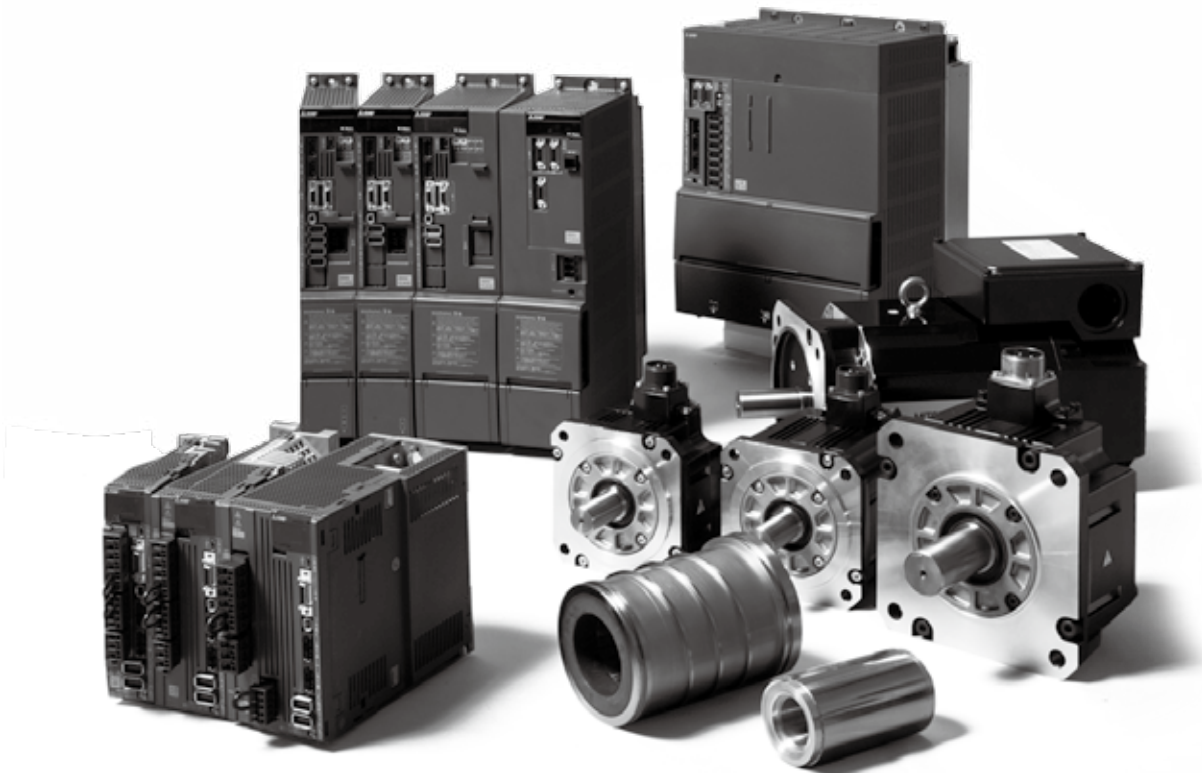


MITSUBISHI CNC DRIVE SYSTEM GENERAL CATALOG



- MDS-E/EH Series
- MDS-EM Series
- MDS-EJ/EJH Series

GLOBAL IMPACT OF MITSUBISHI ELECTRIC



Through Mitsubishi Electric's vision, "Changes for the Better" are possible for a brighter future.

Changes for the Better

We bring together the best minds to create the best technologies. At Mitsubishi Electric, we understand that technology is the driving force of change in our lives. By bringing greater comfort to daily life, maximizing the efficiency of businesses and keeping things running across society, we integrate technology and innovation to bring changes for the better.

Mitsubishi Electric is involved in many areas including the following

Energy and Electric Systems

A wide range of power and electrical products from generators to large-scale displays.

Electronic Devices

A wide portfolio of cutting-edge semiconductor devices for systems and products.

Home Appliance

Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems

Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems

Maximizing productivity and efficiency with cutting-edge automation technology.

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DRIVE SYSTEM

Drive unit



High-performance Servo/Spindle Drive Units MDS-E/EH Series

- The servo control-dedicated core processor realizes an increase in control speed, leading to improved basic performance. When combined with a higher resolution motor sensor and enhanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- Motor power connector comprises an anti-misinsertion mechanism. This helps to eliminate connection errors.
- Improved diagnostic and preventive-maintenance features.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are supported in effort to enhance safety features.



Multi-hybrid Drive Units MDS-EM Series

- The multi-hybrid drive unit is capable of driving a maximum of three servo axes and one spindle. This contributes to the downsizing of machines and offers technical advantages.
- Motor power connector comprises an anti-misinsertion mechanism. This helps to eliminate connection errors.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are supported in effort to enhance safety features.



All-in-one compact drive units MDS-EJ/EJH Series

- Ultra-compact drive units with built-in power supplies contribute to reduced control panel size.
- The servo control-dedicated core processor realizes an increase in control speed, leading to improved basic performance. When combined with a higher resolution motor sensor and enhanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are supported in effort to enhance safety features.
- MDS-EJH 400V system drive unit is available (Note 1).

Spindle motor



High-performance Spindle Motor SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.
- High-speed bearing incorporated as a standard feature helps to achieve higher speed, lower vibration and improved durability.
- Range: Normal SJ-D Series 3.7 to 11 [kW] Compact & light SJ-DJ Series 5.5 to 15 [kW]
- Maximum speed 10,000 or 12,000 [r/min]



High-output, High-torque Spindle Motor SJ-DG Series

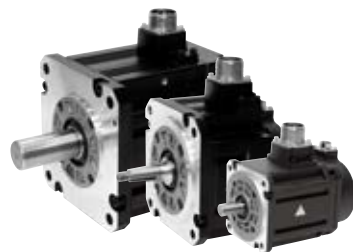
- Addition of S3 rating (%ED rating) has improved output and torque acceleration/deceleration characteristics.
- Balance adjustment ring has been added to the counter-load side for fine tuning.
- Range S3 rating: 5.5 to 15 [kW]
- Maximum speed 10,000 or 12,000 [r/min]



Low-inertia, High-speed Spindle Motor SJ-DL Series

- The spindle motors are dedicated to tapping machines requiring faster drilling and tapping.
- The latest design technologies have made it possible to attain lower vibration and greater rigidity even with the lighter weight.
- Range 0.75 to 7.5 [kW]

Servo motors



Medium-inertia, high-accuracy and high-speed motors HG Series

- Sensor resolution has been significantly improved. The servo motors, which boast smooth rotation and outstanding acceleration capabilities, are well-suited to serve as feed axes of machine tools.
- Range 0.2 to 9 [kW]
- Maximum rotation speed: 4,000 or 5,000 [r/min]
- Safety support sensors are included as standard specification. Sensor connectors are screw-locked and have enhanced vibration resistance. Three sensor resolutions (i.e., 1, 4 and 67 million pulses/rev) are available.



Linear Servo Motor LM-F Series

- Use in clean environments is possible since no ball screws are used, eliminating possible contamination from grease.
- Elimination of transmission mechanisms, including backlash, enables smooth and quiet operation even at high speeds.
- Dimensions: Length: 170 to 1,010 [mm] Width: 120 to 240 [mm]



Direct Drive Servo Motor TM-RB Series

- High-torque, direct-drive motor combined with high-gain control provides quick acceleration and positioning, which makes rotation smoother.
- Suitable for rotary axes that drive tables or spindle heads.
- Range: Maximum torque: 36 to 1,280 [N·m]



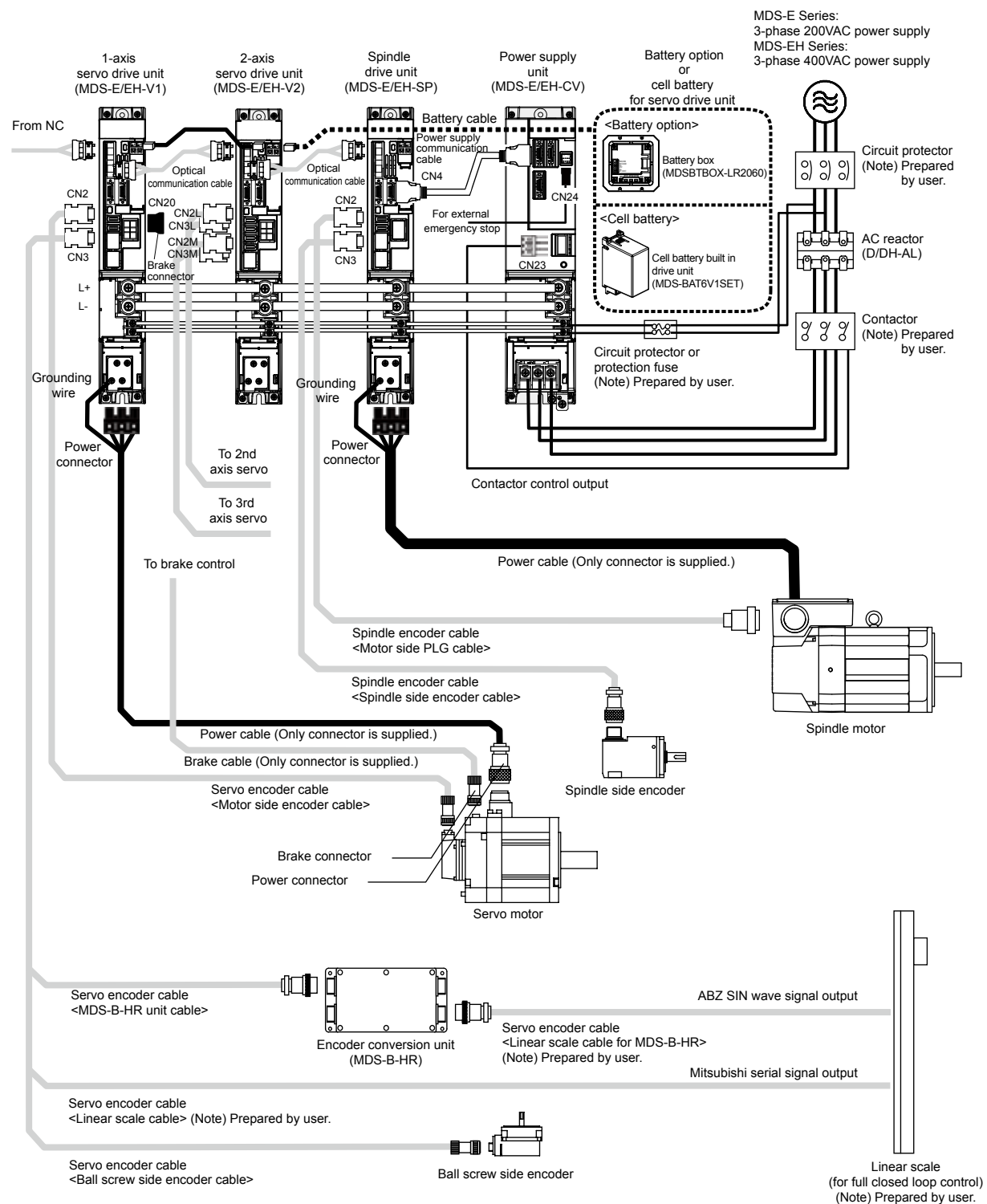
Built-in Spindle Motor SJ-BG Series

- The electrical design has been optimized to increase the continuous rated torque per unit volume, contributing to the downsizing of spindle units.
- A mold with cooling jacket is available as an optional feature.

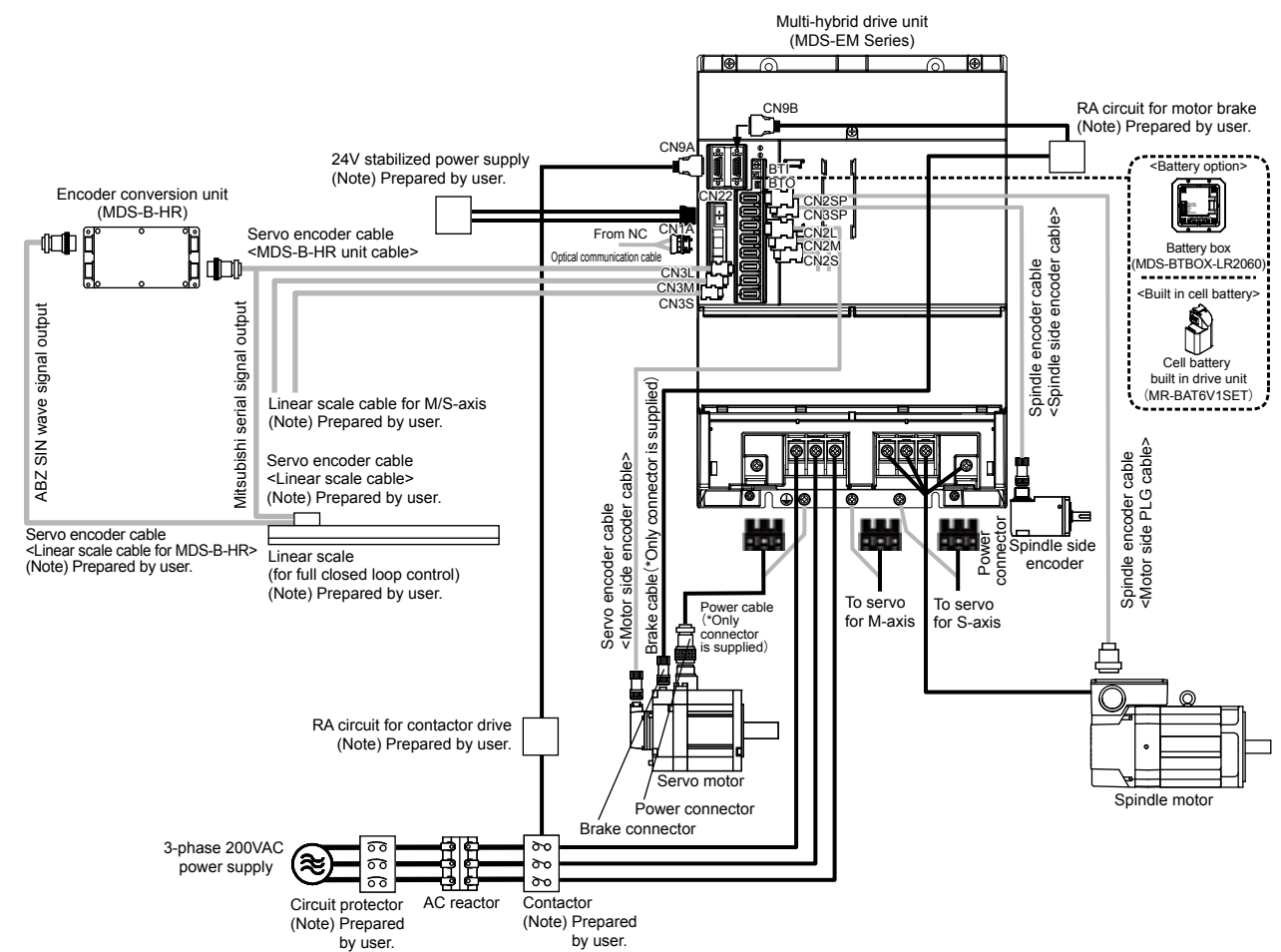
(Note 1) For servo motors only

SYSTEM CONFIGURATION

■MDS-E/EH Series



■MDS-EM Series

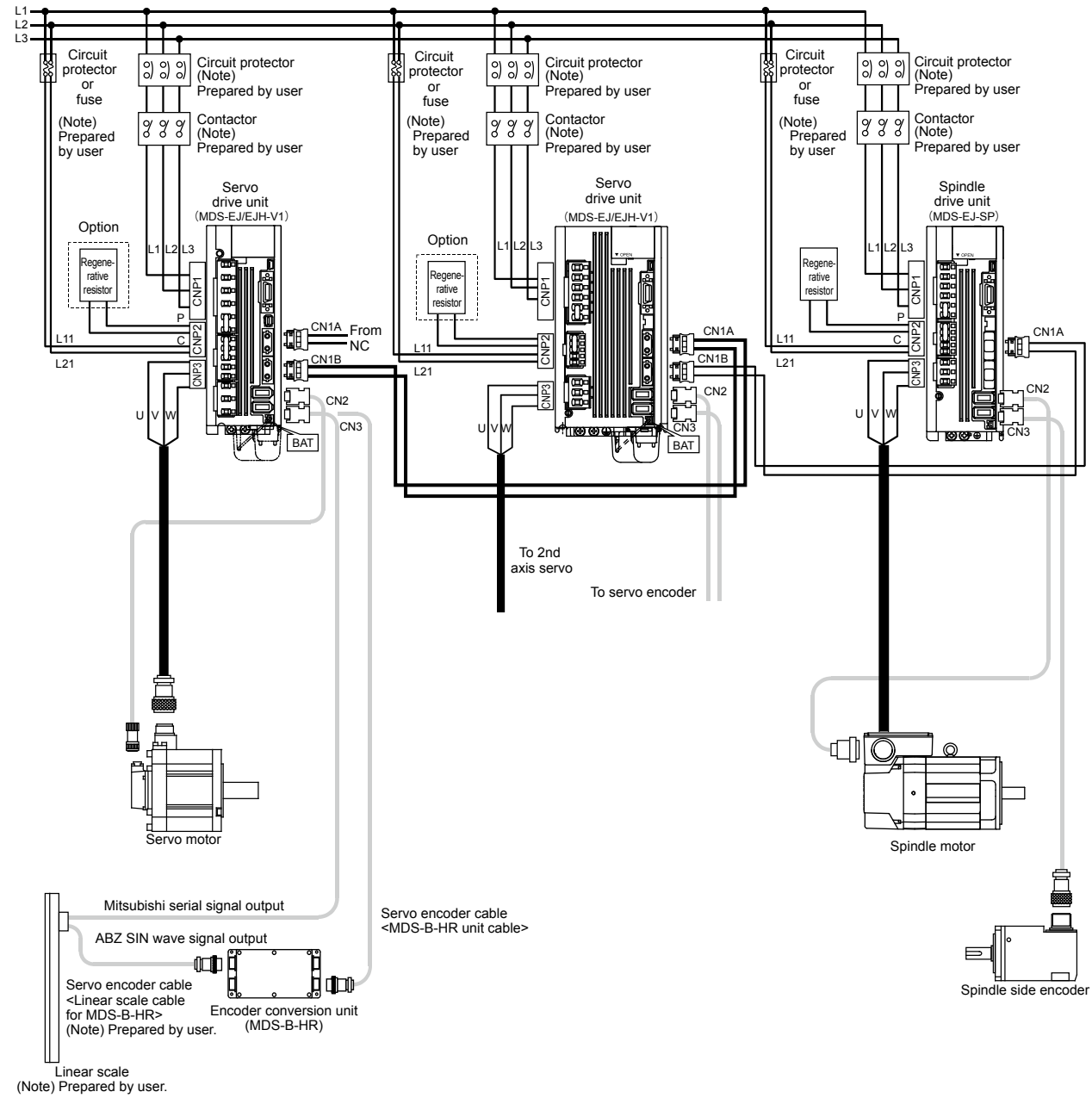


2 SYSTEM CONFIGURATION

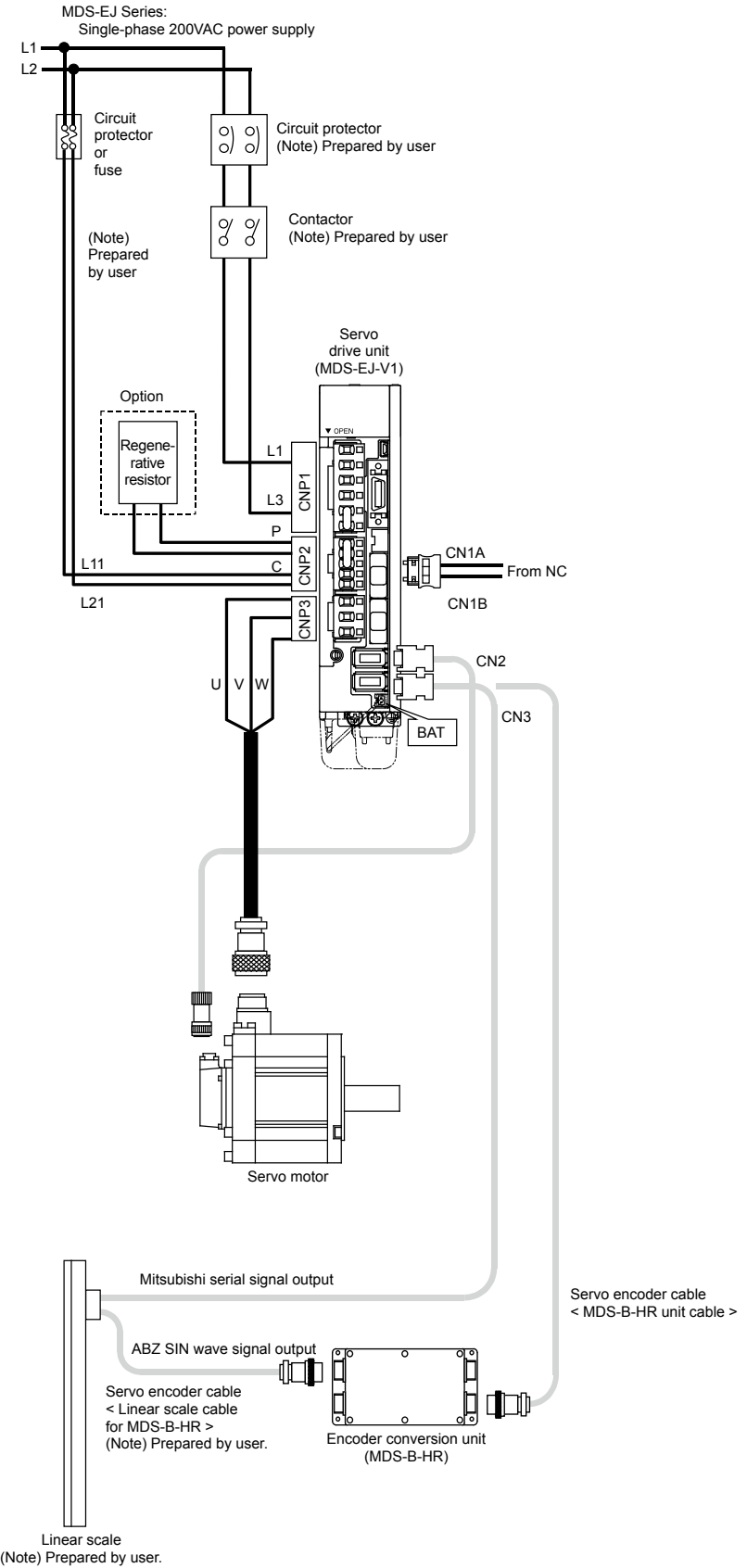
2 SYSTEM CONFIGURATION

■ MDS-EJ/EJH Series

MDS-EJ Series:
3-phase 200VAC power supply
MDS-EJH Series:
3-phase 400VAC power supply (MDS-EJH-V1 only)



<For single-phase power supply>



SPECIFICATIONS

<Servo specification>

Item		MDS-E-V1/V2/V3	MDS-EH-V1/V2	MDS-EM-SPV3	MDS-EJ/EJH-V1
1 Base control functions	1.1 Full closed loop control	●	●	●	●
	1.2 Position command synchronous control	●	●	●	●
	1.3 Speed command synchronous control	●(Note 2)	●	●	●
	1.4 Distance-coded reference position control	●	●	●	●
2 Servo control function	2.1 Torque limit function (stopper function)	●	●	●	●
	2.2 Variable speed loop gain control	●	●	●	●
	2.3 Gain changeover for synchronous tapping control	●	●	●	●
	2.4 Speed loop PID changeover control	●	●	●	●
	2.5 Disturbance torque observer	●	●	●	●
	2.6 Smooth High Gain control (SHG control)	●	●	●	●
	2.7 High-speed synchronous tapping control (OMR-DD control)	●	●	●	●
	2.8 Dual feedback control	●	●	●	●
	2.9 HAS control	●	●	●	●
	2.10 OMR-FF control	●	●	●	●
3 Compensation control function	3.1 Jitter compensation	●	●	●	●
	3.2 Notch filter	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1
	3.3 Adaptive tracking-type notch filter	●	●	●	●
	3.4 Overshooting compensation	●	●	●	●
	3.5 Machine end compensation control	●	●	●	●
	3.6 Lost motion compensation type 2	●	●	●	●
	3.7 Lost motion compensation type 3	●	●	●	●
	3.8 Lost motion compensation type 4	●	●	●	●
4 Protection function	4.1 Deceleration control at emergency stop	●	●	●	●
	4.2 Vertical axis drop prevention/pull-up control	●	●	●	●
	4.3 Earth fault detection	●	●	●	●
	4.4 Collision detection function	●	●	●	●
	4.5 SLS (Safely Limited Speed) function (Note 1)	●	●	●	●
	4.6 Fan stop detection	●	●	●	●
5 Sequence function	4.9 STO (Safe Torque Off) function	●	●	●	●
	4.10 SBC (Safe Brake Control) function	●	●	●	●
	5.2 Motor brake control function	●	●	●	●
	5.4 Specified speed output	●	●	●	●
6 Diagnosis function	5.5 Quick READY ON sequence	●	●	●	●
	6.1 Monitor output function	●	●	●	●
	6.2 Machine resonance frequency display function	●	●	●	●
	6.3 Machine inertia display function	●	●	●	●

(Note 1) 4.5 SLS (Safely Limited Speed) function is set on NC side.

(Note 2) Always set L-axis as primary axis and M-axis as secondary axis for the speed command synchronous control using MDS-E-V3. Other settings cause the initial parameter error alarm.

<Spindle specification>

Item		MDS-E-SP	MDS-EH-SP	MDS-E-SP2	MDS-EM-SPV3	MDS-EJ-SP	
1 Base control functions	1.1 Full closed loop control	●	●	●	●	●	
	1.5 Spindle's continuous position loop control	●	●	●	●	●	
	1.6 Coil changeover control	●	●	●	●	●	
	1.7 Gear changeover control	●	●	●	●	●	
	1.8 Orientation control	●	●	●	●	●	
	1.9 Indexing control	●	●	●	●	●	
	1.10 Synchronous tapping control	●	●	●	●	●	
	1.11 Spindle synchronous control	●	●	●	●	●	
	1.12 Spindle/C axis control	●	●	●	●	●	
	1.13 Proximity switch orientation control	●	●	●(Note 1)	●	●	
	2 Spindle control functions	2.1 Torque limit function	●	●	●	●	●
		2.2 Variable speed loop gain control	●	●	●	●	●
		2.5 Disturbance torque observer	●	●	●	●	●
2.6 Smooth High Gain control (SHG control)		●	●	●	●	●	
2.7 High-speed synchronous tapping control (OMR-DD control)		●	●	●	●	●	
2.8 Dual feedback control		●	●	●	●	●	
2.11 Control loop gain changeover		●	●	●	●	●	
2.12 Spindle output stabilizing control		●	●	●	●	●	
2.13 High-response spindle acceleration/deceleration function		●	●	●	●	●	
3 Compensation control function		3.1 Jitter compensation	●	●	●	●	●
	3.2 Notch filter	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	
	3.3 Adaptive tracking-type notch filter	●	●	●	●	●	
	3.4 Overshooting compensation	●	●	●	●	●	
	3.6 Lost motion compensation type 2	●	●	●	●	●	
	3.9 Spindle motor temperature compensation function	●	●	●	●	●	
4 Protection function	4.1 Deceleration control at emergency stop	●	●	●	●	●	
	4.3 Earth fault detection	●	●	●	●	●	
	4.5 SLS (Safely Limited Speed) function	●	●	●	●	●	
	4.6 Fan stop detection	●	●	●	●	●	
5 Sequence function	4.9 STO (Safe Torque Off) function	●	●	●	●	●	
	5.4 Specified speed output	●	●	●	●	●	
6 Diagnosis function	5.5 Quick READY ON sequence	●	●	●	●	●	
	6.1 Monitor output function	●	●	●	●	●	
	6.2 Machine resonance frequency display function	●	●	●	●	●	
	6.3 Machine inertia display function	●	●	●	●	●	
	6.4 Motor temperature display function	●	●	●	●	●	
	6.5 Load monitor output function	●	●	●	●	●	
	6.6 Open loop control function	●	●	●	●	●	

(Note 1) As for 2-axis spindle drive unit, setting is available only for one of the axes.

(Note 2) 4.5 SLS (Safely Limited Speed) function is set on NC side.

<Power Supply>

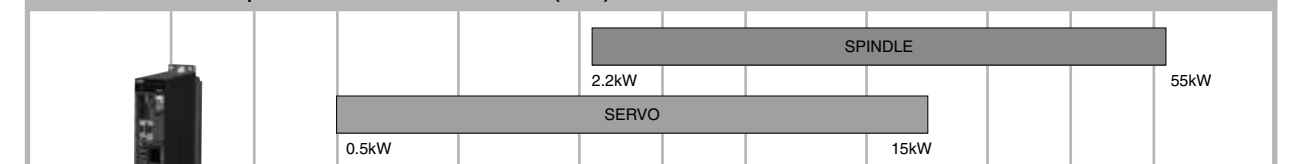
Item		MDS-E-CV	MDS-EH-CV	MDS-EM built-in converter	MDS-EJ/EJH-V1 built-in converter	MDS-EJ-SP built-in converter
1 Base control functions	1.14 Power regeneration control	●	●	●	●	●
	1.15 Resistor regeneration control	●	●	●	●	●
4 Protection function	4.6 Fan stop detection	●	●	●	●	●
	4.7 Open-phase detection	●	●	●	●	●
	4.8 Contactor weld detection	●	●	●	●	●
	4.11 Deceleration and stop function at power failure (Note 1)	●	●	●	●	●
5 Sequence function	4.12 Retraction function at power failure (Note 2)	●	●	●	●	●
	5.1 Contactor control function	●	●	●	●	●
6 Diagnosis function	5.3 External emergency stop function	●	●	●	●	●
	5.5 High-speed ready ON sequence	●	●	●	●	●
	6.7 Power supply voltage display function	●	●	●	●	●
	6.8 Drive Unit Diagnosis Display Function	●	●	●	●	●

(Note 1) The power backup unit and resistor unit option are required.

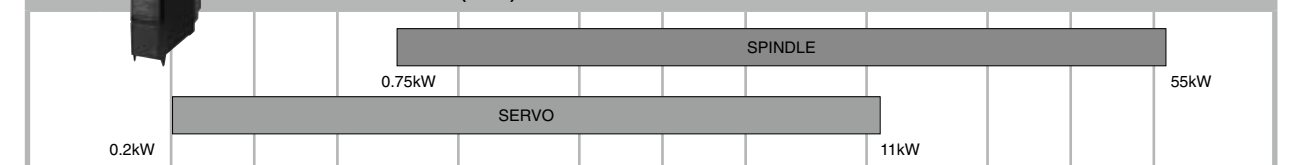
(Note 2) The power backup unit and capacitor unit option are required.

■ MITSUBISHI CNC DRIVE SYSTEM LINES

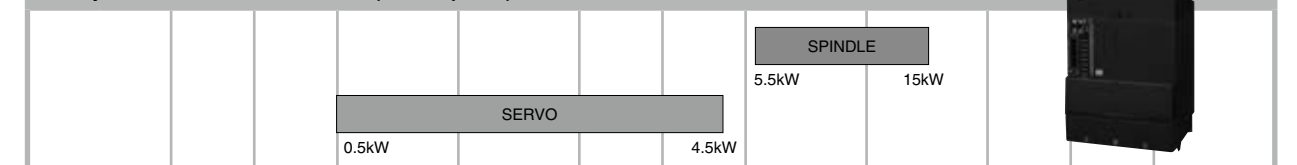
Drive unit to realize complete nano control MDS-EH Series (400V)



MDS-E Series (200V)



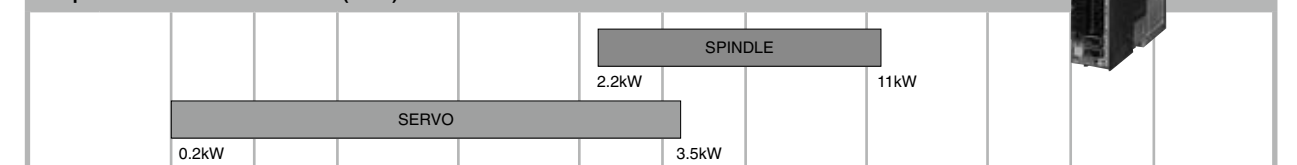
Multi-hybrid drive unit MDS-EM Series (servo+spindle)



Compact drive unit MDS-EJH Series (400V)



Compact drive unit MDS-EJ Series (200V)



Compatible motors' rated capacity

TYPE

200V HG servo motor

<HG Series>
 HG ① ② ③ - ④ - ⑤

① **Rated output and maximum rotation speed**

Symbol	Rated output	Max. 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.
703	7.0 kW	3000 r/min	176 SQ.
903	9.0 kW	3000 r/min	204 SQ.
142	1.4 kW	2000 r/min	130 SQ.
302	3.0 kW	2000 r/min	176 SQ.

② **Magnetic brake**

Symbol	Magnetic brake
None	None
B	With magnetic brake

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.

④ **Power connector**

Symbol	Connector
None	Normal
S105010	Compact (horizontal direction)

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

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.

200V Direct-drive motor

<TM-RB Series>
 Primary side [coil side] TM-RBP ① ② ③
 Secondary side [magnet side] TM-RBS ① ② ③

① **Rated torque**

Symbol	Rated torque
012	12 N·m
036	36 N·m
048	48 N·m
105	105 N·m
150	150 N·m
340	340 N·m
500	500 N·m

② **Stator dimensions**

Symbol	Dimension
C	DIA 130 mm
E	DIA 180 mm
G	DIA 230 mm
J	DIA 330 mm

③ **Rated rotation speed**

Symbol	Speed
10	100 r/min
20	200 r/min

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

200V Linear servo motor

<LM-F Series>
 Primary side [coil side] LM-FP ① ② - ③ M-1WW0
 Secondary side [magnet side] LM-FS ① 0- ② -1WW0

① **Width**

Symbol	Width (nominal)
2	120 mm
4	200 mm

② **Length**

Symbol	Length (nominal)
A	170 mm
B	290 mm
D	530 mm
F	770 mm
H	1010 mm

③ **Rated thrust**

Symbol	Rated thrust
03	300 N
06	600 N
12	1200 N
18	1800 N
24	2400 N
36	3600 N
48	4800 N

① **Width**

Symbol	Width (nominal)
2	120 mm
4	200 mm

② **Length**

Symbol	Length (nominal)
384	384 mm
480	480 mm
576	576 mm

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

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

200V SJ-D spindle motor

<SJ-D Series (for 200V)> SJ-D ① ② / ③ - ④ ⑤ - ⑥

① **Motor Series**

Symbol	Motor Series
None	Normal specifications
G	High-output specifications
J	Compact & lightweight specifications
L	Low-inertia specifications

② **Short-time (or %ED) rated output**

Symbol	Short-time rated output
0.75	0.75 kW
1.5	1.5 kW
3.7	3.7 kW
5.5	5.5 kW
7.5	7.5 kW
11	11 kW
15	15 kW

③ **Maximum rotation speed**
 Indicates the hundreds place and higher order digits.

④ **Specification code**
 Indicates a specification code (01 to 99).

⑤ **Encoder**

Symbol	Type
None	Type 1
T	Type 2

⑥ **Option (Note)**

Symbol	Option
None	Standard
A	With leg
C	Shaft with key
J	Oil seal
S	Hollow shaft
X	Reversed cooling air

(Note) If more than one option is included, the symbols are in alphabetical order.

200V SJ-V spindle motor

<SJ-V/VL Series> SJ- ① ② ③ ④ - ⑤ ⑥ T

① **Motor Series**

Symbol	Motor Series
V	Medium inertia Series
VL	Low inertia Series

② **Coil changeover**

Symbol	Coil changeover
None	Unavailable
K	Available

③ **Shaft configuration**

Symbol	Shaft configuration
None	Standard

④ **Short-time rated output (Standard specification)**

Symbol	Short-time rated output
0.75	0.75 kW
1.5	1.5 kW
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

⑤ **Specification code**
 The SJ-V/VL Series is indicated with a specification code (01 to 99).

⑥ **Special specifications**

Symbol	Special specifications
None	Standard
Z	High-speed bearing
FZ	High-speed bearing front-lock

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

200V Built-in spindle motor

<SJ-BG Series> SJ-BG ① ② / ③ - ④ ⑤ ⑥ ⑦

① Stator dimensions

Symbol	Stator dimensions
150	φ150mm
160	φ160mm

② Core width(A to Z)

③ Maximum rotation speed

Indicates the hundreds place and higher order digits.

④ Specification code (01 to 99)

⑤ Power line

Symbol	Length of lead
1	500mm
2	1000mm
3	1500mm
4	2000mm

⑦ Option

Symbol	Stator dimensions
None	Standard
J	With cooling jacket
S	Mold with cooling jacket
L	Mold without cooling jacket
R	Zoom in rotor inner diameter

⑥ Coil changeover

Symbol	Coil changeover
None	Unavailable
D	Available (Δ-2//Δ)
K	Available (Λ-Δ)

<SJ-B Series> SJ- ① B ② ③ ④ ⑤ ⑥

① Voltage

Symbol	Voltage
2	200V
4	400V

* 400V is available by special order.

② Number of poles

Symbol	Number of poles
2	2 poles
4	4 poles
6	6 poles

③ Motor size

Symbol	Stator dimensions
0	φ110
1	φ128
2	φ160
3	φ180
4	φ210
5	φ230
6	φ255
7	φ300
9	φ370
A	φ90
B	φ115

Stator outline (frame No.) is indicated with 0 to 9, A, B.

④ Specification code

Specification code (01 to 99)

⑤ Overheat protection sensor

Symbol	Overheat protection sensor
T	Thermistor

⑥ Coil changeover

Symbol	Coil changeover
None	Unavailable
D	Available (Δ-2//Δ)
K	Available (Λ-Δ)

<SJ-PMB Series> SJ- ① PMB ② ③ ④ - ⑤

① Voltage

Symbol	Voltage
None	200V
4	400V

* 400V is available by special order.

② Continuous rated torque

Indicates with 3 digits. For 1000 [N·m] or more (for 9999 [N·m] or less), the upper digit is indicated by alphabetic character and the others are indicated by the carried number. Example) 020 : 20 [N·m] A55 : 1550 [N·m]

④ Overheat protection sensor

Symbol	Overheat protection sensor
T	Thermistor

③ Base rotation speed

Indicates the thousands and the hundreds places (the ten places are rounded off.) Example) 03 : 250 to 349 [r/min] 15 : 1450 to 1549 [r/min]

⑤ Design management No.

Indicates with 2 digits number or alphabetic characters Example) 00, A1

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

200V Tool spindle motor

<HG Series> HG ① ② - ③ - ④

① Rated output · Maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size(mm)
46	0.4 kW	6000 r/min	60 SQ.
56	0.5 kW	6000 r/min	60 SQ.
96	0.9 kW	6000 r/min	80 SQ.
75	0.75 kW	4000 r/min	90 SQ.
105	1.0 kW	4000 r/min	90 SQ.
54	0.5 kW	3000 r/min	130 SQ.
104	1.0 kW	3000 r/min	130 SQ.
154	1.5 kW	3000 r/min	130 SQ.
224	2.2 kW	3000 r/min	130 SQ.
204	2.0 kW	3000 r/min	176 SQ.
354	3.5 kW	3000 r/min	176 SQ.
453	4.5 kW	3000 r/min	176 SQ.
703	7.0 kW	3000 r/min	176 SQ.
903	9.0 kW	3000 r/min	204 SQ.

② Shaft end structure

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

(Note) *K: With keyway (with key)* is only available for HG46/56/96.

③ Power connector

Symbol	Connector
None	Normal
S105010	Compact (horizontal direction)

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

④ Encoder

Symbol	Type	Resolution
D47	OSA24RS-120	1,048,576 p/rev
D48	OSA24RS	1,048,576 p/rev

(Note 1) Encoder D51 and D74 can not be used with the tool spindle motor.
(Note 2) Encoder D47 can only be used with HG46/56/96.

<HG-JR Series> HG-JR ① E1 ② W9C - ③

① Rated output · Maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size (mm)
73	0.75 kW	8000 r/min	90 SQ.
153	1.5 kW	8000 r/min	90 SQ.

② Shaft end structure

Symbol	Shaft end structure
None	Straight
K	With keyway (without key)

③ Power connector

Symbol	Connector
S105003	Normal (vertical direction)
S105010	Compact (horizontal direction)

400V HG-H servo motor

<HG-H Series> HG-H ① ② ③ - ④ - ⑤

① Rated output · Maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size(mm)
75	0.75 kW	5000r/min	90 SQ.
105	1.0 kW	5000r/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.
204	2.0 kW	4000 r/min	176 SQ.
354	3.5 kW	4000 r/min	176 SQ.
453	4.5 kW	3500 r/min	176 SQ.
703	7.0 kW	3000 r/min	176 SQ.
903	9.0 kW	3000 r/min	204 SQ.
1502	15.0kW	2500r/min	250 SQ.

② Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

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.

④ Power connector

Symbol	Connector
None	Normal
S105010	Compact (horizontal direction)

(Note) S105010 can only be used with HG-H75/105.

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

<HQ-H Series>

HQ-H ① ② S - ③

① Rated output · Maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size(mm)
903	9.0kW	3000 r/min	220 SQ.
1103	11.0kW	3000 r/min	220 SQ.

② Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

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

400V Linear servo motor

<LM-F Series>

Primary side [coil side]

LM-FP ① ② - ③ M-1WW0

① Width

Symbol	Width (nominal)
5	240 mm

② Length

Symbol	Length (nominal)
H	1010 mm

③ Rated thrust

Symbol	Rated thrust
60	6000 N

Secondary side [magnet side]

LM-FS ① 0- ② -1WW0

① Width

Symbol	Width (nominal)
5	240 mm

② Length

Symbol	Length (nominal)
480	480 mm
576	576 mm

400V SJ-4-V spindle motor

<SJ-V Series>
SJ-4- ① ② ③ ④ - ⑤ ⑥ T

① **Motor Series**

Symbol	Motor Series
V	Medium inertia Series

② **Coil changeover**

Symbol	Coil changeover
None	Unavailable

③ **Shaft configuration**

Symbol	Shaft configuration
None	Standard

④ **Short-time rated output (Standard specification)**

Symbol	Short-time rated output
2.2	2.2kW
3.7	3.7kW
5.5	5.5kW
7.5	7.5kW
11	11kW
15	15kW
18.5	18.5kW
22	22kW
26	26kW
45	45kW
55	55kW

⑤ **Specification code**
 The SJ-4-V Series is indicated with a specification code (01 to 99).

⑥ **Special specifications**

Symbol	Special specifications
None	None
Z	High-speed bearing

(Note 1) The built-in 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.

400V Tool spindle motor

<HG-JR Series>
HG-JR ① E1 ② W9C- ③

① **Rated output · Maximum rotation speed**

Symbol	Rated output	Max. rotation speed	Flange size (mm)
734	0.75 kW	8000 r/min	90 SQ.
1534	1.5 kW	8000 r/min	90 SQ.

② **Shaft end structure**




Symbol	Shaft end structure
None	Straight
K	With keyway (without key)






③ **Power connector**

Symbol	Connector
S105003	Normal (vertical direction)
S105010	Compact (horizontal direction)

SERVO MOTOR 200V

HG Series

Motor type		HG46	HG56	HG96
Compatible drive unit	1-axis type	MDS-E-V1-20	20	20
	2-axis type	MDS-E-V2-20	20	20
	3-axis type	MDS-E-V3-20	20	20
	Multi-hybrid type	MDS-EM-SPV3-xxx40	-	-
	Regenerative resistor type	MDS-EJ-V1-10	10	15
Output [N·m]		8	15	30
Stall torque		6	5.0	7.2
Max. torque		2	1.3	2.4
Rated output [kW]		0.2	0.4	0.75
Max. rotation speed [r/min]		6000	6000	6000
Motor inertia [$\times 10^{-4}$ kg·m ²]		0.234	0.379	1.27
Motor inertia with a brake [$\times 10^{-4}$ kg·m ²]		0.261	0.407	1.37
Degree of protection (The shaft-through portion, power connector portion and brake connector portion are excluded.)		IP67		
Outline dimension drawing (Without a brake, Straight shaft) [mm]				
		117.2	138.9	147.8
Flange fitting diameter [mm]		φ50	φ50	φ70
Shaft diameter [mm]		φ14	φ14	φ19
Mass (with a brake) [kg]		1.2(1.6)	1.6(2.0)	2.9(3.7)
Absolute position encoder compatible drive unit		1,048,576 [p/rev] (D47)	E, EJ	E, EM, EJ

Motor type		HG75	HG105	HG54	HG104	HG154	
Compatible drive unit	1-axis type	MDS-E-V1-20	20	40	40	80	-
	2-axis type	MDS-E-V2-40	40	40	80	80	-
	3-axis type	MDS-E-V3-40	40	40	40	-	40
	Multi-hybrid type	MDS-EM-SPV3-xxx40	xxx40	xxx40	xxx40*	xxx40*	xxx80*
	Regenerative resistor type	MDS-EJ-V1-30	30	30	30	40	80
Output [N·m]		50	50	50	50	50	50
Stall torque		40	40	40	40	40	40
Max. torque		10	10	10	10	10	10
Rated output [kW]		0.75	1.0	0.5	1.0	1.5	1.5
Max. rotation speed [r/min]		5000	5000	4000	4000	4000	4000
Motor inertia [$\times 10^{-4}$ kg·m ²]		2.62	5.12	6.13	11.9	17.8	17.8
Motor inertia with a brake [$\times 10^{-4}$ kg·m ²]		2.70	5.20	8.26	14.0	20.0	20.0
Degree of protection (The shaft-through portion is excluded.)		IP67					
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder) [mm]							
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.		127.5	163.5	118.5	140.5	162.5	
Flange fitting diameter [mm]		φ80	φ80	φ110	φ110	φ110	
Shaft diameter [mm]		φ14	φ14	φ24	φ24	φ24	
Mass (with a brake) [kg]		2.6(3.6)	4.4(5.3)	4.8(6.7)	6.5(8.5)	8.3(11.0)	
Absolute position encoder compatible drive unit		E	E	E	E	E	E
		67,108,864 [p/rev] (D74)	4,194,304 [p/rev] (D51)	1,048,576 [p/rev] (D48)	EM, EJ	EM, EJ	EM, EJ

*Refer to "MDS-EM Series Multi-hybrid drive" in this book for compatible drive unit type.
 (Note) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

■HG Series

Motor type		HG224	HG204		HG354		
Compatible drive unit	1-axis type MDS-E-V1-	80	-	80	-	160	
	2-axis type MDS-E-V2-	80	-	80	-	160	
	3-axis type MDS-E-V3-	160	-	160	-	160W	
	Multi-hybrid type MDS-EM-SPV3-	xxx80* 200120	-	xxx80* 200120	-	200120	
	Regenerative resistor type MDS-EJ-V1-	80	80	-	100	-	
Output	[N·m]50						
Stall torque	40						
Max. torque	20						
Rated output	[kW]	2.2	2.0		3.5		
Max. rotation speed	[r/min]	4000	4000		3500	4000	
Motor inertia	[×10 ⁻⁴ kg·m ²]	23.7	38.3		75.0		
Motor inertia with a brake	[×10 ⁻⁴ kg·m ²]	25.9	47.9		84.7		
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67		IP67		
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)	[mm]						
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.							
Flange fitting diameter	[mm]	φ110	φ114.3		φ114.3		
Shaft diameter	[mm]	φ24	φ35		φ35		
Mass (with a brake)	[kg]	10.0(12.0)	12.0(18.0)		19.0(25.0)		
Absolute position encoder compatible drive unit		67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	E	-	E	-	
			E	E	E	E	
			EM, EJ	EJ	EM	E	

■HG Series

Motor type		HG703	HG903	HG142	HG302
Compatible drive unit	1-axis type MDS-E-V1-	160W	320	20	40
	2-axis type MDS-E-V2-	160W	-	20	40
	3-axis type MDS-E-V3-	-	-	40	80
	Multi-hybrid type MDS-EM-SPV3-	-	-	20	40
	Regenerative resistor type MDS-EJ-V1-	-	-	40	40
Output	[N·m]200				
Stall torque	150				
Max. torque	100				
Rated output	[kW]	7.0	9.0	1.4	3.0
Max. rotation speed	[r/min]	3000	3000	2000	2000
Motor inertia	[×10 ⁻⁴ kg·m ²]	154.0	196.0	17.8	75.0
Motor inertia with a brake	[×10 ⁻⁴ kg·m ²]	164.0	206.0	20.0	84.7
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)	[mm]				
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.					
Flange fitting diameter	[mm]	φ114.3	φ180	φ110	φ114.3
Shaft diameter	[mm]	φ35	φ42	φ24	φ35
Mass (with a brake)	[kg]	32.0(38.0)	43.0(49.0)	8.3(11.0)	19.0(25.0)
Absolute position encoder compatible drive unit		67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	E	E	E
			E	E, EM, EJ	E, EM, EJ

*Refer to "MDS-EM Series Multi-hybrid drive" in this book for compatible drive unit type.
(Note) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

Motor type		HG123	HG223	HG303	HG453
Compatible drive unit	1-axis type MDS-E-V1-	20	40	80	-
	2-axis type MDS-E-V2-	20	40	80	-
	3-axis type MDS-E-V3-	40	80	160	-
	Multi-hybrid type MDS-EM-SPV3-	20	40	-	-
	Regenerative resistor type MDS-EJ-V1-	40	40	80	-
Output	[N·m]100				
Stall torque	80				
Max. torque	40				
Rated output	[kW]	1.2	2.2	3.0	4.5
Max. rotation speed	[r/min]	3000	3000	3000	3500
Motor inertia	[×10 ⁻⁴ kg·m ²]	11.9	23.7	75.0	112.0
Motor inertia with a brake	[×10 ⁻⁴ kg·m ²]	14.0	25.9	84.7	122.0
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)	[mm]				
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.					
Flange fitting diameter	[mm]	φ110	φ110	φ114.3	φ114.3
Shaft diameter	[mm]	φ24	φ24	φ35	φ35
Mass (with a brake)	[kg]	6.5(8.5)	10.0(12.0)	19.0(25.0)	25.0(31.0)
Absolute position encoder compatible drive unit		67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	E	E	-
			E	E	E
			EM, EJ	EM, EJ	EM

*Refer to "MDS-EM Series Multi-hybrid drive" in this book for compatible drive unit type.
(Note) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

DIRECT-DRIVE MOTOR 200V

TM-RB Series

Direct-drive motor type	Primary side type		TM-RBP012C20	TM-RBP036E20	TM-RBP048G20	TM-RBP105G10
	Secondary side type		TM-RBS012C20	TM-RBS036E20	TM-RBS048G20	TM-RBS105G10
Compatible drive unit	1-axis type	MDS-E-V1-	40	80	80	160
	2-axis type	MDS-E-V2-	40	80	80	160
	Regenerative resistor type	MDS-EJ-V1-	40	80	80	100
Output	[N·m]300					
	Rated torque (liquid-cooling)	<input type="checkbox"/>	12	36	48	105
	Max. torque	<input type="checkbox"/>	36	108	144	260
	Rated output	[W]	252	754	1005	1100
Max. rotation speed	[r/min]	500	500	500	250	
Motor inertia	[×10 ⁻⁴ kg·m ²]	22	127	280	395	
Degree of protection		IP00	IP00	IP00	IP00	
Outline dimension drawing	[mm]					
			76 DIA 56 DIA 130	91 DIA 100 DIA 180	80 DIA 130 DIA 230	105 DIA 130 DIA 230
Mass [kg]	Primary side (coil)		3.9	7.1	10	13
	Secondary side (magnet)		1.7	3.7	5	7

Motor type	Primary side type		TM-RBP105G20	TM-RBP150G20	TM-RBP340J20	TM-RBP500J20
	Secondary side type		TM-RBS105G20	TM-RBS150G20	TM-RBS340J20	TM-RBS500J20
Compatible drive unit	1-axis type	MDS-E-V1-	160	160	320	320W
	2-axis type	MDS-E-V2-	160	160	-	-
	Regenerative resistor type	MDS-EJ-V1-	-	-	-	-
Output	[N·m]1400					
	Rated torque (liquid-cooling)	<input type="checkbox"/>	105	150	340	500
	Max. torque	<input type="checkbox"/>	260	375	850	1280
	Rated output	[W]	2199	3141	7120	10471
Max. rotation speed	[r/min]	500	500	400	400	
Motor inertia	[×10 ⁻⁴ kg·m ²]	395	510	2778	3538	
Degree of protection		IP00	IP00	IP00	IP00	
Outline dimension drawing	[mm]					
			105 DIA 130 DIA 230	130 DIA 130 DIA 230	15 DIA 205 DIA 330	19 DIA 205 DIA 330
Mass [kg]	Primary side (coil)		13	16	33	41
	Secondary side (magnet)		7	9	20	26

(Note 1) The encoder should be procured by the user.

(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

LINEAR SERVO MOTOR 200V

LM-F Series

Linear servo motor type	Primary side type		LM-FP2A-03M-1WW0	LM-FP2B-06M-1WW0	LM-FP2D-12M-1WW0	LM-FP2F-18M-1WW0
	Secondary side type		LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0
Compatible drive unit	1-axis type	MDS-E-V1-	40	40	80	160
	2-axis type	MDS-E-V2-	40	40	80	160
	3-axis type	MDS-E-V3-	40	40	-	-
	Regenerative resistor type	MDS-EJ-V1-	40	40	80	-
Thrust force	[N]6000					
	Continuous (natural-cooling)	<input type="checkbox"/>	150	300	600	900
	Continuous (liquid-cooling)	<input type="checkbox"/>	300	600	1200	1800
	Maximum	<input type="checkbox"/>	900	1800	3600	5400
Rated thrust	[N]	300	600	1200	1800	
Maximum speed (Note 1)	[m/s]	2.0	2.0	2.0	2.0	
Magnetic attraction force	[N]	2500	4500	9000	13500	
Degree of protection		IP00	IP00	IP00	IP00	
Outline dimension drawing	[mm]					
			170 1000 120	290 1000 120	530 1000 120	770 1000 120
Mass [kg]	Primary side (coil)		5	9	18	27
	Secondary side (magnet)		5.8(384mm) 7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)

Motor type	Primary side type		LM-FP4B-12M-1WW0	LM-FP4D-24M-1WW0	LM-FP4F-36M-1WW0	LM-FP4H-48M-1WW0
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS40-□-1WW0
Compatible drive unit	1-axis type	MDS-E-V1-	80	160	320	320
	2-axis type	MDS-E-V2-	80	160	-	-
	3-axis type	MDS-E-V3-	-	-	-	-
	Regenerative resistor type	MDS-EJ-V1-	80	-	-	-
Thrust force	[N]20000					
	Continuous (natural-cooling)	<input type="checkbox"/>	600	1200	2400	3600
	Continuous (liquid-cooling)	<input type="checkbox"/>	1200	2400	4800	7200
	Maximum	<input type="checkbox"/>	3600	7200	10800	14400
Rated thrust	[N]	1200	2400	3600	4800	
Maximum speed (Note 1)	[m/s]	2.0	2.0	2.0	2.0	
Magnetic attraction force	[N]	9000	18000	27000	36000	
Degree of protection		IP00	IP00	IP00	IP00	
Outline dimension drawing	[mm]					
			290 1000 200	530 1000 200	770 1000 200	1010 1000 200
Mass [kg]	Primary side (coil)		14	28	42	56
	Secondary side (magnet)		13.5(480mm) 16.0(576mm)	13.5(480mm) 16.0(576mm)	13.5(480mm) 16.0(576mm)	13.5(480mm) 16.0(576mm)

(Note 1) The maximum speed in actual use is either the linear scale's maximum speed or this specified value, whichever is smaller.

(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

■LM-F Series (Dual-axis drive unit)

Motor type	Primary side type		LM-FP2A-03M-1WW0	LM-FP2B-06M-1WW0	LM-FP2D-12M-1WW0	LM-FP2F-18M-1WW0
	Secondary side type		LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0
Compatible drive unit	1-axis type	MDS-E-V1-	80	80	160	320
	2-axis type	MDS-E-V2-	80	80	160	-
	Regenerative resistor type	MDS-EJ-V1-	80	80	-	-
Thrust force	[N]12000					
	Continuous (natural-cooling)		600	1200	2400	3600
	Continuous (liquid-cooling)		600	1200	2400	3600
	Maximum		1800	3600	7200	10800
Rated thrust	[N]		600	1200	2400	3600
Maximum speed (Note 1)	[m/s]		2.0	2.0	2.0	2.0
Magnetic attraction force (per motor)	[N]		2500	4500	9000	13500
Degree of protection			IP00	IP00	IP00	IP00
Outline dimension drawing	[mm]					
	Primary side (coil)		5x2	9x2	18x2	27x2
Mass [kg]	Primary side (coil)		5.8(384mm)	7.1(480mm)	7.1(480mm)	7.1(480mm)
	Secondary side (magnet)		7.1(480mm) 9.0(576mm)	9.0(576mm)	9.0(576mm)	9.0(576mm)

Motor type	Primary side type		LM-FP4B-12M-1WW0	LM-FP4D-24M-1WW0
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0
Compatible drive unit	1-axis type	MDS-E-V1-	160	320
	2-axis type	MDS-E-V2-	160	-
	Regenerative resistor type	MDS-EJ-V1-	-	-
Thrust force	[N]16000			
	Continuous (natural-cooling)		2400	4800
	Continuous (liquid-cooling)		2400	4800
	Maximum		7200	14400
Rated thrust	[N]		2400	4800
Maximum speed (Note 1)	[m/s]		2.0	2.0
Magnetic attraction force (per motor)	[N]		9000	18000
Degree of protection			IP00	IP00
Outline dimension drawing	[mm]			
	Primary side (coil)		14x2	28x2
Mass [kg]	Primary side (coil)		13.5(480mm)	13.5(480mm)
	Secondary side (magnet)		16.0(576mm)	16.0(576mm)

(Note 1) The maximum speed in actual use is either the linear scale's maximum speed or this specified value, whichever is smaller.
 (Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SPINDLE MOTOR 200V

■SJ-D Series (Normal specifications)

Motor type	SJ-D3.7/100-01		SJ-D5.5/100-01		SJ-D5.5/120-01		SJ-D7.5/100-01		SJ-D7.5/120-01			
	Compatible drive unit	1-axis type	MDS-E-SP-	80	80	80	160	160	160	160	160	
Output	2-axis type	MDS-E-SP2-	80	80	80	16080(M)	16080(L)	16080(L)	16080(L)	16080(L)		
	Multi-hybrid type	MDS-EM-SPV3-	-	100xx	100xx	100xx	100xx	100xx	100xx	100xx		
	Regenerative resistor type	MDS-EJ-SP-	80	100	100	120	120	120	120	120		
Short-time rating	kW											
	Standard output during acceleration/deceleration	[kW]	3.7	5.5	5.5	7.5	7.5					
	Actual acceleration/deceleration output (Note 2)	[kW]	4.4	6.6	6.6	9	9					
	Base rotation speed	[r/min]	1500	1500	1500	1500	1500					
Max. rotation speed in constant output range	[r/min]	6000	6000	6000	6000	6000						
Maximum rotation speed	[r/min]	10000	10000	12000	10000	12000						
Continuous rated torque	[N·m]	14.0	23.6	23.6	35.0	35.0						
Motor inertia	[x10 ⁻⁴ kg·m ²]	0.0074	0.013	0.013	0.023	0.023						
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54	IP54	IP54						
Outline dimension drawing (flange type)	[mm]											
	Flange fitting diameter	[mm]	φ150	φ150	φ150	φ180	φ180					
Shaft diameter	[mm]	φ28	φ28	φ28	φ32	φ32						
Mass	[kg]	26	39	39	53	53						

Motor type	SJ-D11/100-01		SJ-D5.5/120-02					
	Compatible drive unit	1-axis type	MDS-E-SP-	160	-	160	200	
Output	2-axis type	MDS-E-SP2-	16080(L)	-	16080(L)	-		
	Multi-hybrid type	MDS-EM-SPV3-	160xx	100xx	160xx	200xx		
	Regenerative resistor type	MDS-EJ-SP-	160	-	-	-		
Acceleration/Deceleration	kW							
	Standard output during acceleration/deceleration	[kW]	11	7.5	9.2	10.4		
	Actual acceleration/deceleration output (Note 2)	[kW]	13.2	9	11.0	12.5		
	Base rotation speed	[r/min]	1500	2800	2800	2800		
Max. rotation speed in constant output range	[r/min]	4500	8000	8000	8000			
Maximum rotation speed	[r/min]	10000	12000	12000	12000			
Continuous rated torque	[N·m]	47.7	12.6	12.6	12.6			
Motor inertia	[x10 ⁻⁴ kg·m ²]	0.031	0.0074	0.0074	0.0074			
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54	IP54			
Outline dimension drawing (flange type)	[mm]							
	Flange fitting diameter	[mm]	φ180	φ150	φ150	φ150		
Shaft diameter	[mm]	φ48	φ28	φ28	φ28			
Mass	[kg]	64	26	26	26			

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-D Series (Hollow shaft specifications)

Motor type		SJ-D5.5/120-02T-S			
Compatible drive unit	1-axis type	MDS-E-SP-	-	160	200
	2-axis type	MDS-E-SP2-	-	16080(L)	-
	Multi-hybrid type	MDS-EM-SPV3-	100xx	160xx	200xx
	Regenerative resistor type	MDS-EJ-SP-	-	-	-
Output					
Standard output during acceleration/deceleration [kW]	7.5				
Actual acceleration/deceleration output (Note 2) [kW]	9				
Base rotation speed [r/min]	2800				
Max. rotation speed in constant output range [r/min]	8000				
Maximum rotation speed [r/min]	12000				
Continuous rated torque [N·m]	12.6				
Motor inertia [$\times 10^{-4}$ kg·m ²]	0.0075				
Degree of protection (The shaft-through portion is excluded.)	IP54				
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]	$\phi 150$				
Shaft diameter [mm]	$\phi 28$				
Mass [kg]	24				

■SJ-DJ Series (Compact & lightweight specifications)

Motor type		SJ-DJ5.5/100-01	SJ-DJ5.5/120-01	SJ-DJ7.5/100-01	
Compatible drive unit	1-axis type	MDS-E-SP-	80	80	160
	2-axis type	MDS-E-SP2-	80	80	16080(M)
	Multi-hybrid type	MDS-EM-SPV3-	16080(M)	100xx	100xx
	Regenerative resistor type	MDS-EJ-SP-	100xx	100	120
Output					
Standard output during acceleration/deceleration [kW]	5.5				
Actual acceleration/deceleration output (Note 2) [kW]	6.6				
Base rotation speed [r/min]	1500				
Max. rotation speed in constant output range [r/min]	2000				
Maximum rotation speed [r/min]	4500				
Continuous rated torque [N·m]	17.7				
Motor inertia [kg·m ²]	0.0074				
Degree of protection (The shaft-through portion is excluded.)	IP54				
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]	$\phi 150$				
Shaft diameter [mm]	$\phi 28$				
Mass [kg]	26				

■SJ-DG Series (High-output specifications)

Motor type		SJ-DG3.7/120-03T	SJ-DG5.5/120-04T	SJ-DG7.5/120-05T	SJ-DG11/100-03T
Compatible drive unit	1-axis type	MDS-E-SP-	160	160	200
	2-axis type	MDS-E-SP2-	-	-	-
	Multi-hybrid type	MDS-EM-SPV3-	160xx	160xx	160xx
	Regenerative resistor type	MDS-EJ-SP-	-	-	-
Output					
Standard output during acceleration/deceleration [kW]	5.5				
Actual acceleration/deceleration output (Note 2) [kW]	6.6				
Base rotation speed [r/min]	1500				
Max. rotation speed in constant output range [r/min]	10000				
Maximum rotation speed [r/min]	12000				
Continuous rated torque [N·m]	14.0				
Motor inertia [$\times 10^{-4}$ kg·m ²]	0.0066				
Degree of protection (The shaft-through portion is excluded.)	IP54				
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]	$\phi 150$				
Shaft diameter [mm]	$\phi 28$				
Mass [kg]	24				

Motor type		SJ-DJ7.5/120-01	SJ-DJ11/100-01	SJ-DJ15/80-01	
Compatible drive unit	1-axis type	MDS-E-SP-	160	160	200
	2-axis type	MDS-E-SP2-	16080(L)	16080(L)	-
	Multi-hybrid type	MDS-EM-SPV3-	100xx	160xx	200xx
	Regenerative resistor type	MDS-EJ-SP-	120	160	-
Output					
Standard output during acceleration/deceleration [kW]	7.5				
Actual acceleration/deceleration output (Note 2) [kW]	9				
Base rotation speed [r/min]	1500				
Max. rotation speed in constant output range [r/min]	2000				
Maximum rotation speed [r/min]	4500				
Continuous rated torque [N·m]	26.3				
Motor inertia [kg·m ²]	0.013				
Degree of protection (The shaft-through portion is excluded.)	IP54				
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]	$\phi 150$				
Shaft diameter [mm]	$\phi 28$				
Mass [kg]	39				

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".
 (Note 3) %ED is a load time ratio of operating time relative to a 10-minute cycle time. At 25%ED, for example, the operating time is 2.5 minutes and non-operation time is 7.5 minutes of a 10-minute cycle time.

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".
 (Note 3) %ED is a load time ratio of operating time relative to a 10-minute cycle time. At 25%ED, for example, the operating time is 2.5 minutes and non-operation time is 7.5 minutes of a 10-minute cycle time.

■SJ-DL Series (Low-inertia specification)

Motor type		SJ-DL0.75/100-01	SJ-DL1.5/100-01	SJ-DL5.5/150-01T
Compatible drive unit	1-axis type	MDS-E-SP-20	MDS-E-SP-40	MDS-E-SP-160
	2-axis type	MDS-E-SP2-20	MDS-E-SP2-40	MDS-E-SP2-16080(L)
	Multi-hybrid type	MDS-EM-SPV3-	MDS-EM-SPV3-	MDS-EM-SPV3-160xx
	Regenerative resistor type	MDS-EJ-SP-	MDS-EJ-SP-	MDS-EJ-SP-
Output Acceleration/Deceleration Short-time rating Continuous rating				
	Standard output during acceleration/deceleration [kW]	0.9	1.5	11
	Actual acceleration/deceleration output (Note 2) [kW]	1.1	1.8	13.2
Base rotation speed [r/min]	1500	1500	2500	
Max. rotation speed in constant output range [r/min]	10000	10000	15000	
Maximum rotation speed [r/min]	10000	10000	15000	
Continuous rated torque [N·m]	2.6	4.8	14.1	
Motor inertia [kg·m ²]	0.0011	0.0019	0.0046	
Degree of protection (The shaft-through portion is excluded.)	IP54	IP54	IP54	
Outline dimension drawing (flange type) [mm]				
	Flange fitting diameter [mm]	φ110	φ110	φ150
Shaft diameter [mm]	φ22	φ22	φ28	
Mass [kg]	10	14	30	

■SJ-DL Series (Hollow shaft specifications)

Motor type		SJ-DL5.5/200-01T-S
Compatible drive unit	1-axis type	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)
	Multi-hybrid type	MDS-EM-SPV3-
	Regenerative resistor type	MDS-EJ-SP-
Output Acceleration/Deceleration Short-time rating Continuous rating		
	Standard output during acceleration/deceleration [kW]	11
	Actual acceleration/deceleration output (Note 2) [kW]	13.2
Base rotation speed [r/min]	2500	
Max. rotation speed in constant output range [r/min]	20000	
Maximum rotation speed [r/min]	20000	
Continuous rated torque [N·m]	14.1	
Motor inertia [kg·m ²]	0.0046	
Degree of protection (The shaft-through portion is excluded.)	IP54	
Outline dimension drawing (flange type) [mm]		
	Flange fitting diameter [mm]	φ150
Shaft diameter [mm]	φ22	
Mass [kg]	28	

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

Motor type		SJ-DL5.5/200-01T	SJ-DL7.5/150-01T
Compatible drive unit	1-axis type	MDS-E-SP-160	MDS-E-SP-160
	2-axis type	MDS-E-SP2-16080(L)	MDS-E-SP2-16080(L)
	Multi-hybrid type	MDS-EM-SPV3-	MDS-EM-SPV3-160xx
	Regenerative resistor type	MDS-EJ-SP-	MDS-EJ-SP-
Output Acceleration/Deceleration Short-time rating Continuous rating			
	Standard output during acceleration/deceleration [kW]	11	11
	Actual acceleration/deceleration output (Note 2) [kW]	13.2	13.2
Base rotation speed [r/min]	2500	1500	
Max. rotation speed in constant output range [r/min]	20000	8000	
Maximum rotation speed [r/min]	20000	15000	
Continuous rated torque [N·m]	14.1	35.0	
Motor inertia [kg·m ²]	0.0046	0.016	
Degree of protection (The shaft-through portion is excluded.)	IP54	IP54	
Outline dimension drawing (flange type) [mm]			
	Flange fitting diameter [mm]	φ150	φ180
Shaft diameter [mm]	φ28	φ32	
Mass [kg]	30	56	

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-V Series (Normal specification)

Motor type		SJ-V2.2-01T	SJ-V3.7-02ZT	SJ-V7.5-03ZT
Compatible drive unit	1-axis type MDS-E-SP-	40	80	160
	2-axis type MDS-E-SP2-	40	80 16080(M)	16080(L)
	Multi-hybrid type MDS-EM-SPV3-	-	-	160xx
Output	Short-time rating			
	Continuous rating			
Standard output during acceleration/deceleration [kW]		2.2	3.7	7.5
Actual acceleration/deceleration output (Note 2) [kW]		2.6	4.4	9
Base rotation speed [r/min]		1500	3000	1500
Max. rotation speed in constant output range [r/min]		6000	12000	10000
Maximum rotation speed [r/min]		10000	15000	12000
Continuous rated torque [N·m]		9.5	7.0	35
Motor inertia [kg·m ²]		0.00675	0.00675	0.0245
Degree of protection		IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]			
	Flange fitting diameter [mm]	φ150	φ150	φ180
Shaft diameter [mm]		φ28	φ28	φ32
Mass [kg]		25	25	60

Motor type		SJ-V11-08ZT	SJ-V11-13ZT	SJ-V15-01ZT
Compatible drive unit	1-axis type MDS-E-SP-	200	200	200
	2-axis type MDS-E-SP2-	-	-	-
	Multi-hybrid type MDS-EM-SPV3-	200xx	200xx	200xx
Output	Short-time rating			
	Continuous rating			
Standard output during acceleration/deceleration [kW]		11	11	15
Actual acceleration/deceleration output (Note 2) [kW]		13.2	13.2	18
Base rotation speed [r/min]		1500	1500	1500
Max. rotation speed in constant output range [r/min]		8000	6000	4500
Maximum rotation speed [r/min]		8000	8000	8000
Continuous rated torque [N·m]		47.7	47.7	70
Motor inertia [kg·m ²]		0.03	0.03	0.0575
Degree of protection		IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]			
	Flange fitting diameter [mm]	φ180	φ180	φ230
Shaft diameter [mm]		φ48	φ48	φ48
Mass [kg]		70	70	110

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-V Series (Normal specification)

Motor type		SJ-V15-09ZT	SJ-V18.5-01ZT	SJ-V18.5-04ZT	SJ-V22-01ZT
Compatible drive unit	1-axis type MDS-E-SP-	200	200	240	240
	2-axis type MDS-E-SP2-	-	-	-	-
	Multi-hybrid type MDS-EM-SPV3-	200xx	200xx	-	-
Output	Short-time rating				
	Continuous rating				
Standard output during acceleration/deceleration [kW]		15	18.5	18.5	22
Actual acceleration/deceleration output (Note 2) [kW]		18	22.2	22.2	26.4
Base rotation speed [r/min]		1500	1500	1500	1500
Max. rotation speed in constant output range [r/min]		6000	4500	6000	4500
Maximum rotation speed [r/min]		8000	8000	8000	8000
Continuous rated torque [N·m]		70	95.5	95.5	118
Motor inertia [kg·m ²]		0.0575	0.0575	0.0575	0.08
Degree of protection		IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]				
	Flange fitting diameter [mm]	φ230	φ230	φ230	φ230
Shaft diameter [mm]		φ48	φ48	φ48	φ55
Mass [kg]		110	110	110	135

Motor type		SJ-V22-04ZT	SJ-V22-06ZT	SJ-V26-01ZT	SJ-V37-01ZT
Compatible drive unit	1-axis type MDS-E-SP-	320	240	320	400
	2-axis type MDS-E-SP2-	-	-	-	-
	Multi-hybrid type MDS-EM-SPV3-	-	-	-	-
Output	Short-time rating				
	Continuous rating				
Standard output during acceleration/deceleration [kW]		22	15	26	37
Actual acceleration/deceleration output (Note 2) [kW]		26.4	18	31.2	44.4
Base rotation speed [r/min]		1500	1500	1500	1150
Max. rotation speed in constant output range [r/min]		6000	10000	6000	3450
Maximum rotation speed [r/min]		8000	10000	8000	6000
Continuous rated torque [N·m]		118	70.0	140	249
Motor inertia [kg·m ²]		0.08	0.0575	0.0925	0.34
Degree of protection		IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]				
	Flange fitting diameter [mm]	φ230	φ230	φ230	φ300
Shaft diameter [mm]		φ55	φ48	φ55	φ60
Mass [kg]		135	110	155	300

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-V Series (Normal specification)

Motor type		SJ-V45-01ZT	SJ-V55-01ZT
Compatible drive unit	1-axis type	MDS-E-SP-640	640
	2-axis type	MDS-E-SP2-	-
	Multi-hybrid type	MDS-EM-SPV3-	-
Output	Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>
	Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>
Output graph			
Standard output during acceleration/deceleration [kW]		45	55
Actual acceleration/deceleration output (Note 2) [kW]		54	66
Base rotation speed [r/min]		1500	1150
Max. rotation speed in constant output range [r/min]		4500	3450
Maximum rotation speed [r/min]		6000	4500
Continuous rated torque [N · m]		236	374
Motor inertia [kg · m ²]		0.34	0.8475
Degree of protection		IP44	IP44
Outline dimension drawing (flange type) [mm]			
Flange fitting diameter [mm]		φ300	φ450
Shaft diameter [mm]		φ60	φ75
Mass [kg]		300	450

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-V Series (Wide range constant output specification)

Motor type		SJ-V11-01T	SJ-V11-09T	SJ-V15-03T	SJ-V18.5-03T
Compatible drive unit	1-axis type	MDS-E-SP-160	160	200	240
	2-axis type	MDS-E-SP2-16080(L)	16080(L)	-	-
	Multi-hybrid type	MDS-EM-SPV3-160xx	160xx	200xx	-
Output	Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Output graph					
Standard output during acceleration/deceleration [kW]		5.5	7.5	9	11
Actual acceleration/deceleration output (Note 2) [kW]		6.6	9	10.8	13.2
Base rotation speed [r/min]		750	750	750	750
Max. rotation speed in constant output range [r/min]		6000	6000	6000	6000
Maximum rotation speed [r/min]		6000	6000	6000	6000
Continuous rated torque [N · m]		47.1	70.0	95.5	115
Motor inertia [kg · m ²]		0.03	0.0575	0.0575	0.08
Degree of protection		IP44	IP44	IP44	IP44
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]		φ180	φ230	φ230	φ230
Shaft diameter [mm]		φ48	φ48	φ48	φ55
Mass [kg]		70	110	110	135

Motor type		SJ-V22-05T	SJ-V22-09T	SJ-VK22-19ZT
Compatible drive unit	1-axis type	MDS-E-SP-320	320	320
	2-axis type	MDS-E-SP2-	-	-
	Multi-hybrid type	MDS-EM-SPV3-	-	-
Output	Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Output graph				
Standard output during acceleration/deceleration [kW]		15	18.5	18.5
Actual acceleration/deceleration output (Note 2) [kW]		18	22.2	22.2
Base rotation speed [r/min]		750	500	330
Max. rotation speed in constant output range [r/min]		6000	3500	750
Maximum rotation speed [r/min]		6000	4500	750
Continuous rated torque [N · m]		140	239	310
Motor inertia [kg · m ²]		0.08	0.31	0.34
Degree of protection		IP44	IP44	IP44
Outline dimension drawing (flange type) [mm]				
Flange fitting diameter [mm]		φ230	φ300	φ300
Shaft diameter [mm]		φ55	φ60	φ60
Mass [kg]		135	280	300

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-VL Series (Low-inertia specification)

Motor type		SJ-VL2.2-02ZT	SJ-VL11-02FZT	SJ-VL11-05FZT-S01 **	SJ-VL18.5-05FZT
Compatible drive unit	1-axis type	MDS-E-SP-40	160	160	240
	2-axis type	MDS-E-SP2-40	16080(L)	16080(L)	-
	Multi-hybrid type	MDS-EM-SPV3-	-	160xx	160xx *2
Output	Acceleration/Deceleration				
	Short-time rating	Short-time (15min) <input type="checkbox"/>	Short-time (15min) <input type="checkbox"/>	Short-time (10min) <input type="checkbox"/>	Short-time (5min) <input type="checkbox"/> (15min) <input type="checkbox"/>
Standard output during acceleration/deceleration [kW]		2.2	11	11	18.5
Actual acceleration/deceleration output (Note 2) [kW]		2.6	13.2	13.2	22.2
Base rotation speed [r/min]		3000	1500	5000	3000
Max. rotation speed in constant output range [r/min]		15000	15000	20000	15000
Maximum rotation speed [r/min]		15000	15000	20000	15000
Continuous rated torque [N·m]		4.8	14.0	2.9	7.0
Motor inertia [$\times 10^{-4}$ kg·m ²]		0.0024	0.003	0.0024	0.00525
Degree of protection		IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]				
		130 SQ, 325	174 SQ, 441	130 SQ, 325	174 SQ, 441
Flange fitting diameter [mm]		φ110	φ150	φ110	φ150
Shaft diameter [mm]		φ22	φ28	φ22	φ28
Mass [kg]		20	42	20	40

*1 The acceleration/deceleration frequency is limited by the regenerative resistor.

*2 The maximum rotation speed is 15000r/min.

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

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

BUILT-IN SPINDLE MOTOR 200V

■SJ-BG Series

Motor type (Note 1)		SJ-BG150B/150-01 <input type="checkbox"/>	40	SJ-BG160B/150-01 (R) <input type="checkbox"/>	160	SJ-BG160D/150-01 (R) <input type="checkbox"/>
Compatible drive unit	MDS-E-SP-	80	40	80	160	80
	Output					
%ED rating		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]		5.5	3.7	3.7	7.5	5.5
Actual acceleration/deceleration output (Note 4) [kW]		6.6	4.44	4.44	9	6.6
Continuous base rotation speed [r/min]		2500	3500	1300	1770	1500
Maximum rotation speed [r/min]		15000	15000	15000	15000	15000
Continuous rated torque [N·m]		14.1	6.0	16.2	20.0	23.6
Rotor inertia [kg·m ²]		0.00575	0.005(0.0042)	0.005(0.0042)	0.005(0.0042)	0.0075(0.0061)
Outline dimension drawing	[mm]					
		170, φ55(Notes), φ149.5(Notes2)		153, φ60(Notes2), φ70(Notes5), φ159.5(Notes2)		188, φ60(Notes2), φ70(Notes5), φ159.5(Notes2)
Mass	Stator [kg]	6.3	7.1	7.1	7.1	10.0
	Rotor [kg]	3.7	2.9(2.3)	2.9(2.3)	2.9(2.3)	4.3(3.3)

Motor type (Note 1)		SJ-BG160D/150-02 (R) <input type="checkbox"/>	SJ-BG120C/200-011R	SJ-BG120A/200-011KR	
Compatible drive unit	MDS-E-SP-	160	80	80	
	Output				
%ED rating		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]		7.5	3.7	3.7	5.5
Actual acceleration/deceleration output (Note 4) [kW]		9	4.4	4.4	6.6
Continuous base rotation speed [r/min]		1500	2500	2500	5500
Maximum rotation speed [r/min]		15000	20000	15000	20000
Continuous rated torque [N·m]		23.6	8.4	5.7	2.6
Rotor inertia [kg·m ²]		0.0075(0.0061)	0.0027	0.0014	
Outline dimension drawing	[mm]				
		188, φ60(Notes2), φ70(Notes5), φ159.5(Notes2)	195, φ52(Notes2), φ119.5(Notes2)	135, φ52(Notes2), φ119.5(Notes2)	
Mass	Stator [kg]	11.0	5.9	3.0	
	Rotor [kg]	4.3(3.3)	2.5	1.3	

(Note 1) Please contact your Mitsubishi Electric dealer for the special products not listed above.

(Note 2) These dimensions are the dimensions after machine machining.

(Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

(Note 5) A value in brackets is for the motor type which have (R) in the end of the type name.

■SJ-B Series

Motor type (Note 1)		SJ-2B4002T	SJ-2B4004T	SJ-2B4003T	SJ-2B4B03T	SJ-2B4112T
Compatible drive unit	MDS-E-SP-	20	40	40	160	40
Output Acceleration/Deceleration Short-time rating Continuous rating						
	Standard output during acceleration/deceleration [kW]	0.75	1.5	2.2	7.5	2.2
	Actual acceleration/deceleration output (Note 4) [kW]	0.9	1.8	2.64	9	2.64
	Continuous base rotation speed [r/min]	3000	3000	3000	5500	2500
Maximum rotation speed [r/min]	10000	15000	12000	10000	10000	
Continuous rated torque [N·m]	1.27	2.39	4.77	3.82	5.73	
Rotor inertia [kg·m ²]	0.00078	0.00078	0.00138	0.00163	0.00168	
Outline dimension drawing [mm]						
	Mass	Stator [kg] Rotor [kg]	2.2 0.9	2.2 0.9	3.9 1.7	3.0 1.5

■SJ-B Series

Motor type (Note 1)		SJ-2B4327T	SJ-2B4340T	SJ-2B4313TK		SJ-2B4323TK	
Compatible drive unit	MDS-E-SP-	160	200	160		200	
Output Acceleration/Deceleration Short-time rating Continuous rating							
	Standard output during acceleration/deceleration [kW]	11	11	7.5	7.5	11	11
	Actual acceleration/deceleration output (Note 4) [kW]	13.2	13.2	9	9	13.2	13.2
	Continuous base rotation speed [r/min]	1700	1500	1000	2100	1000	2000
Maximum rotation speed [r/min]	8000	8000	2100	12000	2000	12000	
Continuous rated torque [N·m]	30.9	47.7	52.5	25.0	52.5	26.3	
Rotor inertia [kg·m ²]	0.0175	0.0175	0.0175		0.0175		
Outline dimension drawing [mm]							
	Mass	Stator [kg] Rotor [kg]	20 7.6	20 7.6	20 7.6	20 7.6	

Motor type (Note 1)		SJ-2B4111T	SJ-2B4105T	SJ-2B4102T	SJ-2B4310T	SJ-2B4301T
Compatible drive unit	MDS-E-SP-	80	80	80	80	160
Output Short-time rating Continuous rating						
	Standard output during acceleration/deceleration [kW]	5.5	3.7	3.7	5.5	7.5
	Actual acceleration/deceleration output (Note 4) [kW]	6.6	4.44	4.44	6.6	9
	Continuous base rotation speed [r/min]	6000	3000	1500	1750	1100
Maximum rotation speed [r/min]	10000	15000	15000	8000	12000	
Continuous rated torque [N·m]	5.89	7.00	7.00	20.2	32.1	
Rotor inertia [kg·m ²]	0.00168	0.003	0.00425	0.0128	0.0128	
Outline dimension drawing [mm]						
	Mass	Stator [kg] Rotor [kg]	4.1 1.7	7.4 3.0	10 4.3	15 5.6

Motor type (Note 1)		SJ-2B4325TK		SJ-2B4303TK		SJ-2B4326TK	
Compatible drive unit	MDS-E-SP-	240		200		240	
Output %ED rating Short-time rating Continuous rating							
	Standard output during acceleration/deceleration [kW]	15	22	11	15	15	18.5
	Actual acceleration/deceleration output (Note 4) [kW]	18	26.4	13.2	18	18	22.2
	Continuous base rotation speed [r/min]	2000	4700	680	1250	1000	1600
Maximum rotation speed [r/min]	5200	12000	3000	12000	2500	12000	
Continuous rated torque [N·m]	52.5	30.5	77.2	42.0	71.6	44.8	
Rotor inertia [kg·m ²]	0.0175		0.0225		0.0225		
Outline dimension drawing [mm]							
	Mass	Stator [kg] Rotor [kg]	20 7.6	26 9.8	26 9.8		

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 (Note 2) These dimensions are the dimensions after machine machining.
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 (Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

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 (Note 2) These dimensions are the dimensions after machine machining.
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■SJ-B Series

Motor type (Note 1)		SJ-2B4304TK		SJ-2B4318TK		SJ-2B4412T		
Compatible drive unit		MDS-E-SP-		320		160		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		15		18.5		5.5	
	Actual acceleration/deceleration output (Note 4) [kW]		18		22.2		6.6	
	Continuous base rotation speed [r/min]		450		1200		1500	
	Maximum rotation speed [r/min]		1500		3000		10000	
Continuous rated torque [N·m]		117		119		23.6		
Rotor inertia [kg·m ²]		0.028		0.028		0.0193		
Outline dimension drawing								
	[mm]							
Mass	Stator [kg]	33		33		15		
	Rotor [kg]	12		12		6.2		

■SJ-B Series

Motor type (Note 1)		SJ-2B6602TK		SJ-2B4601TK		SJ-2B6605TK		
Compatible drive unit		MDS-E-SP-		320		240		
Output Acceleration/Deceleration Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		15		26		15	
	Actual acceleration/deceleration output (Note 4) [kW]		18		31.2		18	
	Continuous base rotation speed [r/min]		550		1250		440	
	Maximum rotation speed [r/min]		2000		3500		1500	
Continuous rated torque [N·m]		191		168		239		
Rotor inertia [kg·m ²]		0.133		0.105		0.173		
Outline dimension drawing								
	[mm]							
Mass	Stator [kg]	49		55		63		
	Rotor [kg]	25		24		33		

Motor type (Note 1)		SJ-2B4501TK		SJ-2B6611TK		SJ-2B4502TK		
Compatible drive unit		MDS-E-SP-		200		320		
Output Acceleration/Deceleration Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		15		11		22	
	Actual acceleration/deceleration output (Note 4) [kW]		18		13.2		26.4	
	Continuous base rotation speed [r/min]		700		500		525	
	Maximum rotation speed [r/min]		2250		1500		3000	
Continuous rated torque [N·m]		102		143		136		
Rotor inertia [kg·m ²]		0.08		0.102		0.105		
Outline dimension drawing								
	[mm]							
Mass	Stator [kg]	29		37		37		
	Rotor [kg]	18		19		24		

Motor type (Note 1)		SJ-2B4503TK		SJ-2B6603TK		SJ-2B4602TK		
Compatible drive unit		MDS-E-SP-		320		320		
Output Acceleration/Deceleration Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		15		22		22	
	Actual acceleration/deceleration output (Note 4) [kW]		18		26.4		26.4	
	Continuous base rotation speed [r/min]		475		1250		600	
	Maximum rotation speed [r/min]		2000		10000		1500	
Continuous rated torque [N·m]		221		115		245		
Rotor inertia [kg·m ²]		0.135		0.173		0.135		
Outline dimension drawing								
	[mm]							
Mass	Stator [kg]	48		63		71		
	Rotor [kg]	31		33		31		

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 (Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

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■SJ-B Series

Motor type (Note 1)		SJ-2B4511TK		SJ-2B6720TK		SJ-2B6705TK		
Compatible drive unit		MDS-E-SP-320		320		200		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		22		26		11	
	Actual acceleration/deceleration output (Note 4) [kW]		26.4		31.2		13.2	
	Continuous base rotation speed [r/min]		600		1550		500	
Maximum rotation speed [r/min]		2000		4500		4500		
Continuous rated torque [N·m]		239		136		133		
Rotor inertia [kg·m ²]		0.15		0.20		0.288		
Outline dimension drawing								
	Mass		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]	
		54 34		45 26		65 38		

■SJ-B Series

Motor type (Note 1)		SJ-2B6721TK		SJ-2B6704TK		SJ-2B6709TK		
Compatible drive unit		MDS-E-SP-320		320		400		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		22		30		22	
	Actual acceleration/deceleration output (Note 4) [kW]		26.4		36		26.4	
	Continuous base rotation speed [r/min]		500		1500		350	
Maximum rotation speed [r/min]		1500		6000		1500		
Continuous rated torque [N·m]		353		140		409		
Rotor inertia [kg·m ²]		0.283		0.37		0.37		
Outline dimension drawing								
	Mass		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]	
		70 35		83 49		83 49		

Motor type (Note 1)		SJ-2B6711TK		SJ-2B6706TK		SJ-2B6716TK		
Compatible drive unit		MDS-E-SP-320		400		400		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Standard output during acceleration/deceleration [kW]		22		26		26	
	Actual acceleration/deceleration output (Note 4) [kW]		26.4		31.2		31.2	
	Continuous base rotation speed [r/min]		400		450		350	
Maximum rotation speed [r/min]		1700		2000		600		
Continuous rated torque [N·m]		263		318		409		
Rotor inertia [kg·m ²]		0.280		0.288		0.283		
Outline dimension drawing								
	Mass		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]	
		65 37		65 38		70 35		

Motor type (Note 1)		SJ-2B6905TK		SJ-2B6908TK		
Compatible drive unit		MDS-E-SP-320		320		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating						
	Standard output during acceleration/deceleration [kW]		26		22	
	Actual acceleration/deceleration output (Note 4) [kW]		31.2		26.4	
	Continuous base rotation speed [r/min]		420		175	
Maximum rotation speed [r/min]		1500		1000		
Continuous rated torque [N·m]		500		819		
Rotor inertia [kg·m ²]		0.853		1.105		
Outline dimension drawing						
	Mass		Stator [kg] Rotor [kg]		Stator [kg] Rotor [kg]	
		110 70		143 91		

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 (Note 2) These dimensions are the dimensions after machine machining.
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 (Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

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 (Note 2) These dimensions are the dimensions after machine machining.
 (Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

■SJ-B Series

Motor type (Note 1)		SJ-2B6906TK		SJ-2B6914TK						
Compatible drive unit		MDS-E-SP-400		MDS-E-SP-640						
Output Acceleration/Deceleration <input type="checkbox"/> Short-time rating <input type="checkbox"/> Continuous rating <input type="checkbox"/>										
	Standard output during acceleration/deceleration [kW]		22		37		30		45	
	Actual acceleration/deceleration output (Note 4) [kW]		26.4		44.4		36		54	
	Continuous base rotation speed [r/min]		175		600		240		470	
Maximum rotation speed [r/min]		1000		3300		1000		3300		
Continuous rated torque [N·m]		819		477		995		508		
Rotor inertia [kg·m ²]		1.105		1.105		1.105		1.105		
Outline dimension drawing [mm]										
	Mass		Stator [kg]		143		Rotor [kg]		91	

■SJ-PMB Series

Motor type (Note 1)		SJ-PMB02215T-02		SJ-PMB04412T-B0		SJ-PMB14007T-01						
Compatible drive unit		MDS-E-SP-240		MDS-E-SP-200		MDS-E-SP-320						
Output %ED rating <input type="checkbox"/> Continuous rating <input type="checkbox"/>												
	Standard output during acceleration/deceleration [kW]		5.5		7.5		7.5		15		15	
	Actual acceleration/deceleration output (Note 4) [kW]		6.6		9		9		18		18	
	Continuous base rotation speed [r/min]		1500		1200		3000		750		1800	
Maximum rotation speed [r/min]		10000		3000		8000		1800		6000		
Continuous rated torque [N·m]		22.3		43.8		17.5		140		58.4		
Rotor inertia [kg·m ²]		0.006		0.0162		0.0633		0.0633		0.0633		
Outline dimension drawing [mm]												
	Mass		Stator [kg]		4.4		Rotor [kg]		3.7		14.0	
										30		
										15		

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 (Note 2) These dimensions are the dimensions after machine machining.
 (Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 4) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

TOOL SPINDLE MOTOR 200V

■HG Series

Motor type		HG Series			
		HG□-D47			
		HG46	HG56	HG96	
Compatible drive unit	1-axis type	MDS-E-SP-	20	20	20
	2-axis type	MDS-E-SP2-	20	20	20
	Regenerative resistor type	MDS-EJ-SP-	20	20	20
Output Rated torque <input type="checkbox"/> Max. torque <input type="checkbox"/>	[N·m]8				
	Rated output [kW]		0.40		
	Max. rotation speed [r/min]		6000		
	Motor inertia [$\times 10^{-4}$ kg·m ²]		0.234		
Degree of protection (The shaft-through portion, power connector portion and brake connector portion are excluded.)		IP67			
Outline dimension drawing [mm]					
	Flange fitting diameter [mm]		φ50		φ70
Shaft diameter [mm]		φ14		φ19	
Mass [kg]		1.2		2.9	

■HG-JR Series

Motor type		HG-JR Series		
		HG-JR73	HG-JR153	
Compatible drive unit	1-axis type	MDS-E-SP-	40	80
	2-axis type	MDS-E-SP2-	40	80
	Regenerative resistor type	MDS-EJ-SP-	40	80
Output Rated torque <input type="checkbox"/> Max. torque <input type="checkbox"/>	[N·m]15			
	Rated output [kW]		0.75	
	Max. rotation speed [r/min]		8000	
	Motor inertia [$\times 10^{-4}$ kg·m ²]		2.09	
Degree of protection (The shaft-through portion is excluded.)		IP67		
Outline dimension drawing [mm]				
	Flange fitting diameter [mm]		φ80	
Shaft diameter [mm]		φ16		
Mass [kg]		3.7		

(Note 1) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

■HG Series

Motor type			HG Series											
			HG□-D48											
			HG75	HG105	HG54	HG104	HG154	HG224						
Compatible drive unit	1-axis type	MDS-E-SP-	20	20	40	40	80	80						
	2-axis type	MDS-E-SP2-	20	20	40	40	80	80						
	Regenerative resistor type	MDS-EJ-SP-	40	40	80	80	16080	16080						
Output	Rated torque	[N·m]	1.8	2.4	1.6	3.2	4.8	7.0						
	Max. torque	[N·m]	7.0	8.1	12.1	23.3	33.9	46.5						
	Rated output	[kW]	0.75	1.0	0.5	1.0	1.5	2.2						
Rated rotation speed			4000			3000								
Max. rotation speed			4000			3000								
Motor inertia			2.62		5.12		6.13		11.9		17.8		23.7	
Degree of protection			IP67											
Outline dimension drawing (flange type)			[mm]											
			90 SQ.	90 SQ.	130 SQ.	130 SQ.	130 SQ.	130 SQ.	130 SQ.					
			127.5	163.5	118.5	140.5	162.5	184.5						
Flange fitting diameter			φ80		φ110		φ110		φ110		φ110			
Shaft diameter			φ14		φ24		φ24		φ24		φ24			

Motor type			HG Series									
			HG□-D48									
			HG204	HG354	HG453	HG703	HG903					
Compatible drive unit	1-axis type	MDS-E-SP-	80	160	160	160	320					
	2-axis type	MDS-E-SP2-	80	16080	16080	16080	-					
	Regenerative resistor type	MDS-EJ-SP-	16080	-	-	-	-					
Output	Rated torque	[N·m]	6.4	11.1	14.3	22.3	28.6					
	Max. torque	[N·m]	46.5	74.5	89.3	116.5	171.0					
	Rated output	[kW]	2.0	3.5	4.5	7.0	9.0					
Rated rotation speed			3000									
Max. rotation speed			3000									
Motor inertia			38.3		75.0		112.0		154.0		196.0	
Degree of protection			IP67									
Outline dimension drawing (flange type)			[mm]									
			176 SQ.	176 SQ.	176 SQ.	176 SQ.	204 SQ.					
			143.5	183.5	223.5	263.5	330					
Flange fitting diameter			φ114.3				φ180					
Shaft diameter			φ35				φ42					

(Note 1) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SERVO MOTOR 400V


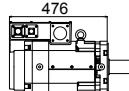
■HG-H Series

Motor type		HG-H75	HG-H105	HG-H54	HG-H104	HG-H154	
Compatible drive unit	1-axis type	MDS-EH-V1-	10	10	20	20	
	2-axis type	MDS-EH-V2-	10	10	20	20	
	Regenerative resistor type	MDS-EJH-V1	20	20	40	40	
Output	Rated torque	[N·m]	2.0	3.0	2.9	5.9	9.0
	Max. torque	[N·m]	8.0	11.0	13.0	23.3	42.0
	Rated output	[kW]	0.75	1.0	0.5	1.0	1.5
Max. rotation speed		5000		4000		4000	
Motor inertia		2.62		5.12		6.13	
Motor inertia with a brake		2.70		5.20		8.26	
Degree of protection		IP67					
Outline dimension drawing (flange type)		[mm]					
		90 SQ.	90 SQ.	130 SQ.	130 SQ.	130 SQ.	
		127.5	163.5	118.5	140.5	162.5	
Flange fitting diameter		φ80		φ110		φ110	
Shaft diameter		φ14		φ24		φ24	
Mass (with a brake)		2.6(3.6)		4.4(5.3)		4.8(6.7)	
Absolute position encoder compatible		EH		EH		EH	
drive unit		EH, EJH		EH, EJH		EH, EJH	

Motor type		HG-H204	HG-H354	HG-H453	HG-H703	HG-H903	
Compatible drive unit	1-axis type	MDS-EH-V1-	40	80	80	80W	
	2-axis type	MDS-EH-V2-	40	80	80	80W	
	Regenerative resistor type	MDS-EJH-V1	80	80W	80W	-	
Output	Rated torque	[N·m]	13.7	22.5	37.2	49.0	58.8
	Max. torque	[N·m]	47.0	90.0	122.0	152.0	208.0
	Rated output	[kW]	2.0	3.5	4.5	7.0	9.0
Max. rotation speed		4000		3500		3000	
Motor inertia		38.3		75.0		112.0	
Motor inertia with a brake		47.9		84.7		122.0	
Degree of protection		IP67					
Outline dimension drawing (flange type)		[mm]					
		176 SQ.	176 SQ.	176 SQ.	176 SQ.	204 SQ.	
		143.5	183.5	223.5	263.5	330	
Flange fitting diameter		φ114.3				φ180	
Shaft diameter		φ35				φ42	
Mass (with a brake)		12.0(18.0)		19.0(25.0)		25.0(31.0)	
Absolute position encoder compatible		EH		EH		EH	
drive unit		EH		EH		EH	

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

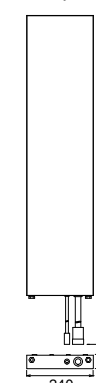
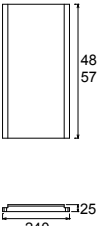
■HG-H Series

Motor type		HG-H1502
Compatible drive unit	1-axis type	MDS-EH-V1-200
	2-axis type	MDS-EH-V2-
	Regenerative resistor type	MDS-EJH-V1-
Output	[N·m]	350
	Stall torque	320.0
	Max. torque	152.1
		150
		100
Rated output	[kW]	15.0
Max. rotation speed	[r/min]	2500
Motor inertia	[$\times 10^{-4}$ kg·m ²]	489.0
Motor inertia with a brake	[$\times 10^{-4}$ kg·m ²]	-
Degree of protection (The shaft-through portion is excluded.)		IP44
Outline dimension drawing (flange type)		
		
Flange fitting diameter	[mm]	φ230
Shaft diameter	[mm]	φ65
Mass (with a brake)	[kg]	120
Absolute position encoder compatible drive unit		EH
	67,108,864 [p/rev] (D74)	
	4,194,304 [p/rev] (D51)	
	1,048,576 [p/rev] (D48)	

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

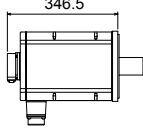
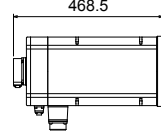
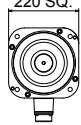
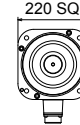
LINEAR SERVO MOTOR 400V

■LM-F Series

Motor type	Primary side type	LM-FP5H-60M-1WW0
	Secondary side type	LM-FS50-□-1WW0
Compatible drive unit	1-axis type	MDS-EH-V1-200
	2-axis type	MDS-EH-V2-
	Regenerative resistor type	MDS-EJH-V1-
Thrust force	[N]	20000
	Continuous (natural-cooling)	15000
	Continuous (liquid-cooling)	10000
	Maximum	5000
		0
Rated thrust	[N]	6000
Maximum speed (Note 1)	[m/s]	2.0
Magnetic attraction force	[N]	45000
Degree of protection		IP00
Outline dimension drawing [mm]	Primary side	
	Secondary side	
Mass [kg]	Primary side (coil)	67
	Secondary side (magnet)	20.0(480mm) 26.0(576mm)

(Note 1) The maximum speed in actual use is either the linear scale's maximum speed or this specified value, whichever is smaller.

■HQ-H Series

Motor type		HQ-H903	HQ-H1103
Compatible drive unit	1-axis type	MDS-EH-V1-160	MDS-EH-V1-160W
Stall torque		70.0	110.0
Output	[N·m]	300	
	Stall torque	170	260
	Max. torque	70	110
		150	
		100	
Max. rotation speed	[r/min]	3000	3000
Motor inertia	[$\times 10^{-4}$ kg·m ²]	230.0	350.0
Motor inertia with a brake	[$\times 10^{-4}$ kg·m ²]	254.0	374.0
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67
Outline dimension drawing (flange type) (Without a brake, Straight shaft, D48 encoder)			
			
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.			
Flange fitting diameter	[mm]	φ200	φ200
Shaft diameter	[mm]	φ55	φ55
Mass (with a brake)	[kg]	51.0(61.4)	74.0(84.4)
Absolute position encoder compatible drive unit		EH	EH
	67,108,864 [p/rev] (D74)		
	4,194,304 [p/rev] (D51)		
	1,048,576 [p/rev] (D48)		

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

SPINDLE MOTOR 400V

■SJ-4-V Series (Normal)

Motor type	SJ-4-V2.2-03T	SJ-4-V3.7-03T	SJ-4-V5.5-07T	SJ-4-V7.5-12T	SJ-4-V7.5-13ZT	SJ-4-V11-18T
Compatible drive unit	MDS-EH-SP-20	20	40	40	80	80
Output						
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	2.2	3.7	5.5	7.5	7.5	11
Actual acceleration/deceleration output (Note 2) [kW]	2.64	4.44	6.6	9	9	13.2
Base rotation speed [r/min]	1500		1500			
Maximum rotation speed [r/min]	10000		8000		6000	
Continuous rated torque [N·m]	9.5	14.0	23.6	35.0	35.0	47.7
Inertia [kg·m ²]	0.007	0.009	0.015	0.025	0.025	0.03
Degree of protection	IP44					
Outline dimension drawing (flange type)						
Flange fitting diameter [mm]	φ150		φ150		φ180	
Shaft diameter [mm]	φ28		φ28		φ48	
Mass [kg]	25	30	49	60	60	70

■SJ-4-V Series (Wide range constant output)

Motor type	SJ-4-V15-20T	SJ-4-V22-16T
Compatible drive unit	MDS-EH-SP-100	160
Output		
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	9	15
Actual acceleration/deceleration output (Note 2) [kW]	10.8	18
Base rotation speed [r/min]	750	
Maximum rotation speed [r/min]	6000	
Continuous rated torque [N·m]	95.5	140
Inertia [kg·m ²]	0.06	0.08
Degree of protection	IP44	
Outline dimension drawing (flange type)		
Flange fitting diameter [mm]	φ230	
Shaft diameter [mm]	φ48	
Mass [kg]	110	135

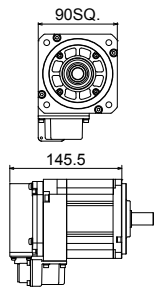
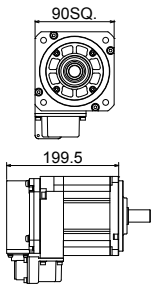
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".
 (Note 3) The rated output is guaranteed at the rated input voltage (380 to 440VAC 50Hz / 380 to 480VAC 60Hz) to the power supply unit.
 If the input voltage fluctuates and drops below 380VAC, the rated output may not be attained.

Motor type	SJ-4-V18.5-14T	SJ-4-V22-18ZT	SJ-4-V22-15T	SJ-4-V26-08ZT	SJ-4-V45-02T	SJ-4-V55-03T
Compatible drive unit	MDS-EH-SP-100	160	160	160	320	320
Output						
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	18.5	15	22	26	45	55
Actual acceleration/deceleration output (Note 2) [kW]	22.2	18	26.4	31.2	54	66
Base rotation speed [r/min]	1500					
Maximum rotation speed [r/min]	6000	8000	6000	10000	4500	3450
Continuous rated torque [N·m]	95.5	70.0	118	140	236	374
Inertia [kg·m ²]	0.06	0.06	0.08	0.10	0.34	0.85
Degree of protection	IP44					
Outline dimension drawing (flange type)						
Flange fitting diameter [mm]	φ230		φ230		φ300	φ450
Shaft diameter [mm]	φ48		φ55		φ60	φ75
Mass [kg]	110	110	135	155	300	450

(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
 (Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".
 (Note 3) The rated output is guaranteed at the rated input voltage (380 to 440VAC 50Hz / 380 to 480VAC 60Hz) to the power supply unit.
 If the input voltage fluctuates and drops below 380VAC, the rated output may not be attained.

TOOL SPINDLE MOTOR 400V

■HG-JR Series

Motor type		HG-JR734	HG-JR1534
Compatible drive unit	1-axis type MDS-EH-SP-	20	40
Output	[N·m]20	
	15	
Rated torque	10	
	5	
Max. torque	0	
		2.4 7.2	4.8 14.3
Rated output	[kW]	0.75	1.5
Max. rotation speed	[r/min]	8000	
Motor inertia	[×10 ⁻⁴ kg·m ²]	2.09	3.79
Degree of protection (The shaft-through portion is excluded.)		IP67	
Outline dimension drawing	[mm]		
		145.5	199.5
Flange fitting diameter	[mm]	φ80	φ80
Shaft diameter	[mm]	φ16	φ16
Mass	[kg]	3.7	5.9

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

DRIVE UNIT

■MDS-E Series

1-axis servo drive unit

Drive unit type		MDS-E-V1-20	MDS-E-V1-40	MDS-E-V1-80	MDS-E-V1-160	MDS-E-V1-160W	MDS-E-V1-320	MDS-E-V1-320W
Drive unit category		1-axis servo						
Nominal maximum current (peak) [A]		20	40	80	160	160	320	320
Power input	Rated voltage [V]	270 to 324DC						
	Rated current [A]	7	7	14	30	35	45	55
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.2						
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%						
Control method		Sine wave PWM control method						
Dynamic brakes		Built-in						External (MDS-D-DBU)
Machine end encoder		Compatible						
Degree of protection		IP20 (excluding terminal block)						
Cooling method		Forced air cooling						
Mass	[kg]	3.8	3.8	3.8	3.8	4.5	5.8	7.5
Unit outline dimension drawing		A1	A1	A1	A1	B1	C1	D1

2-axis servo drive unit

Drive unit type		MDS-E-V2-20	MDS-E-V2-40	MDS-E-V2-80	MDS-E-V2-160	MDS-E-V2-160W
Drive unit category		2-axis servo				
Nominal maximum current (peak) [A]		20/20	40/40	80/80	160/160	160/160
Power input	Rated voltage [V]	270 to 324DC				
	Rated current [A]	14 (7/7)	14 (7/7)	28 (14/14)	60 (30/30)	70 (35/35)
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%				
	Current [A]	MAX. 0.2				
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%				
Control method		Sine wave PWM control method				
Dynamic brakes		Built-in				
Machine end encoder		Compatible				
Degree of protection		IP20 (excluding terminal block)				
Cooling method		Forced air cooling				
Mass	[kg]	3.8	3.8	3.8	5.2	6.3
Unit outline dimension drawing		A1	A1	A1	B1	C1

3-axis servo drive unit

Drive unit type		MDS-E-V3-20	MDS-E-V3-40
Drive unit category		3-axis servo	
Nominal maximum current (peak) [A]		20/20/20	40/40/40
Power input	Rated voltage [V]	270 to 324DC	
	Rated current [A]	21(7/7/7)	
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%	
	Current [A]	MAX. 0.2	
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%	
Control method		Sine wave PWM control method	
Dynamic brakes		Built-in	
Machine end encoder		Compatible	
Degree of protection		IP20 [over all]	
Cooling method		Forced air cooling	
Mass	[kg]	3.8	
Unit outline dimension drawing		A1	

■MDS-E Series

1-axis spindle drive unit

Drive unit type	MDS-E-SP-20	MDS-E-SP-40	MDS-E-SP-80	MDS-E-SP-160	MDS-E-SP-200	MDS-E-SP-240	MDS-E-SP-320	MDS-E-SP-400	MDS-E-SP-640	
Drive unit category	1-axis spindle									
Nominal maximum current (peak) [A]	20	40	80	160	200	240	320	400	640	
Power input	Rated voltage [V]	270 to 324DC								
	Rated current [A]	7	13	20	41	76	95	140	150	210
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%								
	Current [A]	MAX. 0.2								
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%								
Control method	Sine wave PWM control method									
Degree of protection	IP20 (excluding terminal block)									
Cooling method	Forced air cooling									
Mass [kg]	3.8	3.8	3.8	4.5	5.8	6.5	7.5	16.5	16.5	
Unit outline dimension drawing	A1	A1	A1	B1	C1	D1	D2	E1	F1	

2-axis spindle drive unit

Drive unit type	MDS-E-SP2-20	MDS-E-SP2-40	MDS-E-SP2-80	MDS-E-SP2-16080
Drive unit category	2-axis spindle			
Nominal maximum current (peak) [A]	20/20	40/40	80/80	160/80
Power input	Rated voltage [V]	270 to 324DC		
	Rated current [A]	14 (7/7)	26 (13/13)	40 (20/20)
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%		
	Current [A]	MAX. 0.2		
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%		
Control method	Sine wave PWM control method			
Degree of protection	IP20 (excluding terminal block)			
Cooling method	Forced air cooling			
Mass [kg]	4.5	4.5	6.5	5.2
Unit outline dimension drawing	A1	A1	B1	B1

Power supply unit

Power supply unit	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-E-CV-550
30-minute rated output [kW]	3.7	7.5	11.0	18.5	30.0	37.0	45.0	55.0
Continuous rated output [kW]	2.2	5.5	7.5	15.0	26.0	30.0	37.0	45.0
Power input	Rated voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%						
	Rated current [A]	15	26	35	65	107	121	200
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.2						
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%						
Regeneration method	Power regeneration method							
Degree of protection	IP20 (excluding terminal block)							
Cooling method	Natural-cooling				Forced air cooling			
Mass [kg]	4.0	4.0	6.0	6.0	10.0	10.0	10.0	25.5
Unit outline dimension drawing	A2	A2	B1	B1	D1	D1	D2	F1

AC reactor

AC reactor model	D-AL-7.5K	D-AL-11K	D-AL-18.5K	D-AL-30K	D-AL-37K	D-AL-45K	D-AL-55K	
Compatible power supply unit type	MDS-E-CV-	37, 75	110	185	300	370	450	550
Rated capacity [kW]	7.5	11	18.5	30	37	45	55	
Rated voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%							
Rated current [A]	27	40	66	110	133	162	200	
Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%							
Mass [kg]	4.2	3.7	5.3	6.1	8.6	9.7	11.5	
Unit outline dimension drawing	R1	R1	R2	R2	R3	R3	R4	

■MDS-EH Series

1-axis servo drive unit

Drive unit type	MDS-EH-V1-10	MDS-EH-V1-20	MDS-EH-V1-40	MDS-EH-V1-80	MDS-EH-V1-80W	MDS-EH-V1-160	MDS-EH-V1-160W	MDS-EH-V1-200
Drive unit category	1-axis servo							
Nominal maximum current (peak) [A]	10	20	40	80	80	160	160	200
Power input	Rated voltage [V]	513 to 648DC						
	Rated current [A]	0.9	1.6	2.9	6.0	8.0	11.9	16.7
Control power input	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.1						
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%						
Control method	Sine wave PWM control method							
Dynamic brakes	Built-in					External (MDS-D-DBU)		
Degree of protection	IP20 (over all) / IP00 (Terminal block TE1)							
Cooling method	Natural-cooling				Forced air cooling			
Mass [kg]	3.8	3.8	3.8	3.8	4.5	5.8	7.5	16.5
Unit outline dimension drawing	A1	A1	A1	A1	B1	C1	D1	E1

2-axis servo drive unit

Drive unit type	MDS-EH-V2-10	MDS-EH-V2-20	MDS-EH-V2-40	MDS-EH-V2-80	MDS-EH-V2-80W
Drive unit category	2-axis servo				
Nominal maximum current (peak) [A]	10/10	20/20	40/40	80/80	80/80
Power input	Rated voltage [V]	513 to 648DC			
	Rated current [A]	1.8 (0.9/0.9)	3.2 (1.6 /1.6)	5.8 (2.9/2.9)	12 (6.0/6.0)
Control power input	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%			
	Current [A]	MAX. 0.1			
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%			
Control method	Sine wave PWM control method - Current control method				
Dynamic brakes	Built-in				
Degree of protection	IP20				
Cooling method	Natural-cooling		Forced air cooling		
Mass [kg]	3.8	3.8	3.8	5.2	6.3
Unit outline dimension drawing	A1	A1	A1	B1	C1

1-axis spindle drive unit

Drive unit type	MDS-EH-SP-20	MDS-EH-SP-40	MDS-EH-SP-80	MDS-EH-SP-100	MDS-EH-SP-160	MDS-EH-SP-200	MDS-EH-SP-320	MDS-EH-SP-480	MDS-EH-SP-600
Drive unit category	1-axis spindle								
Nominal maximum current (peak) [A]	20	40	80	100	160	200	320	480	600
Power input	Rated voltage [V]	513 to 648DC							
	Rated current [A]	10	15	21	38	72	82	119	150
Control power input	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%							
Control method	Sine wave PWM control method								
Degree of protection	IP20 (over all) / IP00 (Terminal block TE1)								
Cooling method	Forced air cooling								
Mass [kg]	3.8	4.5	4.5	5.8	7.5	16.5	22.5	23.0	
Unit outline dimension drawing	A1	A1	B1	C1	D1	E1	E1	F1	F1

(Note) Rated output capacity and rated speed of the motor used in combination with the drive unit are as indicated when using the power supply voltage and frequency listed. The torque drops when the voltage is less than specified.

Power supply unit

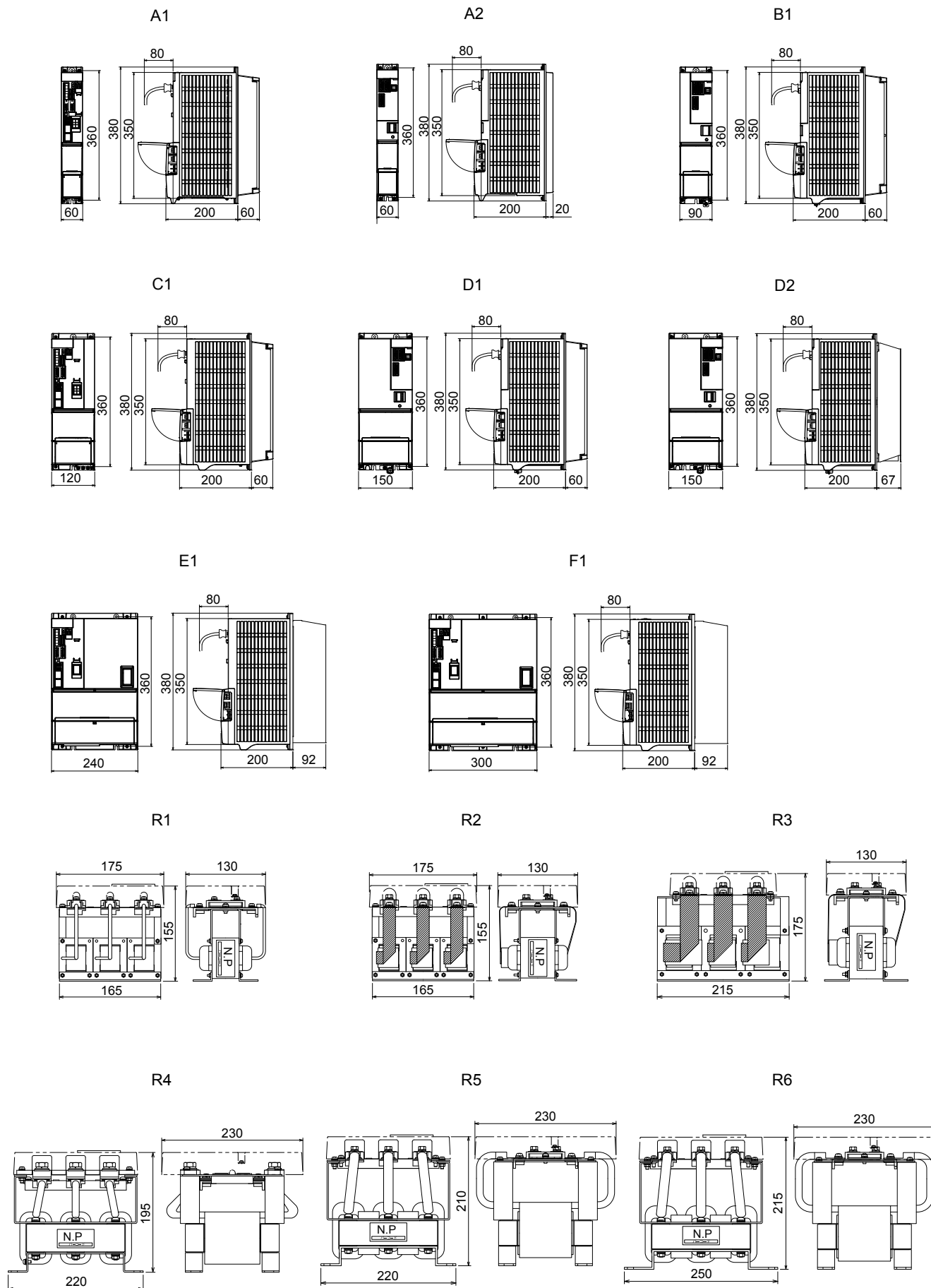
Power supply unit type	MDS-EH-CV-37	MDS-EH-CV-75	MDS-EH-CV-110	MDS-EH-CV-185	MDS-EH-CV-300	MDS-EH-CV-370	MDS-EH-CV-450	MDS-EH-CV-550	MDS-EH-CV-750
30-minute rated output [kW]	3.7	7.5	11.0	18.5	30.0	37.0	45.0	55.0	75.0
Continuous rated output [kW]	2.2	5.5	7.5	15	26	30	37	45	55
Power input	Rated voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%							
	Rated current [A]	5.2	13	18	35	61	70	85	106
Control power input	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%							
Main circuit method	Converter with power regeneration circuit								
Degree of protection	IP20 (excluding terminal block)								
Cooling method	Forced air cooling								
Mass [kg]	6.0	6.0	6.0	6.0	10.0	10.0	10.0	25.5	25.5
Unit outline dimension drawing	B1	B1	B1	B1	D1	D1	D1	F1	F1

AC reactor

AC reactor model	DH-AL-7.5K	DH-AL-11K	DH-AL-18.5K	DH-AL-30K	DH-AL-37K	DH-AL-45K	DH-AL-55K	DH-AL-75K	
Compatible power supply unit type	MDS-EH-CV-	37, 75	110	185	300	370	450	550	750
Rated capacity [kW]	7.5	11	18.5	30	37	45	55	75	
Rated voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%								
Rated current [A]	14	21	37	65	75	85	106	142	
Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%								
Mass [kg]	4.0	3.7	5.3	6.0	8.5	9.8	10.5	13.0	
Unit outline dimension drawing	R1	R1	R2	R2	R3	R3	R5	R6	

Unit Outline Dimension Drawing

[Unit : mm]



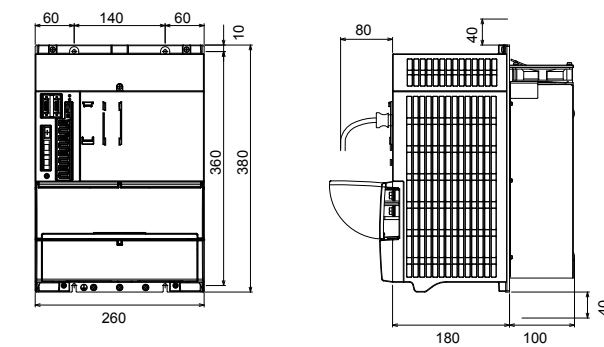
■MDS-EM Series
Multi-hybrid drive unit

Drive unit type	MDS-EM-SPV3-10040	MDS-EM-SPV3-10080	MDS-EM-SPV3-16040	MDS-EM-SPV3-16080	MDS-EM-SPV3-20080	MDS-EM-SPV3-200120
Drive unit category	3-axis servo, 1-axis spindle (with converter)					
Nominal maximum current (spindle/servo) [A]	100/40×3	100/80×3	160/40×3	160/80×3	200/80×3	200/120×3
Power input	Rated voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%				
	Rated current [A]	36	38	45	48	60
Control power input	Voltage [V]	24DC Tolerable fluctuation: between +10% and -10%				
	Current [A]	MAX. 4				
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%				
Control method	Sine wave PWM control method					
Regeneration method	Power regeneration method					
Dynamic brakes (servo)	Built-in					
Machine end encoder (servo)	Compatible					
Degree of protection	IP20 (excluding terminal block)					
Cooling method	Forced air cooling					
Mass [kg]	15	15	15	15	15	15

Unit outline dimension drawing

Drive unit MDS-EM-SPV3-□

[Unit : mm]



■MDS-EJ/EJH Series

All-in-one compact servo drive unit

Drive unit type	MDS-EJ-V1-10	MDS-EJ-V1-15	MDS-EJ-V1-30	MDS-EJ-V1-40	MDS-EJ-V1-80	MDS-EJ-V1-100
Drive unit category	1-axis servo (with converter)					
Nominal maximum current (peak) [A]	10	15	30	40	80	100
Power input	Rated voltage [V]	3-phase or single-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%			3-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%	
	Rated current [A]	1.5	2.9	3.8	5.0	10.5
Control power input	Voltage [V]	Single-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%				
	Current [A]	MAX. 0.2				
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%				
Control method	Sine wave PWM control method					
Regeneration method	Power regeneration method					
Dynamic brakes	Built-in					
Machine end encoder	Compatible					
Degree of protection	IP20					
Cooling method	Natural cooling			Forced air cooling		
Mass [kg]	0.8	1.0	1.4	2.1	2.1	2.3
Unit outline dimension drawing	J1a	J2	J3	J4a	J4a	J4b

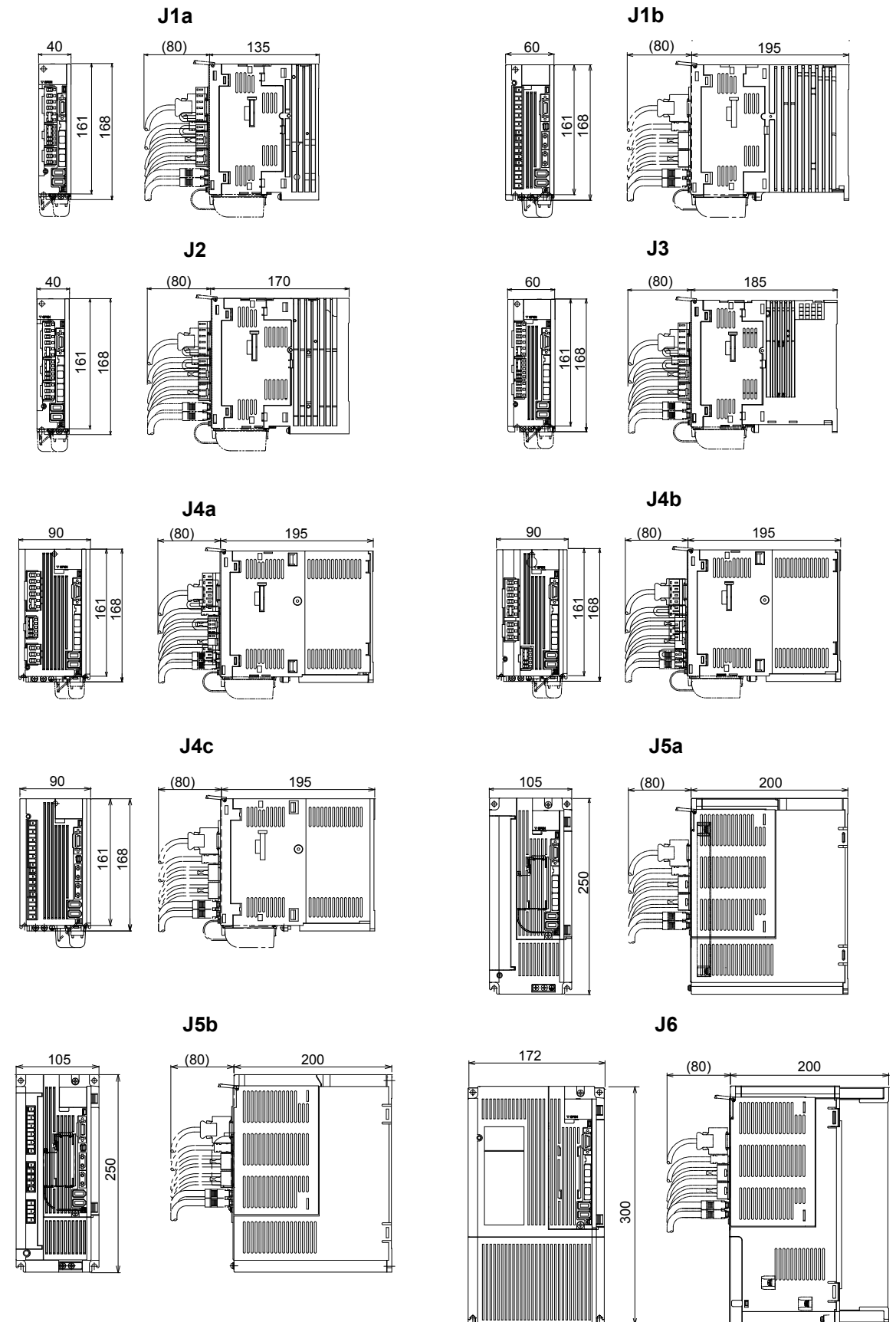
Drive unit type	MDS-EJH-V1-10	MDS-EJH-V1-15	MDS-EJH-V1-20	MDS-EJH-V1-40
Drive unit category	1-axis servo (with converter)			
Nominal maximum current (peak) [A]	10	15	20	40
Power input	Rated voltage [V]	3-phase 380 to 480AC Tolerable fluctuation: between +10% and -15%		
	Rated current [A]	1.4	2.5	5.1
Control power input	Voltage [V]	Single-phase 380 to 480AC Tolerable fluctuation: between +10% and -15%		
	Current [A]	MAX. 0.1		MAX. 0.2
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%		
Control method	Sine wave PWM control method			
Regeneration method	Power regeneration method			
Dynamic brakes	Built-in			
Machine end encoder	Compatible			
Degree of protection	IP20			
Cooling method	Natural cooling		Forced air cooling	
Mass [kg]	1.7	1.7	2.1	3.6
Unit outline dimension drawing	J1b		J4c	J5b

All-in-one compact spindle drive unit

Drive unit type	MDS-EJ-SP-20	MDS-EJ-SP-40	MDS-EJ-SP-80	MDS-EJ-SP-100	MDS-EJ-SP-120	MDS-EJ-SP-160
Drive unit category	1-axis spindle (with converter)					
Nominal maximum current (peak) [A]	20	40	80	100	120	160
Power input	Rated voltage [V]	3-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%				
	Rated current [A]	2.6	9.0	10.5	16.0	16.0
Control power input	Voltage [V]	Single-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%				
	Current [A]	MAX. 0.2				
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%				
Control method	Sine wave PWM control method					
Regeneration method	Power regeneration method					
Degree of protection	IP20 (excluding terminal block)					
Cooling method	Forced air cooling					
Mass [kg]	1.4	2.1	2.3	4.0	4.0	6.2
Unit outline dimension drawing	J3	J4a	J4b	J5a	J5a	J6

Unit outline dimension drawing

Unit [mm]



DEDICATED OPTIONS SERVO OPTIONS

The option units are required depending on the servo system configuration. Check the option units to be required referring the following items.

System establishment in the full closed loop control

Full closed loop control for linear axis

Machine side encoder to be used		Encoder signal output	Interface unit	Drive unit input signal	Battery option	Remarks		
Incremental encoder	Rectangular wave signal output	SR74, SR84 (MAGNESCALE)	Rectangular wave signal	-	Rectangular wave signal	-		
		Various scale	Rectangular wave signal	-	Rectangular wave signal	-		
	SIN wave signal output	LS187, LS487 (HEIDENHAIN)	SIN wave signal	IBV Series (HEIDENHAIN)	Rectangular wave signal	-		
				EIB Series (HEIDENHAIN)	Mitsubishi serial signal	-		
				APE Series (HEIDENHAIN)	Mitsubishi serial signal	-		
		LS187C, LS487C (HEIDENHAIN)	SIN wave signal	MDS-B-HR-11(P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale (Note 2)	
	Various scale	SIN wave signal	SIN wave signal	MDS-B-HR-11(P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale is also available (Note 2)	
				EIB Series (HEIDENHAIN)	Mitsubishi serial signal	-		
	Mitsubishi serial signal output	SR75, SR85 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	-		
	Absolute position encoder	Mitsubishi serial signal output	OSA405ET2AS, OSA676ET2AS (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	-	Mitsubishi serial signal	Required	Ball screw side encoder
SR27, SR77, SR87 (MAGNESCALE)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
LC195M, LC495M, LC291M (HEIDENHAIN)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mistu03-04	
LC193M, LC493M (HEIDENHAIN)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mistu02-04	
AT343, AT543, AT545, ST748 (Mitutoyo)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
SAM Series (FAGOR)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
SVAM Series (FAGOR)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
GAM Series (FAGOR)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
LAM Series (FAGOR)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
RL40N Series (Renishaw)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
AMS-ABS-3B Series (Schneeberger)			Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
SIN wave signal output			MPS Series (MME Corp.)	SIN wave signal	ADB-20J60 (Mitsubishi Heavy Industries)	Mitsubishi serial signal	Required	
			MPI Series (Mitsubishi Heavy Industries)	SIN wave signal	ADS-20J60 (Mitsubishi Heavy Industries)	Mitsubishi serial signal	Required	

(Note 1) When using the distance-coded reference scale, it is recommended to use with distance-coded reference check function. In this case, the battery option is required.

(Note 2) Use the option of M800 Series for the distance-coded reference scale.

Full closed loop control for rotary axis

Machine side encoder to be used		Encoder signal output	Interface unit	Output signal	Battery option	Remarks	
Incremental encoder	Rectangular wave signal output	Various scale	Rectangular wave signal	-	Rectangular wave signal	-	
	SIN wave signal output	ERM280 Series (HEIDENHAIN)	SIN wave signal	EIB Series (HEIDENHAIN)	Mitsubishi serial signal	-	
Various scale		SIN wave signal	MDS-B-HR-11(P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale is also available (Note 2)	
Absolute position encoder	Mitsubishi serial signal output	MBA405W Series (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Provided)	Mitsubishi serial signal	Required	
		RU77 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		RCN223M, RCN227M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mistu02-04
		RCN727M, RCN827M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mistu02-04
		RA Series (Renishaw)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		HAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
	SIN wave signal output	MPRZ Series (Mitsubishi Heavy Industries)	SIN wave signal	ADB-20J71 (Mitsubishi Heavy Industries)	Mitsubishi serial signal	Not required	
		MPI Series (Mitsubishi Heavy Industries)	SIN wave signal	ADB-20J60 (Mitsubishi Heavy Industries)	Mitsubishi serial signal	Required	

(Note 1) When using the distance-coded reference scale, it is recommended to use with distance-coded reference check function. In this case, the battery option is required.

(Note 2) Use the option of M800 Series for the distance-coded reference scale.

System establishment in the synchronous control

Position command synchronous control

The synchronous control is all executed in the NC, and the each servo is controlled as an independent axis.

Therefore, preparing special options for the synchronous control is not required on the servo side.

Speed command synchronization control

The common position control in two axes is performed by one linear scale. Basically, the multi axis integrated type drive unit (MDS-E/EH-V2/V3) is used, and the feedback signal is divided for two axes inside the drive unit.

When the two 1-axis type drive units are used in driving the large capacity servo motor, the linear scale feedback signal must be divided outside.

<Required option in the speed command synchronous control>

Machine side encoder to be used	For MDS-E/EH-V2/V3	For MDS-E/EH-V1x2 units	Remarks
SIN wave signal output scale	MDS-B-HR-11(P) (Serial conversion)	MDS-B-HR-12(P) (Serial conversion/signal division)	
Mitsubishi serial signal output scale	-	MDS-B-SD (Signal division)	Including the case that an interface unit of the scale manufacturer is used with SIN wave output scale.

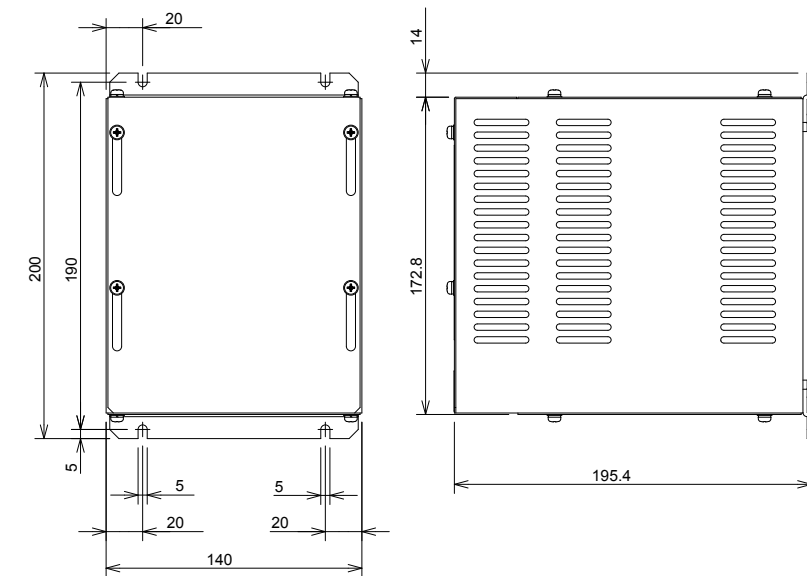
(Note) The rectangular wave signal output scale speed command synchronous control is not available.

Dynamic brake unit (MDS-D-DBU)

Specifications

Type	MDS-D-DBU
Coil specifications	DC24V 160mA
Wire size	5.5mm ² or more (For IV wire)
Compatible drive unit	MDS-E-V1-320W, MDS-EH-V1-160W or larger
Mass	3kg

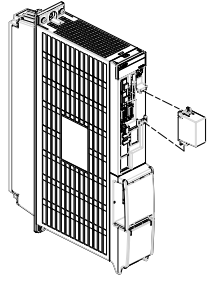
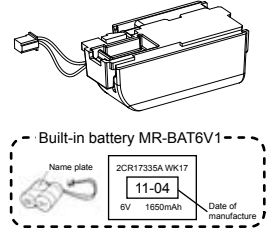
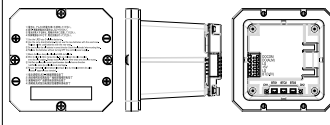
Outline dimension drawing MDS-D-DBU



[Unit : mm]

■Battery option

This battery option may be required to establish absolute position system. Select a battery option from the table below depending on the servo system.

Type	MDS-BAT6V1SET	MR-BAT6V1SET	MDSBTBOX-LR2060
Installation type	Drive unit with battery holder type	Drive unit with battery holder type	Unit and battery integration type
Hazard Class	Not applicable	Not applicable	Not applicable
Number of connectable axes	Up to 3 axes	Up to 3 axes	Up to 8 axes
Battery change	Possible	Possible	Possible
Appearance			
Compatible model	E/EH EM EJ/EJH	- - ○	○ ○ ○

■Battery box (MDSBTBOX-LR2060)

Specifications

Battery option type	Battery box
	MDSBTBOX-LR2060
Battery model name (Note 1)	Size-D alkaline batteries LR20×4 pieces
Nominal voltage	6.0V (Unit output: BTO1/2/3) 3.6V (Unit output: BT(3.6V)) 1.5V (Isolated battery)
Number of connectable axes	8 axis
Battery continuous backup time (Note 2)	Approx. 10000 hours (when 8 axes are connected, cumulative time in non-energized state)
Back up time from battery warning to alarm occurrence (Note 2)	Approx. 336 hours (when 8 axes are connected)
Compatible model	E/EH EM EJ/EJH

(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) 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.

■Cell battery (MDS-BAT6V1SET)

Specifications

Battery option type	Cell battery
	MDS-BAT6V1SET
Battery model name	2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 10000 hours 3 axes connected: Approx. 6600 hours
Back up time from battery warning to alarm occurrence (Note 2)	Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Compatible model	E/EH EM EJ/EJH

(Note 1) MDS-BAT6V1SET is a battery built in a servo drive unit. Install this battery only in the servo drive unit that executes absolute position control.

(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) 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 number of load shaft should be two.

■Cell battery (MR-BAT6V1SET)

Specifications

Battery option type	Cell battery
	MR-BAT6V1SET (Note 1)
Battery model name	2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 10000 hours 3 axes connected: Approx. 6600 hours
Back up time from battery warning to alarm occurrence (Note 2)	Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Compatible model	E/EH EM EJ/EJH

(Note 1) MR-BAT6V1SET is a battery built in a servo drive unit. Install this battery only in the servo drive unit that executes absolute position control.

(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) 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 number of load shaft should be two.

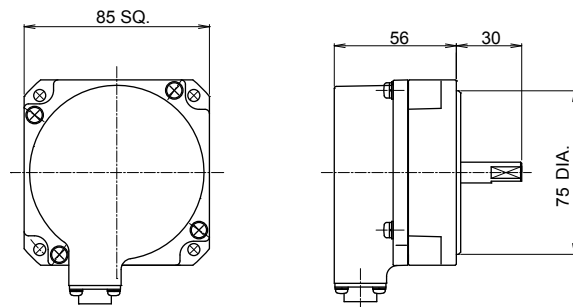
Ball screw side encoder OSA405ET2AS, OSA676ET2AS

Specifications

Type	OSA405ET2AS	OSA676ET2AS	
Electrical characteristics	Encoder resolution	4,194,304pulse/rev	67,108,864pulse/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	
Mechanical characteristics for rotation	Power consumption	0.3A	
	Inertia	0.5×10 ⁻⁴ kg·m ² or less	
	Shaft friction torque	0.1Nm or less	
	Shaft angle acceleration	4×10 ⁴ 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/19.6N	
	Mass	0.6kg	
	Degree of protection	IP67 (The shaft-through portion is excluded.)	
	Recommended coupling	Bellows coupling	
Compatible model	E/EH	○	○
	EM	○	-
	EJ/EJH	○	-

(*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.

Outline dimension drawing
OSA405ET2AS/OSA676ET2AS



[Unit : mm]

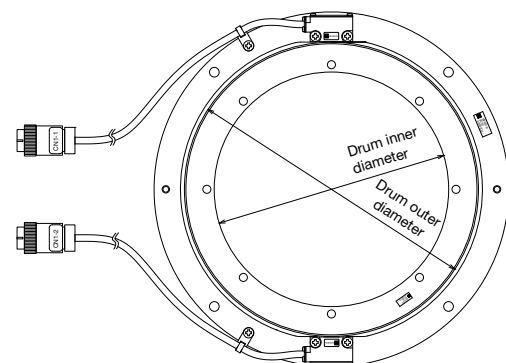
Twin-head magnetic encoder (MBA Series)

Specifications

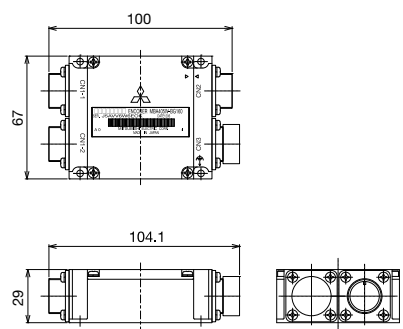
Type	MBA405W-BE082	MBA405W-BF125	MBA405W-BG160	
Electrical characteristics	Encoder resolution	4,000,000 pulse/rev		
	Detection method	Absolute position method (battery backup method)		
	Tolerable rotation speed at power off	3000r/min	2000r/min	1500r/min
	Accuracy (*1) (*2)	±4 seconds	±3 seconds	±2 seconds
	Wave number within one rotation	512 waves	768 waves	1024 waves
Mechanical characteristics for rotation	Encoder output data	Serial data		
	Power consumption	0.2A or less		
	Inertia	0.5×10 ⁻³ kg·m ²	2.4×10 ⁻³ kg·m ²	8.7×10 ⁻³ kg·m ²
	Tolerable angle acceleration (time of backup)	500rad/s ²		
	Tolerable continuous rotation speed	3000r/min	2000r/min	1500r/min
Mechanical configuration	Drum inner diameter	φ82mm	φ125mm	φ160mm
	Drum outer diameter	φ100mm	φ150.3mm	φ200.6mm
	Drum mass	0.2kg	0.46kg	1.0kg
	Degree of protection (*3)	IP67		
	Outline dimension	φ140mm×21.5mm	φ190mm×23.5mm	φ242mm×25.5mm

(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.
 (*2) The user is requested to install the magnetic drum and installation ring in the encoder within the accuracy range specified herein. Even when the accuracy of the encoder when shipped and when installed by the user is both within the specified range, there is a difference in the installation position. Therefore, the accuracy at the time of our shipment may not be acquired.
 (*3) It is the degree of protection when fitted with a connector.

Outline dimension drawing
Encoder



Pre-amplifier



[Unit : mm]

DEDICATED OPTIONS SPINDLE OPTIONS

According to the spindle control to be adopted, select the spindle side encoder based on the following table.

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	●			
	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)			

(Note) When spindle and motor are coupled with a 1:1 gear ratio, use of a spindle side encoder is recommended to assure the precision.

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/MPC/MBE405W Series	OSE-1024	Proximity switch
Spindle control	Normal cutting control	●	●	●	●
	Constant surface speed control (lathe)	● (Note 1)	●	●	● (Note 1)
	Thread cutting (lathe)	x	●	●	x
Orientation control	1-point orientation control	x	●	●	● (Note 3)
	Multi-point orientation control	x	●	●	x
	Orientation indexing	x	●	●	x
Synchronous tap control	Standard synchronous tap	● (Note 2)	●	●	● (Note 2)
	Synchronous tap after zero point return	x	●	●	x
Spindle synchronous control	Without phase alignment function	● (Note 1)	●	●	● (Note 1)
	With phase alignment function	x	●	●	x
C-axis control	C-axis control	x	●	x	x

(Note 1) Control not possible when connected with the V-belt.
 (Note 2) Control not possible when connected with other than the gears.
 (Note 3) When using a proximity switch, an orientation is executed after the spindle is stopped. As for 2-axis spindle drive unit, setting is available only for one of the axes.

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.

■Spindle side ABZ pulse output encoder (OSE-1024 Series)

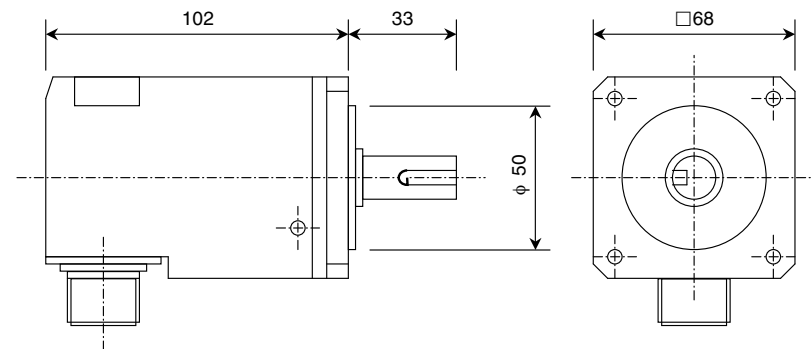
When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side encoder to detect the position and speed of the spindle. Also use this encoder when orientation control and synchronous tap control, etc are executed under the above conditions.

Specifications

Type		OSE-1024-3-15-68	OSE-1024-3-15-68-8
Mechanical characteristics for rotation	Inertia	0.1x10 ⁻⁴ kgm ² or less	0.1x10 ⁻⁴ kgm ² or less
	Shaft friction torque	0.98Nm or less	0.98Nm or less
	Shaft angle acceleration	10 ⁴ rad/s ² or less	10 ⁴ rad/s ² or less
	Tolerable continuous rotation speed	6000r/min	8000r/min
Mechanical configuration	Bearing maximum non-lubrication time	20000h/6000r/min	20000h/8000r/min
	Shaft amplitude (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	
Compatible model	E/EH	○	○
	EM	○	○
	EJ/EJH	○	○

(Note) Confirm that the gear ratio (pulley ratio) of the spindle end to the encoder is 1:1.

Outline dimension drawing



Spindle side encoder (OSE-1024-3-15-68, OSE-1024-3-15-68-8)

[Unit : mm]

■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.

Specifications

Series type		TS5690N64xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Water-proof 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 wire lead-out direction		Vertical direction					Shaft direction				
Detection gear	Type	MU1606N601										
	The number of teeth	64										
	Outer diameter [mm]	φ52.8										
	Inner diameter [mm]	φ40H5										
Notched fitting section	Thickness [mm]	12										
	Outer diameter [mm]	φ59.4										
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										
Compatible model	E/EH	○										
	EM	○										
	EJ/EJH	○										

Series type		TS5690N90xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Water-proof 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 wire lead-out direction		Vertical direction					Shaft direction				
Detection gear	Type	MU1606N906										
	The number of teeth	90										
	Outer diameter [mm]	φ73.6										
	Inner diameter [mm]	φ60H5										
Notched fitting section	Thickness [mm]	12										
	Outer diameter [mm]	φ79.2										
The number of output pulse	A/B phase	90										
	Z phase	1										
Detection resolution [p/rev]		2,880,000										
Absolute accuracy at stop		105°										
Tolerable speed [r/min]		30,000										
Signal output		Mitsubishi high-speed serial										
Compatible model	E/EH	○										
	EM	○										
	EJ/EJH	○										

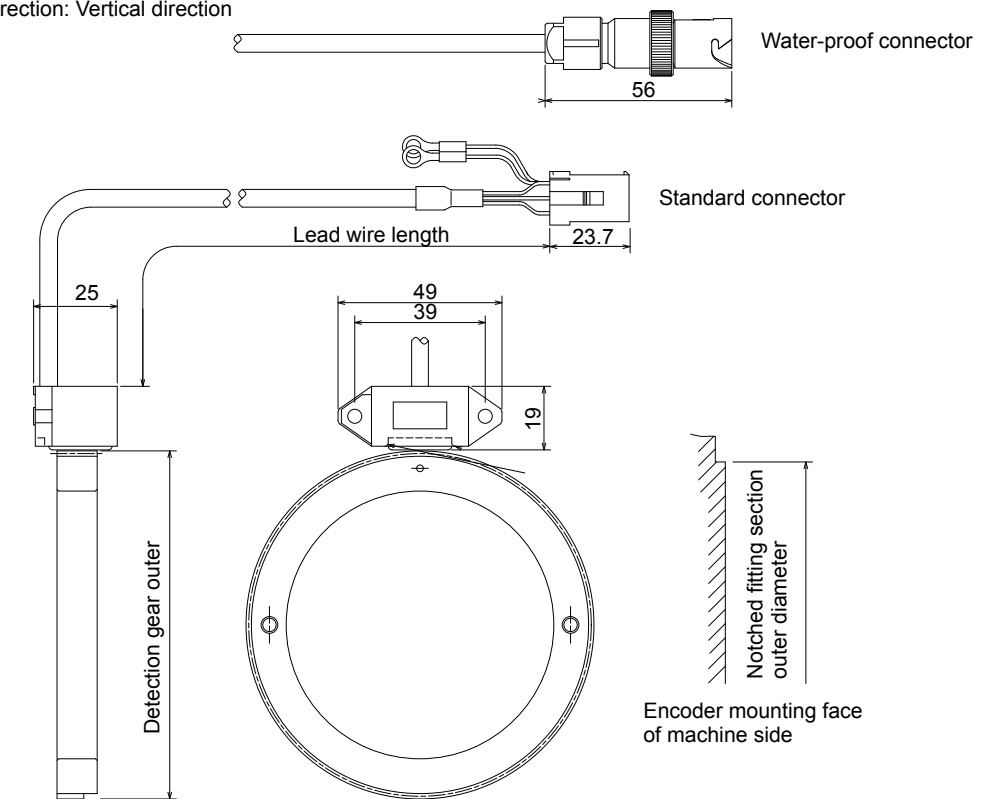
Series type		TS5690N12xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Water-proof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		Vertical direction					Shaft direction				
Detection gear	Type	MU1606N709										
	The number of teeth	128										
	Outer diameter [mm]	φ104.0										
	Inner diameter [mm]	φ80H5										
Notched fitting section	Thickness [mm]	12										
	Outer diameter [mm]	φ108.8										
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										
Compatible model	E/EH	○										
	EM	○										
	EJ/EJH	○										

Sensor	Series type		TS5690N19xx									
	xx (The end of the type name)	Standard connector Water-proof connector	12	22	32	42	52	17	27	37	47	57
			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 wire lead-out direction		Vertical direction					Shaft direction				
Detection gear	Type		MU1606N203									
	The number of teeth		192									
	Outer diameter [mm]		φ155.2									
	Inner diameter [mm]		φ125H5									
Notched fitting section	Thickness [mm]		12									
	Outer diameter [mm]		φ158.4									
The number of output pulse	Outer diameter tolerance [mm]		-0.040 to 0									
	A/B phase		192									
Detection resolution [p/rev]	Z phase		1									
			6 million									
Absolute accuracy at stop [r/min]			97.5°									
			15,000									
Signal output			Mitsubishi high-speed serial									
	E/EH		○									
Compatible model	EM		○									
	EJ/EJH		○									

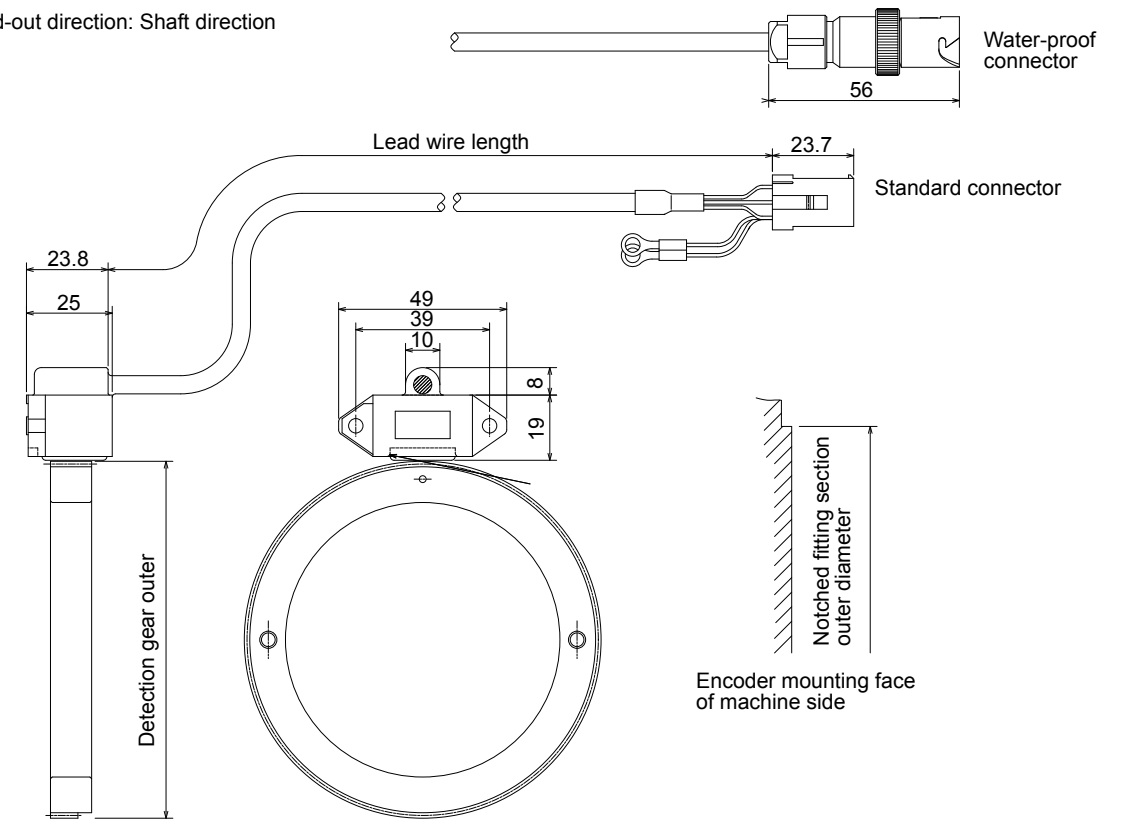
Sensor	Series type		TS5690N25xx									
	xx (The end of the type name)	Standard connector Water-proof connector	12	22	32	42	52	17	27	37	47	57
			19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		Vertical direction					Shaft direction				
Detection gear	Type		MU1606N802									
	The number of teeth		256									
	Outer diameter [mm]		φ206.4									
	Inner diameter [mm]		φ160H5									
Notched fitting section	Thickness [mm]		15.8									
	Outer diameter [mm]		φ210.2									
The number of output pulse	Outer diameter tolerance [mm]		+0.0 to +0.040									
	A/B phase		256									
Detection resolution [p/rev]	Z phase		1									
			8 million									
Absolute accuracy at stop [r/min]			95°									
			10,000									
Signal output			Mitsubishi high-speed serial									
	E/EH		○									
Compatible model	EM		○									
	EJ/EJH		○									

Outline dimension drawing

Lead wire lead-out direction: Vertical direction



Lead wire lead-out direction: Shaft direction



[Unit : mm]

[Unit : mm]

■Twin-head magnetic encoder (MBE Series)

Specifications

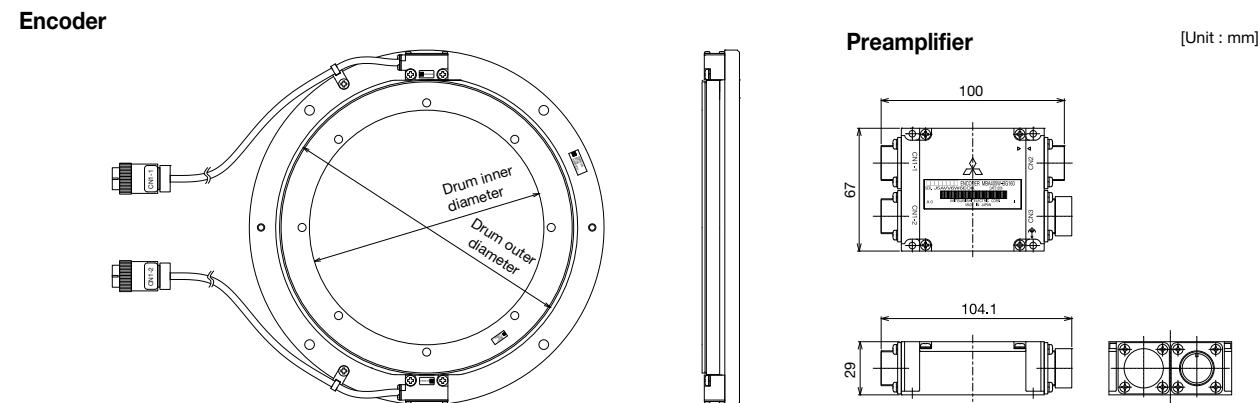
Type	MBE405W-BE082	MBE405W-BF125	MBE405W-BG160	
Electrical characteristics	Encoder resolution	4,000,000 pulse/rev		
	Detection method	Incremental		
	Accuracy (*1) (*2)	±4 seconds	±3 seconds	±2 seconds
	Wave number within one rotation	512 waves	768 waves	1024 waves
	Encoder output data	Serial data		
Mechanical characteristics for rotation	Power consumption	0.2A or less		
	Inertia	0.5×10 ⁻³ kg·m ²	2.4×10 ⁻³ kg·m ²	8.7×10 ⁻³ kg·m ²
	Tolerable continuous rotation speed	15000r/min	10000r/min	8000r/min
	Drum inner diameter	φ82mm	φ125mm	φ160mm
Mechanical configuration	Drum outer diameter	φ100mm	φ150.3mm	φ200.6mm
	Drum mass	0.2kg	0.46kg	1.0kg
	Degree of protection (*3)	IP67		
	Outline dimension	φ140mm×21.5mm	φ190mm×23.5mm	φ242mm×25.5mm

(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.

(*2) The user is requested to install the magnetic drum and installation ring in the encoder within the accuracy range specified herein. Even when the accuracy of the encoder when shipped and when installed by the user is both within the specified range, there is a difference in the installation position. Therefore, the accuracy at the time of our shipment may not be acquired.

(*3) It is the degree of protection when fitted with a connector.

Outline dimension drawing



ENCODER INTERFACE UNIT

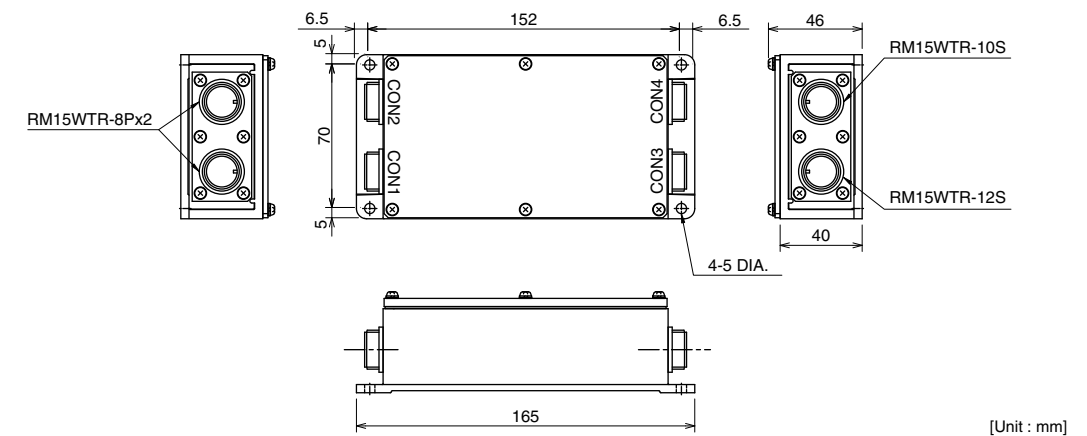
■Serial output interface unit for ABZ analog encoder MDS-B-HR

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. MDS-B-HR-12 (P) is used for the synchronous control system that 1-scale 2-drive operation is possible.

Specifications

Type	MDS-B-HR-11	MDS-B-HR-12	MDS-B-HR-11P	MDS-B-HR-12P
Compatible scale (example)	LS186 / LS486/LS186C / LS486C (HEIDENHAIN)			
Signal 2-division function	×	○	×	○
Analog signal input specifications	A-phase, B-phase, Z-phase (Amplitude 1Vp-p)			
Compatible frequency	Analog raw waveform max. 200kHz			
Scale resolution	Analog raw waveform/512 division			
Input/output communication style	High-speed serial communication I/F, RS485 or equivalent			
Tolerable power voltage	DC5V±5%			
Maximum heating value	2W			
Mass	0.5kg or less			
Degree of protection	IP65		IP67	
Compatible model	E/EH	○	○	○
	EM	○	-	○
	EJ/EJH	○	○	○

Outline dimension drawing



■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/EH-V1 drive units.

Specifications

Type	MDS-B-SD	
Compatible servo drive unit	MDS-E/EH-V1-□	
Input/output communication style	High-speed serial communication I/F, RS485 or equivalent	
Tolerable power voltage	DC5V±10%	
Maximum heating value	4W	
Mass	0.5kg or less	
Degree of protection	IP20	
Compatible model	E/EH	○
	EM	-
	EJ/EJH	○

■Spindle side accuracy serial output encoder (ERM280, MPC1 Series)

C-axis control encoder is used in order to perform an accurate C-axis control.

Manufacturer	HEIDENHAIN	Mitsubishi Heavy Industries
Encoder type	ERM280 1200	ERM280 2048
Interface unit type	EIB192M C4 1200	EIB192M C6 2048
	EIB392M C4 1200	EIB392M C6 2048
Minimum detection resolution	0.0000183°	0.0000107°
	(19,660,800p/rev)	(33,554,432p/rev)
Tolerable maximum speed	20000r/min	11718r/min
		10000r/min
Compatible model	E/EH	○
	EM	○
	EJ/EJH	○

Serial output interface unit for ABZ analog encoder EIB192M (Other manufacturer's product)

Specifications

Type	EIB192M A4 20µm	EIB192M C4 1200	EIB192M C4 2048
Manufacturer	HEIDENHAIN		
Input signal	A-phase, B-phase: SIN wave 1Vpp, Z-phase		
Maximum input frequency	400kHz		
Output signal	Mitsubishi high-speed serial signal (MITSU02-4)		
Interpolation division number	Maximum 16384 divisions		
Compatible encoder	LS187, LS487	ERM280 1200	ERM280 2048
Minimum detection resolution	0.0012µm	0.0000183° (19,660,800p/rev)	0.0000107° (33,554,432p/rev)
Degree of protection	IP65		
Outline dimension	98mm×64mm×38.5mm		
Mass	300g		
Compatible model	E/EH	○	○
	EM	○	○
	EJ/EJH	○	○

Serial output interface unit for ABZ analog encoder EIB392M (Other manufacturer's product)

Specifications

Type	EIB392M A4 20µm	EIB392M C4 1200	EIB392M C4 2048
Manufacturer	HEIDENHAIN		
Input signal	A-phase, B-phase: SIN wave 1Vpp, Z-phase		
Maximum input frequency	400kHz		
Output signal	Mitsubishi high-speed serial signal(MITSU02-4)		
Interpolation division number	Maximum 16384 divisions		
Compatible encoder	LS187, LS487	ERM280 1200	ERM280 2048
Minimum detection resolution	0.0012µm	0.0000183° (19,660,800p/rev)	0.0000107° (33,554,432p/rev)
Degree of protection	IP40		
Outline dimension	76.5mm×43mm×16.6mm		
Mass	140g		
Compatible model	E/EH	○	○
	EM	○	○
	EJ/EJH	○	○

Serial output interface unit for ABZ analog encoder ADB-20J Series (Other manufacturer's product)

Specifications

Type	ADB-20J20	ADB-20J60		ADB-20J71
Manufacturer	Mitsubishi Heavy Industries			
Maximum response speed	10,000r/min	3,600r/min	5,000r/min	10,000r/min
Output signal	Mitsubishi high-speed serial signal			
Compatible encoder	MPCI series	MPS series	MPI series	MPRZ series
Minimum detection resolution	0.00005° (7,200,000p/rev)	0.05µm	0.000025° (1,440,000p/rev)	0.000043° (8,388,608p/rev)
Degree of protection	IP20			
Outline dimension	190mm×160mm×40mm			
Mass	0.9kg			
Compatible model	E/EH	○	○	○
	EM	○	○	○
	EJ/EJH	○	○	○

DEDICATED OPTIONS DRIVE UNIT OPTION

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.

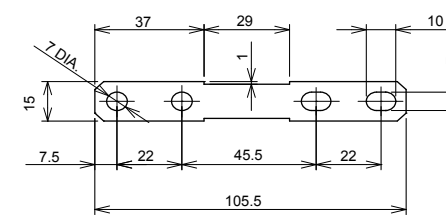
Specifications

Series	MDS-E		MDS-EH		
	Large capacity drive unit	MDS-E-SP-400 MDS-E-SP-640	MDS-E-SP-400 MDS-E-SP-640	MDS-EH-SP-200 MDS-EH-SP-320 MDS-EH-SP-480	MDS-EH-V1-200 MDS-EH-SP-200 MDS-EH-SP-320
Power supply unit	MDS-E-CV-300 MDS-E-CV-370 MDS-E-CV-450	MDS-E-CV-550	MDS-EH-CV-550 MDS-EH-CV-750	MDS-E-CV-300 MDS-E-CV-370 MDS-E-CV-450	MDS-EH-CV-185
Required connection bar	E-BAR-B0606	E-BAR-A0606 (Two-parts set)	E-BAR-A0606 (Two-parts set)	DH-BAR-B0606	DH-BAR-C0606
Compatible model	E/EH	○	○	○	○
	EM	-	-	-	-
	EJ/EJH	-	-	-	-

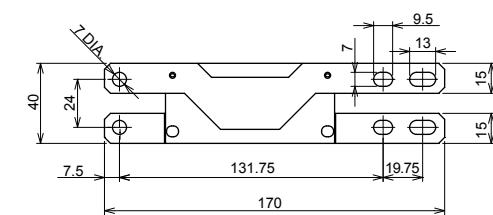
Outline dimension drawings

[Unit:mm]

E-BAR-A0606

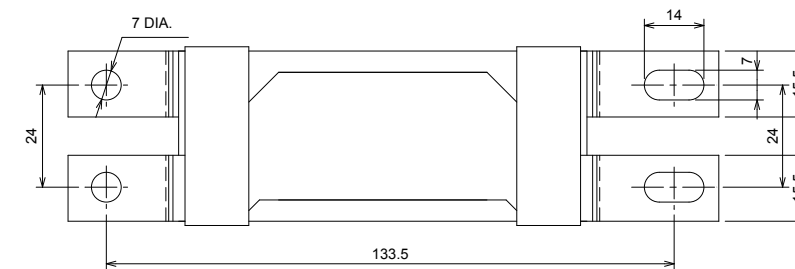


E-BAR-B0606

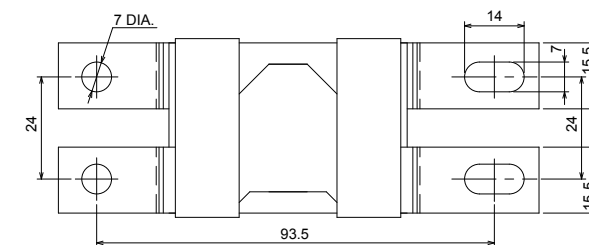


(Note) E-BAR-A0606 is a set of two DC connection bars.

DH-BAR-B0606



DH-BAR-C0606



Side protection cover (E-COVER-1/E-COVER-2)

Install the side protection cover outside the both ends of the connected units.

■ Regenerative option

Confirm the regeneration resistor capacity and possibility of connecting with the drive unit. 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.

Combination with servo drive unit

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
	Mass	0.5kg	1.1kg	2.9kg	2.9kg	5.6kg	2.9kg	5.6kg
	Unit outline dimension	168mm×30mm×119mm	168mm×40mm×149mm	150mm×100mm×318mm	150mm×100mm×318mm	150mm×100mm×318mm	150mm×100mm×318mm	350mm×128mm×200mm
		W1	W2	W3	W3	W4	W3	W4
	External option regenerative resistor	-	GZG200W39OHMK	GZG200W120OHMK×3	GZG200W39OHMK×3	GZG300W39OHMK×3	GZG200W20OHMK×3	GZG300W20OHMK×3
	Regenerative capacity	30W	100W	300W	300W	500W	300W	500W
		Resistance value	40Ω	40Ω	40Ω	13Ω	13Ω	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					○	○

Corresponding servo drive unit	Standard built-in regenerative resistor	External option regenerative resistor			
		MR-RB1H-4	MR-RB3M-4	MR-RB3G-4	MR-RB5G-4 (Note 1)
	Mass	1.1kg	2.9kg	2.9kg	5.6kg
	Unit outline dimension	168mm×40mm×149mm	150mm×100mm×318mm	150mm×100mm×318mm	350mm×128mm×200mm
		W2	W3	W3	W4
	Regenerative capacity	100W	300W	300W	500W
		Resistance value	82Ω	120Ω	47Ω
MDS-EJH-V1-10	20W	80Ω	○	○	-
MDS-EJH-V1-15	20W	80Ω	○	○	-
MDS-EJH-V1-20	100W	40Ω	-	-	○
MDS-EJH-V1-40	120W	47Ω	-	-	○

(Note 1) Install a cooling fan in the unit.

Combination with spindle drive unit



The regenerative resistor is not incorporated in the spindle drive unit. Make sure to install the external option regenerative resistor.

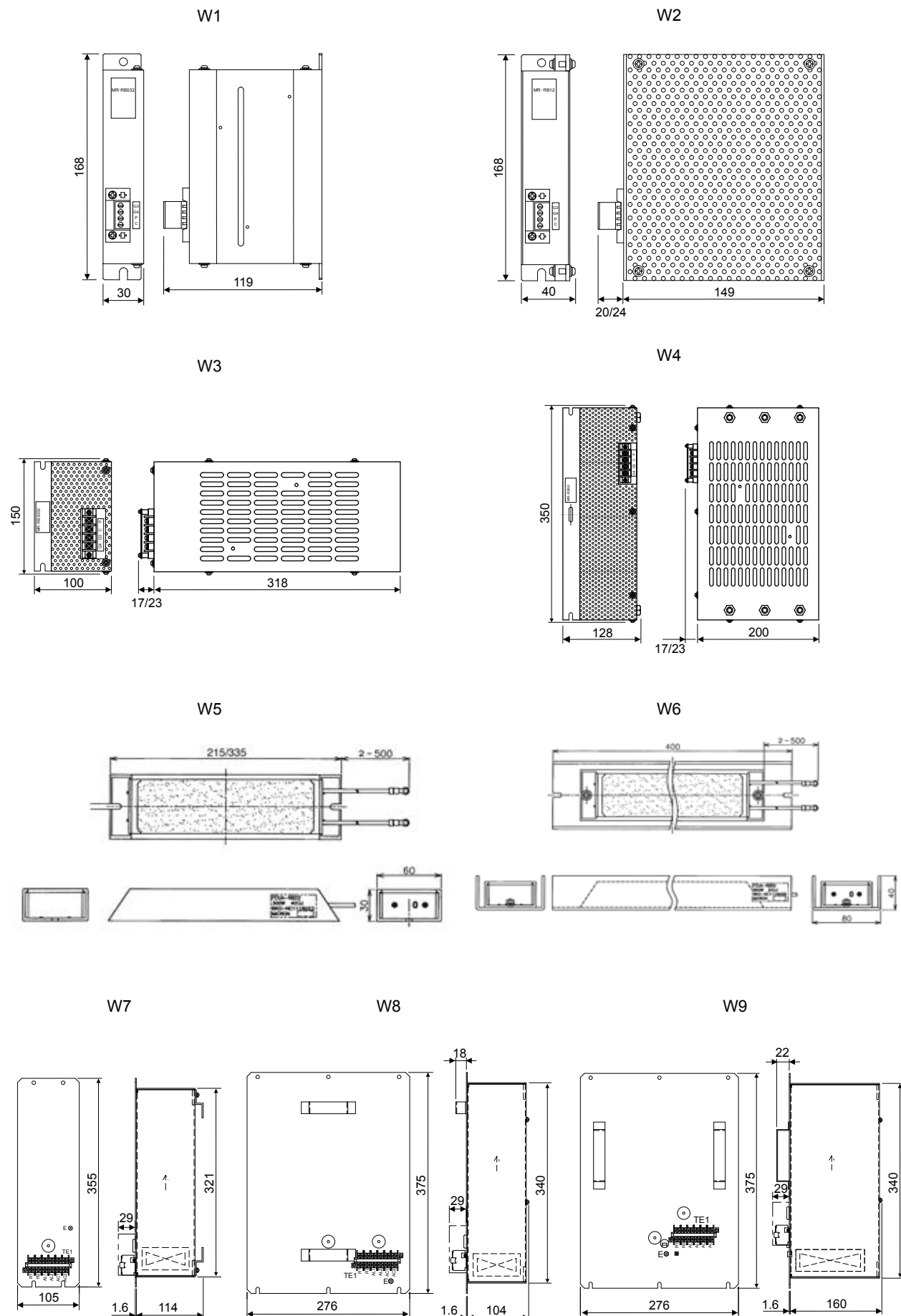
Corresponding spindle drive unit		External option regenerative resistor			
		MR-RB12	MR-RB32	MR-RB30	MR-RB50
	Mass	0.8kg	2.9kg	2.9kg	5.6kg
	Unit outline dimension	168mm×40mm×149mm	150mm×100mm×318mm	150mm×100mm×318mm	350mm×128mm×200mm
		W2	W3	W3	W4
	External option regenerative resistor	GZG200W39OHMK	GZG200W120OHMK×3	GZG200W39OHMK×3	GZG300W39OHMK×3
	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	-				

Corresponding spindle drive unit		External option regenerative resistor			
		FCUA-RB22	FCUA-RB37	FCUA-RB55	FCUA-RB75/2 (1 unit)
	Mass	0.8kg	1.2kg	2.2kg	2.2kg
	Unit outline dimension	30mm×60mm×215mm	30mm×60mm×335mm	40mm×80mm×400mm	40mm×80mm×400mm
		W5	W5	W6	W6
	Regenerative capacity	155W	185W	340W	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	-				

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
	Mass	4.3kg	4.4kg	10.8kg	11.0kg	15.0kg	4.4kg	4.4kg
	Unit outline dimension	355mm×105mm×114mm	355mm×105mm×114mm	375mm×276mm×104mm	375mm×276mm×104mm	375mm×276mm×160mm	40mm×80mm×400mm	40mm×80mm×400mm
		W7	W7	W8	W8	W9	W6	W6
	Regenerative capacity	700W	700W	2100W	2100W	3100W	680W	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	-				○	○		

External option regenerative resistor

[Unit : mm]



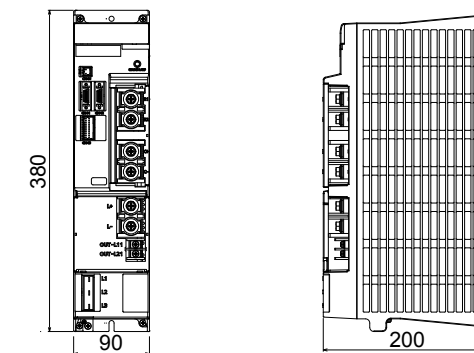
Power backup unit MDS-D/DH-PFU

Use this unit to protect machines or drive units at power failure.

Specifications

Power backup unit type		MDS-DH-PFU	MDS-D-PFU
AC Input	Rated voltage [V]	380 to 480AC (50/60Hz) (Exclusively for earthed-star supply system) Tolerable fluctuation : between +10% and -10%	200 to 230AC (50/60Hz) Tolerable fluctuation : between +10% and -15%
	Frequency [Hz]	50/60 Tolerable fluctuation : between +3% and -3%	
	Rated current [A]	2	4
DC Input/ Output	Rated voltage [V]	513 to 648DC	270 to 311DC
	Rated current [A]	Regenerative input: MAX 200A Power running output: MAX 160A	Regenerative input: MAX 300A Power running output: MAX 200A
AC output for control power backup	Voltage [V]	Single-phase 200 to 230VAC (50Hz or 60Hz) 50Hz at backup	Single-phase 380 to 480VAC (50Hz or 60Hz) 50Hz at backup
	Current [A]	MAX 2	MAX 4
	Maximum number of drive units to connect	6 units (except for the power supply unit)	
	Switching time	Within 100ms after AC input instantaneous interruption	
Minimum backup time	75ms or more (380VAC input, at maximum number of drive units to connect)		75ms or more (200VAC input, at maximum number of drive units to connect)
	Degree of protection		
IP20 [except for the terminal block and connector area]			
Cooling method			Natural-cooling
Mass [kg]	4		

Outline dimension drawing



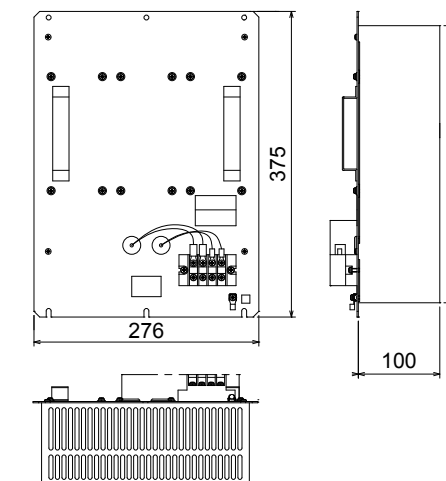
[Unit : mm]

Regenerative resistor unit for power backup unit R-UNIT-6, R-UNIT-7

Specifications

Regenerative resistor type	R-UNIT-6	R-UNIT-7
Corresponding power backup unit type	MDS-DH-PFU	MDS-D-PFU
Resistance value [Ω]	5	1.4
Instantaneous regeneration capacity [kW]	128	114
Tolerable regeneration work amount [kJ]	180	180
Cooling method	Natural-cooling	Natural-cooling
Mass [kg]	10	10

Outline dimension drawing



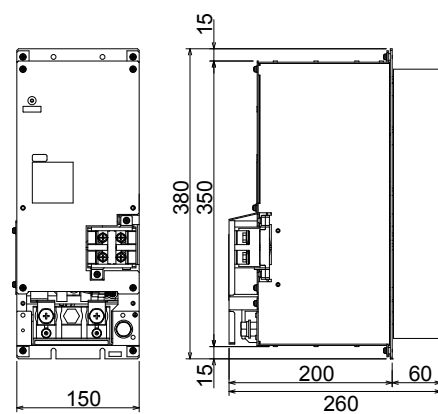
[Unit : mm]

■Capacitor unit MDS-D/DH-CU

Specifications

Capacitor unit type	MDS-DH-CU	MDS-D-CU
Compatible capacitor unit type	MDS-DH-PFU	MDS-D-PFU
Capacity [μF]	7000	28000
DC Input/Output Rated voltage [V]	513 to 648DC	270 to 311DC
Cooling method	Natural-cooling	Natural-cooling
Mass [kg]	11	11

Outline dimension drawing

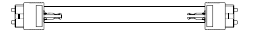




[Unit : mm]

■MEMO

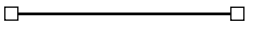

LIST OF CABLES

<Optical communication cable>





Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM	EJ	
For CN1A/ CN1B/ OPT1A	Optical communication cable For wiring between drive units (inside panel)	J396 L0.3M	0.3		○	○	○
		J396 L0.5M	0.5				
		J396 L1M	1				
		J396 L2M	2				
		J396 L3M	3				
	Optical communication cable For wiring between drive units (outside panel)	J395 L3M	3		○	○	○
		J395 L5M	5				
		J395 L7M	7				
	Optical communication cable For wiring between drive units (outside panel)	J395 L10M	10		○	○	○
		G380 L5M	5				
G380 L10M		10					
G380 L12M		12					
G380 L15M		15					
G380 L20M		20					
G380 L25M		25					
G380 L30M	30						

(Note1) For details on the optical communication cable, refer to the section "Optical communication cable specification" in Specifications Manual of each drive unit.




<Battery cable and connector>

Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM	EJ	
For drive unit	Battery cable (For drive unit - battery box, For drive unit - drive unit)	DG30-0.3M	0.3		○	○	-
		DG30-0.5M	0.5				
		DG30-1M	1.0				
		DG30-2M	2.0				
		DG30-3M	3.0				
		DG30-5M	5.0				
		DG30-7M	7.0				
		DG30-10M	10.0				
	Battery cable (For drive unit - drive unit)	MR-BT6V2CBL0.3M	0.3		-	-	○
		MR-BT6V2CBL1M	1				



<Power supply communication cable and connector>

Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM	EJ	
For CN4/9	Power supply communication cable	SH21	0.35		○	-	-
		0.5					
		1					
		2					
		3					
	Power supply communication cable connector set	FCUA-CS000	-		○	-	-
For CN23	Contacter control output connector Applicable cable outline: 0.85mm ² to 3.5mm ² Finish outside diameter: to φ4.2mm	-	-		○	-	-
For CN24	External emergency stop input connector	CNU24S (AWG24)	-		○	-	-

<Power backup unit connector>

Item	Model	Length (m)	Contents	Compatible model		
				D-PFU	DH-PFU	
For CN43	Input/output connector for power backup unit	CNU43S (AWG22)	-		○	○
For TE1	Power connector for power backup unit	-	-		○	○
						○

<STO input connector>

Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM	EJ	
For CN8	STO cable	MR-D05UDL3M-B	-		○	-	○
	STO short-circuit connector	These connectors are supplied for each drive unit.	-	Required when not using dedicated wiring STO function. 	○	-	○

<Servo encoder cable and connector>

Item	Model	Length (m)	Contents	Compatible model		
				E/EH	EM	EJ
For CN2/3 For HG/HG-H, HQ-H Motor side encoder cable (for D48/D51/D74)	CNV2E-8P-2M	2		○	○	○
	CNV2E-8P-3M	3				
	CNV2E-8P-4M	4				
	CNV2E-8P-5M	5				
	CNV2E-8P-7M	7				
	CNV2E-8P-10M	10				
	CNV2E-8P-15M	15				
	CNV2E-8P-20M	20				
	CNV2E-8P-25M	25				
	CNV2E-8P-30M	30				
	CNV2E-9P-2M	2				
	CNV2E-9P-3M	3				
	CNV2E-9P-4M	4				
	CNV2E-9P-5M	5				
	CNV2E-9P-7M	7				
	CNV2E-9P-10M	10				
CNV2E-9P-15M	15					
CNV2E-9P-20M	20					
CNV2E-9P-25M	25					
CNV2E-9P-30M	30					
For motor encoder/ Ball screw side encoder	CNE10-R10S(9)	-		○	○	○
	CNE10-R10L(9)	-		○	○	○
	CNE10S-R10S(9)	-		○	○	○
	CNE10S-R10L(9)	-		○	○	○

Item	Model	Length (m)	Contents	Compatible model							
				E/EH	EM	EJ					
CN3 MDS-B-HR unit cable	CNV2E-HP-2M	2		○	○	○					
	CNV2E-HP-3M	3									
	CNV2E-HP-4M	4									
	CNV2E-HP-5M	5									
	CNV2E-HP-7M	7									
	CNV2E-HP-10M	10									
	CNV2E-HP-15M	15									
	CNV2E-HP-20M	20									
	CNV2E-HP-25M	25									
	CNV2E-HP-30M	30									
	For MDS-B-HR unit	CNEHRS(10)					-		○	○	○
	For CN3 MDS-B-SD unit cable	CNV2E-D-2M					2		○	-	-
CNV2E-D-3M		3									
CNV2E-D-4M		4									
CNV2E-D-5M		5									
CNV2E-D-7M		7									
CNV2E-D-10M		10									
CNV2E-D-15M		15									
CNV2E-D-20M		20									
CNV2E-D-25M		25									
CNV2E-D-30M		30									
For MDS-B-SD unit	FCUA-CS000	-		○	-	-					
For CN2/3	CNU2S(AWG18)	-		○	○	○					
















<Brake cable and connector>

Item	Model	Length (m)	Contents	Compatible model							
				E/EH	EM	EJ					
For motor brake	CNB10-R2S(6)	-		○	○	○					
	CNB10-R2L(6)	-									
	CNB10S-R2S(6)	-									
	CNB10S-R2L(6)	-									
For motor brake	MR-BKS1CBL 2M-A1-H	2		○	○	○					
	MR-BKS1CBL 3M-A1-H	3									
	MR-BKS1CBL 5M-A1-H	5									
	MR-BKS1CBL 7M-A1-H	7									
	MR-BKS1CBL 10M-A1-H	10									
	MR-BKS1CBL 2M-A2-H	2									
For motor brake	MR-BKS1CBL 3M-A2-H	3		○	○	○					
	MR-BKS1CBL 5M-A2-H	5									
	MR-BKS1CBL 7M-A2-H	7									
	MR-BKS1CBL 10M-A2-H	10									
	For CN20	CNU23S(AWG14)					-		○	-	-








<Power connector>

Item	Model	Length (m)	Contents	Compatible model							
				E/EH	EM	EJ					
For motor power	CNP18-10S(14)	-		○	○	○					
	CNP18-10L(14)	-									
	Applicable cable outline φ10.5 to 14mm	CNP22-22S(16)	-		○	○	○				
		CNP22-22L(16)	-								
	Applicable cable outline φ12.5 to 16mm	CNP32-17S(23)	-		○	-	-				
		CNP32-17L(23)	-								
	Applicable cable outline φ22 to 23.8mm	CNP14-2S(12)	-		○	○	○				
		CNP14-2L(12)	-								
	Power connector for <200V series> HG75, 105□-S105010	MR-PWS1CBL 2M-A1-H	2		○	-	○				
		MR-PWS1CBL 3M-A1-H	3								
MR-PWS1CBL 5M-A1-H		5									
MR-PWS1CBL 7M-A1-H		7									
MR-PWS1CBL 10M-A1-H		10									
Power cable for HG46/56/96 Lead out in direction of motor shaft	MR-PWS1CBL 2M-A2-H	2		○	-	○					
	MR-PWS1CBL 3M-A2-H	3									
	MR-PWS1CBL 5M-A2-H	5									
	MR-PWS1CBL 7M-A2-H	7									
	MR-PWS1CBL 10M-A2-H	10									
Power connector for MDS-E-V1-20 to 160 MDS-E-V2-20 to 160 MDS-E-V3-20 to 40 MDS-E-SP-20 to 80 MDS-E-SP2-16080 (L-axis) MDS-EH-V1-10 to 80W MDS-EH-V2-10 to 80W MDS-EH-SP-20 to 80	CNU01SEF(AWG14)	-		○	-	-					
	CNU01SEL(AWG14)	-									
	CNU01SEM(AWG14)	-									
	CNU01SES(AWG14)	-									
	Power connector for MDS-E-CV-37/75	CNU01SECV(AWG14)					-		○	-	-
		CNU01SECV(AWG14)					-				
	For CN31 L/M/S	CNU01SEF(AWG14)					-		-	○	-
		CNU01SEL(AWG14)					-				
	For CN22	CNU01SEM(AWG14)					-		-	○	-
		CNU01SES(AWG14)					-				
Control power connector for MDS-EM Series Applicable cable outline φ1.25 to 2.2mm	RCN22	-		-	○	-					
	RCN22	-									




<Drive unit side main circuit connector>

Item	Model	Length (m)	Contents	Compatible model		
				E/EH	EM	EJ
For drive unit	For MDS-EJ-V1-10, 15, 30 For MDS-EJ-SP-20 Applicable cable outline: 0.8mm ² to 2.1mm ² Finish outside diameter: to φ3.9mm	-		-	-	○
				-	-	○
				-	-	○
				-	-	○
				-	-	○
				-	-	○
	For MDS-EJ-V1-40, 80 Applicable cable outline: (For CNP1, for CNP3) 1.25mm ² to 5.5mm ² (For CNP2) 0.14mm ² to 2.1mm ² Finish outside diameter: (For CNP1, for CNP3) to φ4.7mm (For CNP2) to φ3.9mm ²	-		-	-	○
				-	-	○
				-	-	○
				-	-	○
				-	-	○
				-	-	○
For MDS-EJH-V1-10,15,20,40 Applicable cable outline:0.8mm ² to 2.1mm ² Finish outside diameter: to φ3.9mm	-		-	-	○	
			-	-	○	
			-	-	○	

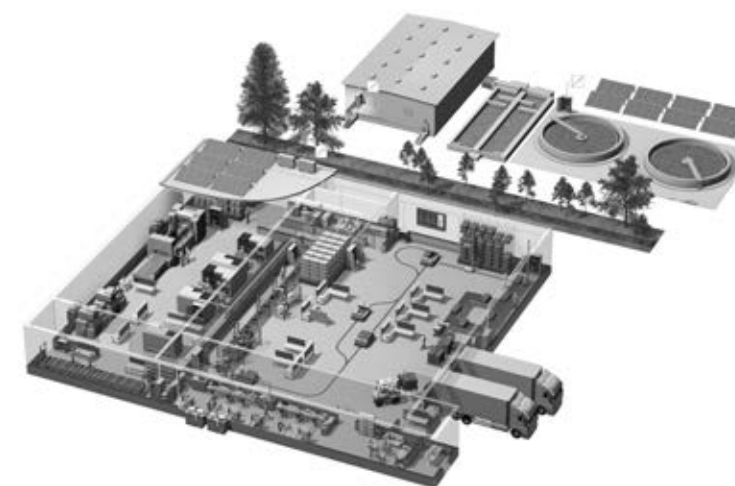
<Spindle encoder cable and connector>

Item	Model	Length (m)	Contents	Compatible model							
				E/EH	EM	EJ					
For CN2	Motor side PLG cable Spindle side accuracy encoder TS5690 cable	CNP2E-1-2M	2		○	○	○				
		CNP2E-1-3M	3								
		CNP2E-1-4M	4								
		CNP2E-1-5M	5								
		CNP2E-1-7M	7								
		CNP2E-1-10M	10								
		CNP2E-1-15M	15								
		CNP2E-1-20M	20								
		CNP2E-1-25M	25								
		CNP2E-1-30M	30								
For CN3	Spindle side encoder OSE-1024 cable	CNP3EZ-2P-2M	2		○	○	○				
		CNP3EZ-2P-3M	3								
		CNP3EZ-2P-4M	4								
		CNP3EZ-2P-5M	5								
		CNP3EZ-2P-7M	7								
		CNP3EZ-2P-10M	10								
		CNP3EZ-2P-15M	15								
		CNP3EZ-2P-20M	20								
		CNP3EZ-2P-25M	25								
		CNP3EZ-2P-30M	30								
		CNP3EZ-3P-2M	2						○	○	○
		CNP3EZ-3P-3M	3								
		CNP3EZ-3P-4M	4								
		CNP3EZ-3P-5M	5								
		CNP3EZ-3P-7M	7								
		CNP3EZ-3P-10M	10								
		CNP3EZ-3P-15M	15								
		CNP3EZ-3P-20M	20								
CNP3EZ-3P-25M	25										
CNP3EZ-3P-30M	30										
For spindle motor	Motor side PLG connector Spindle side accuracy encoder TS5690 connector	CNEPGS	-		○	○	○				
	Spindle side encoder OSE-1024 cable	CNE20-29S(10)	-		○	○	○				
	Applicable cable outline φ6.8 to 10mm	CNE20-29L(10)	-		○	○	○				
For CN2/3	Spindle encoder drive unit side connector	CNU2S(AWG18)	-		○	○	○				

<Twin-head magnetic encoder (MBE405W / MBA405W) cable and connector>

Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM	EJ	
For CN2/3	Cable for MBE405W/MBA405W	CNV2E-MB-2M	2		○	○	○
		CNV2E-MB-3M	3				
		CNV2E-MB-4M	4				
		CNV2E-MB-5M	5				
		CNV2E-MB-7M	7				
		CNV2E-MB-10M	10				
		CNV2E-MB-15M	15				
CNV2E-MB-20M	20						
For CN3 of preamplifier	Connector for MBE405W/MBA405W	CNEMB2S(8)	-		○	○	○
		Thermistor connector for MBE405W/ MBA405W	CNEMB3S(8)	-		○	○

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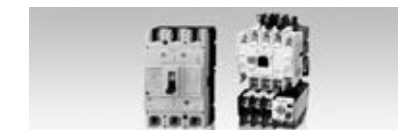
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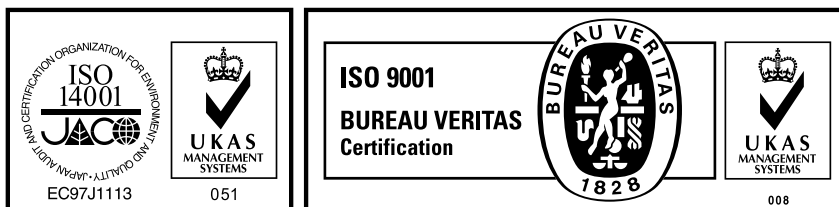
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