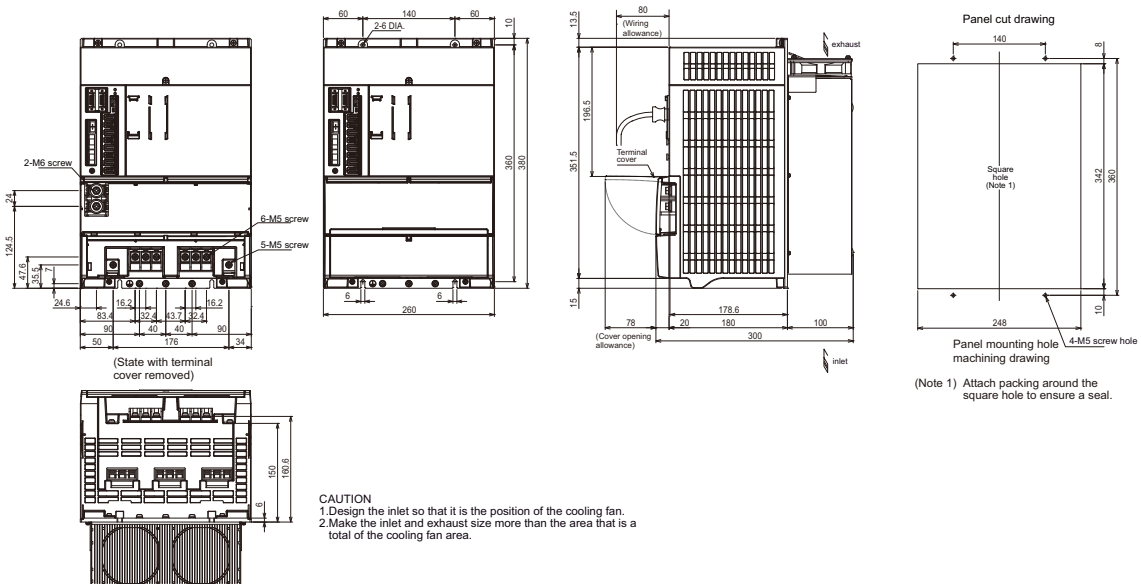
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	14	6	14	6	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	8	8	8	8	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	5.5	10	8	8	1.25	16	1.25	16

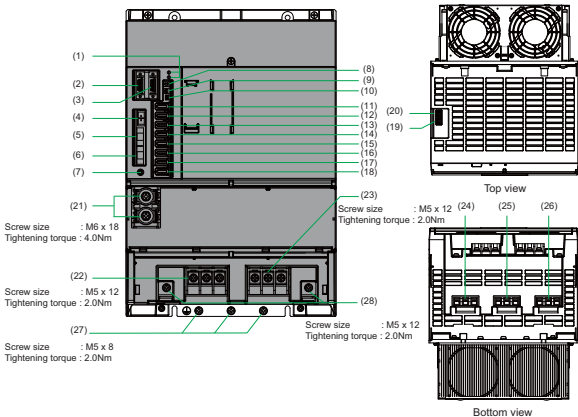
## Outline dimension drawings [Unit : mm]





Multi axis unit

# MDS-EM-SPV3-10080



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)	PE	Grounding terminal (also including grounding of the spindle motor)
(28)		

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	100
Nominal maximum current (at peak of servo) [A]	80x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	16x3
Rated current [spindle][A]	43
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	38
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[ma]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	140
Outside panel[W]	590
Cooling method	Forced air cooling
Mass[kg]	14

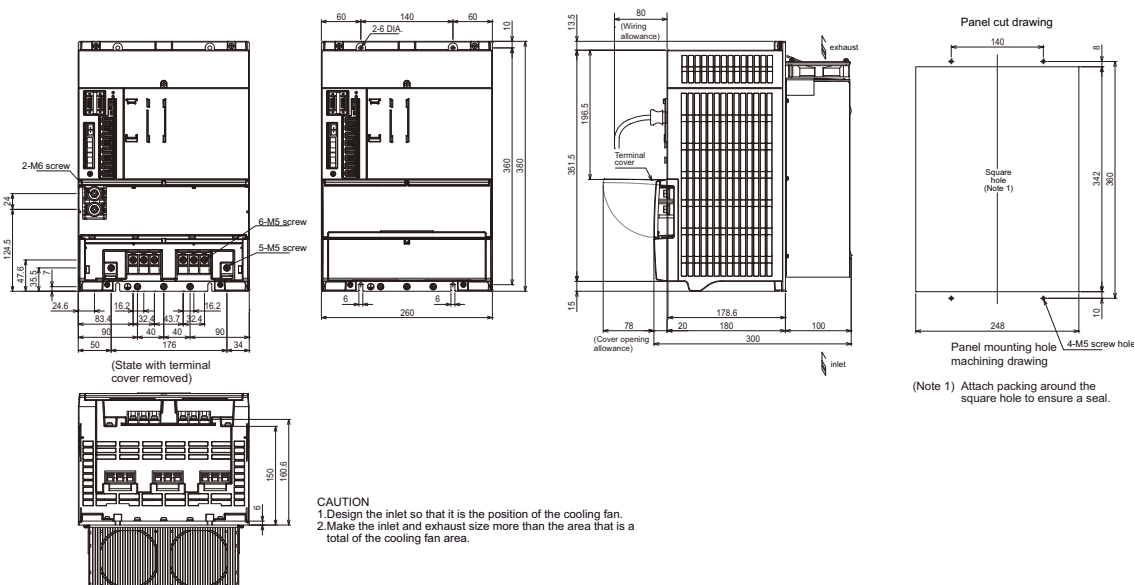
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

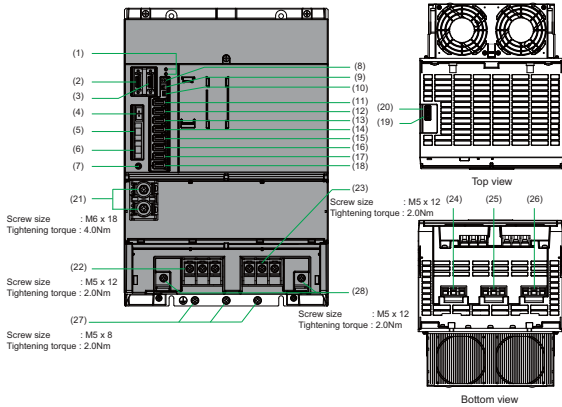
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	14	6	14	6	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	8	8	8	8	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	5.5	10	8	8	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EM-SPV3-16040



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		Grounding terminal (also including grounding of the spindle motor)
(28)	PE	

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	160
Nominal maximum current (at peak of servo) [A]	40x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	10.9x3
Rated current [spindle][A]	58
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	45
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	145
Outside panel[W]	620
Cooling method	Forced air cooling
Mass[kg]	14

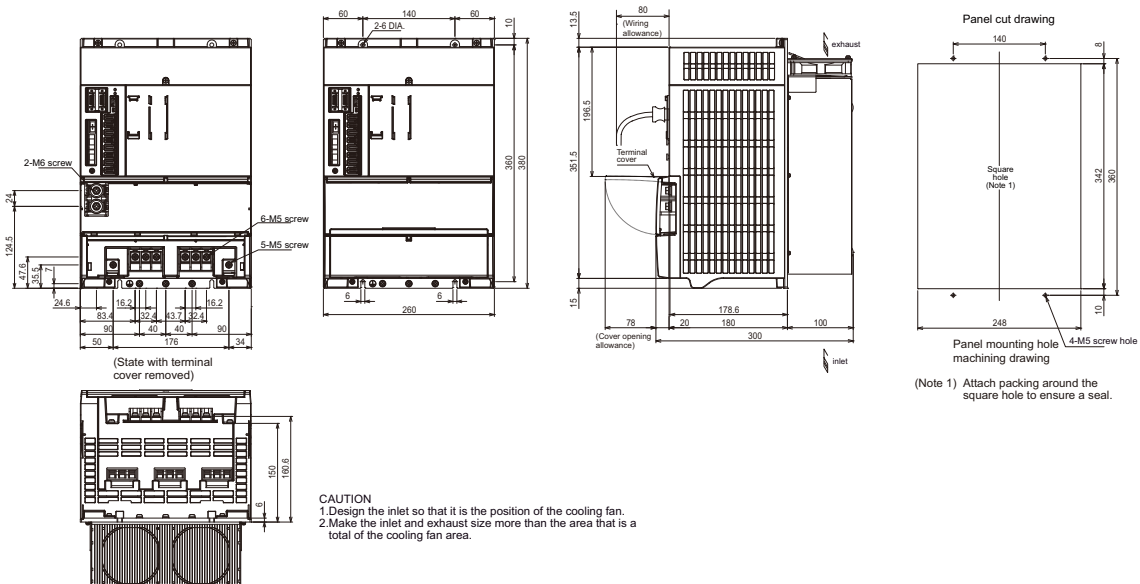
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	14	6	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	14	6	8	8	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8	8	8	8	8	8	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]

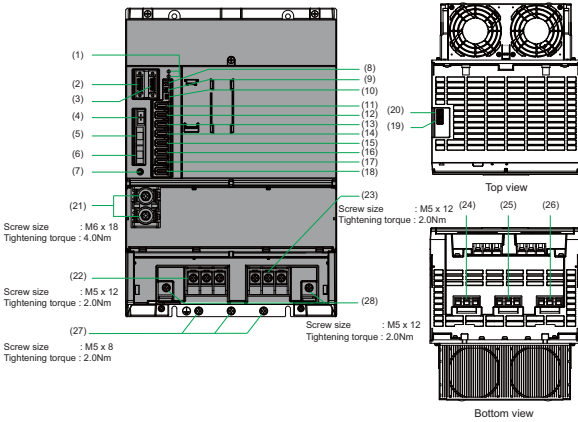


CAUTION  
1. Design the inlet so that it is the position of the cooling fan.  
2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area.



Multi axis unit

# MDS-EM-SPV3-16080



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		Grounding terminal (also including grounding of the spindle motor)
(28)	PE	

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	160
Nominal maximum current (at peak of servo) [A]	80x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	16x3
Rated current [spindle][A]	58
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	48
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[ma]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	150
Outside panel[W]	650
Cooling method	Forced air cooling
Mass[kg]	14

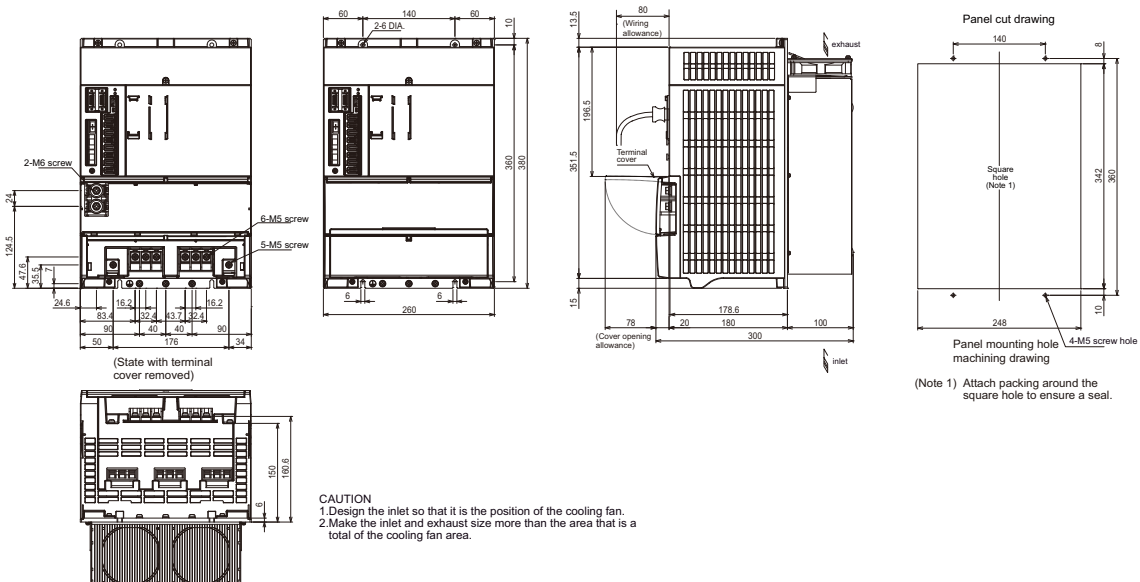
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

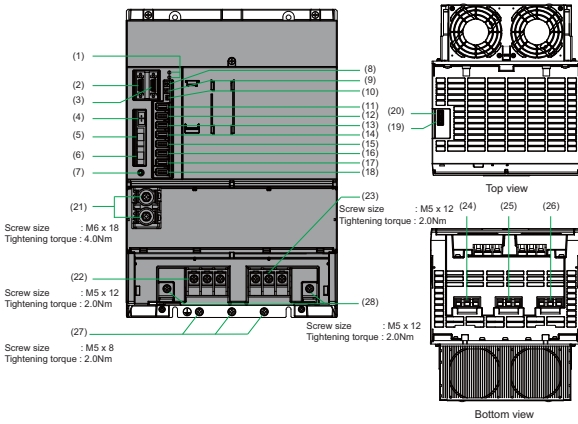
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (L, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	14	6	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14	6	14	6	8	8	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8	8	8	8	8	8	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EM-SPV3-20080



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIQ/analog output connector (spindle)
(3)	CN9B	DIQ/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	200
Nominal maximum current (at peak of servo) [A]	80x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	16x3
Rated current [spindle][A]	85
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	60
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[ma]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	175
Outside panel[W]	815
Cooling method	Forced air cooling
Mass[kg]	14

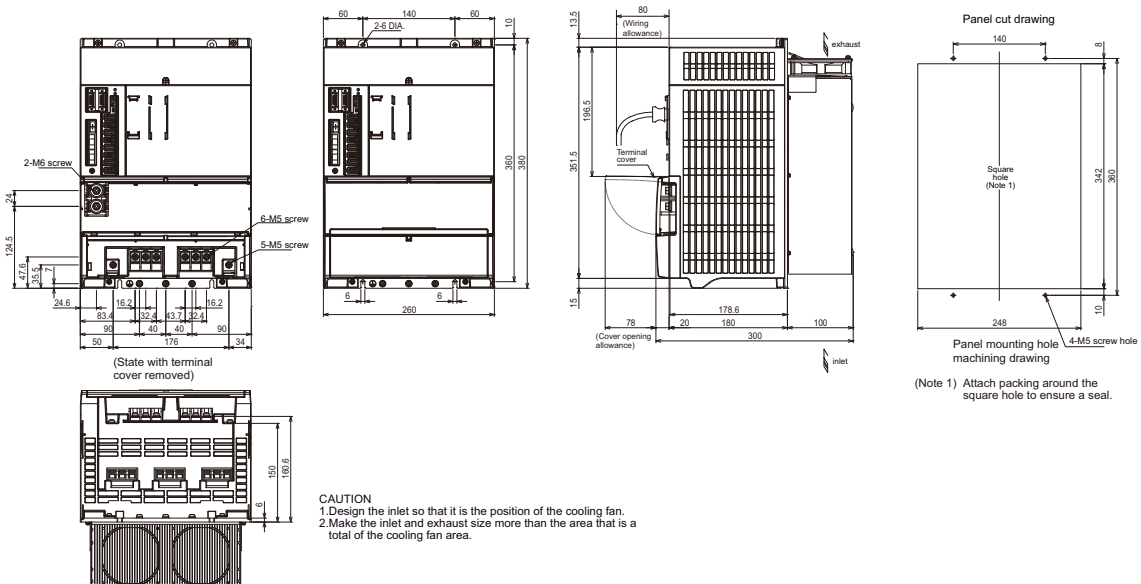
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

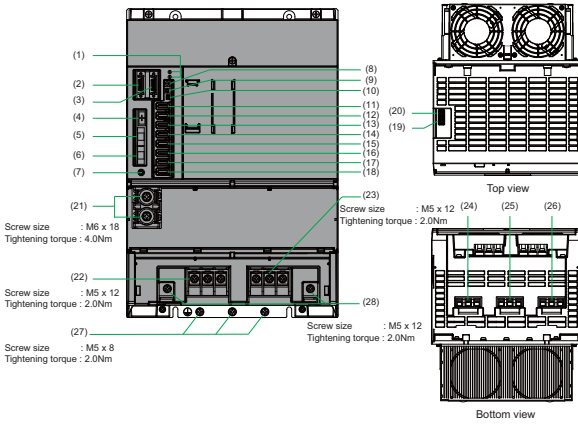
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	22	4	38	2	14	6	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	8	8	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8	8	14	6	8	8	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EM-SPV3-200120



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIQ/analog output connector (spindle)
(3)	CN9B	DIQ/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		
(28)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	200
Nominal maximum current (at peak of servo) [A]	120x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	28x3
Rated current [spindle][A]	85
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	65
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[ma]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	235
Outside panel[W]	1025
Cooling method	Forced air cooling
Mass[kg]	14

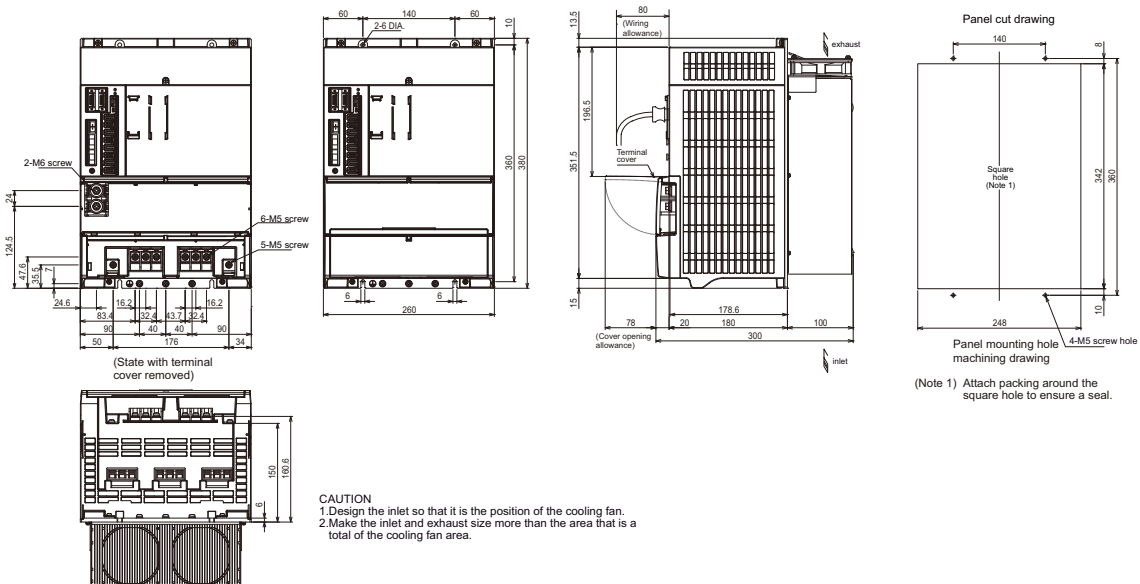
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

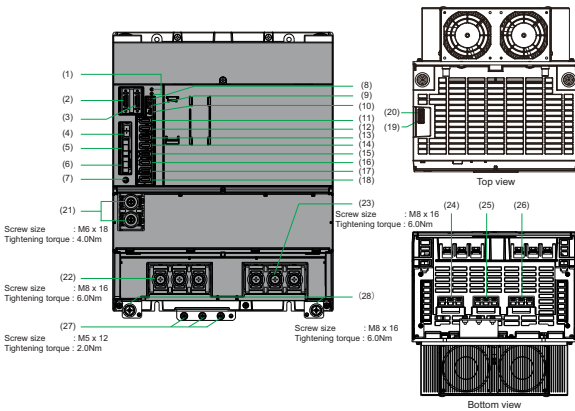
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (L, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	22	4	38	2	14	6	5.5	10	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	8	8	5.5	10	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6	14	6	8	8	3.5	12	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EM-SPV3-320120



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		
(28)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	320
Nominal maximum current (at peak of servo) [A]	120x3
Output	
Rated voltage[V]	170AC
Rated current [servo][A]	28x3
Rated current [spindle][A]	150
Input	
Rated voltage (50Hz) [V]	200 to 240AC
Rated voltage (60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	121
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	630
Outside panel[W]	1020
Cooling method	Forced air cooling
Mass[kg]	20.7

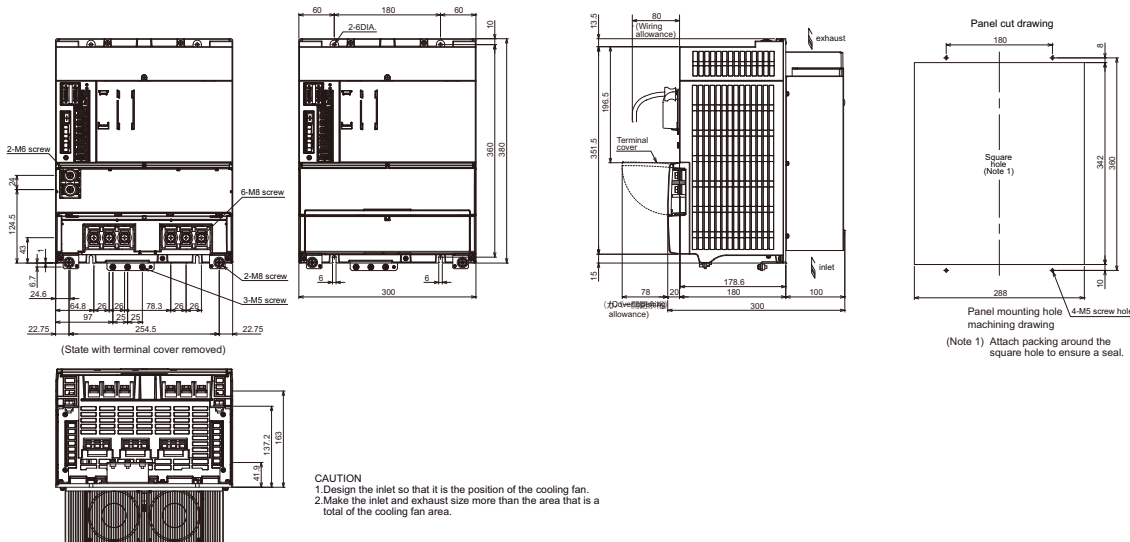
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0	-	-	14	6	5.5	10	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0	60	1/0	8	8	5.5	10	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2	38	2	60	1/0	3.5	12	1.25	16

## Outline dimension drawings [Unit : mm]

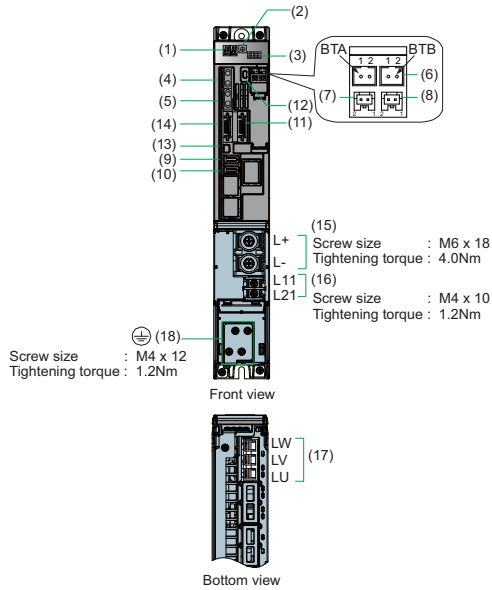




# Spindle Drive Unit

Spindle drive unit

# MDS-E-SP-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	20	
Output	Rated voltage[V]	170AC
	Rated current[A]	9.0
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	7.0
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	24
	Outside panel[W]	31
Cooling method	Forced air cooling	
Mass[kg]	3.8	

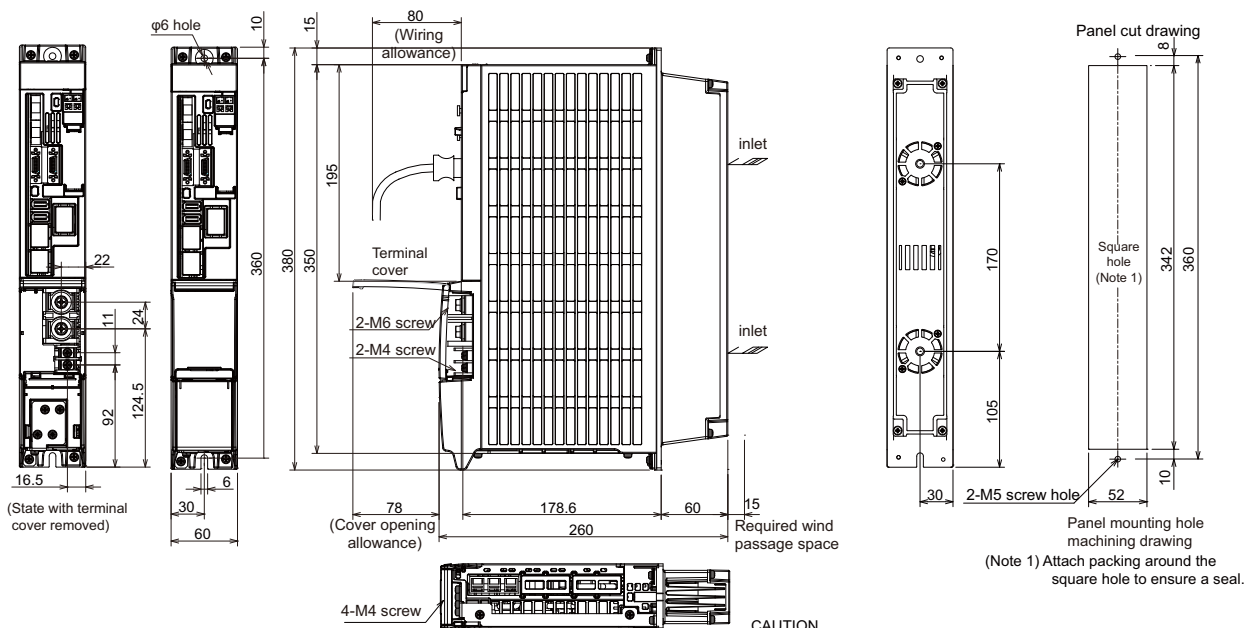
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

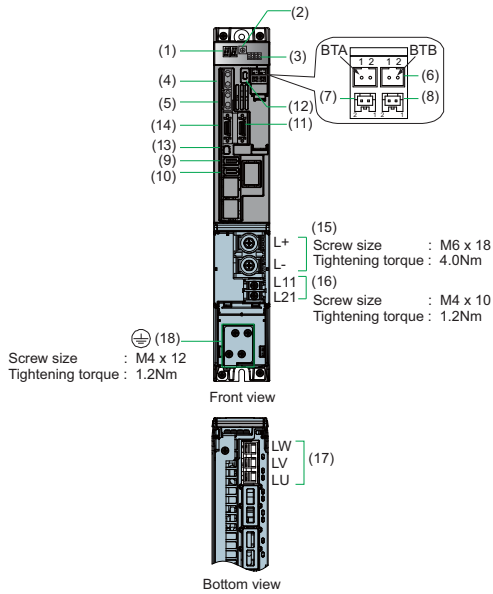
## Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-E-SP-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTB	(Unused)
(7)	BT1	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	40	
Output	Rated voltage[V]	170AC
	Rated current[A]	15
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	13
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	29
	Outside panel[W]	65
Cooling method	Forced air cooling	
Mass[kg]	3.8	

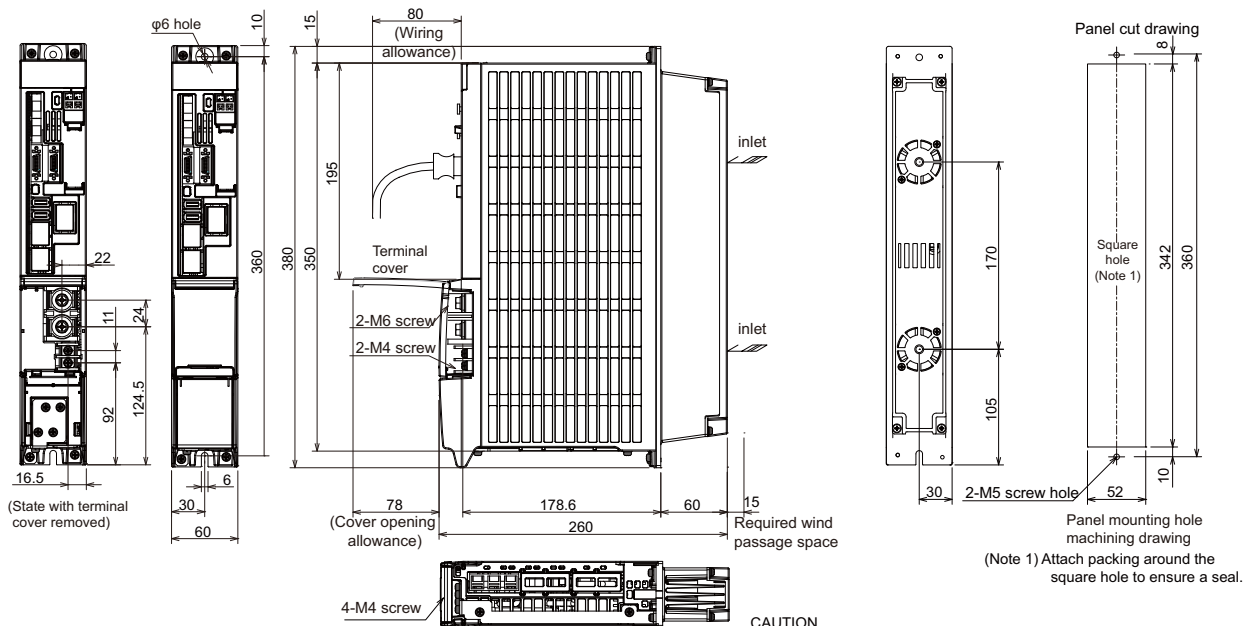
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



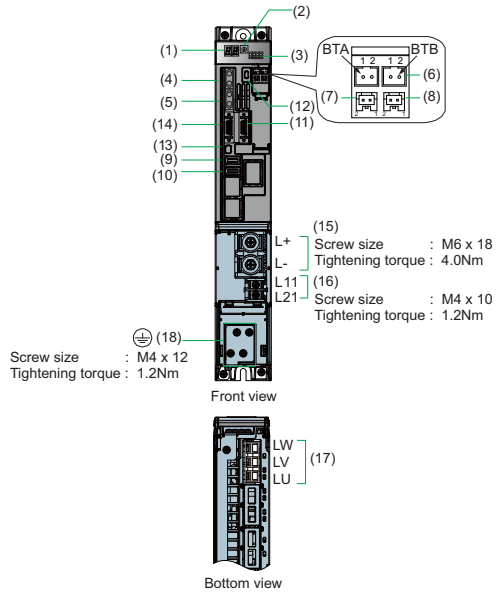
### CAUTION

1. Design the inlet so that it is the position of the cooling fan.
2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area



Spindle drive unit

# MDS-E-SP-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	80	
Output	Rated voltage[V]	170AC
	Rated current[A]	27
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	20
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
	Max. rush conductivity time[ms]	6
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	37
	Outside panel[W]	121
Cooling method	Forced air cooling	
Mass[kg]	3.8	

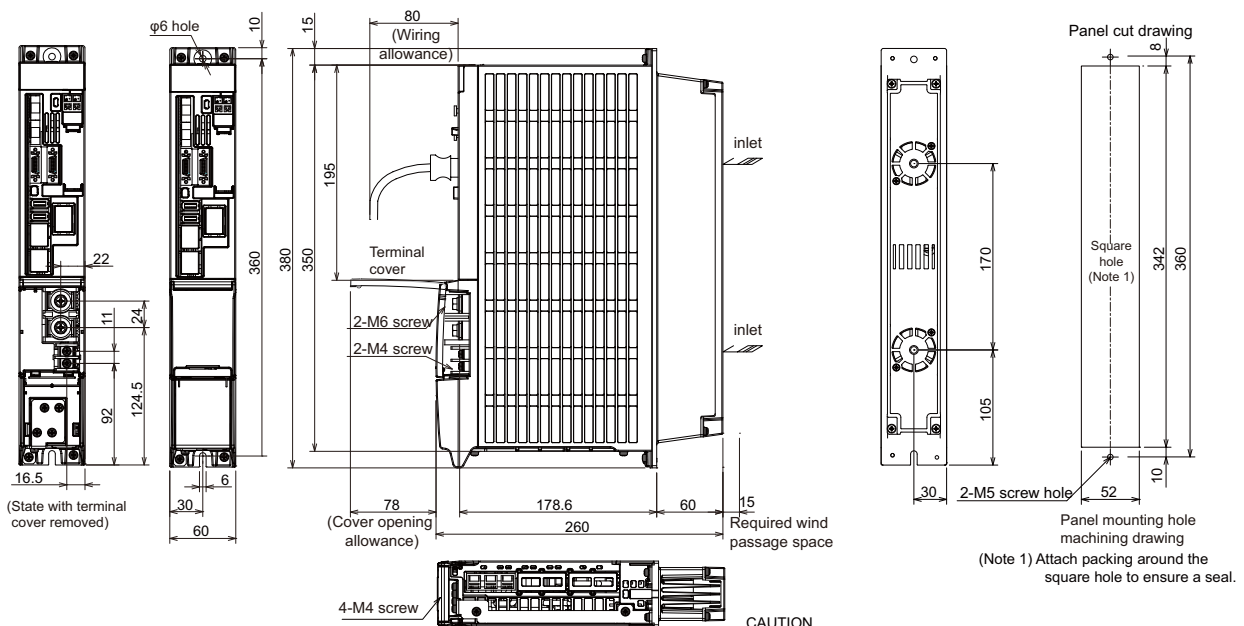
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]

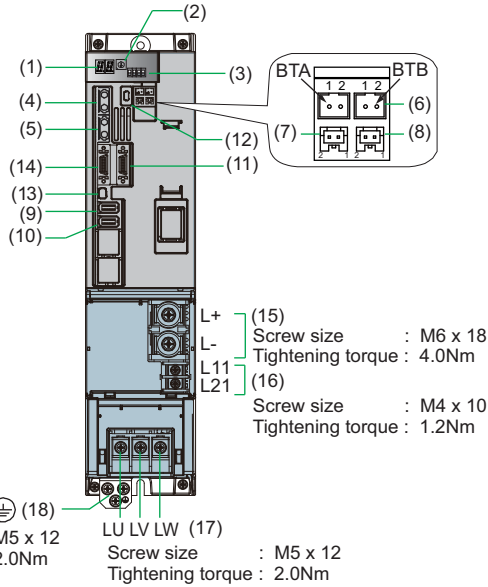


### CAUTION

1. Design the inlet so that it is the position of the cooling fan.
2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area

Spindle drive unit

# MDS-E-SP-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	160	
Output	Rated voltage[V]	170AC
	Rated current[A]	54
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	41
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	54
	Outside panel[W]	236
Cooling method	Forced air cooling	
Mass[kg]	4.5	

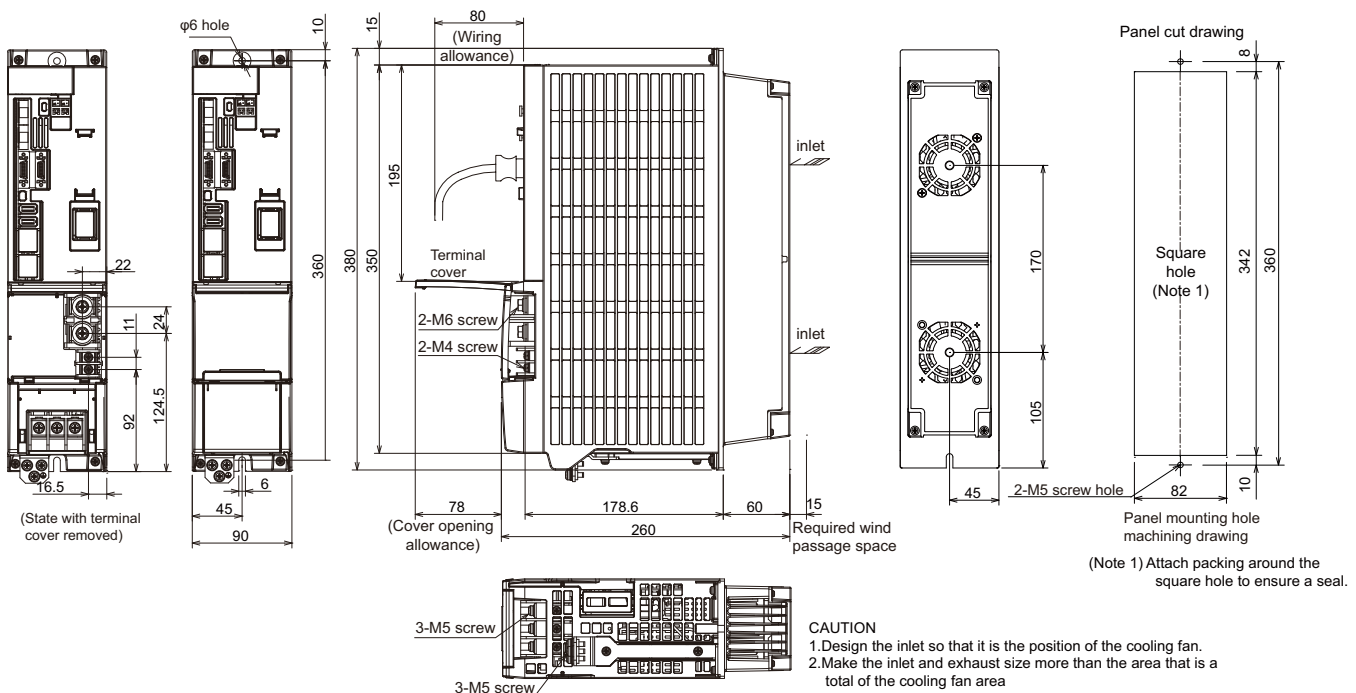
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

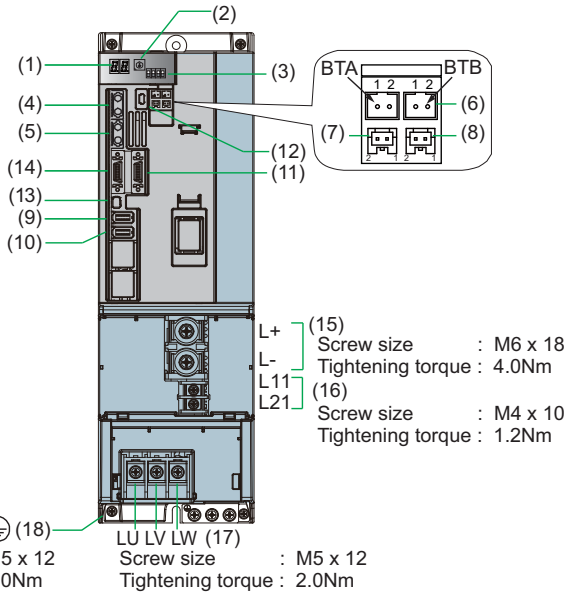
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	22	4	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14	6			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8	8			1.25 to 2	16 to 14

### Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP-200



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	200	
Output	Rated voltage[V]	170AC
	Rated current[A]	85
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	76
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	78
	Outside panel[W]	404
Cooling method	Forced air cooling	
Mass[kg]	5.8	

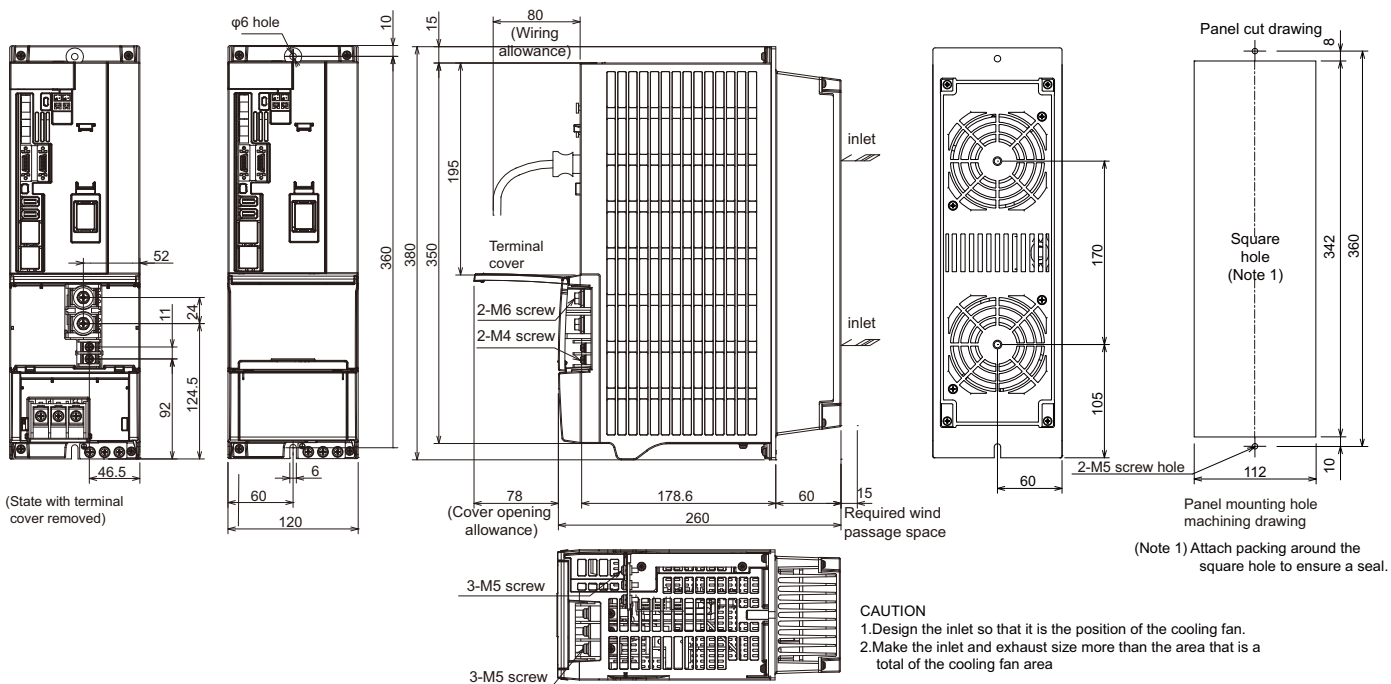
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

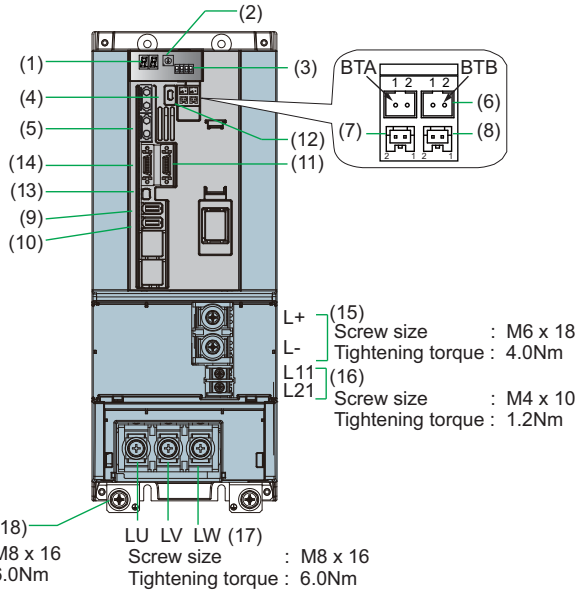
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6			1.25 to 2	16 to 14

### Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP-240



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	240	
Output	Rated voltage[V]	170AC
	Rated current[A]	94
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	95
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	100
	Outside panel[W]	520
Cooling method	Forced air cooling	
Mass[kg]	7.5	

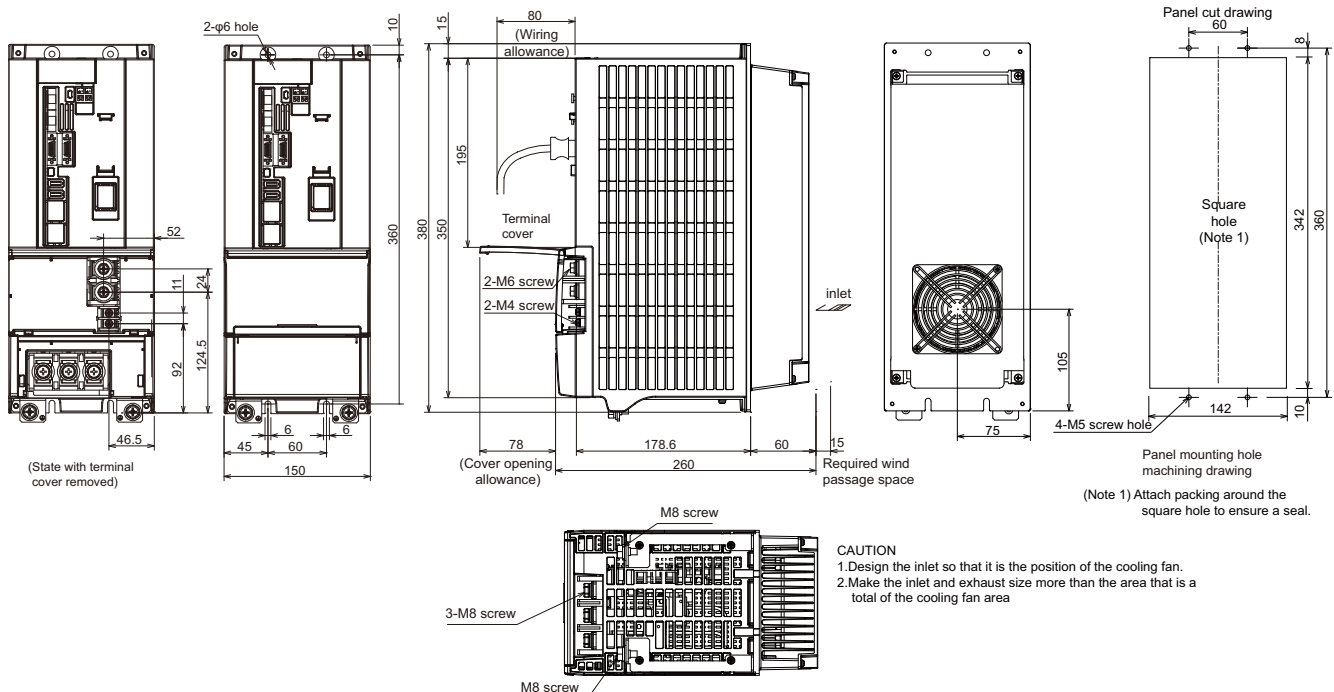
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

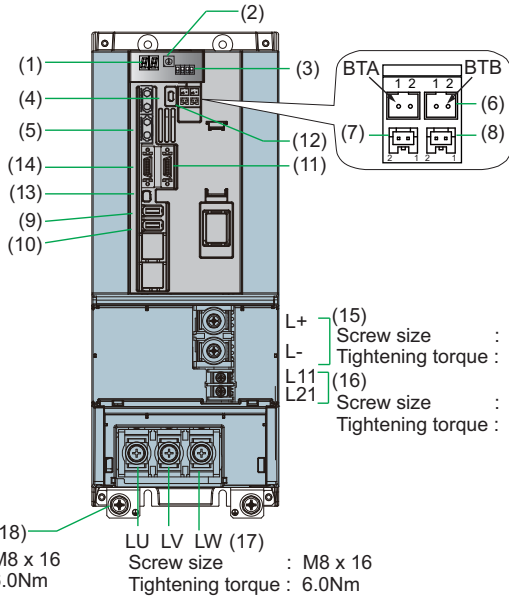
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	38	2			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	22	4			1.25 to 2	16 to 14

### Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP-320



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BT1	(Unused)
(8)	BT0	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	320	
Output	Rated voltage[V]	170AC
	Rated current[A]	150
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	140
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	118
	Outside panel[W]	688
Cooling method	Forced air cooling	
Mass[kg]	8.5	

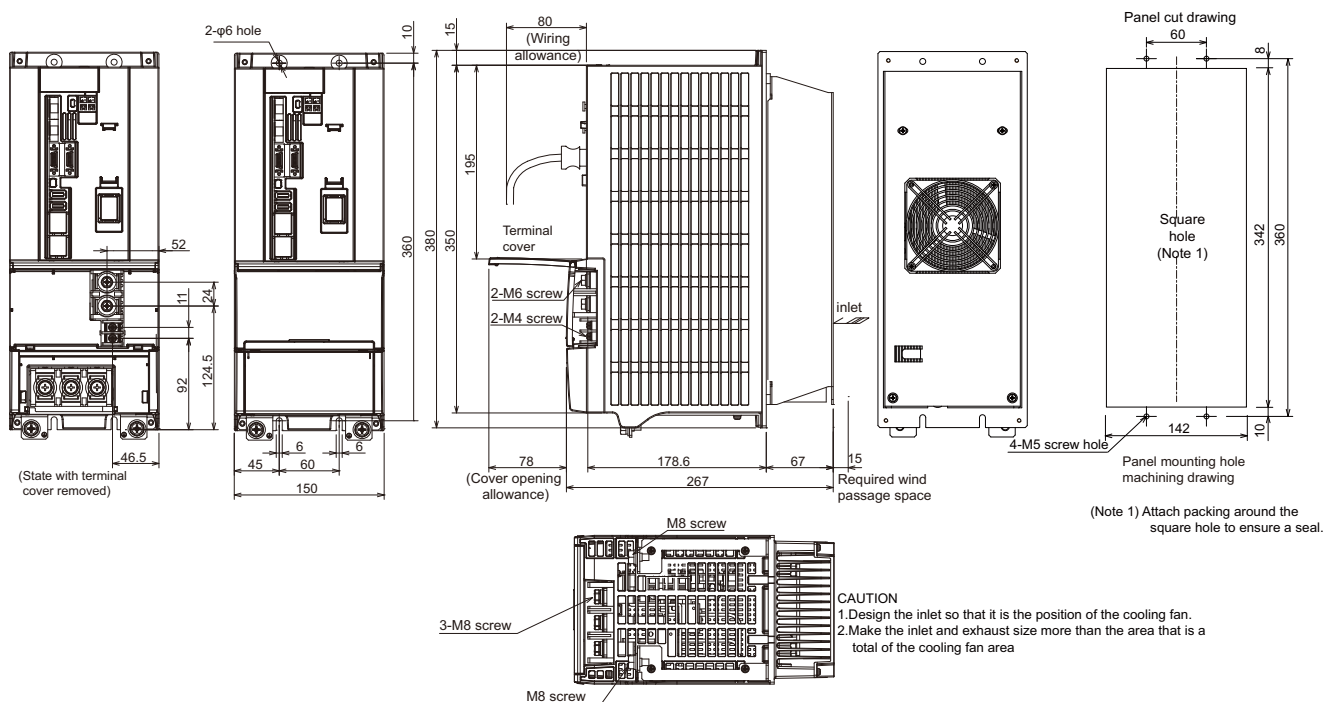
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2			1.25 to 2	16 to 14

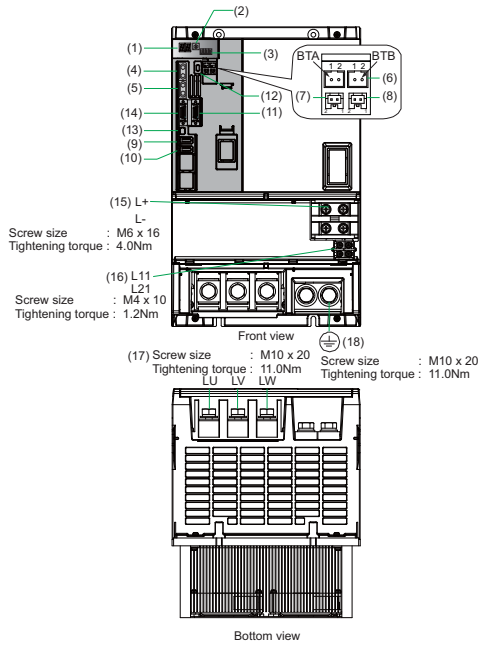
### Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-E-SP-400



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BT1	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	400	
Output	Rated voltage[V]	170AC
	Rated current[A]	180
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	150
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	9	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	148
	Outside panel[W]	897
Cooling method	Forced air cooling	
Mass[kg]	15.6	

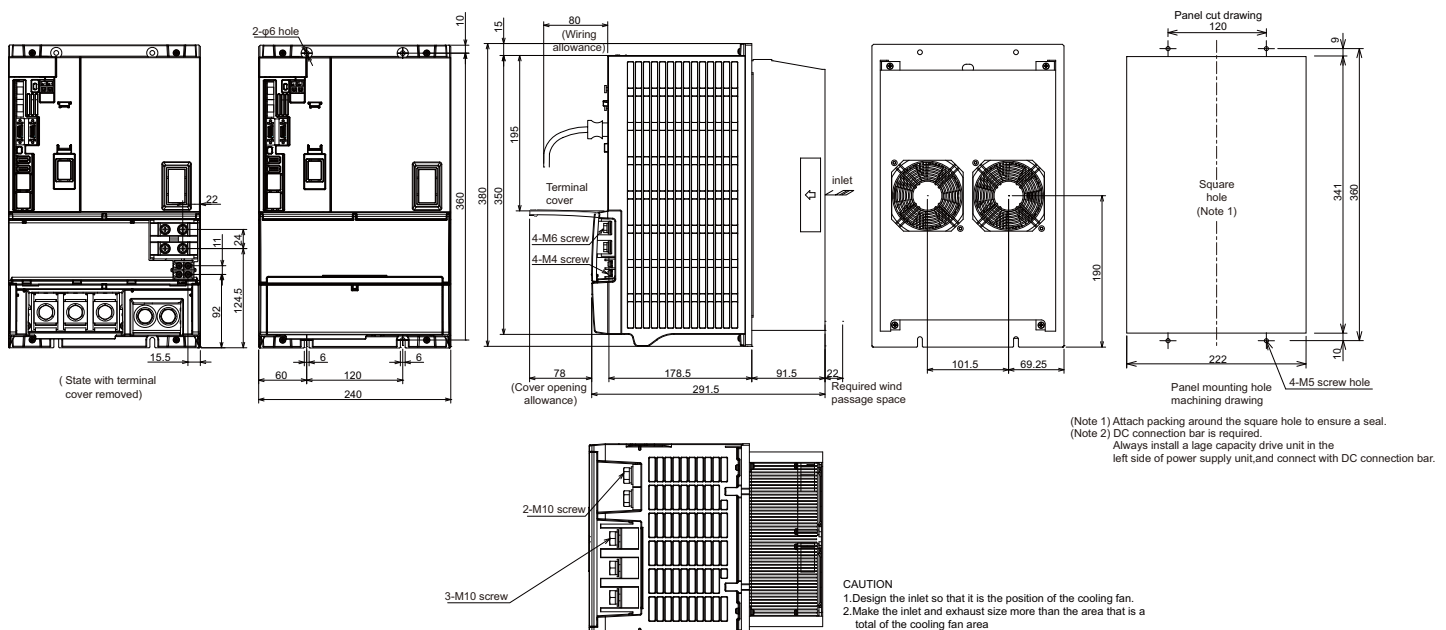
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

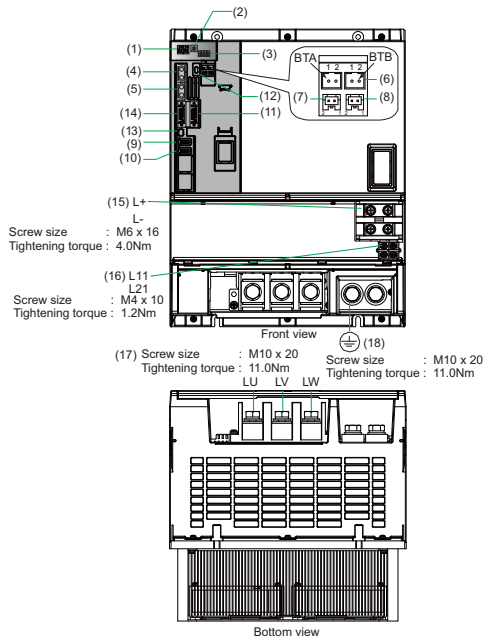
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	80	3/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	60	1/0			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP-640



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	640	
Output	Rated voltage[V]	170AC
	Rated current[A]	225
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	210
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	9	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking	
Heating value	Inside panel[W]	196
	Outside panel[W]	1231
Cooling method	Forced air cooling	
Mass[kg]	18.3	

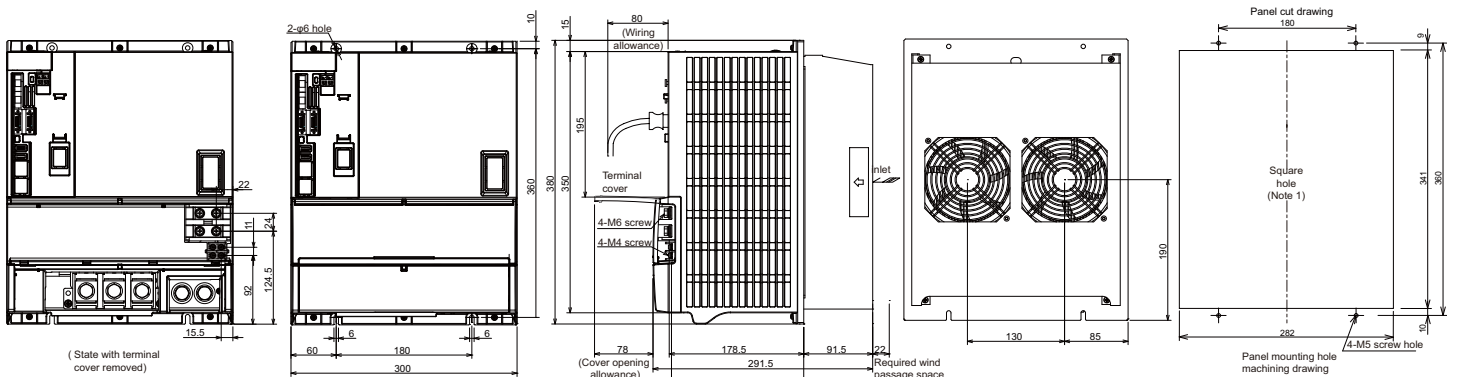
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	100	4/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	80	3/0			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]

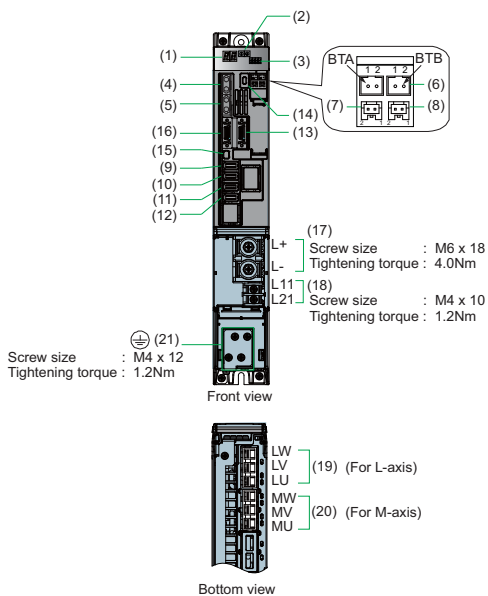


(Note 1) Attach packing around the square hole to ensure a seal.  
(Note 2) DC connection bar is required.  
Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

CAUTION  
1. Design the inlet so that it is the position of the cooling fan.  
2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area.

Spindle drive unit

# MDS-E-SP2-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BT1	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Spindle side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Spindle side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	TE2	Converter voltage input terminal (DC input)
(18)	TE3	Control power input terminal (single-phase AC input)
(19)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(20)		Motor power supply output connector (M-axis, 3-phase AC output)
(21)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	20	20
Output	Rated voltage[V]	170AC
	Rated current[A]	9.0 9.0
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	14
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. earth leakage current[mA]	15	15
Braking	Regenerative braking	
Heating value	Inside panel[W]	28
	Outside panel[W]	62
Cooling method	Forced air cooling	
Mass[kg]	4.5	

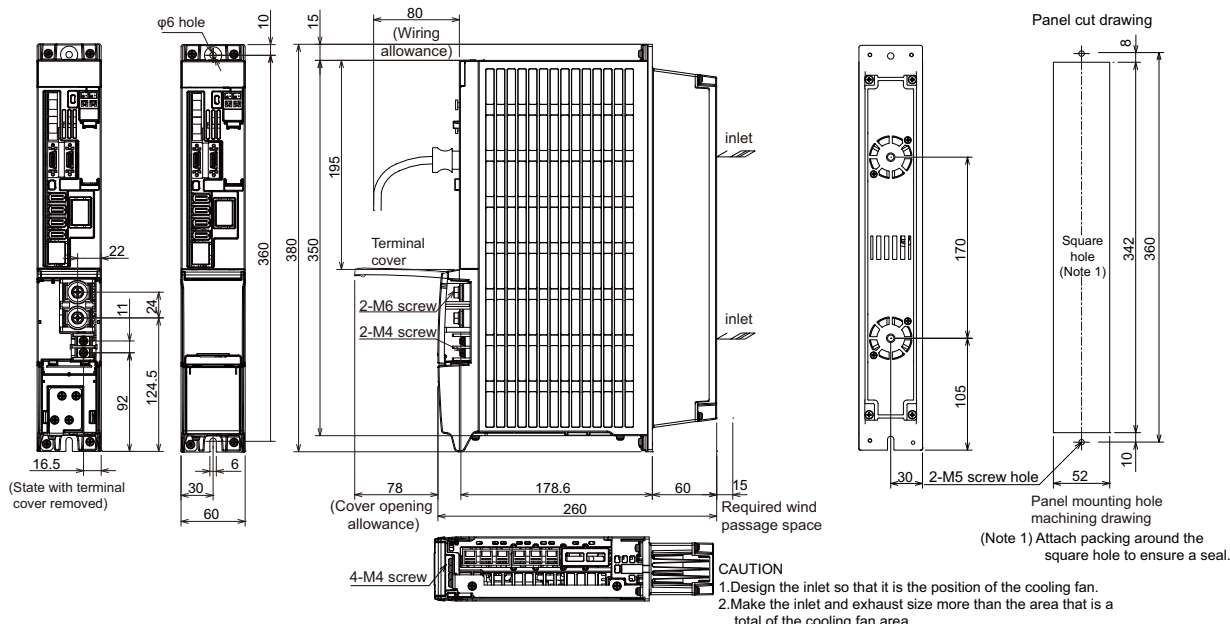
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3(L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

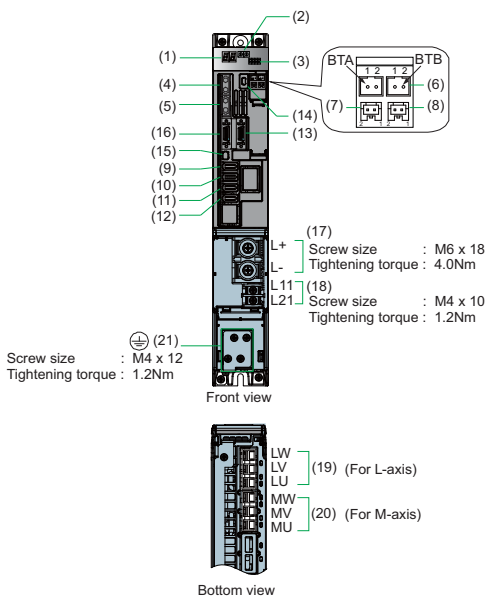
## Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-E-SP2-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Spindle side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Spindle side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	TE2	Converter voltage input terminal (DC input)
(18)	TE3	Control power input terminal (single-phase AC input)
(19)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(20)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(21)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	40	40
Output	Rated voltage[V]	170AC
	Rated current[A]	15 15
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	26
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	15
Braking	Regenerative braking	
Heating value	Inside panel[W]	38
	Outside panel[W]	130
Cooling method	Forced air cooling	
Mass[kg]	4.5	

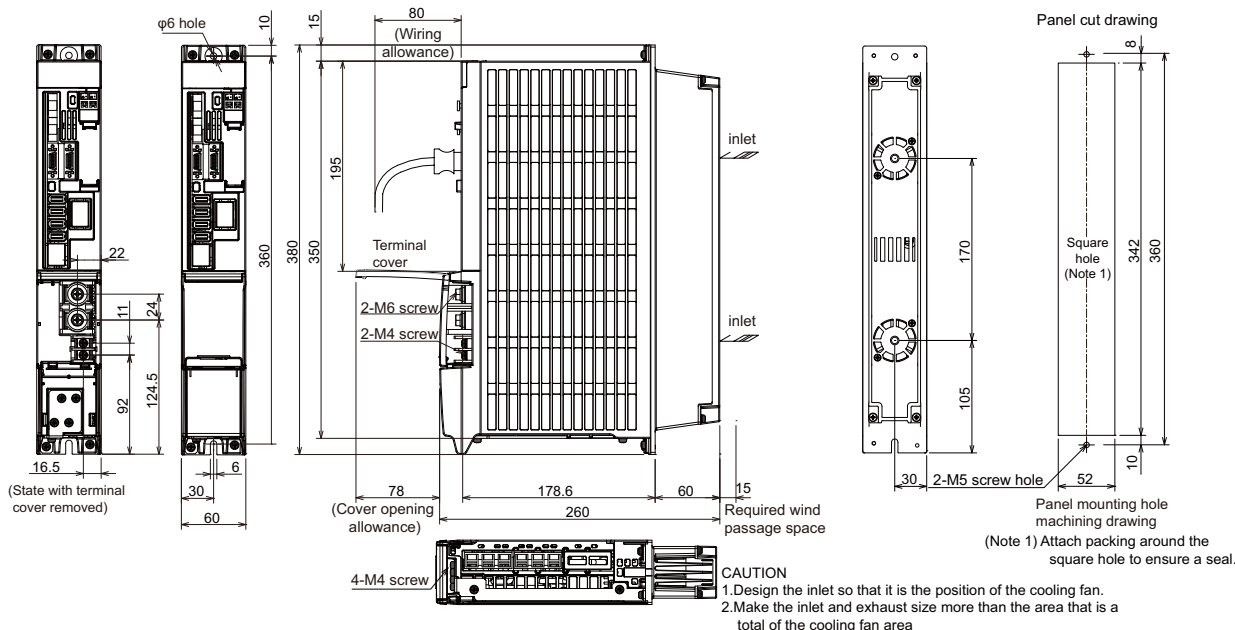
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

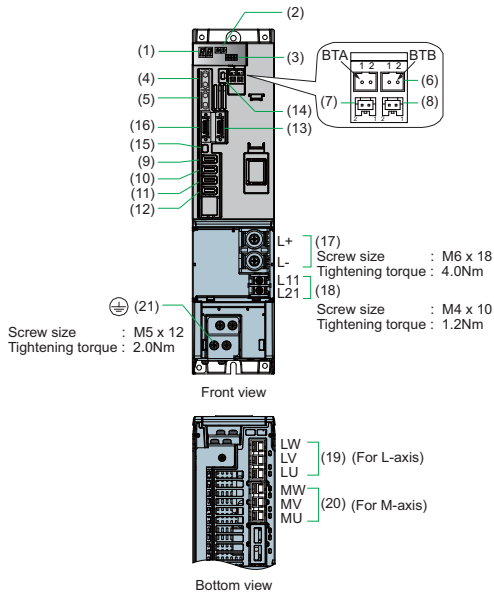
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3(L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP2-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Spindle side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Spindle side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	TE2	Converter voltage input terminal (DC input)
(18)	TE3	Control power input terminal (single-phase AC input)
(19)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(20)		Motor power supply output connector (M-axis, 3-phase AC output)
(21)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	80	80
Output	Rated voltage[V]	170AC
	Rated current[A]	27    27
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	40
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	15
Braking	Regenerative braking	
Heating value	Inside panel[W]	54
	Outside panel[W]	242
Cooling method	Forced air cooling	
Mass[kg]	5.2	

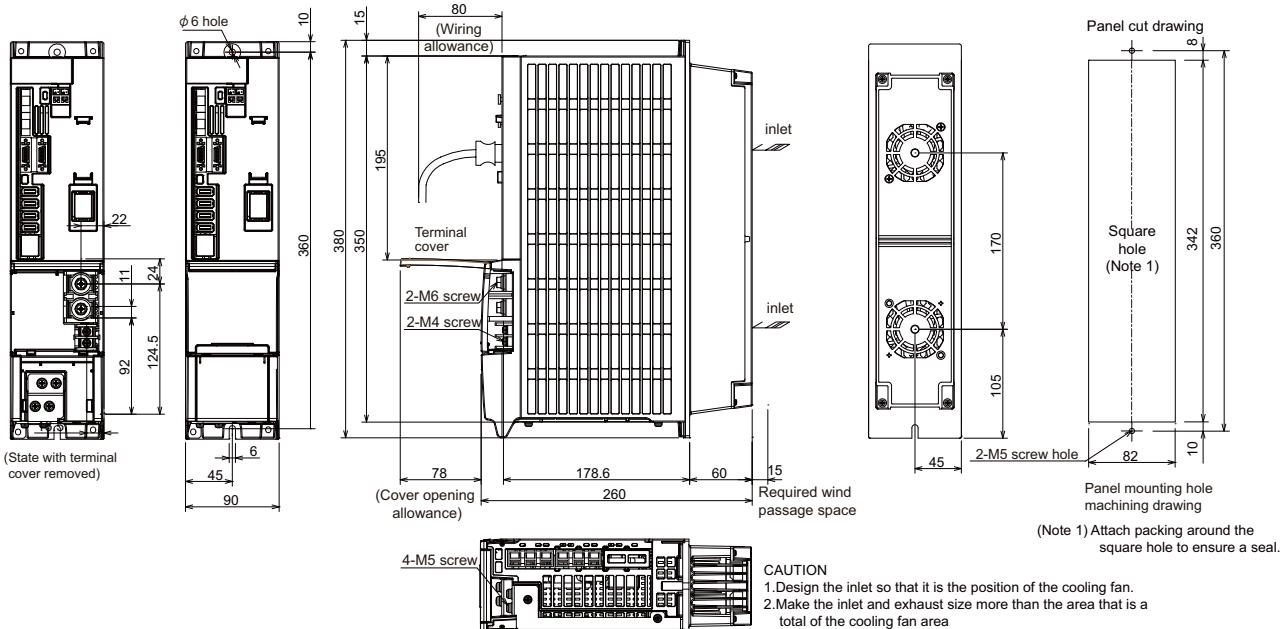
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

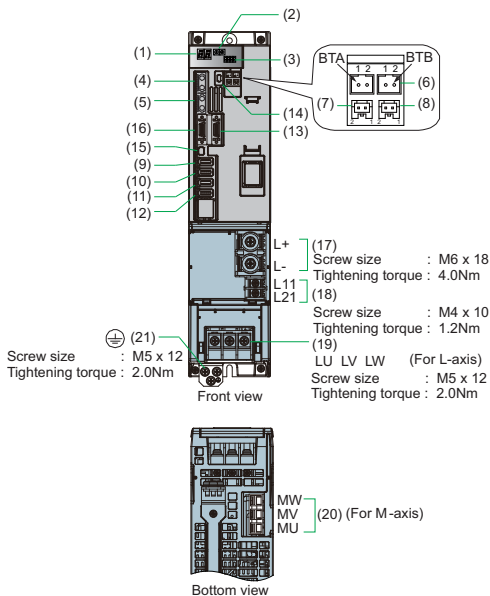
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3(L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-E-SP2-16080



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Spindle side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Spindle side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	TE2	Converter voltage input terminal (DC input)
(18)	TE3	Control power input terminal (single-phase AC input)
(19)	TE1	Motor power supply output terminal (L-axis, 3-phase AC output)
(20)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(21)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	160	80
Output	Rated voltage[V]	170AC
	Rated current[A]	54 27
Input	Rated voltage[V]	270 to 324DC
	Rated current[A]	61
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	200 to 240AC
	Voltage(60Hz) [V]	200 to 240AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.6
	Max. rush current[A]	30
Max. rush conductivity time[ms]	6	
Max. earth leakage current[mA]	15	15
Braking	Regenerative braking	
Heating value	Inside panel[W]	70
	Outside panel[W]	358
Cooling method	Forced air cooling	
Mass[kg]	5.2	

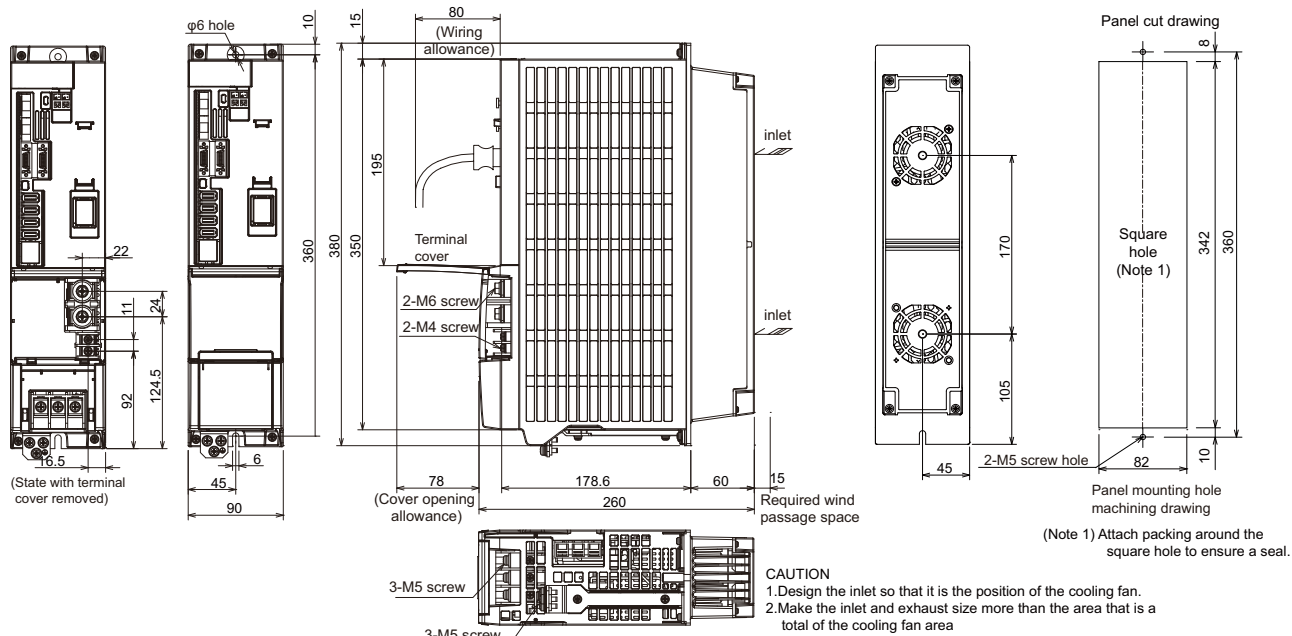
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth) The values inside of ( ) are M side		TE2 (L+, L-)		TE3(L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	22 (5.5)	4 (10)	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14 (5.5)	6 (10)			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	8 (3.5)	8 (12)			1.25 to 2	16 to 14

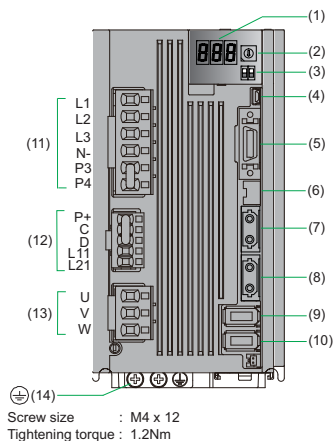
## Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-EJ-SP-40

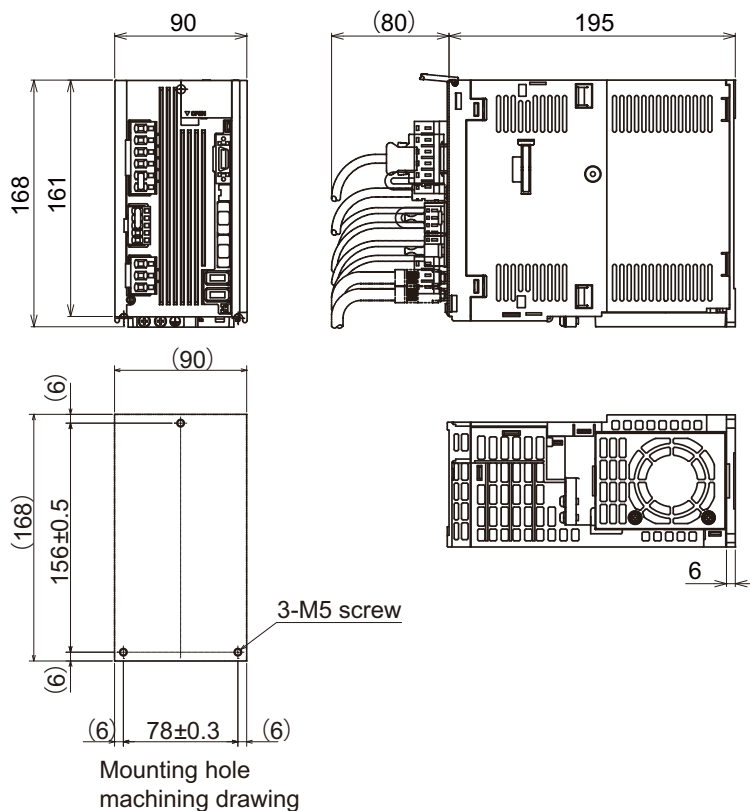


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CNP1	L1,L2,L3: 3-phase AC power input N: Test terminal for the manufacturer (Do not connect.) P3,P4: Not used (short-circuit between the P3 and P4.)
(12)	CNP2	P+,C,D: Regenerative resistor connection terminal L11,L12: Control power input terminal (single-phase AC input)
(13)	CNP3	Motor power output terminal (3-phase AC output)
(14)	PE	Grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	40
Rated output[kW]	2.2
Power facility capacity[kVA]	4.0
Output	Rated voltage[V] 170AC Rated current[A] 10
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 9.0
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 30 Max. Rush conductivity time[ms] 7
Maximum earth leakage current[mA]	15
Braking	Regenerative braking
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 90
Cooling method	Forced air cooling
Mass[kg]	2.1
Selection example of contactor (option part)	S-T20-AC200V
Free-air thermal current[A]	20
Selection current (for 200V input) [A]	9
Selection example of circuit protector (option part)	NF30-SW3P-20A
Rated current[A]	20
Selection current (for 200V input) [A]	9
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

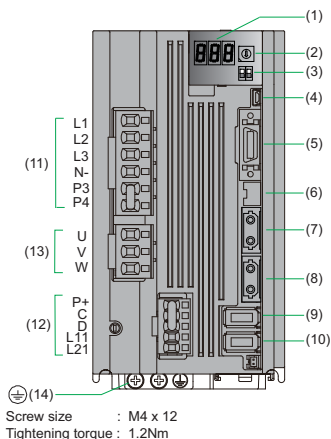
## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	-	-



Spindle drive unit

# MDS-EJ-SP-80

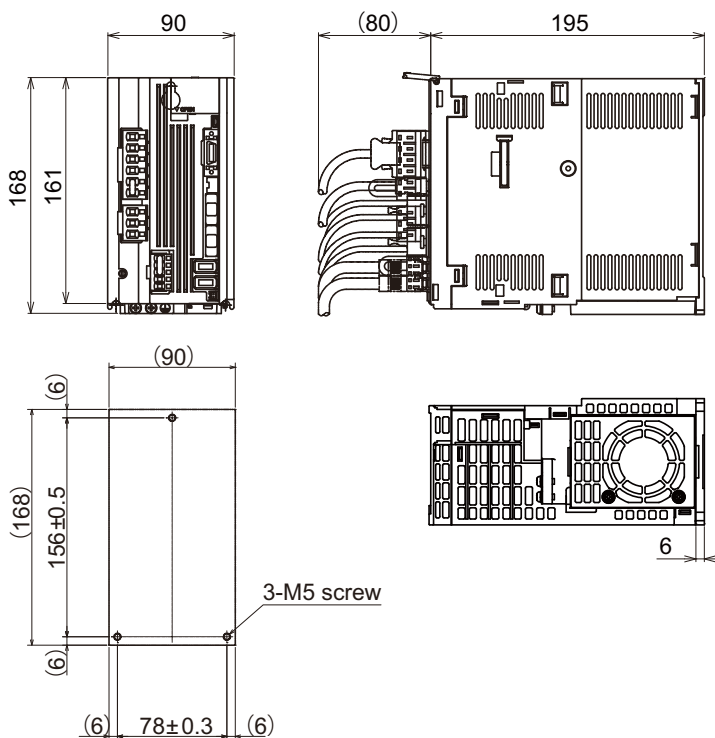


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CNP1	L1,L2,L3: 3-phase AC power input N: Test terminal for the manufacturer (Do not connect.) P3,P4: Not used (short-circuit between the P3 and P4.)
(12)	CNP2	P+,C,D: Regenerative resistor connection terminal L11,L12: Control power input terminal (single-phase AC input)
(13)	CNP3	Motor power output terminal (3-phase AC output)
(14)	PE	Grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	80
Rated output[kW]	3.7
Power facility capacity[kVA]	7.0
Output	Rated voltage[V] 170AC Rated current[A] 15
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 10.5
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 30 Max. Rush conductivity time[ms] 7
Maximum earth leakage current[mA]	15
Braking	Regenerative braking
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 130
Cooling method	Forced air cooling
Mass[kg]	2.3
Selection example of contactor (option part)	S-T21-AC200V
Free-air thermal current[A]	32
Selection current (for 200V input) [A]	15
Selection example of circuit protector (option part)	NF30-SW3P-30A
Rated current[A]	30
Selection current (for 200V input) [A]	15
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



Mounting hole machining drawing

## Environmental conditions

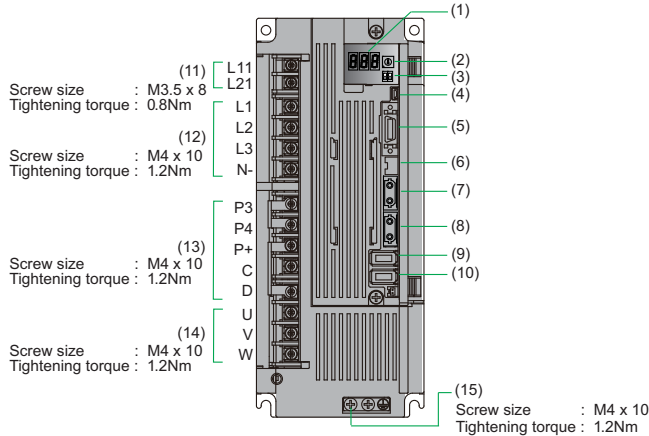
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	-	-

Spindle drive unit

# MDS-EJ-SP-100

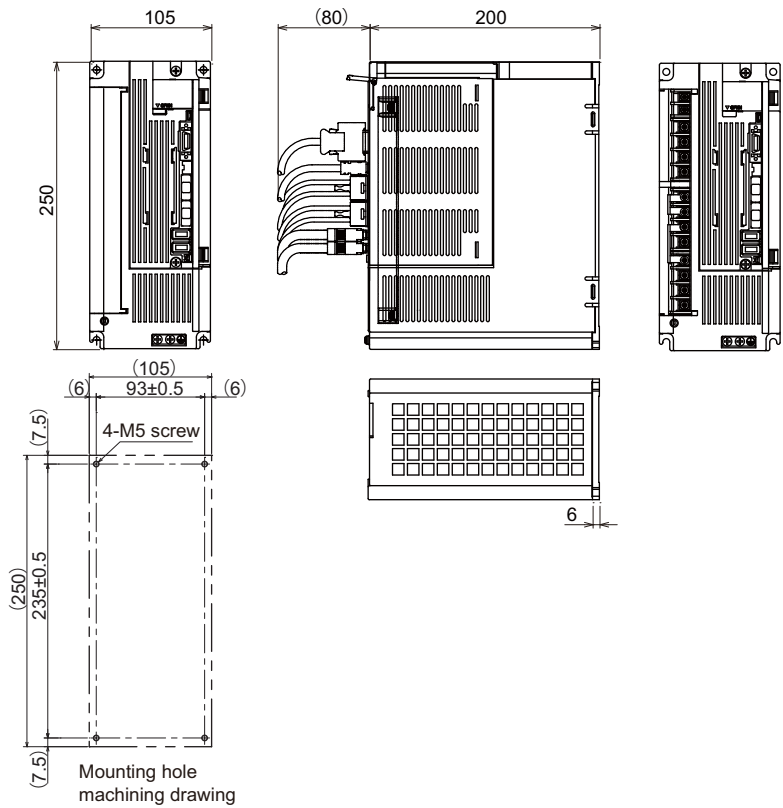


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	D/I/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	TE2	L11,L21: Control power input terminal (single-phase AC input)
(12)	TE1	L1,L2,L3,N-: 3-phase AC power input
(13)	TE3	P3,P4,P+,C,D: Regenerative resistor connection terminal
(14)	TE4	U,V,W: Motor power output terminal (3-phase AC output)
(15)	PE	Grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	100
Rated output[kW]	5.5
Power facility capacity[kVA]	9.0
Output	Rated voltage[V] 170AC Rated current[A] 24
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 200 to 240AC Rated voltage(60Hz) [V] 3-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 16
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 200 to 240AC Voltage(60Hz) [V] Single-phase 200 to 240AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 34 Max. Rush conductivity time[ms] 7
Maximum earth leakage current[mA]	15
Braking	Regenerative braking
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 150
Cooling method	Forced air cooling
Mass[kg]	4.0
Selection example of contactor (option part)	S-T35-AC200V
Free-air thermal current[A]	60
Selection current (for 200V input) [A]	23
Selection example of circuit protector (option part)	NF50-SW3P-50A
Rated current[A]	50
Selection current (for 200V input) [A]	23
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

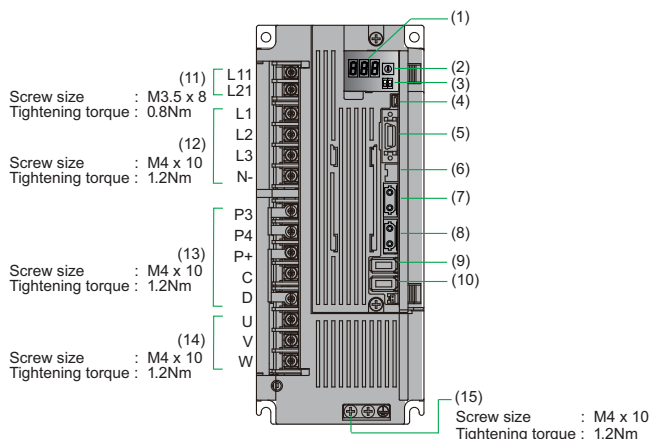
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P, C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	5.5	10	2	14	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	2	14	5.5	10	2	14	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	3.5	12	2	14	-	-

Spindle drive unit

# MDS-EJ-SP-120

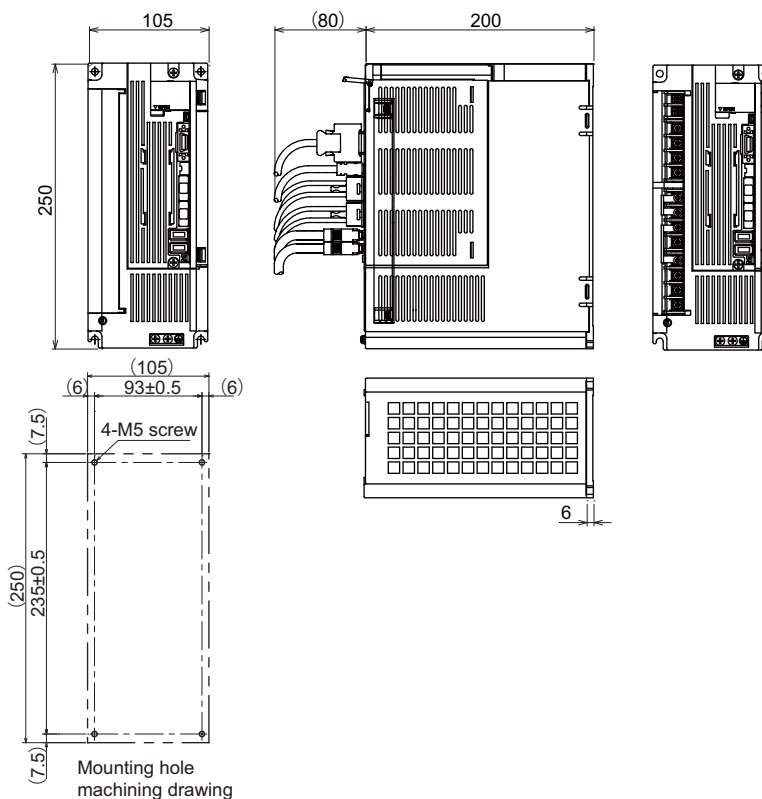


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	D/I/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	TE2	L11,L21: Control power input terminal (single-phase AC input)
(12)	TE1	L1,L2,L3,N-: 3-phase AC power input
(13)	TE3	P3,P4,P+,C,D: Regenerative resistor connection terminal
(14)	TE4	U,V,W: Motor power output terminal (3-phase AC output)
(15)	PE	Grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	120
Rated output[kW]	7.5
Power facility capacity[kVA]	12.0
Output	Rated voltage[V] 170AC Rated current[A] 35
Input	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Rated voltage(50Hz) [V] 3-phase 200 to 240AC
	Rated voltage(60Hz) [V] 3-phase 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Rated current[A] 26
Control power	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Voltage(50Hz) [V] Single-phase 200 to 240AC
	Voltage(60Hz) [V] Single-phase 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Max. Current[A] 0.2 Max. Rush current[A] 34 Max. Rush conductivity time[ms] 7
Maximum earth leakage current[mA]	15
Braking	Regenerative braking
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 200
	Cooling method
Mass[kg]	4.0
Selection example of contactor (option part)	S-T35-AC200V
	Free-air thermal current[A] 60
	Selection current (for 200V input) [A] 31
Selection example of circuit protector (option part)	NF100-SW3P-60A
	Rated current[A] 60
	Selection current (for 200V input) [A] 31
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

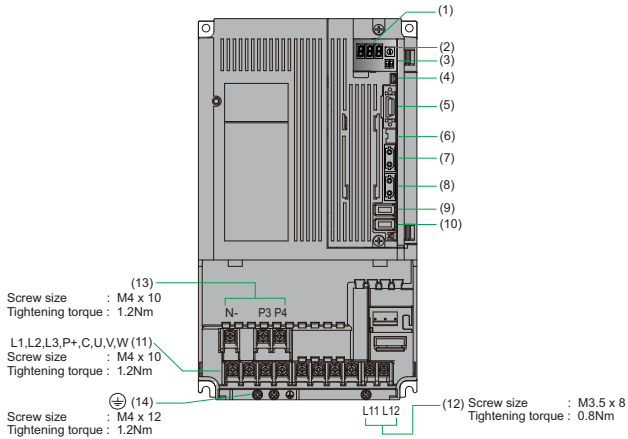
## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	2	14	14	6	3.5	12	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	2	14	8	8	3.5	12	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12	1.25	16	5.5	10	3.5	12	-	-



Spindle drive unit

# MDS-EJ-SP-160

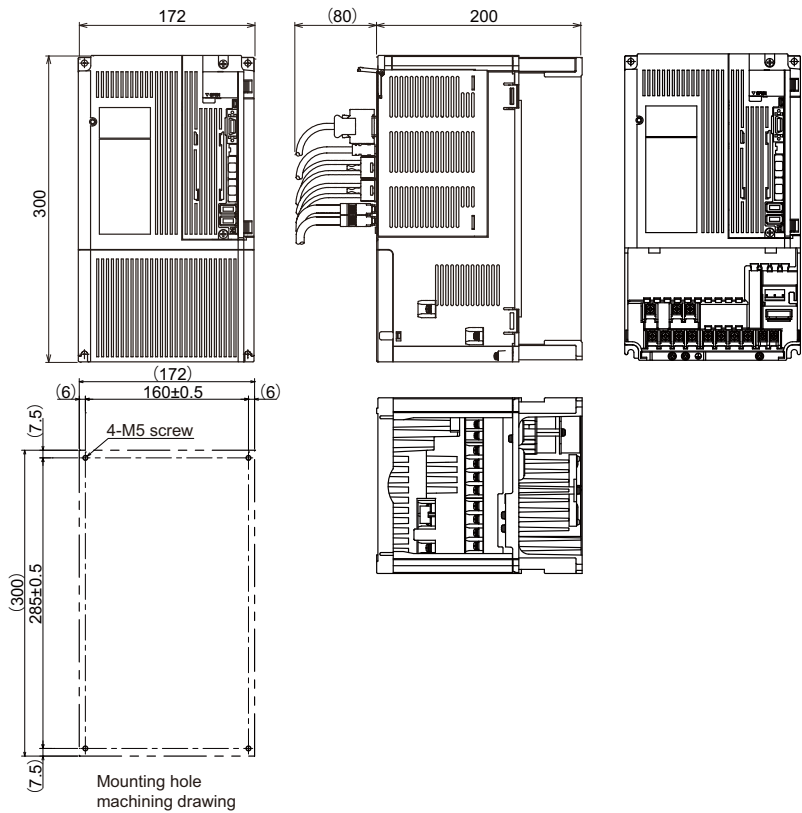


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	TE1	L1,L2,L3: 3-phase AC power input P,C: Regenerative resistor connection terminal U,V,W: Motor power output terminal (3-phase AC output)
(12)	TE2	L11,L21: Control power input terminal (single-phase AC input)
(13)	TE3	N: 3-phase AC power input P3,P4: Regenerative resistor connection terminal
(14)	PE	Grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	160
Rated output[kW]	11.0
Power facility capacity[kVA]	17.0
Output	Rated voltage[V] 170AC Rated current[A] 44
Input	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Rated voltage(50Hz) [V] 3-phase 200 to 240AC
	Rated voltage(60Hz) [V] 3-phase 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Rated current[A] 35.4
Control power	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Voltage(50Hz) [V] Single-phase 200 to 240AC
	Voltage(60Hz) [V] Single-phase 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Max. Current[A] 0.2
Max. Rush current[A] 34	
Max. Rush conductivity time[ms] 7	
Maximum earth leakage current[mA] 15	
Braking	Regenerative braking
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 300
	Cooling method
Mass[kg] 6.2	
Selection example of contactor (option part)	S-T35-AC200V
	Free-air thermal current[A] 60
	Selection current (for 200V input) [A] 45
Selection example of circuit protector (option part)	NF100-SW3P-100A
	Rated current[A] 100
	Selection current (for 200V input) [A] 45
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

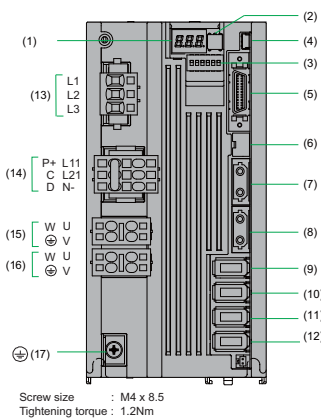
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	2	14	14	6	3.5	12	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	2	14	8	8	3.5	12	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	1.25	16	5.5	10	3.5	12	-	-

Spindle drive unit

# MDS-EJ-SP2-20



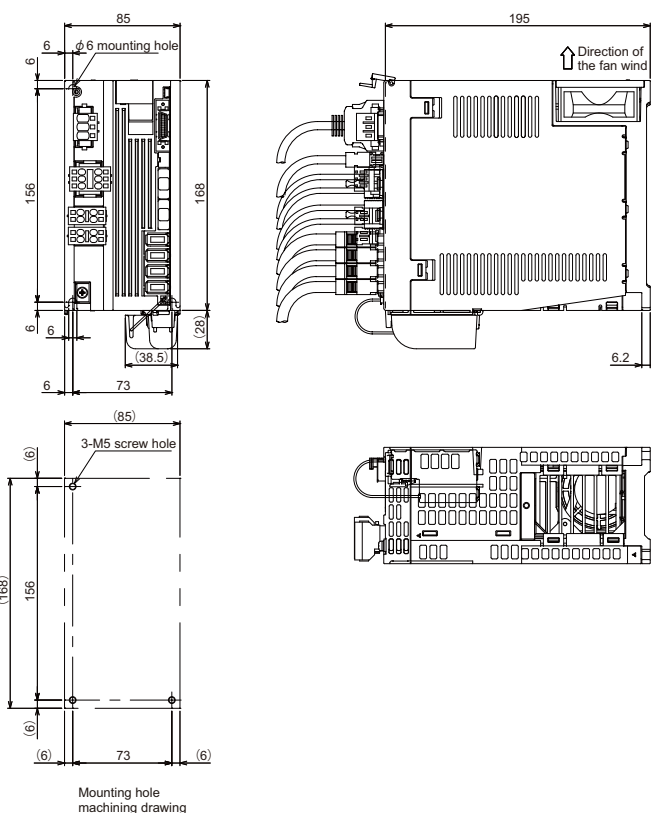
No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch (L,M-axis)
(3)	SW2	Unused axis setting switch (L,M-axis)
(4)	CN5	USB maintenance connector usually not used
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CNP1	L1,L2,L3: Power supply input terminal (3-phase AC input)
(14)	CNP2	P+,C,D: Regenerative resistor connection terminal L1,L2,L1: Control power input terminal (single-phase AC input) N-: Test terminal for the manufacturer (Do not connect.)
(15)	CNP3L	Motor power output terminal (3-phase AC output) (L-axis)
(16)	CNP3M	Motor power output terminal (3-phase AC output) (M-axis)
(17)	PE	Grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak)[A]	20	20
Rated output[kW]	0.75	0.75
Power facility capacity[kVA]	4.0	
Output	Rated voltage[V] 170AC	
	4.5	4.5
Input	Rated current[A] 5.2	
	Frequency[Hz] 50 / 60	
	Tolerable frequency fluctuation[%] ±5% max	
	Rated voltage(50Hz) [V] 3-phase 200 to 240AC	
	Rated voltage(60Hz) [V] 3-phase 200 to 240AC	
	Tolerable voltage fluctuation[%] +10%, -15%	
	Rated current[A] 5.2	
Control power	Frequency[Hz] 50 / 60	
	Tolerable frequency fluctuation[%] ±5% max	
	Voltage(50Hz)[V] Single-phase 200 to 240AC	
	Voltage(60Hz)[V] Single-phase 200 to 240AC	
	Tolerable voltage fluctuation[%] +10%, -15%	
	Max. Current[A] 0.4	
	Max. Rush current[A] 30	
Max.Rush conductivity time[ms] 6		
Maximum earth leakage current[mA]	15	15
Braking	Regenerative braking	
Main circuit method	Converter with resistor regeneration circuit	
Heating value	Inside panel[W] 90	
	Cooling method Forced air cooling	
Mass[kg]	1.9	
Selection example of contactor (option part)	S-T12-AC200V	
	Free-air thermal current[A] 20	
	Selection current (for 200V input)[A] 9	
Selection example of circuit protector (option part)	NF30-SW3P-20A	
	Rated current[A] 20	
	Selection current (for 200V input)[A] 9	
Regenerative option	Refer to "Regenerative option".	

## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	-	-
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	2	14	2	14	-	-

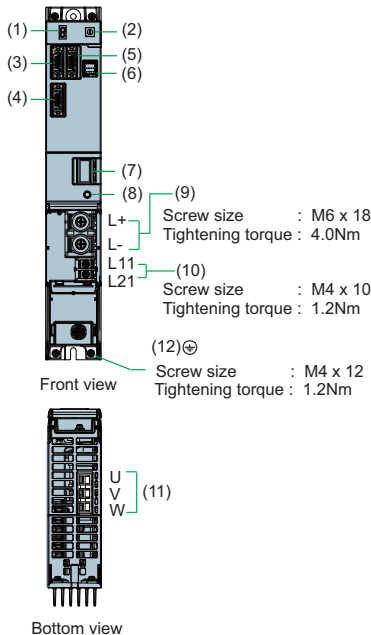


# Power Supply Unit

Power supply unit  
**MDS-E-CV-37**

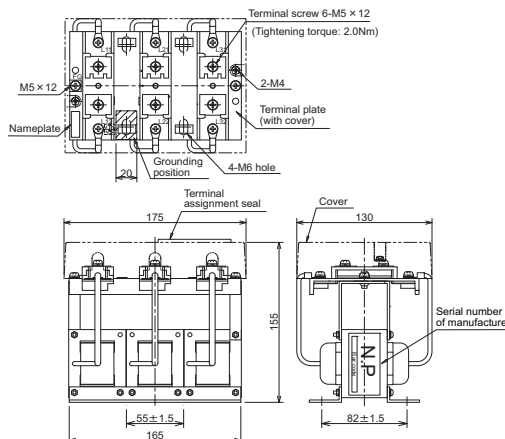
Specifications

Item	Specifications
30-minute rated output[kW]	3.7
Continuous rated output[kW]	2.2
Power facility capacity[kVA]	5.3
Output	
Rated voltage[V]	270 to 324DC
Rated current[A]	17
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	200 to 240AC
Rated voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	15
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.2
Max. rush current[A]	38
Max. rush conductivity time[ms]	3
Heating value	
Inside panel[W]	20
Outside panel[W]	34
Cooling method	Natural-cooling
Mass[kg]	3.5
AC reactor	D-AL-7.5K
Selection example of contactor (option part)	S-T12-AC200V
Free-air thermal current[A]	20
Selection current (for 200V input) [A]	15
Selection example of circuit protector (option part)	NF63-CW3P-20A
Rated current[A]	20
Selection current (for 200V input) [A]	15

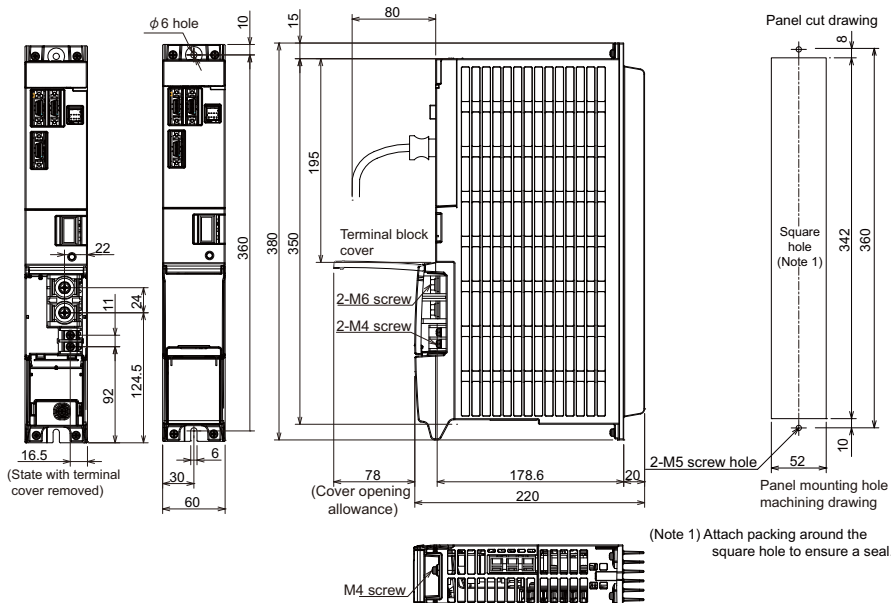


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

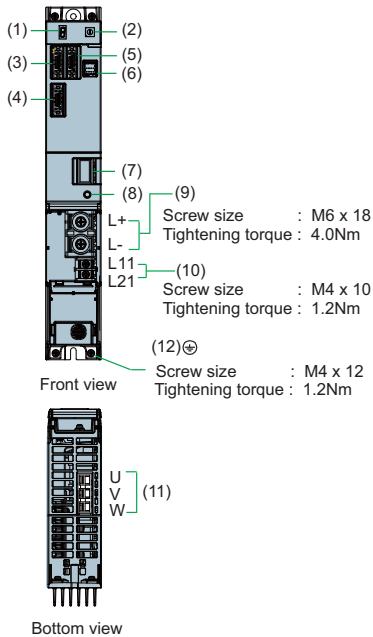
Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	1.25 to 2	16 to 14

Power supply unit  
**MDS-E-CV-75**

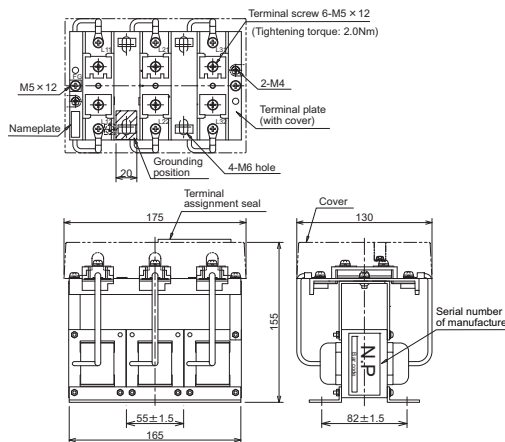
Specifications

Item	Specifications
30-minute rated output[kW]	7.5
Continuous rated output[kW]	5.5
Power facility capacity[kVA]	11.0
Output	
Rated voltage[V]	270 to 324DC
Rated current[A]	30
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	200 to 240AC
Rated voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	26
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.2
Max. rush current[A]	38
Max. rush conductivity time[ms]	3
Heating value	
Inside panel[W]	24
Outside panel[W]	55
Cooling method	Natural-cooling
Mass[kg]	3.5
AC reactor	D-AL-7.5K
Selection example of contactor (option part)	S-T35-AC200V
Free-air thermal current[A]	60
Selection current (for 200V input) [A]	31
Selection example of circuit protector (option part)	NF63-CW3P-40A
Rated current[A]	40
Selection current (for 200V input) [A]	31

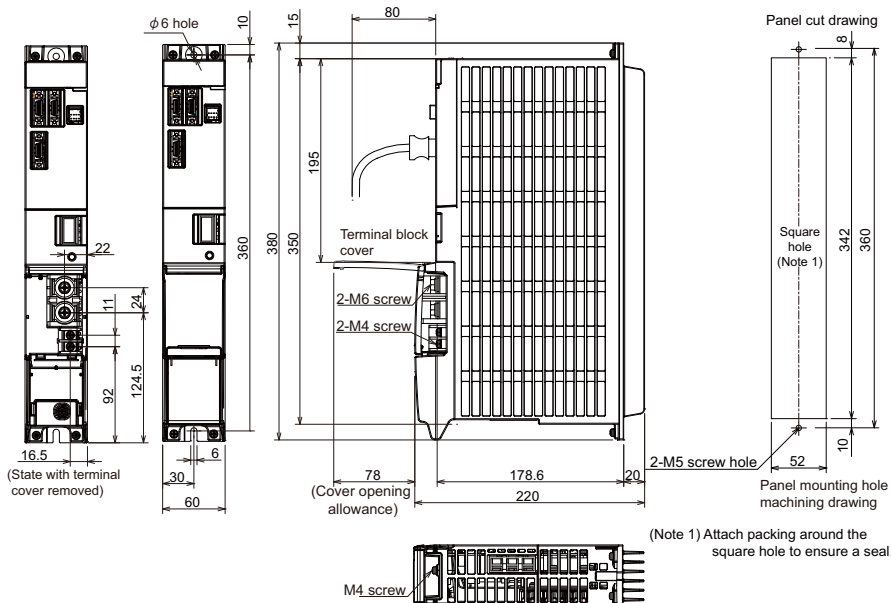


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

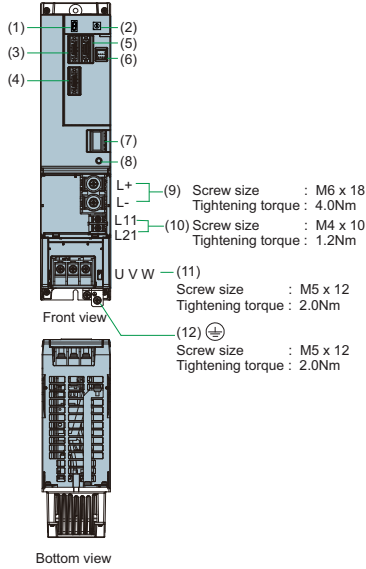
Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	8	8	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	5.5	10	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12	3.5	12	1.25 to 2	16 to 14

Power supply unit  
**MDS-E-CV-110**

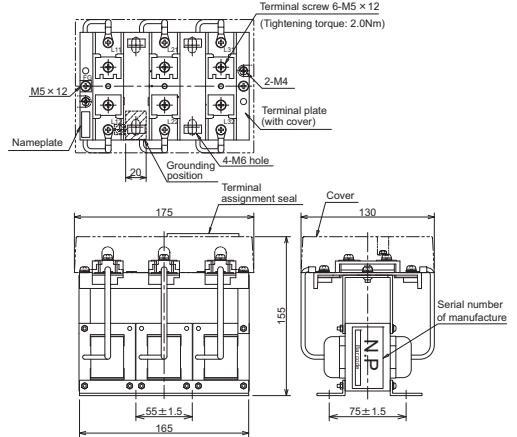
Specifications

Item	Specifications
30-minute rated output[kW]	11.0
Continuous rated output[kW]	7.5
Power facility capacity[kVA]	16.0
Output	
Rated voltage[V]	270 to 324DC
Rated current[A]	41
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	200 to 240AC
Rated voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	35
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.2
Max. rush current[A]	38
Max. rush conductivity time[ms]	3
Heating value	
Inside panel[W]	25
Outside panel[W]	99
Cooling method	Forced air cooling
Mass[kg]	5.6
AC reactor	D-AL-11K
Selection example of contactor (option part)	S-T35-AC200V
Free-air thermal current[A]	60
Selection current (for 200V input) [A]	45
Selection example of circuit protector (option part)	NF63-CW3P-50A
Rated current[A]	50
Selection current (for 200V input) [A]	45

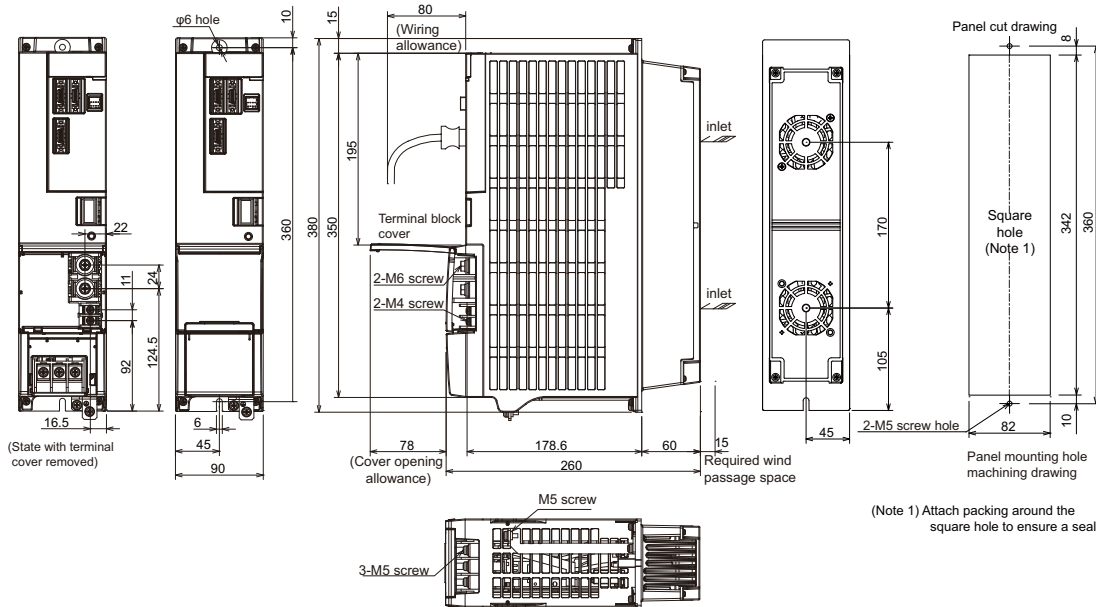


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	14	6	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	14	6	1.25 to 2	16 to 14



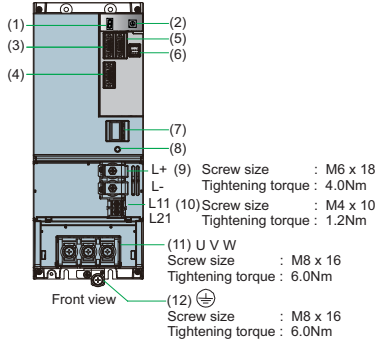




# Power supply unit MDS-E-CV-300

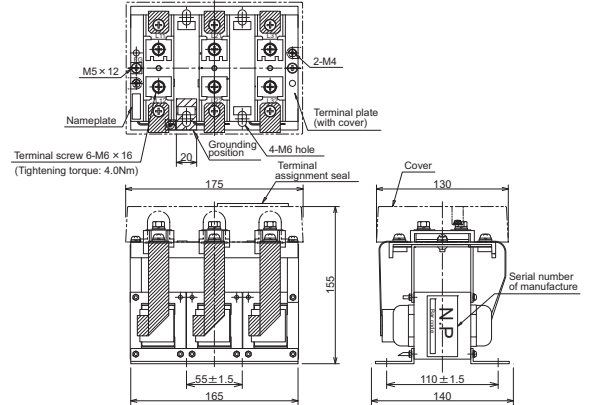
## Specifications

Item	Specifications
30-minute rated output[kW]	30.0
Continuous rated output[kW]	26
Power facility capacity[kVA]	43.0
Output	
Rated voltage[V]	270 to 324DC
Rated current[A]	144
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	200 to 240AC
Rated voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	107
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.2
Max. rush current[A]	38
Max. rush conductivity time[ms]	3
Heating value	
Inside panel[W]	45
Outside panel[W]	272
Cooling method	Forced air cooling
Mass[kg]	10.6
AC reactor	D-AL-30K
Selection example of contactor (option part)	S-T100-AC200V
Free-air thermal current[A]	150
Selection current (for 200V input) [A]	124
Selection example of circuit protector (option part)	NF250-CW3P-125A
Rated current[A]	125
Selection current (for 200V input) [A]	124

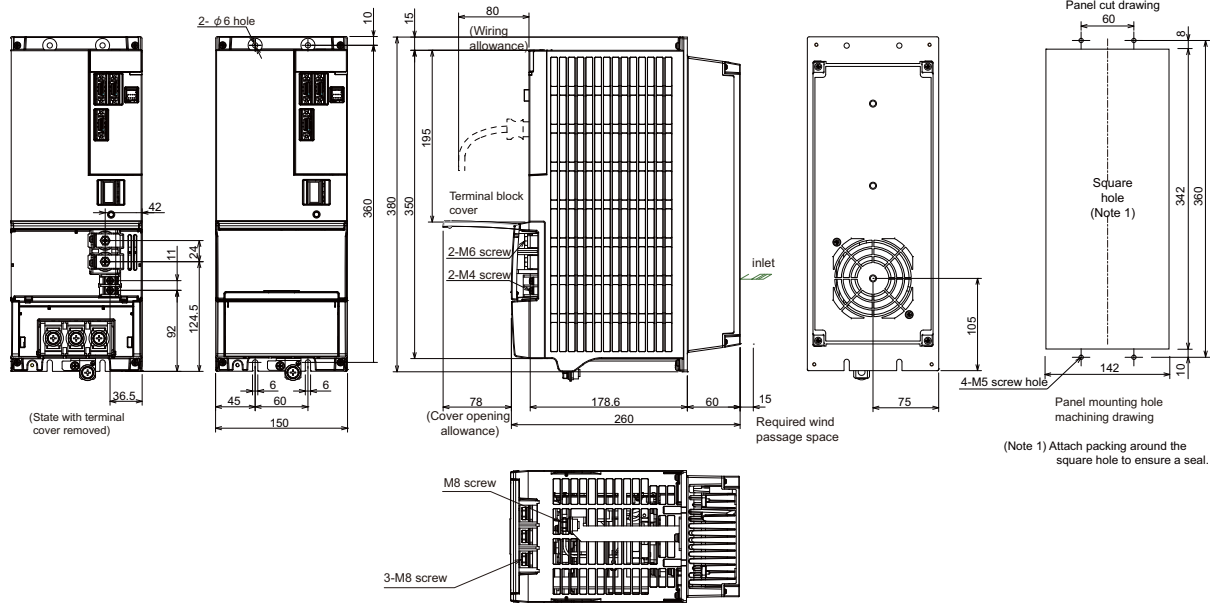


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

## AC reactor



## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

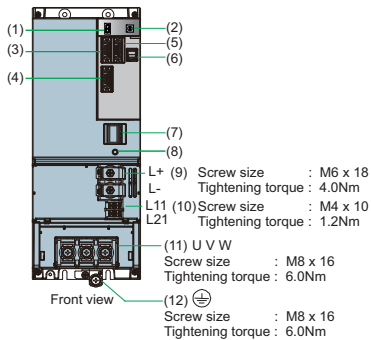
## Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	38	2	60 or bar enclosed	1/0 or bar enclosed	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2	50	1	1.25 to 2	16 to 14

Power supply unit  
**MDS-E-CV-370**

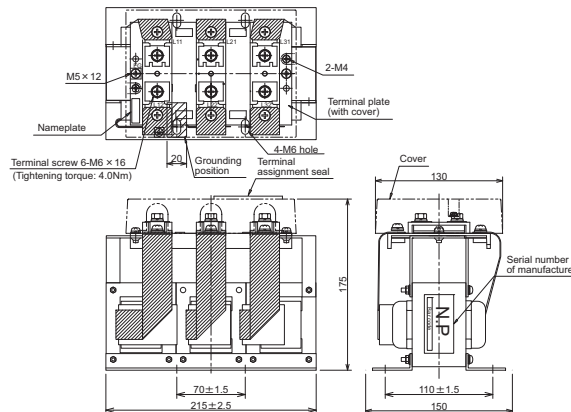
Specifications

Item	Specifications
30-minute rated output[kW]	37.0
Continuous rated output[kW]	30
Power facility capacity[kVA]	53.0
Output	
Rated voltage[V]	270 to 324DC
Rated current[A]	164
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	200 to 240AC
Rated voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	121
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	200 to 240AC
Voltage(60Hz) [V]	200 to 240AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.2
Max. rush current[A]	38
Max. rush conductivity time[ms]	3
Heating value	
Inside panel[W]	53
Outside panel[W]	343
Cooling method	Forced air cooling
Mass[kg]	11.2
AC reactor	D-AL-37K
Selection example of contactor (option part)	S-N150-AC200V
Free-air thermal current[A]	200
Selection current (for 200V input) [A]	153
Selection example of circuit protector (option part)	NF250-CW3P-175A
Rated current[A]	175
Selection current (for 200V input) [A]	153

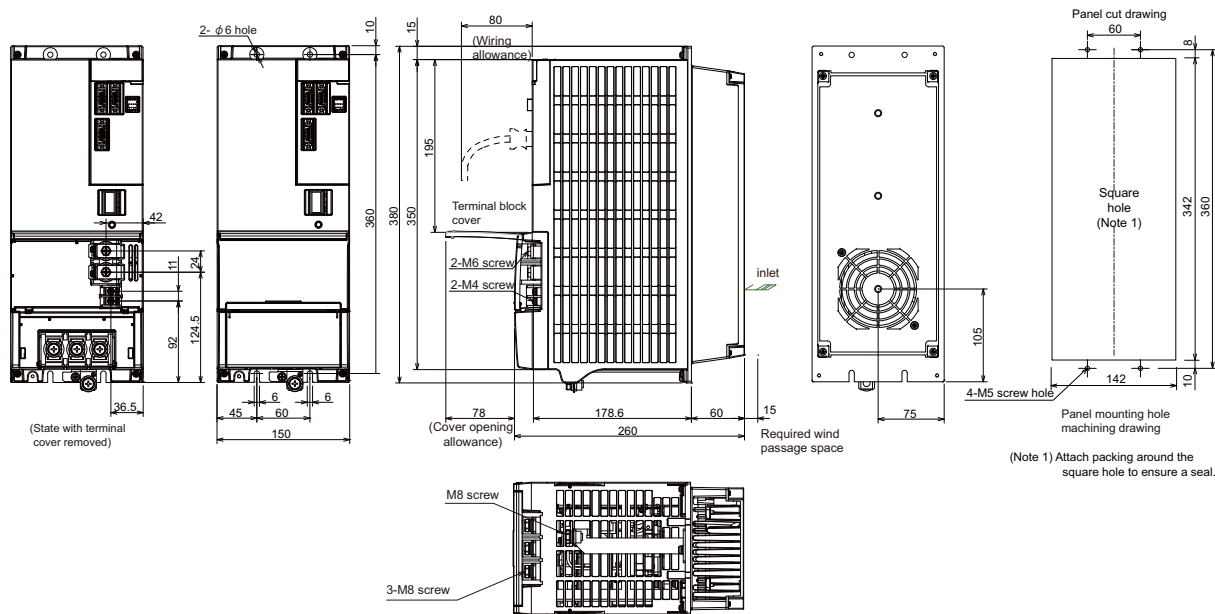


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

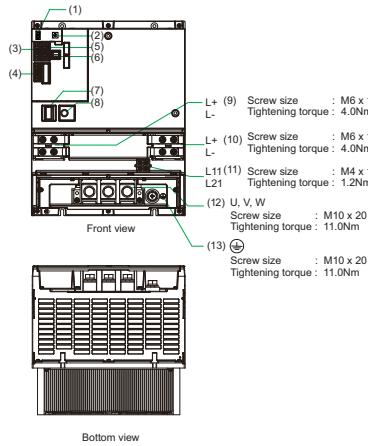
Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0	Bar enclosed		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2	60	1/0	1.25 to 2	16 to 14



Power supply unit  
**MDS-E-CV-550**

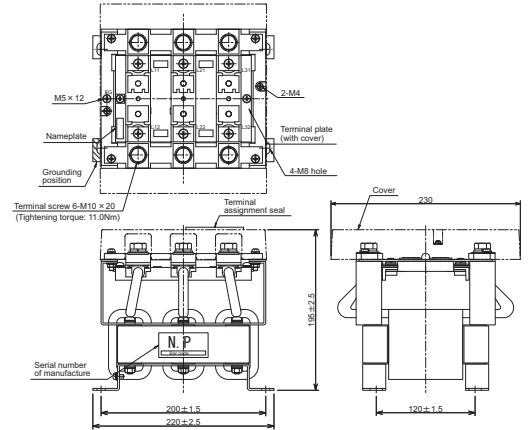
Specifications

Item	Specifications
30-minute rated output[kW]	55.0
Continuous rated output[kW]	45
Power facility capacity[kVA]	78.0
Output	Rated voltage[V] 270 to 324DC
	Rated current[A] 238
Input	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Rated voltage(50Hz) [V] 200 to 240AC
	Rated voltage(60Hz) [V] 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Rated current[A] 200
Control power	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Voltage(50Hz) [V] 200 to 240AC
	Voltage(60Hz) [V] 200 to 240AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Max. current[A] 0.2
	Max. rush current[A] 38
Max. rush conductivity time[ms] 3	
Heating value	Inside panel[W] 164
	Outside panel[W] 431
Cooling method	Forced air cooling
Mass[kg]	25.5
AC reactor	D-AL-55K
Selection example of contactor (option part)	S-N180-AC200V
	Free-air thermal current[A] 260
	Selection current (for 200V input) [A] 224
Selection example of circuit protector (option part)	NF250-CW3P-225A
	Rated current[A] 225
	Selection current (for 200V input) [A] 224

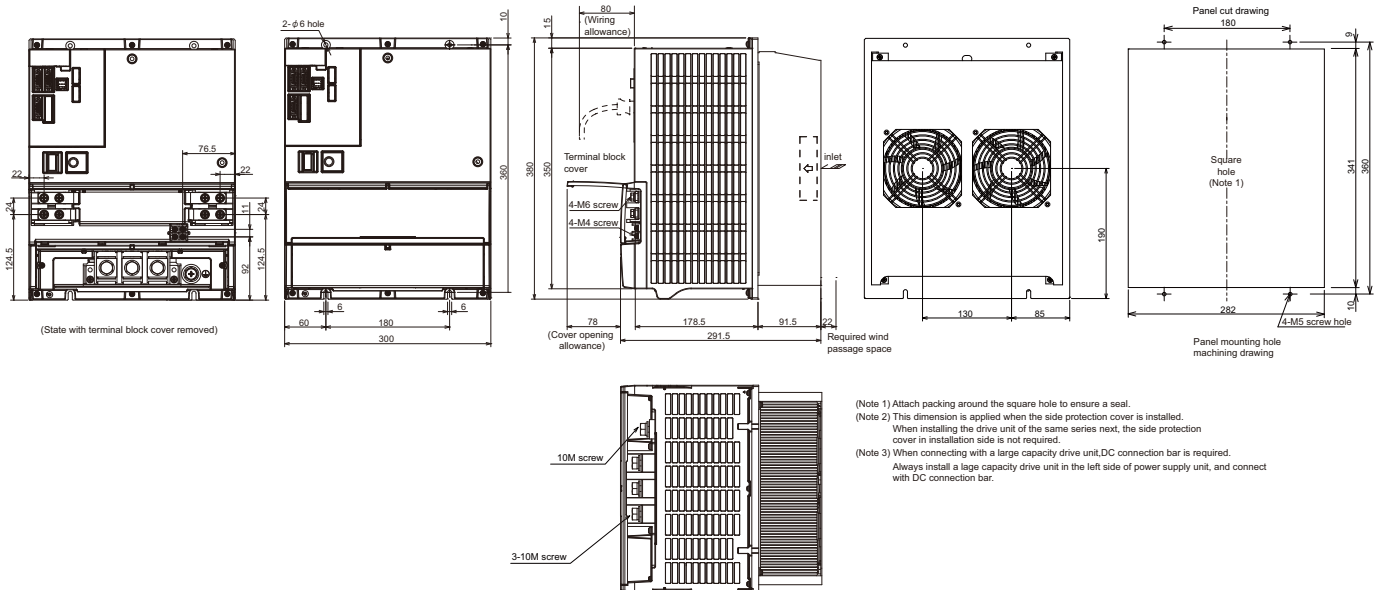


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)		
(11)	TE3	Control power input terminal (single-phase AC input)
(12)	TE1	Power input terminal (3-phase AC input)
(13)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



(Note 1) Attach packing around the square hole to ensure a seal.  
 (Note 2) This dimension is applied when the side protection cover is installed.  
 When installing the drive unit of the same series next, the side protection cover in installation side is not required.  
 (Note 3) When connecting with a large capacity drive unit, DC connection bar is required.  
 Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed	-	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	80	3/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	60	1/0			1.25 to 2	16 to 14

## Dynamic Brake Unit (MDS-D-DBU)

The MDS-E-V1-320W units do not have dynamic brakes built in, so install an external dynamic brake unit.

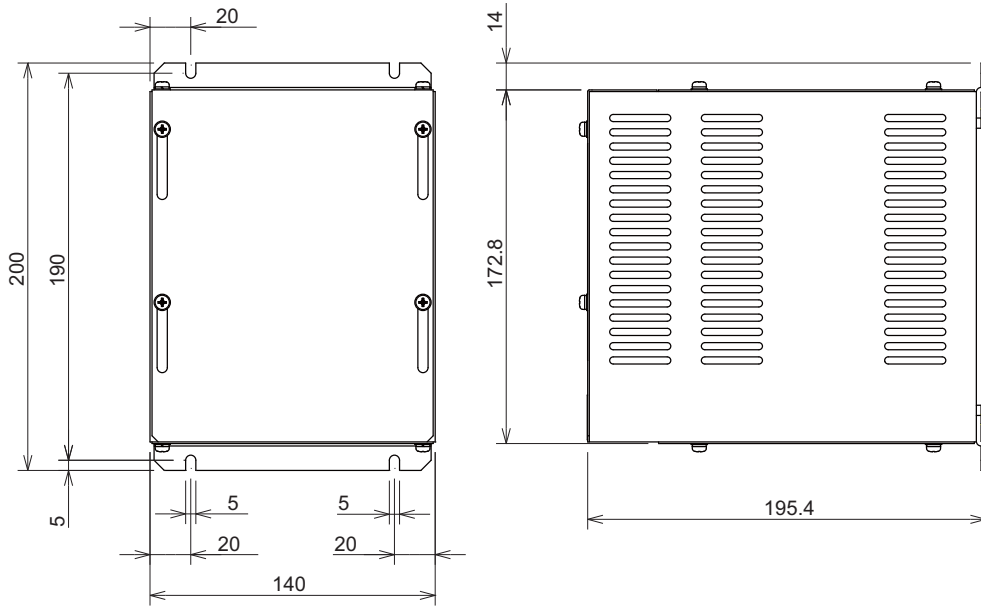
### (1) Specifications

Type	Coil specifications	Wire size	Compatible drive unit	Mass (kg)
MDS-D-DBU	24VDC 160mA	5.5mm <sup>2</sup> or more (For IV wire)	MDS-E-V1-320W	3kg

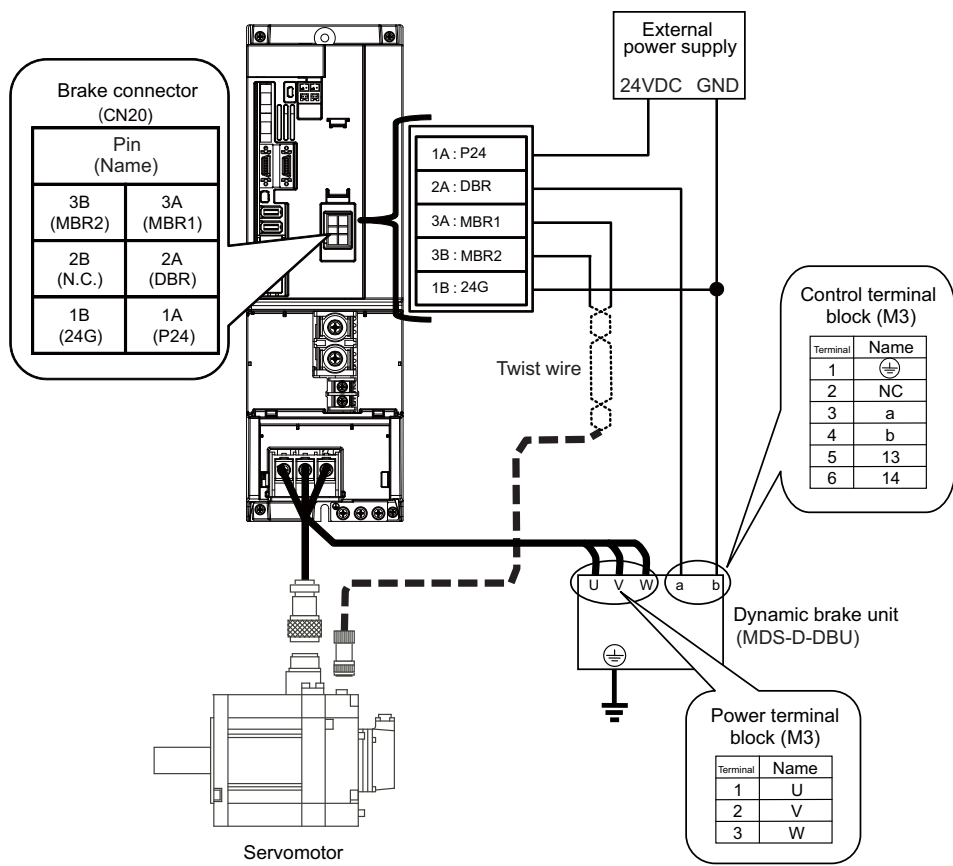
### (2) Outline dimension drawings

MDS-D-DBU

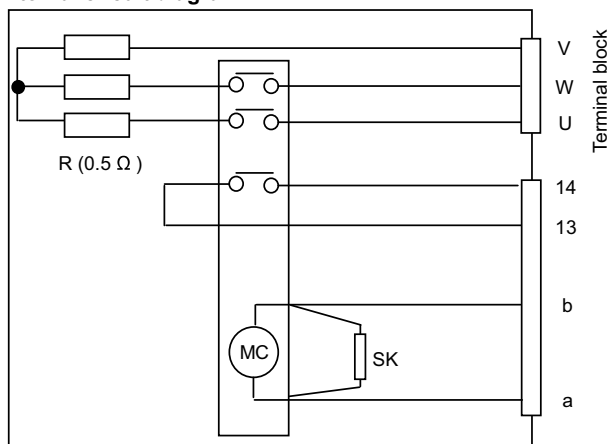
[Unit: mm]



(3) Connecting with the servo drive unit



Internal circuit diagram



**CAUTION**

Correctly wire the dynamic brake unit to the servo drive unit.

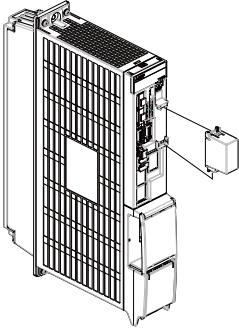
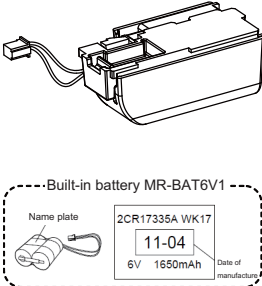

Do not use for applications other than emergencies (normal braking, etc.). The internal resistor could heat up, and lead to fires or faults.

**POINT**

When you use a motor with a brake, please wire (between 1pin and 3pin) for the CN20 connector.

## Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060)

This battery option may be required to establish absolute position system.

Type	MDS-BAT6V1SET	MR-BAT6V1SET	MDSBTBOX-LR2060
Installation type	Drive unit installation	Drive unit installation	Control panel installation
Hazard class	Not applicable	Not applicable	Not applicable
Number of connectable axes	Up to 3 axes	Up to 3 axes	Up to 8 axes
Change method	Battery option change	Battery option change	Battery change
Appearance	(1) 	(2) 	(3) 

### CAUTION

1. When transporting lithium batteries with means such as by air transport, measures corresponding to the United Nations Dangerous Goods Regulations must be taken.
2. The lithium battery must be transported according to the rules set forth by the International Civil Aviation Organization (ICAO), International Air Transportation Association (IATA), International Maritime Organization (IMO), and United States Department of Transportation (DOT), etc. The packaging methods, correct transportation methods, and special regulations are specified according to the quantity of lithium alloys. The battery unit exported from Mitsubishi is packaged in a container (UN approved part) satisfying the standards set forth in this UN Advisory.
3. To protect the absolute value, do not shut off the servo drive unit control power supply if the battery voltage becomes low (warning 9F).
4. The battery life (backup time) is greatly affected by the working ambient temperature. The above data is the theoretical value for when the battery is used 8 hours a day/240 days a year at an ambient temperature of 25°C. Generally, if the ambient temperature increases, the backup time and useful life will both decrease.



(1) Cell battery (MDS-BAT6V1SET)

(a) Specifications

Battery option type		Cell battery
		MDS-BAT6V1SET
Battery model name		2CR17335A
Nominal voltage		6V
Nominal capacity		1650mAh
Battery safety	Hazard class	Class9 Not applicable
	Battery shape	Set battery
	Number of batteries used	2
	Lithium alloy content	1.2g
	Mercury content	1ppm or less
Number of connectable axes (Note 1)		Up to 3 axes
Battery continuous backup time		Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 hours
Battery useful life (From date of unit manufacture)		5 years
Data save time in battery replacement		Approx. 20 hours at time of delivery, approx. 10 hours after 5 years
Back up time from battery warning to alarm occurrence (Note 2)		Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Mass		34g

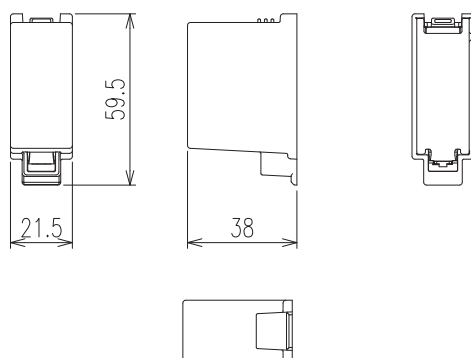
(Note 1) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.

(Note 2) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery warning occurs.

(Note 3) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

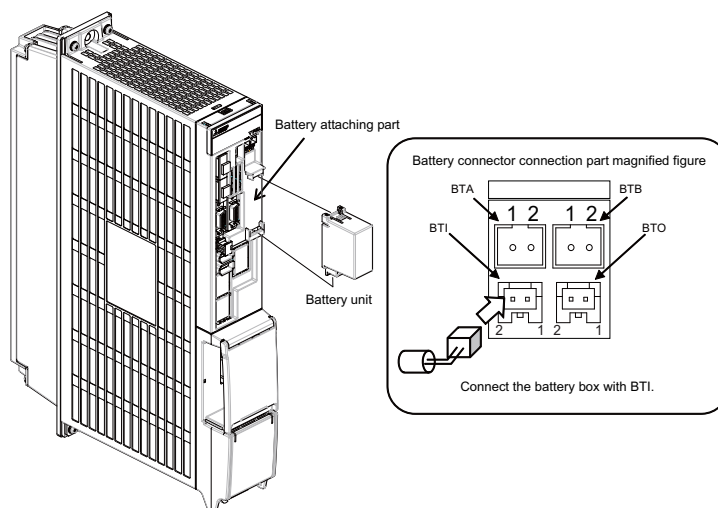
(b) Outline dimension drawings

[Unit: mm]



(c) Installing the cell battery

Connect the connector for the cell battery and install the battery case body to the upper front part of the servo drive unit.





(2) Cell battery (MR-BAT6V1SET)

(a) Specifications

Battery option type		Cell battery
		MR-BAT6V1SET
Battery model name		2CR17335A
Nominal voltage		6V
Nominal capacity		1650mAh
Battery safety	Hazard class	Class 9 Not applicable
	Battery shape	Set battery
	Number of batteries used	2
	Lithium alloy content	1.2g
	Mercury content	Less than 1ppm
Number of connectable axes (Note 1)		Up to 3 axes
Battery continuous backup time		Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 hours
Battery useful life (From date of unit manufacture)		5 years
Data save time in battery replacement		Approx. 20 hours at time of delivery, approx. 10 hours after 5 years
Back up time from battery warning to alarm occurrence (Note 2)		Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Mass		34g

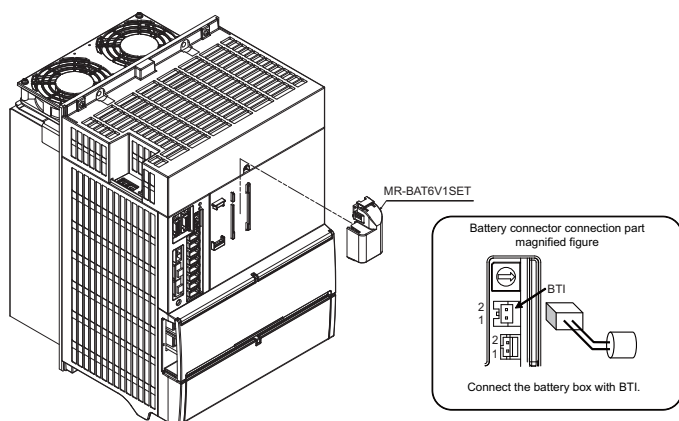
(Note 1) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.

(Note 2) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery alarm occurs.

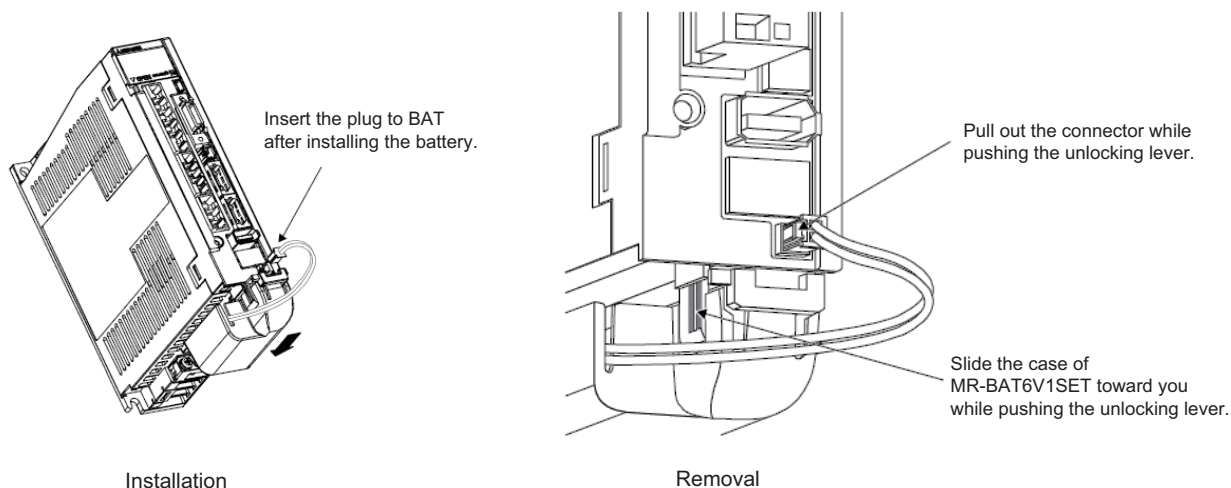
(Note 3) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

(b) Installing and removing the cell battery

< MDS-EM Series >

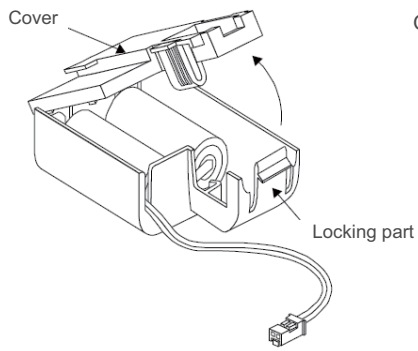


< MDS-EJ Series >

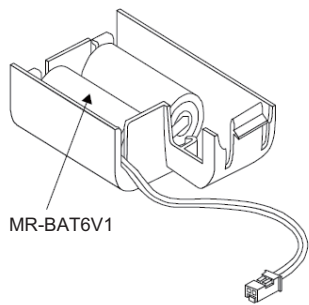


(c) Replacing the built-in battery

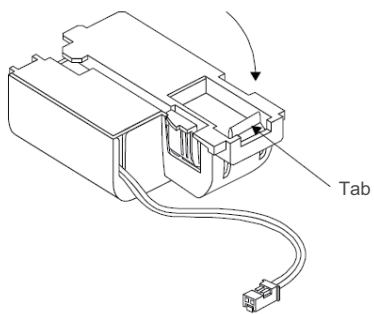
MR-BAT6V1SET that reached the end of the life can be reused by replacing the MR-BAT6V1 battery.



Open the cover while pushing the locking part.



Replace the built-in battery with a new battery for MR-BAT6V1.



Close the cover by pushing until it is fixed with the tab of the locking part.

(3) Battery box (MDSBTBOX-LR2060)

(a) Specifications

Battery option type	Battery box
Battery model name (Note 1)	MDSBTBOX-LR2060 size-D alkaline batteries LR20 × 4 pieces
Nominal voltage (Note 2)	6.0V (Unit output: BTO1/2/3) 3.6V (Unit output: BT(3.6V))
Number of connectable axes (Note 3)	Up to 8 axes
Battery continuous backup time (Note 4)	Approx. 10000 hours (when 8 axes are connected, cumulative time in non-energized state)
Back up time from battery warning to alarm occurrence (Note 4)	Approx. 336 hours (when 8 axes are connected)

(Note 1) Install commercially-available alkaline dry batteries into MDSBTBOX-LR2060. The batteries should be procured by customers.

Make sure to use new batteries that have not passed the expiration date. We recommend you to replace the batteries in the one-year cycle.

(Note 2) 3.6V output is for old-type drive unit. It is not used for MDS-E/EH, EM/EMH, and EJ/EJH Series.

(Note 3) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.

(Note 4) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery warning (9F) occurs.

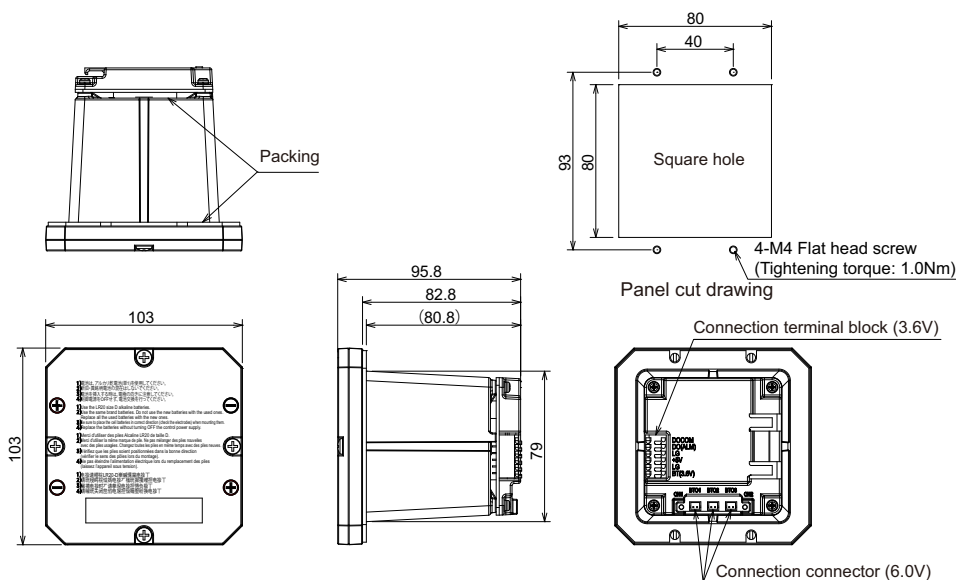
(Note 5) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

(b) Explanation of connectors (BTO1/2/3)

	Name	Description
(1)	BTO	6V output for absolute position encoder backup
(2)	LG	Ground

(c) Outline dimension drawings

[Unit: mm]



**POINT**

As soon as the battery warning (9F) has occurred, replace the batteries with new ones. Make sure to use new batteries that have not passed the expiration date. We recommend you to replace the batteries in the one-year cycle.

**CAUTION**

When installing the battery box on the panel, it may be damaged if the screw is tightened too much. Make sure the tightening torque of the screw.

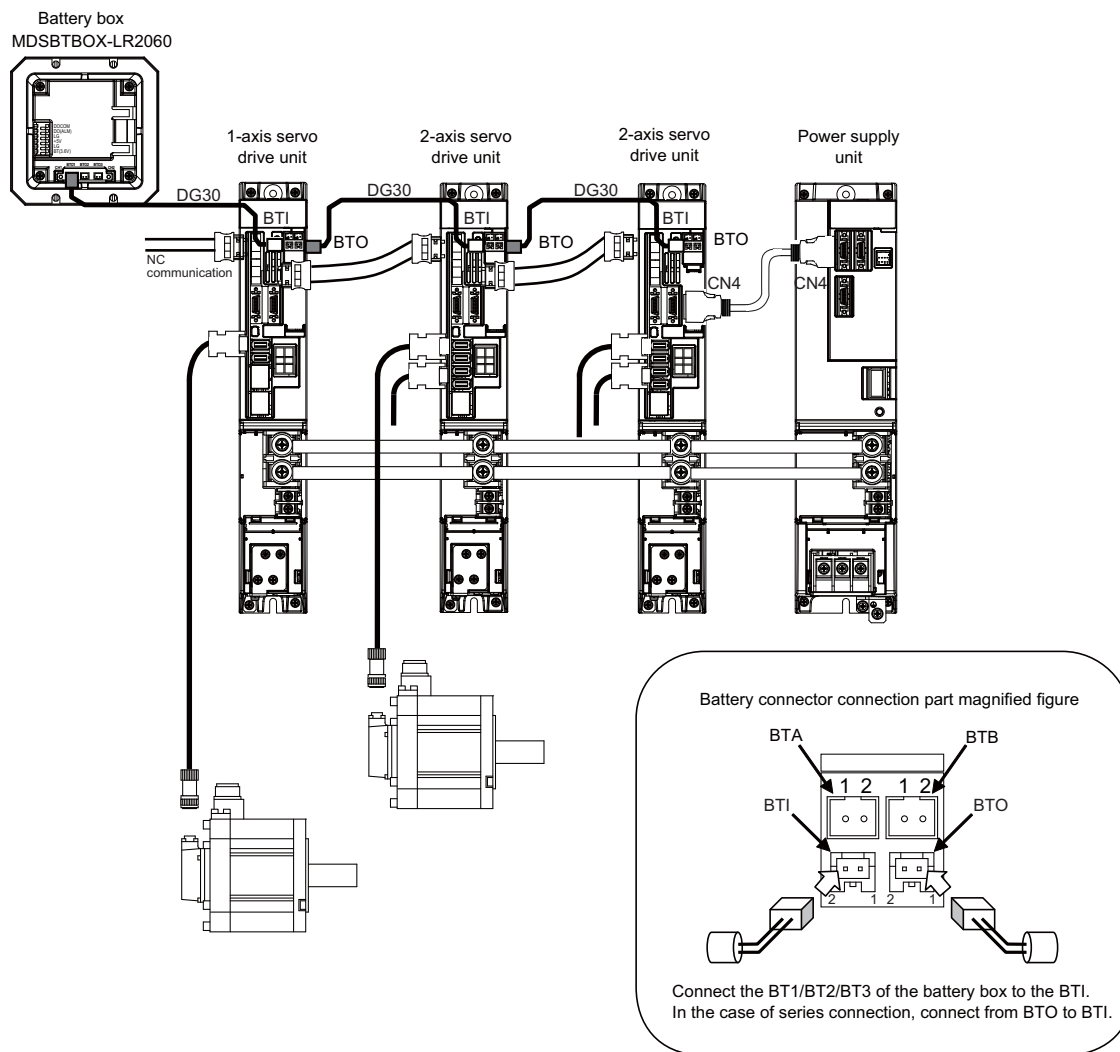
(d) When backing up for more than 8 axes

Add a MDSBTBOX-LR2060 so that the number of connectable axes for a battery unit is 8 axes or less. For all of servo drive units supported by one MDSBTBOX-LR2060, start the control powers ON simultaneously.

**CAUTION**

1. The drive unit which is connected to the battery box and cell battery cannot be used together.
2. Replace the batteries with new ones without turning the control power of the drive unit OFF immediately after the battery voltage drop alarm (9F) has been detected.
3. Replace the batteries while applying the control power of all drive units which are connected to the battery box.

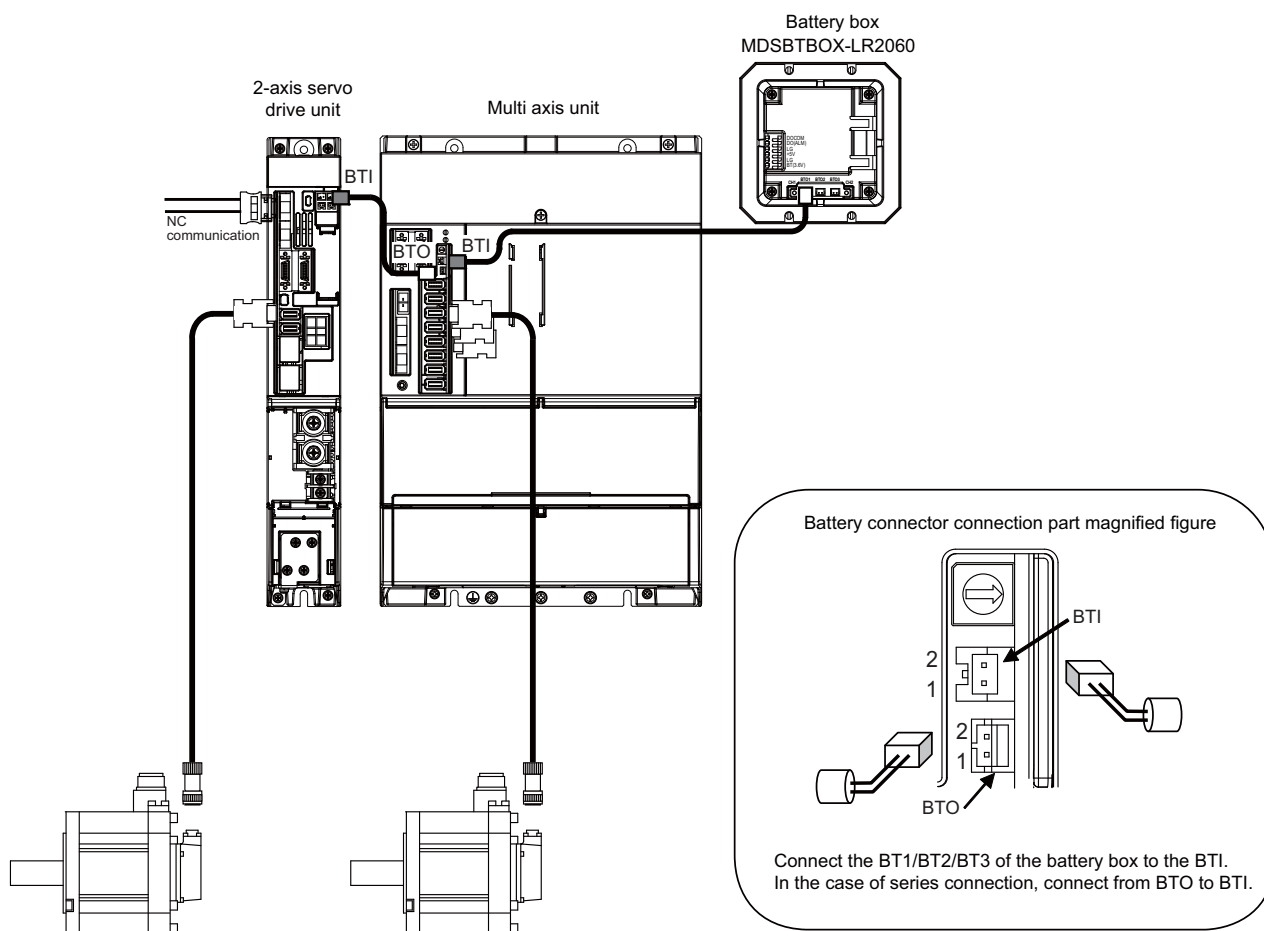
(e) System configuration  
 < MDS-E Series >



**CAUTION**

The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.

< MDS-EM Series >

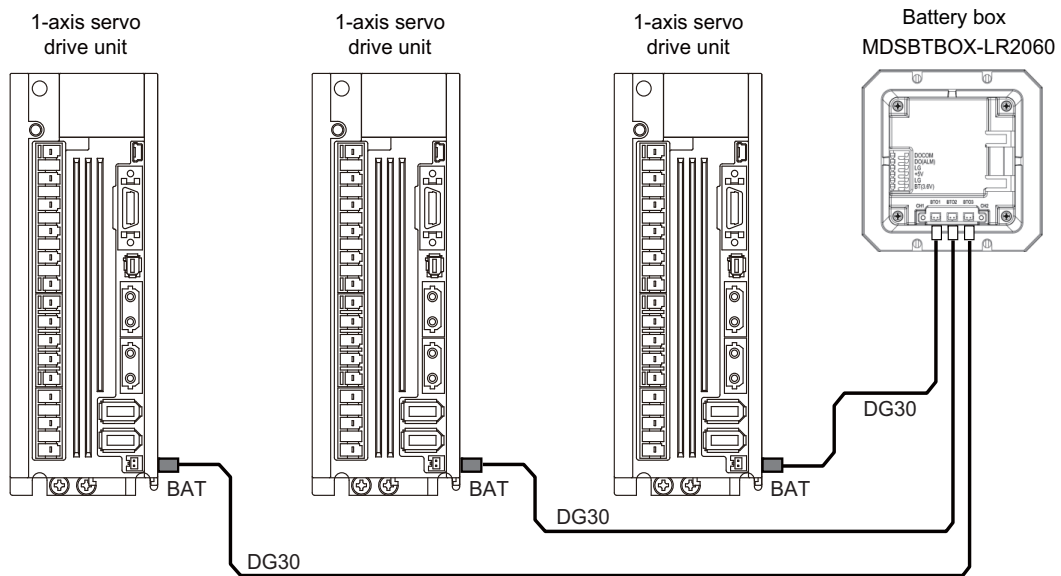


**CAUTION**

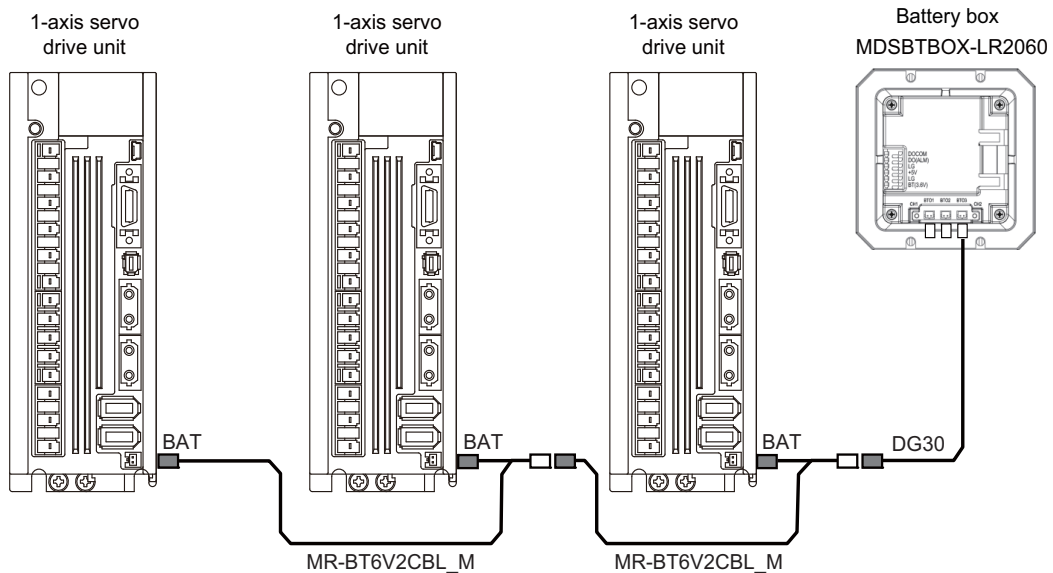
The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.

< MDS-EJ Series >

Parallel connection



Daisy-chain connection



**CAUTION**

1. The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.
2. MR-BT6V2CBL\_M is required for the daisy-chain connection.

## Ball Screw Side Encoder (OSA405ET2AS, OSA676ET2AS)

## (1) Specifications

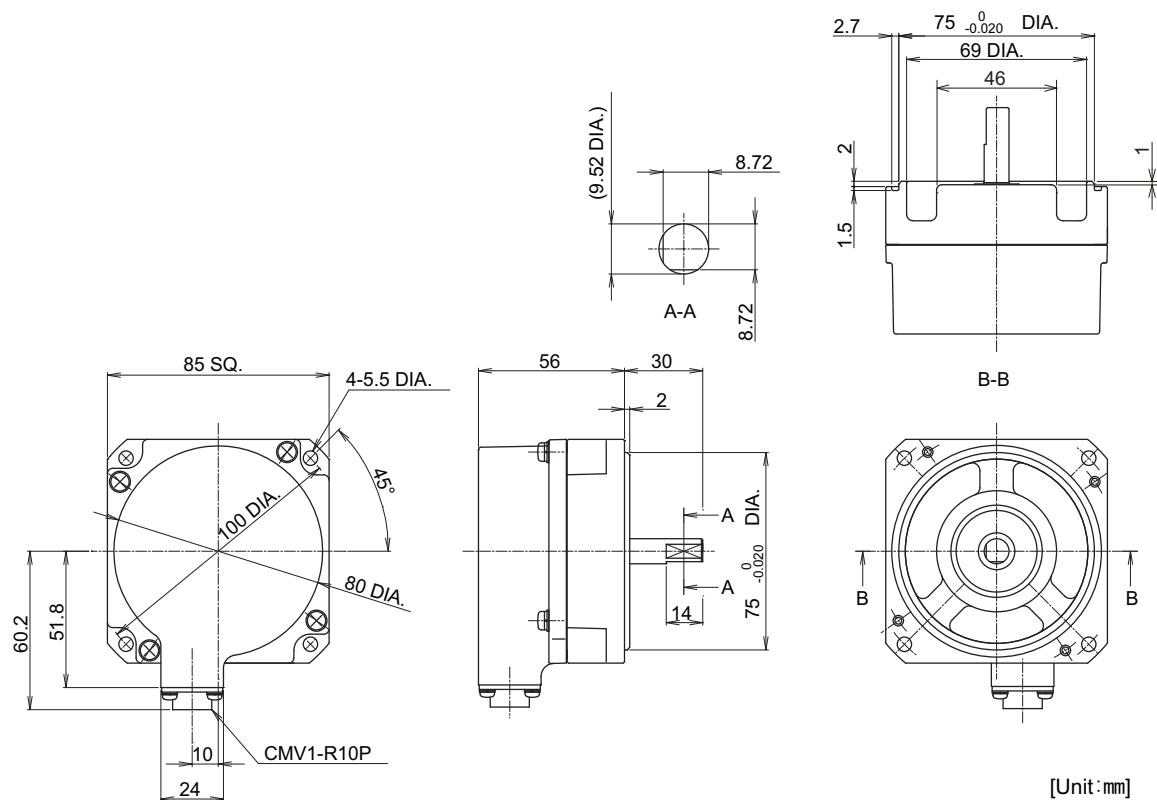
Encoder type		OSA405ET2AS	OSA676ET2AS
Electrical characteristics	Encoder resolution	4,194,304 pulse/rev	67,108,864 pulse/rev
	Detection method	Absolute position method (battery backup method)	
	Accuracy (*1)	±3 seconds	
	Tolerable rotation speed at power off (*2)	500r/min	
	Encoder output data	Serial data	
	Power consumption	0.3A	
Mechanical characteristics for rotation	Inertia	$0.5 \times 10^{-4} \text{kgm}^2$ or less	
	Shaft friction torque	0.1Nm or less	
	Shaft angle acceleration	$4 \times 10^4 \text{rad/s}^2$ or less	
	Tolerable continuous rotation speed	4000r/min	
Mechanical configuration	Shaft amplitude (position 15mm from end)	0.02mm or less	
	Tolerable load (thrust direction/radial direction)	9.8N/19.8N	
	Mass	0.6kg	
	Degree of protection	IP65 (The shaft-through portion is excluded.)	
	Recommended coupling	bellows coupling	
Working environment	Ambient temperature	0°C to +55°C	
	Storage temperature	-20°C to +85°C	
	Humidity	95%Ph	
	Vibration resistance	5 to 50Hz, total vibration width 1.5mm, each shaft for 30min	
	Impact resistance	490m/s <sup>2</sup> (50G)	

(\*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.

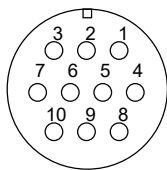
(\*2) If the tolerable rotation speed at power off is exceeded, the absolute position cannot be repaired.



(2) Outline dimension drawings  
OSA405ET2AS / OSA676ET2AS



(3) Explanation of connectors



Connector pin layout

Pin	Function	Pin	Function
1	RQ	6	SD
2	RQ*	7	SD*
3	-	8	P5(+5V)
4	BAT	9	-
5	LG(GND)	10	SHD

## Regenerative Option for MDS-EJ

The regenerative resistor generates heats, so wire and install the unit while taking care to safety. When using the regenerative resistor, make sure that flammable matters, such as cables, do not contact the resistor, and provide a cover on the machine so that dust or oil does not accumulate on the resistor and ignite.

### (1) Combination with MDS-EJ-V1/V2 (200V)

Corresponding servo drive unit	Standard built-in regenerative resistor	External option regenerative resistor						
		MR-RB032	MR-RB12	MR-RB32	MR-RB30	MR-RB50	MR-RB31	MR-RB51
			GZG200W 39OHMK	GZG200W 120OHMK ×3 units	GZG200W 39OHMK ×3 units	GZG300W 39OHMK ×3 units	GZG200W 20OHMK ×3 units	GZG300W 20OHMK ×3 units
	Regenerative capacity	30W	100W	300W	300W	500W	300W	500W
	Resistance value	40Ω	40Ω	40Ω	13Ω	13Ω	6.7Ω	6.7Ω
MDS-EJ-V1-10	10W	100Ω	○	○				
MDS-EJ-V1-15	10W	100Ω	○	○				
MDS-EJ-V1-30	20W	40Ω	○	○	○			
MDS-EJ-V1-40	100W	13Ω				○	○	
MDS-EJ-V1-80	100W	9Ω				○	○	○
MDS-EJ-V1-100	100W	9Ω				○	○	○
MDS-EJ-V2-30	100W	9Ω				○	○	
MDS-EJ-V2-40	150W	6.7Ω				○	○	○

Corresponding servo drive unit	Standard built-in regenerative resistor	External option regenerative resistor							
		FCUA-RB22	FCUA-RB37	FCUA-RB55	FCUA-RB75/2	FCUA-RB55 2 units connected in parallel	FCUA-RB75/2 2 units connected in parallel	R-UNIT	R-UNIT2
	Regenerative capacity	155W	185W	340W	340W	680W	680W	700W	700W
	Resistance value	40Ω	25Ω	20Ω	30Ω	10Ω	15Ω	30Ω	15Ω
MDS-EJ-V1-10	10W	100Ω							
MDS-EJ-V1-15	10W	100Ω							
MDS-EJ-V1-30	20W	40Ω	○						
MDS-EJ-V1-40	100W	13Ω		○	○		○		○
MDS-EJ-V1-80	100W	9Ω			○	○	○		○
MDS-EJ-V1-100	100W	9Ω				○	○		○
MDS-EJ-V2-30	100W	9Ω		○	○				
MDS-EJ-V2-40	150W	6.7Ω				○	○		○

(2) Combination with spindle drive unit

**⚠ CAUTION**

The regenerative resistor is not incorporated in the spindle drive unit. Make sure to install the external option regenerative resistor.

Corresponding spindle drive unit		External option regenerative resistor			
		MR-RB12	MR-RB32	MR-RB30	MR-RB50
		GZG200W39OHMK	GZG200W120 OHMK×3 units	GZG200W39 OHMK×3 units	GZG300W39 OHMK×3 units
	Regenerative capacity	100W	300W	300W	500W
	Resistance value	40Ω	40Ω	13Ω	13Ω
MDS-EJ-SP-20	---	○	○		
MDS-EJ-SP-40	---			○	○
MDS-EJ-SP-80	---			○	○
MDS-EJ-SP-100	---			○	○
MDS-EJ-SP-120	---				○
MDS-EJ-SP-160	---				○
MDS-EJ-SP2-20	---			○	○

Corresponding spindle drive unit		External option regenerative resistor			
		FCUA-RB22	FCUA-RB37	FCUA-RB55	FCUA-RB75/2 (1 unit)
		Regenerative capacity	155W	185W	340W
Resistance value	40Ω	25Ω	20Ω	30Ω	
MDS-EJ-SP-20	---	○	○		
MDS-EJ-SP-40	---	○	○	○	○
MDS-EJ-SP-80	---		○	○	○
MDS-EJ-SP-100	---			○	
MDS-EJ-SP-120	---				
MDS-EJ-SP-160	---				
MDS-EJ-SP2-20	---	○	○	○	

Corresponding spindle drive unit		External option regenerative resistor						
		R-UNIT1	R-UNIT2	R-UNIT3	R-UNIT4	R-UNIT5	FCUA-RB55 2 units connected in parallel	FCUA-RB75/2 2 units connected in parallel
		Regenerative capacity	700W	700W	2100W	2100W	3100W	680W
Resistance value	30Ω	15Ω	15Ω	10Ω	10Ω	10Ω	15Ω	
MDS-EJ-SP-20	---							
MDS-EJ-SP-40	---	○	○	○			○	
MDS-EJ-SP-80	---	○	○	○	○	○	○	
MDS-EJ-SP-100	---		○	○	○	○	○	
MDS-EJ-SP-120	---		○	○	○	○	○	
MDS-EJ-SP-160	---				○	○		
MDS-EJ-SP2-20	---							

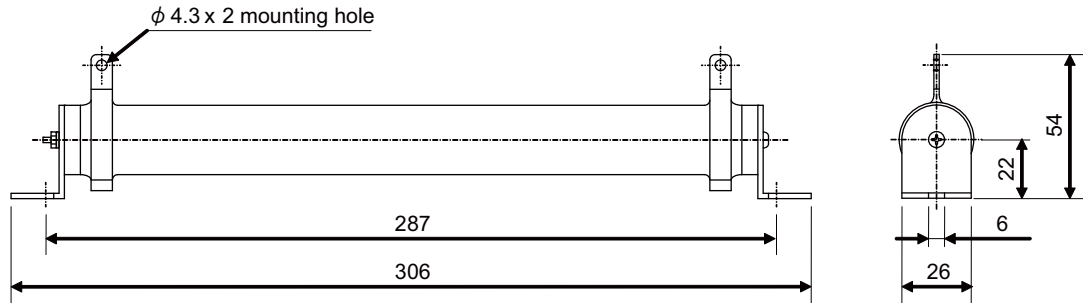
**⚠ CAUTION**

Only the designated combination can be used for the external option regenerative resistor and drive unit. There is a risk of fire, so always use the designated combination.

(3) Outline dimension drawing of regenerative resistor

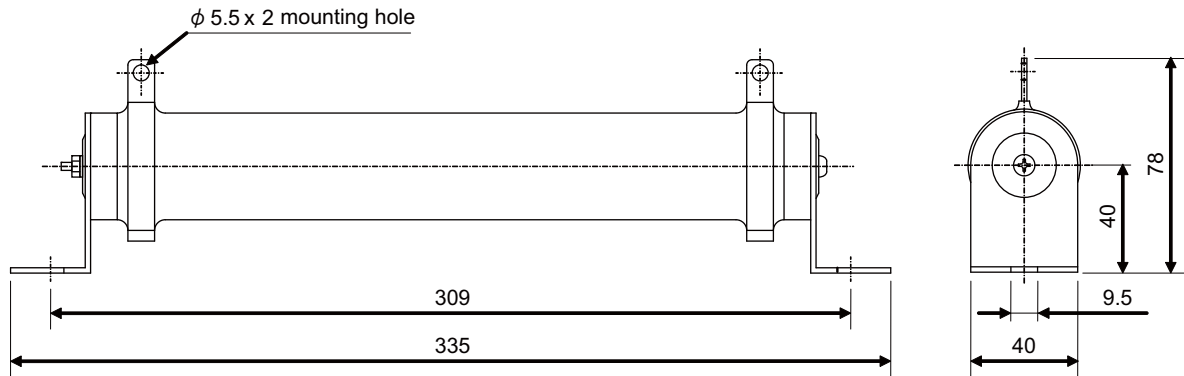
< GZG200W39OHMK, GZG200W120OHMK >

[Unit: mm]



< GZG300W39OHMK >

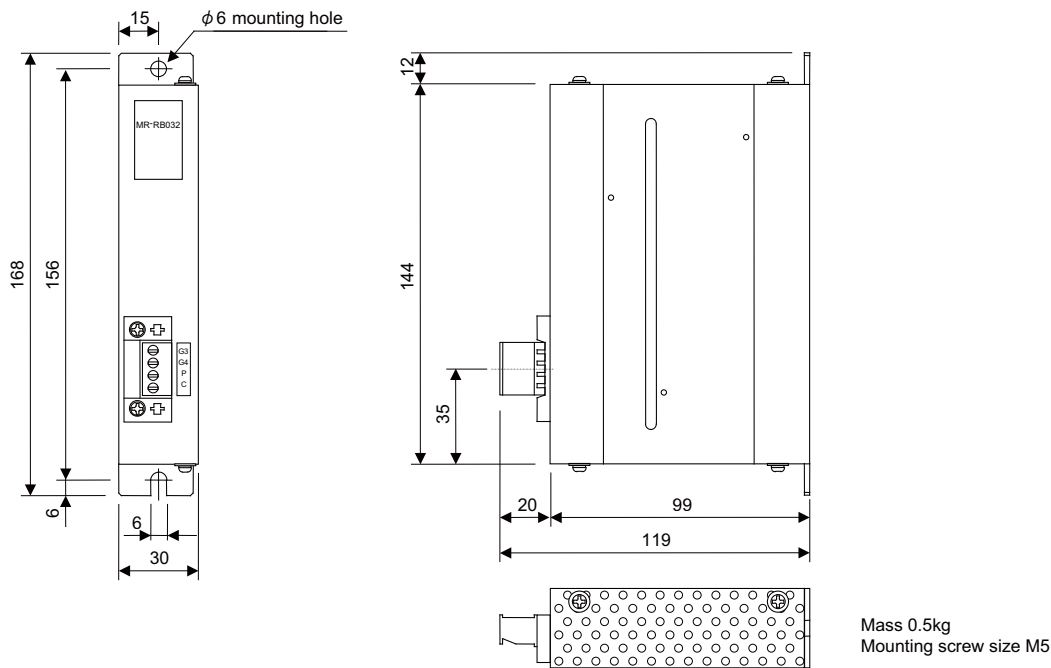
[Unit: mm]



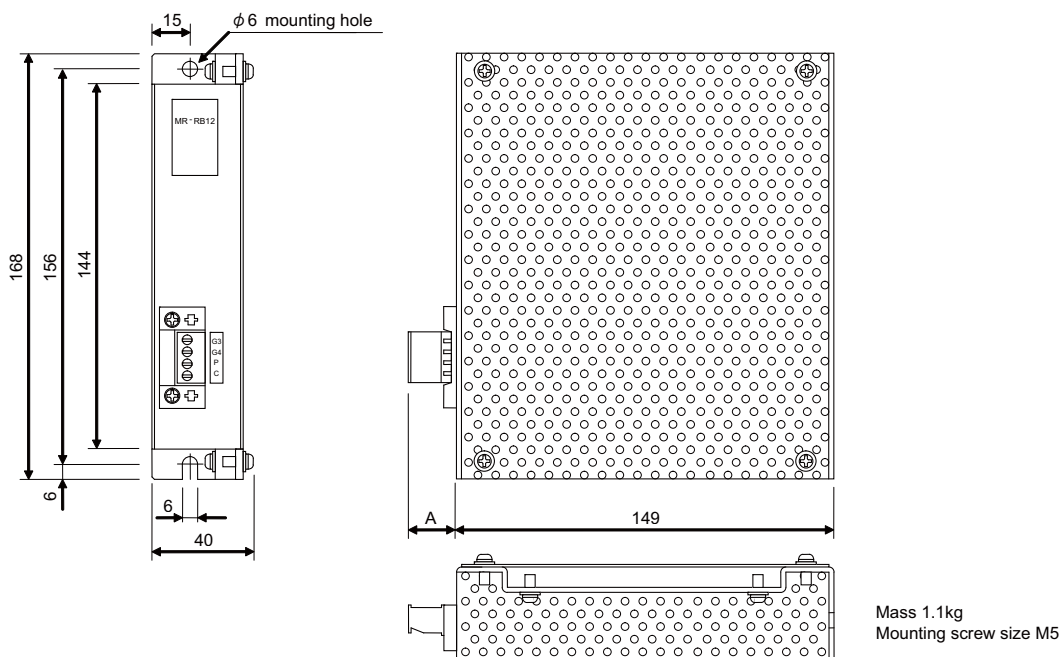
(4) Outline dimension drawing of regenerative option

[Unit: mm]

< MR-RB032 >



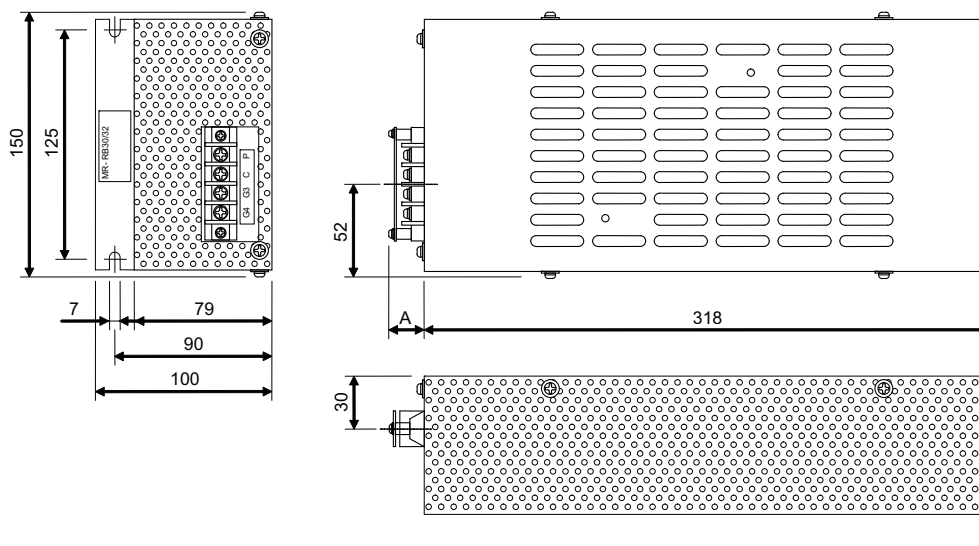
< MR-RB12 >



Variable dimensions

Type	A	Applicable cable size
MR-RB12	20	0.2 to 2.5mm <sup>2</sup> (AWG24 to 12)

< MR-RB30, MR-RB31, MR-RB32 >

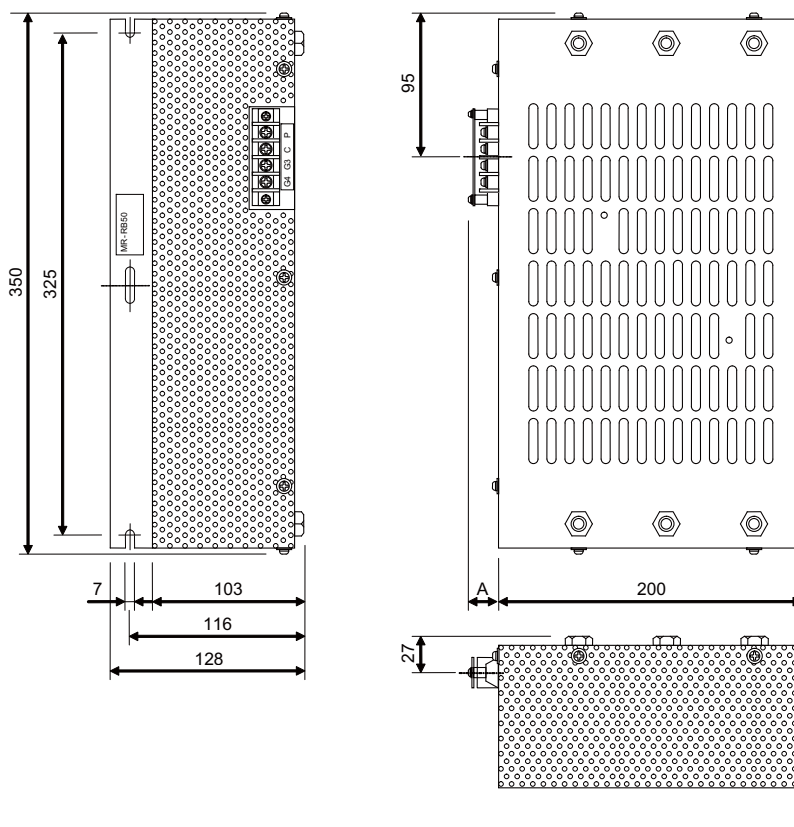


Mass 2.9kg  
Terminal screw size M4  
Mounting screw size M8

Variable dimensions

Type	A
MR-RB30, MR-RB31, MR-RB32	17

< MR-RB50, MR-RB51 >



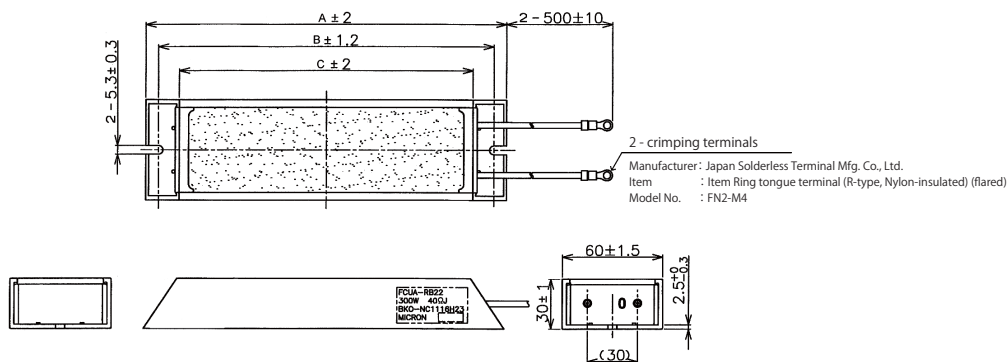
Mass 5.6kg  
Terminal screw size M4  
Mounting screw size M6

Variable dimensions

Type	A
MR-RB50, MR-RB51	17

< FCUA-RB22, FCUA-RB37 >

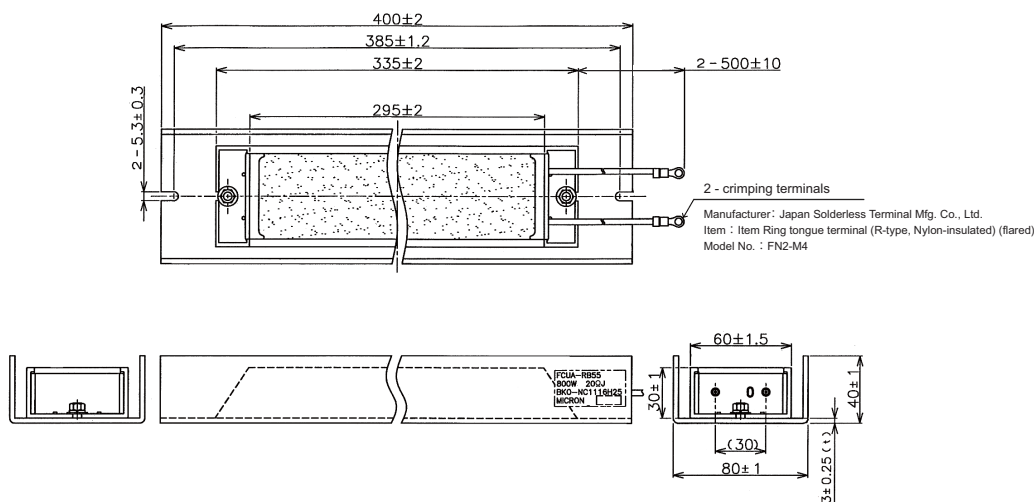
[Unit: mm]



Type	Regenerative capacity (W)	Outline dimension (mm)			Resistance value (Ω)	Mass (kg)
		A	B	C		
FCUA-RB22	155	215	200	175	40	0.8
FCUA-RB37	185	335	320	295	25	1.2

< FCUA-RB55, FCUA-RB75/2 >

[Unit: mm]



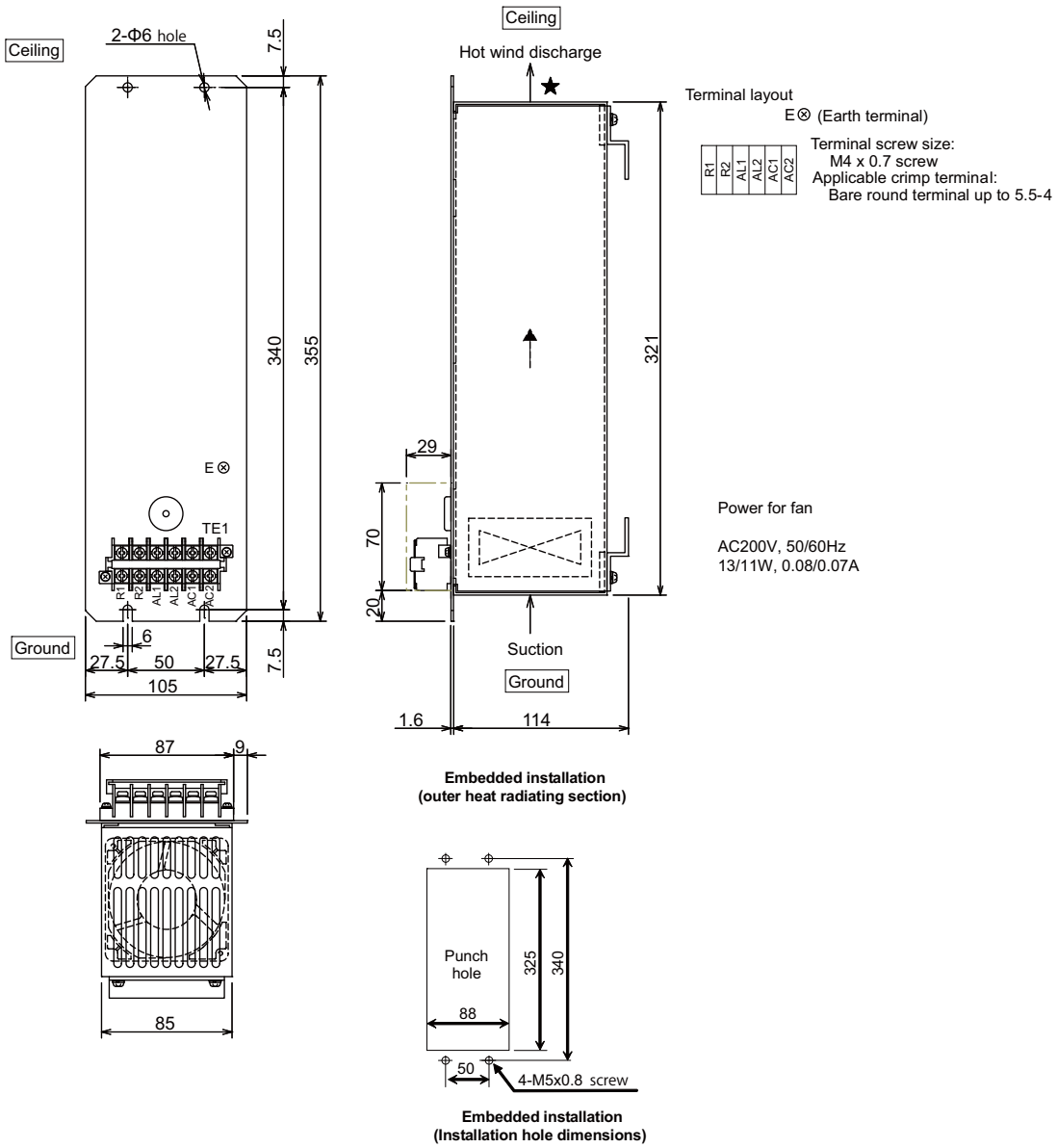
Type	Regenerative capacity (W)	Resistance value (Ω)	Mass (kg)
FCUA-RB75/2 (1 unit)	340	30	2.2
FCUA-RB55	340	20	2.2
FCUA-RB75/2 (2 units connected in parallel)	680	15	4.4 (total of 2 units)
FCUA-RB55 (2 units connected in parallel)	680	10	4.4 (total of 2 units)

**CAUTION**

- When using an operation pattern in which the regenerative resistor is used at a high frequency, the surface of the resistor may exceed 300°C, so take care to the installation and the heat radiation.  
Do not install the resistor in a place where it can be easily touched by hand or body parts as touching could lead to burns. Install a well-ventilated protective cover (punched metal, etc.) if body parts might come in contact.
- Installation of the regenerative resistor on a metallic surface outside the panel is recommended to improve the heat radiating effect.
- Install the regenerative resistor so that the section where the lead wires are led out is not at the top of the resistor.

< R-UNIT-1, -2 >

[Unit: mm]



Type	Regenerative capacity (W)	Resistance value (Ω)	Mass (kg)
R-UNIT-1	700	30	4.3
R-UNIT -2	700	15	4.4

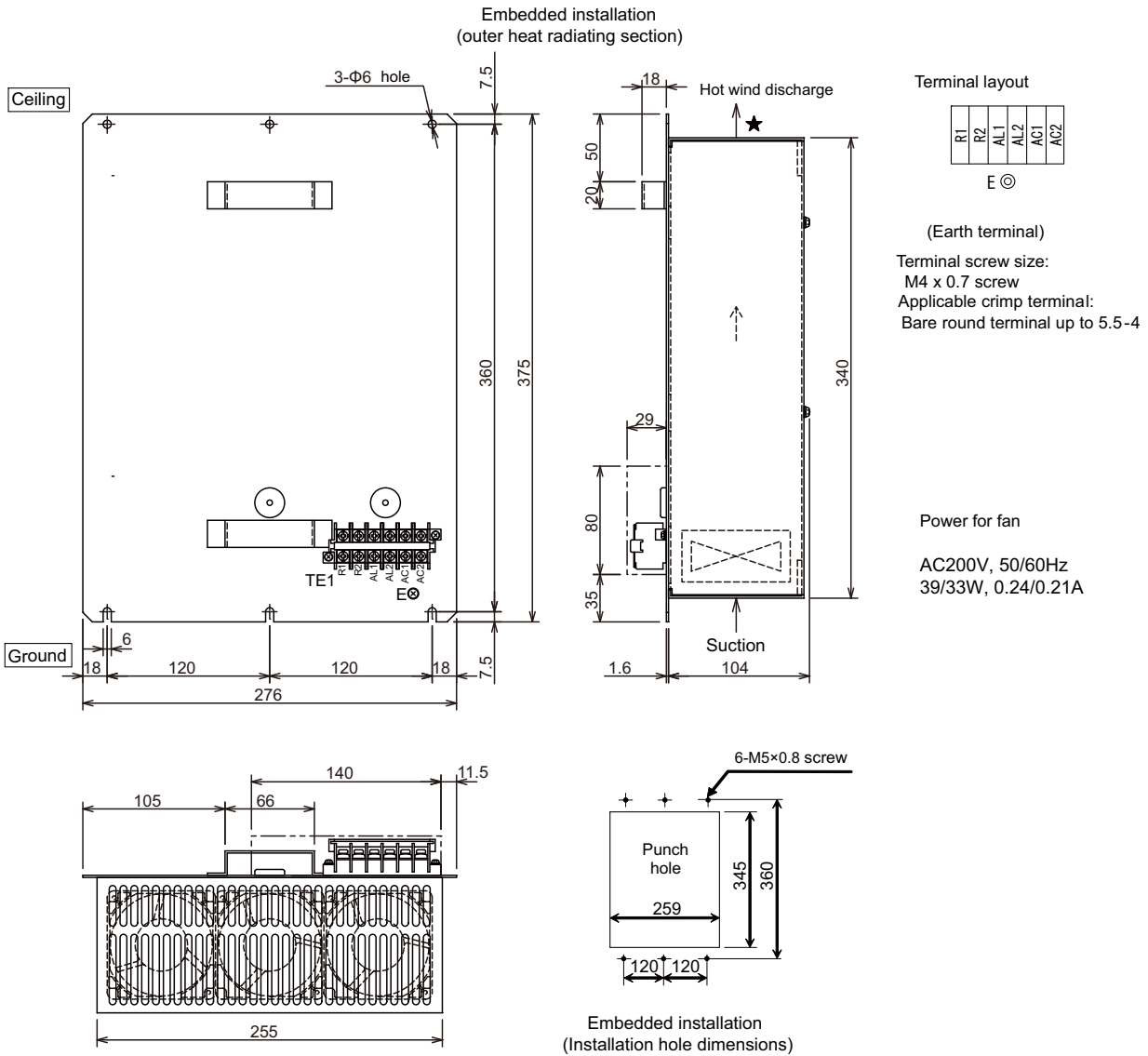
**CAUTION**

1. Do not wire or arrange other devices in front of the section marked with a as extremely hot wind will be blown out.
2. For the installation direction of this resistor, the "Ceiling" is the top and "Ground" is the bottom.
3. Touching the resistor when it is hot could lead to burns. Always install a protective cover or consider the installation site so that workers will not touch the unit.
4. The resistor's heating value will differ according to the acceleration/deceleration frequency, speed being used and the load  $GD^2$  conditions, etc. However, install the resistor so that the hot wind is always exhausted to outside the panel.



< R-UNIT-3, -4 >

[Unit: mm]



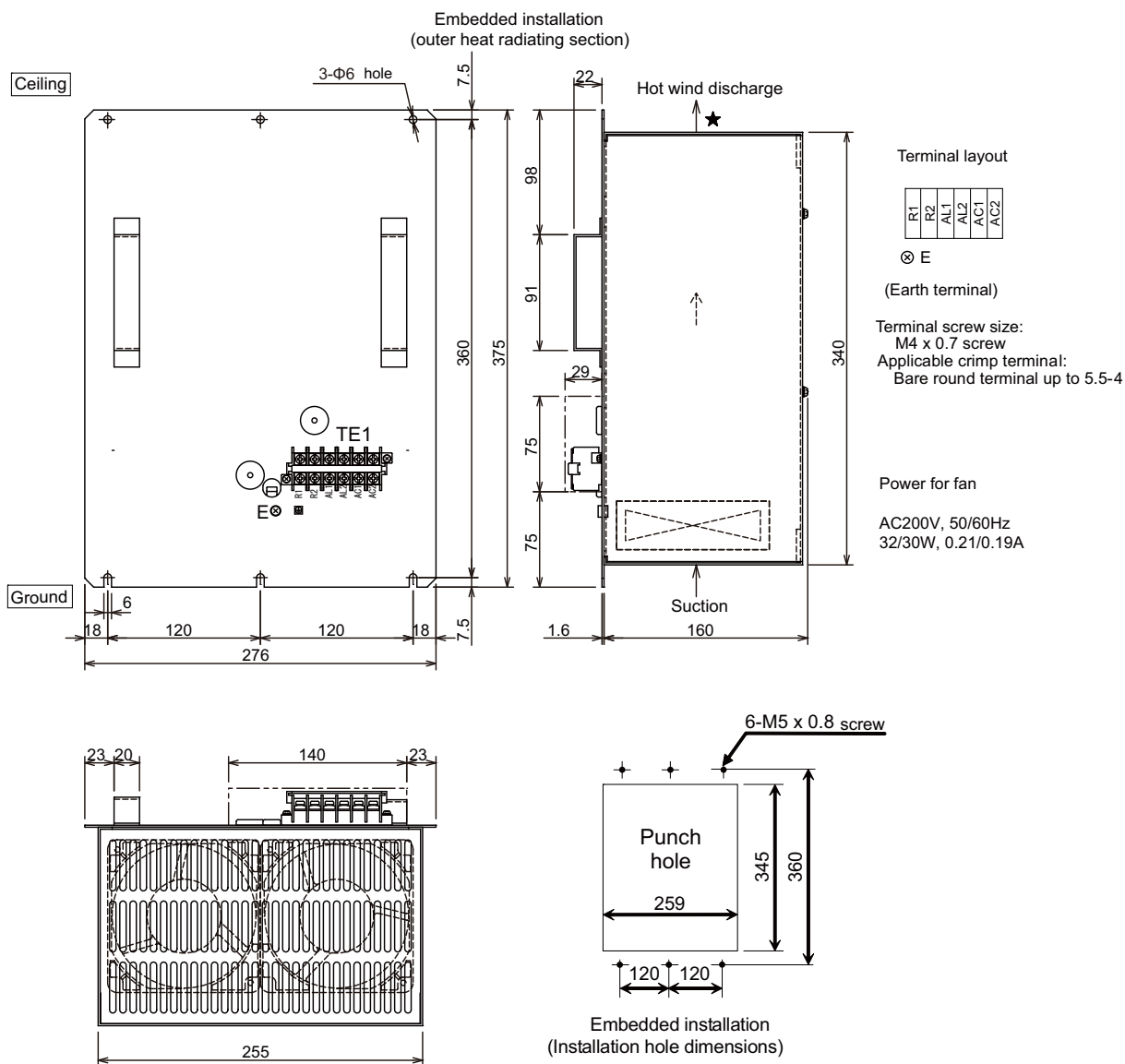
Type	Regenerative capacity (W)	Resistance value (Ω)	Mass (kg)
R-UNIT-3	2100	15	10.8
R-UNIT-4	2100	10	11.0

**⚠ CAUTION**

1. Attach packing to the flange section.
2. Do not wire or arrange other devices in front of the section marked with a as extremely hot wind will be blown out.
3. For the installation direction of this resistor, the "Ceiling" is the top and "Ground" is the bottom.
4. Touching the resistor when it is hot could lead to burns. Always install a protective cover or consider the installation site so that workers will not touch the unit.
5. The resistor's heating value will differ according to the acceleration/deceleration frequency, speed being used and the load  $GD^2$  conditions, etc. However, install the resistor so that the hot wind is always exhausted to outside the panel.

< R-UNIT-5 >

[Unit: mm]



Type	Regenerative capacity (W)	Resistance value (Ω)	Mass (kg)
R-UNIT-5	3100	10	15.0

**CAUTION**

1. Attach packing to the flange section.
2. Do not wire or arrange other devices in front of the section marked with a as extremely hot wind will be blown out.
3. For the installation direction of this resistor, the "Ceiling" is the top and "Ground" is the bottom.
4. Touching the resistor when it is hot could lead to burns. Always install a protective cover or consider the installation site so that workers will not touch the unit.
5. The resistor's heating value will differ according to the acceleration/deceleration frequency, speed being used and the load GD<sup>2</sup> conditions, etc. However, install the resistor so that the hot wind is always exhausted to outside the panel.

## Encoder for Spindle Motor

- (1) No-variable speed control  
 (When spindle and motor are directly coupled or coupled with a 1:1 gear ratio)

Spindle control item	Control specifications	Without spindle side encoder	With spindle side encoder
Spindle control	Normal cutting control	●	This normally is not used for no-variable speed control.
	Constant surface speed control (lathe)	●	
	Thread cutting (lathe)	●	
Orientation control	1-point orientation control	●	
	Multi-point orientation control	●	
	Orientation indexing	●	
Synchronous tap control	Standard synchronous tap	●	
	Synchronous tap after zero point return	●	
Spindle synchronous control	Without phase alignment function	●	
	With phase alignment function	●	
C-axis control	C-axis control	● (Note 2)	●

(Note 1) ● :Control possible

x :Control not possible

(Note 2) When spindle and motor are coupled with a 1:1 gear ratio, use of a spindle side encoder is recommended to assure the precision.

- (2) Variable speed control  
 (When using V-belt, or when spindle and motor are connected with a gear ratio other than 1:1)

Spindle control item	Control specifications	Without spindle side encoder	With spindle side encoder		
			TS5690/ERM280/ GEL2449M/MHS-04B Series	OSE-1024	Proximity switch
Spindle control	Normal cutting control	●	●	●	●
	Constant surface speed control (lathe)	● (Note 2)	●	●	● (Note 2)
	Thread cutting (lathe)	x	●	●	x
Orientation control	1-point orientation control	x	●	●	● (Note 4)
	Multi-point orientation control	x	●	●	x
	Orientation indexing	x	●	●	x
Synchronous tap control	Standard synchronous tap	● (Note 3)	●	●	● (Note 3)
	Synchronous tap after zero point return	x	●	●	x
Spindle synchronous control	Without phase alignment function	● (Note 2)	●	●	● (Note 2)
	With phase alignment function	x	●	●	x
C-axis control	C-axis control	x	●	x	x

(Note 1) ● :Control possible

x :Control not possible

(Note 2) Control not possible when connected with the V-belt.

(Note 3) Control not possible when connected with other than the gears.

(Note 4) Orientation is carried out after the spindle is stopped when a proximity switch is used.

As for 2-axis spindle drive unit, setting is available only for one of the axes.

## Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series)

When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side encoder to detect the position and speed of the spindle. Also use this encoder when orientation control and synchronous tap control, etc are executed under the above conditions.

## (1) Specifications

Encoder type		OSE-1024-3-15-68	OSE-1024-3-15-68-8
Mechanical characteristics for rotation	Inertia	$0.1 \times 10^{-4} \text{kgm}^2$ or less	$0.1 \times 10^{-4} \text{kgm}^2$ or less
	Shaft friction torque	0.98Nm or less	0.98Nm or less
	Shaft angle acceleration	$10^4 \text{rad/s}^2$ or less	$10^4 \text{rad/s}^2$ or less
	Tolerable continuous rotation speed	6000 r/min	8000 r/min
Mechanical configuration	Bearing maximum non-lubrication time	20000h/6000r/min	20000h/8000r/min
	Shaft run-out (position 15mm from end)	0.02mm or less	0.02mm or less
	Tolerable load (thrust direction/radial direction)	10kg/20kg Half of value during operation	10kg/20kg Half of value during operation
	Mass	1.5kg	1.5kg
	Degree of protection	IP54	
	Squareness of flange to shaft	0.05mm or less	
	Flange matching eccentricity	0.05mm or less	
Working environment	Ambient temperature range	-5°C to +55°C	
	Storage temperature range	-20°C to +85°C	
	Humidity	95%Ph	
	Vibration resistance	5 to 50Hz, total vibration width 1.5mm, each shaft for 30min.	
	Impact resistance	294.20m/s <sup>2</sup> (30G)	

## (2) Detection signals

Signal name	Number of detection pulses
A, B phase	1024p/rev
Z phase	1p/rev

Connector pin layout

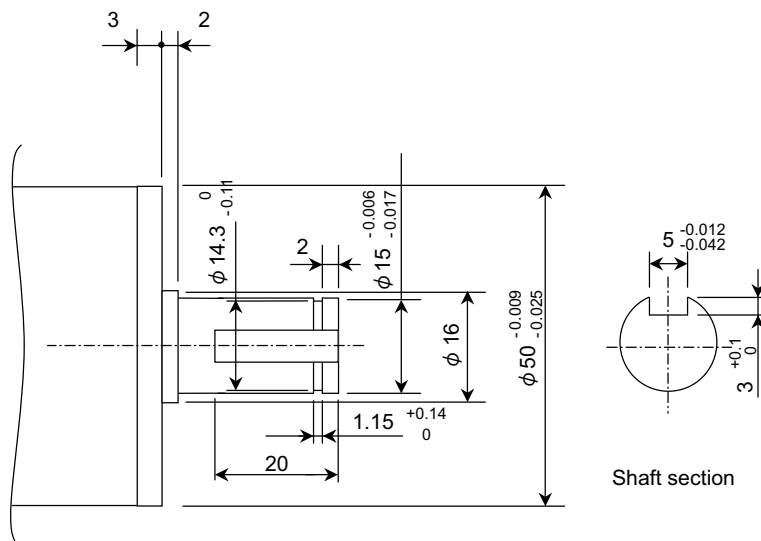
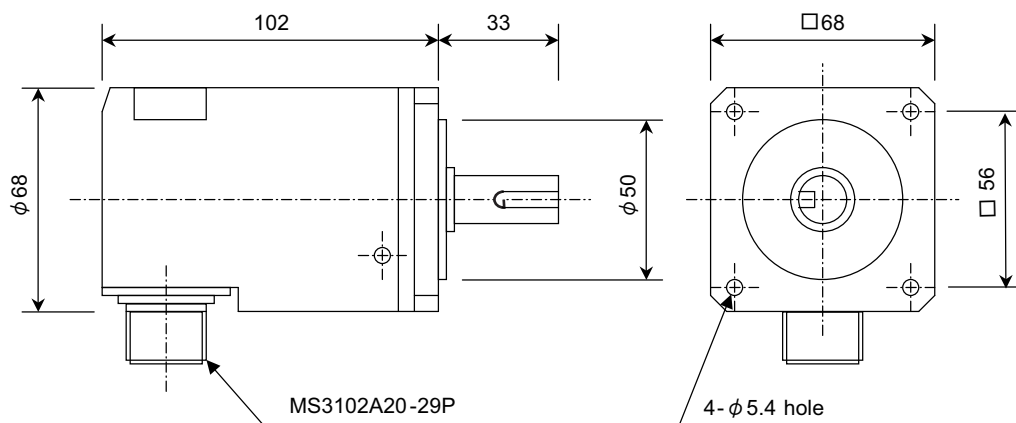
Pin	Function	Pin	Function
A	A+ signal	K	0V
B	Z+ signal	L	-
C	B+ signal	M	-
D	-	N	A- signal
E	Case earth	P	Z- signal
F	-	R	B- signal
G	-	S	-
H	+5V	T	-
J	-		

 **CAUTION**

Cautions for connecting the spindle end with an OSE-1024 encoder

1. Confirm that the gear ratio (pulley ratio) of the spindle end to the encoder is 1:1.
2. Use a timing belt when connecting by a belt.

(3) Outline dimension drawings



Key way magnified figure

[Unit: mm]

Spindle side encoder (OSE-1024-3-15-68, OSE-1024-3-15-68-8)

## Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)

This encoder is used when a more accurate synchronous tapping control or C-axis control than OSE encoder is performed to the spindle which is not directly-connected to the spindle motor.

### (1) Type configuration

< Sensor type >

TS5690N (1) (2) (3)

(1)

Symbol	The number of compatible detection gear teeth
64	64
90	90
12	128
19	192
25	256

(2)

Symbol	Length of the cable
1	400mm
2	800mm
3	1200mm
4	1600mm
5	2000mm

(3)

Symbol	Lead-out direction	Connector specifications
2	Vertical direction	Standard
7	Shaft direction	Standard
8	Shaft direction	Waterproof
9	Vertical direction	Waterproof

< Detection gear type >

MU1606N (1) (2)

(1)

Symbol	The number of detection gear teeth
6	64
9	90
7	128
2	192
8	256

(2) Each specification number

(2) Specifications

Series type		TS5690N64xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Detection gear	Type		MU1606N601									
	The number of teeth		64									
	Outer diameter [mm]		Φ52.8									
	Inner diameter [mm]		Φ40H5									
	Thickness [mm]		12									
Notched fitting section	Outer diameter [mm]		Φ59.4									
	Outer diameter tolerance [mm]		-0.070 to -0.030									
The number of output pulse	A/B phase		64									
	Z phase		1									
Detection resolution [p/rev]		2 million										
Absolute accuracy at stop		150"										
Tolerable speed [r/min]		40,000										
Signal output		Mitsubishi high-speed serial										

Series type		TS5690N90xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Detection gear	Type		MU1606N906									
	The number of teeth		90									
	Outer diameter [mm]		Φ73.6									
	Inner diameter [mm]		Φ60H5									
	Thickness [mm]		12									
Notched fitting section	Outer diameter [mm]		Φ79.2									
	Outer diameter tolerance [mm]		-0.040 to 0									
The number of output pulse	A/B phase		90									
	Z phase		1									
Detection resolution [p/rev]		2.88 million										
Absolute accuracy at stop		105"										
Tolerable speed [r/min]		30,000										
Signal output		Mitsubishi high-speed serial										

Series type		TS5690N12xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Detection gear	Type		MU1606N709									
	The number of teeth		128									
	Outer diameter [mm]		Φ104.0									
	Inner diameter [mm]		Φ80H5									
	Thickness [mm]		12									
Notched fitting section	Outer diameter [mm]		Φ108.8									
	Outer diameter tolerance [mm]		-0.015 to +0.025									
The number of output pulse	A/B phase		128									
	Z phase		1									
Detection resolution [p/rev]		4 million										
Absolute accuracy at stop		100"										
Tolerable speed [r/min]		20,000										
Signal output		Mitsubishi high-speed serial										

Sensor	Series type		TS5690N19xx									
	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead-out direction of lead		Vertical direction					Axis direction				
Detection gear	Type		MU1606N203									
	The number of teeth		192									
	Outer diameter [mm]		Φ155.2									
	Inner diameter [mm]		Φ125H5									
	Thickness [mm]		12									
Notched fitting section	Outer diameter [mm]		Φ159.4									
	Outer diameter tolerance [mm]		-0.035 to +0.005									
The number of output pulse	A/B phase		192									
	Z phase		1									
Detection resolution [p/rev]			6 million									
Absolute accuracy at stop			97.5"									
Tolerable speed [r/min]			15,000									
Signal output			Mitsubishi high-speed serial									

Sensor	Series type		TS5690N25xx									
	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead-out direction of lead		Vertical direction					Axis direction				
Detection gear	Type		MU1606N802									
	The number of teeth		256									
	Outer diameter [mm]		Φ206.4									
	Inner diameter [mm]		Φ160									
	Thickness [mm]		15.8									
Notched fitting section	Outer diameter [mm]		Φ210.2									
	Outer diameter tolerance [mm]		0.0 to +0.040									
The number of output pulse	A/B phase		256									
	Z phase		1									
Detection resolution [p/rev]			8 million									
Absolute accuracy at stop			95"									
Tolerable speed [r/min]			10,000									
Signal output			Mitsubishi high-speed serial									

**⚠ CAUTION**

1. Selected encoders must be able to tolerate the maximum rotation speed of the motor.
2. Please contact your Mitsubishi Electric dealer for the special products not listed above.



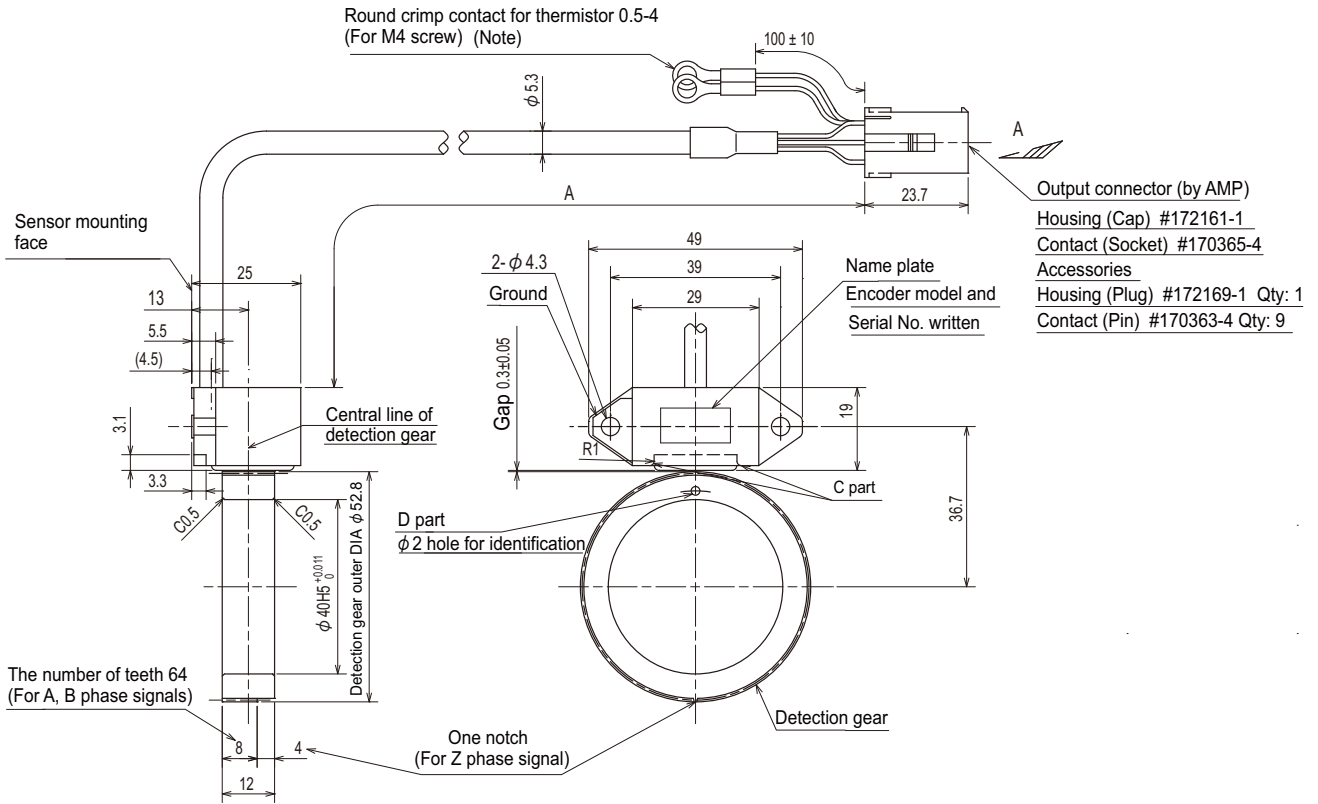
(3) Outline dimension drawings

**CAUTION**

Always apply the notched fitting section machining with the specified dimensions to the sensor installation surface.

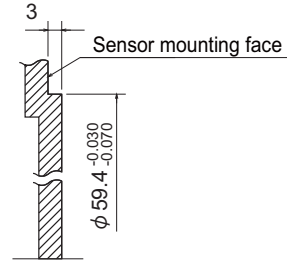
< TS5690N64x2 + MU1606N601 >

[Unit: mm]



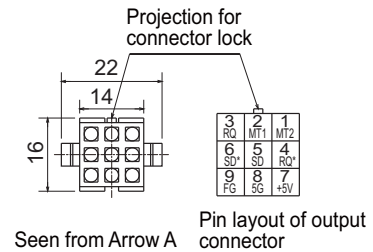
- Output connector (by AMP)
- Housing (Cap) #172161-1
- Contact (Socket) #170365-4
- Accessories
- Housing (Plug) #172169-1 Qty: 1
- Contact (Pin) #170363-4 Qty: 9

(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



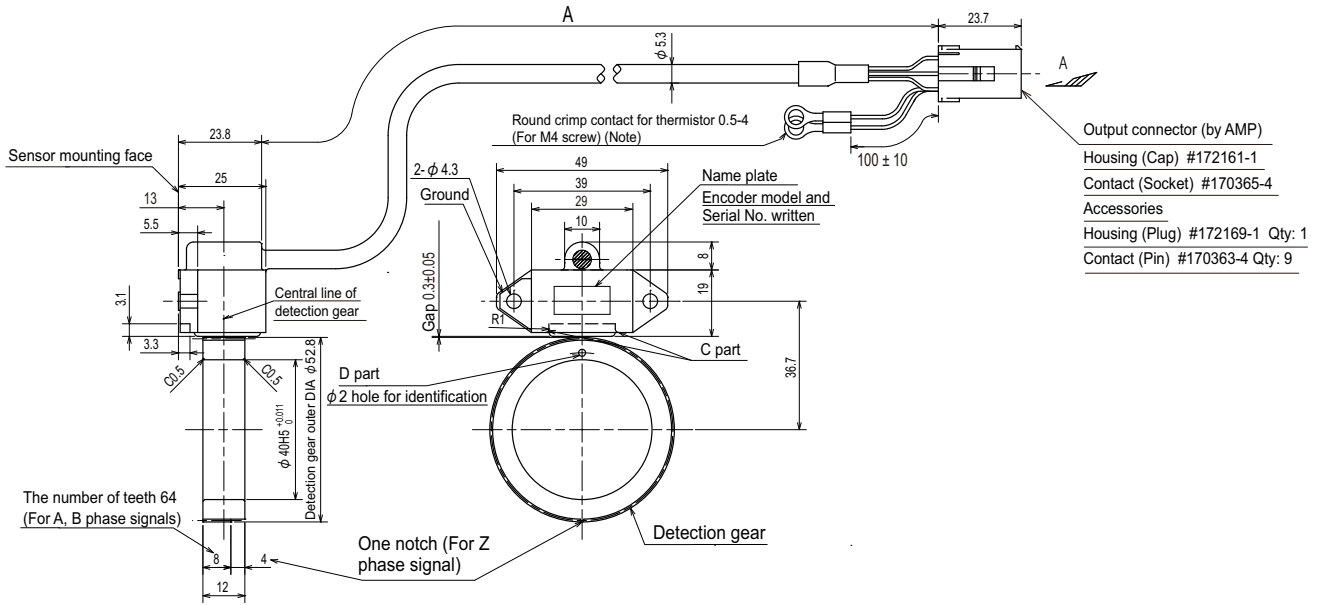
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6412	400±10	Vertical direction	MU1606N601
TS5690N6422	800±20		
TS5690N6432	1200±20		
TS5690N6442	1600±30		
TS5690N6452	2000±30		



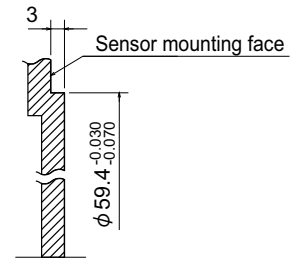
< TS5690N64x7 + MU1606N601 >

[Unit: mm]



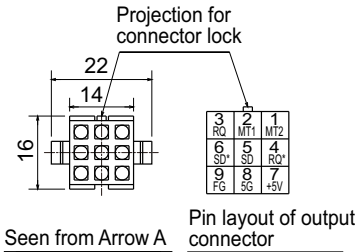
- Output connector (by AMP)
- Housing (Cap) #172161-1
  - Contact (Socket) #170365-4
  - Accessories
  - Housing (Plug) #172169-1 Qty: 1
  - Contact (Pin) #170363-4 Qty: 9

(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



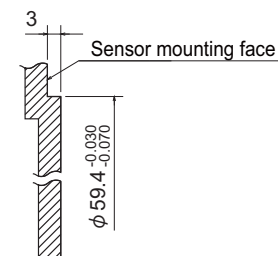
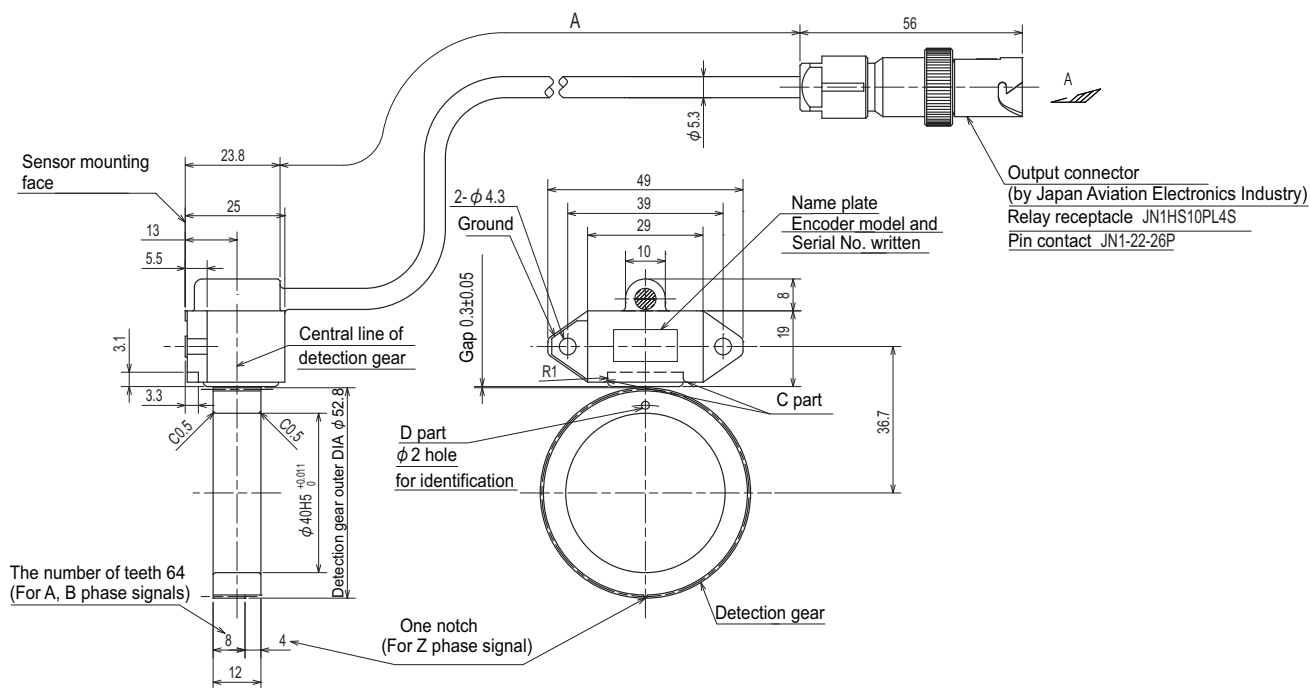
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6417	400±10	Axis direction	MU1606N601
TS5690N6427	800±20		
TS5690N6437	1200±20		
TS5690N6447	1600±30		
TS5690N6457	2000±30		

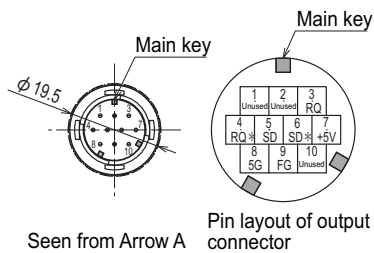


< TS5690N64x8 + MU1606N601 >

[Unit: mm]



Encoder mounting face of machine side



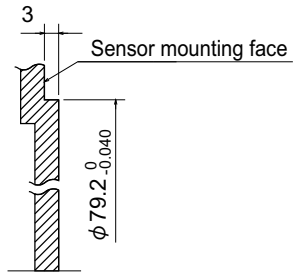
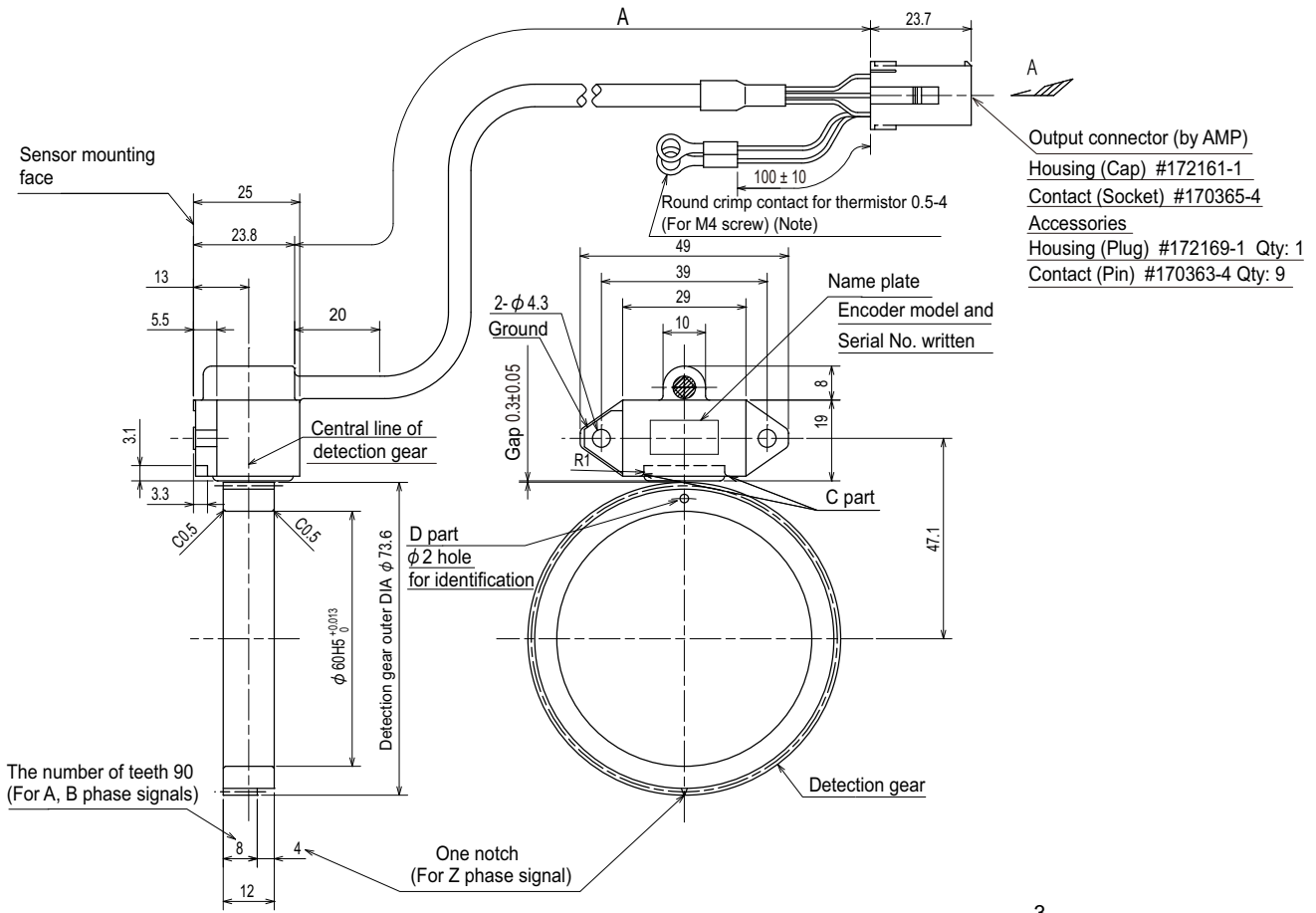
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6418	400±10	Axis direction	MU1606N601
TS5690N6428	800±20		
TS5690N6438	1200±20		
TS5690N6448	1600±30		
TS5690N6458	2000±30		





< TS5690N90x7 + MU1606N906 >

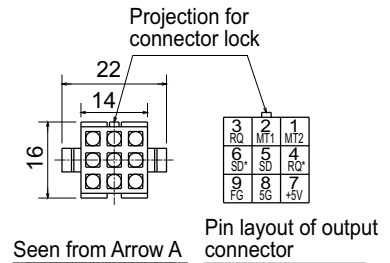
[Unit: mm]



Encoder mounting face of machine side

(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9017	400±10	Axis direction	MU1606N906
TS5690N9027	800±20		
TS5690N9037	1200±20		
TS5690N9047	1600±30		
TS5690N9057	2000±30		

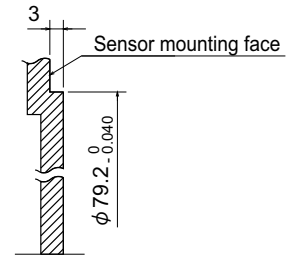
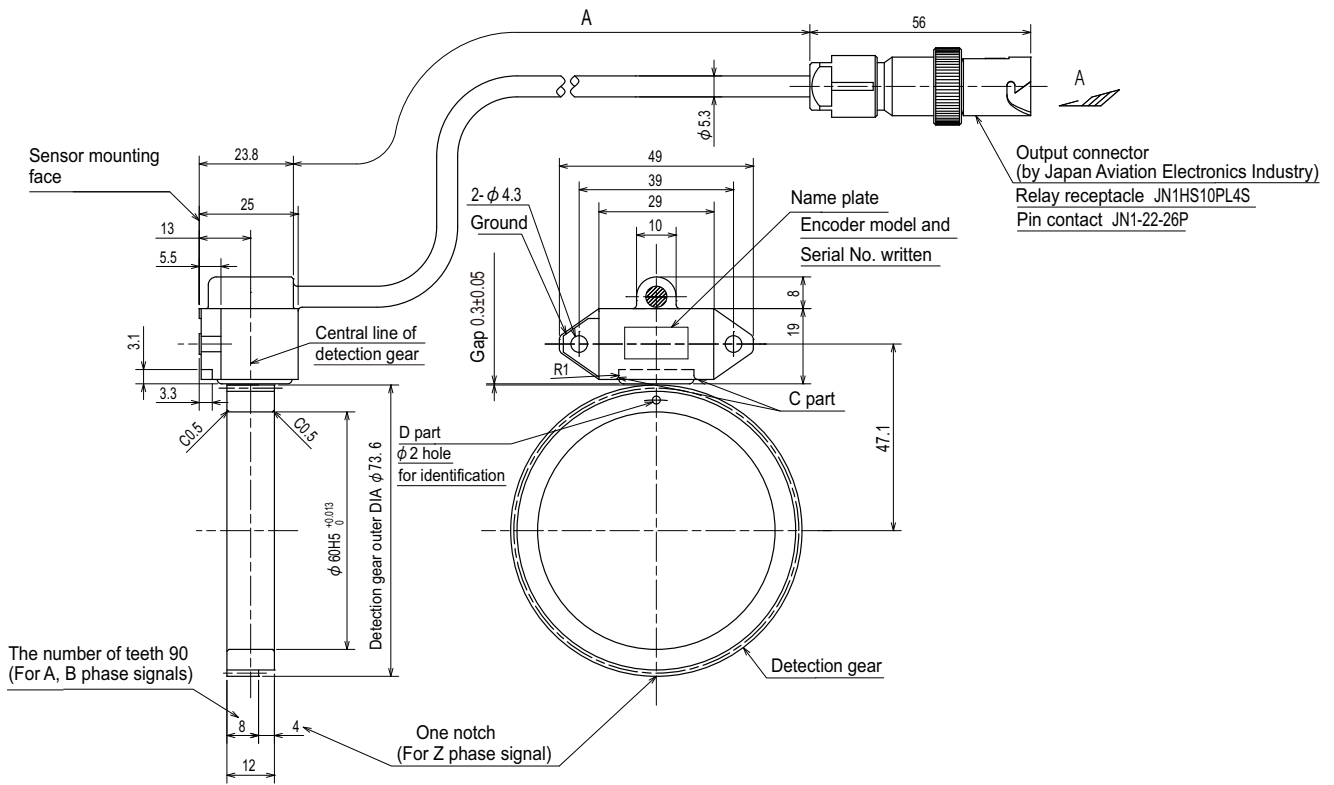


Seen from Arrow A

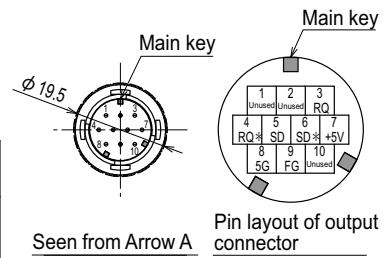
Pin layout of output connector

< TS5690N90x8 + MU1606N906 >

[Unit: mm]



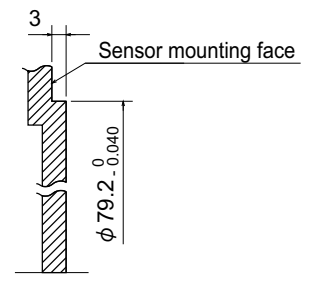
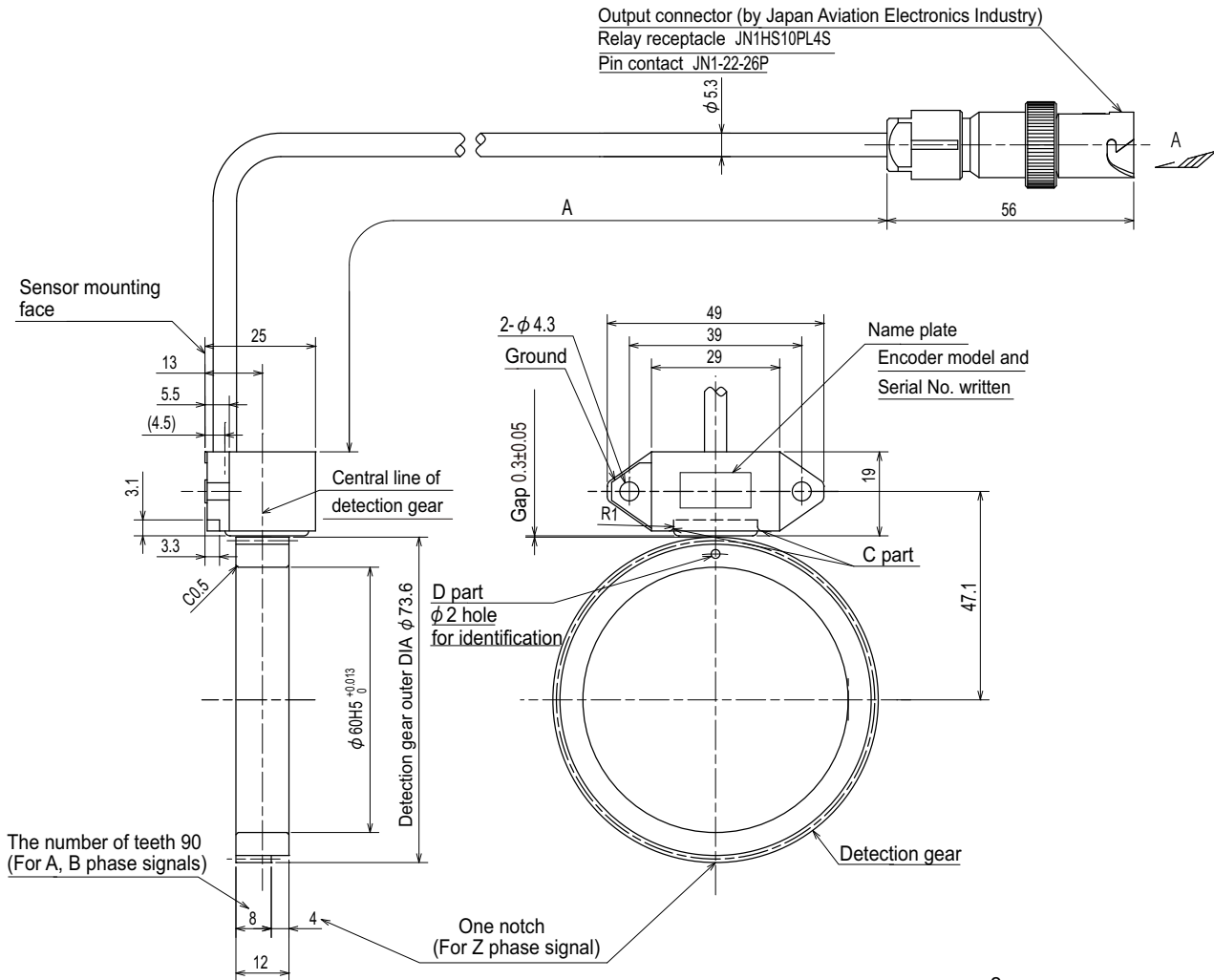
Encoder mounting face of machine side



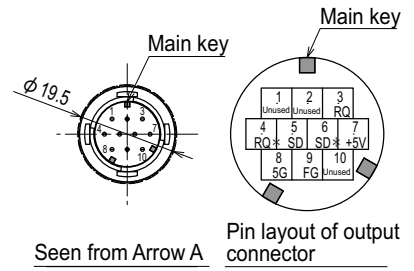
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9018	400±10	Axis direction	MU1606N906
TS5690N9028	800±20		
TS5690N9038	1200±20		
TS5690N9048	1600±30		
TS5690N9058	2000±30		

< TS5690N90x9 + MU1606N906 >

[Unit: mm]



Encoder mounting face of machine side

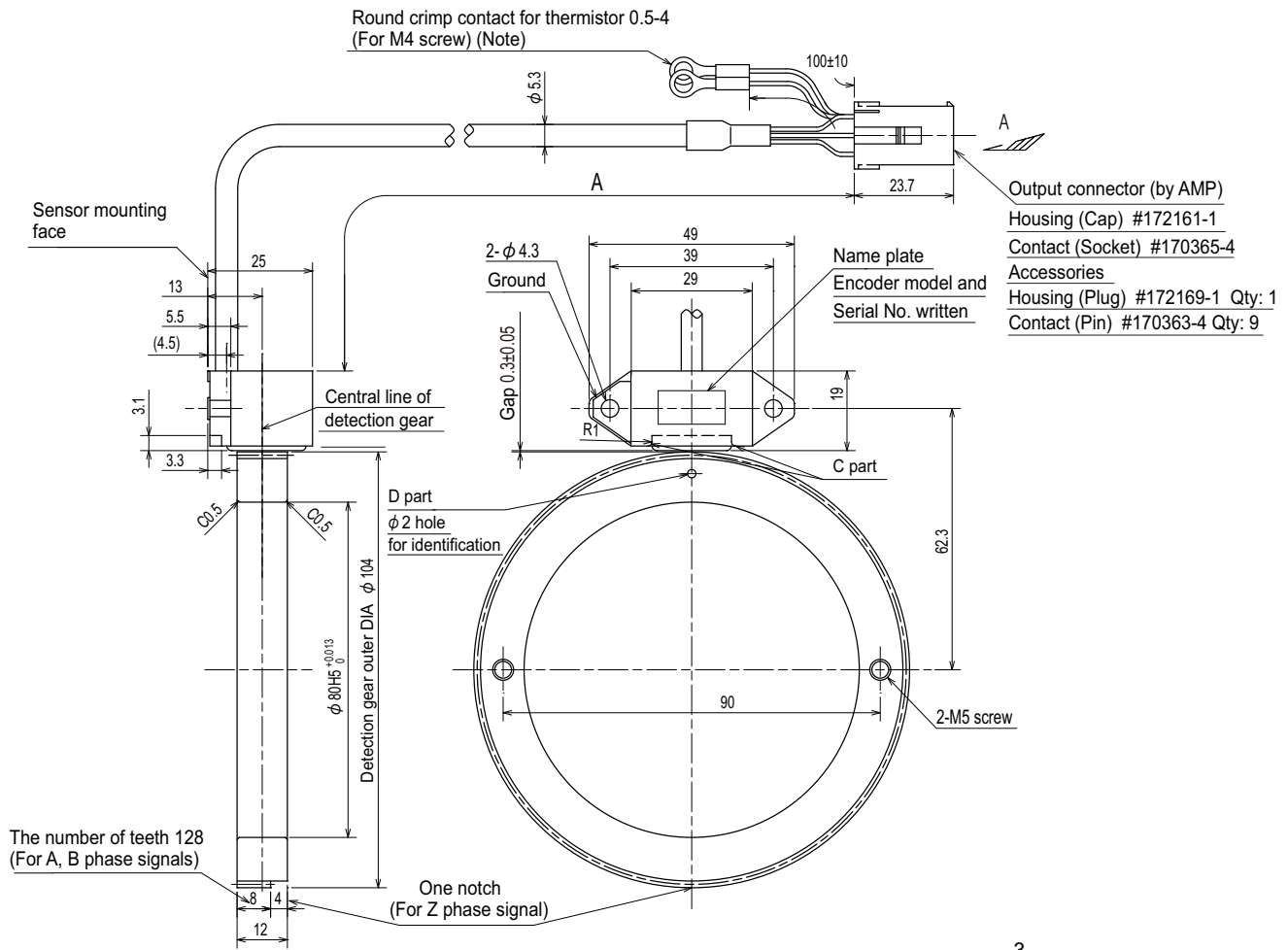


Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9019	400±10	Vertical direction	MU1606N906
TS5690N9029	800±20		
TS5690N9039	1200±20		
TS5690N9049	1600±30		
TS5690N9059	2000±30		

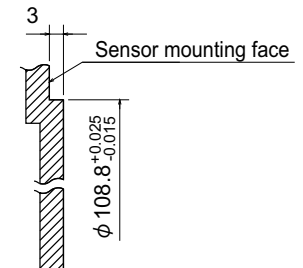


< TS5690N12x2 + MU1606N709 >

[Unit: mm]

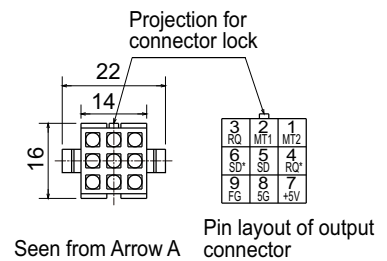


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



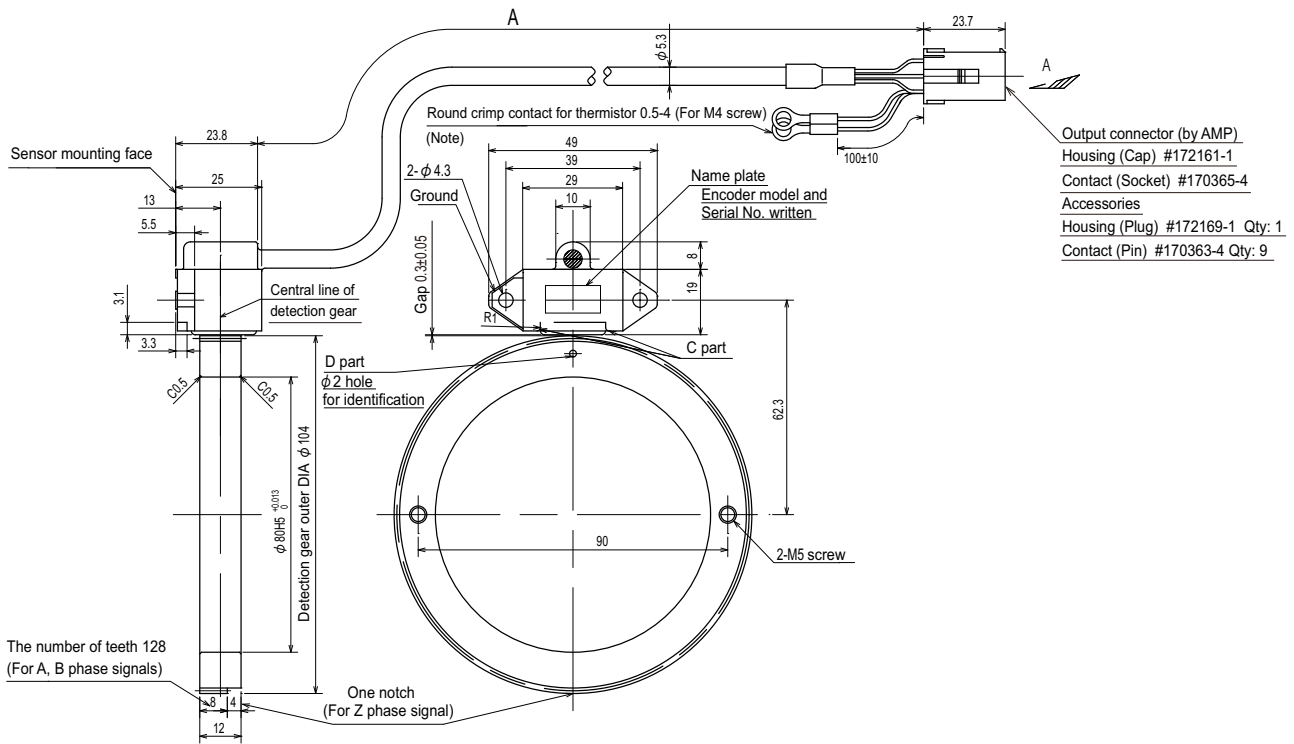
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1212	400±10	Vertical direction	MU1606N709
TS5690N1222	800±20		
TS5690N1232	1200±20		
TS5690N1242	1600±30		
TS5690N1252	2000±30		

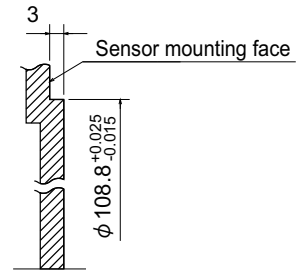


< TS5690N12x7 + MU1606N709 >

[Unit: mm]

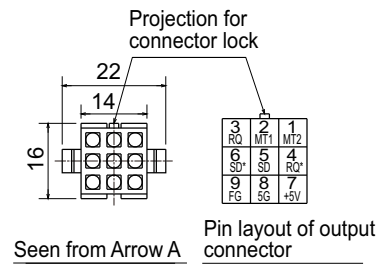


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



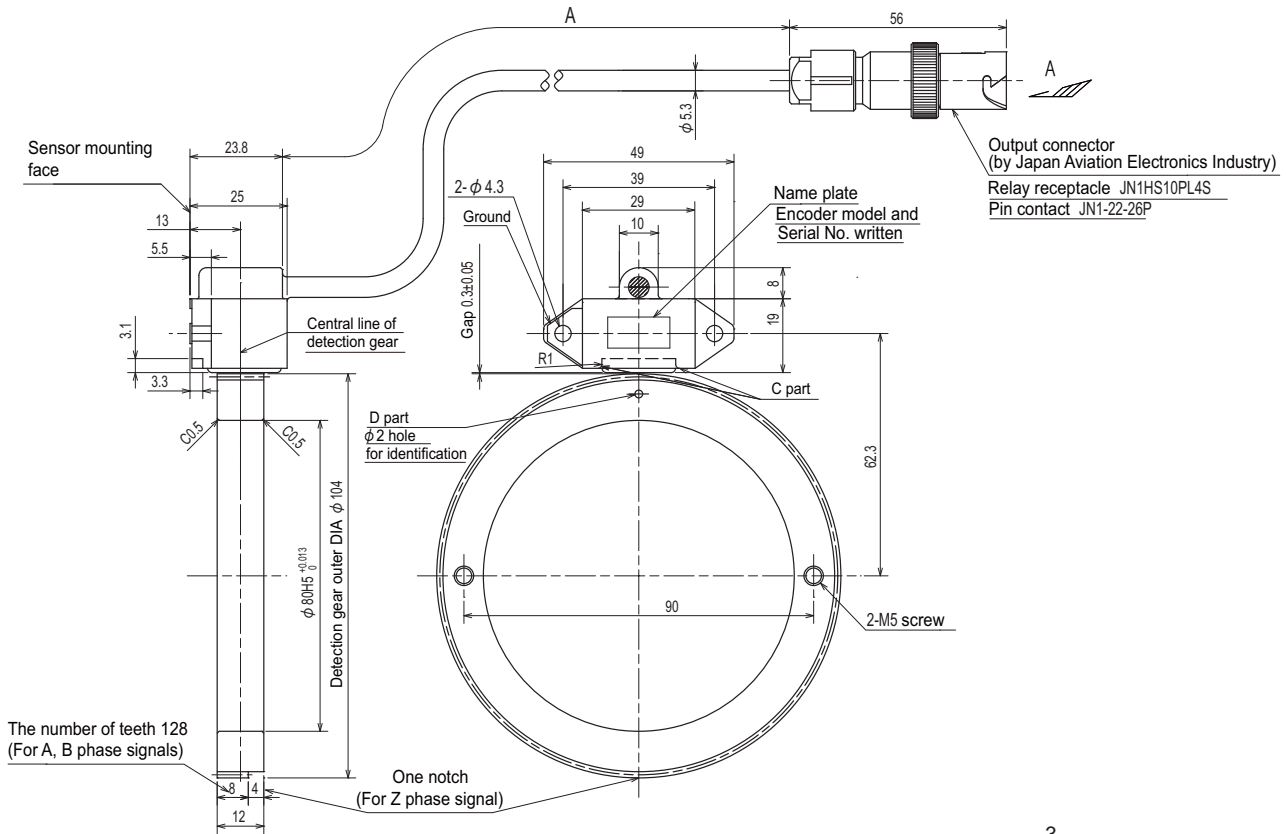
Encoder mounting face of machine side

Sensor		Lead-out direction of lead	Detection gear
Parts name	Lead wire length A [mm]		Parts name
TS5690N1217	400±10	Axis direction	MU1606N709
TS5690N1227	800±20		
TS5690N1237	1200±20		
TS5690N1247	1600±30		
TS5690N1257	2000±30		



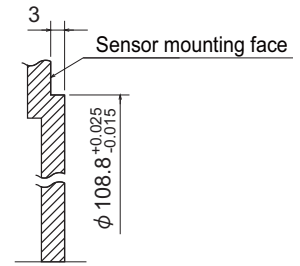
< TS5690N12x8 + MU1606N709 >

[Unit: mm]



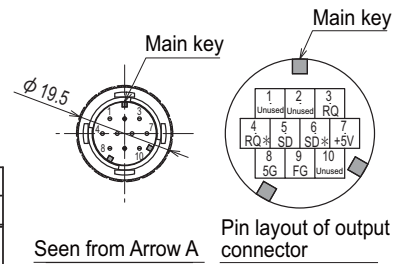
The number of teeth 128  
(For A, B phase signals)

One notch  
(For Z phase signal)



Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1218	400±10	Axis direction	MU1606N709
TS5690N1228	800±20		
TS5690N1238	1200±20		
TS5690N1248	1600±30		
TS5690N1258	2000±30		

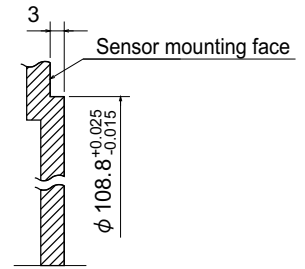
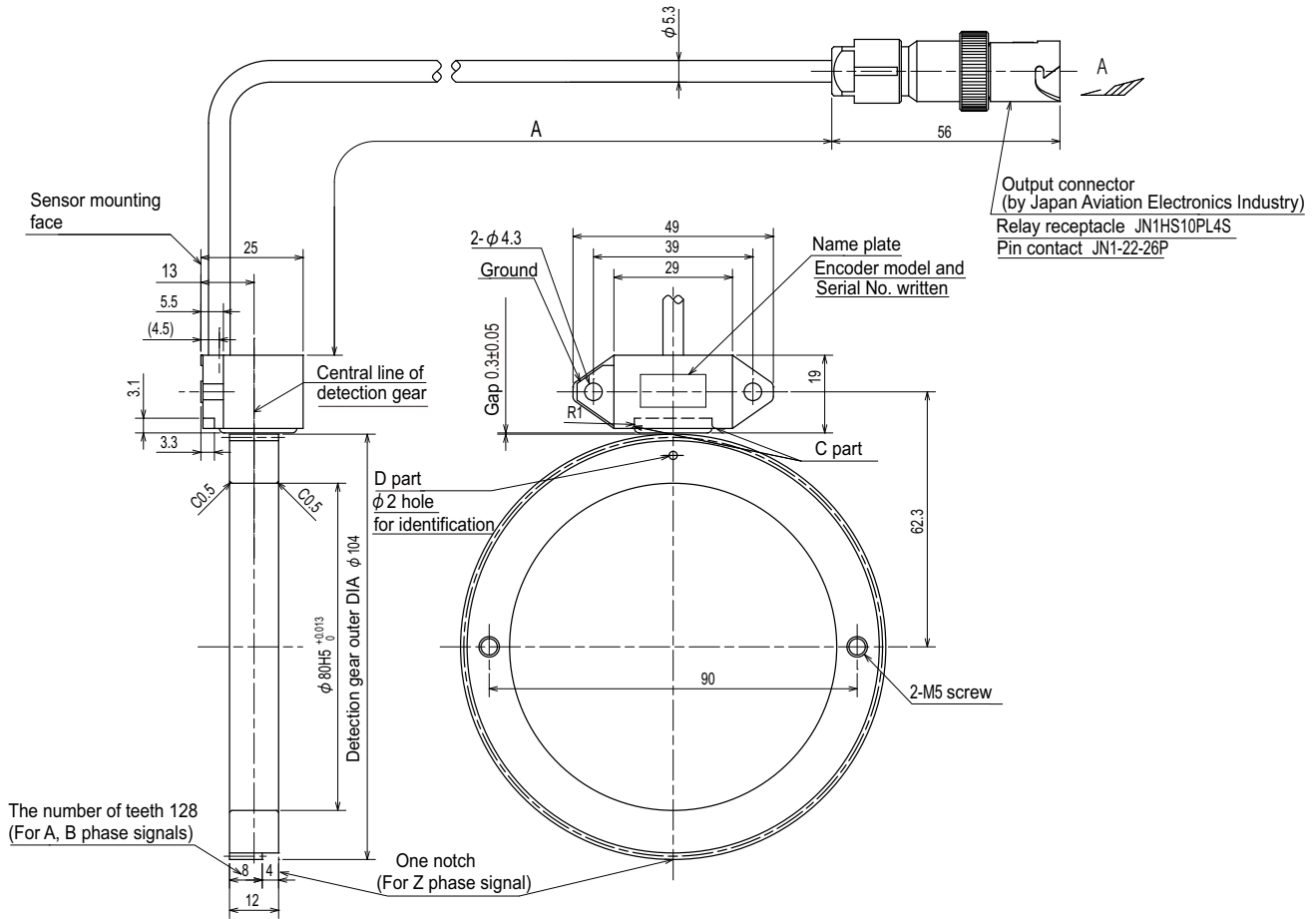


Seen from Arrow A

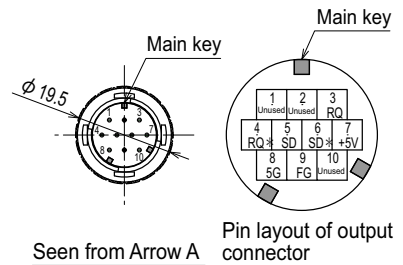
Pin layout of output connector

< TS5690N12x9 + MU1606N709 >

[Unit: mm]



Encoder mounting face of machine side



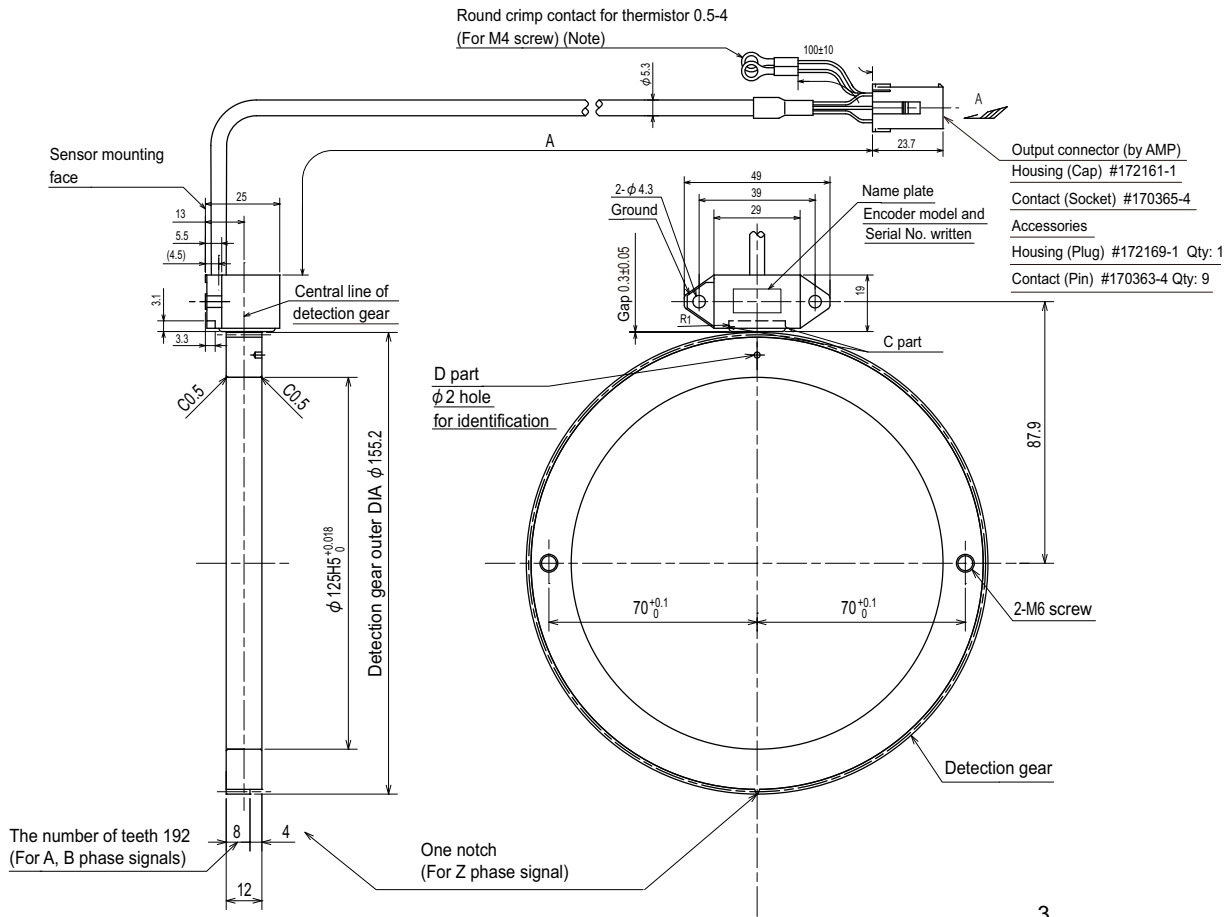
Seen from Arrow A

Pin layout of output connector

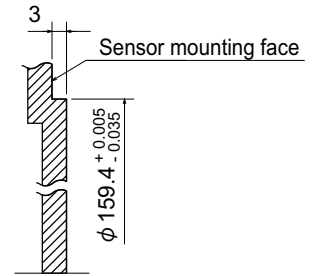
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1219	400±10	Vertical direction	MU1606N709
TS5690N1229	800±20		
TS5690N1239	1200±20		
TS5690N1249	1600±30		
TS5690N1259	2000±30		

< TS5690N19x2 + MU1606N203 >

[Unit: mm]

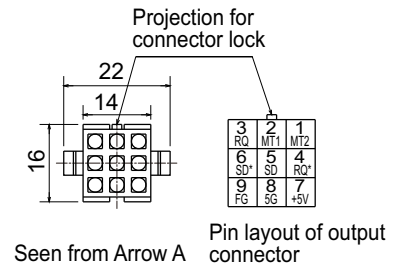


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



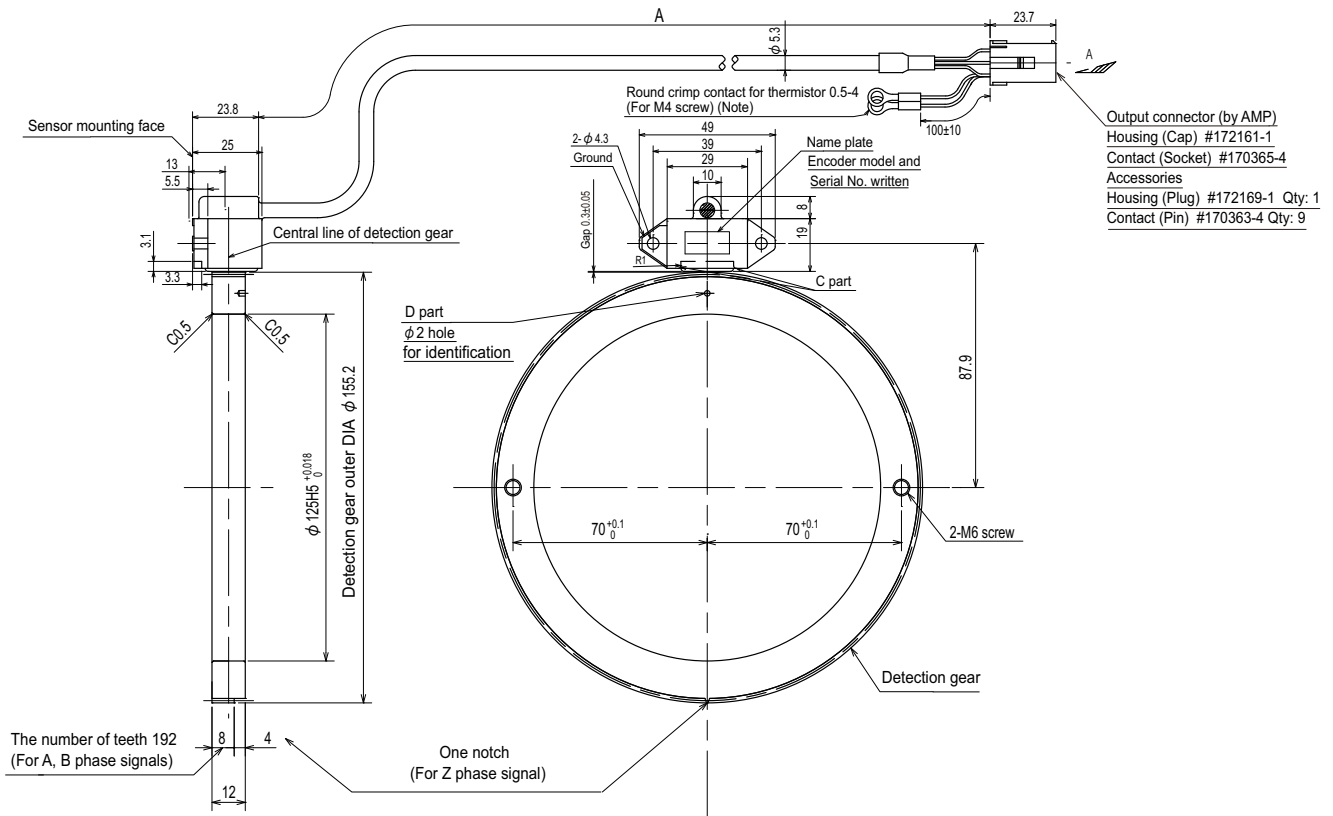
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1912	400±10	Vertical direction	MU1606N203
TS5690N1922	800±20		
TS5690N1932	1200±20		
TS5690N1942	1600±30		
TS5690N1952	2000±30		

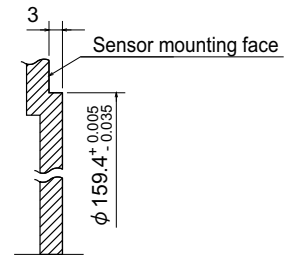


< TS5690N19x7 + MU1606N203 >

[Unit: mm]

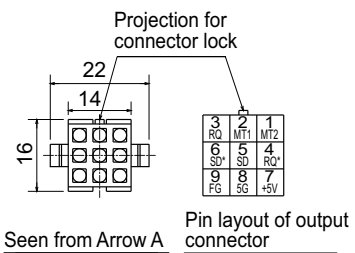


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



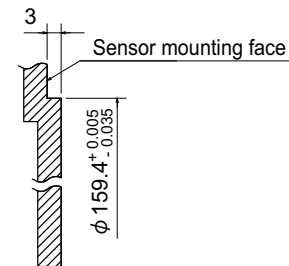
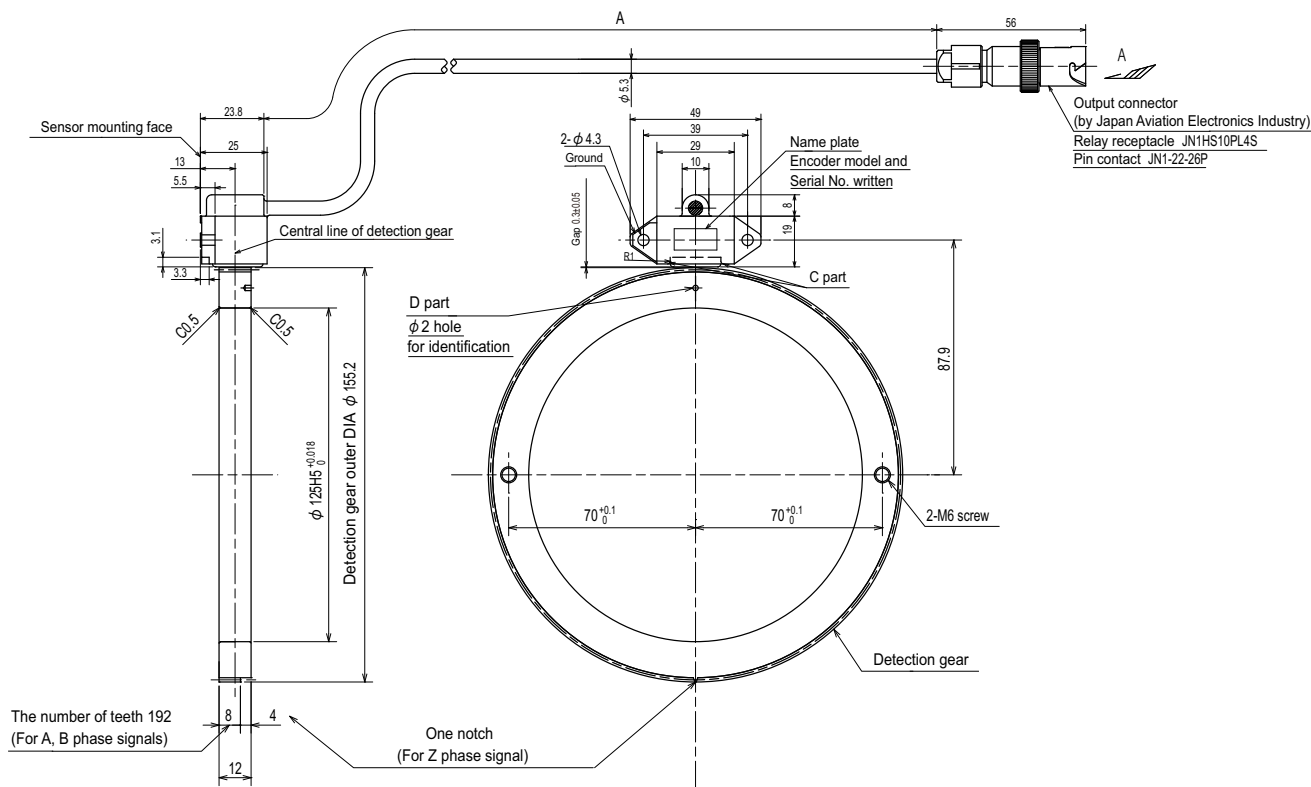
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1917	400±10	Axis direction	MU1606N203
TS5690N1927	800±20		
TS5690N1937	1200±20		
TS5690N1947	1600±30		
TS5690N1957	2000±30		

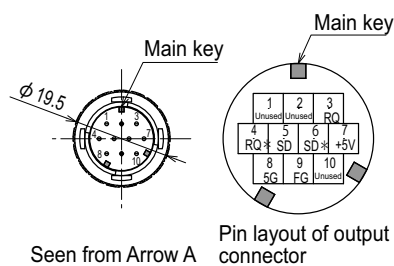


< TS5690N19x8 + MU1606N203 >

[Unit: mm]



Encoder mounting face of machine side



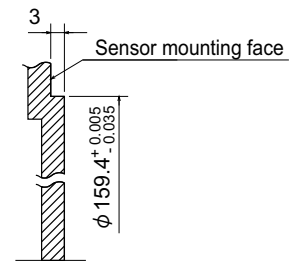
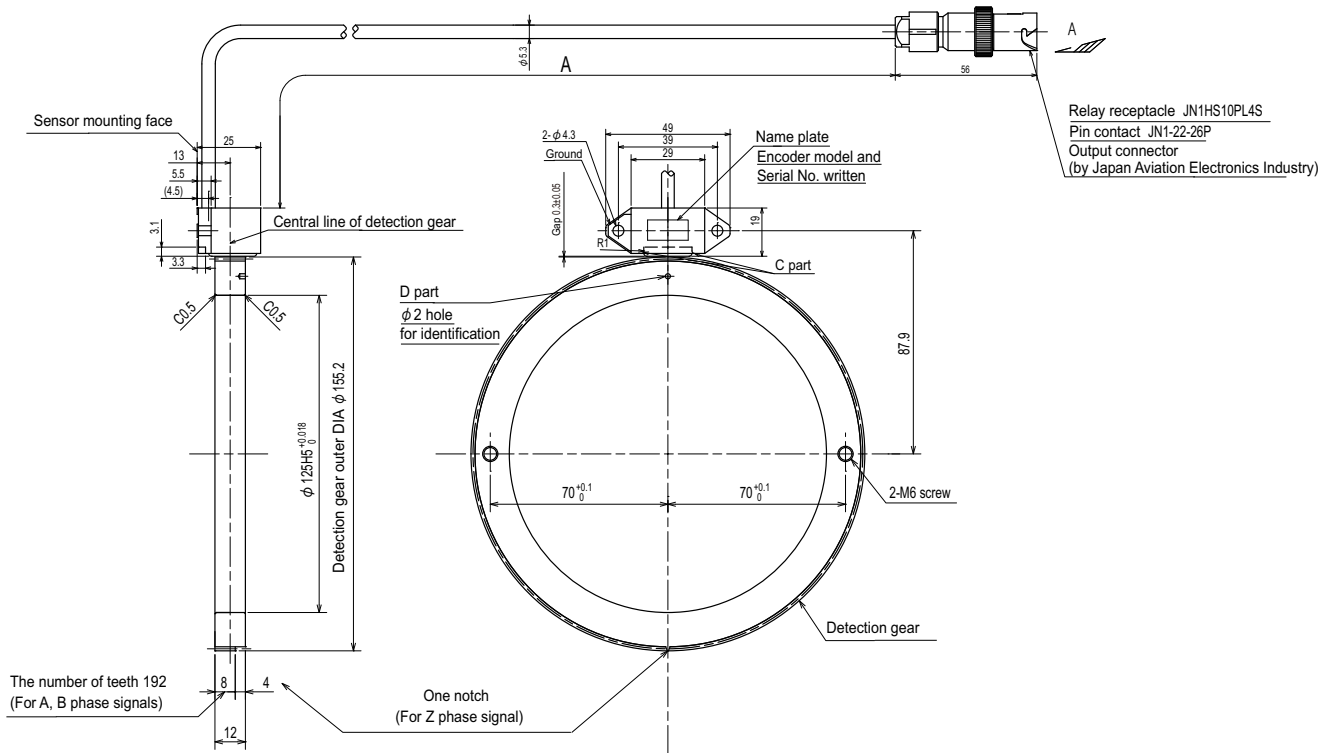
Seen from Arrow A

Pin layout of output connector

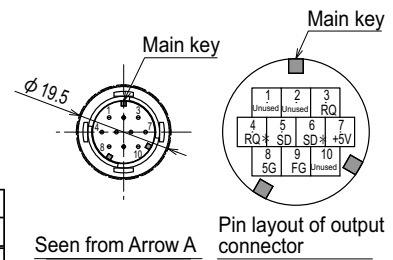
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1918	400±10	Axis direction	MU1606N203
TS5690N1928	800±20		
TS5690N1938	1200±20		
TS5690N1948	1600±30		
TS5690N1958	2000±30		

< TS5690N19x9 + MU1606N203 >

[Unit: mm]



Encoder mounting face of machine side

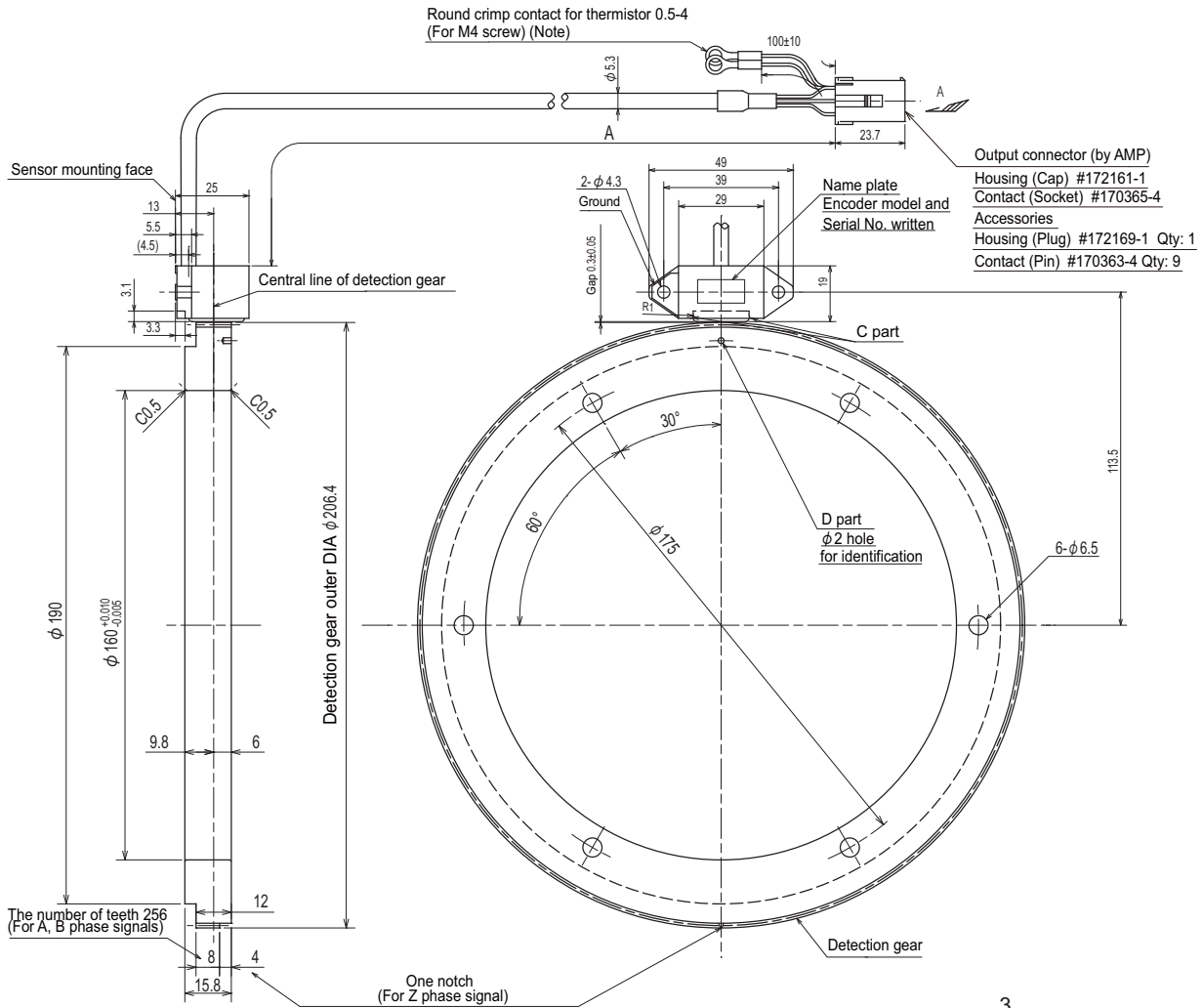


Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1919	400±10	Vertical direction	MU1606N203
TS5690N1929	800±20		
TS5690N1939	1200±20		
TS5690N1949	1600±30		
TS5690N1959	2000±30		

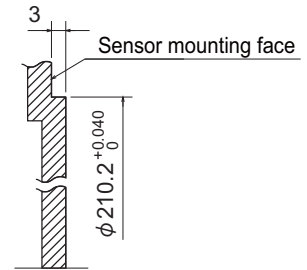


< TS5690N25x2 + MU1606N802 >

[Unit: mm]

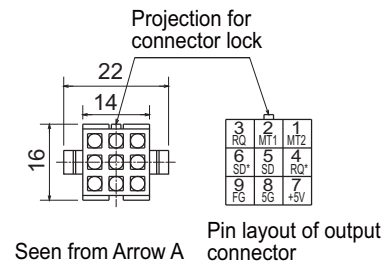


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder.  
Insulate the terminal.



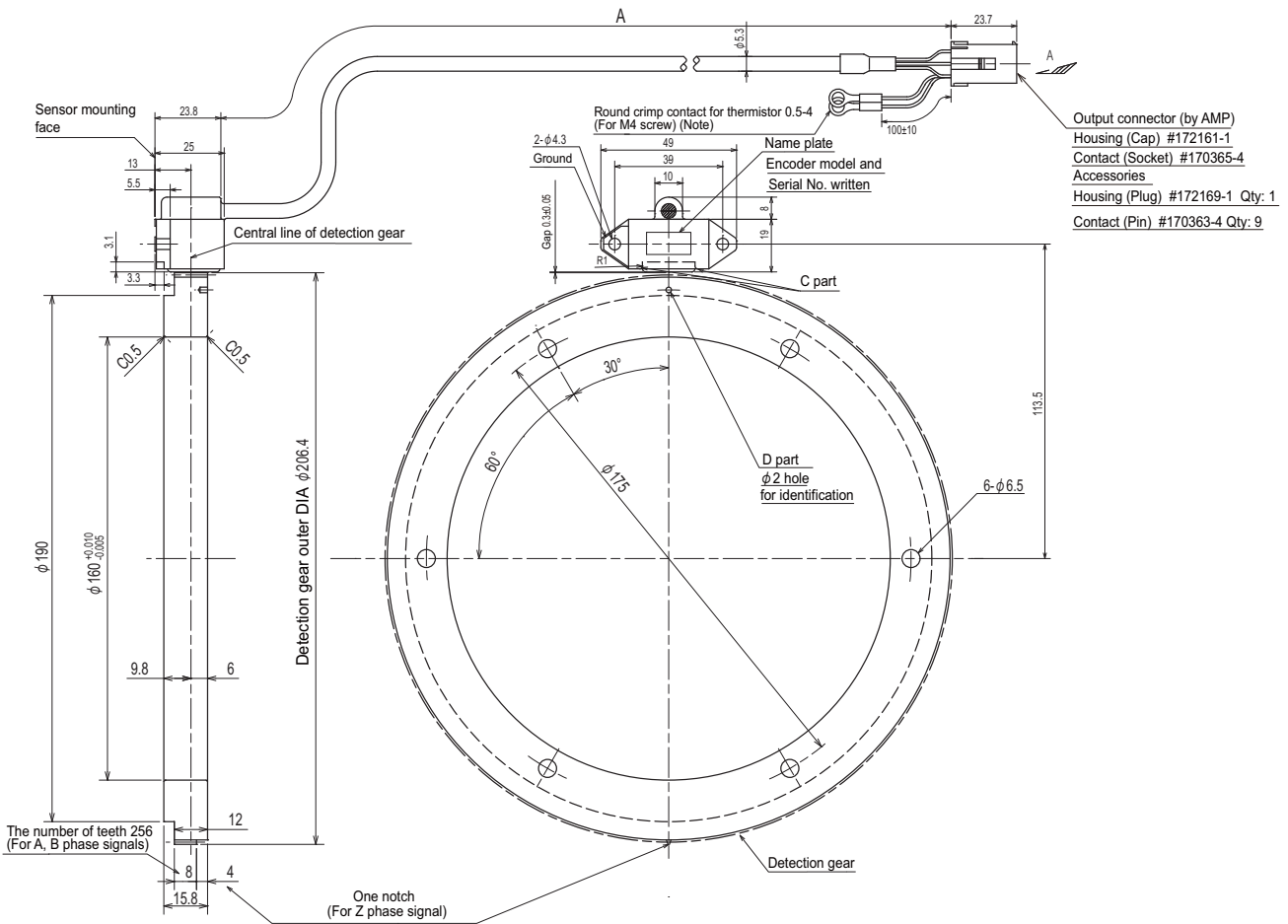
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2512	400±10	Vertical direction	MU1606N802
TS5690N2522	800±20		
TS5690N2532	1200±20		
TS5690N2542	1600±30		
TS5690N2552	2000±30		

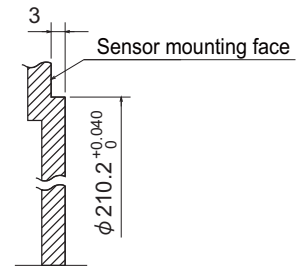


< TS5690N25x7 + MU1606N802 >

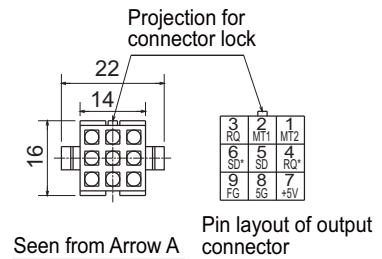
[Unit: mm]



(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



Encoder mounting face of machine side



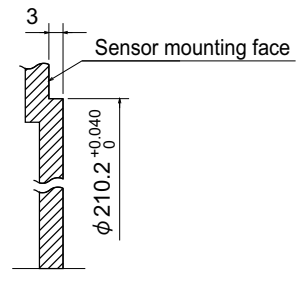
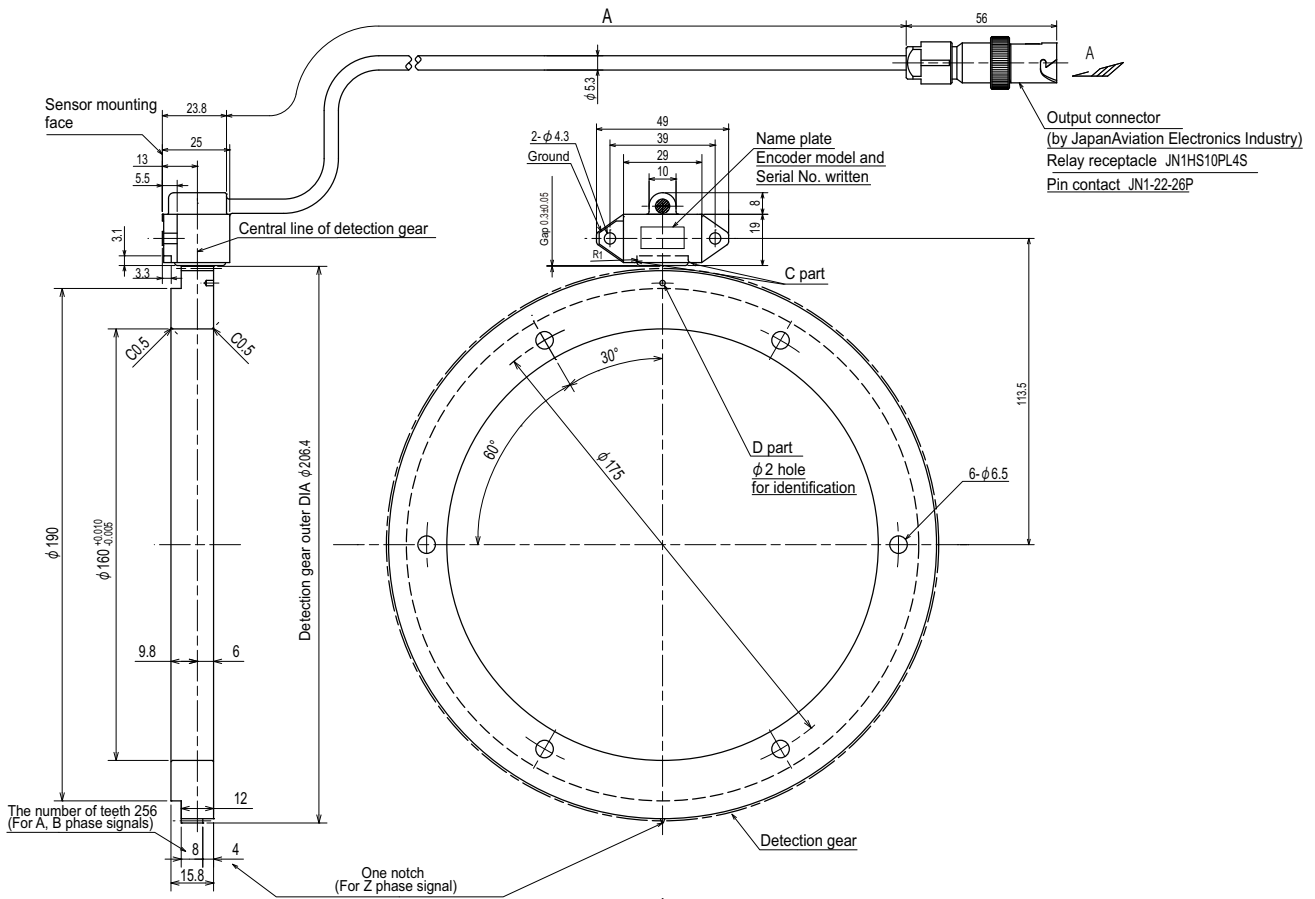
Seen from Arrow A

Pin layout of output connector

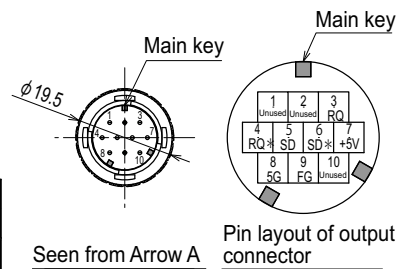
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2517	400±10	Axis direction	MU1606N802
TS5690N2527	800±20		
TS5690N2537	1200±20		
TS5690N2547	1600±30		
TS5690N2557	2000±30		

< TS5690N25x8 + MU1606N802 >

[Unit: mm]



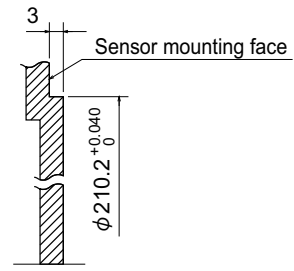
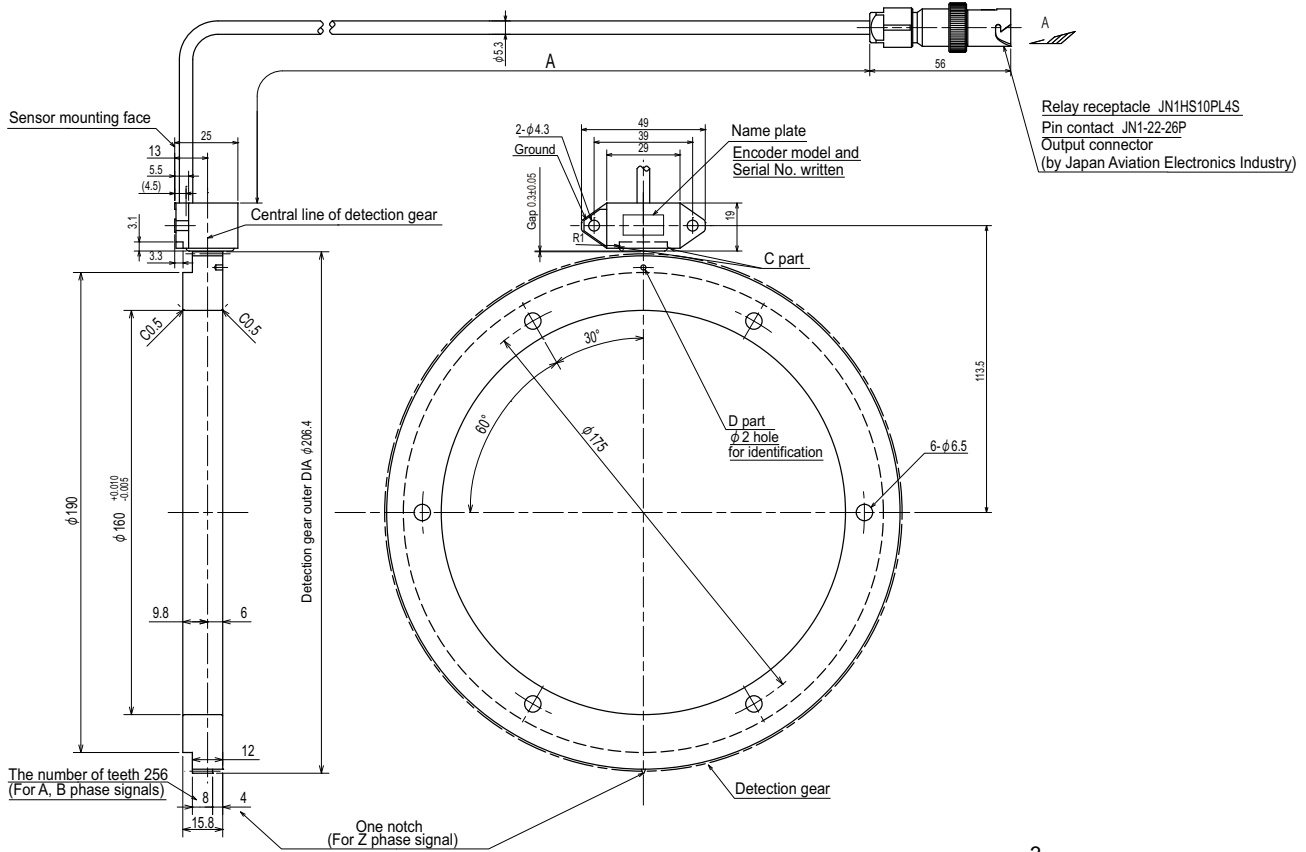
Encoder mounting face of machine side



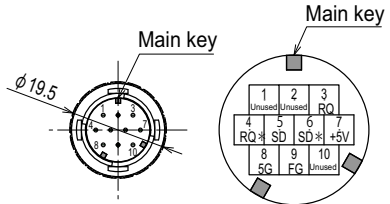
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2518	400±10	Axis direction	MU1606N802
TS5690N2528	800±20		
TS5690N2538	1200±20		
TS5690N2548	1600±30		
TS5690N2558	2000±30		

< TS5690N25x9 + MU1606N802 >

[Unit: mm]



Encoder mounting face of machine side



Seen from Arrow A

Pin layout of output connector

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2519	400±10	Vertical direction	MU1606N802
TS5690N2529	800±20		
TS5690N2539	1200±20		
TS5690N2549	1600±30		
TS5690N2559	2000±30		

## Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR

This unit superimposes the scale analog output raw waves, and generates high resolution position data. Increasing the encoder resolution is effective for the servo high-gain.

## (1) Specifications

Type	MDS-EX-HR-11
Consumption current	150mA
Analog signal input specifications	A -phase, B -phase, Z-phase (Amplitude 1Vp-p/ Min.: 0.8Vp-p Max.: 1.2Vp-p)
Compatible frequency	Analog raw waveform max.200kHz
Scale resolution	Analog raw waveform / 16384 division
Output communication style	High-speed serial communication
Working ambient temperature	0 to 55°C
Working ambient humidity	90%RH or less (with no dew condensation)
Atmosphere	No toxic gases
Tolerable vibration	98.0 m/s <sup>2</sup> (10G)
Tolerable impact	294.0 m/s <sup>2</sup> (30G)
Tolerable power voltage	5VDC±5%
Maximum heating value	2W
Cable length	Drive side: Max. 30m / Encoder side: Max. 15m
Mass	0.2kg
Degree of protection	IP67

(Note) For the encoder side cable, wire the power line redundantly so that the voltage supplied to the encoder will not drop below the minimum tolerance.

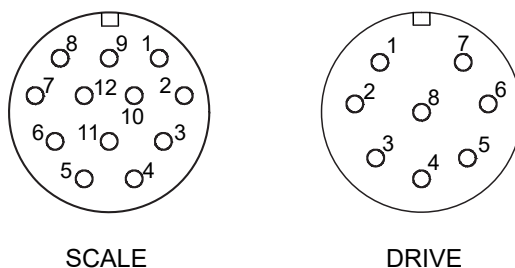
(2) Explanation of connectors

Connector name	Application
SCALE	For connection with scale
DRIVE	For connection with servo drive unit

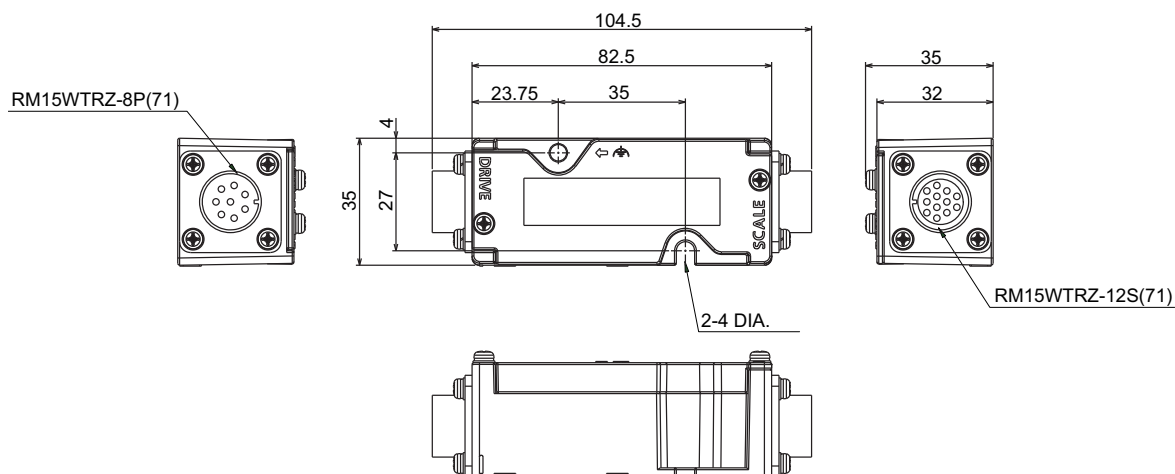
SCALE		DRIVE	
Pin No.	Function	Pin No.	Function
1	A+ signal	1	RQ+ signal
2	A- signal	2	RQ- signal
3	B+ signal	3	SD+ signal
4	B- signal	4	SD- signal
5	Z+ signal	5	P5
6	Z- signal	6	P5
7	-	7	GND
8	-	8	GND
9	-		
10	-		
11	P5		
12	GND		

< Connector pin layout >

Connector	Type
SCALE	RM15WTRZ-12S(71) (Hirose Electric)
DRIVE	RM15WTRZ- 8P(71) (Hirose Electric)

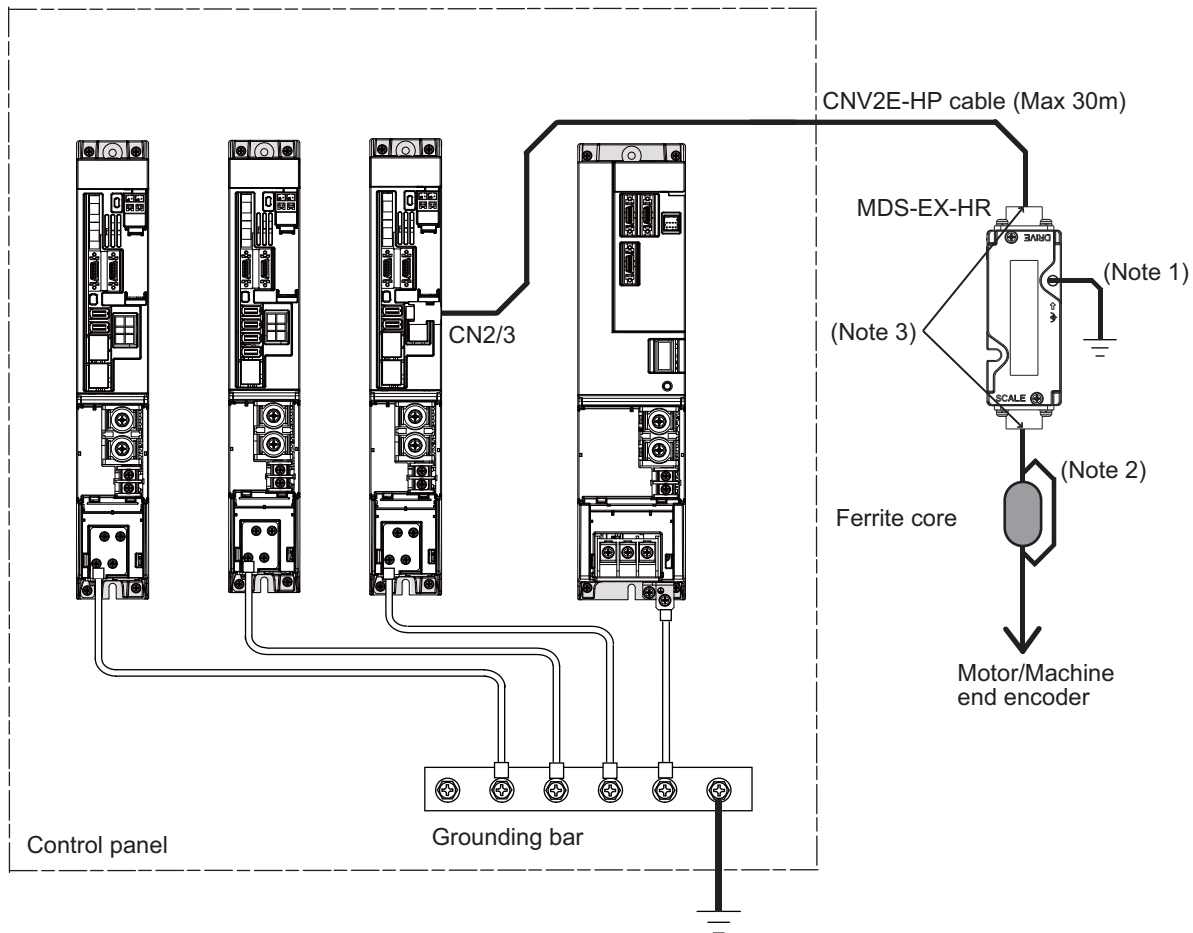


(3) Outline dimension drawings



[Unit:mm]

(4) Example of wiring  
< MDS-E Series >



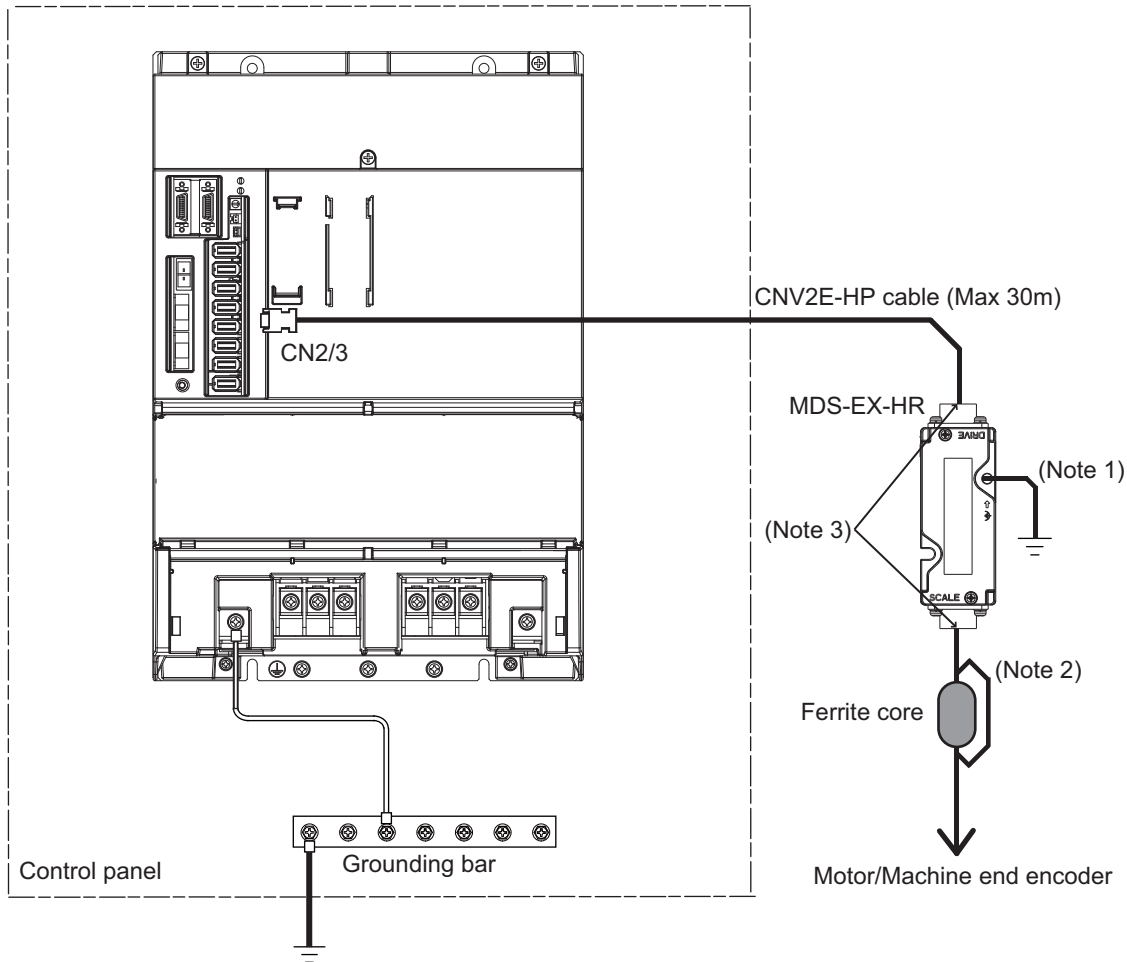
(Note 1) Ground the MDS-EX-HR unit.

(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.

< MDS-EM Series >



(Note 1) Ground the MDS-EX-HR unit.

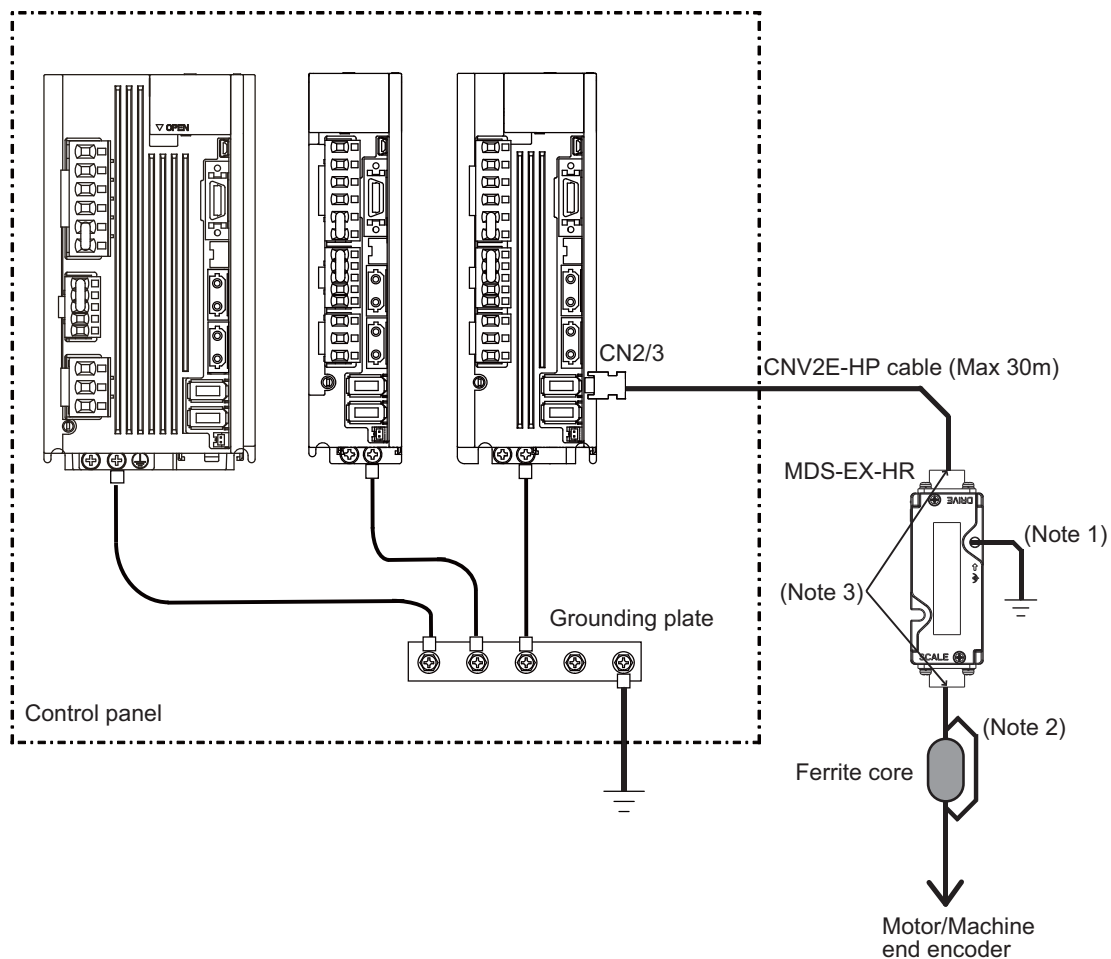
(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.



< MDS-EJ Series >



(Note 1) Ground the MDS-EX-HR unit.

(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.

## Serial Signal Division Unit MDS-B-SD

This unit has a function to divide the position and speed signals fed back from the high-speed serial encoder and high-speed serial linear scale. This unit is used to carry out synchronized control of the motor with two MDS-E-V1 drive units.

## (1) Specifications

Type	MDS-B-SD
Compatible servo drive unit	MDS-E-V1-□
Input/output communication style	High-speed serial communication I/F, RS485 or equivalent
Working ambient temperature	0 to 55°C
Working ambient humidity	90%RH or less (with no dew condensation)
Atmosphere	No toxic gases
Tolerable vibration	98.0 m/s <sup>2</sup> (10G)
Tolerable impact	294.0 m/s <sup>2</sup> (30G)
Tolerable power voltage	5VDC±10%
Maximum heating value	4W
Mass	0.5kg or less
Degree of protection	IP20

**POINT**

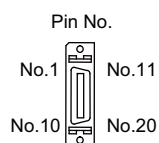
Always provide one MDS-B-SD unit for one speed command synchronous control operation.  
The CN2 system's CN2A and the CN3 system's CN3A cannot be connected to different servo drive units.

## (2) Explanation of connectors

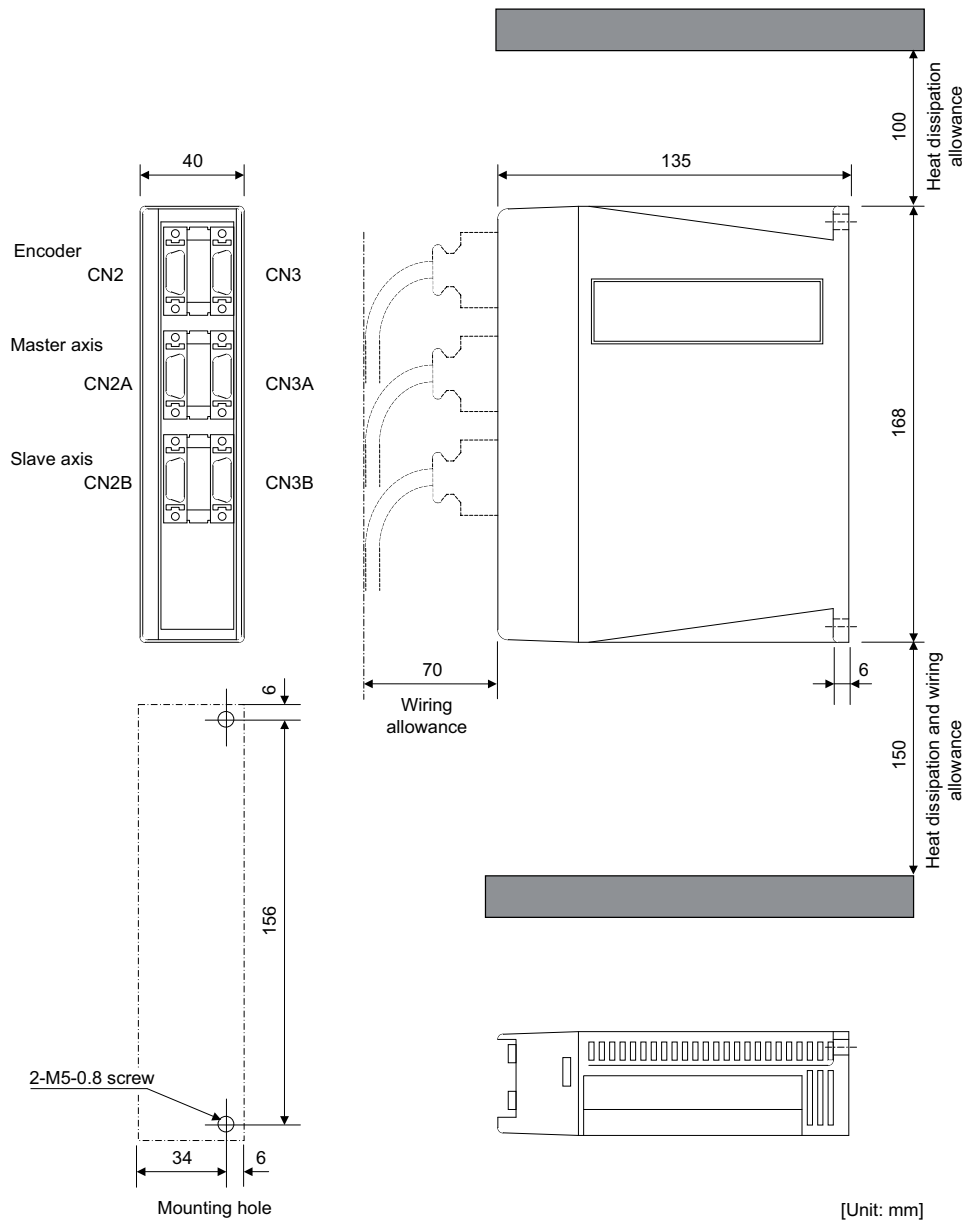
Encoder connector : CN2			
Pin No.	Name	Pin No.	Name
1	LG	11	LG
2		12	
3		13	
4		14	
5		15	
6	SD	16	SD*
7	RQ	17	RQ*
8		18	
9	BAT	19	
10	P5 (+5V)	20	P5 (+5V)

< Connector pin layout >

Encoder connector : CN2



(3) Outline dimension drawings



## DC Connection Bar

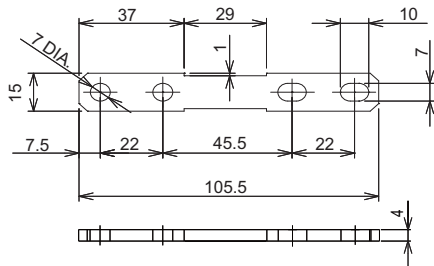
When connecting a large capacity drive unit with L+L- terminal of power supply unit, DC connection bar is required. In use of the following large capacity drive units, use a dedicated DC connection bar. The DC connection bar to be used depends on the connected power supply, so make a selection according to the following table.

Large capacity drive unit	Power supply unit	Required connection bar
MDS-E-SP-400 MDS-E-SP-640	MDS-E-CV-300 MDS-E-CV-370 MDS-E-CV-450	E-BAR-B0606
MDS-E-SP-400 MDS-E-SP-640	MDS-E-CV-550	E-BAR-A0606 (Two-parts set)

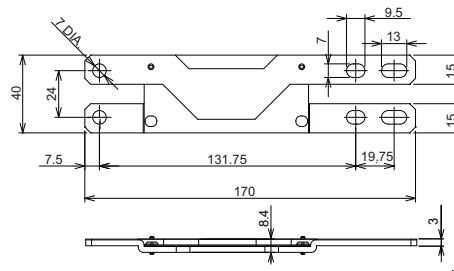
### (1) Outline dimension drawings

[Unit:mm]

E-BAR-A0606



E-BAR-B0606



(Note) E-BAR-A0606 is a set of two DC connection bars.



### POINT

Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

## Power Backup Unit (MDS-D-PFU)

MDS-D-PFU unit is a system to protect the machine and the drive units safely by decelerating and stopping the motor at power failure.

### (1) Type configuration

MDS- (1) -PFU

(1)

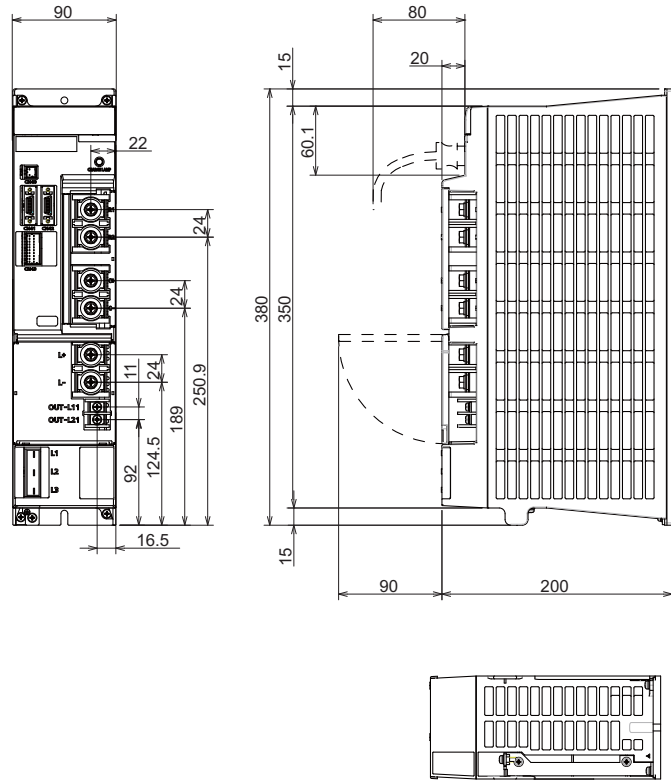
Symbol	Voltage class
D	200V
DH	400V

### (2) Specifications

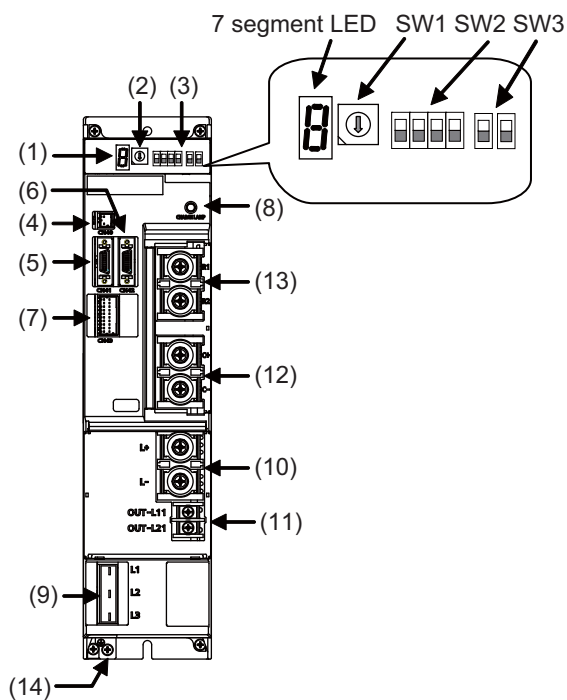
Model Name		MDS-D-PFU
AC Input	Rated voltage [V]	200 to 230AC (50/60Hz) Tolerable fluctuation : between +10% and -15%
	Frequency [Hz]	50/60 Tolerable fluctuation : between +3% and -3%
	Rated current [A]	4
DC Input and output	Rated voltage [V]	270 to 311DC
	Rated current [A]	Regenerating Input: MAX 300A Powering Output: MAX 200A
AC output for control power supply backup	Voltage [V]	Single phase 200 to 230VAC (50Hz or 60Hz) 50Hz at backup
	Current [A]	MAX 4
	Maximum number of connectable drive units	6 (excluding power supply units)
	Changeover time	100ms or less after instantaneous interruption of AC input
	Minimum backup time	75ms or longer (When 200VAC is input and the maximum number of connectable drive units is connected)
Degree of protection		IP20 (Except for Terminal block and Connector)
Environment	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		4

(3) Outline dimension drawings  
< MDS-D-PFU >

[Unit : mm]

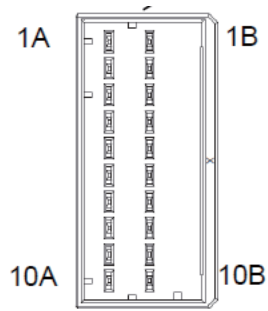


(4) Explanation of each part  
< MDS-D-PFU >



		Name	Application	Screw size	Compatible wire
(1)	Control circuit	LED	Unit status indication 7 segment LED	---	---
(2)		SW1	Function setting rotary switch	---	---
(3)		SW2,SW3	Function setting DIP switch	---	---
(4)		CN40	(Not used)	---	---
(5)		CN41	For connecting MDS-E-CV	---	---
(6)		CN42	Maintenance	---	---
(7)		CN43	DIO	---	---
(8)		Charge LED	---	Voltage status indication between TE4 terminals	---
(9)	Main circuit	TE1	L1 L2 L3 Control power input terminal (Three-phase AC input)	---	AWG#14 (2mm <sup>2</sup> )
(10)		TE2	L+ L- Power backup unit voltage input/output terminal Connected to the L+ and L- terminals of the power supply unit	M6×18 Tightening torque 4.0Nm	AWG#4 (22 mm <sup>2</sup> ) or above
(11)		TE3	OUT-L11 OUT-L21 Power backup unit voltage output terminal (AC output) Connected to the L11 and L21 terminals of the power supply unit and drive unit	M4×10 Tightening torque 1.2Nm	AWG#14 (2mm <sup>2</sup> )
(12)		TE4	C+ C- Capacitor unit connection terminal	M6×18 Tightening torque 4.0Nm	AWG#10 (5.5 mm <sup>2</sup> )
(13)		TE5	R1 R2 Regenerative resistor connection terminal	M6×18 Tightening torque 4.0Nm	AWG#10 (5.5 mm <sup>2</sup> )
(14)		PE	Grounding terminal	M4×12 Tightening torque 1.2Nm	AWG#14 (2mm <sup>2</sup> )

(5) Explanation of connectors  
 < CN43 connector >



No.	Signal name	Function	Description
1B	24VOUT	Internal 24V output	Internal 24V output. This enables connection to the 24V input power supply for DO. (Note that the DO output current should be 100mA or less.)
2B	DO_COM	DO common terminal	Common terminal for DO output circuit
5B	DO2	Tool escape request	ON:Normal, OFF: Tool escape request
10B	THM1	Thermal error detection	Shorted: Normal, Open: Error detection
1A	24GOUT	Internal 24V output GND	
2A	DO_COM2	DO common terminal 2	
3A	DO_COM2	DO common terminal 2	
10A	THM2(24GOUT)	Thermal error detection	GND for internal 24V input



## Regenerative Resistor for Power Backup Unit (R-UNIT-7)

Check the availability of connection of the power backup unit and the regenerative resistor for the power backup unit. The regenerative resistor generates heats, so wire and install the unit while taking care to safety.

### (1) Specifications

Model Name		R-UNIT-7
Compatible power backup unit name		MDS-D-PFU
Resistance value [ $\Omega$ ]		1.4
Instantaneous regeneration capacity [kW]		114
Allowable regeneration workload [kJ]		180
Environment	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		10

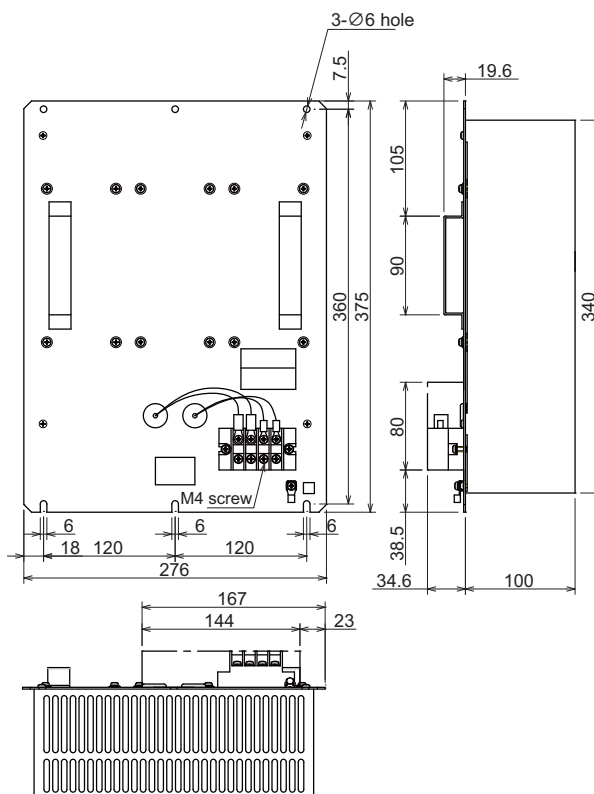
### CAUTION

- Only the designated combination can be used for the power backup unit and the regenerative resistor for the power backup unit.  
There is a risk of fire, so always use the designated combination.
- Select the function selection rotary switch (SW1) of the power backup unit according to the regenerative resistor for the power backup unit to be used.

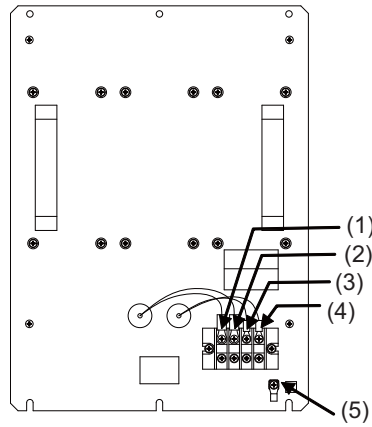
### (2) Outline dimension drawings

< R-UNIT-7 >

[ Unit : mm ]



(3) Explanation of each part  
< R-UNIT-7 >



Name		Function	Compatible wire	Terminal specification
(1)	R1	PFU connection terminal	AWG10 (5.5 mm <sup>2</sup> )	M4 screw
(2)	R2			Compatible crimp terminal: Round: Up to 5.5-4
(3)	AL1	Thermal connection output terminal	AWG#18 to AWG#24 (0.75mm <sup>2</sup> to 0.2mm <sup>2</sup> )	M4 screw
(4)	AL2			Compatible crimp terminal: Round: Up to 1.25-4
(5)	E	Grounding terminal	AWG10 (5.5 mm <sup>2</sup> )	M4 screw Compatible crimp terminal: Round: Up to 5.5-4

## Capacitor Unit for Power Backup Unit (MDS-D-CU)

Check the availability of connection of the power backup unit and the capacitor unit. The powering energy at retraction/tool escape is supplied to the capacitor unit.

### (1) Specifications

Model Name		MDS-D-CU
Compatible power backup unit name		MDS-D-PFU
Capacity [ $\mu$ F]		28000
DC Input and output	Rated voltage [V]	DC270 to 311
	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
Environment	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		11

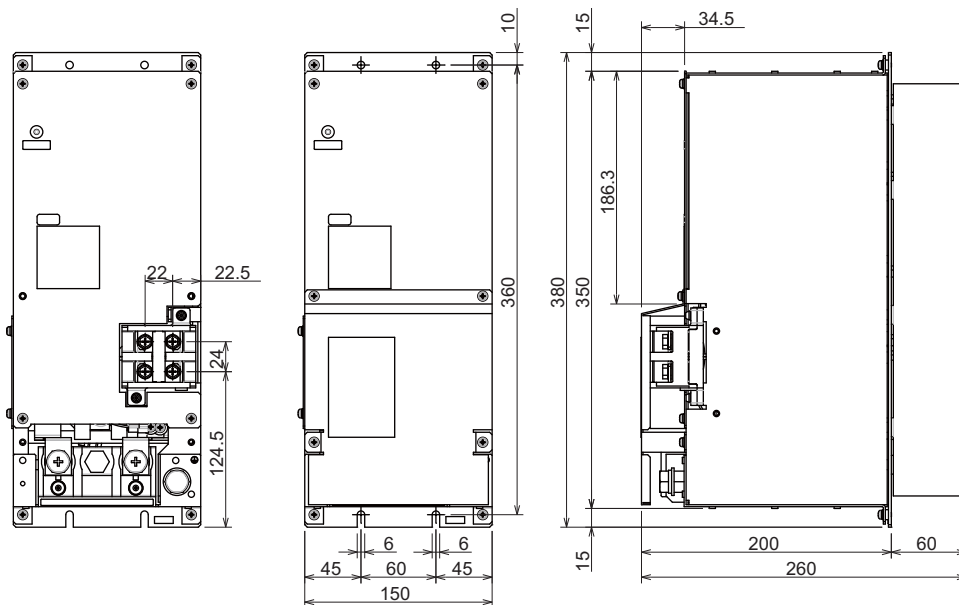
### CAUTION

1. Only the designated combination can be used for the power backup unit and the capacitor unit.  
There is a risk of fire, so always use the designated combination.
2. Do not reverse the polarity when connecting.
3. When using the retraction/tool escape function, the supported software version for the power backup unit is A1 or later.
4. Select the function setting dip switch (SW2) of the power backup unit according to the capacitor unit to be used.

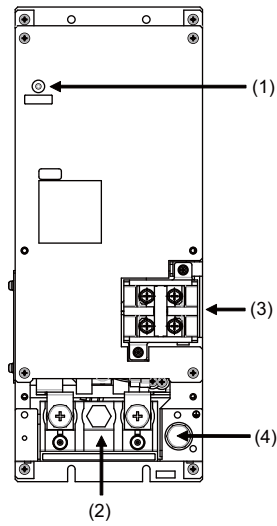
### (2) Outline dimension drawings

< MDS-D-CU >

[Unit : mm]



(3) Explanation of each part  
< MDS-D-CU >



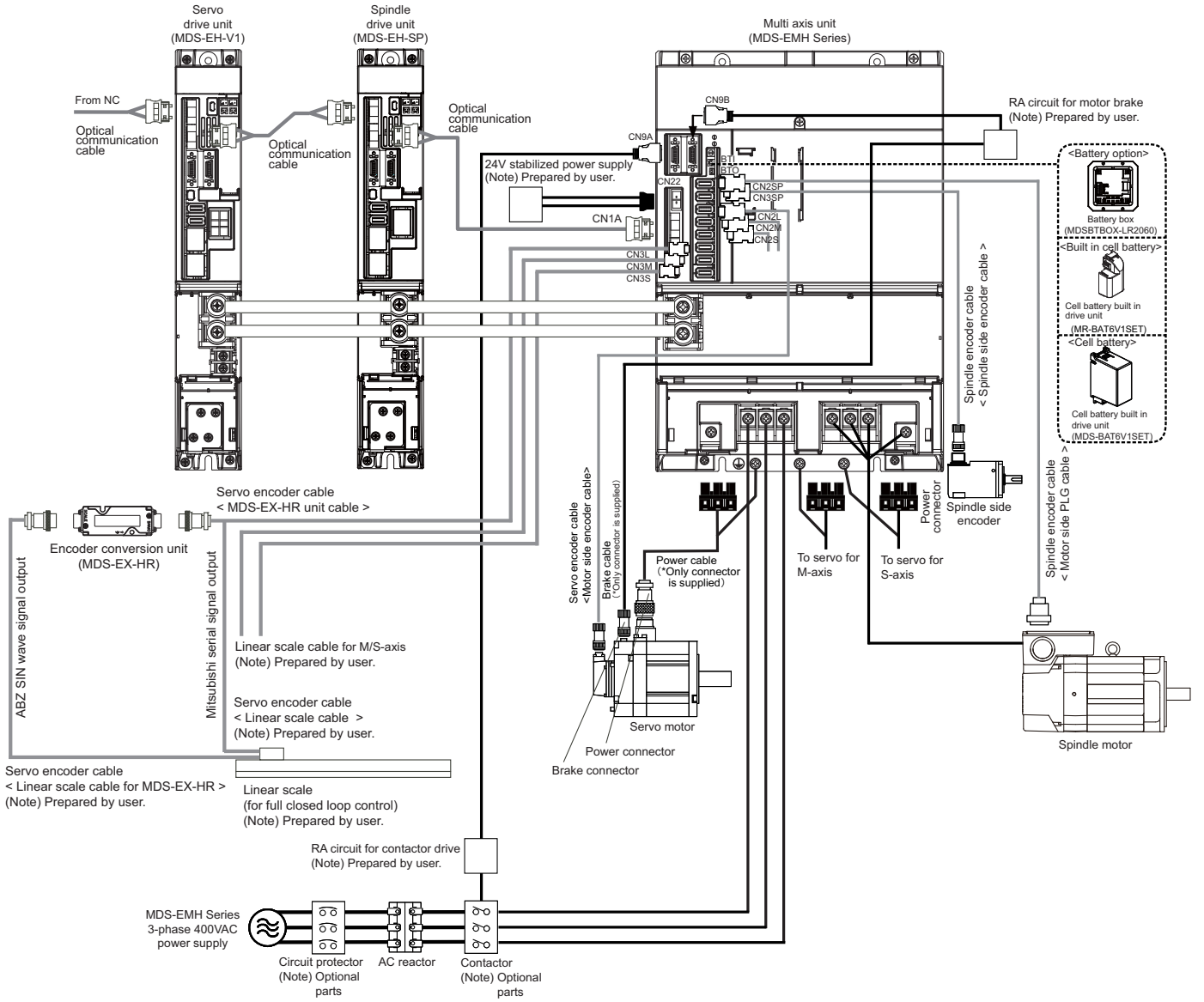
	Name		Function	Compatible wire	Terminal specification
(1)	Charge LED	---	Voltage status indication between TE1 terminals	---	---
(2)	TE1	C+ C-	PFU connection terminal	AWG#4 (22 mm <sup>2</sup> )	M10 screw Compatible crimp terminal: Round Up to 8-10
(3)	TE2	C+ C-	Capacitor unit connection terminal (for extension)	AWG#4 (22 mm <sup>2</sup> )	M6 screw Compatible crimp terminal: Round Up to 8-6
(4)	PE		Grounding terminal	AWG#10 (5.5mm <sup>2</sup> )	M10 screw Compatible crimp terminal: Round Up to 8-10



# 400V System Servo/spindle Drive System



< MDS-EMH Series >







# Explanation of Type

## 1. Servo motor type

### < HG-H Series >

HG-H (1) (2) (3) - (4) - (5)

(1) Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
75	0.75 kW	5000r/min	90 SQ.
105	1.0 kW	5000r/min	90 SQ.
54	0.5kW	4000r/min	130 SQ.
104	1.0kW	4000r/min	130 SQ.
154	1.5kW	4000r/min	130 SQ.
224	2.2kW	4000r/min	130 SQ.
204	2.0kW	4000r/min	176 SQ.
354	3.5kW	4000r/min	176 SQ.
453	4.5kW	3500r/min	176 SQ.
703	7.0kW	3000r/min	176 SQ.
903	9.0kW	3000r/min	204 SQ.
1502	15.0kW	2500r/min	250 SQ.

(3) Shaft end structure

Symbol	Shaft end structure
S	Straight
T	Taper

(Note) "Taper" is available for the motor whose flange size is 90 SQ. mm or 130 SQ. mm.

(5) Encoder

Symbol	Type	Detection method	Resolution
D48	OSA24RS	Absolute position	1,048,576 p/rev
D51	OSA405S5AS		4,194,304 p/rev
D74	OSA676S5AS		67,108,864 p/rev

(2) Magnetic brakes

Symbol	Magnetic brakes
None	None
B	With magnetic brakes

(Note) Magnetic brakes cannot be used for HG-H1502.

(4) Power connector

Symbol	Connector
None	Normal
S105010	Compact (horizontal direction)

(Note) S105010 can only be used with HG-H75/105.

### < HQ-H Series >

HQ-H (1) (2) S- (3)

(1) Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
903	9.0kW	3000r/min	220 SQ.
1103	11.0kW	3000r/min	220 SQ.

(3) Encoder

Symbol	Type	Detection method	Resolution
D48	OSA24RS	Absolute position	1,048,576 p/rev
D51	OSA405S5AS		4,194,304 p/rev
D74	OSA676S5AS		67,108,864 p/rev

(2) Magnetic brakes

Symbol	Magnetic brakes
None	None
B	With magnetic brakes

### < HK-H Series >

HK-H (1) (2) (3) - (4)

(1) Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
76	0.75 kW	6700 r/min	90 SQ.
105	1.0 kW	5000 r/min	90 SQ.
55	0.5 kW	5000 r/min	130 SQ.
104	1.0 kW	4500 r/min	130 SQ.
123	1.2 kW	3500 r/min	130 SQ.
154	1.5 kW	4500 r/min	130 SQ.
223	2.2 kW	3000 r/min	130 SQ.
224	2.2 kW	4500 r/min	130 SQ.
204	2.0 kW	4000 r/min	176 SQ.
302	3.0 kW	2000 r/min	176 SQ.
303	3.0 kW	3000 r/min	176 SQ.
354	3.5 kW	4000 r/min	176 SQ.
453	4.5 kW	3500 r/min	176 SQ.
603	6.0 kW	3000 r/min	176 SQ.
702	7.0 kW	2000 r/min	176 SQ.
703	7.0 kW	3000 r/min	176 SQ.

(3) Shaft end structure

Symbol	Shaft end structure
K	With keyway (with key)
S	Straight
T	Taper

(Note 1) "Taper" is available for the motor whose flange size is 90 SQ. mm or 130 SQ. mm.

(2) Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brakes

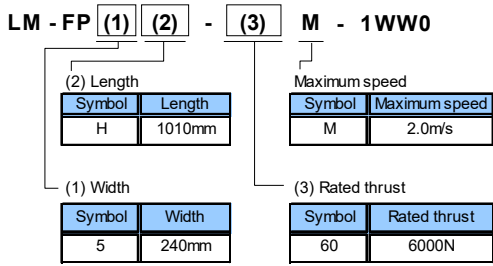
(4) Encoder

Symbol	Type	Detection method	Resolution
G48	CSW26KS	Batteryless absolute position	1,048,576 p/rev

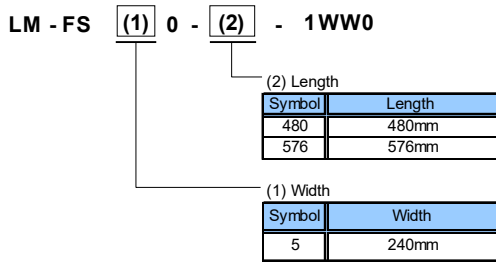
2. Linear servo motor type

LM-F Series

< Primary side: Coil >



< Secondary side: Magnet >



3. Servo drive unit type

< 1-axis servo drive unit >

MDS-EH-V1- (1)

(1) Unit type MDS-EH-V1-	Unit width	Compatible motor type Stall torque (N·m) Unit nominal maximum current	HG-H□											HQ-H□			
			75	105	54	104	154	224	204	354	453	703	903	1502	903	1103	
10	60mm	10A	●	●													
20		20A			●	●											
40		40A					●	●	●								
80		80A								●	●						
80W	90mm	80A											●				
160	120mm	160A												●		●	
160W	150mm	160A														●	
200 (Note)	240mm	200A													●		

● Indicates the compatible motor for each servo drive unit.

(Note) DC connection bar is required. Always install a large capacity drive unit (MDS-EH-V1-200) in the left side of power supply unit, and connect with DC connection bar.

MDS-EH-V1- (1)

(1) Unit type MDS-EH-V1-	Unit width	Compatible motor type Stall torque (N·m) Unit nominal maximum current	HK-H□															
			76	105	55	104	123	154	223	224	204	302	303	354	453	603	702	703
10	60mm	10A	●	●			●											
20		20A			●	●												
40		40A						●			□	●	●	●				
80		80A								●					●	●	●	●
80W	90mm	80A																●
160	120mm	160A																
160W	150mm	160A																
200 (Note)	240mm	200A																

● Indicates the compatible motor for each servo drive unit.

□ Indicates the motor that can be combined with the drive unit although the stall torque and maximum torque are limited.

When combining MDS-EH-V1-40 with HK-H224, stall torque is 13.5N·m.

(Note) DC connection bar is required. Always install a large capacity drive unit (MDS-EH-V1-200) in the left side of power supply unit, and connect with DC connection bar.

**CAUTION**

The dynamic brake unit (MDS-D-DBU) is required for the MDS-EH-V1-160W and MDS-EH-V1-200.

MDS-EJH-V1- (1)

(1) Unit Type MDS-EJH-V1-		Compatible motor type Stall torque (N·m) Unit nominal maximum current	HG-H□				
Unit width	75		105	54	104	154	
10	60mm	10A	2.0	3.0	2.9	5.9	9.0
15	60mm	15A	●				
20	90mm	20A		●	●	●	
40	105mm	40A					●

● Indicates the compatible motor for each servo drive unit.

MDS-EJH-V1- (1)

(1) Unit Type MDS-EJH-V1-		Compatible motor type Stall torque (N·m) Unit nominal maximum current	HK-H□			
Unit width	105		55	104	154	
10	60mm	10A	3.8	3.5	7.0	9.0
15	60mm	15A				
20	90mm	20A	●	●	●	
40	105mm	40A				●

● Indicates the compatible motor for each servo drive unit.

< 2-axis servo drive unit >

MDS-EH-V2- (1)

(1) Unit type MDS-EH-V2-	Compatible motor type	HG-H□											HQ-H□
		75	105	54	104	154	224	204	354	453	703	903	903
Unit width	Stall torque (N·m) Unit nominal maximum current	2.0	3.0	2.9	5.9	9.0	12.0	13.7	22.5	30.0	49.0	58.8	70.0
10	60mm	10A+10A (L+M axis)	●	●									
20	60mm	20A+20A (L+M axis)	●	●	●	●							
40		40A+40A (L+M axis)			●	●	●	●					
80	90mm	80A+80A (L+M axis)				●	●	●	●	●			
80W	120mm	80A+80A (L+M axis)							●	●	●		
160		160A+160A (L+M axis)									●	●	●

● Indicates the compatible motor for each servo drive unit.

MDS-EH-V2- (1)

(1) Unit type MDS-EH-V2-	Compatible motor type	HK-H□															
		76	105	55	104	123	154	223	224	204	302	303	354	453	603	702	703
Unit width	Stall torque (N·m) Unit nominal maximum current	2.8	3.8	3.5	8.6	5.7	12.0	13.5	14.0	15.0	28.0	21.5	27.0	39.0	45.0	57.0	51.0
10	60mm	10A+10A (L+M axis)	●	●			●										
20		20A+20A (L+M axis)	●	●	●	●	●		●								
40	90mm	40A+40A (L+M axis)			●	●		●	●	□	●	●					
80		80A+80A (L+M axis)						●		●	●	●	●	●	●	●	●
80W	120mm	80A+80A (L+M axis)											●	●	●	●	●
160		160A+160A (L+M axis)															●

● Indicates the compatible motor for each servo drive unit.

□ Indicates the motor that can be combined with the drive unit although the stall torque and maximum torque are limited.

When combining MDS-EH-V2-40 with HK-H224, stall torque is 13.5N·m.

< 3-axis servo drive unit >

**MDS-EH-V3-** (1)

(1) Unit type MDS-EH-V3-	Compatible motor type	HG-H□				
		54	104	154	224	204
Unit width	Stall torque (N·m)	2.9	5.9	9.0	12.0	13.7
Unit nominal maximum current						
40	90mm 40A+40A+40A (L+M+S axis)	●	●	●	●	●

● Indicates the compatible motor for each servo drive unit.

**MDS-EH-V3-** (1)

(1) Unit type MDS-EH-V3-	Compatible motor type	HK-H□							
		55	104	154	223	224	204	302	303
Unit width	Stall torque (N·m)	3.5	8.6	9.0	13.5	13.5	15.0	28.0	21.5
Unit nominal maximum current									
40	90mm 40A+40A+40A (L+M+S axis)	●	●	●	●	●	●	●	●

● Indicates the compatible motor for each servo drive unit.

4. Multi Axis Unit

**MDS-EMH-SPV3-** (1)

(1) Drive unit capacity	Spindle nominal maximum current	Servo nominal maximum current	Unit width	Power supply capacity
8040	80A	40A	260mm	22kW
10040	100A	40A		
10060	100A	60A		

Servo capacity	Compatible servo motor type	HG-H□					
		54	104	154	204	354	453
Servo axis configuration	Stall torque (N·m)	2.9	5.9	9.0	13.7	22.5	30.0
40	40A+40A+40A (L+M+S axis)	●	●	●	●		
60	60A+60A+60A (L+M+S axis)			●	●	●	●

● Indicates the compatible motor for each servo drive unit.

Servo capacity	Compatible servo motor type	HK-H□					
		55	104	154	204	354	453
Servo axis configuration	Stall torque (N·m)	3.5	8.6	12.0	15.0	27.0	39.0
40	40A+40A+40A (L+M+S axis)	●	●	●	●		
60	60A+60A+60A (L+M+S axis)			●	●	●	●

● Indicates the compatible motor for each servo drive unit.



**POINT**

When the rotary switch is set to "4 to 7", driving by two servo motor axes (L axis + M axis) is available. Refer to "4.1.1 Setting the Rotary Switch" in "MDS-EM/EMH Series Instruction Manual" (IB-1501241(ENG)) for details.

5. Spindle motor type

< SJ-4-V Series >

SJ-4 - (1) (2) (3) (4) - (5) (6) T

(1) Motor series

Symbol	Motor series
V	Medium-inertia series

(3) Shaft configuration

Symbol	Axis configuration
None	Standard

(2) Coil changeover

Symbol	Coil changeover
None	Unavailable

(4) Short time rated output  
(For normal specification)

Symbol	Short time rated output
2.2	2.2 kW
3.7	3.7 kW
5.5	5.5 kW
7.5	7.5 kW
11	11 kW
15	15 kW
18.5	18.5 kW
22	22 kW
26	26 kW
37	37 kW
45	45 kW
55	55 kW

(6) Special specification

Symbol	Special specification
None	Standard
Z	High-speed bearing

(5) Specification code

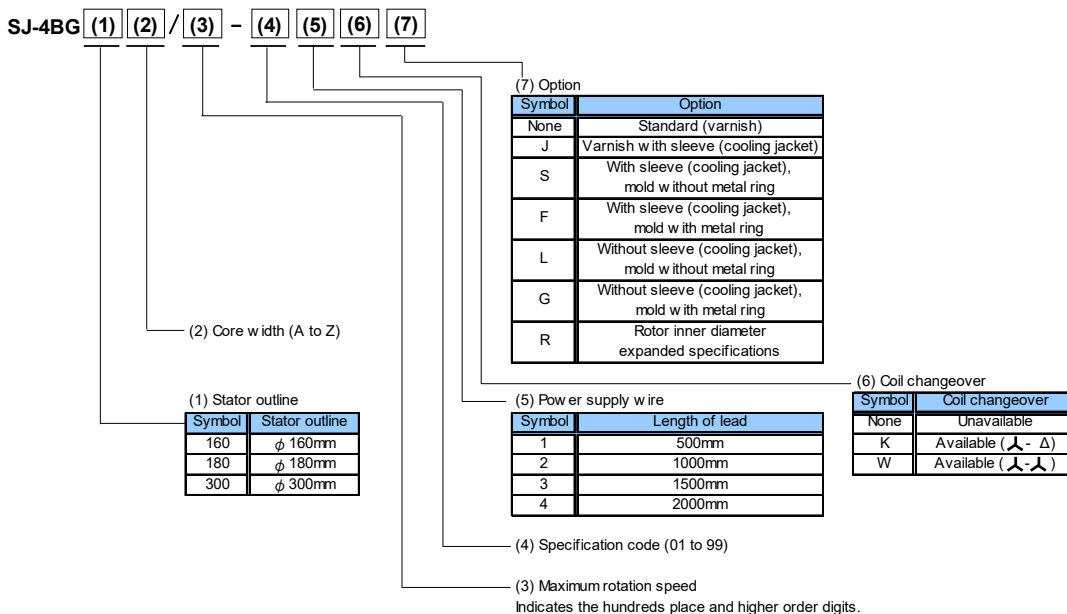
The SJ-4-V Series is indicated with a specification code (01 to 99).

(Note) This explains the model name system of spindle motors, but does not mean all the combinations are available.

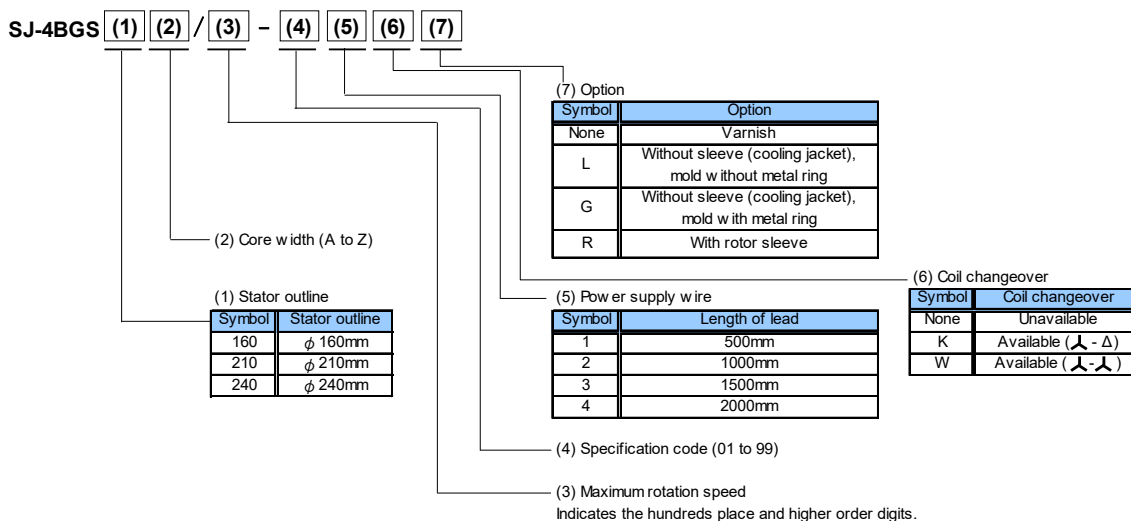


6. Built-in spindle motor type

< SJ-4BG Series >



< SJ-4BGS Series >

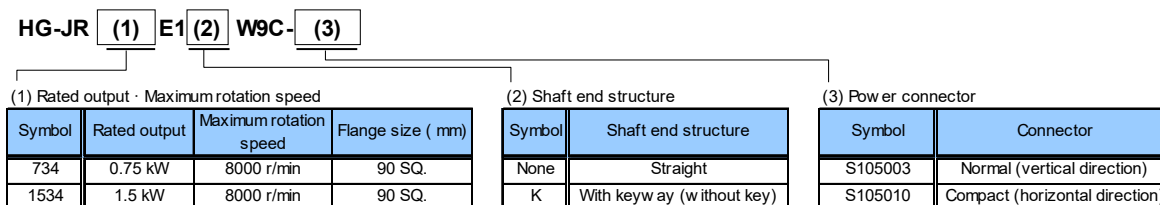


**CAUTION**

1. Check the rating table to see whether the coil changeover specification (Δ-Δ connection, Δ-Δ connection) is included or not.
2. This explains the model name system of spindle motors, but does not mean all the combinations are available.

7. Tool spindle motor type

< HG-JR Series >



8. Spindle drive unit type

< 1-axis spindle drive unit >

MDS-EH-SP- (1)

(1) Capacity

Symbol	Unit nominal maximum current	Unit width
20	20A	60mm
40	40A	
80	80A	
100	100A	120mm
160	160A	150mm
200	200A	240mm (Note)
320	320A	
480	480A	
600	600A	300mm (Note)

(Note) DC connection bar is required. Always install a large capacity drive unit (MDS-EH-SP-200,320,480,600) in the left side of power supply unit, and connect with DC connection bar.

9. Power supply unit type

MDS-EH-CV- (1)

Power supply unit				Compatible AC reactor	Compatible contactor (Mitsubishi) (Note 1)	Compatible circuit protector (Mitsubishi) (Note 1)
(1) Type MDS-EH-CV-	30-minute rated output	Continuous rated output	Unit width			
37	3.7kW	2.2kW	90mm	DH-AL-7.5K	S-T12-AC400V	NF63-CW3P-10A
75	7.5kW	5.5kW				NF63-CW3P-20A
110	11.0kW	7.5kW				NF63-CW3P-30A
185	18.5kW	15.0kW		DH-AL-18.5K	S-T35-AC400V	NF63-CW3P-40A
300	30.0kW	26.0kW	150mm (Note 2)	DH-AL-30K	S-T50-AC400V	NF125-CW3P-75A
370	37.0kW	30.0kW		DH-AL-37K	S-T65-AC400V	NF125-CW3P-100A
450	45.0kW	37.0kW		DH-AL-45K		NF125-CW3P-100A
550	55.0kW	45.0kW	300mm (Note 2)	DH-AL-55K	S-T80-AC400V	NF250-CW3P-125A
750	75.0kW	55.0kW		DH-AL-75K	S-N150-AC400V	NF250-CW3P-200A

(Note 1) This is an optional part that is not included with the parts provided in the NC system.

(Note 2) When connecting with a large capacity drive unit, DC connection bar is required.

Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

10. AC reactor type

DH-AL- (1)

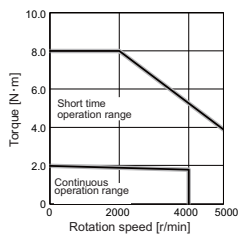
AC reactor		Compatible power supply unit
(1) Type DH-AL-	Capacity	
7.5K	7.5kW	MDS-EH-CV-37
		MDS-EH-CV-75
11K	11.0kW	MDS-EH-CV-110
18.5K	18.5kW	MDS-EH-CV-185
30K	30.0kW	MDS-EH-CV-300
37K	37.0kW	MDS-EH-CV-370
45K	45.0kW	MDS-EH-CV-450
55K	55.0kW	MDS-EH-CV-550
75K	75.0kW	MDS-EH-CV-750



# Servo Motor

Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
<b>2.0N·m</b>	<b>4000r/min</b>	<b>HG-H75</b> □□-□-XXX	(1) Magnetic brake	B with brake None without brake
			(2) Shaft end	S Straight T Taper
			(3) Power connector	S105010 Compact None Normal
			(4) Encoder	XXX Type

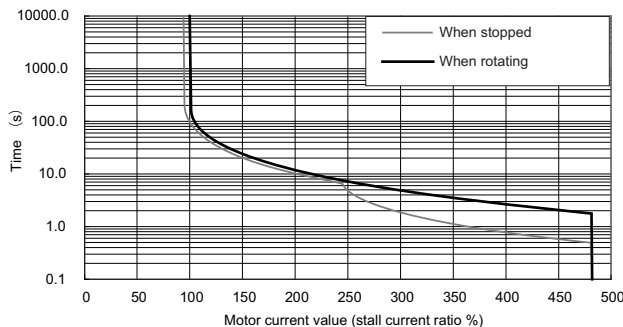
Torque characteristics



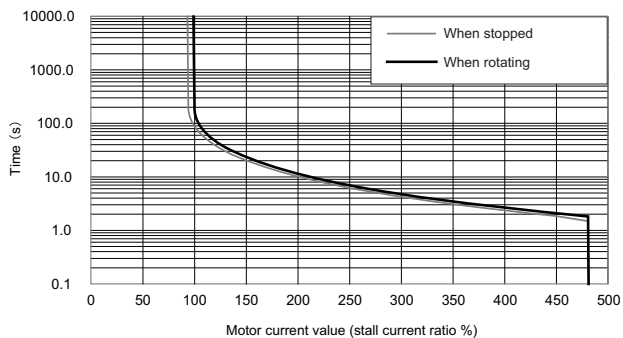
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

EH Series



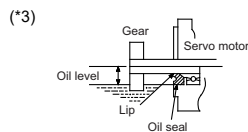
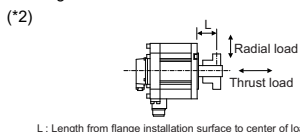
EJH Series



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	10
	2-axis type	MDS-EH-V2-	10, 20
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	15
Continuous characteristics	Rated output[kW]		0.75
	Rated current[A]		1.5
	Rated torque[N·m]		1.8
	Stall current[A]		1.6
	Stall torque[N·m]		2.0
	Maximum momentary output (For power supply selection) [kW]		2.2
Rated rotation speed[r/min]		4000	
Maximum rotation speed[r/min]		5000	
Maximum current[A]		7.0	
Maximum torque[N·m]		8.0	
Power rate at continuous rated torque[kW/s]		12.3	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		5.11	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		2.62	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		2.70	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		18.3	
Mass	(Without) [kg]		2.6
	(With brake) [kg]		3.6
Heat-resistant class		155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] [(mm)]		245 (L=33)
	Thrust load[N]		147
Axis tolerable load (Straight shaft)	Radial load (*2) [N] [(mm)]		245 (L=33)
	Thrust load[N]		147
Oil level (*3) [mm]		15	
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2
	4,194,304 p/rev (D51)		MDS-EH-V1/V2, MDS-EJH-V1
	1,048,576 p/rev (D48)		MDS-EH-V1/V2, MDS-EJH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	9
Static friction torque[N·m]	2.4 or more
Release delay time (*1) [s]	0.03
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

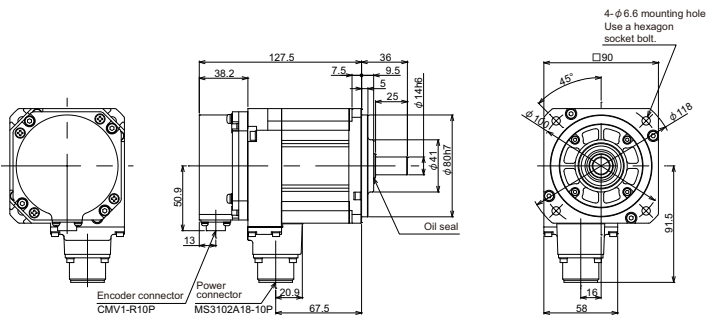
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

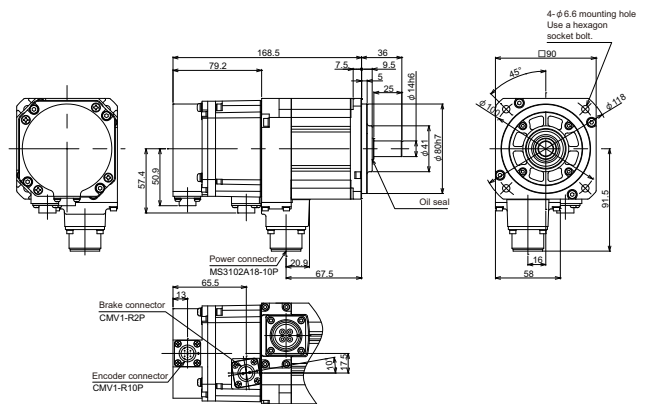
# 400V System Medium Inertia Servo Motor HG-H Series

Outline dimension drawings [Unit : mm]

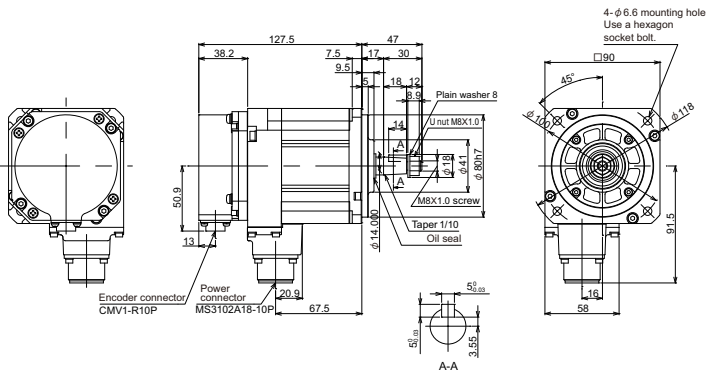
HG-H75S-D48



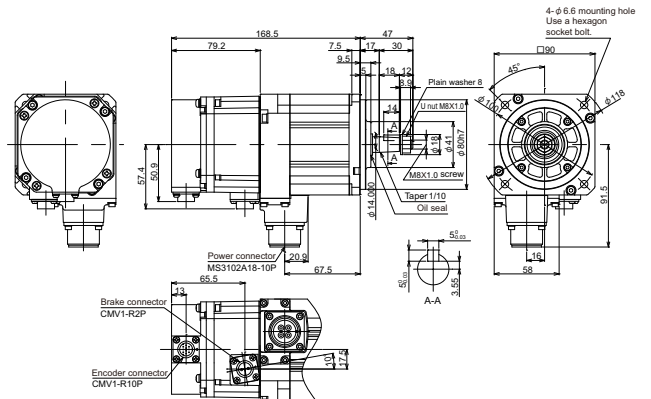
HG-H75BS-D48



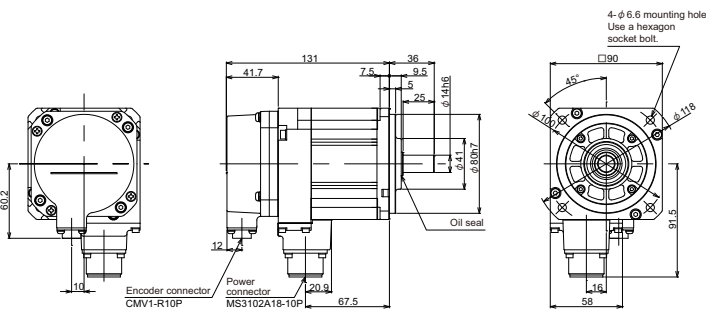
HG-H75T-D48



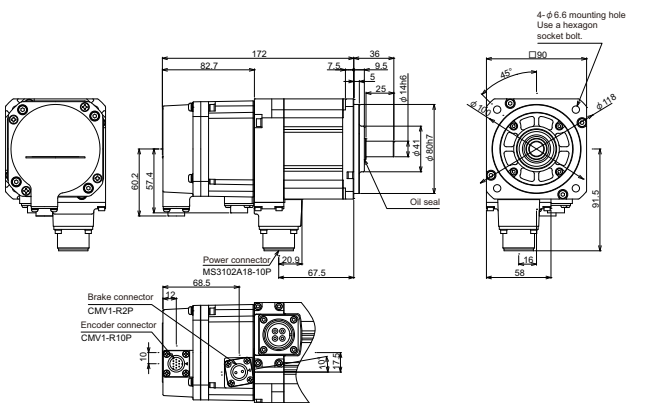
HG-H75BT-D48



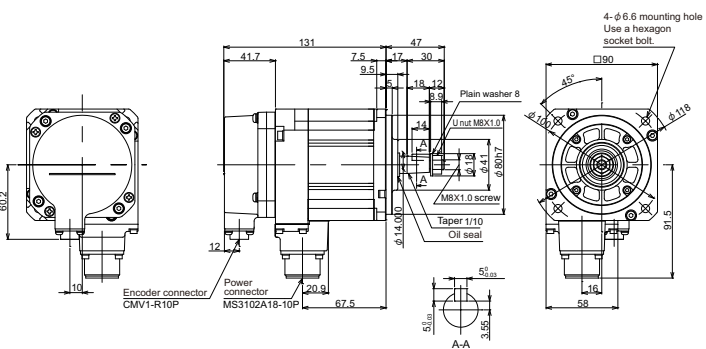
HG-H75S-D51,-D74



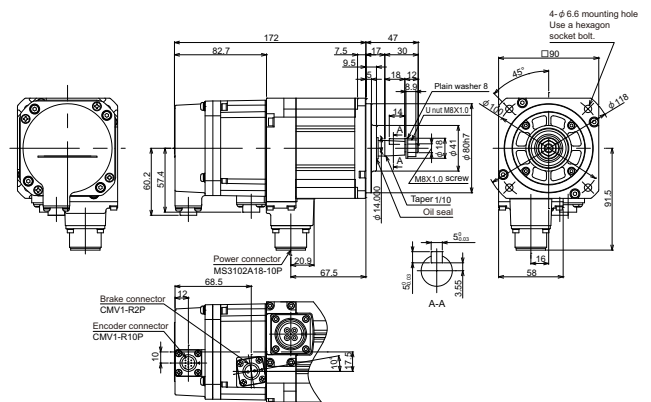
HG-H75BS-D51,-D74



HG-H75T-D51,-D74



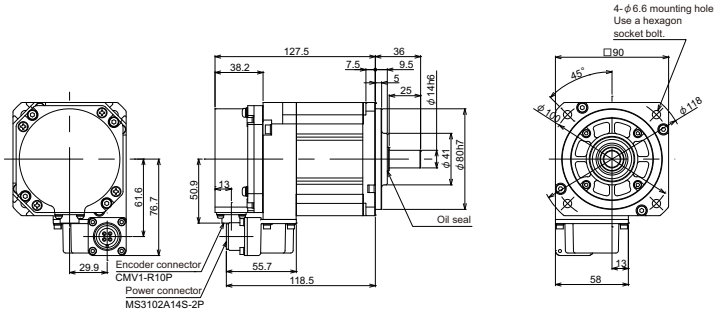
HG-H75BT-D51,-D74



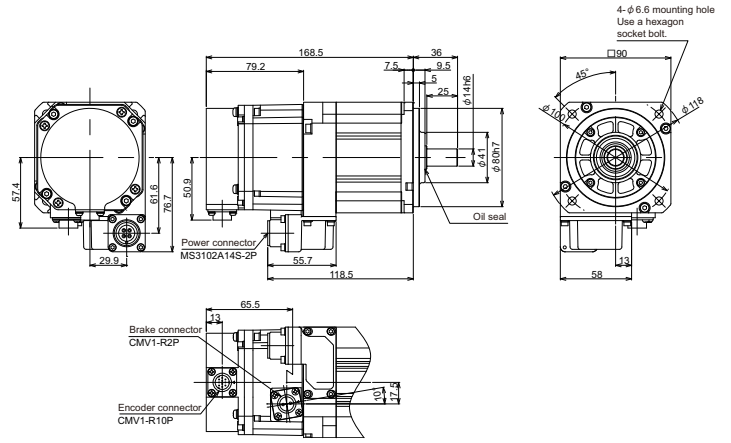
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

Outline dimension drawings [Unit : mm]

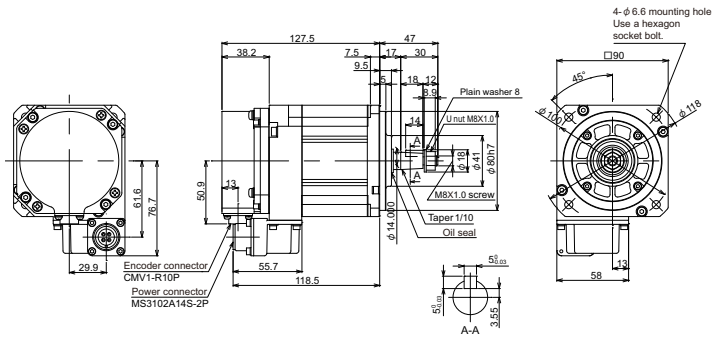
HG-H75S-S105010-D48



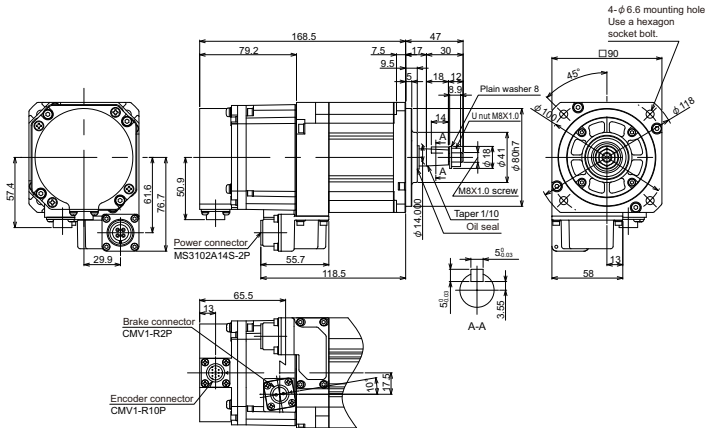
HG-H75BS-S105010-D48



HG-H75T-S105010-D48

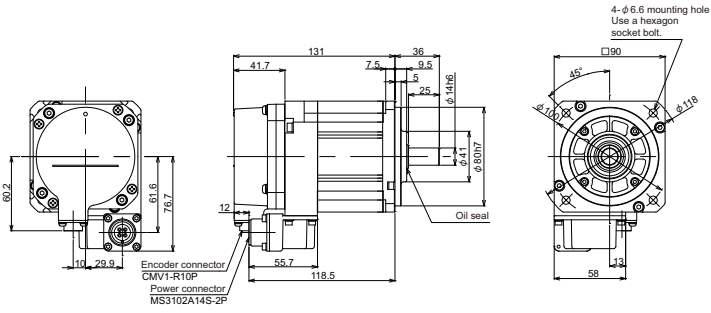


HG-H75BT-S105010-D48

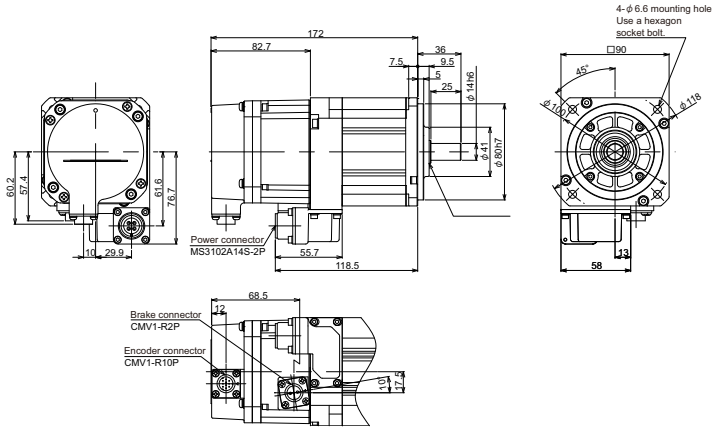


Outline dimension drawings [Unit : mm]

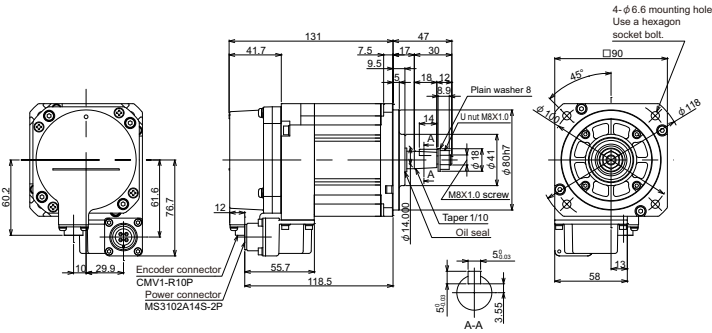
HG-H75S-S105010-D51,-D74



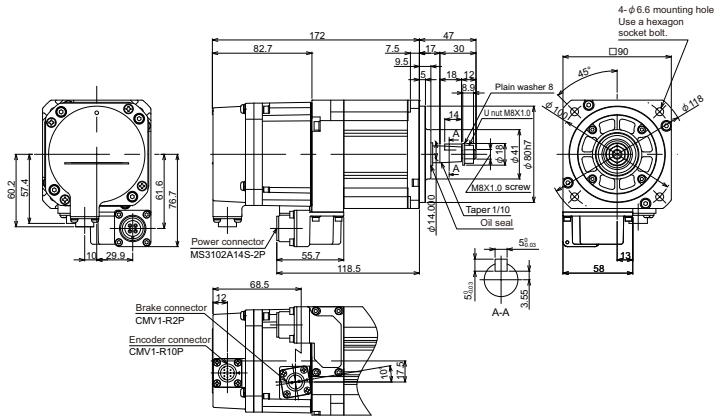
HG-H75BS-S105010-D51,-D74



HG-H75T-S105010-D51,-D74



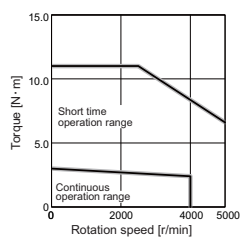
HG-H75BT-S105010-D51,-D74





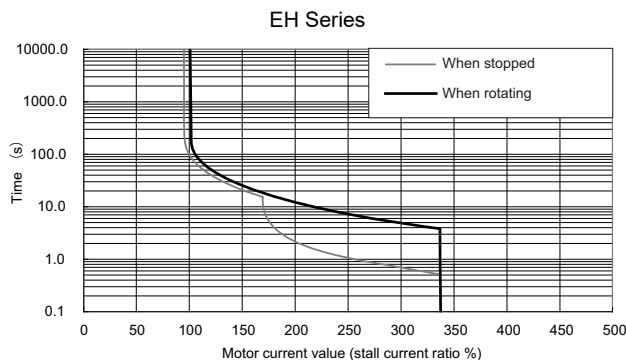
Stall torque	Rated rotation speed	Servo motor type	Explanation of type	
<b>3.0N·m</b>	<b>4000r/min</b>	<b>HG-H105</b> □□-□-XXX	(1) Magnetic brake	B with brake None without brake
			(2) Shaft end	S Straight T Taper
			(3) Power connector	S105010 Compact None Normal
			(4) Encoder	XXX Type

Torque characteristics



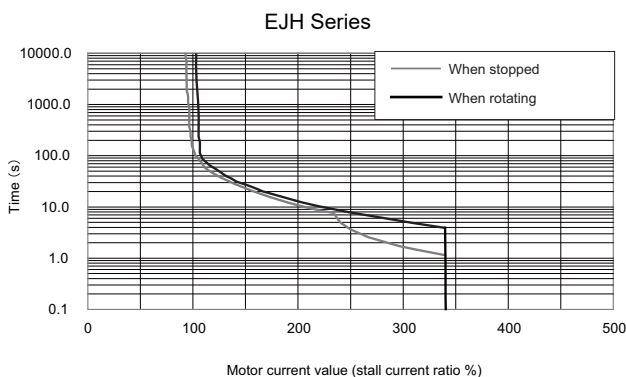
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

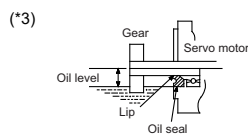
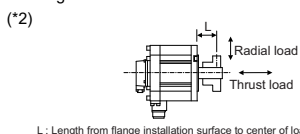


Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 10
	2-axis type MDS-EH-V2- 10, 20
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- 20
Continuous characteristics	Rated output[kW] 1.0
	Rated current[A] 1.8
	Rated torque[N·m] 2.4
	Stall current[A] 2.3
	Stall torque[N·m] 3.0
	Maximum momentary output (For power supply selection) [kW] 3.5
Rated rotation speed[r/min] 4000	
Maximum rotation speed[r/min] 5000	
Maximum current[A] 7.8	
Maximum torque[N·m] 11.0	
Power rate at continuous rated torque[kW/s] 11.2	
Max. deceleration torque of dynamic brake(Tdp) [N·m] 10.19	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 5.12	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 5.20	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 35.8	
Mass	(Without) [kg] 4.4
	(With brake) [kg] 5.3
Heat-resistant class	155(F)
Degree of protection	IP67 (The shaft-through portion is excluded.)
Cooling method	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] (mm) 245 (L=33)
	Thrust load[N] 147
Axis tolerable load (Straight shaft)	Radial load (*2) [N] (mm) 245 (L=33)
	Thrust load[N] 147
Oil level (*3) [mm]	15
Absolute position encoder	67,108,864 p/rev (D74) MDS-EH-V1/V2
	4,194,304 p/rev (D51) MDS-EH-V1/V2, MDS-EJH-V1
	1,048,576 p/rev (D48) MDS-EH-V1/V2, MDS-EJH-V1



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	9
Static friction torque[N·m]	2.4 or more
Release delay time (*1) [s]	0.03
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

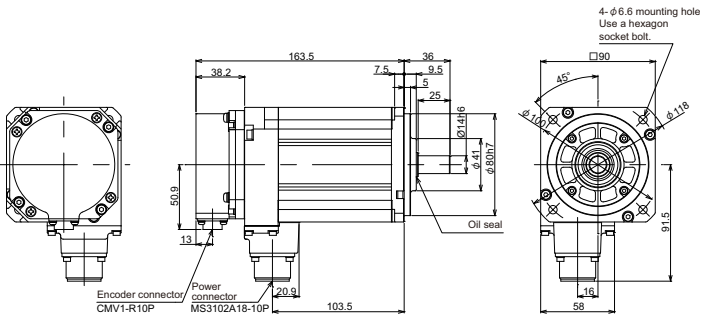
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

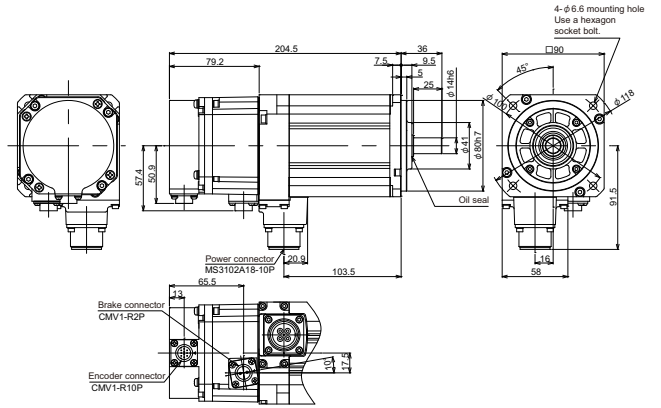
# 400V System Medium Inertia Servo Motor HG-H Series

Outline dimension drawings [Unit : mm]

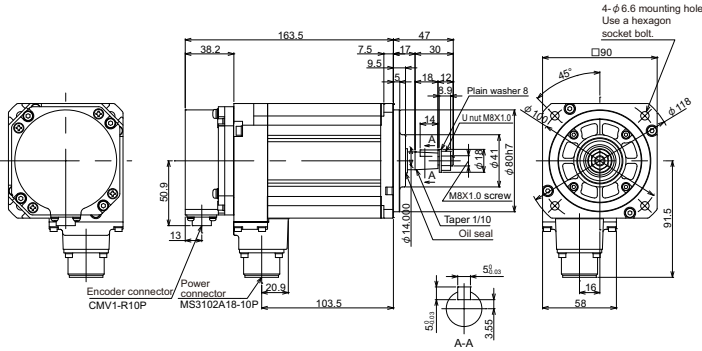
HG-H105S-D48



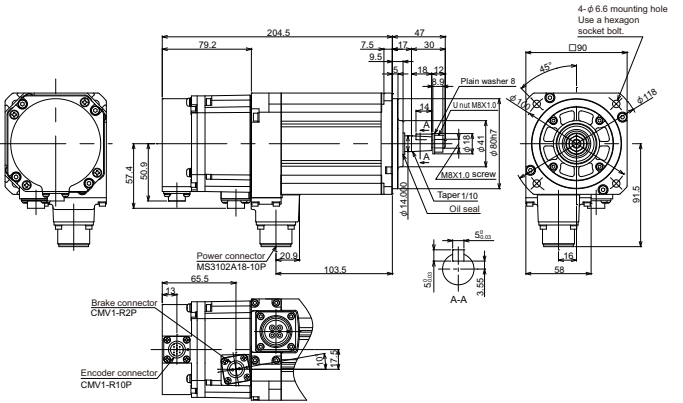
HG-H105BS-D48



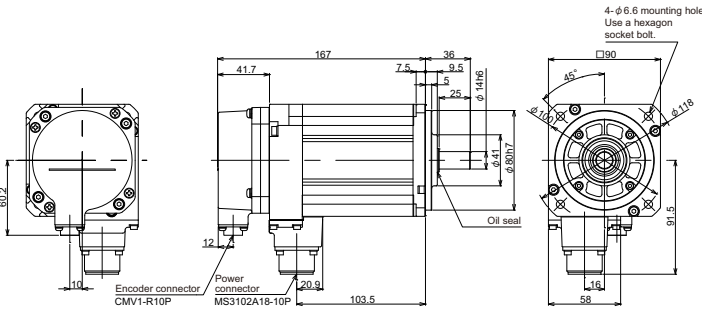
HG-H105T-D48



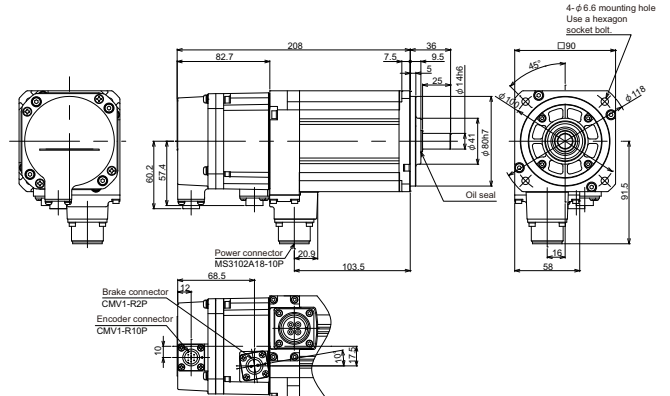
HG-H105BT-D48



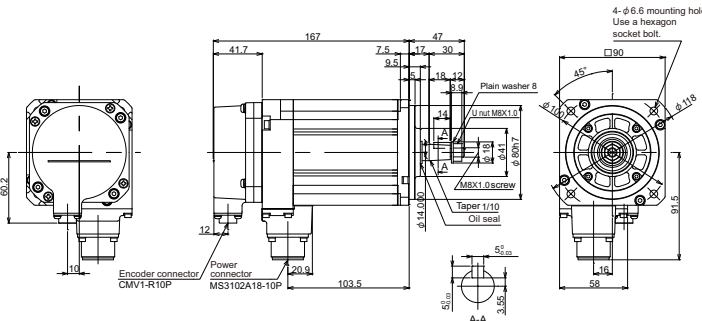
HG-H105S-D51,-D74



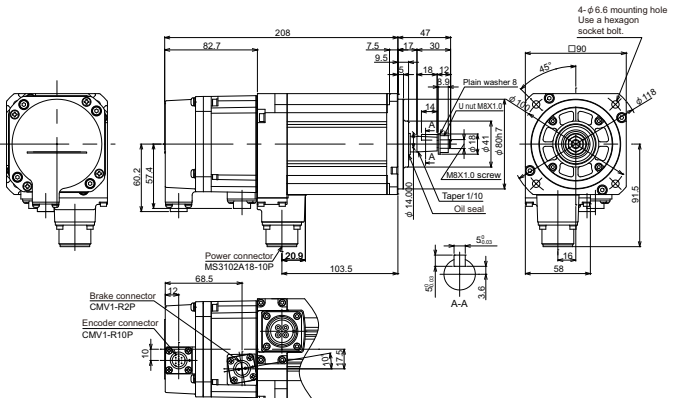
HG-H105BS-D51,-D74



HG-H105T-D51,-D74



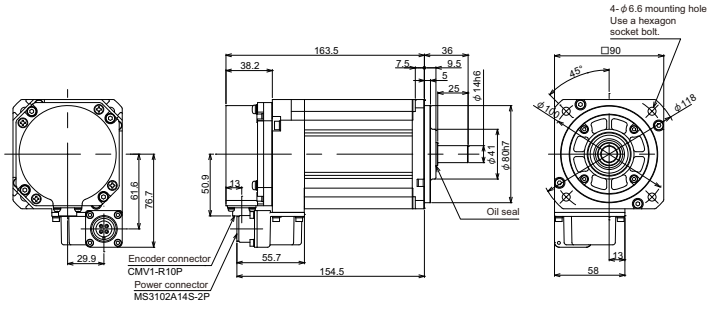
HG-H105BT-D51,-D74



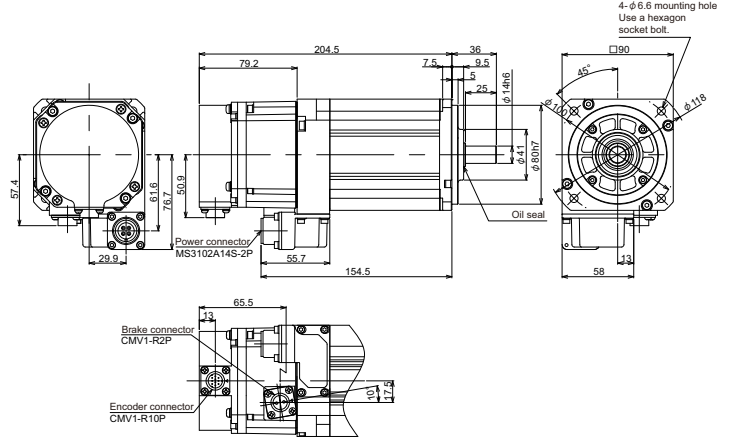
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

Outline dimension drawings [Unit : mm]

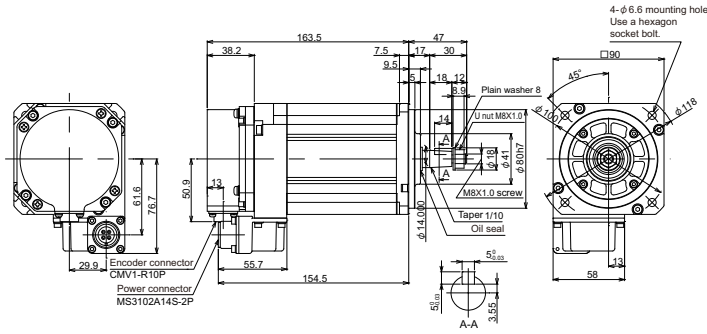
HG-H105S-S105010-D48



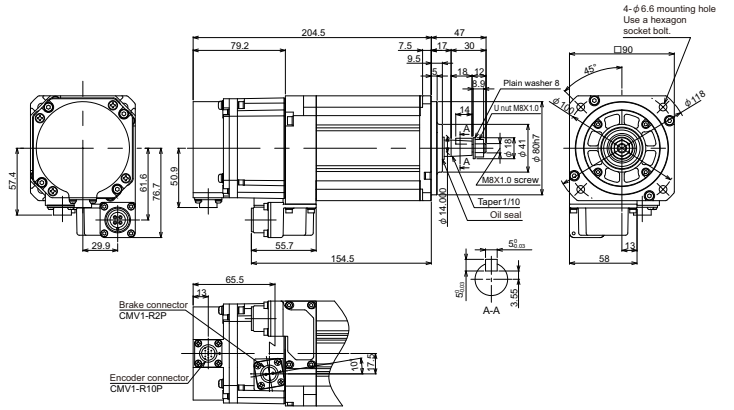
HG-H105BS-S105010-D48



HG-H105T-S105010-D48

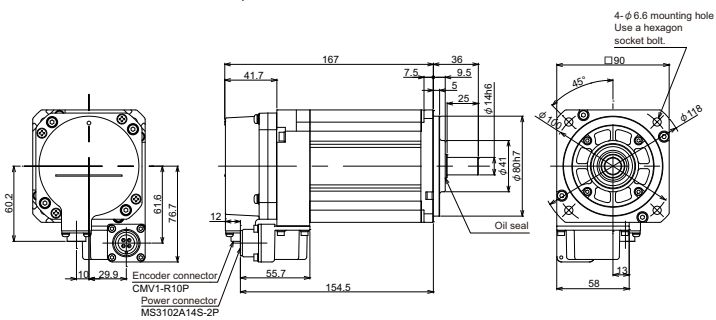


HG-H105BT-S105010-D48

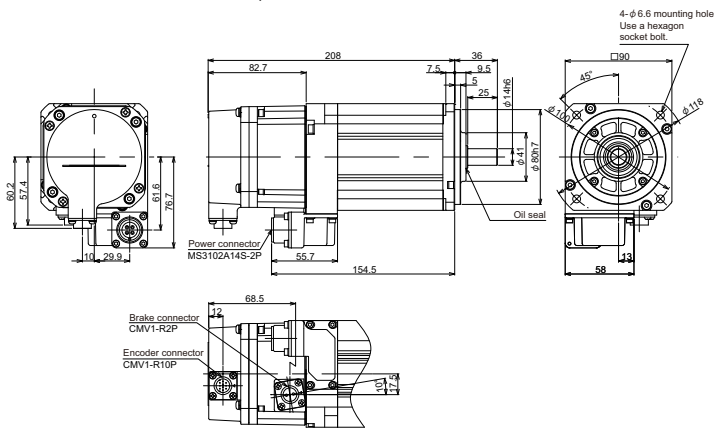


Outline dimension drawings [Unit : mm]

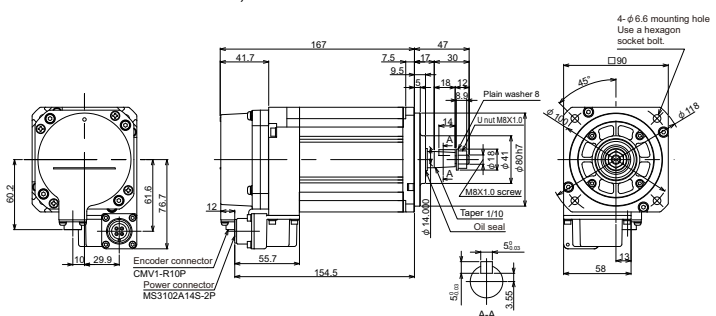
HG-H105S-S105010-D51,-D74



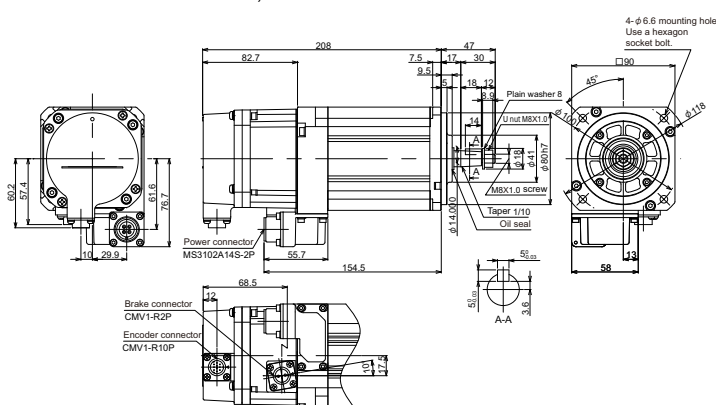
HG-H105BS-S105010-D51,-D74



HG-H105T-S105010-D51,-D74

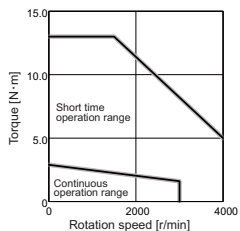


HG-H105BT-S105010-D51,-D74



Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
2.9N·m	3000r/min	HG-H54 □□-XXX	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
			T Taper	
			(3) Encoder	XXX Type

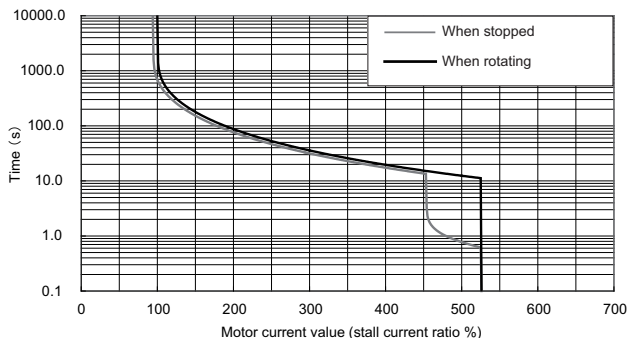
Torque characteristics



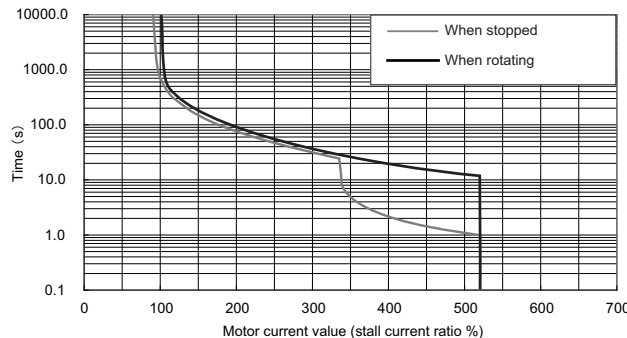
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

EH, EMH Series



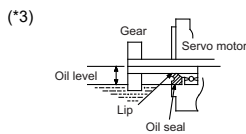
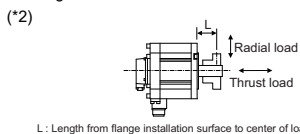
EJH Series



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	20
	2-axis type	MDS-EH-V2-	20, 40
	3-axis type	MDS-EH-V3-	40
	Multi axis type	MDS-EMH-SPV3-	8040, 10040
	Regenerative resistor type	MDS-EJH-V1-	20
Continuous characteristics	Rated output[kW]		0.5
	Rated current[A]		1.1
	Rated torque[N·m]		1.6
	Stall current[A]		1.6
	Stall torque[N·m]		2.9
Maximum momentary output (For power supply selection) [kW]			2.3
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			4000
Maximum current[A]			8.4
Maximum torque[N·m]			13.0
Power rate at continuous rated torque[kW/s]			4.1
Max. deceleration torque of dynamic brake(Tdp) [N·m]			3.96
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			6.13
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			8.26
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			42.7
Mass	(Without) [kg]		4.8
	(With brake) [kg]		6.7
Heat-resistant class			155(F)
Degree of protection			IP67
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		392 (L=58)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3) [mm]			22.5
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2/V3
	4,194,304 p/rev (D51)		MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3
	1,048,576 p/rev (D48)		MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

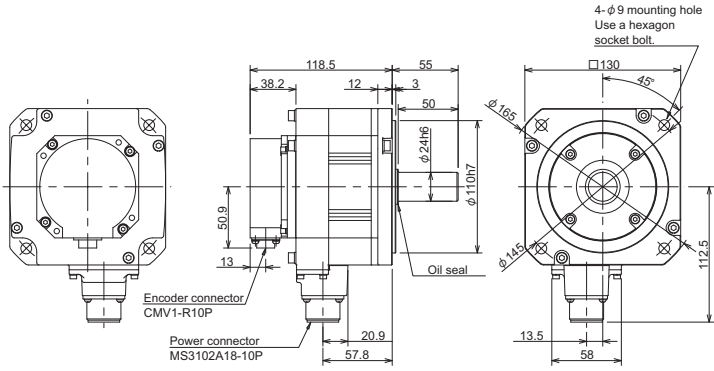
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

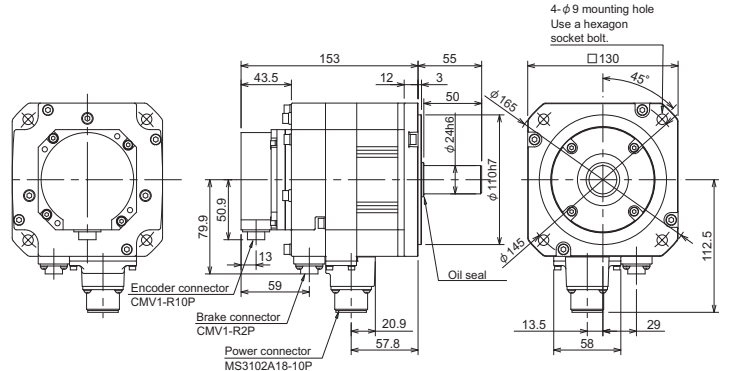
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

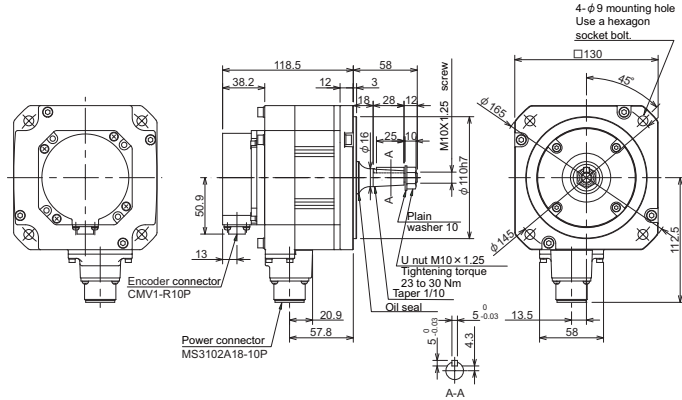
HG-H54S-D48



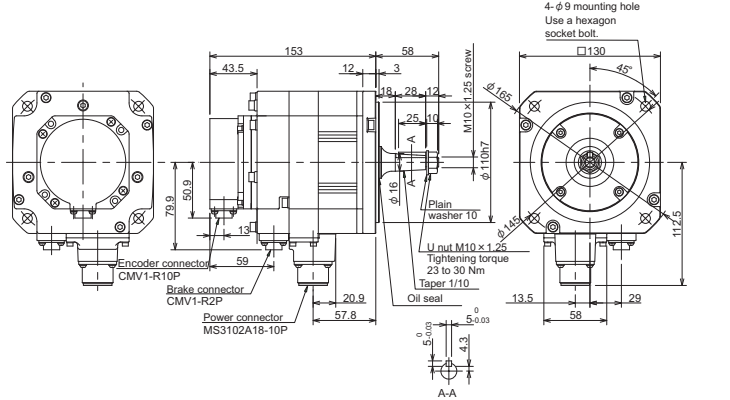
HG-H54BS-D48



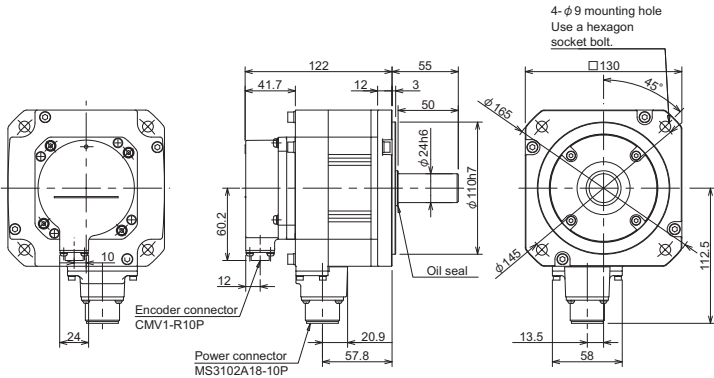
HG-H54T-D48



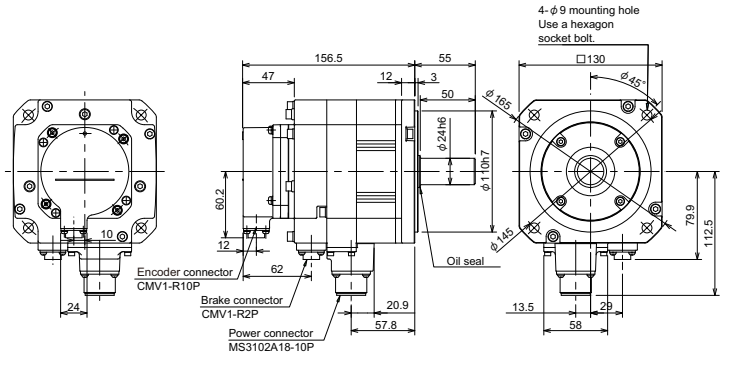
HG-H54BT-D48



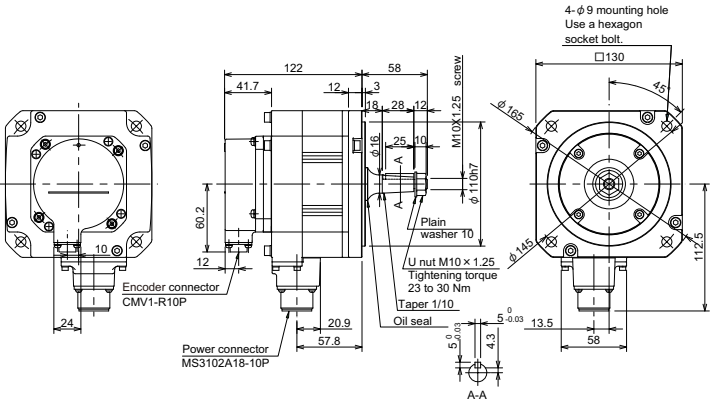
HG-H54S-D51,-D74



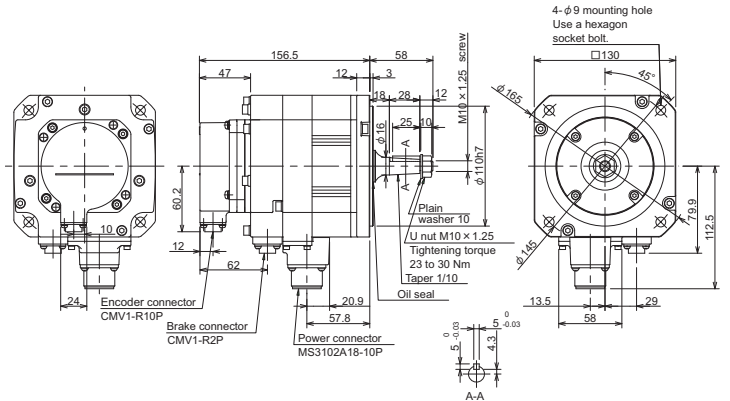
HG-H54BS-D51,-D74



HG-H54T-D51,-D74



HG-H54BT-D51,-D74

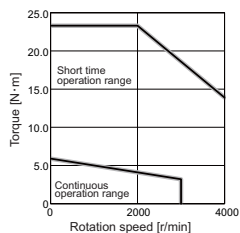


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(169)	(64)	(169)	(64)	(169)	(103)	(169)	(103)
	(76)		(76)		(86)		(86)
	(33)		(33)		(33)		(33)
	(50)		(50)		(50)		(50)



Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
5.9N·m	3000r/min	HG-H104 □□-XXX	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
			T Taper	
			(3) Encoder	XXX Type

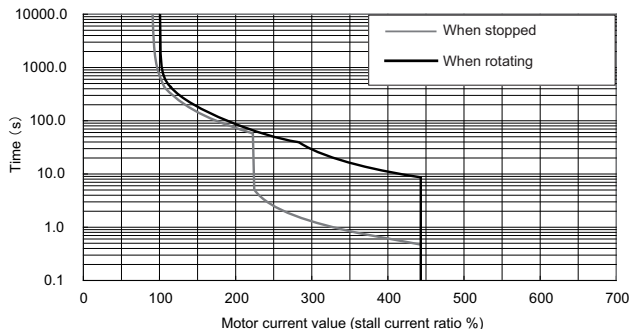
Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

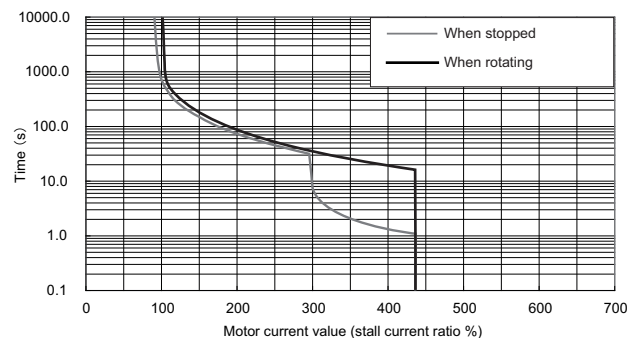
EH, EMH Series



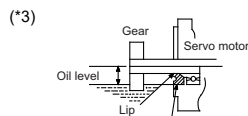
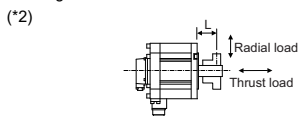
Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-
	2-axis type	MDS-EH-V2-
	3-axis type	MDS-EH-V3-
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	1.0
	Rated current[A]	2.0
	Rated torque[N·m]	3.2
	Stall current[A]	3.3
	Stall torque[N·m]	5.9
Maximum momentary output (For power supply selection) [kW]	5.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	15.0	
Maximum torque[N·m]	23.3	
Power rate at continuous rated torque[kW/s]	8.4	
Max. deceleration torque of dynamic brake(Tdp) [N·m]	10.03	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	11.9	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	14.0	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	83.3	
Mass	(Without) [kg]	6.5
	(With brake) [kg]	8.5
Heat-resistant class	155(F)	
Degree of protection	IP67	
Cooling method	(The shaft-through portion is excluded.) Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2) [N] (mm)	392 (L=58)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2) [N] (mm)	980 (L=55)
	Thrust load[N]	490
Oil level (*3) [mm]	22.5	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-EH-V1/V2/V3
	4,194,304 p/rev (D51)	MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3
	1,048,576 p/rev (D48)	MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3

EJH Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

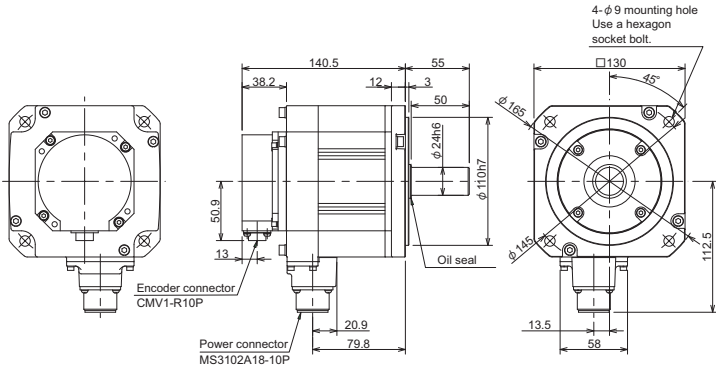
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

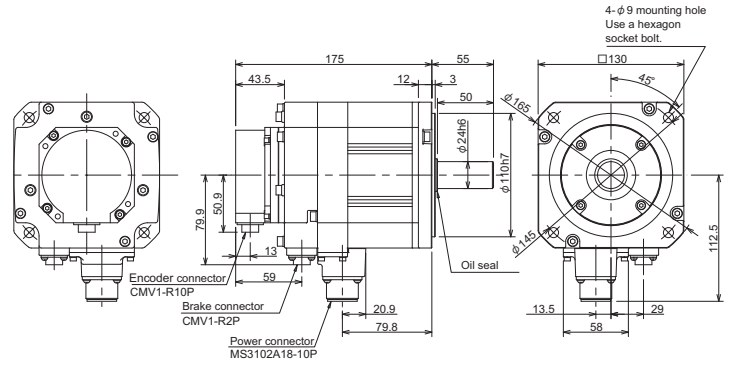
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

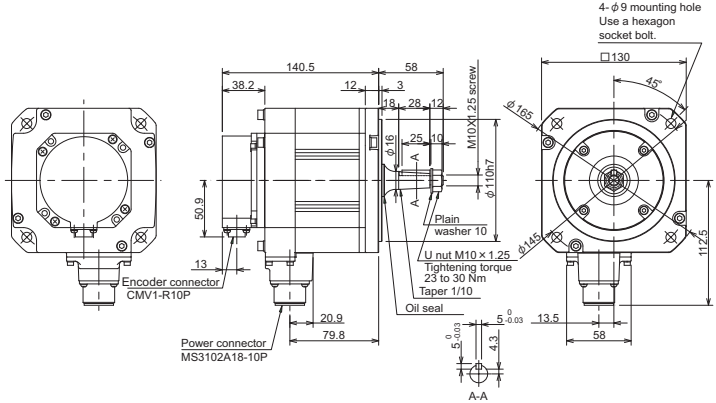
HG-H104S-D48



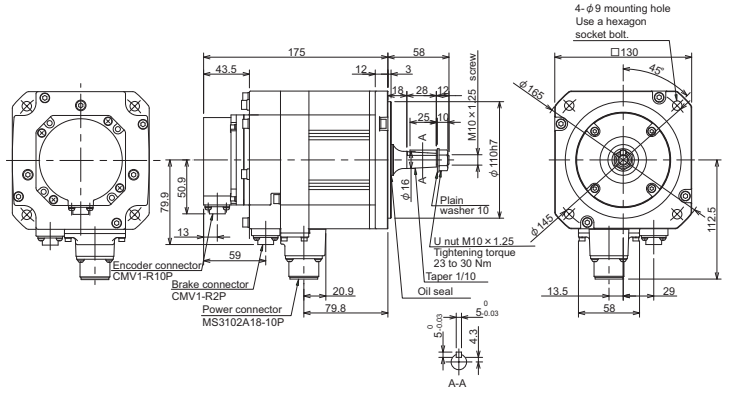
HG-H104BS-D48



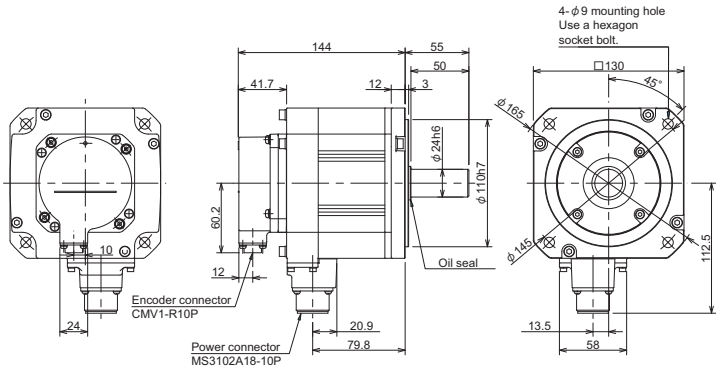
HG-H104T-D48



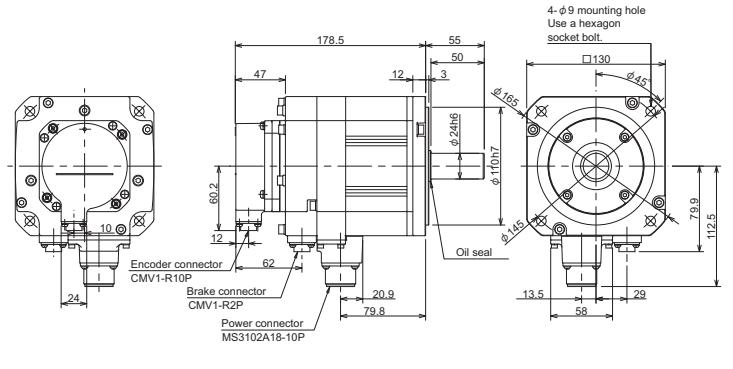
HG-H104BT-D48



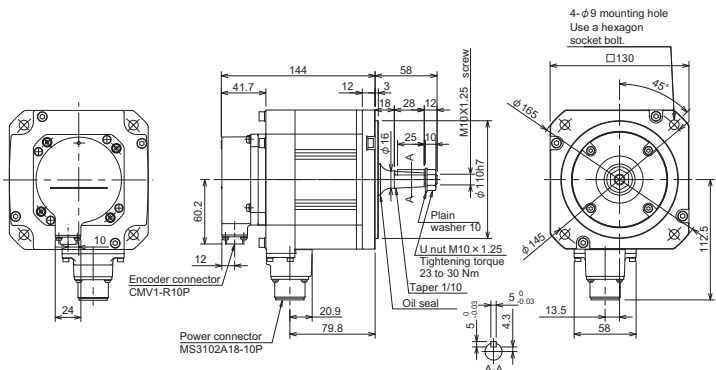
HG-H104S-D51,-D74



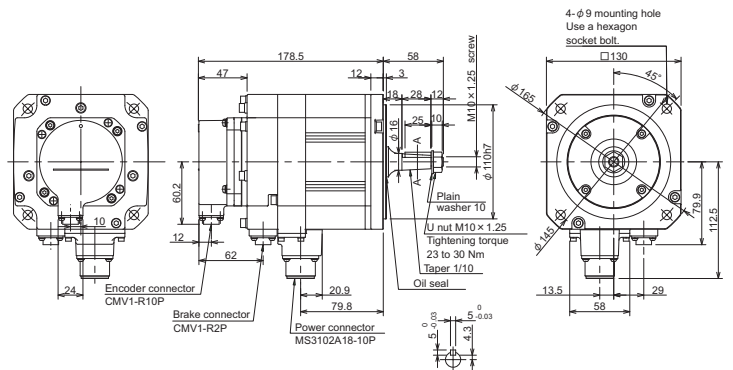
HG-H104BS-D51,-D74



HG-H104T-D51,-D74



HG-H104BT-D51,-D74



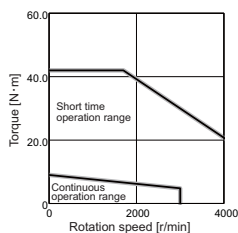
D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(169) (64)	(167) (76) (33) (50)	(169) (123) (64)	(167) (105) (76) (33) (33) (50)	(169) (103)	(167) (86) (33) (50)	(169) (123) (103)	(167) (105) (86) (33) (33) (50)



# 400V System Medium Inertia Servo Motor HG-H Series

Stall torque	Rated rotation speed	Servomotor type	Explanation of type													
<b>9.0N·m</b>	<b>3000r/min</b>	<b>HG-H154 □□-XXX</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2" style="width: 30%;">(1) Magnetic brake</td> <td style="width: 10%;">B</td> <td style="width: 60%;">with brake</td> </tr> <tr> <td>None</td> <td>without brake</td> </tr> <tr> <td rowspan="2" style="width: 30%;">(2) Shaft end</td> <td>S</td> <td>Straight</td> </tr> <tr> <td>T</td> <td>Taper</td> </tr> <tr> <td rowspan="2" style="width: 30%;">(3) Encoder</td> <td>XXX</td> <td>Type</td> </tr> </table>	(1) Magnetic brake	B	with brake	None	without brake	(2) Shaft end	S	Straight	T	Taper	(3) Encoder	XXX	Type
(1) Magnetic brake	B	with brake														
	None	without brake														
(2) Shaft end	S	Straight														
	T	Taper														
(3) Encoder	XXX	Type														
			(1)(2) (3)													

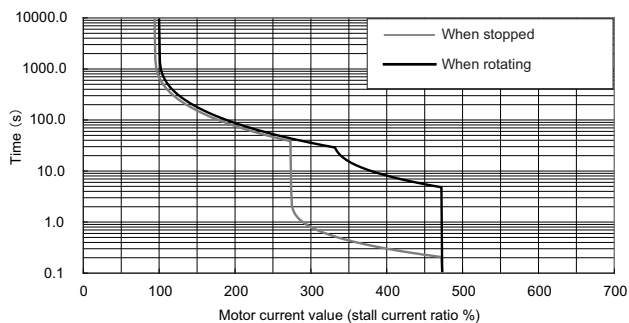
## Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

## Servo overload protection characteristics

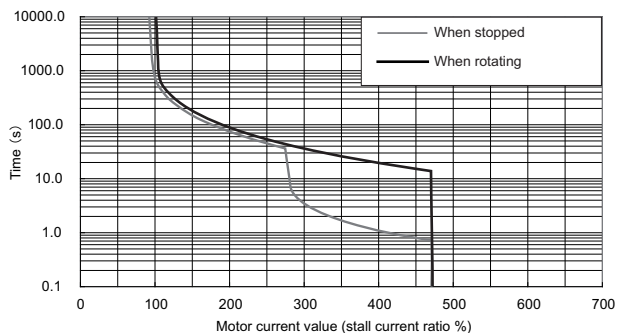
### EH, EMH Series



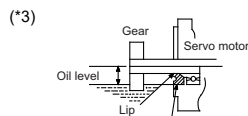
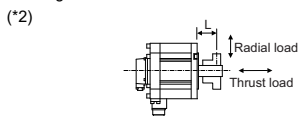
## Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 40
	2-axis type MDS-EH-V2- 40,80
	3-axis type MDS-EH-V3- 40
	Multi axis type MDS-EMH-SPV3- 8040, 10040, 10060
	Regenerative resistor type MDS-EJH-V1- 40
Continuous characteristics	Rated output[kW] 1.5
	Rated current[A] 2.7
	Rated torque[N·m] 4.8
	Stall current[A] 5.5
	Stall torque[N·m] 9.0
Maximum momentary output (For power supply selection) [kW] 9.0	
Rated rotation speed[r/min] 3000	
Maximum rotation speed[r/min] 4000	
Maximum current[A] 26.0	
Maximum torque[N·m] 42.0	
Power rate at continuous rated torque[kW/s] 12.7	
Max. deceleration torque of dynamic brake(Tdp) [N·m] 15.05	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 17.8	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 20.0	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ] 125	
Mass	(Without) [kg] 8.3
	(With brake) [kg] 11
Heat-resistant class 155(F)	
Degree of protection IP67	
(The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm)) 392 (L=58)
	Thrust load[N] 490
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm)) 980 (L=55)
	Thrust load[N] 490
Oil level (*3) [mm] 22.5	
Absolute position encoder	67,108,864 p/rev (D74) MDS-EH-V1/V2/V3
	4,194,304 p/rev (D51) MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3
	1,048,576 p/rev (D48) MDS-EH-V1/V2/V3, MDS-EJH-V1, MDS-EMH-SPV3

### EJH Series



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

## Magnetic brake characteristics

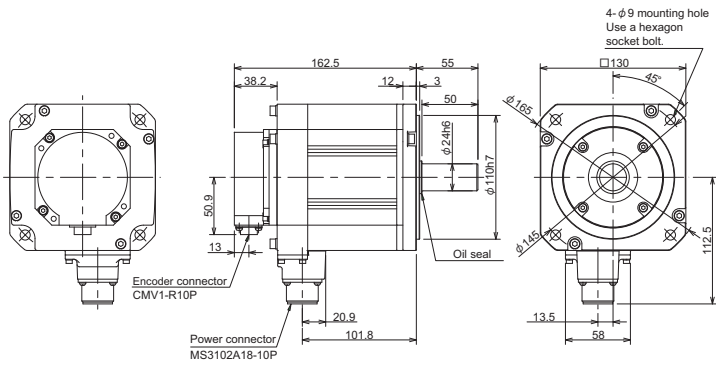
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

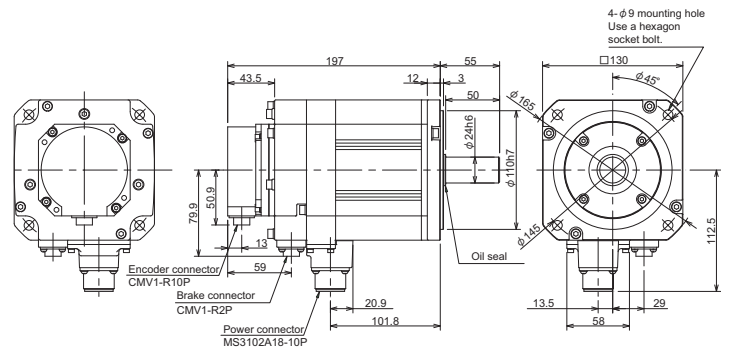
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

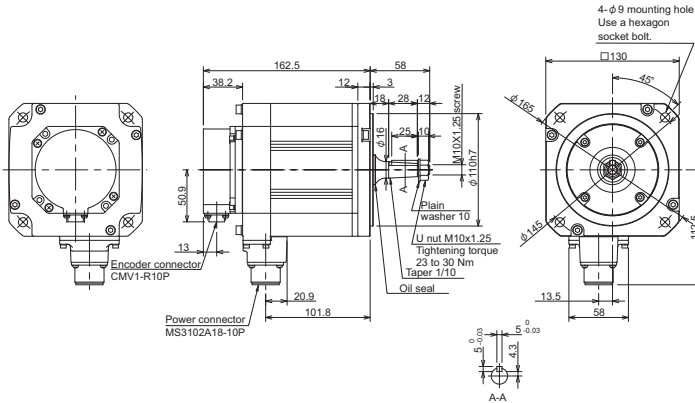
HG-H154S-D48



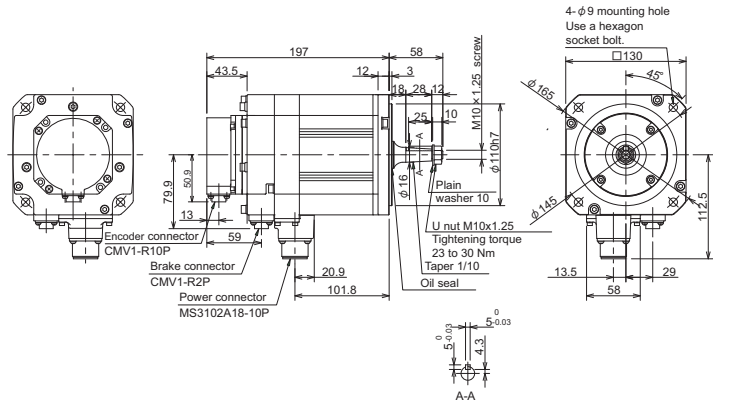
HG-H154BS-D48



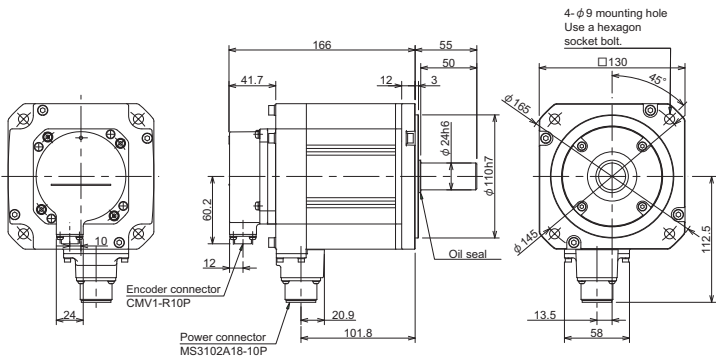
HG-H154T-D48



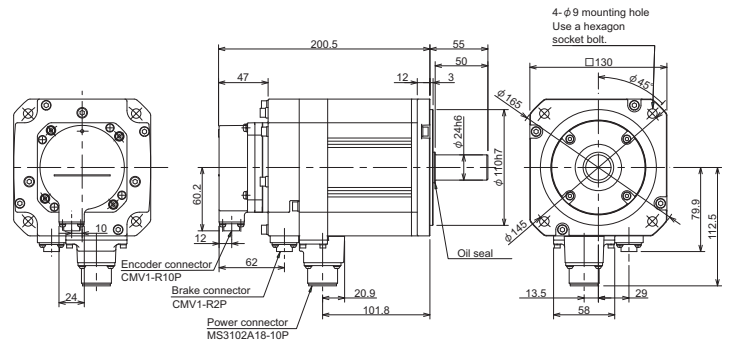
HG-H154BT-D48



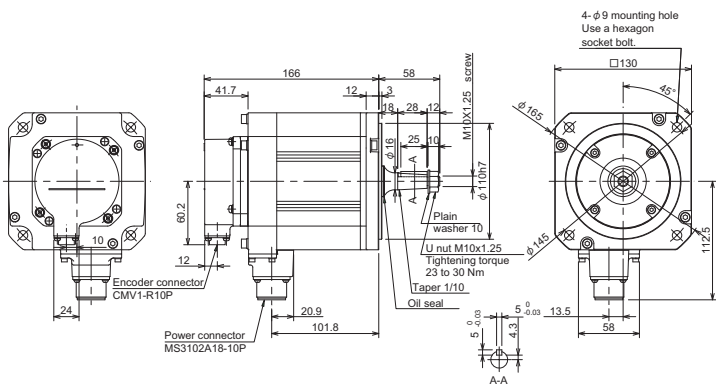
HG-H154S-D51,-D74



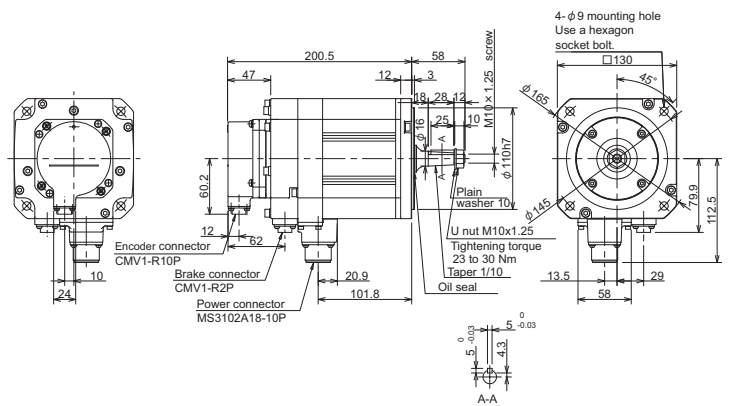
HG-H154BS-D51,-D74



HG-H154T-D51,-D74



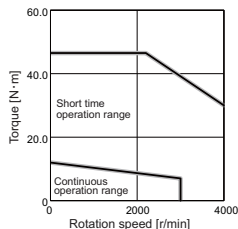
HG-H154BT-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(169) (94)	(167) (76) (50)	(169) (123) (94) (50)	(167) (105) (76) (33) (50)	(169) (103)	(167) (86) (33) (50)	(169) (123) (103)	(167) (105) (86) (33) (50)

Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
12.0N·m	3000r/min	HG-H224 □□-XXX	(1) Magnetic brake	B with brake
				None without brake
			(2) Shaft end	S Straight
			T Taper	
			(3) Encoder	XXX Type

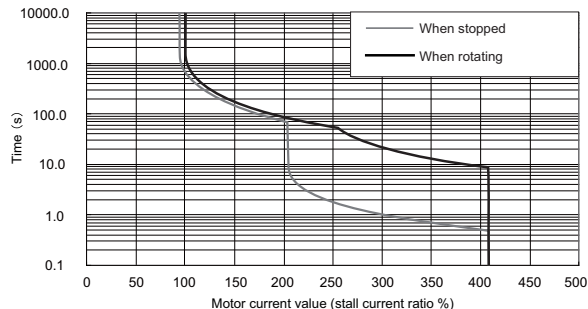
Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

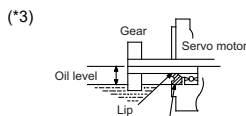
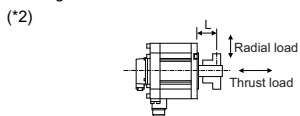
EH Series



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	40
	2-axis type	MDS-EH-V2-	40,80
	3-axis type	MDS-EH-V3-	40
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		2.2
	Rated current[A]		4.3
	Rated torque[N·m]		7.0
	Stall current[A]		7.4
	Stall torque[N·m]		12.0
Maximum momentary output (For power supply selection) [kW]		13.1	
Rated rotation speed[r/min]		3000	
Maximum rotation speed[r/min]		4000	
Maximum current[A]		28.5	
Maximum torque[N·m]		46.5	
Power rate at continuous rated torque[kW/s]		20.7	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		21.78	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		23.7	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		25.9	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		166	
Mass	(Without) [kg]		10
	(With brake) [kg]		12
Heat-resistant class		155(F)	
Degree of protection		IP67	
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		392 (L=58)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3) [mm]		22.5	
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2/V3
	4,194,304 p/rev (D51)		MDS-EH-V1/V2/V3
	1,048,576 p/rev (D48)		MDS-EH-V1/V2/V3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	19
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

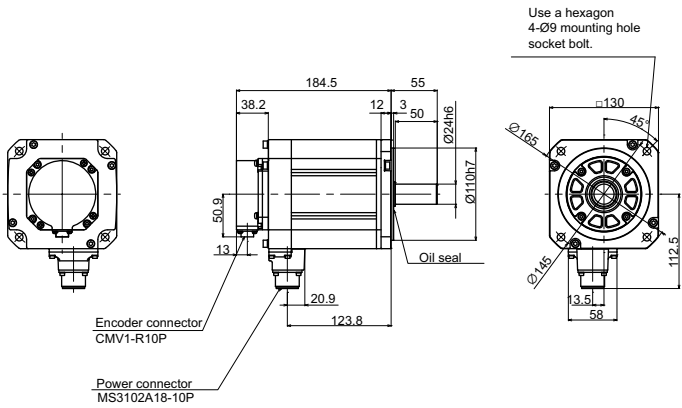
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

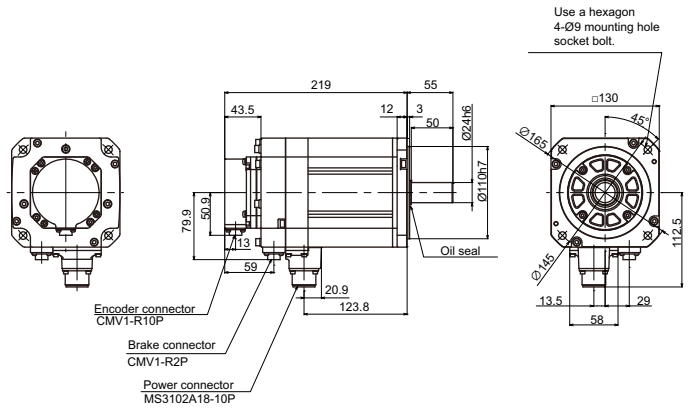
# 400V System Medium Inertia Servo Motor HG-H Series

Outline dimension drawings [Unit : mm]

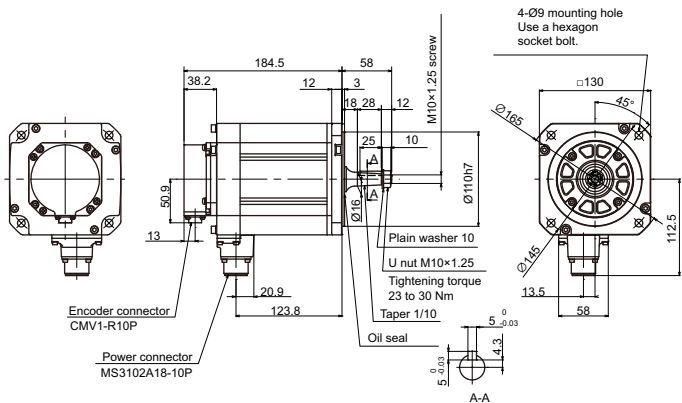
HG-H224S-D48



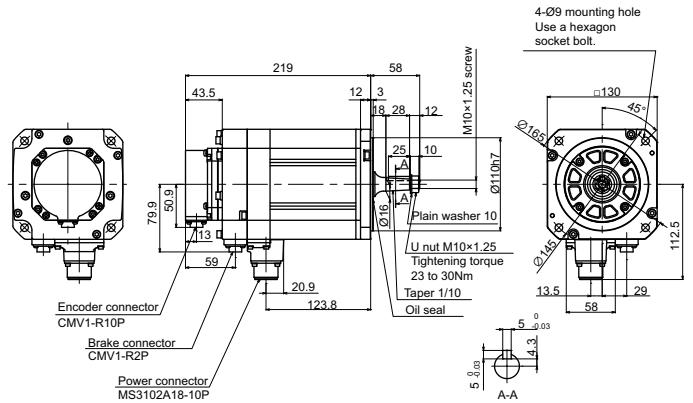
HG-H224BS-D48



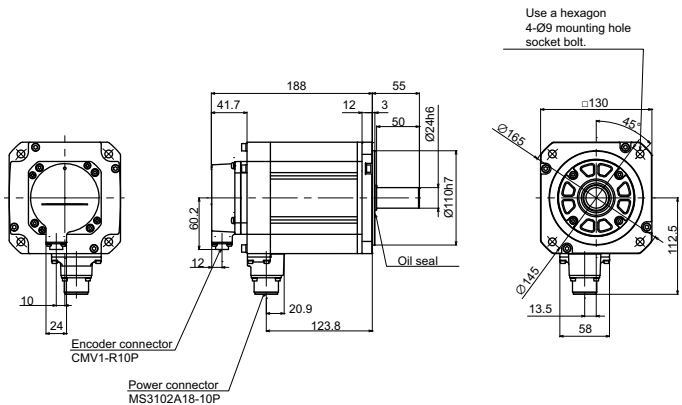
HG-H224T-D48



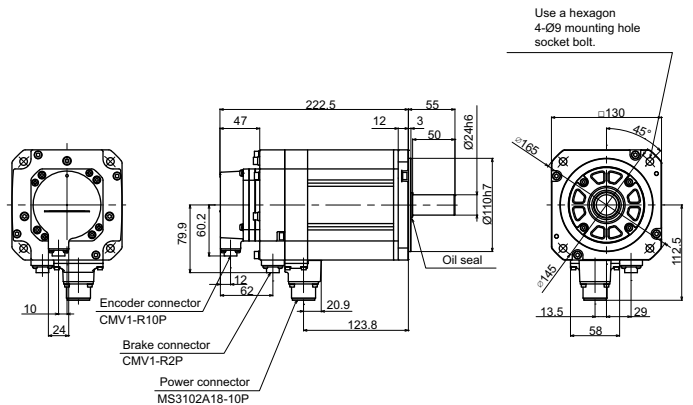
HG-H224BT-D48



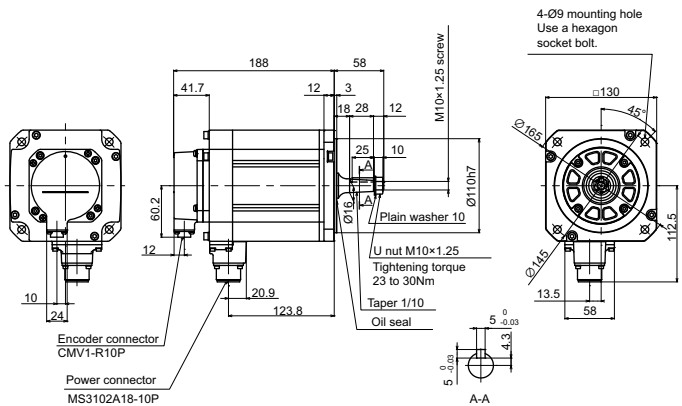
HG-H224S-D51,-D74



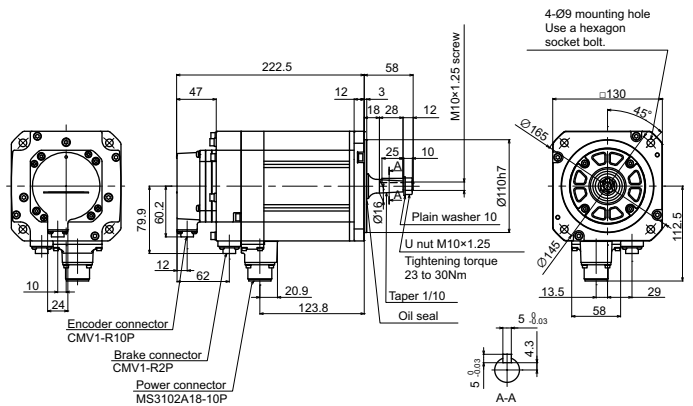
HG-H224BS-D51,-D74



HG-H224T-D51,-D74



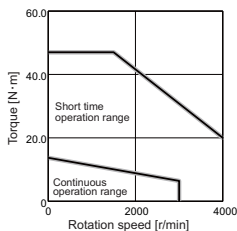
HG-H224BT-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

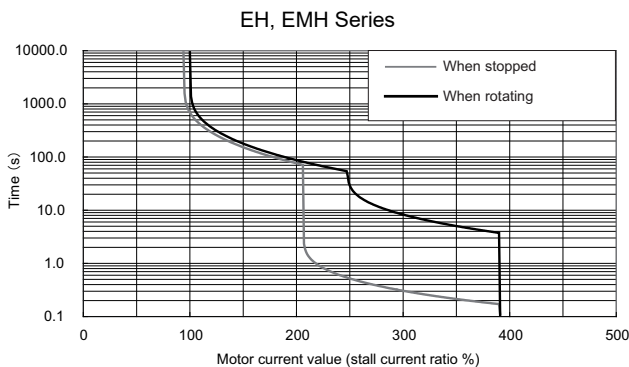
Stall torque <b>13.7N·m</b>	Rated rotation speed <b>3000r/min</b>	Servomotor type <b>HG-H204</b> (1) (2) <b>□S-xxx</b>	Explanation of type	
			(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

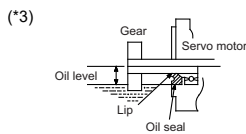
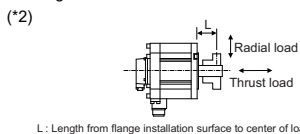
Servo overload protection characteristics



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	40
	2-axis type	MDS-EH-V2-	40, 80
	3-axis type	MDS-EH-V3-	40
	Multi axis type	MDS-EMH-SPV3-	8040, 10040, 10060
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		2.0
	Rated current[A]		3.5
	Rated torque[N·m]		6.4
	Stall current[A]		7.3
	Stall torque[N·m]		13.7
Maximum momentary output (For power supply selection) [kW]			8.0
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			4000
Maximum current[A]			29.0
Maximum torque[N·m]			47.0
Power rate at continuous rated torque[kW/s]			10.6
Max. deceleration torque of dynamic brake(Tdp) [N·m]			15.82
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			38.3
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			47.9
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			268
Mass	(Without) [kg]		12.0
	(With brake) [kg]		18
Heat-resistant class			155(F)
Degree of protection			IP67
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:29.4(3)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		2058 (L=79)
	Thrust load[N]		980
Oil level (*3) [mm]			30
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2/V3
	4,194,304 p/rev (D51)		MDS-EH-V1/V2/V3, MDS-EMH-SPV3
	1,048,576 p/rev (D48)		MDS-EH-V1/V2/V3, MDS-EMH-SPV3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

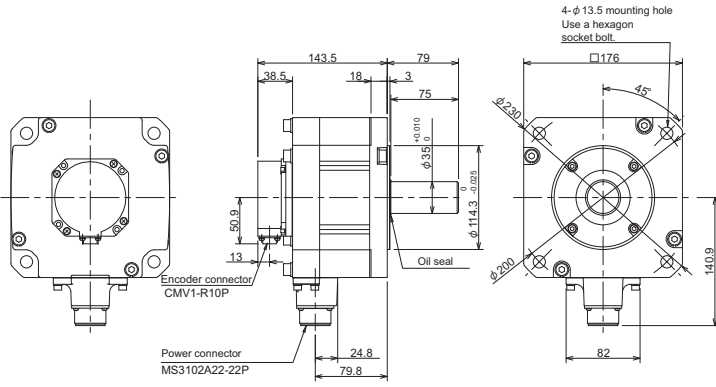
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

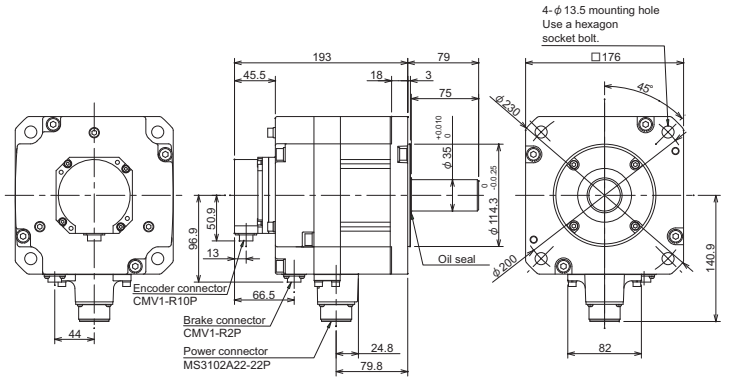
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

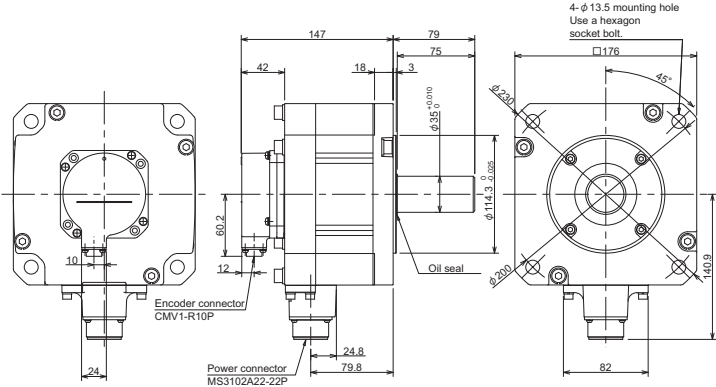
HG-H204S-D48



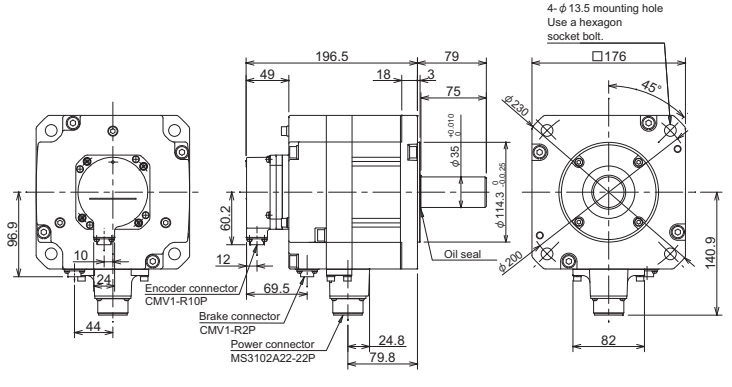
HG-H204BS-D48



HG-H204S-D51,-D74



HG-H204BS-D51,-D74

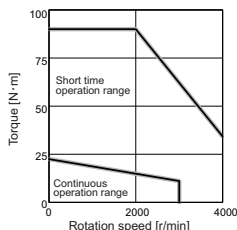


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug



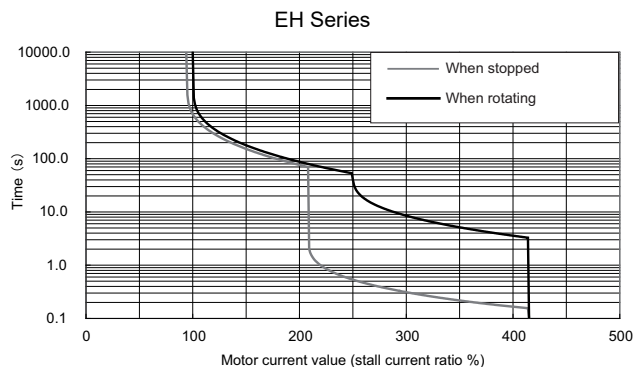
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
22.5N·m	3000r/min	HG-H354 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



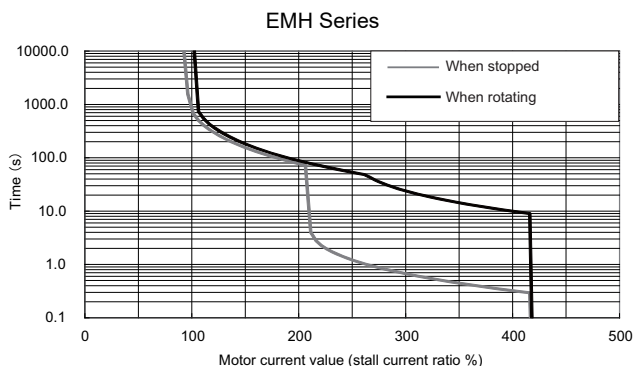
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

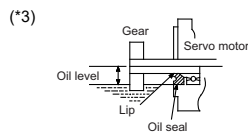
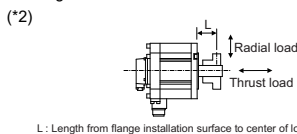


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	80
	2-axis type	MDS-EH-V2-	80, 80W
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	10060
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		3.5
	Rated current[A]		7.8
	Rated torque[N·m]		11.1
	Stall current[A]		14
	Stall torque[N·m]		22.5
	Maximum momentary output (For power supply selection) [kW]		18.0
Rated rotation speed[r/min]		3000	
Maximum rotation speed[r/min]		4000	
Maximum current[A]		58.0	
Maximum torque[N·m]		90.0	
Power rate at continuous rated torque[kW/s]		16.5	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		37.33	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		75.0	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		84.7	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		525	
Mass	(Without) [kg]		19.0
	(With brake) [kg]		25
Heat-resistant class		155(F)	
Degree of protection		IP67	
Cooling method	(The shaft-through portion is excluded.)		Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))			X:24.5(2.5), Y:29.4(3)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] (mm)		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] (mm)		2058 (L=79)
	Thrust load[N]		980
Oil level (*3) [mm]			30
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2
	4,194,304 p/rev (D51)		MDS-EH-V1/V2, MDS-EMH-SPV3
	1,048,576 p/rev (D48)		MDS-EH-V1/V2, MDS-EMH-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

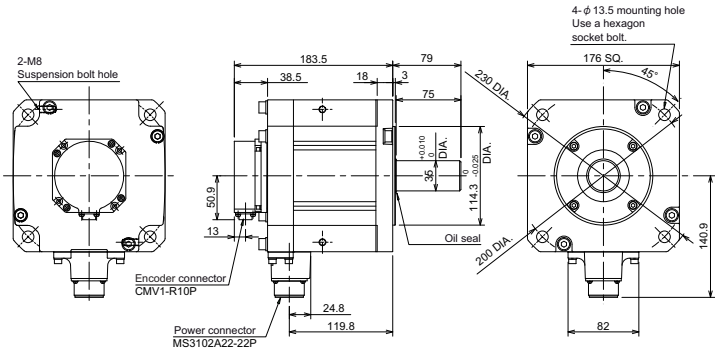
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

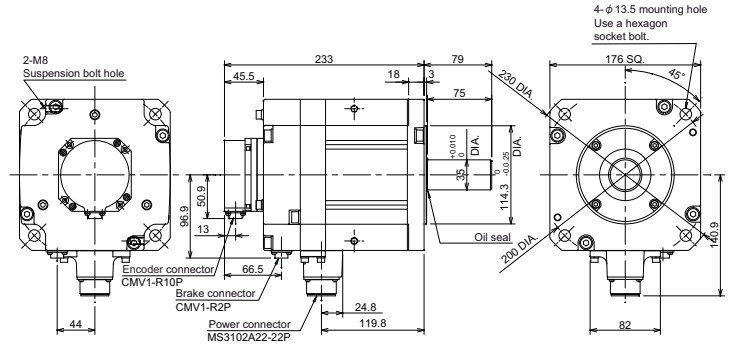
(\*1) This is the representative value for the initial attraction gap at 20°C.  
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

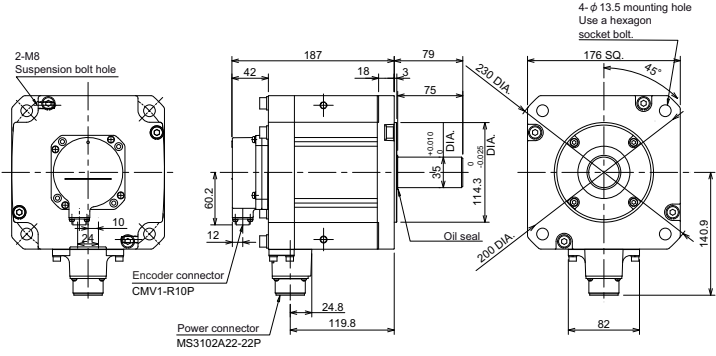
HG-H354S-D48



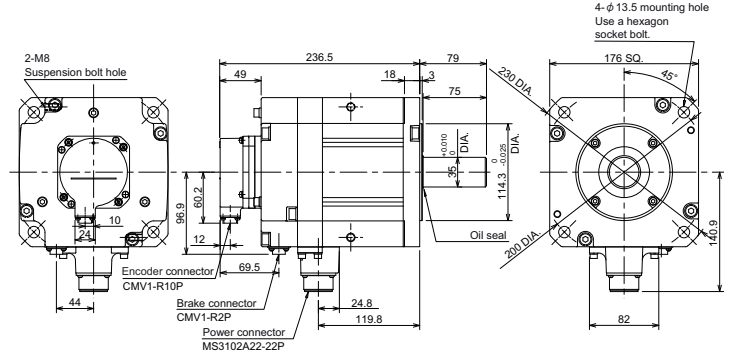
HG-H354BS-D48



HG-H354S-D51,-D74



HG-H354BS-D51,-D74

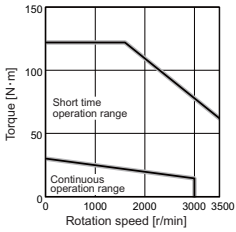


D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug



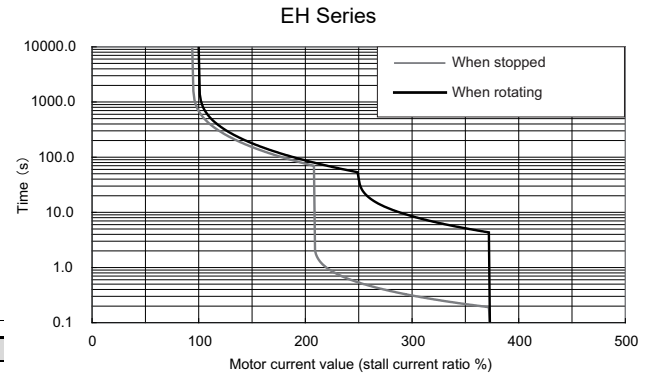
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
30.0N·m	3000r/min	HG-H453 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



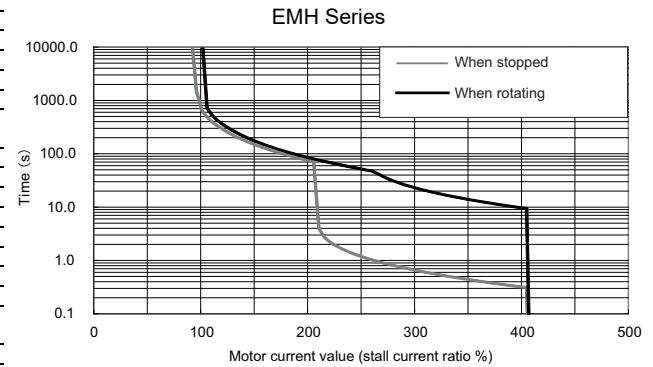
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

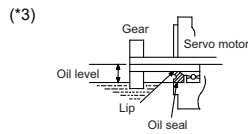
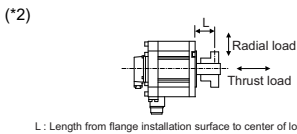


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	80
	2-axis type	MDS-EH-V2-	80, 80W
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	10060
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		4.5
	Rated current[A]		9.3
	Rated torque[N·m]		14.3
	Stall current[A]		14
	Stall torque[N·m]		30.0
Maximum momentary output (For power supply selection) [kW]			22.0
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			3500
Maximum current[A]			53.0
Maximum torque[N·m]			122.0
Power rate at continuous rated torque[kW/s]			18.3
Max. deceleration torque of dynamic brake(Tdp) [N·m]			52.91
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			112.0
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			122.0
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			784
Mass	(Without) [kg]		25
	(With brake) [kg]		31
Heat-resistant class			155(F)
Degree of protection			IP67
Cooling method			(The shaft-through portion is excluded.) Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))			X:24.5(2.5),Y:29.4(3)
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		2058 (L=79)
	Thrust load[N]		980
Oil level (*3) [mm]			30
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2
	4,194,304 p/rev (D51)		MDS-EH-V1/V2, MDS-EMH-SPV3
	1,048,576 p/rev (D48)		MDS-EH-V1/V2, MDS-EMH-SPV3



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

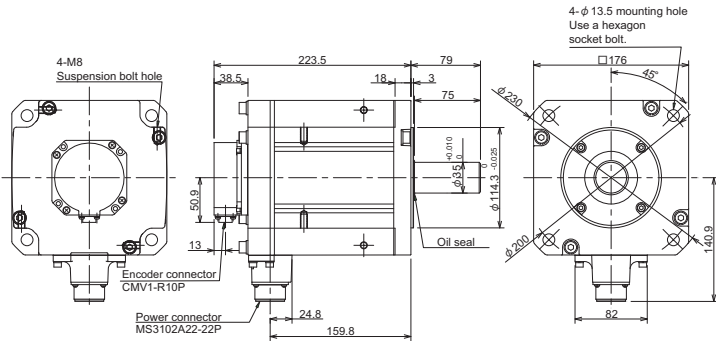
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

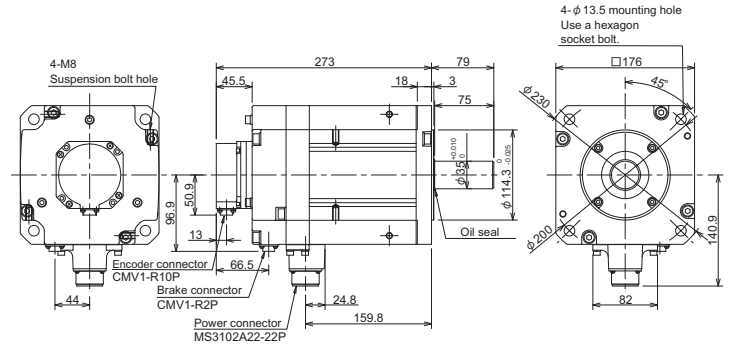
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

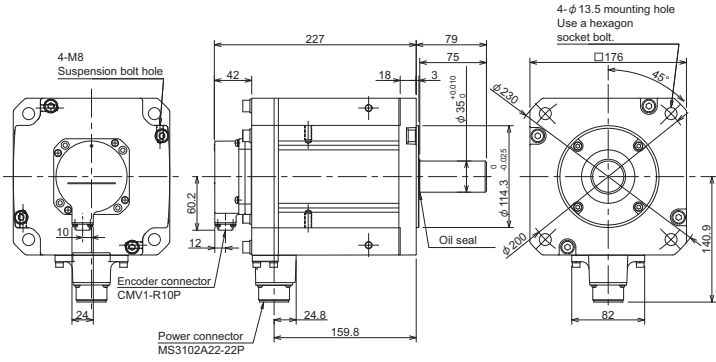
HG-H453S-D48



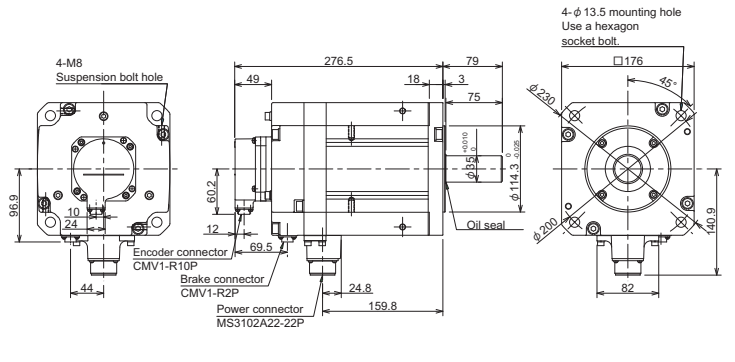
HG-H453BS-D48



HG-H453S-D51,-D74



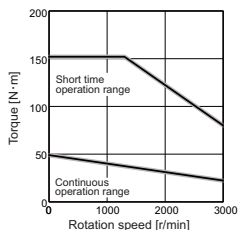
HG-H453BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

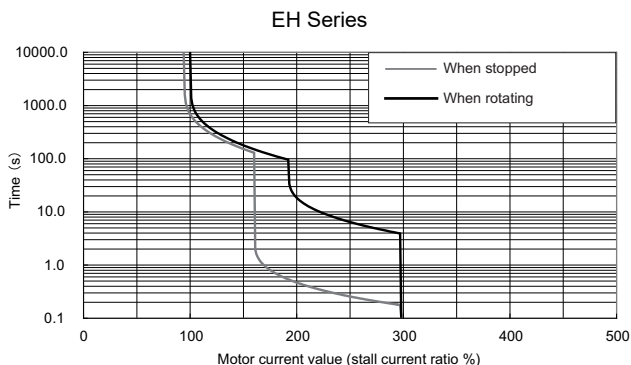
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
49.0N·m	3000r/min	HG-H703 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

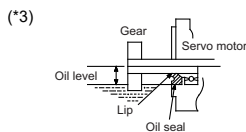
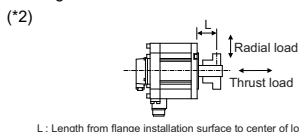
Servo overload protection characteristics



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	80W
	2-axis type	MDS-EH-V2-	80W, 160
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	-
	Continuous characteristics	Rated output[kW]	
	Rated current[A]		16
	Rated torque[N·m]		22.3
	Stall current[A]		19
	Stall torque[N·m]		49.0
Maximum momentary output (For power supply selection) [kW]			27.0
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			3000
Maximum current[A]			55.0
Maximum torque[N·m]			152.0
Power rate at continuous rated torque[kW/s]			32.2
Max. deceleration torque of dynamic brake(Tdp) [N·m]			71.76
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			154.0
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			164.0
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]			1078
Mass	(Without) [kg]		32.0
	(With brake) [kg]		38
Heat-resistant class			155(F)
Degree of protection			IP67
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:29.4(3)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] (mm)		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] (mm)		2058 (L=79)
	Thrust load[N]		980
Oil level (*3) [mm]			30
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1/V2
	4,194,304 p/rev (D51)		MDS-EH-V1/V2
	1,048,576 p/rev (D48)		MDS-EH-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

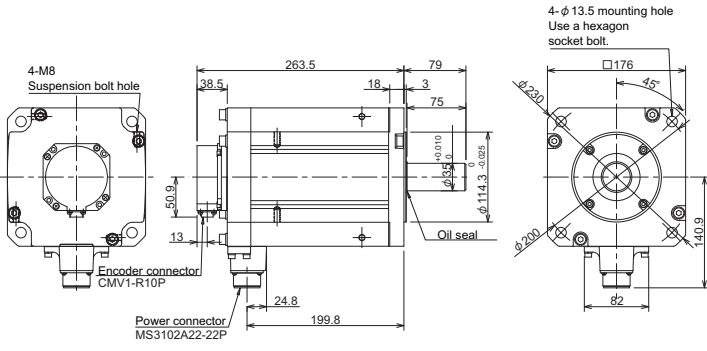
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

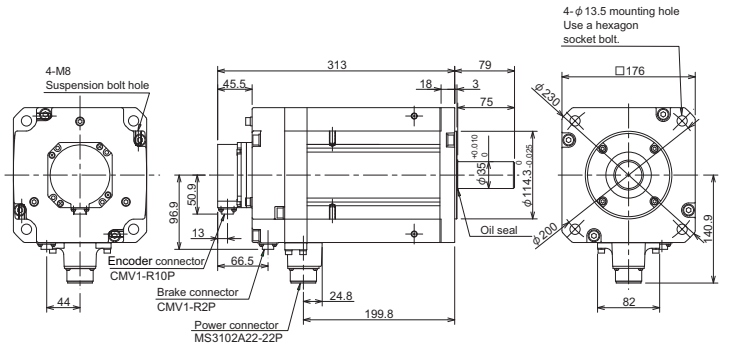
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

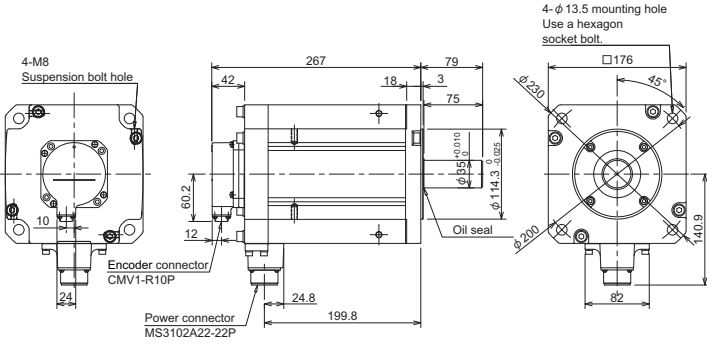
HG-H703S-D48



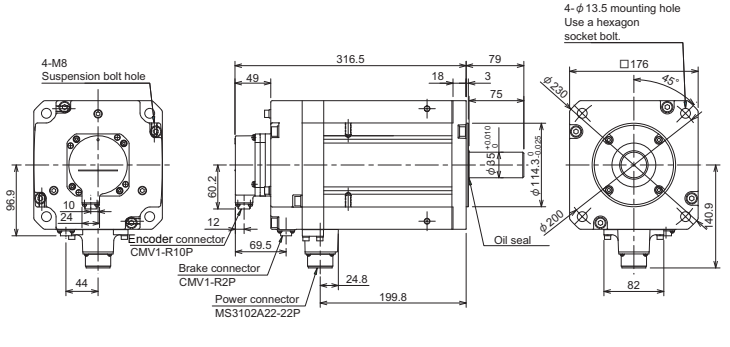
HG-H703BS-D48



HG-H703S-D51,-D74



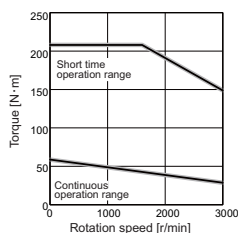
HG-H703BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug

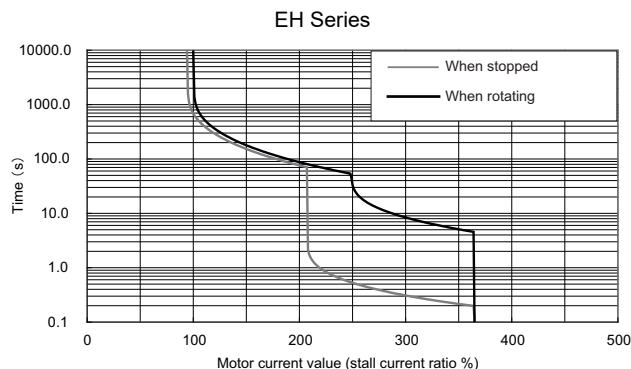
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
58.8N·m	3000r/min	HG-H903 □S-xxx	(1) Magnetic brake	B with brake None without brake
			(2) Encoder	XXX Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

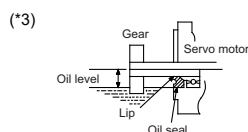
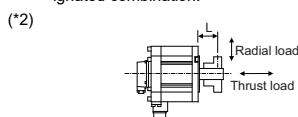
Servo overload protection characteristics



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	160
	2-axis type	MDS-EH-V2-	160
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		9.0
	Rated current[A]		17
	Rated torque[N·m]		28.6
	Stall current[A]		28
	Stall torque[N·m]		58.8
Maximum momentary output (For power supply selection) [kW]		41.0	
Rated rotation speed[r/min]		3000	
Maximum rotation speed[r/min]		3000	
Maximum current[A]		102.0	
Maximum torque[N·m]		208.0	
Power rate at continuous rated torque[kW/s]		42.1	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		89.63	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		196.0	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		206.0	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		1372	
Mass	(Without) [kg]		43
	(With brake) [kg]		49
Heat-resistant class		155(F)	
Degree of protection		IP67	
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:9.8(1), Y:9.8(1)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		2450 (L=85)
	Thrust load[N]		980
Oil level (*3) [mm]		34	
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1
	4,194,304 p/rev (D51)		MDS-EH-V1
	1,048,576 p/rev (D48)		MDS-EH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

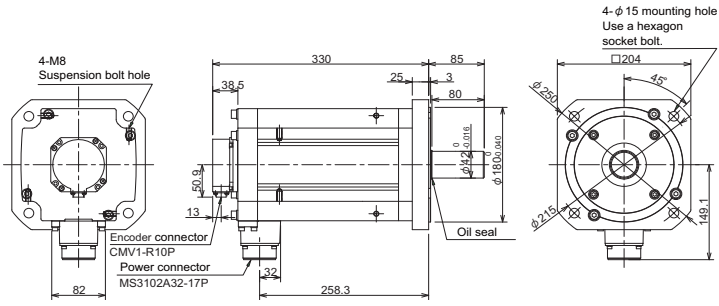
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

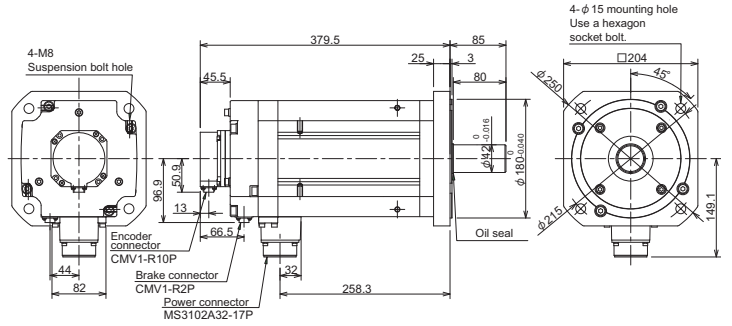
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

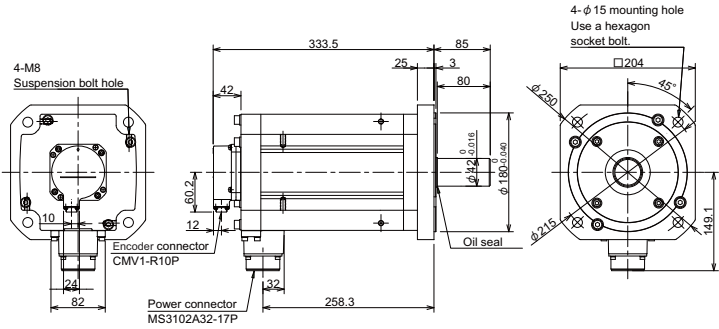
HG-H903S-D48



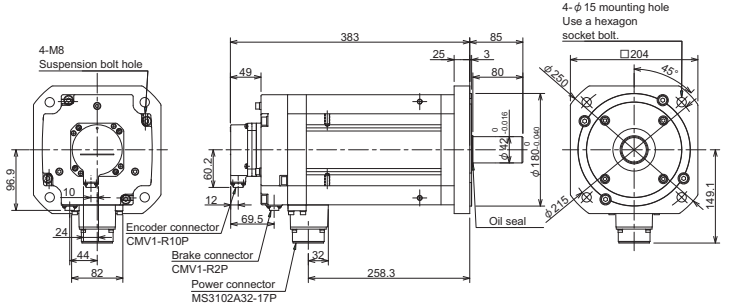
HG-H903BS-D48



HG-H903S-D51,-D74



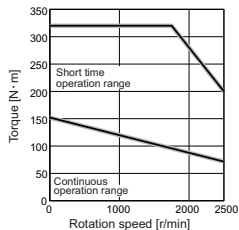
HG-H903BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
(227)	(226)	(227)	(226)	(227)	(226)	(227)	(226)
(84)	(76)	(84)	(76)	(103)	(88)	(140)	(122)
	(33)		(33)		(33)		(33)
	(70)		(70)		(70)		(70)

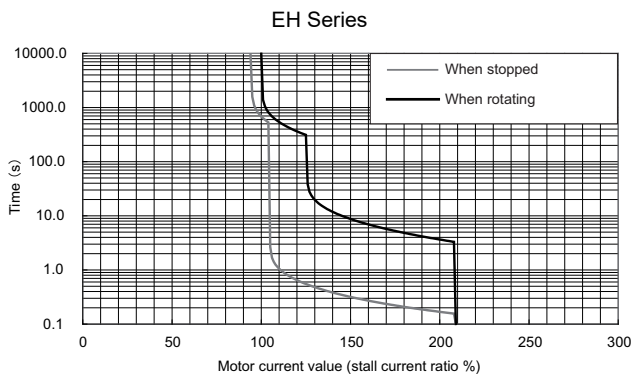
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
152.1N·m	2000r/min	HG-H1502 -xxx	(1) Encoder	XXX
				Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

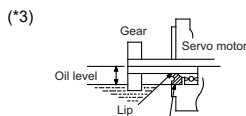
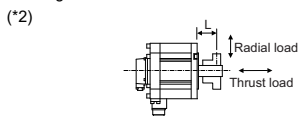
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-
	2-axis type	MDS-EH-V2-
	3-axis type	MDS-EH-V3-
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	15.0
	Rated current[A]	24
	Rated torque[N·m]	71.6
	Stall current[A]	48
	Stall torque[N·m]	152.1
Maximum momentary output (For power supply selection) [kW]	59.0	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	2500	
Maximum current[A]	111.0	
Maximum torque[N·m]	320.0	
Power rate at continuous rated torque[kW/s]	105.0	
Max. deceleration torque of dynamic brake(Tdp) [N·m]	206.55	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	489	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	-	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	4890	
Mass	(Without) [kg]	120
	(With brake) [kg]	-
Heat-resistant class	155(F)	
Degree of protection	IP44	
	(The shaft-through portion is excluded.)	
Cooling method	Totally enclosed forced air cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)	
Axis tolerable load (Taper shaft)	Radial load (*2) [N] (mm)	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] (mm)	3234 (L=140)
	Thrust load[N]	1470
Oil level (*3) [mm]	45	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-EH-V1
	4,194,304 p/rev (D51)	MDS-EH-V1
	1,048,576 p/rev (D48)	MDS-EH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	-
Power consumption at 20°C [W]	-
Static friction torque[N·m]	-
Release delay time (*1) [s]	-
Braking delay time (DC OFF) (*1) [s]	-
Brake life (*2) [times]	-

(\*1) This is the representative value for the initial attraction gap at 20°C.

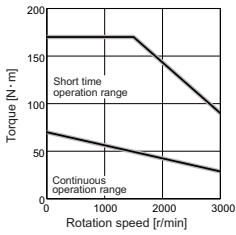
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.





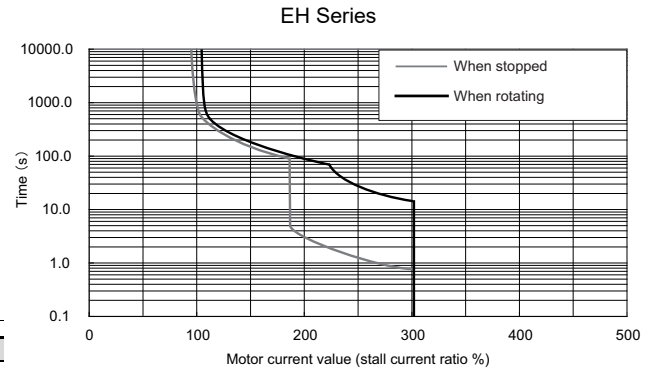
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
70.0N·m	3000r/min	HQ-H903 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

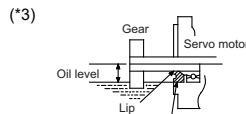
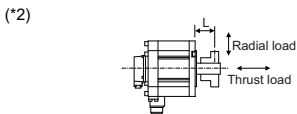
Servo overload protection characteristics



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	160
	2-axis type	MDS-EH-V2-	160
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		9.0
	Rated current[A]		14.7
	Rated torque[N·m]		28.7
	Stall current[A]		32.0
	Stall torque[N·m]		70.0
Maximum momentary output (For power supply selection) [kW]		31.0	
Rated rotation speed[r/min]		3000	
Maximum rotation speed[r/min]		3000	
Maximum current[A]		92.7	
Maximum torque[N·m]		170.0	
Power rate at continuous rated torque[kW/s]		36.0	
Max. deceleration torque of dynamic brake(Tdp) [N·m]		111.25	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		230.0	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		254.0	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]		2250	
Mass	(Without) [kg]		51.0
	(With brake) [kg]		61.4
Heat-resistant class		155(F)	
Degree of protection		IP67	
	(The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:9.8(1), Y:9.8(1)		
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))		-
	Thrust load[N]		-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))		2500 (L=52.7)
	Thrust load[N]		1100
Oil level (*3) [mm]		30	
Absolute position encoder	67,108,864 p/rev (D74)		MDS-EH-V1
	4,194,304 p/rev (D51)		MDS-EH-V1
	1,048,576 p/rev (D48)		MDS-EH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation:80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

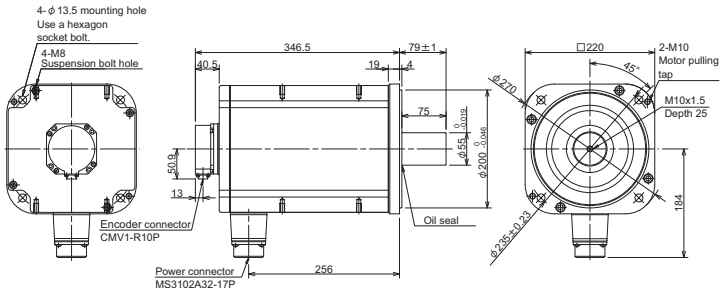
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	41
Static friction torque[N·m]	90 or more
Release delay time (*1) [s]	0.3
Braking delay time (DC OFF) (*1) [s]	0.1
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

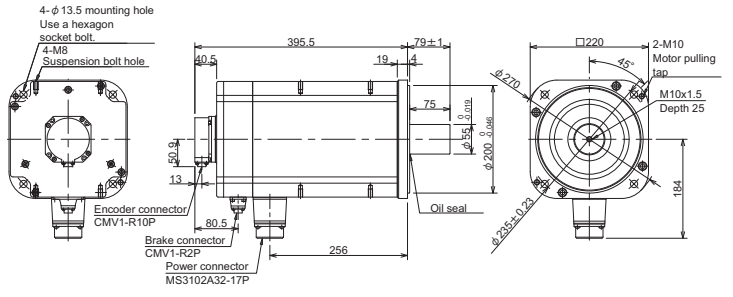
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

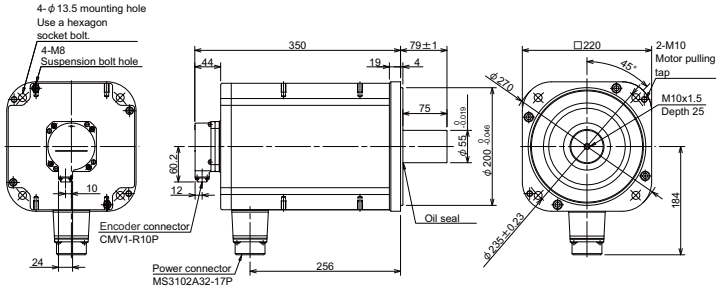
HQ-H903S-D48



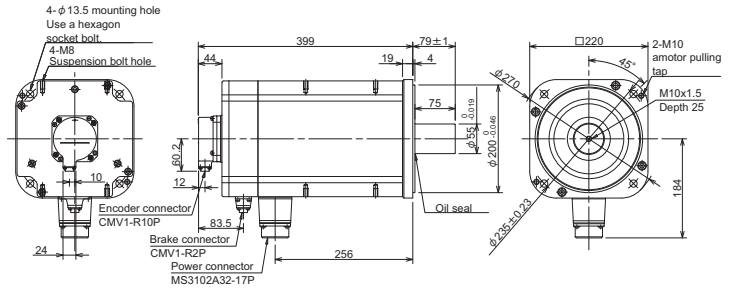
HQ-H903BS-D48



HQ-H903S-A51,-D74



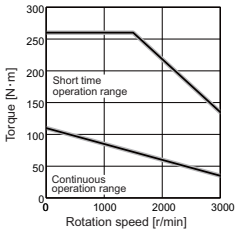
HQ-H903BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5
(84.5)	(76)	(84.5)	(76)	(83.9)	(85.3)	(83.9)	(85.3)
	(34)		(34)		(34)		(34)
	84.9±1.5		84.9±1.5		84.9±1.5		84.9±1.5

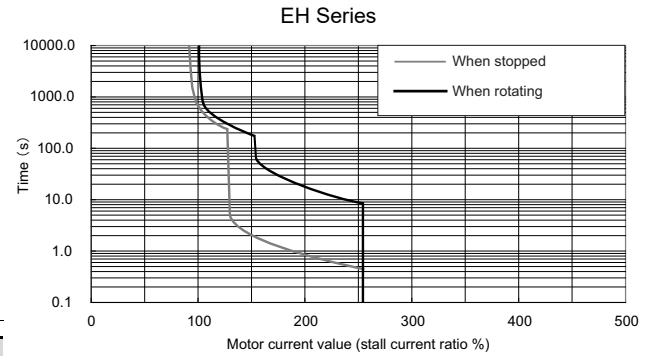
Stall torque	Rated rotation speed	Servomotor type	Explanation of type	
110.0N·m	3000r/min	HQ-H1103 □S-xxx	(1) Magnetic brake	B with brake
				None without brake
			(2) Encoder	XXX Type

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

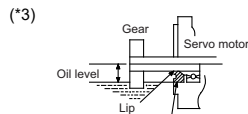
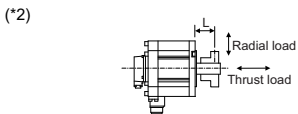
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-
	2-axis type	MDS-EH-V2-
	3-axis type	MDS-EH-V3-
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	11.0
	Rated current[A]	18.5
	Rated torque[N·m]	35.0
	Stall current[A]	46.0
	Stall torque[N·m]	110.0
Maximum momentary output (For power supply selection) [kW]	47.0	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	3000	
Maximum current[A]	114.6	
Maximum torque[N·m]	260.0	
Power rate at continuous rated torque[kW/s]	35.0	
Max. deceleration torque of dynamic brake(Tdp) [N·m]	190.83	
Motor inertia [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	350.0	
(Brake inertia) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	374.0	
Maximum motor shaft conversion load inertia ratio (*4) [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	3000	
Mass	(Without) [kg]	74.0
	(With brake) [kg]	84.4
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:9.8(1), Y:9.8(1)	
Axis tolerable load (Taper shaft)	Radial load (*2) [N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2) [N] ((mm))	2700 (L=52.7)
	Thrust load[N]	1500
Oil level (*3) [mm]	30	
Absolute position encoder	67,108,864 p/rev (D74)	MDS-EH-V1
	4,194,304 p/rev (D51)	MDS-EH-V1
	1,048,576 p/rev (D48)	MDS-EH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]  
 (\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 80% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

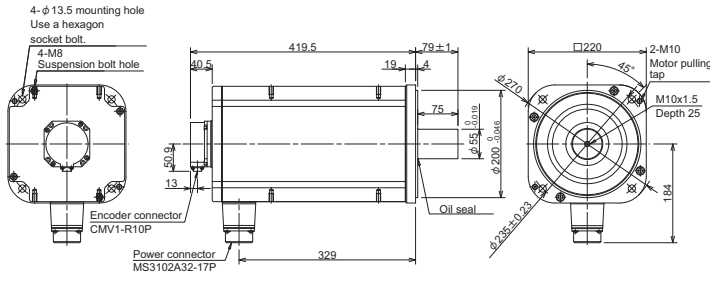
Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	41
Static friction torque[N·m]	90 or more
Release delay time (*1) [s]	0.3
Braking delay time (DC OFF) (*1) [s]	0.1
Brake life (*2) [times]	20,000

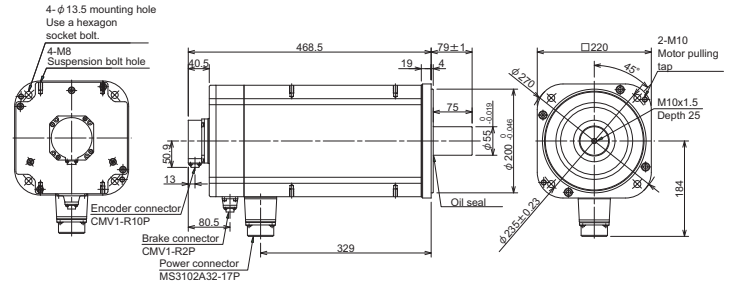
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

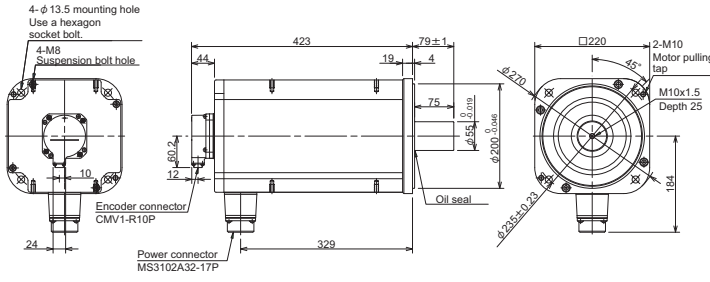
HQ-H1103S-D48



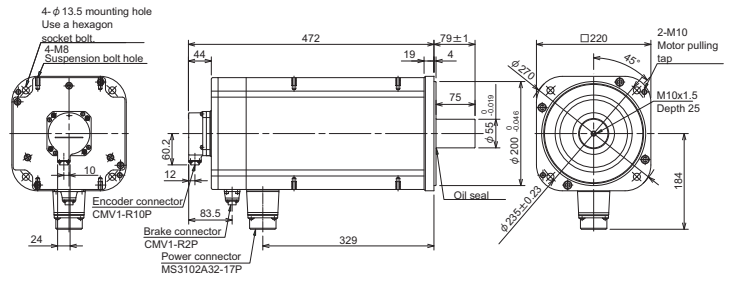
HQ-H1103BS-D48



HQ-H1103S-D51,-D74



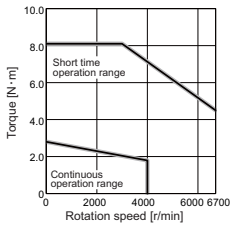
HQ-H1103BS-D51,-D74



D48				D51/D74			
Without brake		With brake		Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug	Straight plug	Right angle plug
276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5	276.9±1.5	260.9±1.5
(84.5)	(76)	(84.5)	(82.1)	(103.5)	(86.3)	(103.5)	(86.3)
	(34)		(34)		(34)		(34)
	84.9±1.5		84.9±1.5		84.9±1.5		84.9±1.5

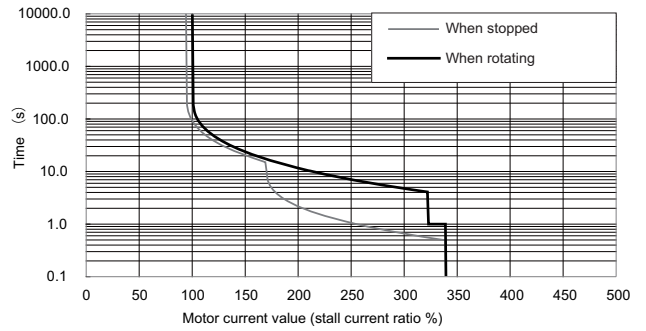
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
2.8N·m	4000r/min	HK-H76 □□-G48 (1)(2)	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

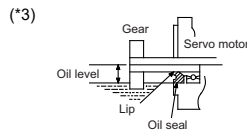
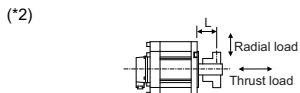
Servo overload protection characteristics



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-
	2-axis type	MDS-EH-V2-
	3-axis type	MDS-EH-V3-
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	0.75
	Rated current[A]	1.5
	Rated torque[N·m]	1.8
	Stall current[A]	2.3
	Stall torque[N·m]	2.8
Maximum momentary output (For power supply selection)[kW]	3.3	
Rated rotation speed[r/min]	4000	
Maximum rotation speed[r/min]	6700	
Maximum current[A]	7.8	
Maximum torque[N·m]	8.1	
Power rate at continuous rated torque[kW/s]	15.4	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	5.73	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.08	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	2.23	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	18.3	
Mass	(Without) [kg]	2.7
	(With brake)[kg]	3.6
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	245 (L=35)
	Thrust load[N]	147
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	392 (L=36)
	Thrust load[N]	147
Oil level (*3)[mm]	16	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

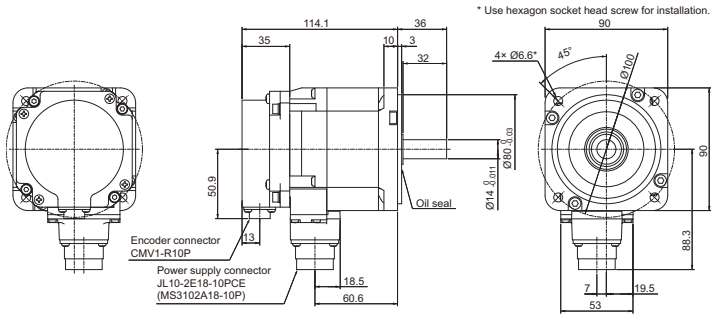
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	10
Static friction torque[N·m]	3.2 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

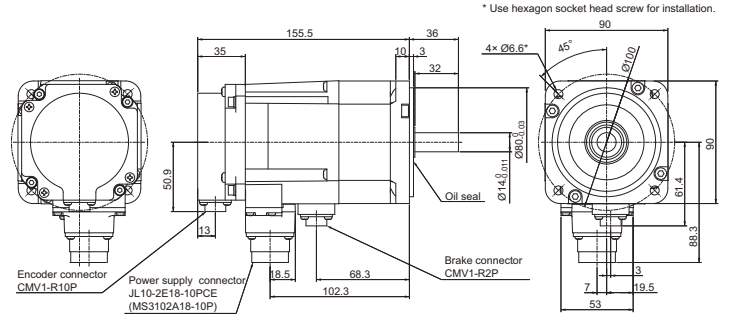
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

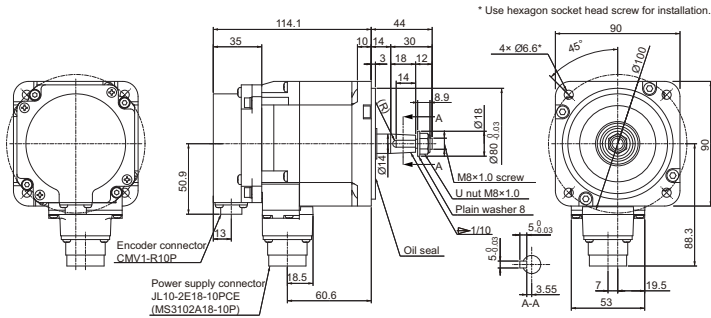
HK-H76S-G48



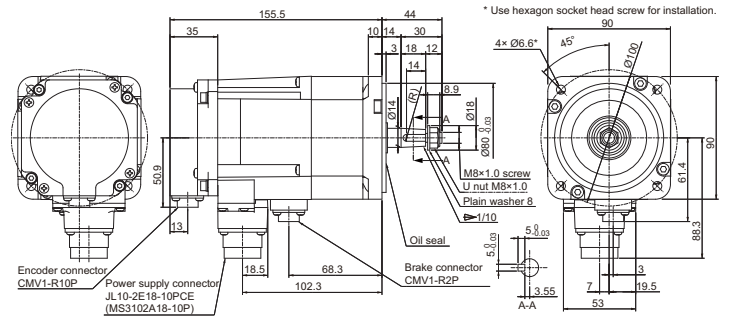
HK-H76BS-G48



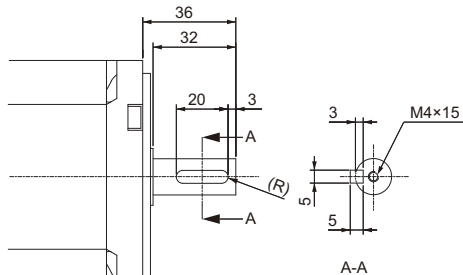
HK-H76T-G48



HK-H76BT-G48



Shaft with keyway (HK-H76K/HK-H76BK-G48)

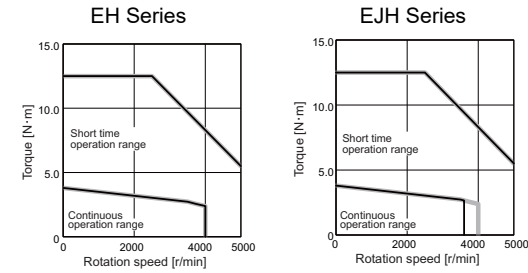


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

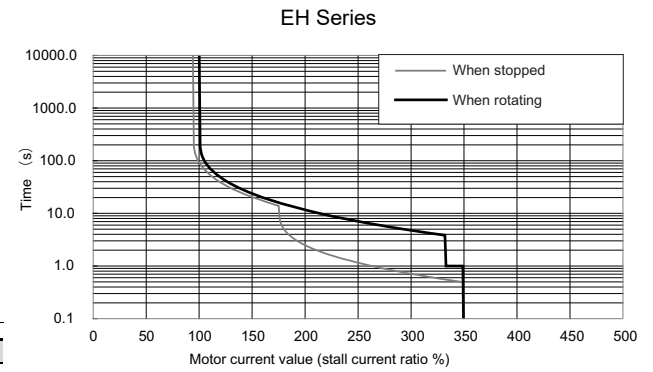
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
3.8N·m	3500r/min	HK-H105 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



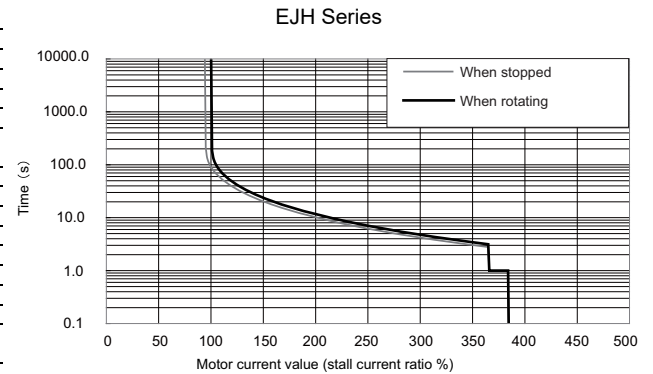
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

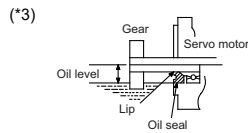
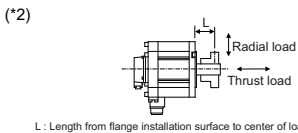


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	10
	2-axis type	MDS-EH-V2-	10, 20
	3-axis type	MDS-EH-V3-	-
	Multi axis type	MDS-EMH-SPV3-	-
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]	1.0	
	Rated current[A]	1.7	
	Rated torque[N·m]	2.7	
	Stall current[A]	2.3	
	Stall torque[N·m]	3.8	
Maximum momentary output (For power supply selection)[kW]	3.6		-
Rated rotation speed[r/min]	3500		
Maximum rotation speed[r/min]	5000		
Maximum current[A]	7.8		
Maximum torque[N·m]	12.5		
Power rate at continuous rated torque[kW/s]	17.1		
Max. deceleration torque of dynamic brake(Tdp)[N·m]	12.38		
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	4.36		
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	4.51		
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	35.7		
Mass	(Without) [kg]	4.1	
	(With brake)[kg]	5.0	
Heat-resistant class	155(F)		
Degree of protection	IP67 (The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:24.5(2.5)		
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	245 (L=35)	
	Thrust load[N]	147	
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	392 (L=36)	
	Thrust load[N]	147	
Oil level (*3)[mm]	16		
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2	MDS-EJH-V1



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	10
Static friction torque[N·m]	3.2 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.02
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

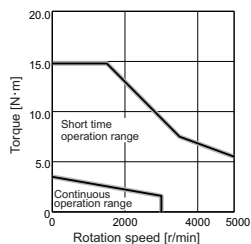
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.





Stall torque	Rated rotation speed	Servo motor type	Explanation of type
3.5N·m	3000r/min	HK-H55 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

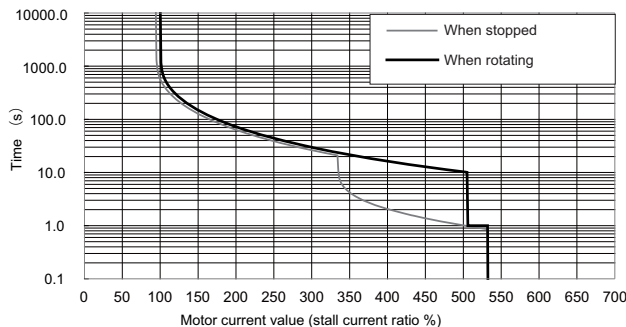
Torque characteristics



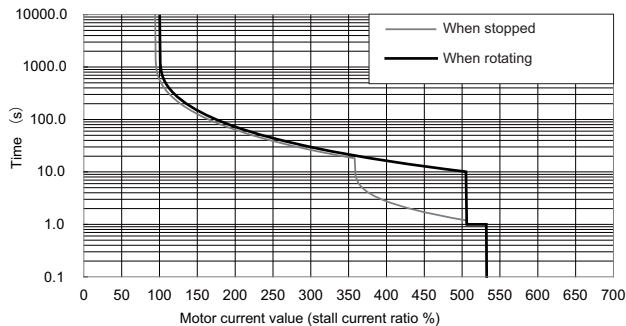
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

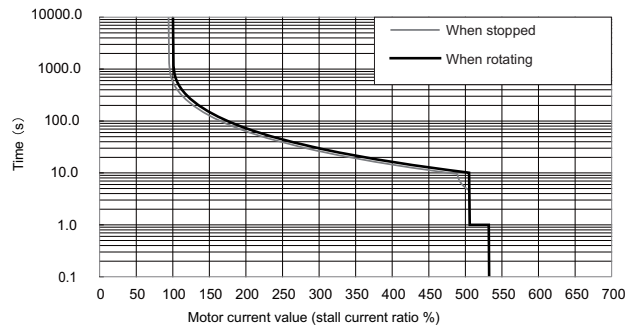
EH Series



EMH Series



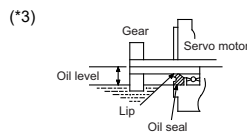
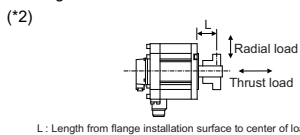
EJH Series



Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	20
	2-axis type	MDS-EH-V2-	20, 40
	3-axis type	MDS-EH-V3-	40
	Multi axis type	MDS-EMH-SPV3-	8040, 10040
	Regenerative resistor type	MDS-EJH-V1-	20
Continuous characteristics	Rated output[kW]	0.5	
	Rated current[A]	1.1	
	Rated torque[N·m]	1.6	
	Stall current[A]	2.2	
	Stall torque[N·m]	3.5	
Maximum momentary output (For power supply selection)[kW]	2.9		-
Rated rotation speed[r/min]	3000		
Maximum rotation speed[r/min]	5000		
Maximum current[A]	11		
Maximum torque[N·m]	14.8		
Power rate at continuous rated torque[kW/s]	4.3		
Max. deceleration torque of dynamic brake(Tdp)[N·m]	4.93		
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	5.90		
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	7.75		
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	42.7		
Mass	(Without) [kg]	5.0	
	(With brake)[kg]	6.8	
Heat-resistant class	155(F)		
Degree of protection	IP67 (The shaft-through portion is excluded.)		
Cooling method	Totally enclosed natural-cooling		
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)		
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)	
	Thrust load[N]	490	
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)	
	Thrust load[N]	490	
Oil level (*3)[mm]	22.5		
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2/V3 MDS-EMH-SPV3	MDS-EJH-V1

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

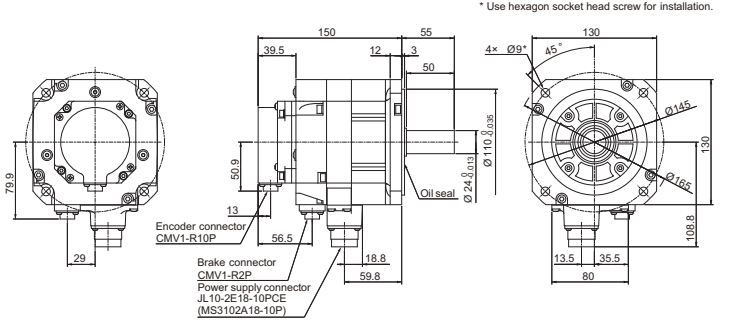
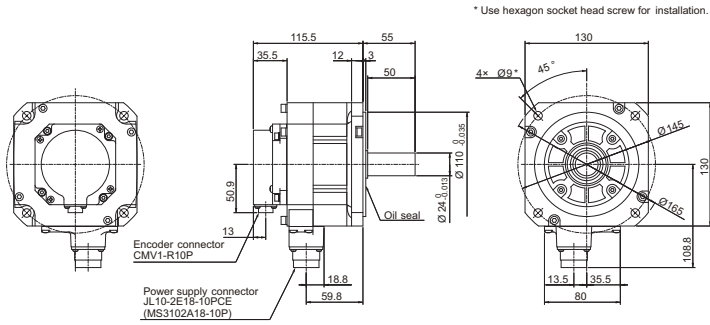
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

# 400V System Medium Inertia Servo Motor HK-H Series

Outline dimension drawings [Unit : mm]

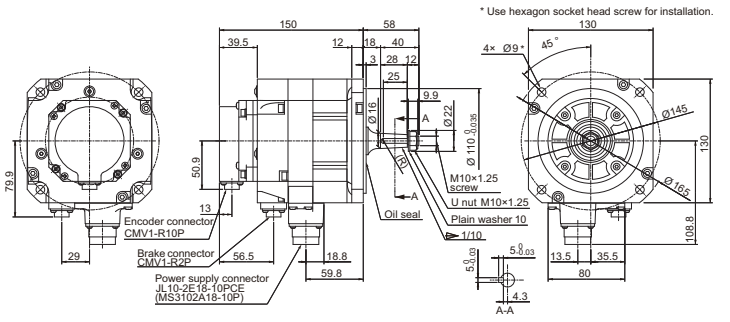
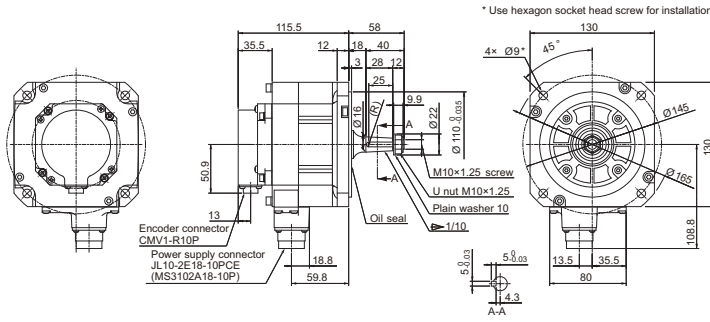
## HK-H55S-G48

## HK-H55BS-G48

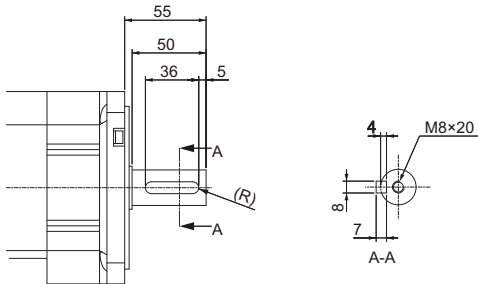


## HK-H55T-G48

## HK-H55BT-G48



## Shaft with keyway (HK-H55K/HK-H55BK-G48)

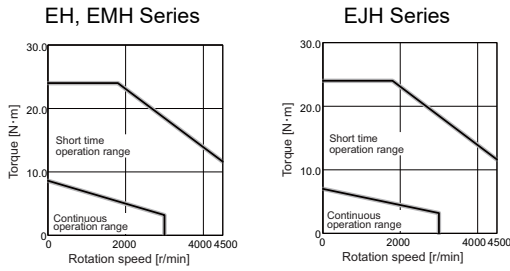


The appearance is the same as the straight (without keyway) except the shaft shape.

G48		G48	
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

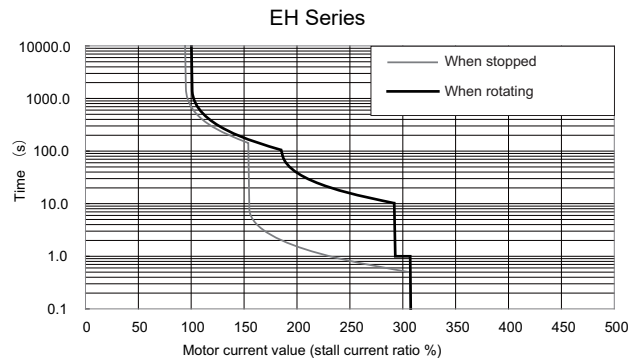
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
8.6N·m	3000r/min	HK-H104 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



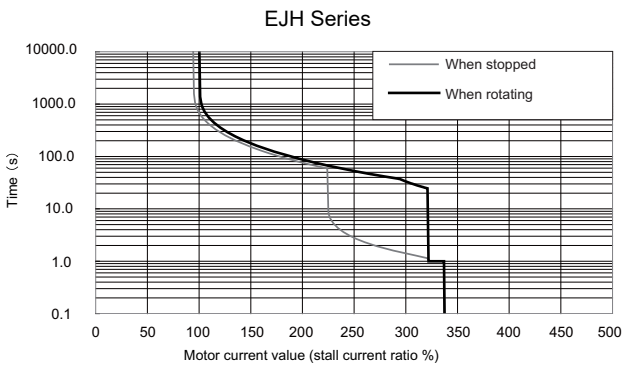
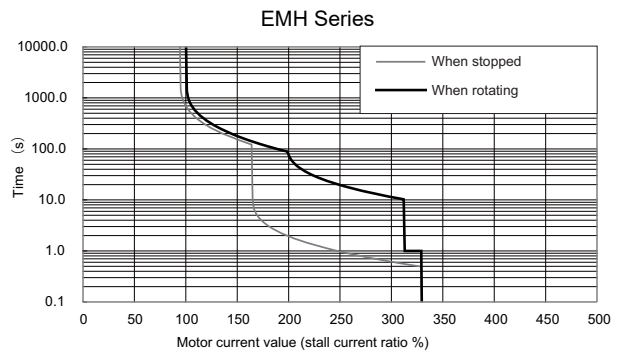
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

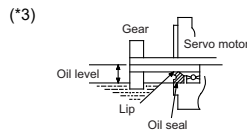
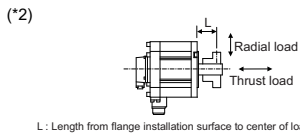


Specifications

Item	Specifications		
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	20
	2-axis type	MDS-EH-V2-	20, 40
	3-axis type	MDS-EH-V3-	40
	Multi axis type	MDS-EMH-SPV3-	8040, 10040
	Regenerative resistor type	MDS-EJH-V1-	-
Continuous characteristics	Rated output[kW]		1.0
	Rated current[A]		1.9
	Rated torque[N·m]		3.2
	Stall current[A]	4.8	3.9
	Stall torque[N·m]	8.6	7.0
Maximum momentary output (For power supply selection)[kW]			5.9
Rated rotation speed[r/min]			3000
Maximum rotation speed[r/min]			4500
Maximum current[A]			15
Maximum torque[N·m]			24.0
Power rate at continuous rated torque[kW/s]			8.9
Max. deceleration torque of dynamic brake(Tdp)[N·m]			10.74
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			11.4
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]			13.3
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]			83.3
Mass	(Without) [kg]		7.1
	(With brake)[kg]		8.8
Heat-resistant class			155(F)
Degree of protection			IP67 (The shaft-through portion is excluded.)
Cooling method			Totally enclosed natural-cooling
Quakeproof level[m/s <sup>2</sup> ] ((G))			X:24.5(2.5), Y:49(5)
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))		392 (L=46)
	Thrust load[N]		490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))		980 (L=55)
	Thrust load[N]		490
Oil level (*3)[mm]			22.5
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/N2/V3 MDS-EMH-SPV3	MDS-EJH-V1



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

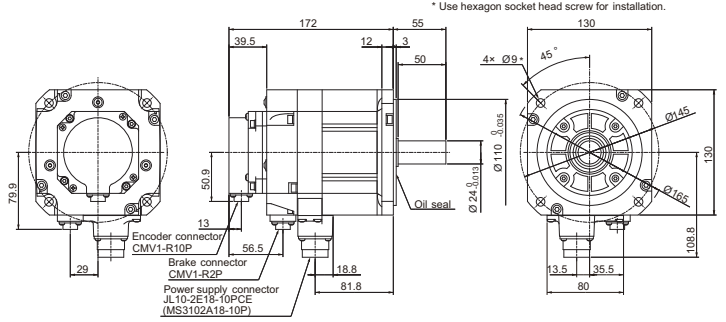
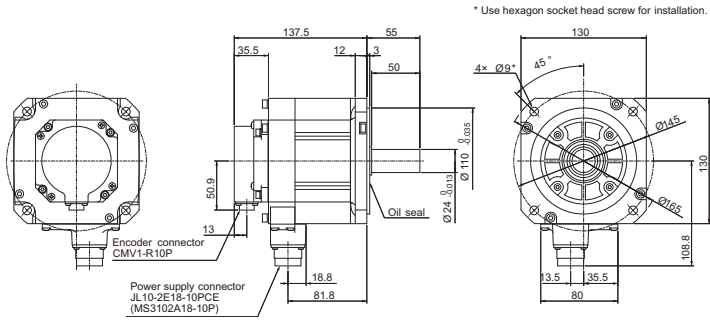
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

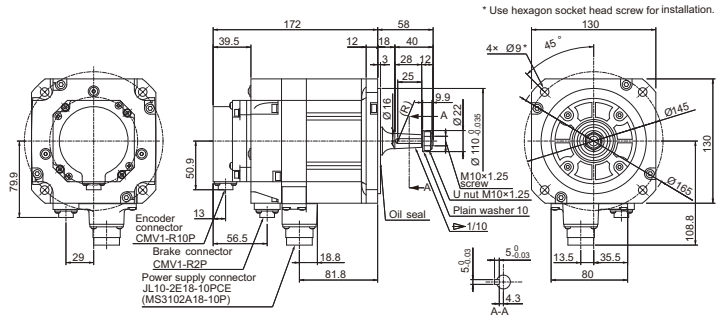
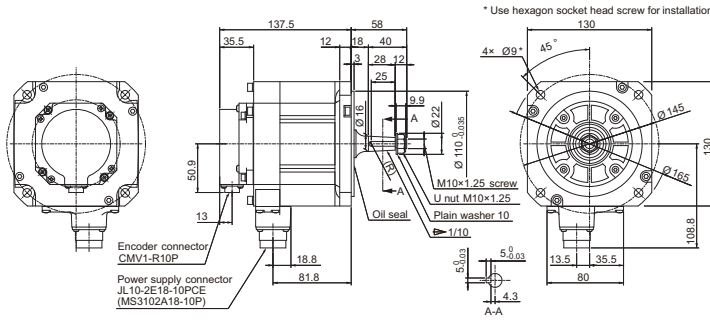
HK-H104S-G48

HK-H104BS-G48

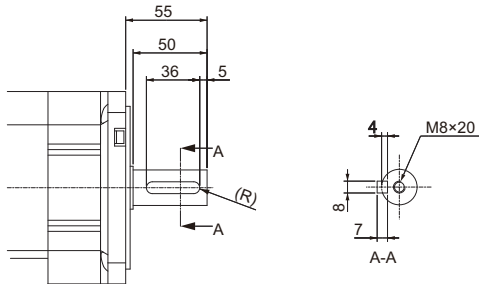


HK-H104T-G48

HK-H104BT-G48



Shaft with keyway (HK-H104K/HK-H104BK-G48)

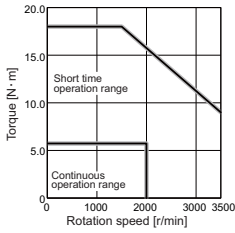


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

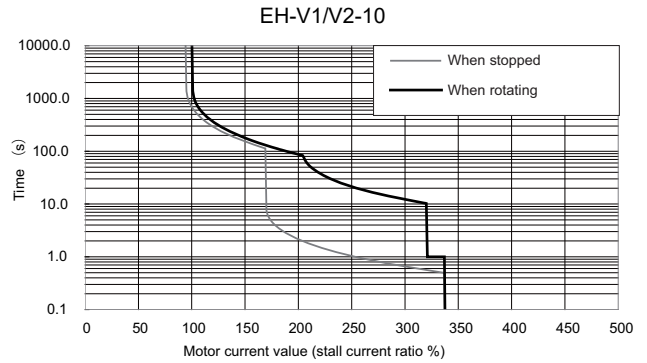
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
5.7N·m	2000r/min	HK-H123 □□-G48	(1) Magnetic brake
			(2) Shaft end
		(1) Magnetic brake	B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



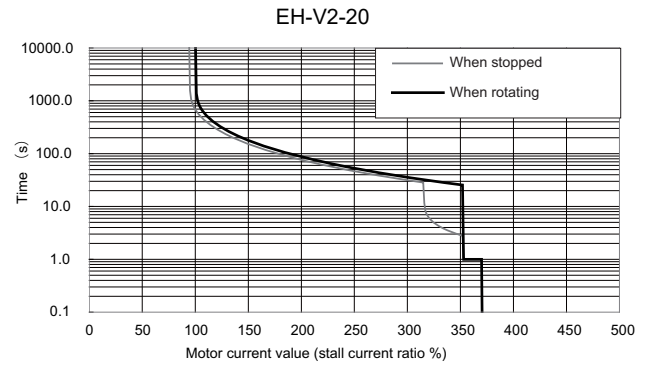
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

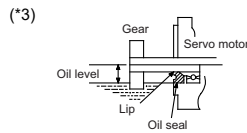
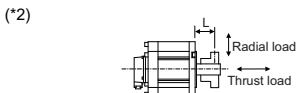


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-10
	2-axis type	MDS-EH-V2-10, 20
	3-axis type	MDS-EH-V3-
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	1.2
	Rated current[A]	2.3
	Rated torque[N·m]	5.7
	Stall current[A]	2.3
	Stall torque[N·m]	5.7
Maximum momentary output (For power supply selection)[kW]	3.6	
Rated rotation speed[r/min]	2000	
Maximum rotation speed[r/min]	3500	
Maximum current[A]	7.8	
Maximum torque[N·m]	18.0	
Power rate at continuous rated torque[kW/s]	28.8	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	10.75	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	11.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	13.3	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	83.3	
Mass	(Without) [kg]	7.1
	(With brake)[kg]	8.8
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

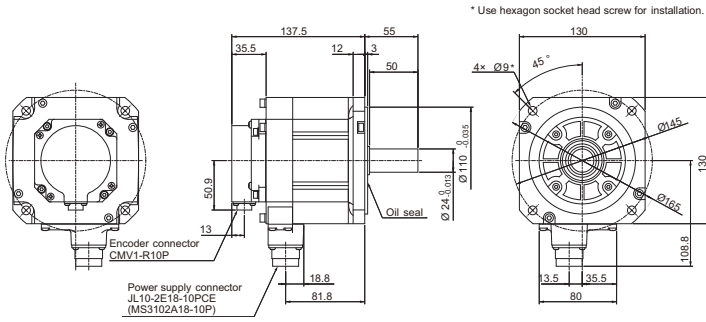
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

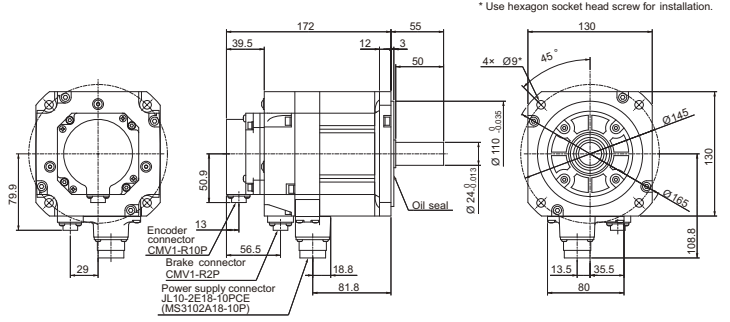
# 400V System Medium Inertia Servo Motor HK-H Series

Outline dimension drawings [Unit : mm]

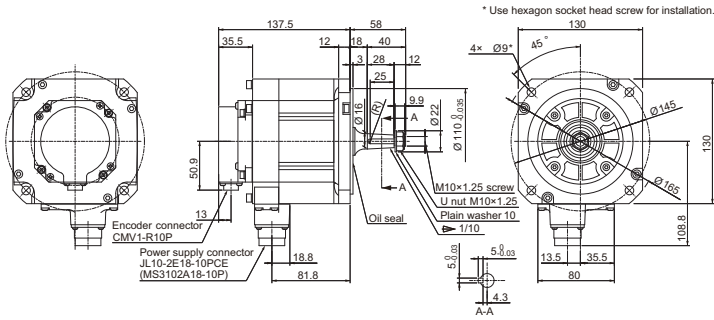
## HK-H123S-G48



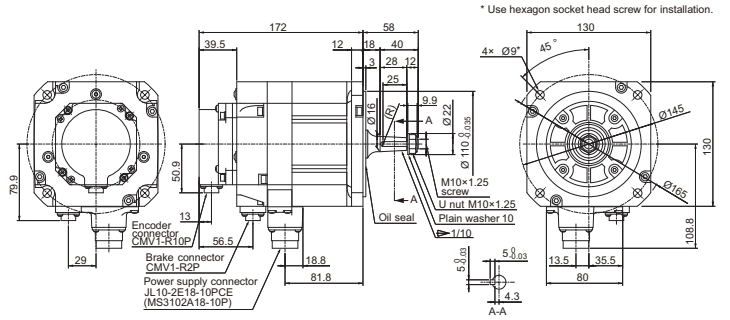
## HK-H123BS-G48



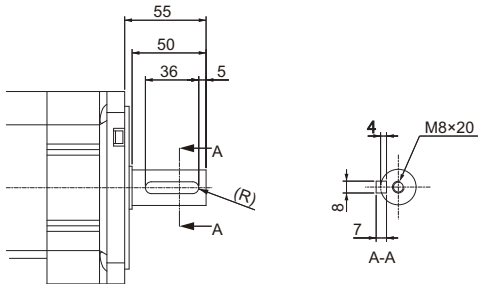
## HK-H123T-G48



## HK-H123BT-G48



## Shaft with keyway (HK-H123K/HK-H123BK-G48)

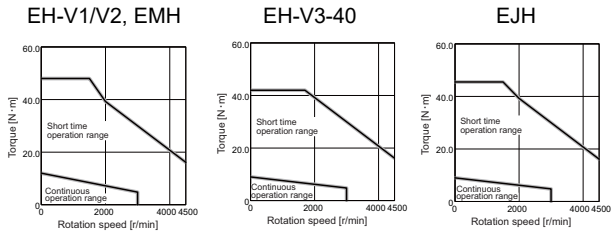


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

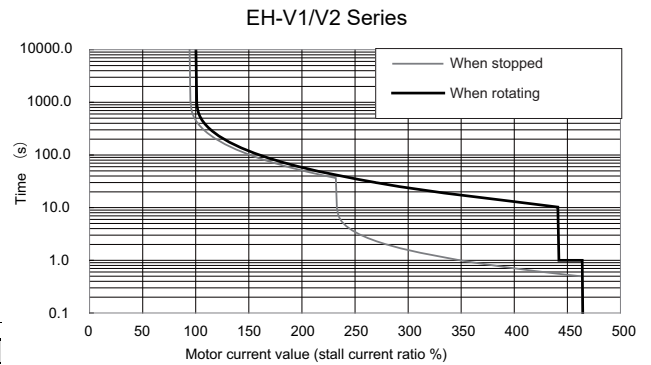
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
<b>12.0N·m</b>	<b>3000r/min</b>	<b>HK-H154 □□-G48</b> (1)(2)	(1) Magnetic brake B with brake None without brake (2) Shaft end K With keyway (with key) S Straight (without keyway) T Taper (without keyway)

Torque characteristics



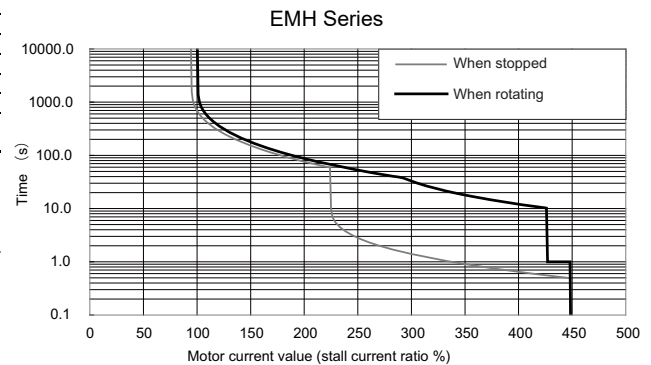
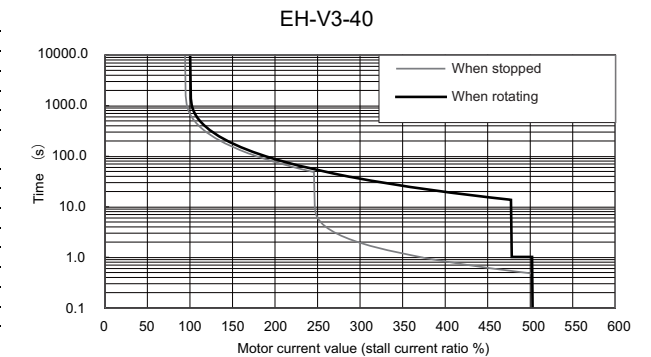
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

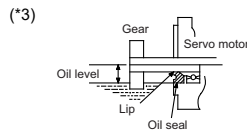
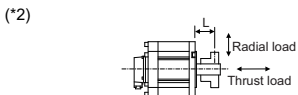


Specifications

Item	Specifications				
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-	40	-	
	2-axis type	MDS-EH-V2-	40, 80	-	
	3-axis type	MDS-EH-V3-	-	40	
	Multi axis type	MDS-EMH-SPV3-	-	8040, 10040, 10060	
	Regenerative resistor type	MDS-EJM-V1-	-	-	40
Continuous characteristics	Rated output[kW]	1.5			
	Rated current[A]	2.7			
	Rated torque[N·m]	4.8			
	Stall current[A]	6.5	4.9	6.5	4.9
	Stall torque[N·m]	12.0	9.0	12.0	9.0
Maximum momentary output (For power supply selection)[kW]	9.4				
Rated rotation speed[r/min]	3000				
Maximum rotation speed[r/min]	4500				
Maximum current[A]	29	25	29	27	
Maximum torque[N·m]	48.0	42.0	48.0	45.5	
Power rate at continuous rated torque[kW/s]	13.5				
Max. deceleration torque of dynamic brake(Tdp)[N·m]	16.62				
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	16.9				
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	18.8				
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	125				
Mass	(Without) [kg]	9.1			
	(With brake)[kg]	11			
Heat-resistant class	155(F)				
Degree of protection	IP67 (The shaft-through portion is excluded.)				
Cooling method	Totally enclosed natural-cooling				
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)				
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)			
	Thrust load[N]	490			
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)			
	Thrust load[N]	490			
Oil level (*3)[mm]	22.5				
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2	MDS-EH-V3-40	MDS-EMH-SPV3	MDS-EJM-V1



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

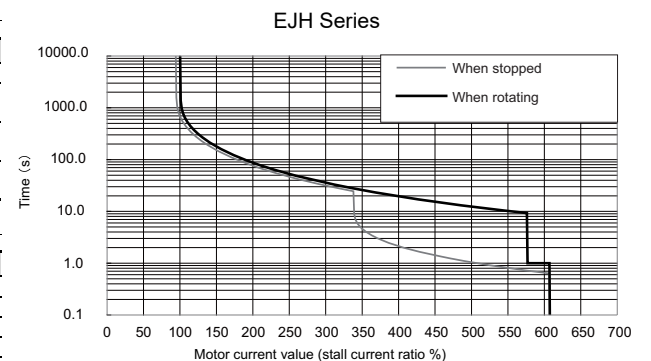
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



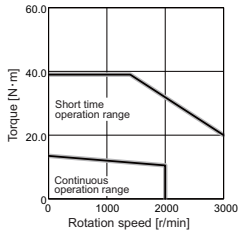






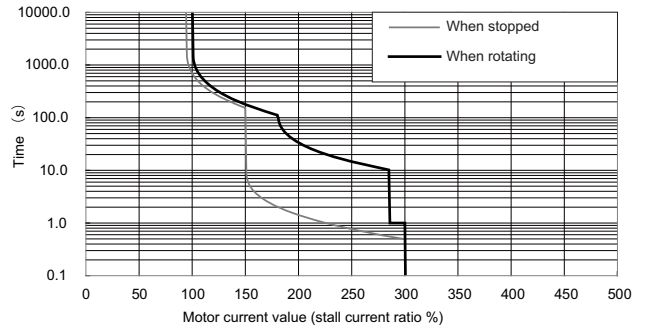
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
13.5N·m	2000r/min	HK-H223 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

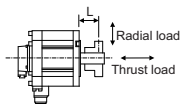


Specifications

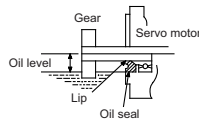
Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 20
	2-axis type MDS-EH-V2- 20, 40
	3-axis type MDS-EH-V3- 40
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 2.2
	Rated current[A] 3.8
	Rated torque[N·m] 10.5
	Stall current[A] 4.9
	Stall torque[N·m] 13.5
Maximum momentary output (For power supply selection)[kW] 6.8	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 15	
Maximum torque[N·m] 39.0	
Power rate at continuous rated torque[kW/s] 49.3	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 22.48	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 22.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 24.2	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 166	
Mass	(Without) [kg] 11
	(With brake)[kg] 13
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) 392 (L=46)
	Thrust load[N] 490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 980 (L=55)
	Thrust load[N] 490
Oil level (*3)[mm] 22.5	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2/V3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



(\*3)



L: Length from flange installation surface to center of load weight [mm]

(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

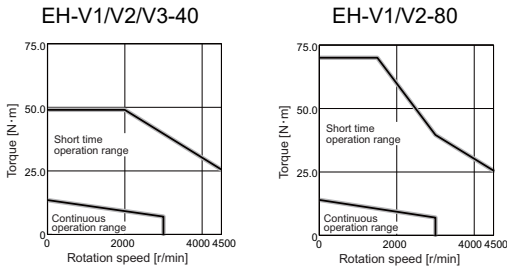
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



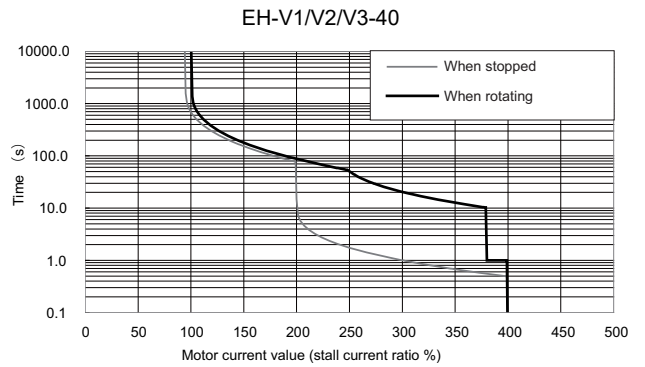
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
14.0N·m	3000r/min	HK-H224 □□-G48	(1) Magnetic brake
			(2) Shaft end
		(1) Magnetic brake	B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)
			T Taper (without keyway)

Torque characteristics



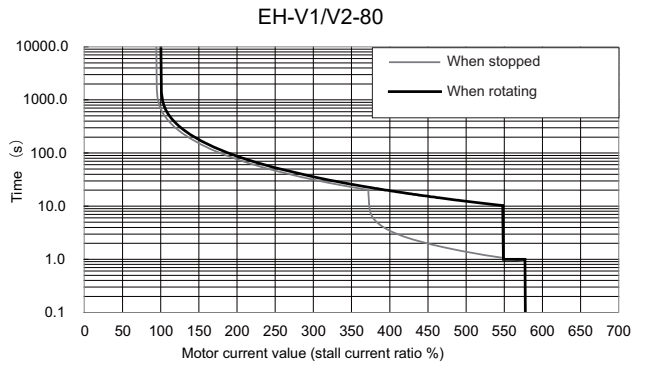
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

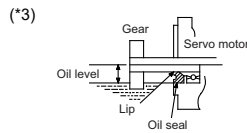
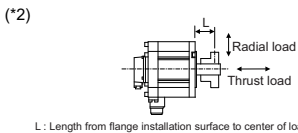


Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-40
	2-axis type	MDS-EH-V2-40
	3-axis type	MDS-EH-V3-40
	Multi axis type	MDS-EMH-SPV3-
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	2.2
	Rated current[A]	4.0
	Rated torque[N·m]	7.0
	Stall current[A]	7.6
	Stall torque[N·m]	13.5
Maximum momentary output (For power supply selection)[kW]	12.8	13.0
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	4500	
Maximum current[A]	29	41
Maximum torque[N·m]	49.0	70.0
Power rate at continuous rated torque[kW/s]	21.9	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	22.47	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	22.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	24.2	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	166	
Mass	(Without) [kg]	11
	(With brake)[kg]	13
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	392 (L=46)
	Thrust load[N]	490
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	980 (L=55)
	Thrust load[N]	490
Oil level (*3)[mm]	22.5	
Absolute position encoder	1,048,576 p/rev (G48)	MDS-EH-V1/V2/V3
		MDS-EH-V1/V2



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	20
Static friction torque[N·m]	8.5 or more
Release delay time (*1) [s]	0.04
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

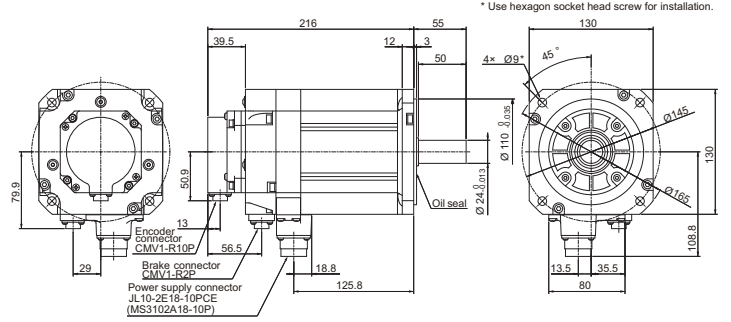
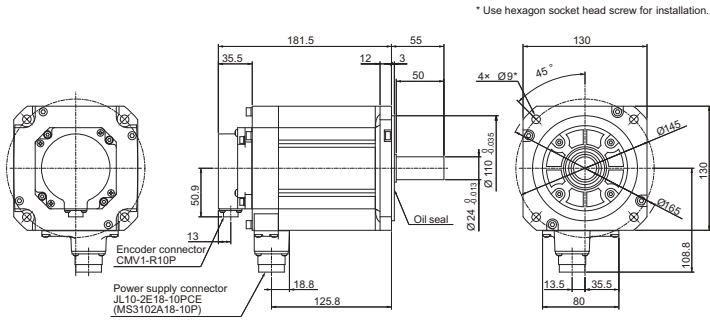
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

# 400V System Medium Inertia Servo Motor HK-H Series

Outline dimension drawings [Unit : mm]

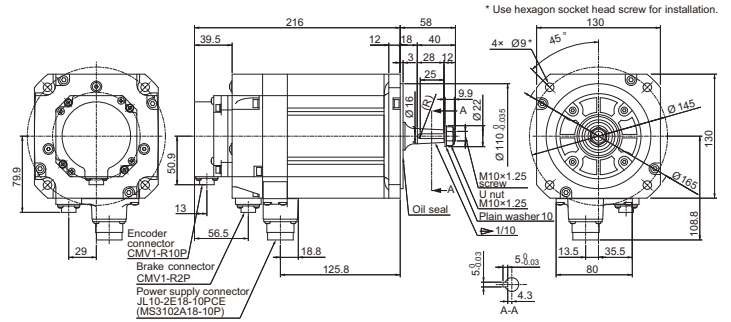
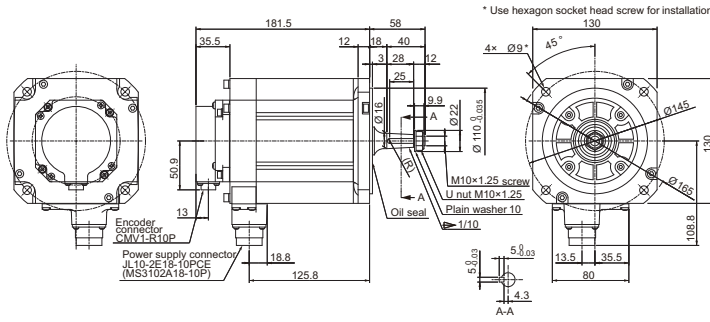
HK-H224S-G48

HK-H224BS-G48

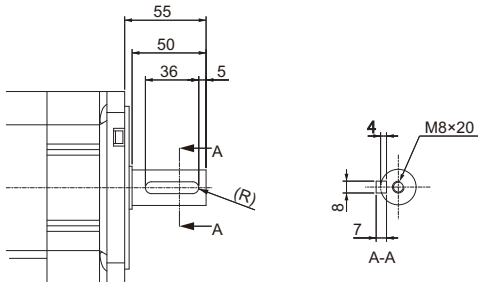


HK-H224T-G48

HK-H224BT-G48



Shaft with keyway (HK-H224K/HK-H224BK-G48)

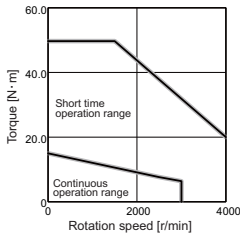


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type
15.0N·m	2500r/min	HK-H204 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

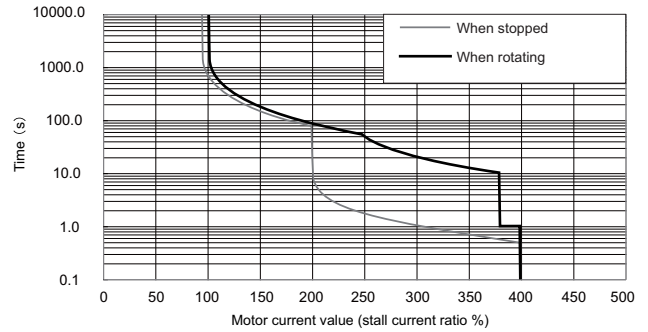
Torque characteristics



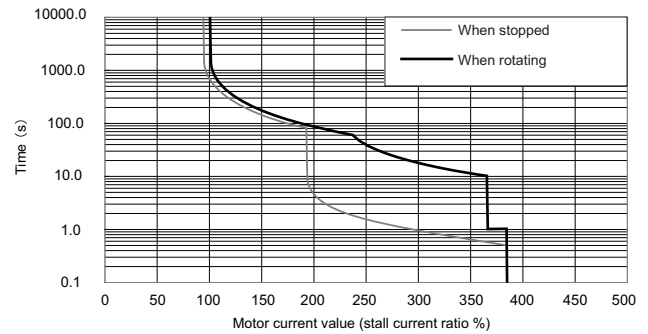
(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

EH Series



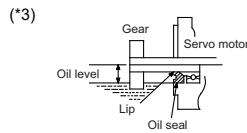
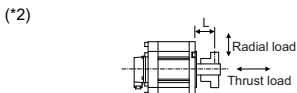
EMH Series



Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-40
	2-axis type	MDS-EH-V2-40, 80
	3-axis type	MDS-EH-V3-40
	Multi axis type	MDS-EMH-SPV3-8040, 10040, 10060
	Regenerative resistor type	MDS-EJH-V1-
Continuous characteristics	Rated output[kW]	2.0
	Rated current[A]	3.9
	Rated torque[N·m]	7.6
	Stall current[A]	7.6
	Stall torque[N·m]	15.0
Maximum momentary output (For power supply selection)[kW]	10.0	
Rated rotation speed[r/min]	2500	
Maximum rotation speed[r/min]	4000	
Maximum current[A]	29	
Maximum torque[N·m]	49.7	
Power rate at continuous rated torque[kW/s]	16.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m]	18.65	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	36.4	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	41.4	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ]	198	
Mass	(Without) [kg]	13
	(With brake)[kg]	18
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5), Y:49(5)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm))	-
	Thrust load[N]	-
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm))	2058 (L=79)
	Thrust load[N]	980
Oil level (*3)[mm]	30	
Absolute position encoder	MDS-EH-V1/V2/V3	
	MDS-EMH-SPV3	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

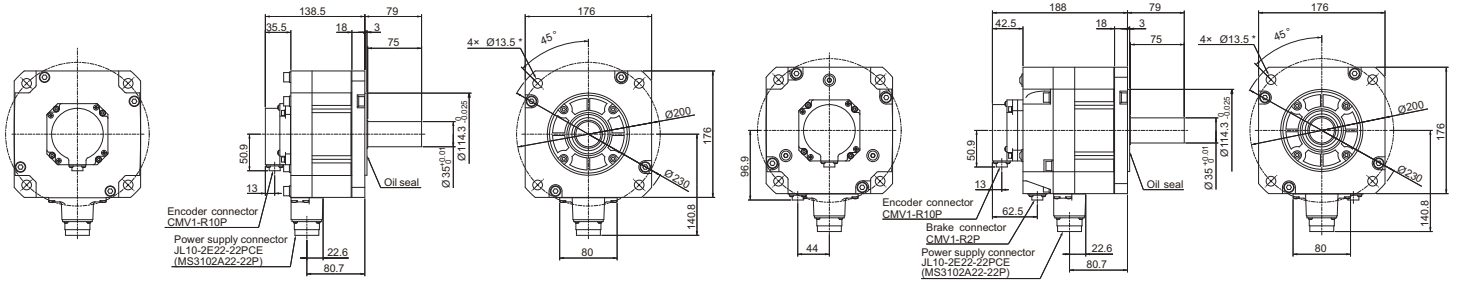
Outline dimension drawings [Unit : mm]

HK-H204S-G48

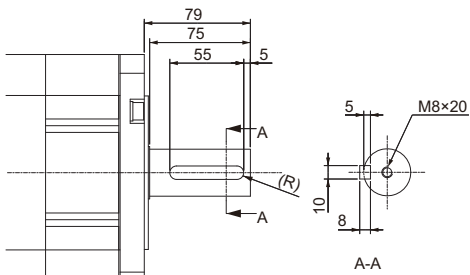
HK-H204BS-G48

\* Use hexagon socket head screw for installation.

\* Use hexagon socket head screw for installation.



Shaft with keyway (HK-H204K/HK-H204BK-G48)



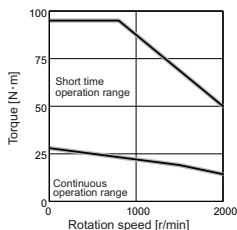
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type
28.0N·m	1500r/min	HK-H302 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

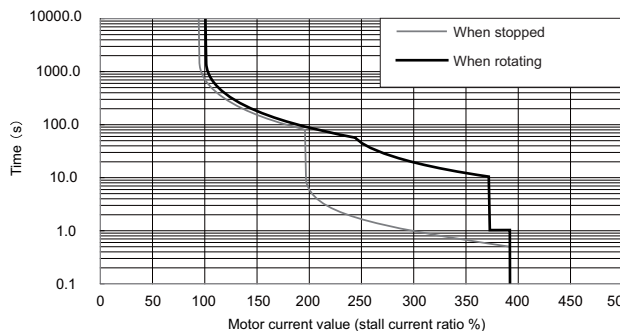
Torque characteristics

Servo overload protection characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

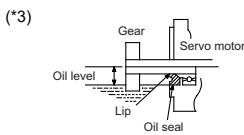
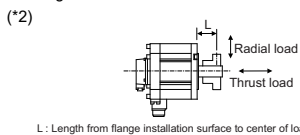
EH Series



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 40
	2-axis type MDS-EH-V2- 40
	3-axis type MDS-EH-V3- 40
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 3.0
	Rated current[A] 5.3
	Rated torque[N·m] 19.1
	Stall current[A] 7.7
	Stall torque[N·m] 28.0
Maximum momentary output (For power supply selection)[kW] 10.9	
Rated rotation speed[r/min] 1500	
Maximum rotation speed[r/min] 2000	
Maximum current[A] 29	
Maximum torque[N·m] 95.0	
Power rate at continuous rated torque[kW/s] 51.5	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 39.69	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 70.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 75.8	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 525	
Mass	(Without) [kg] 20
	(With brake)[kg] 25
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2/V3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

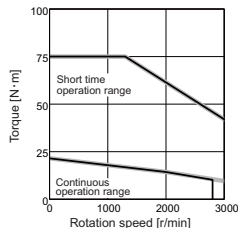
(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.





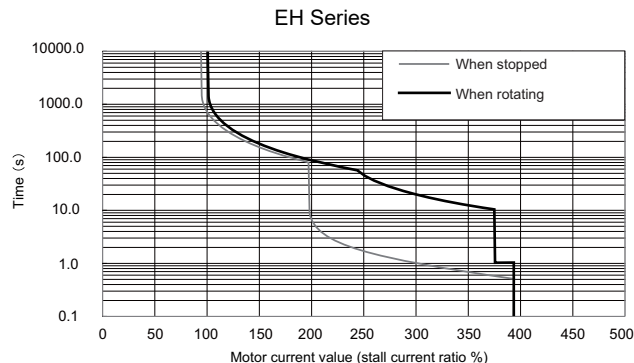
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
21.5N·m	2000r/min	HK-H303 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

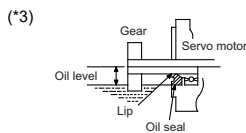
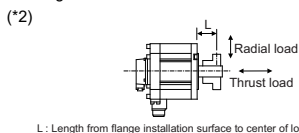
Servo overload protection characteristics



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 40
	2-axis type MDS-EH-V2- 40, 80
	3-axis type MDS-EH-V3- 40
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 3.0
	Rated current[A] 5.2
	Rated torque[N·m] 14.3
	Stall current[A] 7.7
	Stall torque[N·m] 21.5
Maximum momentary output (For power supply selection)[kW] 13.5	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 29	
Maximum torque[N·m] 75.0	
Power rate at continuous rated torque[kW/s] 29.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 39.69	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 70.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 75.8	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 232	
Mass	(Without) [kg] 20
	(With brake)[kg] 25
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2/V3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

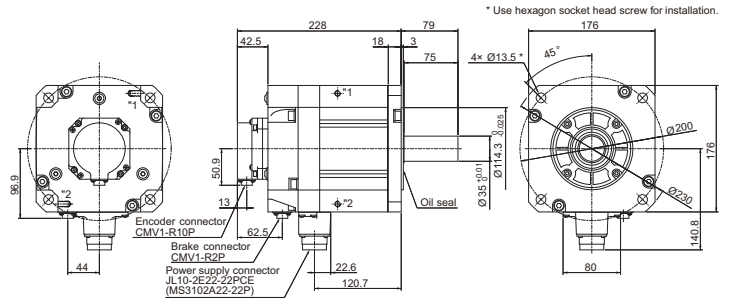
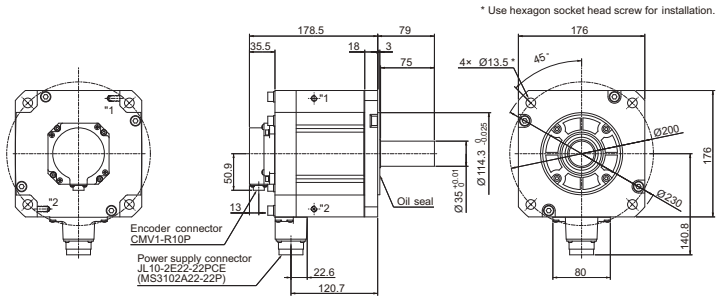
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

Outline dimension drawings [Unit : mm]

HK-H303S-G48

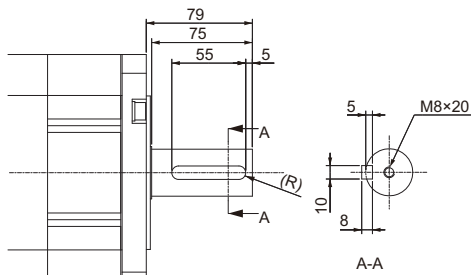
HK-H303BS-G48



Note. The mark (\*1, \*2) is a female screw (M8) for the hanging bolt.

Note. The mark (\*1, \*2) is a female screw (M8) for the hanging bolt.

Shaft with keyway (HK-H303K/HK-H303BK-G48)

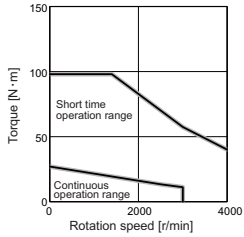


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

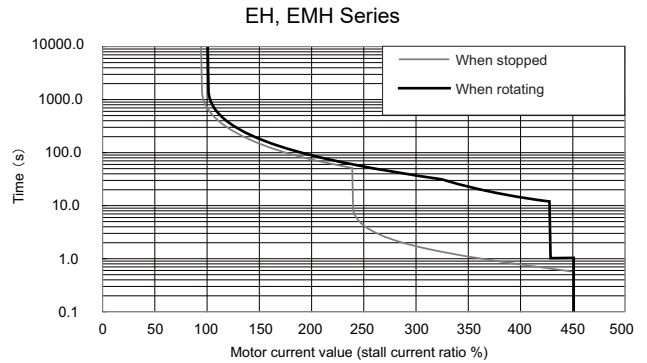
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
27.0N·m	2500r/min	HK-H354 □□-G48	(1) Magnetic brake
			B with brake None without brake
			(2) Shaft end
			K With keyway (with key) S Straight (without keyway)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

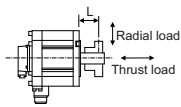


Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 80
	2-axis type MDS-EH-V2- 80, 80W
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- 10060
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 3.5
	Rated current[A] 6.2
	Rated torque[N·m] 13.4
	Stall current[A] 13
	Stall torque[N·m] 27.0
Maximum momentary output (For power supply selection)[kW] 18.4	
Rated rotation speed[r/min] 2500	
Maximum rotation speed[r/min] 4000	
Maximum current[A] 50	
Maximum torque[N·m] 98.0	
Power rate at continuous rated torque[kW/s] 25.2	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 39.68	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 70.8	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 75.8	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 525	
Mass	(Without) [kg] 20
	(With brake)[kg] 25
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2, MDS-EMH-SPV3

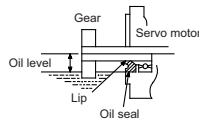
(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



L: Length from flange installation surface to center of load weight [mm]

(\*3)



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

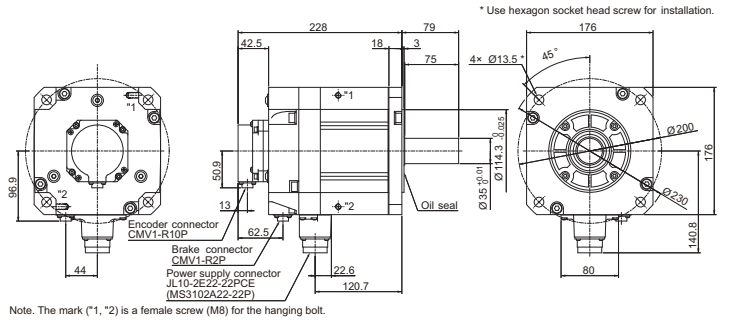
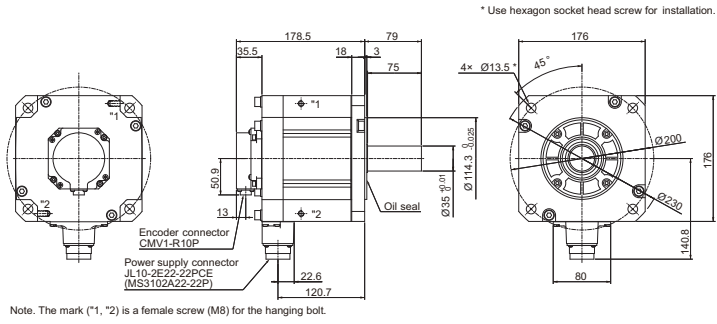
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

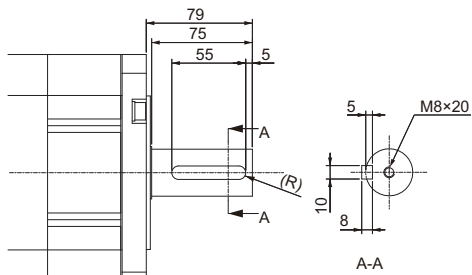
Outline dimension drawings [Unit : mm]

HK-H354S-G48

HK-H354BS-G48



Shaft with keyway (HK-H354K/HK-H354BK-G48)

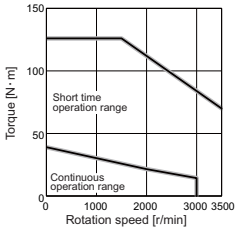


The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type
39.0N·m	2000r/min	HK-H453 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

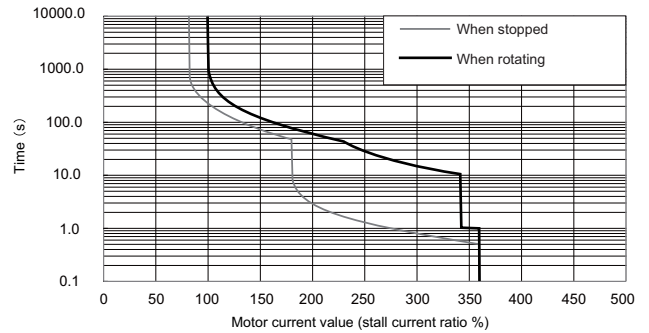
Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

Servo overload protection characteristics

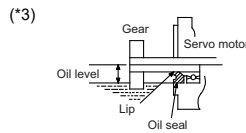
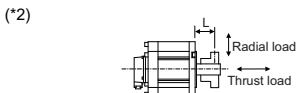
EH, EMH Series



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 80
	2-axis type MDS-EH-V2- 80, 80W
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- 10060
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 4.5
	Rated current[A] 9.1
	Rated torque[N·m] 21.5
	Stall current[A] 17
	Stall torque[N·m] 39.0
Maximum momentary output (For power supply selection)[kW] 26.4	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3500	
Maximum current[A] 58	
Maximum torque[N·m] 126	
Power rate at continuous rated torque[kW/s] 44.0	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 60.87	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 105	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 110	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 605	
Mass	(Without) [kg] 27
	(With brake)[kg] 31
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2, MDS-EMH-SPV3

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.

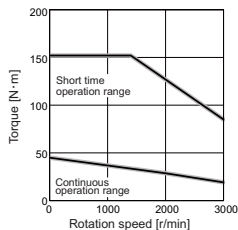
(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.



Stall torque	Rated rotation speed	Servo motor type	Explanation of type
45.0N•m	2000r/min	HK-H603 □□-G48	(1) Magnetic brake
			(2) Shaft end
		(1) Magnetic brake	B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

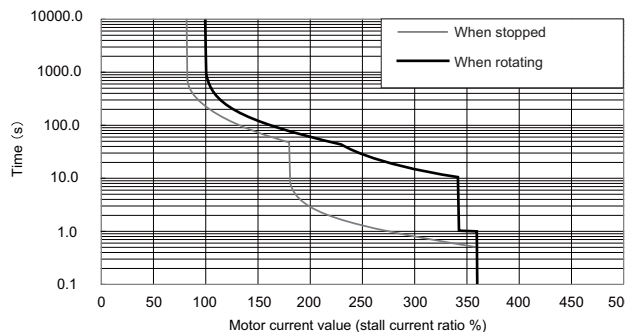
Torque characteristics

Servo overload protection characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

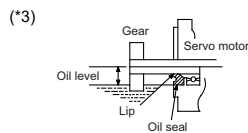
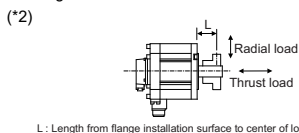
EH Series



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 80
	2-axis type MDS-EH-V2- 80, 80W
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 6.0
	Rated current[A] 11
	Rated torque[N•m] 28.6
	Stall current[A] 17
	Stall torque[N•m] 45.0
Maximum momentary output (For power supply selection)[kW] 27.7	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 58	
Maximum torque[N•m] 152	
Power rate at continuous rated torque[kW/s] 58.6	
Max. deceleration torque of dynamic brake(Tdp)[N•m] 81.97	
Motor inertia[×10 <sup>-4</sup> kg•m <sup>2</sup> ] 140	
(Brake inertia)[×10 <sup>-4</sup> kg•m <sup>2</sup> ] 145	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg•m <sup>2</sup> ] 756	
Mass	(Without) [kg] 33
	(With brake)[kg] 38
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48)	MDS-EH-V1/V2

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

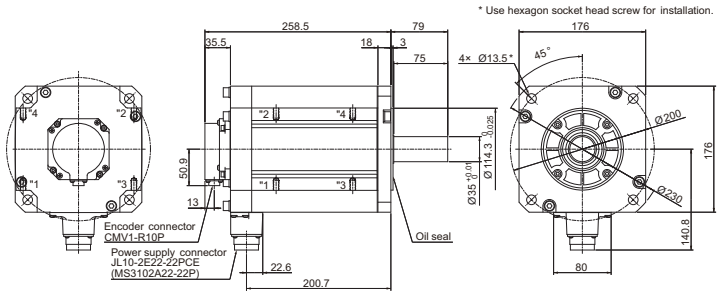
Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N•m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

(\*1) This is the representative value for the initial attraction gap at 20°C.  
 (\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

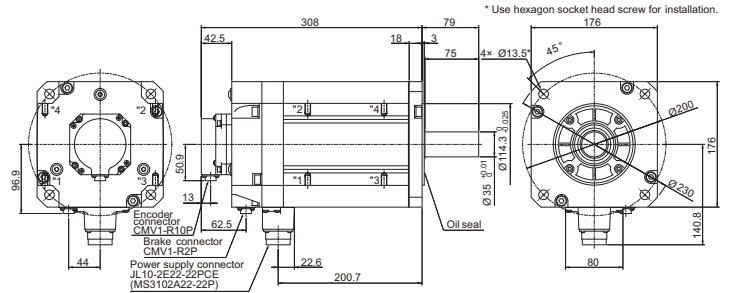
Outline dimension drawings [Unit : mm]

HK-H603S-G48

HK-H603BS-G48

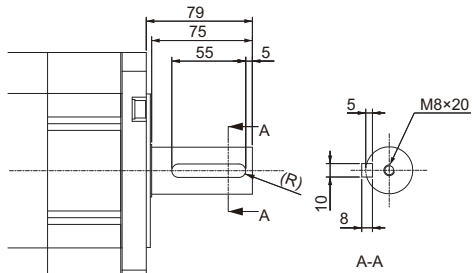


Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.



Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.

Shaft with keyway (HK-H603K/HK-H603BK-G48)



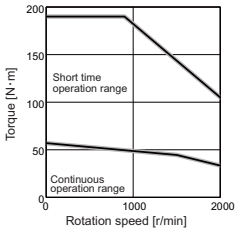
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug



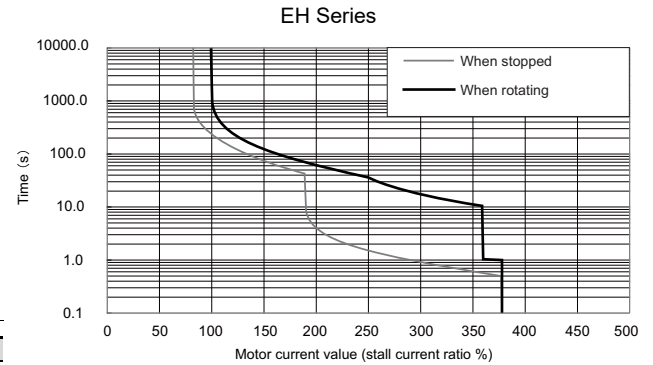
Stall torque	Rated rotation speed	Servo motor type	Explanation of type
57.0N·m	1500r/min	HK-H702 □□-G48	(1) Magnetic brake
			B with brake None without brake
			(2) Shaft end
			K With keyway (with key) S Straight (without keyway)

Torque characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
(\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

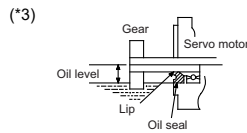
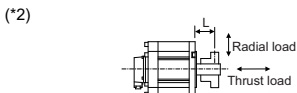
Servo overload protection characteristics



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 80
	2-axis type MDS-EH-V2- 80, 80W
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 7.0
	Rated current[A] 13
	Rated torque[N·m] 44.6
	Stall current[A] 16
	Stall torque[N·m] 57.0
Maximum momentary output (For power supply selection)[kW] 22.8	
Rated rotation speed[r/min] 1500	
Maximum rotation speed[r/min] 2000	
Maximum current[A] 58	
Maximum torque[N·m] 190	
Power rate at continuous rated torque[kW/s] 142	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 81.97	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 140	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 145	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 1078	
Mass	(Without) [kg] 33
	(With brake)[kg] 38
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48) MDS-EH-V1/V2	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

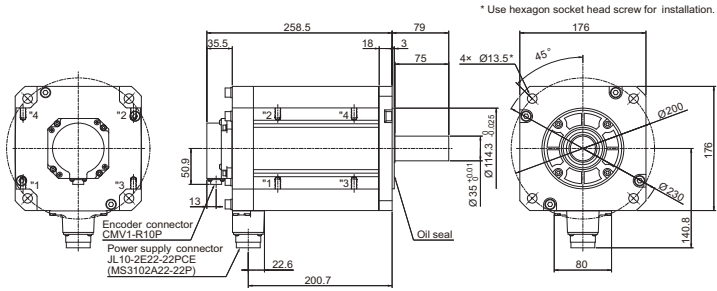
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

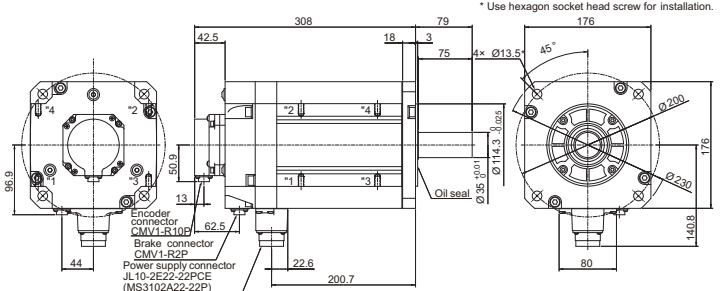
Outline dimension drawings [Unit : mm]

HK-H702S-G48

HK-H702BS-G48

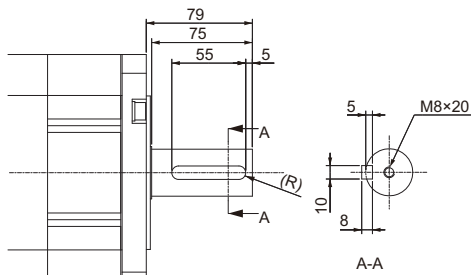


Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.



Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.

Shaft with keyway (HK-H702K/HK-H702BK-G48)



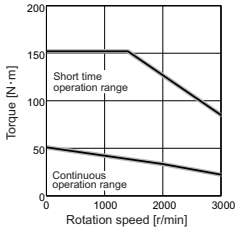
The appearance is the same as the straight (without keyway) except the shaft shape.

G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug

Stall torque	Rated rotation speed	Servo motor type	Explanation of type
51.0N·m	2000r/min	HK-H703 □□-G48	(1) Magnetic brake
			(2) Shaft end
			B with brake
			None without brake
			K With keyway (with key)
			S Straight (without keyway)

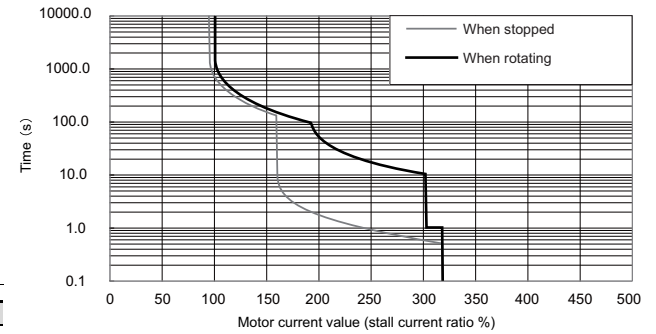
Torque characteristics

Servo overload protection characteristics



(\*1) The line (gray) of short time operation range shows the characteristics of 3-phase 400V input.  
 (\*2) The line (black) of short time operation range shows the characteristics of 3-phase 380V input.

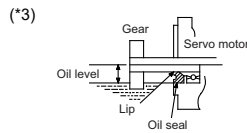
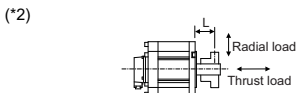
EH Series



Specifications

Item	Specifications
Compatible drive unit (*1)	1-axis type MDS-EH-V1- 80W
	2-axis type MDS-EH-V2- 80W, 160
	3-axis type MDS-EH-V3- -
	Multi axis type MDS-EMH-SPV3- -
	Regenerative resistor type MDS-EJH-V1- -
Continuous characteristics	Rated output[kW] 7.0
	Rated current[A] 13
	Rated torque[N·m] 33.4
	Stall current[A] 19
	Stall torque[N·m] 51.0
Maximum momentary output (For power supply selection)[kW] 27.7	
Rated rotation speed[r/min] 2000	
Maximum rotation speed[r/min] 3000	
Maximum current[A] 58	
Maximum torque[N·m] 152	
Power rate at continuous rated torque[kW/s] 79.8	
Max. deceleration torque of dynamic brake(Tdp)[N·m] 81.97	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 140	
(Brake inertia)[×10 <sup>-4</sup> kg·m <sup>2</sup> ] 145	
Maximum motor shaft conversion load inertia ratio (*4) [×10 <sup>-4</sup> kg·m <sup>2</sup> ] 899	
Mass	(Without) [kg] 33
	(With brake)[kg] 38
Heat-resistant class 155(F)	
Degree of protection IP67 (The shaft-through portion is excluded.)	
Cooling method Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G)) X:24.5(2.5), Y:29.4(3)	
Axis tolerable load (Taper shaft)	Radial load (*2)[N] ((mm)) -
	Thrust load[N] -
Axis tolerable load (Straight shaft)	Radial load (*2)[N] ((mm)) 2058 (L=79)
	Thrust load[N] 980
Oil level (*3)[mm] 30	
Absolute position encoder 1,048,576 p/rev (G48) MDS-EH-V1/V2	

(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(\*4) 3 times or less the motor inertia is recommended for a high-speed, high-accuracy machine, and 5 times or less the motor inertia is recommended for a general machine tool interpolation axis.

Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 10 to 90% RH or less(with no dew condensation) Storage: 10 to 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust No object generating a strong magnetic field External magnetic field: 10 mT or less
Altitude	Operation/Storage: 1000m or less above sea level Transportation: 10000m or less above sea level

Magnetic brake characteristics

Item	Specifications
Rated voltage	24VDC
Power consumption at 20°C [W]	34
Static friction torque[N·m]	44 or more
Release delay time (*1) [s]	0.1
Braking delay time (DC OFF) (*1) [s]	0.03
Brake life (*2) [times]	20,000

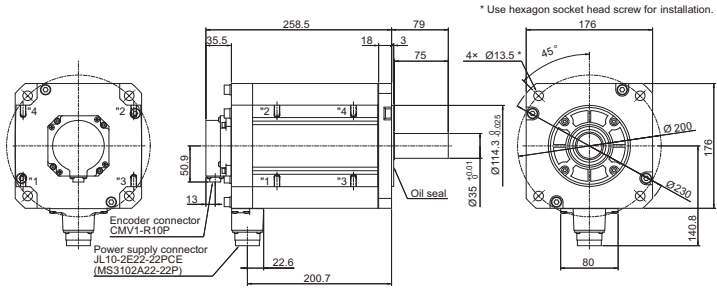
(\*1) This is the representative value for the initial attraction gap at 20°C.

(\*2) The brake gap will widen through brake lining wear caused by braking. However, the gap cannot be adjusted. Thus, the brake life is considered to be reached when adjustments are required.

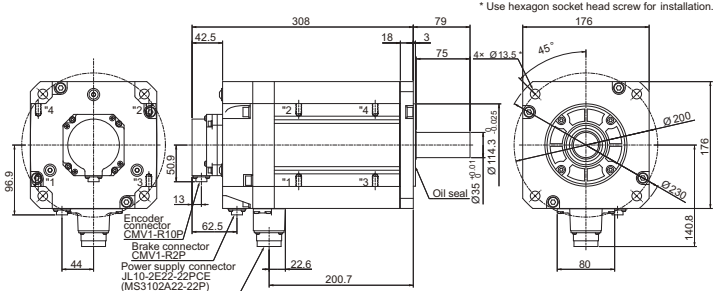
Outline dimension drawings [Unit : mm]

HK-H703S-G48

HK-H703BS-G48

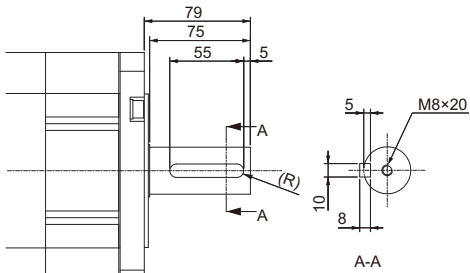


Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.



Note. The mark (\*1, \*2, \*3, \*4) is a female screw (M8) for the hanging bolt.

Shaft with keyway (HK-H703K/HK-H703BK-G48)



The appearance is the same as the straight (without keyway) except the shaft shape.

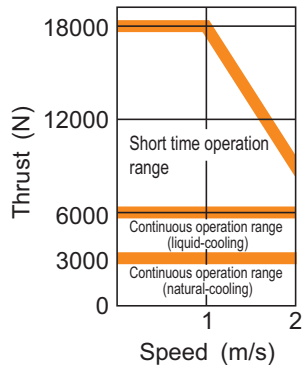
G48			
Without brake		With brake	
Straight plug	Right angle plug	Straight plug	Right angle plug



# Linear Motor

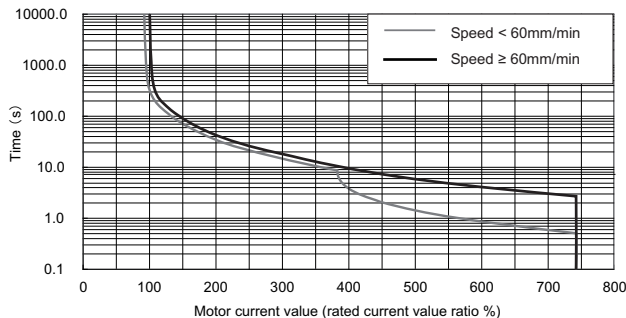
Thrust		Linear servo motor type		Explanation of type	
Rated (natural-cooling)	3000N	Primary side (coil)	LM-FP5H-60M -1WW0		
Rated (liquid-cooling)	6000N	Secondary side (magnet)			
Maximum	18000N				
			LM-FS50 -□-1WW0		576

Thrust Characteristics



Servo overload protection characteristics

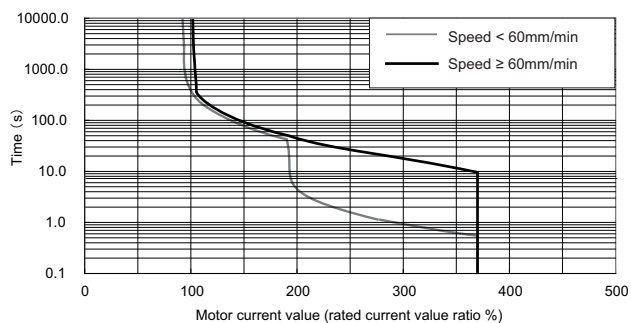
EH Series (For natural-cooling)



Specifications

Item		Specifications
		Standard
Compatible drive unit (*1)	1-axis type	MDS-EH-V1-200
	2-axis type	-
	3-axis type	-
	Regenerative resistor type	-
Power facility capacity [kVA]		22
Current	Rated (natural-cooling) [Arms]	21.1
	Rated (liquid-cooling) [Arms]	42.2
	Maximum [Arms]	142.0
Cooling method		Natural-cooling, liquid-cooling
Thrust	Rated (natural-cooling) [N]	3000
	Rated (liquid-cooling) [N]	6000
	Maximum [N]	18000
Maximum speed [m/s] (*2)		2.0
Magnetic attraction force [N]		45000
Mass	Primary side [kg]	67
	Secondary side [kg]	20.0 (480mm) 26.0 (576mm)
Recommended load mass ratio		15 times linear servo motor primary side mass maximum
Structure		Open (Degree of protection IP00)

EH Series (For liquid-cooling)



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2) The above value may be limited by the maximum speed of the linear scale.

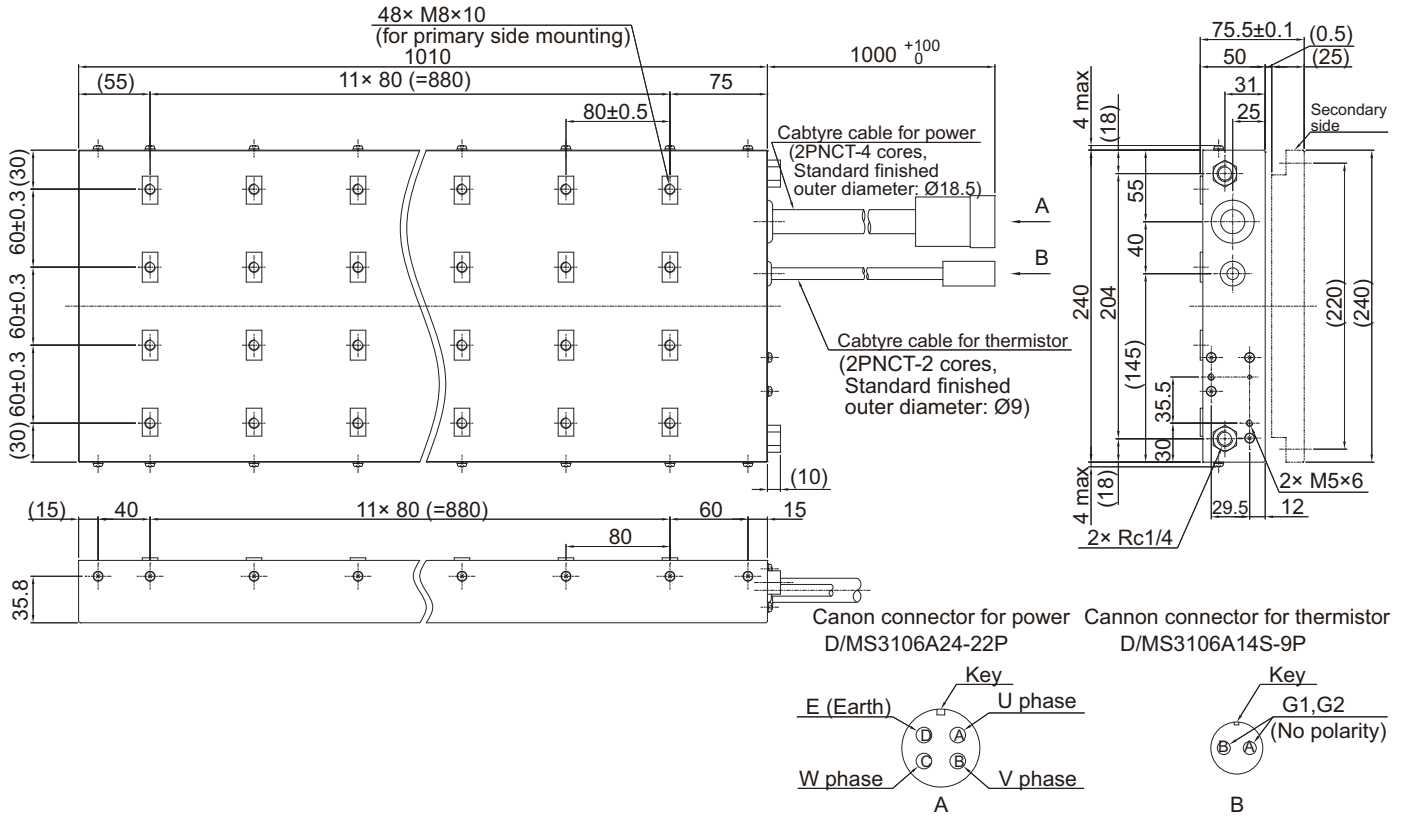
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to 70°C (with no freezing)
Ambient humidity	Operation: 80%RH or less (with no dew condensation) Storage: 90%RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, or dust
Vibration	49m/s <sup>2</sup> or less
Altitude	1000 meters or less above sea level

Outline dimension drawings [Unit : mm]

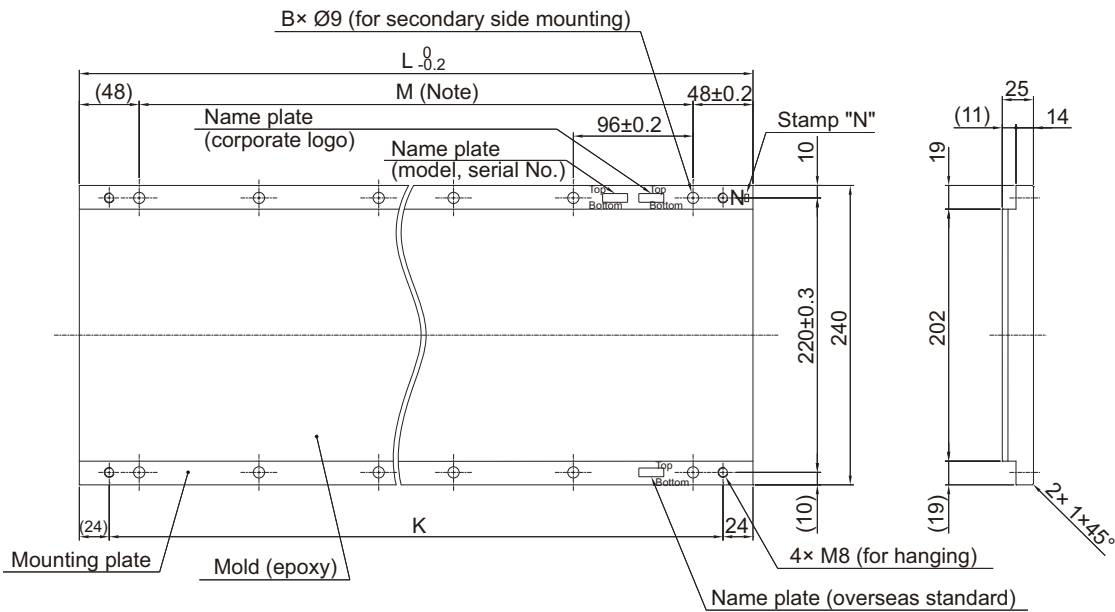
< Primary side >

LM-FP5H-60M-1WW0



< Secondary side >

LM-FS50-□-1WW0



(Note) Pitch tolerance between holes at both ends: ±0.2

Model	Variable dimensions			
	L	M	K	B
LM-FS50-480-1WW0	480	4x 96 (=384)	432	10
LM-FS50-576-1WW0	576	5x 96 (=480)	528	12





# Spindle Motor

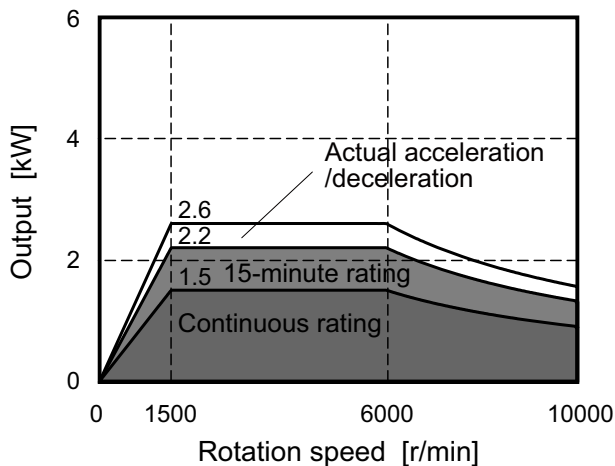
Normal specifications

# SJ-4-V2.2-03T

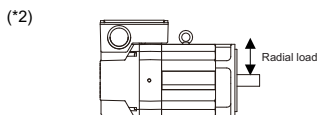
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP- 20
	Multi axis type	MDS-EMH-SPV3- -
Output capacity[kW]	Continuous rated output	1.5
	Short time rated output	2.2 (15-minute rating)
	Standard output during acceleration/ deceleration	2.2
	Actual acceleration/deceleration output(*3)	2.64
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		A90
Continuous rated current[A]		6
Continuous rated torque[N·m]		9.5
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.027
Inertia[kg·m <sup>2</sup> ]		0.00675
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	Single-phase 400V
Degree of protection		IP44
Mass[kg]		25
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

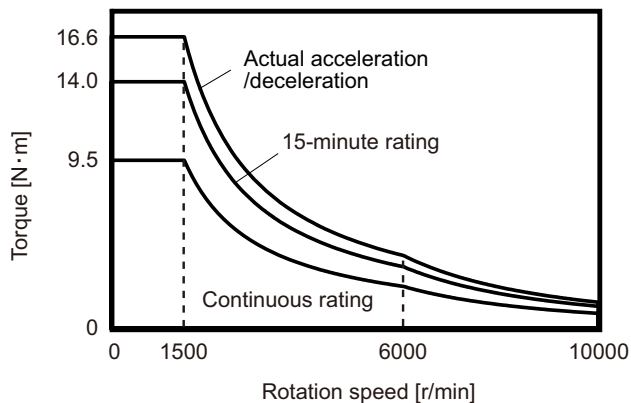
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

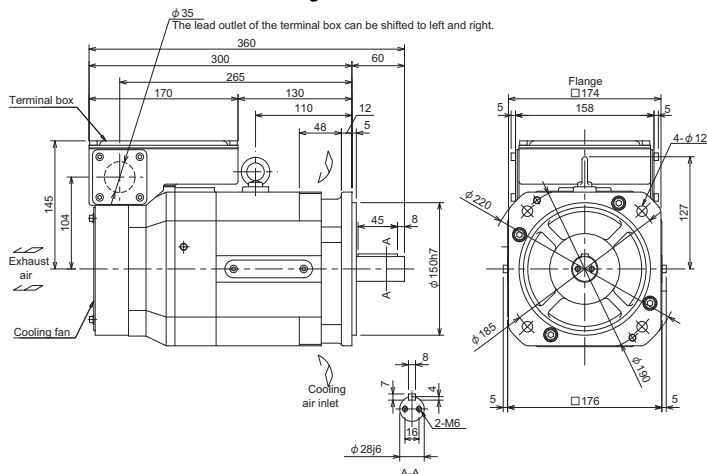
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

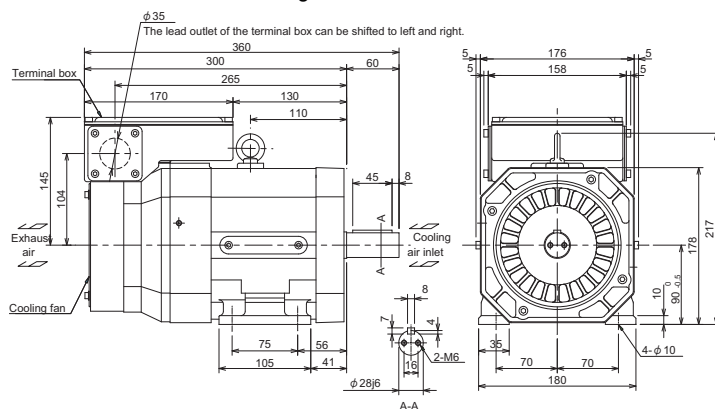


## Outline dimension drawings [Unit : mm]

### SJ-4-V2.2-03T with standard flange



### SJ-4-V2.2-03T with standard legs



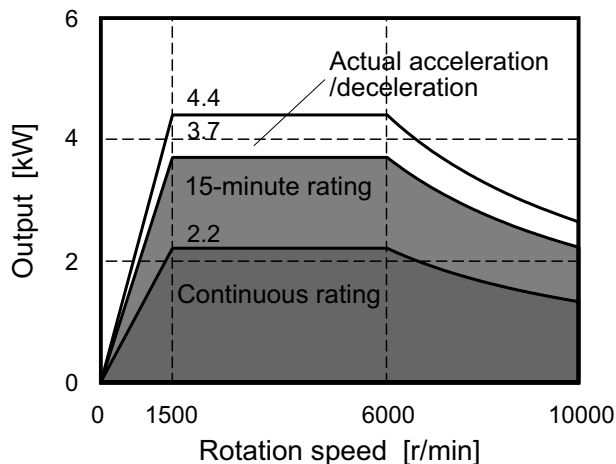
Normal specifications

# SJ-4-V3.7-03T

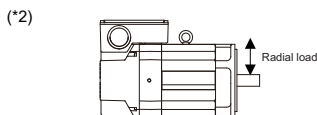
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP- 20
	Multi axis type	MDS-EMH-SPV3- -
Output capacity[kW]	Continuous rated output	2.2
	Short time rated output	3.7 (15-minute rating)
	Standard output during acceleration/ deceleration	3.7
	Actual acceleration/deceleration output(*3)	4.44
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		B90
Continuous rated current[A]		8
Continuous rated torque[N·m]		14.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.035
Inertia[kg·m <sup>2</sup> ]		0.00875
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	Single-phase 400V
Degree of protection		IP44
Mass[kg]		30
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

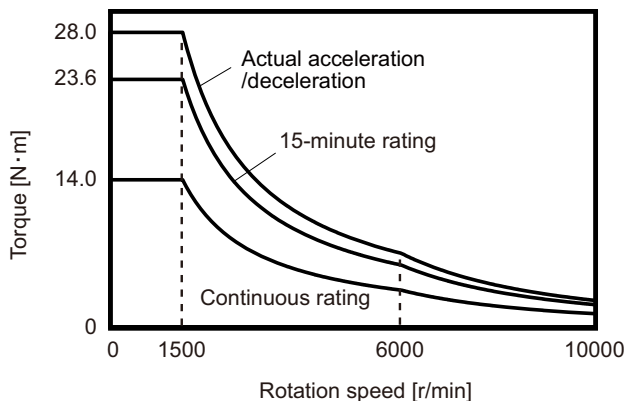
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

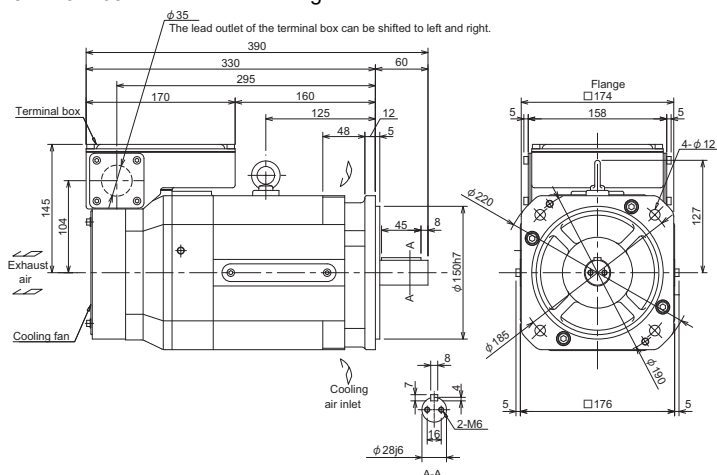
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

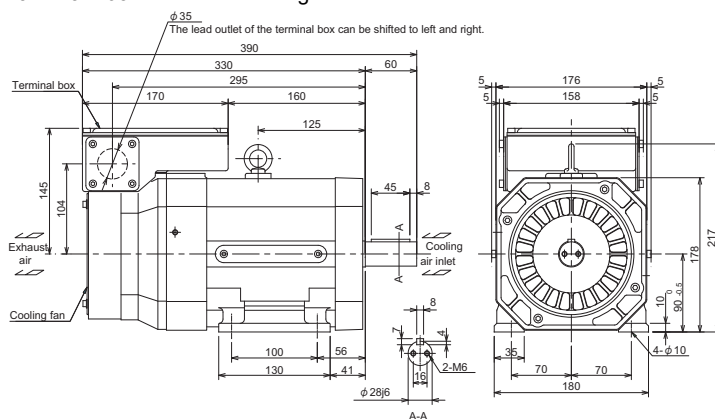


## Outline dimension drawings [Unit : mm]

### SJ-4-V3.7-03T with standard flange



### SJ-4-V3.7-03T with standard legs



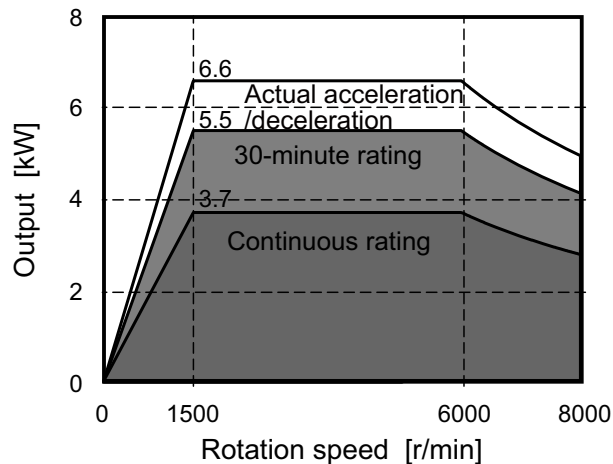
Normal specifications

# SJ-4-V5.5-07T

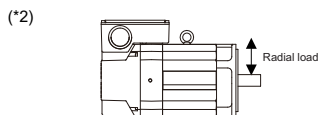
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP- 40
	Multi axis type	MDS-EMH-SPV3- -
Output capacity[kW]	Continuous rated output	3.7
	Short time rated output	5.5 (15-minute rating)
	Standard output during acceleration/ deceleration	5.5
	Actual acceleration/deceleration output(*3)	6.6
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		D90
Continuous rated current[A]		12
Continuous rated torque[N·m]		23.6
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.059
Inertia[kg·m <sup>2</sup> ]		0.0148
Tolerable radial load(*2) [N]		1470
Cooling fan	Input voltage	Single-phase 400V
Degree of protection		IP44
Mass[kg]		49
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

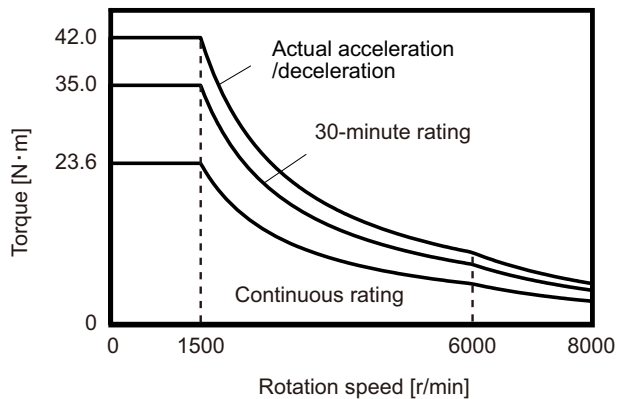
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

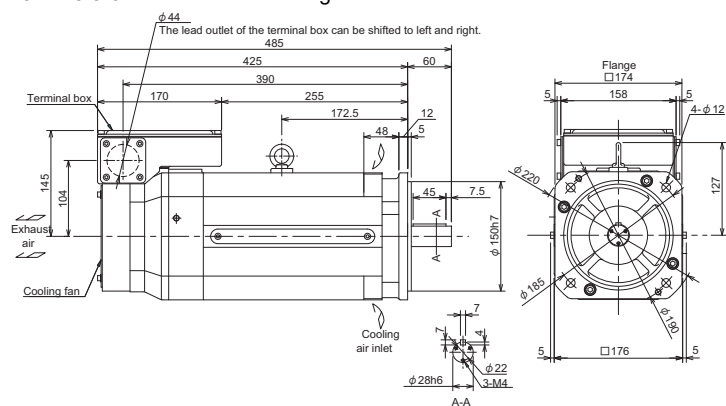
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

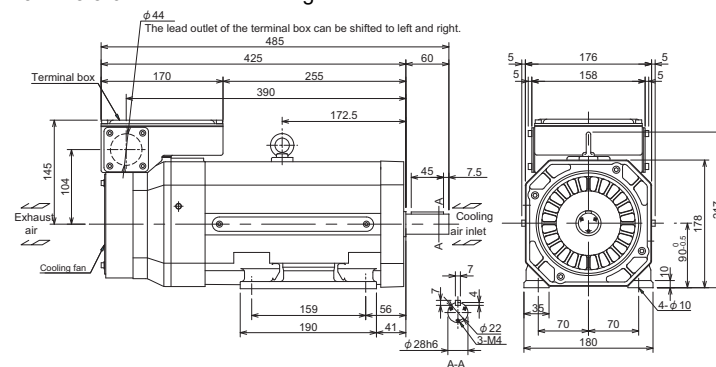


## Outline dimension drawings [Unit : mm]

### SJ-4-V5.5-07T with standard flange



### SJ-4-V5.5-07T with standard legs



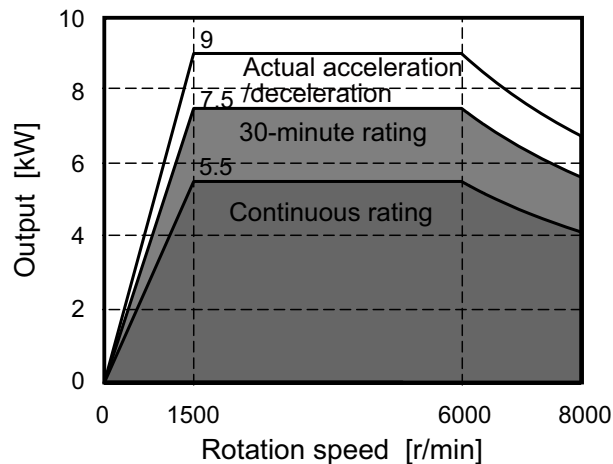
Normal specifications

# SJ-4-V7.5-12T

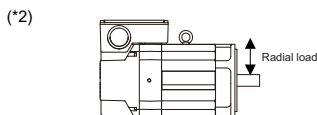
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-40
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	7.5 (30-minute rating)
	Standard output during acceleration/deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		A112
Continuous rated current[A]		19
Continuous rated torque[N·m]		35.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.098
Inertia[kg·m <sup>2</sup> ]		0.0245
Tolerable radial load(*2) [N]		1960
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		60
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

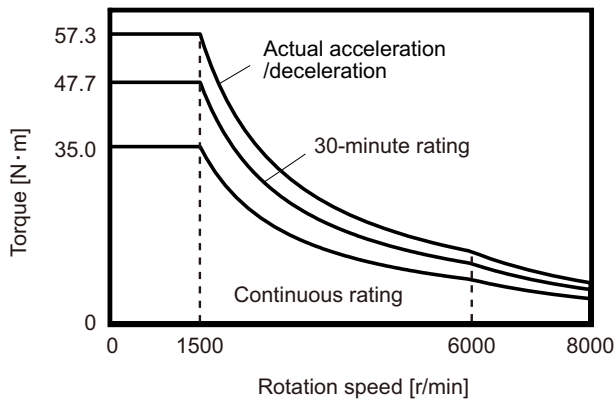
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

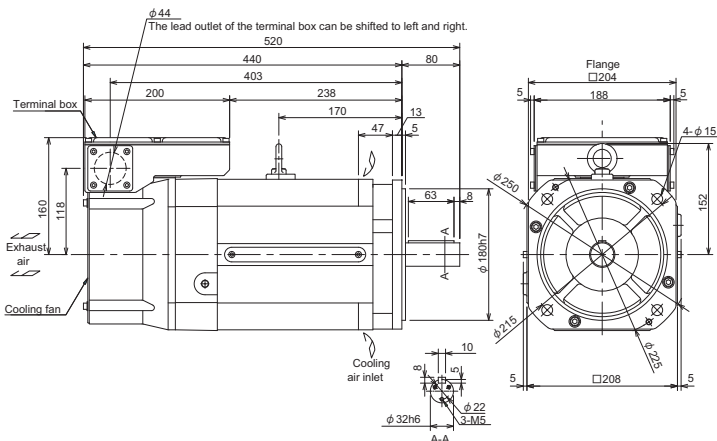
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

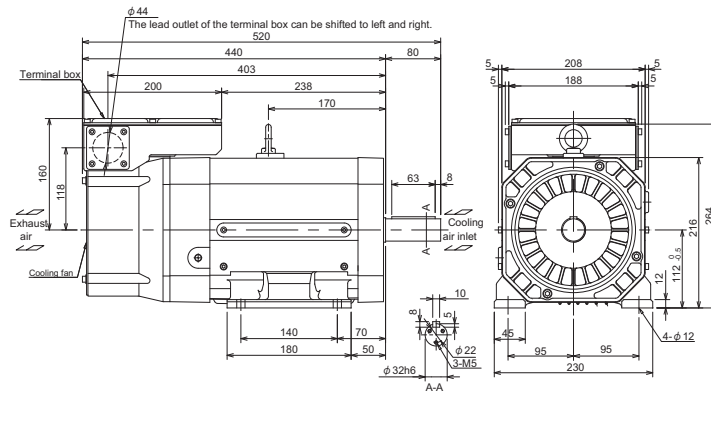


## Outline dimension drawings [Unit : mm]

### SJ-4-V7.5-12T with standard flange



### SJ-4-V7.5-12T with standard legs



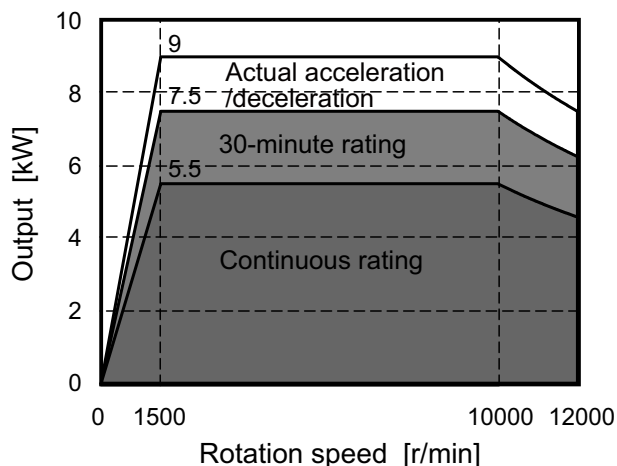
Normal specifications

# SJ-4-V7.5-13ZT

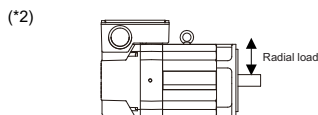
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP- 80
	Multi axis type	MDS-EMH-SPV3- 8040
Output capacity[kW]	Continuous rated output	5.5
	Short time rated output	7.5 (30-minute rating)
	Standard output during acceleration/ deceleration	7.5
	Actual acceleration/deceleration output(*3)	9
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		12000
Frame No.		A112
Continuous rated current[A]		24
Continuous rated torque[N·m]		35.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.098
Inertia[kg·m <sup>2</sup> ]		0.0245
Tolerable radial load(*2) [N]		980
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		60
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

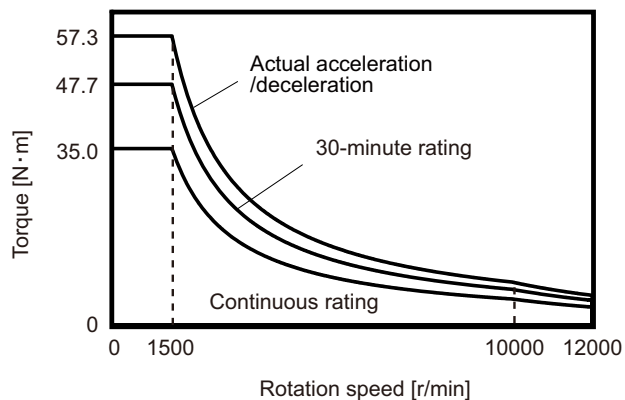
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

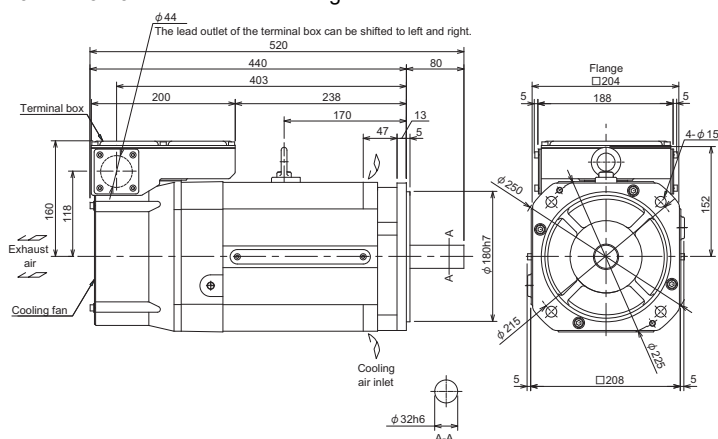
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-4-V7.5-13ZT with standard flange



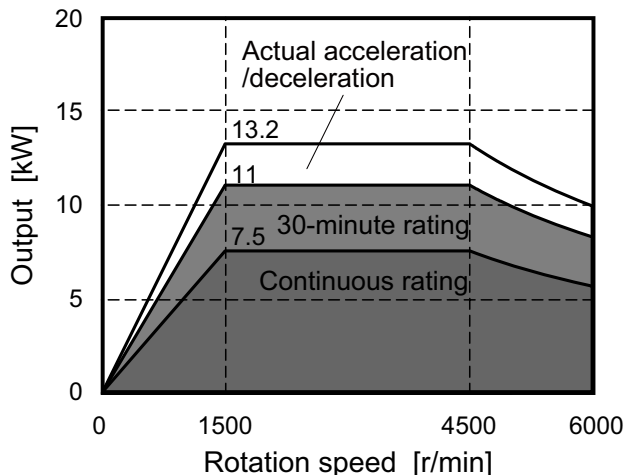
Normal specifications

# SJ-4-V11-18T

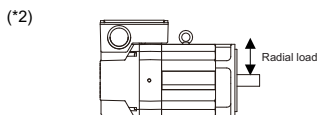
## Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	11 (30-minute rating)
	Standard output during acceleration/ deceleration	11
	Actual acceleration/deceleration output(*3)	13.2
		13.2
Base rotation speed[r/min]	1500	
Maximum rotation speed[r/min]	6000	
Frame No.	B112	
Continuous rated current[A]	23	
Continuous rated torque[N·m]	47.7	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.12	
Inertia[kg·m <sup>2</sup> ]	0.03	
Tolerable radial load(*2) [N]	1960	
Cooling fan	Input voltage	3-phase 400V
Degree of protection	IP44	
Mass[kg]	70	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

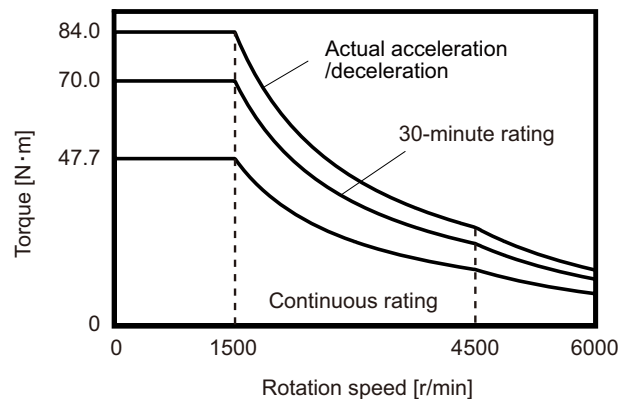
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

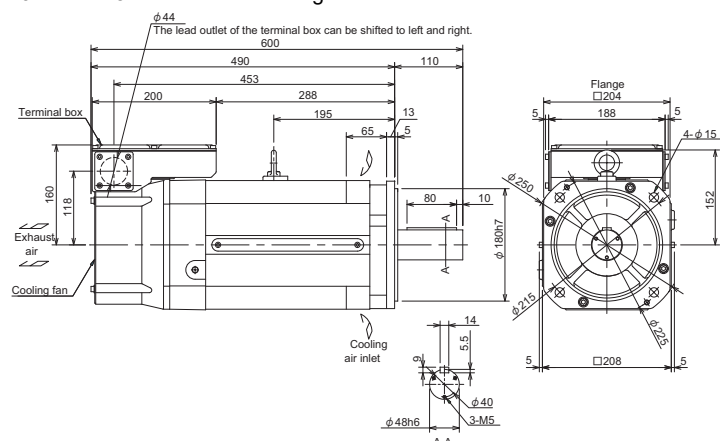
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

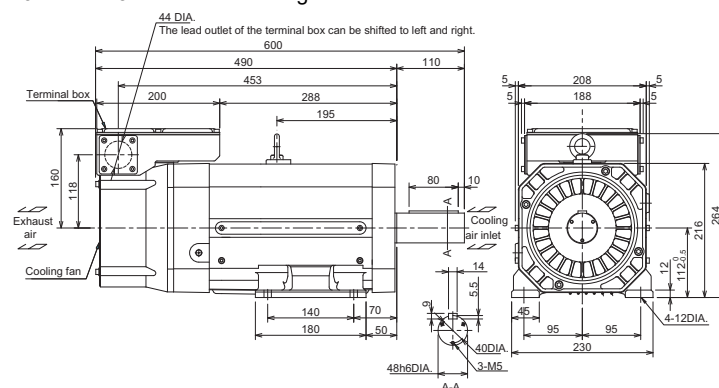


## Outline dimension drawings [Unit : mm]

### SJ-4-V11-18T with standard flange



### SJ-4-V11-18T with standard legs





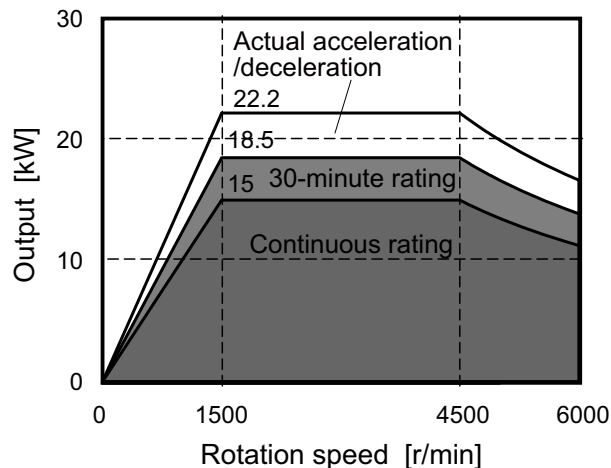
Normal specifications

# SJ-4-V18.5-14T

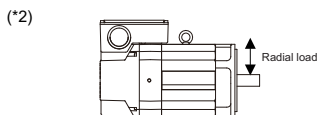
## Specifications

Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	15
	Short time rated output	18.5 (30-minute rating)
	Standard output during acceleration/deceleration	18.5
	Actual acceleration/deceleration output(*3)	22.2
Base rotation speed[r/min]	1500	
Maximum rotation speed[r/min]	6000	
Frame No.	A160	
Continuous rated current[A]	41	
Continuous rated torque[N·m]	95.5	
GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.23	
Inertia[kg·m <sup>2</sup> ]	0.0575	
Tolerable radial load(*2) [N]	2940	
Cooling fan	Input voltage	3-phase 400V
Degree of protection	IP44	
Mass[kg]	110	
Heat-resistant class	155(F)	

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

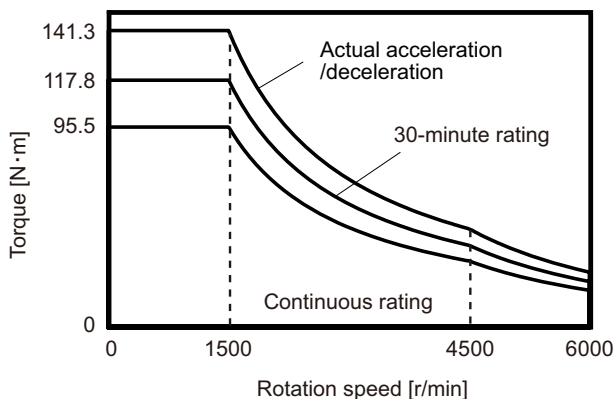
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

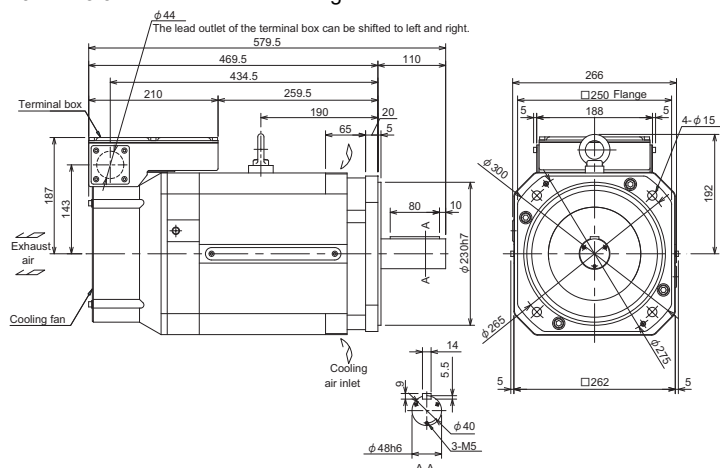
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

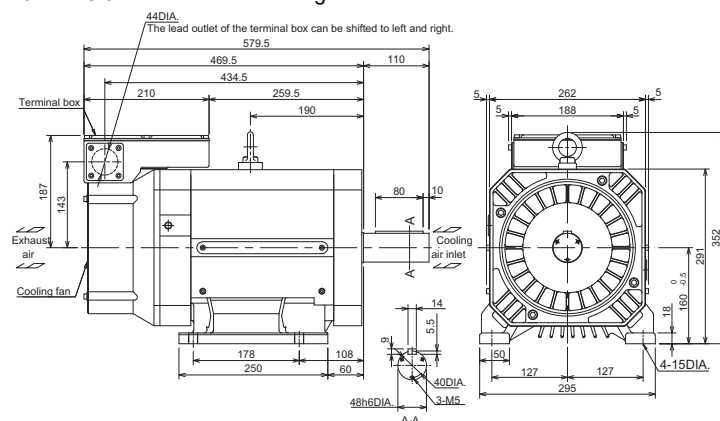


## Outline dimension drawings [Unit : mm]

### SJ-4-V18.5-14T with standard flange



### SJ-4-V18.5-14T with standard legs



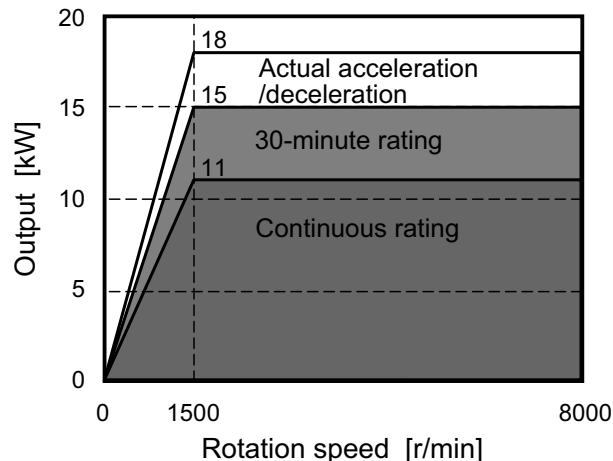
Normal specifications

# SJ-4-V22-18ZT

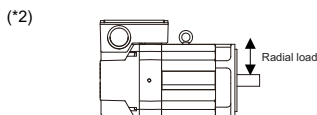
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-160
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (30-minute rating)
	Standard output during acceleration/deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		8000
Frame No.		A160
Continuous rated current[A]		44
Continuous rated torque[N·m]		70.0
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.23
Inertia[kg·m <sup>2</sup> ]		0.0575
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		110
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

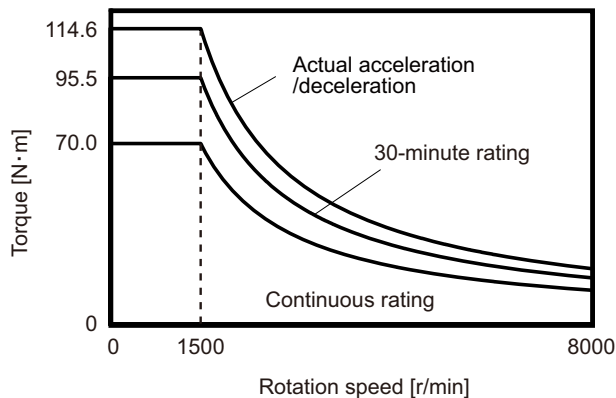
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

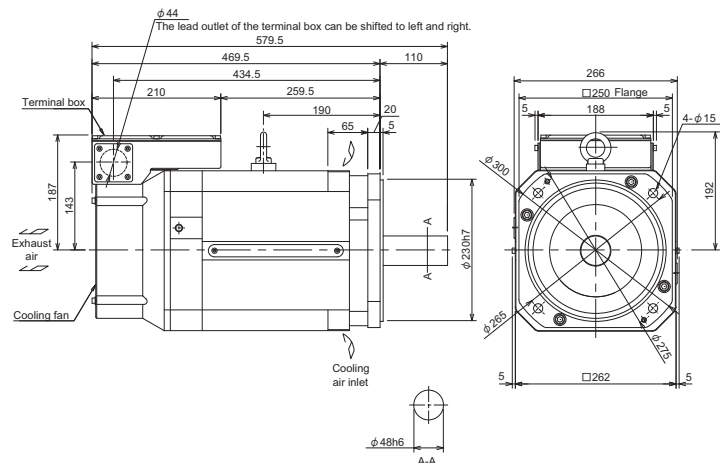
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-4-V22-18ZT with standard flange



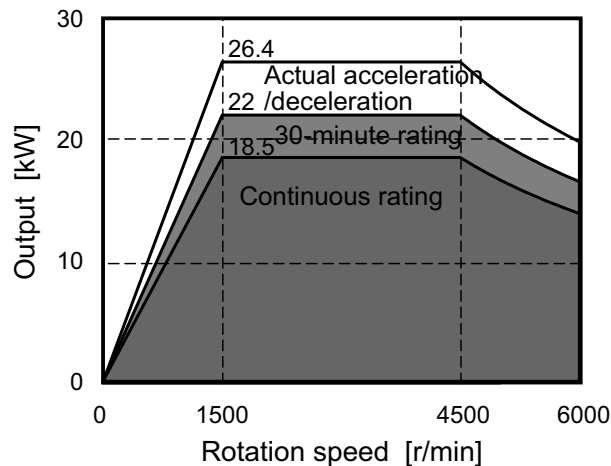
Normal specifications

# SJ-4-V22-15T

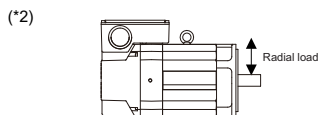
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-160
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	18.5
	Short time rated output	22 (30-minute rating)
	Standard output during acceleration/deceleration	22
	Actual acceleration/deceleration output(*3)	26.4
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		6000
Frame No.		B160
Continuous rated current[A]		46
Continuous rated torque[N·m]		118
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.32
Inertia[kg·m <sup>2</sup> ]		0.08
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		135
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



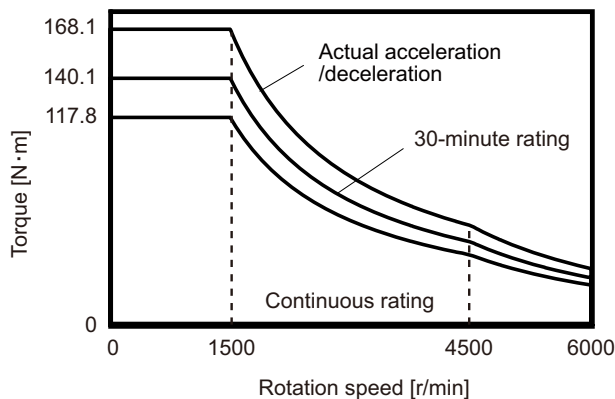
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

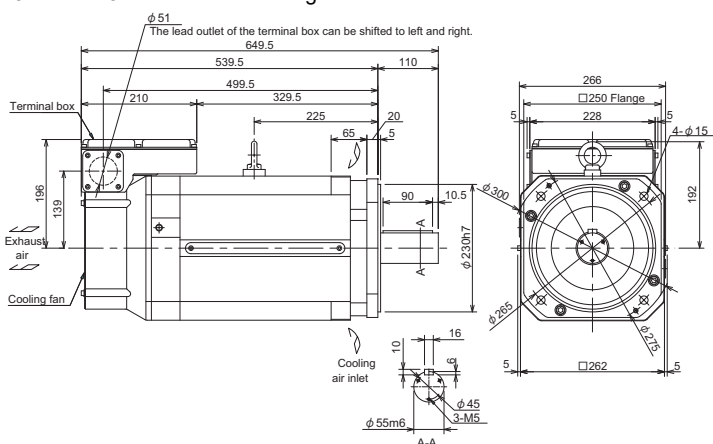
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

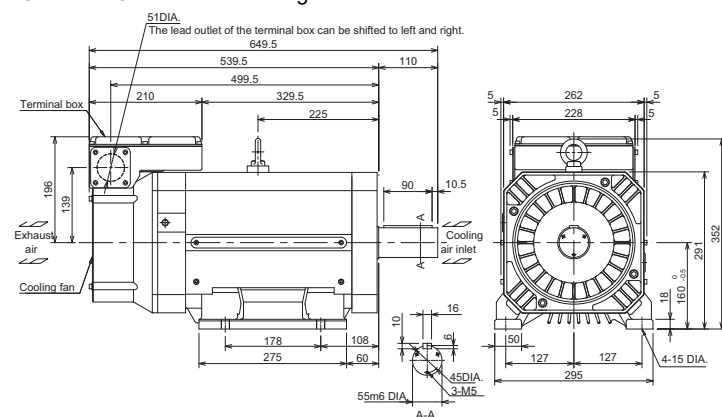


## Outline dimension drawings [Unit : mm]

### SJ-4-V22-15T with standard flange



### SJ-4-V22-15T with standard legs



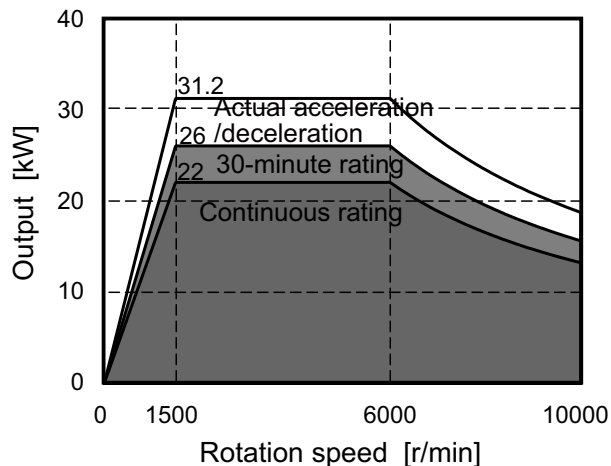
Normal specifications

# SJ-4-V26-08ZT

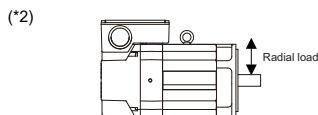
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-160
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	22
	Short time rated output	26 (30-minute rating)
	Standard output during acceleration/deceleration	26
	Actual acceleration/deceleration output(*3)	31.2
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		10000
Frame No.		C160
Continuous rated current[A]		70
Continuous rated torque[N·m]		140
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.37
Inertia[kg·m <sup>2</sup> ]		0.0925
Tolerable radial load(*2) [N]		2450
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		155
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



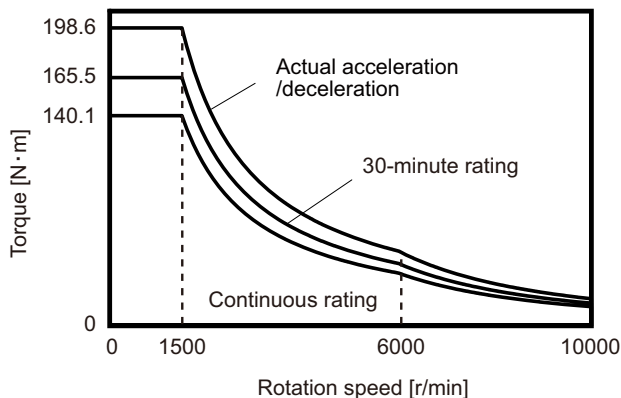
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

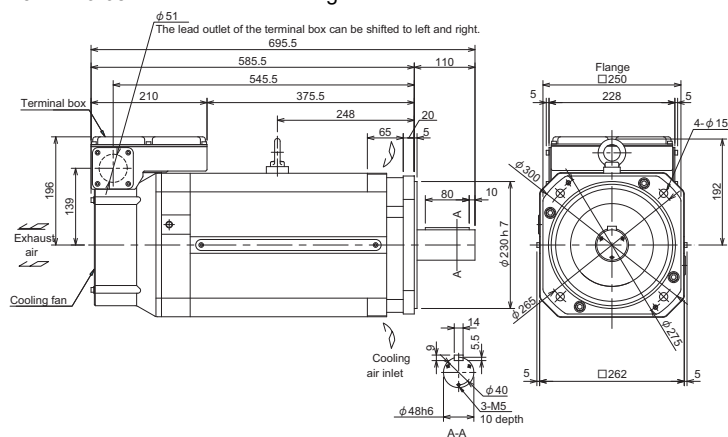
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics



## Outline dimension drawings [Unit : mm]

### SJ-4-V26-08ZT with standard flange



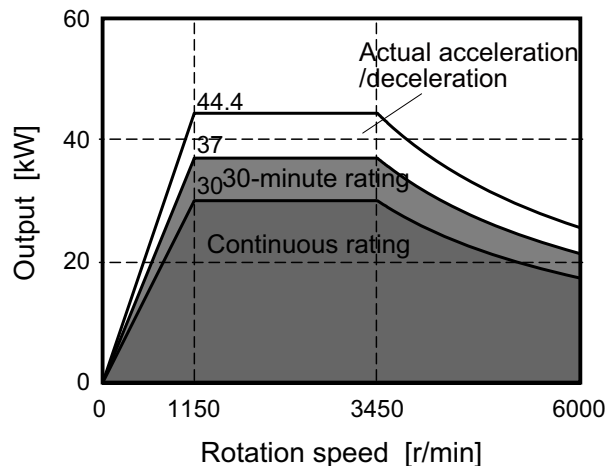
Normal specifications

# SJ-4-V37-04ZT

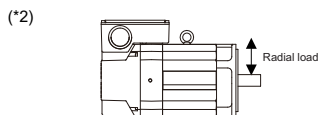
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-200
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	30
	Short time rated output	37 (30-minute rating)
	Standard output during acceleration/deceleration	37
	Actual acceleration/deceleration output(*3)	44.4
Base rotation speed[r/min]		1150
Maximum rotation speed[r/min]		6000
Frame No.		B180
Continuous rated current[A]		79
Continuous rated torque[N·m]		249
GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.36
Inertia[kg·m <sup>2</sup> ]		0.34
Tolerable radial load(*2) [N]		3920
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		300
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

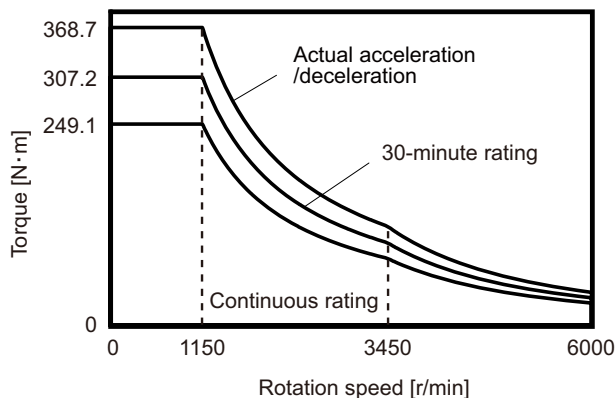
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

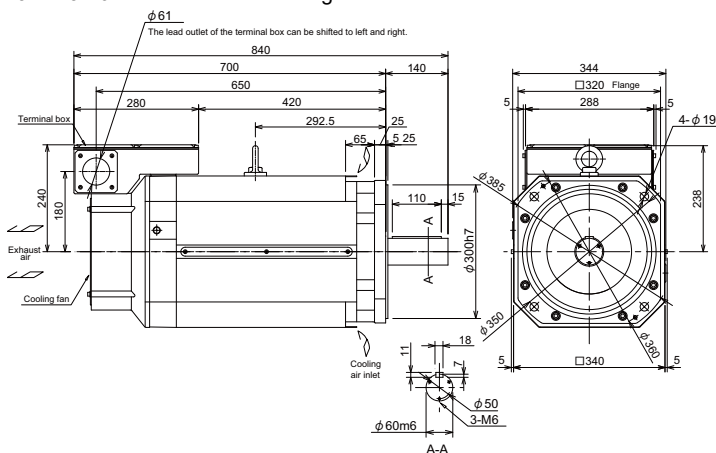
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

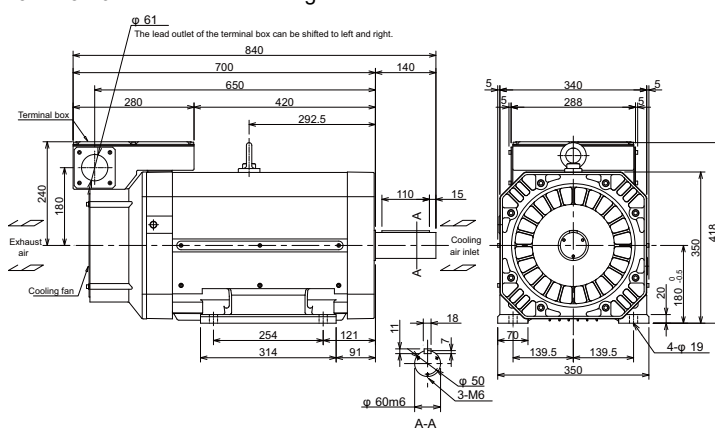


## Outline dimension drawings [Unit : mm]

### SJ-4-V37-04ZT with standard flange



### SJ-4-V37-04ZT with standard legs



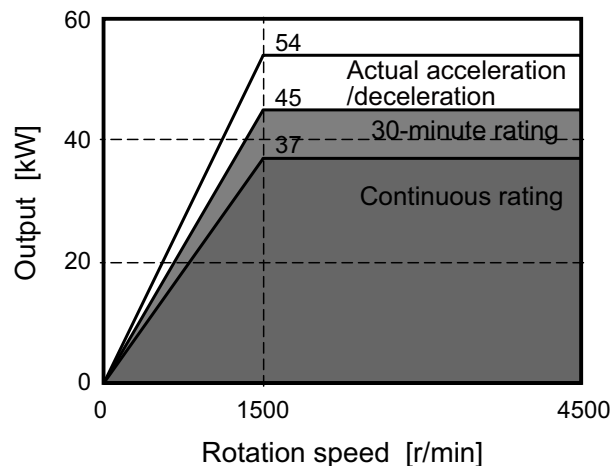
Normal specifications

# SJ-4-V45-02T

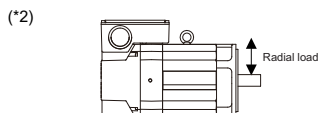
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-320
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	37
	Short time rated output	45 (30-minute rating)
	Standard output during acceleration/deceleration	45
	Actual acceleration/deceleration output(*3)	54
Base rotation speed[r/min]		1500
Maximum rotation speed[r/min]		4500
Frame No.		B180
Continuous rated current[A]		96
Continuous rated torque[N·m]		236
GD <sup>2</sup> [kg·m <sup>2</sup> ]		1.36
Inertia[kg·m <sup>2</sup> ]		0.34
Tolerable radial load(*2) [N]		3920
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		300
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

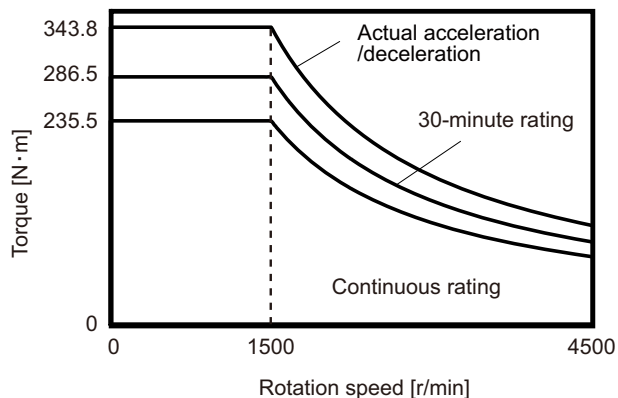
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

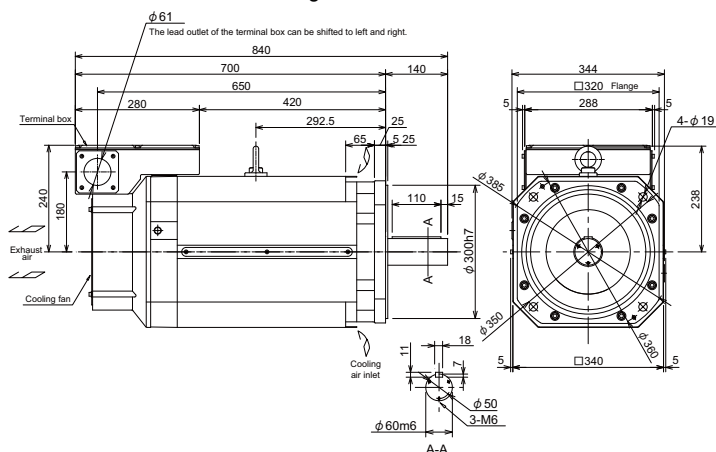
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

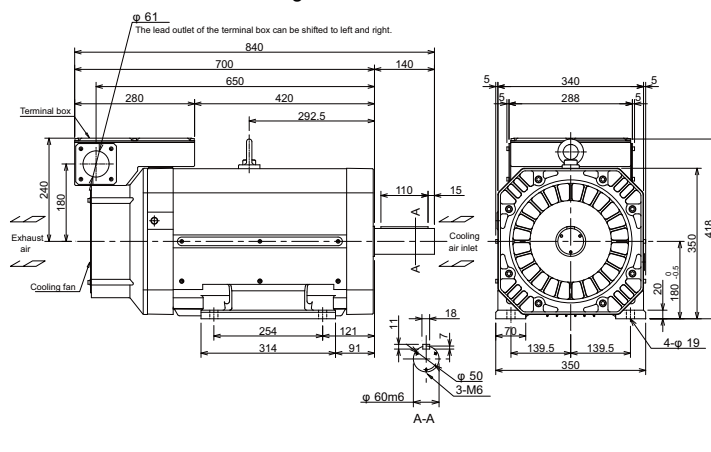


## Outline dimension drawings [Unit : mm]

### SJ-4-V45-02T with standard flange



### SJ-4-V45-02T with standard legs



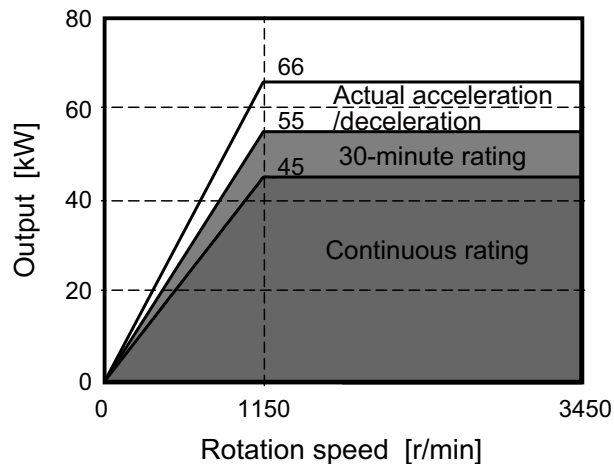
Normal specifications

# SJ-4-V55-03T

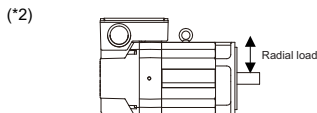
## Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-320
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	45
	Short time rated output	55 (30-minute rating)
	Standard output during acceleration/deceleration	55
	Actual acceleration/deceleration output(*3)	66
Base rotation speed[r/min]		1150
Maximum rotation speed[r/min]		3450
Frame No.		A225
Continuous rated current[A]		110
Continuous rated torque[N·m]		374
GD <sup>2</sup> [kg·m <sup>2</sup> ]		3.39
Inertia[kg·m <sup>2</sup> ]		0.85
Tolerable radial load(*2) [N]		5880
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		450
Heat-resistant class		155(F)

## Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

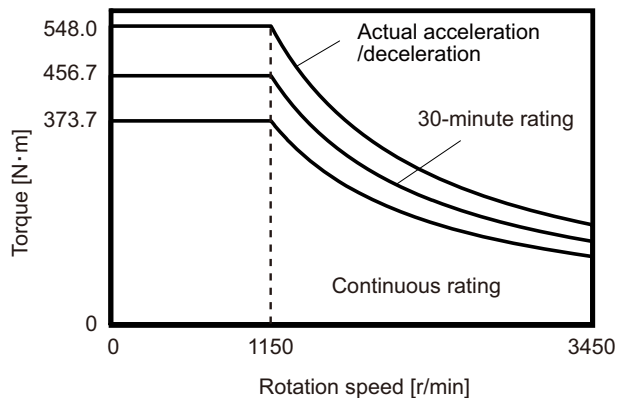
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

## Environmental conditions

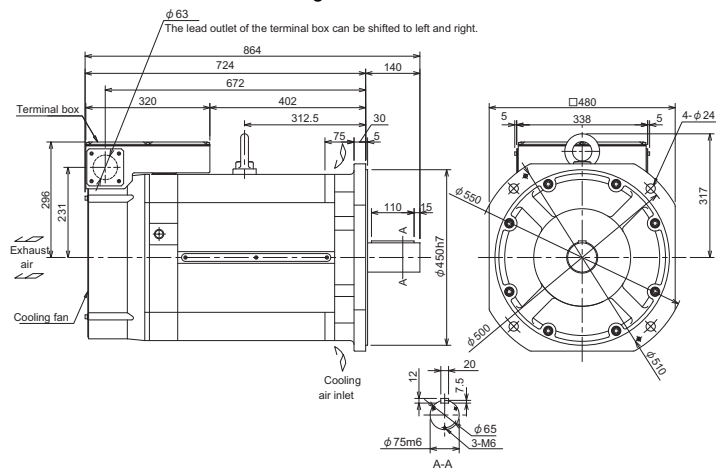
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Torque - rotation speed characteristics

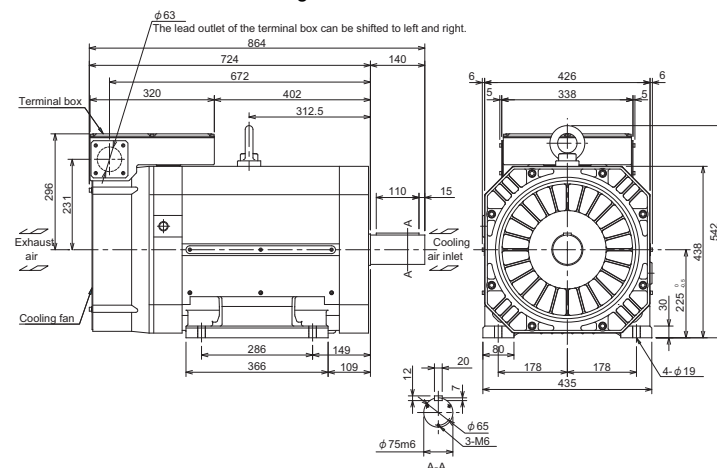


## Outline dimension drawings [Unit : mm]

### SJ-4-V55-03T with standard flange



### SJ-4-V55-03T with standard legs



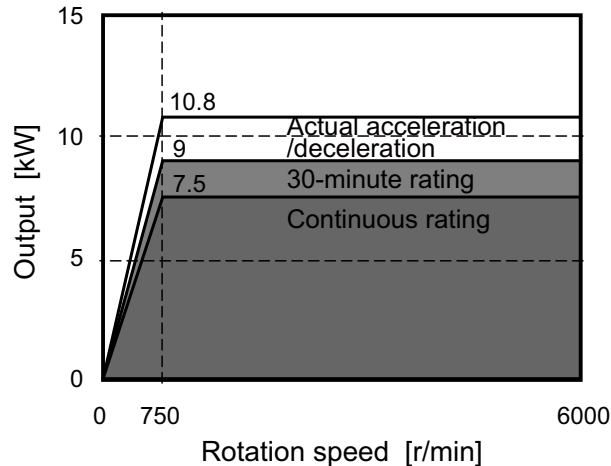


Wide range constant output specifications  
**SJ-4-V15-20T**

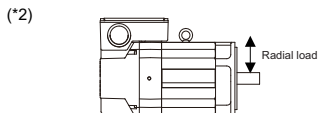
Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-100
	Multi axis type	MDS-EMH-SPV3-10040, 10060
Output capacity[kW]	Continuous rated output	7.5
	Short time rated output	9 (30-minute rating)
	Standard output during acceleration/deceleration	9
	Actual acceleration/deceleration output(*3)	10.8
Base rotation speed[r/min]		750
Maximum rotation speed[r/min]		6000
Frame No.		A160
Continuous rated current[A]		36
Continuous rated torque[N·m]		95.5
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.23
Inertia[kg·m <sup>2</sup> ]		0.06
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		110
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

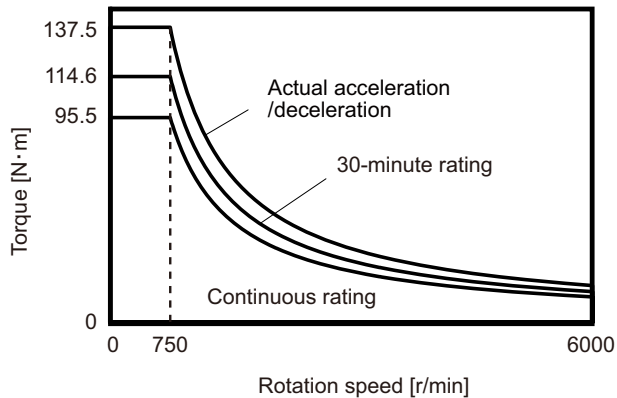
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

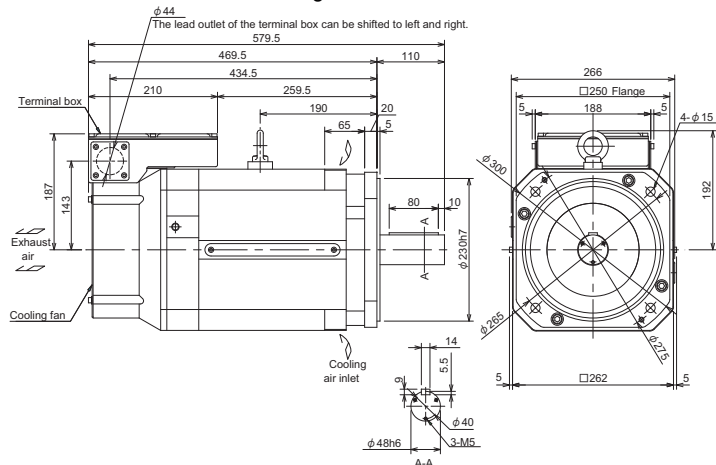
Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

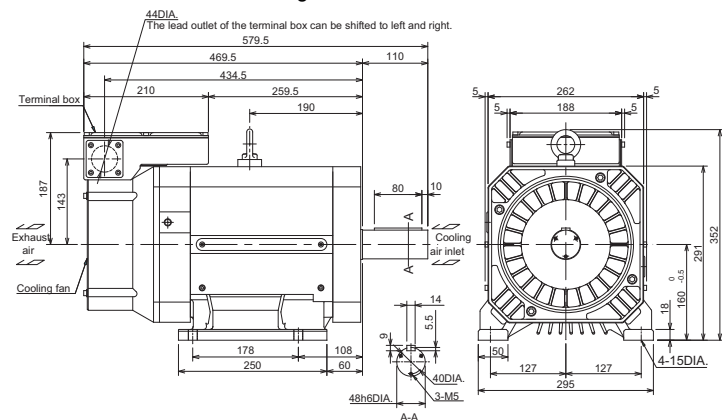


Outline dimension drawings [Unit : mm]

SJ-4-V15-20T with standard flange



SJ-4-V15-20T with standard legs



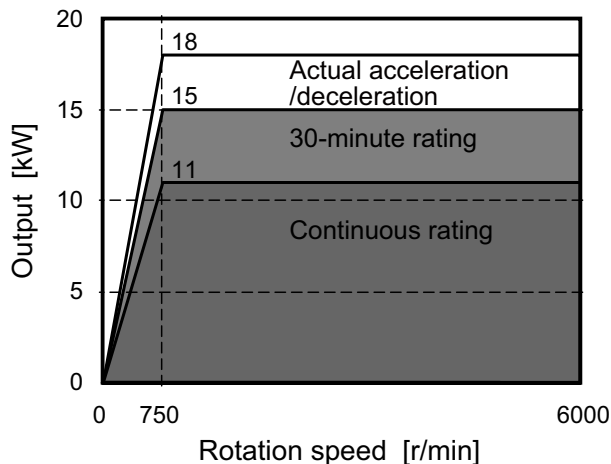


Wide range constant output specifications  
**SJ-4-V22-16T**

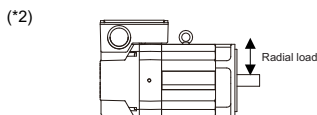
Specifications

Item		Specifications
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-160
	Multi axis type	MDS-EMH-SPV3-
Output capacity[kW]	Continuous rated output	11
	Short time rated output	15 (30-minute rating)
	Standard output during acceleration/deceleration	15
	Actual acceleration/deceleration output(*3)	18
Base rotation speed[r/min]		750
Maximum rotation speed[r/min]		6000
Frame No.		B160
Continuous rated current[A]		53
Continuous rated torque[N·m]		140
GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.32
Inertia[kg·m <sup>2</sup> ]		0.08
Tolerable radial load(*2) [N]		2940
Cooling fan	Input voltage	3-phase 400V
Degree of protection		IP44
Mass[kg]		135
Heat-resistant class		155(F)

Output characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.



(Note) The load point is at the one-half of the shaft length.

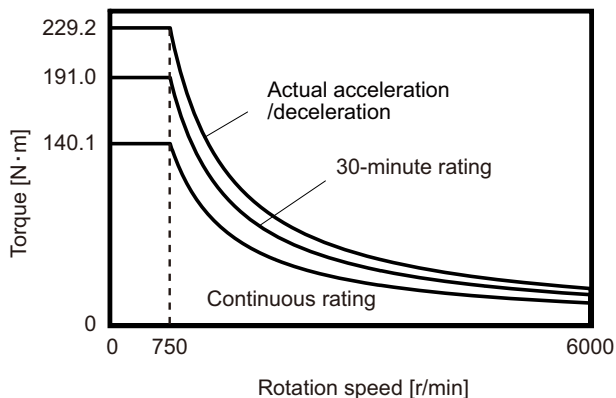
(\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

(\*4) IP code classifies the degree of protection of the motor body. It does not apply to the other electronic parts such as the cooling fan and the encoder.

Environmental conditions

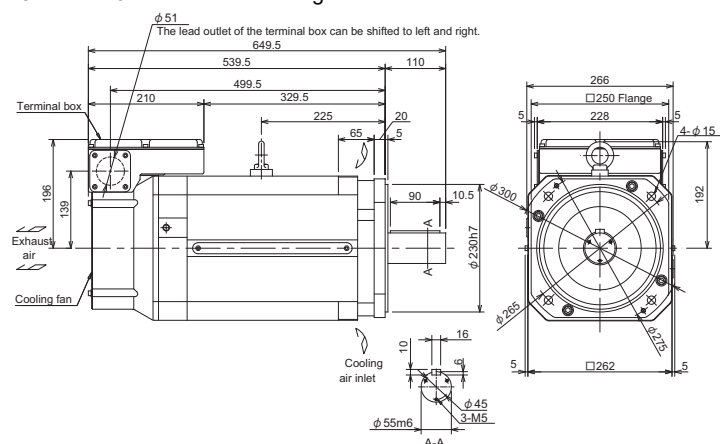
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

Torque - rotation speed characteristics

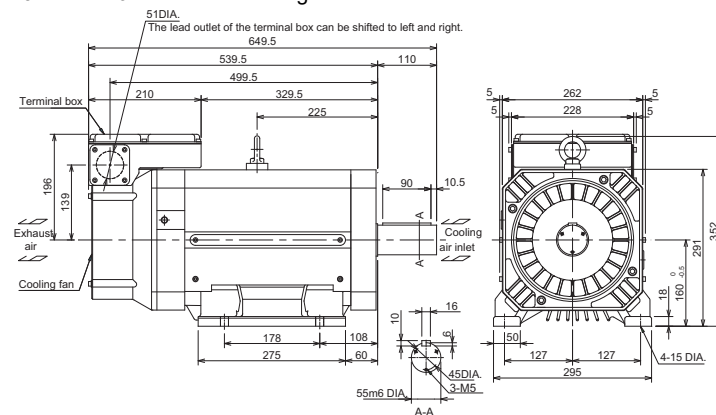


Outline dimension drawings [Unit : mm]

SJ-4-V22-16T with standard flange



SJ-4-V22-16T with standard legs



# Built-in Spindle Motor

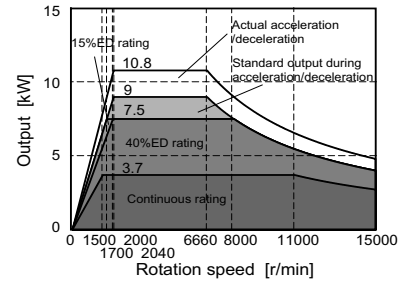
Normal specifications

# SJ-4BG160D/150-01

## Specifications

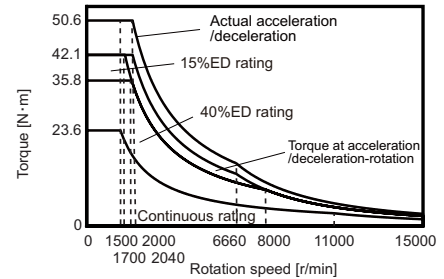
Item	Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-80
Coil changeover	-	
Output capacity[kW]	Continuous rated output	23.6
	Short time rated output	7.5 (40%ED rating)
	Standard output during acceleration/deceleration	9.0
	Actual acceleration/deceleration output(*3)	10.8
Base rotation speed	Continuous[r/min]	1500
	Short time[r/min]	1700
Maximum rotation speed[r/min]	15000	
Frame No. - Core width	100-110	
Torque (Base rotation speed)	Continuous[N·m]	23.6
	Short time[N·m]	42.1
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]	0.028	
Rotor inertia moment[kg·m <sup>2</sup> ]	0.0070	
Mass	Stator[kg]	11
	Rotor[kg]	4.2
Overload capacity (for one minute)	120% of short-time rated output	
Ambient temperature[°C]	0 to 40	
Heat-resistant class	155(F)	
Tolerable vibration	Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]	1220	
Cooling oil amount[l/min (20°C)]	10	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

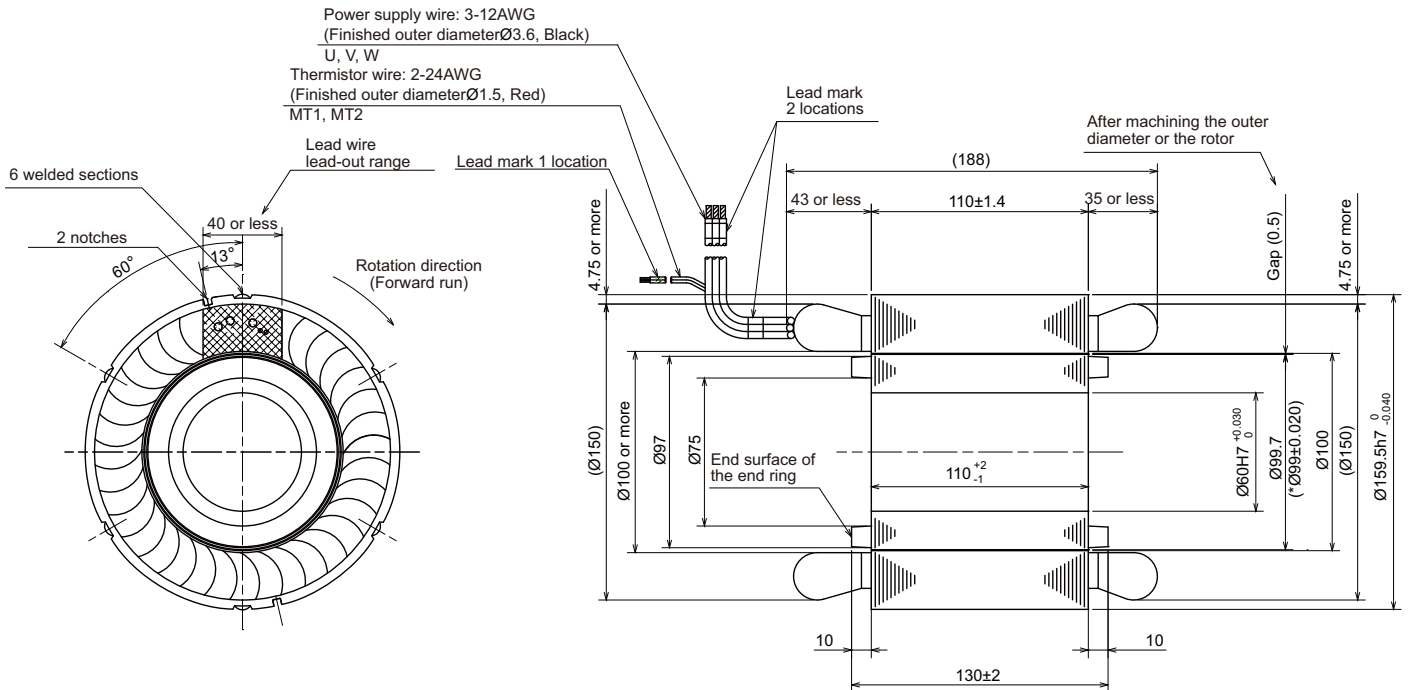
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -20°C to +65°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 \* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
 ( ) These are reference values.

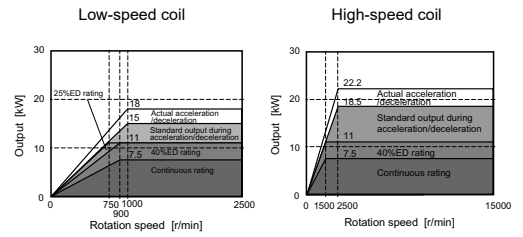
Normal specifications

# SJ-4BG180F/150-01

## Specifications

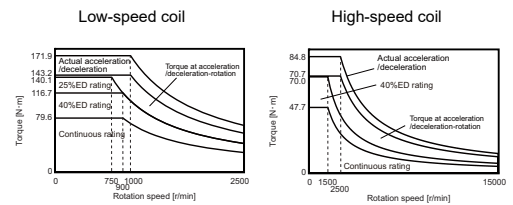
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-160	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	7.5	7.5
	Short time rated output	11 (25%ED rating) (40%ED rating)	11 (40%ED rating)
	Standard output during acceleration/deceleration	15	18.5
	Actual acceleration/deceleration output(*3)	18	22.2
Base rotation speed	Continuous[r/min]	900	1500
	Short time[r/min]	750	1500
Maximum rotation speed[r/min]		2500	15000
Frame No. - Core width		112-225	
Torque (Base rotation speed)	Continuous[N·m]	79.6	47.7
	Short time[N·m]	140	70.0
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.092	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.023	
Mass	Stator[kg]	27	
	Rotor[kg]	10	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		2500	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

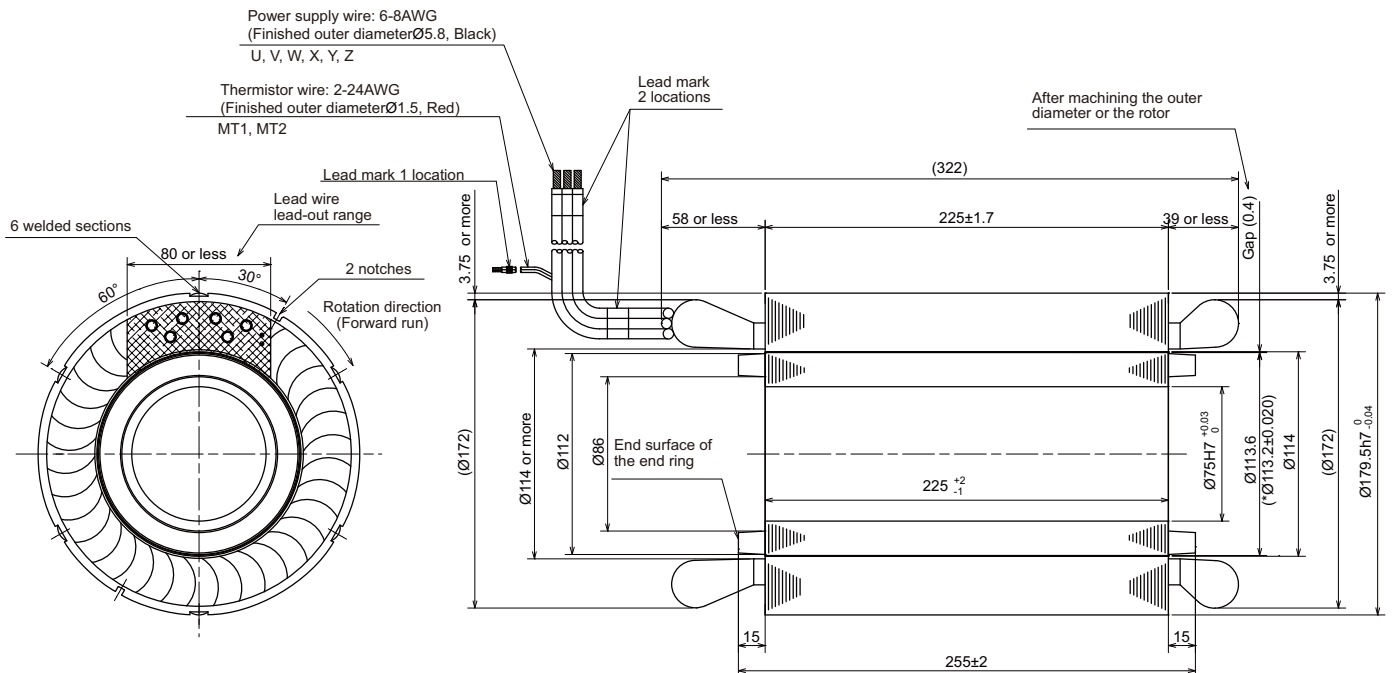
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

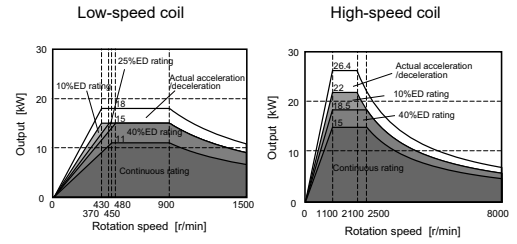
Normal specifications

# SJ-4BG300C/080-02

## Specifications

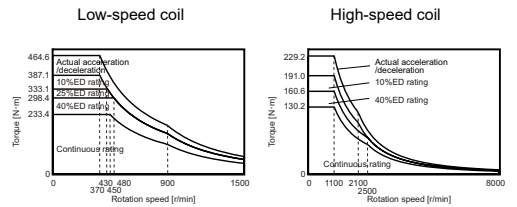
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-100	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	11	15
	Short time rated output	15 (10%ED rating)(25%ED rating)(40%ED rating)	22 (10%ED rating)
	Standard output during acceleration/deceleration	15	22
	Actual acceleration/deceleration output(*3)	18	26.4
Base rotation speed	Continuous[r/min]	450	1100
	Short time[r/min]	370	1100
Maximum rotation speed[r/min]		1500	8000
Frame No. - Core width		180-170	
Torque (Base rotation speed)	Continuous[N·m]	233	130
	Short time[N·m]	387	191
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ]		0.85	
Rotor inertia moment[kg·m <sup>2</sup> ]		0.21	
Mass	Stator[kg]	48	
	Rotor[kg]	28	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		3100	
Cooling oil amount[l/min (20°C)]		20	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".

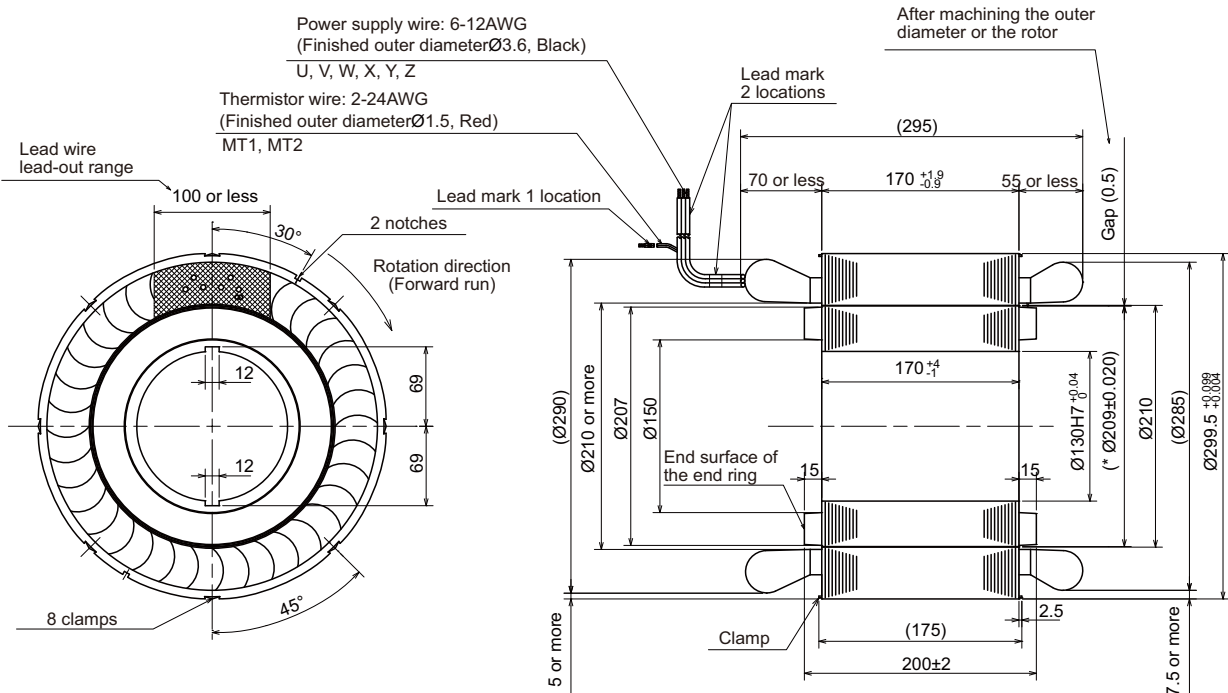
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation:90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
\* Apply finishing machining after carrying out shrink-fitting to the applicable shaft to realize these dimensions.  
( ) These are reference values.

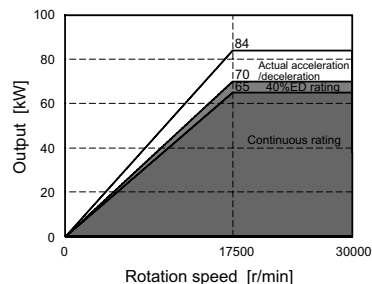
Normal specifications

# SJ-4BGS160B/300-01

## Specifications

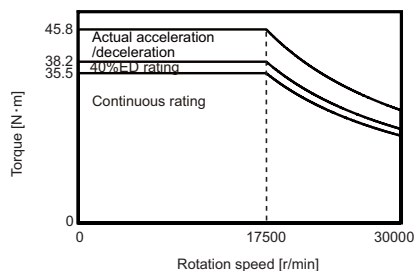
Item	Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-600
Coil changeover	-	
Output capacity[kW]	Continuous rated output	65
	Short time rated output	70 (40%ED rating)
	Standard output during acceleration/deceleration	70
	Actual acceleration/deceleration output(*3)	84
Base rotation speed	Continuous[r/min]	17500
	Short time[r/min]	17500
Maximum rotation speed[r/min]	30000	
Frame No. - Core width	100-120	
Torque (Base rotation speed)	Continuous[N·m]	35.5
	Short time[N·m]	38.2
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ] (*4)	0.0172	
Rotor inertia moment[kg·m <sup>2</sup> ] (*4)	0.0043	
Mass (*4)	Stator[kg]	14
	Rotor[kg]	2.2
Overload capacity (for one minute)	120% of short-time rated output	
Ambient temperature[°C]	0 to 40	
Heat-resistant class	155(F)	
Tolerable vibration	Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]	4420	
Cooling oil amount[l/min (20°C)]	10	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".
- (\*4) Without rotor sleeve

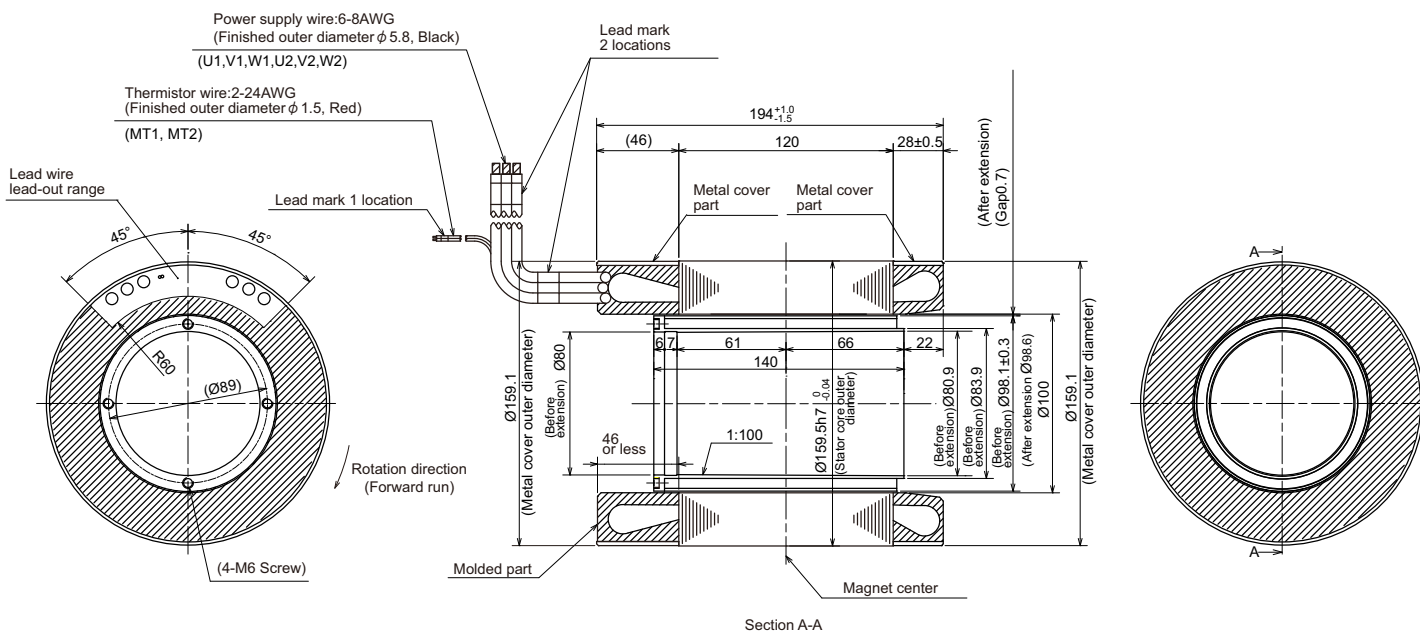
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
△ and the shaded areas indicate the lead wire lead-out ranges from the molded parts.  
( ) These are reference values.

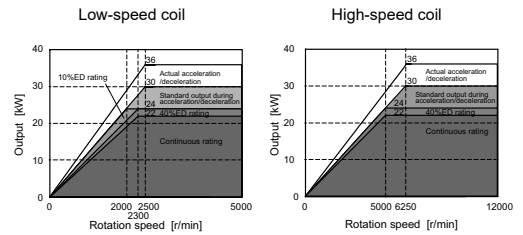
Normal specifications

# SJ-4BGS210B/120-01

## Specifications

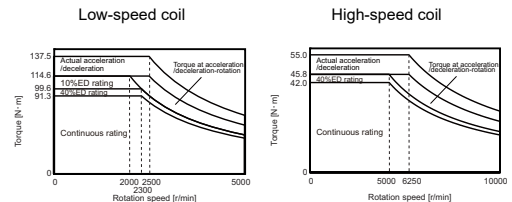
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-160	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	22	22
	Short time rated output	24 (10%ED rating)	24 (40%ED rating)
	Standard output during acceleration/deceleration	30	30
	Actual acceleration/deceleration output(*3)	36	36
Base rotation speed	Continuous[r/min]	2300	5000
	Short time[r/min]	2000	5000
Maximum rotation speed[r/min]		5000	12000
Frame No. - Core width		132-90	
Torque (Base rotation speed)	Continuous[N·m]	91.3	42.0
	Short time[N·m]	115	45.8
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ] (*4)		0.081	
Rotor inertia moment[kg·m <sup>2</sup> ] (*4)		0.020	
Mass (*4)	Stator[kg]	18	
	Rotor[kg]	6.8	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		2120	
Cooling oil amount[l/min (20°C)]		15	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".
- (\*4) With rotor sleeves

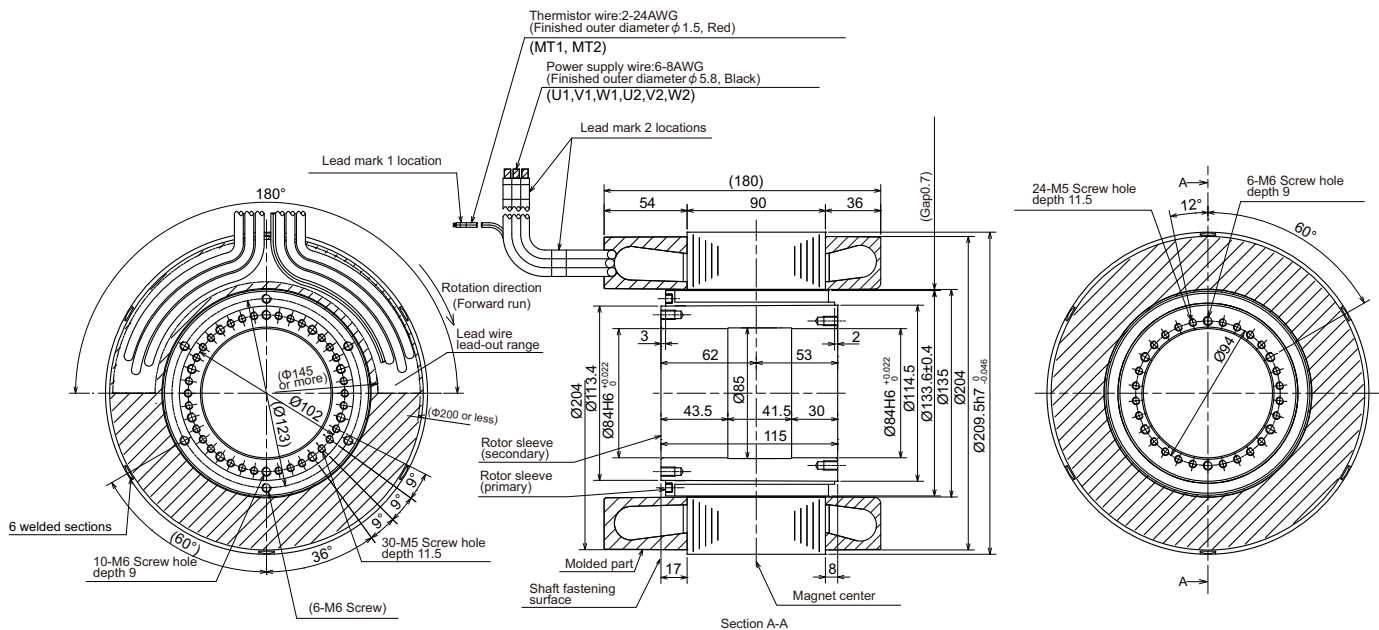
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 △ and the shaded areas indicate the lead wire lead-out ranges from the molded parts.  
 ( ) These are reference values.



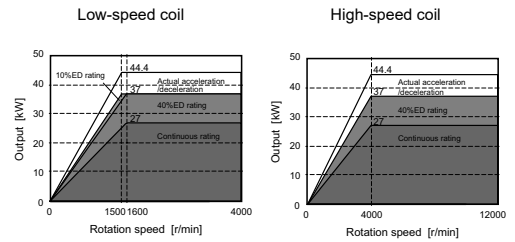
Normal specifications

# SJ-4BGS240B/120-01

## Specifications

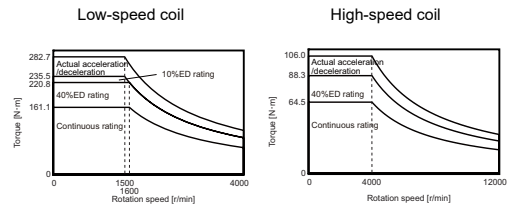
Item		Specifications	
Compatible spindle drive unit (*1)	1-axis type	MDS-EH-SP-320	
Coil changeover		Low-speed coil	High-speed coil
Output capacity[kW]	Continuous rated output	27	27
	Short time rated output	37 (10%ED rating)	37 (40%ED rating)
	Standard output during acceleration/deceleration	37	37
	Actual acceleration/deceleration output(*3)	44.4	44.4
Base rotation speed	Continuous[r/min]	1600	4000
	Short time[r/min]	1500	4000
Maximum rotation speed[r/min]		4000	12000
Frame No. - Core width		160-120	
Torque (Base rotation speed)	Continuous[N·m]	161	64.5
	Short time[N·m]	236	88.3
Rotor GD <sup>2</sup> [kg·m <sup>2</sup> ] (*4)		0.22	
Rotor inertia moment[kg·m <sup>2</sup> ] (*4)		0.054	
Mass (*4)	Stator[kg]	28	
	Rotor[kg]	13	
Overload capacity (for one minute)		120% of short-time rated output	
Ambient temperature[°C]		0 to 40	
Heat-resistant class		155(F)	
Tolerable vibration		Maximum stationary tolerable value 9.8m/s <sup>2</sup> (1G), Momentary stationary tolerable value 49.0m/s <sup>2</sup> (5G)	
Required cooling capacity (*2) [W]		3430	
Cooling oil amount[l/min (20°C)]		20	

## Output characteristics



- (\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
- (\*2) The value for the short-time rated output is shown for the required cooling capacity. Install a cooling jacket around the stator and use fluid cooling (oil cooling).
- (\*3) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or 1.2-fold of "Short time rated output".
- (\*4) With rotor sleeves

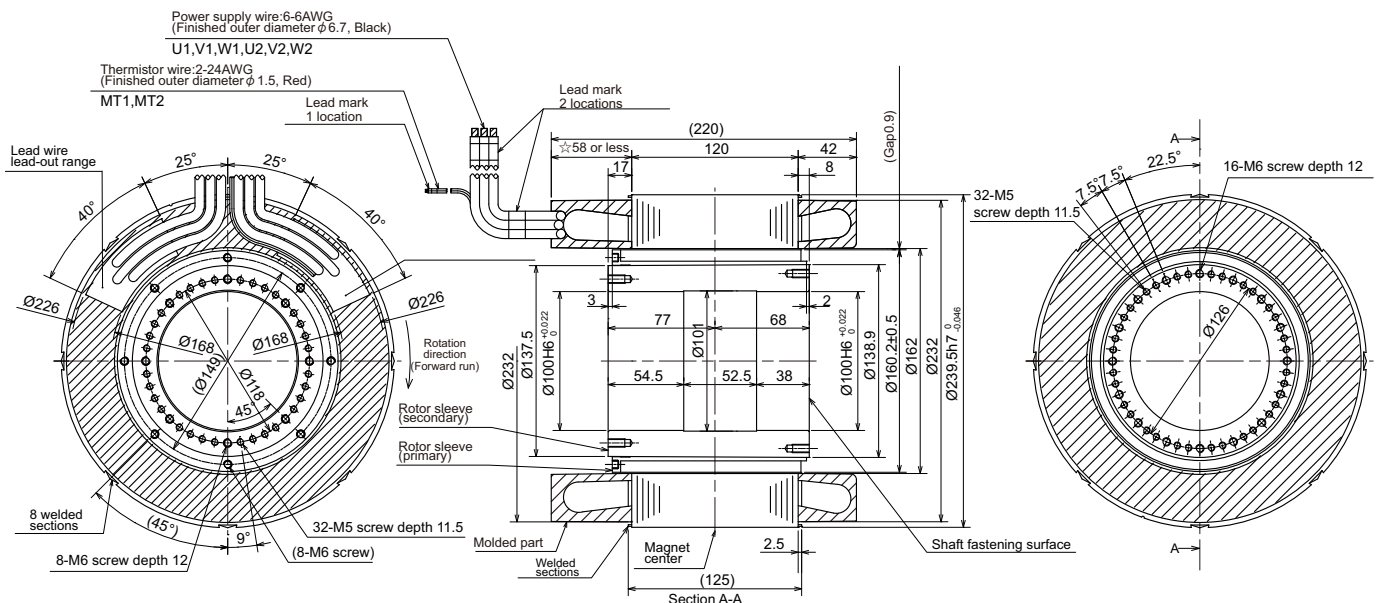
## Torque - rotation speed characteristics



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0 to 40°C(with no freezing) Storage: -20°C to +65°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation/storage: 1000m or less above sea level, Transportation: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]



☆ These dimensions are the dimensions when shipped from the plant.  
 △ and the shaded areas indicate the lead wire lead-out ranges from the molded parts.  
 ( ) These are reference values.





# Tool Spindle Motor



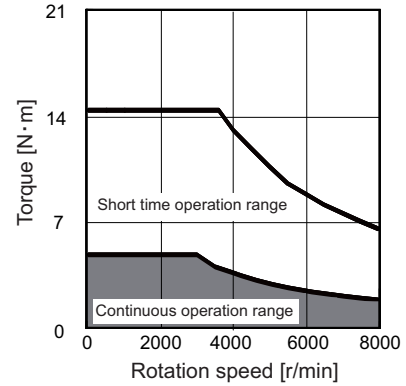
# 400V System Tool Spindle Motor HG Series

Rated torque	Rated rotation speed	Tool spindle motor type	Explanation of type			
<b>4.8N·m</b>	<b>3000r/min</b>	<b>HG-JR1534 E1□W9C-□</b>	(1)	(2)		
					(1) Shaft end	None
					K	With keyway (without key)
			(2) Power connector		S105003	Normal (vertical direction)
					S105010	Compact (horizontal direction)

## Specifications

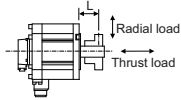
Item	Specifications	
Compatible drive unit (*1)	1-axis type	MDS-EH-SP-40
	2-axis type	-
	3-axis type	-
	Multi axis type	-
	Regenerative resistor type	-
Continuous characteristics	Rated output[kW]	1.5
	Rated current[A]	11
	Rated torque[N·m]	4.8
Maximum momentary output (For power supply selection) [kW]	6.3	
Rated rotation speed[r/min]	3000	
Maximum rotation speed[r/min]	8000	
Maximum current[A]	17	
Maximum torque[N·m]	14.3	
Motor inertia[×10 <sup>-4</sup> kg·m <sup>2</sup> ]	3.79	
Mass[kg]	5.9	
Heat-resistant class	155(F)	
Degree of protection	IP67 (The shaft-through portion is excluded.)	
Cooling method	Totally enclosed natural-cooling	
Quakeproof level[m/s <sup>2</sup> ] ((G))	X:24.5(2.5),Y:24.5(2.5)	
Axis tolerable load	Radial load (*2) [N] ((mm))	323 (L=40)
	Thrust load[N]	284
Encoder	1,048,576 p/rev (D48) MDS-EH-SP	

## Torque characteristics



(\*1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(\*2)



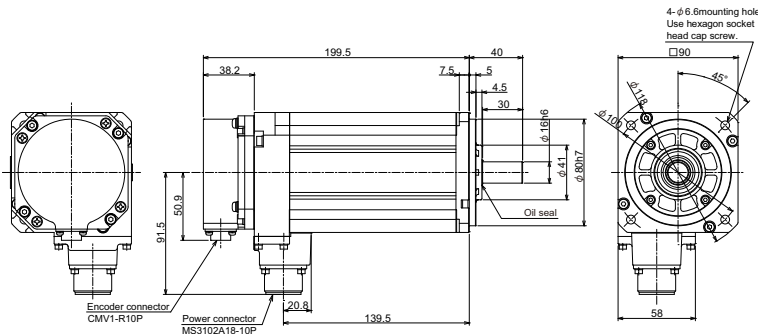
L: Length from flange installation surface to center of load weight [mm]

## Environmental conditions

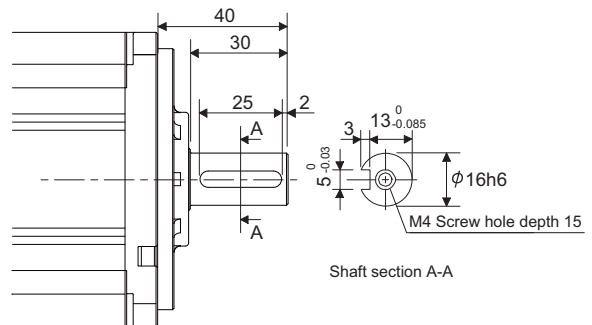
Item	Conditions
Ambient temperature	Operation: 0 to 40°C (with no freezing) Storage: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 80% RH or less (with no dew condensation) Storage: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust
Altitude	Operation: 1000m or less above sea level Storage: 10000m or less above sea level

## Outline dimension drawings [Unit : mm]

### HG-JR1534E1W9C-S105003

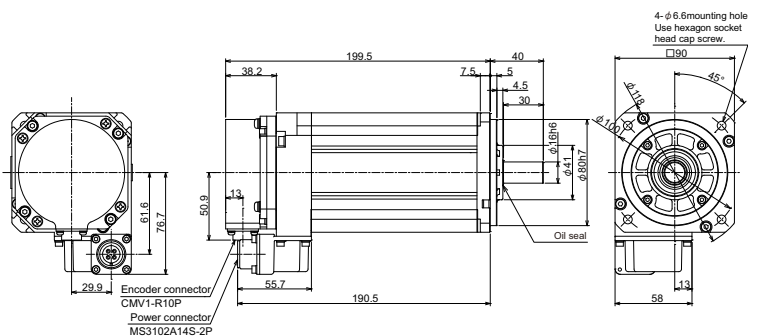


### Shaft with keyway



The appearance is the same as the straight (without keyway) except the shaft shape.

### HG-JR1534E1W9C-S105010

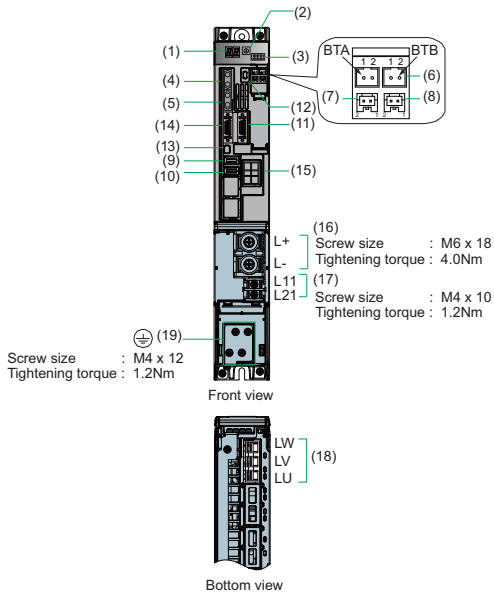




# Servo Drive Unit

Servo drive unit

# MDS-EH-V1-10



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	10	
Output	Rated voltage[V]	323AC
	Rated current[A]	2.3
Input	Rated voltage[V]	513 to 648DC
	Rated current[A]	0.9
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
	Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2	
Braking	Regenerative braking and dynamic brakes	
	Dynamic brakes	Built-in
Heating value	Inside panel[W]	19
	Outside panel[W]	27
Cooling method	Natural-cooling	
Mass[kg]	3.8	

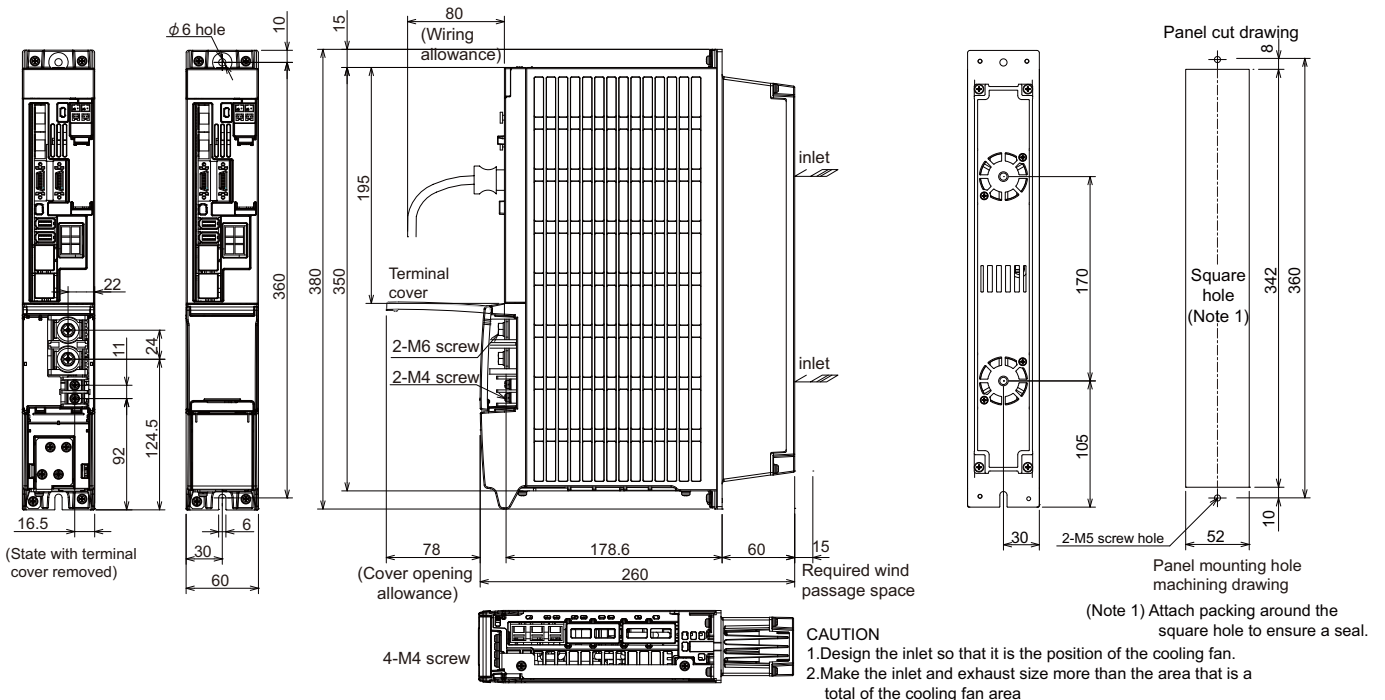
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

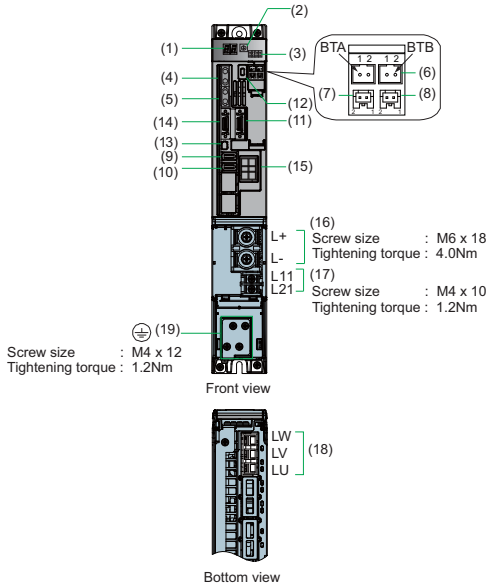
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V1-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	20
Output	
Rated voltage[V]	323AC
Rated current[A]	4.9
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	1.6
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	22
Outside panel[W]	46
Cooling method	Forced air cooling
Mass[kg]	3.8

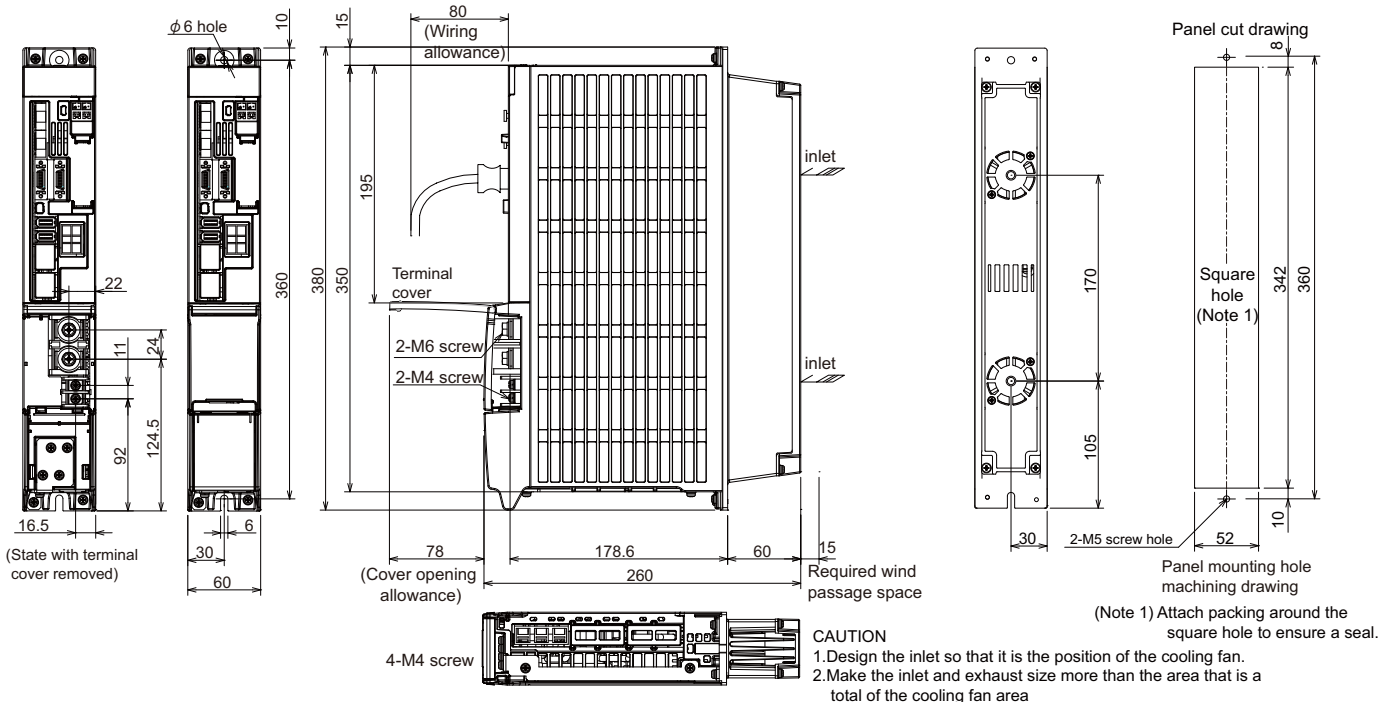
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

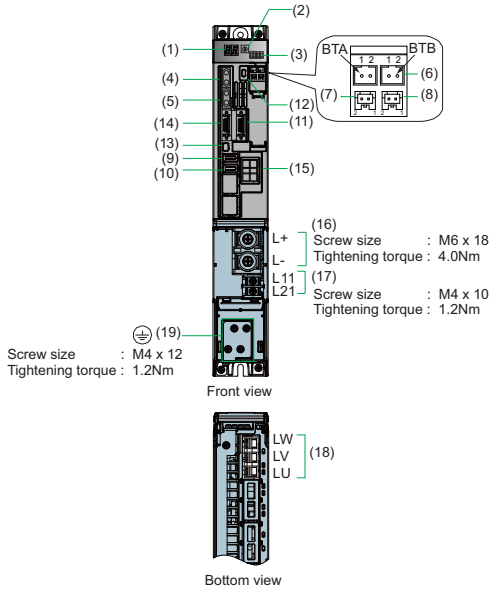
## Outline dimension drawings [Unit : mm]





Servo drive unit

# MDS-EH-V1-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	40
Output	
Rated voltage[V]	323AC
Rated current[A]	7.7
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	2.9
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	27
Outside panel[W]	87
Cooling method	Forced air cooling
Mass[kg]	3.8

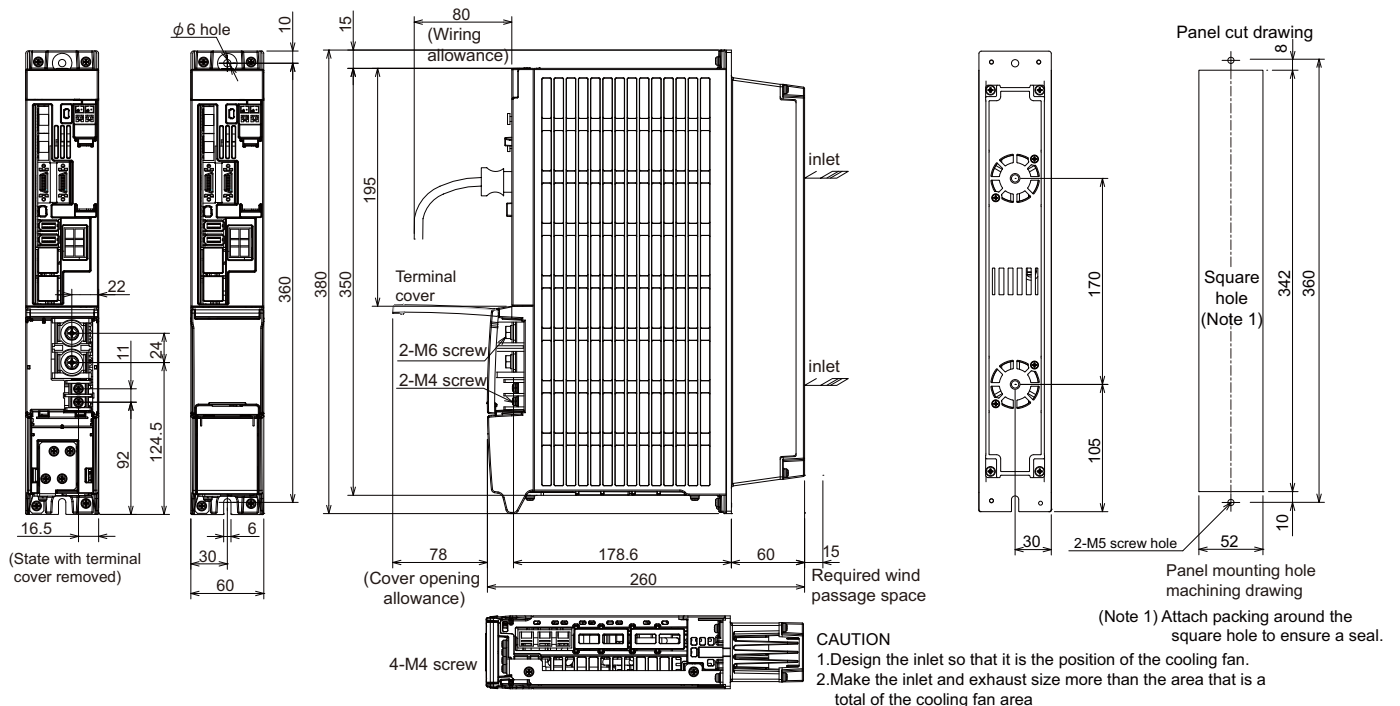
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

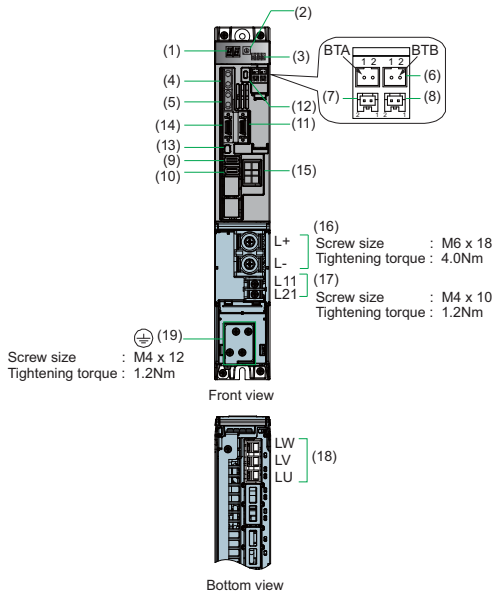
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V1-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	80
Output	
Rated voltage[V]	323AC
Rated current[A]	17
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	6.0
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Heating value	
Dynamic brakes	Built-in
Inside panel[W]	40
Outside panel[W]	175
Cooling method	Forced air cooling
Mass[kg]	3.8

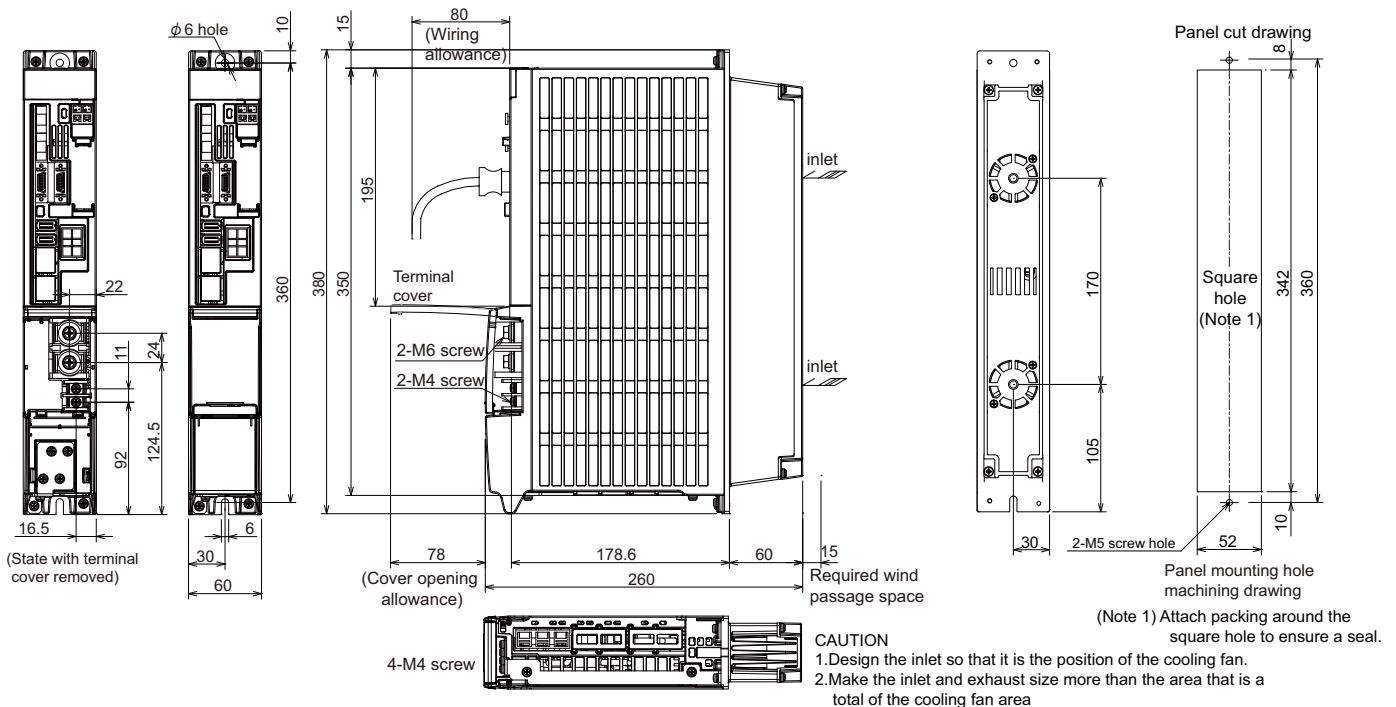
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

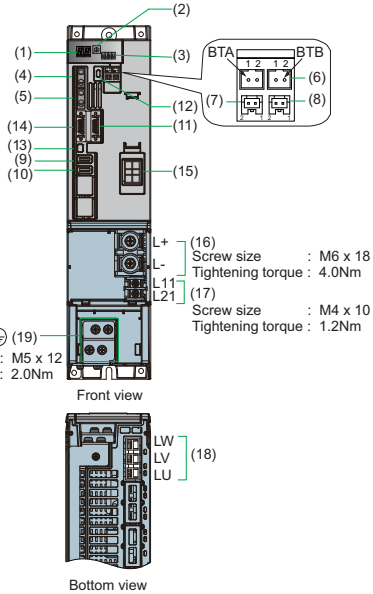
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V1-80W



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BT1	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output connector (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	80
Output	
Rated voltage[V]	323AC
Rated current[A]	21
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	8.0
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Heating value	
Inside panel[W]	47
Outside panel[W]	222
Cooling method	Forced air cooling
Mass[kg]	4.5

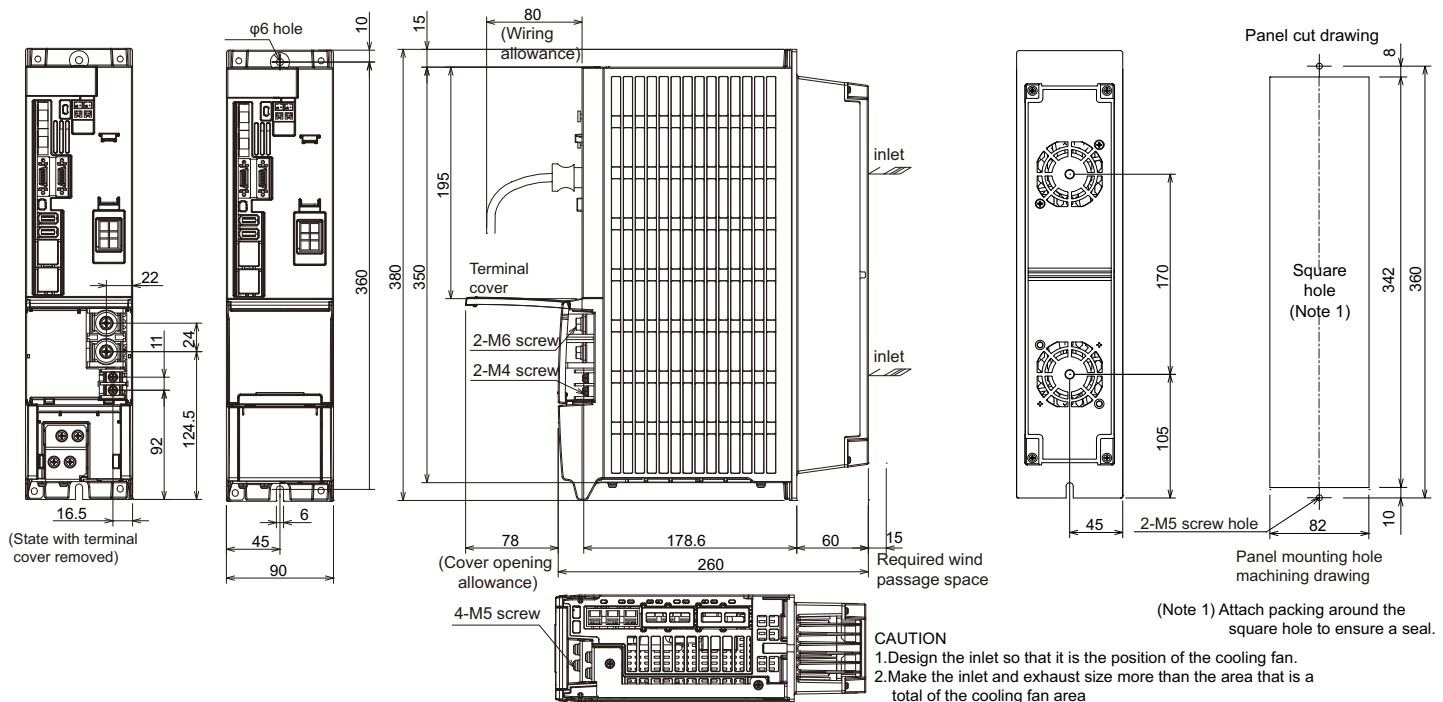
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

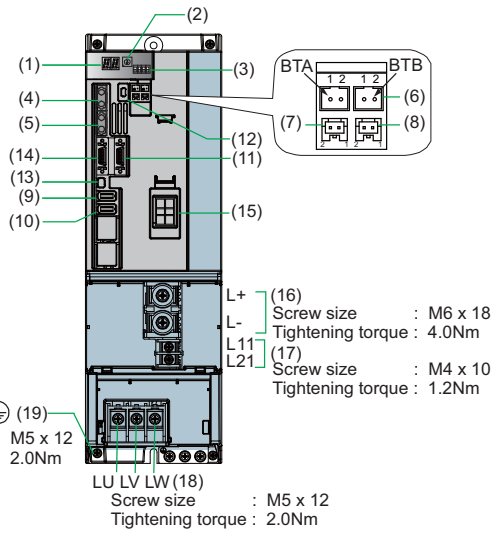
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V1-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output terminal (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	160
Output	
Rated voltage[V]	323AC
Rated current[A]	32
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	11.9
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Heating value	
Dynamic brakes	Built-in
Inside panel[W]	62
Outside panel[W]	328
Cooling method	Forced air cooling
Mass[kg]	5.8

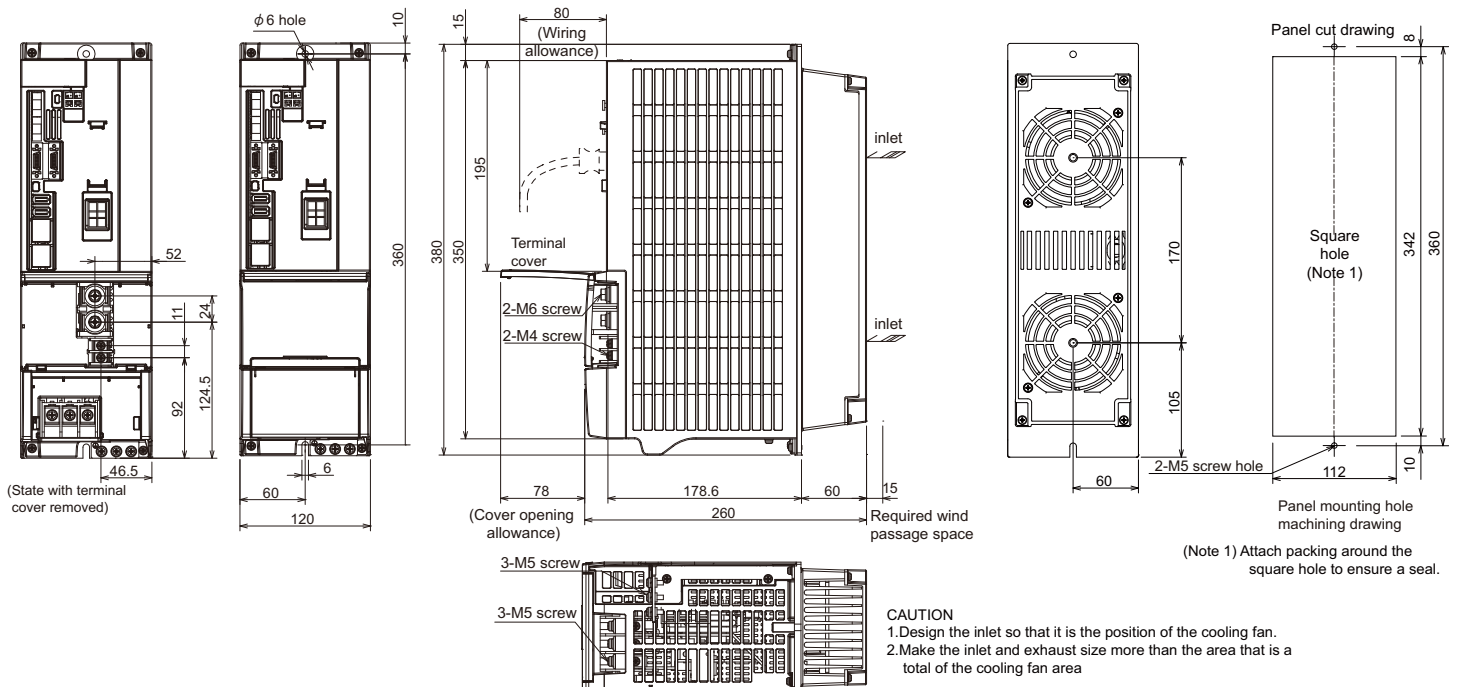
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

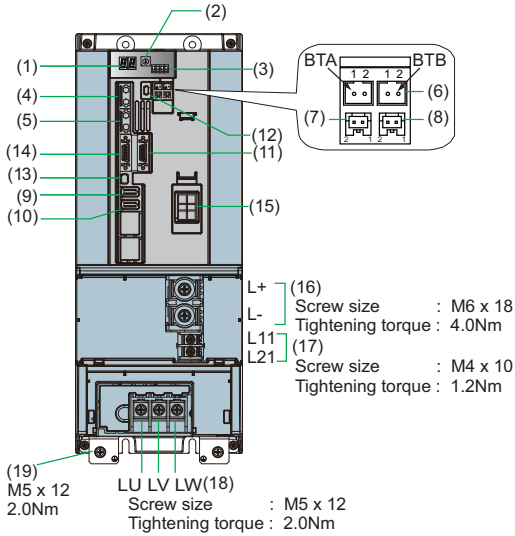
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V1-160W



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake/dynamic brake unit control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output terminal (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications
Nominal maximum current(peak) [A]	160
Output	
Rated voltage[V]	323AC
Rated current[A]	46
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	16.7
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Heating value	External (MDS-D-DBU)
Dynamic brakes	81
Inside panel[W]	461
Outside panel[W]	
Cooling method	Forced air cooling
Mass[kg]	7.5

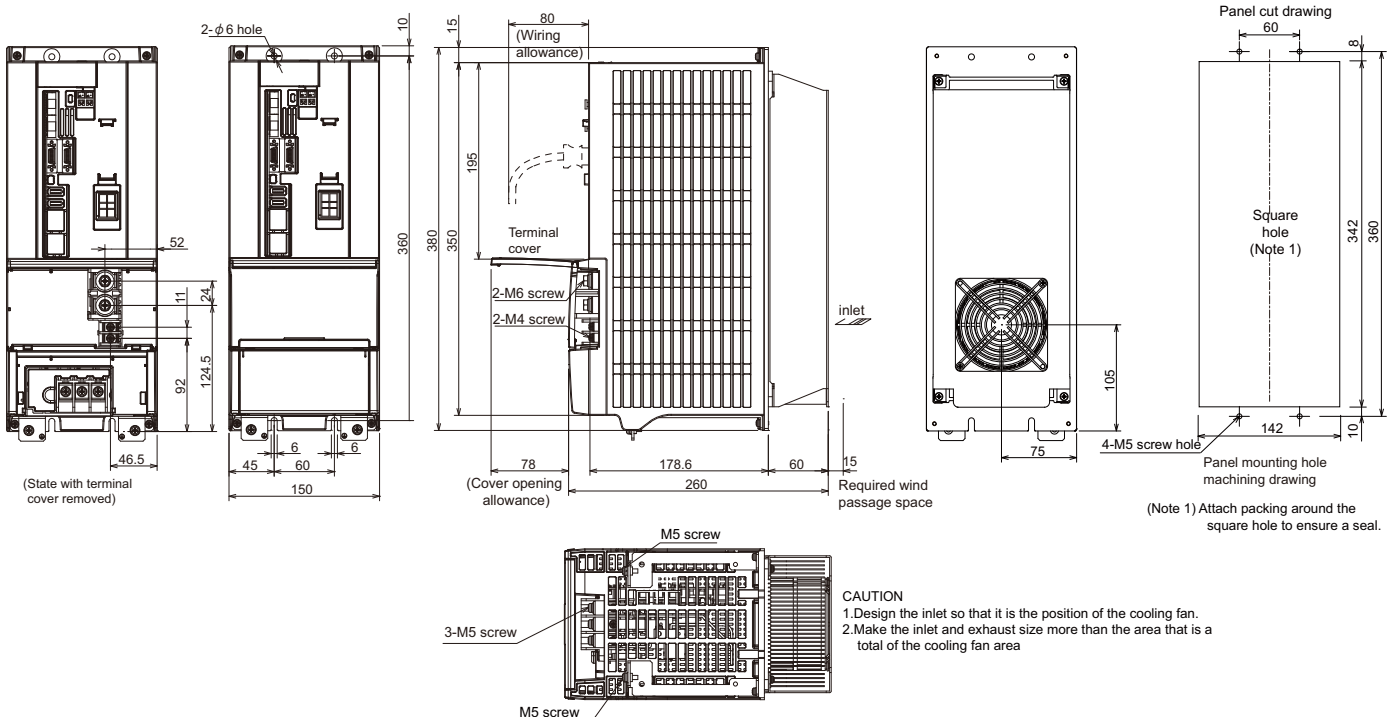
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10			1.25 to 2	16 to 14

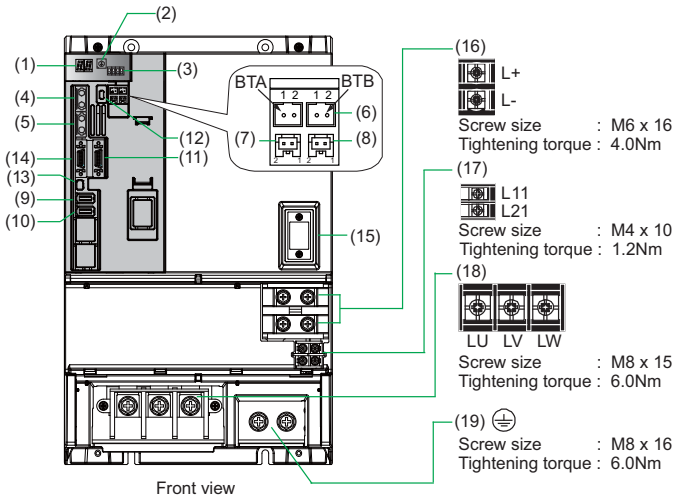
### Outline dimension drawings [Unit : mm]





Servo drive unit

# MDS-EH-V1-200



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	CN20	Motor brake/dynamic brake unit control connector (Key way: X type)
(16)	TE2	Converter voltage input terminal (DC input)
(17)	TE3	Control power input terminal (single-phase AC input)
(18)	TE1	Motor power supply output terminal (3-phase AC output)
(19)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	200
Output	
Rated voltage[V]	323AC
Rated current[A]	76.8
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	39
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	18
Max. earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
Heating value	External (MDS-D-DBU)
Dynamic brakes	External (MDS-D-DBU)
Inside panel[W]	105
Outside panel[W]	630
Cooling method	Forced air cooling
Mass[kg]	15.4

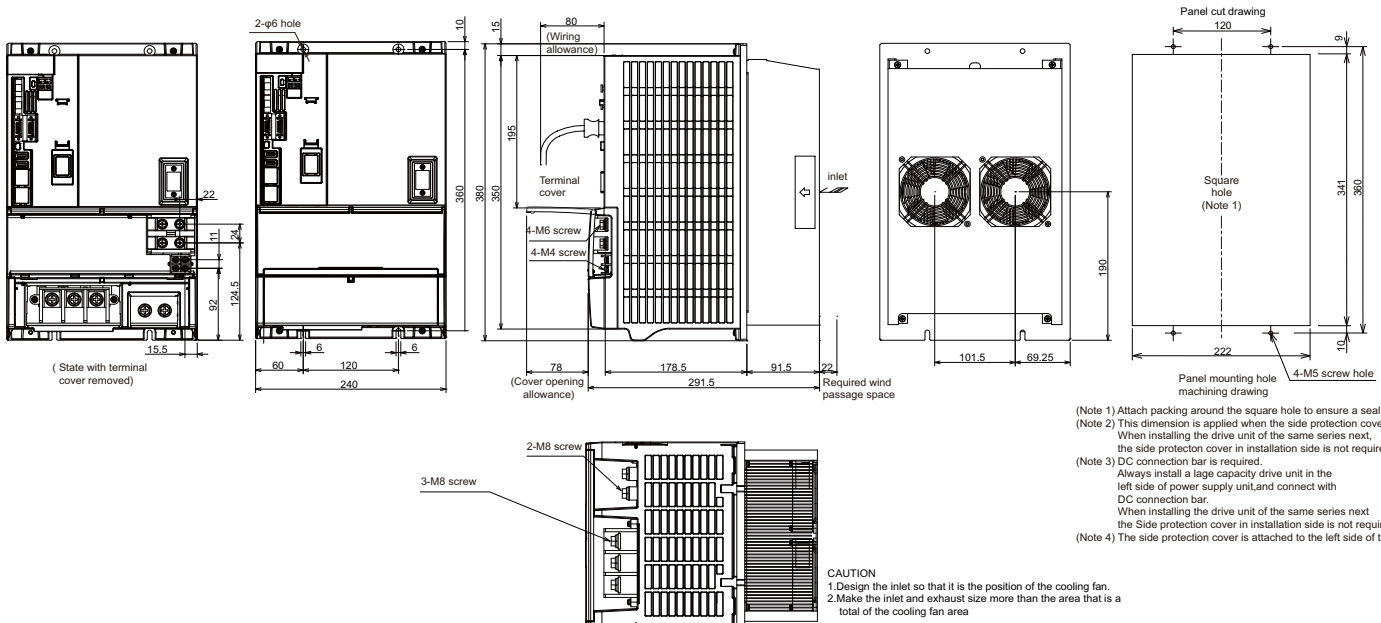
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]

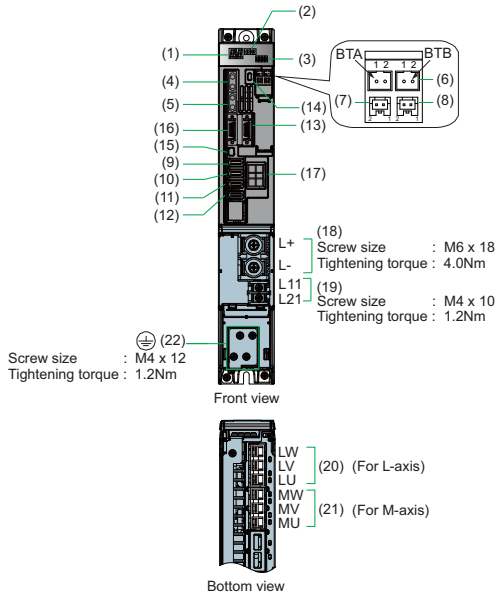


- (Note 1) Attach packing around the square hole to ensure a seal.
- (Note 2) This dimension is applied when the side protection cover is installed. When installing the drive unit of the same series next, the side protection cover in installation side is not required.
- (Note 3) DC connection bar is required. Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar. When installing the drive unit of the same series next, the Side protection cover in installation side is not required.
- (Note 4) The side protection cover is attached to the left side of the unit.

**CAUTION**  
 1. Design the inlet so that it is the position of the cooling fan.  
 2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area

Servo drive unit

# MDS-EH-V2-10



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	10	10
Output	Rated voltage[V] 323AC	
	Rated current[A]	2.3 2.3
Input	Rated voltage[V] 513 to 648DC	
	Rated current[A]	1.8
Control power	Frequency[Hz] 50 / 60	
	Tolerable frequency fluctuation[%] ±5% max	
	Voltage(50Hz) [V] 380 to 480AC	
	Voltage(60Hz) [V] 380 to 480AC	
	Tolerable voltage fluctuation[%] +10%, -15%	
	Max. current[A] 0.3	
	Max. rush current[A] 18	
	Max. rush conductivity time[ms] 12	
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	Inside panel[W] 28	
	Outside panel[W] 54	
Cooling method	Natural-cooling	
Mass[kg]	4.6	

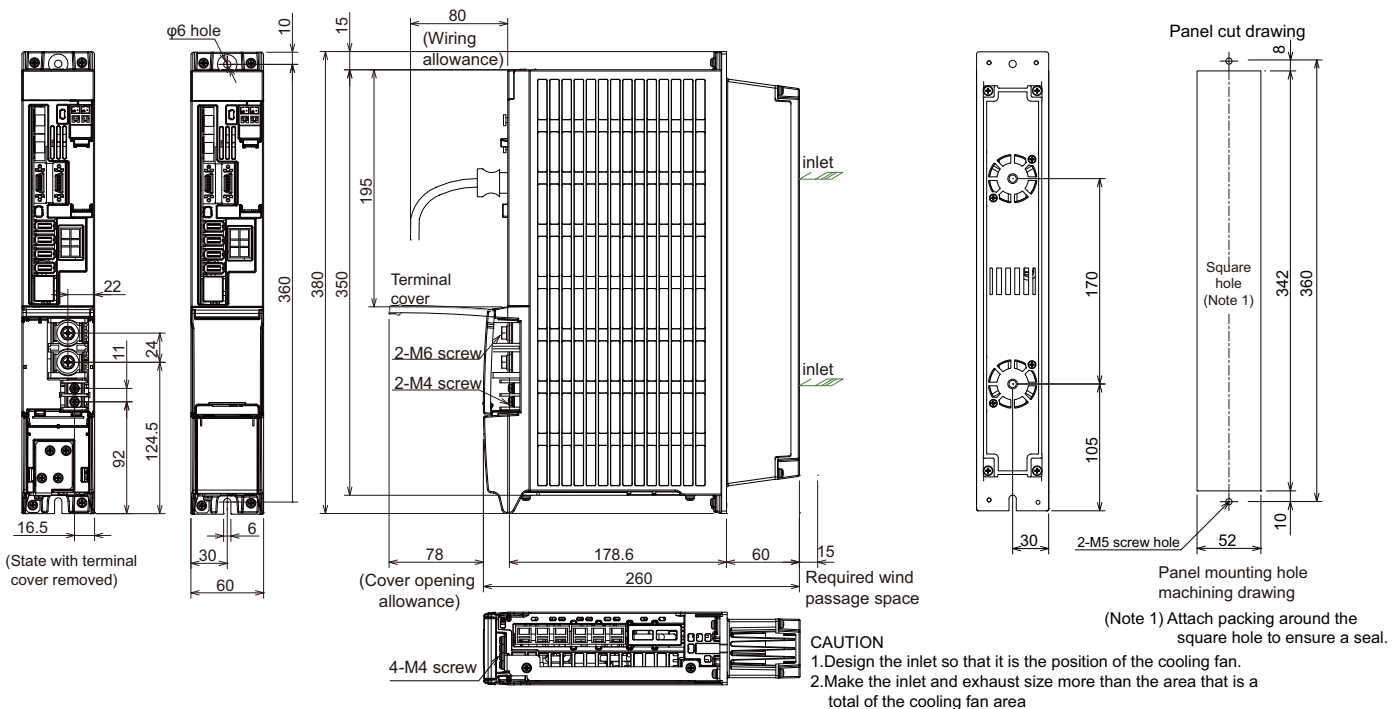
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

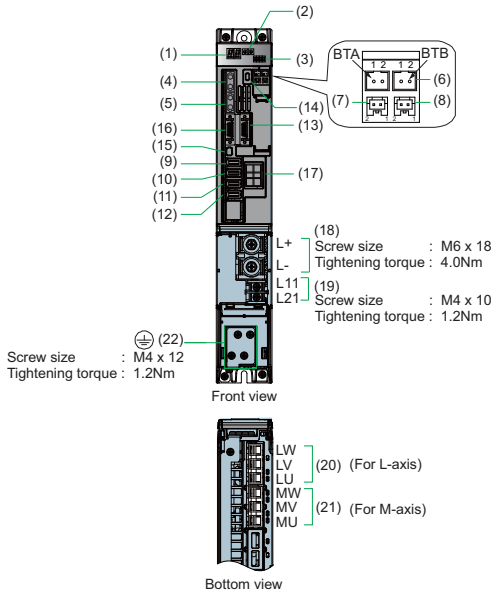
Item	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
Types	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V2-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)		Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	20	20
Output	Rated voltage[V]	323AC
	Rated current[A]	4.9 / 4.9
Input	Rated voltage[V]	513 to 648DC
	Rated current[A]	3.2
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
	Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	Inside panel[W]	33
	Outside panel[W]	93
Cooling method	Forced air cooling	
Mass[kg]	4.6	

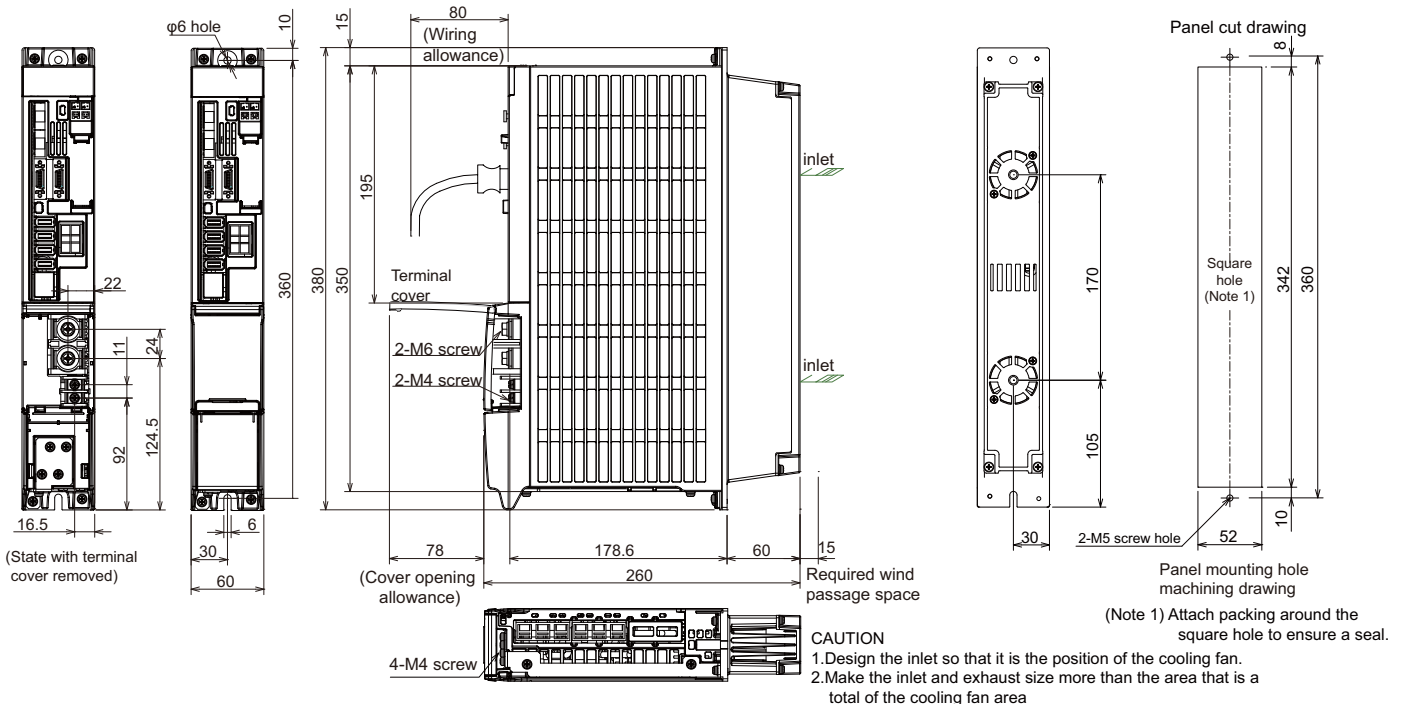
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

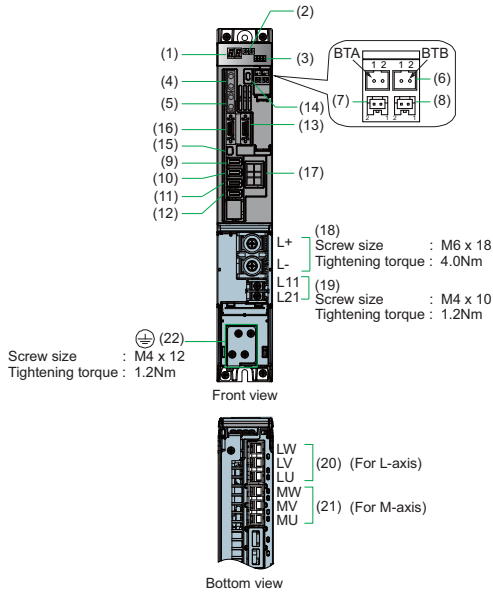
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]





Servo drive unit  
**MDS-EH-V2-40**



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	40	40
Output	Rated voltage[V] 323AC	
	Rated current[A] 7.7 7.7	
Input	Rated voltage[V] 513 to 648DC	
	Rated current[A] 5.8	
Control power	Frequency[Hz] 50 / 60	
	Tolerable frequency fluctuation[%] ±5% max	
	Voltage(50Hz) [V] 380 to 480AC	
	Voltage(60Hz) [V] 380 to 480AC	
	Tolerable voltage fluctuation[%] +10%, -15%	
	Max. current[A] 0.3	
	Max. rush current[A] 18	
Max. earth leakage current[mA]	2	2
	Braking Regenerative braking and dynamic brakes	
Heating value	Dynamic brakes Built-in	
	Inside panel[W] 45	
Cooling method	Outside panel[W] 173	
	Forced air cooling	
Mass[kg]	4.6	

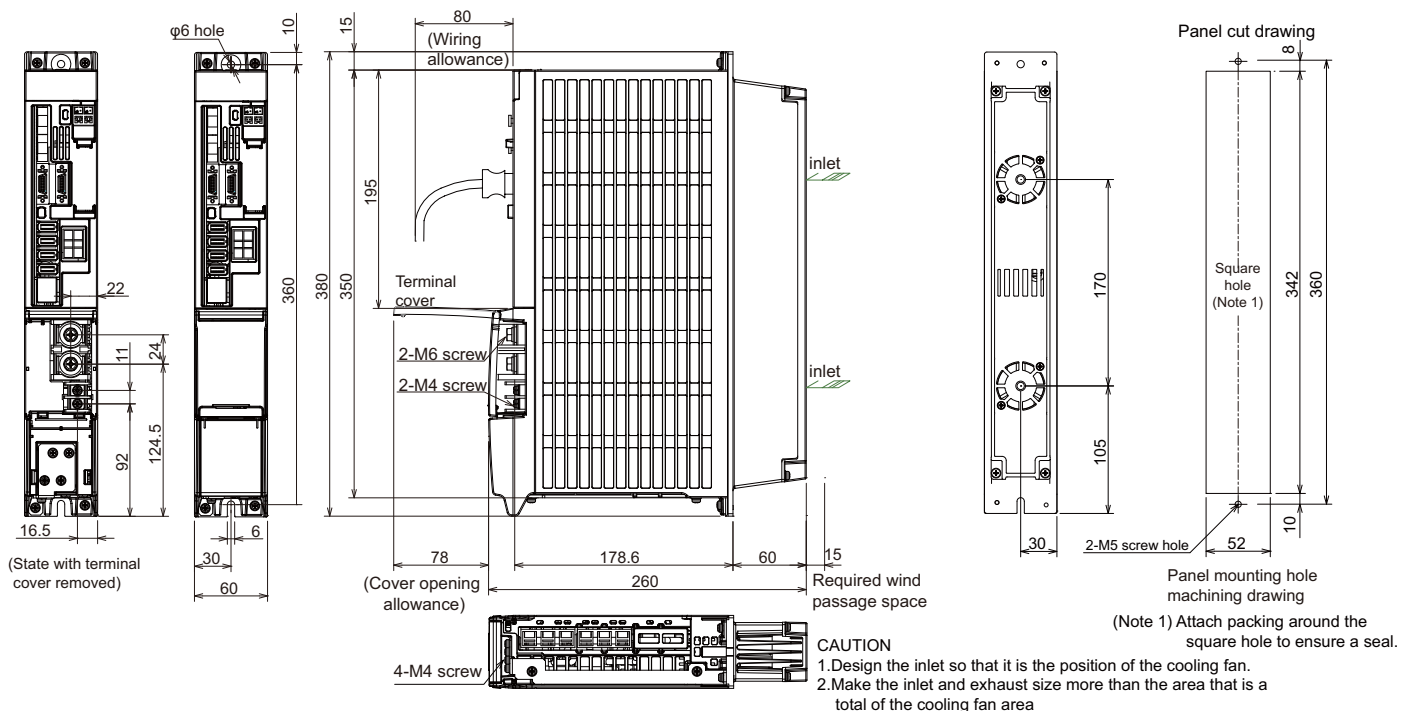
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

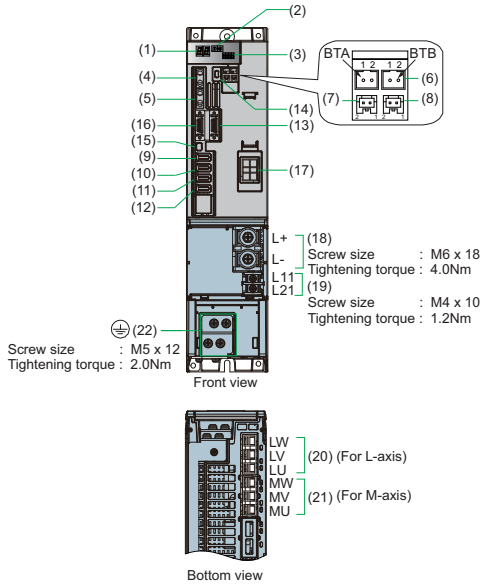
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V2-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	80	80
Output	Rated voltage[V]	323AC
	Rated current[A]	17 17
Input	Rated voltage[V]	513 to 648DC
	Rated current[A]	12
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
Max. earth leakage current[mA]	2	2
	2	2
Braking	Regenerative braking and dynamic brakes	Built-in
	Dynamic brakes	Built-in
Heating value	Inside panel[W]	70
	Outside panel[W]	350
Cooling method	Forced air cooling	
Mass[kg]	5.2	

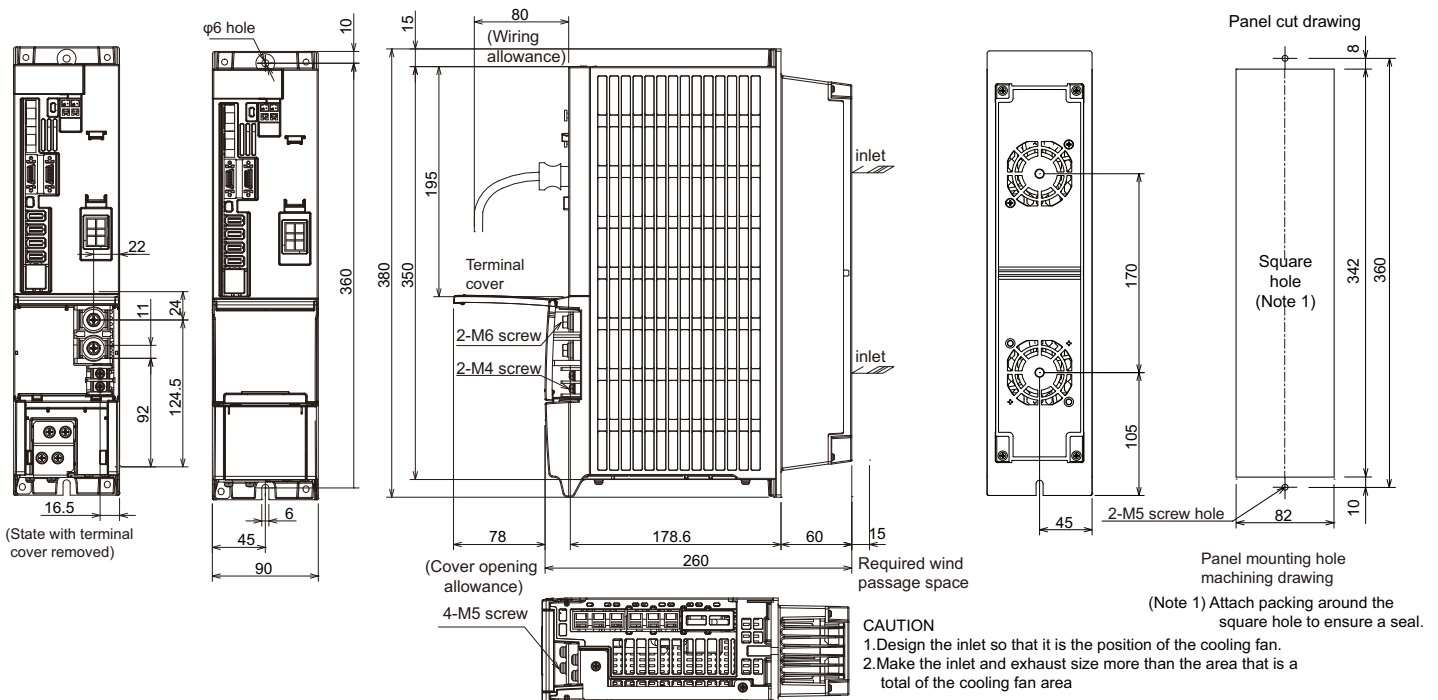
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

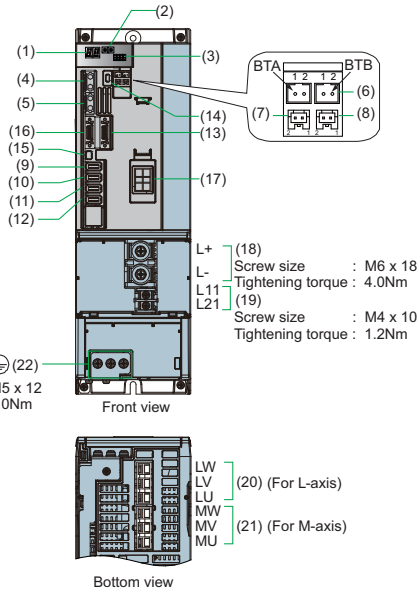
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V2-80W



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)	TE1	Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	80	80
Output	323AC	
Rated voltage[V]	21	
	21	
Input	513 to 648DC	
	16	
Control power	50 / 60	
	±5% max	
	380 to 480AC	
	380 to 480AC	
	+10%, -15%	
	0.3	
	18	
	12	
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	83	
	445	
Cooling method	Forced air cooling	
Mass[kg]	6.3	

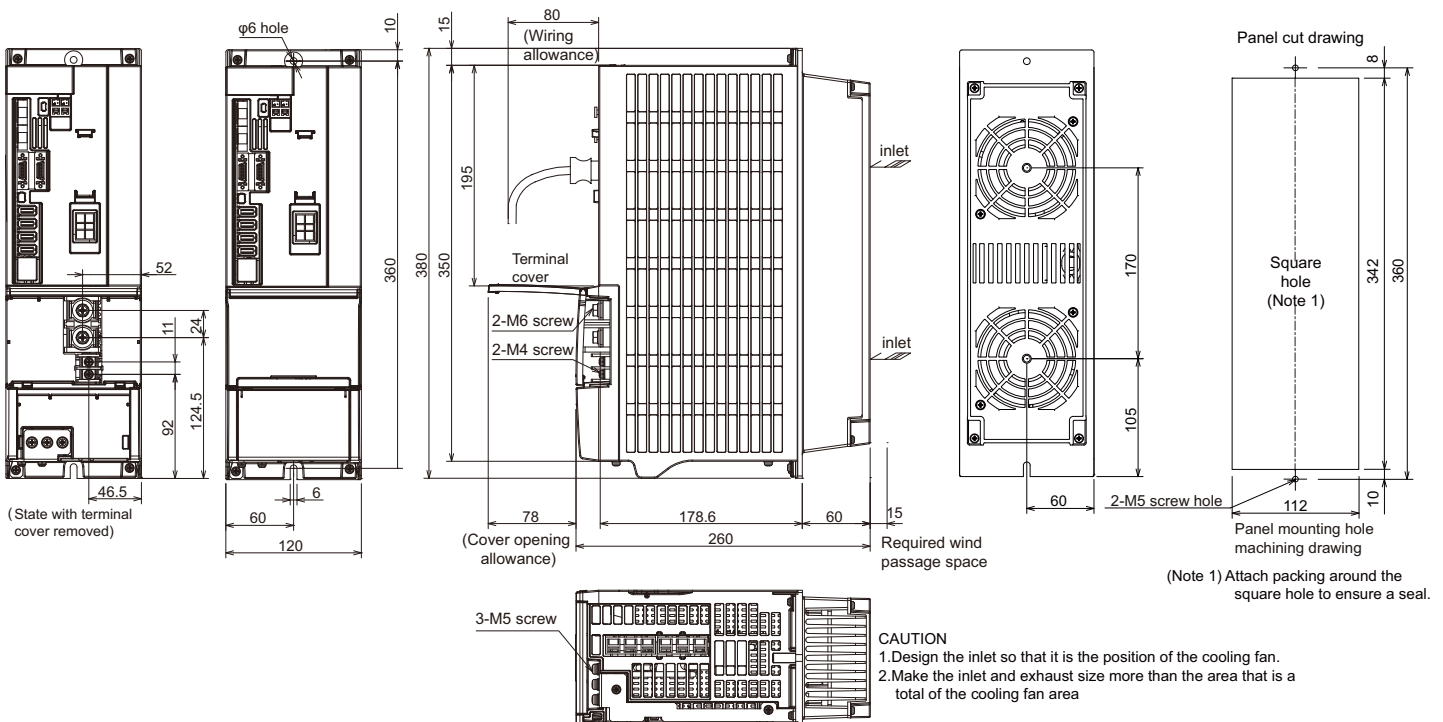
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

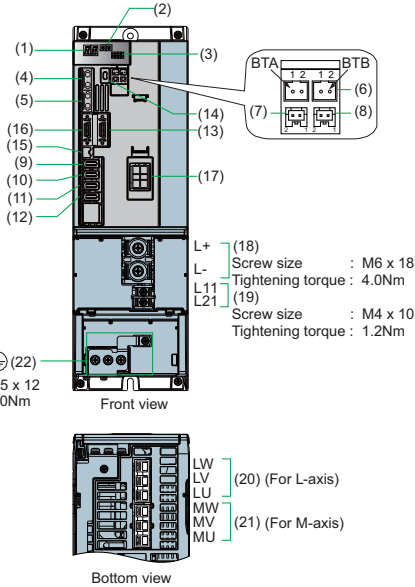
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V2-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN4	Power supply communication connector
(14)	CN5	USB maintenance connector (usually not used)
(15)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(16)	CN9	DIO/analog output connector
(17)	CN20	Motor brake control connector (Key way: X type)
(18)	TE2	Converter voltage input terminal (DC input)
(19)	TE3	Control power input terminal (single-phase AC input)
(20)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(21)		Motor power supply output connector (M-axis, 3-phase AC output)
(22)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
	L	M
Nominal maximum current(peak) [A]	160	160
Output	Rated voltage[V]	323AC
	Rated current[A]	32 32
Input	Rated voltage[V]	513 to 648DC
	Rated current[A]	23.8
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
	Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	2	2
Braking	Regenerative braking and dynamic brakes	
	Built-in	
Heating value	Dynamic brakes	
	Inside panel[W]	111
	Outside panel[W]	656
Cooling method	Forced air cooling	
Mass[kg]	7.2	

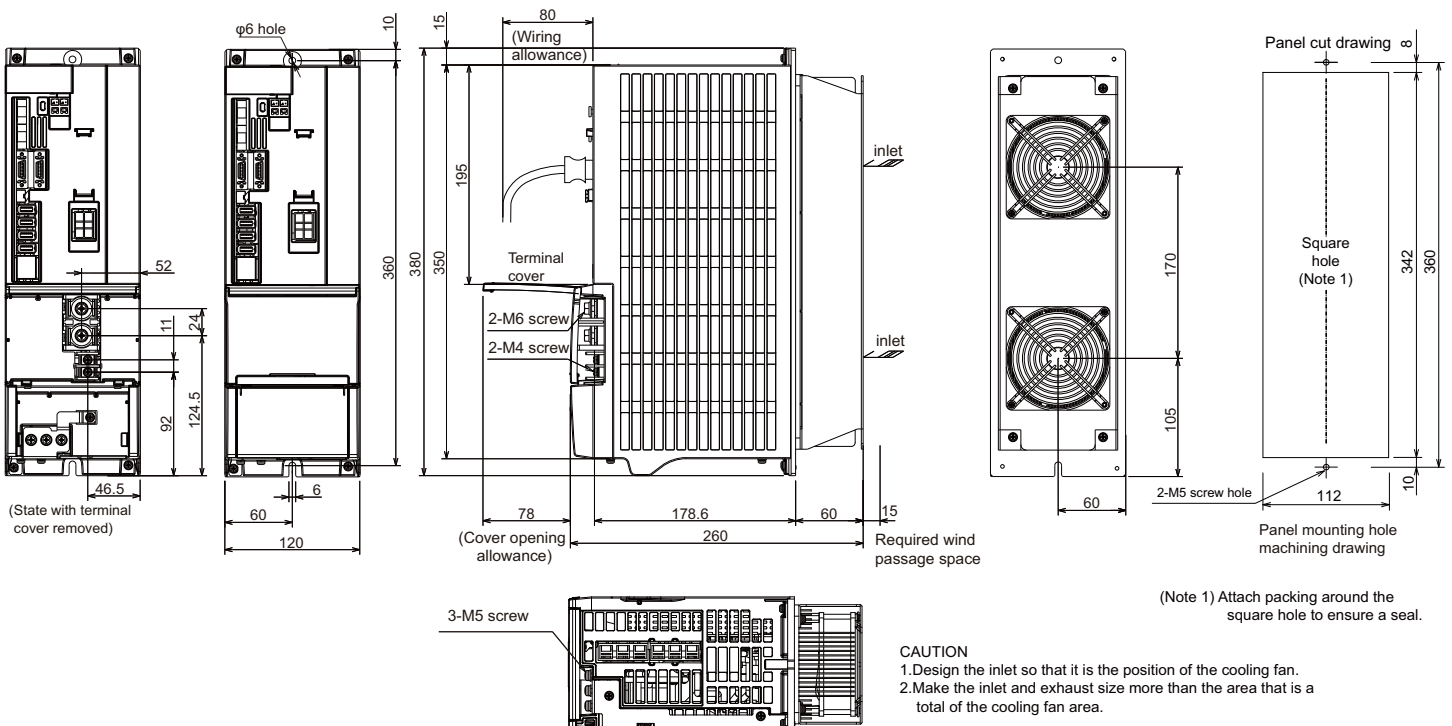
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

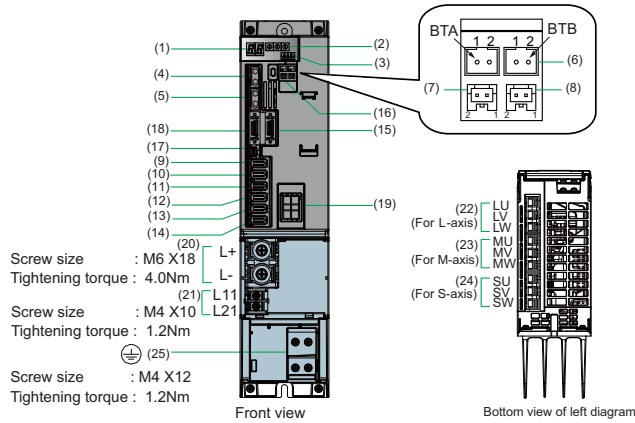
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	8	8	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Servo drive unit

# MDS-EH-V3-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL SWM SWS	Axis No. setting switch (L,M,S-axis)
(3)	SW1	Unused axis setting switch (L,M,S-axis)
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA BTB	(Unused)
(7)	BTI	Battery input side
(8)	BTO	Battery output side
(9)	CN2L	Motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(10)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(11)	CN2M	Motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(12)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(13)	CN2S	Motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN4	Power supply communication connector
(16)	CN5	USB maintenance connector (usually not used)
(17)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(18)	CN9	DIO/analog output connector
(19)	CN20	Motor brake control connector (Key way: X type)
(20)	TE2	Converter voltage input terminal (DC input)
(21)	TE3	Control power input terminal (single-phase AC input)
(22)	TE1	Motor power supply output connector (L-axis, 3-phase AC output)
(23)		Motor power supply output connector (M-axis, 3-phase AC output)
(24)		Motor power supply output connector (S-axis, 3-phase AC output)
(25)	PE	Grounding terminal, Motor grounding terminal

(Note) Select a machine side encoder so that the consumption current of the entire unit is 1.5A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	40/40/40	
Output	Rated voltage[V]	323AC
	Rated current[A]	7.7/7.7/7.7
Input	Rated voltage[V]	513 to 648DC
	Rated current[A]	8.7
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
	Max. rush conductivity time[ms]	12
	Max. earth leakage current[mA]	6
	Braking	Regenerative braking and dynamic brakes
Dynamic brakes		Built-in
Heating value	Inside panel[W]	125
	Outside panel[W]	83
Cooling method	Natural-cooling	
Mass[kg]	6.2	

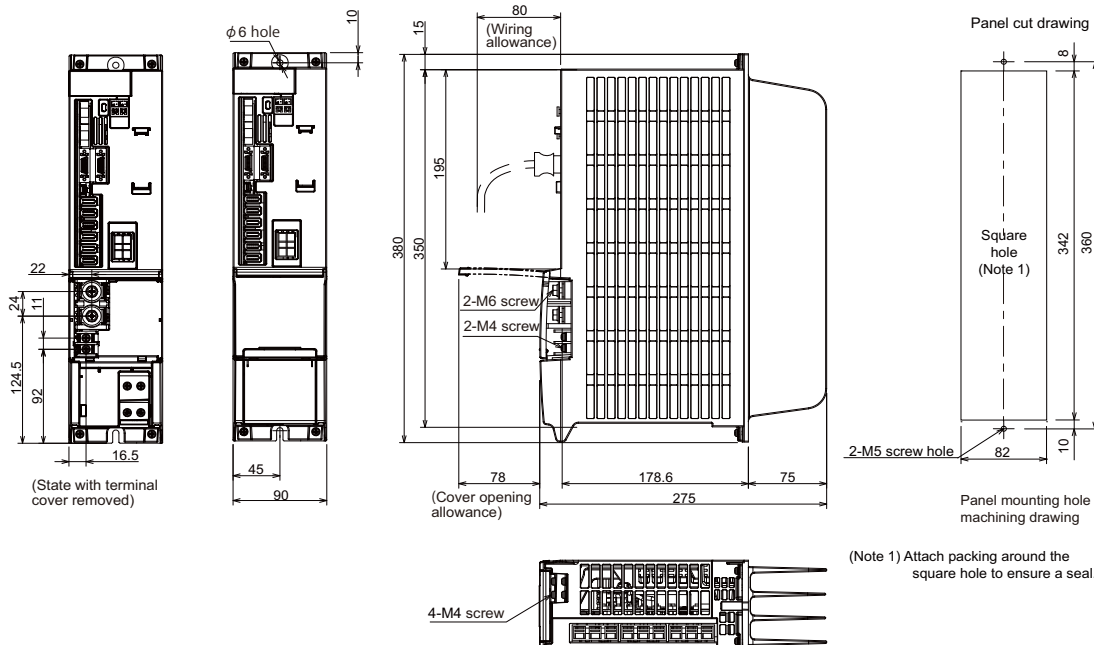
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21, L12, L22)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

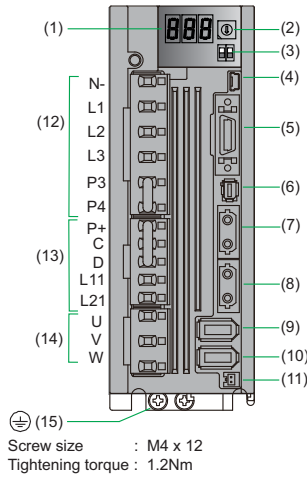
## Outline dimension drawings [Unit : mm]





Servo drive unit

# MDS-EJH-V1-10

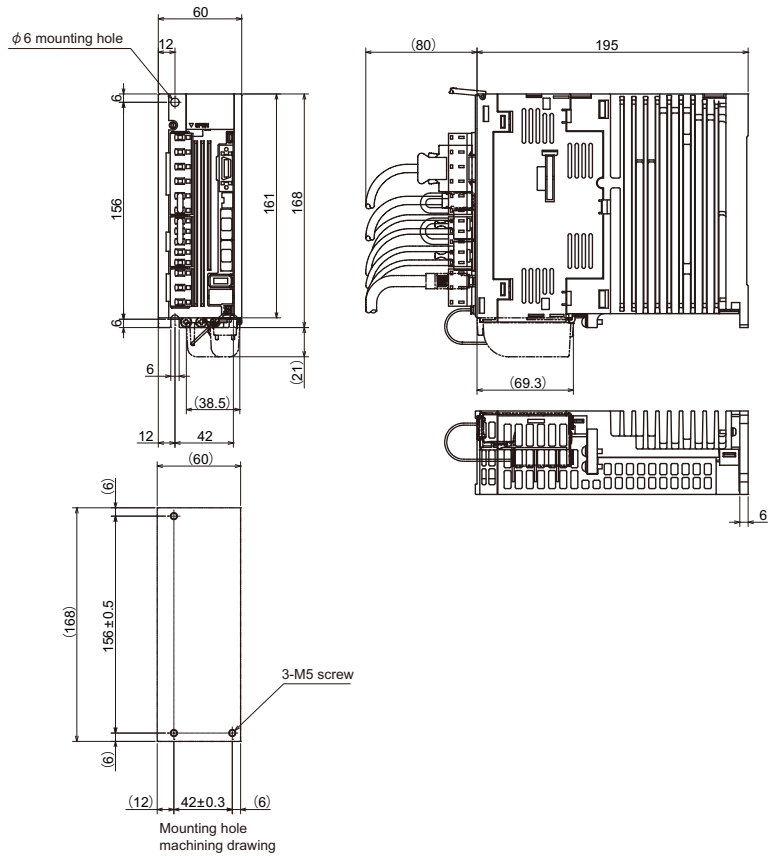


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	Regenerative resistor connection connector Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	10
Rated output[kW]	0.75
Power facility capacity[kVA]	1.0
Output	Rated voltage[V] 323AC Rated current[A] 1.5
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 380 to 480AC Rated voltage(60Hz) [V] 3-phase 380 to 480AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 1.4
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 380 to 480AC Voltage(60Hz) [V] Single-phase 380 to 480AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.1 Max. Rush current[A] 50 Max.Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes Dynamic brakes Built-in Main circuit method Converter with resistor regeneration circuit
Heating value	Inside panel[W] 40
Cooling method	Natural-cooling
Mass[kg]	1.7
Selection example of contactor (option part)	S-T12-AC400V
Free-air thermal current[A]	20
Selection current (for 380V input) [A]	1.5
Selection example of circuit protector (option part)	NF30-SW3P-3A
Rated current[A]	3
Selection current (for 380V input) [A]	1.5
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

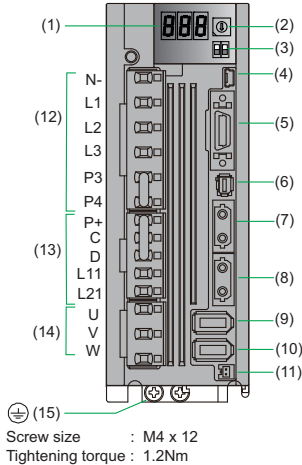
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16

Servo drive unit

# MDS-EJH-V1-15

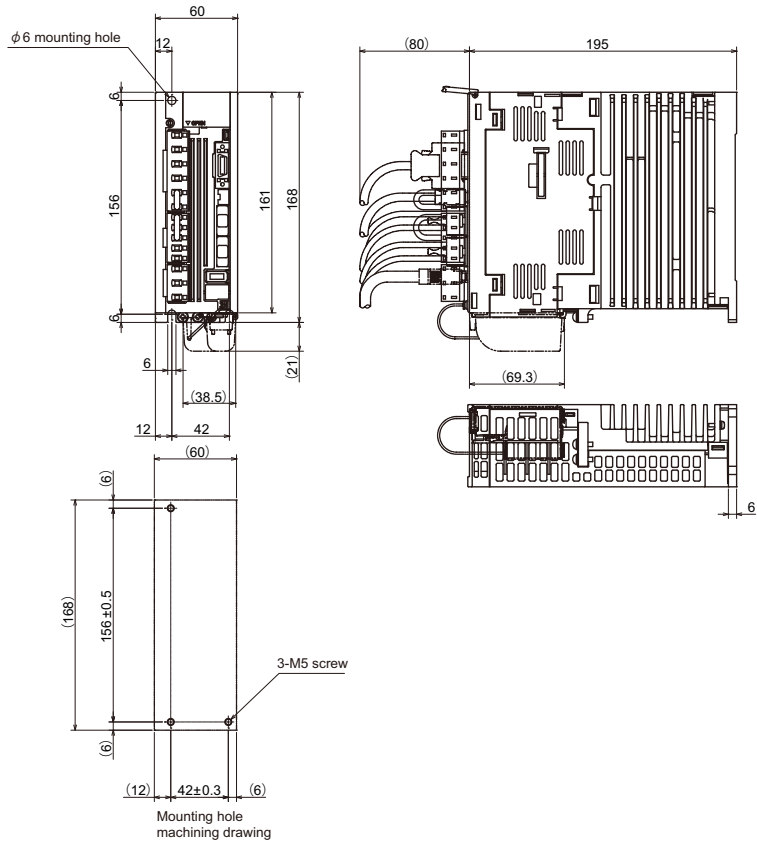


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	Regenerative resistor connection connector Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	15
Rated output[kW]	2.2
Power facility capacity[kVA]	1.7
Output	
Rated voltage[V]	323AC
Rated current[A]	2.8
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	3-phase 380 to 480AC
Rated voltage(60Hz) [V]	3-phase 380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	2.5
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	Single-phase 380 to 480AC
Voltage(60Hz) [V]	Single-phase 380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. Current[A]	0.1
Max. Rush current[A]	50
Max.Rush conductivity time[ms]	6
Maximum earth leakage current[mA]	2
Braking	
Dynamic brakes	Regenerative braking and dynamic brakes
Main circuit method	Built-in Converter with resistor regeneration circuit
Heating value	
Inside panel[W]	60
Cooling method	Natural-cooling
Mass[kg]	1.7
Selection example of contactor (option part)	S-T12-AC400V
Free-air thermal current[A]	20
Selection current (for 380V input) [A]	3.5
Selection example of circuit protector (option part)	NF30-SW3P-5A
Rated current[A]	5
Selection current (for 380V input) [A]	3.5
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

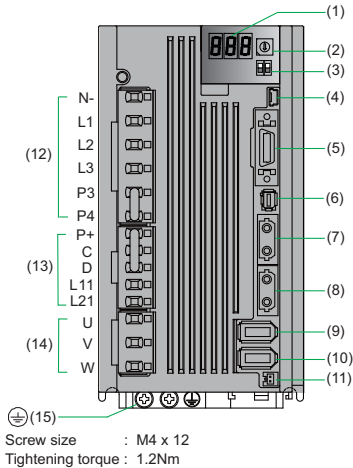
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16

Servo drive unit

# MDS-EJH-V1-20

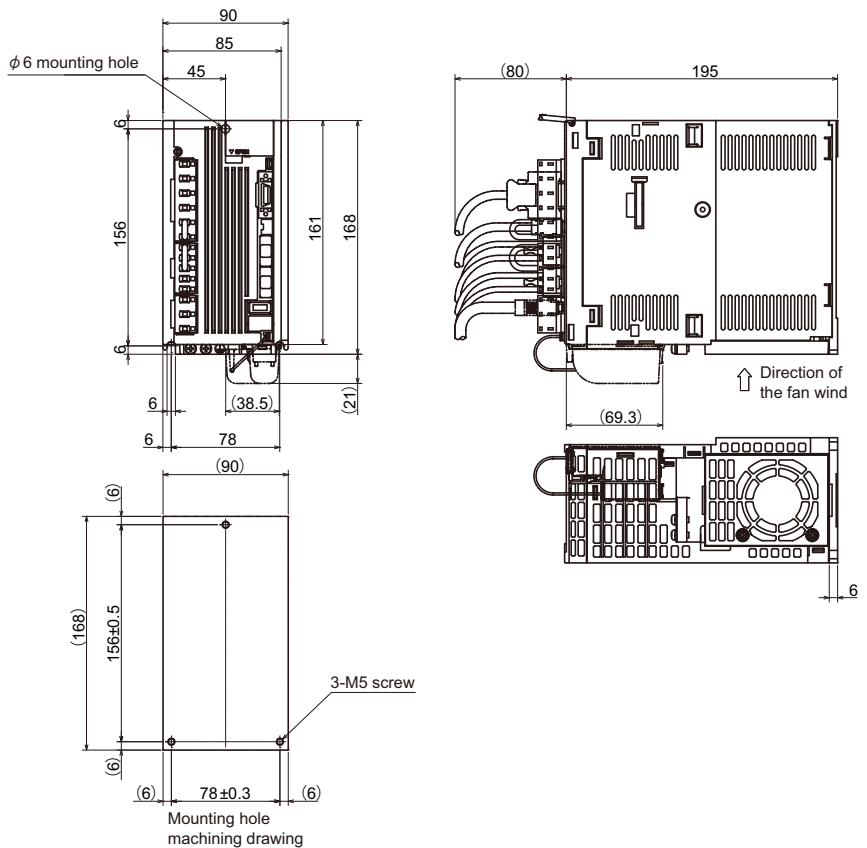


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	Regenerative resistor connection connector Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current (peak) [A]	20
Rated output[kW]	3.7
Power facility capacity[kVA]	3.5
Output	Rated voltage[V] 323AC
	Rated current[A] 5.4
Input	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Rated voltage(50Hz) [V] 3-phase 380 to 480AC
	Rated voltage(60Hz) [V] 3-phase 380 to 480AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Rated current[A] 5.1
Control power	Frequency[Hz] 50 / 60
	Tolerable frequency fluctuation[%] ±5% max
	Voltage(50Hz) [V] Single-phase 380 to 480AC
	Voltage(60Hz) [V] Single-phase 380 to 480AC
	Tolerable voltage fluctuation[%] +10%, -15%
	Max. Current[A] 0.1
	Max. Rush current[A] 50
	Max.Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes
	Dynamic brakes Built-in
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 90
Cooling method	Forced air cooling
Mass[kg]	2.1
Selection example of contactor (option part)	S-T12-AC400V
	Free-air thermal current[A] 20
	Selection current (for 380V input) [A] 6
Selection example of circuit protector (option part)	NF30-SW3P-10A
	Rated current[A] 10
	Selection current (for 380V input) [A] 6
Regenerative option	Refer to "Regenerative option".

## Outline dimension drawings [Unit : mm]



## Environmental conditions

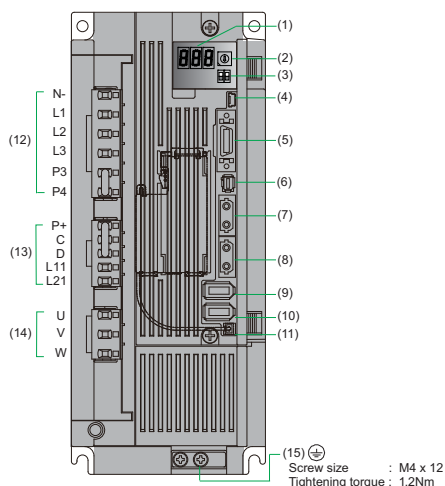
Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16



Servo drive unit  
**MDS-EJH-V1-40**

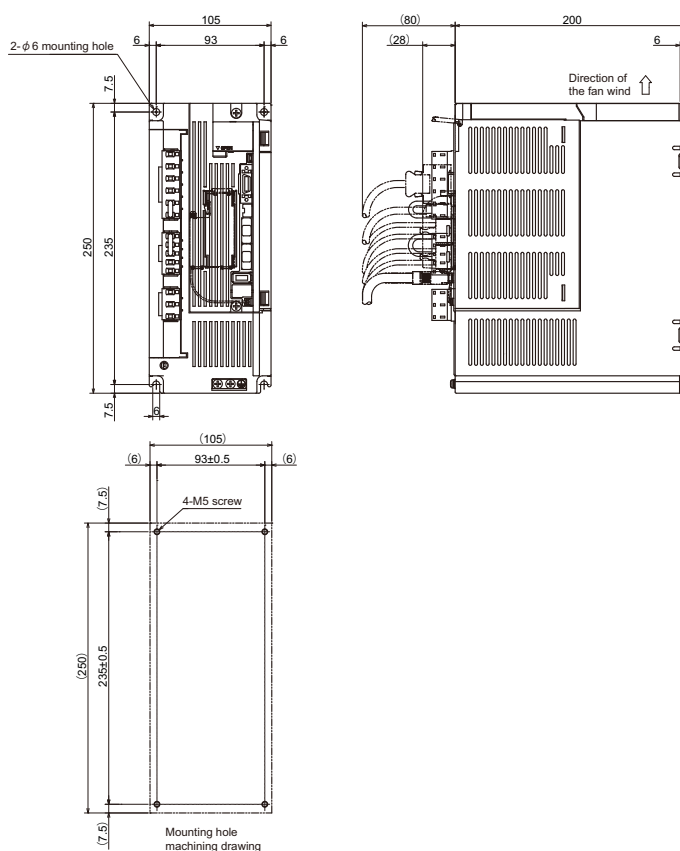


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Axis No. setting switch
(3)	SW2	For machine tool builder adjustment: Always OFF (facing bottom)
(4)	CN5	USB maintenance connector (usually not used)
(5)	CN9	DI/O or maintenance connector
(6)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(7)	CN1A	NC or master axis optical communication connector
(8)	CN1B	Slave axis optical communication connector
(9)	CN2	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3	Machine side encoder connection connector 5V power supply capacity: 0.35A
(11)	BAT	Battery connection connector
(12)	CNP1	L1,L2,L3: Power supply input connector(3-phase AC input) N-: Test terminal for the manufacturer (Do not connect.) P3,P4: not used (short-circuit between the P3 and P4.)
(13)	CNP2	Regenerative resistor connection connector Control power input connector (single-phase AC input)
(14)	CNP3	Motor power output connector (3-phase AC output)
(15)	PE	Grounding terminal, Motor grounding terminal

Specifications

Item	Specifications
Nominal maximum current (peak) [A]	40
Rated output[kW]	5.5
Power facility capacity[kVA]	5.5
Output	Rated voltage[V] 323AC Rated current[A] 8.6
Input	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Rated voltage(50Hz) [V] 3-phase 380 to 480AC Rated voltage(60Hz) [V] 3-phase 380 to 480AC Tolerable voltage fluctuation[%] +10%, -15% Rated current[A] 7.9
Control power	Frequency[Hz] 50 / 60 Tolerable frequency fluctuation[%] ±5% max Voltage(50Hz) [V] Single-phase 380 to 480AC Voltage(60Hz) [V] Single-phase 380 to 480AC Tolerable voltage fluctuation[%] +10%, -15% Max. Current[A] 0.2 Max. Rush current[A] 50 Max.Rush conductivity time[ms] 6
Maximum earth leakage current[mA]	2
Braking	Regenerative braking and dynamic brakes Dynamic brakes Built-in
Main circuit method	Converter with resistor regeneration circuit
Heating value	Inside panel[W] 160
Cooling method	Forced air cooling
Mass[kg]	3.6
Selection example of contactor (option part)	S-T12-AC400V
Free-air thermal current[A]	20
Selection current (for 380V input) [A]	11
Selection example of circuit protector (option part)	NF30-SW3P-15A
Rated current[A]	15
Selection current (for 380V input) [A]	11
Regenerative option	Refer to "Regenerative option".

Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight);no corrosive gas, inflammable gas, oil mist, or dust
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

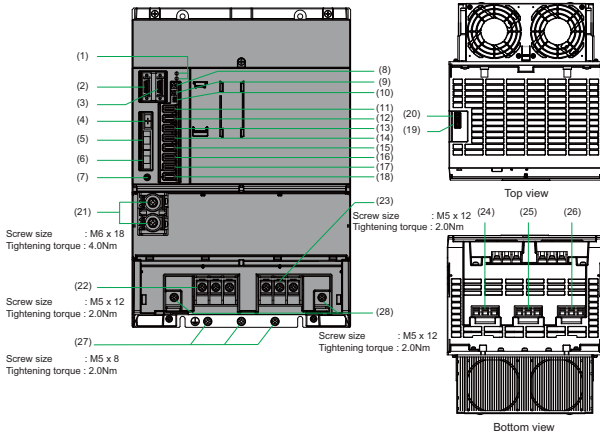
Recommended wire

Types	Terminal name									
	CNP1 (L1, L2, L3, earth)		CNP2 (L11, L21)		CNP3 (U, V, W, earth)		CNP2 (P,C)		Magnetic brake	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	1.25	16	2	14	2	14	1.25	16

# Multi Axis Unit

Multi axis unit

# MDS-EMH-SPV3-8040



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		
(28)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	80
Nominal maximum current (at peak of servo) [A]	40x3
Output	
Rated voltage[V]	323AC
Rated current [servo][A]	10.9x3
Rated current [spindle][A]	27
Input	
Rated voltage (50Hz) [V]	380 to 480AC
Rated voltage (60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	27
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	150
Outside panel[W]	650
Cooling method	Forced air cooling
Mass[kg]	15

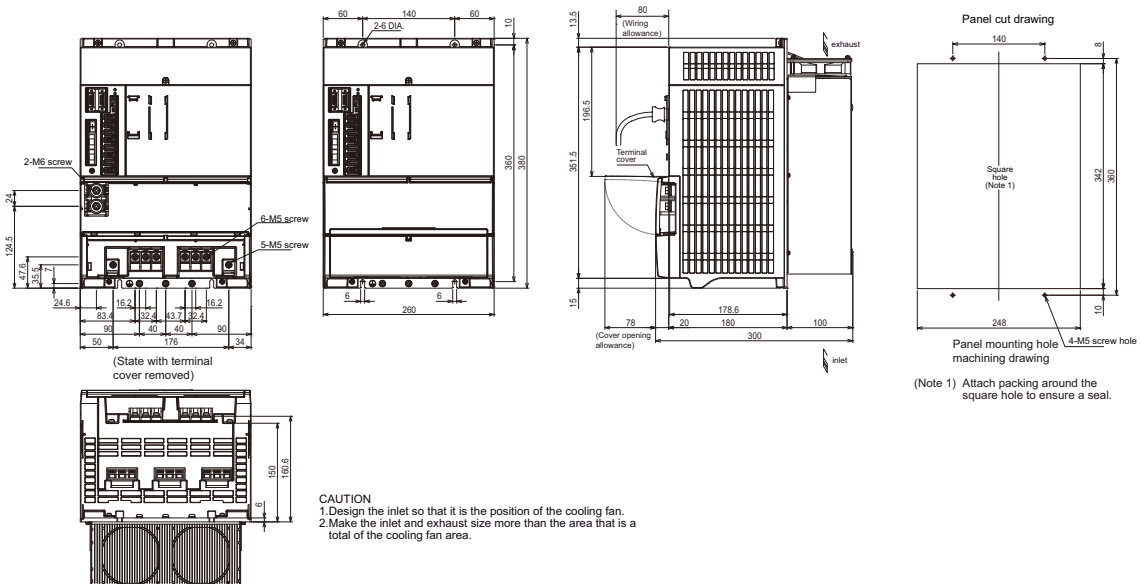
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

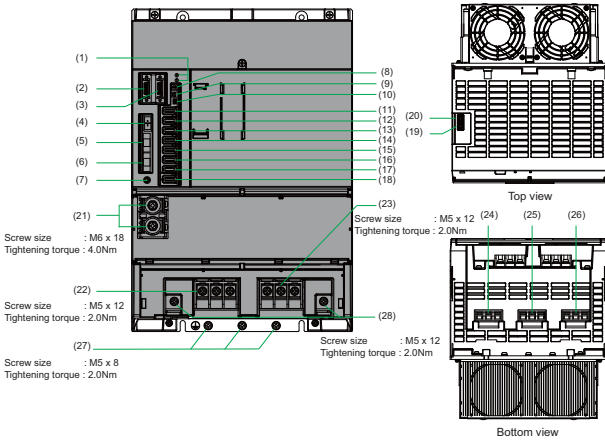
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	5.5	10	5.5	10	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	5.5	10	5.5	10	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12	3.5	12	5.5	10	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EMH-SPV3-10040



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		
(28)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	100
Nominal maximum current (at peak of servo) [A]	40x3
Output	
Rated voltage[V]	323AC
Rated current [servo][A]	10.9x3
Rated current [spindle][A]	43
Input	
Rated voltage (50Hz) [V]	380 to 480AC
Rated voltage (60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	34
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	175
Outside panel[W]	815
Cooling method	Forced air cooling
Mass[kg]	15

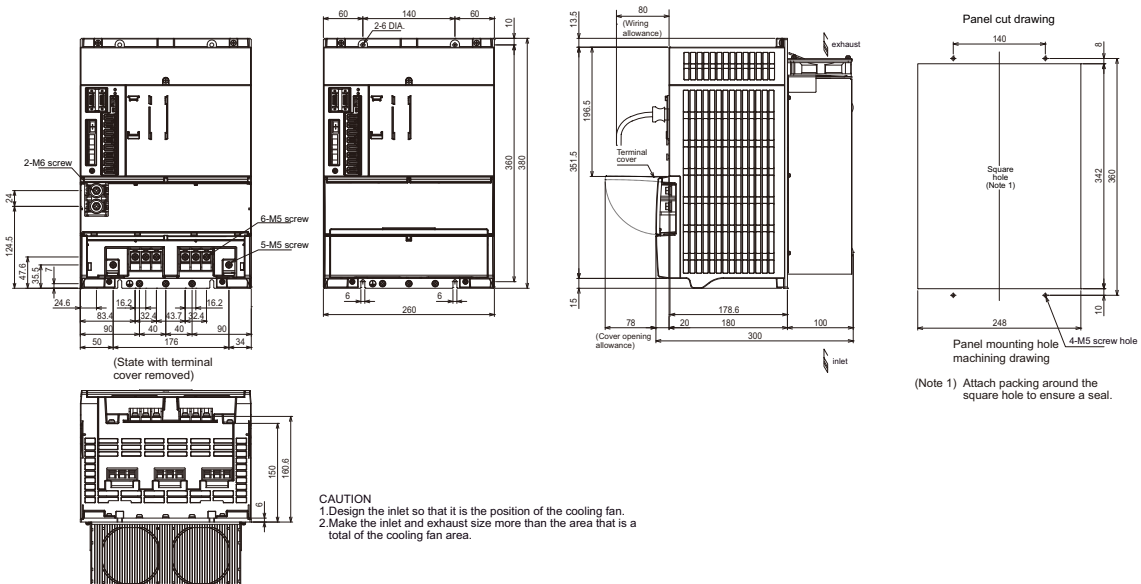
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

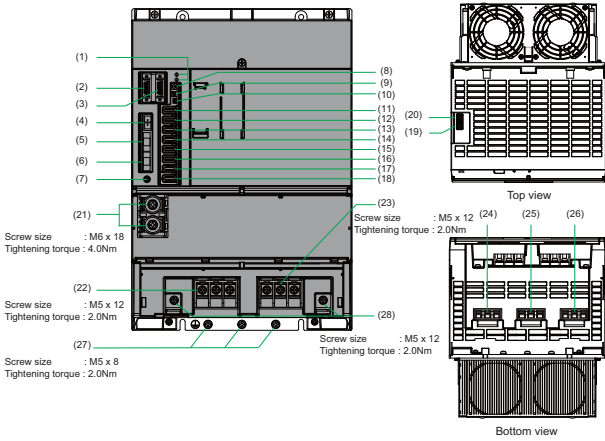
Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	8	8	14	6	5.5	10	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	8	8	5.5	10	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12	5.5	10	5.5	10	1.25	16	1.25	16

## Outline dimension drawings [Unit : mm]



Multi axis unit

# MDS-EMH-SPV3-10060



No.	Name	Description
(1)	SP1,SV1	Unit status indication LED
(2)	CN9A	DIO/analog output connector (spindle)
(3)	CN9B	DIO/analog output connector (servo)
(4)	CN22	Control power input connector (24VDC input)
(5)	CN1A	NC optical communication connector
(6)	CN1B	Slave axis optical communication connector
(7)	CHARGE LAMP	Converter voltage output charge-discharge status indication LED
(8)	SW	Axis No. setting switch
(9)	BTI	Battery input side
(10)	BTO	Battery output side
(11)	CN2SP	Spindle motor side encoder connection connector 5V power supply capacity: 0.35A (Note)
(12)	CN3SP	Spindle side encoder connection connector 5V power supply capacity: 0.35A (Note)
(13)	CN2L	Servo motor side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(14)	CN2M	Servo motor side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(15)	CN2S	Servo motor side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(16)	CN3L	Machine side encoder connection connector (L-axis) 5V power supply capacity: 0.35A (Note)
(17)	CN3M	Machine side encoder connection connector (M-axis) 5V power supply capacity: 0.35A (Note)
(18)	CN3S	Machine side encoder connection connector (S-axis) 5V power supply capacity: 0.35A (Note)
(19)	CN5A	USB maintenance connector (spindle) usually not used
(20)	CN5B	USB maintenance connector (servo) usually not used
(21)	TE2	Converter voltage input terminal (DC input)
(22)	TE1	Power supply input terminal (3-phase AC input)
(23)	TE3	Motor power supply output terminal (Spindle, 3-phase AC output)
(24)	CN31L	Motor power supply output connector (L-axis, 3-phase AC output)
(25)	CN31M	Motor power supply output connector (M-axis, 3-phase AC output)
(26)	CN31S	Motor power supply output connector (S-axis, 3-phase AC output)
(27)		
(28)	PE	Grounding terminal (also including grounding of the spindle motor)

(Note) Select a machine side encoder so that the consumption current of the entire unit is 2.0A or less with a motor side encoder set to 0.25A.

## Specifications

Item	Specifications
Nominal maximum current (at peak of spindle) [A]	100
Nominal maximum current (at peak of servo) [A]	60x3
Output	
Rated voltage[V]	323AC
Rated current [servo][A]	17x3
Rated current [spindle][A]	43
Input	
Rated voltage (50Hz) [V]	380 to 480AC
Rated voltage (60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Tolerable frequency fluctuation[%]	±5% max
Rated current[A]	37
Control power	
Voltage[V]	24DC
Tolerable voltage fluctuation[%]	+10%, -10%
Max. current[A]	4
Max. rush current[A]	10
Max. rush conductivity time[ms]	100
Max. earth leakage current[mA]	21
Braking [servo]	Regenerative braking and dynamic brakes
Dynamic brakes	Built-in
Braking [spindle]	Regenerative braking
Heating value	
Inside panel[W]	235
Outside panel[W]	1025
Cooling method	Forced air cooling
Mass[kg]	15

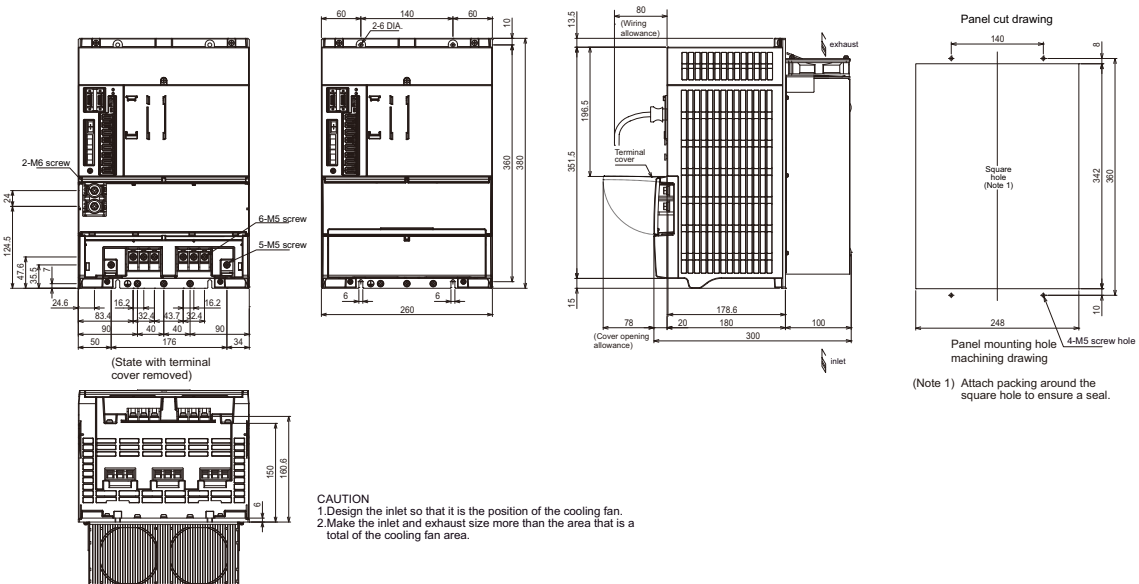
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name									
	TE1 (L1, L2, L3)		TE3 (U, V, W)		TE2 (L+, L-)		CN31 L/M/S (U, V, W, PE)		CN22 (VDD, SG)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	14	6	5.5	10	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	8	8	5.5	10	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	5.5	10	5.5	10	2	14	1.25	16

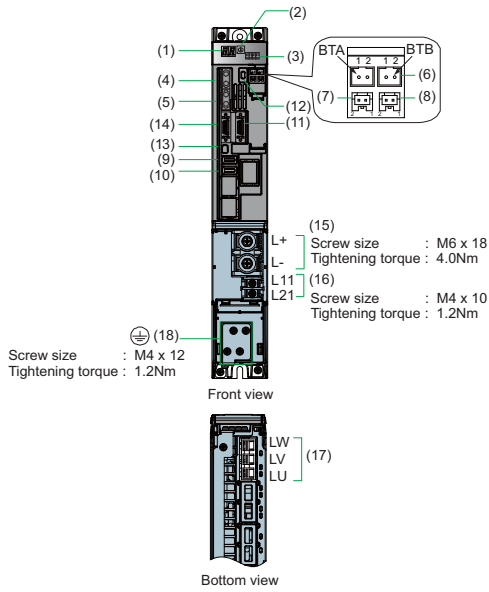
## Outline dimension drawings [Unit : mm]



# Spindle Drive Unit

Spindle drive unit

# MDS-EH-SP-20



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	20
Output	
Rated voltage[V]	323AC
Rated current[A]	11
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	10
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	32
Outside panel[W]	88
Cooling method	Forced air cooling
Mass[kg]	3.8

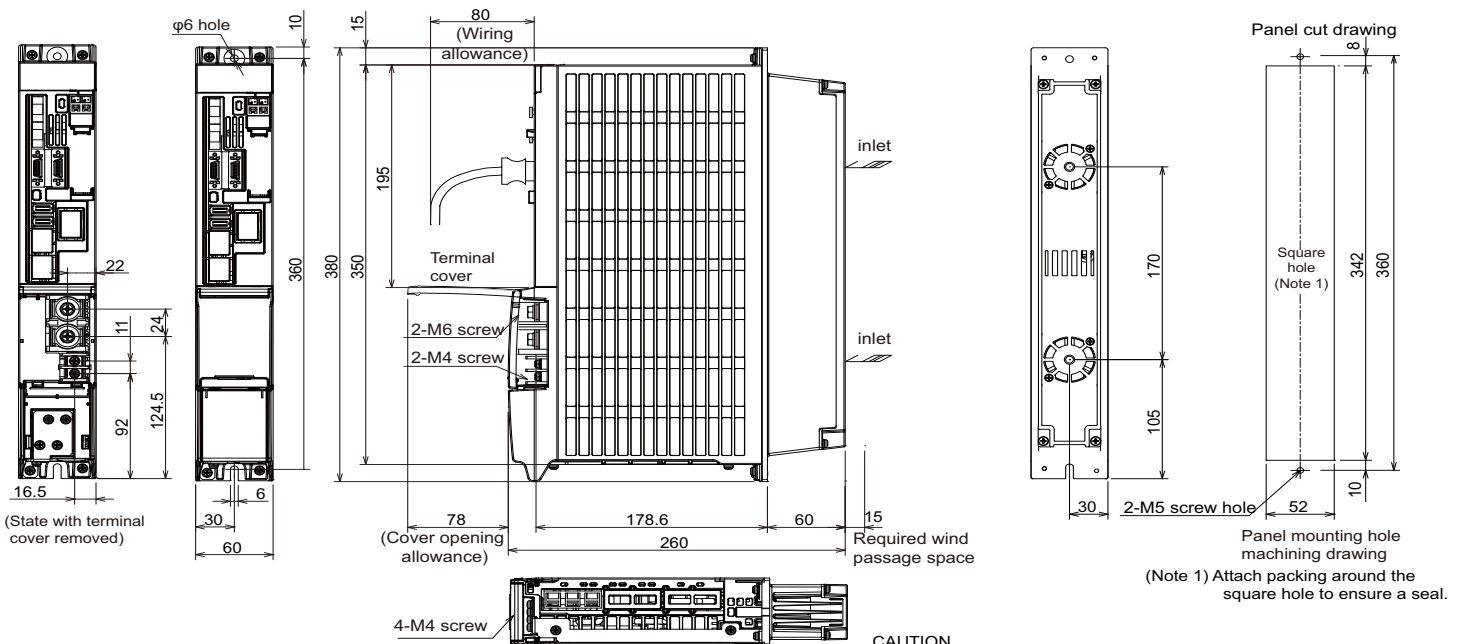
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

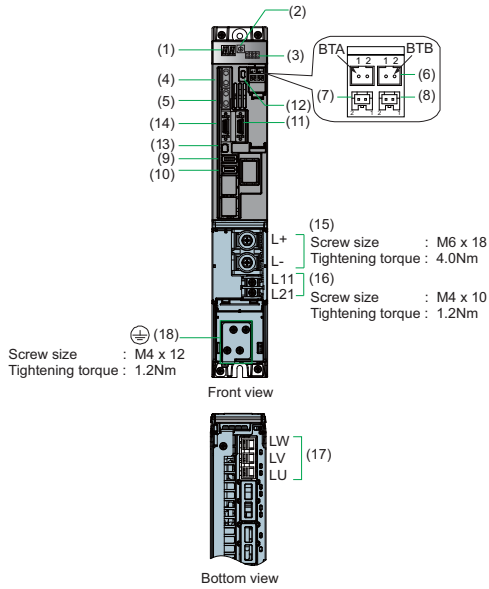
## Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-EH-SP-40



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	40
Output	
Rated voltage[V]	323AC
Rated current[A]	18
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	15
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	42
Outside panel[W]	158
Cooling method	Forced air cooling
Mass[kg]	3.8

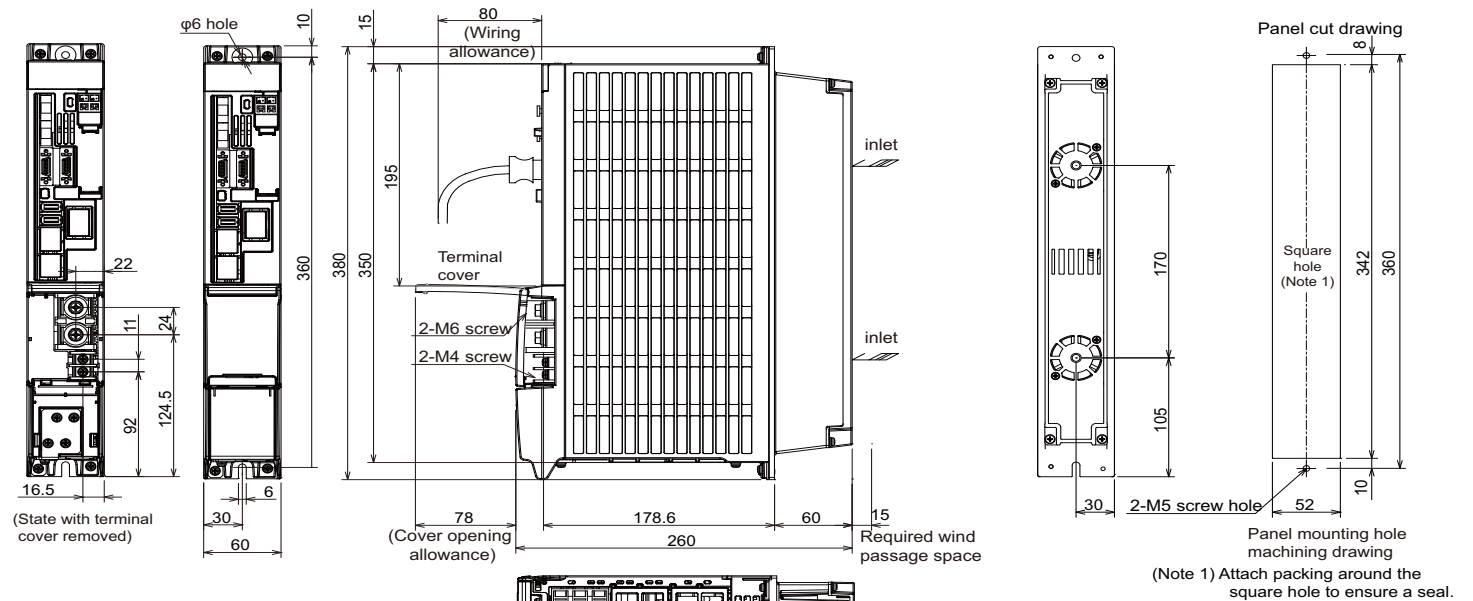
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



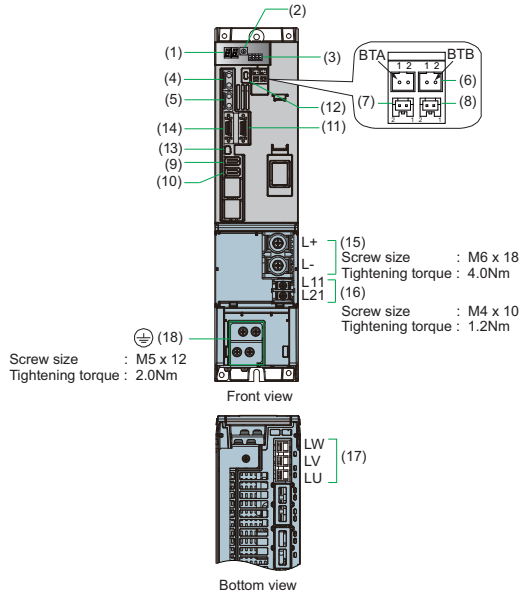
### CAUTION

- 1.Design the inlet so that it is the position of the cooling fan.
- 2.Make the inlet and exhaust size more than the area that is a total of the cooling fan area



Spindle drive unit

# MDS-EH-SP-80



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output connector (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	80
Output	
Rated voltage[V]	323AC
Rated current[A]	27
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	21
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	54
Outside panel[W]	237
Cooling method	Forced air cooling
Mass[kg]	4.5

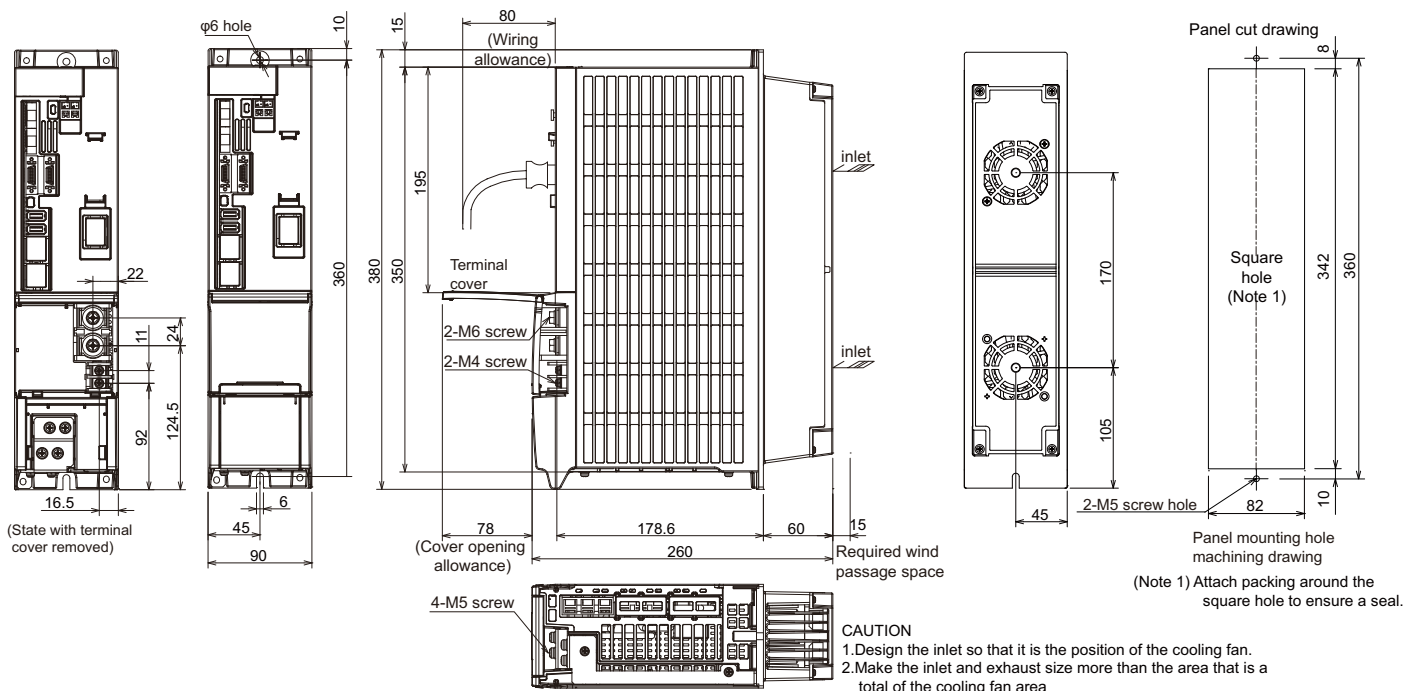
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

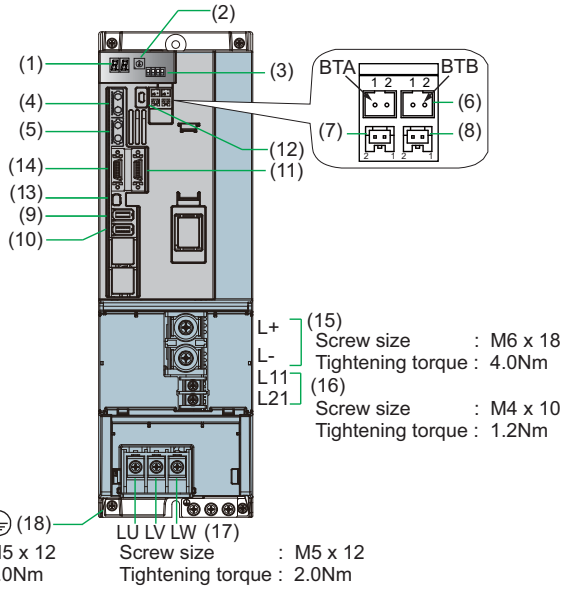
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	5.5	10			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	3.5	12			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-EH-SP-100



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications
Nominal maximum current(peak) [A]	100
Output	
Rated voltage[V]	323AC
Rated current[A]	43
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	38
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	73
Outside panel[W]	369
Cooling method	Forced air cooling
Mass[kg]	5.8

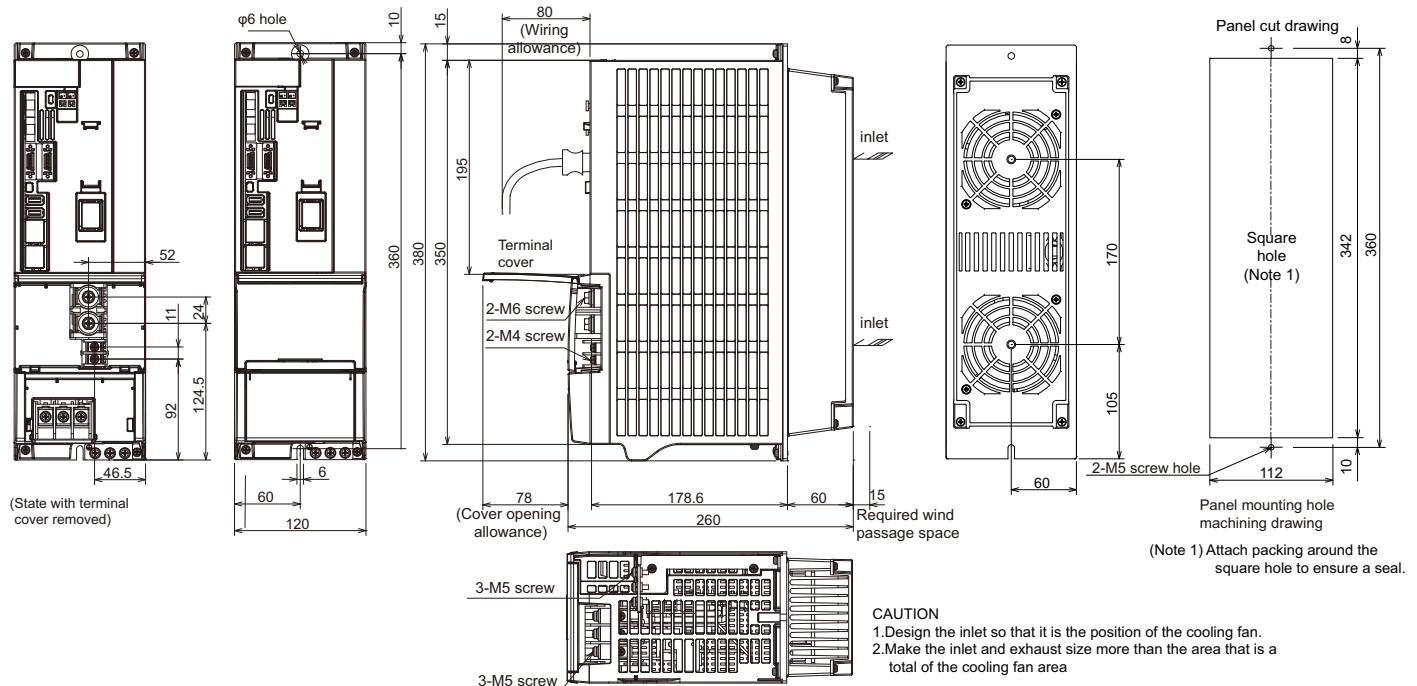
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

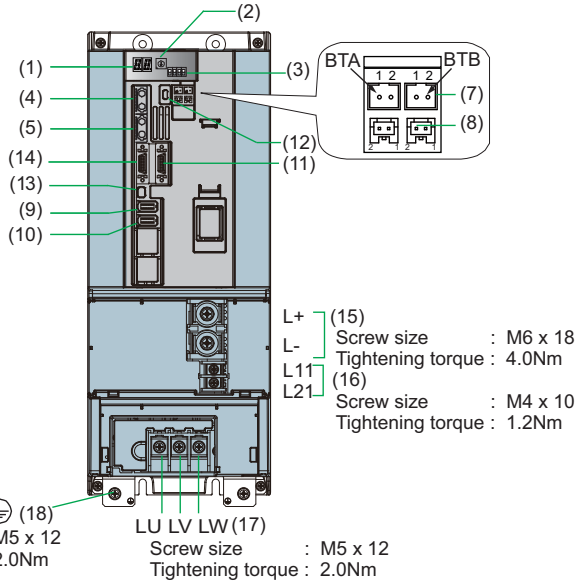
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10			1.25 to 2	16 to 14

### Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-EH-SP-160



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

### Specifications

Item	Specifications
Nominal maximum current(peak) [A]	160
Output	
Rated voltage[V]	323AC
Rated current[A]	75
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	72
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	110
Outside panel[W]	639
Cooling method	Forced air cooling
Mass[kg]	7.5

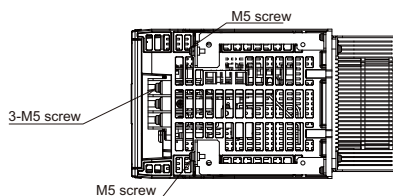
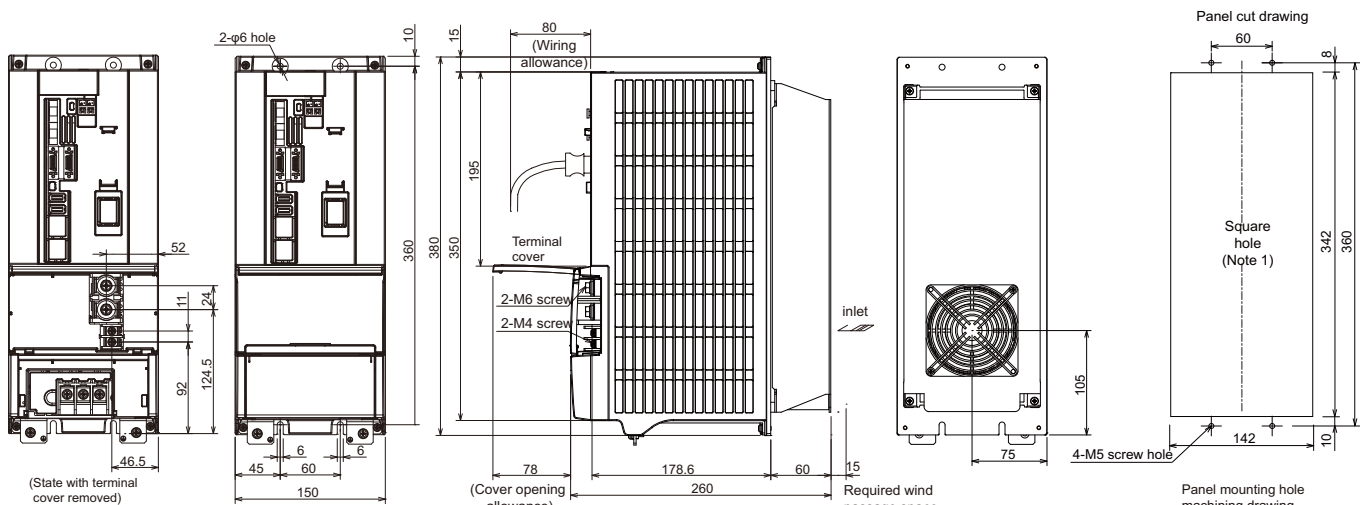
### Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

### Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Match with TE2 of selected power supply unit		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6			1.25 to 2	16 to 14

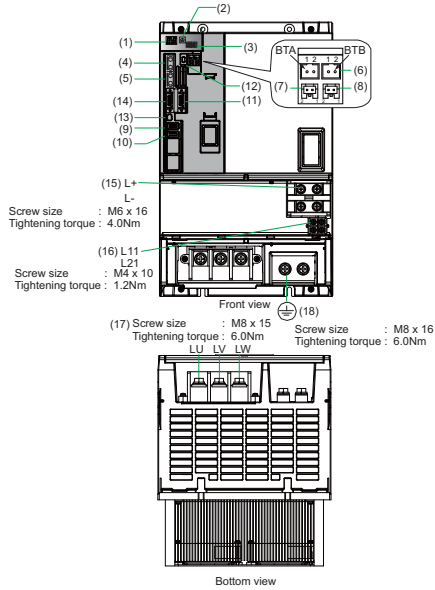
### Outline dimension drawings [Unit : mm]



**CAUTION**  
 1. Design the inlet so that it is the position of the cooling fan.  
 2. Make the inlet and exhaust size more than the area that is a total of the cooling fan area

Spindle drive unit

# MDS-EH-SP-200



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	200
Output	
Rated voltage[V]	323AC
Rated current[A]	90
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	82
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	18
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	126
Outside panel[W]	746
Cooling method	Forced air cooling
Mass[kg]	15.4

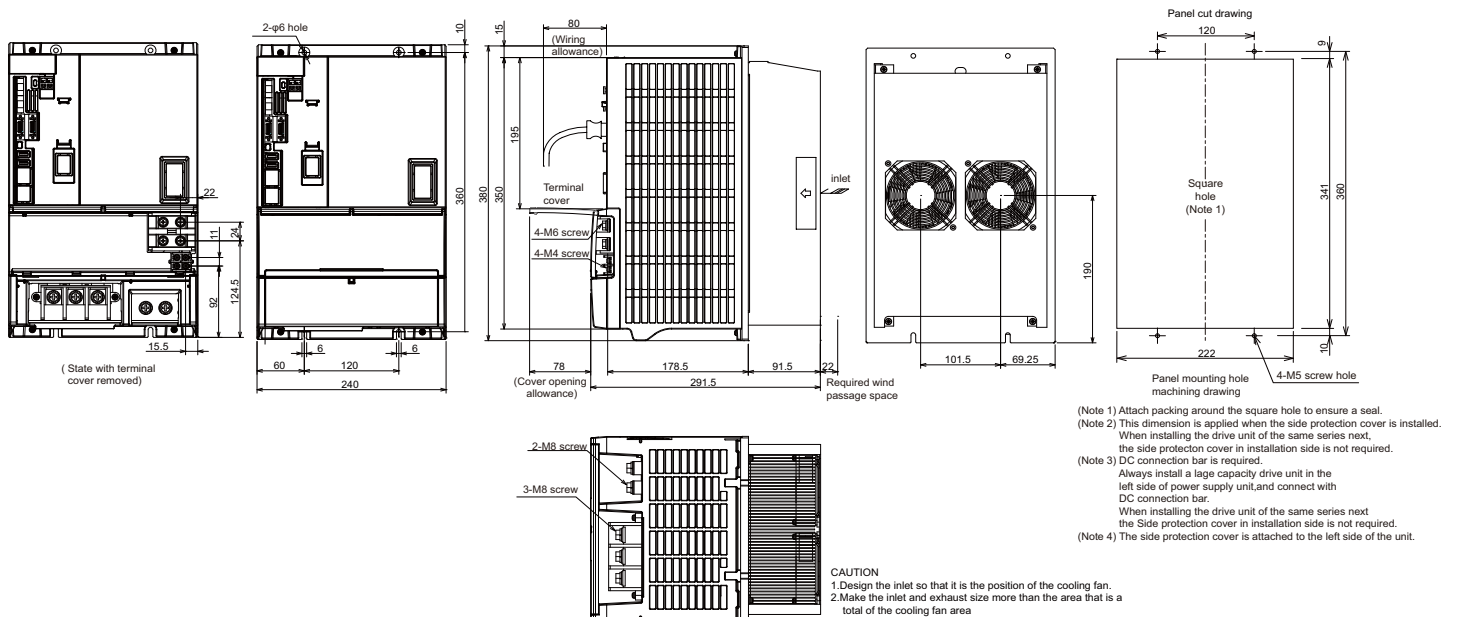
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

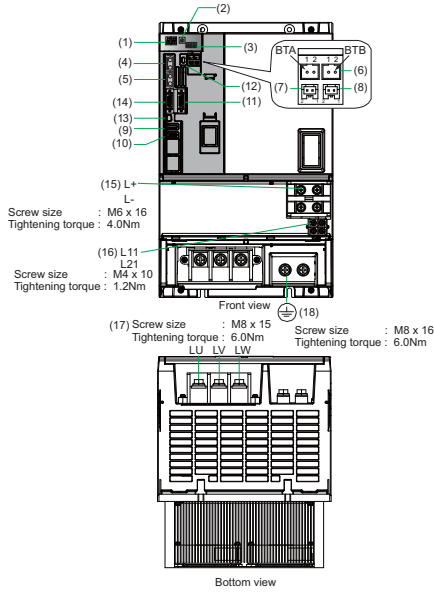
## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-			2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	38	2	Match with TE2 of selected power supply unit		2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	22	4			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit  
**MDS-EH-SP-320**



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

Specifications

Item	Specifications
Nominal maximum current(peak) [A]	320
Output	
Rated voltage[V]	323AC
Rated current[A]	125
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	119
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	18
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	168
Outside panel[W]	1034
Cooling method	Forced air cooling
Mass[kg]	15.4

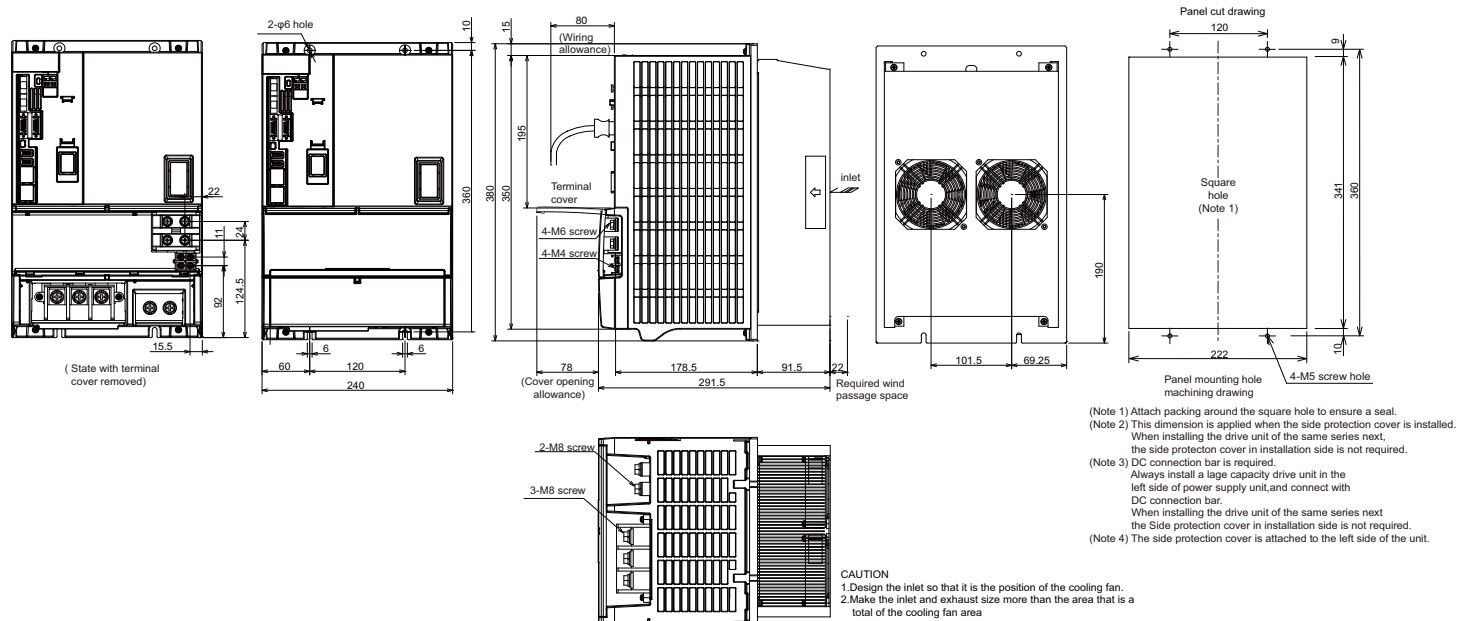
Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2			1.25 to 2	16 to 14

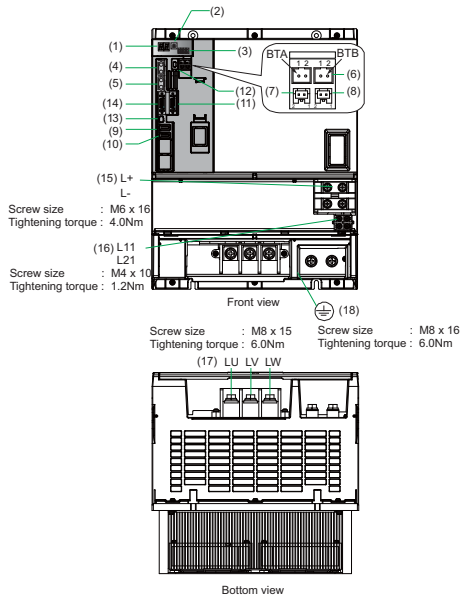
Outline dimension drawings [Unit : mm]





Spindle drive unit

# MDS-EH-SP-480



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications
Nominal maximum current(peak) [A]	480
Output	
Rated voltage[V]	323AC
Rated current[A]	180
Input	
Rated voltage[V]	513 to 648DC
Rated current[A]	150
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.3
Max. rush current[A]	18
Max. rush conductivity time[ms]	18
Max. earth leakage current[mA]	15
Braking	Regenerative braking and dynamic brakes
Heating value	
Inside panel[W]	232
Outside panel[W]	1488
Cooling method	Forced air cooling
Mass[kg]	18.3

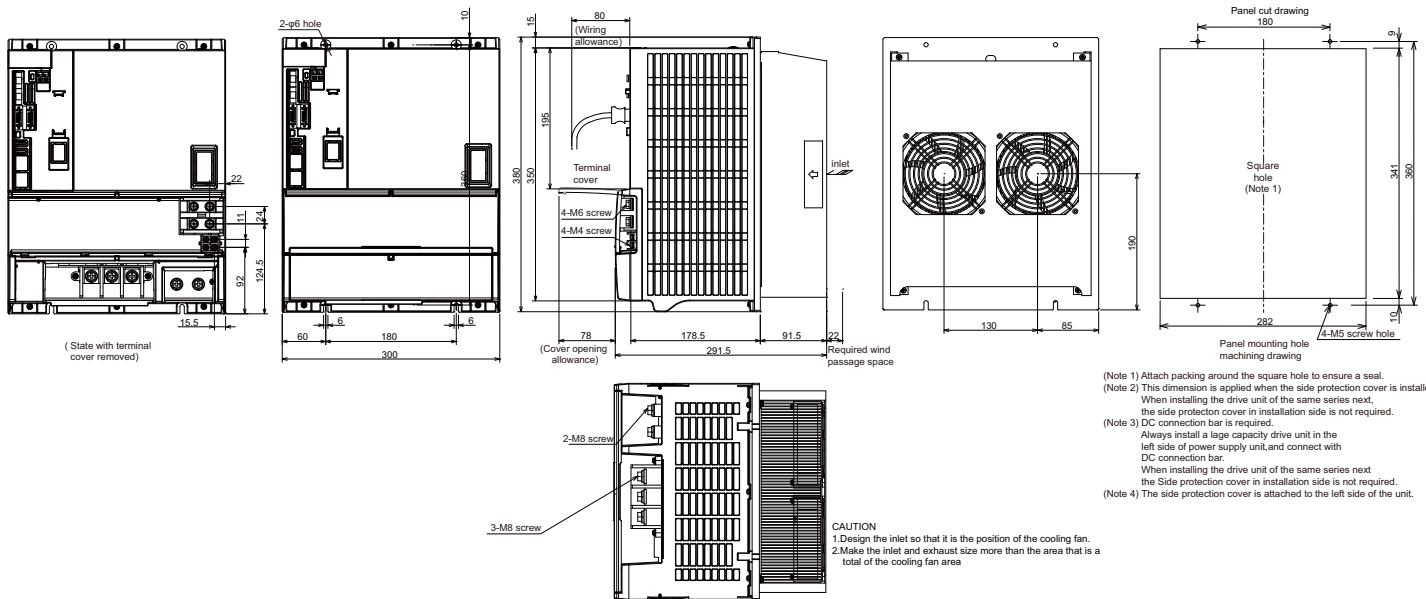
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

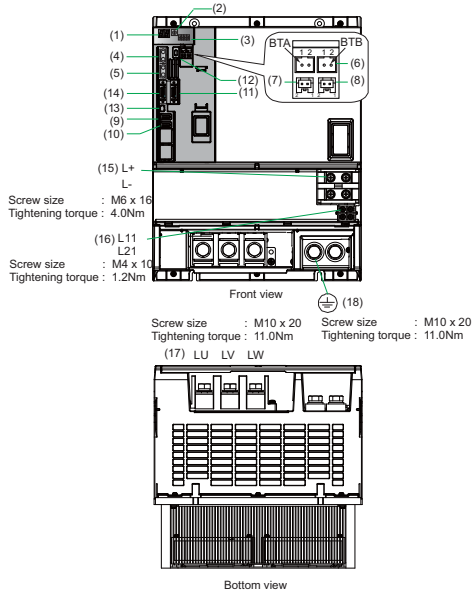
Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	80 or 38 (two wires)	3/0 or 2 (two wires)			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	60	1/0			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



Spindle drive unit

# MDS-EH-SP-600



No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SWL	Axis No. setting switch
(3)	SW1	Unused axis setting switch
(4)	CN1A	NC or master axis optical communication connector
(5)	CN1B	Slave axis optical communication connector
(6)	BTA, BTB	(Unused)
(7)	BTI	(Unused)
(8)	BTO	(Unused)
(9)	CN2L	Motor side encoder connection connector 5V power supply capacity: 0.35A
(10)	CN3L	Spindle side encoder connection connector 5V power supply capacity: 0.35A
(11)	CN4	Power supply communication connector
(12)	CN5	USB maintenance connector (usually not used)
(13)	CN8	External STO input connector (Insert the provided STO short-circuit connector when not using external STO input.)
(14)	CN9	DIO/analog output connector
(15)	TE2	Converter voltage input terminal (DC input)
(16)	TE3	Control power input terminal (single-phase AC input)
(17)	TE1	Motor power supply output terminal (3-phase AC output)
(18)	PE	Grounding terminal, Motor grounding terminal

## Specifications

Item	Specifications	
Nominal maximum current(peak) [A]	600	
Output	Rated voltage[V]	323AC
	Rated current[A]	200
Input	Rated voltage[V]	513 to 700DC
	Rated current[A]	200
Control power	Frequency[Hz]	50 / 60
	Tolerable frequency fluctuation[%]	±5% max
	Voltage(50Hz) [V]	380 to 480AC
	Voltage(60Hz) [V]	380 to 480AC
	Tolerable voltage fluctuation[%]	+10%, -15%
	Max. current[A]	0.3
	Max. rush current[A]	18
Max. rush conductivity time[ms]	18	
Max. earth leakage current[mA]	15	
Braking	Regenerative braking and dynamic brakes	
Heating value	Inside panel[W]	310
	Outside panel[W]	2039
Cooling method	Forced air cooling	
Mass[kg]	20.1	

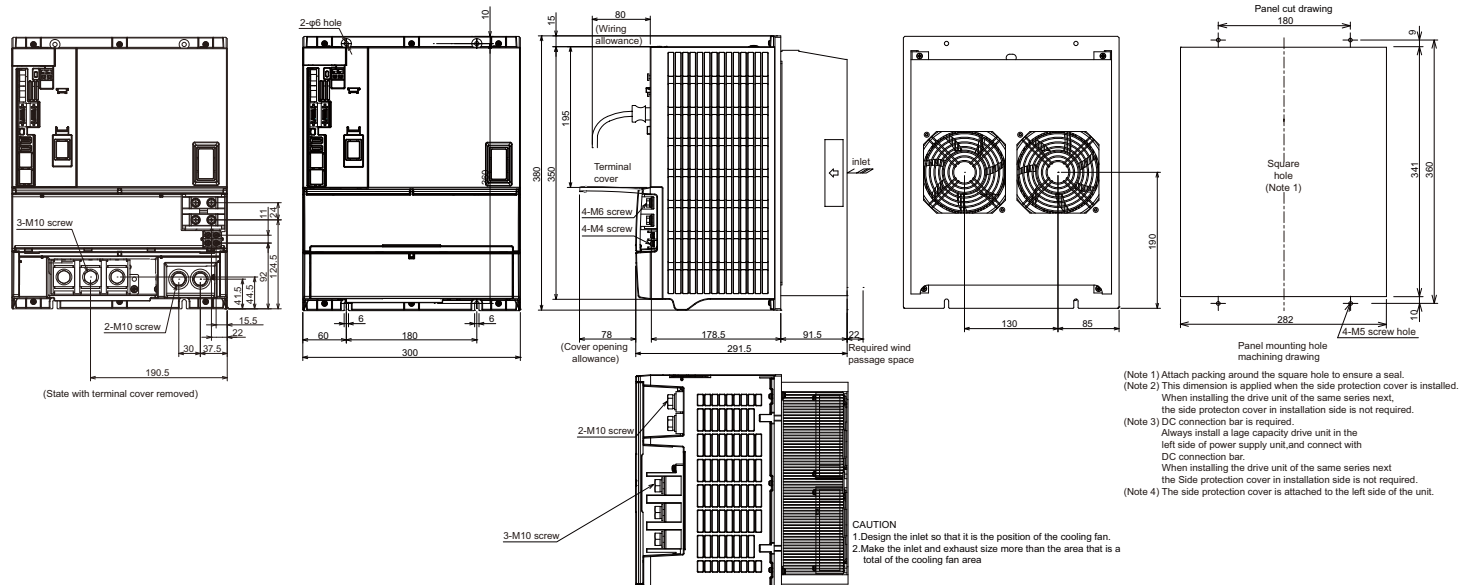
## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C(with no freezing) Storage/transportation: -15°C to +70°C(with no freezing)
Ambient humidity	Operation: 90% RH or less(with no dew condensation) Storage/transportation: 90% RH or less(with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

## Recommended wire

Types	Terminal name					
	TE1 (U, V, W, earth)		TE2 (L+, L-)		TE3 (L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed		2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60 (two wires)	1/0 (two wires)			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	60	1/0			1.25 to 2	16 to 14

## Outline dimension drawings [Unit : mm]



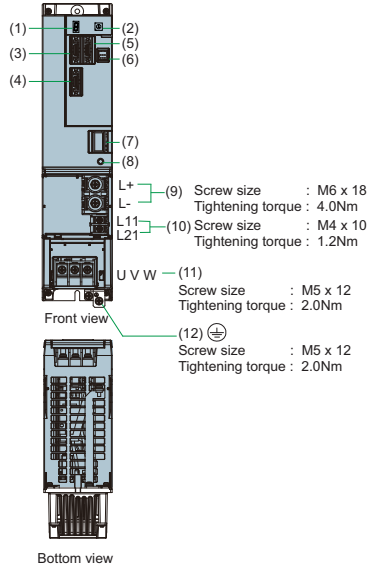
# Power Supply Unit



# Power supply unit MDS-EH-CV-37

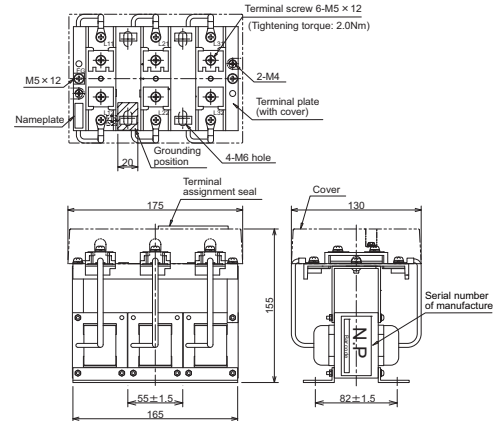
## Specifications

Item	Specifications
30-minute rated output[kW]	3.7
Continuous rated output[kW]	2.2
Power facility capacity[kVA]	5.3
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	7.1
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	5.2
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	20
Outside panel[W]	34
Cooling method	Forced air cooling
Mass[kg]	5.7
AC reactor	DH-AL-7.5K
Selection example of contactor (option part)	S-T12-AC400V
Free-air thermal current[A]	20
Selection current (for 380V input) [A]	8
Selection example of circuit protector (option part)	NF63-CW3P-10A
Rated current[A]	10
Selection current (for 380V input) [A]	8

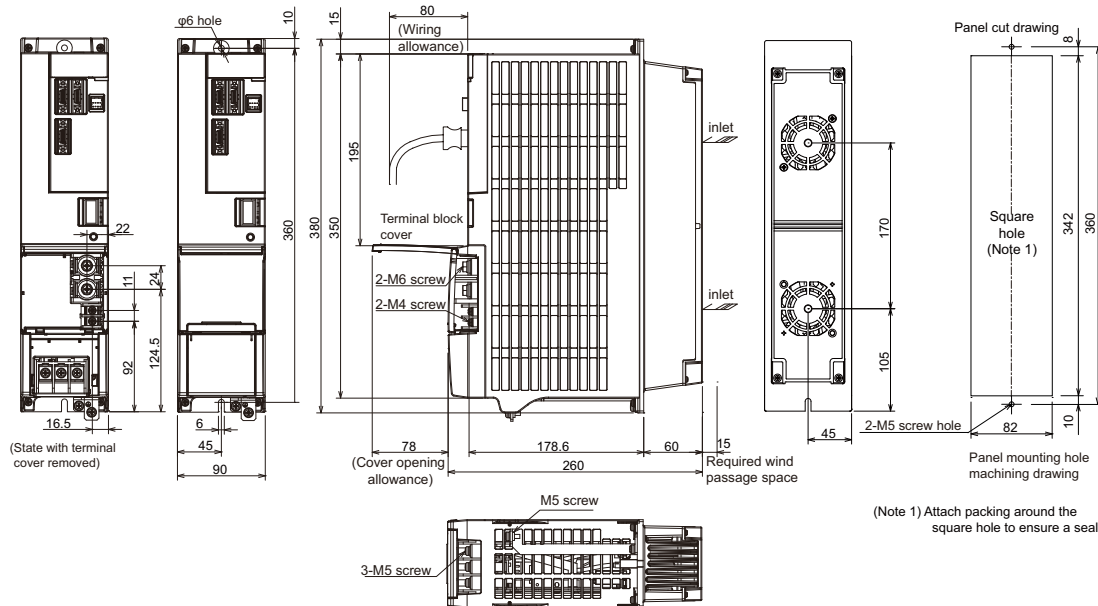


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

## AC reactor



## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

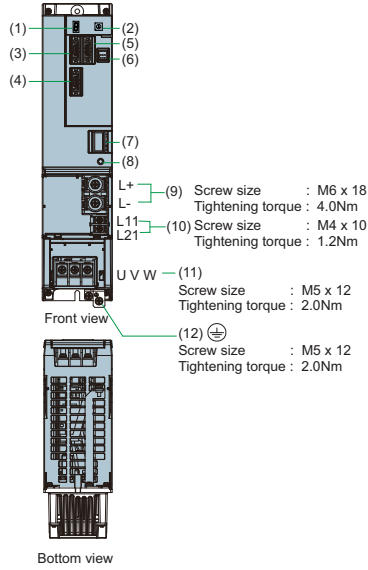
## Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	2	14	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	1.25 to 2	16 to 14

Power supply unit  
**MDS-EH-CV-75**

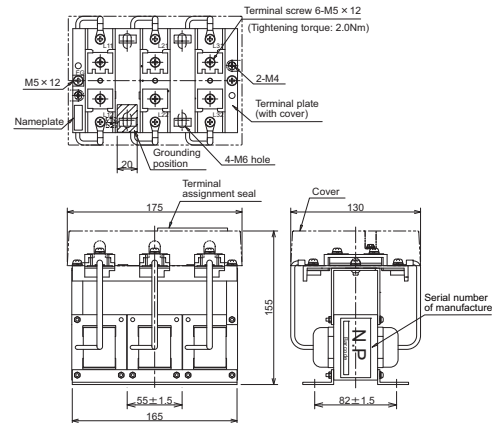
Specifications

Item	Specifications
30-minute rated output[kW]	7.5
Continuous rated output[kW]	5.5
Power facility capacity[kVA]	11.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	15
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	13
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	24
Outside panel[W]	55
Cooling method	Forced air cooling
Mass[kg]	5.7
AC reactor	DH-AL-7.5K
Selection example of contactor (option part)	S-T12-AC400V
Free-air thermal current[A]	20
Selection current (for 380V input) [A]	16
Selection example of circuit protector (option part)	NF63-CW3P-20A
Rated current[A]	20
Selection current (for 380V input) [A]	16

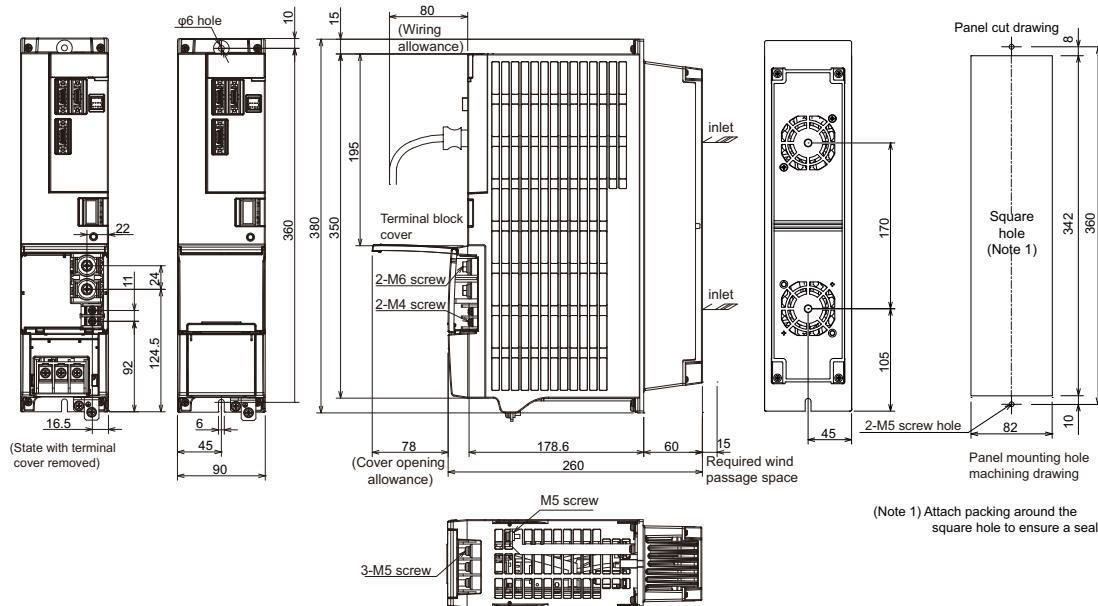


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

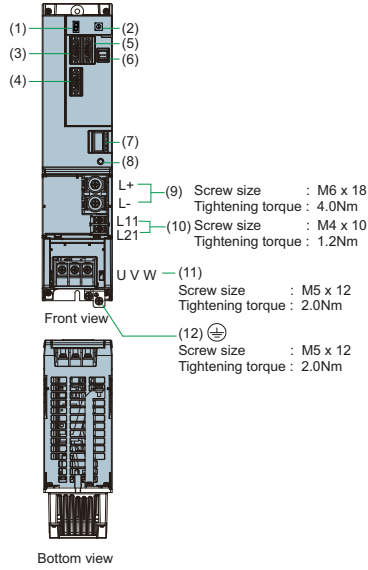
Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	2	14	3.5	12	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	2	14	3.5	12	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	2	14	1.25 to 2	16 to 14

# Power supply unit MDS-EH-CV-110

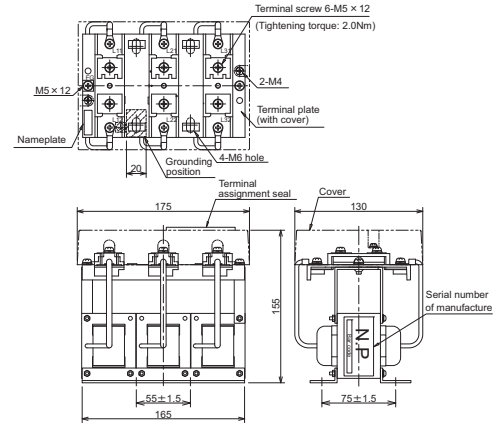
## Specifications

Item	Specifications
30-minute rated output[kW]	11.0
Continuous rated output[kW]	7.5
Power facility capacity[kVA]	16.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	21
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	18
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	25
Outside panel[W]	99
Cooling method	Forced air cooling
Mass[kg]	6.0
AC reactor	DH-AL-11K
Selection example of contactor (option part)	S-T21-AC400V
Free-air thermal current[A]	32
Selection current (for 380V input) [A]	24
Selection example of circuit protector (option part)	NF63-CW3P-30A
Rated current[A]	30
Selection current (for 380V input) [A]	24

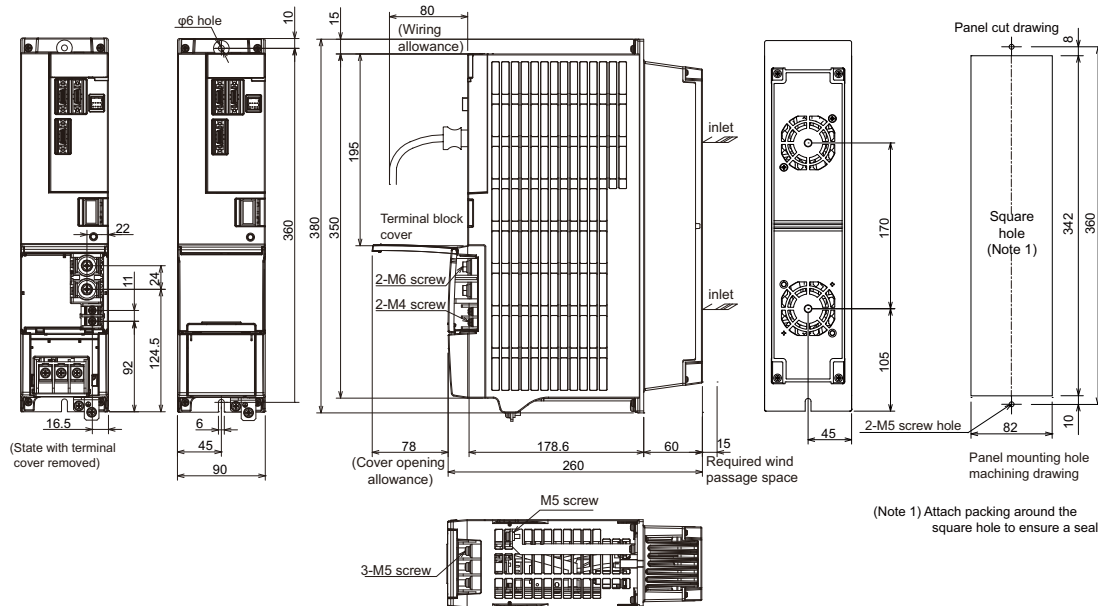


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

## AC reactor



## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

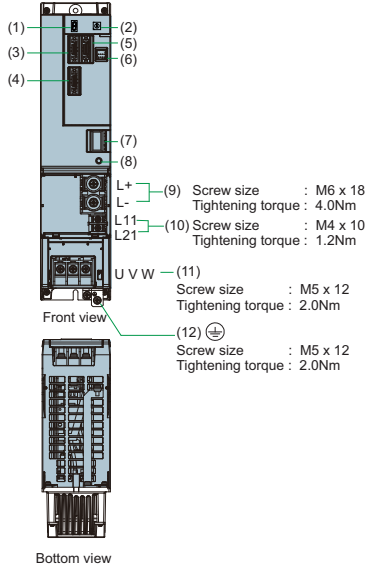
## Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	5.5	10	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	3.5	12	5.5	10	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	2	14	3.5	12	1.25 to 2	16 to 14

Power supply unit  
**MDS-EH-CV-185**

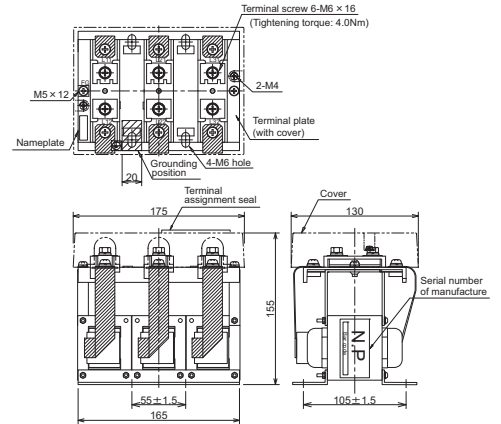
Specifications

Item	Specifications
30-minute rated output[kW]	18.5
Continuous rated output[kW]	15
Power facility capacity[kVA]	27.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	38
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	35
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	32
Outside panel[W]	161
Cooling method	Forced air cooling
Mass[kg]	6.0
AC reactor	DH-AL-18.5K
Selection example of contactor (option part)	S-T35-AC400V
Free-air thermal current[A]	60
Selection current (for 380V input) [A]	40
Selection example of circuit protector (option part)	NF63-CW3P-40A
Rated current[A]	40
Selection current (for 380V input) [A]	40

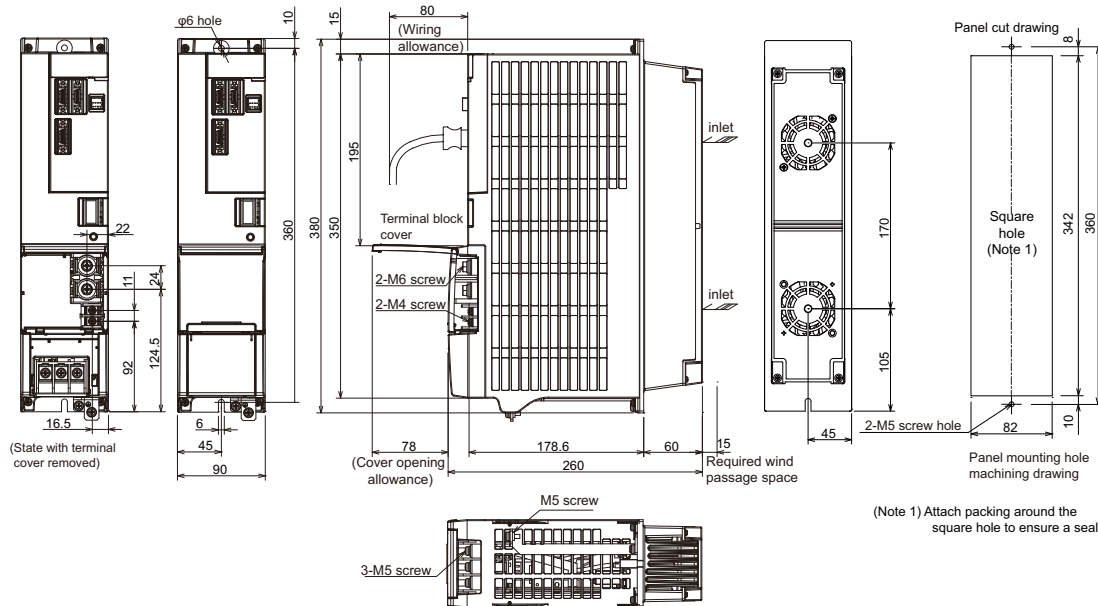


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

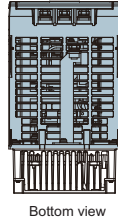
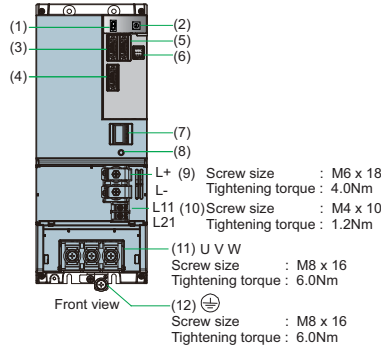
Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	14	6	14	6	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	8	8	8	8	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	5.5	10	5.5	10	1.25 to 2	16 to 14

Power supply unit  
**MDS-EH-CV-300**

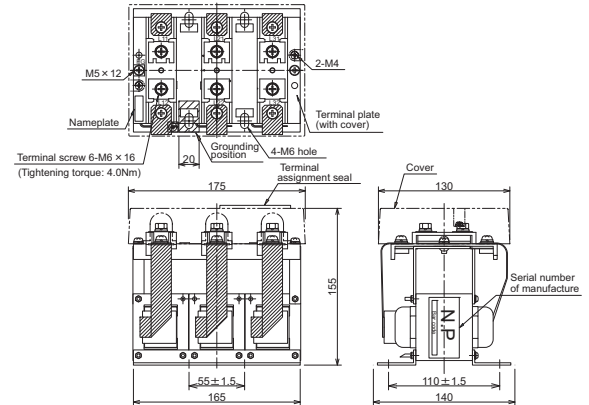
Specifications

Item	Specifications
30-minute rated output[kW]	30.0
Continuous rated output[kW]	26
Power facility capacity[kVA]	43.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	72
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	61
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	45
Outside panel[W]	272
Cooling method	Forced air cooling
Mass[kg]	10.0
AC reactor	DH-AL-30K
Selection example of contactor (option part)	S-T50-AC400V
Free-air thermal current[A]	80
Selection current (for 380V input) [A]	65
Selection example of circuit protector (option part)	NF125-CW3P-75A
Rated current[A]	75
Selection current (for 380V input) [A]	65

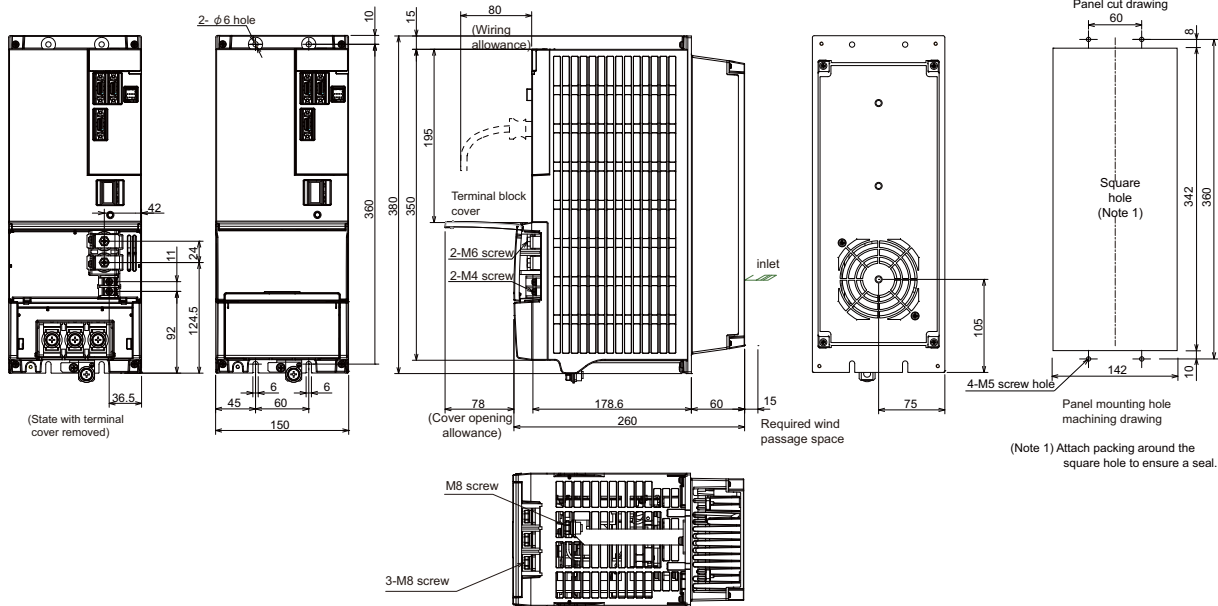


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

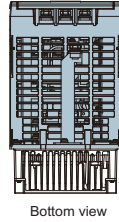
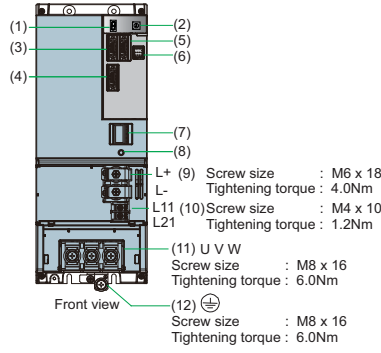
Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	22	4	38	2	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	14	6	22	4	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6	14	6	1.25 to 2	16 to 14



# Power supply unit MDS-EH-CV-370

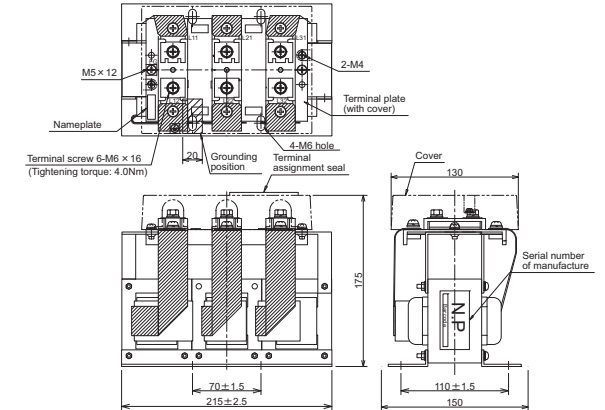
## Specifications

Item	Specifications
30-minute rated output[kW]	37.0
Continuous rated output[kW]	30
Power facility capacity[kVA]	53.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	82
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	70
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	53
Outside panel[W]	343
Cooling method	Forced air cooling
Mass[kg]	10.0
AC reactor	DH-AL-37K
Selection example of contactor (option part)	S-T65-AC400V
Free-air thermal current[A]	100
Selection current (for 380V input) [A]	80
Selection example of circuit protector (option part)	NF125-CW3P-100A
Rated current[A]	100
Selection current (for 380V input) [A]	80

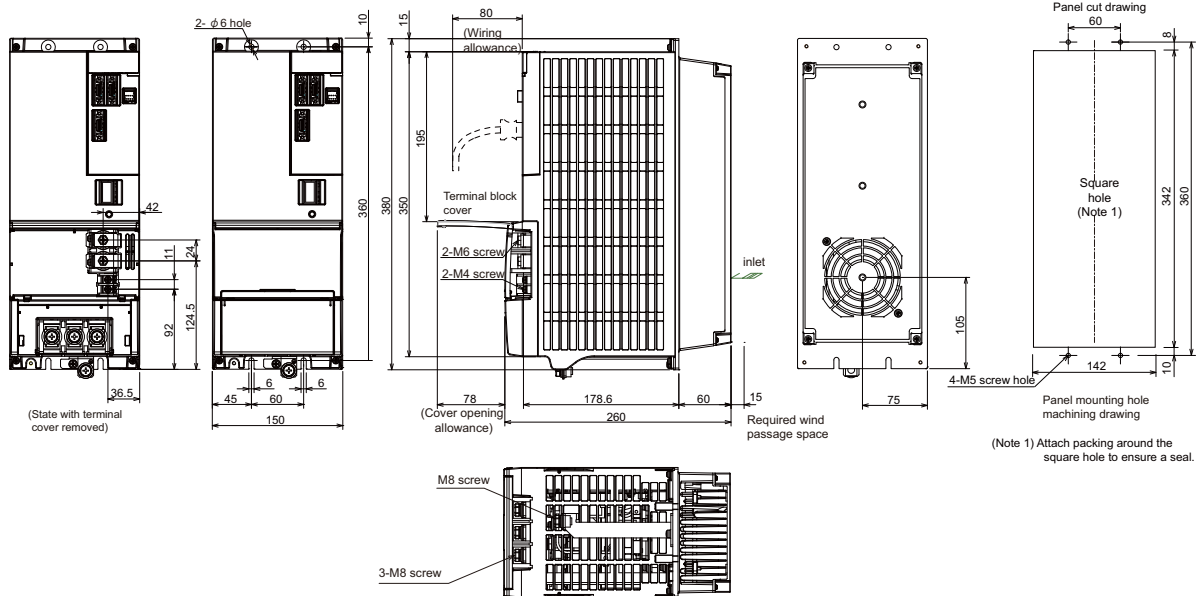


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

## AC reactor



## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

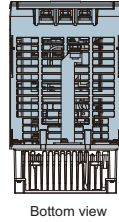
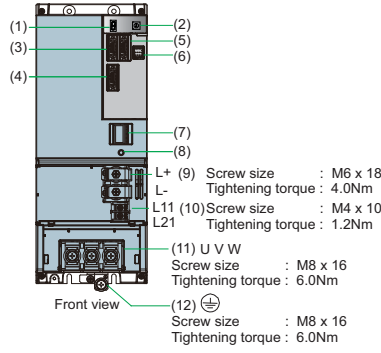
## Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	38	2	60	1/0	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4	38	2	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	14	6	22	4	1.25 to 2	16 to 14

# Power supply unit MDS-EH-CV-450

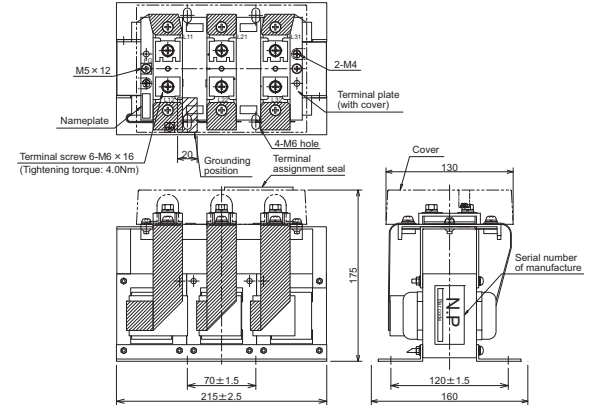
## Specifications

Item	Specifications
30-minute rated output[kW]	45.0
Continuous rated output[kW]	37
Power facility capacity[kVA]	64.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	99
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	85
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	104
Outside panel[W]	392
Cooling method	Forced air cooling
Mass[kg]	10.0
AC reactor	DH-AL-45K
Selection example of contactor (option part)	S-T65-AC400V
Free-air thermal current[A]	100
Selection current (for 380V input) [A]	98
Selection example of circuit protector (option part)	NF125-CW3P-100A
Rated current[A]	100
Selection current (for 380V input) [A]	98

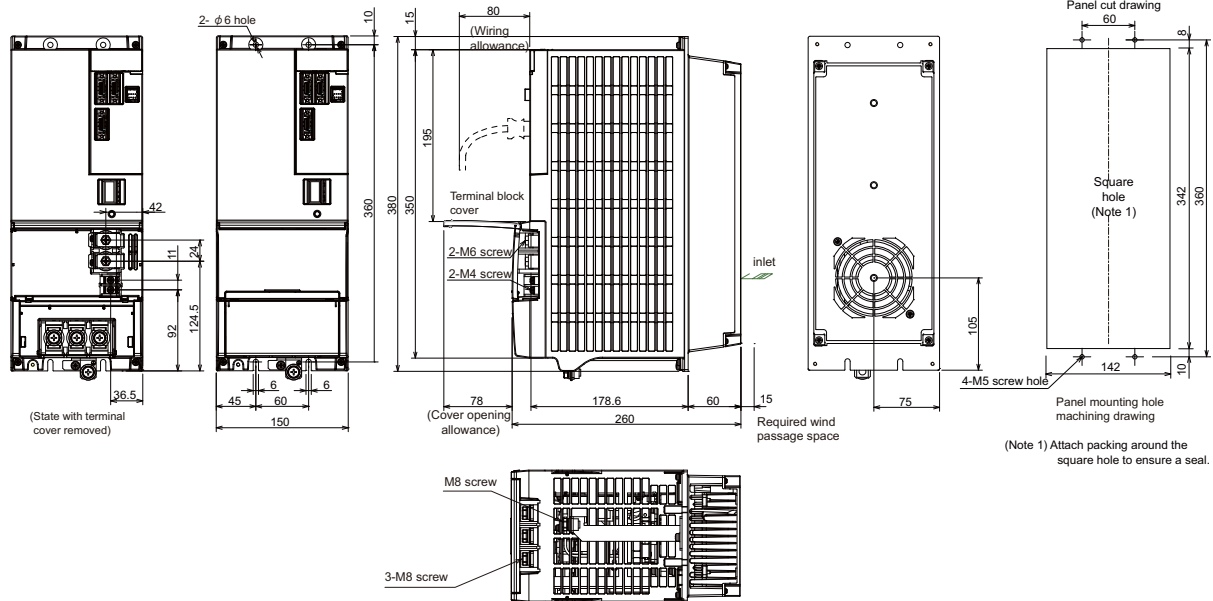


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

## AC reactor



## Outline dimension drawings [Unit : mm]



## Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

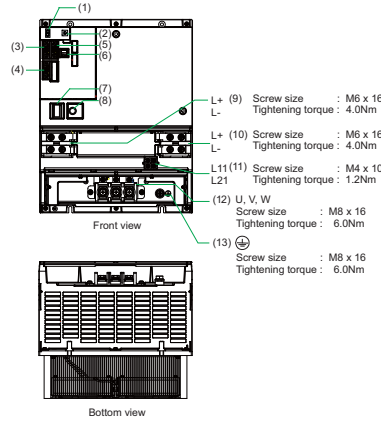
## Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	38	2	60 or bar enclosed	1/0 or bar enclosed	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	22	4	60 or bar enclosed	1/0 or bar enclosed	2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	22	4	30	3	1.25 to 2	16 to 14

Power supply unit  
**MDS-EH-CV-550**

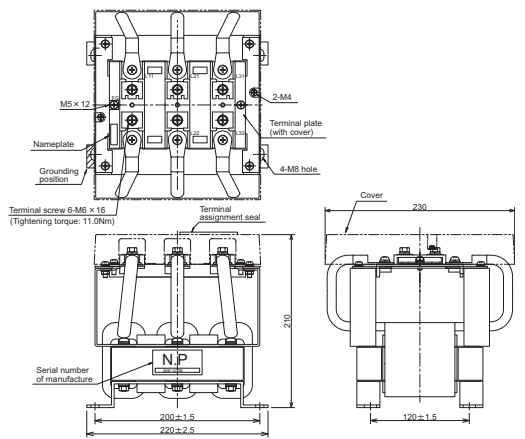
Specifications

Item	Specifications
30-minute rated output[kW]	55.0
Continuous rated output[kW]	45
Power facility capacity[kVA]	78.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	119
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	106
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	164
Outside panel[W]	431
Cooling method	Forced air cooling
Mass[kg]	25.5
AC reactor	DH-AL-55K
Selection example of contactor (option part)	S-T80-AC400V
Free-air thermal current[A]	120
Selection current (for 380V input) [A]	119
Selection example of circuit protector (option part)	NF250-CW3P-125A
Rated current[A]	125
Selection current (for 380V input) [A]	119

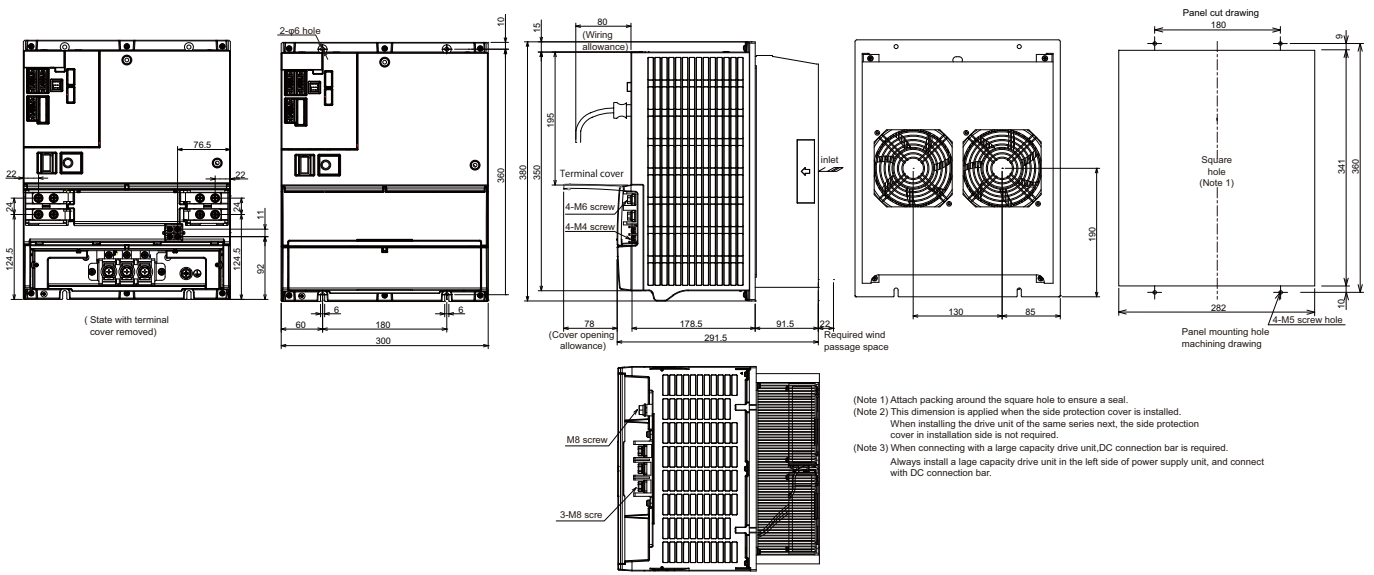


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

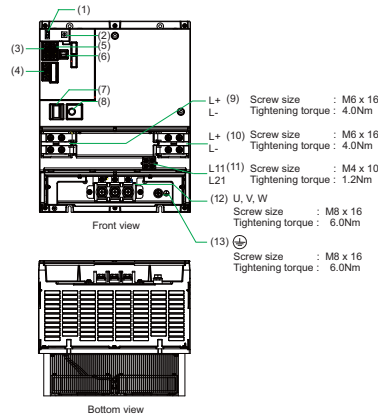
Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed	Bar enclosed	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	38	2			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	22	4			1.25 to 2	16 to 14



Power supply unit  
**MDS-EH-CV-750**

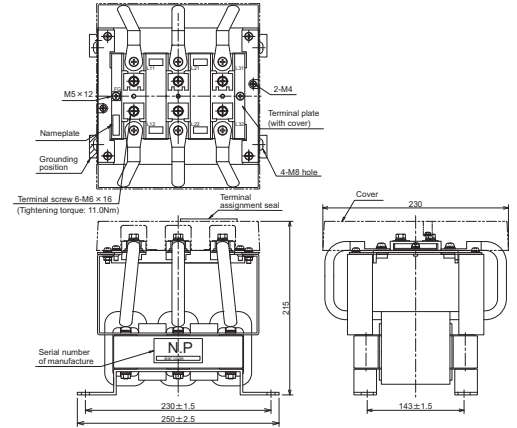
Specifications

Item	Specifications
30-minute rated output[kW]	75.0
Continuous rated output[kW]	55
Power facility capacity[kVA]	107.0
Output	
Rated voltage[V]	513 to 648DC
Rated current[A]	150
Input	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Rated voltage(50Hz) [V]	380 to 480AC
Rated voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Rated current[A]	130
Control power	
Frequency[Hz]	50 / 60
Tolerable frequency fluctuation[%]	±5% max
Voltage(50Hz) [V]	380 to 480AC
Voltage(60Hz) [V]	380 to 480AC
Tolerable voltage fluctuation[%]	+10%, -15%
Max. current[A]	0.1
Max. rush current[A]	18
Max. rush conductivity time[ms]	12
Heating value	
Inside panel[W]	228
Outside panel[W]	614
Cooling method	Forced air cooling
Mass[kg]	25.5
AC reactor	DH-AL-75K
Selection example of contactor (option part)	S-N150-AC400V
Free-air thermal current[A]	200
Selection current (for 380V input) [A]	163
Selection example of circuit protector (option part)	NF250-CW3P-200A
Rated current[A]	200
Selection current (for 380V input) [A]	163

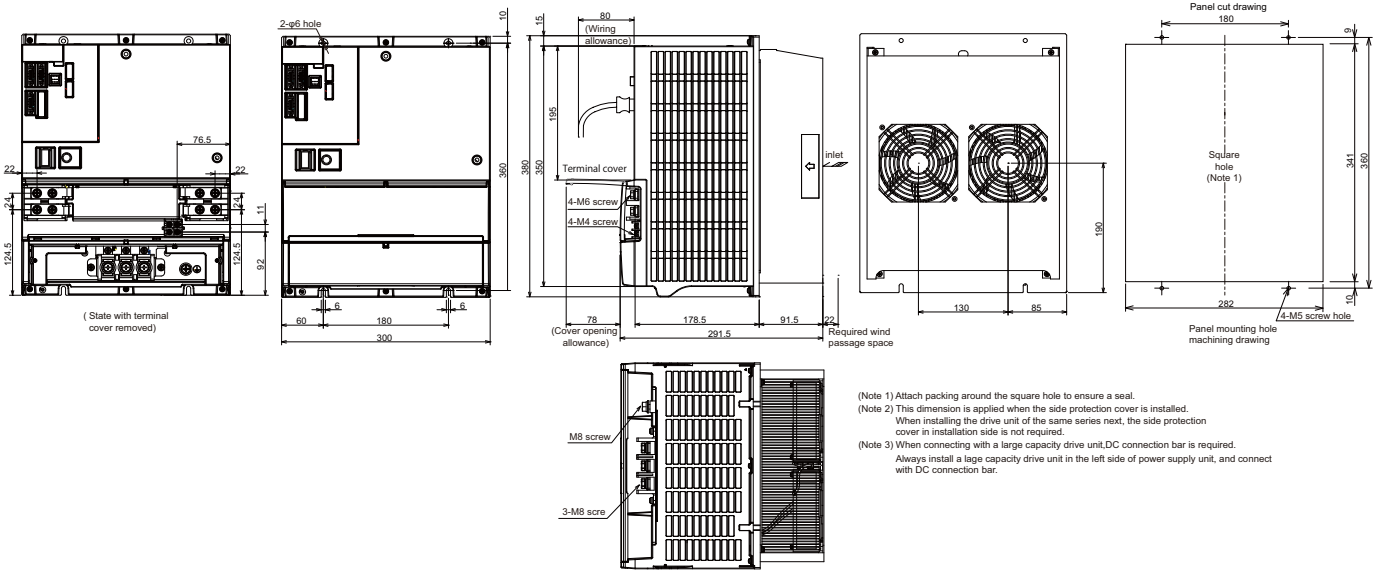


No.	Name	Description
(1)	LED	Unit status indication LED
(2)	SW1	Power supply setting switch
(3)	CN4	Servo/spindle communication connector (primary)
(4)	CN9	Servo/spindle communication connector (secondary)
(5)	CN41	Power backup unit communication connector
(6)	CN24	External emergency stop input connector
(7)	CN23	External contactor control connector
(8)	CHARGE	TE2 output charging/discharging circuit indication LED
(9)	TE2	Converter voltage output terminal (DC output)
(10)	TE3	Control power input terminal (single-phase AC input)
(11)	TE1	Power input terminal (3-phase AC input)
(12)	PE	Grounding terminal

AC reactor



Outline dimension drawings [Unit : mm]



Environmental conditions

Item	Conditions
Ambient temperature	Operation: 0°C to +55°C (with no freezing) Storage/transportation: -15°C to +70°C (with no freezing)
Ambient humidity	Operation: 90% RH or less (with no dew condensation) Storage/transportation: 90% RH or less (with no dew condensation)
Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
Altitude	Operation/storage: 1000m or less above sea level Transportation: 13000m or less above sea level
Vibration/impact	4.9m/s <sup>2</sup> (0.5G) / 49m/s <sup>2</sup> (5G)

Recommended wire

Types	Terminal name					
	TE1(U, V, W, earth)		TE2(L+, L-)		TE3(L11, L21)	
	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG
600V vinyl insulated wire (IV wire) 60°C product (Example according to IEC/EN60204-1, UL508C)	-	-	Bar enclosed	Bar enclosed	2	14
600V double (heat proof) vinyl insulated wire (HIV wire) 75°C product (Example according to IEC/EN60204-1, UL508C)	60	1/0			2	14
600V bridge polyethylene insulated wire (IC) 105°C product (Example according to JEAC8001)	38	2			1.25 to 2	16 to 14

## Dynamic Brake Unit (MDS-D-DBU)

The MDS-EH-V1-160W and MDS-EH-V1-200 or larger units do not have dynamic brakes built in, so install an external dynamic brake unit.

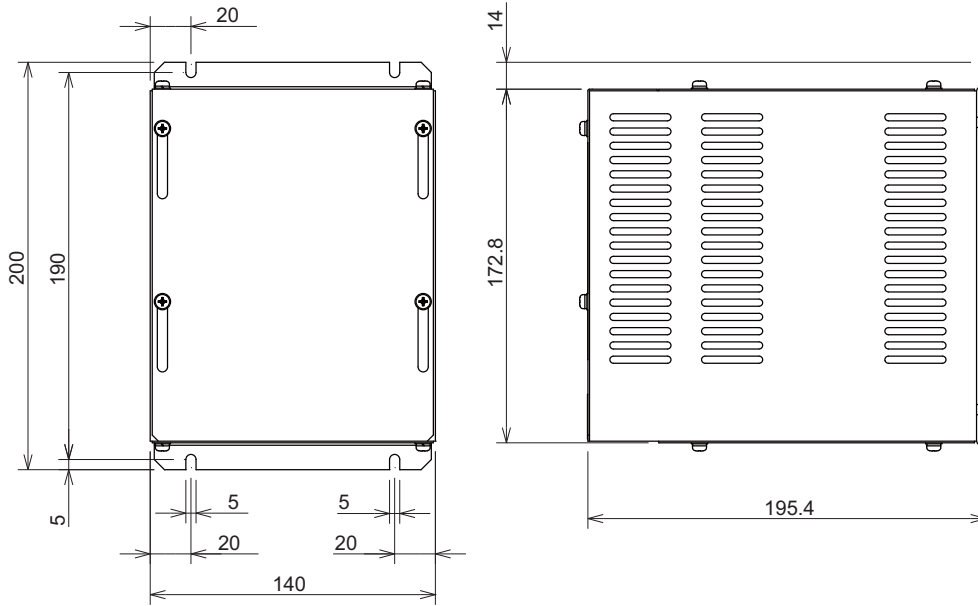
### (1) Specifications

Type	Coil specifications	Wire size	Compatible drive unit	Mass (kg)
MDS-D-DBU	24VDC 160mA	5.5mm <sup>2</sup> or more (For IV wire)	MDS-EH-V1-160W, MDS-EH-V1-200	3kg

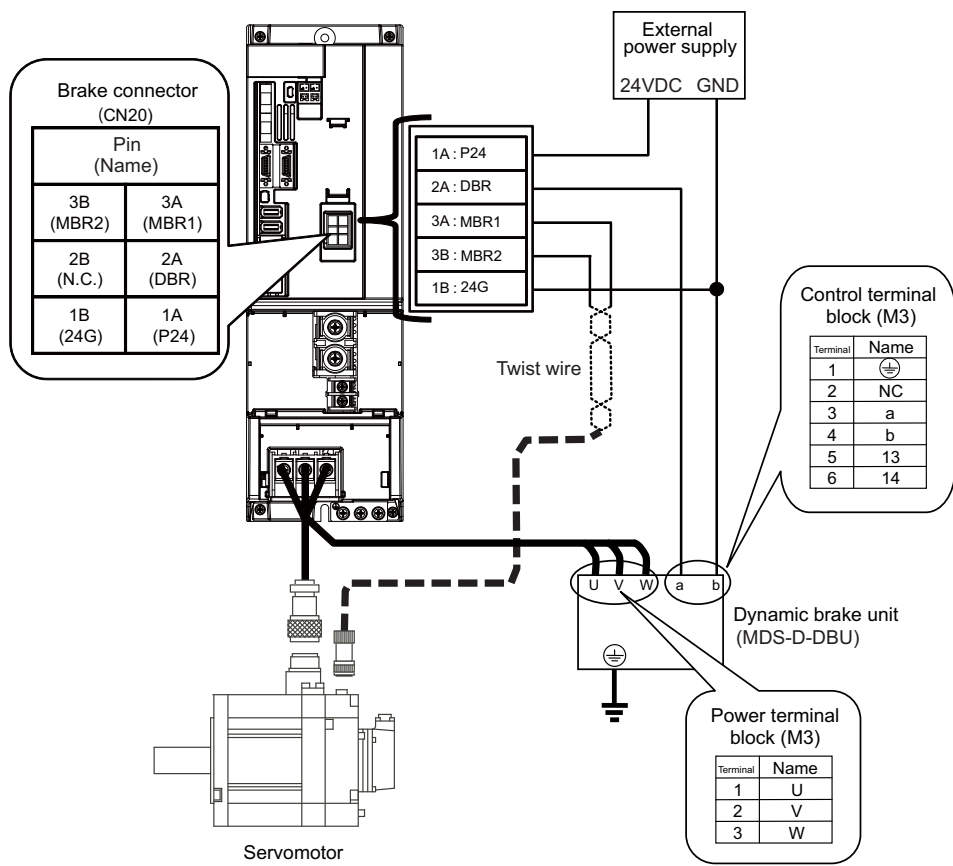
### (2) Outline dimension drawings

MDS-D-DBU

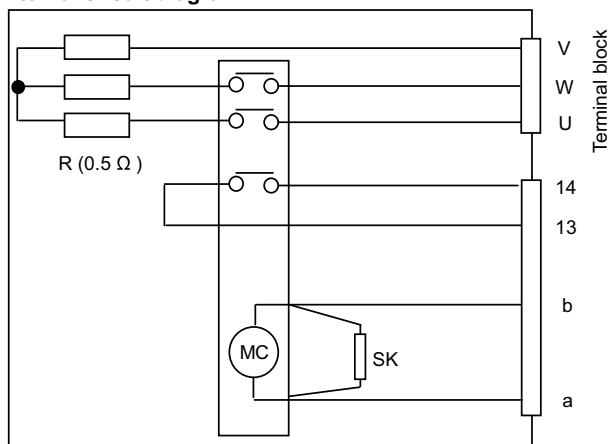
[Unit: mm]



(3) Connecting with the servo drive unit



Internal circuit diagram



**CAUTION**

Correctly wire the dynamic brake unit to the servo drive unit.

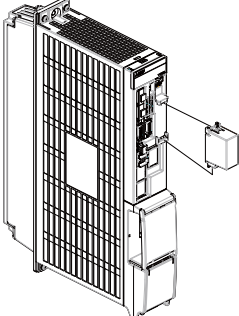
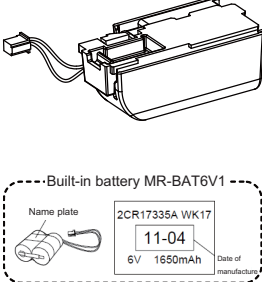

Do not use for applications other than emergencies (normal braking, etc.). The internal resistor could heat up, and lead to fires or faults.

**POINT**

When you use a motor with a brake, please wire (between 1pin and 3pin) for the CN20 connector.

## Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060)

This battery option may be required to establish absolute position system.

Type	MDS-BAT6V1SET	MR-BAT6V1SET	MDSBTBOX-LR2060
Installation type	Drive unit installation	Drive unit installation	Control panel installation
Hazard class	Not applicable	Not applicable	Not applicable
Number of connectable axes	Up to 3 axes	Up to 3 axes	Up to 8 axes
Change method	Battery option change	Battery option change	Battery change
Appearance	(1) 	(2) 	(3) 

### CAUTION

1. When transporting lithium batteries with means such as by air transport, measures corresponding to the United Nations Dangerous Goods Regulations must be taken.
2. The lithium battery must be transported according to the rules set forth by the International Civil Aviation Organization (ICAO), International Air Transportation Association (IATA), International Maritime Organization (IMO), and United States Department of Transportation (DOT), etc. The packaging methods, correct transportation methods, and special regulations are specified according to the quantity of lithium alloys. The battery unit exported from Mitsubishi is packaged in a container (UN approved part) satisfying the standards set forth in this UN Advisory.
3. To protect the absolute value, do not shut off the servo drive unit control power supply if the battery voltage becomes low (warning 9F).
4. The battery life (backup time) is greatly affected by the working ambient temperature. The above data is the theoretical value for when the battery is used 8 hours a day/240 days a year at an ambient temperature of 25°C. Generally, if the ambient temperature increases, the backup time and useful life will both decrease.

(1) Cell battery (MDS-BAT6V1SET)

(a) Specifications

Battery option type		Cell battery
		MDS-BAT6V1SET
Battery model name		2CR17335A
Nominal voltage		6V
Nominal capacity		1650mAh
Battery safety	Hazard class	Class9 Not applicable
	Battery shape	Set battery
	Number of batteries used	2
	Lithium alloy content	1.2g
	Mercury content	1ppm or less
Number of connectable axes (Note 1)		Up to 3 axes
Battery continuous backup time		Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 hours
Battery useful life (From date of unit manufacture)		5 years
Data save time in battery replacement		Approx. 20 hours at time of delivery, approx. 10 hours after 5 years
Back up time from battery warning to alarm occurrence (Note 2)		Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Mass		34g

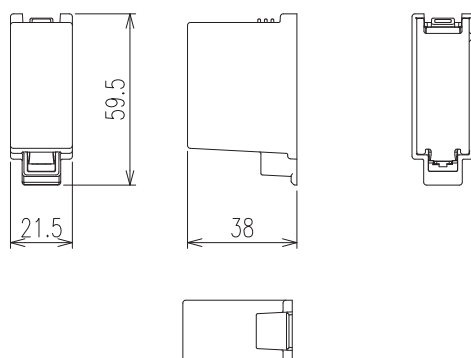
(Note 1) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.

(Note 2) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery warning occurs.

(Note 3) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

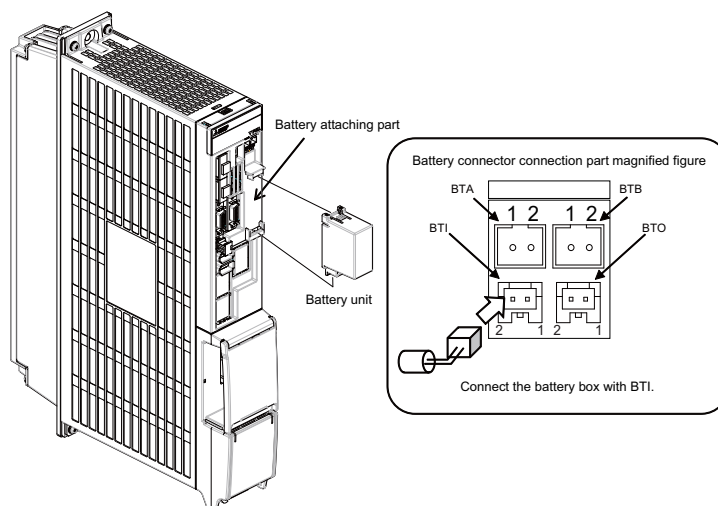
(b) Outline dimension drawings

[Unit: mm]



(c) Installing the cell battery

Connect the connector for the cell battery and install the battery case body to the upper front part of the servo drive unit.



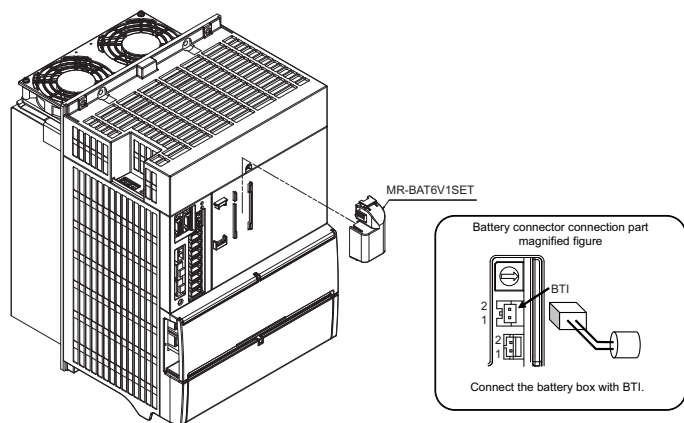
(2) Cell battery (MR-BAT6V1SET)

(a) Specifications

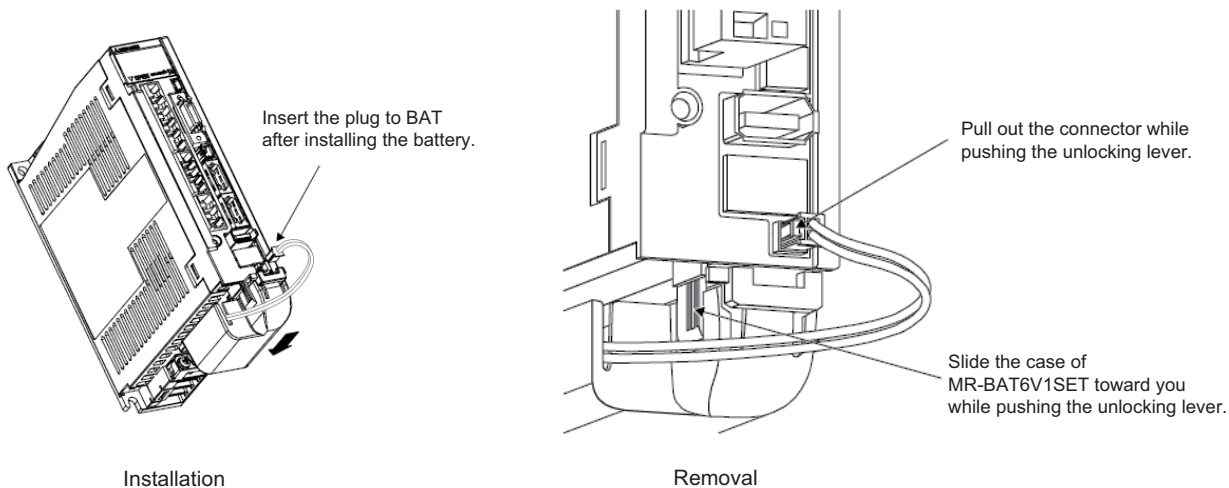
Battery option type		Cell battery
		MR-BAT6V1SET
Battery model name		2CR17335A
Nominal voltage		6V
Nominal capacity		1650mAh
Battery safety	Hazard class	Class 9 Not applicable
	Battery shape	Set battery
	Number of batteries used	2
	Lithium alloy content	1.2g
	Mercury content	Less than 1ppm
Number of connectable axes (Note 1)		Up to 3 axes
Battery continuous backup time		Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 hours
Battery useful life (From date of unit manufacture)		5 years
Data save time in battery replacement		Approx. 20 hours at time of delivery, approx. 10 hours after 5 years
Back up time from battery warning to alarm occurrence (Note 2)		Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Mass		34g

- (Note 1) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.
- (Note 2) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery alarm occurs.
- (Note 3) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

(b) Installing and removing the cell battery  
< MDS-EMH Series >

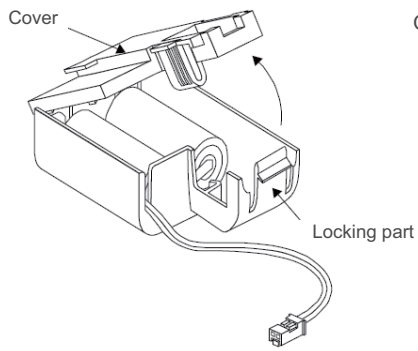


< MDS-EJH Series >

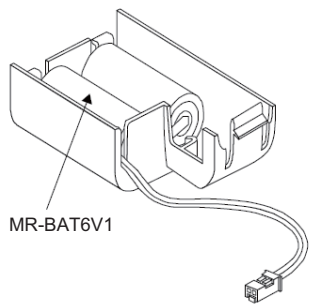


(c) Replacing the built-in battery

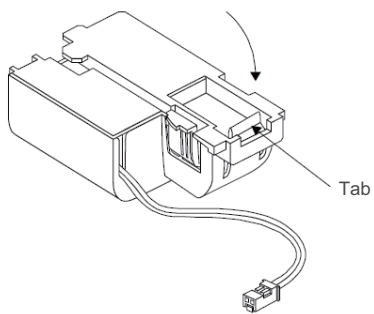
MR-BAT6V1SET that reached the end of the life can be reused by replacing the MR-BAT6V1 battery.



Open the cover while pushing the locking part.



Replace the built-in battery with a new battery for MR-BAT6V1.



Close the cover by pushing until it is fixed with the tab of the locking part.

(3) Battery box (MDSBTBOX-LR2060)

(a) Specifications

Battery option type	Battery box
	MDSBTBOX-LR2060
Battery model name (Note 1)	size-D alkaline batteries LR20 × 4 pieces
Nominal voltage (Note 2)	6.0V (Unit output: BTO1/2/3) 3.6V (Unit output: BT(3.6V))
Number of connectable axes (Note 3)	Up to 8 axes
Battery continuous backup time (Note 4)	Approx. 10000 hours (when 8 axes are connected, cumulative time in non-energized state)
Back up time from battery warning to alarm occurrence (Note 4)	Approx. 336 hours (when 8 axes are connected)

(Note 1) Install commercially-available alkaline dry batteries into MDSBTBOX-LR2060. The batteries should be procured by customers.

Make sure to use new batteries that have not passed the expiration date. We recommend you to replace the batteries in the one-year cycle.

(Note 2) 3.6V output is for old-type drive unit. It is not used for MDS-E/EH, EM/EMH, and EJ/EJH Series.

(Note 3) When using ball screw side encoder, both ball screw side encoder and motor side encoder need to be backed up by a battery, so the load becomes double.

(Note 4) This time is a guideline, so does not guarantee the back up time. Replace the battery with a new battery as soon as a battery warning (9F) occurs.

(Note 5) A battery load is generated in the axis for which the incremental control is set when a battery is connected.

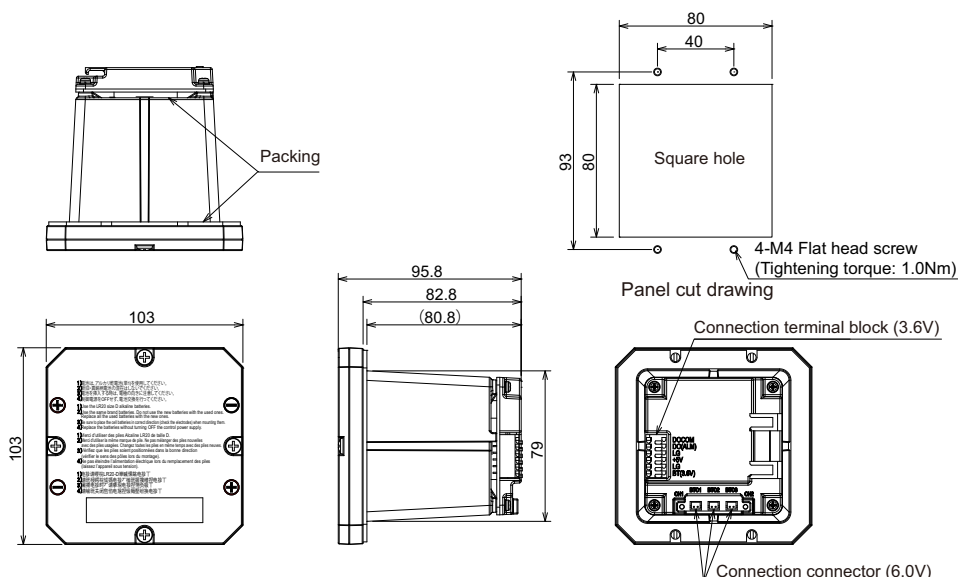
(b) Explanation of connectors (BTO1/2/3)

		Name	Description
(1)	Power supply output for absolute position encoder	BTO	6V output for absolute position encoder backup
(2)	backup	LG	Ground



(c) Outline dimension drawings

[Unit: mm]



**POINT**

As soon as the battery warning (9F) has occurred, replace the batteries with new ones. Make sure to use new batteries that have not passed the expiration date. We recommend you to replace the batteries in the one-year cycle.

**CAUTION**

When installing the battery box on the panel, it may be damaged if the screw is tightened too much. Make sure the tightening torque of the screw.

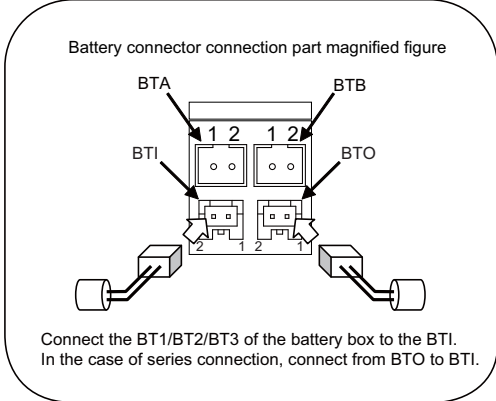
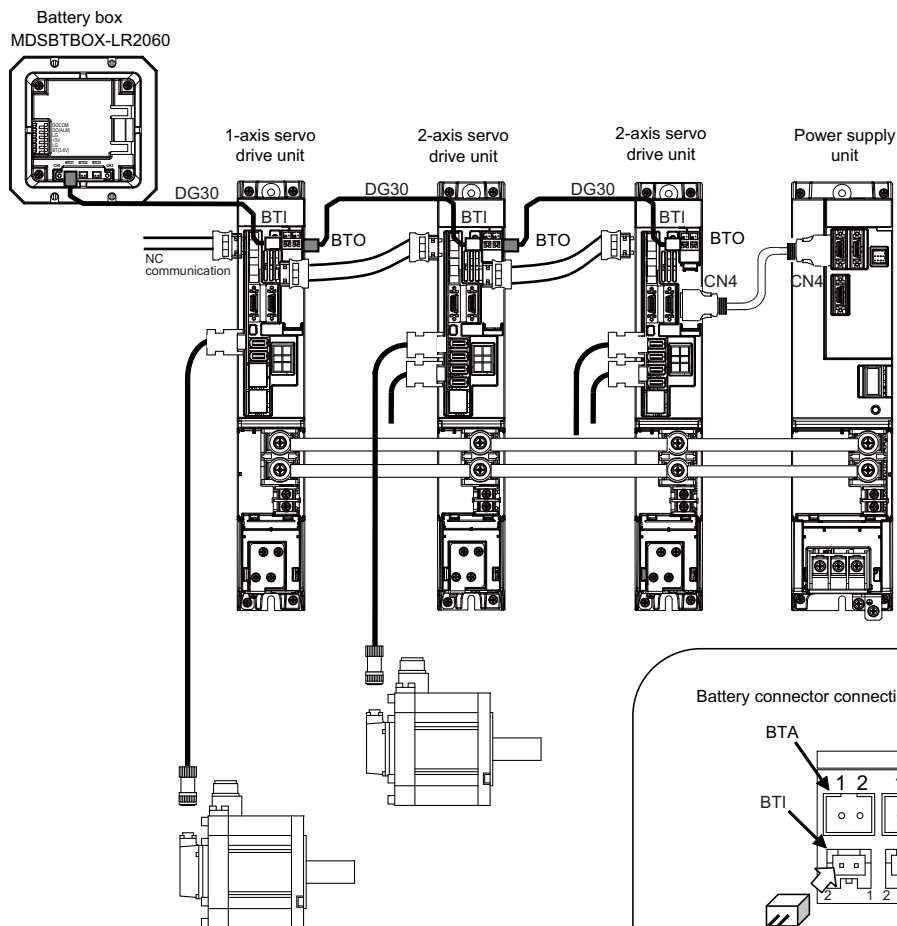
(d) When backing up for more than 8 axes

Add a MDSBTBOX-LR2060 so that the number of connectable axes for a battery unit is 8 axes or less. For all of servo drive units supported by one MDSBTBOX-LR2060, start the control powers ON simultaneously.

**CAUTION**

1. The drive unit which is connected to the battery box and cell battery cannot be used together.
2. Replace the batteries with new ones without turning the control power of the drive unit OFF immediately after the battery voltage drop alarm (9F) has been detected.
3. Replace the batteries while applying the control power of all drive units which are connected to the battery box.

(e) System configuration  
< MDS-EH Series >

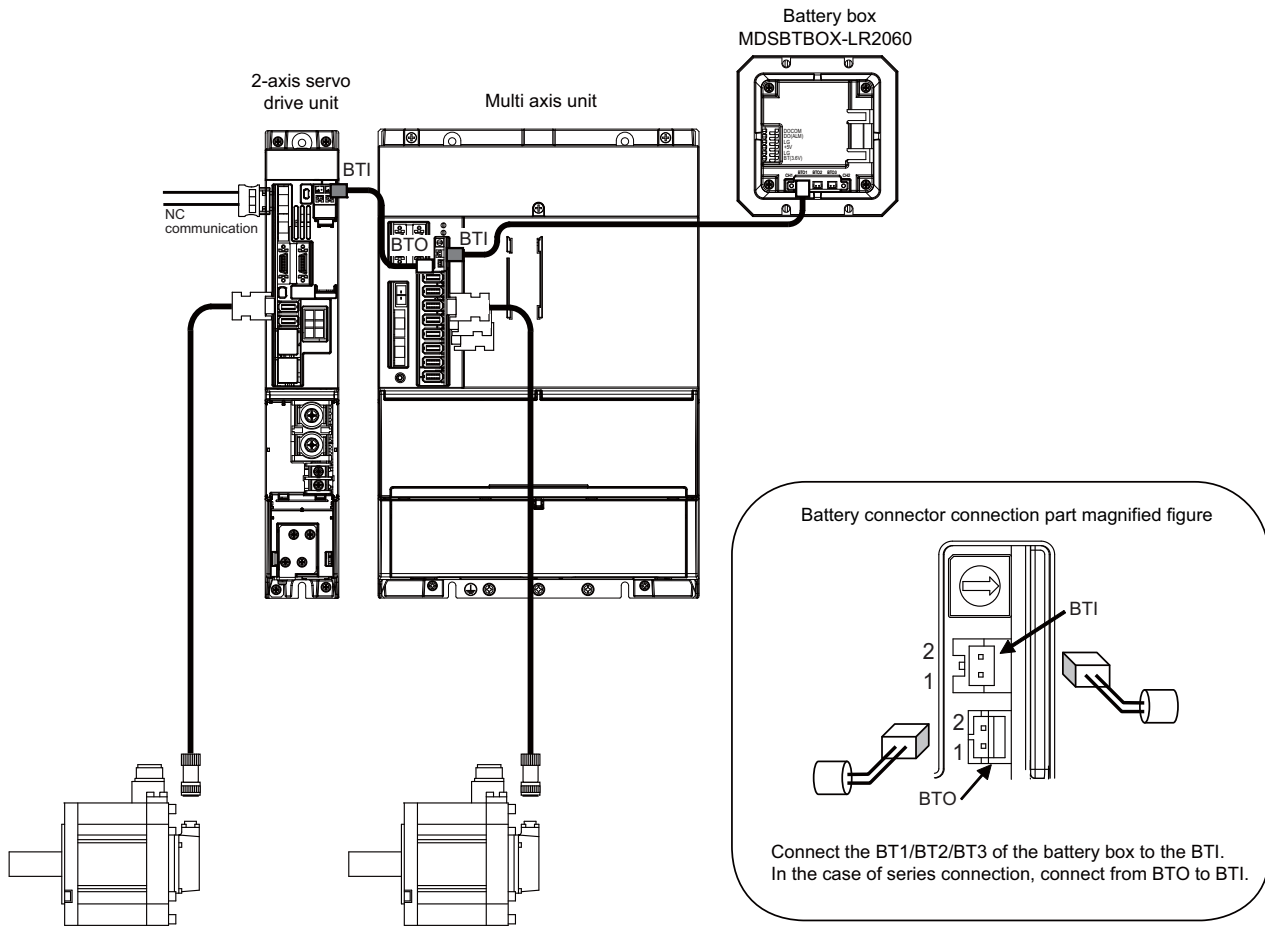


Connect the BT1/BT2/BT3 of the battery box to the BTI.  
In the case of series connection, connect from BTO to BTI.

**CAUTION**

The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.

< MDS-EMH Series >

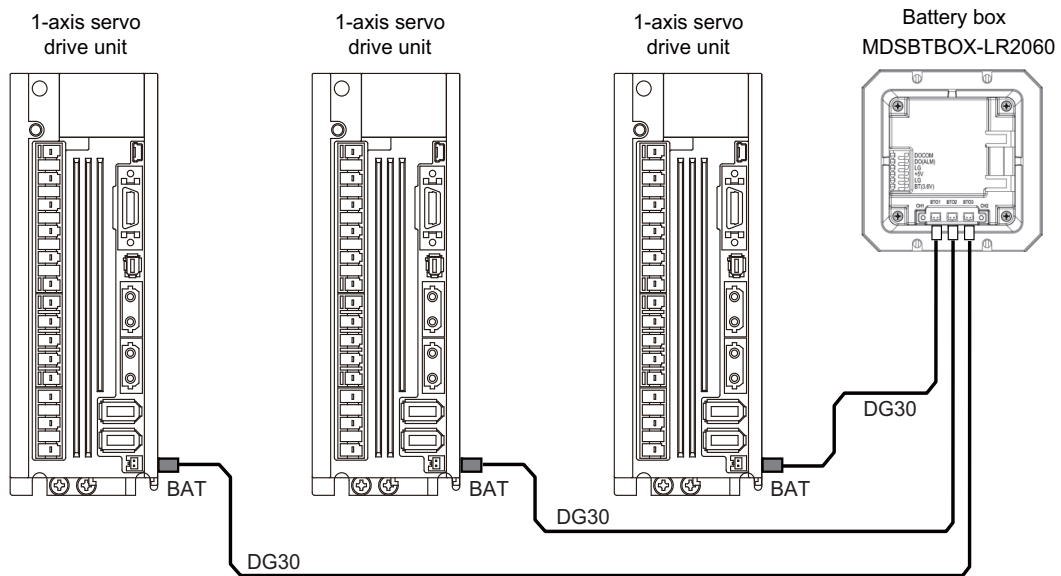


**⚠ CAUTION**

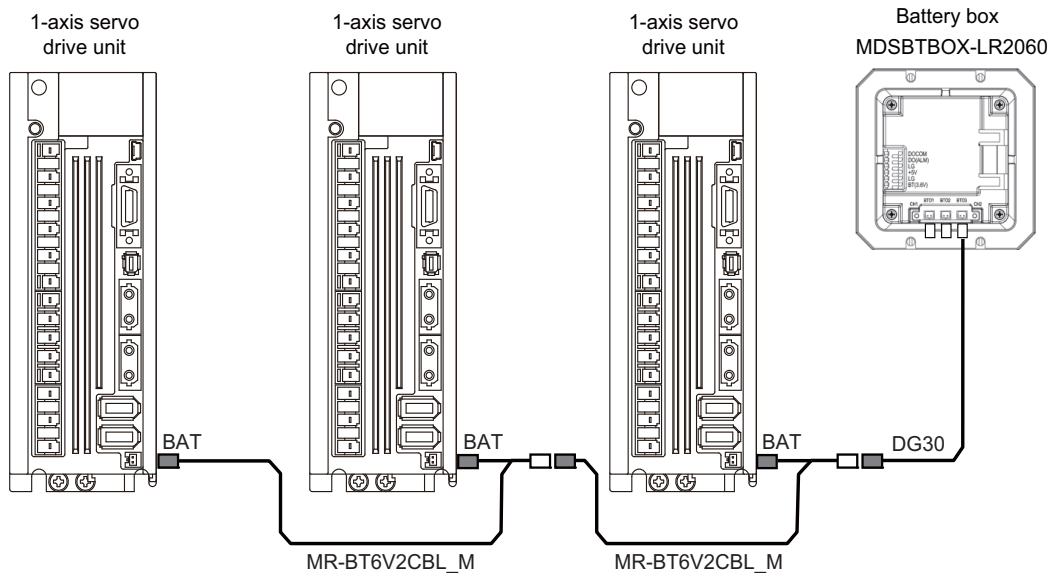
The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.

< MDS-EJH Series >

Parallel connection



Daisy-chain connection



**⚠ CAUTION**

1. The total length of battery cable (from the battery unit to the last connected drive unit) must be 30m or less.
2. MR-BT6V2CBL\_M is required for the daisy-chain connection.

## Ball Screw Side Encoder (OSA405ET2AS, OSA676ET2AS)

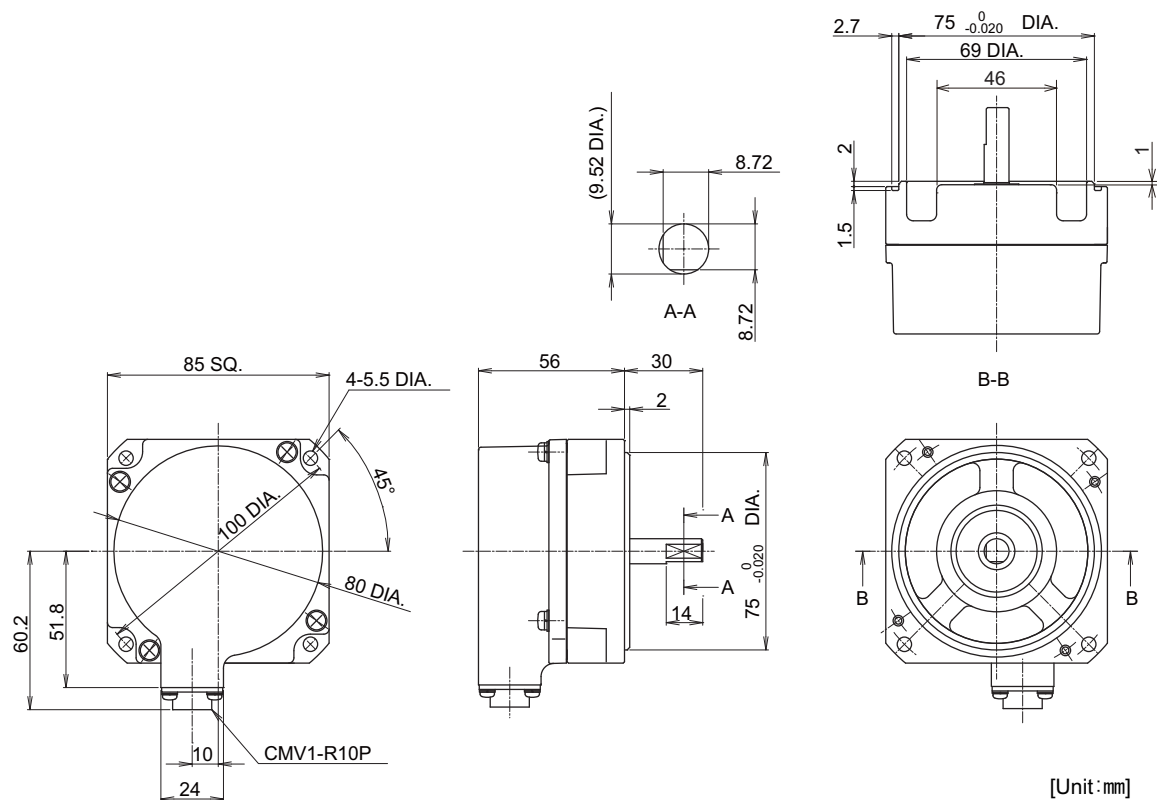
## (1) Specifications

Encoder type		OSA405ET2AS	OSA676ET2AS
Electrical characteristics	Encoder resolution	4,194,304 pulse/rev	67,108,864 pulse/rev
	Detection method	Absolute position method (battery backup method)	
	Accuracy (*1)	±3 seconds	
	Tolerable rotation speed at power off (*2)	500r/min	
	Encoder output data	Serial data	
	Power consumption	0.3A	
Mechanical characteristics for rotation	Inertia	0.5 x 10 <sup>-4</sup> kgm <sup>2</sup> or less	
	Shaft friction torque	0.1Nm or less	
	Shaft angle acceleration	4 x 10 <sup>4</sup> rad/s <sup>2</sup> or less	
	Tolerable continuous rotation speed	4000r/min	
Mechanical configuration	Shaft amplitude (position 15mm from end)	0.02mm or less	
	Tolerable load (thrust direction/radial direction)	9.8N/19.8N	
	Mass	0.6kg	
	Degree of protection	IP65 (The shaft-through portion is excluded.)	
	Recommended coupling	bellows coupling	
Working environment	Ambient temperature	0°C to +55°C	
	Storage temperature	-20°C to +85°C	
	Humidity	95%Ph	
	Vibration resistance	5 to 50Hz, total vibration width 1.5mm, each shaft for 30min	
	Impact resistance	490m/s <sup>2</sup> (50G)	

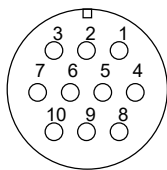
(\*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.

(\*2) If the tolerable rotation speed at power off is exceeded, the absolute position cannot be repaired.

(2) Outline dimension drawings  
OSA405ET2AS / OSA676ET2AS



(3) Explanation of connectors



Connector pin layout

Pin	Function	Pin	Function
1	RQ	6	SD
2	RQ*	7	SD*
3	-	8	P5(+5V)
4	BAT	9	-
5	LG(GND)	10	SHD

## Regenerative Option for MDS-EJH

The regenerative resistor generates heats, so wire and install the unit while taking care to safety. When using the regenerative resistor, make sure that flammable matters, such as cables, do not contact the resistor, and provide a cover on the machine so that dust or oil does not accumulate on the resistor and ignite.

## (1) Combination with MDS-EJH-V1 (400V)

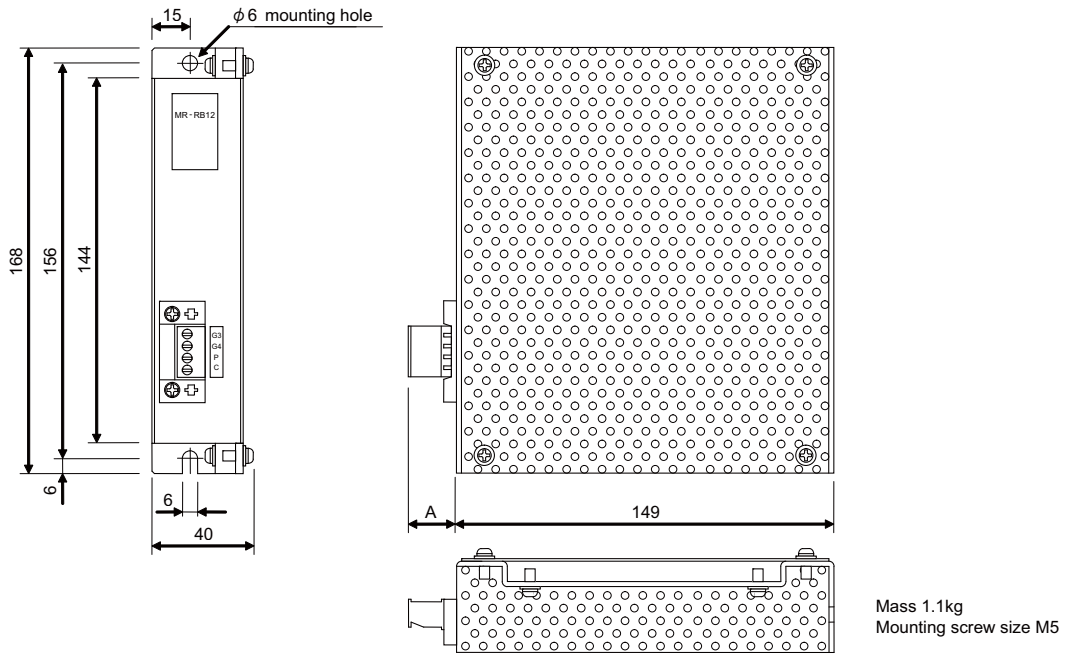
Corresponding servo drive unit	Standard built-in regenerative resistor	Regenerative option regenerative electrical power			
		MR-RB1H-4	MR-RB3M-4	MR-RB3G-4	MR-RB5G-4 (Note 1)
	Regenerative capacity	100W	300W	300W	500W
	Resistance value	82Ω	120Ω	47Ω	47Ω
MDS-EJH-V1-10	20W	○	○	-	-
MDS-EJH-V1-15	20W	○	○	-	-
MDS-EJH-V1-20	100W	-	-	○	○
MDS-EJH-V1-40	120W	-	-	○	○

(Note 1) Install a cooling fan.

(2) Outline dimension drawing of regenerative option

[Unit: mm]

< MR-RB1H-4 >

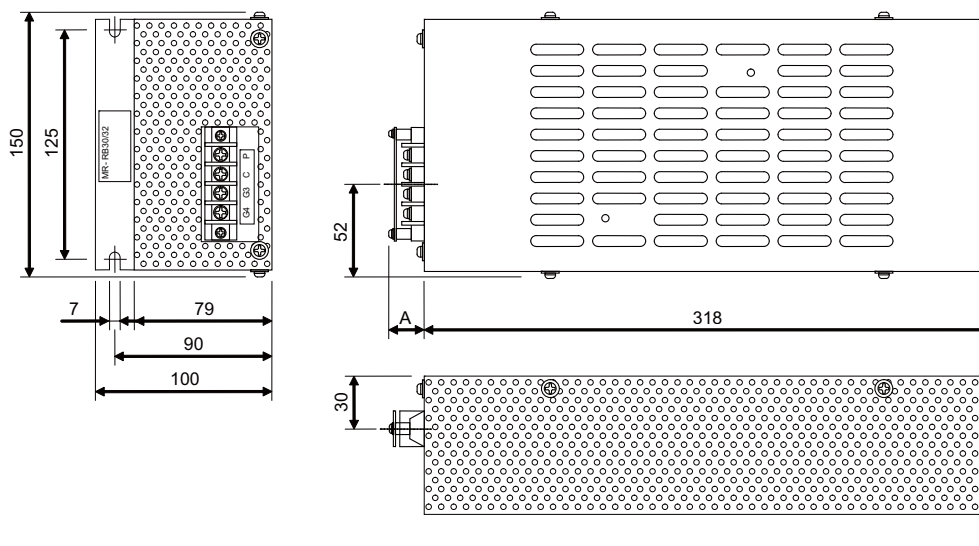


Variable dimensions

Type	A	Applicable cable size
MR-RB1H-4	24	0.2 to 4.0mm <sup>2</sup> (AWG24 to 10)



< MR-RB3M-4, MR-RB3G-4 >

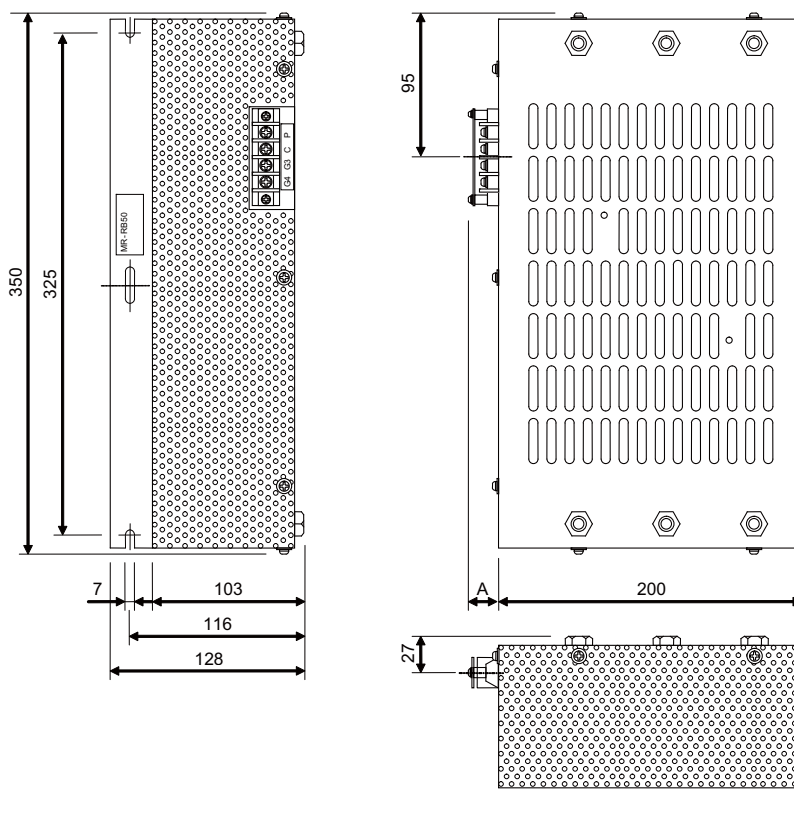


Mass 2.9kg  
Terminal screw size M4  
Mounting screw size M8

Variable dimensions

Type	A
MR-RB3M-4, MR-RB3G-4	23

< MR-RB5G-4 >



Mass 5.6kg  
Terminal screw size M4  
Mounting screw size M6

Variable dimensions

Type	A
MR-RB5G-4	23

## Encoder for Spindle Motor

## (1) No-variable speed control

(When spindle and motor are directly coupled or coupled with a 1:1 gear ratio)

Spindle control item	Control specifications	Without spindle side encoder	With spindle side encoder
Spindle control	Normal cutting control	●	This normally is not used for no-variable speed control.
	Constant surface speed control (lathe)	●	
	Thread cutting (lathe)	●	
Orientation control	1-point orientation control	●	
	Multi-point orientation control	●	
	Orientation indexing	●	
Synchronous tap control	Standard synchronous tap	●	
	Synchronous tap after zero point return	●	
Spindle synchronous control	Without phase alignment function	●	
	With phase alignment function	●	
C-axis control	C-axis control	● (Note 2)	●

(Note 1) ● :Control possible

x :Control not possible

(Note 2) When spindle and motor are coupled with a 1:1 gear ratio, use of a spindle side encoder is recommended to assure the precision.

## (2) Variable speed control

(When using V-belt, or when spindle and motor are connected with a gear ratio other than 1:1)

Spindle control item	Control specifications	Without spindle side encoder	With spindle side encoder		
			TS5690/ERM280/ GEL2449M/MHS- 04B Series	OSE-1024	Proximity switch
Spindle control	Normal cutting control	●	●	●	●
	Constant surface speed control (lathe)	● (Note 2)	●	●	● (Note 2)
	Thread cutting (lathe)	x	●	●	x
Orientation control	1-point orientation control	x	●	●	● (Note 4)
	Multi-point orientation control	x	●	●	x
	Orientation indexing	x	●	●	x
Synchronous tap control	Standard synchronous tap	● (Note 3)	●	●	● (Note 3)
	Synchronous tap after zero point return	x	●	●	x
Spindle synchronous control	Without phase alignment function	● (Note 2)	●	●	● (Note 2)
	With phase alignment function	x	●	●	x
C-axis control	C-axis control	x	●	x	x

(Note 1) ● :Control possible

x :Control not possible

(Note 2) Control not possible when connected with the V-belt.

(Note 3) Control not possible when connected with other than the gears.

(Note 4) Orientation is carried out after the spindle is stopped when a proximity switch is used.

As for 2-axis spindle drive unit, setting is available only for one of the axes.

## Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series)

When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side encoder to detect the position and speed of the spindle. Also use this encoder when orientation control and synchronous tap control, etc are executed under the above conditions.

## (1) Specifications

Encoder type		OSE-1024-3-15-68	OSE-1024-3-15-68-8
Mechanical characteristics for rotation	Inertia	0.1x10 <sup>-4</sup> kgm <sup>2</sup> or less	0.1x10 <sup>-4</sup> kgm <sup>2</sup> or less
	Shaft friction torque	0.98Nm or less	0.98Nm or less
	Shaft angle acceleration	10 <sup>4</sup> rad/s <sup>2</sup> or less	10 <sup>4</sup> rad/s <sup>2</sup> or less
	Tolerable continuous rotation speed	6000 r/min	8000 r/min
Mechanical configuration	Bearing maximum non-lubrication time	20000h/6000r/min	20000h/8000r/min
	Shaft run-out (position 15mm from end)	0.02mm or less	0.02mm or less
	Tolerable load (thrust direction/radial direction)	10kg/20kg Half of value during operation	10kg/20kg Half of value during operation
	Mass	1.5kg	1.5kg
	Degree of protection	IP54	
	Squareness of flange to shaft	0.05mm or less	
	Flange matching eccentricity	0.05mm or less	
Working environment	Ambient temperature range	-5°C to +55°C	
	Storage temperature range	-20°C to +85°C	
	Humidity	95%Ph	
	Vibration resistance	5 to 50Hz, total vibration width 1.5mm, each shaft for 30min.	
	Impact resistance	294.20m/s <sup>2</sup> (30G)	

## (2) Detection signals

Signal name	Number of detection pulses
A, B phase	1024p/rev
Z phase	1p/rev

Connector pin layout

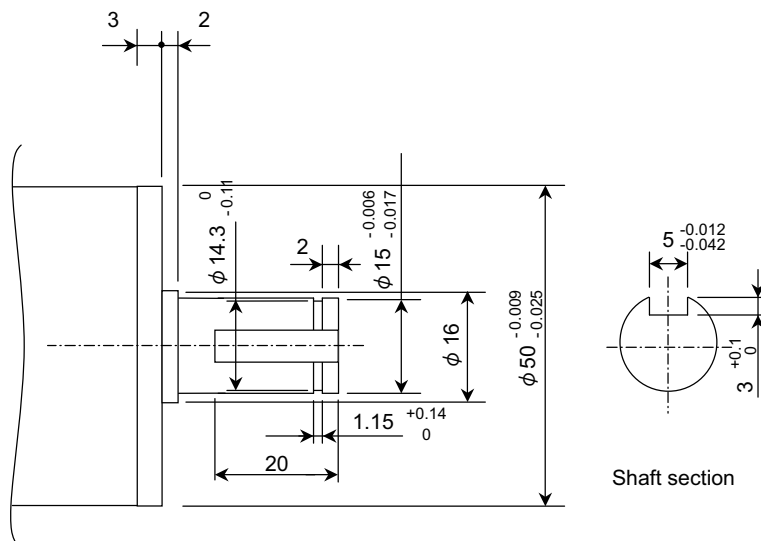
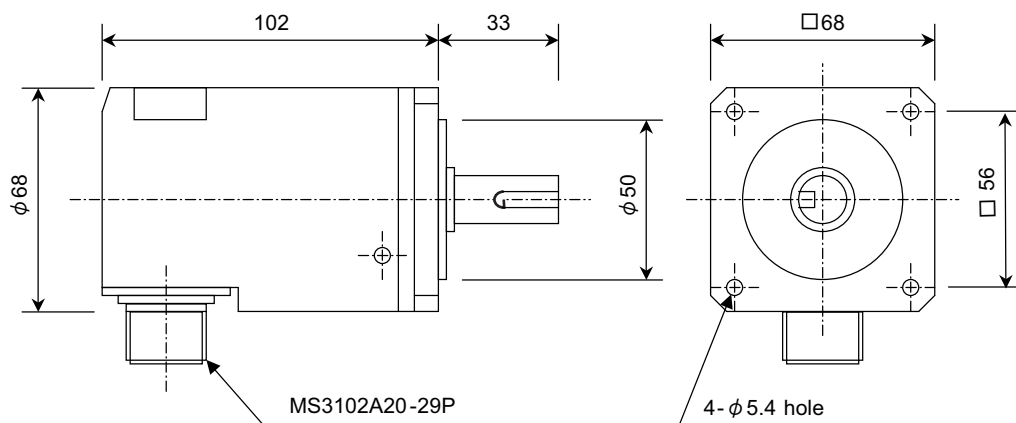
Pin	Function	Pin	Function
A	A+ signal	K	0V
B	Z+ signal	L	-
C	B+ signal	M	-
D	-	N	A- signal
E	Case earth	P	Z- signal
F	-	R	B- signal
G	-	S	-
H	+5V	T	-
J	-		

 **CAUTION**

Cautions for connecting the spindle end with an OSE-1024 encoder

1. Confirm that the gear ratio (pulley ratio) of the spindle end to the encoder is 1:1.
2. Use a timing belt when connecting by a belt.

(3) Outline dimension drawings



Key way magnified figure

[Unit: mm]

Spindle side encoder (OSE-1024-3-15-68, OSE-1024-3-15-68-8)

## Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)

This encoder is used when a more accurate synchronous tapping control or C-axis control than OSE encoder is performed to the spindle which is not directly-connected to the spindle motor.

### (1) Type configuration

< Sensor type >

TS5690N (1) (2) (3)

(1)

Symbol	The number of compatible detection gear teeth
64	64
90	90
12	128
19	192
25	256

(2)

Symbol	Length of the cable
1	400mm
2	800mm
3	1200mm
4	1600mm
5	2000mm

(3)

Symbol	Lead-out direction	Connector specifications
2	Vertical direction	Standard
7	Shaft direction	Standard
8	Shaft direction	Waterproof
9	Vertical direction	Waterproof

< Detection gear type >

MU1606N (1) (2)

(1)

Symbol	The number of detection gear teeth
6	64
9	90
7	128
2	192
8	256

(2) Each specification number

(2) Specifications

Series type		TS5690N64xx										
		xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47
Sensor	Waterproof connector	19	29	39	49	59	18	28	38	48	58	
	Length of lead [mm]	400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Type		MU1606N601										
Detection gear	The number of teeth	64										
	Outer diameter [mm]	Φ52.8										
	Inner diameter [mm]	Φ40H5										
	Thickness [mm]	12										
Notched fitting section	Outer diameter [mm]	Φ59.4										
	Outer diameter tolerance [mm]	-0.070 to -0.030										
The number of output pulse	A/B phase	64										
	Z phase	1										
Detection resolution [p/rev]		2 million										
Absolute accuracy at stop		150"										
Tolerable speed [r/min]		40,000										
Signal output		Mitsubishi high-speed serial										

Series type		TS5690N90xx										
		xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47
Sensor	Waterproof connector	19	29	39	49	59	18	28	38	48	58	
	Length of lead [mm]	400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Type		MU1606N906										
Detection gear	The number of teeth	90										
	Outer diameter [mm]	Φ73.6										
	Inner diameter [mm]	Φ60H5										
	Thickness [mm]	12										
Notched fitting section	Outer diameter [mm]	Φ79.2										
	Outer diameter tolerance [mm]	-0.040 to 0										
The number of output pulse	A/B phase	90										
	Z phase	1										
Detection resolution [p/rev]		2.88 million										
Absolute accuracy at stop		105"										
Tolerable speed [r/min]		30,000										
Signal output		Mitsubishi high-speed serial										

Series type		TS5690N12xx										
		xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47
Sensor	Waterproof connector	19	29	39	49	59	18	28	38	48	58	
	Length of lead [mm]	400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30	
Lead-out direction of lead		Vertical direction					Axis direction					
Type		MU1606N709										
Detection gear	The number of teeth	128										
	Outer diameter [mm]	Φ104.0										
	Inner diameter [mm]	Φ80H5										
	Thickness [mm]	12										
Notched fitting section	Outer diameter [mm]	Φ108.8										
	Outer diameter tolerance [mm]	-0.015 to +0.025										
The number of output pulse	A/B phase	128										
	Z phase	1										
Detection resolution [p/rev]		4 million										
Absolute accuracy at stop		100"										
Tolerable speed [r/min]		20,000										
Signal output		Mitsubishi high-speed serial										

Sensor	Series type		TS5690N19xx									
	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead-out direction of lead		Vertical direction					Axis direction				
Detection gear	Type		MU1606N203									
	The number of teeth		192									
	Outer diameter [mm]		Φ155.2									
	Inner diameter [mm]		Φ125H5									
	Thickness [mm]		12									
Notched fitting section	Outer diameter [mm]		Φ159.4									
	Outer diameter tolerance [mm]		-0.035 to +0.005									
The number of output pulse	A/B phase		192									
	Z phase		1									
Detection resolution [p/rev]			6 million									
Absolute accuracy at stop			97.5"									
Tolerable speed [r/min]			15,000									
Signal output			Mitsubishi high-speed serial									

Sensor	Series type		TS5690N25xx									
	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Waterproof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead-out direction of lead		Vertical direction					Axis direction				
Detection gear	Type		MU1606N802									
	The number of teeth		256									
	Outer diameter [mm]		Φ206.4									
	Inner diameter [mm]		Φ160									
	Thickness [mm]		15.8									
Notched fitting section	Outer diameter [mm]		Φ210.2									
	Outer diameter tolerance [mm]		0.0 to +0.040									
The number of output pulse	A/B phase		256									
	Z phase		1									
Detection resolution [p/rev]			8 million									
Absolute accuracy at stop			95"									
Tolerable speed [r/min]			10,000									
Signal output			Mitsubishi high-speed serial									

**⚠ CAUTION**

1. Selected encoders must be able to tolerate the maximum rotation speed of the motor.
2. Please contact your Mitsubishi Electric dealer for the special products not listed above.

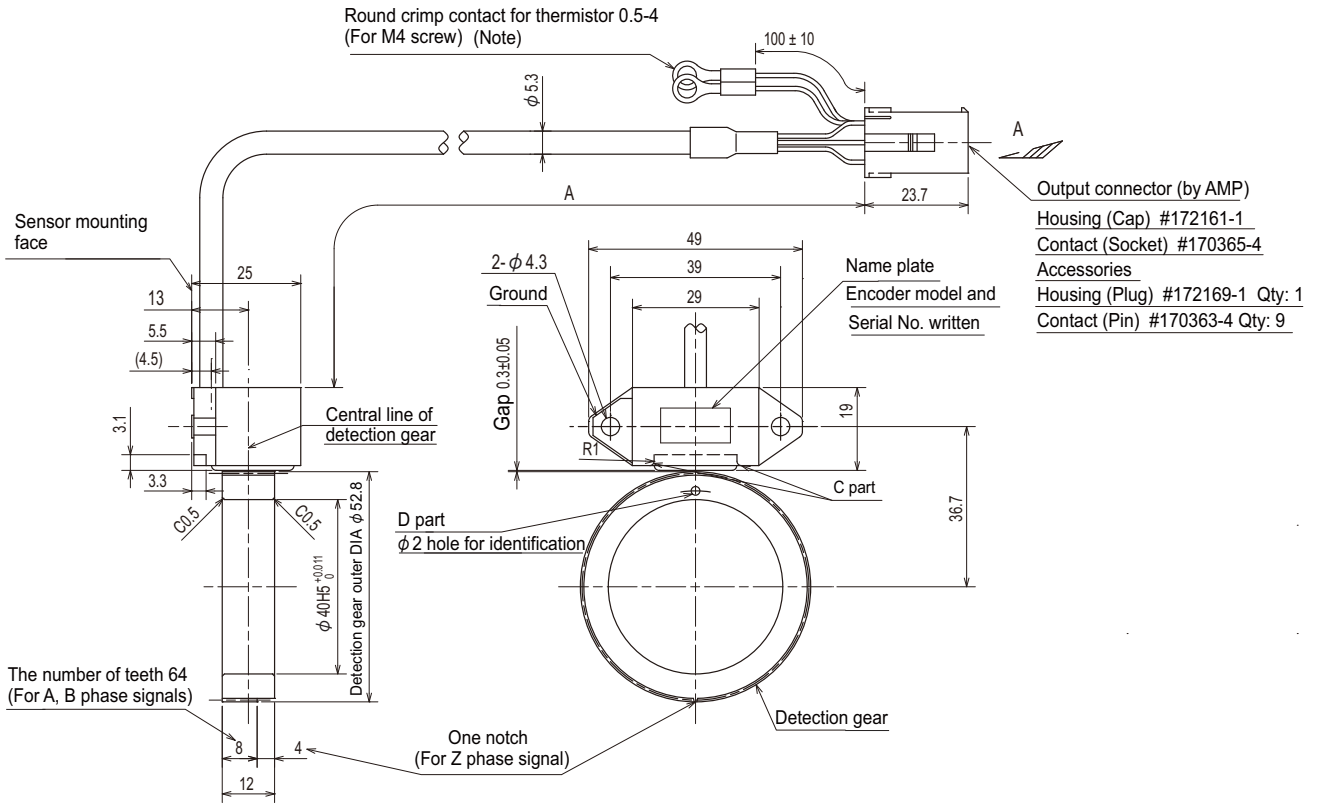
(3) Outline dimension drawings

**CAUTION**

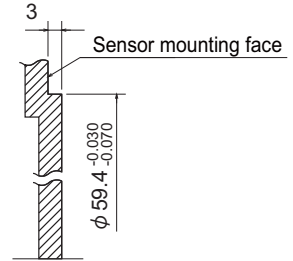
Always apply the notched fitting section machining with the specified dimensions to the sensor installation surface.

< TS5690N64x2 + MU1606N601 >

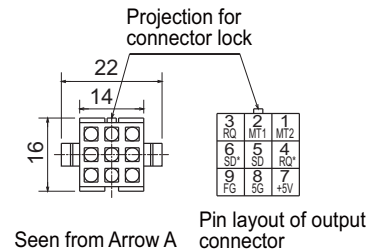
[Unit: mm]



(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



Encoder mounting face of machine side

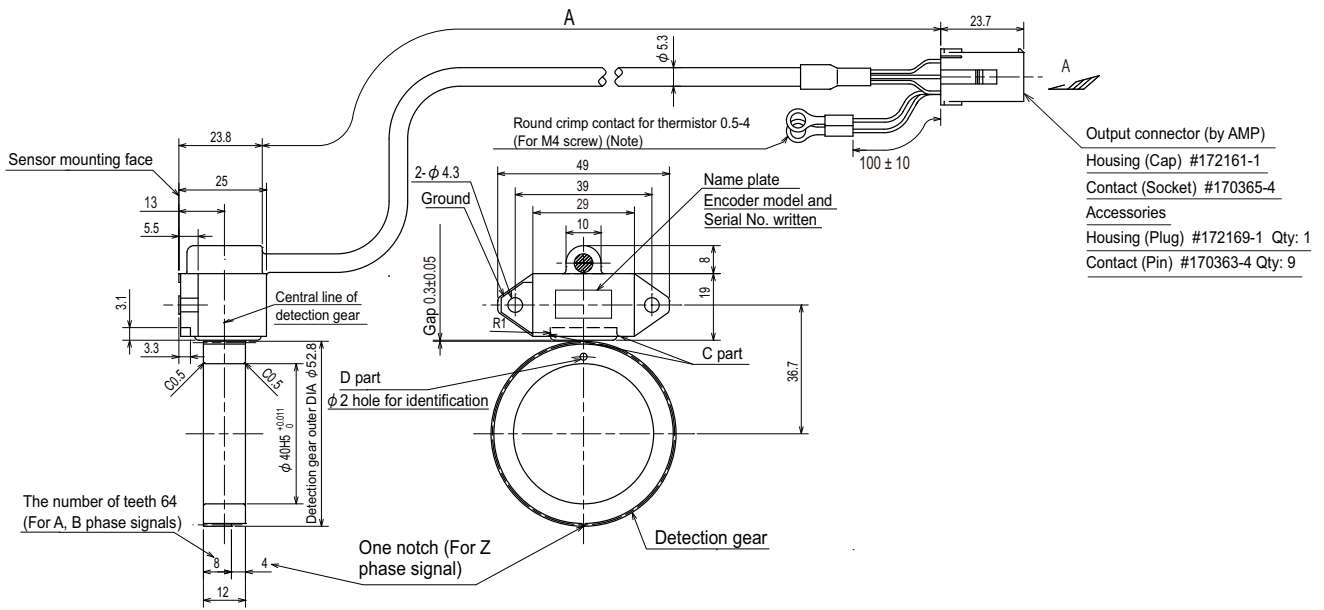


Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6412	400±10	Vertical direction	MU1606N601
TS5690N6422	800±20		
TS5690N6432	1200±20		
TS5690N6442	1600±30		
TS5690N6452	2000±30		



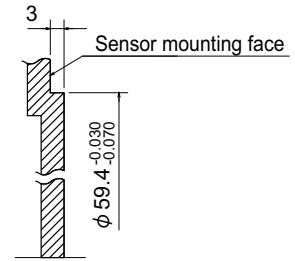
< TS5690N64x7 + MU1606N601 >

[Unit: mm]



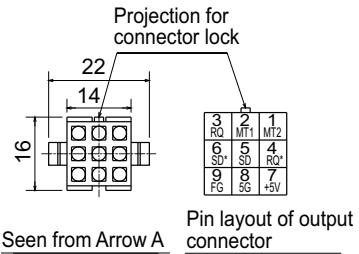
- Output connector (by AMP)
- Housing (Cap) #172161-1
- Contact (Socket) #170365-4
- Accessories
- Housing (Plug) #172169-1 Qty: 1
- Contact (Pin) #170363-4 Qty: 9

(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



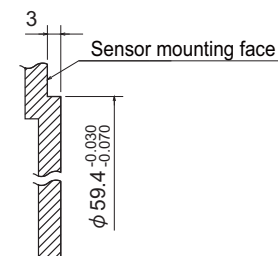
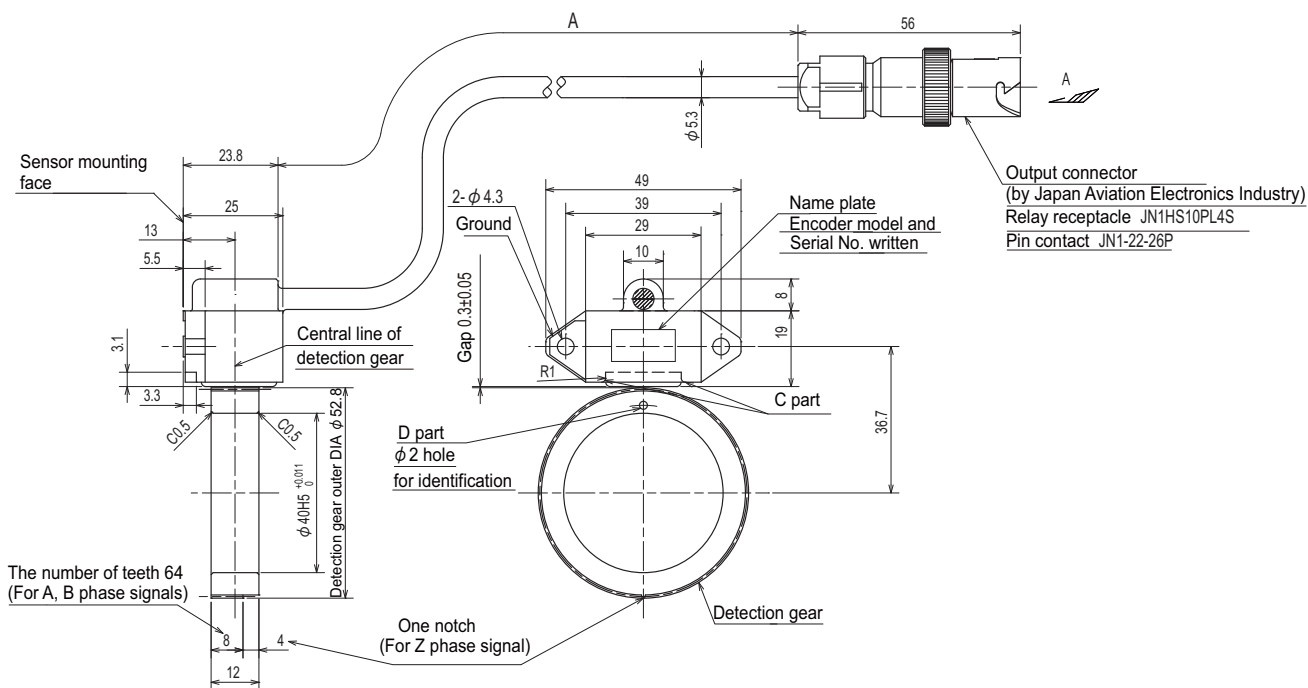
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6417	400±10	Axis direction	MU1606N601
TS5690N6427	800±20		
TS5690N6437	1200±20		
TS5690N6447	1600±30		
TS5690N6457	2000±30		

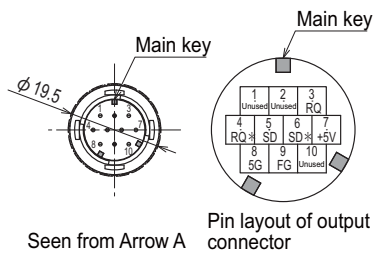


< TS5690N64x8 + MU1606N601 >

[Unit: mm]



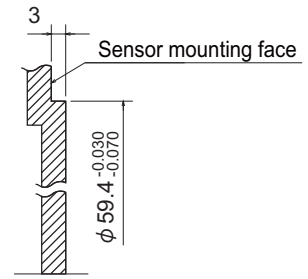
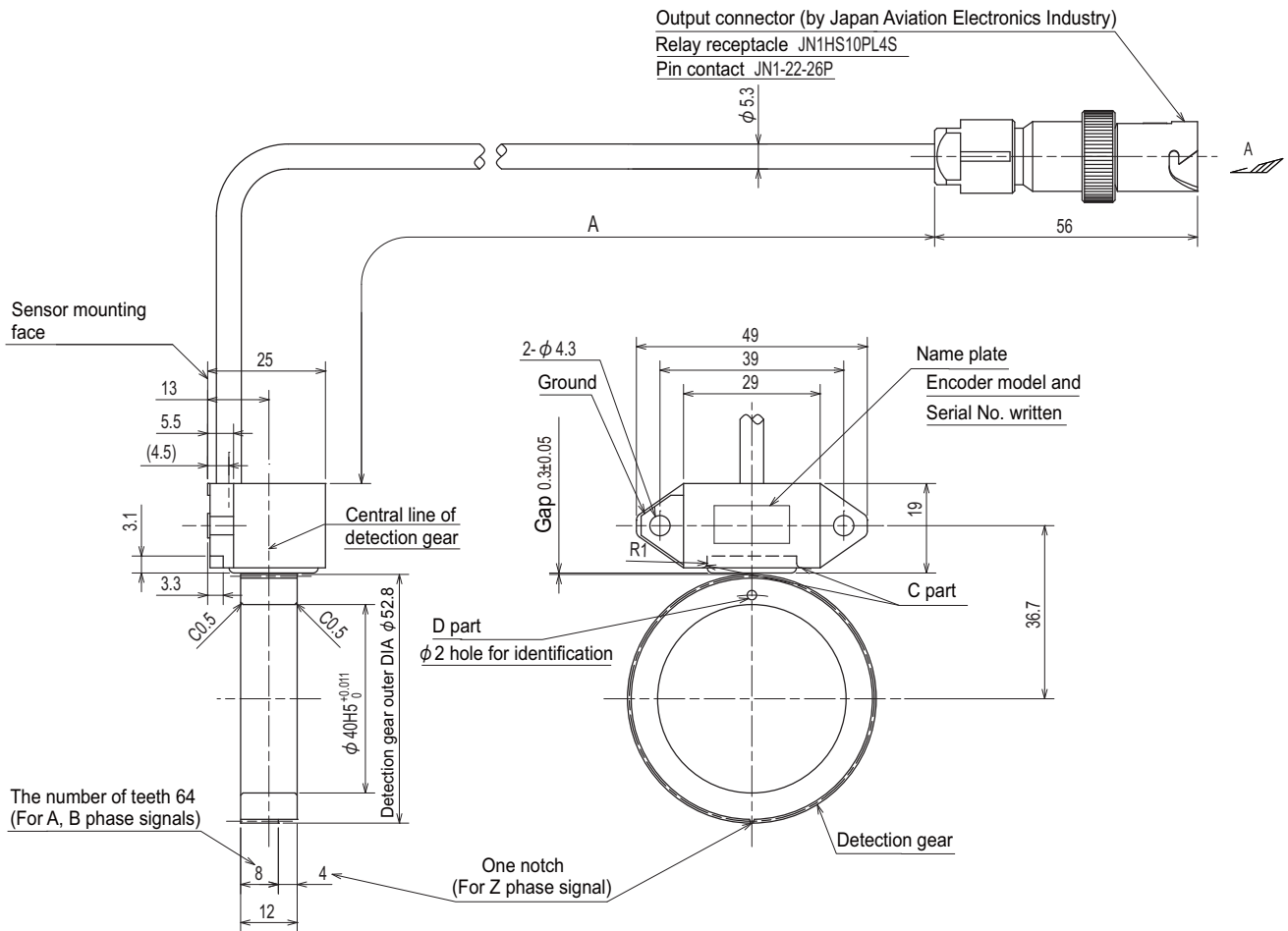
Encoder mounting face of machine side



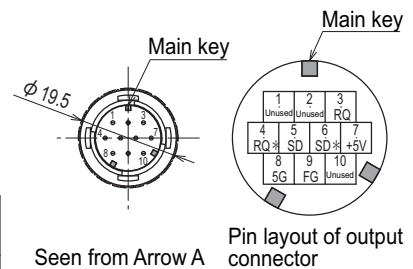
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6418	400±10	Axis direction	MU1606N601
TS5690N6428	800±20		
TS5690N6438	1200±20		
TS5690N6448	1600±30		
TS5690N6458	2000±30		

< TS5690N64x9 + MU1606N601 >

[Unit: mm]



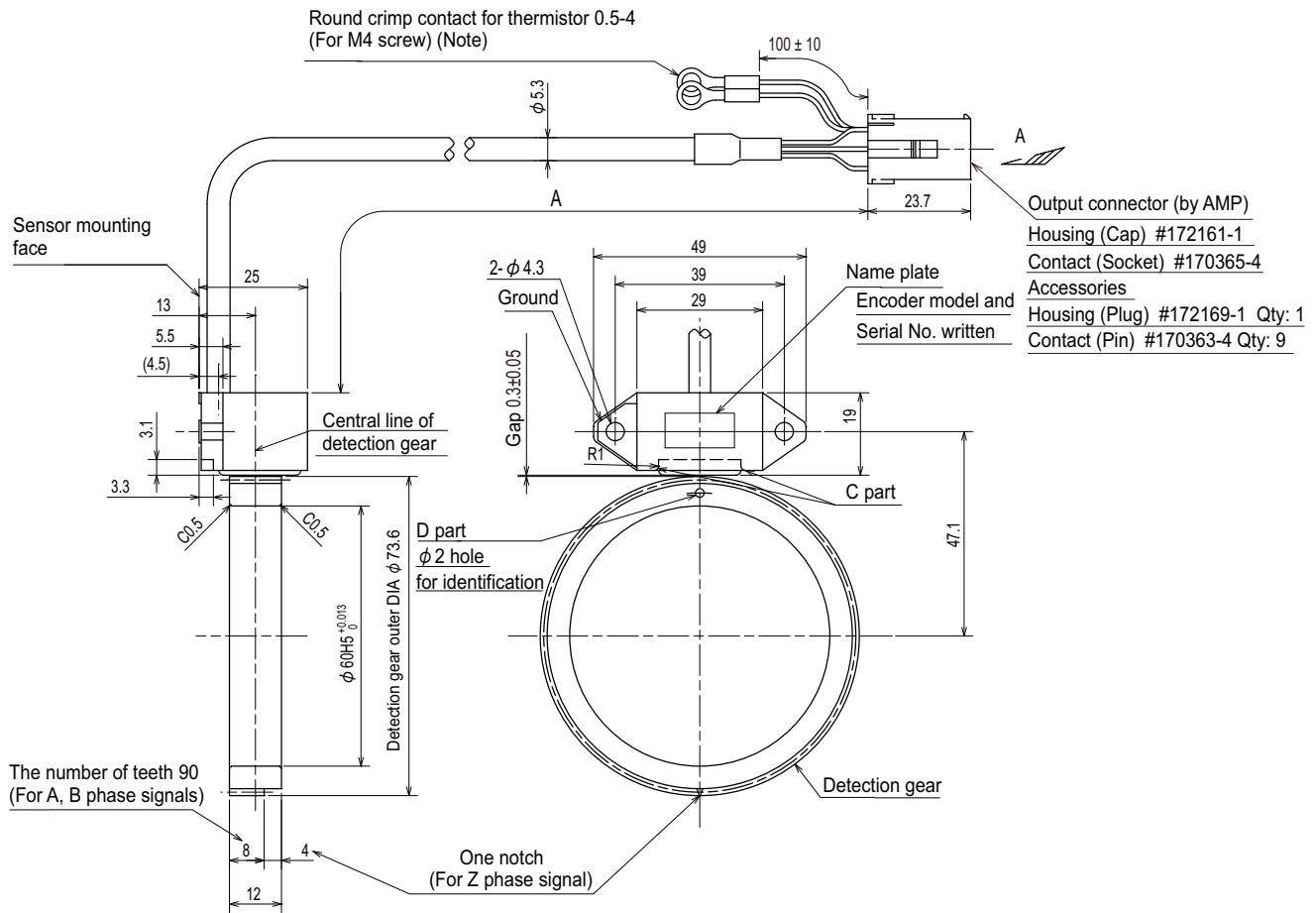
Encoder mounting face of machine side



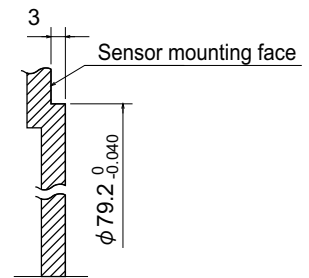
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N6419	400±10	Vertical direction	MU1606N601
TS5690N6429	800±20		
TS5690N6439	1200±20		
TS5690N6449	1600±30		
TS5690N6459	2000±30		

< TS5690N90x2 + MU1606N906 >

[Unit: mm]

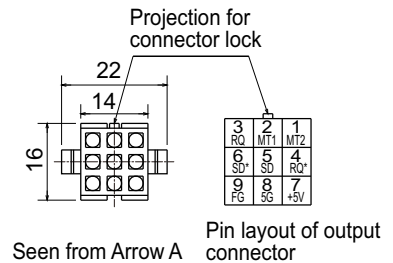


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



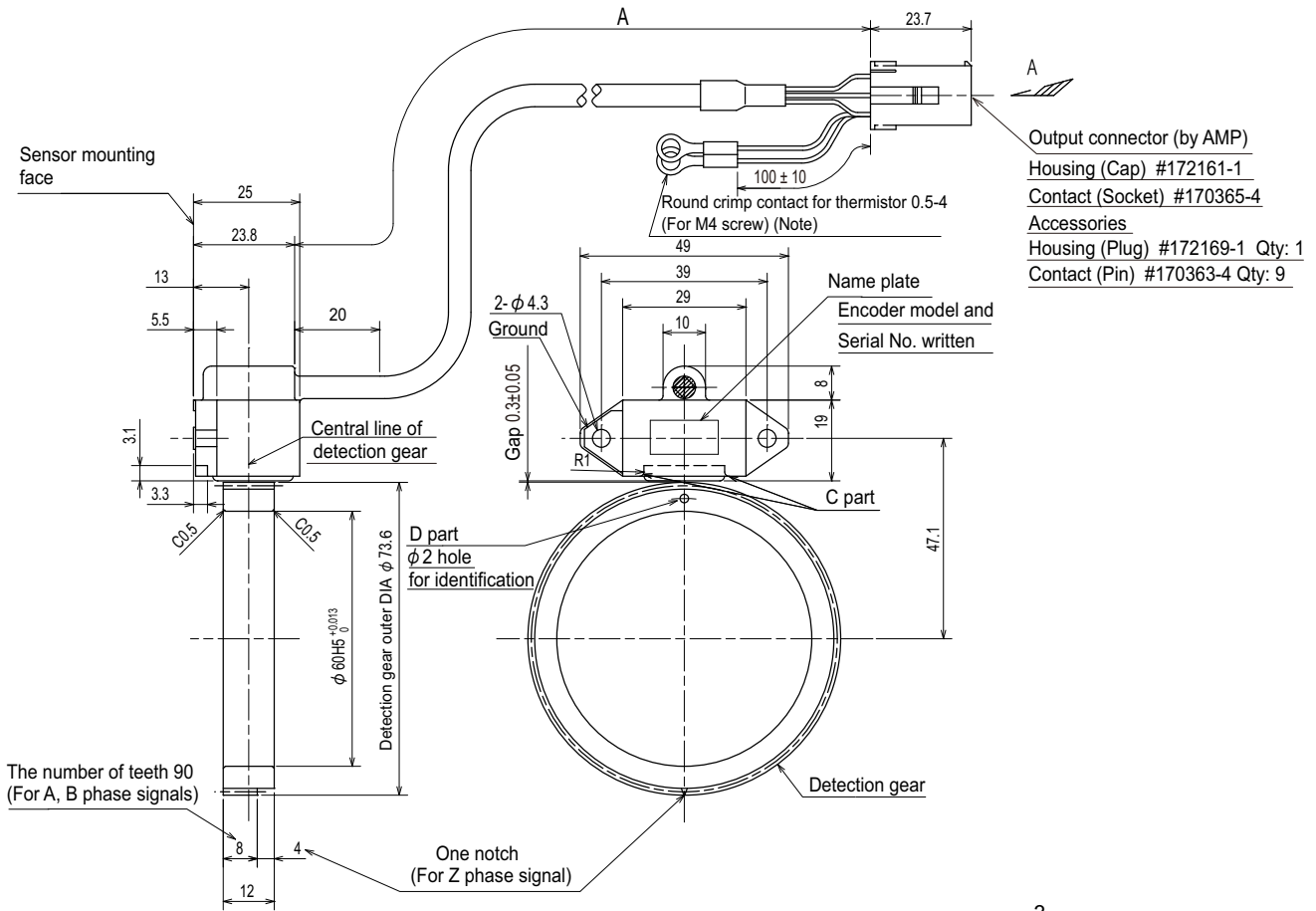
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9012	400±10	Vertical direction	MU1606N906
TS5690N9022	800±20		
TS5690N9032	1200±20		
TS5690N9042	1600±30		
TS5690N9052	2000±30		

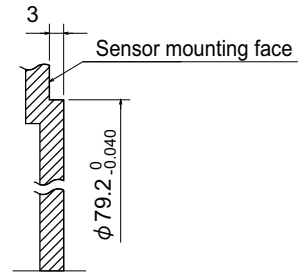


< TS5690N90x7 + MU1606N906 >

[Unit: mm]

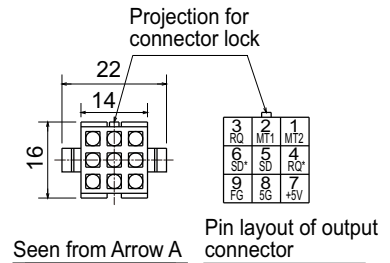


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



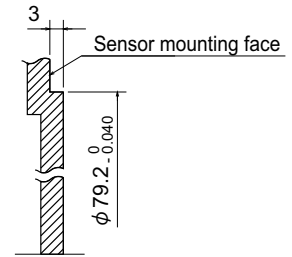
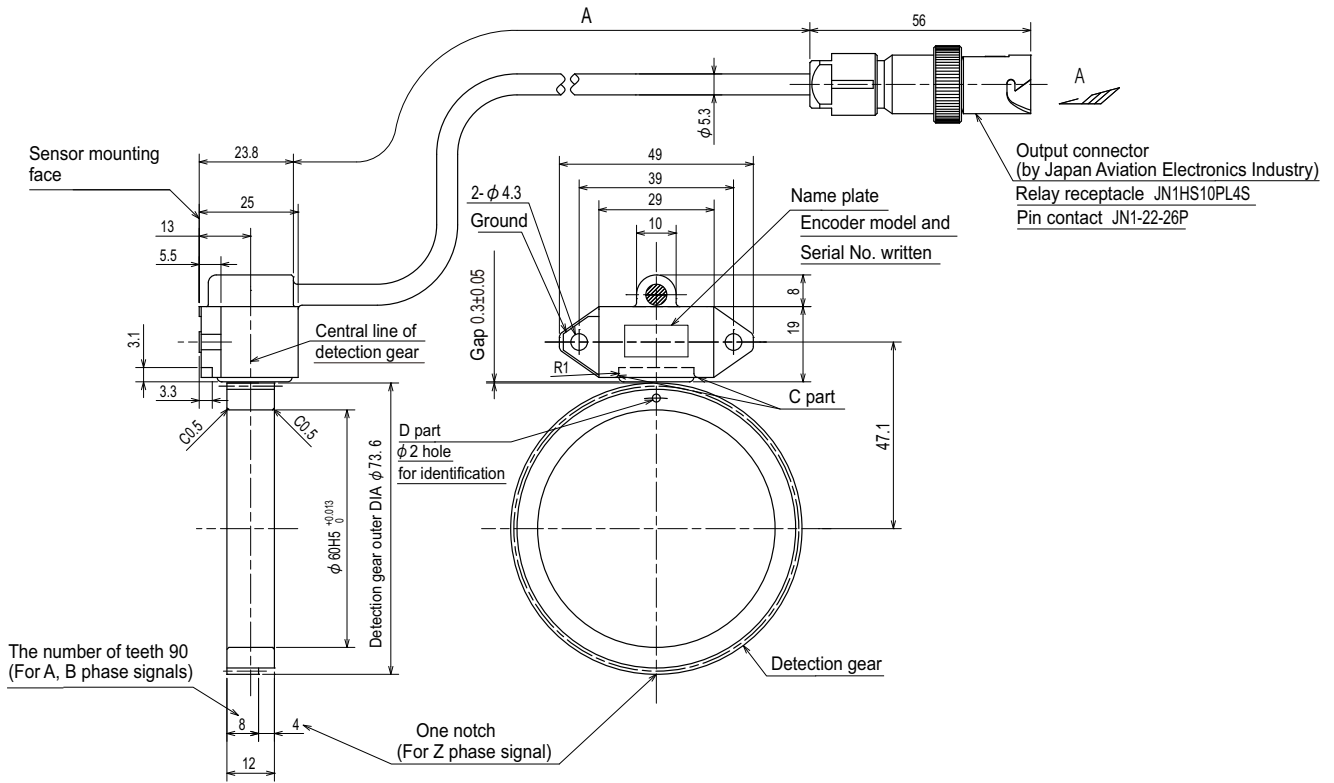
Encoder mounting face of machine side

Sensor		Lead-out direction of lead	Detection gear
Parts name	Lead wire length A [mm]		Parts name
TS5690N9017	400±10	Axis direction	MU1606N906
TS5690N9027	800±20		
TS5690N9037	1200±20		
TS5690N9047	1600±30		
TS5690N9057	2000±30		

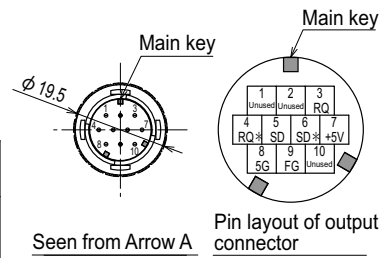


< TS5690N90x8 + MU1606N906 >

[Unit: mm]



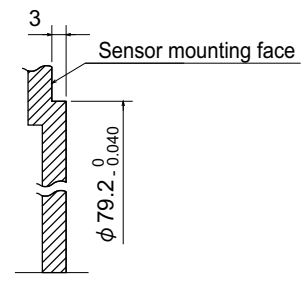
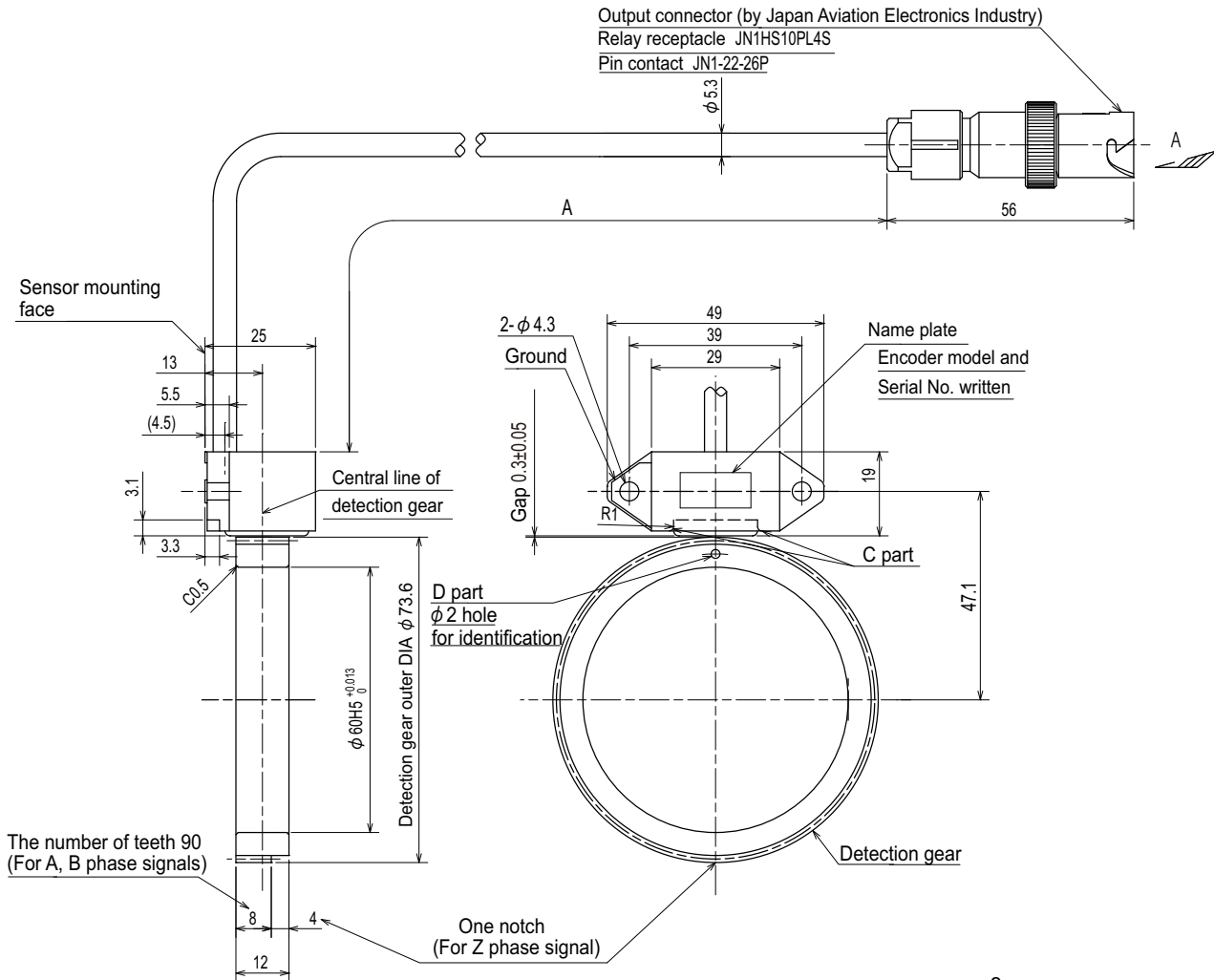
Encoder mounting face of machine side



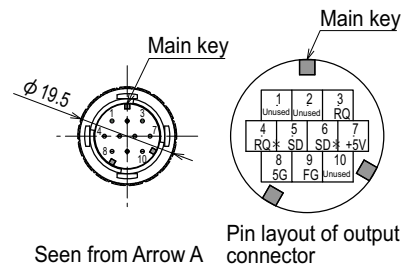
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9018	400±10	Axis direction	MU1606N906
TS5690N9028	800±20		
TS5690N9038	1200±20		
TS5690N9048	1600±30		
TS5690N9058	2000±30		

< TS5690N90x9 + MU1606N906 >

[Unit: mm]



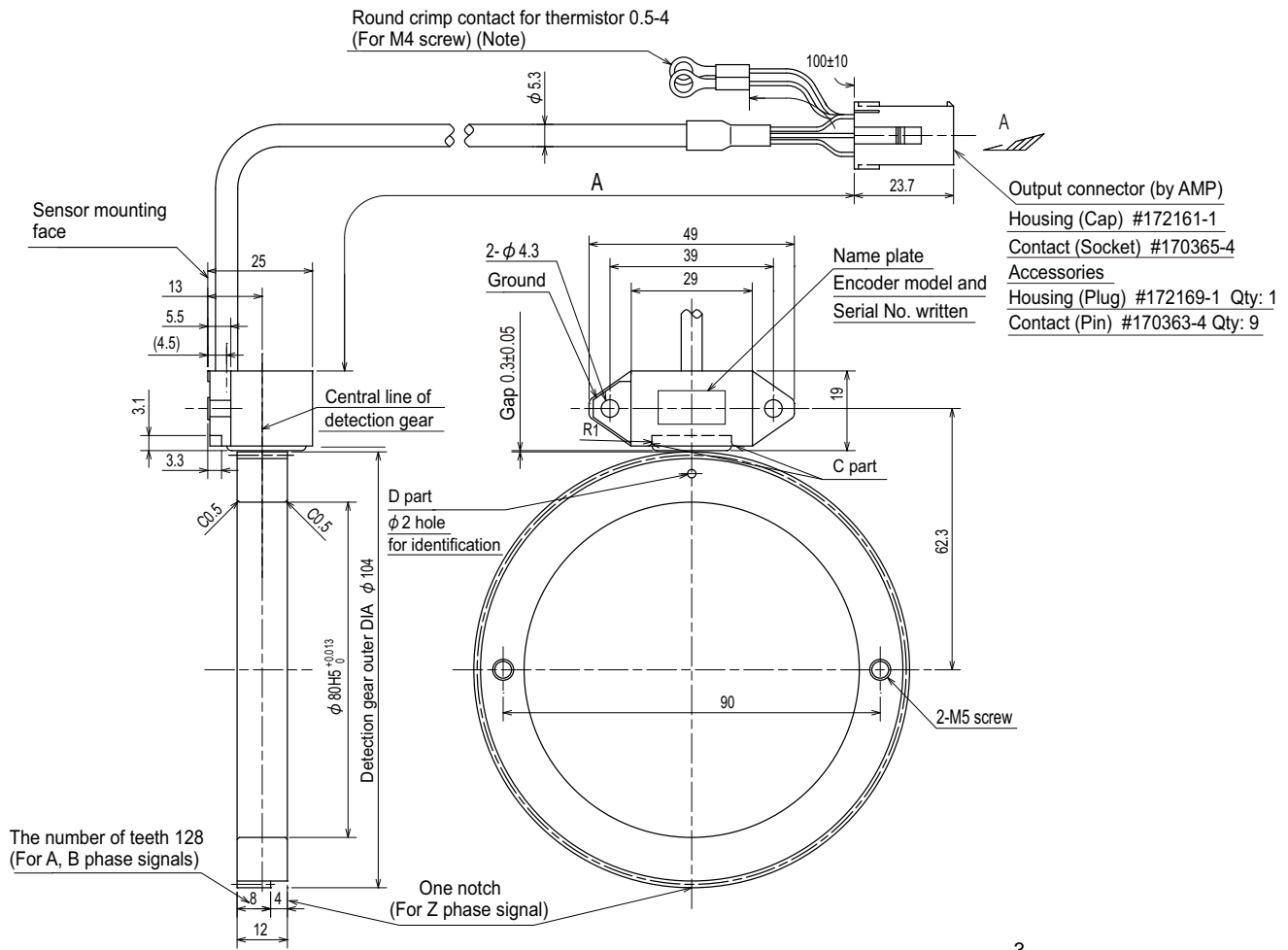
Encoder mounting face of machine side



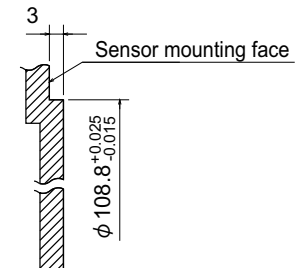
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N9019	400±10	Vertical direction	MU1606N906
TS5690N9029	800±20		
TS5690N9039	1200±20		
TS5690N9049	1600±30		
TS5690N9059	2000±30		

< TS5690N12x2 + MU1606N709 >

[Unit: mm]

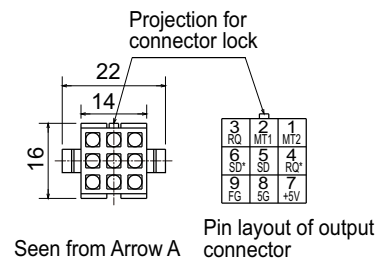


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1212	400±10	Vertical direction	MU1606N709
TS5690N1222	800±20		
TS5690N1232	1200±20		
TS5690N1242	1600±30		
TS5690N1252	2000±30		

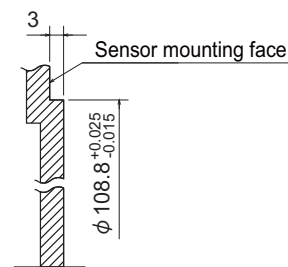
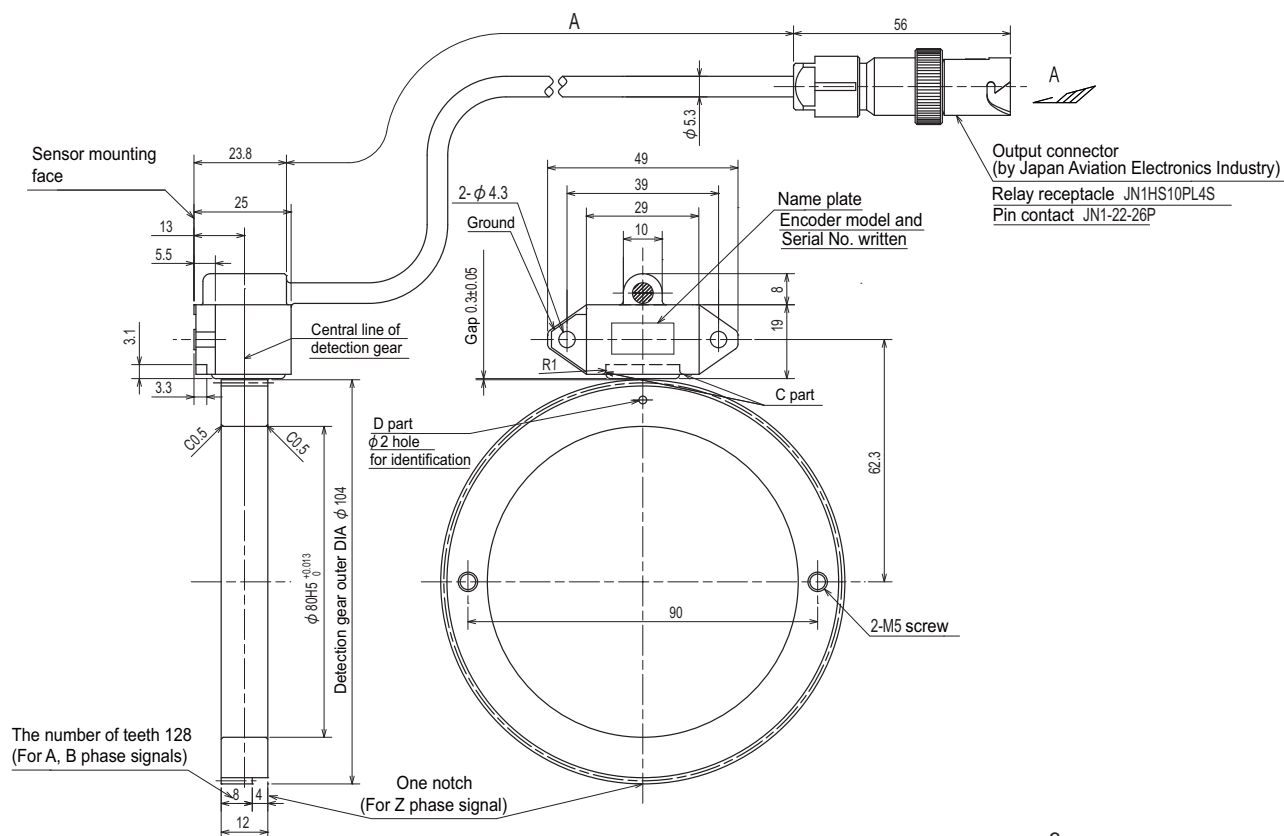






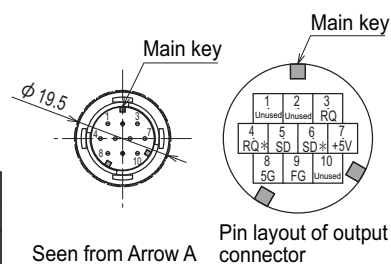
< TS5690N12x8 + MU1606N709 >

[Unit: mm]



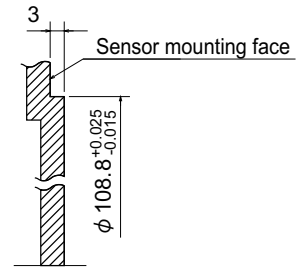
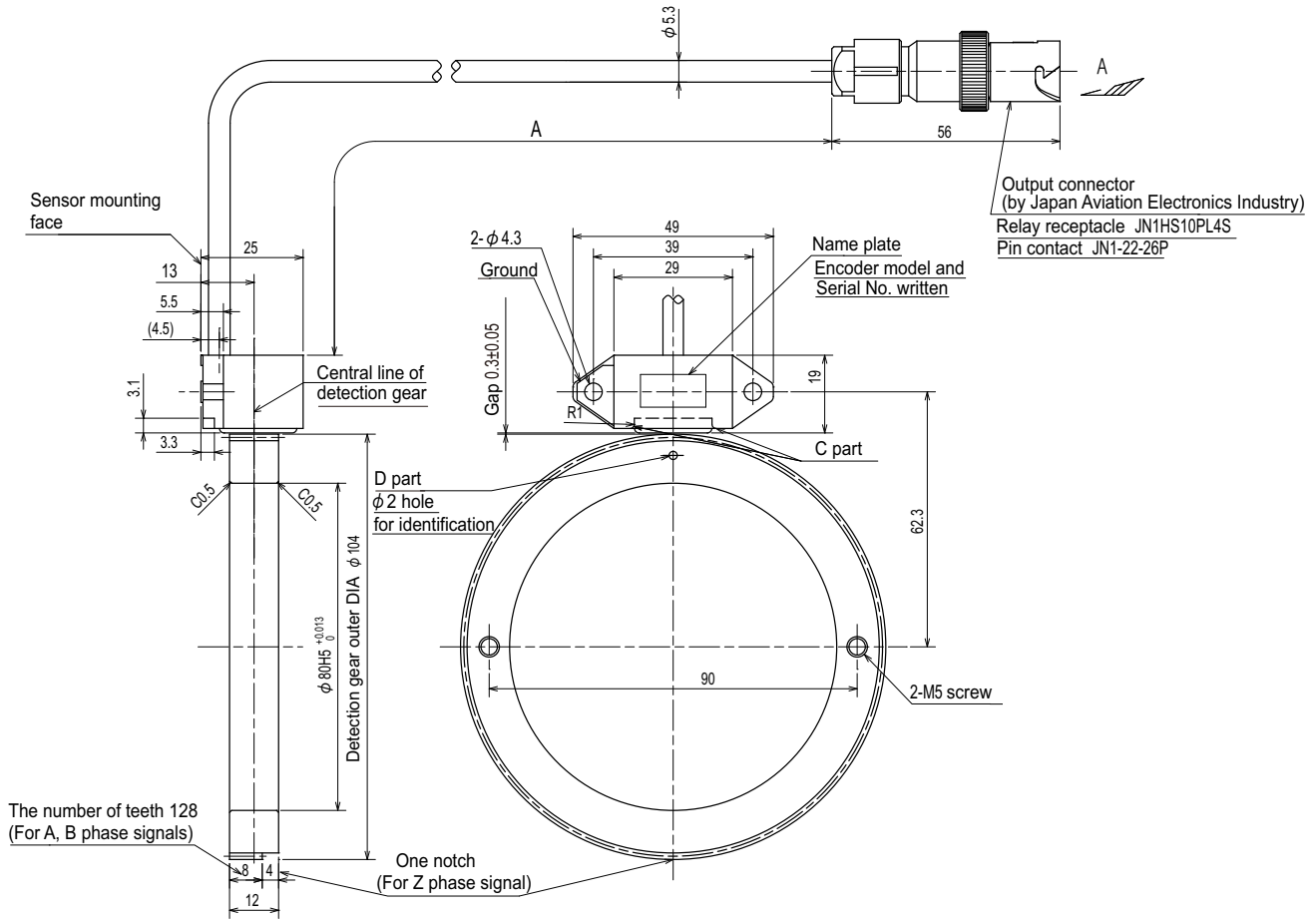
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1218	400±10	Axis direction	MU1606N709
TS5690N1228	800±20		
TS5690N1238	1200±20		
TS5690N1248	1600±30		
TS5690N1258	2000±30		

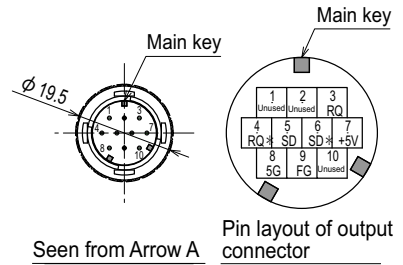


< TS5690N12x9 + MU1606N709 >

[Unit: mm]



Encoder mounting face of machine side



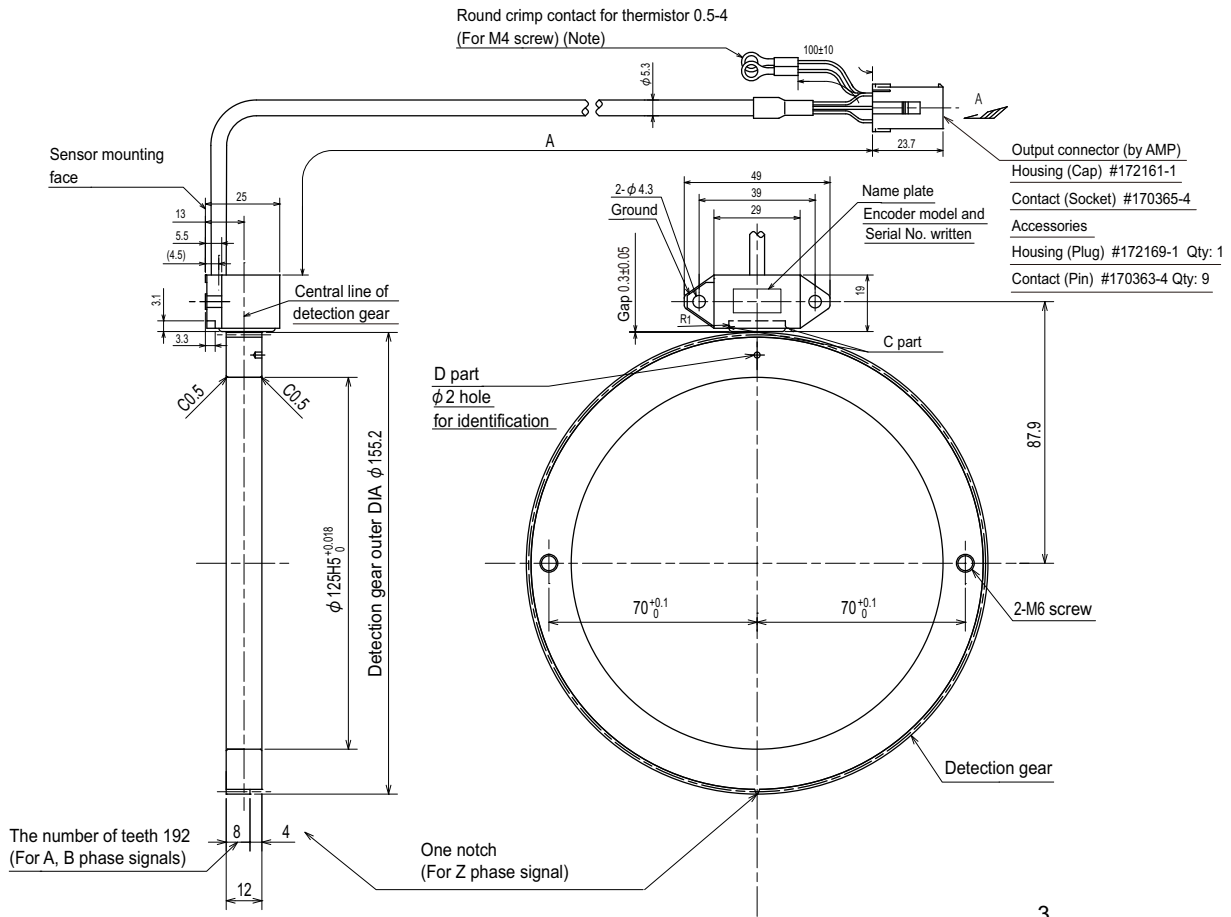
Seen from Arrow A

Pin layout of output connector

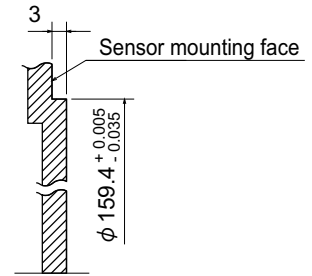
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1219	400±10	Vertical direction	MU1606N709
TS5690N1229	800±20		
TS5690N1239	1200±20		
TS5690N1249	1600±30		
TS5690N1259	2000±30		

< TS5690N19x2 + MU1606N203 >

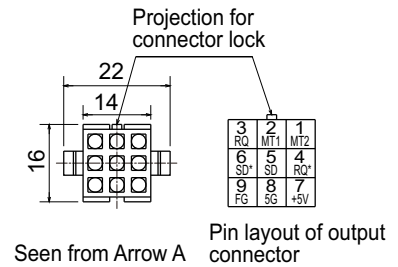
[Unit: mm]



(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



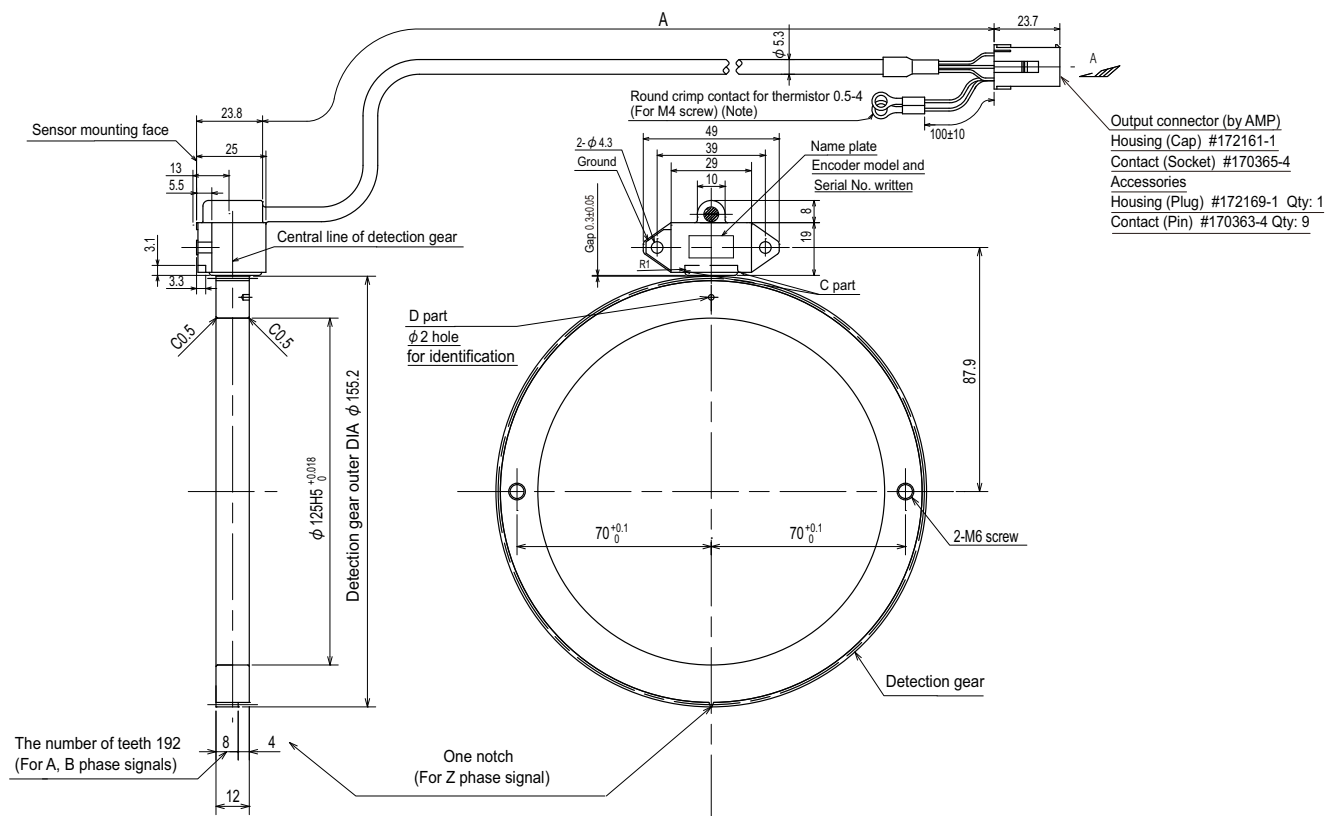
Encoder mounting face of machine side



Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1912	400±10	Vertical direction	MU1606N203
TS5690N1922	800±20		
TS5690N1932	1200±20		
TS5690N1942	1600±30		
TS5690N1952	2000±30		

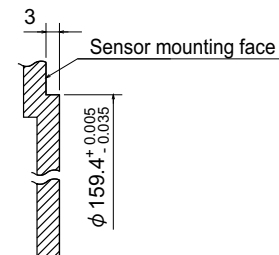
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[Unit: mm]



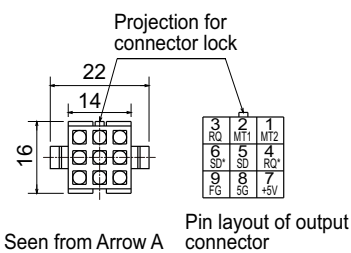
Output connector (by AMP)  
 Housing (Cap) #172161-1  
 Contact (Socket) #170365-4  
 Accessories  
 Housing (Plug) #172169-1 Qty: 1  
 Contact (Pin) #170363-4 Qty: 9

(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder. Insulate the terminal.



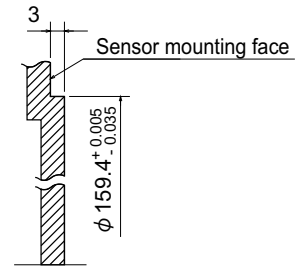
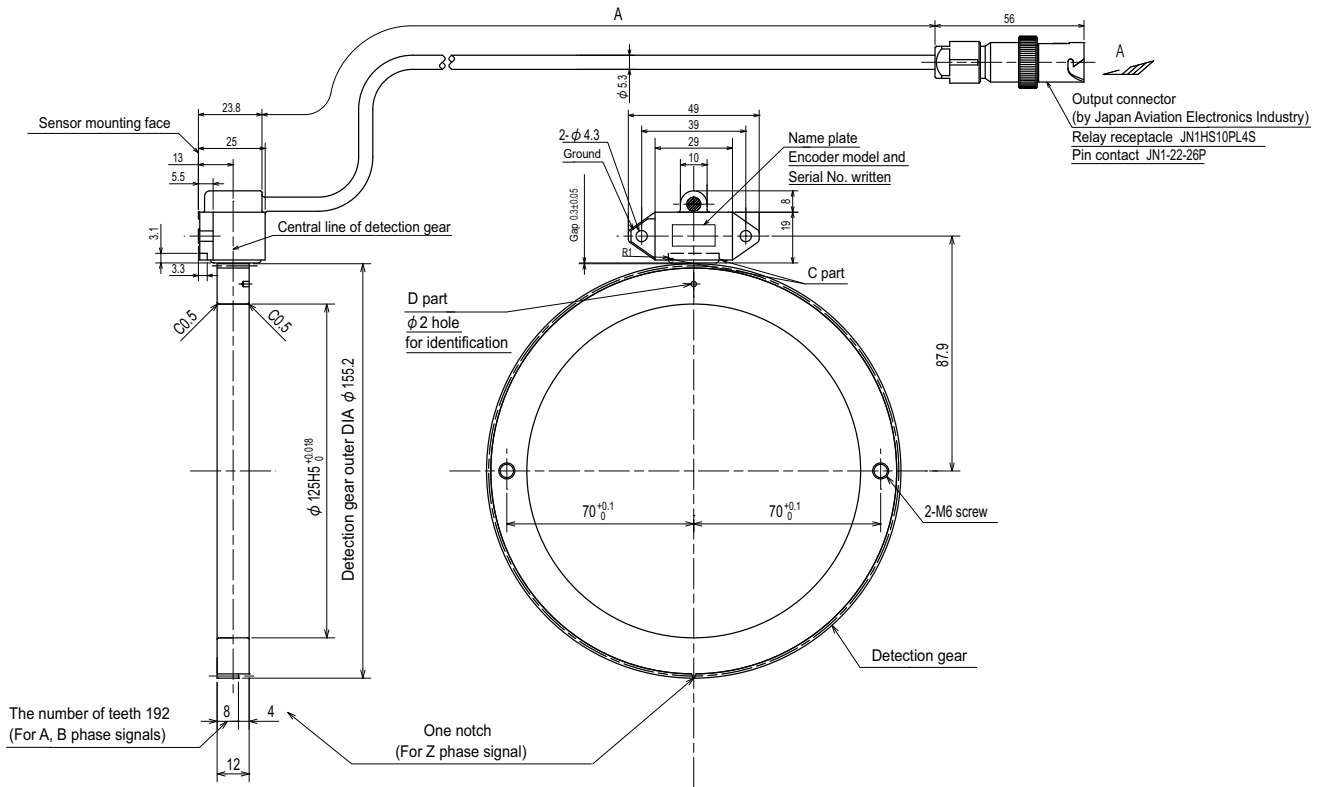
Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1917	400±10	Axis direction	MU1606N203
TS5690N1927	800±20		
TS5690N1937	1200±20		
TS5690N1947	1600±30		
TS5690N1957	2000±30		

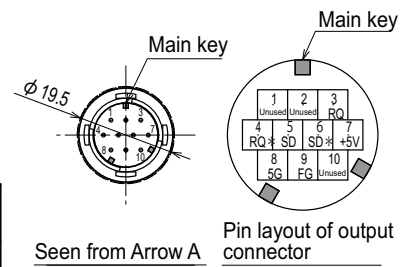


< TS5690N19x8 + MU1606N203 >

[Unit: mm]



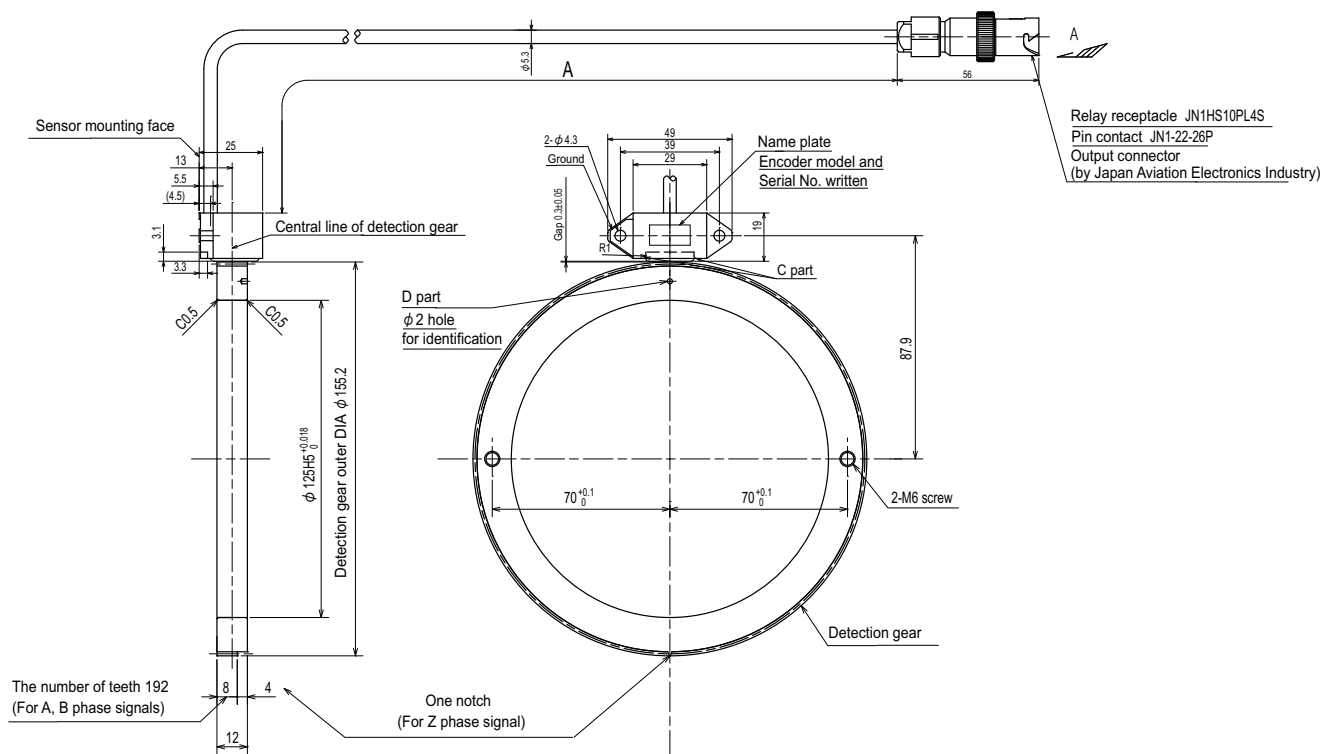
Encoder mounting face of machine side



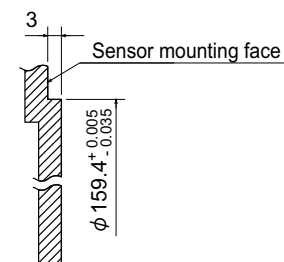
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1918	400±10	Axis direction	MU1606N203
TS5690N1928	800±20		
TS5690N1938	1200±20		
TS5690N1948	1600±30		
TS5690N1958	2000±30		

< TS5690N19x9 + MU1606N203 >

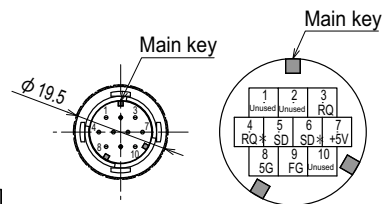
[Unit: mm]



Relay receptacle JN1HS10PL4S  
Pin contact JN1-22-26P  
Output connector  
(by Japan Aviation Electronics Industry)



Encoder mounting face of machine side

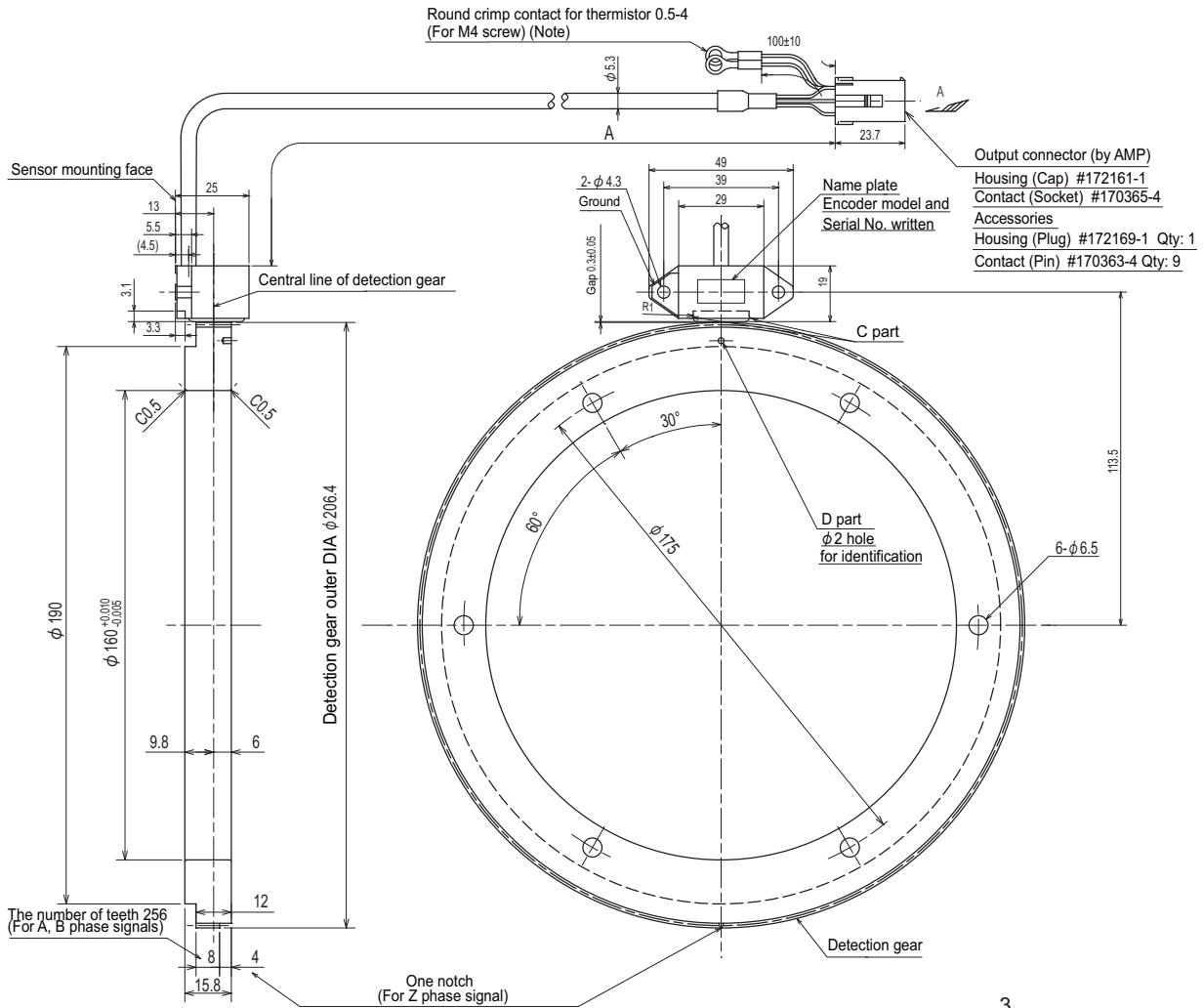


Seen from Arrow A Pin layout of output connector

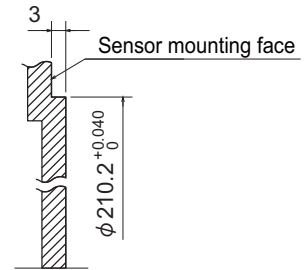
Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N1919	400±10	Vertical direction	MU1606N203
TS5690N1929	800±20		
TS5690N1939	1200±20		
TS5690N1949	1600±30		
TS5690N1959	2000±30		

< TS5690N25x2 + MU1606N802 >

[Unit: mm]

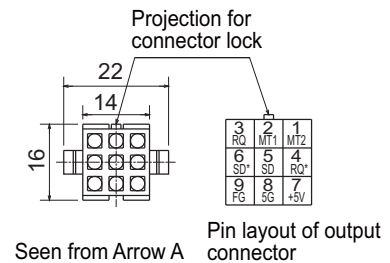


(Note) The thermistor contact is not used when the encoder is used as a spindle side encoder.  
Insulate the terminal.



Encoder mounting face of machine side

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2512	400±10	Vertical direction	MU1606N802
TS5690N2522	800±20		
TS5690N2532	1200±20		
TS5690N2542	1600±30		
TS5690N2552	2000±30		

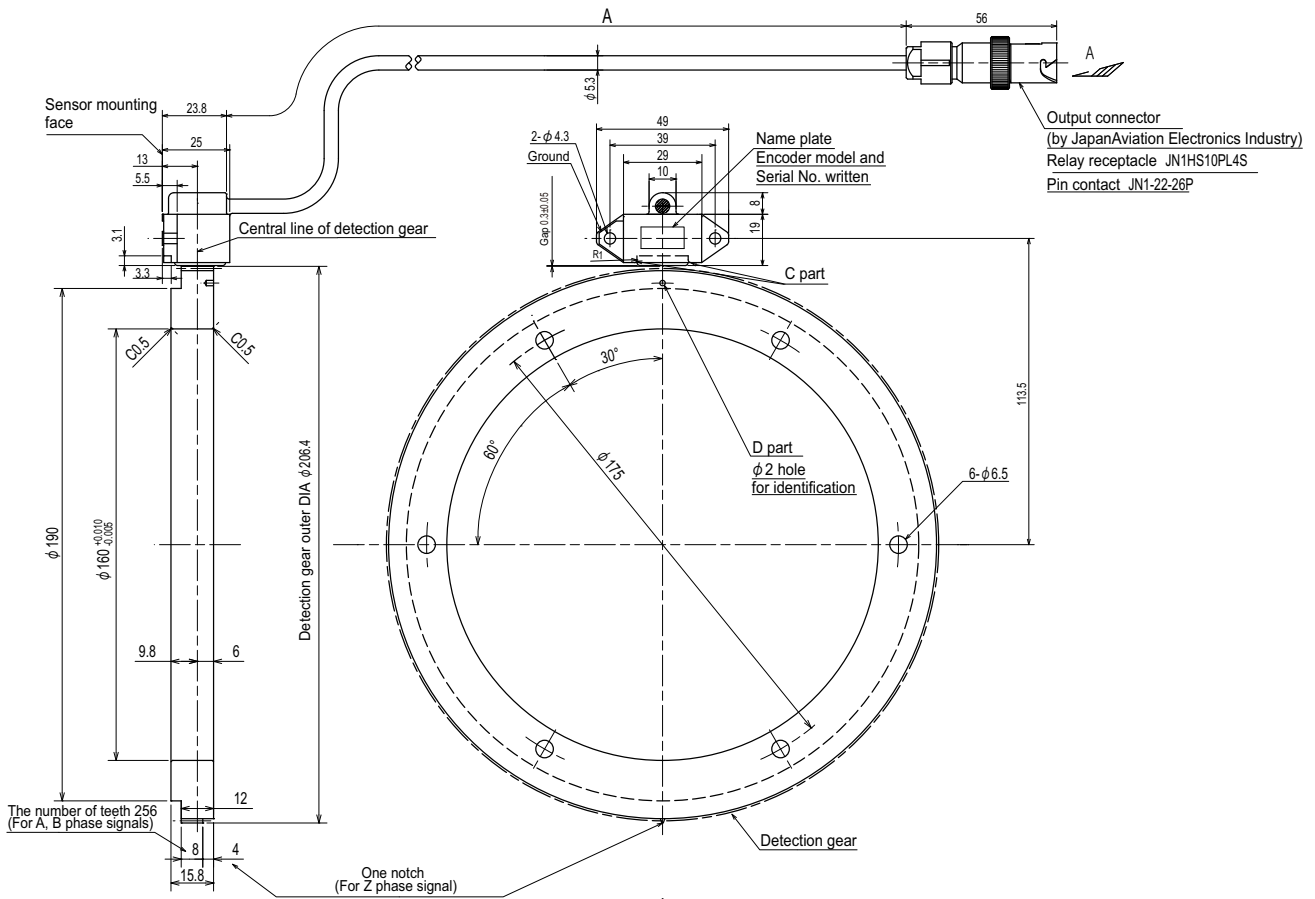




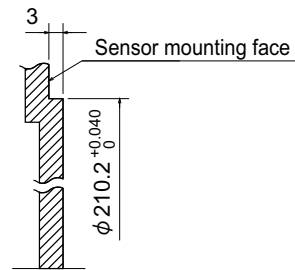


< TS5690N25x8 + MU1606N802 >

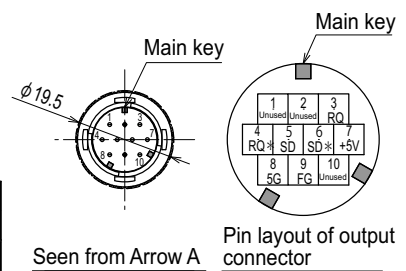
[Unit: mm]



Output connector  
(by JapanAviation Electronics Industry)  
Relay receptacle JN1HS10PL4S  
Pin contact JN1-22-26P



Encoder mounting face of machine side



Pin layout of output connector

Sensor			Detection gear
Parts name	Lead wire length A [mm]	Lead-out direction of lead	Parts name
TS5690N2518	400±10	Axis direction	MU1606N802
TS5690N2528	800±20		
TS5690N2538	1200±20		
TS5690N2548	1600±30		
TS5690N2558	2000±30		



## Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR

This unit superimposes the scale analog output raw waves, and generates high resolution position data. Increasing the encoder resolution is effective for the servo high-gain.

## (1) Specifications

Type	MDS-EX-HR-11
Consumption current	150mA
Analog signal input specifications	A -phase, B -phase, Z-phase (Amplitude 1Vp-p/ Min.: 0.8Vp-p Max.: 1.2Vp-p)
Compatible frequency	Analog raw waveform max.200kHz
Scale resolution	Analog raw waveform / 16384 division
Output communication style	High-speed serial communication
Working ambient temperature	0 to 55°C
Working ambient humidity	90%RH or less (with no dew condensation)
Atmosphere	No toxic gases
Tolerable vibration	98.0 m/s <sup>2</sup> (10G)
Tolerable impact	294.0 m/s <sup>2</sup> (30G)
Tolerable power voltage	5VDC±5%
Maximum heating value	2W
Cable length	Drive side: Max. 30m / Encoder side: Max. 15m
Mass	0.2kg
Degree of protection	IP67

(Note) For the encoder side cable, wire the power line redundantly so that the voltage supplied to the encoder will not drop below the minimum tolerance.

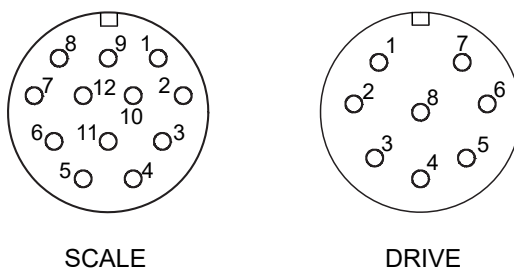
(2) Explanation of connectors

Connector name	Application
SCALE	For connection with scale
DRIVE	For connection with servo drive unit

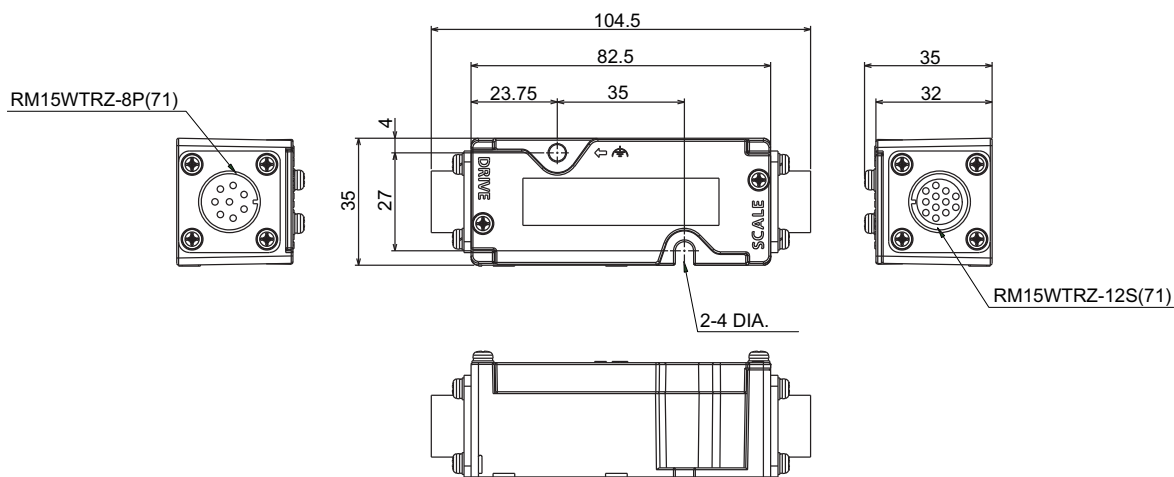
SCALE		DRIVE	
Pin No.	Function	Pin No.	Function
1	A+ signal	1	RQ+ signal
2	A- signal	2	RQ- signal
3	B+ signal	3	SD+ signal
4	B- signal	4	SD- signal
5	Z+ signal	5	P5
6	Z- signal	6	P5
7	-	7	GND
8	-	8	GND
9	-		
10	-		
11	P5		
12	GND		

< Connector pin layout >

Connector	Type
SCALE	RM15WTRZ-12S(71) (Hirose Electric)
DRIVE	RM15WTRZ- 8P(71) (Hirose Electric)

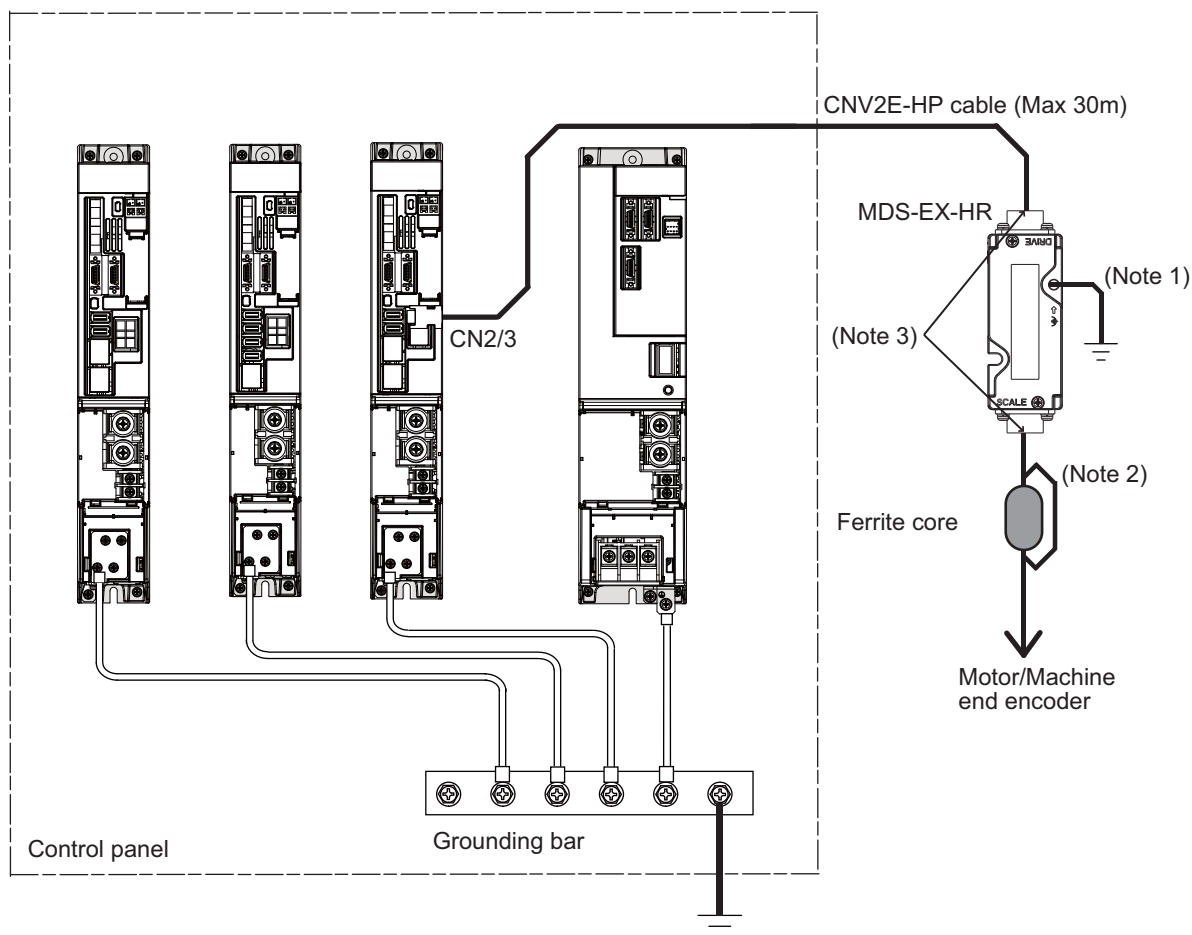


(3) Outline dimension drawings



[Unit:mm]

(4) Example of wiring  
 < MDS-EH Series >



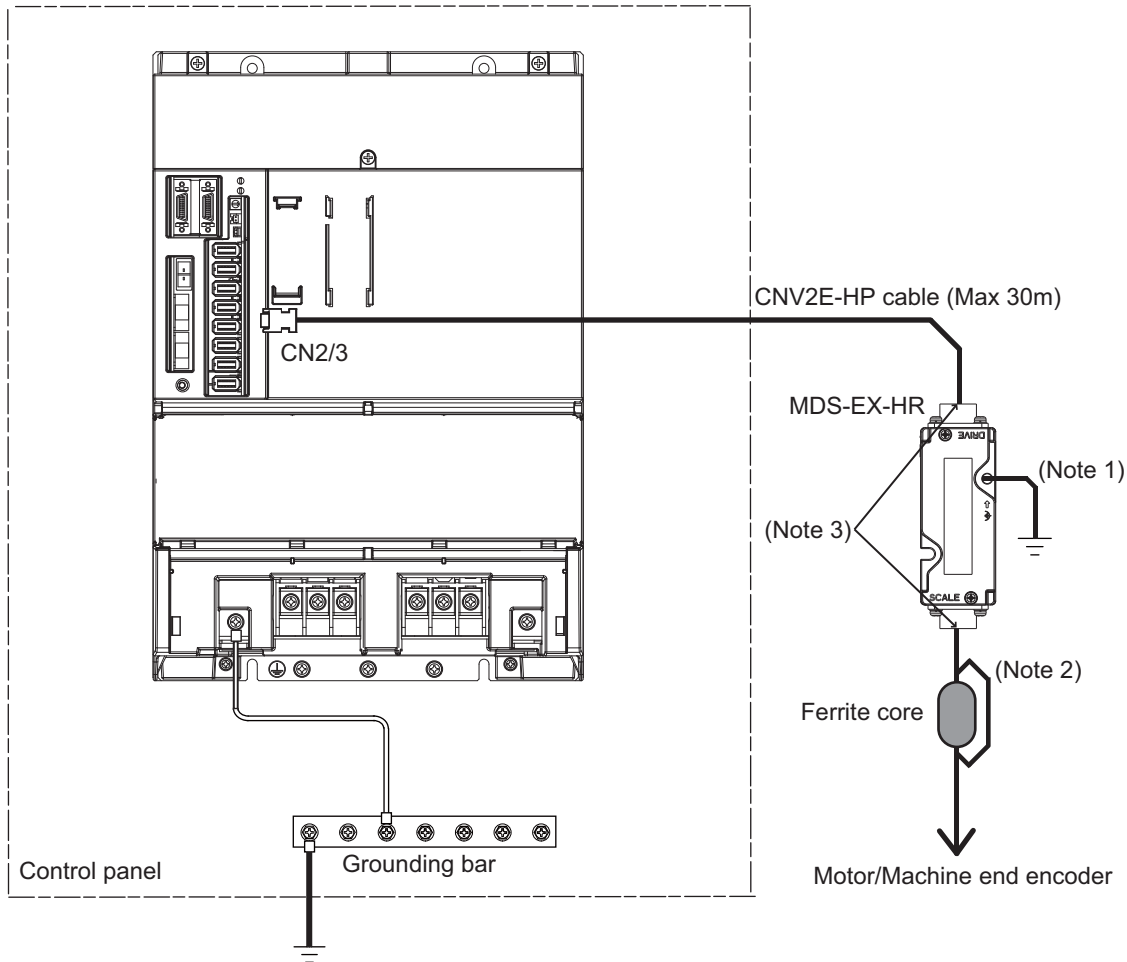
(Note 1) Ground the MDS-EX-HR unit.

(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.

< MDS-EMH Series >



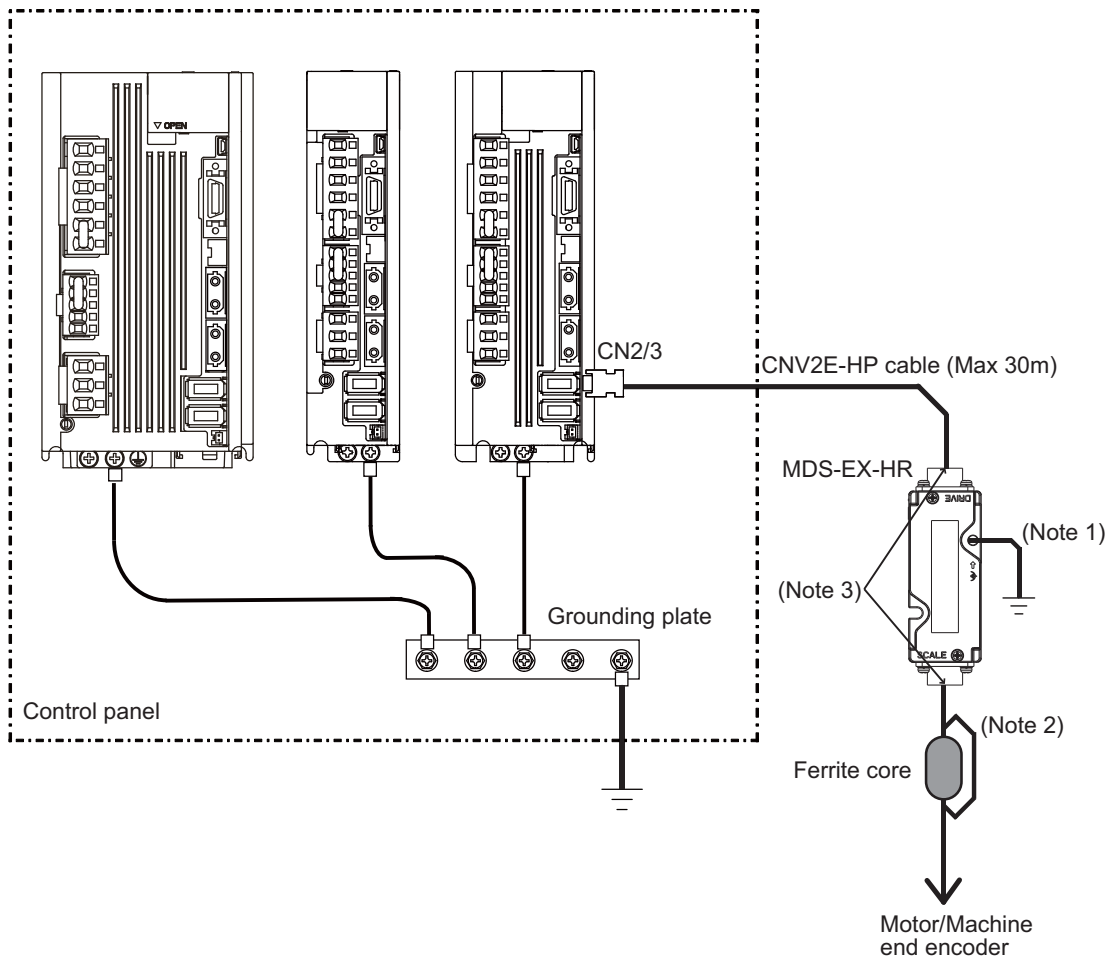
(Note 1) Ground the MDS-EX-HR unit.

(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.

< MDS-EJH Series >



(Note 1) Ground the MDS-EX-HR unit.

(Note 2) Place a ferrite core as close as possible to the MDS-EX-HR unit.

The effect of noise suppression is obtained as much as the number of times the cable is wound around the ferrite core according to the cable diameter.

(Note 3) Use shielded cables and join the shield to the connector shell.



## Serial Signal Division Unit MDS-B-SD

This unit has a function to divide the position and speed signals fed back from the high-speed serial encoder and high-speed serial linear scale. This unit is used to carry out synchronized control of the motor with two MDS-EH-V1 drive units.

## (1) Specifications

Type	MDS-B-SD
Compatible servo drive unit	MDS-EH-V1-□
Input/output communication style	High-speed serial communication I/F, RS485 or equivalent
Working ambient temperature	0 to 55°C
Working ambient humidity	90%RH or less (with no dew condensation)
Atmosphere	No toxic gases
Tolerable vibration	98.0 m/s <sup>2</sup> (10G)
Tolerable impact	294.0 m/s <sup>2</sup> (30G)
Tolerable power voltage	5VDC±10%
Maximum heating value	4W
Mass	0.5kg or less
Degree of protection	IP20

**POINT**

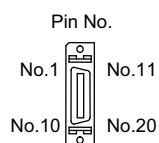
Always provide one MDS-B-SD unit for one speed command synchronous control operation.  
The CN2 system's CN2A and the CN3 system's CN3A cannot be connected to different servo drive units.

## (2) Explanation of connectors

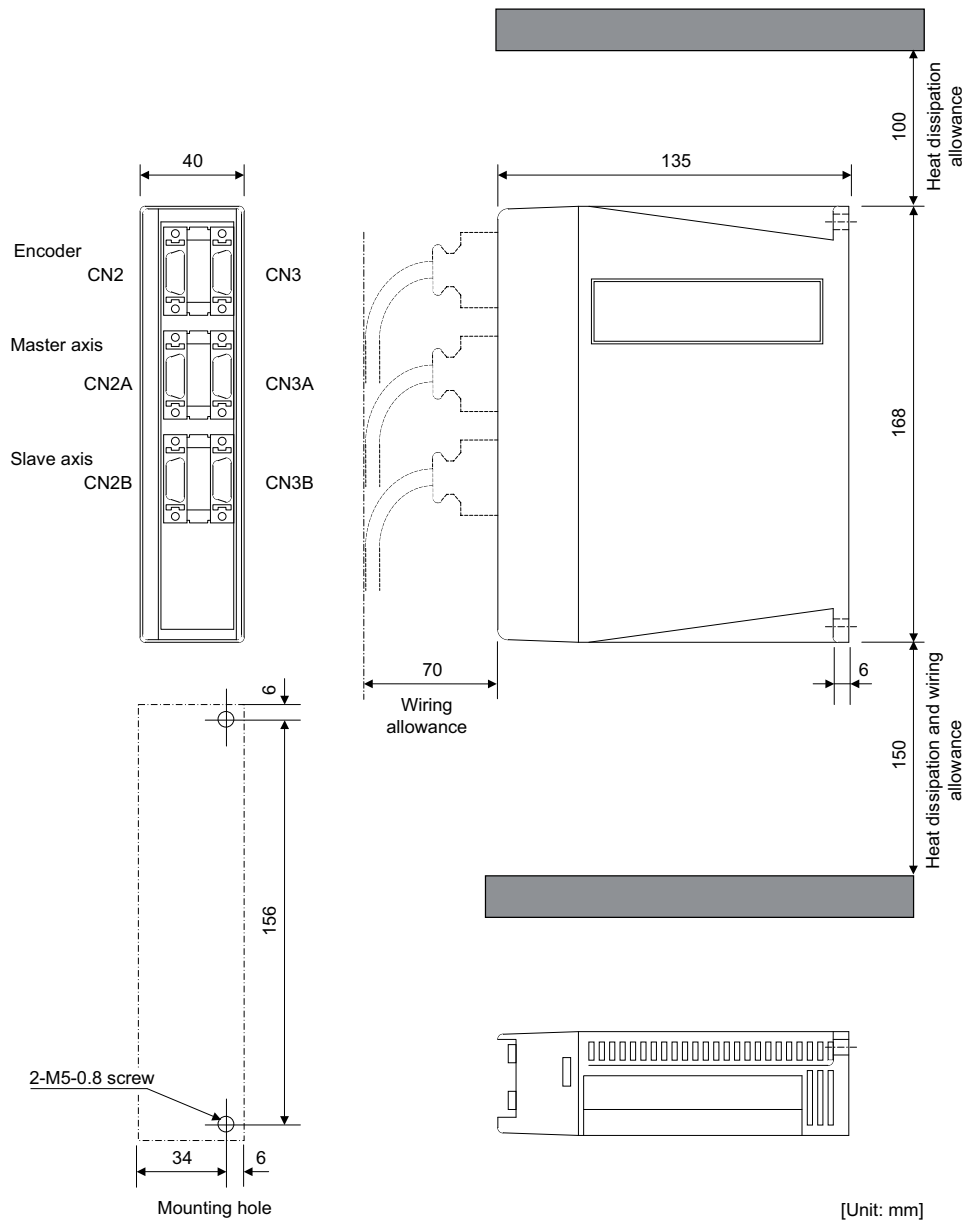
Encoder connector : CN2			
Pin No.	Name	Pin No.	Name
1	LG	11	LG
2		12	
3		13	
4		14	
5		15	
6	SD	16	SD*
7	RQ	17	RQ*
8		18	
9	BAT	19	
10	P5 (+5V)	20	P5 (+5V)

< Connector pin layout >

Encoder connector : CN2



(3) Outline dimension drawings



## DC Connection Bar

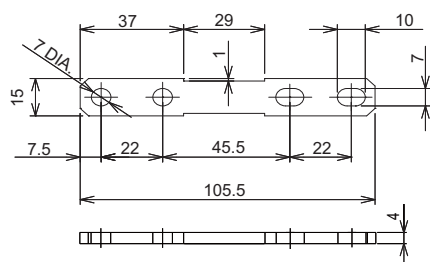
When connecting a large capacity drive unit with L+L- terminal of power supply unit, DC connection bar is required. In use of the following large capacity drive units, use a dedicated DC connection bar. The DC connection bar to be used depends on the connected power supply, so make a selection according to the following table.

Large capacity drive unit	Power supply unit	Required connection bar
MDS-EH-SP-200 MDS-EH-SP-320 MDS-EH-SP-480 MDS-EH-SP-600	MDS-EH-CV-550 MDS-EH-CV-750	E-BAR-A0606 (Two-parts set)
MDS-EH-V1-200 MDS-EH-SP-200 MDS-EH-SP-320	MDS-EH-CV-300 MDS-EH-CV-370 MDS-EH-CV-450	DH-BAR-B0606
MDS-EH-V1-200	MDS-EH-CV-185	DH-BAR-C0606

### (1) Outline dimension drawings

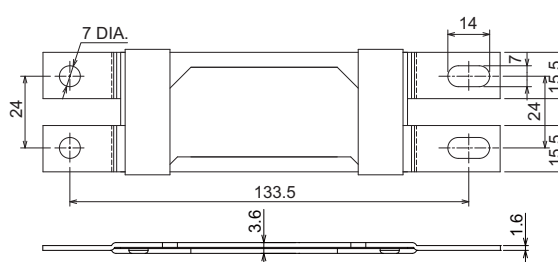
[Unit:mm]

E-BAR-A0606

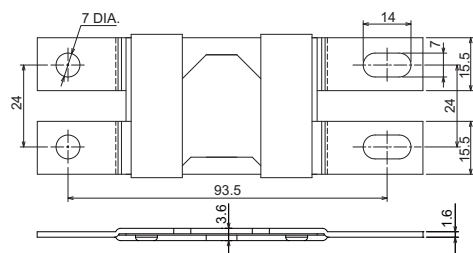


(Note) E-BAR-A0606 is a set of two DC connection bars.

DH-BAR-B0606



DH-BAR-C0606



### POINT

Always install a large capacity drive unit in the left side of power supply unit, and connect with DC connection bar.

## Power Backup Unit (MDS-DH-PFU)

MDS-DH-PFU unit is a system to protect the machine and the drive units safely by decelerating and stopping the motor at power failure.

### (1) Type configuration

MDS- (1) -PFU

(1)

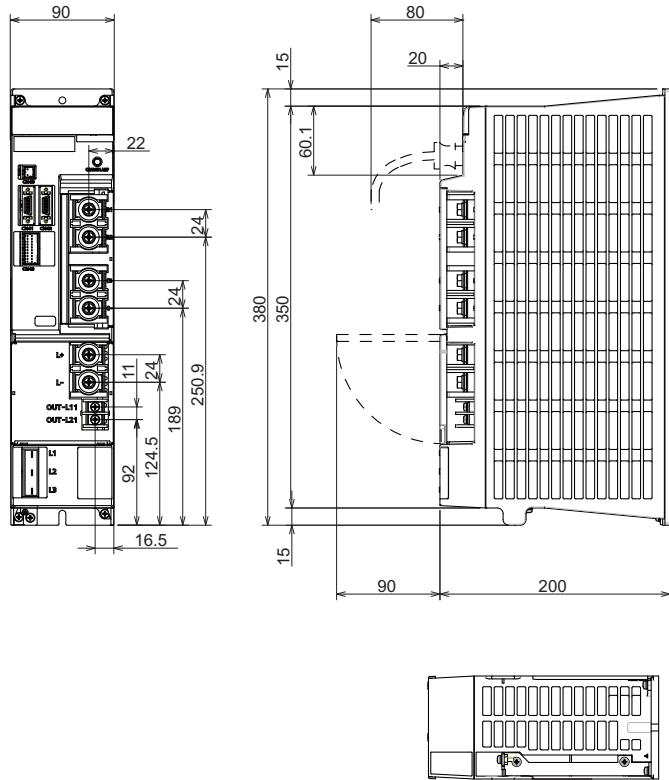
Symbol	Voltage class
D	200V
DH	400V

### (2) Specifications

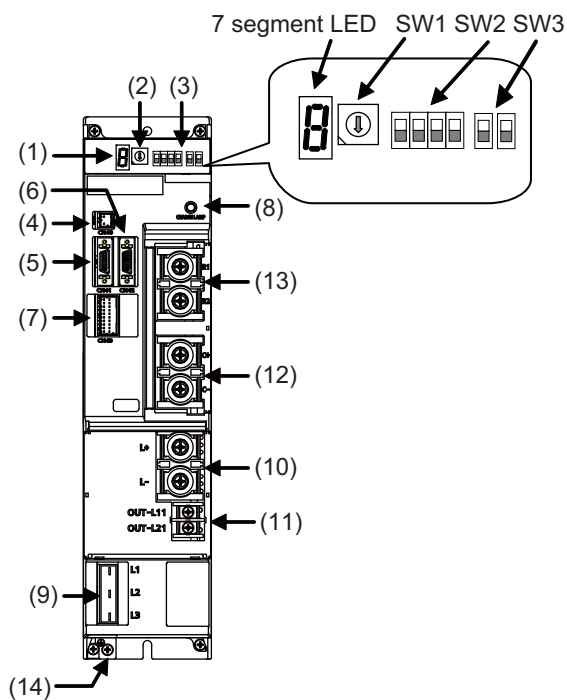
Model Name		MDS-DH-PFU
AC Input	Rated voltage [V]	380 to 480AC (50/60Hz) (Exclusively for earthed-star supply system) Tolerable fluctuation : between +10% and -10%
	Frequency [Hz]	50/60 Tolerable fluctuation : between +3% and -3%
	Rated current [A]	2
DC Input and output	Rated voltage [V]	513 to 648DC
	Rated current [A]	Regenerating Input: MAX 200A Powering Output: MAX 160A
AC output for control power supply backup	Voltage [V]	Single phase 380 to 480VAC (50Hz or 60Hz) 50Hz at backup
	Current [A]	MAX 2
	Maximum number of connectable drive units	6 (excluding power supply units)
	Changeover time	100ms or less after instantaneous interruption of AC input
	Minimum backup time	75ms or longer (When 380VAC is input and the maximum number of connectable drive units is connected)
Degree of protection		IP20 (Except for Terminal block and Connector)
Environment	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		4

(3) Outline dimension drawings  
 < MDS-DH-PFU >

[Unit : mm]

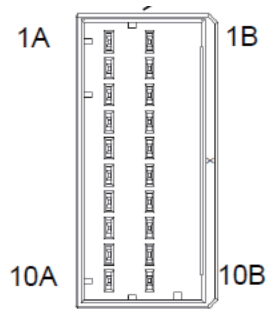


(4) Explanation of each part  
< MDS-DH-PFU >



		Name	Application	Screw size	Compatible wire
(1)	Control circuit	LED	Unit status indication 7 segment LED	---	---
(2)		SW1	Function setting rotary switch	---	---
(3)		SW2,SW3	Function setting DIP switch	---	---
(4)		CN40	(Not used)	---	---
(5)		CN41	For connecting MDS-EH-CV	---	---
(6)		CN42	Maintenance	---	---
(7)		CN43	DIO	---	---
(8)		Charge LED	---	Voltage status indication between TE4 terminals	---
(9)	Main circuit	TE1	L1 L2 L3 Control power input terminal (Three-phase AC input)	---	AWG#14 (2mm <sup>2</sup> )
(10)		TE2	L+ L- Power backup unit voltage input/output terminal Connected to the L+ and L- terminals of the power supply unit	M6×18 Tightening torque 4.0Nm	AWG#4 (22 mm <sup>2</sup> ) or above
(11)		TE3	OUT-L11 OUT-L21 Power backup unit voltage output terminal (AC output) Connected to the L11 and L21 terminals of the power supply unit and drive unit	M4×10 Tightening torque 1.2Nm	AWG#14 (2mm <sup>2</sup> )
(12)		TE4	C+ C- Capacitor unit connection terminal	M6×18 Tightening torque 4.0Nm	AWG#10 (5.5 mm <sup>2</sup> )
(13)		TE5	R1 R2 Regenerative resistor connection terminal	M6×18 Tightening torque 4.0Nm	AWG#10 (5.5 mm <sup>2</sup> )
(14)		PE	Grounding terminal	M4×12 Tightening torque 1.2Nm	AWG#14 (2mm <sup>2</sup> )

(5) Explanation of connectors  
 < CN43 connector >



No.	Signal name	Function	Description
1B	24VOUT	Internal 24V output	Internal 24V output. This enables connection to the 24V input power supply for DO. (Note that the DO output current should be 100mA or less.)
2B	DO_COM	DO common terminal	Common terminal for DO output circuit
5B	DO2	Tool escape request	ON:Normal, OFF: Tool escape request
10B	THM1	Thermal error detection	Shorted: Normal, Open: Error detection
1A	24GOUT	Internal 24V output GND	
2A	DO_COM2	DO common terminal 2	
3A	DO_COM2	DO common terminal 2	
10A	THM2(24GOUT)	Thermal error detection	GND for internal 24V input

## Regenerative Resistor for Power Backup Unit (R-UNIT-6)

Check the availability of connection of the power backup unit and the regenerative resistor for the power backup unit. The regenerative resistor generates heats, so wire and install the unit while taking care to safety.

### (1) Specifications

Model Name		R-UNIT-6
Compatible power backup unit name		MDS-DH-PFU
Resistance value [ $\Omega$ ]		5
Instantaneous regeneration capacity [kW]		128
Allowable regeneration workload [kJ]		180
Environment	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		10

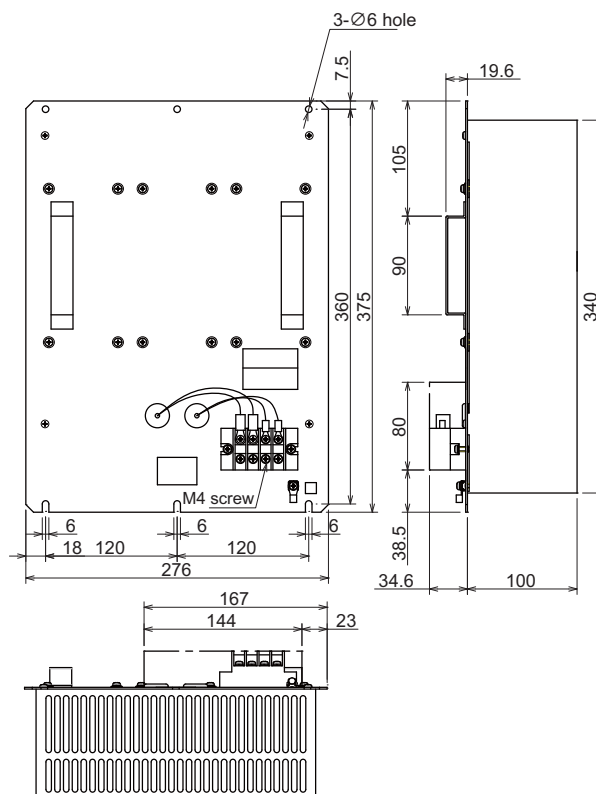
### CAUTION

- Only the designated combination can be used for the power backup unit and the regenerative resistor for the power backup unit.  
There is a risk of fire, so always use the designated combination.
- Select the function selection rotary switch (SW1) of the power backup unit according to the regenerative resistor for the power backup unit to be used.

### (2) Outline dimension drawings

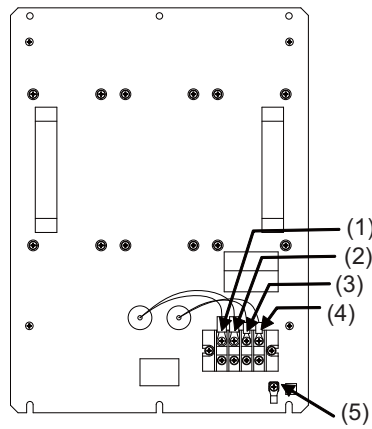
< R-UNIT-6 >

[ Unit : mm ]





(3) Explanation of each part  
< R-UNIT-6 >



Name		Function	Compatible wire	Terminal specification
(1)	R1	PFU connection terminal	AWG10 (5.5 mm <sup>2</sup> )	M4 screw
(2)	R2			Compatible crimp terminal: Round: Up to 5.5-4
(3)	AL1	Thermal connection output terminal	AWG#18 to AWG#24 (0.75mm <sup>2</sup> to 0.2mm <sup>2</sup> )	M4 screw
(4)	AL2			Compatible crimp terminal: Round: Up to 1.25-4
(5)	E	Grounding terminal	AWG10 (5.5 mm <sup>2</sup> )	M4 screw Compatible crimp terminal: Round: Up to 5.5-4

## Capacitor Unit for Power Backup Unit (MDS-DH-CU)

Check the availability of connection of the power backup unit and the capacitor unit. The powering energy at retraction/tool escape is supplied to the capacitor unit.

### (1) Specifications

Model Name		MDS-DH-CU
Compatible power backup unit name		MDS-DH-PFU
Capacity [ $\mu$ F]		7000
DC Input and output	Rated voltage [V]	DC513 to 648
	Ambient temperature	Operation: 0 to 55°C (with no freezing) Storage / Transportation: -15°C to 70°C (with no freezing)
Environment	Ambient humidity	Operation / Storage / Transportation: 90%RH or less (with no dew condensation)
	Atmosphere	Indoors (no direct sunlight) With no corrosive gas, inflammable gas, oil mist, dust or conductive fine particles
	Altitude	Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Vibration	Operation / Storage: 4.9m/s <sup>2</sup> (0.5G) or less
Cooling method		Natural air cooling
Mass [kg]		11

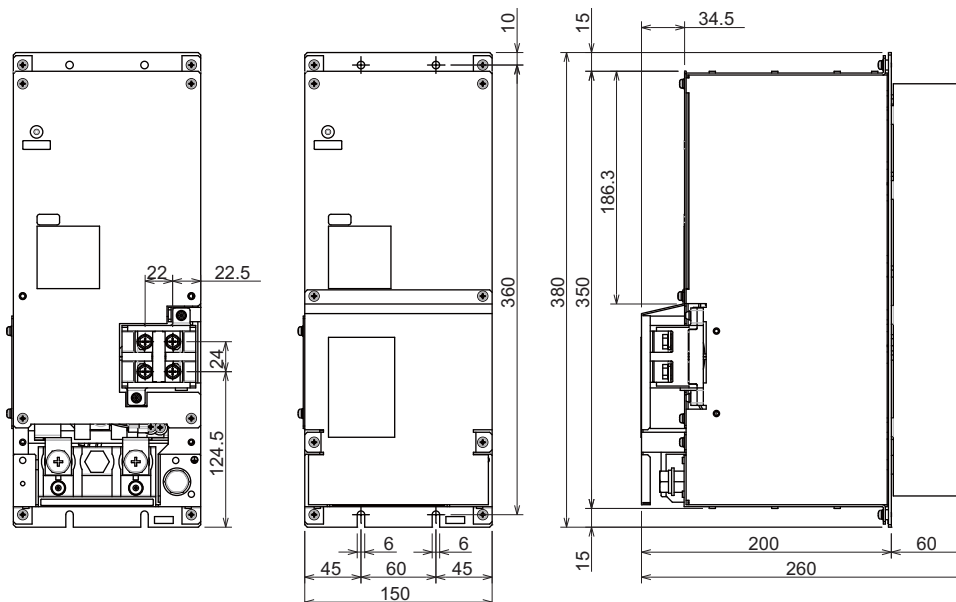
### CAUTION

1. Only the designated combination can be used for the power backup unit and the capacitor unit.  
There is a risk of fire, so always use the designated combination.
2. Do not reverse the polarity when connecting.
3. When using the retraction/tool escape function, the supported software version for the power backup unit is A1 or later.
4. Select the function setting dip switch (SW2) of the power backup unit according to the capacitor unit to be used.

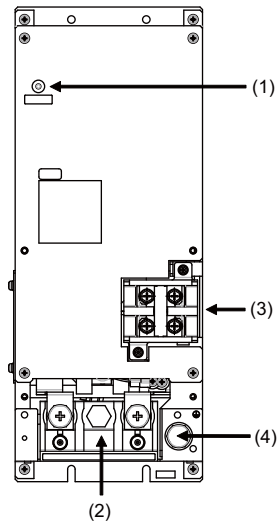
### (2) Outline dimension drawings

< MDS-DH-CU >

[Unit : mm]



(3) Explanation of each part  
< MDS-DH-CU >



	Name		Function	Compatible wire	Terminal specification
(1)	Charge LED	---	Voltage status indication between TE1 terminals	---	---
(2)	TE1	C+ C-	PFU connection terminal	AWG#4 (22 mm <sup>2</sup> )	M10 screw Compatible crimp terminal: Round Up to 8-10
(3)	TE2	C+ C-	Capacitor unit connection terminal (for extension)	AWG#4 (22 mm <sup>2</sup> )	M6 screw Compatible crimp terminal: Round Up to 8-6
(4)	PE		Grounding terminal	AWG#10 (5.5mm <sup>2</sup> )	M10 screw Compatible crimp terminal: Round Up to 8-10

## Revision History

Date of revision	Manual No.	Revision details
May. 2015	IB(NA)1501252-B	First edition created.
Sep. 2015	IB(NA)1501252-C	<ul style="list-style-type: none"> <li>- Descriptions related to "MDS-EM Series" were added.</li> <li>- Descriptions related to "MDS-EJ-SP Series" were added.</li> <li>- Descriptions related to "Built-in IM spindle motor SJ-BG Series" were added.</li> <li>- MDS-EJ-V1-40 was added to the compatible drive unit for the following motors. HG123, HG142</li> <li>- Outline drawings of the following units are revised. MDS-E-SP-160, MDS-E-CV-550 MDS-EH-V1-160, MDS-EH-V1-160W, MDS-EH-SP-80</li> <li>- "Battery (MDS-BAT6V1SET, MDSBTBOX-LR2060, MR-BAT6V1SET)" was revised.</li> <li>- "Regenerative Option" was revised.</li> <li>- "Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)" was revised.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-B-HR" was revised.</li> <li>- "DC Connection Bar" was revised.</li> <li>- Miswrite was corrected.</li> </ul>
Mar. 2016	IB(NA)1501252-D	<ul style="list-style-type: none"> <li>- System Configurations of E/EH and EM Series were revised.</li> <li>- "Explanation of Type" was revised.</li> <li>- Servo motor HG75, HG105, HG46, HG56, HG96, HG-H75, HG-H105, and HG-H1502 were added.</li> <li>- Specifications of servo motor HG, HG-H, and HQ-H Series were changed.</li> <li>- The encoder D47 was added.</li> <li>- Descriptions for direct drive motor were added.</li> <li>- Descriptions for linear motor were added.</li> <li>- Specifications of the following spindle motors were changed. SJ-D5.5/120-02, SJ-D11/100-01, SJ-D5.5/120-02T-S, SJ-DJ11/100-01, SJ-DL5.5/150-01T, SJ-DL7.5/150-01T, SJ-V7.5-03ZT, SJ-V11-01T, SJ-V11-09T, SJ-VL11-02FZT, SJ-VL11-05FZT-S01</li> <li>- The following spindle motors were deleted. SJ-VS7.5-14FZT, SJ-VKS26-09FZT, SJ-VKS30-16FZT, SJ-VLS15-11FZT, SJ-4-V3.7-05ZT, SJ-4-V11-23ZT, SJ-4-V15-18T, SJ-4-V37-04ZT, SJ-4-V11-21T, SJ-4-V18.5-17T</li> <li>- Descriptions for tool spindle motor were added.</li> <li>- MDS-E-V3-20 was added to the compatible drive unit for the following motors. HG123, HG142</li> <li>- MDS-E-V3-40 was added to the compatible drive unit for the following motors. HG54, HG104, HG154, HG123, HG223, HG142, HG302</li> <li>- TE1 and TE3 of MDS-E/EH Series in "Servo Drive Unit" were revised.</li> <li>- Multi axis integrated drive unit MDS-EM-SPV3-16040 was added.</li> <li>- Descriptions for tolerable frequency fluctuation and TE2 were added and recommended wire was revised for MDS-EM Series in "Multi Axis Integrated Drive Unit".</li> <li>- Spindle drive unit MDS-EH-SP-600 was added.</li> <li>- TE1 of MDS-E/EH Series in "Spindle Drive Unit" were revised.</li> <li>- Rated current of MDS-E-CV-37 was revised.</li> <li>- Compatible contactors for the following power supply units were revised. MDS-E-CV-75, MDS-E-CV-110, MDS-E-CV-185, MDS-E-CV-300, MDS-EH-CV-185, MDS-EH-CV-300, MDS-EH-CV-370, MDS-EH-CV-450, MDS-EH-CV-550</li> <li>- Outline drawings of the following power supply units were revised. MDS-E-CV-300, MDS-E-CV-370, MDS-E-CV-450, MDS-EH-CV-300, MDS-EH-CV-370, MDS-EH-CV-450</li> <li>- "Battery (MDS-BAT6V1SET, MDSBTBOX-LR2060, MR-BAT6V1SET)" was revised.</li> <li>- "OSA105ET2A" was replaced by "OSA405ET2AS".</li> <li>- "OSA166ET2NA" was replaced by "OSA676ET2AS".</li> <li>- "Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)" was revised.</li> </ul>

Date of revision	Manual No.	Revision details
Mar. 2016	IB(NA)1501252-D	<ul style="list-style-type: none"> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-B-HR" was revised.</li> <li>- "DC Connection Bar" was revised.</li> <li>- Miswrite was corrected.</li> </ul>
Apr. 2017	IB(NA)1501252-E	<ul style="list-style-type: none"> <li>- "Multi axis integrated drive unit" was replaced by "Multi axis unit".</li> <li>- "System Configuration" was revised.</li> <li>- "Servo motor type" was revised.</li> <li>- "Multi axis integrated type" was replaced by "Multi axis type".</li> <li>- Rated current and stall current of servo motor and tool spindle motor were revised.</li> <li>- Rated output of HG46, HG56, and HG96 were revised.</li> <li>- SJ-VL2.2-02ZT was changed to low-inertia specifications.</li> <li>- Motor inertia of tool spindle motor HG46, HG56, and HG96 were revised.</li> <li>- Output current, input current, and recommended wire of servo drive unit, multi axis unit, spindle drive unit and power supply unit were revised.</li> <li>- Outline dimension drawings of MDS-E-V3-20 and MDS-E-V3-40 were revised.</li> <li>- Mounting hole machining drawings were added to outline dimension drawings of MDS-EJ-SP.</li> <li>- "Dynamic Brake Unit (MDS-D-DBU)" was revised.</li> <li>- "Twin-head Magnetic Encoder (MBA Series)" and "Twin-head Magnetic Encoder (MBE Series)" were deleted.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR" was added.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-B-HR" was revised.</li> <li>- SJ-4-V11-18ZT was replaced by SJ-4-V11-18T.</li> <li>- Output characteristics of SJ-4-V26-08ZT was revised.</li> <li>- SJ-4-V37-04ZT was added.</li> <li>- Specifications and output characteristics of SJ-4-V45-02T were revised.</li> <li>- Miswrite was corrected.</li> </ul>
Sep. 2017	IB(NA)1501252-F	<ul style="list-style-type: none"> <li>- Descriptions related to MDS-EMH Series, MDS-EJ-V2/SP2 Series, and MDS-E-V3-80 were added.</li> <li>- "Explanation of Type" was revised.</li> <li>- Maximum momentary output value of servo motors were revised.</li> <li>- Torque characteristics of MDS-E-V3-40 was added for HG154.</li> <li>- Descriptions above the type names of spindle motors were changed.</li> <li>- Specifications tables of spindle motors were revised.</li> <li>- "Continuous rated current" was added.</li> <li>- Values for each frequency were added to "Maximum power consumption".</li> <li>- Actual acceleration/deceleration output of the following spindle motors were revised. SJ-D3.7/100-01, SJ-DL0.75/100-01, SJ-V2.2-01T, SJ-V3.7-02ZT, SJ-VL2.2-02ZT</li> <li>- Outline dimension drawings of the following spindle motors were revised. SJ-D3.7/100-01, SJ-D5.5/100-01, SJ-D5.5/120-01, SJ-D5.5/120-02, SJ-D7.5/100-01, SJ-D7.5/120-01, SJ-D11/100-01, SJ-D5.5/120-02T-S, SJ-DG3.7/120-03T, SJ-DG5.5/120-04T, SJ-DG7.5/120-05T, SJ-DG11/100-03T, SJ-DJ5.5/100-01, SJ-DJ5.5/120-01, SJ-DJ7.5/100-01, SJ-DJ7.5/120-01, SJ-DJ11/100-01, SJ-DJ15/80-01, SJ-DL5.5/150-01T, SJ-DL5.5/200-01T, SJ-V2.2-01T, SJ-V3.7-02ZT, SJ-V15-01ZT, SJ-V15-09ZT, SJ-V18.5-01ZT, SJ-V18.5-04ZT, SJ-V22-01ZT, SJ-V22-04ZT, SJ-V22-06ZT, SJ-V26-01ZT, SJ-V37-01ZT, SJ-V45-01ZT, SJ-V55-01ZT, SJ-V11-01T, SJ-V11-09T, SJ-V15-03T, SJ-V18.5-03T, SJ-V22-05T, SJ-V22-09T, SJ-VK22-19ZT, SJ-VL11-02FZT, SJ-VL11-05FZT-S01, SJ-4-V26-08ZT</li> <li>- Output characteristics of SJ-D11/100-01 was revised.</li> <li>- Following spindle motors were added. SJ-D15/80-01, SJ-D18.5/80-01, SJ-D22/80-01, SJ-D26/80-01, SJ-DG11/120-03T, SJ-DL3.7/240-01T</li> <li>- Descriptions related to tolerable radial load of the following spindle motors were revised and added. SJ-D5.5/120-02T-S, SJ-DL5.5/200-01T-S</li> <li>- Mass of the following spindle motors were revised. SJ-DG3.7/120-03T, SJ-DG5.5/120-04T, SJ-DG7.5/120-05T, SJ-DG11/100-03T</li> <li>- Images for tolerable radial load of the following spindle motors were revised. SJ-DL0.75/100-01, SJ-DL1.5/100-01</li> </ul>

Date of revision	Manual No.	Revision details
Sep. 2017	IB(NA)1501252-F	<ul style="list-style-type: none"> <li>- GD<sup>2</sup> of the following spindle motors were revised. SJ-DL0.75/100-01, SJ-DL1.5/100-01, SJ-V2.2-01T, SJ-V18.5-03T, SJ-V22-05T</li> <li>- Continuous rated torque of the following spindle motors were revised. SJ-DL1.5/100-01, SJ-VL2.2-02ZT, SJ-VL11-05FZT-S01</li> <li>- Base rotation speed of the following spindle motors were revised. SJ-DL5.5/150-01T, SJ-DL5.5/200-01T, SJ-DL5.5/200-01T-S, SJ-VK22-19ZT</li> <li>- Following spindle motors were deleted. SJ-V7.5-03ZT, SJ-V11-08ZT, SJ-V11-13ZT</li> <li>- "□" was deleted from each built-in spindle motor's type name.</li> <li>- Following built-in spindle motors were added. SJ-BG090A/300-01(R), SJ-BG090B/300-03, SJ-BG090D/300-03, SJ-BG110F/240-01, SJ-BG120A/200-01(R), SJ-BG120C/200-01(R), SJ-BG180B/150-01, SJ-BG180D/150-01, SJ-BG180F/150-01, SJ-BG180H/150-01, SJ-BG240H/100-01, SJ-BG300L/080-01, SJ-BG160D/200-01, SJ-BG180F/200-01, SJ-BG240H/130-01,</li> <li>- "2-axis type" was added to each Specifications table of built-in spindle motors.</li> <li>- Outline dimension drawings of SJ-BG Series were revised.</li> <li>- SJ-BG150B/150-01□ was replaced by SJ-BG150D/150-01.</li> <li>- Base rotation speed (short time) and required cooling capacity of SJ-BG160B/150-01(R) were revised.</li> <li>- Short time rated output, base rotation speed (short time), and torque (short time) of SJ-BG160D/150-02(R) were revised.</li> <li>- Following built-in spindle motors were deleted. SJ-2B4112T, SJ-2B4111T, SJ-2B4105T, SJ-2B4102T, SJ-2B4310T, SJ-2B4301T, SJ-2B4327T, SJ-2B4340T, SJ-2B4313TK, SJ-2B4323TK, SJ-2B4325TK, SJ-2B4303TK, SJ-2B4326TK, SJ-2B4304TK, SJ-2B4318TK, SJ-2B4412T, SJ-2B4511TK, SJ-2B6716TK</li> <li>- "Selection example of contactor" and "Selection example of circuit protector" of MDS-EJ/EJH Series were revised.</li> <li>- Rated output of MDS-EJ-V1-30 was revised.</li> <li>- The numbers in Top view of MDS-EM Series were revised, and (28) was added.</li> <li>- Output rated voltage of MDS-EJ-SP Series were revised.</li> <li>- "Rated output" was deleted from "Selection example of contactor" and "Selection example of circuit protector" of MDS-E/EH-CV.</li> <li>- "Battery" was revised.</li> <li>- "Regenerative Option for MDS-EJ" was revised.</li> <li>- "Encoder for Spindle Motor" and "Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)" were revised.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR" and "Serial Output Interface Unit for ABZ Analog Encoder MDS-B-HR" were revised.</li> <li>- Inertia of HG-H75 was revised.</li> <li>- CNP1 layout of MDS-EJH Series was revised.</li> <li>- Miswrite was corrected.</li> </ul>
May. 2018	IB(NA)1501252-G	<ul style="list-style-type: none"> <li>- Descriptions related to MDS-EM-SPV3-16040S, MDS-EM-SPV3-320120, and MDS-EH-V3-40 were added.</li> <li>- System Configurations of EM/EMH and EJ/EJH Series were revised.</li> <li>- "Explanation of Type" was revised.</li> <li>- Specifications tables of servo motors were revised.</li> <li>- Descriptions of Type were deleted from "Specifications" and were moved to "Item".</li> <li>- MDS-EJ-V2 Series were added to the compatible drive unit for the following motors. HG96, HG75, HG105, HG54, HG104, HG123, HG223, HG142, HG302</li> <li>- Maximum momentary output value of servo motors were revised for the following motors. HG46, HG56, HG54, HG104, HG154, HG224, HG204, HG354, HG453, HG903, HG-H54, HG-H104, HG-H154, HG-H204, HG-H354, HG-H453, HG-H903</li> <li>- Outline dimension drawings were revised for the following motors. HG46, HG56, HG96</li> <li>- Dimension drawings when connecting the connector were added for the following motors. HG75, HG105</li> </ul>

Date of revision	Manual No.	Revision details
May. 2018	IB(NA)1501252-G	<ul style="list-style-type: none"> <li>- Specifications tables of spindle motors were revised.</li> <li>- Descriptions of Type were deleted from "Specifications" and were moved to "Item".</li> <li>- The model names in the outline dimension drawings of the spindle motors were revised.</li> <li>- Outline dimension drawings of the following spindle motors were revised. SJ-D3.7/100-01, SJ-D5.5/100-01, SJ-D7.5/100-01, SJ-D15/80-01, SJ-D18.5/80-01, SJ-D22/80-01, SJ-D26/80-01, SJ-DJ5.5/100-01, SJ-DJ11/100-01, SJ-DL0.75/100-01, SJ-DL1.5/100-01, SJ-DL3.7/240-01T, SJ-V18.5-01ZT, SJ-V37-01ZT, SJ-V45-01ZT, SJ-V11-01T, SJ-V11-09T, SJ-V22-05T, SJ-VL2.2-02ZT</li> <li>- An output characteristics image of SJ-D5.5/120-01 was revised.</li> <li>- Descriptions related to tool spindle motor HG-JR73, HG-JR153, HG-JR734, HG-JR1534 were added.</li> <li>- Rated output of the following tool spindle motors were revised. HG46, HG56, HG96</li> <li>- Outline dimension drawings of the following tool spindle motors were revised. HG46, HG56, HG96</li> <li>- Output characteristics images (EJ Series) of the following tool spindle motors were revised. HG46, HG56, HG96, HG54</li> <li>- Screw sizes of servo drive unit E/EH Series were revised.</li> <li>- Descriptions of CN2L, CN2M, CN2S, and CN20 for servo drive unit E/EH Series were revised.</li> <li>- Control power voltage (50Hz) and max. earth leakage current of the servo drive unit MDS-E-V3-20 and MDS-E-V3-40 were revised.</li> <li>- Descriptions of the screw sizes were added in the drawings of multi axis unit MDS-EM/EMH Series.</li> <li>- Descriptions of CN2L, CN2M, CN2S, CN3L, CN3M, CN3S for multi axis unit MDS-EM/EMH Series were revised.</li> <li>- TE1, TE3 were revised for multi axis unit MDS-EM/EMH Series.</li> <li>- Screw sizes of spindle drive unit MDS-E/EH Series were revised.</li> <li>- Screw sizes of power supply unit MDS-E/EH Series were revised.</li> <li>- "Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060)" was revised.</li> <li>- "Encoder for Spindle Motor", "Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series)", and "Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)" were revised.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR" was revised.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-B-HR" was deleted.</li> <li>- Miswrite was corrected.</li> </ul>
May. 2019	IB(NA)1501252-H	<ul style="list-style-type: none"> <li>- "Power Backup Unit (MDS-D-PFU)" was revised.</li> <li>- "Power Backup Unit (MDS-DH-PFU)" was revised.</li> </ul>
Jan. 2020	IB(NA)1501252-J	<ul style="list-style-type: none"> <li>- "System Configuration" was revised.</li> <li>- "Explanation of Type" was revised.</li> <li>- Servo motor HG1103 was added.</li> <li>- Degrees of protection of servo motors HG46, HG56, and HG96 were revised.</li> <li>- Max. deceleration torques of dynamic brake of servo motors HG75, HG-H75, HQ-H903, and HQ-H1103 were revised.</li> <li>- Mass of servo motor HG-H75 was revised.</li> <li>- MDS-EH-V2-160 was added to the compatible drive unit for servo motors HG-H703, HG-H903, and HQ-H903.</li> <li>- Ambient temperature of linear motors was revised.</li> <li>- MDS-EJ-V2-40 was added to the compatible drive unit for the following linear motors. LM-FP2A-03M, LM-FP2B-06M</li> <li>- MDS-E-V3-80 was added to the compatible drive unit for the following linear motors. LM-FP2D-12M, LM-FP4B-12M</li> <li>- MDS-E-V1/V2-160W was added to the compatible drive unit for the following linear motors. LM-FP2D-12M, LM-FP2F-18M, LM-FP4B-12M, LM-FP4D-24M</li> </ul>

Date of revision	Manual No.	Revision details
Jan. 2020	IB(NA)1501252-J	<ul style="list-style-type: none"> <li>- MDS-E-V1-320W was added to the compatible drive unit for the following linear motors. LM-FP2F-18M, LM-FP4D-24M, LM-FP4F-36M, LM-FP4H-48M</li> <li>- Descriptions for spindle motor SJ-DN series were added.</li> <li>- The following spindle motors were added. SJ-DG15/120-02T-K, SJ-DL5.5/240-05T</li> <li>- The following spindle motors were deleted. SJ-V15-01ZT, SJ-VL18.5-05FZT</li> <li>- Specifications tables of spindle motors were revised.</li> <li>- "Maximum power consumption 50/60Hz" were deleted.</li> <li>- Notes for IP degree of protection were added.</li> <li>- Degrees of protection for SJ-DG series were revised.</li> <li>- Output characteristics for the following spindle motors were revised. SJ-D18.5/80-01, SJ-D22/80-01, SJ-D5.5/120-02T-S, SJ-4-V26-08ZT</li> <li>- Outline dimension drawings for the following spindle motors were revised. SJ-DG3.7/120-03T, SJ-DG5.5/120-04T, SJ-DG7.5/120-05T, SJ-DG11/100-03T, SJ-DG11/120-03T, SJ-V22-09T</li> <li>- Dimensions "when shipped from the plant" were deleted from dimensions other than rotor outer diameter for "Built-in Spindle Motor".</li> <li>- Descriptions for built-in spindle motors SJ-4BG series, SJ-4BGS series were added.</li> <li>- The following built-in spindle motor was added. SJ-BG135D/200-01</li> <li>- Standard output during acceleration/deceleration and actual acceleration/deceleration output were revised for SJ-BG160D/150-02(R).</li> <li>- Base rotation speed, torque, and required cooling capacity were revised for SJ-BG180H/150-01.</li> <li>- Model name of SJ-BG160D/200-01 was changed to SJ-BG160D/200-03.</li> <li>- The compatible drive unit for SJ-BG180F/200-01 was changed to MDS-E-SP-400.</li> <li>- Output characteristics for the following built-in spindle motors were revised. SJ-BG180H/150-01, SJ-BG160D/150-02(R), SJ-BG160D/200-03</li> <li>- Rotor GD<sup>2</sup> and rotor inertia moment were revised for the following built-in spindle motors. SJ-BG160B/150-01, SJ-BG160D/150-01, SJ-BG160D/150-02</li> <li>- Mass for the following built-in spindle motors were revised. SJ-BG160D/150-01(R), SJ-BG160D/150-02</li> <li>- Degrees of protection for tool spindle motors HG46, HG56, and HG96 were revised.</li> <li>- Outline dimension drawings for tool spindle motors HG75 and HG105 were revised.</li> <li>- MDS-E-SP2-16080 was added to the compatible drive unit for tool spindle motor HG-JR153.</li> <li>- Descriptions of "5V power supply capacity" were added for encoder connectors for "Servo Drive Unit", "Multi Axis Unit", and "Spindle Drive Unit".</li> <li>- Panel cut drawings for E/EH series "Servo Drive Unit", "Spindle Drive Unit", and "Power Supply Unit" were revised.</li> <li>- Max. current for servo drive unit E/EH series was revised.</li> <li>- MDS-EH-V2-160 was added.</li> <li>- Mass for the following servo drive units were revised. MDS-E-V2-80, MDS-E-V3-20, MDS-E-V3-40, MDS-EH-V1-200, MDS-EH-V2-10, MDS-EH-V2-20, MDS-EH-V2-40, MDS-EJ-V1-40, MDS-EJ-V1-80, MDS-EJ-V2-30</li> <li>- Recommended wires for MDS-EH-V1-200 were revised.</li> <li>- Mass for the multi axis units MDS-EM/EMH series were revised.</li> <li>- Max. current for spindle drive unit MDS-E/EH series were revised.</li> <li>- Mass for the following drive units were revised. MDS-E-SP-240, MDS-E-SP-320, MDS-E-SP2-80, MDS-E-SP-400, MDS-E-SP-640, MDS-EH-SP-40, MDS-EH-SP-200, MDS-EH-SP-320, MDS-EH-SP-480, MDS-EH-SP-600, MDS-EJ-SP2-20</li> <li>- Screw sizes for the following spindle drive unit were revised. MDS-E-SP-240, MDS-E-SP-320</li> <li>- Recommended wires for MDS-EH-SP-480 were revised.</li> <li>- Mass for the following power supply units were revised. MDS-E-CV-37, MDS-E-CV-75, MDS-E-CV-110, MDS-E-CV-185, MDS-E-CV-300, MDS-E-CV-370, MDS-E-CV-450, MDS-EH-CV-37, MDS-EH-CV-75</li> </ul>



Date of revision	Manual No.	Revision details
Jan. 2020	IB(NA)1501252-J	<ul style="list-style-type: none"> <li>- Screw sizes for the following power supply units were revised. MDS-E-CV-300, MDS-E-CV-370, MDS-E-CV-450, MDS-EH-CV-300, MDS-EH-CV-370, MDS-EH-CV-450, MDS-EH-CV-550, MDS-EH-CV-750</li> <li>- Recommended wires for MDS-E-CV-300, MDS-E-CV-370, and MDS-E-CV-450 were revised.</li> <li>- "Battery (MDS-BAT6V1SET, MR-BAT6V1SET, MDSBTBOX-LR2060)" was revised.</li> <li>- "Ball Screw Side Encoder (OSA405ET2AS, OSA676ET2AS)" was revised.</li> <li>- "Encoder for Spindle Motor" was revised.</li> <li>- "Spindle Side ABZ Pulse Output Encoder (OSE-1024 Series)" was revised.</li> <li>- "Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR" was revised.</li> <li>- "DC Connection Bar" was revised.</li> <li>- Miswrite was corrected.</li> </ul>
Sep. 2020	IB(NA)1501252-K	<ul style="list-style-type: none"> <li>- Servo motor HG603, HG702, HG-H224 were added.</li> <li>- Outline dimension drawings for the following servo motors were revised. HG54, HG104, HG154, HG224, HG204, HG354, HG123, HG223, HG303, HG453, HG703, HG903, HG142, HG302, HG-H54, HG-H104, HG-H154, HG-H204, HG-H354, HG-H453, HG-H703, HG-H903, HQ-H903, HQ-H1103</li> <li>- Outline dimension drawings for the following tool spindle motors were revised. HG54, 104, 154, 224, 204, 354, 453, 703, 903</li> <li>- Temperature characteristics for the following tool spindle motors were deleted. HG46, HG56, HG96</li> <li>- The compatible drive units for the following tool spindle motors were revised. HG154, HG224, HG204, HG354, HG453, HG703, HG-JR153</li> <li>- Screw sizes for servo drive unit EJ/EJH series were revised.</li> <li>- Screw sizes for multi axis unit MDS-EM-SPV3-320120 were revised.</li> <li>- Screw sizes for the following spindle drive units were revised. MDS-EJ-SP-20, MDS-EJ-SP-40, MDS-EJ-SP-80, MDS-EJ-SP2-20</li> <li>- Rated current for the following spindle drive units was revised. MDS-EJ-SP-80, MDS-EJ-SP-100, MDS-EJ-SP-120, MDS-EJ-SP-160, MDS-EH-SP-600</li> <li>- Recommended wires for the following spindle drive units were revised. MDS-EJ-SP-80, MDS-EJ-SP-100, MDS-EJ-SP-120</li> <li>- Outline dimension drawings and screw sizes for "Power Backup Unit(MDS-D-PFU)/(MDS-DH-PFU)" were revised.</li> <li>- Miswrite was corrected.</li> </ul>
Mar. 2021	IB(NA)1501252-L	<ul style="list-style-type: none"> <li>- Output characteristics and torque characteristics for all the spindle motors were revised.</li> <li>- Torque characteristics were revised for servo motor HG-H1502.</li> <li>- Cooling method was added to specifications for all servo motors and tool spindle motors.</li> <li>- Outline dimension drawings for the following built-in spindle motors were revised. SJ-4BGS160B/300-01, SJ-4BGS210B/120-01, SJ-4BGS240B/120-01</li> <li>- Cooling oil amount for the following built-in spindle motors was revised. SJ-4BGS210B/120-01, SJ-4BGS240B/120-01</li> <li>- Miswrite was corrected.</li> </ul>
Sep. 2022	IB(NA)1501252-M	<ul style="list-style-type: none"> <li>- "Explanation of Type" was revised.</li> <li>- The following servo overload protection characteristics of servo motors were revised. HG46, HG56, HG96, HG75, HG105, HG54, HG104, HG223, HG702, HG1103, HG142, HG302, HG-H75, HG-H105</li> <li>- The following spindle motors were added. SJ-DG11/120-12T-K, SJ-DG11/150-06T, SJ-DG11/150-15T-K, SJ-DG11/120-03T-S, SJ-DG11/120-12T-KS, SJ-DG11/150-06T-S, SJ-DG11/150-15T-KS, SJ-DG15/120-02T-KS, SJ-DM11/120-01T</li> <li>- Standard output during acceleration/deceleration and Actual acceleration/deceleration output of SJ-DL0.75/100-01 were revised.</li> <li>- The following built-in spindle motor were added. SJ-BG135B/200-01, SJ-BG135D/200-01</li> <li>- Bottom view of left diagram of MDS-E-V3-80 was revised.</li> <li>- "Regenerative Option for MDS-EJ" was revised.</li> <li>- Miswrite was corrected.</li> </ul>

Date of revision	Manual No.	Revision details
Apr. 2023	IB(NA)1501252-N	<ul style="list-style-type: none"> <li>- Descriptions related to HK(-H) motors were added.</li> <li>- "Torque characteristics", "Servo overload protection characteristics", "Maximum motor shaft conversion load inertia ratio", and "Magnetic brake characteristics" were revised for servo motors HG(-H) and HQ-H Series.</li> <li>- Stall torque of the following servo motors were revised. HG453, HG-H453</li> <li>- Stall current of the following servo motors were revised. HG-H453</li> <li>- Outline dimension drawings of linear motors were revised.</li> <li>- "Encoder for Spindle Motor" was revised.</li> <li>- "Spindle Side PLG Serial Output Encoder (TS5690, MU1606 Series)" was revised.</li> <li>- Compatible scale (example) was deleted in "Serial Output Interface Unit for ABZ Analog Encoder MDS-EX-HR".</li> <li>- Miswrite was corrected.</li> </ul>
Sep. 2023	IB(NA)1501252-P	<ul style="list-style-type: none"> <li>- Plug dimension drawings for all the servo motors were revised.</li> <li>- Torque characteristics for the following for servo motors were revised. HG453, HG-H453</li> <li>- "Free-air thermal current" for servo drive unit MDS-EJ-V1-80 was revised.</li> <li>- "Free-air thermal current" for the following spindle drive units were revised. MDS-EJ-SP-40, MDS-EJ-SP-100, MDS-EJ-SP-120</li> <li>- "Free-air thermal current" for the following power supply units were revised. MDS-E-CV-75, MDS-E-CV-110, MDS-E-CV-300, MDS-EH-CV-185, MDS-EH-CV-550</li> <li>- "Selection example of contactor" for power supply unit MDS-E-CV-300 was revised.</li> <li>- Miswrite was corrected.</li> </ul>

## **Notice**

Every effort has been made to keep up with software and hardware revisions in the contents described in this manual. However, please understand that in some unavoidable cases simultaneous revision is not possible.

Please contact your Mitsubishi Electric dealer with any questions or comments regarding the use of this product.

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MODEL	MDS-E/EH/EM/EMH/EJ/EJH
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