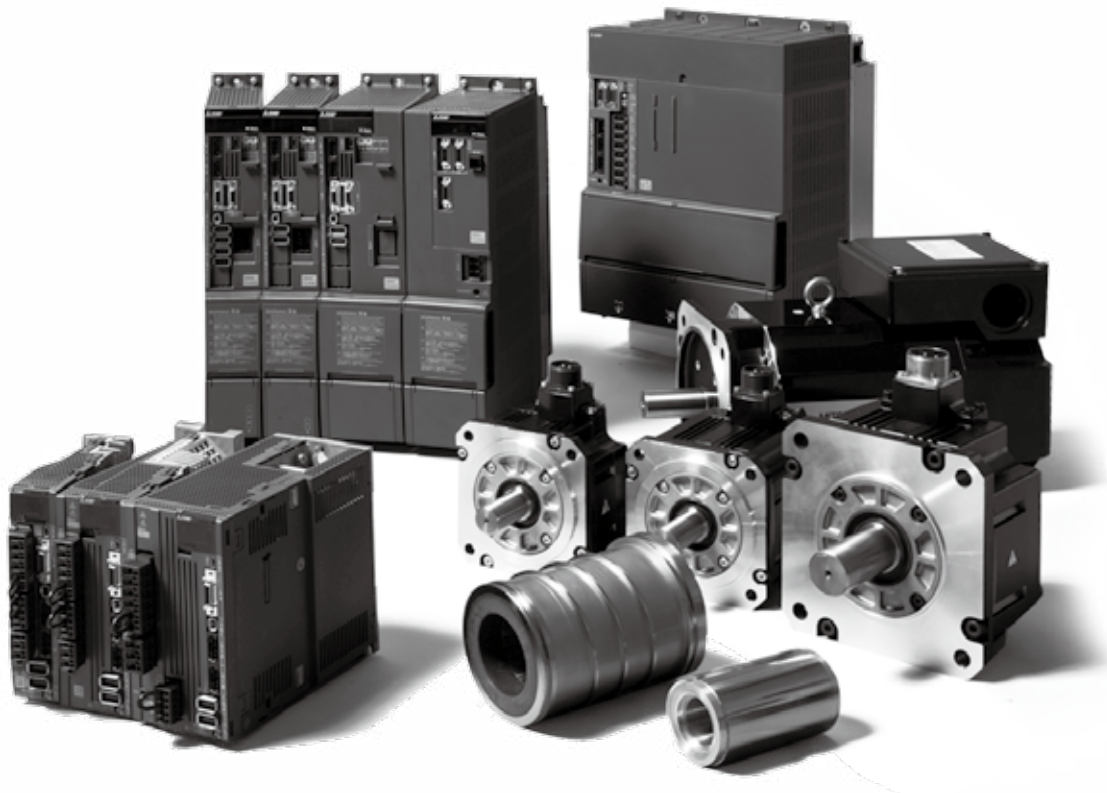


MITSUBISHI CNC DRIVE SYSTEM GENERAL CATALOG



- MDS-E/EH Series
- MDS-EM/EMH 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.

OVERVIEW

DRIVE SYSTEM	3
SYSTEM CONFIGURATION	5
SPECIFICATIONS	9
TYPE	11
SERVO MOTOR 200V	16
DIRECT-DRIVE MOTOR 200V	19
LINEAR SERVO MOTOR 200V	20
SPINDLE MOTOR 200V	22
BUILT-IN SPINDLE MOTOR 200V	32
TOOL SPINDLE MOTOR 200V	40
SERVO MOTOR 400V	43
LINEAR SERVO MOTOR 400V	45
SPINDLE MOTOR 400V	46
TOOL SPINDLE MOTOR 400V	48
DRIVE UNIT	49
DEDICATED OPTIONS SERVO OPTIONS	57
DEDICATED OPTIONS SPINDLE OPTIONS	62
ENCODER INTERFACE UNIT	68
DEDICATED OPTIONS DRIVE UNIT OPTION	70
LIST OF CABLES	77
YOUR SOLUTION PARTNER	82

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21

DRIVE SYSTEM

Drive unit



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

- The servo control-dedicated core processor realizes improved control speed, leading to enhanced basic performance. When combined with a higher resolution motor sensor and advanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- The motor power connector is equipped with 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 also incorporated as additional safety features.



Multi-hybrid Drive Units MDS-EM/EMH Series

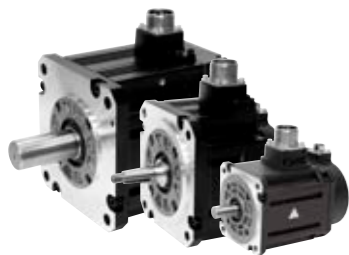
- The multi-hybrid drive units are capable of driving a maximum of three servo axes and one spindle. This contributes to the downsizing of machines and offers technical advantages.
- The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors.
- Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.
- Fan unit contributes to easier fan exchange.
- MDS-EMH 400V system drive unit is available.



All-in-one Compact Drive Units MDS-EJ/EJH Series

- Ultra-compact drive units with built-in power supplies contribute to smaller control panel size.
- The 2-axis type is added for further downsizing.
- 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 also incorporated as additional safety features.
- MDS-EJH 400V system drive unit is available (Note 1).

Servo motors



Medium-inertia, High-accuracy, 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.
- This can also be used as a tool spindle motor.
- Small-sized connector allows horizontal cable connection, which helps to save space in machines. (Note 2)



Linear Servo Motors 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, quiet operation even at high speeds.
- Range: Maximum thrust: 900 to 18,000 [N·m]



Direct-drive Servo Motors TM-RB Series

- High-torque, direct-drive motors combined with high-gain control provide 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]

Spindle motor



High-performance Spindle Motors SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.
- High-speed bearings are incorporated as a standard feature, helping 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 Motors SJ-DG Series

- Addition of S3 rating (%ED rating) has improved output and torque (acceleration/deceleration characteristics).
- Balance adjustment ring 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 Motors SJ-DL Series

- This series of spindle motors is dedicated to use in tapping machines that require 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]



Built-in Spindle Motors 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.
- Options for mold specification and cooling jacket specification are prepared.



Tool Spindle Motors HG-JR Series

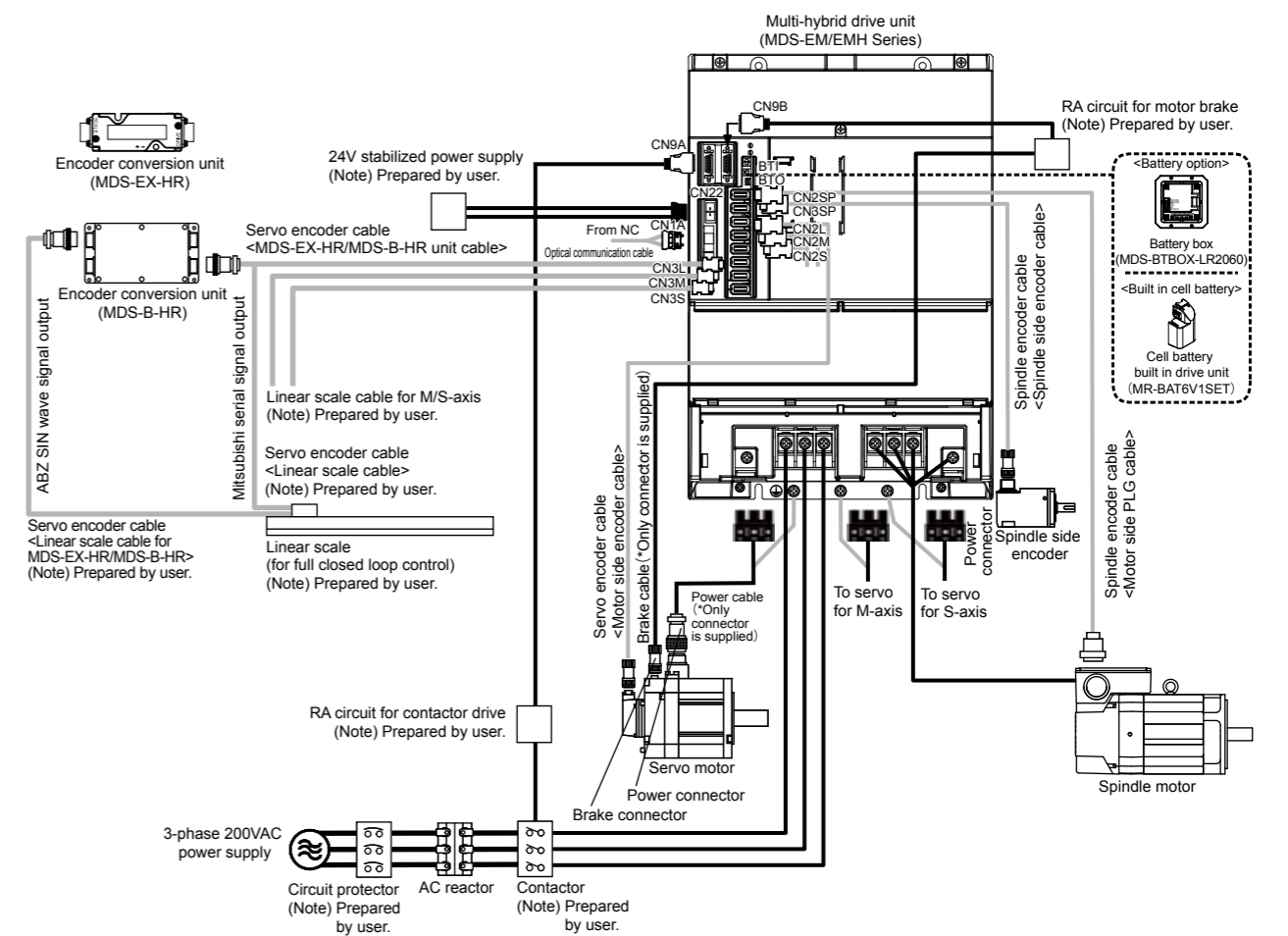
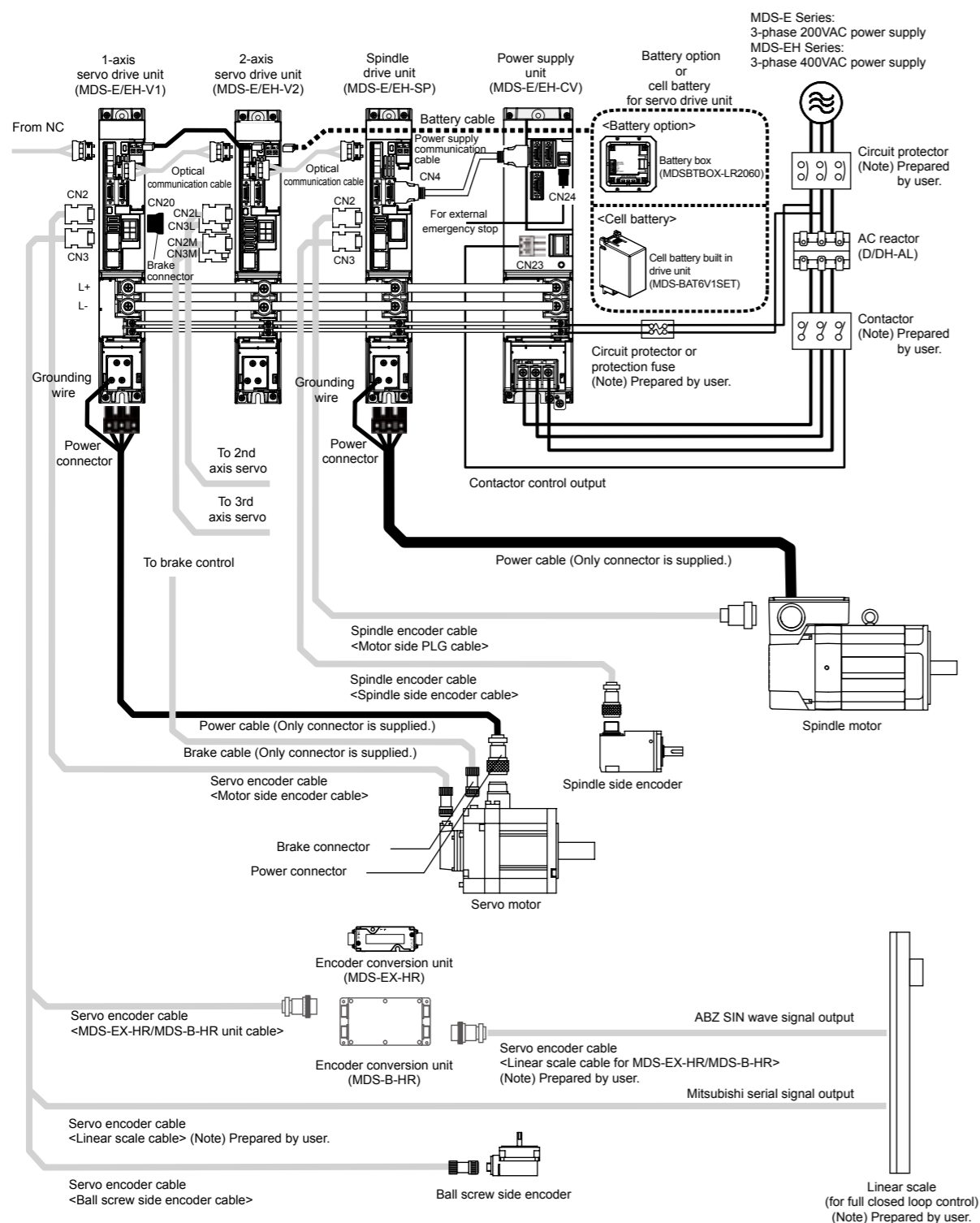
- Compact tool spindle motors are designed to have the small, high-output characteristics of servo motors yet offer high-speed rotation (8,000rpm). These motors contribute to downsizing spindle size, like rotary tool spindles.
- Product line: 0.75 to 1.5 [kW]
- Maximum rotation speed: 8,000 [r/min]
- Small-sized connector allows horizontal cable connection, which helps to save space in machines. (Note 2)

(Note 1) For servo motors only
(Note 2) Options supported. (Flange size 90SQ only)

SYSTEM CONFIGURATION

■MDS-E/EH Series

■MDS-EM/EMH Series

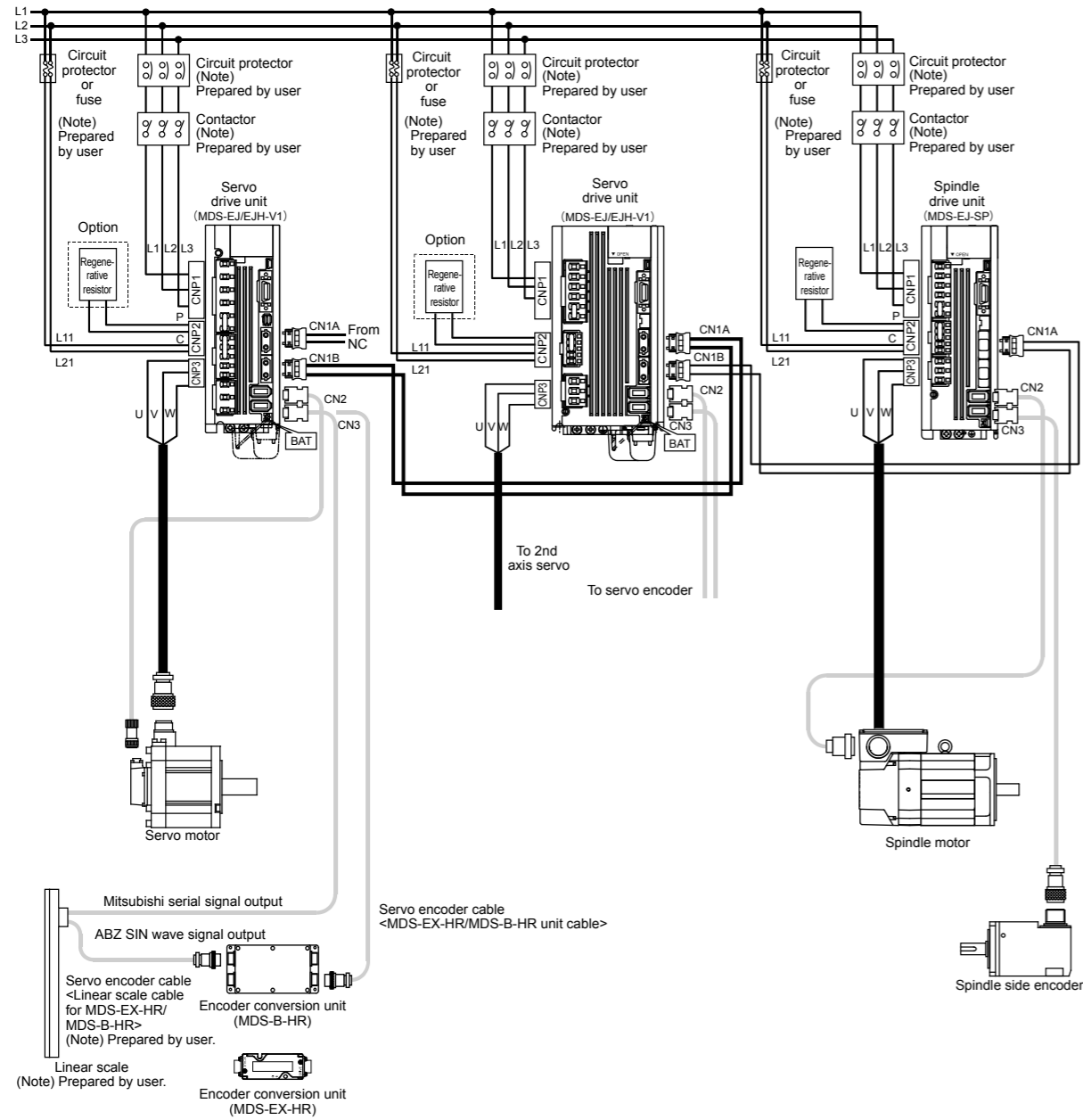


2 SYSTEM CONFIGURATION

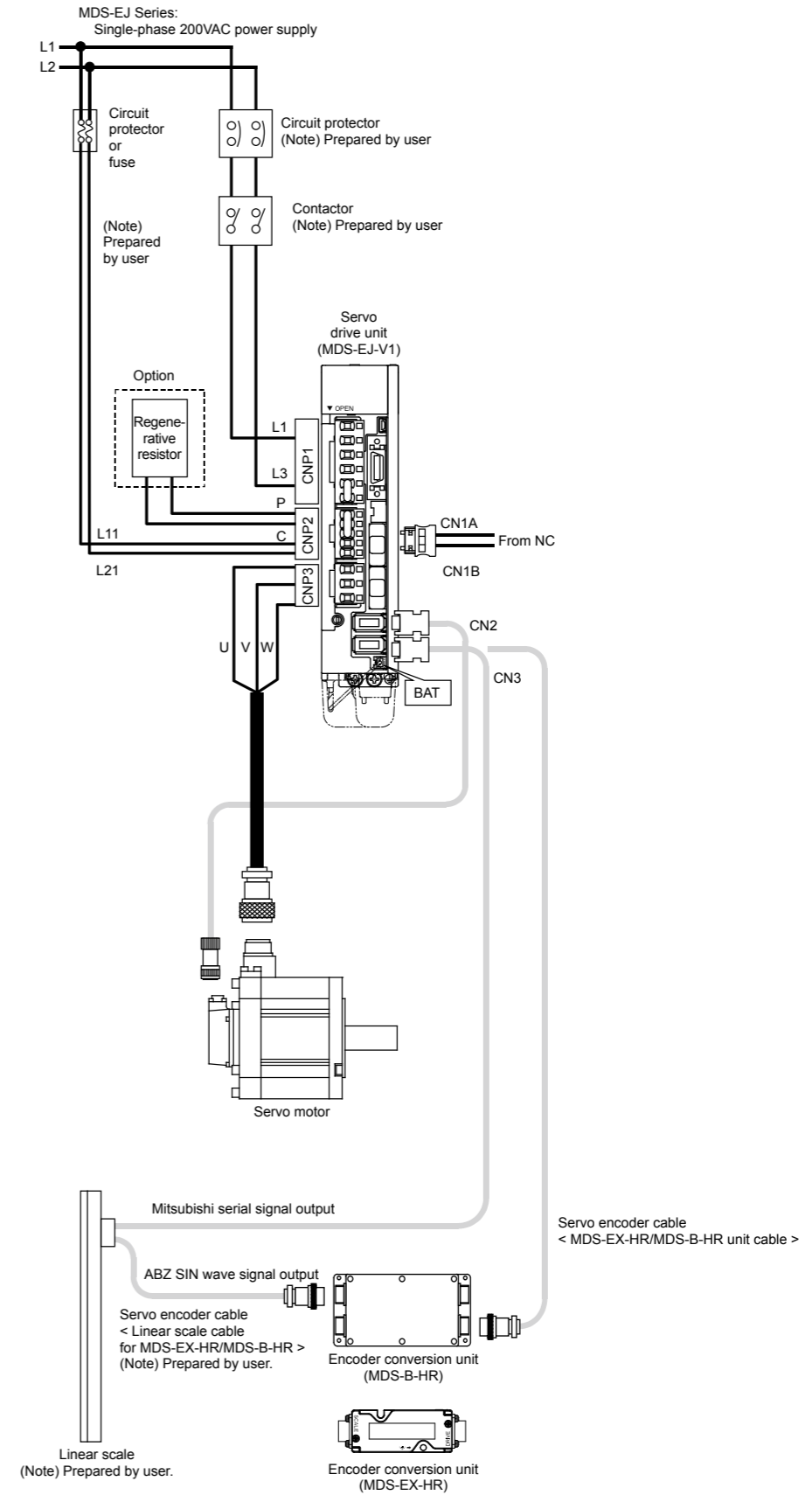
2 SYSTEM CONFIGURATION

■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/EMH-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/EMH-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	●	●	●	●	●	
	3.9 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>

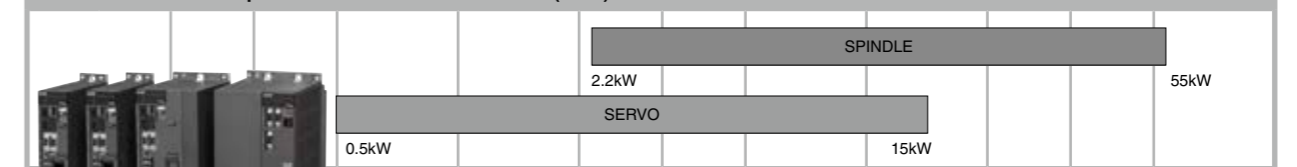
Item		MDS-E-CV	MDS-EH-CV	MDS-EM/EMH built-in converter	MDS-EJ/EJH-V1 built-in converter	MDS-EJ-SP built-in converter
1 Base control functions	1.14 Power regeneration control	●	●	●	●	●
	1.15 Resistor regeneration control	●	●	●	●	●
4 Protection function	4.6 Fan stop detection	●	●	●	●	●
	4.7 Open-phase 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.

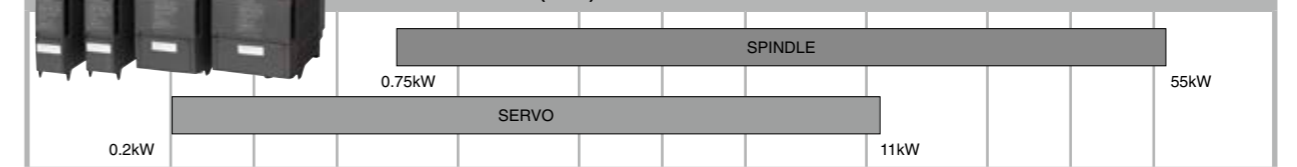
(Note 2) The power backup unit and capacitor unit option are required.

■ MITSUBISHI CNC DRIVE SYSTEM LINES

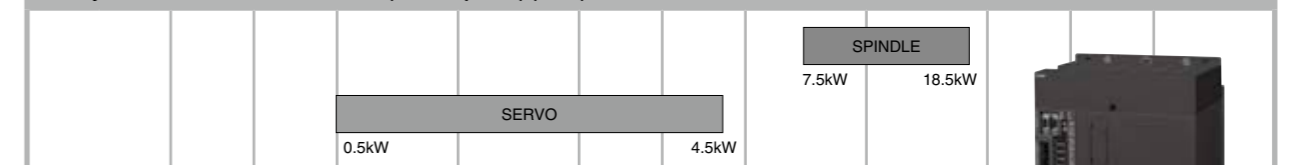
Drive unit to realize complete nano control MDS-EH Series (400V)



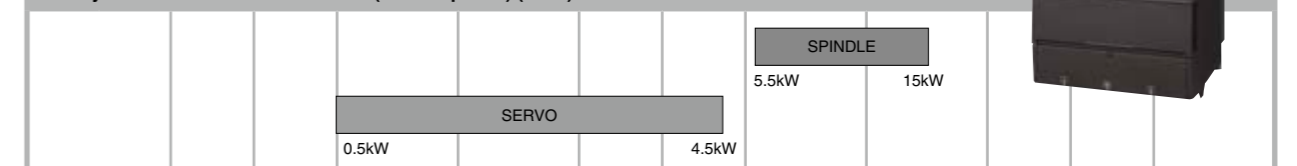
MDS-E Series (200V)



Multi-hybrid drive unit MDS-EMH Series (servo+spindle) (400V)



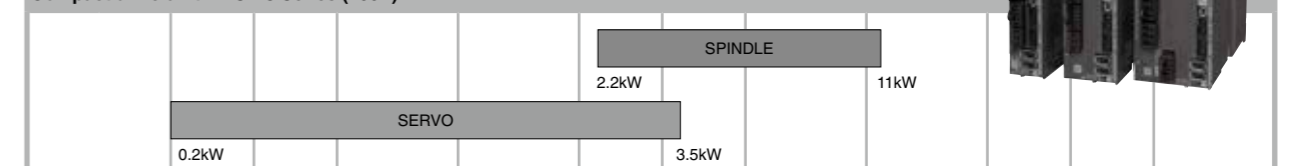
Multi-hybrid drive unit MDS-EM Series (servo+spindle) (200V)



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
K	With keyway (with key)
S	Straight
T	Taper

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

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	OSA405S5AS		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-1WWO
 Secondary side [magnet side] LM-FS ① 0- ② -1WWO

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
18.5	18.5 kW
22	22 kW
26	26 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
90	φ90mm
110	φ110mm
120	φ120mm
150	φ150mm
160	φ160mm
180	φ180mm
240	φ240mm
300	φ300mm

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

⑥ Coil changeover

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

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

<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 (人-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]

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]

④ Overheat protection sensor

Symbol	Overheat protection sensor
T	Thermistor

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-1WWO

Secondary side [magnet side] LM-FS ① 0- ② -1WWO

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

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-	-	-
	Regenerative resistor type	MDS-EJ-V1-10	10	15
Output	[N · m]	8	5.0	7.2
	Stall torque	6	5.0	7.2
Max. torque	□	2.5	1.3	2.4
	□	2	1.3	2.4
Rated output	[kW]	0.2	0.4	0.75
Max. rotation speed	[r/min]	6000	6000	6000
Motor inertia	[×10 ⁻⁴ kg · m ²]	0.234	0.379	1.27
Motor inertia with a brake	[×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]	60 SQ. 117.2	60 SQ. 138.9	80 SQ. 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, 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-V2-20	20	40	40	80	-	
	3-axis type	MDS-E-V3-20	20	40	40	80	40	
	Multi-hybrid type	MDS-EM-SPV3-	xxx40*	xxx40*	xxx40* xxx80*	xxx40* xxx80*	xxx80* 200120	-
	Regenerative resistor type	MDS-EJ-V1-	30	30	30	40	80	-
Output	[N · m]	50	42.0	23.3	23.7	9.0	7.0	
	Stall torque	40	42.0	23.3	23.7	9.0	7.0	
Max. torque	□	8.0	11.0	13.0	5.9	9.0	7.0	
	□	10	11.0	13.0	5.9	9.0	7.0	
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	[×10 ⁻⁴ kg · m ²]	2.62	5.12	6.13	11.9	17.8	17.8	
Motor inertia with a brake	[×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]	90 SQ. 127.5	90 SQ. 163.5	130 SQ. 118.5	130 SQ. 140.5	130 SQ. 162.5	130 SQ. 162.5	
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.								
Flange fitting diameter	[mm]	φ80	φ80	φ110	φ110	φ110	φ110	
Shaft diameter	[mm]	φ14	φ14	φ24	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)	8.3(11.0)	
Absolute position encoder compatible drive unit	67,108,864 [p/rev] (D74)	E	E	E	E	E	E	
	4,194,304 [p/rev] (D51)	E	E	E	E	E	E	
	1,048,576 [p/rev] (D48)	EM, EJ	EM, EJ	EM, EJ	EM, EJ	EM, EJ	E	

*Refer to "MDS-EM/EMH 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-	80 160	-	80 160	-	160 160W
	3-axis type MDS-E-V3-	-	-	-	-	-
	Multi-hybrid type MDS-EM-SPV3-	xxx80* 200120	-	xxx80* 200120	-	200120
	Regenerative resistor type MDS-EJ-V1-	80	80	-	100	-
Output	[N·m]	50	40	30	20	10
Stall torque	█	46.5	42.0	47.0	65.0	75.0
Max. torque	□	12.0	13.7	13.7	22.5	22.5
Rated output	[kW]	2.2	2.0	3.5	4.0	4.0
Max. rotation speed	[r/min]	4000	4000	3500	4000	4000
Motor inertia	[x10 ⁻⁴ kg·m ²]	23.7	38.3	75.0	84.7	84.7
Motor inertia with a brake	[x10 ⁻⁴ kg·m ²]	25.9	47.9	84.7	84.7	84.7
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67	IP67	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)		130 SQ.	176 SQ.	176 SQ.	176 SQ.	176 SQ.
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.	[mm]	184.5	143.5	183.5	183.5	183.5
Flange fitting diameter	[mm]	φ110	φ114.3	φ114.3	φ114.3	φ114.3
Shaft diameter	[mm]	φ24	φ35	φ35	φ35	φ35
Mass (with a brake)	[kg]	10.0(12.0)	12.0(18.0)	19.0(25.0)	19.0(25.0)	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 EJ	- EJ	E EM	- EJ

■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	40 80
	3-axis type MDS-E-V3-	-	-	20 40	40
	Multi-hybrid type MDS-EM-SPV3-	-	-	xxx40*	xxx40* xxx80*
	Regenerative resistor type MDS-EJ-V1-	-	-	40	40
Output	[N·m]	200	150	100	50
Stall torque	█	152.0	208.0	26.5	50.0
Max. torque	□	49.0	58.8	11.0	20.0
Rated output	[kW]	7.0	9.0	1.4	3.0
Max. rotation speed	[r/min]	3000	3000	2000	2000
Motor inertia	[x10 ⁻⁴ kg·m ²]	154.0	196.0	17.8	75.0
Motor inertia with a brake	[x10 ⁻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)		176 SQ.	204 SQ.	130 SQ.	176 SQ.
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.	[mm]	263.5	330	162.5	183.5
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, EM, EJ	E E, EM, EJ

*Refer to "MDS-EM/EMH 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	40 80	80 160	-
	3-axis type MDS-E-V3-	20 40	40	-	-
	Multi-hybrid type MDS-EM-SPV3-	xxx40*	xxx40* xxx80*	xxx80* 200120	200120
	Regenerative resistor type MDS-EJ-V1-	40	40	80	-
Output	[N·m]	100	80	60	40
Stall torque	█	7.0	17.0	32.0	64.0
Max. torque	□	12.0	12.0	22.5	37.2
Rated output	[kW]	1.2	2.2	3.0	4.5
Max. rotation speed	[r/min]	3000	3000	3000	3500
Motor inertia	[x10 ⁻⁴ kg·m ²]	11.9	23.7	75.0	112.0
Motor inertia with a brake	[x10 ⁻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)		130 SQ.	130 SQ.	176 SQ.	176 SQ.
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.	[mm]	140.5	184.5	183.5	223.5
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 EM, EJ	E E EM, EJ	- EM E

*Refer to "MDS-EM/EMH 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

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					
	250					
	200					
	150					
Rated torque (liquid-cooling)	100					
	50					
Max. torque	12					
	36					
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]					
	DIA 56					
	DIA 130					
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					
	1200					
	800					
	400					
Rated torque (liquid-cooling)	200					
	105					
Max. torque	260					
	375					
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]					
	DIA 130					
	DIA 230					
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

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					
	5000					
	4000					
	3000					
Continuous (natural-cooling)	2000					
	1000					
Continuous (liquid-cooling)	150					
	300					
Maximum	900					
	1800					
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					
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					
	15000					
	10000					
	5000					
Continuous (natural-cooling)	600					
	1200					
Continuous (liquid-cooling)	3600					
	7200					
Maximum	1800					
	3600					
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					
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]														
	Continuous (natural-cooling)														
	Continuous (liquid-cooling)														
	Maximum														
	Rated thrust														
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]														
	Mass [kg]		<table border="1"> <tr> <td>Primary side (coil)</td> <td>5x2</td> <td>9x2</td> <td>18x2</td> <td>27x2</td> </tr> <tr> <td>Secondary side (magnet)</td> <td>5.8(384mm) 7.1(480mm) 9.0(576mm)</td> <td>7.1(480mm) 9.0(576mm)</td> <td>7.1(480mm) 9.0(576mm)</td> <td>7.1(480mm) 9.0(576mm)</td> </tr> </table>				Primary side (coil)	5x2	9x2	18x2	27x2	Secondary side (magnet)	5.8(384mm) 7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)
Primary side (coil)	5x2	9x2	18x2	27x2											
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					
	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]								
	Continuous (natural-cooling)								
	Continuous (liquid-cooling)								
	Maximum								
	Rated thrust								
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]								
	Mass [kg]		<table border="1"> <tr> <td>Primary side (coil)</td> <td>14x2</td> <td>28x2</td> </tr> <tr> <td>Secondary side (magnet)</td> <td>13.5(480mm) 16.0(576mm)</td> <td>13.5(480mm) 16.0(576mm)</td> </tr> </table>		Primary side (coil)	14x2	28x2	Secondary side (magnet)	13.5(480mm) 16.0(576mm)
Primary side (coil)	14x2	28x2							
Secondary side (magnet)	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.

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-D5.5/120-02																
	1-axis type	MDS-E-SP-	80	80	80	-	160	200															
Compatible drive unit	2-axis type	MDS-E-SP2-	16080(M)	16080(M)	16080(M)	-	16080(L)	-															
	Multi-hybrid type	MDS-EM-SPV3-	-	100xx*	100xx*	100xx*	160xx*	200xx*															
	Regenerative resistor type	MDS-EJ-SP-	80	100	100	-	-	-															
Output	[kW]																						
	%ED rating																						
	Short-time rating																						
	Continuous rating																						
	Standard output during acceleration/deceleration																						
Actual acceleration/deceleration output (Note 2)	[kW]	3.7	5.5	5.5	7.5	9.2	11.0	12.5															
Continuous base rotation speed	[r/min]	1500	1500	1500	2800	2800	2800	2800															
Max. rotation speed in constant output range	[r/min]	6000	6000	6000	8000	8000	8000	8000															
Maximum rotation speed	[r/min]	10000	10000	12000	12000	12000	12000	12000															
Continuous rated torque	[N·m]	14.0	23.6	23.6	12.6	12.6	12.6	12.6															
Motor inertia	[kg·m ²]	0.0074	0.013	0.013	0.0074	0.0074	0.0074	0.0074															
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54	IP54	IP54	IP54	IP54															
Outline dimension drawing (flange type)	[mm]																						
	Mass [kg]		<table border="1"> <tr> <td>Flange fitting diameter</td> <td>φ150</td> <td>φ150</td> <td>φ150</td> <td>φ150</td> </tr> <tr> <td>Shaft diameter</td> <td>φ28</td> <td>φ28</td> <td>φ28</td> <td>φ28</td> </tr> <tr> <td>Mass</td> <td>26</td> <td>39</td> <td>39</td> <td>26</td> </tr> <tr> <td>With leg</td> <td>Possible</td> <td>Possible</td> <td>Possible</td> <td>Possible</td> </tr> </table>		Flange fitting diameter	φ150	φ150	φ150	φ150	Shaft diameter	φ28	φ28	φ28	φ28	Mass	26	39	39	26	With leg	Possible	Possible	Possible
Flange fitting diameter	φ150	φ150	φ150	φ150																			
Shaft diameter	φ28	φ28	φ28	φ28																			
Mass	26	39	39	26																			
With leg	Possible	Possible	Possible	Possible																			

Motor type	SJ-D7.5/100-01		SJ-D7.5/120-01		SJ-D11/100-01		SJ-D15/80-01		SJ-D18.5/80-01																		
	1-axis type	MDS-E-SP-	160	160	160	200	240	320	240	320																	
Compatible drive unit	2-axis type	MDS-E-SP2-	16080(L)	16080(L)	16080(L)	-	-	-	-	-																	
	Multi-hybrid type	MDS-EM-SPV3-	100xx*	100xx*	160xx*	200xx*	-	-	-	-																	
	Regenerative resistor type	MDS-EJ-SP-	120	120	160	-	-	-	-	-																	
Output	[kW]																										
	%ED rating																										
	Short-time rating																										
	Continuous rating																										
	Standard output during acceleration/deceleration																										
Actual acceleration/deceleration output (Note 2)	[kW]	7.5	7.5	11	18.5	18.5	22.2	25.0	22.2	30.0																	
Continuous base rotation speed	[r/min]	1500	1500	1500	1500	1500	1500	1500	1500	1500																	
Max. rotation speed in constant output range	[r/min]	6000	6000	4500	6000	6000	6000	6000	6000	6000																	
Maximum rotation speed	[r/min]	10000	12000	10000	8000	8000	8000	8000	8000	8000																	
Continuous rated torque	[N·m]	35.0	35.0	47.7	70.0	95.5	70.0	95.5	70.0	95.5																	
Motor inertia	[kg·m ²]	0.023	0.023	0.031	0.086	0.10	0.086	0.10	0.086	0.10																	
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54																	
Outline dimension drawing (flange type)	[mm]																										
	Mass [kg]		<table border="1"> <tr> <td>Flange fitting diameter</td> <td>φ180</td> <td>φ180</td> <td>φ180</td> <td>φ230</td> <td>φ230</td> </tr> <tr> <td>Shaft diameter</td> <td>φ32</td> <td>φ32</td> <td>φ48</td> <td>φ48</td> <td>φ48</td> </tr> <tr> <td>Mass</td> <td>53</td> <td>53</td> <td>64</td> <td>93</td> <td>103</td> </tr> <tr> <td>With leg</td> <td>Possible</td> <td>Possible</td> <td>Possible</td> <td>under development</td> <td>under development</td> </tr> </table>		Flange fitting diameter	φ180	φ180	φ180	φ230	φ230	Shaft diameter	φ32	φ32	φ48	φ48	φ48	Mass	53	53	64	93	103	With leg	Possible	Possible	Possible	under development
Flange fitting diameter	φ180	φ180	φ180	φ230	φ230																						
Shaft diameter	φ32	φ32	φ48	φ48	φ48																						
Mass	53	53	64	93	103																						
With leg	Possible	Possible	Possible	under development	under development																						

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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 (Normal specifications)

Motor type		SJ-D22/80-01		SJ-D26/80-01	
Compatible drive unit	1-axis type	MDS-E-SP-	240	320	320
	2-axis type	MDS-E-SP2-	-	-	-
	Multi-hybrid type	MDS-EM-SPV3-	-	-	-
	Regenerative resistor type	MDS-EJ-SP-	-	-	-
Output	%ED rating				
	Short-time rating				
Standard output during acceleration/deceleration [kW]		22.0		35.0	
Actual acceleration/deceleration output (Note 2) [kW]		26.4		42.0	
Continuous base rotation speed [r/min]		1500		1500	
Max. rotation speed in constant output range [r/min]		6000		6000	
Maximum rotation speed [r/min]		8000		8000	
Continuous rated torque [N·m]		118		140	
Motor inertia [kg·m ²]		0.14		0.16	
Degree of protection (The shaft-through portion is excluded.)		IP54		IP54	
Outline dimension drawing (flange type)	[mm]				
Flange fitting diameter [mm]		φ230		φ230	
Shaft diameter [mm]		φ55		φ55	
Mass [kg]		131		147	
With leg		under development		under development	

■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	Acceleration/Deceleration				
	%ED rating				
Standard output during acceleration/deceleration [kW]		7.5			
Actual acceleration/deceleration output (Note 2) [kW]		9			
Continuous 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 [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]		φ150			
Shaft diameter [mm]		φ28			
Mass [kg]		24			
With leg		Not possible			

■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	SJ-DG11/120-03T		
Compatible drive unit	1-axis type	MDS-E-SP-	160	160	160	200	160	200
	2-axis type	MDS-E-SP2-	-	-	-	-	16080(L)	-
	Multi-hybrid type	MDS-EM-SPV3-	160xx*	160xx*	160xx*	200xx*	160xx*	200xx*
	Regenerative resistor type	MDS-EJ-SP-	-	-	-	-	-	-
Output	%ED rating							
	Short-time rating							
Standard output during acceleration/deceleration [kW]		5.5		7.5		11.0		15.0
Actual acceleration/deceleration output (Note 2) [kW]		6.6		9.0		13.2		18.0
Continuous base rotation speed [r/min]		1500		1500		1500		1500
Max. rotation speed in constant output range [r/min]		10000		7000		8000		6000
Maximum rotation speed [r/min]		12000		12000		12000		10000
Continuous rated torque [N·m]		14.0		23.6		35.0		47.7
Motor inertia [kg·m ²]		0.0066		0.012		0.022		0.029
Degree of protection (The shaft-through portion is excluded.)		IP54		IP54		IP54		IP54
Outline dimension drawing (flange type)	[mm]							
Flange fitting diameter [mm]		φ150		φ180		φ180		
Shaft diameter [mm]		φ28		φ32		φ48		
Mass [kg]		24		37		61		
With leg		Not possible		Not possible		Not possible		

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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-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-SPV3-100xx*	100xx*	100xx*
	Regenerative resistor type	MDS-EJ-SP-100	100	120
Output				
Standard output during acceleration/deceleration [kW]	5.5	5.5	7.5	
Actual acceleration/deceleration output (Note 2) [kW]	6.6	6.6	9	
Base rotation speed	Short-time	1500	1500	1500
	Continuous	2000	2000	2000
Max. rotation speed in constant output range	[r/min]	4500	4500	4500
Maximum rotation speed	[r/min]	10000	12000	10000
Continuous rated torque	[N · m]	17.7	17.7	26.3
Motor inertia	[kg · m ²]	0.0074	0.0074	0.013
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54
Outline dimension drawing (flange type)				
Flange fitting diameter	[mm]	φ150	φ150	φ150
Shaft diameter	[mm]	φ28	φ28	φ28
Mass	[kg]	26	26	39
With leg		Possible	Possible	Possible

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	11	15	
Actual acceleration/deceleration output (Note 2) [kW]	9	13.2	18	
Base rotation speed	Short-time	1500	1500	1500
	Continuous	2000	2000	2000
Max. rotation speed in constant output range	[r/min]	4500	4500	4000
Maximum rotation speed	[r/min]	12000	10000	8000
Continuous rated torque	[N · m]	26.3	35.8	52.5
Motor inertia	[kg · m ²]	0.013	0.023	0.031
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54
Outline dimension drawing (flange type)				
Flange fitting diameter	[mm]	φ150	φ180	φ180
Shaft diameter	[mm]	φ28	φ32	φ48
Mass	[kg]	39	53	64
With leg		Possible	Possible	Possible

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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-DL3.7/240-01T
Compatible drive unit	1-axis type	MDS-E-SP-20	40	200
	2-axis type	MDS-E-SP2-20	40	-
	Multi-hybrid type	MDS-EM-SPV3-	-	200xx*
	Regenerative resistor type	MDS-EJ-SP-	-	-
Output				
Standard output during acceleration/deceleration [kW]	0.9	1.5	15.0	
Actual acceleration/deceleration output (Note 2) [kW]	1.1	1.8	18.0	
Continuous base rotation speed	[r/min]	1500	1500	3000
Max. rotation speed in constant output range	[r/min]	10000	10000	24000
Maximum rotation speed	[r/min]	10000	10000	24000
Continuous rated torque	[N · m]	2.55	4.77	4.8
Motor inertia	[kg · m ²]	0.0011	0.0019	0.0024
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54
Outline dimension drawing (flange type)				
Flange fitting diameter	[mm]	φ110	φ110	φ110
Shaft diameter	[mm]	φ22	φ22	φ22
Mass	[kg]	10	14	17
With leg		Not possible	Not possible	Not possible

Motor type		SJ-DL5.5/150-01T	SJ-DL5.5/200-01T	SJ-DL7.5/150-01T
Compatible drive unit	1-axis type	MDS-E-SP-160	160	160
	2-axis type	MDS-E-SP2-16080(L)	16080(L)	16080(L)
	Multi-hybrid type	MDS-EM-SPV3-160xx*	-	160xx*
	Regenerative resistor type	MDS-EJ-SP-	-	-
Output				
Standard output during acceleration/deceleration [kW]	11	11	11	
Actual acceleration/deceleration output (Note 2) [kW]	13.2	13.2	13.2	
Continuous base rotation speed	[r/min]	2500	2500	1500
Max. rotation speed in constant output range	[r/min]	15000	20000	8000
Maximum rotation speed	[r/min]	15000	20000	15000
Continuous rated torque	[N · m]	14.1	14.1	35.0
Motor inertia	[kg · m ²]	0.0046	0.0046	0.016
Degree of protection (The shaft-through portion is excluded.)		IP54	IP54	IP54
Outline dimension drawing (flange type)				
Flange fitting diameter	[mm]	φ150	φ150	φ180
Shaft diameter	[mm]	φ28	φ28	φ32
Mass	[kg]	30	30	56
With leg		Not possible	Not possible	Not possible

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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-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	<input type="checkbox"/>	
	Short-time rating	<input type="checkbox"/>	
Continuous rating	<input checked="" type="checkbox"/>		
Standard output during acceleration/deceleration [kW]			11
Actual acceleration/deceleration output (Note 2) [kW]			13.2
Continuous 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
With leg			Not possible

■SJ-V Series (Normal specification)

Motor type		SJ-V2.2-01T	SJ-V3.7-02ZT	SJ-V15-01ZT	
Compatible drive unit	1-axis type	MDS-E-SP-	40	80	
	2-axis type	MDS-E-SP2-	40	80	
	Multi-hybrid type	MDS-EM-SPV3-	-	16080(M)	
Output	Short-time rating	<input type="checkbox"/>			
	Continuous rating	<input checked="" type="checkbox"/>			
Standard output during acceleration/deceleration [kW]		2.2	3.7	15	
Actual acceleration/deceleration output (Note 2) [kW]		2.64	4.4	18	
Continuous base rotation speed [r/min]		1500	3000	1500	
Max. rotation speed in constant output range [r/min]		6000	12000	4500	
Maximum rotation speed [r/min]		10000	15000	8000	
Continuous rated torque [N·m]		9.5	7.0	70	
Motor inertia [kg·m ²]		0.00675	0.00675	0.0575	
Degree of protection		IP44	IP44	IP44	
Outline dimension drawing (flange type) [mm]					
Flange fitting diameter [mm]		φ150	φ150	φ230	
Shaft diameter [mm]		φ28	φ28	φ48	
Mass [kg]		25	25	110	
With leg		Possible	Possible	Possible	

■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	
	2-axis type	MDS-E-SP2-	-	-	-	
	Multi-hybrid type	MDS-EM-SPV3-	200xx	200xx	-	
Output	Short-time rating	<input type="checkbox"/>				
	Continuous rating	<input checked="" type="checkbox"/>				
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	
Continuous 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	
With leg		Possible	Possible	Possible	Possible	

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	
	2-axis type	MDS-E-SP2-	-	-	-	
	Multi-hybrid type	MDS-EM-SPV3-	-	-	-	
Output	Short-time rating	<input type="checkbox"/>				
	Continuous rating	<input checked="" type="checkbox"/>				
Standard output during acceleration/deceleration [kW]		22	15	26	37	
Actual acceleration/deceleration output (Note 2) [kW]		26.4	18	31.2	44.4	
Continuous base rotation speed [r/min]		1500	1500	1500	1150	
Max. rotation speed in constant output range [r/min]		6000	9500	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	
With leg		Possible	Possible	Possible	Possible	

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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".

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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		
	Continuous rating		
Standard output during acceleration/deceleration [kW]		45	55
Actual acceleration/deceleration output (Note 2) [kW]		54	66
Continuous 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
With leg		Possible	Possible

(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				
	Continuous rating				
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
Continuous 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
With leg		Possible	Possible	Possible	Possible

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			
	Continuous rating			
Standard output during acceleration/deceleration [kW]		15	18.5	18.5
Actual acceleration/deceleration output (Note 2) [kW]		18	22.2	22.2
Continuous base rotation speed [r/min]		750	600	400
Max. rotation speed in constant output range [r/min]		6000	3500	750
Maximum rotation speed [r/min]		6000	4500	6000
Continuous rated torque [N·m]		140	239	310
Motor inertia [kg·m ²]		0.08	0.308	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
With leg		Possible	Possible	Possible

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.
 (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 *1	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*1*2	-
Output	Acceleration/Deceleration				
	Short-time rating				
	Continuous rating				
	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	
Continuous 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]	4.77	14.0	2.9	7.0	
Motor inertia [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.	174 SQ.	130 SQ.	174 SQ.
		325	441	325	441
Flange fitting diameter [mm]	φ110	φ150	φ110	φ150	
Shaft diameter [mm]	φ22	φ28	φ22	φ28	
Mass [kg]	20	42	20	40	
With leg	Not possible	Not possible	Not possible	Not possible	

* Refer to "MDS-EM/EMH Series Multi-hybrid drive" in this book for compatible drive unit type.

*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-BG090A/300-01 □(R)	SJ-BG090B/300-03 □	SJ-BG090D/300-03 □	SJ-BG110F/240-01 □
Compatible drive unit		MDS-E-SP-20	MDS-E-SP-40	MDS-E-SP-160	MDS-E-SP-80
Output	Acceleration/Deceleration				
	%ED rating				
	Continuous rating				
	Standard output during acceleration/deceleration [kW]	1.5	1.5	9.0	5.5
Actual acceleration/deceleration output (Note 4) [kW]	1.8	1.8	10.8	6.6	
Continuous base rotation speed [r/min]	8400	6000	12000	3000	
Maximum rotation speed [r/min]	30000	30000	30000	24000	
Continuous rated torque [N·m]	0.85	1.91	4.38	9.5	
Rotor inertia [kg·m ²]	0.00021	0.0004	0.0008	0.0026	
Outline dimension drawing [mm]		81 (φ33) (Note 2)	100 (φ33) (Note 2)	153 (φ33) (Note 2)	240 (φ42) (Note 2)
		φ89.5 (Note 2)	φ89.5 (Note 2)	φ89.5 (Note 2)	φ109.5 (Note 2)
Mass	Stator [kg]	0.7	1.2	2.6	7.4
	Rotor [kg]	0.4	0.7	1.4	3.2

Motor type (Note 1)		SJ-BG120A/200-01 □(R)	SJ-BG120C/200-01 □(R)	SJ-BG150D/150-01 □
Compatible drive unit		MDS-E-SP-80	MDS-E-SP-80	MDS-E-SP-80
Output	Acceleration/Deceleration			
	%ED rating			
	Continuous rating			
	Standard output during acceleration/deceleration [kW]	3.7	5.5	3.7
Actual acceleration/deceleration output (Note 4) [kW]	4.4	6.6	4.4	
Continuous base rotation speed [r/min]	2500	5500	2500	
Maximum rotation speed [r/min]	15000	20000	20000	
Continuous rated torque [N·m]	5.7	2.6	8.4	
Rotor inertia [kg·m ²]	0.0014		0.0027	0.0057
Outline dimension drawing [mm]		135 (φ33) (Note 2)	195 (φ33) (Note 2)	170 (φ33) (Note 2)
		φ119.5 (Note 2)	φ119.5 (Note 2)	φ149.5 (Note 2)
Mass	Stator [kg]	3.0	5.9	8.1
	Rotor [kg]	1.3	2.5	3.7

(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".

■SJ-BG Series

Motor type (Note 1)		SJ-BG160B/150-01 (R)			SJ-BG160D/150-01 (R)		SJ-BG160D/150-02 (R)		
Compatible drive unit		MDS-E-SP-			40		80		
Output Acceleration/Deceleration %ED rating Continuous rating									
		%ED rating(40%ED)		%ED rating(40%ED)		%ED rating(10%ED) (20%ED)(40%ED)		%ED rating(15%ED) (40%ED)	
		Standard output during acceleration/deceleration [kW]	3.7	3.7	7.5	5.5	9	7.5	9
		Actual acceleration/deceleration output (Note 4) [kW]	4.44	4.44	9	6.6	10.8	8.25	10.8
Continuous base rotation speed [r/min]	3500	1300	1770	1500	1500	1500	1500		
Maximum rotation speed [r/min]	15000	15000	15000	15000	15000	15000	15000		
Continuous rated torque [N·m]	6.0	16.2	20.0	23.6	23.6	23.6	23.6		
Rotor inertia [kg·m ²]	0.005(0.0042)		0.005(0.0042)		0.0075(0.0061)		0.0075(0.0061)		
Outline dimension drawing [mm]									
	Mass	Stator [kg]	7.1	7.1	7.1	10.0	11.0	11.0	
	Rotor [kg]	2.9(2.3)	2.9(2.3)	2.9(2.3)	4.3(3.3)	4.3(3.3)	4.3(3.3)		

■SJ-BG Series

Motor type (Note 1)		SJ-BG180F/150-01		SJ-BG180H/150-01		
Compatible drive unit		MDS-E-SP-		320		
Output Acceleration/Deceleration %ED rating Continuous rating						
		%ED rating(15%ED) (25%ED)(40%ED)		%ED rating(15%ED) (25%ED)(40%ED)		
		Standard output during acceleration/deceleration [kW]	22	37	26	37
		Actual acceleration/deceleration output (Note 4) [kW]	26.4	44.4	31.2	44.4
Continuous base rotation speed [r/min]	1650	5700	1300	5500		
Maximum rotation speed [r/min]	4000	15000	6000	15000		
Continuous rated torque [N·m]	86.8	36.9	110	45.1		
Rotor inertia [kg·m ²]	0.023		0.029			
Outline dimension drawing [mm]						
	Mass	Stator [kg]	27	33	33	
	Rotor [kg]	10	12	12		

Motor type (Note 1)		SJ-BG180B/150-01		SJ-BG180D/150-01		
Compatible drive unit		MDS-E-SP-		400		
Output Acceleration/Deceleration %ED rating Continuous rating						
		%ED rating(15%ED) (25%ED)(40%ED)		%ED rating(15%ED) (25%ED)(40%ED)		
		Standard output during acceleration/deceleration [kW]	18.5	30	22	30
		Actual acceleration/deceleration output (Note 4) [kW]	22.2	36	26.4	36
Continuous base rotation speed [r/min]	2300	6000	2000	6500		
Maximum rotation speed [r/min]	6000	15000	6000	15000		
Continuous rated torque [N·m]	45.7	29.4	71.6	32.3		
Rotor inertia [kg·m ²]	0.012		0.018			
Outline dimension drawing [mm]						
	Mass	Stator [kg]	14	21	21	
	Rotor [kg]	5.1	8.0	8.0		

Motor type (Note 1)		SJ-BG240H/100-01		SJ-BG300L/080-01		
Compatible drive unit		MDS-E-SP-		400		
Output Acceleration/Deceleration %ED rating Continuous rating						
		%ED rating(15%ED) (25%ED)(40%ED)		%ED rating(15%ED) (25%ED)(40%ED)		
		Standard output during acceleration/deceleration [kW]	30	45	37	55
		Actual acceleration/deceleration output (Note 4) [kW]	36	54	44.4	66
Continuous base rotation speed [r/min]	700	2500	350	1800		
Maximum rotation speed [r/min]	2000	10000	1500	8000		
Continuous rated torque [N·m]	252	99.3	600	196		
Rotor inertia [kg·m ²]	0.14		0.48			
Outline dimension drawing [mm]						
	Mass	Stator [kg]	63	107	107	
	Rotor [kg]	32	63	63		

*1 The cycle times for 10%ED rating, 15%ED rating, and 25%ED rating (Low-speed coil) are 5 minutes.

- (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.

*1 The cycle times for 10%ED rating, 15%ED rating, 25%ED rating (Low-speed coil), and 25%ED rating (High-speed coil) are 5 minutes.

- (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".

■SJ-B Series

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

■SJ-B Series

Motor type (Note 1)		SJ-2B602TK		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	22	26	26	15	15
Actual acceleration/deceleration output (Note 4) [kW]		18	26.4	31.2	31.2	18	18
Continuous base rotation speed [r/min]		550	1193	1250	3000	440	1000
Maximum rotation speed [r/min]		2000	8000	3500	10000	1500	6000
Continuous rated torque [N·m]		191	88.0	168	70.0	239	105
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	15	11	15	22	22
Actual acceleration/deceleration output (Note 4) [kW]		18	18	13.2	18	26.4	26.4
Continuous base rotation speed [r/min]		700	1320	500	1030	525	1050
Maximum rotation speed [r/min]		2250	10000	1500	6000	3000	10000
Continuous rated torque [N·m]		102	54.3	143	69.5	136	68.2
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	22	22	22
Actual acceleration/deceleration output (Note 4) [kW]		18	26.4	26.4	26.4	26.4	26.4
Continuous base rotation speed [r/min]		475	1250	600	1200	720	1500
Maximum rotation speed [r/min]		2000	10000	1500	6000	2000	10000
Continuous rated torque [N·m]		221	115	239	119	245	118
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	

(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 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".

■SJ-B Series

Motor type (Note 1)		SJ-2B6720TK		SJ-2B6705TK		SJ-2B6711TK	
Compatible drive unit		MDS-E-SP-320		200		320	
Output	%ED rating						
	Short-time rating						
	Continuous rating						
	Acceleration/Deceleration						
Standard output during acceleration/deceleration [kW]		22	26	11	11	22	22
Actual acceleration/deceleration output (Note 4) [kW]		26.4	31.2	13.2	13.2	26.4	26.4
Continuous base rotation speed [r/min]		700	1550	250	500	400	820
Maximum rotation speed [r/min]		1500	4500	750	4500	1700	5000
Continuous rated torque [N·m]		205	136	286	133	263	114
Rotor inertia [kg·m ²]		0.20		0.288		0.280	
Outline dimension drawing	[mm]						
		φ299.5 (Note 2)		φ299.5 (Note 2)		φ299.5 (Note 2)	
Mass	Stator [kg]	45		65		65	
	Rotor [kg]	26		38		37	

■SJ-B Series

Motor type (Note 1)		SJ-2B6709TK		SJ-2B6905TK		SJ-2B6908TK	
Compatible drive unit		MDS-E-SP-400		320		320	
Output	%ED rating						
	Short-time rating						
	Continuous rating						
	Acceleration/Deceleration						
Standard output during acceleration/deceleration [kW]		22	30	26	26	22	30
Actual acceleration/deceleration output (Note 4) [kW]		26.4	36	31.2	31.2	26.4	36
Continuous base rotation speed [r/min]		350	1000	420	1000	175	450
Maximum rotation speed [r/min]		1500	6000	1500	4000	1000	3300
Continuous rated torque [N·m]		409	210	500	210	819	467
Rotor inertia [kg·m ²]		0.37		0.853		1.105	
Outline dimension drawing	[mm]						
		φ299.5 (Note 2)		φ369.5 (Note 2)		φ369.5 (Note 2)	
Mass	Stator [kg]	83		110		143	
	Rotor [kg]	49		70		91	

Motor type (Note 1)		SJ-2B6706TK		SJ-2B6721TK		SJ-2B6704TK	
Compatible drive unit		MDS-E-SP-400		320		320	
Output	%ED rating						
	Short-time rating						
	Continuous rating						
	Acceleration/Deceleration						
Standard output during acceleration/deceleration [kW]		26	30	22	30	22	30
Actual acceleration/deceleration output (Note 4) [kW]		31.2	36	26.4	36	26.4	36
Continuous base rotation speed [r/min]		450	1080	500	1500	475	1000
Maximum rotation speed [r/min]		2000	6000	1500	6000	1150	6000
Continuous rated torque [N·m]		318	133	353	140	302	175
Rotor inertia [kg·m ²]		0.288		0.283		0.37	
Outline dimension drawing	[mm]						
		φ299.5 (Note 2)		φ299.5 (Note 2)		φ299.5 (Note 2)	
Mass	Stator [kg]	65		70		83	
	Rotor [kg]	38		35		49	

Motor type (Note 1)		SJ-2B6906TK		SJ-2B6914TK	
Compatible drive unit		MDS-E-SP-400		640	
Output	%ED rating				
	Short-time rating				
	Continuous rating				
	Acceleration/Deceleration				
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	
Outline dimension drawing	[mm]				
		φ369.5 (Note 2)		φ369.5 (Note 2)	
Mass	Stator [kg]	143		143	
	Rotor [kg]	91		91	

(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 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".

■SJ-PMB Series

Motor type (Note 1)		SJ-PMB02215T-02	SJ-PMB04412T-B0		SJ-PMB14007T-01		
Compatible drive unit		240		200		320	
Output	%ED rating						
	Continuous rating						
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		
Outline dimension drawing [mm]							
Mass	Stator [kg]	4.4	14.0		30		
	Rotor [kg]	3.7	8.0		15		

(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".

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	[N·m]			
	Max. torque	8			
Rated output		[kW]	0.4	0.5	0.9
Max. rotation speed		[r/min]	6000	6000	6000
Motor inertia		[×10 ⁻⁴ kg·m ²]	0.234	0.379	1.27
Degree of protection (The shaft-through portion, power connector portion and brake connector portion are excluded.)			IP67	IP67	IP67
Outline dimension drawing [mm]					
Flange fitting diameter		[mm]	φ50	φ50	φ70
Shaft diameter		[mm]	φ14	φ14	φ19
Mass		[kg]	1.2	1.6	2.9







■HG-JR Series

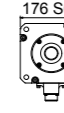
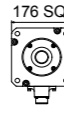
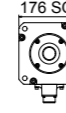
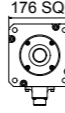

Motor type		HG-JR Series		
		HG-JR73	HG-JR153	
Compatible drive unit	1-axis type	MDS-E-SP-	40	80
	2-axis type	MDS-E-SP2-	40	80
	Regenerative resistor type	MDS-EJ-SP-	40	80
Output	Rated torque	[N·m]		
	Max. torque	15		
Rated output		[kW]	0.75	1.5
Max. rotation speed		[r/min]	8000	8000
Motor inertia		[×10 ⁻⁴ kg·m ²]	2.09	3.79
Degree of protection (The shaft-through portion is excluded.)			IP67	IP67
Outline dimension drawing [mm]				
Flange fitting diameter		[mm]	φ80	φ80
Shaft diameter		[mm]	φ16	φ16
Mass		[kg]	3.7	5.9

(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

■MEMO

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	[N·m] 100							
	80							
	60							
Rated torque	[N·m]		1.8	2.4	1.6	3.2	4.8	7.0
	Max. torque		8.0	11.0	13.0	23.3	42.0	46.5
Rated output	[kW]		0.75	1.0	0.5	1.0	1.5	2.2
Rated rotation speed	[r/min]		4000			3000		
Max. rotation speed	[r/min]		4000			3000		
Motor inertia	[×10 ⁻⁴ kg·m ²]		2.62	5.12	6.13	11.9	17.8	23.7
Degree of protection (The shaft-through portion is excluded.)			IP67					
Outline dimension drawing (flange type)	[mm]							
			127.5	163.5	118.5	140.5	162.5	184.5
Flange fitting diameter	[mm]		φ80	φ80	φ110	φ110	φ110	φ110
Shaft diameter	[mm]		φ14	φ14	φ24	φ24	φ24	φ24
Mass	[kg]		2.6	4.4	4.8	6.5	8.3	10.0

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	[N·m] 250						
	200						
	150						
Rated torque	[N·m]		6.4	11.1	14.3	22.3	28.6
	Max. torque		47.0	90.0	122.0	152.0	208.0
Rated output	[kW]		2.0	3.5	4.5	7.0	9.0
Rated rotation speed	[r/min]		3000				
Max. rotation speed	[r/min]		3000				
Motor inertia	[×10 ⁻⁴ kg·m ²]		38.3	75.0	112.0	154.0	196.0
Degree of protection (The shaft-through portion is excluded.)			IP67				
Outline dimension drawing (flange type)	[mm]						
			143.5	183.5	223.5	263.5	330
Flange fitting diameter	[mm]		φ114.3	φ114.3	φ114.3	φ114.3	φ180
Shaft diameter	[mm]		φ35	φ35	φ35	φ35	φ42
Mass	[kg]		12.0	19.0	25.0	32.0	43.0

(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	40
	2-axis type MDS-EH-V2-	10	10	20	20	40
	Multi-hybrid type MDS-EMH-SPV3-	20	20	40	40	80
	Regenerative resistor type MDS-EJH-V1	-	-	xxx40*	xxx40*	xxx40* 10060
Output	Stall torque	2.0	3.0	2.9	5.9	9.0
	Max. torque	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	[r/min]	5000		4000		
Motor inertia	[$\times 10^{-4}$ kg·m ²]	2.62	5.12	6.13	11.9	17.8
Motor inertia with a brake	[$\times 10^{-4}$ kg·m ²]	2.70	5.20	8.26	14.0	20.0
Degree of protection (The shaft-through portion is excluded.)		IP67				
Outline dimension drawing (flange type) (Without a brake, Straight shaft, D48 encoder)	[mm]	90 SQ.	90 SQ.	130 SQ.	130 SQ.	130 SQ.
		127.5	163.5	118.5	140.5	162.5
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.						
Flange fitting diameter	[mm]	φ80	φ80	φ110	φ110	φ110
Shaft diameter	[mm]	φ14	φ14	φ24	φ24	φ24
Mass (with a brake)	[kg]	2.62(2.70)	4.4(5.3)	4.8(6.7)	6.5(8.5)	8.3(11.0)
Absolute position encoder compatible drive unit	67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	EH	EH	EH	EH	EH
		EH, EJH	EH, EJH	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	160
	2-axis type MDS-EH-V2-	40	80	80	80W	-
	Multi-hybrid type MDS-EMH-SPV3-	xxx40*	10060	10060	-	-
	Regenerative resistor type MDS-EJH-V1	-	-	-	-	-
Output	Stall torque	13.7	22.5	37.2	49.0	58.8
	Max. torque	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	[r/min]	4000		3500	3000	
Motor inertia	[$\times 10^{-4}$ kg·m ²]	38.3	75.0	112.0	154.0	196.0
Motor inertia with a brake	[$\times 10^{-4}$ kg·m ²]	47.9	84.7	122.0	164.0	206.0
Degree of protection (The shaft-through portion is excluded.)		IP67				
Outline dimension drawing (flange type) (Without a brake, Straight shaft, D48 encoder)	[mm]	176 SQ.	176 SQ.	176 SQ.	176 SQ.	204 SQ.
		143.5	183.5	223.5	263.5	330
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.						
Flange fitting diameter	[mm]	φ114.3	φ114.3	φ114.3	φ114.3	φ180
Shaft diameter	[mm]	φ35	φ35	φ35	φ35	φ42
Mass (with a brake)	[kg]	12.0(18.0)	19.0(25.0)	25.0(31.0)	32.0(38.0)	43.0(49.0)
Absolute position encoder compatible drive unit	67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	EH	EH	EH	EH	EH

■HG-H Series

Motor type		HG-H1502
Compatible drive unit	1-axis type MDS-EH-V1-	200
	2-axis type MDS-EH-V2-	-
	Multi-hybrid type MDS-EMH-SPV3-	-
	Regenerative resistor type MDS-EJH-V1	-
Output	Stall torque	152.1
	Max. torque	320.0
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)	[mm]	250SQ.
		476
Flange fitting diameter	[mm]	φ230
Shaft diameter	[mm]	φ65
Mass (with a brake)	[kg]	120
Absolute position encoder compatible drive unit	67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	EH

■HQ-H Series

Motor type		HQ-H903	HQ-H1103
Compatible drive unit	1-axis type MDS-EH-V1-	160	160W
Stall torque		70.0	110.0
Output	Stall torque	70	110
	Max. torque	170	260
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)	[mm]	346.5	468.5
		220 SQ.	220 SQ.
(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	67,108,864 [p/rev] (D74) 4,194,304 [p/rev] (D51) 1,048,576 [p/rev] (D48)	EH	EH

* Refer to "MDS-EM/EMH 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.

(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	18000
Continuous (natural-cooling)	15000	6000
Continuous (liquid-cooling)	10000	3000
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.
 (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 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
Compatible drive unit	MDS-EH-SP-20	MDS-EH-SP-20	MDS-EH-SP-40	MDS-EH-SP-40	MDS-EH-SP-80
Output					
	Standard output during acceleration/deceleration [kW]	2.2	3.7	5.5	7.5
Actual acceleration/deceleration output (Note 2) [kW]	2.64	4.44	6.6	9	9
Base rotation speed [r/min]	1500	1500	1500	1500	1500
Maximum rotation speed [r/min]	10000	10000	8000	8000	12000
Continuous rated torque [N·m]	9.5	14.0	23.6	35.0	35.0
Inertia [kg·m ²]	0.007	0.009	0.015	0.025	0.025
Degree of protection	IP44	IP44	IP44	IP44	IP44
Outline dimension drawing [mm] (flange type)					
	Flange fitting diameter [mm]	φ150	φ150	φ150	φ180
Shaft diameter [mm]	φ28	φ28	φ28	φ32	φ32
Mass [kg]	25	30	49	60	60

Motor type	SJ-4-V11-18T	SJ-4-V18.5-14T	SJ-4-V22-18ZT	SJ-4-V22-15T	SJ-4-V26-08ZT
Compatible drive unit	MDS-EH-SP-80	MDS-EH-SP-100	MDS-EH-SP-160	MDS-EH-SP-160	MDS-EH-SP-160
Output					
	Standard output during acceleration/deceleration [kW]	11	18.5	15	22
Actual acceleration/deceleration output (Note 2) [kW]	13.2	22.2	18	26.4	31.2
Base rotation speed [r/min]	6000	6000	1500	6000	6000
Maximum rotation speed [r/min]	6000	6000	8000	6000	10000
Continuous rated torque [N·m]	47.7	95.5	70.0	118	140
Inertia [kg·m ²]	0.03	0.06	0.06	0.08	0.10
Degree of protection	IP44	IP44	IP44	IP44	IP44
Outline dimension drawing [mm] (flange type)					
	Flange fitting diameter [mm]	φ180	φ230	φ230	φ230
Shaft diameter [mm]	φ48	φ48	φ48	φ55	φ55
Mass [kg]	70	110	110	135	155

(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.

■SJ-4-V Series (Normal)

Motor type		SJ-4-V37-04ZT	SJ-4-V45-02T	SJ-4-V55-03T
Compatible drive unit	MDS-EH-SP- MDS-EMH-SPV3-	200	320	320
Output				
Standard output during acceleration/deceleration [kW]		37	45	55
Actual acceleration/deceleration output (Note 2) [kW]		44.4	54	66
Base rotation speed [r/min]		1150	1500	1150
Maximum rotation speed [r/min]		6000	4500	3450
Continuous rated torque [N·m]		249	236	374
Inertia [kg·m ²]		0.34	0.34	0.85
Degree of protection		IP44	IP44	IP44
Outline dimension drawing (flange type) [mm]				
Flange fitting diameter [mm]		φ300	φ300	φ450
Shaft diameter [mm]		φ60	φ60	φ75
Mass [kg]		300	300	450

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

Motor type		SJ-4-V15-20T	SJ-4-V22-16T
Compatible drive unit	MDS-EH-SP- MDS-EMH-SPV3-	100 100xx	160 -
Output			
Standard output during acceleration/deceleration [kW]		9	15
Actual acceleration/deceleration output (Note 2) [kW]		10.8	18
Base rotation speed [r/min]		750	750
Maximum rotation speed [r/min]		6000	6000
Continuous rated torque [N·m]		95.5	140
Inertia [kg·m ²]		0.06	0.08
Degree of protection		IP44	IP44
Outline dimension drawing (flange type) [mm]			
Flange fitting diameter [mm]		φ230	φ230
Shaft diameter [mm]		φ48	φ55
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.

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			
Rated output [kW]		0.75	1.5
Max. rotation speed [r/min]		8000	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]			
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]	7.0	7.0	14	30	35	45
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	14	28	60
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
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]	7.0	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	26	40
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	148
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-						
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	198
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	513 to 648DC							
	Rated voltage [V]	0.9	1.6	2.9	6.0	8.0	11.9	16.7
Control power input	Rated current [A]	MAX. 0.1						
	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.1						
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	513 to 648DC				
	Rated voltage [V]	1.8	3.2	5.8	12
Control power input	Rated current [A]	MAX. 0.1			
	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%			
	Current [A]	MAX. 0.1			
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	513 to 648DC								
	Rated voltage [V]	10	15	21	38	72	82	119	150
Control power input	Rated current [A]	MAX. 0.1							
	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
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	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

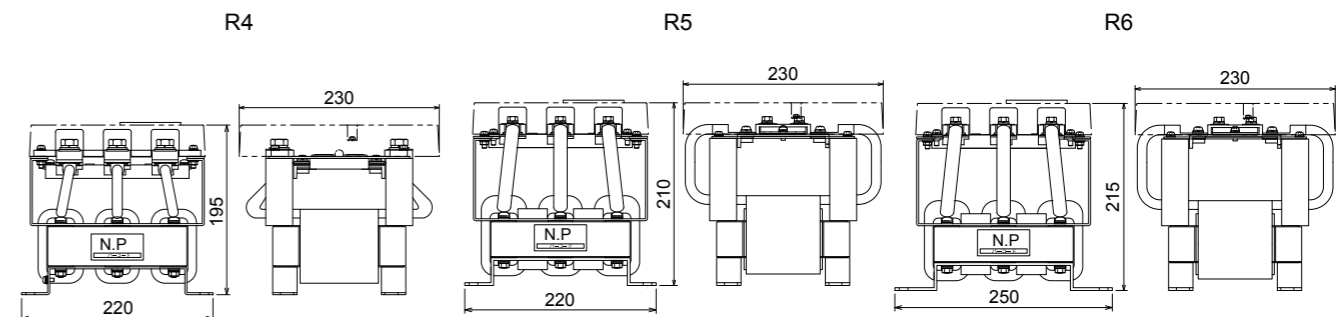
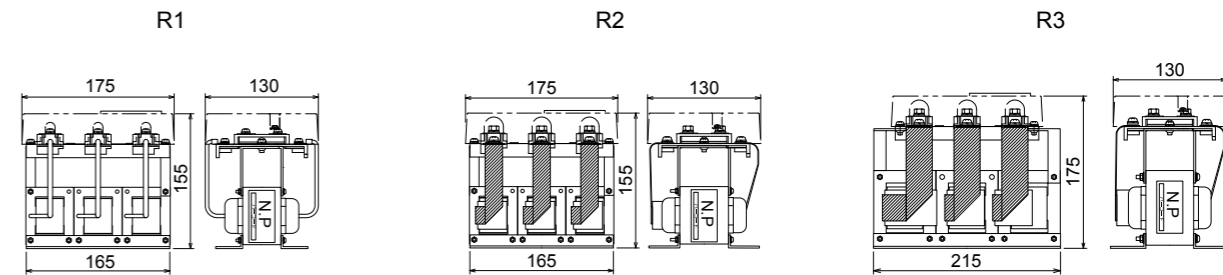
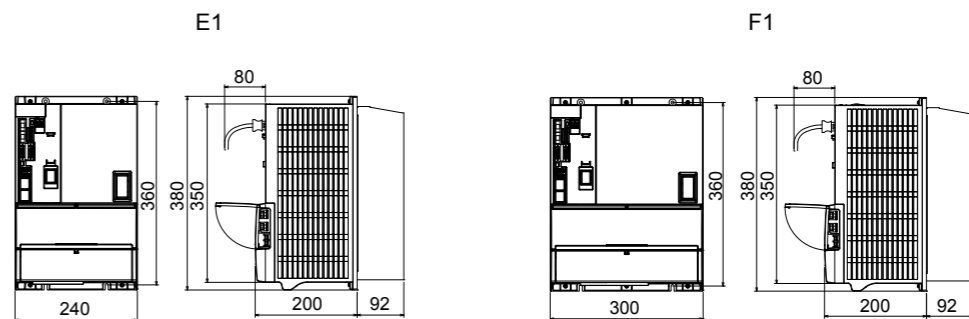
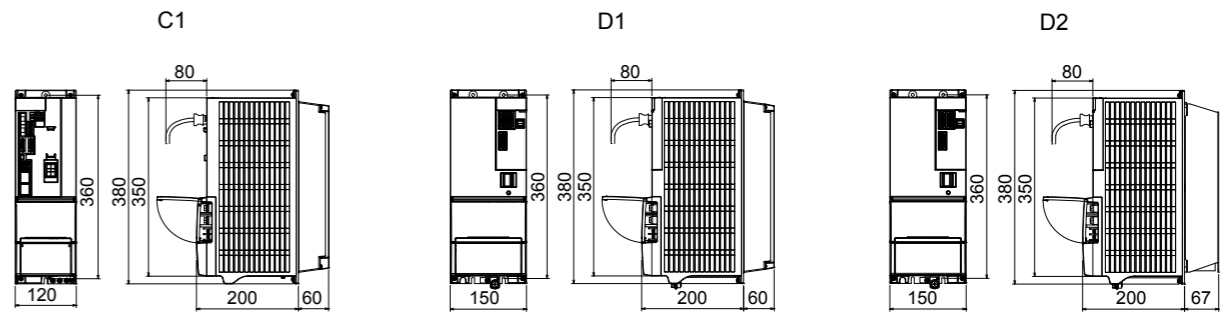
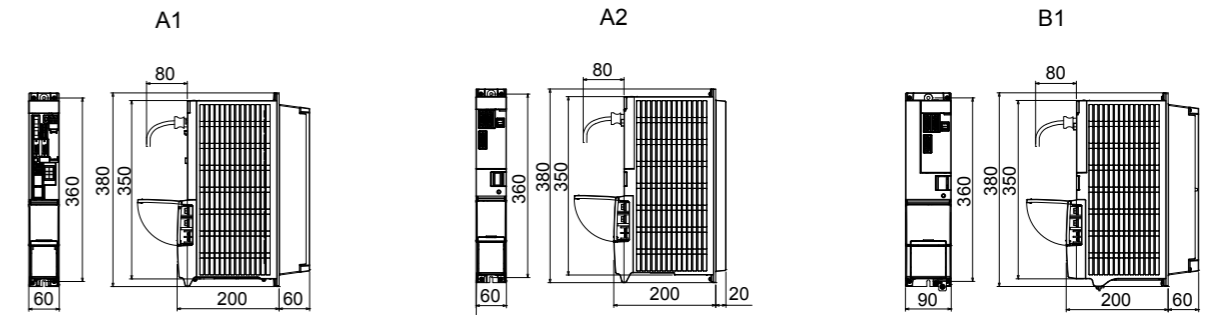
Power supply unit type	MDS-EH-CV-37	MDS-EH-CV-75	MDS-EH-CV-110	MDS-EH-CV-185	MDS-EH-CV-300	MDS-EH-CV-370	MDS-EH-CV-450	MDS-EH-CV-550	MDS-EH-CV-750
30-minute rated output [kW]	3.7	7.5	11.0	18.5	30.0	37.0	45.0	55.0	75.0
Continuous rated output [kW]	2.2	5.5	7.5	15	26	30	37	45	55
Power input	380 to 480AC Tolerable fluctuation: between +10% and -15%								
	Rated voltage [V]	5.2	13	18	35	61	70	85	106
Control power input	Rated current [A]	MAX. 0.1							
	Voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
Control method	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	105	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/EMH Series

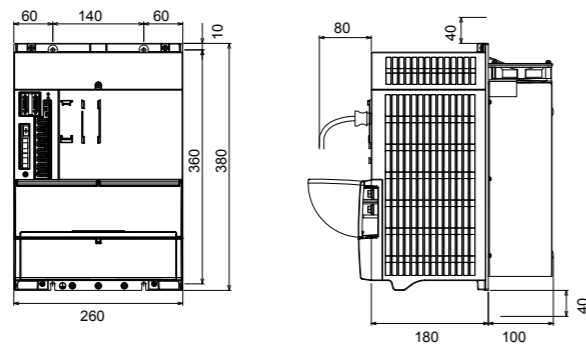
Multi-hybrid drive unit

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

Drive unit type	MDS-EMH-SPV3-8040	MDS-EMH-SPV3-10040	MDS-EMH-SPV3-10060
Drive unit category	3-axis servo, 1-axis spindle (with converter)		
Nominal maximum current (spindle/servo) [A]	80/40×3	100/40×3	100/60×3
Power input	Rated voltage [V]	380 to 480AC Tolerable fluctuation: between +10% and -15%	
	Rated current [A]	27	34
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

Unit outline dimension drawing

[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%				
	Rated current [A]	1.5	2.9	3.8	8.0	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

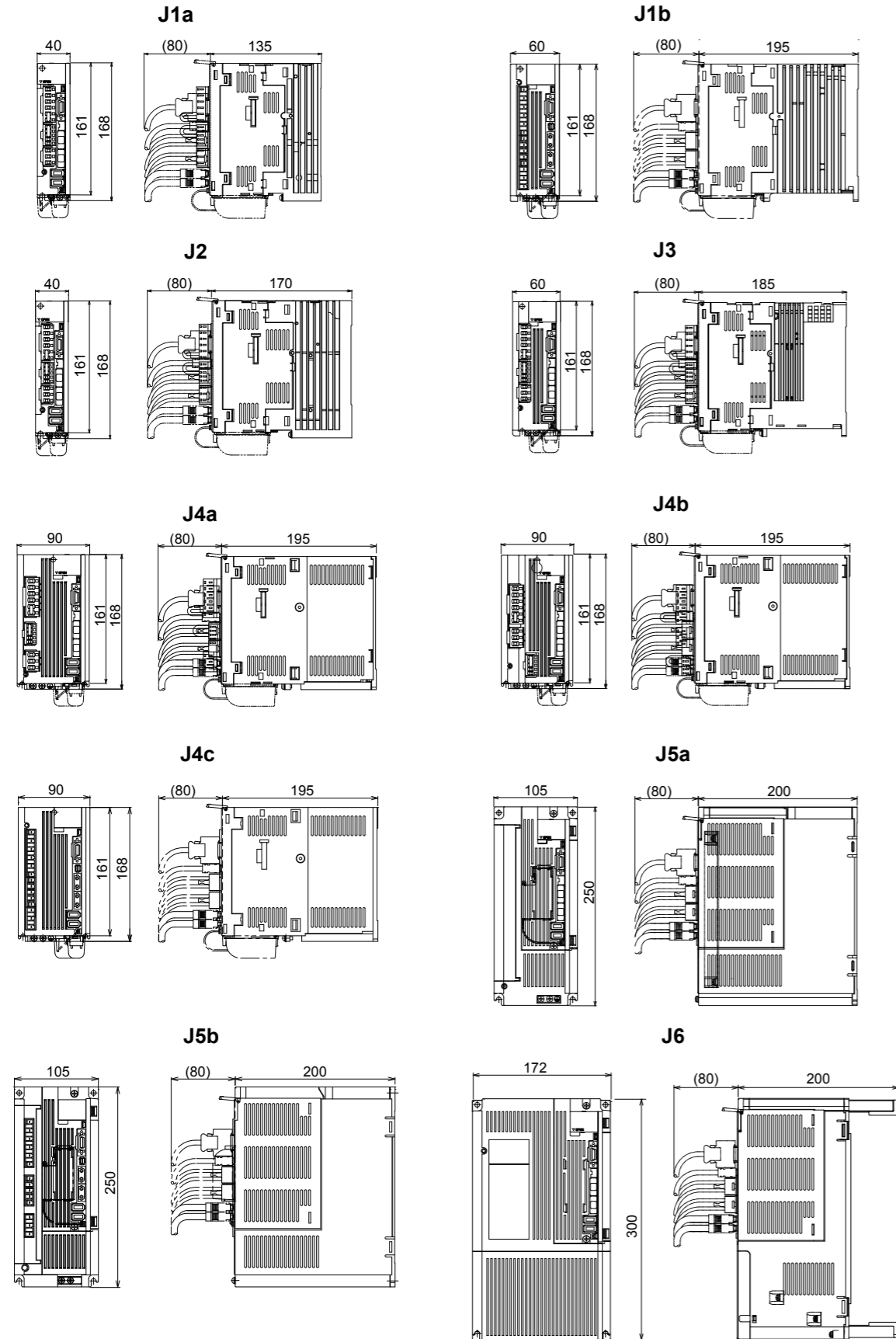
All-in-one compact spindle drive unit

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	26
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]

MEMO



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	-		
	SIN wave signal output	LS187, LS487 (HEIDENHAIN)	-	Rectangular wave signal	-		
			IBV Series (HEIDENHAIN)	Rectangular wave signal	-		
			EIB Series (HEIDENHAIN)	Rectangular wave signal	-		
		APE Series (HEIDENHAIN)	Rectangular wave signal	-			
	LS187C, LS487C (HEIDENHAIN)	SIN wave signal	MDS-EX-HR-11 (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale (Note 2)	
Various scale	SIN wave signal	MDS-EX-HR-11 (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale is also available (Note 2)		
Mitsubishi serial signal output	SR75, SR85 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	-		
Absolute position encoder	Mitsubishi serial signal output	OSA405ET2AS, OSA676T2AS (MITSUBISHI ELECTRIC)	-	Mitsubishi serial signal	Required	Ball screw side encoder	
		SR27, SR77, SR87, SR67A (MAGNESCALE)	-	Mitsubishi serial signal	Not required		
		LC195M, LC495M, LC291M (HEIDENHAIN)	-	Mitsubishi serial signal	Not required	Mitsu03-4	
		LC193M, LC493M (HEIDENHAIN)	-	Mitsubishi serial signal	Not required	Mitsu02-4	
		AT343, AT543, AT545, ST748 (Mitutoyo)	-	Mitsubishi serial signal	Not required		
		SAM Series (FAGOR)	-	Mitsubishi serial signal	Not required		
		SVAM Series (FAGOR)	-	Mitsubishi serial signal	Not required		
		GAM Series (FAGOR)	-	Mitsubishi serial signal	Not required		
		LAM Series (FAGOR)	-	Mitsubishi serial signal	Not required		
		RL40N Series (Renishaw)	-	Mitsubishi serial signal	Not required		
	AMS-ABS-3B Series (Schneeberger)	-	Mitsubishi serial signal	Not required			
	LMFA Series (AMO)	-	Mitsubishi serial signal	Not required			
	LMBA Series (AMO)	-	Mitsubishi serial signal	Not required			
	SIN wave signal output	MPS Series (Mitsubishi Heavy Industries Machine Tool)	SIN wave signal	ADB-20J60 (Mitsubishi Heavy Industries Machine Tool)	Mitsubishi serial signal	Required	
		MPI Series (Mitsubishi Heavy Industries Machine Tool)	SIN wave signal	ADS-20J60 (Mitsubishi Heavy Industries Machine Tool)	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	-		
	SIN wave signal output	ERM280 Series (HEIDENHAIN)	EIB Series (HEIDENHAIN)	Mitsubishi serial signal	-		
		Various scale	MDS-EX-HR-11 (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)	(Provided)	Mitsubishi serial signal	Required		
		RU77 (MAGNESCALE)	-	Mitsubishi serial signal	Not required		
		RCN223M, RCN227M (HEIDENHAIN)	-	Mitsubishi serial signal	Not required	Mitsu02-4	
		RCN727M, RCN827M (HEIDENHAIN)	-	Mitsubishi serial signal	Not required	Mitsu02-4	
		RA Series (Renishaw)	-	Mitsubishi serial signal	Not required		
		HAM Series (FAGOR)	-	Mitsubishi serial signal	Not required		
	SIN wave signal output	WMFA Series	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		WMBA Series	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		WMRA Series (AMO)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		MPI Series (Mitsubishi Heavy Industries Machine Tool)	SIN wave signal	ADB-20J71 (Mitsubishi Heavy Industries Machine Tool)	Mitsubishi serial signal	Not required	
MPI Series (Mitsubishi Heavy Industries Machine Tool)	SIN wave signal	ADB-20J60 (Mitsubishi Heavy Industries Machine Tool)	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.

(Note 3) Use the encoders according to each manufacturer's specifications.

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-EX-HR-11 (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.

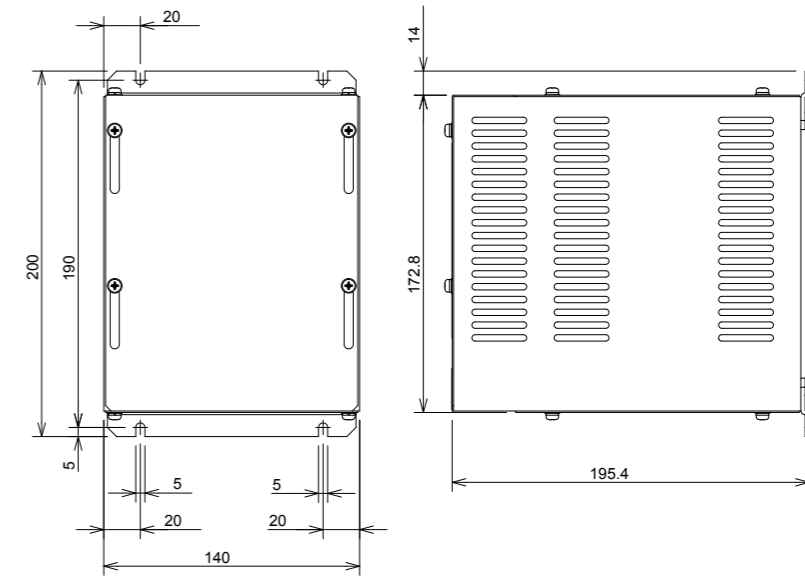
(Note) The rectangular wave signal output scale speed command synchronous control is not available.

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

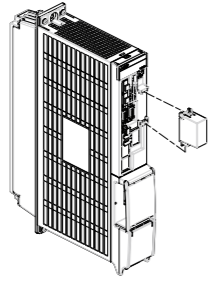
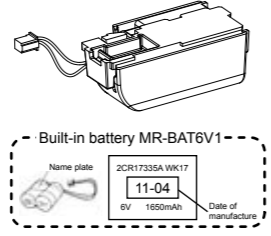
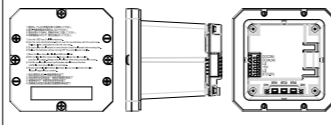
Outline dimension drawing MDS-D-DBU



[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/EMH EJ/EJH	- - -	○ ○ ○

■Battery box (MDSBTBOX-LR2060)

Specifications

Battery option type	Battery box
Battery model name (Note 1)	MDSBTBOX-LR2060 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/EMH 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
Battery model name	MDS-BAT6V1SET 2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 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/EMH 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
Battery model name	MR-BAT6V1SET (Note 1) 2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 10,000 hours 3 axes connected: Approx. 6,600 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/EMH 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

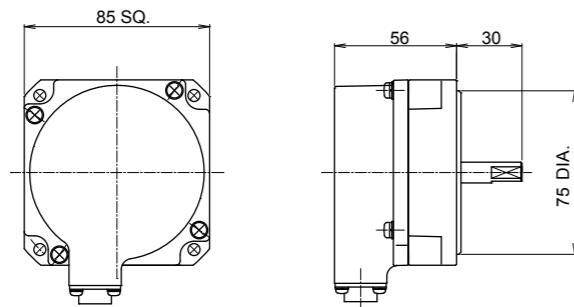
Specifications

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/EMH	○	-
	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)

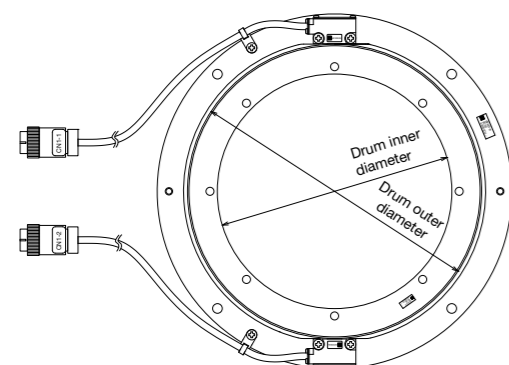
Specifications

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

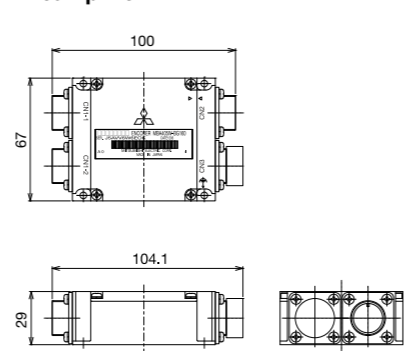
(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.
 (*2) The user is requested to install the magnetic drum and installation ring in the encoder within the accuracy range specified herein. Even when the accuracy of the encoder when shipped 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)

●: Control possible x: Control not possible

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)			

This normally is not used for novariable speed control.

(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)

●: Control possible x: Control not possible

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)

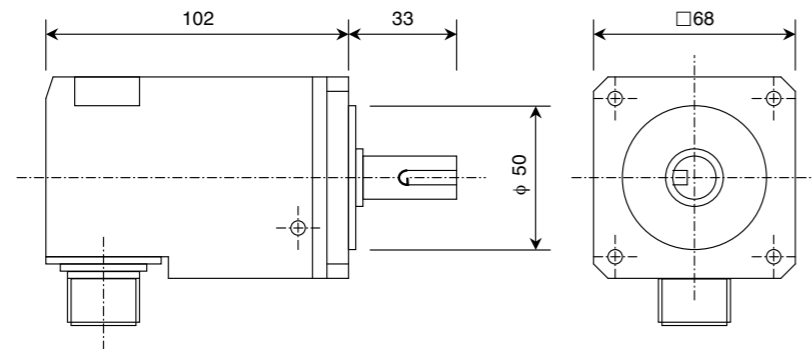
When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side encoder to detect the position and speed of the spindle. Also use this encoder when orientation control and synchronous tap control, etc are executed under the above conditions.

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/EMH 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/EMH	○										
	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/EMH	○										
	EJ/EJH	○										

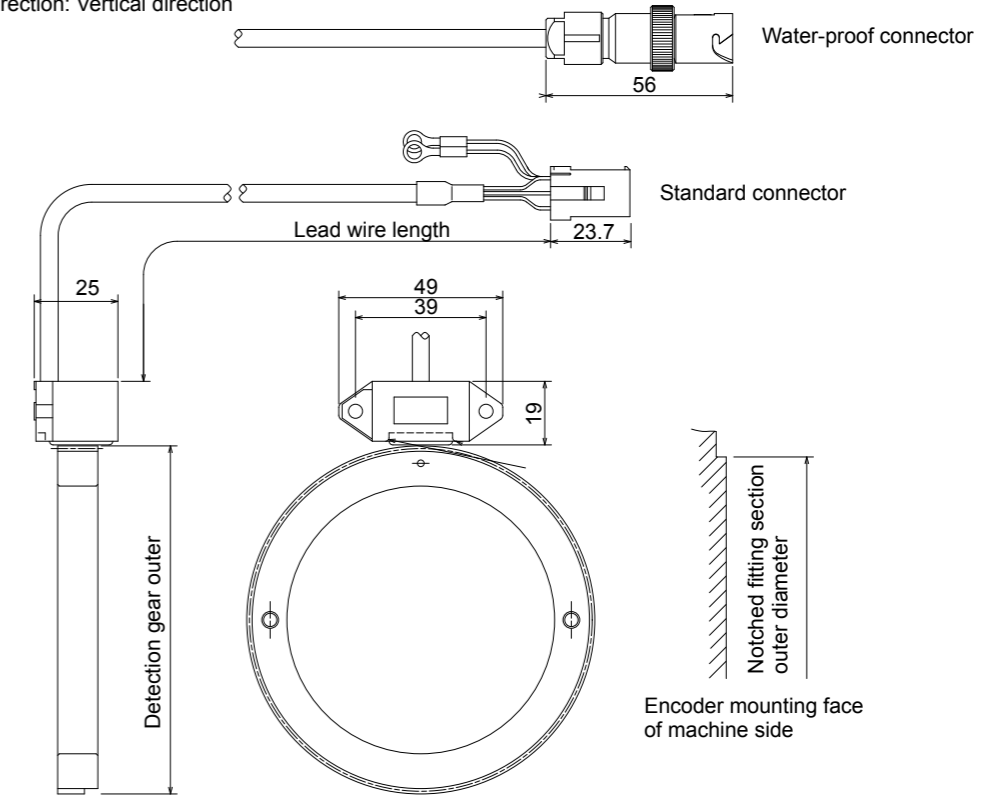
Series type		TS5690N12xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Water-proof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		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/EMH	○										
	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			97.5°									
	Tolerable speed [r/min]		15,000									
Signal output			Mitsubishi high-speed serial									
	E/EH		○									
Compatible model	EM/EMH		○									
	EJ/EJH		○									

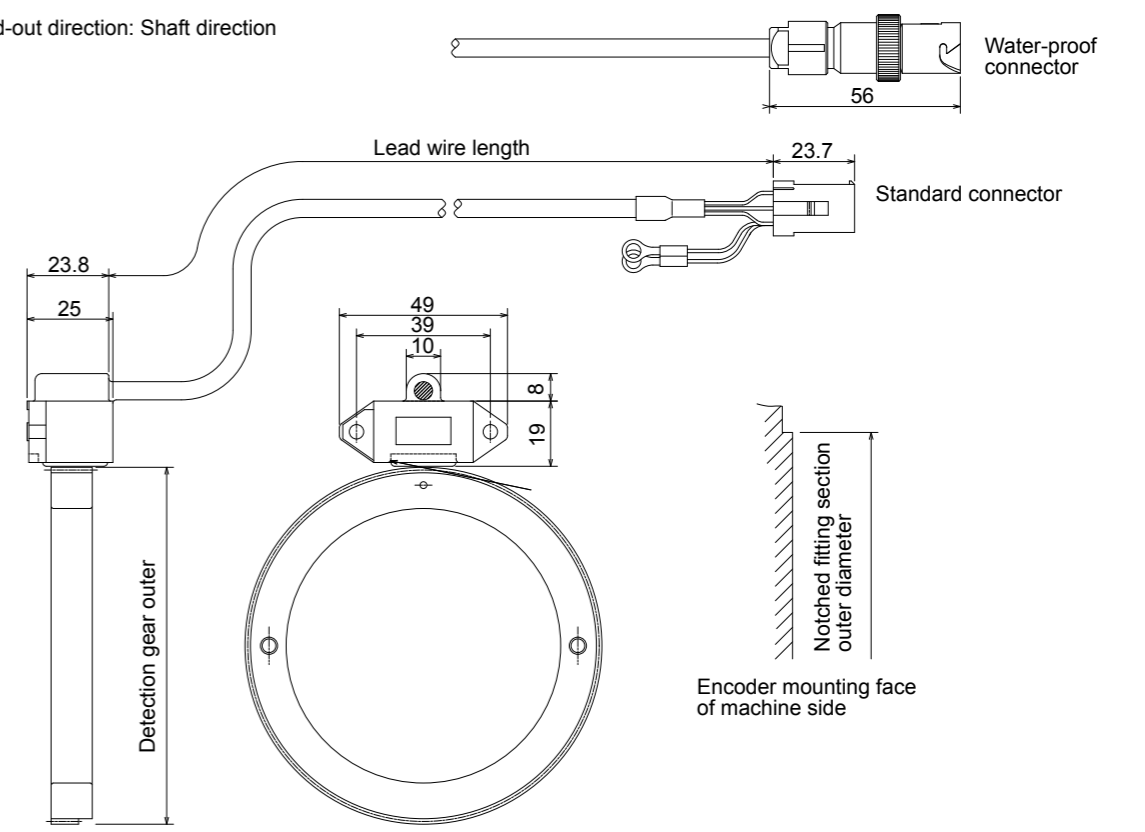
Sensor	Series type		TS5690N25xx									
	xx (The end of the type name)	Standard connector Water-proof connector	12	22	32	42	52	17	27	37	47	57
			19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		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			95°									
	Tolerable speed [r/min]		10,000									
Signal output			Mitsubishi high-speed serial									
	E/EH		○									
Compatible model	EM/EMH		○									
	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

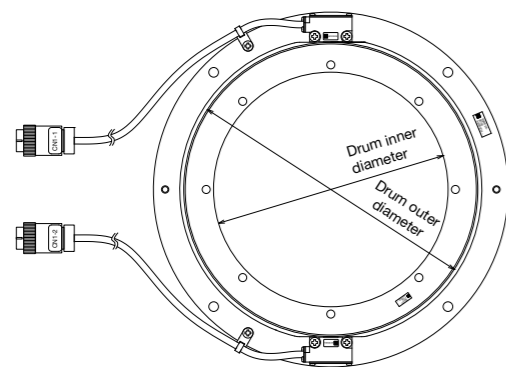
(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.

(*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.

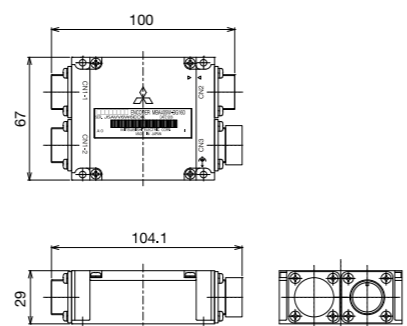
(*3) It is the degree of protection when fitted with a connector.

Outline dimension drawing

Encoder



Preamplifier



[Unit : mm]

■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 Machine Tool
Encoder type	ERM280 1200	ERM280 2048	MPC1 Series
Interface unit type	EIB192M C4 1200	EIB192M C6 2048	ADB-20J20
	EIB392M C4 1200	EIB392M C6 2048	
Minimum detection resolution	0.0000183° (19,660,800p/rev)	0.0000107° (33,554,432p/rev)	0.00005° (7,200,000p/rev)
Tolerable maximum speed	20000r/min	11718r/min	10000r/min
Compatible model	E/EH	○	○
	EM/EMH	○	○
	EJ/EJH	○	○

ENCODER INTERFACE UNIT

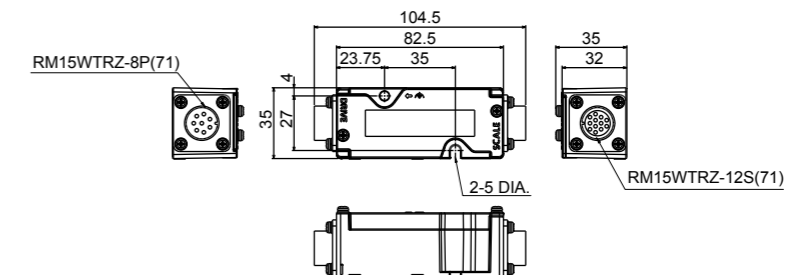
■Serial output interface unit for ABZ analog encoder MDS-EX-HR

This unit superimposes the scale analog output raw waves, and generates high resolution position data. Increasing the encoder resolution is effective for the servo high-gain.

Specifications

Type	MDS-EX-HR-11	
Compatible scale (example)	LS186 / LS486 / LS186C / LS486C (HEIDENHAIN)	
Signal 2-division function	Not possible	
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 / 16384 division	
Input/output communication style	High-speed serial communication I/F, RS485 or equivalent	
Tolerable power voltage	5VDC±5%	
Maximum heating value	2W	
Mass	0.2kg or less	
Degree of protection	IP67	
Compatible model	E/EH	○
	EM/EMH	○
	EJ/EJH	○

Outline dimension drawing



[Unit : mm]

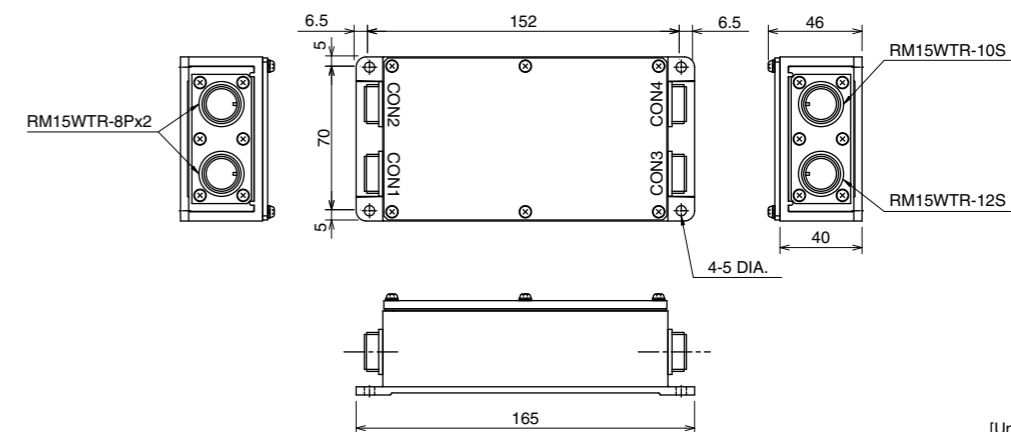
■Serial output interface unit for ABZ analog encoder MDS-B-HR

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	x	○	x	○
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/EMH	○	-	○
	EJ/EJH	○	○	○

Outline dimension drawing



[Unit : mm]

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/EMH	-
	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/EMH	○	○
	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/EMH	○	○
	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 Machine Tool Co., Ltd.		
Maximum response speed	10,000r/min	3,600r/min	5,000r/min
Output signal	Mitsubishi high-speed serial signal		
Compatible encoder	MPCI series	MPS series	MPI series
Minimum detection resolution	0.00005° (7,200,000p/rev)	0.05µm	0.000025° (1,440,000p/rev)
Degree of protection	IP20		
Outline dimension	190mm×160mm×40mm		
Mass	0.9kg		
Compatible model	E/EH	○	○
	EM/EMH	○	○
	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.

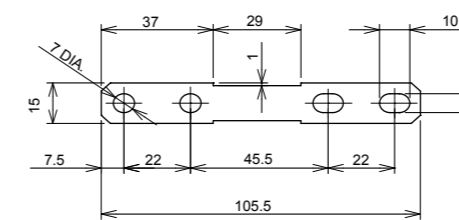
Specifications

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/EMH	-	-	-	-
	EJ/EJH	-	-	-	-

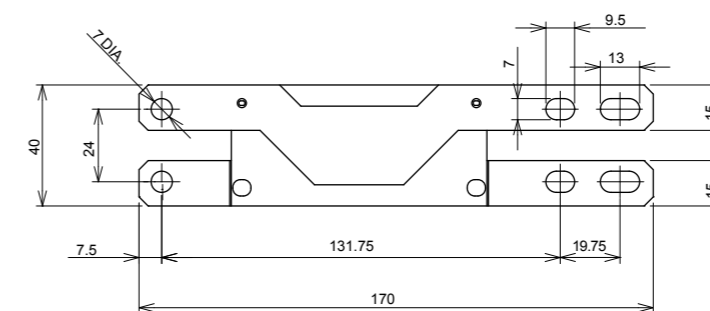
Outline dimension drawings

[Unit:mm]

E-BAR-A0606

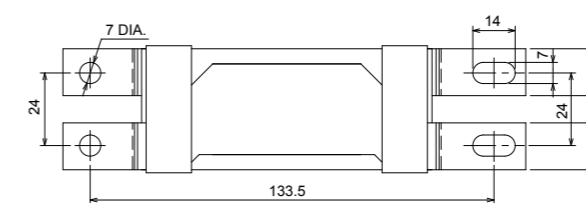


E-BAR-B0606

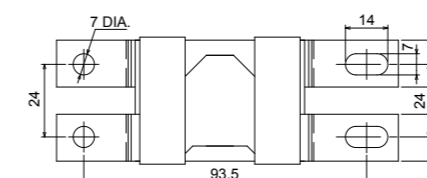


(Note) E-BAR-A0606 is a set of two DC connection bars.

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.

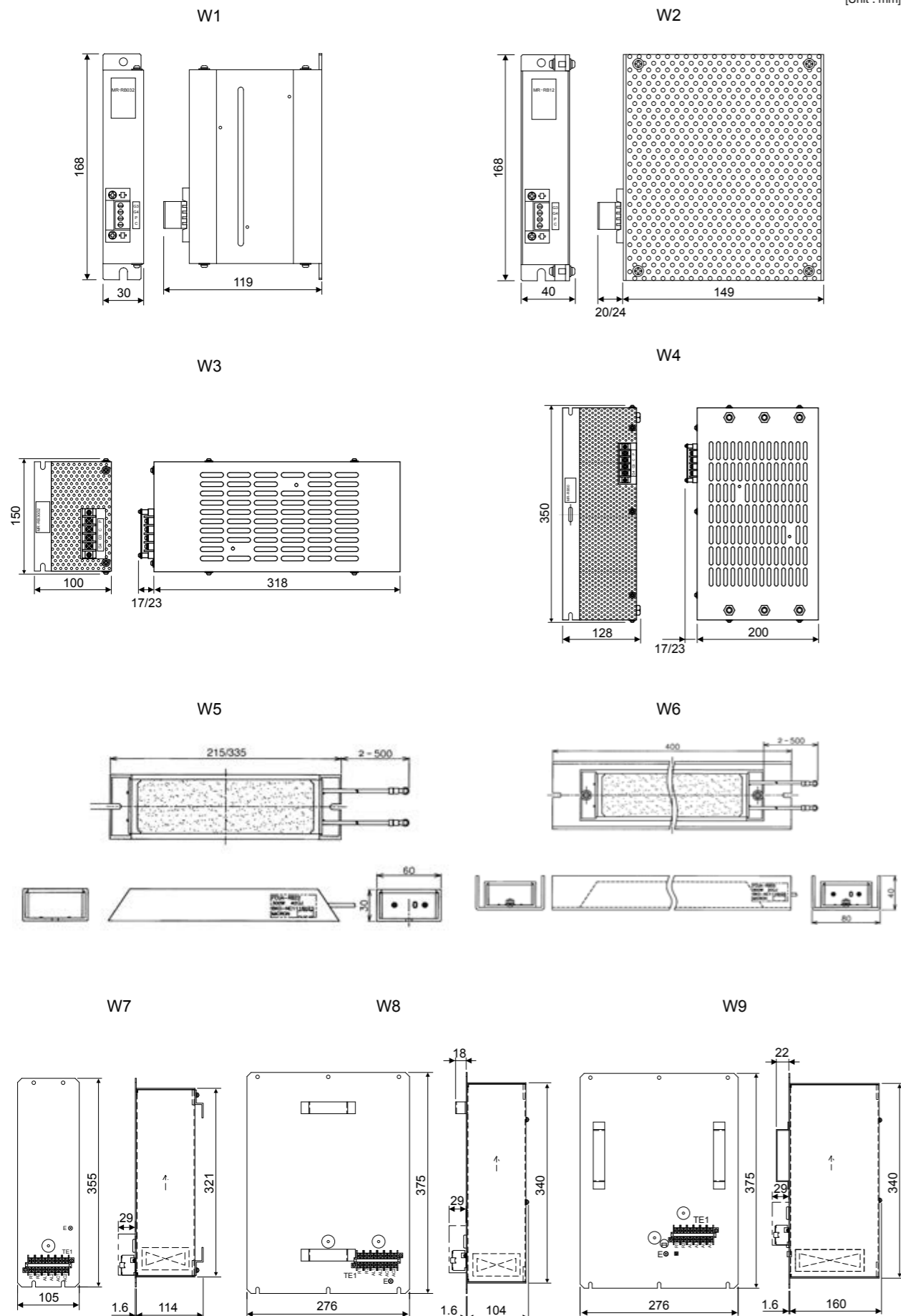
Corresponding spindle drive unit		External option regenerative resistor			
		MR-RB12	MR-RB32	MR-RB30	MR-RB50
	Mass	0.8kg	2.9kg	2.9kg	5.6kg
	Unit outline dimension	168mm×40mm×149mm	150mm×100mm×318mm	150mm×100mm×318mm	350mm×128mm×200mm
		W2	W3	W3	W4
	External option regenerative resistor	GZG200W39OHMK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



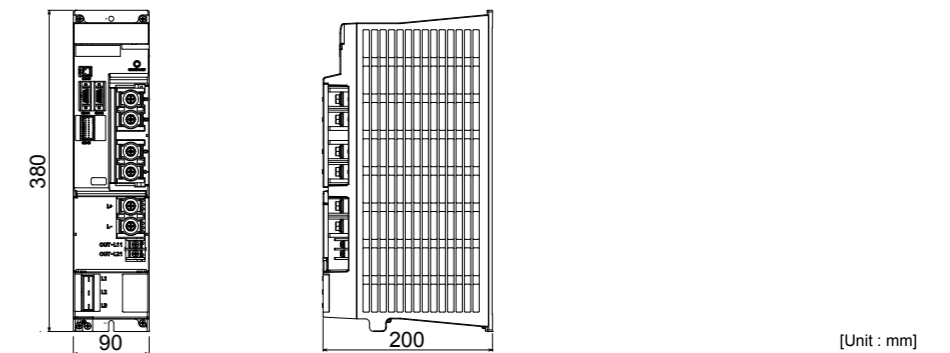
Power backup unit MDS-D/DH-PFU

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		
Degree of protection			IP20 [except for the terminal block and connector area]
Cooling method			Natural-cooling
Mass [kg]			4

Outline dimension drawing



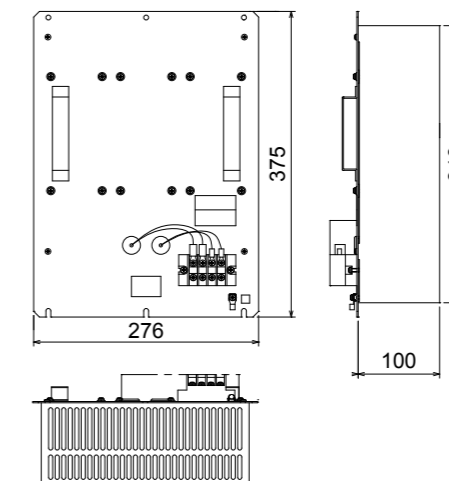
[Unit : mm]

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



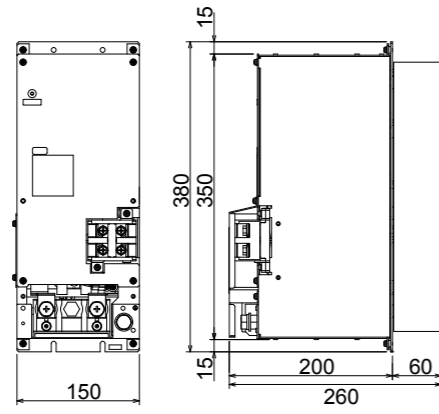
[Unit : mm]

■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

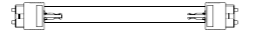




[Unit : mm]

■MEMO

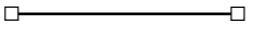

LIST OF CABLES

<Optical communication cable>






Item	Model	Length (m)	Contents	Compatible model			
				E/EH	EM/EMH	EJ/EJH	
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				
		J395 L10M	10				
		J395 L10M	10				
Optical communication cable For wiring between drive units (outside panel)	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/EMH	EJ/EJH	
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/EMH	EJ/EJH	
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	Contactor 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/EMH	EJ/EJH	
For CN8	STO cable	-	-		○	-	○
	STO short-circuit connector	-	-	These connectors are supplied for each drive unit.	○	-	○

<Servo encoder cable and connector>

Item	Model	Length (m)	Contents	Compatible model		
				E/EH	EM/EMH	EJ/EJH
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/EMH	EJ/EJH					
CN3 MDS-EX-HR/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-EX-HR/ 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/EMH	EJ/EJH	
For motor brake	Brake connector for <200V Series> HG <400V Series> HG-H, HQ-H Applicable cable outline φ4.0 to 6.0mm	CNB10-R2S(6)	-		○	○	○
		CNB10-R2L(6)	-		○	○	○
		CNB10S-R2S(6)	-		○	○	○
		CNB10S-R2L(6)	-		○	○	○
	Brake cable for HG46/56/96 Lead out in direction of motor shaft	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				
	Brake cable for HG46/56/96 Lead out in opposite direction of motor shaft	MR-BKS1CBL 2M-A2-H	2		○	○	○
		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/EMH	EJ/EJH					
For motor power	Power connector for <200V Series> HG75, 105, 54, 104, 154, 224, 123, 223, 142 HG-JR73, 153□-S105003 <400V Series> HG-H75, 105, 54, 104, 154 HG-JR734, 1534□-S105003 Applicable cable outline φ10.5 to 14mm	CNP18-10S(14)	-		○	○	○				
		CNP18-10L(14)	-		○	○	○				
	Power connector for <200V Series> HG204, 354, 303, 453, 302 <400V Series> HG-H204, 354, 453, 703 Applicable cable outline φ12.5 to 16mm	CNP22-22S(16)	-		○	○	○				
		CNP22-22L(16)	-		○	○	○				
	Power connector for <200V Series> HG703, 903 <400V Series> HG-H903 HQ-H903,1103 Applicable cable outline φ22 to 23.8mm	CNP32-17S(23)	-		○	-	-				
		CNP32-17L(23)	-		○	-	-				
	Power connector for <200V Series> HG75, 105□-S105010 HG-JR73, 153□-S105010 <400V Series> HG-JR734, 1534□-S105010	CNP14-2S(12)	-		○	○	○				
		CNP14-2L(12)	-		○	○	○				
	Power cable for HG46/56/96 Lead out in direction of motor shaft	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									
MR-PWS1CBL 2M-A2-H		2									
Power cable for HG46/56/96 Lead out in opposite direction of motor shaft	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-SP2-20 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)					-		○	-	-
							CNU01SECV(AWG14)	-		○	-
For CN31 L/M/S Power connector for MDS-EM/EMH Series	CNU01SEF(AWG14) CNU01SEL(AWG14) CNU01SEM(AWG14) CNU01SES(AWG14)	-		-	○	-					
		-		-	○	-					
For CN22 Control power connector for MDS-EM/EMH Series Applicable cable outline φ0.5 to 1.25mm	RCN22	-		-	○	-					
		RCN22S	-		-	○	-				

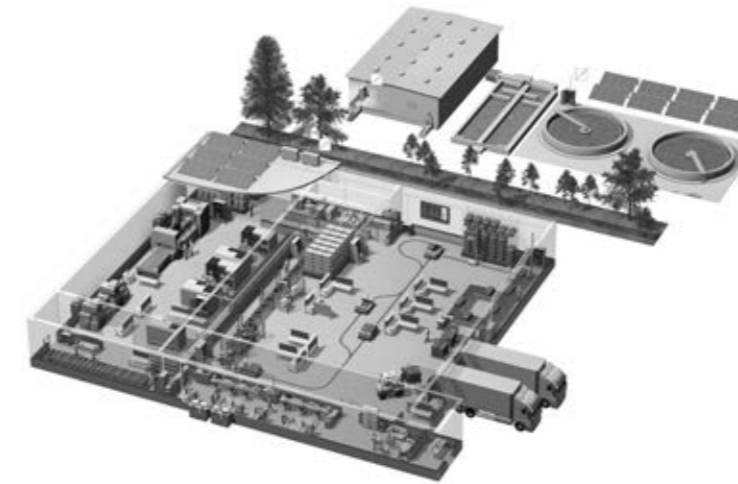
<Drive unit side main circuit connector>

Item	Model	Length (m)	Contents	Compatible model		
				E/EH	EM/EMH	EJ/EJH
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/EMH	EJ/EJH	
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)	-		○	○	○

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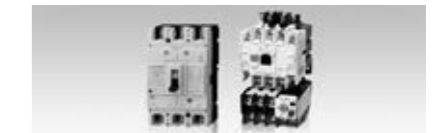
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The Mitsubishi brand name is recognized around the world as a symbol of premium quality.

Mitsubishi Electric Corporation is active in space development, transportation, semi-conductors, energy systems, communications and information processing, audio visual equipment and home electronics, building and energy management and automation systems, and has 237 factories and laboratories worldwide in over 121 countries.

This is why you can rely on Mitsubishi Electric automation solution - because we know first hand about the need for reliable, efficient, easy-to-use automation and control in our own factories.

As one of the world's leading companies with a global turnover of over 4 trillion Yen (over \$40 billion), employing over 100,000 people, Mitsubishi Electric has the resource and the commitment to deliver the ultimate in service and support as well as the best products.



Low voltage: MCCB, MCB, ACB



Medium voltage: VCB, VCC



Power monitoring, energy management



Compact and Modular Controllers



Inverters, Servos and Motors



Visualisation: HMIs



Numerical Control (NC)



Robots: SCARA, Articulated arm



Processing machines: EDM, Lasers, IDS



Transformers, Air conditioning, Photovoltaic systems

* Not all products are available in all countries.

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⚠ Safety Warning

To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.

Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems)



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