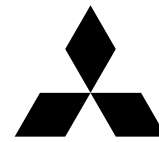




for a greener tomorrow



**MITSUBISHI
ELECTRIC**

Changes for the Better

FACTORY AUTOMATION

MITSUBISHI CNC NC Specification Selection Guide M800/M80/C80 Series



- **M800W Series**
- **M800S Series**
- **M80W Series**
- **M80 Series**
- **C80 Series**

GLOBAL IMPACT OF MITSUBISHI ELECTRIC



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

Changes for the Better

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

Mitsubishi Electric is involved in many areas including the following

Energy and Electric Systems

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

Electronic Devices

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

Home Appliance

Dependable consumer products like air conditioners and home entertainment systems.

Information and Communication Systems

Commercial and consumer-centric equipment, products and systems.

Industrial Automation Systems

Maximizing productivity and efficiency with cutting-edge automation technology.

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 - SPINDLE MOTOR/ BUILT-IN SPINDLE MOTOR /TOOL SPINDLE MOTOR 200V

SJ-D Series78	SJ-DG Series80	SJ-DJ Series81
SJ-DL Series82	SJ-V Series83	SJ-VL Series87
SJ-BG Series88	SJ-B Series91	SJ-PMB Series95
HG Series96	HG-JR Series96	HG Series97
 - SERVO MOTOR/LINEAR SERVO MOTOR 400V

HG-H Series98	HQ-H Series99	LM-F Series100
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 - SPINDLE MOTOR /TOOL SPINDLE MOTOR 400V

SJ-4-V Series101	HG-JR Series103	
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 - DRIVE UNIT

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CNC LINEUP

M800W



Premium CNC provides expandability and flexibility

- Separated type, a control unit separated from display
- Windows-based display is included in the lineup, which provides excellent expandability
- Four expansion slots are provided as standard specifications, allowing for expansion using option card slot

M800S



High-grade CNC well suited to high-speed high-accuracy machining and multi-axis multi-part system control

- Panel-in type, a control unit with integrated display
- Multi-CPU architecture allows for high performance and high functional graphics
- Windows-less display provides easy operability

M80W



Standard CNC with expandability and flexibility

- Separated type, a control unit separated from display
- Windows-based display is included in the lineup, which provides excellent expandability
- Packaged type for selecting a machine type easily
- Two expansion slots are provided as standard specifications, allowing for expansion using option cards slot

M80



Standard CNC provides high productivity and easy operability

- Panel-in type, a control unit with integrated display
- Provided in package (TypeA/TypeB) for easier selection
- Windows-less based display provides easy operability

C80



iQ Platform compatible CNC C80 Series incorporated with Mitsubishi's state-of-the-art technologies

- Easy linkage with many and varied MELSEC units.
- MELSEC sequencer for PLC and GOT2000 for display unit are used.
- Three of C80 can be mounted on one base and the control system with up to 21 part systems/48 axes can be established.

SELECTION PROCEDURE

Selection procedure flow chart

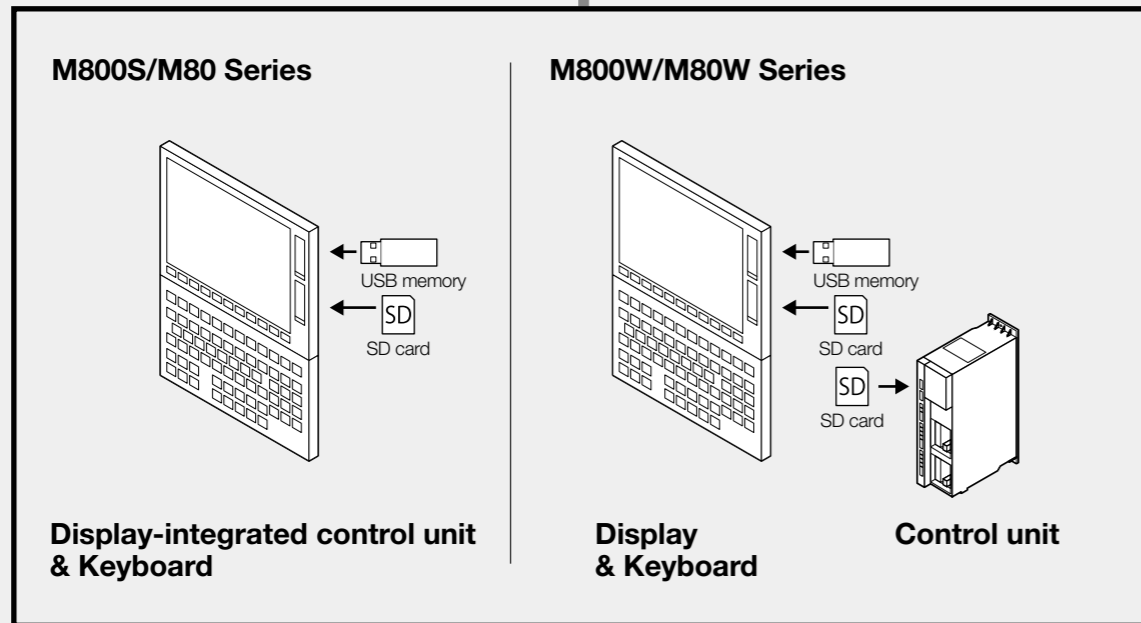
Start selecting the NC specifications!

STEP 1	Check the machine type and specifications	
	<ul style="list-style-type: none"> • Machine type: lathe / machining center / grinding machine / special-purpose machine, etc. • Details of control, required accuracy, with/without auxiliary axes (for workpiece feeding, turret, etc.) 	
STEP 2	Decide the NC specifications	P4
	<ul style="list-style-type: none"> • Number of axes, axis configuration, number of part systems, with/without spindles, number of I/O points • Check the position detection method and detection performance (absolute/relative position, number of pulses) • Select the size of the display unit, keyboard 	
STEP 3	Decide the servo motor	P72
	<ul style="list-style-type: none"> • Select the servo motor capacity (NC Servo Selection) • Check the outline dimensions, encoder, and whether it has a scale or break 	
STEP 4	Decide the spindle motor	P78
	<ul style="list-style-type: none"> • Check the spindle's base/maximum rotation speed, output, torque, outline dimensions and whether it has a keyway • Frame-type or built-in spindle motor • With/without optional specifications (orientation, spindle/C-axis, synchronization, etc.) • Check the C axis accuracy and the speed (when C axis is used) 	
STEP 5	Decide the drive unit	P104
	<ul style="list-style-type: none"> • Check the capacity and the dimensions of a drive unit • Check the power regeneration/resistor regeneration 	
STEP 6	Decide the power supply unit	
	<ul style="list-style-type: none"> • Select the power supply unit only when a power regenerative drive unit is used (NC Servo Selection) 	
STEP 7	Decide the hardware options	P37,P53,P132
	<ul style="list-style-type: none"> • Check the options (manual pulse generator, synchronous encoder, availability of network connection and PLC connection, etc.) • Check the required cables and connectors (In some cases, customers may need to prepare cables and connectors themselves.) 	
STEP 8	Decide the software options	P11
	<ul style="list-style-type: none"> • Check the number of programs stored (memory capacity), number of variable sets, etc. • Check the required functions 	
STEP 9	Check the development tools	P149
	<ul style="list-style-type: none"> • Check the screen development tool (when screen customization is required) 	

NC specification selection completed!

PRODUCT LINES (M800/M80 Series)

Ethernet



Software

- NC Analyzer2
- NC Configurator2

PC server

- Production control system

Software

- NC Designer2
- NC Trainer2
- NC Trainer2 plus
- NC Explorer
- NC Monitor2
- MITSUBISHI CNC communication software (FCSB1224W000)

Field Network

- CC-Link
- PROFIBUS-DP

EcoMonitorLight
 * Optional part

Remote I/O unit

Drive unit

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

Power backup unit

Manual pulse generator

Machine operation panel

Power supply unit

Tool spindle motor

- HG Series
- HG-JR Series

Servo motors

- HG Series
- LM-F Series
- TM-RB Series

Spindle motor

- SJ-D Series
- SJ-DG Series
- SJ-DL Series
- SJ-BG Series

MC
 * Optional part

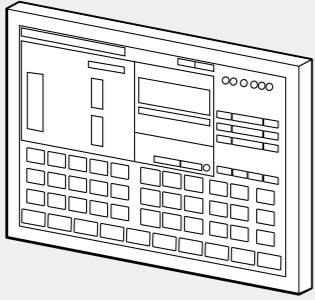
AC reactor
AC power supply

User-prepared

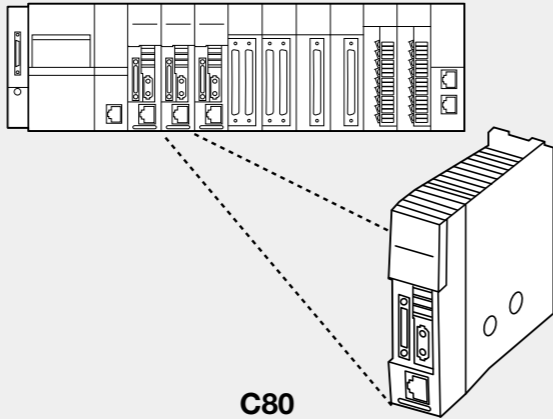
* Optional parts are not provided as accessories for NC equipment. Please purchase desired components from a Mitsubishi Electric dealership, etc.

PRODUCT LINES (C80 Series)

Ethernet



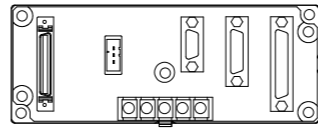
Display
•GOT2000 Series *1



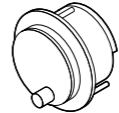
Control unit
MELSEC iQ-R Series
C80

Computer server
•Production control system

Field Network
•CC-Link



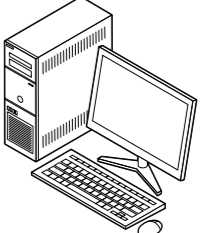
Signal splitter



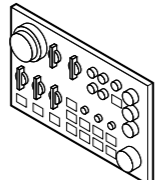
Manual pulse generator

Software

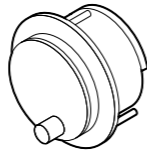
- GX Works3
- GT Works3
- NC Analyzer2
- NC Configurator2
- NC Explorer
- NC Monitor2



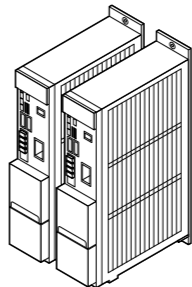

USB keyboard



Machine operation panel
* Made by the machine tool builder

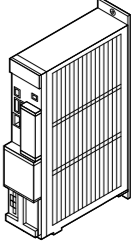


Manual pulse generator

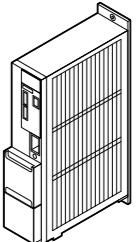


Drive unit *2

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



Power backup unit
•MDS-D/DH-PFU

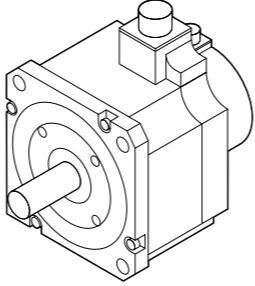


Power supply unit
•MDS-E/EH-CV

This CNC makes it easier to configure Factory automation systems, and design and build machine tools.

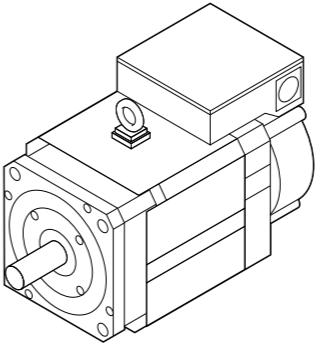
- Software tools have been upgraded, and now support everything from designing to setting up machine tools. These tools simplify design processes and building machine tools.

- A wide variety of FA units helps flexible line configuration.



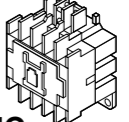
Servo motors *2

- HG Series
- LM-F Series
- TM-RB Series

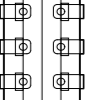


Spindle motor *2

- SJ-D Series
- SJ-DG Series
- SJ-DL Series
- SJ-BG Series




MC
*3 Optional part



AC reactor



AC power supply

 User-prepared

*1 For target models, refer to "List of Components". *2 Use Mitsubishi CNC's dedicated drive unit and motor.
*3 Optional parts are not provided as accessories for NC equipment.
Please purchase desired components from a Mitsubishi Electric dealership, etc.

M800/M80/C80 SERIES LINEUP

		Lathe system								
		(Display/Control unit separated-type)		(Display/Control unit integrated-type)		(Display/Control unit separated-type)		(Display/Control unit integrated-type)		
Model name		M800W Series		M800S Series		M80W Series		M80 Series		C80 Series
		M850W	M830W	M850S	M830S	—		TypeA	TypeB	—
Number of control axes	Max. number of axes (NC axes + Spindles + PLC axes)	32		32		12		12	9	16
	Max. number of NC axes (in total for all the part systems)	32		32		10		10	7	16
	Max. number of spindles	8		8		4+G/B ^(*)		4+G/B ^(*)	3	4
	Max. number of PLC axes	8		8		6		6		8
	Max. number of PLC indexing axes	8		8		4		4		8
	Number of simultaneous contouring control axes	8	4	8	4	4		4		4
	Max. number of NC axes in a part system	12		12		8		8	5	8
Max. number of part systems (main + sub)	8		8		4		4	2	3	
Max. number of main part systems	8		8		2		2	2	3	
Max. number of sub part systems	8		8		2		2	1	2	
Control unit-side High-speed program server mode	Available		—		Available		—		—	
Display unit-side High-speed program server mode	Available/— ^(*)		Available		Available/— ^(*)		Available		—	
Front-side SD card mode	Available		Available		Available		Available		—	
Least command increment	1nm		1nm		0.1μm		0.1μm		0.1μm	
Least control increment	1nm		1nm		1nm		1nm		1nm	
Number of tool offset sets	999		999		256		256	99	256	
Max. program capacity	2,000kB (5,120m) (1,000)		2,000kB (5,120m) (1,000)		500kB (1,280m) (1,000)		500kB (1,280m) (1,000)		500kB (1,280m) (1,000)	
Max. PLC program capacity [steps]	512,000		512,000		64,000		64,000	32,000	Available (MELSEC)	
Multi-project [number of PLC projects stored]	6		6		3	3	1		—	
Interactive cycle insertion	Available									
High-speed machining mode I maximum [kBPM]	33.7		33.7		33.7		33.7	—	Available	
High-speed machining mode II maximum [kBPM]	168		168		67.5		67.5	—	Available	
High-speed high-accuracy control I maximum [kBPM]	67.5		67.5		33.7		33.7	—	Available	
High-speed high-accuracy control II maximum [kBPM]	168		168		67.5		67.5	—	Available	
High-speed high-accuracy control III maximum [kBPM]	—									
High-accuracy control	Available								—	Available
SSS control (Super Smooth Surface)	Available								—	—
Tolerance control	Available								—	—
CC-Link (Master/Local)	Available								Available (MELSEC)	
PROFIBUS-DP (Master)	Available								—	
MES interface library	Available								—	
Smart Safety observation	Available									
Display unit ^(*)	19-type touchscreen, 19-type horizontal touchscreen, 15-type touchscreen, or 10.4-type touchscreen can be selected		15-type touchscreen or 10.4-type touchscreen can be selected		19-type touchscreen, 19-type horizontal touchscreen, 15-type touchscreen, 10.4-type touchscreen, or 8.4-type can be selected		15-type touchscreen, 10.4-type, touchscreen or 8.4 type can be selected		12.1-type touchscreen, 10.4-type touchscreen, 8.4-type touchscreen or 5.7-type touchscreen can be selected	
Windows®8 selection ^(*)	Available/— ^(*)		—		Available/— ^(*)		—		—	

* Maximum specifications including optional specifications are listed. Refer to the Specifications List for the details of each option.

(*) G/B: Guide Bush

(**) Windows-based display unit/Windows-less display unit

(***) For details, refer to "CNC SYSTEM CONTROL UNIT/DISPLAY UNIT" to be described.

		Machining center system								
		(Display/Control unit separated-type)		(Display/Control unit integrated-type)		(Display/Control unit separated-type)		(Display/Control unit integrated-type)		
Model name		M800W Series		M800S Series		M80W Series		M80 Series		C80 Series
		M850W	M830W	M850S	M830S	—		TypeA	TypeB	—
Number of control axes	Max. number of axes (NC axes + Spindles + PLC axes)	32		32		11		11	9	16
	Max. number of NC axes (in total for all the part systems)	16		16		8		8	5	16
	Max. number of spindles	4		4		2		2		7
	Max. number of PLC axes	8		8		6		6		8
	Max. number of PLC indexing axes	8		8		4		4		8
	Number of simultaneous contouring control axes	8	4	8	4	4		4		4
	Max. number of NC axes in a part system	12		12		8		8	5	8
Max. number of part systems (main + sub)	2		2		2		2	1	7	
Max. number of main part systems	2		2		2		2	1	7	
Max. number of sub part systems	2		2		—		—	—	—	
Control unit-side High-speed program server mode	Available		—		Available		—		—	
Display unit-side High-speed program server mode	Available/— ^(*)		Available		Available/— ^(*)		Available		—	
Front-side SD card mode	Available		Available		Available		Available		—	
Least command increment	1nm		1nm		0.1μm		0.1μm		0.1μm	
Least control increment	1nm		1nm		1nm		1nm		1nm	
Number of tool offset sets	999		999		400		400	400	400	
Max. program capacity	2,000kB (5,120m) (1,000)		2,000kB (5,120m) (1,000)		500kB (1,280m) (1,000)		500kB (1,280m) (1,000)		500kB (1,280m) (1,000)	
Max. PLC program capacity [steps]	512,000		512,000		64,000		64,000	32,000	Available (MELSEC)	
Multi-project [number of PLC projects stored]	6		6		3		3	1	—	
Interactive cycle insertion	—									
High-speed machining mode I maximum [kBPM]	33.7		33.7		33.7		33.7	16.8	Available	
High-speed machining mode II maximum [kBPM]	168		168		67.5		67.5		Available	
High-speed high-accuracy control I maximum [kBPM]	67.5		67.5		33.7		33.7		Available	
High-speed high-accuracy control II maximum [kBPM]	168		168		67.5		67.5		Available	
High-speed high-accuracy control III maximum [kBPM]	270		270		135		135	—	Available	
High-accuracy control	Available									
SSS control (Super Smooth Surface)	Available									
Tolerance control	Available									
CC-Link (Master/Local)	Available								Available (MELSEC)	
PROFIBUS-DP (Master)	Available								—	
MES interface library	Available								—	
Smart Safety observation	Available									
Display unit ^(*)	19-type touchscreen, 19-type horizontal touchscreen, 15-type touchscreen, or 10.4-type touchscreen can be selected		15-type touchscreen or 10.4-type touchscreen can be selected		19-type touchscreen, 19-type horizontal touchscreen, 15-type touchscreen, 10.4-type touchscreen, or 8.4-type can be selected		15-type touchscreen, 10.4-type, touchscreen or 8.4 type can be selected		12.1-type touchscreen, 10.4-type touchscreen, 8.4-type touchscreen or 5.7-type touchscreen can be selected	
Windows®8 selection ^(*)	Available/— ^(*)		—		Available/— ^(*)		—		Available	

(*) G/B: Guide Bush

(**) Windows-based display unit/Windows-less display unit

(***) For details, refer to "CNC SYSTEM CONTROL UNIT/DISPLAY UNIT" to be described.

CNC SYSTEM M800/M80/C80 SERIES SPECIFICATIONS LIST

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

class	Lathe system								Machining center system		General explanation
	M800W		M800S		M80W	M80		C80	M800W		
	M850W	M830W	M850S	M830S	—	M80 TypeA	M80 TypeB	—	M850W	M830W	
1 Control axes											
1 Control axes											
1	Number of basic control axes (NC axes)	○2	○2	○2	○2	○2	○2	○2	○2	○3	○3
2	Max. number of axes (NC axes + Spindles + PLC axes)	○16 △32	○16 △32	○16 △32	○16 △32	12	12	9	16	○16 △32	○16 △32
1	Max. number of NC axes (in total for all the part systems)	○16 △32	○16 △32	○16 △32	○16 △32	10	10	7	16	○16	○16
2	Max. number of spindles	8	8	8	8	4+G/B*	4+G/B*	3	4	4	4
3	Max. number of PLC axes	8	8	8	8	6	6	6	8	8	8
4	Max. number of PLC indexing axes	8	8	8	8	4	4	4	8	8	8
5	Number of simultaneous contouring control axes	8	4	8	4	4	4	4	4	8	4
6	Max. number of NC axes in a part system	○8 △12	○8 △12	○8 △12	○8 △12	8	8	5	8	○8 △12	○8 △12
7	Axis name extension	○	○	○	○	○	○	○	—	○	○
2 Control part system											
1	Standard number of part systems	1	1	1	1	1	1	1	1	1	1
2	Max. number of part systems (main + sub)	○4 △8	○4 △8	○4 △8	○4 △8	○4	○4	○2	△3	○2	○2
1	Max. number of main part systems	○4 △8	○4 △8	○4 △8	○4 △8	○2	○2	○2	△3	○2	○2
2	Max. number of sub part systems	○4 △8	○4 △8	○4 △8	○4 △8	○2	○2	○1	△2	○2	○2
3 Control axes and operation modes											
1	Tape (RS-232C input) mode	○	○	○	○	○	○	○	—	○	○
2	Memory mode	○	○	○	○	○	○	○	○	○	○
3	MDI mode	○	○	○	○	○	○	○	○	○	○
4	High-speed program server mode										
1	Control unit-side High-speed program server mode	△	△	—	—	○	—	—	—	△	△
2	Display unit-side High-speed program server mode	△/—	△/—	△	△	○/—	○	○	—	△/—	△/—
5	Front-side SD card mode	○	○	○	○	○	○	○	—	○	○
6	Front-side USB memory mode	○	○	○	○	○	○	○	—	○	○
2 Input command											
1 Data increment											
1	Least command increment										
	Least command increment 1μm	○	○	○	○	○	○	○	○	○	○
	Least command increment 0.1μm	○	○	○	○	○	○	○	○	○	○
	Least command increment 0.01μm (10nm)	△	△	△	△	—	—	—	—	△	△
	Least command increment 0.001μm (1nm)	△	△	△	△	—	—	—	—	△	△
2	Least control increment										
	Least control increment 0.01μm (10nm)	○	○	○	○	○	○	○	○	○	○
	Least control increment 0.001μm (1nm)	○	○	○	○	○	○	○	○	○	○
3	Indexing increment	○	○	○	○	○	○	○	○	○	○
2 Unit system											
1	Inch / Metric changeover	○	○	○	○	○	○	○	○	○	○
2	Input command increment tenfold	—	—	—	—	—	—	—	—	○	○
3 Program format											
1	Program format										
1	Format 1 for Lathe (G Code List 2, 3)	○	○	○	○	○	○	○	○	—	—
2	Format 2 for Lathe (G Code List 4, 5)	○	○	○	○	○	○	○	○	—	—
3	Special format for lathe (G Code List 6, 7)	○	○	○	○	○	○	○	○	—	—
4	Format 1 for Machining center	—	—	—	—	—	—	—	—	○	○
5	Format 2 for Machining center (M2 format)	—	—	—	—	—	—	—	—	○	○
6	MITSUBISHI CNC special format	○	○	○	○	○	○	○	○	—	—
2	Program format switch	△	△	△	△	—	—	—	—	—	—
4 Command value											
1	Decimal point input I, II	○	○	○	○	○	○	○	○	○	○
2	Absolute / Incremental command	○	○	○	○	○	○	○	○	○	○
3	Diameter / Radius designation	○	○	○	○	○	○	○	○	—	—
4	Diameter / Radius designation switch	○	○	○	○	○	○	—	—	○	○
3 Positioning / Interpolation											
1 Positioning											
1	Positioning	○	○	○	○	○	○	○	○	○	○
2	Unidirectional positioning	—	—	—	—	—	—	—	—	△	△
2 Linear / Circular interpolation											
1	Linear interpolation	○	○	○	○	○	○	○	○	○	○
2	Circular interpolation (Center / Radius designation)	○	○	○	○	○	○	○	○	○	○
3	Helical interpolation	○	○	○	○	○	○	○	○	○	○
4	Spiral / Conical interpolation	—	—	—	—	—	—	—	—	△	△

Machining center system						General explanation
M800S		M80W	M80		C80	
M850S	M830S	—	M80 TypeA	M80 TypeB	—	
○3	○3	○3	○3	○3	○3	The NC axis, spindle, and PLC axis are generically called the control axis. The NC axis can be manually or automatically operated using a machining program. The PLC axis can be controlled using a sequence program. The number of axes that is within the max. number of control axes, and that does not exceed the max. number given for the NC axis, spindle and PLC axis, can be used. * G/B: Guide Bush The number of PLC axes available to be used as indexing axis. Number of axes with which simultaneous interpolation control is possible. Max. number of NC axes possible to control in the same part system. The axis name (command axis name) to issue the absolute/incremental value command to NC control axis can be expanded to two letters.
○16 △32	○16 △32	11	11	9	16	
○16	○16	8	8	5	16	
4	4	2	2	2	7	
8	8	6	6	6	8	
8	8	4	4	4	8	
8	4	4	4	4	4	
○8 △12	○8 △12	8	8	5	8	
○	○	○	○	○	—	
1	1	1	1	1	1	
○2	○2	○2	○2	○1	△7	[M800/M80] Up to eight part systems for a lathe system, and up to two part systems for a machining center system. [C80] Up to three part systems for a lathe system, and up to seven part systems for a machining center system.
○2	○2	○2	○2	○1	△7	
○2	○2	—	—	—	—	
○	○	○	○	○	—	In this mode, operation is performed using the machining program data from the RS-232C interface built in the CNC unit. Machining programs stored in the memory of the CNC module are run. MDI data stored in the memory of the CNC unit are executed.
○	○	○	○	○	○	
○	○	○	○	○	○	
—	—	○	—	—	—	The machining program stored in SD card can be operated by installing a SD card in the control unit SD card interface. The machining program stored in the built-in disk of the display unit can be operated. The built-in disk of the display unit is mounted in the personal computer for M800W/M80W (Windows-based display unit). For M800S/M80, the SD card inserted into SD card I/F on the back of the display unit is equivalent to the built-in disk of the display unit. The machining program stored in a SD card can be operated. This SD card is installed to the front-side SD card I/F. The machining program stored in a USB memory can be operated. This USB memory is installed to the front-side USB memory I/F.
△	△	○/—	○	○	—	
○	○	○	○	○	—	
○	○	○	○	○	—	The data increment handled in the controller includes the input setting increment and command increment. Each type is set with parameters. Possible to command in increments of 0.001mm (linear axis) and 0.001° (rotary axis). Possible to command in increments of 0.0001mm (linear axis) and 0.0001° (rotary axis). Possible to command in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis). Possible to command in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis). The least control increment determines the CNC's internal operation accuracy. Possible to control in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis). Possible to control in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis). This function limits the command value for the rotary axis.
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	The unit systems of the data handled in the controller include the metric system and inch system. The type can be designated with a parameter and a machining program. The program's command increment can be multiplied by an arbitrary scale with the parameter designation. This function is valid when a decimal point is not used for the command increment.
—	—	—	—	—	—	
—	—	—	—	—	—	
○	○	○	○	○	○	G code list for the lathe system. The G code list is selected by parameter. G code list for the machining center system. The G-code list is selected by parameter. The formats of the fixed cycle for turning machining (G77 to G79), compound type fixed cycle for turning machining (G71 to G76) and fixed cycle for drilling (G80 to G89) can be switched to the MITSUBISHI CNC special formats. This function is designed to switch the program format (G code list) using G codes or PLC signal. When you run a lathe-based multi-tasking machine, and if you change to the G code list of machining center system, you can use a free-curved surface machining program made with CAM without modifying the program.
—	—	—	—	—	—	
—	—	—	—	—	—	
○	○	○	○	○	○	For the decimal point input type 1, the unit of the last digit of a command without a decimal point is the same as that of the least command increment. For decimal point input type 2, the last digit of a command without a decimal point is interpreted in millimeters during the metric mode, in inches in the inch mode, or in seconds for a time-based command. When axis coordinate data are issued in a machining program command, either the incremental command method, which commands a relative distance from the current position, or the absolute command method, which commands a movement to a designated position in a predetermined coordinate system, can be selected. The designation method of an axis command value can be changed over with parameters between the radius designation or diameter designation. When the diameter designation is selected, the scale of the length of the selected axis is doubled. (moves only half (1/2) the commanded amount)
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	This function carries out positioning at high speed using a rapid traverse rate with the travel command value given in the program. The G code command always moves the tool to the final position in the direction determined by parameters.
△	△	○	○	○	△	
○	○	○	○	○	○	
○	○	○	○	○	○	Linear interpolation is a function that moves a tool linearly by the travel command value supplied in the program at the cutting feedrate designated by the F code. This function moves a tool along a circular arc on the plane selected by the travel command value supplied in the program. With this function, any two of three axes intersecting orthogonally are made to perform circular interpolation while the third axis performs linear interpolation in synchronization with the arc rotation. This control can be exercised to machine large-diameter screws or 3-dimensional cams.
○	○	○	○	○	○	
△	△	○	○	—	△	

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

Table with columns for class, Lathe system (M800W, M800S, M80W, M80, C80), and Machining center system (M800W, M850W, M830W). Rows include Tool spindle synchronization, Spindle speed clamp, Tool functions, Miscellaneous functions, 2nd miscellaneous functions, Tool compensation, and Coordinate system.

Table with columns for Machining center system (M800S, M80W, M80, C80), Machining center system (M850S, M830S, M80 TypeA, M80 TypeB), and General explanation. Rows describe various functions like spindle synchronization, tool compensation, and coordinate system settings.

5 CNC SYSTEM

5 CNC SYSTEM

M800/M80/C80 SERIES SPECIFICATIONS LIST

M800/M80/C80 SERIES SPECIFICATIONS LIST

Standard ΔOptional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

Table with columns for class, Lathe system (M800W, M800S, M80W, M80, C80), Machining center system (M800W, M830W), and various function specifications.

Table with columns for Machining center system (M800S, M80W, M80, C80), General explanation, and various function specifications.

5 CNC SYSTEM

5 CNC SYSTEM

M800/M80/C80 SERIES SPECIFICATIONS LIST

M800/M80/C80 SERIES SPECIFICATIONS LIST

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

Table with columns for 'class', 'Lathe system' (M800W, M800S, M80W, M80, C80), and 'Machining center system' (M800W, M850W, M830W). Rows include categories like 2 Display for ensuring safety, 3 Protection, 4 Maintenance and troubleshooting, and 5 Functional safety.

Table with columns for 'Machining center system' (M800S, M80W, M80, C80) and 'General explanation'. Rows provide detailed descriptions for the corresponding specification items.

(Note 1) Please contact us to purchase this tool.

(Note 2) Please contact us to purchase a full function version. A limited function version is also available free of charge.

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

class	Lathe system								Machining center system		
	M800W		M800S		M80W	M80		C80	M800W		
	M850W	M830W	M850S	M830S	—	M80 TypeA	M80 TypeB	—	M850W	M830W	
5	SBC / SBT (Safe Brake Control / Safe Brake Test)	△	△	△	△	○	□	□	△	△	△
6	SCA (Safe Cam)	△	△	△	△	○	□	□	△	△	△
7	SS1 / SS2 (Safe Stop)	△	△	△	△	○	□	□	△	△	△
8	STO (Safe Torque Off)	△	△	△	△	○	□	□	△	△	△
16 Drive system											
1 Servo / Spindle											
1 Feed axis											
1	MDS-E-Vx	□	□	□	□	□	□	□	□	□	□
2	MDS-EH-Vx	□	□	□	□	□	□	□	□	□	□
3	MDS-EJ-Vx	□	□	□	□	□	□	□	□	□	□
4	MDS-EJH-Vx	□	□	□	□	□	□	□	□	□	□
5	MDS-EM-SPVx	□	□	□	□	□	□	□	□	□	□
6	MDS-EMH-SPVx	□	□	□	□	□	□	□	□	□	□
2 Spindle											
1	MDS-E-SPx	□	□	□	□	□	□	□	□	□	□
2	MDS-EH-SPx	□	□	□	□	□	□	□	□	□	□
3	MDS-EJ-SPx	□	□	□	□	□	□	□	□	□	□
5	MDS-EM-SPVx	□	□	□	□	□	□	□	□	□	□
6	MDS-EMH-SPVx	□	□	□	□	□	□	□	□	□	□
4 Power supply											
1	MDS-E-CV	□	□	□	□	□	□	□	□	□	□
2	MDS-EH-CV	□	□	□	□	□	□	□	□	□	□
17 Machine support functions											
1 PLC											
1	Built-in PLC processing mode	○	○	○	○	○	○	○	—	○	○
2 PLC functions											
1	Built-in PLC basic function	○	○	○	○	○	○	○	△ (MELSEC)	○	○
1	Index modification	○	○	○	○	○	○	○	△ (MELSEC)	○	○
2	Multi-program [number of programs]	○120	○120	○120	○120	○60	○60	○60	△ (MELSEC)	○120	○120
3	Multi-project [number of projects stored]										
	Number of PLC projects: 1	○	○	○	○	—	—	○	—	○	○
	Number of PLC projects: 3	△	△	△	△	○	○	—	—	△	△
	Number of PLC projects: 6	△	△	△	△	—	—	—	—	△	△
4	Function block (FB)	○	○	○	○	○	○	○	△ (MELSEC)	○	○
5	Label programming	○	○	○	○	○	○	○	△ (MELSEC)	○	○
2	PLC exclusive instruction	○	○	○	○	○	○	○	△ (MELSEC)	○	○
3 PLC support functions											
1	Alarm message display	○	○	○	○	○	○	○	—	○	○
2	Operator message display	○	○	○	○	○	○	○	○*	○	○
3 Memory switch (PLC switch)											
1	Memory switch (PLC switch) 32 points	○	○	○	○	○	○	○	—	○	○
2	Memory switch (PLC switch) 64 points	△	△	△	△	—	—	—	—	△	△
3	Memory switch (PLC switch) 96 points	△	△	△	△	—	—	—	—	△	△
4	Load meter display	○	○	○	○	○	○	○	○	○	○
5	User PLC version display	○	○	○	○	○	○	○	○	○	○
6	Ladder program writing during RUN	○	○	○	○	○	○	○	△ (MELSEC)	○	○
7	PLC program protection	○	○	○	○	○	○	○	△ (MELSEC)	○	○
4 Built-in PLC capacity											
1	Standard PLC capacity [number of steps]	○128000	○128000	○128000	○128000	○64000	○64000	○32000	△ (MELSEC)	○128000	○128000
2	Large PLC capacity: 256000 steps	△	△	△	△	—	—	—	—	△	△
3	Large PLC capacity: 512000 steps	△	△	△	△	—	—	—	—	△	△
5	Machine contact input / output I/F	○	○	○	○	○	○	○	△ (MELSEC)	○	○
6	Ladder monitor	○	○	○	○	○	○	○	○(GOT)	○	○

Machining center system						General explanation
M800S		M80W	M80		C80	
M850S	M830S	—	M80 TypeA	M80 TypeB	—	
△	△	○	□	□	△	The brakes connected to motors are activated by this function. Because there are two circuits for activating the brakes, one circuit can activate the brakes even when the other circuit is broken down. Furthermore, Safe Brake Test (SBT) can diagnose the circuits for activating the breaks and the effectiveness of the brakes (deterioration due to abrasion, etc.). * Safety card is required for M80.
△	△	○	□	□	△	This function uses the safety signals to inform that the axis absolute position (command position, FB position) is within the range of safe position. *Safety card is required for M80.
△	△	○	□	□	△	[Safe stop 1 (SS1)] STO function is activated after an axis is decelerated and the speed (command speed, FB speed) becomes equal to or below the safe stop speed. [Safe stop 2 (SS2)] SCS function is activated after an axis is decelerated and the speed (command speed, FB speed) becomes equal to or below the safe stop speed. * Safety card is required for M80.
△	△	○	□	□	△	This function shuts OFF power supply to axes. Because there are two power shutoff circuits, one circuit can shut OFF the power supply even when the other circuit is broken down. * Safety card is required for M80.
□	□	□	□	□	□	CNC-dedicated drive units, spindle motors, and servo motors are used.
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
□	□	□	□	□	□	
○	○	○	○	○	—	An exclusive sequence program that controls various signals between the controller and the machine to realize the operations applicable to each machine can be created and built in.
○	○	○	○	○	△ (MELSEC)	[M800/M80] Basic commands (bit processing commands): 43 commands including LD, LDI, OR, ORI, AND, ANI, OUT, PLS, etc. Function commands: 188 commands including data transfer, 4 basic arithmetic operations, logic arithmetic operations, large/small identification, binary/BCD conversion, branching, conditional branching, decoding, encoding, etc. [C80] For the details, refer to the manual of MITSUBISHI Programmable Controller "MELSEC IQ-R series".
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	PLC-dedicated instruction is provided for some limited applications, enabling a complex machining process, which is difficult to carry out only by the basic instructions and function instructions.
○	○	○	○	○	—	The contents of the alarms which have occurred during sequence (user PLC) processing can be displayed on the setting and display unit.
○	○	○	○	○	○*	When some conditions occur where you wish to inform a messages to the operator, an operator message can be displayed separately from the alarm message. * Only the macro alarm message can be displayed.
○	○	○	○	○	—	PLC switches can be set on the setting and display unit screen, and the ON / OFF control executed.
△	△	—	—	—	—	
△	△	—	—	—	—	
○	○	○	○	○	○	A load meter can be displayed on the setting and display unit.
○	○	○	○	○	○	The user PLC version can be displayed in the software list on the Software Configuration screen.
○	○	○	○	○	△ (MELSEC)	Ladder program can be edited while PLC is running. This function is available, either by GX Developer or PLC onboard edit.
○	○	○	○	○	△ (MELSEC)	For PLC data protection, the file password can be set to each file of PLC data.
○	○	○	○	○	△ (MELSEC)	[M800/M80] In the program memory, it is possible to store the system area of parameters, intelligent function module parameters, sequence programs, device comments, and device initial values. [C80] For the details, refer to the manual of MITSUBISHI Programmable Controller "MELSEC IQ-R series".
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	△ (MELSEC)	
○	○	○	○	○	○(GOT)	[M800/M80] The operation panel I/O unit or the remote I/O unit is selected based on the types of input signals (sink/source) or output signals (source) available for input or output and the number of contacts required. [C80] The device is selected from the I/O modules of the MITSUBISHI Programmable Controller "MELSEC IQ-R Series".
○	○	○	○	○	○(GOT)	[M800/M80] This function enables the operating status of the sequence circuit to be checked on the controller's setting and display unit. [C80] This function enables to display on GOT the operating status of the sequence circuit to be checked. "Sequence program monitor" (GOT2000) is used.

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

class	Lathe system								Machining center system	
	M800W		M800S		M80W	M80		C80	M800W	
	M850W	M830W	M850S	M830S	—	M80 TypeA	M80 TypeB	—	M850W	M830W
7 PLC development										
1 On-board development	○	○	○	○	○	○	○	○(GOT)	○	○
2 MELSEC development tool (GX Developer)	○	○	○	○	○	○	○	—	○	○
3 MELSEC development tool (GX Works3) (Note 1)	—	—	—	—	—	—	—	○	—	—
8 PLC parameter										
1 PLC constant (150 points)	○	○	○	○	○	○	○	○	○	○
2 PLC constant extension (Up to 755 points)	○	○	○	○	—	—	—	—	○	○
9 GOT connection										
1 Ethernet connection	○	○	○	○	○	○	○	○	○	○
2 CC-Link connection	○	○	○	○	○	○	○	△(MELSEC)	○	○
3 CC-Link IE field network connection	—	—	—	—	—	—	—	△(MELSEC)	—	—
10 Pallet program registration	—	—	—	—	—	—	—	—	△	△
2 Machine construction										
1 Servo OFF	○	○	○	○	○	○	○	○	○	○
2 Axis detachment	○	○	○	○	○	○	○	○	○	○
3 Synchronous control	△	△	△	△	○	○	○	△	△	△
4 Inclined axis control	△	△	△	△	○	○	○	△	△	△
5 Position switch	○24	○24	○24	○24	○24	○24	○24	○*	○24	○24
7 Index table indexing	○	○	○	○	○	○	○	○	○	○
8 Tool length compensation along the tool axis	△*	△*	△*	△*	—	—	—	—	△	△
9 Tool handle feed & interruption	—	—	—	—	—	—	—	—	△	△
10 Tool center coordinate display	—	—	—	—	—	—	—	—	△	△
11 Tool center point control	—	—	—	—	—	—	—	—	△	△*
12 Inclined surface machining command	△	△	△	△	○	○	—	—	△	△
13 Simple inclined surface machining command	△	△	△	△	○	○	—	—	—	—
14 3-dimensional tool radius compensation (Tool's vertical-direction compensation)	△*	△*	△*	△*	—	—	—	—	△	△
15 Workpiece installation error compensation	△*	—	△*	—	—	—	—	—	△	—
16 3-dimensional manual feed	△	△	△	△	○	○	—	—	△	△
17 R-Navi	—	—	—	—	—	—	—	—	△	△
20 Real-time tuning										
1 Real-time tuning 1 (speed gain)	△	△	△	△	○	○	—	—	△	△
2 Real-time tuning 2 (rapid traverse time constant)	△	△	△	△	○	○	—	—	△	△
21 Constant torque control	△	△	△	△	○	○	—	—	—	—
22 External encoder position output I/F	○	○	○	○	○	○	○	—	○	○
3 PLC operation										
1 Arbitrary feed in manual mode	○	○	○	○	○	○	○	○	○	○
2 Circular feed in manual mode	△	△	△	△	—	—	—	—	△	△
3 PLC axis control	○	○	○	○	○	○	○	○	○	○
5 PLC axis indexing	○	○	○	○	○	○	○	○	○	○
6 NC axis / PLC axis switchover	△	△	△	△	○	○	○	△	△	△
4 PLC interface										
1 CNC control signal	○	○	○	○	○	○	○	○	○	○
2 CNC status signal	○	○	○	○	○	○	○	○	○	○
3 PLC window	○	○	○	○	○	○	○	○	○	○
4 External search	○	○	○	○	○	○	○	○	○	○
5 Direct Screen Selection	○	○	○	○	○	○	○	○	○	○
6 Buzzer sound control	○	○	○	○	○	○	○	—	○	○

(Note 1) Please contact us to purchase this tool.

Machining center system						General explanation
M800S		M80W	M80		C80	
M850S	M830S	—	M80 TypeA	M80 TypeB	—	
○	○	○	○	○	○(GOT)	On-board refers generically to the PLC related operations carried out with the CNC unit. The Mitsubishi CNC on-board realizes functions and operations similar to the MELSEC Series ladder development tool (GX Developer).
○	○	○	○	○	—	This function enables the data of the PLC contained inside the NC system to be developed and debugged using the GX Developer.
—	—	—	—	—	○	Using GX Works3, the sequence programs of the MELSEC CPU can be developed and debugged.
○	○	○	○	○	○	The PLC constants set with the data type, and the bit selection parameters set with the bit types can be specified on the screen as the parameters to use in the built-in PLC.
○	○	○	○	○	○	
○	○	○	○	○	△(MELSEC)	For connecting a MITSUBISHI Graphic Operation Terminal (GOT), refer to the GOT Catalogs.
—	—	—	—	—	△(MELSEC)	
△	△	—	—	—	—	Pallet program function assists the machining setups as it allows machining programs to be registered for each pallet of the auto pallet changer.
○	○	○	○	○	○	
○	○	○	○	○	○	When the servo OFF signal (per axis) is input, the corresponding axis is set in the servo OFF state. When the moving axis is mechanically clamped, this function is designed to prevent the servo motor from being overloaded by the clamping force.
△	△	○	○	○	△	This function enables the control axis to be released from control.
△	△	○	○	○	—	The synchronous control is a control method whereby both master and slave axes are controlled with the same travel command by designating the travel command for the master axis also to the slave axis. This function is assumed to be used in such equipment as large machine tools, which drive one axis with two servo motors.
○24	○24	○24	○24	○24	○*	Even when the control axes in a machine are mounted at an angle other than 90 degrees, this function enables it to be programmed and controlled in the same way as with an orthogonal axis.
○	○	○	○	○	○	Instead of a dog switch on a machine's axis, a hypothetical dog switch is established using a parameter to set a coordinate position to show the axis name and the hypothetical dog position. When the machine reaches the position, a signal is output to the PLC interface.
△	△	—	—	—	—	* 24 points for each part system and 32 points for the whole PLC axes.
△	△	—	—	—	—	The indexing of the index table can be performed by setting the index axes.
△	△	—	—	—	—	(1) Changing the tool length compensation along the tool axis and compensation amount Even if the tool axis direction is not the Z axis direction because the rotary axis is rotated, the tool can be compensated in the tool axis direction. (2) Machine configuration The tool length compensation along the tool axis is carried out in respect to the direction of the tool nose axis (rotary axis).
△	△	—	—	—	—	* This function is available during program format switch for L system.
△	△	—	—	—	—	This function makes it possible to move the axis with the manual pulse generator in the tool axis direction, tool diameter direction X and tool diameter direction Y in the hypothetical coordinate system over the tool axis.
△	△	○*	○*	—	—	The tool center coordinates, handle interrupt amount (tool axis movement) and tool center point speed are displayed during the tool center point control function, tool length compensation along the tool axis function, and tool handle feed & interrupt function (tool axis direction handle feed, tool handle interrupt, tool diameter direction handle feed, nose center rotation handle feed).
△	△	○	○	—	△	This function controls so that the position command in a machining program is at the tool center point in the coordinate system (table coordinate system) which rotates together with the workpiece.
—	—	—	—	—	—	* Restrained to 4-axis simultaneous contouring for M830/M80W/M80A
△	△	○	○	—	△	An arbitrary spatial plane defined with this function can be machined using normal program commands.
△	△	—	—	—	—	* This includes simple tool center point control.
△	△	—	—	—	—	This function is used when a lathe with the orthogonal axes XYZ and the turret with B axis performs the milling on the inclined surface in the end face direction. This allows the operator to perform cutting on an inclined surface with no need for considering the inclination angle.
△	△	—	—	—	—	This function is to compensate the tool radius of the 5-axis machine with two rotary axes, in accordance with the change of the workpiece direction and inclination of the tool due to the movement of the rotary axis.
△	△	—	—	—	—	* This function is available during program format switch for L system.
△	△	○	○	—	△	This function is used for a 5-axis machine. This compensates the error when a workpiece is placed off the workpiece coordinate system to enable machining according to the program.
△	△	○	○	—	△	* This function is available during program format switch for L system.
△	△	○	○	—	△	By selecting the hypothetical coordinate system to be machined, axis can be moved with manual feed (JOG, HANDLE or INCREMENTAL) in the coordinate system with this function. It can be easy to setup because multiple axis is moved by NC according to the tool angle or the inclination of the table.
△	△	○	○	—	△	This provides easy setup of index machining (multiple/inclined surface machining) using a rotary axis.
△	△	○	○	—	—	
△	△	○	○	—	—	This function estimates the inertia (or workpiece weight) of mechanical system and changes the speed control gain automatically according to the estimation results to suppress mechanical vibration. Users can expect suppression of vibration caused by inertia fluctuation, as well as reduction of machining time through adaptation of appropriate speed control gain.
△	△	○	○	—	—	This function estimates the inertia (or workpiece weight) of mechanical system and optimizes the acceleration/deceleration time constant automatically according to the estimation results. It achieves the cycle time reduction when the inertia of workpiece to machine changes significantly.
—	—	—	—	—	—	The servo motor of the axis designated for [Constant torque control] outputs the torque set by the parameter in a constant direction. The servo motor of the axis designated for [Proportional torque stopper control] generates the torque set by the parameter in the stopper direction.
○	○	○	○	○	—	This function outputs the position (angle) of external encoder to PLC device based on the input pulses from the encoder. This function can be used to monitor the position of angular head which the external encoder is connected to. * Encoder expansion card is required for M800W/M80W
○	○	○	○	○	○	
△	△	—	—	—	—	This function enables the feed directions and feed rates of the control axes to be controlled using commands from the user PLC.
○	○	○	○	○	○	By specifying a hypothetical coordinate on the machine coordinate from the user PLC, oblique linear interpolation or circular interpolation is executed with jog / handle feed, manual rapid traverse or incremental feed of either X axis or Y axis.
○	○	○	○	○	○	This function allows independent axes to be controlled with PLC-based commands, separately from the NC control axes.
○	○	○	○	○	○	PLC axis indexing allows a PLC axis to function as an auxiliary axis with no need for changing the user ladder used conventionally for an auxiliary axis.
△	△	○	○	○	△	By setting positioning points (stations) in advance, positioning control can be performed simply by designating a positioning point No. (station No.).
○	○	○	○	○	○	
○	○	○	○	○	○	Control commands to the CNC system are assigned from the PLC. Input signals with skip inputs that respond at high speed can also be used.
○	○	○	○	○	○	The status signals are output from the CNC system. They can be utilized by referencing them from the PLC.
○	○	○	○	○	○	[M800/M80] This function uses the "read window" or "write window" assigned to the R register's user area to read and write the CNC operation status, axis information, parameters and tool data, etc.
○	○	○	○	○	○	[C80] This function uses the "read window" or "write window" to read and write the CNC operation status, axis information, parameters and tool data, etc.
○	○	○	○	○	○	This function enables searching of the program to automatically start from the PLC. The program No., block No. and sequence No. can be designated. In addition, the details of the search in progress can be read.
○	○	○	○	○	○	This signal allows an automatic transition to the alarm display screen when an alarm occurs.
○	○	○	○	○	—	This function gives a buzzer mounted on the NC keyboard by operating the PLC device. This is effective in applications of sounding a buzzer such as during the alarm occurrence, or for the program operation end notification.

○Standard △Optional □Selection Specifications of separated-type display are classified with "Windows-based" and "Windows-less"

[M800/M80]S/W ver.C7 [C80]S/W ver.A2

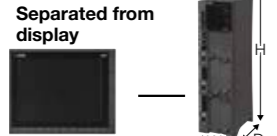
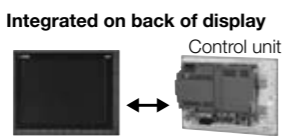



class	Lathe system								Machining center system	
	M800W		M800S		M80W	M80		C80	M800W	
	M850W	M830W	M850S	M830S	—	M80 TypeA	M80 TypeB	—	M850W	M830W
5 Machine contact I/O										
1 Operation Panel I/O										
1	□/—	□/—	—	—	□/—	—	—	—	□/—	□/—
2	□/—	□/—	—	—	□/—	—	—	—	□/—	□/—
3	—/□	—/□	□	□	—/□	□	□	—	—/□	—/□
2 Remote I/O										
1	□	□	□	□	□	□	□	—	□	□
2	□	□	□	□	□	□	□	—	□	□
3	□	□	□	□	□	□	□	—	□	□
5	□	□	□	□	□	□	□	—	□	□
6	□	□	□	□	□	□	□	—	□	□
7	□	□	□	□	□	□	□	—	□	□
6 External PLC link										
1	□	□	□	□	□	□	□	△ (MELSEC)	□	□
2	□	□	□	□	□	□	□	—	□	□
3	—	—	—	—	—	—	—	△ (MELSEC)	—	—
7 Installing S/W for machine tools										
1 Customization(NC Designer2) (Note 1)										
1	□	□	□	□	□	□	□	—	□	□
2	6	6	6	6	3	3	3	—	6	6
2 User-defined key										
1	○	○	○	○	○	○	○	—	○	○
3 EZSocket I/F (Note 1)										
1	△	△	△	△	○	○	○	△	△	△
4 APLC release (Note 1)										
1	○	○	○	○	○	○	○	—	○	○
5 Custom API library										
1	△	△	△	△	○	○	○	—	△	△
6 MES interface library										
1	○	○	○	○	○	○	○	—	○	○
7 SLMP Server										
1	○	○	○	○	○	○	○	—	○	○
8 Mitsubishi CNC communication software FCSB1224W000 (Note 1)										
1	○	○	○	○	○	○	○	—	○	○
10 GOT2000 screen design tool GT Works3										
1	—	—	—	—	—	—	—	○	—	—
8 Others										
1 System lock										
1	△	△	△	△	○	○	○	—	△	△
2 CNC remote operation tool										
1 NC Monitor2 (Note 1)										
1	○	○	○	○	○	○	○	○	○	○
2 NC Explorer (Note 3)										
1	○	○	○	○	○	○	○	○	○	○
3 Automatic operation lock										
1	○	○	○	○	○	○	○	○	○	○
4 Power consumption computation										
1	○	○	○	○	○	○	○	○	○	○
5 EcoMonitorLight connection										
1	○	○	○	○	○	○	○	—	○	○
6 GOT Window										
1	—	—	—	—	—	—	—	○	—	—
7 Log Viewer										
1	—	—	—	—	—	—	—	○	—	—

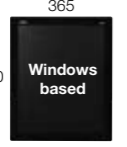
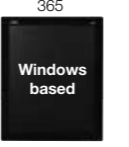
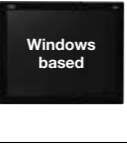
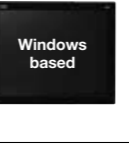


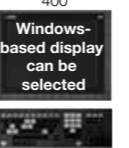

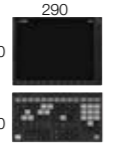



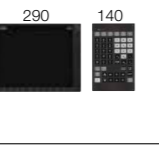
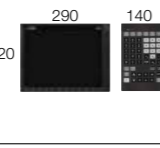

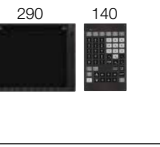








(Note 1) Please contact us to purchase this tool.
 (Note 3) This tool is free of charge. Please contact us.

Machining center system						General explanation
M800S		M80W	M80		C80	
M850S	M830S	—	M80 TypeA	M80 TypeB	—	
—	—	□/—	—	—	—	Some types of signals can be input/output from the operation panel I/O unit according to the type and No. of contacts.
—	—	□/—	—	—	—	
□	□	—/□	□	□	—	
□	□	—/□	□	□	—	
□	□	□	□	□	—	The remote I/O unit equipped with the maximum number of DI/DO points is the one with 64 points for DI and 48 points for DO. Multiple remote I/O units can be used as long as the total number of occupied stations is 64 or less. * Safety card is required for M80 when using "DI:32/DO:32+SDI:8/SDO:4" or "SDI:8/SDO:4".
□	□	□	□	□	—	
□	□	□	□	□	—	
□	□	□	□	□	—	
□	□	□	□	□	—	
□	□	□	□	□	—	
□	□	□	□	□	—	
□	□	□	□	□	—	[M800/M80] NC unit can be directly connected to the network to serve as the master/local station of the MELSEC CC-Link. [C80] Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance. NC can input / output devices to / from slave stations as a master station of PROFIBUS-DP communication by connecting to PROFIBUS-DP-capable slave stations. Refer to manuals of each unit of MITSUBISHI Programmable Controller "MELSEC iQ-R series" for information on the function and the performance.
□	□	□	□	□	△ (MELSEC)	
□	□	□	□	□	—	
—	—	—	—	—	△ (MELSEC)	
○	○	○	○	○	—	It is an optional function that allows a user-created screen or window to be displayed as an HMI screen or another application on the screen. * Capacity depends on memory space for M800W/M80W
6	6	□	6	6	—	
6	6	3	3	3	—	
○	○	○	○	○	—	This function allows an arbitrary character string to be assigned to a key and makes it easy to input a typical character string.
○	○	○	○	○	△	This middleware makes it easy to develop applications having the Windows interface.
△	△	○	○	○	△	APLC (Advanced Programmable Logic Controller) release is a function that allows the user-generated C language module to be called from the NC. Control operations that are difficult to express in a sequence program can be created with the C language.
○	○	○	○	○	—	This function is designed to interface an NC with an application developed by a user. You can set and refer the data for NC using this function. * Please contact us for details.
△	△	○	○	○	—	The MES interface library function links the NC internal data and the database of information system (manufacturing execution system) without a communication gateway.
○	○	○	○	○	—	Transfers data using the SLMP between an NC and an external device. This function enables easy connection with external devices and read/write NC data through the Ethernet cable.
○	○	○	○	○	—	The software designed to help development of an application with Windows interface for Mitsubishi computerized numerical controller. The product can accelerate development by using OLE interface common to computerized numerical controller without knowing internal processing of the machine.
—	—	—	—	—	○	This integrated software is used to create professional screen designs for GOTs.
△	△	○	○	○	—	This function locks the operations of the NC if the release code is not entered before the specified time limit.
○	○	○	○	○	○	NC Monitor2 is a PC software tool that monitors information in the NC unit connected with the Ethernet.
○	○	○	○	○	○	NC Explorer is a software tool to operate the machining data files of each NC unit connected with a host personal computer by Ethernet connection from the Explorer on the host personal computer.
○	○	○	○	○	○	Automatic operation lock function prevents the falsification of APLC (C language module) by a third party.
○	○	○	○	○	○	Present power consumption and accumulated power consumption can be acquired with this function. The present power consumption notifies the instantaneous power consumption and the accumulated power consumption notifies the integrated value of the present power consumption.
○	○	○	○	○	—	NC system can collect and manage the electric power of the machine tool which is measured by the energy measuring unit "EcoMonitorLight (sold separately)".
—	—	—	—	—	○	This is the interface to display the variety of NC data on GOT connected to the CNC CPU. This reads out the running machining program No., the running machining program and the coordinate values, etc. by the device read command.
—	—	—	—	—	○	This function enables the recorded data by the data sampling function of the NC to display with a graph on the GOT, and to store the data as a file.

CNC SYSTEM HARDWARE

[mm]

Control unit		Machine operation panel	
M800W/M80W Series (Separated-type) Separated from display  M800W : 90×180×380(W×D×H) M80W : 60×180×380(W×D×H)	M800S/M80 Series (Integrated-type) Integrated on back of display 	FCU8-KB921 FCU8-KB923 Key switch: 55 points, LED: 55 points MITSUBISHI standard key layout	KB921/922: 260 KB923/924: 290 
		FCU8-KB922 FCU8-KB924 Key switch: 55 points, LED: 55 points Custom specification key layout	140 
		FCU8-KB931 Rotary switch (Spindle override, cutting override) Selective switch (memory protection) Emergency stop button	140 

Display	Keyboard	M800W Series	M800S Series	M80W Series	M80 Series
19-type Touchscreen	—	365 440 	—	365 440 	—
19-type, horizontal Touchscreen	—	440 365 	—	440 365 	—
15-type Touchscreen	FCU8-KB083 Clear key Full keyboard	400 320 140 Windows-based display can be selected 	400 320 140 	400 320 140 Windows-based display can be selected 	400 320 140 
10.4-type Touchscreen	FCU8-KB047 Clear key Full keyboard	290 220 160 	290 220 160 	290 220 160 	290 220 160 
10.4-type Touchscreen	FCU8-KB041 Clear key ONG(XZF) layout for L system FCU8-KB046 Clear key ONG(XYZ) layout	290 140 220 	290 140 220 	290 140 220 	290 140 220 
10.4-type Touchscreen	FCU8-KB048 Clear key ABC layout	290 230 220 	290 230 220 	290 230 220 	290 230 220 
8.4-type	FCU8-KB026 Clear key ONG(XYZ) layout FCU8-KB028 Clear key ONG(XYZ) layout	—	—	260 140 200 	260 140 200 
8.4-type	FCU8-KB029 Clear key ONG layout	—	—	260 140 200 	260 140 200 

CNC SYSTEM CONTROL UNIT/DISPLAY UNIT

[M800/M80 Series]

■Display unit/control unit separated-type

CNC System

Series	Model name	System type	NC control unit
M800W Series	M850W	FCA850U	FCU8-MA041-001
	M830W	FCA830U	FCU8-MU042-001
M80W Series	M80W	FCA80U	FCU8-MU044-001

CNC System

Classification	Type	Remarks	Supported Series	
			M800	M80W
Windows-based display unit	19-type vertical color LCD touchscreen	FCU8-DU191-75	○	—
		FCU8-DU191-77	—	○
	19-type horizontal color LCD touchscreen	FCU8-DU192-75	○	—
		FCU8-DU192-77	—	○
Windows-less display unit	15-type color LCD touchscreen	FCU8-DU181-34	○	—
		FCU8-DU181-36	—	○
	10.4-type color LCD touchscreen	FCU8-DU141-31	○	—
		FCU8-DU141-32	—	○
8.4-type color LCD	FCU8-DU121-12	—	○	

■Display unit/control unit integrated-type

Series	Model name	System type	NC control unit	Display unit
M800S Series	M850S	FCA850H-8S	FCU8-MA542-001	FCU8-DU181-31 (15-type color LCD touchscreen)
		FCA850H-4S		FCU8-DU141-31 (10.4-type color LCD touchscreen)
	M830S	FCA830H-8S	FCU8-MU542-001	FCU8-DU181-31 (15-type color LCD touchscreen)
		FCA830H-4S		FCU8-DU141-31 (10.4-type color LCD touchscreen)
M80 Series	M80 TypeA	FCA80H-8A	FCU8-MU512-001	FCU8-DU181-32 (15-type color LCD touchscreen)
		FCA80H-4A		FCU8-DU141-32 (10.4-type color LCD touchscreen)
		FCA80P-2A		FCU8-DU121-12 (8.4-type color LCD)
	M80 TypeB	FCA80H-8B	FCU8-MU511-001	FCU8-DU181-32 (15-type color LCD touchscreen)
		FCA80H-4B		FCU8-DU141-32 (10.4-type color LCD touchscreen)
		FCA80P-2B		FCU8-DU121-12 (8.4-type color LCD)

[C80 Series]

■CNC-CPU unit

Product	Model	Remarks
CNC control module	R16NCCPU	

■GOT2000 related unit

SD card

Product	Model	Model code	Remarks
SD card	NZ1MEM-2GBSD	1WC535	2GB SD memory card for GOT

GT27 Model

Product	Model	Model code	Remarks	
GT27 Model	GT2712	GT2712-STBA	1EA780	12.1" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) AC100-240V User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2712-STBD	1EA781	12.1" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2710	GT2710-STBA	1EA770	10.4" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) AC100-240V User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2710-STBD	1EA771	10.4" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2708	GT2708-STBA	1EA740	8.4" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) AC100-240V User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2708-STBD	1EA741	8.4" SVGA [800×600 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2710	GT2710-VTBA	1EA760	10.4" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) AC100-240V User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2710-VTBD	1EA761	10.4" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2708	GT2708-VTBA	1EA730	8.4" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) AC100-240V User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2708-VTBD	1EA731	8.4" VGA [640×480 dots] TFT color LCD 65536 colors (Multimedia & Video / RGB compliant Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 57MB, Memory for operation (RAM): 128MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2705	GT2705-VTBD	1EA721	5.7" VGA [640×480 dots] TFT color LCD 65536 colors (Multi-touch compliant) 24VDC User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	Protective sheet	GT25-12PSCC	1EK307	For 12.1" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
		GT25-10PSCC	1EK304	For 10.4" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
		GT25-08PSCC	1EK301	For 8.4" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.
GT25-05PSCC		1EK316	For 5.7" Clear type, Transparent, With a hole for the USB environmental protection cover, A set of 5 sheets.	

GT25 Model

Product	Model	Model code	Remarks	
GT25 Model	GT2512	GT2512-STBA	1EA580	12.1" SVGA [800×600 dots] TFT color LCD 65536 colors AC100-240V, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
		GT2512-STBD	1EA581	12.1" SVGA [800×600 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.155M or later is required.
	GT2510	GT2510-VTBA	1EA560	10.4" VGA [640×480 dots] TFT color LCD 65536 colors AC100-240V, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2510-VTBD	1EA561	10.4" VGA [640×480 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
	GT2508	GT2508-VTBA	1EA530	8.4" VGA [640×480 dots] TFT color LCD 65536 colors AC100-240V, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.
		GT2508-VTBD	1EA531	8.4" VGA [640×480 dots] TFT color LCD 65536 colors 24VDC, User memory Memory for storage (ROM): 32MB, Memory for operation (RAM): 80MB GT Designer3 Version1 (GOT2000) 1.165X or later is required.

CNC SYSTEM I/O UNIT AND OTHERS

[M800/M80 Series]

■List of Units

Classification	Type	Remarks	Supported Series			
			M800W	M800S	M80W	M80
[Operation Panel I/O Unit]						
DI 24V/0V common input	DO Source output	FCU8-DX830	DI: 64-points 24V/0V common type, DO: 64-points source type, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1 to 4 and 7 to 14, RIO extensible stations: 5, 6, 15 to 64 (For Windows-based display unit)			
		FCU8-DX730	DI: 64-points 24V/0V common type, DO: 64-points source type, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1, 2 and 7 to 12, RIO extensible stations: 3 to 6 and 15 to 64 (For Windows-less display unit)			
		FCU8-DX750	DI: 96-points 24V/0V common type, DO: 64-points source type, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1 to 3 and 7 to 12, RIO extensible stations: 4 to 6 and 13 to 64			
		FCU8-DX760	DI: 96-points 24V/0V common type, DO: 96-points source type, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1 to 4 and 7 to 12, RIO extensible stations: 5, 6 and 13 to 64			
DI 24V/0V common input Safety DI 24V/0V common input	DO Source output	FCU8-DX837	DI: 64-points 24V/0V common type, DO: 64-points source type, Safety DI: 8-points 0V common type, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1 to 4 and 7 to 14, RIO extensible stations: 5, 6 and 15 to 64 (For Windows-based display unit)			
DI 24V/0V common input AI analog input	DO Source output AO Analog output	FCU8-DX761	DI: 96-points 24V/0V common type, DO: 64-points source type, AI: 1 point, AO: 1 point, Manual pulse generator input: 3ch, Remote I/O 2.0 I/F, RIO occupied stations (fixed): 1 to 5 and 7 to 12, RIO extensible stations: 6 and 13 to 64			
[Remote I/O Unit]						
DI 24V/0V common input	DO Source output	FCU8-DX220	DI: 32-points 24V/0V common type, DO: 32-points source type, Number of occupied stations: 1			
		FCU8-DX230	DI: 64-points 24V/0V common type, DO: 48-points source type, Number of occupied stations: 2			
DI 24V/0V common input	DO Source output AO Analog output	FCU8-DX231	DI: 64-points 24V/0V common type, DO: 48-points source type, AO: 1 point, Number of occupied stations: 2			
AI analog input	AO Analog output	FCU8-DX202	AI: 4 points, AO: 1 point, Number of occupied stations: 1			
DI 0V common input (large capacity)	DO Source output (large capacity)	FCU8-DX213	DI: 16-points 0V common type (3mA/point), DO: 8-points source type (2A/point), Number of occupied stations: 1			
		FCU8-DX213-1	DI: 16-points 0V common type (9mA/point), DO: 8-points source type (2A/point), Number of occupied stations: 1			
Thermistor input (12 points)		FCU8-DX408	Thermistor input: 12 points, Number of occupied stations: 3			
Safety DI 0V common input	Safety DO Source output (large capacity)	FCU8-DX654	Safety DI: 8-points 0V common type (3mA/point), Safety DO: 4-points source type (2A/point), Number of occupied stations: 2			
		FCU8-DX654-1	Safety DI: 8-points 0V common type (9mA/point), Safety DO: 4-points source type (2A/point), Number of occupied stations: 2			
DI 24V/0V common input Safety DI 0V common input	DO Source output Safety relay output	FCU8-DX651	DI: 32-points 24V/0V common type, DO: 32-points source type, Safety DI: 8-points 0V common type, Safety relay: 4-points (non-voltage contact), Relay contact welding detection, Number of occupied stations: 3			
[Function Expansion Unit]						
Encoder (manual pulse generator) I/F expansion unit		FCU8-EX544	Encoder input 1ch, 5V manual pulse generator input 2ch			
Functional safety expansion unit		FCU8-EX133	Smart Safety observation			
[Communication Expansion Unit]						
CC-Link expansion unit		FCU8-EX561	CC-Link 1ch			
PROFIBUS-DP master unit		FCU8-EX563	PROFIBUS-DP 1ch			
EtherNet/IP scanner/adaptor unit		FCU8-EX565	EtherNet/IP 1ch (Only LAN1, LAN2 cannot be used)			
Option relay unit		FCU8-EX702	For communication expansion unit 1ch (*1)			
		FCU8-EX703	For communication expansion unit 2ch (*1)			
[Side Memory I/F Unit]						
Side memory I/F Unit		FCU8-EP201-2	SDHC 1ch, USB2.0 1ch, USB communication (between side memory I/F PCB and personal computer), Unit lid (resin molded article), metal plate, etc. Exclusive for 19-type display unit			
[Manual Pulse Generator]						
5V Manual pulse generator		UFO-01-229	Input 5VDC, 100pulse/rev			
12V Manual pulse generator		HD60C	Input 12VDC, 25 pulse/rev			
[Encoder]						
Synchronous feed encoder		OSE1024-3-15-68	Input 5VDC, 1024 pulse/rev, 6000r/min, 68-square flange			
		OSE1024-3-15-68-8	Input 5VDC, 1024 pulse/rev, 8000r/min, 68-square flange			
		OSE1024-3-15-160	Input 5VDC, 1024 pulse/rev, 6000r/min, 160-square flange			
[Handy Terminal]						
Handy terminal		HG17SB12UHM1346-L5				
[Thermistor Sets]						
Thermistor		PT3C-51F-M2 10P				
[Genuine Memory Card]						
Exclusive SD cards for MITSUBISHI CNC 1GB		FCU8-SD001G	1GB capacity			
Exclusive SD cards for MITSUBISHI CNC 4GB		FCU8-SD004G	4GB capacity			
DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals						
(*1) This is required when communication expansion unit is used in M800S/M80 series.						

[C80 Series]

MELSEC iQ-R Series modules

Product	Model	Model code	Remarks	
PLC CPU	R04CPU	1FMA00	Program capacity, 40K steps; basic operation processing speed (LD instruction), 0.98 ns	
	R08CPU	1FMA01	Program capacity, 80K steps; basic operation processing speed (LD instruction), 0.98 ns	
	R16CPU	1FMA02	Program capacity, 160K steps; basic operation processing speed (LD instruction), 0.98 ns	
	R32CPU	1FMA03	Program capacity, 320K steps; basic operation processing speed (LD instruction), 0.98 ns	
	R120CPU	1FMA04	Program capacity, 1200K steps; basic operation processing speed (LD instruction), 0.98 ns	
SD memory card	NZ1MEM-2GBSD	1WC535	SD memory card, 2G bytes	
Extended SRAM cassette	NZ2MC-1MBS	1FMB00	1M bytes	
	R35B	1FME00	5 slots, for MELSEC iQ-R Series modules	
	R38B	1FME01	8 slots, for MELSEC iQ-R Series modules	
Main base	R312B	1FME02	12 slots, for MELSEC iQ-R Series modules	
	R65B	1FME07	5 slots, for MELSEC iQ-R Series modules	
	R68B	1FME06	8 slots, for MELSEC iQ-R Series modules	
Extension base	R612B	1FME05	12 slots, for MELSEC iQ-R Series modules	
	RQ65B	1FME08	5 slots, for MELSEC-Q Series modules	
	RQ68B	1FME03	8 slots, for MELSEC-Q Series modules	
RQ extension base	RQ612B	1FME04	12 slots, for MELSEC-Q Series modules	
	RC06B	1FM001	0.6 m cable for extension and RQ extension base units	
	RC12B	1FM002	1.2 m cable for extension and RQ extension base units	
Extension cable	RC30B	1FM003	3 m cable for extension and RQ extension base units	
	RC50B	1FM004	5 m cable for extension and RQ extension base units	
	R61P	1FMC00	AC power supply; input, 100 to 240 V AC; output, 5 V DC/6.5 A	
	R62P	1FMC02	AC power supply; input, 100 to 240 V AC; output, 5 V DC/3.5 A, 24 V DC/0.6 A	
Power supply	R63P	1FMC01	DC power supply; input, 24 V DC; output, 5 V DC/6.5 A	
	R64P	1FMC03	AC power supply; input, 100 to 240 V AC; output, 5 V DC/9 A	
	Input	AC	RX10	1FM103 AC input, 16 points; 100...120 V AC (50/60 Hz)
DC(Positive Common/Negative Common Shared Type)		RX40C7	1FM100	DC input, 16 points; 24 V DC, 7.0 mA
		RX41C4	1FM101	DC input, 32 points; 24 V DC, 4.0 mA
		RX42C4	1FM102	DC input, 64 points; 24 V DC, 4.0 mA
Relay		RY10R2	1FM153	Relay output, 16 points; 24 V DC/2 A, 240 V AC/2 A
Output	Transistor (Sink)	RY40NT5P	1FM150	Transistor (sink) output, 16 points; 12 to 24 V DC, 0.5 A
		RY41NT2P	1FM151	Transistor (sink) output, 32 points; 12 to 24 V DC, 0.2 A
		RY42NT2P	1FM152	Transistor (sink) output, 64 points; 12 to 24 V DC, 0.2 A
	Transistor (Source)	RY40PT5P	1FM154	Transistor (source) output, 16 points; 12 to 24 V DC, 0.5 A
		RY41PT1P	1FM155	Transistor (source) output, 32 points; 12 to 24 V DC, 0.1 A
I/O combined	DC input/transistor output	RY42PT1P	1FM156	Transistor (source) output, 64 points; 12 to 24 V DC, 0.1 A
		RH42C4NT2P	1FM200	DC input, 32 points; 24 V DC, 4.0 mA Transistor (sink) output, 32 points; 12 to 24 V DC, 0.2 A
Connector	A6CON1	13L101	Soldering 32 point-connector (40-pin connector)	
	A6CON2	13L102	Solderless terminal connection 32 point-connector (40-pin connector)	
	A6CON3	13L103	Flat-cable pressure displacement 32 point-connector (40-pin connector)	
	A6CON4	13L124	Soldering 32 point-connector (40-pin connector, bidirectional cable mountable)	
	A6CON4	13L124	Soldering 32 point-connector (40-pin connector, bidirectional cable mountable)	
Spring clamp terminal block	Q6TE-18SN	1W4299	For 16-point I/O modules, 0.3...1.5 mm ² (22...16 AWG)	
Connector/terminal block conversion module	A6TBX70	13L112	For positive common input modules (3-wire type)	
	A6TBXY36	13L106	For positive common input modules and sink output modules (standard type)	
	A6TBXY54	13L109	For positive common input modules and sink output modules (2-wire type)	
Connector/terminal block conversion module	cable	AC05TB	13L006	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 0.5 m
		AC10TB	13L007	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 1 m
		AC20TB	13L008	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 2 m
		AC30TB	13L009	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 3 m
		AC50TB	13L010	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 5 m
		AC80TB	13L026	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 8 m *Common current 0.5 A or lower
		AC100TB	13L027	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 10 m *Common current 0.5 A or lower
		AC100TB	13L027	For A6TBXY36, A6TBXY54, and A6TBX70 (positive common/sink type), 10 m *Common current 0.5 A or lower
Relay terminal module	A6TE2-16SRN	13L131	For 40-pin connector 24 V DC transistor output modules (sink type)	
Relay terminal module	cable	AC06TE	13L021	For A6TE2-16SRN, 0.6 m
		AC10TE	13L022	For A6TE2-16SRN, 1 m
		AC30TE	13L023	For A6TE2-16SRN, 3 m
		AC50TE	13L024	For A6TE2-16SRN, 5 m
		AC100TE	13L025	For A6TE2-16SRN, 10 m
Analog input	Voltage input	R60ADV8	1FM503	8 channels for voltage inputs -10...10 V DC, -32000...32000; 80 μs/CH
	Current input	R60ADI8	1FM504	8 channels for current inputs 0...20 mA DC/0...32000; 80 μs/CH
	Voltage/current input	R60AD4	1FM501	4 channels for voltage/current inputs -10...10 V DC, -32000...32000; 0...20 mA DC, 0...32000; 80 μs/CH
Analog output	Voltage output	R60DAV8	1FM505	8 channels for voltage outputs -32000...32000, -10...10 V DC; 80 μs/CH
	Current output	R60DAI8	1FM506	8 channels for current outputs 0...32000, 0...20 mA DC; 80 μs/CH
	Voltage/current output	R60DA4	1FM502	4 channels for voltage/current outputs -32000...32000, -10...10 V DC; 0...32000, 0...20 mA DC; 80 μs/CH
Temperature control	Platinum temperature-measuring resistor	R60TCRT4	1FY40E	RTD (Pt100, JPt100), 4 channels for input
		R60TCRT4BW	1FY40F	RTD (Pt100, JPt100), 4 channels for input, heater disconnection detection
	Thermocouple	R60TCRT2T2	1FY40C	Thermocouple (B, R, S, K, E, J, T, N, U, L, PL@, W5Re/W26Re), 4 channels for input (2 channels can also be used for RTD input)
		R60TCRT2T2BW	1FY40D	Thermocouple (B, R, S, K, E, J, T, N, U, L, PL@, W5Re/W26Re), 4 channels for input (2 channels can also be used for RTD input), heater disconnection detection

Product	Model	Model code	Remarks	
High-speed counter	RD62P2	1FM50B	5/12/24 V DC input, 2 channels; counting speed, max. 200k pulse/s; external output, transistor (sink type)	
	RD62D2	1FM50C	Differential input, 2 channels; max. counting speed, 8M pulse/s; external output, transistor (sink type)	
	RD62P2E	1FM50D	5/12/24 V DC input, 2 channels; counting speed, max. 200k pulse/s; external output, transistor (source type)	
Ethernet	RJ71EN71	1FM601	1 Gbps/100 Mbps/10 Mbps, 2 ports Multi-network connectivity (Ethernet/CC-Link IE)	
Serial communication	RJ71C24	1FM604	Max. 230.4 kbps; RS-232, 1 channel; RS-422/485, 1 channel	
	RJ71C24-R2	1FM605	Max. 230.4 kbps; RS-232, 2 channels	
	RJ71C24-R4	1FM606	Max. 230.4 kbps; RS-422/485, 2 channels	
MES Interface	RD81MES96	1FTD00	1000BASE-T/100BASE-TX/10BASE-T Database connection (MX MESInterface-R is required)	
CC-Link IE Control	RJ71GP21-SX	1FM602	1 Gbps, fiber-optic cable, control/normal station	
CC-Link IE Field	RJ71GF11-T2	1FM600	1 Gbps, master/local station	
CC-Link	RJ61BT11	1FM603	Max. 10 Mbps, master/local station, CC-Link Ver.2 supported	
CC-Link Remote I/O module	Screw terminal block type	AJ65SBTB1-32D	1W5141	Input 32 points: 24VDC (positive/negative common shared) 1-wire type Terminal block type Response time 1.5ms
		AJ65SBTB1-32TE1	1W5452	Output 32 points: 12/24VDC (0.5A) Transistor output (source type) 1-wire type Terminal block type
	Waterproof connector type	AJ65FBTA4-16DE	1W5108	Input 24VDC (negative common) 4-wire type Thin, waterproof type Response time 1.5ms
		AJ65FBTA2-16TE	1W5103	Output 16 points: 12/24VDC (1.0A) Transistor output (source type) 2-wire type Thin, waterproof type

MELSEC Q Series modules

Product	Model	Model code	Remarks	
Extension base	Q63B	1W4E07	3 slots, 1 power supply module required, for Q Series modules	
	Q65B	1W4E03	5 slots, 1 power supply module required, for Q Series modules	
	Q68B	1W4E04	8 slots, 1 power supply module required, for Q Series modules	
	Q612B	1W4E05	12 slots, 1 power supply module required, for Q Series modules	
	Q52B	1W4E14	2 slots, power supply module not required, for Q Series modules	
Extension cable	Q55B	1W4E15	5 slots, power supply module not required, for Q Series modules	
	QC05B	1W4006	0.45 m cable for connecting extension base unit	
	QC06B	1W4000	0.6 m cable for connecting extension base unit	
	QC12B	1W4001	1.2 m cable for connecting extension base unit	
	QC30B	1W4002	3m cable for connecting extension base unit	
Power supply	QC50B	1W4003	5m cable for connecting extension base unit	
	QC100B	1W4004	10m cable for connecting extension base unit	
	Q61P	1W4C11	Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 6A	
	Q63P	1W4C02	Input voltage: 24 V DC, output voltage: 5 V DC, output current: 6A	
Output	Transistor (Independent)	Q64PN	1W4C12	Input voltage: 100...240 V AC, output voltage: 5 V DC, output current: 8.5A
		QY68A	1W4310	8 points, 5...24 V DC, 2 A/point, 8 A/module, response time: 10 ms, sink/source type, 18-point terminal block, with surge suppression, all points independent
Analog output	Voltage/current output	Q62DA-FG	1W4571	2 channels, input (resolution): 0...12000, -12000...12000, -16000...16000, output: -12...12 V DC, 0...22 mA DC, conversion speed: 10 ms/2 channels, 18-point terminal block, channel isolated
MELSECNET/H	Optical loop (SI)	QJ71LP21-25	1W4516	SI/QSI/H-PCF/broadband H-PCF fiber optic cable, dual loop, control network (control/normal station) or remote I/O network (remote mater station)
	Coaxial bus	QJ71BR11	1W4511	3C-2V/5C-2V coaxial cable, single bus, control network (control/normal station) or remote I/O network (remote master station)
FL-net(OPCN-2)	Ver.2.00	QJ71FL71-FF01	1W4593	10BASE-T, 100BASE-TX
AS-I		QJ71AS92	1W4524	Master station, AS-Interface Specification Version 2.11 compatible
DeviceNet		QJ71DN91	1W4518	Master station/local station combined use, for QCPU, DeviceNet(Release2.0) compatible. At the time of making Arrangement doc, please issue a Juchu-Shinsei sheet.

Peripheral unit

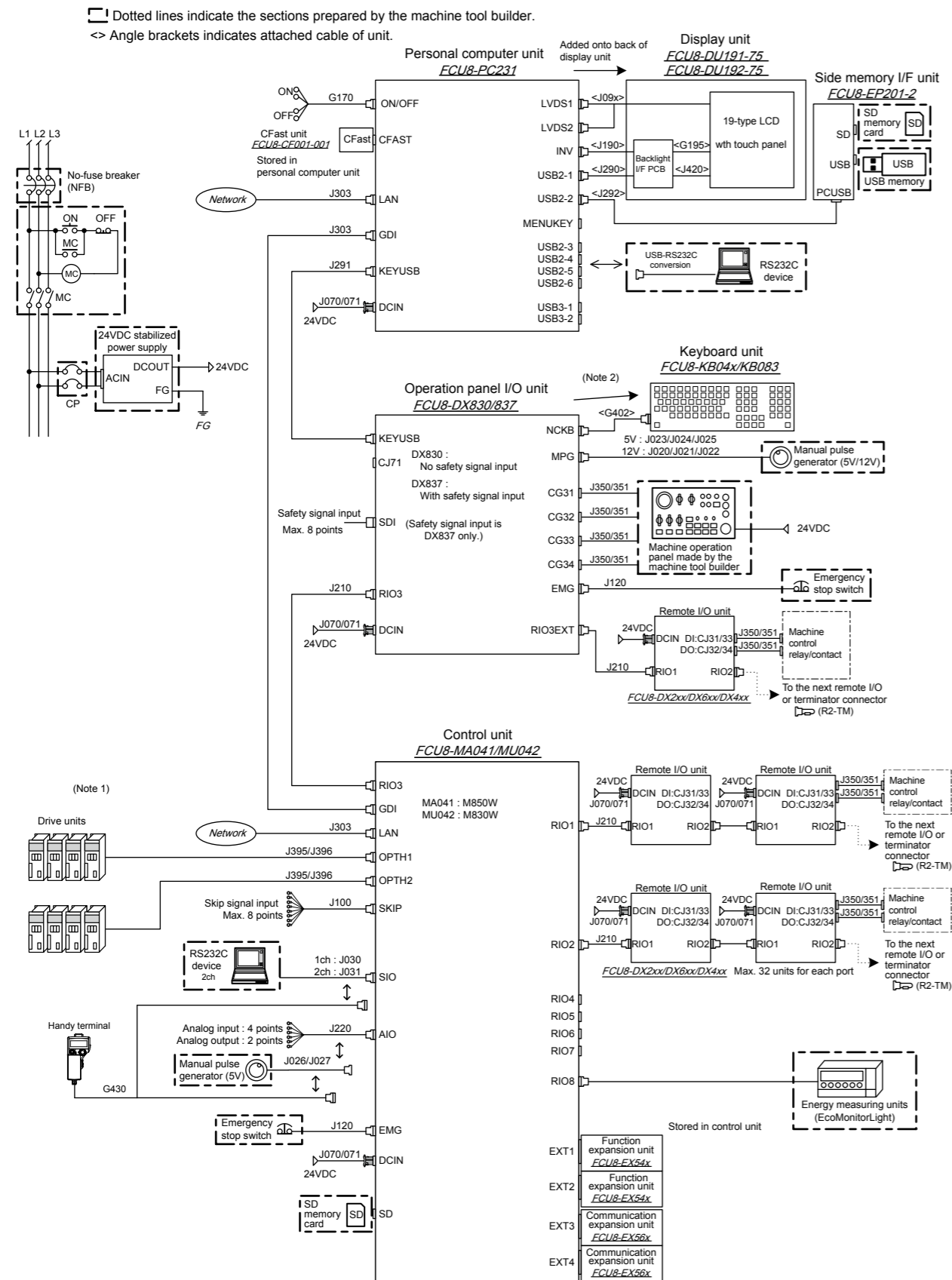
Product	Model	Remarks	
Dual signal module	Dual-signal modules	R173SXY	I/O redundant monitoring module (Up to three modules)
	Terminal block	FA-TBS40P	Terminal block conversion (separately prepared: Mitsubishi Electric Engineering) UL supported
	Terminal block	FA-LTB40P	Terminal block conversion (separately prepared: Mitsubishi Electric Engineering)
	Cable	FA-CBL□□FMV-M	Terminal block conversion connection cable (length □□= 05: 0.5m, 10: 1m, 20: 2m, 30: 3m, 50: 5m) (separately prepared: Mitsubishi Electric Engineering)
Signal splitter	FCU7-HN387	Option (Necessary when manual pulse generator is used for two or three axes)	

Parts

Product	Model	Remarks
Manual pulse generator	UFO-01-Z29	5V specification
	HD60C	12V specification, for the operation board signal splitter connection, 12V power supply separately necessary
Encoder	OSE 1024-3-15-68	6000 r/min, no straight type connector enclosed, new JIS key, 68 square flange
	OSE 1024-3-15-68-8	8000 r/min, no straight type connector enclosed, 68 square flange
	OSE 1024-3-15-160	6000 r/min, no straight type connector enclosed, new JIS key, 160 square flange
Grounding plate	Grounding plate D	With cable clamp A(2)
	Grounding plate E	With cable clamp B(1)

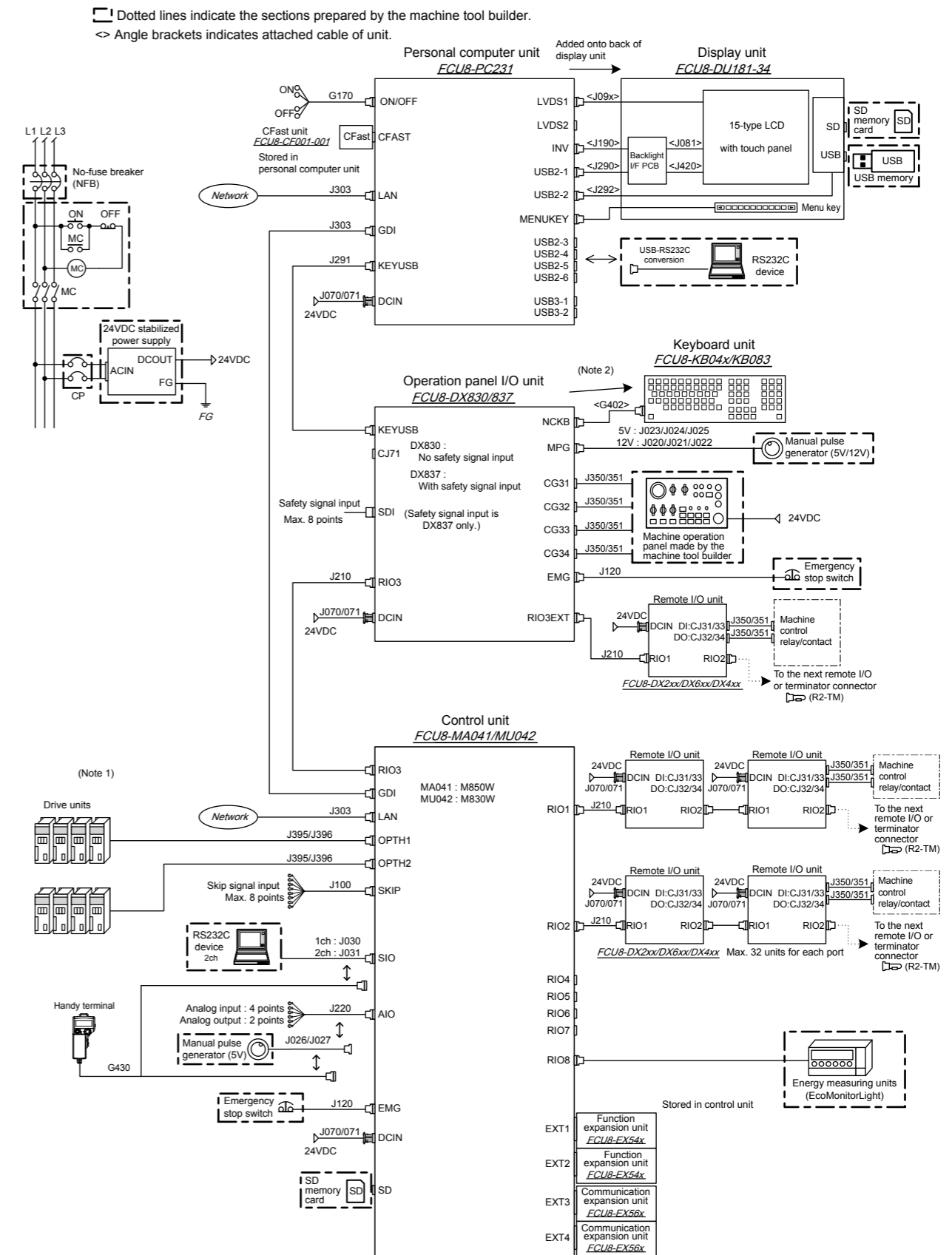
CNC SYSTEM GENERAL CONNECTION DIAGRAM

M800W Series Windows-based display unit (19-type)



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit. When not using a keyboard unit, install the operation panel I/O unit on the back of the display unit.

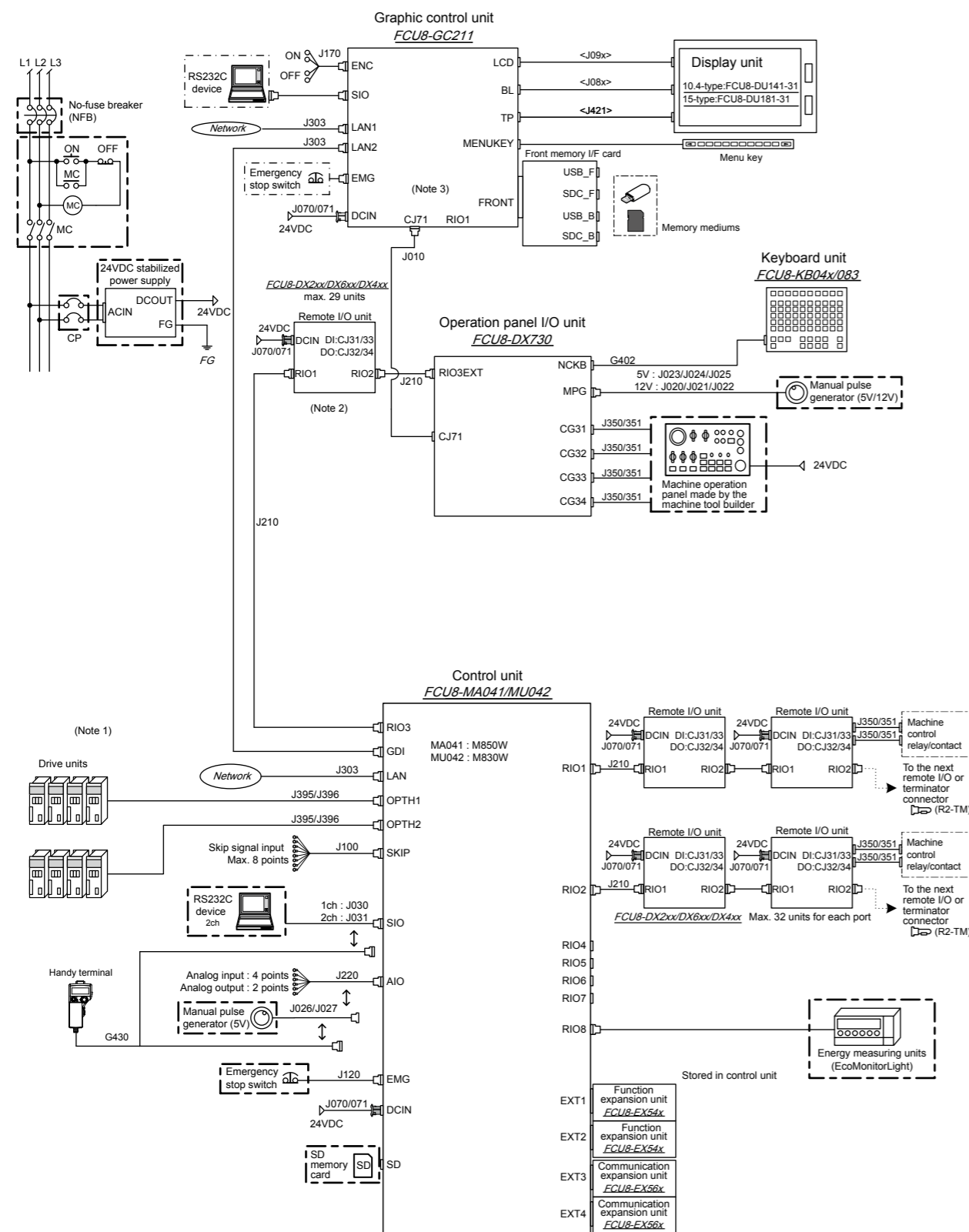
M800W Series Windows-based display unit (15-type)



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit.

■ M800W Series Windows-less display unit (10.4-type/15-type)

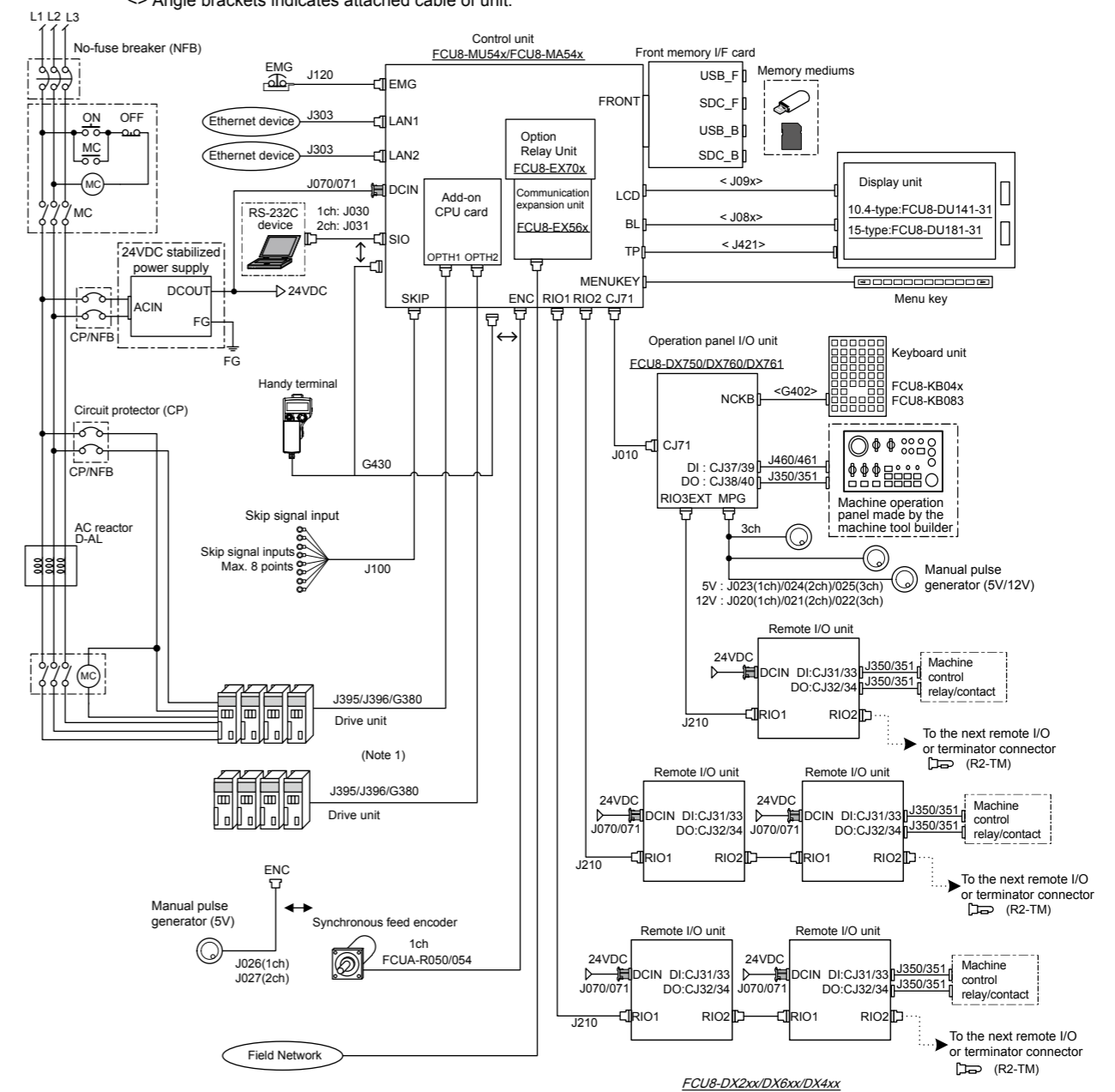
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When connecting a remote I/O unit to the 3rd RIO channel, insert it between the control unit and operation panel I/O unit.
 (Note 4) There is no need to connect a terminator R2-TM to the graphic control unit.

■ M800S Series

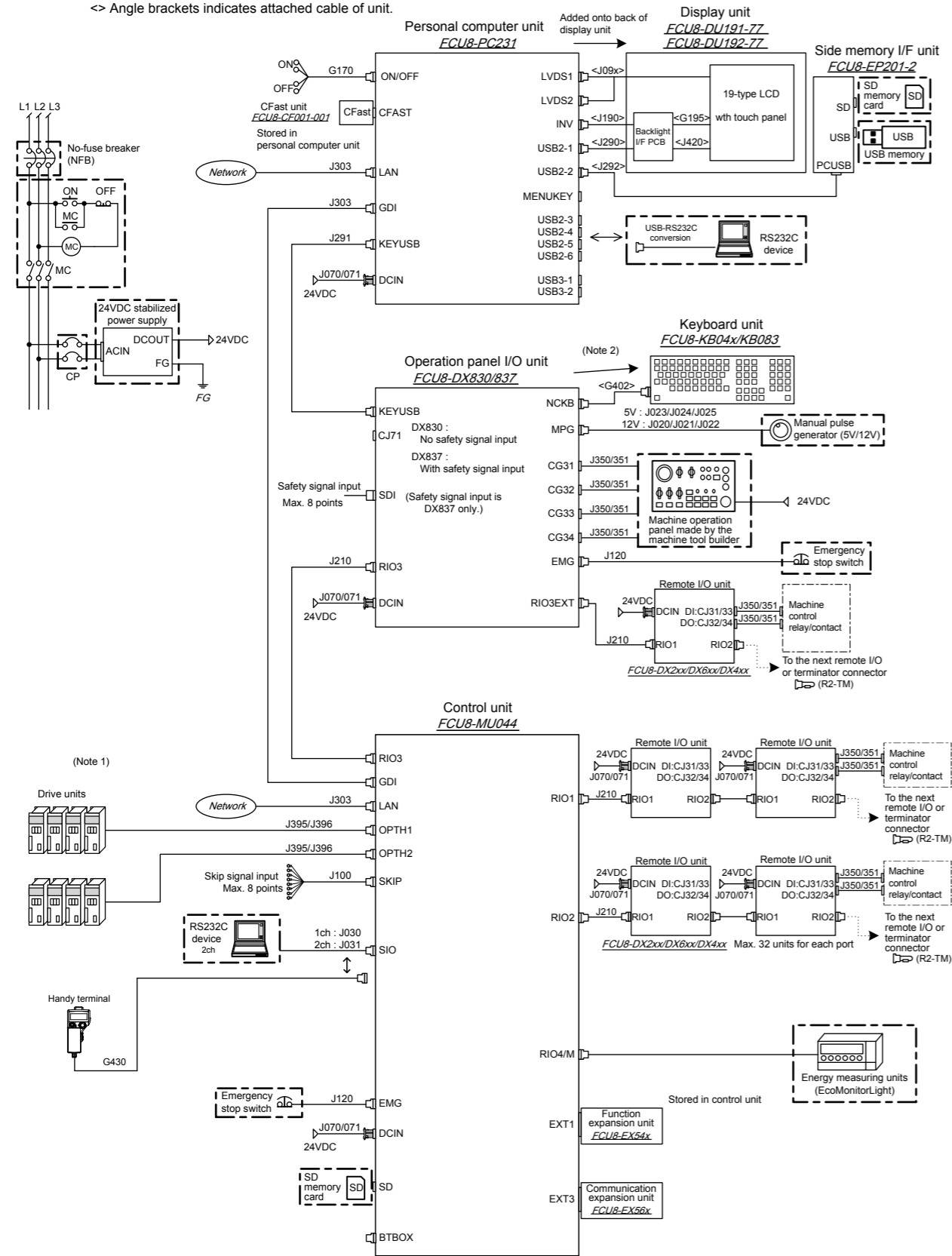
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.

■M80W Series Windows-based display unit (19-type)

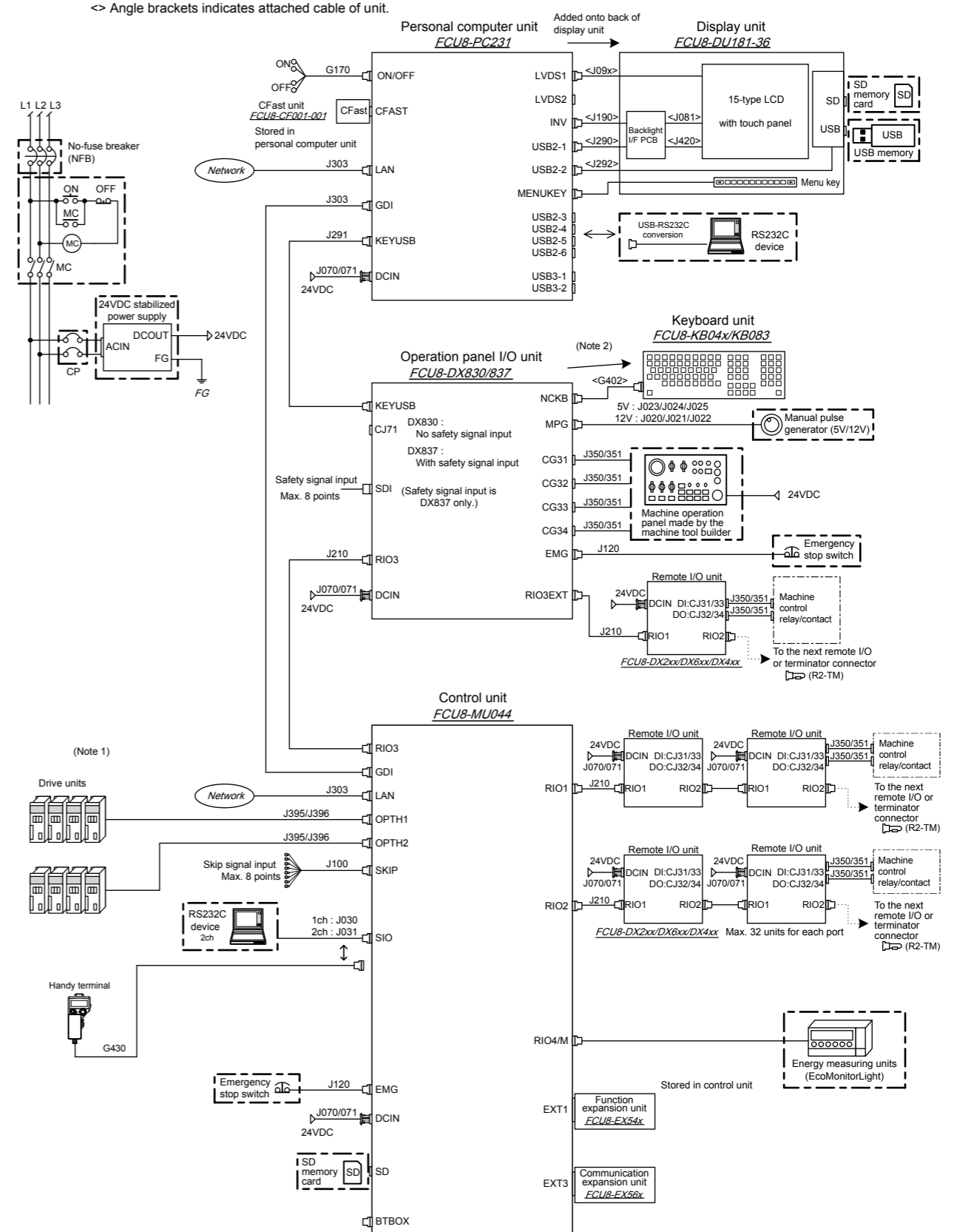
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit. When not using a keyboard unit, install the operation panel I/O unit on the back of the display unit.

■M80W Series Windows-based display unit (15-type)

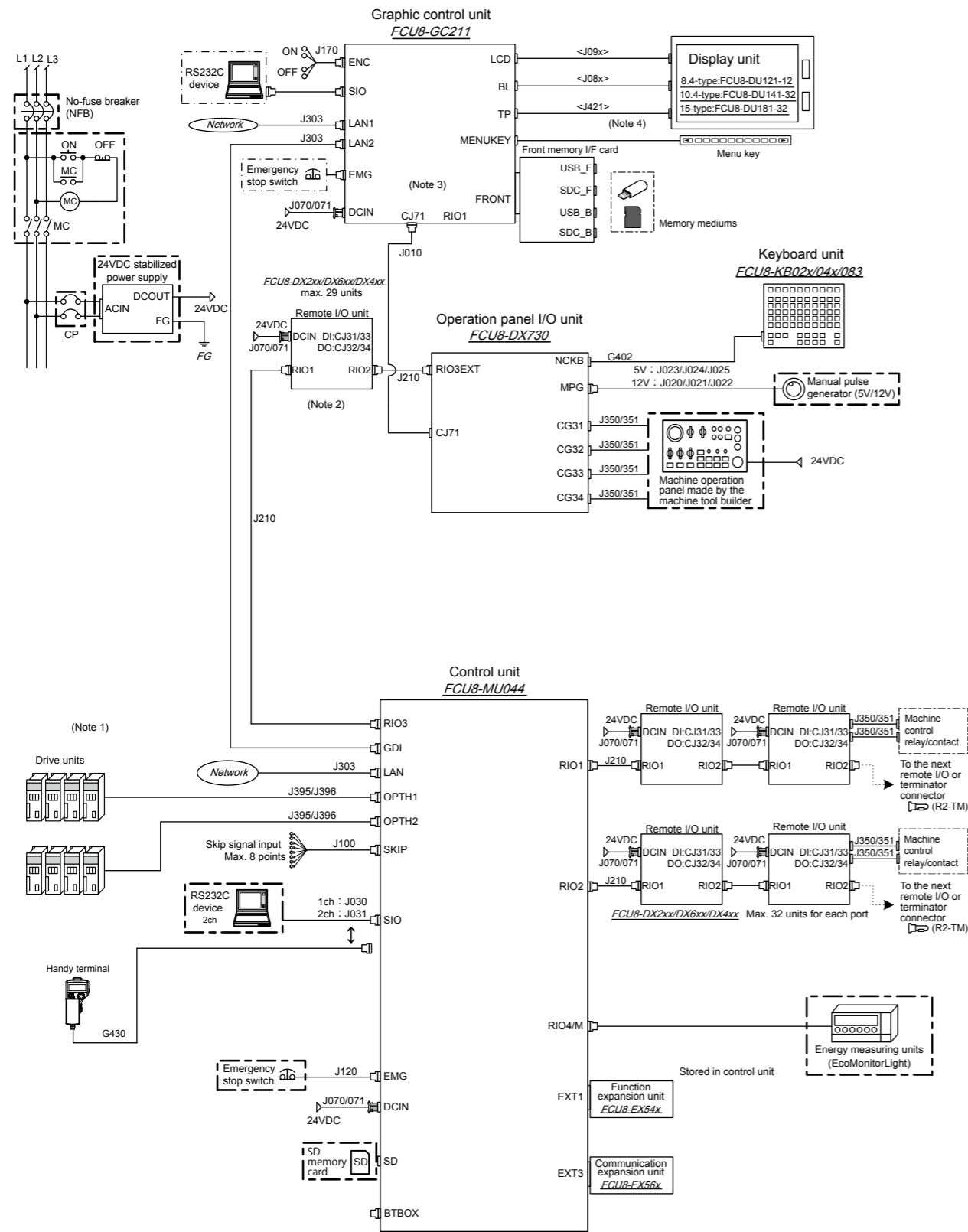
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit.

■ M80W Series Windows-less display unit (8.4-type/10.4-type/15-type)

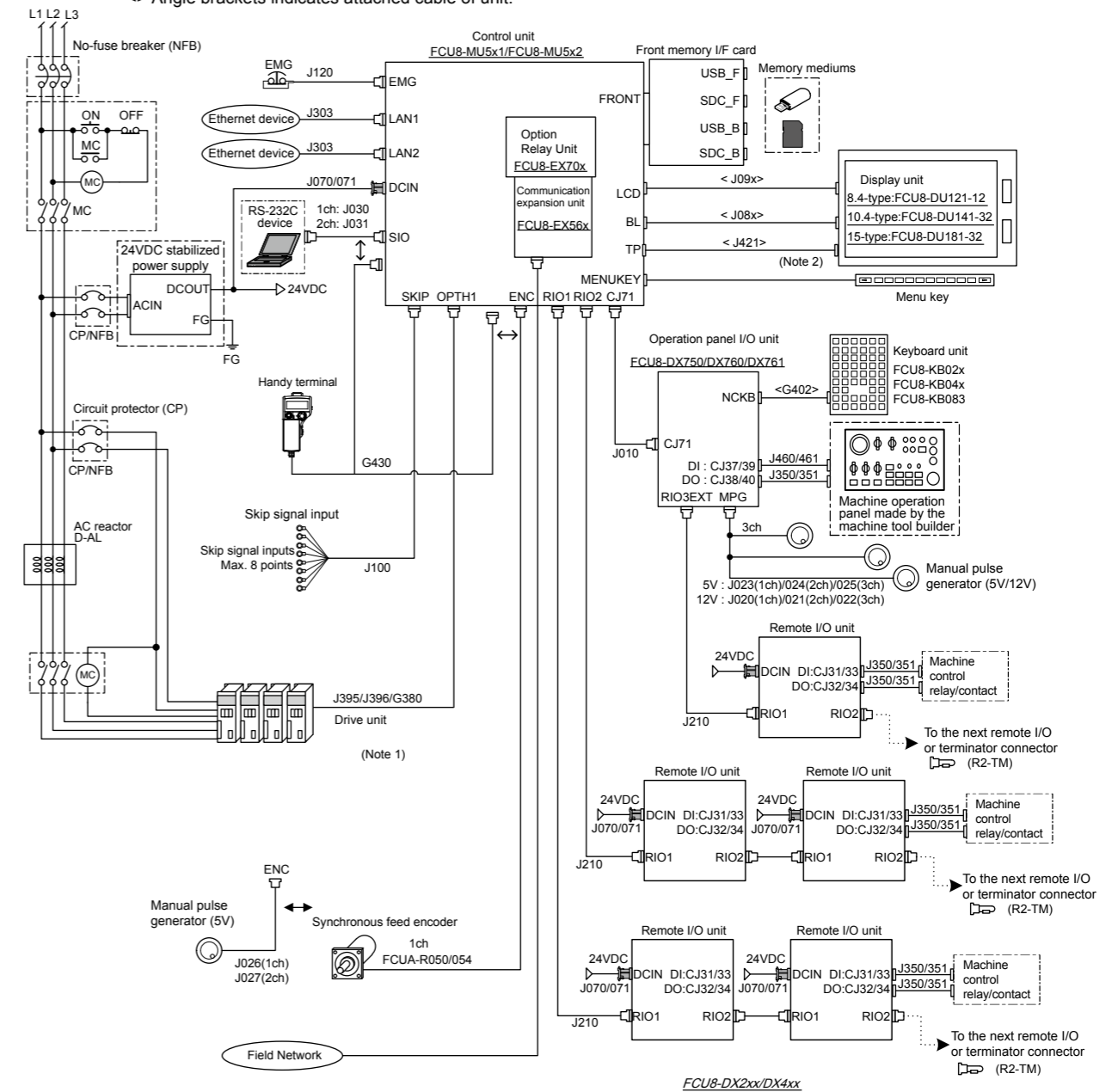
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) When connecting a remote I/O unit to the 3rd RIO channel, insert it between the control unit and operation panel I/O unit.
 (Note 4) There is no need to connect a terminator R2-TM to the graphic control unit.
 (Note 5) The 8.4-type display unit is incompatible with the touchscreen. TP connector is not used.

■ M80 Series without smart safety observation

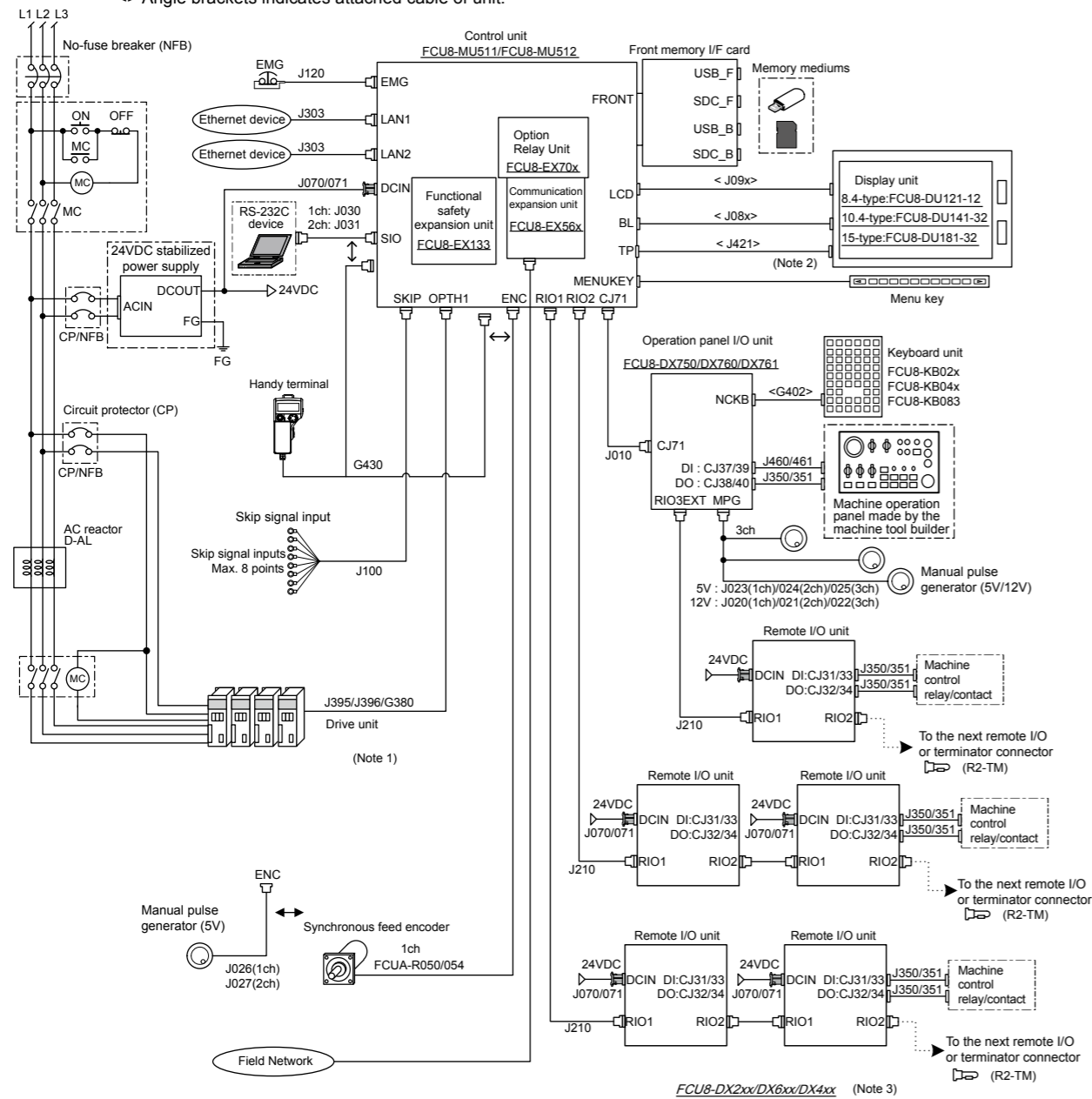
□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



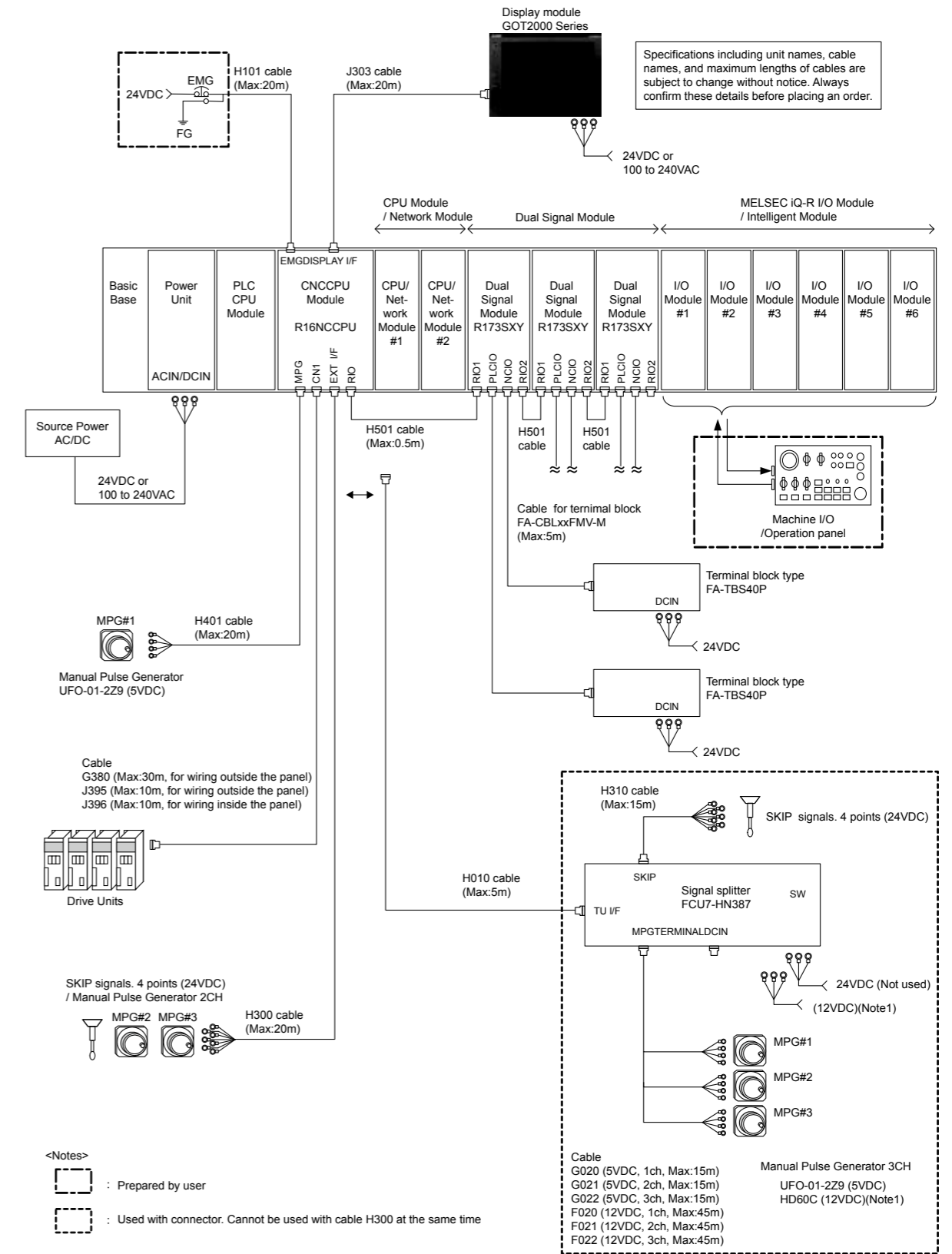
(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) The 8.4-type display unit is incompatible with the touchscreen. TP connector is not used.

■ M80 Series with smart safety observation

□ Dotted lines indicate the sections prepared by the machine tool builder.
 <> Angle brackets indicates attached cable of unit.



■ C80 Series



<Notes>
 □ : Prepared by user
 □ : Used with connector. Cannot be used with cable H300 at the same time

(Note 1) For details of the cable and the connector, refer to "CNC SYSTEM CABLES LIST" to be described.
 (Note 2) For connections of the drive units, refer to "DRIVE SYSTEM SYSTEM CONFIGURATION DRAWING" to be described.
 (Note 3) The 8.4-type display unit is incompatible with the touchscreen. TP connector is not used.
 (Note 4) The safety remote I/O unit is available only when the functional safety expansion unit is mounted.

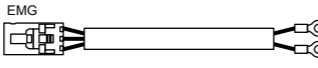
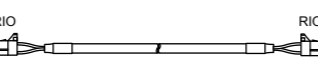
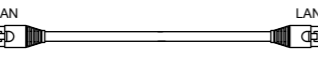



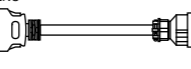
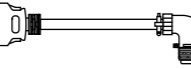
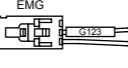
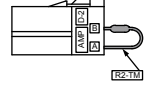
(Note 1) HD60C (12VDC) requires another power source 12VDC.
 (Note 2) A CPU module can be mounted on the CPU slot of the base unit or the slot No. 0 to 6. A slot between CPU modules can be left empty for reservation. Note that you cannot mount an I/O module or intelligent function module on a slot between CPU modules.

CNC SYSTEM LIST OF CABLES




















[M800/M80 Series]

Application	Type	Length (m)	Contents	Supported model			
				M800W	M800S	M80W	M80
(1) Connection cable between personal computer unit and operation panel I/O unit	J291 L0.15M	0.15		○	—	○	—
	J291 L0.5M	0.5					
	J291 L1.0M	1					
(2) 24VDC relay cable for MITSUBISHI CNC machine operation panel	G071 L0.12M	0.12		○	○	○	○
	G071 L0.5M	0.5					
	G071 L1M	1					
(3) ON/OFF switch cable (ON/OFF switch - Personal computer unit) (for Windows-based display unit)	G170 L1M	1		○	—	○	—
	G170 L2M	2					
	G170 L3M	3					
	G170 L5M	5					
	G170 L10M	10					
	G170 L15M	15					
(4) Cable for connection to handy terminal	G430 3M	3		○	○	○	○
	G430 5M	5					
	G430 10M	10					
(5) Cable for MITSUBISHI CNC machine operation panel (Cable between main panel and sub panel)	G460 0.5M	0.5		○	○	○	○
(6) ON/OFF switch cable (ON/OFF switch - Graphic control unit) (for Windows-less display unit)	J170 L1M	1		○	—	○	—
	J170 L2M	2					
	J170 L3M	3					
	J170 L5M	5					
	J170 L10M	10					
(7) Analog output cable	J220 L2M	2		○	—	—	—
	J220 L3M	3					
	J220 L7M	7					
(8) Analog input/output cable (for remote I/O unit)	J221 L2M	2		○	○	○	○
	J221 L3M	3					
	J221 L7M	7					
(9) Analog input/output cable (for operation panel I/O unit)	J224 L1M	1		—	○	—	○
	J224 L2M	2					
	J224 L3M	3					
	J224 L5M	5					
	J224 L7M	7					
	J224 L10M	10					
	J224 L15M	15					
	J224 L20M	20					
(10) Operation panel I/O interface cable (for Windows-less display unit of M800W/M80W)	J010 L0.5M (for 8.4/10.4-type display)	0.5		○	○	○	○
(11) Manual pulse generator cable (12V) : 1ch	J020 L1M	1		○	○	○	○
	J020 L2M	2					
	J020 L3M	3					
	J020 L5M	5					
	J020 L7M	7					
	J020 L10M	10					
	J020 L15M	15					
	J020 L20M	20					
(12) Manual pulse generator cable (12V) : 2ch	J021 L1M	1		○	○	○	○
	J021 L2M	2					
	J021 L3M	3					
	J021 L5M	5					
	J021 L7M	7					
	J021 L10M	10					
	J021 L15M	15					
	J021 L20M	20					

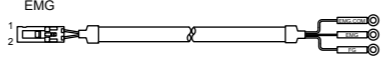
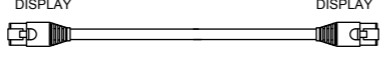
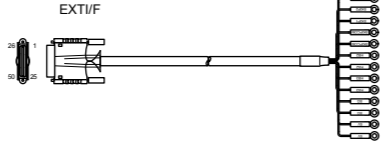
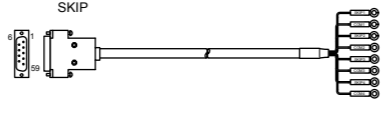
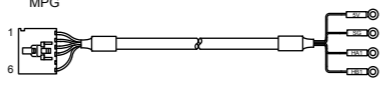
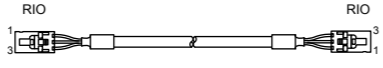

Application	Type	Length (m)	Contents	Supported model			
				M800W	M800S	M80W	M80
(13) Manual pulse generator cable (12V) : 3ch	J022 L1M	1		○	○	○	○
	J022 L2M	2					
	J022 L3M	3					
	J022 L5M	5					
	J022 L7M	7					
	J022 L10M	10					
	J022 L15M	15					
	J022 L20M	20					
	J022 L30M	30					
	(14) Manual pulse generator cable (5V) : 1ch	J023 L1M		1		○	○
J023 L2M		2					
J023 L3M		3					
J023 L5M		5					
J023 L7M		7					
J023 L10M		10					
J023 L15M		15					
J023 L20M		20					
(15) Manual pulse generator cable (5V) : 2ch	J024 L1M	1		○	○	○	○
	J024 L2M	2					
	J024 L3M	3					
	J024 L5M	5					
	J024 L7M	7					
	J024 L10M	10					
	J024 L15M	15					
(16) Manual pulse generator cable (5V) : 3ch	J025 L1M	1		○	○	○	○
	J025 L2M	2					
	J025 L3M	3					
	J025 L5M	5					
	J025 L7M	7					
	J025 L10M	10					
(17) Manual pulse generator cable (5V) : 1ch (for connection to control unit)	J026 L1M	1		○	○	○	○
	J026 L2M	2					
	J026 L3M	3					
	J026 L5M	5					
	J026 L7M	7					
	J026 L10M	10					
	J026 L15M	15					
(18) Manual pulse generator cable (5V) : 2ch (for connection to control unit)	J027 L1M	1		○	○	○	○
	J027 L2M	2					
	J027 L3M	3					
	J027 L5M	5					
	J027 L7M	7					
	J027 L10M	10					
(19) RS-232C I/F cable: 1ch (for control unit)	J030 L1M	1		○	○	○	○
	J030 L2M	2					
	J030 L3M	3					
	J030 L5M	5					
	J030 L7M	7					
	J030 L10M	10					
(20) RS-232C I/F cable: 2ch (for control unit)	J031 L1M	1		○	○	○	○
	J031 L2M	2					
	J031 L3M	3					
	J031 L5M	5					
	J031 L7M	7					
(21) 24VDC power cable	J070 L1M	1		○	○	○	○
	J070 L2M	2					
	J070 L3M	3					
	J070 L5M	5					
	J070 L7M	7					
	J070 L10M	10					
	J070 L15M	15					
	J071 L20M (for long distance)	20					
(22) SKIP input cable	J100 L1M	1		○	○	○	○
	J100 L2M	2					
	J100 L3M	3					
	J100 L5M	5					
	J100 L7M	7					
	J100 L10M	10					
	J100 L15M	15					

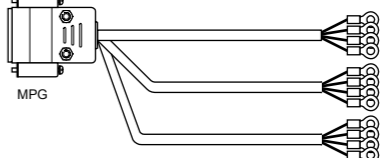
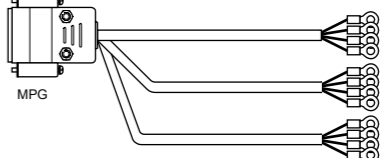
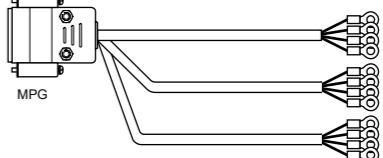
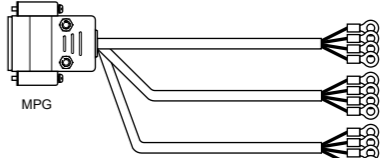
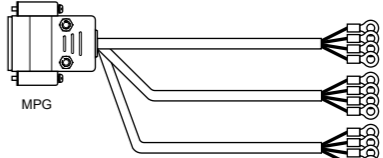
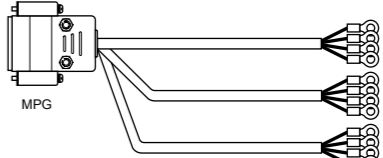
Application	Type	Length (m)	Contents	Supported model			
				M800W	M800S	M80W	M80
(23) Emergency stop cable	J120 L1M	1		○	○	○	○
	J120 L2M	2					
	J120 L3M	3					
	J120 L5M	5					
	J120 L7M	7					
	J120 L10M	10					
	J120 L15M	15					
	J120 L20M	20					
	J120 L30M	30					
	(24) Emergency stop cable for MITSUBISHI CNC machine operation panel	J121 L1M					
J121 L2M		2					
J121 L3M		3					
J121 L5M		5					
J121 L7M		7					
J121 L10M		10					
J121 L15M		15					
J121 L20M		20					
J121 L30M		30					
(25) Remote I/O 2.0 communication cable		J210 L0.3M	0.3		○	○	○
	J210 L1M	1					
	J210 L2M	2					
	J210 L3M	3					
	J210 L5M	5					
	J210 L7M	7					
	J210 L10M	10					
	J210 L15M	15					
	J210 L20M	20					
	J210 L30M	30					
(26) LAN straight cable	J303 L1M	1		○	○	○	○
	J303 L2M	2					
	J303 L3M	3					
	J303 L5M	5					
	J303 L7M	7					
	J303 L10M	10					
	J303 L15M	15					
	J303 L20M	20					
	J303 L30M	30					
	(27) DI/DO cable (connectors at both ends)	J350 L1M					
J350 L2M		2					
J350 L3M		3					
J350 L5M		5					
(28) DI/DO cable (connector at one end)	J351	3		○	○	○	○
(29) DI/DO cable (connectors at both ends) (for operation panel I/O unit)	J460 L1M	1		—	○	—	○
	J460 L2M	2					
	J460 L3M	3					
	J460 L5M	5					
(30) DI/DO cable (connector at one end) (for operation panel I/O unit)	J461	3		—	○	—	○
(31) Synchronous encoder - control unit (straight, with connector) (for FCU8-EX544 (M800W/M80W))	FCUA-R050-5M	5		○	○	○	○
(32) Synchronous encoder - control unit (right angle, with connector) (for FCU8-EX544 (M800W/M80W))	FCUA-R054-3M	3		○	○	○	○
	FCUA-R054-5M	5					
	FCUA-R054-10M	10					
	FCUA-R054-15M	15					
	FCUA-R054-20M	20					
(33) Cable for emergency stop release	G123	—		○	○	○	○
(34) Terminator for remote I/O interface	R2-TM	—		○	○	○	○

■ Cable connector sets for CNC

Application	Type	Contents	Supported model				
			M800W	M800S	M80W	M80	
(1) General I/O units (for SKIP,SIO,MPG,AIO)	FCUA-CS000	Connector (3M) 10120-3000PE x 2pcs. 	Shell kit (3M) 10320-52F0-008 x 2pcs. 	○	○	○	○
(2) Emergency stop connector (for EMG)	50-57-9403 16-02-0103	Connector (MOLEX) 50-57-9403 x 1pc. 	Gold contact (MOLEX) 16-02-0103 x 3pcs. 	○	○	○	○
(3) Connector kit for RIO2.0 unit	RIO2 CON	Connector (Tyco Electronics) 1-1318119-3 x 2pcs. 	Contact (Tyco Electronics) 1318107-1 x 8pcs. 	○	○	○	○
		Connector (Tyco Electronics) 2-178288-3 x 1pc. 	Contact (Tyco Electronics) 1-175218-5 x 3pcs. 				
(4) 24VDC power supply connector (for DCIN)	FCUA-CN220	Connector (Tyco Electronics) 2-178288-3 x 1pc. 	Contact (Tyco Electronics) 1-175218-5 x 3pcs. 	○	○	○	○
(5) DI/DO connector (for operation panel I/O unit (M800W/M80W)) (for remote I/O unit) DO connector (for operation panel I/O unit (M800S/M80))	7940-6500SC 3448-7940	Connector (3M) 7940-6500SC x 4pcs. 	Strain relief (3M) 3448-7940 x 4pcs. 	○	○	○	○
(6) DI connector (for operation panel I/O unit)	7950-6500SC 3448-7950	Connector (3M) 7950-6500SC x 2pcs. 	Strain relief (3M) 3448-7950 x 2pcs. 	○	—	○	—
(7) ON/OFF switch connector	50-57-9404 16-02-0103	Connector (MOLEX) 50-57-9404 x 1pc. 	Contact (MOLEX) 16-02-0103 x 4pcs. 	○	—	○	—
(8) CJ71 connector	2-1318119-4 1318107-1	Connector (Tyco Electronics) 2-1318119-4 x 1pc. 	Contact (Tyco Electronics) 1318107-1 x 8pcs. 	—	○	—	○
(9) THERMISTOR connector (for thermistor input unit)	37104-2165-000FL 10P	Connector (3M) 37104-2165-000FL x 10pcs. 		○	○	○	○

[C80 Series]

Application	Type	Length (m)	Contents	Supported model
(1) Emergency stop cable	H101 L0.5M	0.5		Emergency stop input cable, maximum length: 20m
	H101 L1M	1		
	H101 L2M	2		
	H101 L3M	3		
	H101 L5M	5		
	H101 L7M	7		
	H101 L10M	10		
	H101 L15M	15		
	H101 L20M	20		
(2) Display communication cable (Shielded twisted pair cable)	J303 L1M	1		Display interface, maximum length: 20m
	J303 L2M	2		
	J303 L3M	3		
	J303 L5M	5		
	J303 L10M	10		
	J303 L15M	15		
	J303 L20M	20		
(3) Skip/manual pulse generator input cable (For CNC CPU unit)	H300 L0.5M	0.5		Skip/manual pulse generator input interface, maximum length: 20m (Note) This cable cannot be used together with the H010 cable.
	H300 L1M	1		
	H300 L2M	2		
	H300 L3M	3		
	H300 L5M	5		
	H300 L7M	7		
	H300 L10M	10		
	H300 L15M	15		
	H300 L20M	20		
(4) Skip input cable (For signal splitter)	H310 L0.5M	0.5		Skip input interface when signal splitter is used, maximum length: 15m
	H310 L1M	1		
	H310 L2M	2		
	H310 L3M	3		
	H310 L5M	5		
	H310 L7M	7		
	H310 L15M	15		
(5) Manual pulse generator cable (For CNC CPU unit)	H401 L0.5M	0.5		Manual pulse generator (1ch), maximum length: 20m (5V power supply type)
	H401 L1M	1		
	H401 L2M	2		
	H401 L3M	3		
	H401 L5M	5		
	H401 L7M	7		
	H401 L10M	10		
	H401 L15M	15		
	H401 L20M	20		
(6) Safety signal unit connection cable	H501 L0.1M	0.1		Between safety signal units, maximum length: 0.5m
	H501 L0.2M	0.2		
	H501 L0.3M	0.3		
	H501 L0.5M	0.5		
(7) Signal splitter connection cable	H010 L0.5M	0.5		Signal splitter connection cable, maximum length: 5m (Note) This cable cannot be used together with the H300 cable.
	H010 L1M	1		
	H010 L2M	2		
	H010 L3M	3		
	H010 L5M	5		

Application	Type	Length (m)	Contents	Supported model
(8) Manual pulse generator cable (For signal splitter)	F020 L0.5M	0.5		Manual pulse generator (1ch), maximum length: 45m (12V power supply type) 12V power supply separately necessary
	F020 L1M	1		
	F020 L2M	2		
	F020 L3M	3		
	F020 L5M	5		
	F020 L7M	7		
	F020 L10M	10		
	F020 L15M	15		
	F020 L20M	20		
(9) Manual pulse generator cable (For signal splitter)	F021 L0.5M	0.5		Manual pulse generator (2ch), maximum length: 45m (12V power supply type) 12V power supply separately necessary
	F021 L1M	1		
	F021 L2M	2		
	F021 L3M	3		
	F021 L5M	5		
	F021 L7M	7		
	F021 L10M	10		
(10) Manual pulse generator cable (For signal splitter)	F022 L0.5M	0.5		Manual pulse generator (3ch), maximum length: 45m (12V power supply type) 12V power supply separately necessary
	F022 L1M	1		
	F022 L2M	2		
	F022 L3M	3		
	F022 L5M	5		
	F022 L7M	7		
	F022 L10M	10		
(11) Manual pulse generator cable (For signal splitter)	G020 L0.5M	0.5		Manual pulse generator (1ch), maximum length: 15m (5V power supply type)
	G020 L1M	1		
	G020 L2M	2		
	G020 L3M	3		
	G020 L5M	5		
	G020 L7M	7		
	G020 L15M	15		
(12) Manual pulse generator cable (For signal splitter)	G021 L0.5M	0.5		Manual pulse generator (2ch), maximum length: 15m (5V power supply type)
	G021 L1M	1		
	G021 L2M	2		
	G021 L3M	3		
	G021 L5M	5		
	G021 L10M	10		
(13) Manual pulse generator cable (For signal splitter)	G022 L0.5M	0.5		Manual pulse generator (3ch), maximum length: 15m (5V power supply type)
	G022 L1M	1		
	G022 L2M	2		
	G022 L3M	3		
	G022 L5M	5		
	G022 L15M	15		

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

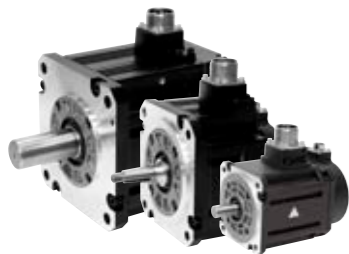
- The multi-hybrid drive units are capable of driving a maximum of three servo axes and one spindle. This contributes to the downsizing of machines and offers technical advantages.
- The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors.
- 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.



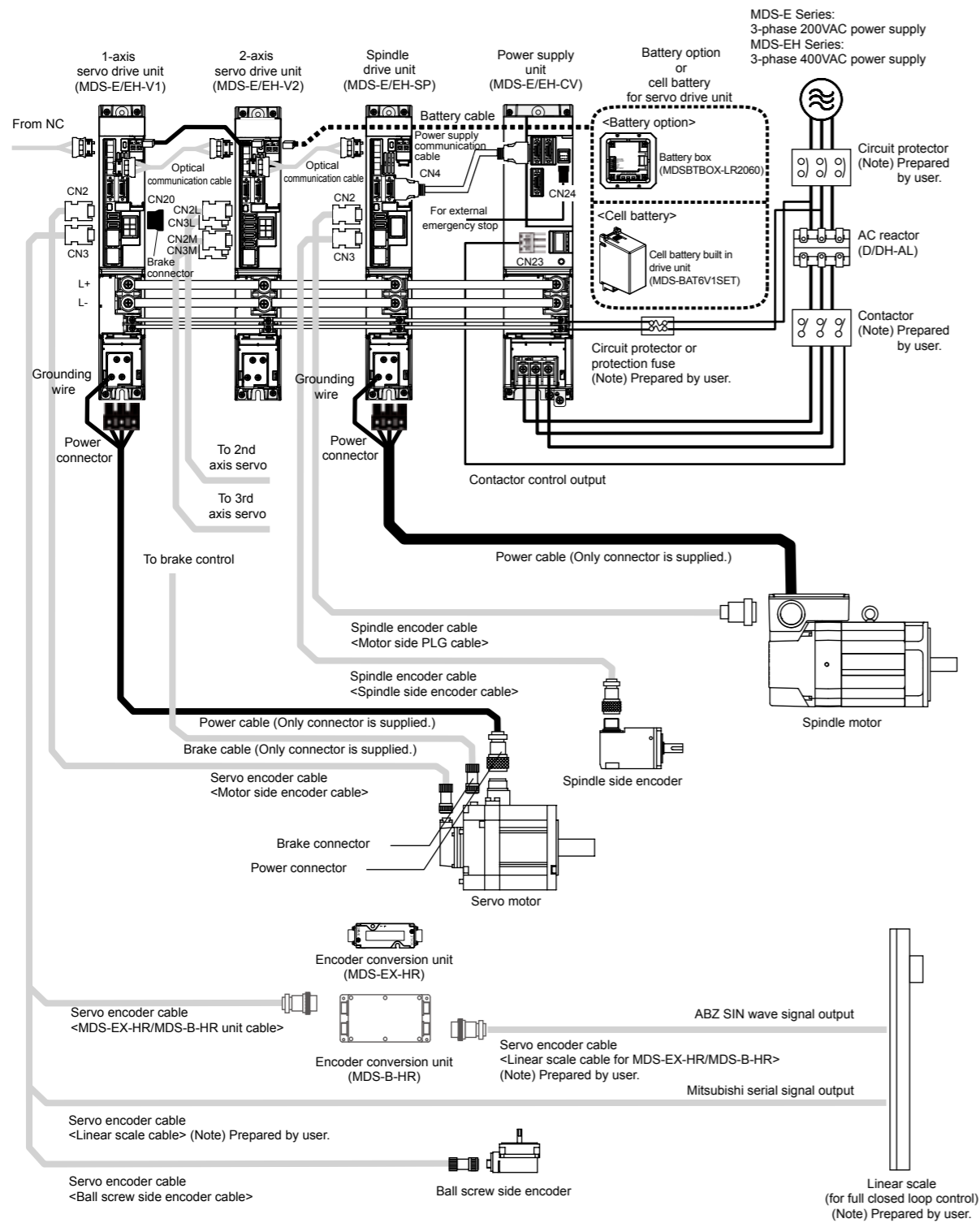
Tool Spindle Motors HG-JR Series

- Compact tool spindle motors are designed to have the small, high-output characteristics of servo motors yet offer high-speed rotation (8,000r/min). 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)

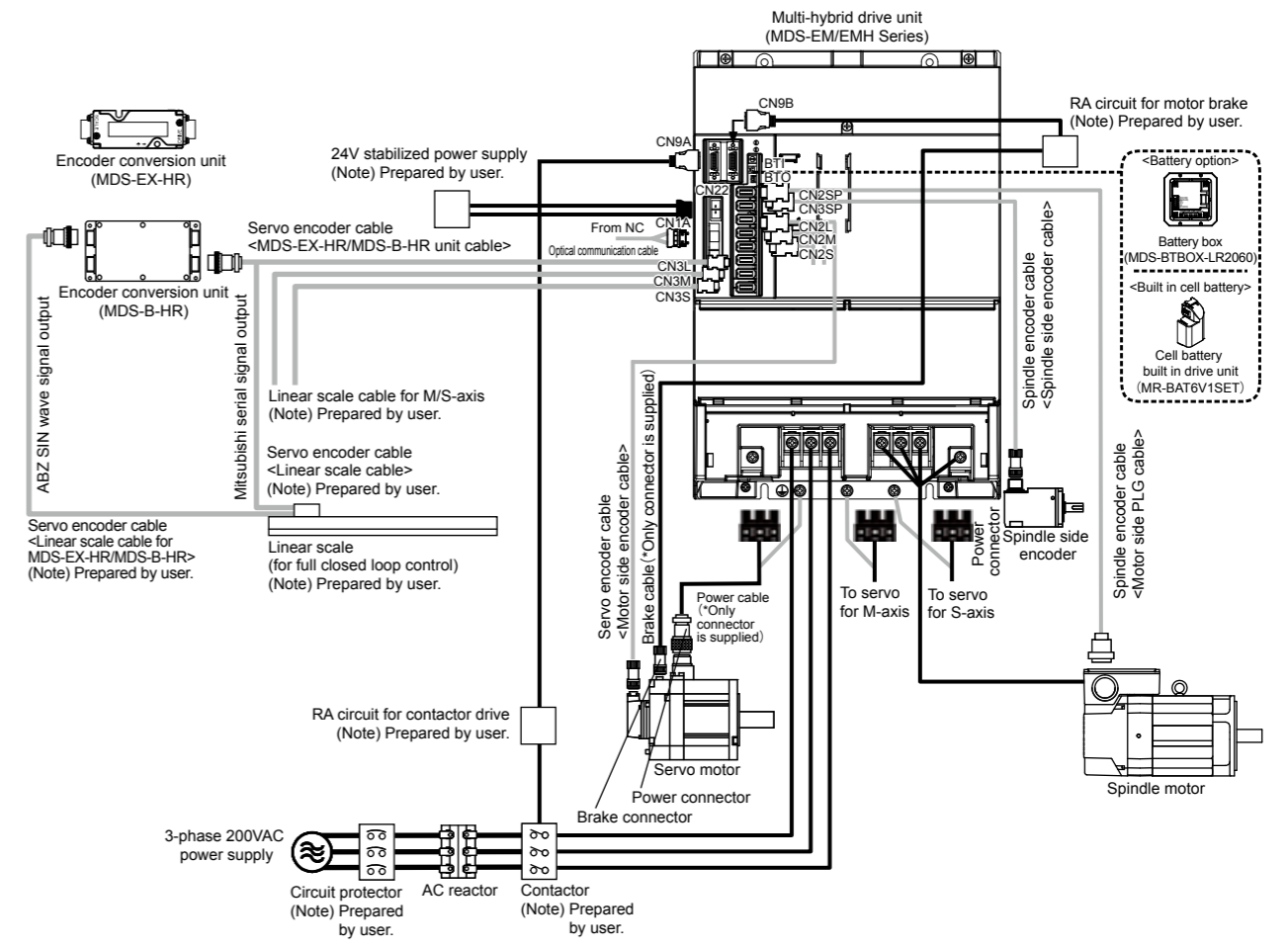
(Note 1) For servo motors only
(Note 2) Options supported. (Flange size 90SQ only)
* Use Mitsubishi CNC's dedicated drive unit and motor.

DRIVE SYSTEM SYSTEM CONFIGURATION

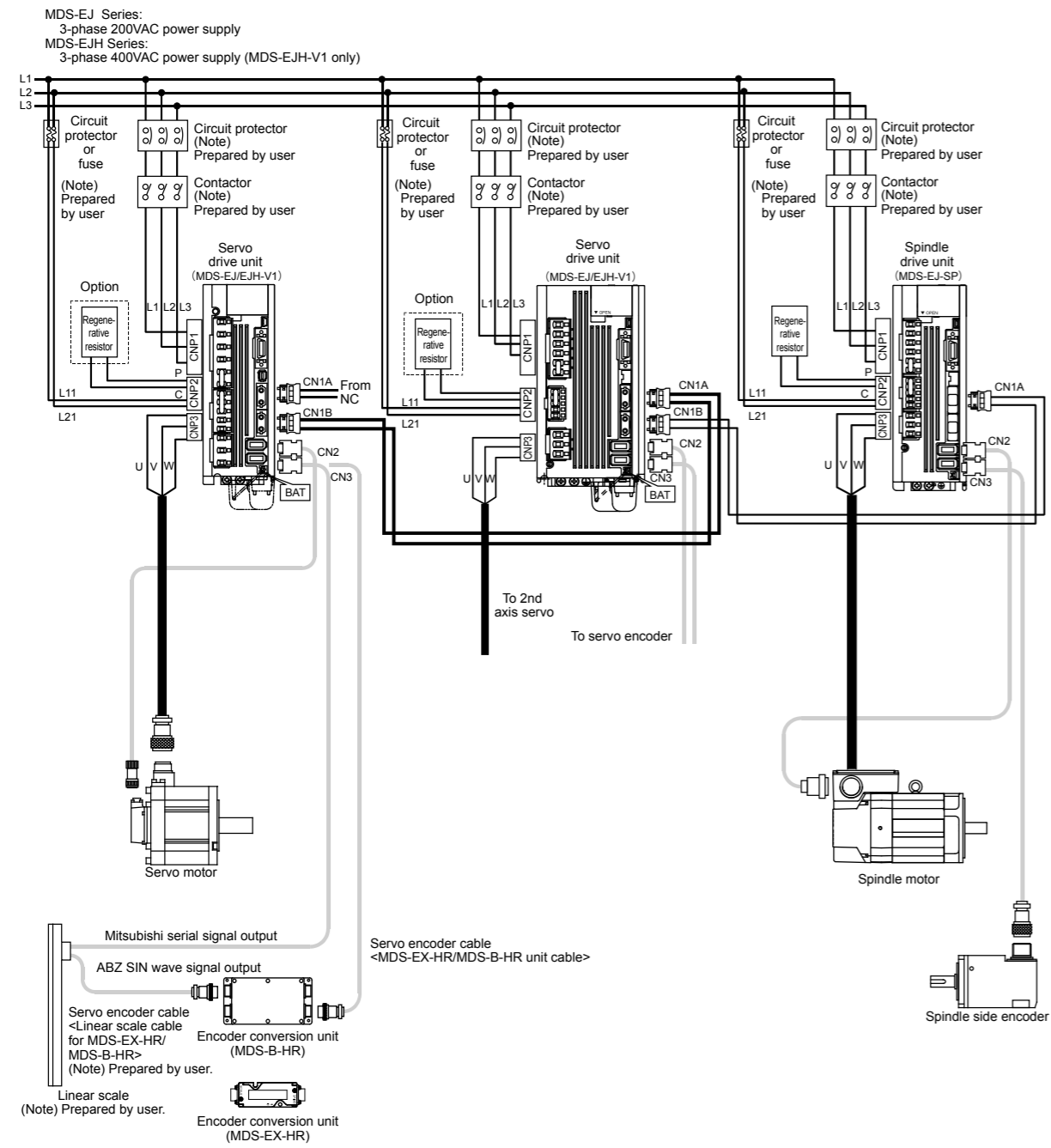
■MDS-E/EH Series



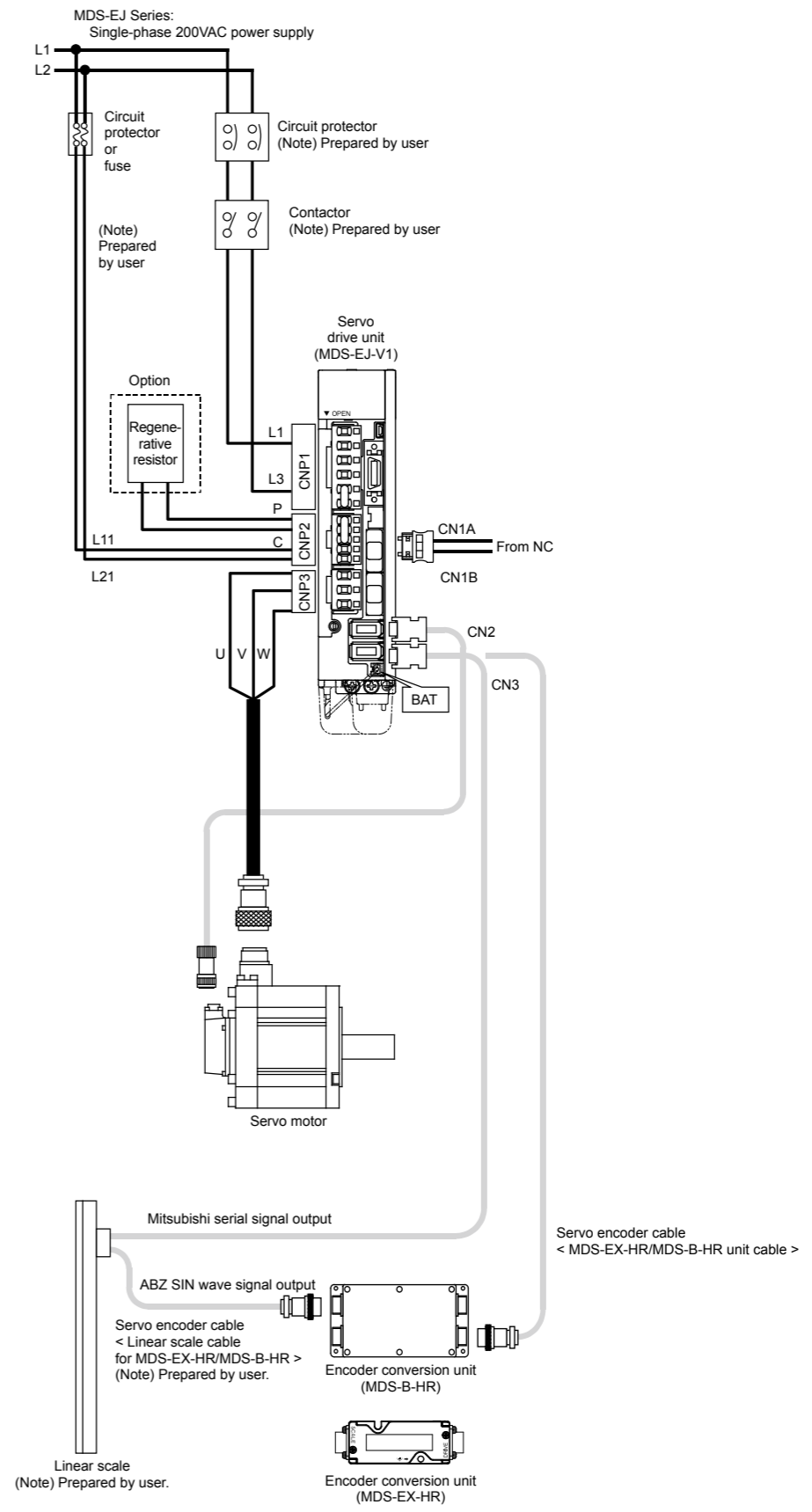
■MDS-EM/EMH Series



■MDS-EJ/EJH Series



<For single-phase power supply>



DRIVE SYSTEM 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
	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	●	●	●
	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	●	●	●
5 Sequence function	5.5 Quick READY ON sequence	●	●	●
	6.1 Monitor output function	●	●	●
6 Diagnosis 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	●	●	●	●
	3.1 Jitter compensation	●	●	●	●
3 Compensation control function	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	●	●	●	●
	3.6 Lost motion compensation type 2	●	●	●	●
	3.9 Spindle motor temperature compensation function	●	●	●	●
	4.1 Deceleration control at emergency stop	●	●	●	●
4 Protection function	4.3 Earth fault detection	●	●	●	●
	4.5 SLS (Safely Limited Speed) function	●	●	●	●
	4.6 Fan stop detection	●	●	●	●
	4.9 STO (Safe Torque Off) function	●	●	●	●
5 Sequence function	5.4 Specified speed output	●	●	●	●
	5.5 Quick READY ON sequence	●	●	●	●
6 Diagnosis function	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	●	●	●	●

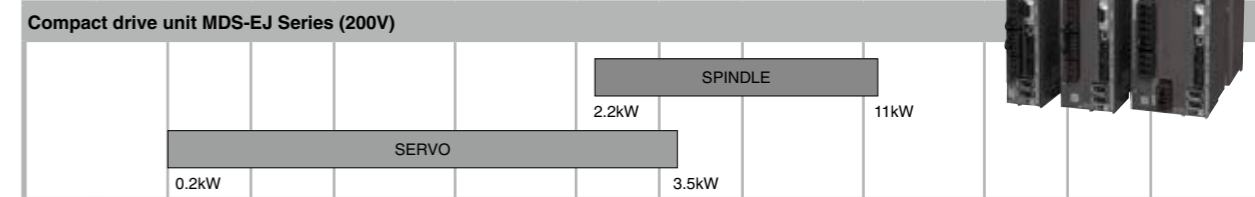
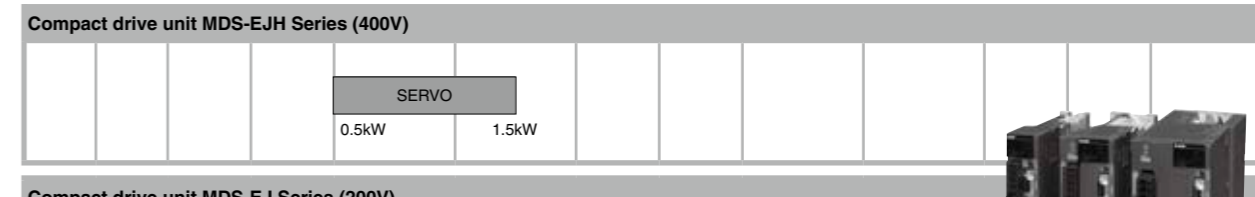
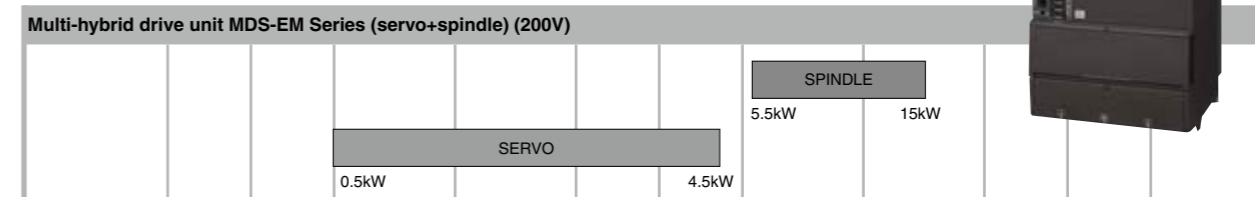
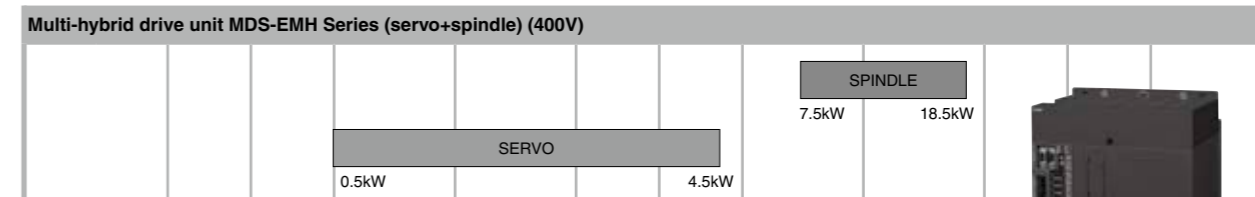
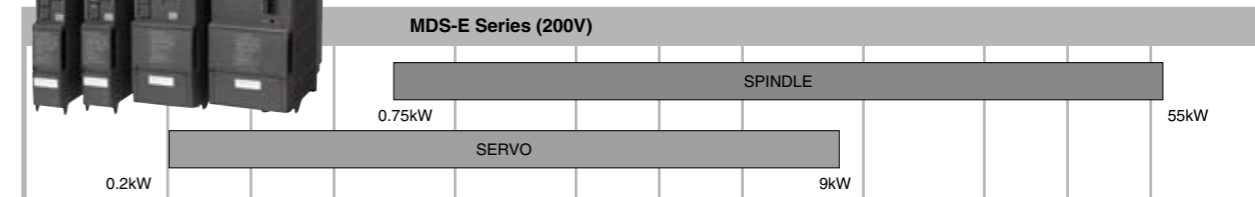
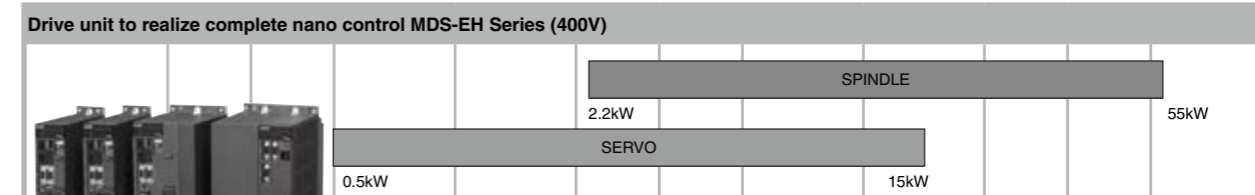
(Note 1) As for 2-axis spindle drive unit, setting is available only for one of the axes.
 (Note 2) 4.5 SLS (Safely Limited Speed) function is set on NC side.

<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



0.1 0.2 0.3 0.5 1.0 2.0 3.0 5.0 10 20 30 50 100 (kW)

Compatible motors' rated capacity

DRIVE SYSTEM 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

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

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)
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/L 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-1WW0

Secondary side [magnet side] LM-FS ① 0- ② -1WW0

① Width

Symbol	Width (nominal)
5	240 mm

② Length

Symbol	Length (nominal)
H	1010 mm

③ Rated thrust

Symbol	Rated thrust
60	6000 N

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**

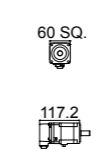
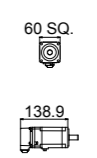
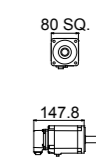
Symbol	Shaft end structure
None	Straight
K	With keyway (without key)

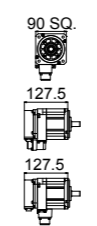
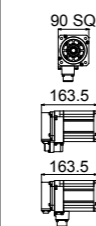
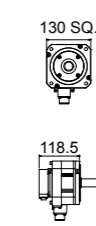
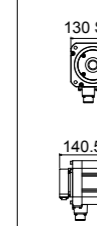
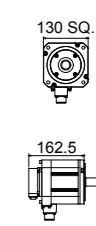
③ **Power connector**

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

DRIVE SYSTEM SERVO MOTOR 200V

HG Series

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

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

■HG Series

Motor type		HG224	HG204		HG354	
Compatible drive unit	1-axis type MDS-E-V1-	80	-	80	-	160
	2-axis type MDS-E-V2-	80	-	80	-	160
	3-axis type MDS-E-V3-	160	-	160	-	160W
	Multi-hybrid type MDS-EM-SPV3-	xxx80* 200120	-	xxx80* 200120	-	200120
	Regenerative resistor type MDS-EJ-V1-	80	80	-	100	-
Output	[N·m]	50	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	[×10 ⁻⁴ kg·m ²]	23.7	38.3	75.0	84.7	84.7
Motor inertia with a brake	[×10 ⁻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
	3-axis type MDS-E-V3-	-	-	40	80
	Multi-hybrid type MDS-EM-SPV3-	-	-	20	40
	Regenerative resistor type MDS-EJ-V1-	-	-	40	40
Output	[N·m]	200	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	[×10 ⁻⁴ kg·m ²]	154.0	196.0	17.8	75.0
Motor inertia with a brake	[×10 ⁻⁴ kg·m ²]	164.0	206.0	20.0	84.7
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)		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	80	-
	3-axis type MDS-E-V3-	40	80	160	-
	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	[×10 ⁻⁴ kg·m ²]	11.9	23.7	75.0	112.0
Motor inertia with a brake	[×10 ⁻⁴ kg·m ²]	14.0	25.9	84.7	122.0
Degree of protection (The shaft-through portion is excluded.)		IP67	IP67	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, D48 encoder)		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.

DRIVE SYSTEM 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					
	Rated torque (liquid-cooling)		12	36	48	105
Max. torque	250					
			36	108	144	260
Rated output	[W]					
Max. rotation speed	[r/min]					
Motor inertia	[×10 ⁻⁴ kg·m ²]					
Degree of protection	IP00					
Outline dimension drawing	[mm]					
Mass [kg]	Primary side (coil)		3.9	7.1	10	13
	Secondary side (magnet)		1.7	3.7	5	7

Motor type	Primary side type		TM-RBP105G20	TM-RBP150G20	TM-RBP340J20	TM-RBP500J20
	Secondary side type		TM-RBS105G20	TM-RBS150G20	TM-RBS340J20	TM-RBS500J20
Compatible drive unit	1-axis type	MDS-E-V1-	160	160	320	320W
	2-axis type	MDS-E-V2-	160	160	-	-
	Regenerative resistor type	MDS-EJ-V1-	-	-	-	-
Output	[N·m] 1400					
	Rated torque (liquid-cooling)		105	260	340	850
Max. torque	1200					
			150	375	500	1280
Rated output	[W]					
Max. rotation speed	[r/min]					
Motor inertia	[×10 ⁻⁴ kg·m ²]					
Degree of protection	IP00					
Outline dimension drawing	[mm]					
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.

DRIVE SYSTEM 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					
	Continuous (natural-cooling)		150	300	600	900
	Continuous (liquid-cooling)		300	600	1200	1800
	Maximum		300	600	1200	1800
Rated thrust	[N]					
Maximum speed (Note 1)	[m/s]					
Magnetic attraction force	[N]					
Degree of protection	IP00					
Outline dimension drawing	[mm]					
Mass [kg]	Primary side (coil)		5	9	18	27
	Secondary side (magnet)		5.8(384mm) 7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)	7.1(480mm) 9.0(576mm)

Motor type	Primary side type		LM-FP4B-12M-1WW0	LM-FP4D-24M-1WW0	LM-FP4F-36M-1WW0	LM-FP4H-48M-1WW0
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS40-□-1WW0
Compatible drive unit	1-axis type	MDS-E-V1-	80	160	320	320
	2-axis type	MDS-E-V2-	80	160	-	-
	3-axis type	MDS-E-V3-	-	-	-	-
	Regenerative resistor type	MDS-EJ-V1-	80	-	-	-
Thrust force	[N] 20000					
	Continuous (natural-cooling)		600	1200	2400	3600
	Continuous (liquid-cooling)		1200	2400	4800	7200
	Maximum		1800	3600	7200	10800
Rated thrust	[N]					
Maximum speed (Note 1)	[m/s]					
Magnetic attraction force	[N]					
Degree of protection	IP00					
Outline dimension drawing	[mm]					
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	[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	[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.

DRIVE SYSTEM 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																
	Compatible drive unit	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]																						
	Acceleration/Deceleration																						
	%ED rating																						
	Short-time rating																						
Standard output during acceleration/deceleration	[kW]		3.7	5.5	5.5	7.5	9.2	10.4															
Actual acceleration/deceleration output (Note 2)	[kW]		4.4	6.6	6.6	9	11.0	12.5															
Continuous base rotation speed	[r/min]		1500	1500	1500	2800	2800	2800															
Max. rotation speed in constant output range	[r/min]		6000	6000	6000	8000	8000	8000															
Maximum rotation speed	[r/min]		10000	10000	12000	12000	12000	12000															
Continuous rated torque	[N·m]		14.0	23.6	23.6	12.6	12.6	12.6															
Motor inertia	[kg·m ²]		0.0074	0.013	0.013	0.0074	0.0074	0.0074															
Degree of protection (The shaft-through portion is excluded.)			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																		
	Compatible drive unit	1-axis type	MDS-E-SP-	160	160	160	200	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	[kW]		7.5	7.5	11	18.5	18.5	25.0																			
Actual acceleration/deceleration output (Note 2)	[kW]		9	9	13.2	22.2	22.2	30.0																			
Continuous base rotation speed	[r/min]		1500	1500	1500	1500	1500	1500																			
Max. rotation speed in constant output range	[r/min]		6000	6000	4500	6000	6000	6000																			
Maximum rotation speed	[r/min]		10000	12000	10000	8000	8000	8000																			
Continuous rated torque	[N·m]		35.0	35.0	47.7	70.0	95.5	95.5																			
Motor inertia	[kg·m ²]		0.023	0.023	0.031	0.086	0.10	0.10																			
Degree of protection (The shaft-through portion is excluded.)			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				
	Continuous 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]				
		538.5		583.5	
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				
	Short-time 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]				
		327			
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								
	Continuous 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]								
		327		417		439		489	
Flange fitting diameter [mm]		φ150		φ150		φ180		φ180	
Shaft diameter [mm]		φ28		φ28		φ32		φ48	
Mass [kg]		24		37		50		61	
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.
 (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-SP2-16080(M)	16080(M)	16080(M)
	Multi-hybrid type	MDS-EM-SPV3-100xx*	100xx*	100xx*
	Regenerative resistor type	MDS-EJ-SP-100	100	120
Output	%ED rating			
	Short-time rating			
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)	[mm]			
		174 SQ. 327	174 SQ. 327	174 SQ. 417
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	%ED rating			
	Short-time rating			
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)	[mm]			
		174 SQ. 417	204 SQ. 439	204 SQ. 489
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	%ED rating			
	Short-time rating			
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)	[mm]			
		130 SQ. 264	130 SQ. 317	130 SQ. 375
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	%ED rating			
	Short-time rating			
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)	[mm]			
		174 SQ. 377	174 SQ. 377	204 SQ. 489
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)			
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)				
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)					
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)					
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	750
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".

DRIVE SYSTEM 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	40	160	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 [kg]	Stator	0.7	1.2	2.6	7.4
	Rotor	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	80	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 (φ42) (Note 2)	195 (φ62) (Note 2)	170 (φ65) (Note 2)
		φ119.5 (Note 2)	φ119.5 (Note 2)	φ149.5 (Note 2)
Mass [kg]	Stator	3.0	5.9	8.1
	Rotor	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	9	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]		Rotor [kg]		Stator [kg]		Rotor [kg]		
		7.1		7.1		7.1		10.0		11.0	
		2.9(2.3)		2.9(2.3)		2.9(2.3)		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]		Rotor [kg]	
		27		33		
		10		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]		Rotor [kg]	
		14		21		
		5.1		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]		Rotor [kg]	
		63		107		
		32		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-20	40	40
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	320	240
Output	Acceleration/Deceleration			
	Short-time rating			
	Continuous rating			
	Standard output during acceleration/deceleration [kW]	15	22	26
Actual acceleration/deceleration output (Note 4) [kW]	18	26.4	31.2	
Continuous base rotation speed [r/min]	550	1193	1250	
Maximum rotation speed [r/min]	2000	8000	3500	
Continuous rated torque [N·m]	191	88.0	168	
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	200	320
Output	Acceleration/Deceleration			
	Short-time rating			
	Continuous rating			
	Standard output during acceleration/deceleration [kW]	15	11	22
Actual acceleration/deceleration output (Note 4) [kW]	18	13.2	26.4	
Continuous base rotation speed [r/min]	700	500	525	
Maximum rotation speed [r/min]	2250	1500	3000	
Continuous rated torque [N·m]	102	143	136	
Rotor inertia [kg·m ²]	0.08	0.102	0.105	
Outline dimension drawing	[mm]			
	Mass			
	Stator [kg]	29	37	37
	Rotor [kg]	18	19	24

Motor type (Note 1)		SJ-2B4503TK	SJ-2B6603TK	SJ-2B4602TK
Compatible drive unit		MDS-E-SP-320	320	320
Output	Acceleration/Deceleration			
	Short-time rating			
	Continuous rating			
	Standard output during acceleration/deceleration [kW]	15	22	22
Actual acceleration/deceleration output (Note 4) [kW]	18	26.4	26.4	
Continuous base rotation speed [r/min]	475	1250	600	
Maximum rotation speed [r/min]	2000	10000	1500	
Continuous rated torque [N·m]	221	115	239	
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						
		Short-time (15min)		Short-time (30min)		Short-time (30min)	
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						
		Short-time (30min)		Short-time (30min)		%ED rating (50%ED)	
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	Acceleration/Deceleration						
	%ED rating						
	Short-time rating						
	Continuous rating						
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	Acceleration/Deceleration				
	%ED rating				
	Short-time rating				
	Continuous rating				
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		MDS-E-SP-		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".

DRIVE SYSTEM 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				
	Max. torque				
		[N·m]			
		8			
		6			
		4			
		2			
		0			
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			
	Max. torque			
		[N·m]		
		15		
		10		
		5		
		0		
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

Motor type		HG Series						
		HG□-D48						
Compatible drive unit	1-axis type	MDS-E-SP-	HG75	HG105	HG54	HG104	HG154	HG224
	2-axis type	MDS-E-SP2-	20	20	40	40	80	80
	Regenerative resistor type	MDS-EJ-SP-	20	20	40	40	80	80
			40	40	80	80	16080	16080
Output	Rated torque	[N·m]	1.8	2.4	1.6	3.2	4.8	7.0
	Max. torque	[N·m]	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					
Compatible drive unit	1-axis type	MDS-E-SP-	HG204	HG354	HG453	HG703	HG903
	2-axis type	MDS-E-SP2-	80	160	160	160	320
	Regenerative resistor type	MDS-EJ-SP-	80	-	-	-	-
			16080	16080	16080	16080	-
Output	Rated torque	[N·m]	6.4	11.1	14.3	22.3	28.6
	Max. torque	[N·m]	47.0	90.0	122.0	152.0	208.0
Rated output	[kW]	2.0	3.5	4.5	7.0	9.0	
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.

DRIVE SYSTEM SERVO MOTOR 400V

■HG-H Series

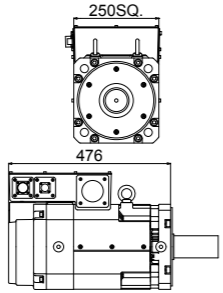
Motor type		HG-H75	HG-H105	HG-H54	HG-H104	HG-H154	
Compatible drive unit	1-axis type	MDS-EH-V1-	10	10	20	20	40
	2-axis type	MDS-EH-V2-	10	10	20	20	40
	Multi-hybrid type	MDS-EMH-SPV3-	-	-	xxx40*	xxx40*	xxx40*
	Regenerative resistor type	MDS-EJH-V1	15	20	20	20	40
Output	Rated torque	[N·m]	2.0	3.0	2.9	5.9	9.0
	Max. torque	[N·m]	8.0	11.0	13.0	23.3	42.0
Rated output	[kW]	0.75	1.0	0.5	1.0	1.5	
Max. rotation speed	[r/min]	5000					
Motor inertia	[×10 ⁻⁴ kg·m ²]	2.62	5.12	6.13	11.9	17.8	
Motor inertia with a brake	[×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)	[mm]						
		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)	EH	EH	EH	EH	
		4,194,304 [p/rev] (D51)	EH, EJH	EH, EJH	EH, EMH, EJH	EH, EMH, EJH	
		1,048,576 [p/rev] (D48)					

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	Rated torque	[N·m]	13.7	22.5	37.2	49.0	58.8
	Max. torque	[N·m]	47.0	90.0	122.0	152.0	208.0
Rated output	[kW]	2.0	3.5	4.5	7.0	9.0	
Max. rotation speed	[r/min]	4000					
Motor inertia	[×10 ⁻⁴ kg·m ²]	38.3	75.0	112.0	154.0	196.0	
Motor inertia with a brake	[×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)	[mm]						
		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)	EH	EH	EH	EH	
		4,194,304 [p/rev] (D51)	EH, EMH	EH, EMH	EH, EMH	EH	
		1,048,576 [p/rev] (D48)					

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

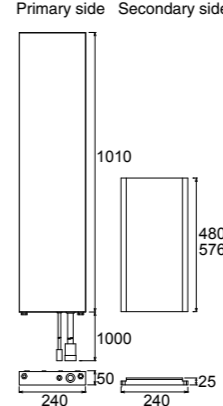
(Note) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

■HG-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]	
Flange fitting diameter	[mm]	φ230
Shaft diameter	[mm]	φ65
Mass (with a brake)	[kg]	120
Absolute position encoder compatible drive unit		EH
		67,108,864 [p/rev] (D74)
		4,194,304 [p/rev] (D51)
		1,048,576 [p/rev] (D48)

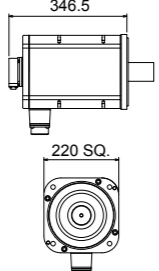
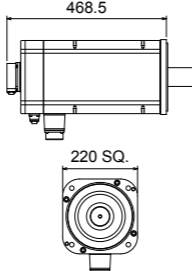
DRIVE SYSTEM LINEAR SERVO MOTOR 400V

■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	Regenerative resistor type	MDS-EJH-V1-
Thrust force	[N] 20000	18000
	15000	6000
	10000	3000
	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]	
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.

■HQ-H Series

Motor type		HQ-H903	HQ-H1103
Compatible drive unit	1-axis type	MDS-EH-V1-160	MDS-EH-V1-160W
Stall torque		70.0	110.0
Output	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]		
(Note) The total length will be 3.5mm longer when using a D51 or D74 encoder.			
Flange fitting diameter	[mm]	φ200	φ200
Shaft diameter	[mm]	φ55	φ55
Mass (with a brake)	[kg]	51.0(61.4)	74.0(84.4)
Absolute position encoder compatible drive unit		EH	EH
		67,108,864 [p/rev] (D74)	
		4,194,304 [p/rev] (D51)	
		1,048,576 [p/rev] (D48)	

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

DRIVE SYSTEM 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-EMH-SPV3-	20	40	40	80 80xx
Output					
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	2.2	3.7	5.5	7.5	7.5
Actual acceleration/deceleration output (Note 2) [kW]	2.64	4.44	6.6	9	9
Base rotation speed [r/min]	1500		1500		12000
Maximum rotation speed [r/min]	10000		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
Outline dimension drawing (flange type)					
Flange fitting diameter [mm]	φ150		φ150		φ180
Shaft diameter [mm]	φ28		φ28		φ32
Mass [kg]	25	30	49	60	60

■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-200 MDS-EMH-SPV3-	320	320
Output			
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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
Outline dimension drawing (flange type)			
Flange fitting diameter [mm]	φ300		φ450
Shaft diameter [mm]	φ60		φ75
Mass [kg]	300	300	450

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-EMH-SPV3-	100	160	160	160
Output					
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	11	18.5	15	22	26
Actual acceleration/deceleration output (Note 2) [kW]	13.2	22.2	18	26.4	31.2
Base rotation speed [r/min]	6000		1500	6000	10000
Maximum rotation speed [r/min]	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
Outline dimension drawing (flange type)					
Flange fitting diameter [mm]	φ180		φ230	φ230	φ230
Shaft diameter [mm]	φ48		φ48	φ55	φ55
Mass [kg]	70	110	110	135	155

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

Motor type	SJ-4-V15-20T	SJ-4-V22-16T
Compatible drive unit	MDS-EH-SP-100 MDS-EMH-SPV3-	160
Output		
Short-time rating	<input type="checkbox"/>	<input type="checkbox"/>
Continuous rating	<input type="checkbox"/>	<input type="checkbox"/>
Standard output during acceleration/deceleration [kW]	9	15
Actual acceleration/deceleration output (Note 2) [kW]	10.8	18
Base rotation speed [r/min]	750	
Maximum rotation speed [r/min]	6000	
Continuous rated torque [N·m]	95.5	140
Inertia [kg·m ²]	0.06	0.08
Degree of protection	IP44	
Outline dimension drawing (flange type)		
Flange fitting diameter [mm]	φ230	
Shaft diameter [mm]	φ48	
Mass [kg]	110	135

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

(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.

DRIVE SYSTEM TOOL SPINDLE MOTOR 400V

■HG-JR Series

Motor type		HG-JR734	HG-JR1534
Compatible drive unit	1-axis type MDS-EH-SP-	20	40
Output	[N·m]	20	
	Rated torque		
	Max. torque		
Rated output	[kW]	0.75	1.5
Max. rotation speed	[r/min]	8000	
Motor inertia	[×10 ⁻⁴ kg·m ²]	2.09	3.79
Degree of protection (The shaft-through portion is excluded.)		IP67	
Outline dimension drawing	[mm]		
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 SYSTEM 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	55
Control power input	Voltage [V]	200 to 240AC Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.2						
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%						
Control method		Sine wave PWM control method						
Dynamic brakes		Built-in						External (MDS-D-DBU)
Machine end encoder		Compatible						
Degree of protection		IP20 (excluding terminal block)						
Cooling method		Forced air cooling						
Mass	[kg]	3.8	3.8	3.8	3.8	4.5	5.8	7.5
Unit outline dimension drawing		A1	A1	A1	A1	B1	C1	D1

2-axis servo drive unit

Drive unit type		MDS-E-V2-20	MDS-E-V2-40	MDS-E-V2-80	MDS-E-V2-160	MDS-E-V2-160W
Drive unit category		2-axis servo				
Nominal maximum current (peak) [A]		20/20	40/40	80/80	160/160	160/160
Power input	Rated voltage [V]	270 to 324DC				
	Rated current [A]	14	14	28	60	70
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	MDS-E-V3-80
Drive unit category		3-axis servo		
Nominal maximum current (peak) [A]		20/20/20	40/40/40	80/80/80
Power input	Rated voltage [V]	270 to 324DC		
	Rated current [A]	21	21	42
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		Natural-cooling
Mass	[kg]	3.8		6.2
Unit outline dimension drawing		A1		B2

■MDS-E Series

1-axis spindle drive unit

Table with 10 columns for Drive unit type (MDS-E-SP-20 to MDS-E-SP-640) and 10 rows for specifications including current, power, control, and mass.

2-axis spindle drive unit

Table with 5 columns for Drive unit type (MDS-E-SP2-20 to MDS-E-SP2-16080) and 10 rows for specifications including current, power, control, and mass.

Power supply unit

Table with 9 columns for Power supply unit type (MDS-E-CV-37 to MDS-E-CV-550) and 10 rows for specifications including output, power, control, and mass.

AC reactor

Table with 8 columns for AC reactor model (D-AL-7.5K to D-AL-55K) and 10 rows for specifications including capacity, voltage, current, and mass.

■MDS-EH Series

1-axis servo drive unit

Table with 9 columns for Drive unit type (MDS-EH-V1-10 to MDS-EH-V1-200) and 10 rows for specifications including current, power, control, and mass.

2-axis servo drive unit

Table with 6 columns for Drive unit type (MDS-EH-V2-10 to MDS-EH-V2-80W) and 10 rows for specifications including current, power, control, and mass.

1-axis spindle drive unit

Table with 10 columns for Drive unit type (MDS-EH-SP-20 to MDS-EH-SP-600) and 10 rows for specifications including current, power, control, and mass.

(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

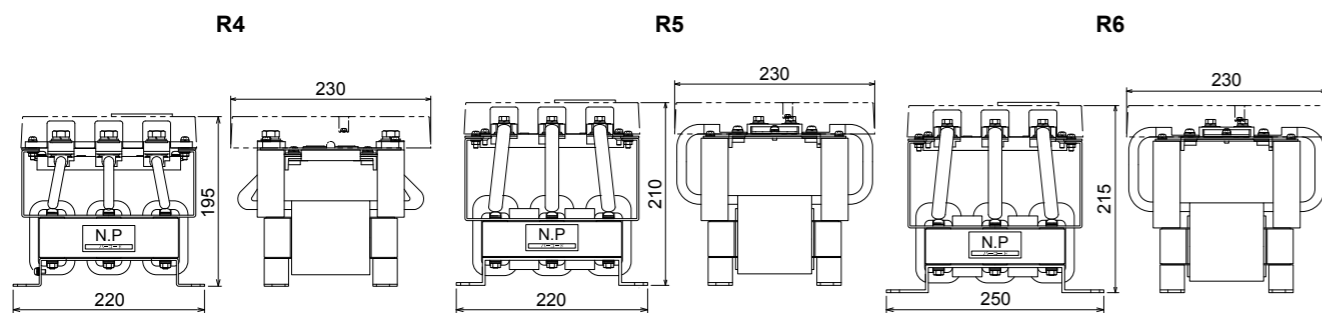
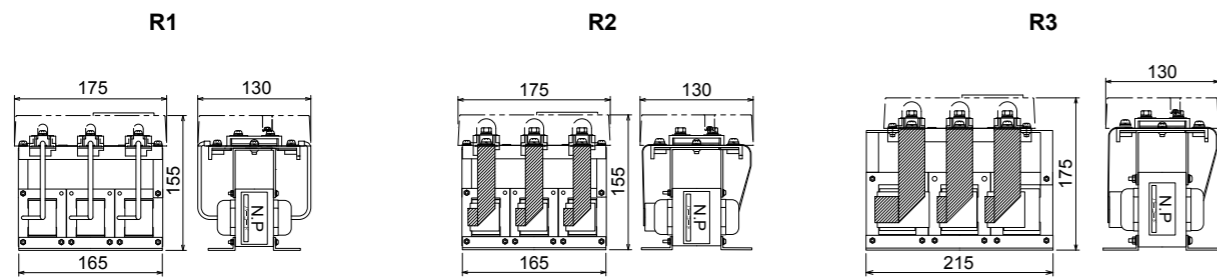
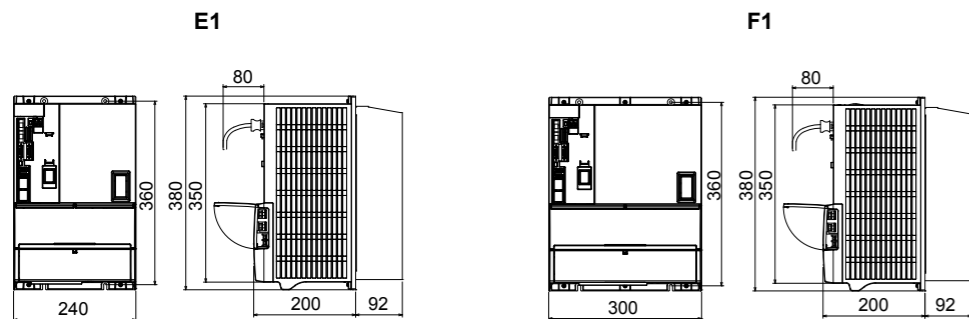
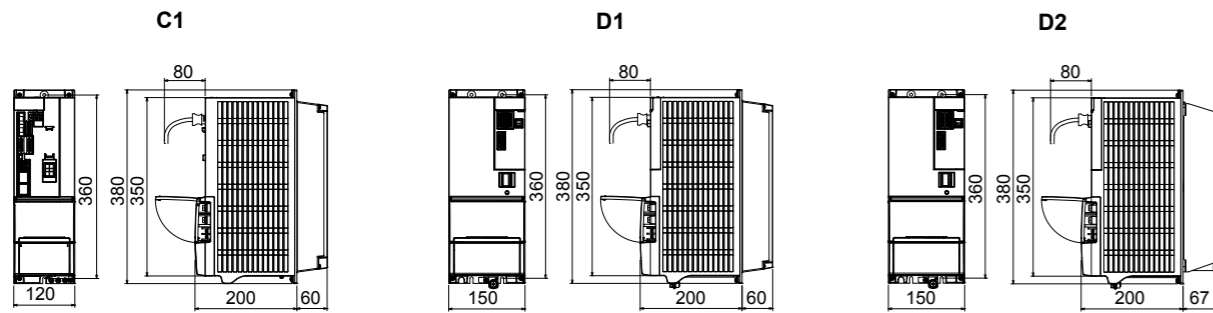
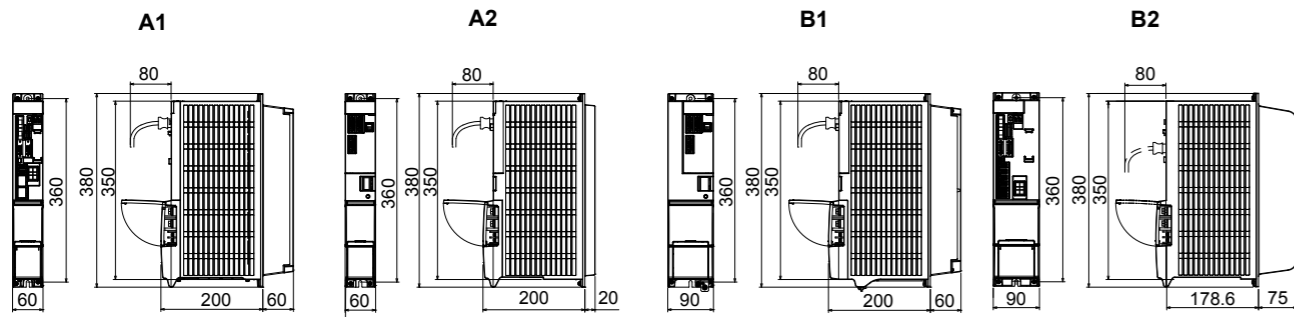
Table with 10 columns for Power supply unit type (MDS-EH-CV-37 to MDS-EH-CV-750) and 10 rows for specifications including output, power, control, and mass.

AC reactor

Table with 9 columns for AC reactor model (DH-AL-7.5K to DH-AL-75K) and 10 rows for specifications including capacity, voltage, current, and mass.

Unit Outline Dimension Drawing

Unit [mm]



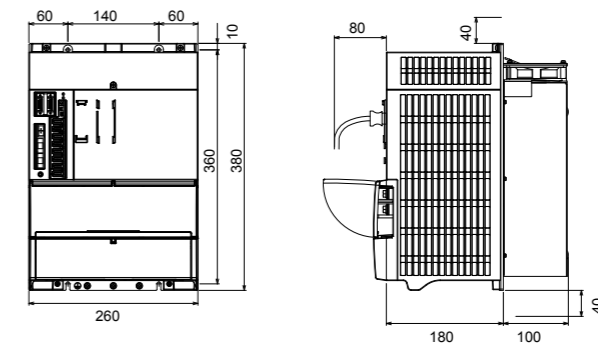
■MDS-EM/EMH Series
Multi-hybrid drive unit

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	16
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-EJ-V2-30	MDS-EJ-V2-40
Drive unit category		2-axis servo (with converter)	
Nominal maximum current (peak) [A]		30/30	40/40
Power input	Rated voltage [V]	3-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%	
	Rated current [A]	7.6	16.0
Control power input	Voltage [V]	Single-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%	
	Current [A]	MAX. 0.4	
	Frequency [Hz]	50/60 Tolerable fluctuation: between +5% and -5%	
Control method		Sine wave PWM control method	
Regeneration method		Power regeneration method	
Dynamic brakes		Built-in	
Machine end encoder		Compatible	
Degree of protection		IP20	
Cooling method		Forced air cooling	
Mass [kg]		2.0	4.6
Unit outline dimension drawing		J7	J8

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	7.9
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

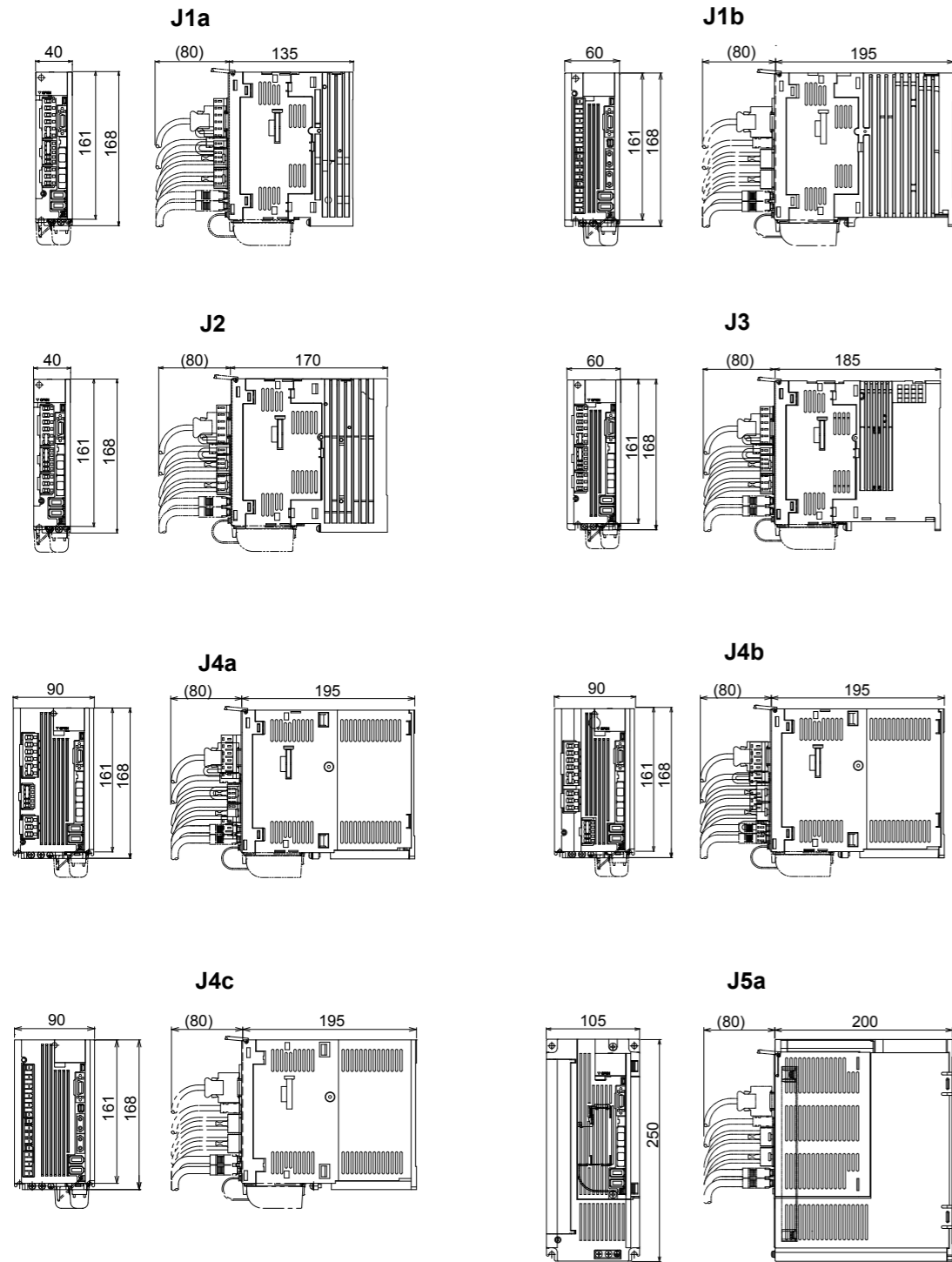
All-in-one compact spindle drive unit

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	35.4
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

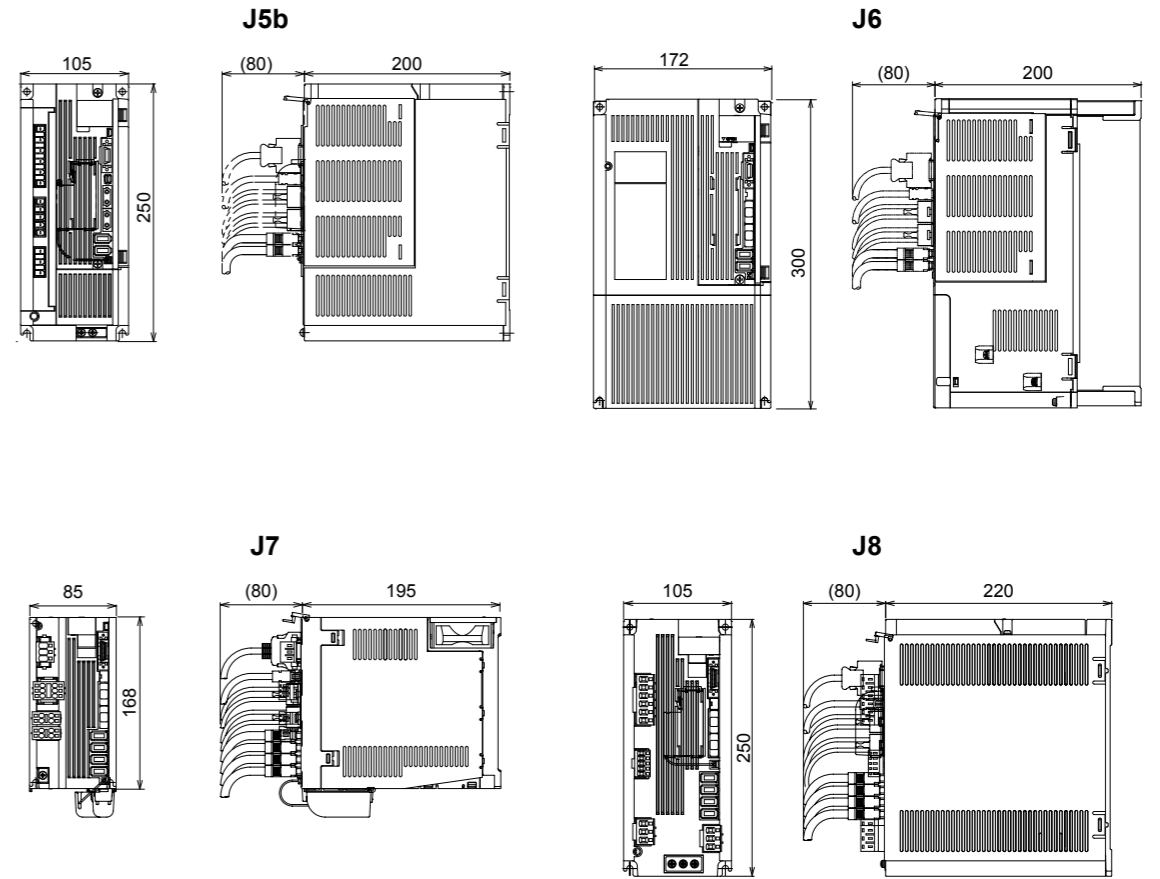
Drive unit type		MDS-EJ-SP2-20
Drive unit category		2-axis servo (with converter)
Nominal maximum current (peak) [A]		20/20
Power input	Rated voltage [V]	3-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%
	Rated current [A]	5.2
Control power input	Voltage [V]	Single-phase 200 to 240AC Tolerable fluctuation: between +10% and -15%
	Current [A]	MAX. 0.4
	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
Cooling method		Forced air cooling
Mass [kg]		2.0
Unit outline dimension drawing		J7

Unit outline dimension drawing

Unit [mm]



Unit [mm]



DRIVE SYSTEM DEDICATED OPTIONS SERVO OPTIONS

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

System establishment in the full closed loop control

Full closed loop control for linear axis

Machine side encoder to be used		Encoder signal output	Interface unit	Drive unit input signal	Battery option	Remarks	
Incremental encoder	Rectangular wave signal output	SR74, SR84 (MAGNESCALE)	Rectangular wave signal	Rectangular wave signal	-		
		Various scale	Rectangular wave signal	Rectangular wave signal	-		
	SIN wave signal output	LS187, LS487 (HEIDENHAIN)	SIN wave signal	IBV Series (HEIDENHAIN) EIB Series (HEIDENHAIN) APE Series (HEIDENHAIN)	Rectangular wave signal	-	
		LS187C, LS487C (HEIDENHAIN)	SIN wave signal	MDS-EX-HR-11 (MITSUBISHI ELECTRIC) EIB Series (HEIDENHAIN)	Mitsubishi serial signal	(Required) Note 1	Distance-coded reference scale (Note 2)
Mitsubishi serial signal output	SR75, SR85 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	-		
Absolute position encoder	Mitsubishi serial signal output	OSA405ET2AS, OSA678T2AS (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	-	Mitsubishi serial signal	Required	Ball screw side encoder
		SR27, SR77, SR87, SR67A (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		LC195M, LC495M, LC291M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mitsu03-4
		LC193M, LC493M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mitsu02-4
	SIN wave signal output	AT343, AT543, AT545, ST748 (Mitutoyo)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		SAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		SVAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		GAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		LAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		RL40N Series (Renishaw)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
	SIN wave signal output	AMS-ABS-3B Series (Schneeberger)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		LMFA Series (AMO)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		LMBA Series (AMO)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		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	Rectangular wave signal	-		
	SIN wave signal output	ERM280 Series (HEIDENHAIN)	SIN wave signal	EIB Series (HEIDENHAIN)	-		
Absolute position encoder	Mitsubishi serial signal output	Various scale	SIN wave signal	MDS-EX-HR-11 (MITSUBISHI ELECTRIC)	(Required) Note 1	Distance-coded reference scale is also available (Note 2)	
		MBA405W Series (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Provided)	Mitsubishi serial signal	Required	
		RU77 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		RCN223M, RCN227M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mitsu02-4
	RCN727M, RCN827M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	Mitsu02-4	
	RA Series (Renishaw)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
	HAM Series (FAGOR)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
	WMFA Series WMBA Series WMRA Series (AMO)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required		
SIN wave signal output	MPRZ 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.

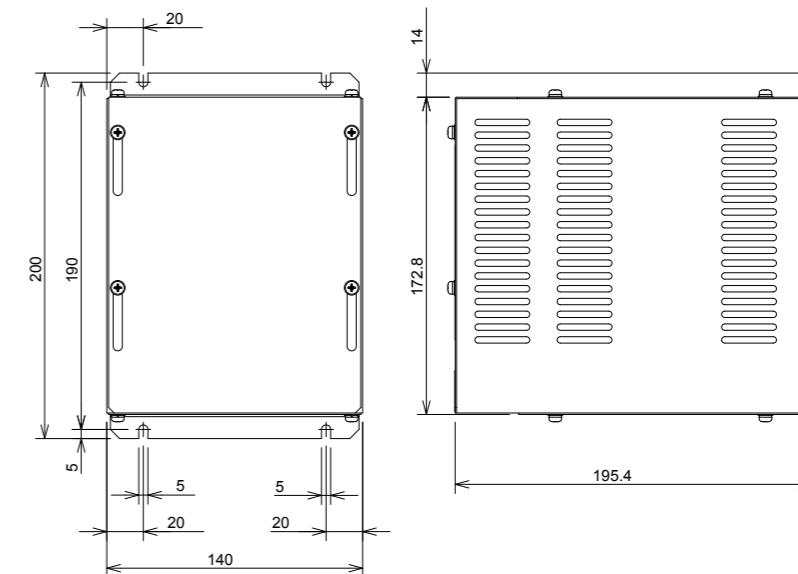
(Note) The rectangular wave signal output scale speed command synchronous control is not available.

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

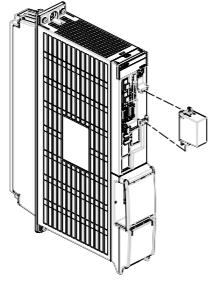
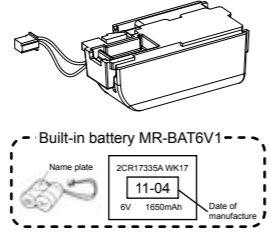
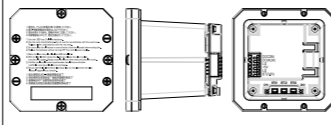
Outline dimension drawing MDS-D-DBU



[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	- - -	- - -

■Cell battery (MDS-BAT6V1SET)

Specifications

Battery option type	Cell battery MDS-BAT6V1SET
Battery model name	2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 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 MR-BAT6V1SET (Note 1)
Battery model name	2CR17335A
Nominal voltage	6V
Number of connectable axes (Note 3)	Up to 3 axes
Battery continuous backup time	Up to 2 axes: Approx. 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.

■Battery box (MDSBTBOX-LR2060)

Specifications

Battery option type	Battery box MDSBTBOX-LR2060
Battery model name (Note 1)	Size-D alkaline batteries LR20x4 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.

Ball screw side encoder OSA405ET2AS, OSA676ET2AS

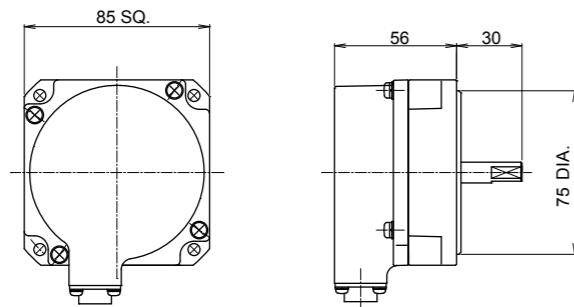
Specifications

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)

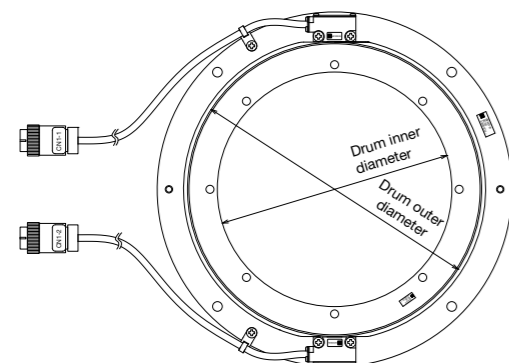
Specifications

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

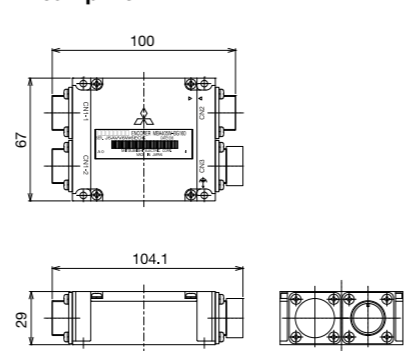
(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.
 (*2) The user is requested to install the magnetic drum and installation ring in the encoder within the accuracy range specified herein. Even when the accuracy of the encoder when shipped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

DRIVE SYSTEM 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)

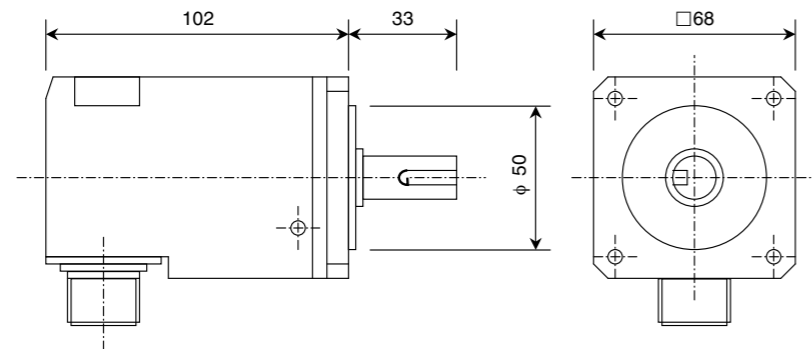
When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side encoder to detect the position and speed of the spindle. Also use this encoder when orientation control and synchronous tap control, etc are executed under the above conditions.

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	○										

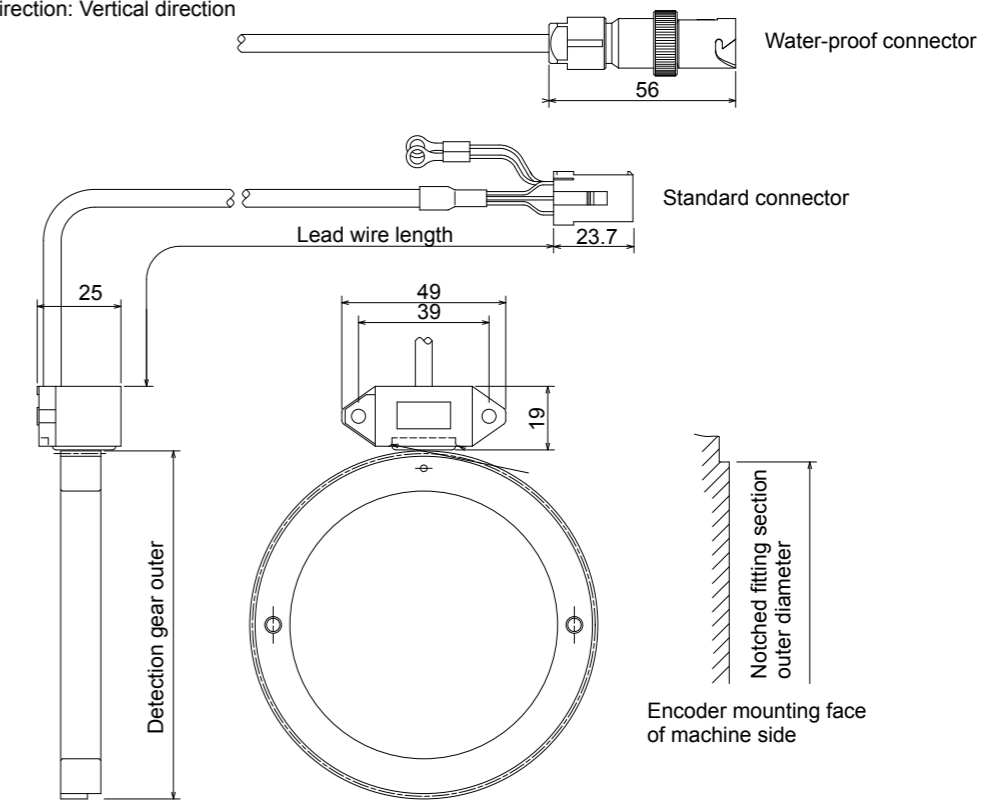
Series type		TS5690N12xx										
Sensor	xx (The end of the type name)	Standard connector	12	22	32	42	52	17	27	37	47	57
		Water-proof connector	19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		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		○									

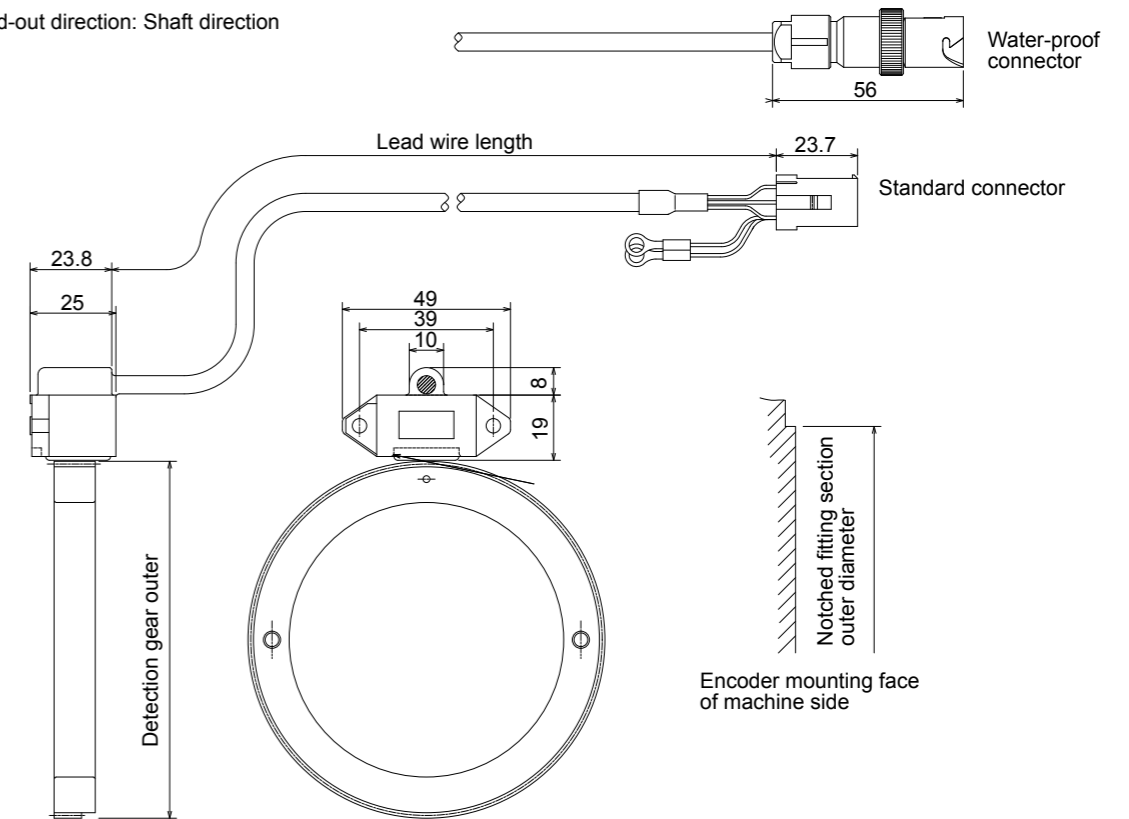
Sensor	Series type		TS5690N25xx									
	xx (The end of the type name)	Standard connector Water-proof connector	12	22	32	42	52	17	27	37	47	57
			19	29	39	49	59	18	28	38	48	58
	Length of lead [mm]		400±10	800±20	1200±20	1600±30	2000±30	400±10	800±20	1200±20	1600±30	2000±30
	Lead wire lead-out direction		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

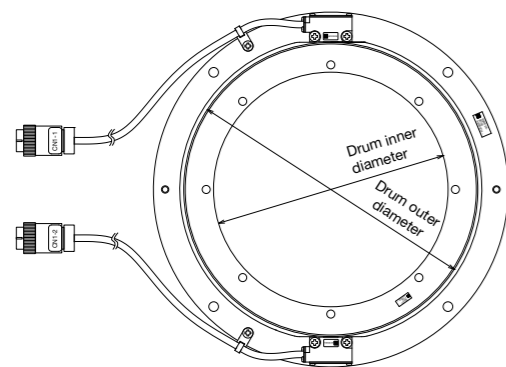
(*1) The values above are typical values after the calibration with our shipping test device and are not guaranteed.

(*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.

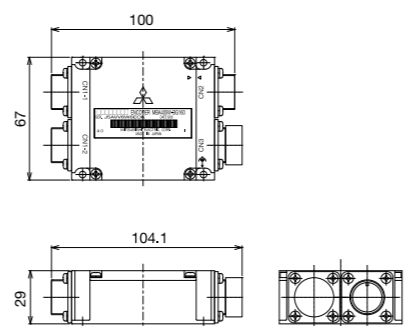
(*3) It is the degree of protection when fitted with a connector.

Outline dimension drawing

Encoder



Preamplifier



[Unit : mm]

[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	○	○

DRIVE SYSTEM ENCODER INTERFACE UNIT

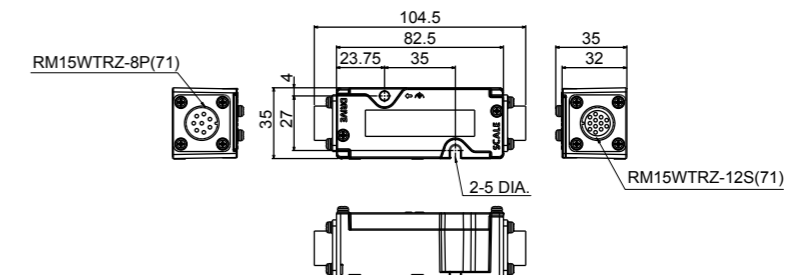
■Serial output interface unit for ABZ analog encoder MDS-EX-HR

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]

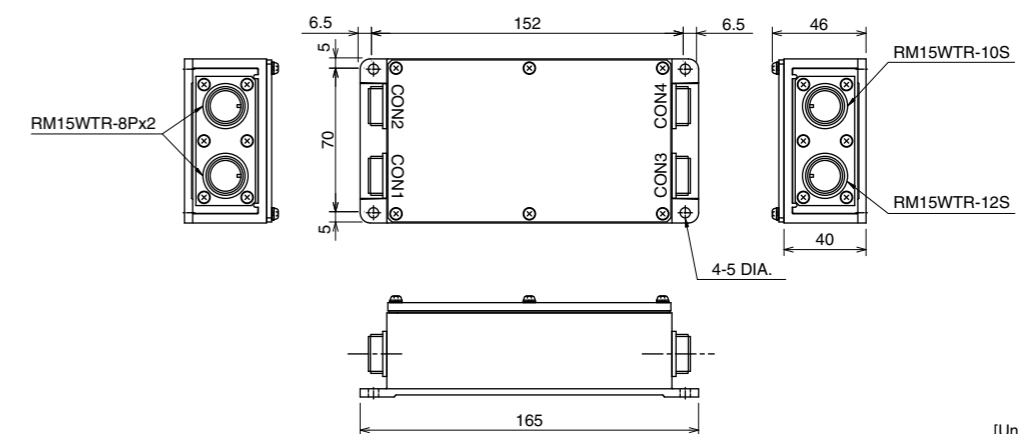
■Serial output interface unit for ABZ analog encoder MDS-B-HR

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	○	○

DRIVE SYSTEM 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.

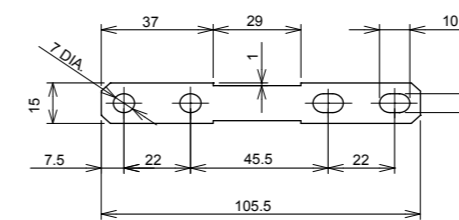
Specifications

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	-	-	-	-

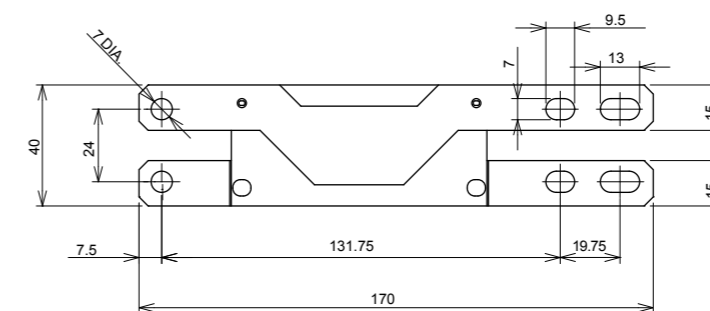
Outline dimension drawings

[Unit:mm]

E-BAR-A0606

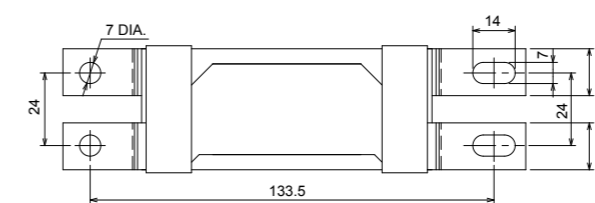


E-BAR-B0606

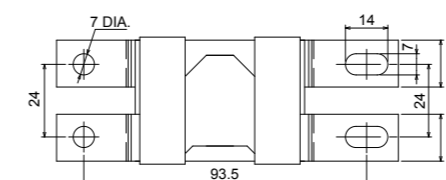


(Note) E-BAR-A0606 is a set of two DC connection bars.

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
	External option regenerative resistor	W1	W2	W3	W3	W4	W3	W4
	Regenerative capacity	30W	100W	300W	300W	500W	300W	500W
	Resistance value	40Ω	40Ω	40Ω	13Ω	13Ω	6.7Ω	6.7Ω
MDS-EJ-V1-10	10W	100Ω	○	○				
MDS-EJ-V1-15	10W	100Ω	○	○				
MDS-EJ-V1-30	20W	40Ω	○	○	○			
MDS-EJ-V1-40	100W	13Ω			○	○		
MDS-EJ-V1-80	100W	9Ω			○	○	○	○
MDS-EJ-V1-100	100W	9Ω			○	○	○	○

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
	Regenerative capacity	100W	300W	300W	500W
	Resistance value	82Ω	120Ω	47Ω	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

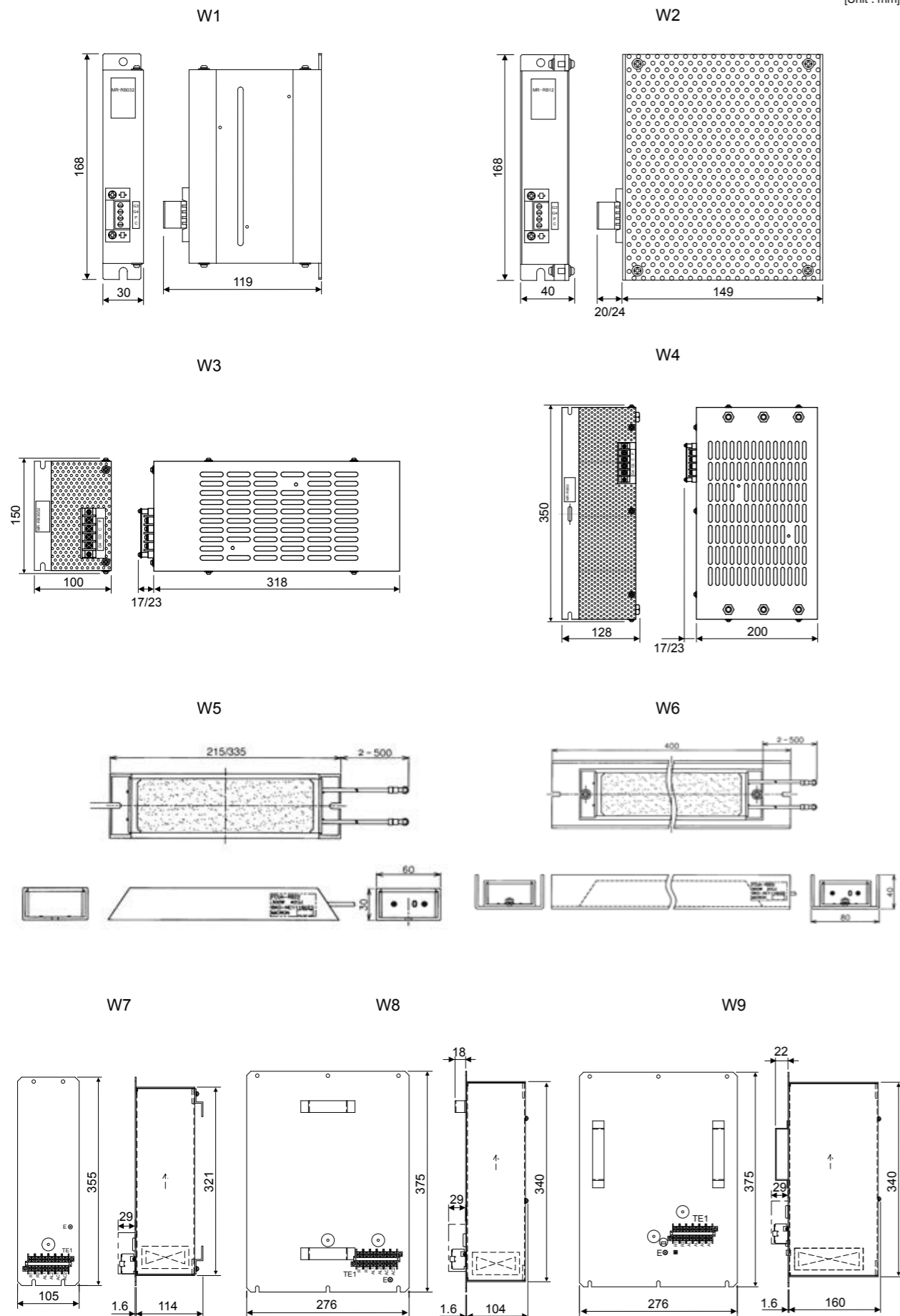
CAUTION The regenerative resistor is not incorporated in the spindle drive unit. Make sure to install the external option regenerative resistor.

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

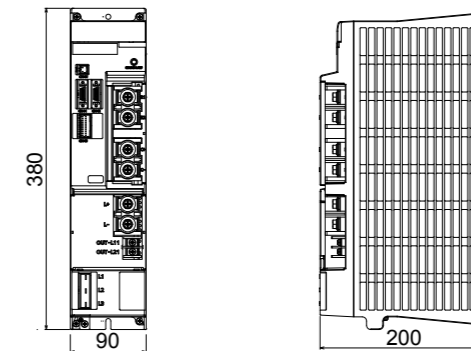
Power backup unit MDS-D/DH-PFU

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



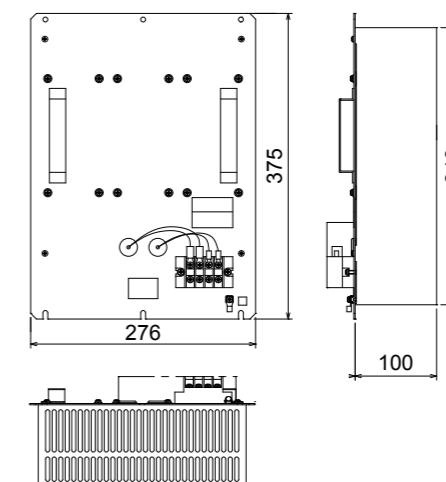
[Unit : mm]

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



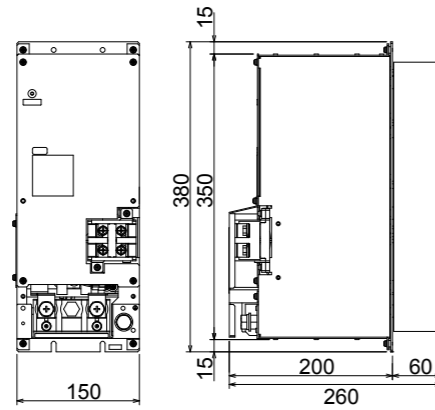
[Unit : mm]

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]

DRIVE SYSTEM SELECTION OF CABLES AND CONNECTORS

MDS-E Series Power Cable/Connector and Brake Cable/Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-E-	Power Cable		Brake Cable				
		Single connector	Cable	Single connector	Cable			
		Drive unit side	Motor side	Drive unit side	Motor side			
HG Series	V1	V2	V3	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	
	HG46	20	20	MR-PWS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-PWS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10	CNU23S (AWG14)	MR-BKS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-BKS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10
	HG56	20	40					
HG96	40	40						

Servo motor type	Drive unit type MDS-E-	Power Connector		Brake Connector										
		Drive unit side	Motor side	Drive unit side	Motor side									
		Straight	Right angle	Straight	Right angle									
HG Series	V1	V2	V3	Cable outline		Cable outline								
	HG75□-S105010	20	40	20	CNP14-2S (12) Applicable cable outline φ10 to 12 (mm)	CNP14-2L (12) Applicable cable outline φ10 to 12 (mm)	CNU23S (AWG14)	CNB10-R2S (6) CNB10S-R2S (6) Applicable cable outline φ4.0 to 6.0 (mm)	CNB10-R2L (6) CNB10S-R2L (6) Applicable cable outline φ4.0 to 6.0 (mm)					
	HG105□-S105010									40	80	40	CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)
	HG75													
	HG105	80	160	—	CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)								
	HG123									160	160W	—	CNP22-22S (16) Applicable cable outline φ12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ12.5 to 16 (mm)
	HG142													
	HG54	320	—	Terminal block connection	Applicable cable outline φ22 to 23.8 (mm)	Applicable cable outline φ22 to 23.8 (mm)								
	HG104													
	HG223													
	HG302													
	HG154													
	HG224													
	HG204													
	HG303													
HG354														
HG453														
HG703														
HG903														

MDS-E Series Encoder Cable and Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-E-	Servo encoder cable														
		Motor side encoder cable				Ball screw side encoder cable										
		Cable (for D48/D51/D74)		Single connector		Cable			Single connector							
		Straight	Right angle	Drive unit side	Motor side	Straight	Right angle	Straight	Right angle	Straight	Right angle					
HG Series	V1	V2	V3	Cable outline		Cable outline		Cable outline		Cable outline						
	HG46	20	40	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9) CNE10S-R10S (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9) CNE10S-R10S (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)				
	HG56												40	80	40	
	HG96															80
	HG75	160	160W										—			
	HG105													320	—	
	HG123															
	HG142															
	HG54															
	HG104															
	HG223															
	HG302															
	HG154															
	HG224															
	HG204															
HG303																
HG354																
HG453																
HG703																
HG903																

■MDS-E Series Power Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-E-		Power Connector		
	SP	SP2	Drive unit side	Motor side	
SJ-D Series (Normal)	SJ-D3.7/100-01	80 16080 (M)	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	Terminal block connection	
	SJ-D5.5/100-01				
	SJ-D5.5/120-01				
	SJ-D5.5/120-02	160 200			16080 (L)
	SJ-D7.5/100-01	160			16080 (L)
SJ-D7.5/120-01					
SJ-D Series (Hollow shaft)	SJ-D11/100-01	160 200	16080 (L)		
SJ-DG Series (High output)	SJ-D5.5/120-02T-S	160 200	16080 (L)		
	SJ-DG3.7/120-03T	160	—		
	SJ-DG5.5/120-04T				
	SJ-DG7.5/120-05T				
SJ-DG11/100-03T	200	—			
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	80 16080 (M)	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	Terminal block connection	
	SJ-DJ5.5/120-01	80 16080 (M)			
	SJ-DJ7.5/100-01	160			16080 (L)
	SJ-DJ7.5/120-01				
	SJ-DJ11/100-01				
SJ-DJ15/80-01	200	—			
SJ-DL Series (Low-inertia)	SJ-DL0.75/100-01	20	20	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	
	SJ-DL1.5/100-01	40	40		
	SJ-DL5.5/150-01T	160	16080 (L)		
	SJ-DL5.5/200-01T				
SJ-DL7.5/150-01T	160	16080 (L)			
SJ-DL Series (Hollow shaft)	SJ-DL5.5/200-01T-S	160	16080 (L)	Terminal block connection	
SJ-V Series (Normal)	SJ-V2.2-01T	40	40	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	
	SJ-V3.7-02ZT	80	80 16080 (M)		
	SJ-V7.5-03ZT	160	16080 (L)		
	SJ-V11-08ZT	200	—		
	SJ-V11-13ZT				
	SJ-V15-01ZT				
	SJ-V15-09ZT	200	—		
	SJ-V18.5-01ZT				
	SJ-V18.5-04ZT	240	—		
	SJ-V22-01ZT				
	SJ-V22-04ZT	320	—		
	SJ-V22-06ZT	240	—		
	SJ-V26-01ZT	320	—		
	SJ-V37-01ZT	400	—		
	SJ-V45-01ZT	640	—		
SJ-V55-01ZT					
SJ-V Series (Wide range constant output)	SJ-V11-01T	160	16080 (L)		
	SJ-V11-09T	200	—		
	SJ-V15-03T				
	SJ-V18.5-03T	240	—		
	SJ-V22-05T	320	—		
SJ-V22-09T					
SJ-VK22-19ZT	—	—			
SJ-VL Series (Low-inertia)	SJ-VL2.2-02ZT	40	40	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	
	SJ-VL11-02FZT	160	16080 (L)		
	SJ-VL11-05FZT-S01				
SJ-VL18.5-05FZT	240	—			

■MDS-E Series Encoder Cable and Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-E-	Spindle encoder cable												
		When connecting to a spindle motor			When connecting to a spindle side encoder									
		Motor side PLG cable			Spindle side accuracy encoder TS5690 cable				Spindle side encoder OSE-1024 cable					
		Cable	Single connector		Cable	Single connector			Cable		Single connector			
Drive unit side	Encoder side		Drive unit side	Encoder side		Straight	Right angle	Drive unit side	Encoder side					
SP	SP2													
SJ-D Series (Normal)	SJ-D3.7/100-01	80 16080 (M)	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNEPGS	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)	
	SJ-D5.5/100-01													
	SJ-D5.5/120-01													
	SJ-D5.5/120-02	160 200												16080 (L)
	SJ-D7.5/100-01	160												16080 (L)
SJ-D Series (Hollow shaft)	SJ-D5.5/120-02T-S	160 200	16080 (L)											
SJ-DG Series (High output)	SJ-DG3.7/120-03T	160	—											
	SJ-DG5.5/120-04T													
	SJ-DG7.5/120-05T			200	—									
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	80 16080 (M)	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNEPGS	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)	
	SJ-DJ5.5/120-01	80 16080 (M)												
	SJ-DJ7.5/100-01	160												16080 (L)
	SJ-DJ7.5/120-01													
	SJ-DJ11/100-01													
SJ-DJ15/80-01	200	—												
SJ-DL Series (Low-inertia)	SJ-DL0.75/100-01	20	20											
	SJ-DL1.5/100-01	40	40											
	SJ-DL5.5/150-01T	160	16080 (L)											
	SJ-DL5.5/200-01T													
SJ-DL7.5/150-01T	160	16080 (L)												
SJ-DL Series (Hollow shaft)	SJ-DL5.5/200-01T-S	160	16080 (L)											
SJ-V Series (Normal)	SJ-V2.2-01T	40	40	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNEPGS	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-V3.7-02ZT	80	80 16080 (M)											
	SJ-V7.5-03ZT	160	16080 (L)											
	SJ-V11-08ZT	200	—											
	SJ-V11-13ZT													
	SJ-V15-01ZT													
	SJ-V15-09ZT	200	—											
	SJ-V18.5-01ZT													
	SJ-V18.5-04ZT	240	—											
	SJ-V22-01ZT													
	SJ-V22-04ZT	320	—											
	SJ-V22-06ZT	240	—											
	SJ-V26-01ZT	320	—											
	SJ-V37-01ZT	400	—											
	SJ-V45-01ZT	640	—											
SJ-V55-01ZT														
SJ-V Series (Wide range constant output)	SJ-V11-01T	160	16080 (L)											
	SJ-V11-09T	200	—											
	SJ-V15-03T													
	SJ-V18.5-03T	240	—											
	SJ-V22-05T	320	—											
SJ-V22-09T														
SJ-VK22-19ZT	—	—												
SJ-VL Series (Low-inertia)	SJ-VL2.2-02ZT	40	40	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNEPGS	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-VL11-02FZT	160	16080 (L)											
	SJ-VL11-05FZT-S01													
SJ-VL18.5-05FZT	240	—												

■MDS-EM Series Power Cable/Connector and Brake Cable/Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EM-SPV3	Power Cable		Brake Cable			
		Single connector	Cable		Cable		
			Motor side	Motor side	Motor side	Motor side	
Drive unit side		Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft		
HG Series	HG96	10040 16040	- All axes CNU01SEF(AWG14) - L-axis only CNU01SEL(AWG14) - M-axis only CNU01SEM(AWG14) - S-axis only CNU01SES(AWG14)	MR-PWS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-PWS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10	MR-BKS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-BKS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10

Servo motor type	Drive unit type MDS-EM-SPV3	Power Connector		Brake Connector								
		Drive unit side	Motor side		Motor side							
			Straight	Right angle	Straight	Right angle						
HG Series	HG75□-S105010	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	CNP14-2S (12) Applicable cable outline φ10 to 12 (mm)	CNP14-2L (12) Applicable cable outline φ10 to 12 (mm)	CNP10-R2S (6) CNP10S-R2S (6) Applicable cable outline φ4.0 to 6.0 (mm)	CNP10-R2L (6) CNP10S-R2L (6) Applicable cable outline φ4.0 to 6.0 (mm)						
	HG105□-S105010		CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)								
	HG75						CNP22-22S (16) Applicable cable outline φ12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ12.5 to 16 (mm)				
	HG105											
	HG123											
	HG142											
	HG54								CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)		
	HG104											
	HG223											
	HG302											
	HG154										CNP22-22S (16) Applicable cable outline φ12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ12.5 to 16 (mm)
	HG224											
	HG204											
	HG303											
	HG354											
HG453												

■MDS-EM Series Encoder Cable and Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EM-SPV3	Servo encoder cable								
		Motor side encoder cable				Ball screw side encoder cable				
		Cable (for D48/D51)		Single connector		Ball screw side encoder (OSA405ET2AS)		Single connector		
		Straight	Right angle	Drive unit side	Motor side	Cable	Single connector	Straight	Right angle	
HG Series	HG96	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9) CNE10S-R10S (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)
	HG75									
	HG105									
	HG123									
	HG142									
	HG54									
	HG104									
	HG223									
	HG302									
	HG154									
	HG224									
	HG204									
	HG303									
	HG354									
	HG453									

■MDS-EM Series Power Connector, Encoder Cable, and Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-EM-SPV3	Power Connector		Spindle encoder cable										
		Drive unit side	Motor side	When connecting to a spindle motor		When connecting to a spindle side encoder				When connecting to a spindle side encoder				
				Motor side PLG cable		Spindle side accuracy encoder TS5690 cable		Spindle side encoder OSE-1024 cable		Single connector				
				Cable	Single connector	Cable	Single connector	Cable	Single connector	Drive unit side	Encoder side			
SJ-D Series (Normal)	SJ-D5.5/100-01	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-D5.5/120-01													
	SJ-D7.5/100-01													
	SJ-D7.5/120-01													
	SJ-D5.5/120-02													
	SJ-D11/100-01													
SJ-D Series (Hollow shaft)	SJ-D5.5/120-02T-S	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-DG Series (High output)													
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-DJ7.5/100-01													
	SJ-DJ7.5/120-01													
	SJ-DJ11/100-01													
SJ-DL Series (Low-inertia)	SJ-DL5.5/150-01T	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-DL7.5/150-01T													
	SJ-V Series (Normal)													
SJ-V Series (Wide range constant output)	SJ-V11-08ZT	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-V11-13ZT													
	SJ-V15-01ZT													
	SJ-V15-09ZT													
SJ-V Series (Hollow shaft)	SJ-V18.5-01ZT	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-V Series (Wide range constant output)													
SJ-V Series (Hollow shaft)	SJ-V11-09T	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-V Series (Wide range constant output)													
SJ-V Series (Hollow shaft)	SJ-VL11-02FZT	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-V Series (Wide range constant output)													

■MDS-EJ Series Power Cable/Connector and Brake Cable/Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EJ-V1	Drive unit side	Power Cable		Brake Cable		
			Single connector	Cable	Single connector	Cable	
			Motor side		Motor side		
			Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	
HG Series	HG46	10	Supplied for each drive unit	MR-PWS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-PWS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10	MR-BKS1CBL □ M-A1-H □ : Length (m) 2, 3, 5, 7, 10	MR-BKS1CBL □ M-A2-H □ : Length (m) 2, 3, 5, 7, 10
	HG56	15					
	HG96	30					

Servo motor type	Drive unit type MDS-EJ-V1	Drive unit side	Power Connector		Brake Connector			
			Motor side		Motor side			
			Straight	Right angle	Straight	Right angle		
HG Series	HG75□-S105010	30	CNP14-2S (12) Applicable cable outline φ10 to 12 (mm)	CNP14-2L (12) Applicable cable outline φ10 to 12 (mm)	CNP10-R2S (6) CNP10S-R2S (6) Applicable cable outline φ4.0 to 6.0 (mm)	CNP10-R2L (6) CNP10S-R2L (6) Applicable cable outline φ4.0 to 6.0 (mm)		
	HG105□-S105010							
	HG75							
	HG105							
	HG54							
	40	HG104	CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)				
		HG123						
		HG142						
		HG223						
		HG302					CNP22-22S (16) Applicable cable outline φ12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ12.5 to 16 (mm)
	HG154							
	80	HG224	CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)				
		HG204						
		HG303						
		HG354					CNP22-22S (16) Applicable cable outline φ12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ12.5 to 16 (mm)

■MDS-EJ Series Encoder Cable and Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EJ-V1	Servo encoder cable								
		Motor side encoder cable				Ball screw side encoder (OSA405ET2AS)				
		Cable (for D48/D51)		Drive unit side	Single connector		Cable		Single connector	
		Straight	Right angle		Straight	Right angle	Straight	Right angle	Straight	Right angle
HG Series	HG46	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9) CNE10S-R10S (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9) CNE10S-R10S (9) Applicable cable outline φ6.0 to 9.0 (mm)	CNE10-R10L (9) CNE10S-R10L (9) Applicable cable outline φ6.0 to 9.0 (mm)
	HG56									
	HG96									
	HG75									
	HG105									
	HG54									
	HG104									
	HG123									
	HG142									
	HG223									
	HG302									
	HG154									
	HG224									
	HG204									
	HG303									
HG354										

■MDS-EJ Series Power Connector, Encoder Cable, and Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-EJ-SP	Power Cable		Spindle encoder cable									
		When connecting to a spindle motor		When connecting to a spindle motor				When connecting to a spindle side encoder					
		Drive unit side	Motor side	Motor side PLG cable		Spindle side accuracy encoder TS5690 cable		Spindle side encoder OSE-1024 cable					
				Cable	Single connector	Cable	Single connector	Cable	Single connector				
				Drive unit side	Encoder side	Drive unit side	Encoder side	Straight	Right angle	Drive unit side	Encoder side		
SJ-D Series (Normal)	SJ-D3.7/100-01	80	Supplied for each drive unit										
	SJ-D5.5/100-01	100	Terminal block connection	CNP2E-1□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-D5.5/120-01												
	SJ-D7.5/100-01												
	SJ-D7.5/120-01												
SJ-D11/100-01	160												
SJ-DJ (Compact & lightweight)	SJ-DJ5.5/100-01	100	Terminal block connection	CNP2E-1□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)
	SJ-DJ5.5/120-01												
	SJ-DJ7.5/100-01												
	SJ-DJ11/100-01	160											

■MDS-EH Series Power Connector and Brake Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EH-		Power Connector				Brake Connector		
	V1	V2	Drive unit side	Motor side		Drive unit side	Motor side		
				Straight	Right angle		Straight	Right angle	
HG-H Series	10	10 20	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	CNP14-2S (12)	CNP14-2L (12)	CNU23S (AWG14)	CNB10-R2S (6) CNB10S-R2S (6) Applicable cable outline φ4.0 to 6.0 (mm)	CNB10-R2L (6) CNB10S-R2L (6) Applicable cable outline φ4.0 to 6.0 (mm)	
				Applicable cable outline φ10 to 12 (mm)	Applicable cable outline φ10 to 12 (mm)				
				CNP18-10S (14)	CNP18-10L (14)				
	Applicable cable outline φ10.5 to 14 (mm)	Applicable cable outline φ10.5 to 14 (mm)							
	CNP22-22S (16)	CNP22-22L (16)							
	Applicable cable outline φ12.5 to 16 (mm)	Applicable cable outline φ12.5 to 16 (mm)							
	CNP32-17S (23)	CNP32-17L (23)							
	Applicable cable outline φ22 to 23.8 (mm)	Applicable cable outline φ22 to 23.8 (mm)							
	Terminal block connection								
	Terminal block connection								
HQ-H Series	160	—	CNP32-17S (23)	CNP32-17L (23)	CNU23S (AWG14)	CNB10-R2S (6) CNB10S-R2S (6) Applicable cable outline φ4.0 to 6.0 (mm)	CNB10-R2L (6) CNB10S-R2L (6) Applicable cable outline φ4.0 to 6.0 (mm)		
	Applicable cable outline φ22 to 23.8 (mm)	Applicable cable outline φ22 to 23.8 (mm)							

■MDS-EH Series Power Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-EH-SP	Power Connector		
		Drive unit side	Motor side	
SJ-4-V Series (Normal)	20	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	Terminal block connection	
	40			
	80			
	100			
	160			
	200			
	320			
	100			Terminal block connection
	160			

■MDS-EH Series Encoder Cable and Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EH-		Servo encoder cable														
	V1	V2	Motor side encoder cable				Ball screw side encoder cable										
			Cable (for D48/D51/D74)		Single connector		Ball screw side encoder (OSA405ET2AS/OSA676ET2AS)		Single connector								
HG Series	10	10 20	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	Cable □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30							
											CNE10-R10S (9)	CNE10-R10L (9)	CNE10S-R10S (9)	CNE10S-R10L (9)			
											Applicable cable outline φ6.0 to 9.0 (mm)	Applicable cable outline φ6.0 to 9.0 (mm)					
	80	80									80	80	80	80	80	80	80
	160	—									—	—	—	—	—	—	—
	200	—									—	—	—	—	—	—	—
	160	—									—	—	—	—	—	—	—
	160W	—									—	—	—	—	—	—	—

■MDS-EH Series Encoder Cable and Connector for Spindle Motor Selection List

Spindle motor type	Drive unit type MDS-EH-SP	Spindle encoder cable																						
		When connecting to a spindle motor				When connecting to a spindle side encoder																		
		Motor side PLG cable		Spindle side accuracy encoder TS5690 cable		Spindle side encoder OSE-1024 cable																		
		Cable	Single connector	Cable	Single connector	Cable		Single connector																
SJ-4-V Series (Normal)	20	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNEPGS	CNE20-29S (10) Applicable cable outline φ6.8 to 10 (mm)	CNE20-29L (10) Applicable cable outline φ6.8 to 10 (mm)												
													SJ-4-V2.2-03T	SJ-4-V3.7-03T	SJ-4-V5.5-07T	SJ-4-V7.5-12T	SJ-4-V11-18T	SJ-4-V18.5-14T	SJ-4-V22-15T	SJ-4-V22-18ZT	SJ-4-V26-08ZT	SJ-4-V37-04ZT	SJ-4-V45-02T	SJ-4-V55-03T
													SJ-4-V15-20T	SJ-4-V22-16T										

■MDS-EMH Series Power Connector and Brake Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EMH- SPV3	Power Connector				Brake Connector	
		Drive unit side	Motor side		Motor side		
			Straight	Right angle	Straight	Right angle	
HG-H Series	HG-H54	8040 10040	- All axes CNU01SEF (AWG14) - L-axis only CNU01SEL (AWG14) - M-axis only CNU01SEM (AWG14) - S-axis only CNU01SES (AWG14)	CNP18-10S (14)	CNP18-10L (14)	CNB10-R2S (6) CNB10S-R2L (6)	CNB10-R2L (6) CNB10S-R2L (6)
	HG-H104			Applicable cable outline φ10.5 to 14 (mm)	Applicable cable outline φ10.5 to 14 (mm)		
	HG-H154	8040		CNP22-22S (16)	CNP22-22L (16)	Applicable cable outline φ4.0 to 6.0 (mm)	Applicable cable outline φ4.0 to 6.0 (mm)
	HG-H204	10040		Applicable cable outline φ12.5 to 16 (mm)	Applicable cable outline φ12.5 to 16 (mm)		
	HG-H354	10060					
	HG-H453						

■MDS-EMH Series Encoder Cable and Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EMH- SPV3	Servo encoder cable											
		Motor side encoder cable					Ball screw side encoder cable						
		Cable (for D48/D51)		Single connector			Ball screw side encoder (OSA405ET2AS)						
		Straight	Right angle	Drive unit side	Motor side		Cable		Single connector				
HG-H Series	HG-H54	8040 10040	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9)	CNE10-R10L (9)	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9)	CNE10-R10L (9)		
	HG-H104					Applicable cable outline φ6.0 to 9.0 (mm)	Applicable cable outline φ6.0 to 9.0 (mm)			Applicable cable outline φ6.0 to 9.0 (mm)	Applicable cable outline φ6.0 to 9.0 (mm)		
	HG-H154	8040											
	HG-H204	10040											
	HG-H354	10060											
	HG-H453												

■MDS-EMH Series Power Connector, Encoder Cable, and Connector for Spindle Motor Selection List

Servo motor type	Drive unit type MDS-EMH- SPV3	Power Cable		Spindle encoder cable										
		Drive unit side	Motor side	When connecting to a spindle motor				When connecting to a spindle side encoder						
				Motor side PLG cable		Spindle side accuracy encoder TS5690 cable		Spindle side encoder OSE-1024 cable						
				Cable	Single connector	Cable	Single connector	Cable		Single connector				
SJ-4-V Series (Normal)	SJ-4-V7.5-13ZT	8040	Terminal block connection	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE20-29S (10)	CNE20-29L (10)
	SJ-4-V11-18T													
	SJ-4-V18.5-14T													
SJ-4-V Series (Wide range constant output)	SJ-4-V15-20T	10060												

■MDS-EJH Series Power Connector and Brake Connector for Servo Motor Selection List

Servo motor type	Drive unit type MDS-EJH- V1	Power Connector				Brake Connector	
		Drive unit side	Motor side		Motor side		
			Straight	Right angle	Straight	Right angle	
HG-H Series	HG-H75□-S105010	Supplied for each drive unit	CNP14-2S (12)	CNP14-2L (12)	CNB10-R2S (6) CNB10S-R2S (6)	CNB10-R2L (6) CNB10S-R2L (6)	
	HG-H105□-S105010		Applicable cable outline φ10 to 12 (mm)	Applicable cable outline φ10 to 12 (mm)			Applicable cable outline φ4.0 to 6.0 (mm)
	HG-H75		15	CNP18-10S (14) Applicable cable outline φ10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ10.5 to 14 (mm)	Applicable cable outline φ4.0 to 6.0 (mm)	Applicable cable outline φ4.0 to 6.0 (mm)
	HG-H105		20				
	HG-H54						
	HG-H104						
HG-H154	40						

■MDS-EJH Series Encoder Cable and Connector for Servo Motor Selection List

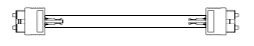


Servo motor type	Drive unit type MDS-EJH- V1	Servo encoder cable										
		Motor side encoder cable					Ball screw side encoder cable					
		Cable (for D48/D51)		Single connector			Ball screw side encoder (OSA405ET2AS)					
		Straight	Right angle	Drive unit side	Motor side		Cable		Single connector			
HG-H Series	HG-H75	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9)	CNE10-R10L (9)	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9)	CNE10-R10L (9)		
	HG-H105				Applicable cable outline φ6.0 to 9.0 (mm)	Applicable cable outline φ6.0 to 9.0 (mm)			Applicable cable outline φ6.0 to 9.0 (mm)	Applicable cable outline φ6.0 to 9.0 (mm)		
	HG-H54				20							
	HG-H104											
	HG-H154				40							

DRIVE SYSTEM LIST OF CABLES

[Manufacturer (Column and figure on the left show drive unit side.)]

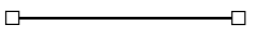
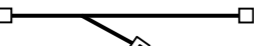
a : Honda Tsushin Kogyo b : Japan Aviation Electronics Industry c : Hirose Electric d : 3M e : J.S.T. f : DDK g : Tyco Electronics

<Optical communication cable>

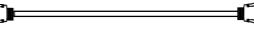




Item	Model	Length (m)	Contents	Manu- facturer	Compatible model				
					E/EH	EM/EMH	EJ/EJH		
For CN1A/ CN1B/ OPT1A	Optical communication cable For wiring between drive units (inside panel)	J396 L0.3M	0.3		a	a	○	○	○
		J396 L0.5M	0.5						
		J396 L1M	1						
		J396 L2M	2						
		J396 L3M	3						
	J396 L5M	5							
	Optical communication cable For wiring between drive units (outside panel)	J395 L3M	3		a	a	○	○	○
		J395 L5M	5						
		J395 L7M	7						
		J395 L10M	10						
		J395 L15M	15						
	Optical communication cable For wiring between drive units (outside panel)	G380 L5M	5		g	g	○	○	○
		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	Manu- facturer	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		e	e	○	○	-							
		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		e	e	-	-	○
			MR-BT6V2CBL1M							1						


<Power supply communication cable and connector>

Item	Model	Length (m)	Contents	Manu- facturer	Compatible model				
					E/EH	EM/EMH	EJ/EJH		
For CN4/9	Power supply communication cable	SH21	0.35		d	d	○	-	-
		0.5							
		1							
		2							
		3							
Power supply communication cable connector set	FCUA-CS000	-		d	d	○	-	-	
	CNU23SCV2 (AWG14) These connectors are supplied for each power supply unit.	-		e		○	-	-	
For CN23	Contact control output connector Applicable cable outline: 0.85mm ² to 3.5mm ² Finish outside diameter: to φ4.2mm	-		e		○	-	-	
For CN24	External emergency stop input connector	-		f		○	-	-	

<Power backup unit connector>

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

<STO input connector>

Item	Model	Length (m)	Contents	Manu- facturer	Compatible model		
					E/EH	EM/EMH	EJ/EJH
For CN8	STO cable	-		g	○	-	○

<Servo encoder cable and connector>

Item	Model	Length (m)	Contents	Manu- facturer	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		d	f	○	○	○
	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)	-		f	○	○	○	
	CNE10-R10L(9)	-		f	○	○	○	
	CNE10S-R10S(9)	-		f	○	○	○	
	CNE10S-R10L(9)	-		f	○	○	○	

Item	Model	Length (m)	Contents	Manu- facturer	Compatible model			
					E/EH	EM/EMH	EJ/EJH	
CN3 MDS-EX-HR/MDS-B-HR unit cable	CNV2E-HP-2M	2		d	c	○	○	○
	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		d	d	○	-	-
	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	-		d	d	○	-	-
For CN2/3	CNU2S(AWG18)	-		d	○	○	○	













<Brake cable and connector>

Item	Model	Length (m)	Contents	Manu- facturer	Compatible model		
					E/EH	EM/EMH	EJ/EJH
For motor brake	CNB10-R2S(6)	-		f	○	○	○
	CNB10-R2L(6)	-					
	CNB10S-R2S(6)	-					
	CNB10S-R2L(6)	-					
For motor brake	MR-BKS1CBL 2M-A1-H	2		b	○	○	○
	MR-BKS1CBL 3M-A1-H	3					
	MR-BKS1CBL 5M-A1-H	5					
	MR-BKS1CBL 7M-A1-H	7					
	MR-BKS1CBL 10M-A1-H	10					
For motor brake	MR-BKS1CBL 2M-A2-H	2		b	○	○	○
	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)	-		f	○	-	-

<Power connector>

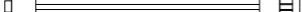






Item	Model	Length (m)	Contents	Manu- facturer	Compatible model							
					E/EH	EM/EMH	EJ/EJH					
For motor power	CNP18-10S(14)	-		f	○	○	○					
								CNP18-10L(14)	-	f	○	○
	CNP22-22S(16)	-		f	○	○	○					
								CNP22-22L(16)	-	f	○	○
	CNP32-17S(23)	-		f	○	-	-					
								CNP32-17L(23)	-	f	○	-
	CNP14-2S(12)	-		f	○	○	○					
								CNP14-2L(12)	-	f	○	○
	Power cable for HG46/56/96 Lead out in direction of motor shaft	MR-PWS1CBL 2M-A1-H	2		b	○	-	○				
		MR-PWS1CBL 3M-A1-H	3									
Power cable for HG46/56/96 Lead out in opposite direction of motor shaft	MR-PWS1CBL 2M-A2-H	2		b	○	-	○					
	MR-PWS1CBL 3M-A2-H	3										
For TE1	CNU01SECV(AWG14)	-		e	○	-	-					
								CNU01SEF(AWG14)	e	○	-	-
For CN31 L/M/S	CNU01SEF(AWG14)	-		e	-	○	-					
								CNU01SEL(AWG14)	e	○	-	-
For CN22	RCN22	-		f	-	○	-					
								RCN22S	-	f	-	○

<Drive unit side main circuit connector>

Item	Model	Length (m)	Contents	Manufacturer	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 ϕ 3.9mm	-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○
	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 ϕ 4.7mm (For CNP2) to ϕ 3.9mm ²	-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○
	For MDS-EJH-V1-10,15,20,40 Applicable cable outline:0.8mm ² to 2.1mm ² Finish outside diameter: to ϕ 3.9mm	-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○
		-		e	-	-	○

MEMO

<Spindle encoder cable and connector>

Item	Model	Length (m)	Contents	Manufacturer	Compatible model										
					E/EH	EM/EMH	EJ/EJH								
For CN2	Motor side PLG cable Spindle side accuracy encoder TS5690 cable	CNP2E-1-2M	2		d	g	○	○	○						
		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		d	f	○	○	○						
		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								d	f	○	○	○
		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	-		g	○	○	○							
	Spindle side encoder OSE-1024 cable	CNE20-29S(10)	-		f	○	○	○							
	Applicable cable outline ϕ 6.8 to 10mm	CNE20-29L(10)	-		f	○	○	○							
For CN2/3	Spindle encoder drive unit side connector	CNU2S(AWG18)	-		d	○	○	○							

SOFTWARE TOOLS

For details on each software tool, refer to the software tools catalog (BNP-A1224).

Process flow from machine design and development to operation and maintenance



•NC-related processes

Servo selection	Custom screen creation	Parameter creation	Training
NC Servo Selection	NC Designer2	NC Configurator2	NC Trainer2
	Debug	Servo/spindle adjustment	Operation
	NC Trainer2 plus	Machine adjustment	Maintenance
		NC Analyzer2	NC Explorer
			NC Monitor2

•Machine design

[NC Servo Selection]
Input machining parameters to determine the optimum servo motor. This function automatically calculates spindle acceleration/deceleration time and selects the optimum power supply module.

Use the following instructions to set machining parameters

Calculation results of the spindle acceleration/deceleration times

The spindle acceleration/deceleration times are shown in a graph.

•Electrical circuitry design

Combine the parts to customize the screen without programming.

Customize buttons with original pictures.

Edit PLC program with PLC development tool of NC Trainer2 plus.

Customize a screen using NC Designer2 and check its operation using NC Trainer2 plus.

[NC Designer2]
We provide a developmental environment where the MTB can customize screens easily. Two types of screen development methods are available; the interpreter system (programming without C++) for simple screen development, and the compiler system with a complex controller (programming with C++).

[NC Trainer2 Plus]
NC Trainer2 plus supports customization development; it helps to program the ladder programming of the user PLC to be developed by machine tool builders and debug it and check the operations of customized screens.

•Machine assembly and adjustment

Check and setup the parameters list using a computer.

Check the contents of the parameters in the help section.

[NC Configurator2]
NC parameters required for NC control or machine operation can be edited on a computer. It is also possible to create initial parameters simply by inputting the machine configuration.

•Machine assembly and adjustment

Adjusting with simple parameter settings

Servo parameters are adjusted automatically

Results displayed in bode diagram

[NC Analyzer2]
Servo parameters can be adjusted automatically by measuring and analyzing machine characteristics. Measurement and analysis can be done by running a servo motor using the machining program for adjustment, or using the vibration signal. This function can sample various types of data.

•Operation and maintenance

[NC Trainer2]
NC Trainer2 plus supports customization development; it helps to program the ladder programming of the user PLC to be developed by machine tool builders and debug it and check the operations of customized screens.

- Put skills obtained into practice
- Smooth start-up
- Quick setup/machining

[NC Explorer]
CNC machining data can be managed using Windows® Explorer on a computer when the computer is connected to multiple CNCs via Ethernet.

[NC Monitor2]
Taking advantage of connection with a factory network, CNC operation status can be monitored from remote locations. Several CNCs can be connected and monitored simultaneously.

Application development support

[Mitsubishi CNC Communication Software (FCSB1224W000)]
This software provides a bunch of API functions. They facilitate development of an Windows application which requires connection and communication with Mitsubishi CNCTM. You can use the common interfaces for any Mitsubishi CNC model, which leads to high efficiency in development.

(*) The compatible model is Mitsubishi CNCs after M700/M70.

Development language: VC++/VB

Example of application

- Data collection/monitoring
- Graphic check
- Display/operation panel function
- Program creation/edit
- Production control
- CAD/CAM

Example of communication with CNC

- Start/stop the machining program
- Upload/download files
- Acquire coordinate value, alarm/diagnosis information
- Read/write NC data such as tools and variables
- Read/write device information

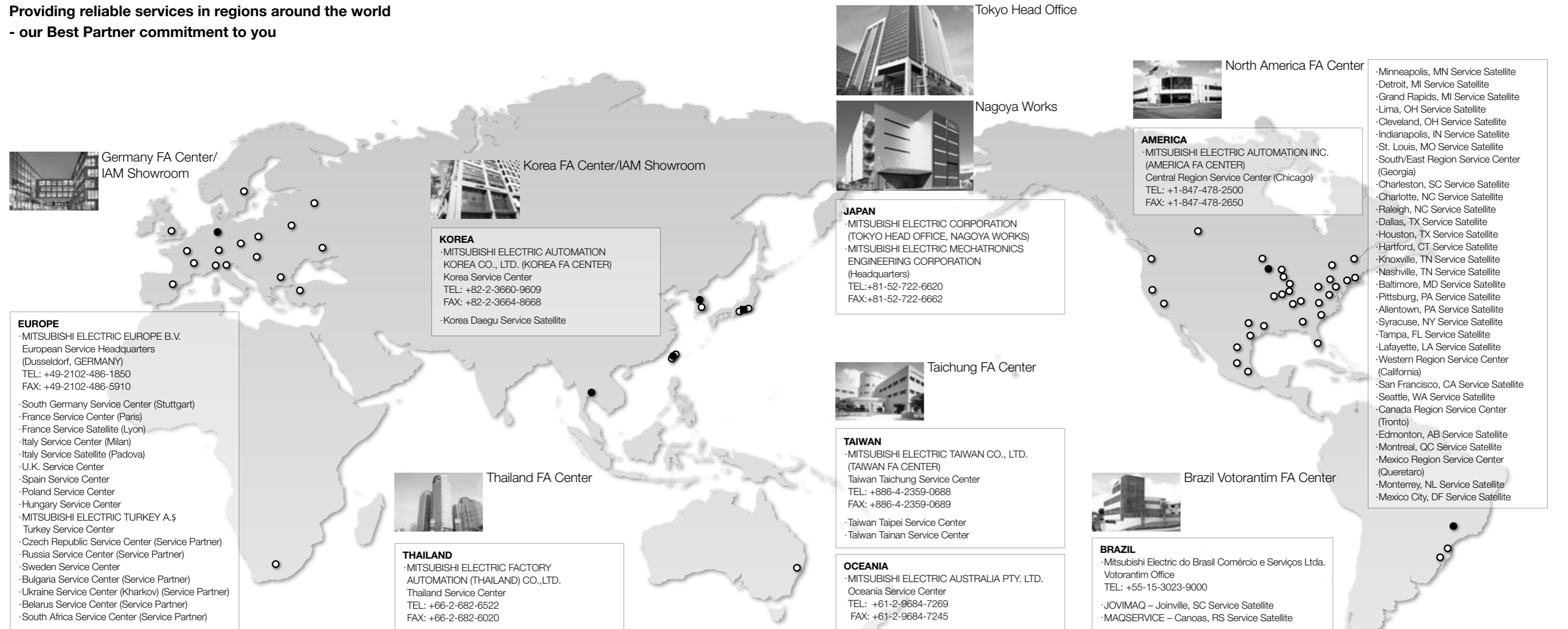
PC → MITSUBISHI CNC Communication Software (FCSB1224W000) → Runtime Library → API → Windows OS

Ethernet → MITSUBISHI CNC → MITSUBISHI CNC → MITSUBISHI CNC

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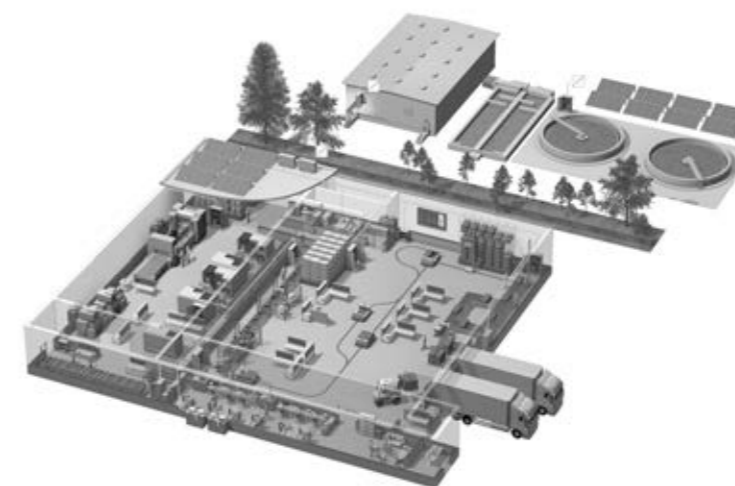
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