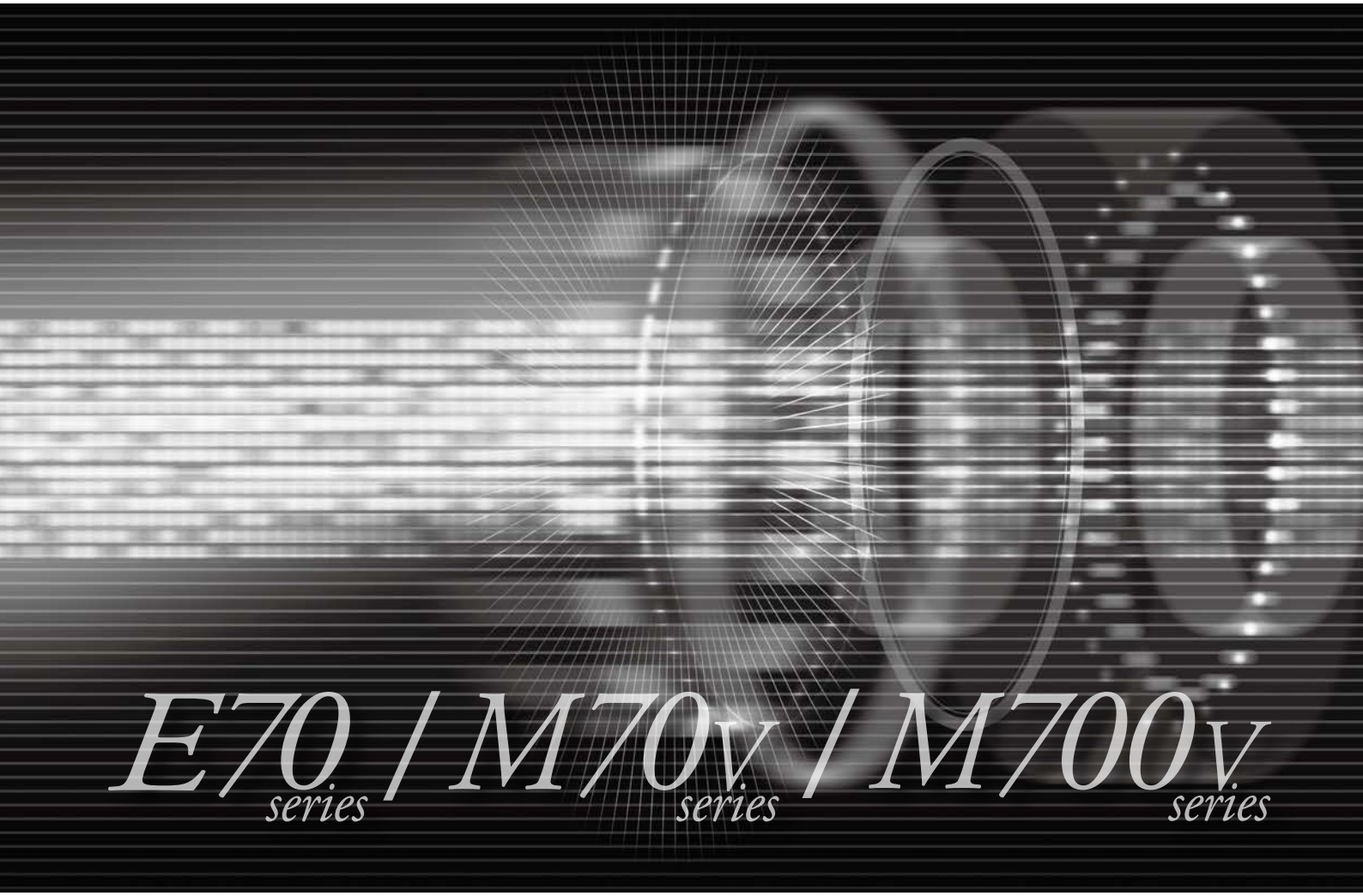
MITSUBISHI ELECTRIC

Changes for the Better

NUMERICAL CONTROL (CNC)
NC Specification Selection Guide
E70 / M70V / M700V Series



BNP-A1225-F[ENG]

Product lines

E70 series

E70 Series

M70V series

M70V Series

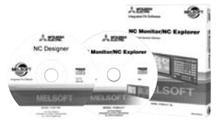
M700V series

M700VS Series

M700VW Series

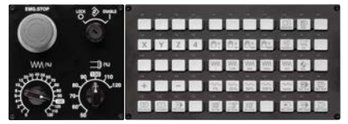
Soft Ware

MELSOFT



NC Designer
NC Monitor
NC Explorer
NC Trainer/NC Trainer plus
NC Analyzer
NC Configurator2
GX Developer etc.

Machine Operation Panel



Machine Operation Panel

Drive Unit

Multi-hybrid drive unit
MDS-DM2 Series

High-performance drive unit
MDS-D2/DH2 Series

Ultra-compact drive unit with built-in power supply
MDS-DJ Series

Servo Motor

Medium-inertia motor
HF Series

Low-inertia motor
HF-KP Series

Linear servo motor
LM-F Series

Twin-head magnetic detector
MBA Series

Direct drive servo motor
TM-RB Series

Manual pulse generator

RIO 1

RIO 2

Spindle Motor

High-performance spindle motor
SJ-D Series / SJ-DJ Series / SJ-V Series

Low-inertia and high-speed spindle motor
SJ-DL Series / SJ-VL Series

Tool spindle motor
HF-KP Series / HF-SP Series

Twin-head magnetic detector
MBE Series

Built-in spindle motor
SJ-B Series / SJ-PMB Series

INDEX

E70/M70V/M700V Series Lineup

Machining center system

(Display/Control unit integrated type)

(Display/Control unit separate type)

Model name		E70 Series	M70V Series		M700VS Series			M700VW Series		
			TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW
Number of control axes	Max. number of axes (NC axes + Spindles + PLC axes)	6	9	11	12	16		12	16	
	Max. number of NC axes (in total for all the part systems)	3	5	8	8	16		8	16	
	Max. number of spindles	1	2		4			4		
	Max. number of PLC axes	2	6		6			6		
	Max. number of PLC indexing axes	1	4		4	6		4	6	
	Number of simultaneous contouring control axes	3	4		4	8		4	8	
	Max. number of NC axes in a part system	3	5	8	6	8		6	8	
Max. number of part systems		1	1	2	2			2		
CF card in control unit		–	–		–			Available		
IC card mode (Front IC card mode)		Available	Available		Available			Available		
Hard disk mode		–	–		–			Available		
Least command increment		0.1μm	0.1μm		0.1μm	1nm		0.1μm	1nm	
Least control increment		1nm	1nm		1nm			1nm		
Max. program capacity		230kB (600m) (400)	500kB (1,280m) (1,000)	2,000kB (5,120m) (1,000)	2,000kB (5,120m) (1,000)			2,000kB (5,120m) (1,000)		
Max. PLC program capacity		8,000 steps	20,000 steps	32,000 steps	128,000 steps			128,000 steps		
High-speed machining mode Ⅰ Max. [kBPM]		–	8.4	16.8	16.8	16.8	16.8	16.8	16.8	16.8
High-speed machining mode Ⅱ Max. [kBPM]		–	–	33.7	67.5	168	168	67.5	168	168
High-speed high-accuracy control 1 Max. [kBPM] (1st part system only)		–	16.8	16.8	16.8	33.7	33.7	16.8	33.7	33.7
High-speed high-accuracy control 2 Max. [kBPM] (limited to 1-part system configuration)		–	–	33.7	67.5	168	168	67.5	168	168
High-accuracy control 1 (1st part system only)		–	Available	Available	Available	Available	Available	Available	Available	Available
SSS Control (1st part system only) (Super Smooth Surface)		–	–	Available	Available	Available	Available	Available	Available	Available
CC-Link (Master/Slave)		–	Available	Available	Available	Available	Available	Available	Available	Available
Display		8.4-type	8.4-type/10.4-type/10.4-type touch panel (selectable)		8.4-type/10.4-type/10.4-type touch panel/15-type (selectable)			10.4-type/10.4-type touch panel/ 15-type/15-type touch panel (selectable)		
Keyboard		sheet keys	sheet keys/clear keys (selectable)					clear keys		
HMI customization function		NC Designer								
Windows® XPe		–						Available		
MITSUBISHI CNC Machine Operation PanelHigh		Compatible								
Languages supported		Japanese/English/German/Italian/French/Spanish/Chinese (traditional)/Chinese (simplified)/ Korean/Portuguese/Hungarian/Dutch/Swedish/Turkish/Polish/Russian/Czech								

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

Lathe system

(Display/Control unit integrated type)

(Display/Control unit separate type)

E70 Series	M70V Series		M700VS Series			M700VW Series		
	TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW
6	9	11	12	16		12	16	
3	5	9	12	16		12	16	
2	3	4	4	6		4	6	
2	6		6			6		
1	4		4	6		4	6	
3	4		4		8	4		8
3	5	8	6	8		6	8	
1	1	2	2	4		2	4	
–	–		–			Available		
Available	Available		Available			Available		
–	–		–			Available		
0.1μm	0.1μm		0.1μm	1nm		0.1μm	1nm	
1nm	1nm		1nm			1nm		
230kB (600m) (400)	500kB (1,280m) (1,000)	2,000kB (5,120m) (1,000)	2,000kB (5,120m) (1,000)			2,000kB (5,120m) (1,000)		
8,000 steps	20,000 steps	32,000 steps	128,000 steps			128,000 steps		
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	–	–	–	–	–	–	–	–
–	Available	Available	Available	Available	Available	Available	Available	Available
8.4-type	8.4-type/10.4-type/10.4-type touch panel (selectable)		8.4-type/10.4-type/10.4-type touch panel/ 15-type (selectable)			10.4-type/10.4-type touch panel/ 15-type/15-type touch panel (selectable)		
sheet keys	sheet keys/clear keys (selectable)					clear keys		
NC Designer								
–						Available		
Compatible								
Japanese/English/German/Italian/French/Spanish/Chinese (traditional)/Chinese (simplified)/ Korean/Portuguese/Hungarian/Dutch/Swedish/Turkish/Polish/Russian/Czech								

Selection procedure flow chart

Start selecting the NC specifications!

STEP 1 Check the machine type and specifications

- 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 P3

- 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 P50

- Select the servo motor capacity
- Check the outline dimensions, detector, and whether it has a scale or break

STEP 4 Decide the spindle motor P55

- 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 P81

- Check the capacity and the dimensions of a drive unit
- Check the power regeneration/resistor regeneration

STEP 6 Decide the power supply unit P89

- Select the power supply unit only when a power regenerative drive unit is used.

STEP 7 Decide the hardware options P7,P13,P115

- 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 P17

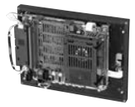
- Check the number of programs stored (memory capacity), number of variable sets, etc.
- Check the required functions

STEP 9 Check the development tools P131

- Check the screen development tool (when screen customization is required)

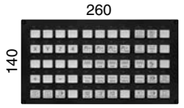
NC specification selection completed!

Control Unit

E70 Series	M70V Series	M700VS Series	M700VW Series
			
Integrated type (Placed on the back of display)			Separate type (Placed separately from the display unit)

MITSUBISHI CNC Machine Operation Panel

[mm]

	Type	Name	Contents
	FCU7-KB921	MITSUBISHI CNC Machine Operation Panel A (Standard specification)	Key switch 55 points, LED 55 points MITSUBISHI standard key layout
	FCU7-KB922	MITSUBISHI CNC Machine Operation Panel A (Custom specification)	Key switch 55 points, LED 55 points Without key tops (purchase custom parts separately)
	FCU7-KB926	MITSUBISHI CNC Machine Operation Panel B	Rotary switches (spindle override, cutting override) Select switch (memory protection) Emergency stop push-button

The internal components of the machine operation panel are protected against water and oil (IP65F).

Handy Terminal

[mm]

	Type	Contents
	HG1T-SB12UH-MK1346-L5	LCD (Monochrome display with backlight) Emergency stop button Manual pulse generator LED 10 points Membrane switch (key) Enable switch

The internal components of the panels are protected against water and oil (IP65F).
Possible to connect with the M700VW Series only.

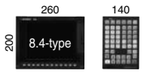
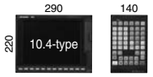
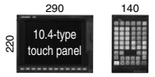
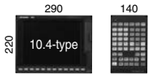
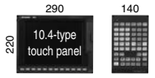
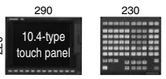
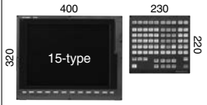
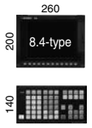
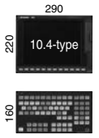
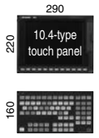
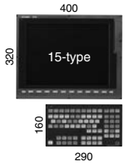
Displays & Keyboards

[mm]

E70 Series

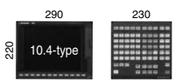
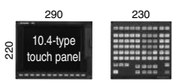
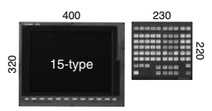
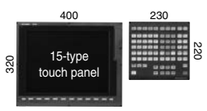
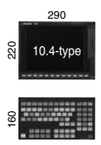
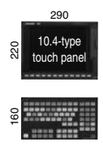
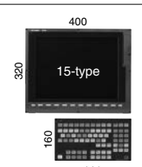
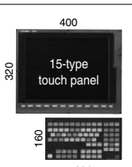
Keyboard \ Display	FCU7-DU120-13 8.4-type
FCU7-KB024 sheet keys FCU7-KB025 sheet keys for lathe system <ONG layout>	

M70V/M700VS Series

Keyboard \ Display	FCU7-DU120-12 (M70V) FCU7-DU120-11 (M700VS) 8.4-type	Keyboard \ Display	FCU7-DU140-12 (M70V) FCU7-DU140-11 (M700VS) 10.4-type	FCU7-DU140-32 (M70V) FCU7-DU140-31 (M700VS) 10.4-type touch panel	FCU7-DU180-11 (M700VS) 15-type
FCU7-KB024 sheet keys FCU7-KB025 sheet keys for lathe system <ONG layout>		FCU7-KB044 sheet keys <ONG layout>			–
FCU7-KB026 clear keys FCU7-KB028 clear keys for lathe system <ONG layout>		FCU7-KB046 clear keys <ONG layout>			–
–	–	FCU7-KB048 clear keys <ABC layout>			
FCU7-KB029 sheet keys <ONG layout>		FCU7-KB047 clear keys <Full keyboard>			

(Note) 15-type display is available with M700VS only. There are restrictions on the keyboard location imposed due to the maximum length of the G011/G012 cable.

M700VW Series

Keyboard \ Display	FCU7-DA646-11 10.4-type	FCU7-DA646-33 10.4-type touch panel	FCU7-DA636-11 15-type	FCU7-DA636-33 15-type touch panel
FCU7-KB041 clear keys <ABC layout>				
FCU7-KB045 clear keys <Full keyboard>				

The internal components of the keyboard are protected against water and oil (IP65F). The interface for USB memory and CF card are mounted on the front panel of the display for E70/M70V/M700VS Series. The interface for USB memory and PCMCIA Ⅱ are mounted on the front panel of the display for M700VW Series.

List of Units

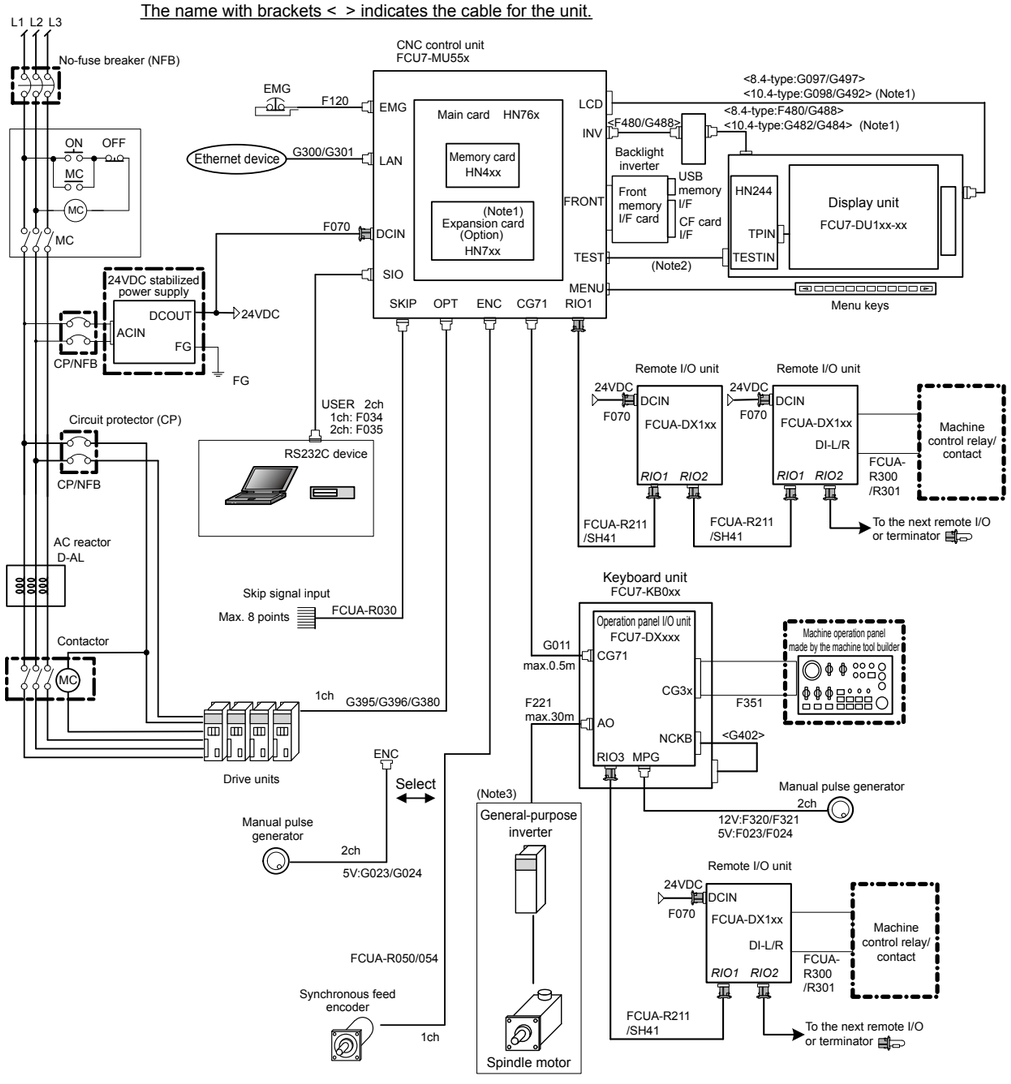
Classification		Type	Remarks	Supported model E70	M70V	M700VS	M700VW
[Operation panel I/O unit]							
DI 24V/0V common input	DO Source output	FCU7-DX621	DI: 64-points 24V/0V common type DO: 48-points source type AO: 1 point MPG:2ch Occupied stations (fixed): 1, 2, 3, 7, 8 RIO3 extensible stations: 4, 5, 6	○	–	–	–
		FCU7-DX711	DI: 64-points 24V/0V common type DO: 64-points source type MPG:2ch Occupied stations (fixed): 1, 2, 7, 8 RIO3 extensible stations: 3, 4, 5, 6	○	○	○	–
		FCU7-DX721	DI: 96-points 24V/0V common type DO: 80-points source type AO: 1 point MPG:2ch Occupied stations (fixed): 1, 2, 3, 7, 8 RIO3 extensible stations: 4, 5, 6	○	○	○	–
		FCU7-DX731	DI: 96-points 24V/0V common type DO: 96-points source type MPG:2ch Occupied stations (fixed): 1, 2, 3, 7, 8 RIO3 extensible stations: 4, 5, 6	○	○	○	–
	DO Sink output	FCU7-DX710	DI: 64-points 24V/0V common type DO: 64-points sink type MPG:2ch Occupied stations (fixed): 1, 2, 7, 8 RIO3 extensible stations: 3, 4, 5, 6	–	○	○	–
		FCU7-DX720	DI: 96-points 24V/0V common type DO: 80-points sink type AO: 1 point MPG:2ch Occupied stations (fixed): 1, 2, 3, 7, 8 RIO3 extensible stations: 4, 5, 6	–	○	○	–
		FCU7-DX730	DI: 96-points 24V/0V common type DO: 96-points sink type MPG: 2ch Occupied stations (fixed): 1, 2, 3, 7, 8 RIO3 extensible stations: 4, 5, 6	–	○	○	–
[Operation panel I/O unit]							
DI 24V/0V common input	DO Source output	FCU7-DX671	DI: 32-points 24V/0V common type DO: 32-points source type MPG:3ch Occupied stations DI/DO: Select 1 station from between 1 and 6 MPG: 7, 8 (fixed) RIO3 extensible stations: Unselected stations between 1 and 6	–	–	–	○
		FCU7-DX771	DI: 64-points 24V/0V common type DO: 64-points source type MPG:3ch Occupied stations DI/DO: Select 2 stations from between 1 and 6 MPG: 7, 8 (fixed) RIO3 extensible stations: Unselected stations between 1 and 6	–	–	–	○
	DO Sink output	FCU7-DX670	DI: 32-points 24V/0V common type DO: 32-points sink type MPG:3ch Occupied stations DI/DO: Select 1 station from between 1 and 6 MPG: 7, 8 (fixed) RIO3 extensible stations: Unselected stations between 1 and 6	–	–	–	○
		FCU7-DX770	DI: 64-points 24V/0V common type DO: 64-points sink type MPG:3ch Occupied stations DI/DO: Select 2 stations from between 1 and 6 MPG: 7, 8 (fixed) RIO3 extensible stations: Unselected stations between 1 and 6	–	–	–	○
[Remote I/O unit]							
DI 24V/0V common input	DO Source output	FCUA-DX101	DI: 32-points 24V/0V common type (photo coupler insulation) DO: 32-points source type (non-insulation) Number of occupied stations: 1	○	○	○	○
		FCUA-DX111	DI: 64-points 24V/0V common type (photo coupler insulation) DO: 48-points source type (non-insulation) Number of occupied stations: 2	○	○	○	○
	Analog output	FCUA-DX121	DI: 64-points 24V/0V common type (photo coupler insulation) DO: 48-points source type (non-insulation) AO: 1 point Number of occupied stations: 2	○	○	○	○
	Analog input/output	FCUA-DX141	DI: 32-points 24V/0V common type (photo coupler insulation) DO: 32-points source type (non-insulation) AI: 4 points AO: 1 point Number of occupied stations: 2	○	○	○	○
	DO Sink output	FCUA-DX100	DI: 32-points 24V/0V common type (photo coupler insulation) DO: 32-points sink type (non-insulation) Number of occupied stations: 1	–	○	○	○
		FCUA-DX110	DI: 64-points 24V/0V common type (photo coupler insulation) DO: 48-points sink type (non-insulation) Number of occupied stations: 2	–	○	○	○
	Analog output	FCUA-DX120	DI: 64-points 24V/0V common type (photo coupler insulation) DO: 48-points sink type (non-insulation) AO: 1 point Number of occupied stations: 2	–	○	○	○
	Analog input/output	FCUA-DX140	DI: 32-points 24V/0V common type (photo coupler insulation) DO: 32-points sink type (non-insulation) AI: 4 points AO: 1 point Number of occupied stations: 2	–	○	○	○
[Scan I/O card]							
Source type		HR357	Scan DI/DO = 64 points/64 points DI/DO = 32 points/32 points	–	○	○	○
Sink type		HR347	Scan DI/DO = 64 points/64 points DI/DO = 32 points/32 points	–	○	○	○
[External power supply unit]							
External power supply with power supply ON/OFF function		PD25	Input 200VAC Output 24VDC (3A)	○	○	○	○
External power supply with power supply ON/OFF function		PD27	Input 200 to 400VAC Output 24VDC (8A)	–	–	–	○
[Manual pulse generator]							
5V Manual pulse generator		UFO-01-2Z9	Input 5VDC 100pulse/rev	○	○	○	○
12V Manual pulse generator		HD60C	Input 12VDC 25pulse/rev	○	○	○	○
[Encoder]							
Synchronous feed encoder		OSE1024-3-15-68	Input 5VDC 1024pulse/rev	○	○	○	○
[Expansion Unit]							
Expansion unit × 1slot		FCU7-EX891	One expansion card HN5xx can be mounted additionally.	–	–	–	○
[Expansion Card]							
PROFIBUS-DP		FCU7-HN571	PROFIBUS-DP × 1ch	–	–	–	○
CC-Link		FCU7-HN576	CC-Link × 1ch	–	–	–	○
CC-Link		FCU7-HN577	CC-Link × 2ch	–	–	–	○
[CC-Link unit]							
CC-Link		FCU7-HN746	CC-Link × 1ch	–	○	○	–
[External PLC Link]							
DeviceNet/FL-net		FCU7-HN747	DeviceNet/FL-net	–	–	○	–
[Memory expansion unit]							
Memory expansion		FCU7-HN754	Memory expansion	–	○	–	–
[Optical communication repeater unit]							
Optical communication repeater unit		FCU7-EX022	Using up to two units, relay of the total length of up to 90m can be performed.	–	○	○	○
[MITSUBISHI CNC machine operation panel]							
MITSUBISHI CNC machine operation panel A		FCU7-KB921	Mitsubishi standard 55 key Key switch 55 points, LED 55 points	○	○	○	○
		FCU7-KB922	Customized 55 key Key switch 55 points, LED 55 point (a key top set is separately required)	○	○	○	○
MITSUBISHI CNC machine operation panel B		FCU7-KB926	Rotary switches (spindle override, cutting override), Select switch (memory protection), Emergency stop push-button	○	○	○	○
Clear key top set		N030C975G51	A set of transparent key tops (20 pieces)	○	○	○	○
Optional key top set A		N030C975G52	A set of key tops marked with 20 identifiable characters such as axis name and part system numbers for additional functions	○	○	○	○
[Function expansion unit]							
Function expansion		FCU7-HN721	Normal option (Graphic check/trace rotary axis drawing)	–	○*1	–	–
Function expansion		FCU7-HN722	Full option (Graphic check/trace rotary axis drawing, SSS control)	–	○*1	–	–

DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals
*1 M70V TypeA only. To use a function expansion unit, only one of the two can be selected: FCU7-HN746 or FCU7-HN754. (Up to 2 units including an expansion unit)

E70/M70V Series

Dotted lines indicate the sections prepared by the machine tool builder.

The name with brackets < > indicates the cable for the unit.

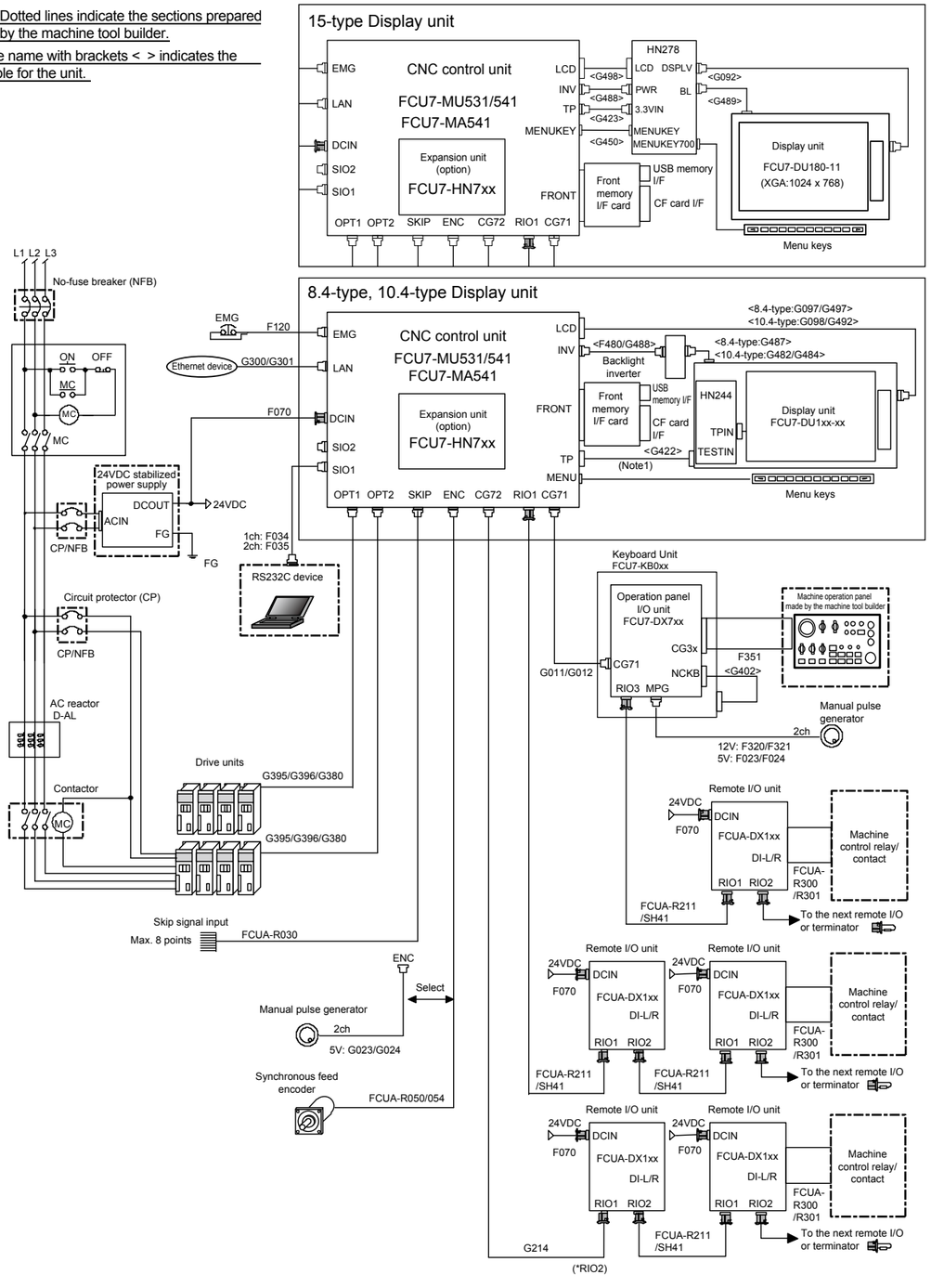


(Note 1) M70V Series only
(Note 2) Touch panels only
(Note 3) With analog spindle configuration
(Note 4) For a connection of the MITSUBISHI CNC Machine Operation Panel, refer to “Connection of MITSUBISHI CNC Machine Operation Panel” to be described.
(Note 5) For connections of the drive units, refer to “Drive system System configuration drawing” to be described.

M700VS Series

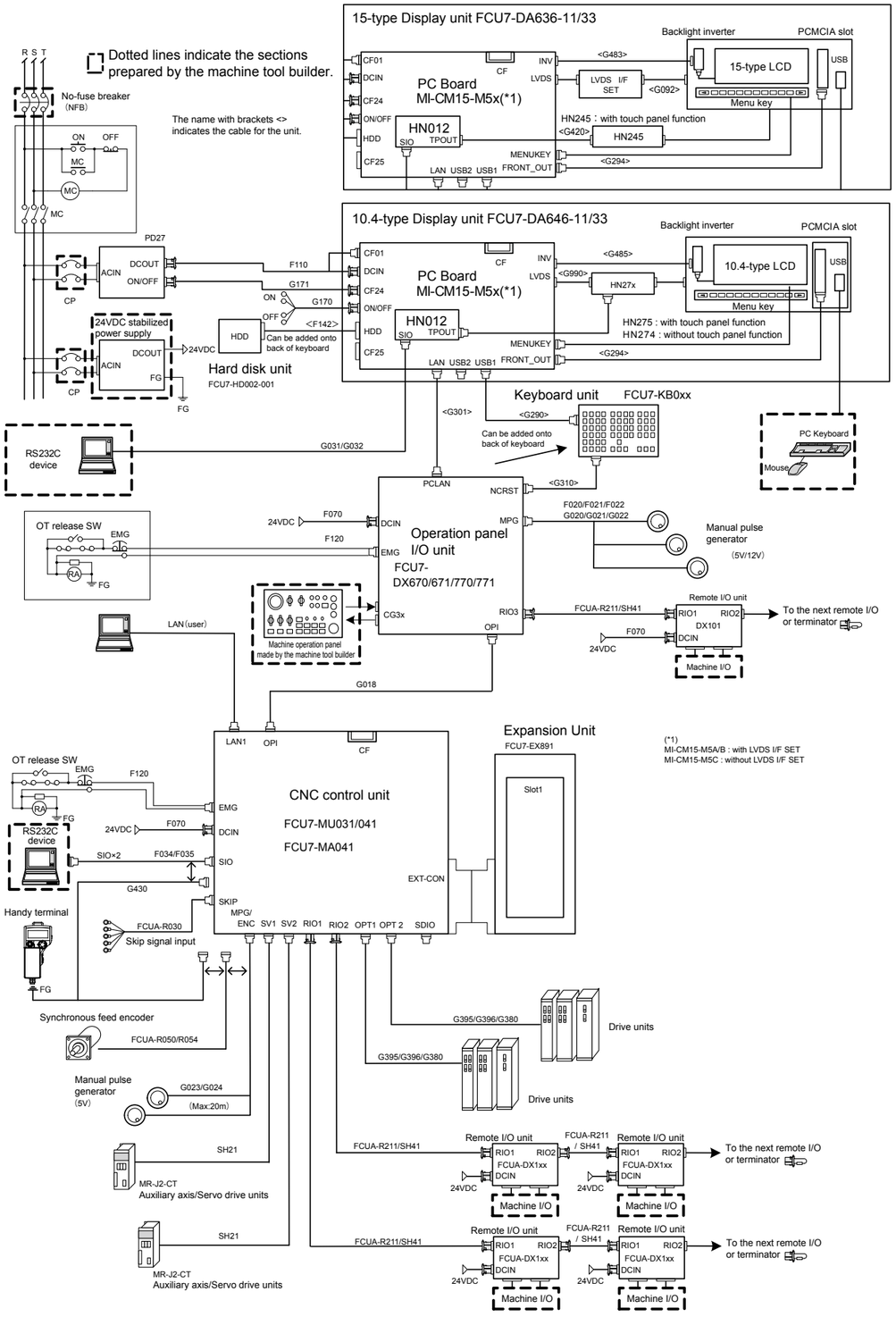
Dotted lines indicate the sections prepared by the machine tool builder.

The name with brackets < > indicates the cable for the unit.



(Note 1) Touch panels only
(Note 2) For a connection of the MITSUBISHI CNC Machine Operation Panel, refer to “Connection of MITSUBISHI CNC Machine Operation Panel” to be described.
(Note 3) For connections of the drive units, refer to “Drive system System configuration drawing” to be described.

M700VW Series

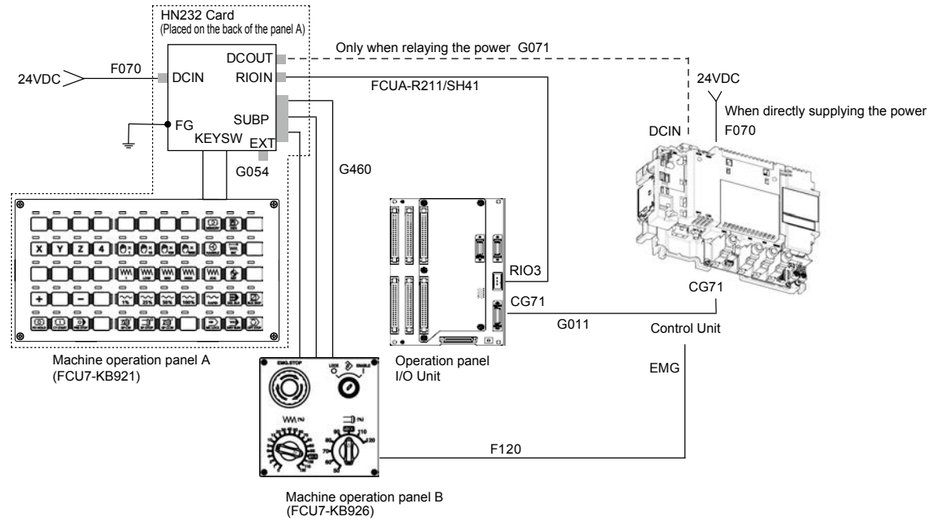


(Note 1) For a connection of the MITSUBISHI CNC Machine Operation Panel, refer to “Connection of MITSUBISHI CNC Machine Operation Panel” to be described.
(Note 2) For connections of the drive units, refer to “Drive system System configuration drawing” to be described.

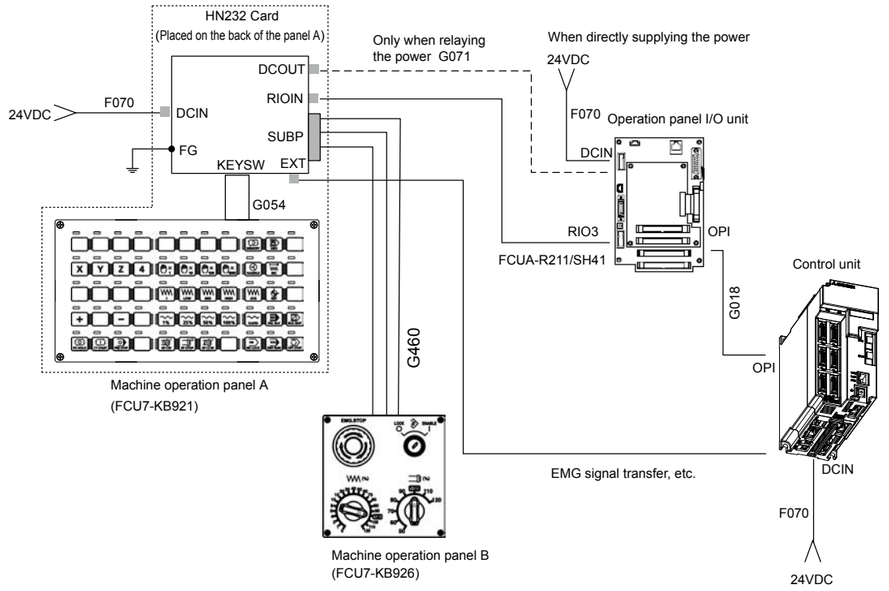
Connection of MITSUBISHI CNC Machine Operation Panel

Machine operation panel	Cable	Connection destination	E70/M70V	M700VS	M700VW
Machine operation panel A (RIOIN)	FCUA-R211 or SH41	Control unit (RIO1)	○	○	○
Machine operation panel A (RIOIN)	FCUA-R211 or SH41	Control unit (RIO2)	–	–	○
Machine operation panel A (RIOIN)	G214	Control unit (CG72)	–	○	–
Machine operation panel A (RIOIN)	FCUA-R211 or SH41	Operation panel I/O unit (RIO3)	○	○	○
Machine operation panel B	G460	Machine operation panel A (SUBP)	○	○	○
Machine operation panel B	F120	Control unit (EMG)	○	○	–

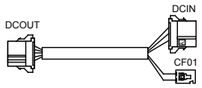
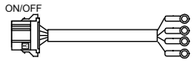
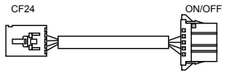
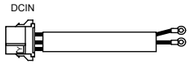
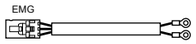
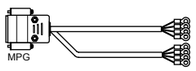
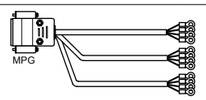
[Example] When connecting to the operation panel I/O unit (RIO3)
(With E70/M70V/M700VS)

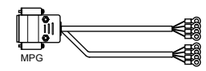
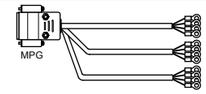
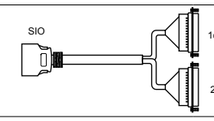
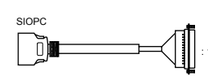
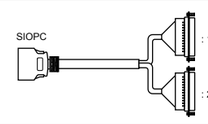
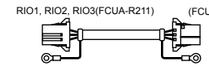
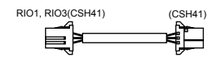


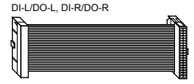
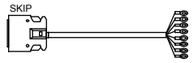
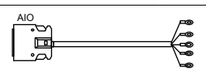
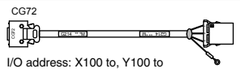
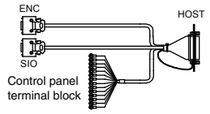
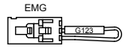
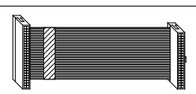
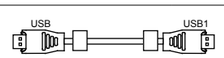
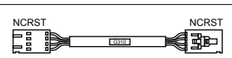
(With M700VW)



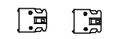
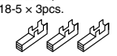
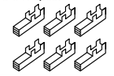
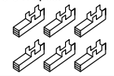
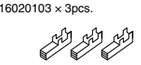
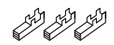
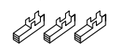
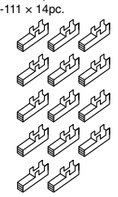
Cables for CNC

	Application	Type	Length (m)	Contents	Supported model		
					E70/M70V	M700VS	M700VW
(1)	24VDC power cable for PD25/PD27	F110 L0.5M	0.5		○	○	○
		F110 L1.5M	1.5				
		F110 L3M	3				
		F110 L5M	5				
		F110 L8M	8				
		F110 L10M	10				
		F110 L15M	15				
(2)	ON/OFF switch cable for PD25/PD27	F170 L0.5M	0.5		○	○	○
		F170 L1.5M	1.5				
		F170 L3M	3				
		F170 L5M	5				
		F170 L8M	8				
		F170 L10M	10				
		F170 L15M	15				
(3)	Power ON/OFF cable Display unit - PD25/PD27 power unit	G171 L0.5M	0.5		–	–	○
		G171 L1M	1				
		G171 L3M	3				
		G171 L5M	5				
		G171 L7M	7				
		G171 L10M	10				
		G171 L15M	15				
(4)	ON/OFF switch cable ON/OFF switch - display unit	G170 L0.35M	0.35		–	–	○
		G170 L0.5M	0.5				
		G170 L1M	1				
		G170 L1.5M	1.5				
		G170 L2M	2				
		G170 L3M	3				
		G170 L5M	5				
		G170 L10M	10				
		G170 L15M	15				
(5)	24VDC power cable	F070 L0.5M	0.5		○	○	○
		F070 L1.5M	1.5				
		F070 L3M	3				
		F070 L5M	5				
		F070 L8M	8				
		F070 L10M	10				
		F070 L15M	15				
		F070 L20M	20				
(6)	Emergency stop cable	F120 L0.5M	0.5		○	○	○
		F120 L1.5M	1.5				
		F120 L3M	3				
		F120 L5M	5				
		F120 L8M	8				
		F120 L10M	10				
		F120 L15M	15				
		F120 L20M	20				
(7)	Manual pulse generator cable (12V) : 1ch (for connection to operation panel I/O unit)	F320 L1M	1		○	○	–
		F320 L2M	2				
		F320 L3M	3				
		F320 L5M	5				
		F320 L8M	8				
		F320 L10M	10				
		F320 L15M	15				
		F320 L20M	20				
(8)	Manual pulse generator cable(12V) : 2ch (for connection to operation panel I/O unit)	F321 L1M	1		○	○	–
		F321 L2M	2				
		F321 L3M	3				
		F321 L5M	5				
		F321 L8M	8				
		F321 L10M	10				
		F321 L15M	15				
		F321 L20M	20				
(9)	Manual pulse generator cable (12V) : 1ch (for connection to operation panel I/O unit)	F020 L0.5M	0.5		–	–	○
		F020 L1M	1				
		F020 L2M	2				
		F020 L3M	3				
		F020 L5M	5				
		F020 L7M	7				
		F020 L10M	10				
		F020 L20M	20				
(10)	Manual pulse generator cable (12V) : 2ch (for connection to operation panel I/O unit)	F021 L1M	1		–	–	○
		F021 L2M	2				
(11)	Manual pulse generator cable (12V) : 3ch (for connection to operation panel I/O unit)	F022 L1M	1		–	–	○
		F022 L2M	2				
(12)	Manual pulse generator cable (5V) : 1ch (for connection to operation panel I/O unit)	F023 L1M	1		○	○	–
		F023 L2M	2				
		F023 L3M	3				
		F023 L5M	5				
		F023 L8M	8				
		F023 L10M	10				
		F023 L15M	15				
		F023 L20M	20				

	Application	Type	Length (m)	Contents	Supported model		
					E70/M70V	M700VS	M700VW
(13)	Manual pulse generator cable (5V) : 2ch (for connection to operation panel I/O unit)	F024 L1M	1		○	○	–
		F024 L2M	2				
		F024 L3M	3				
		F024 L5M	5				
		F024 L8M	8				
		F024 L10M	10				
		F024 L15M	15				
		F024 L20M	20				
(14)	Manual pulse generator cable (5V) : 1ch (for connection to operation panel I/O unit)	G020 L2M	2		–	–	○
(15)	Manual pulse generator cable (5V) : 2ch (for connection to operation panel I/O unit)	G021 L2M	2		–	–	○
(16)	Manual pulse generator cable (5V) : 3ch (for connection to operation panel I/O unit)	G022 L2M	2		–	–	○
(17)	Manual pulse generator cable (5V) : 1ch (for connection to control unit)	G023 L1M	1		○	○	○
		G023 L2M	2				
		G023 L3M	3				
		G023 L5M	5				
		G023 L8M	8				
		G023 L10M	10				
		G023 L15M	15				
		G023 L20M	20				
(18)	Manual pulse generator cable (5V) : 2ch (for connection to control unit)	G024 L1M	1		○	○	○
		G024 L2M	2				
		G024 L3M	3				
		G024 L5M	5				
		G024 L8M	8				
		G024 L10M	10				
		G024 L15M	15				
		G024 L20M	20				
(19)	RS232C I/F cable : 1ch (for control unit)	F034 L0.5M	0.5		○	○	○
		F034 L1M	1				
		F034 L2M	2				
		F034 L3M	3				
		F034 L5M	5				
		F034 L8M	8				
		F034 L10M	10				
(20)	RS232C I/F cable : 2ch (for control unit)	F035 L0.5M	0.5		○	○	○
		F035 L1M	1				
		F035 L2M	2				
		F035 L3M	3				
		F035 L5M	5				
		F035 L8M	8				
		F035 L10M	10				
(21)	RS232C I/F cable : 1ch (for display unit)	G031 L0.5M	0.5		–	–	○
		G031 L1M	1				
		G031 L2M	2				
		G031 L3M	3				
		G031 L5M	5				
		G031 L7M	7				
		G031 L10M	10				
		G031 L15M	15				
(22)	RS232C I/F cable : 2ch (for display unit)	G032 L0.5M	0.5		–	–	○
		G032 L1M	1				
		G032 L2M	2				
		G032 L3M	3				
		G032 L5M	5				
		G032 L7M	7				
		G032 L10M	10				
		G032 L15M	15				
(23)	Analog output cable	F221 L1M	1		○	○	–
		F221 L2M	2				
		F221 L3M	3				
		F221 L5M	5				
		F221 L8M	8				
		F221 L10M	10				
		F221 L15M	15				
		F221 L20M	20				
(24)	Remote I/O (with terminal block) between remote I/O, remote I/O-CNC control unit, remote I/O-Operation panel I/O unit, remote I/O-MITSUBISHI CNC machine operation panel A	FCUA-R211-0.3M	0.3		○	○	○
		FCUA-R211-1M	1				
		FCUA-R211-2M	2				
		FCUA-R211-3M	3				
		FCUA-R211-5M	5				
		FCUA-R211-8M	8				
		FCUA-R211-10M	10				
		FCUA-R211-15M	15				
		FCUA-R211-20M	20				
(25)	Remote I/O cable between remote I/O, remote I/O-CNC control unit, remote I/O-Operation panel I/O unit, remote I/O-MITSUBISHI CNC machine operation panel A (between remote I/O units in a panel)	SH41 0.3M	0.3		○	○	○
		SH41 0.5M	0.5				
		SH41 0.7M	0.7				

	Application	Type	Length (m)	Contents	Supported model E70/M70V	M700VS	M700VW
(26)	DI/DO cable (one side connector) (for remote I/O unit)	FCUA-R300	3	DI-L/DO-L, DI-R/DO-R 	○	○	○
(27)	DI/DO cable (both side connectors) (for remote I/O unit)	FCUA-R301-1M	1	DI-L/DO-L, DI-R/DO-R 	○	○	○
		FCUA-R301-2M	2				
		FCUA-R301-3M	3				
		FCUA-R301-5M	5				
(28)	DI/DO cable (one side connector) (for operation panel I/O unit)	F351	3	CG31, CG32, CG33, CG34, CG35, CG36 	○	○	–
(29)	Cable between control unit - operation panel I/O unit	G018 L1M	1		–	–	○
		G018 L2M	2				
		G018 L3M	3				
		G018 L5M	5				
		G018 L7M	7				
		G018 L10M	10				
		G018 L15M	15				
		G018 L20M	20				
(30)	Operation panel I/O interface cable	G011 L0.5M	0.5		○	○	–
(31)	Operation panel I/O interface cable (Only for M700VS Series 15-type Display unit)	G012 L1M	1		–	○	–
(32)	LAN cross cable (Shielded cable is recommended when the length will be 1m or more)	G300 L1M	1	LAN LAN 	○	○	○
		G300 L3M	3				
		G300 L5M	5				
		G300 L10M	10				
(33)	LAN straight cable (Shielded cable is recommended when the length will be 1m or more)	G301 L1M	1	LAN LAN 	○	○	○
(34)	SKIP input cable	FCUA-R030-3M	3	SKIP 	○	○	○
		FCUA-R030-7M	7				
(35)	Analog input/output cable (for remote I/O unit)	FCUA-R031-2M	2	AIO 	○	○	○
		FCUA-R031-3M	3				
		FCUA-R031-7M	7				
(36)	Synchronous encoder - control unit (straight, with connector)	FCUA-R050-5M	5	ENC 	○	○	○
(37)	Synchronous encoder - control unit (right angle, with connector)	FCUA-R054-3M	3	ENC 	○	○	○
		FCUA-R054-5M	5				
		FCUA-R054-10M	10				
		FCUA-R054-15M	15				
		FCUA-R054-20M	20				
(38)	Remote I/O cable NC for RIO2 - remote I/O unit	G214 L1M	1	CG72  I/O address: X100 to, Y100 to	–	○	–
		G214 L5M	5				
		G214 L10M	10				
		G214 L20M	20				
(39)	Cable for connection to handy terminal	G430-L3M	3	ENC HOST SIO  Control panel terminal block	–	–	○
		G430-L5M	5				
		G430-L10M	10				
(40)	Terminator for emergency stop interface	G123	–	EMG 	–	–	○
(41)	Terminator for remote I/O interface	R-TM	–	One terminator is required to be installed at the final end of remote IO unit. 	○	○	○
(42)	Terminator for OPI interface	E-TM	–	If no operation panel I/O unit is provided, terminator for OPI interface is required to be installed in the CNC unit. 	–	–	○
(43)	Cable for hard disk (comes with the hard disk)	F142	0.5		–	–	○
(44)	USB cable for keyboard (comes with the keyboard unit)	G290	0.7	USB USB1 	–	–	○
(45)	Cable for NC reset (comes with the operation I/O unit)	G310	0.1	NCRST NCRST 	–	–	○

Cable connector sets for CNC

	Application	Type	Contents		Supported model E70/M70V	M700VS	M700VW
(1)	Control unit - General I/O units	FCUA-CS000	Connector (3M) 10120-3000VE × 2pcs. 	Connector case (3M) 10320-52F0-008 × 2pcs. 	○	○	○
(2)	Remote I/O unit - terminal block	FCUA-CS301	Connector (3M) 7940-6500SC x 4pcs. 	Strain relief (3M) 3448-7940 x 2pcs. 	○	○	○
(3)	200VAC power supply connector (for power supply unit PD25) 200V/400VAC power supply connector (for power supply unit PD27)	FCUA-CN200	Connector (Tyco Electronics) 2-178288-3 × 1pc. 	Tin contact (Tyco Electronics) 1-175218-5 × 3pcs. 	○	○	○
(4)	24VDC power supply connector for power supply unit (PD25/PD27) (with power OFF detection)	3-178127-6 1-175218-5* × 6pcs.	Connector (Tyco Electronics) 3-178127-6 × 1pc. 	Tin contact (Tyco Electronics) 1-175218-5 × 6pcs. 	○	○	○
(5)	ON/OFF connector for power supply unit (PD25/PD27)	1-178288-5 1-175218-5* × 6pcs.	Connector (Tyco Electronics) 1-178288-5 × 1pc. 	Tin contact (Tyco Electronics) 1-175218-5 × 6pcs. 	○	○	○
(6)	Emergency stop connector	005057-9403 0016020103* × 3pcs.	Connector (MOLEX) 005057-9403 × 1pc. 	Gold contact (MOLEX) 0016020103 × 3pcs. 	○	○	○
(7)	Remote I/O communication connector	FCUA-CN211	Connector (Tyco Electronics) 1-178288-3 × 1pc. 	Gold contact (Tyco Electronics) 1-175218-2 × 3pcs. 	○	○	○
(8)	24VDC power supply connector	FCUA-CN220	Connector (Tyco Electronics) 2-178288-3 × 1pc. 	Tin contact (Tyco Electronics) 1-175218-5 × 3pcs. 	○	○	○
(9)	DIO connector	FCUA-CN300	Connector (3M) 7940-6500SC x 2pcs. 	–	○	○	○
(10)	Manual pulse generator input connector	CDA-15P HDA-CTH CD-PC-111* × 14pcs.	Connector (Hirose Electric) CDA-15P × 1pc. 	Gold contact (Hirose Electric) CD-PC-111 × 14pc. 	–	–	○
			Housing (Hirose Electric) HDA-CTH × 1pc. 	–			

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system			Lathe system						General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		M700VS Series			M700VW Series			
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
1 Control axes																			
1 Control axes																			
1 Number of basic control axes (NC axes)	○3	○3	○3	○3	○3	○3	○3	○3	○3	○2	○2	○2	○2	○2	○2	○2	○2	○2	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.
2 Max. number of axes (NC axes + Spindles + PLC axes)	6	9	11	12	16	16	12	16	16	6	9	11	12	16	16	12	16	16	
1 Max. number of NC axes (in total for all the part systems)	3	5	8	8	16	16	8	16	16	3	5	9	12	16	16	12	16	16	
2 Max. number of spindles	1	2	2	4	4	4	4	4	4	2	3	4	4	6	6	4	6	6	
3 Max. number of PLC axes	2	6	6	6	6	6	6	6	6	2	6	6	6	6	6	6	6	6	
3 Max. number of auxiliary axes	–	–	–	–	–	–	4	6	6	–	–	–	–	–	–	4	6	6	Auxiliary axis: This can be connected to the channel (SV2) for J2-CT.
4 Max. number of PLC indexing axes	1	4	4	4	6	6	4	6	6	1	4	4	4	6	6	4	6	6	The number of PLC axes available to be used as indexing axis.
5 Number of simultaneous contouring control axes	3	4	4	4	4	8	4	4	8	3	4	4	4	4	8	4	4	8	Number of axes with which simultaneous interpolation control is possible.
6 Max. number of NC axes in a part system	3	5	8	6	8	8	6	8	8	3	5	8	6	8	8	6	8	8	Max. number of NC axes possible to control in the same part system.
2 Control part system																			
1 Standard number of part systems	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	One part system is the standard.
2 Max. number of part systems	○1	○1	○2	○2	○2	○2	○2	○2	○2	○1	○1	○2	○2	○4	○4	○2	○4	○4	Up to four part systems for a lathe system, and up to two part systems for a machining center system.
3 Control axes and operation modes																			
1 Tape (RS-232C input) mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	In this mode, operation is performed using the machining program data from the RS-232C interface built in the CNC unit.
2 Memory mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Machining programs stored in the memory of the CNC module are run.
3 MDI mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	MDI data stored in the memory of the CNC unit are executed.
4 High-speed program server mode																			
1 CF card in control unit	–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	△	△	△	Machining programs stored in a compact flash (CF) card can be operated by installing the CF card in the control unit.
5 IC card mode (Front IC card mode)	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	Machining programs stored in a PCMCIA/CF card can be operated by installing the PCMCIA/CF card on the front of the control unit.
6 Hard disk mode	–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	△	△	△	Machining programs stored in the hard disk can be operated.
2 Input command																			
1 Data increment																			
1 Least command increment																			The data increment handled in the controller includes the input setting increment and command increment. Each type is set with parameters.
1 Least command increment 1μm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Possible to command in increments of 0.001mm (linear axis) and 0.001° (rotary axis).
2 Least command increment 0.1μm	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	Possible to command in increments of 0.0001mm (linear axis) and 0.0001° (rotary axis).
3 Least command increment 0.01μm (10nm)	–	–	–	–	△	△	–	△	△	–	–	–	–	△	△	–	△	△	Possible to command in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis).
4 Least command increment 0.001μm (1nm)	–	–	–	–	△	△	–	△	△	–	–	–	–	△	△	–	△	△	Possible to command in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis).
2 Least control increment																			The least control increment determines the CNC's internal operation accuracy.
1 Least control increment 0.01μm (10nm)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Possible to control in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis).
2 Least control increment 0.001μm (1nm)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Possible to control in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis).
3 Indexing increment	–	–	–	○	○	○	○	○	○	–	–	–	○	○	○	○	○	○	This function limits the command value for the rotary axis.
2 Unit system																			
1 Inch/Metric changeover	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	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.
2 Input command increment tenfold	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	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.
3 Program format																			
1 Program format																			G code (program) format
1 Format 1 for Lathe	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	G code list for the lathe system
2 Format 2 for Lathe	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	The G-code list is selected by parameter.
3 Special format for lathe	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	(Prepared for a specific machine tool builder)
4 Format 1 for Machining center	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	G code list for the machining center system
5 Format 2 for Machining center (M2 format)	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	The G-code list is selected by parameter.
6 MITSUBISHI CNC special format	–	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	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.
4 Command value																			
1 Decimal point input Ⅰ, Ⅱ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	For the decimal point input type Ⅰ, 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 Ⅱ, 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.
2 Absolute/Incremental 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.
3 Diameter/Radius designation	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	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)
3 Positioning/Interpolation																			
1 Positioning																			
1 Positioning	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function carries out positioning at high speed using a rapid traverse rate with the travel command value given in the program.
2 Unidirectional positioning	○	○	○	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	The G code command always moves the tool to the final position in the direction determined by parameters.
2 Linear/Circular interpolation																			
1 Linear interpolation	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
2 Circular interpolation (Center/Radius designation)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function moves a tool along a circular arc on the plane selected by the travel command value supplied in the program.
3 Helical interpolation	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	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.
4 Spiral/Conical interpolation	–	–	○	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	This function interpolates arcs where the start point and end point are not on the circumference of the same circle into spiral shapes.
5 Cylindrical interpolation	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	This function transfers the shape that is on the cylinder's side surface (shape yielded by the cylindrical coordinate system) onto a plane, and when the transferred shape is designated in the program in the form of plane coordinates, the shape is converted into a movement along the linear and rotary axes of the original cylinder coordinates, and the contours are controlled by means of the CNC unit during machining.
6 Polar coordinate interpolation	–	–	–	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	This function converts the commands programmed by the orthogonal coordinate axes into linear axis movements (tool movements) and rotary axis movements (workpiece rotation) to control the contours. It is useful for cutting linear cutouts on the outside diameter of the workpiece, grinding cam shafts, etc.
7 Milling interpolation	–	–	–	–	–	–	–	–	–	–	–	○	△	△	△	△	△	△	When a lathe with linear axes (X, Z axes) and rotary axis (C axis) serving as the control axes is to perform milling at a workpiece end face or in the longitudinal direction of the workpiece, this function uses the hypothetical axis Y, which is at right angles to both the X and Z axes, to enable the milling shape to be programmed as the X, Y and Z orthogonal coordinate system commands.
8 Hypothetical axis interpolation	–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	This function sets one of the axes of the helical interpolation or spiral interpolation, including a linear axis, as a hypothetical axis (axis with no actual movement), and performs pulse distribution. This enables SIN or COS interpolation, which corresponds to the side view (view from the hypothetical axis) of the helical interpolation or spiral interpolation.

○: Standard △: Option □: Selection

S/W ver.K1

Class	Machining center system									Lathe system			General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	
3 Curve interpolation													
2 Exponential interpolation	–	–	–	△	△	△	△	△	△	–	–	–	With this function, the rotary axis movement is changed into exponential functions vis-a-vis the linear axis movements.
3 Spline interpolation (1st part system only)	–	–	○	△	△	△	△	△	△	–	–	–	This function automatically generates spline curves that smoothly pass through rows of dots designated by a fine-segment machining program, and performs interpolation for the paths along the curves. This enables high-speed and high-accuracy machining.
4 NURBS interpolation	–	–	–	–	△	△	–	△	△	–	–	–	This function realizes NURBS curve machining by commanding NURBS curve parameters (number of stages, weight, knot, control point). The path does not need to be replaced with fine segments.
5 3-dimensional circular interpolation	–	–	–	–	△	△	–	△	△	–	–	–	An arc shape determined by three points (start point, intermediate point, end point) designated in the three-dimensional space can be machined.
4 Feed													
1 Feed rate													
1 Rapid traverse rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	The rapid traverse rate can be set independently for each axis using parameters.
2 Cutting feed rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	This function specifies the feedrate of the cutting commands, and gives a command for a feed amount per spindle rotation or feed amount per minute.
3 Manual feed rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	The manual feedrates are designated as the feedrate in jog mode or incremental feed mode for manual operation and the feedrate during dry run ON for automatic operation. The manual feedrates are set using external signals.
4 Rotary axis command speed tenfold	○	○	○	○	○	○	○	○	○	○	○	○	This function multiplies the rotary axis' command speed by ten during initial inching.
2 Feed rate input methods													
1 Feed per minute	○	○	○	○	○	○	○	○	○	○	○	○	By issuing a G command, the command from the block is issued directly with a numerical value following F as the feedrate per minute (mm/min or inch/min).
2 Feed per revolution	○	○	○	△	△	△	△	△	△	○	○	○	By issuing a G command, the command from the block is issued directly with a numerical value following F as the feedrate per spindle revolution (mm/rev or inch/rev).
3 Inverse time feed	–	–	○	△	△	△	△	△	△	–	–	–	This function can issue one block of machining time (inverse) commands in F commands, in place of normal feed commands. This enables the machining speed on the cutting surface to be constantly controlled and prevents the loss of accuracy, even if radius compensation is applied to the machining program that expresses the free curve surface with fine segment lines.
4 F 1-digit feed	○	○	○	○	○	○	○	○	○	○	○	○	The feedrate registered by parameter in advance can be assigned by designating a single digit, following address F.
5 Manual speed command	○	○	○	△	△	△	△	△	△	○	○	○	By enabling a manual speed command and selecting either handle feed or jog (manual) feed in the memory or MDI mode, automatic operation can be carried out at this feedrate.
3 Override													
1 Rapid traverse override	○	○	○	○	○	○	○	○	○	○	○	○	Override can be applied to manual or automatic rapid traverse using the external input signal.
2 Cutting feed override	○	○	○	○	○	○	○	○	○	○	○	○	Override can be applied to the feedrate command designated in the machining program using the external input signal.
3 2nd cutting feed override	○	○	○	○	○	○	○	○	○	○	○	○	Override can be further applied as a second-stage override to the feedrate after the cutting feed override has been applied.
4 Override cancel	○	○	○	○	○	○	○	○	○	○	○	○	By turning on the override cancel external signal, the override is automatically set to 100% for the cutting feed during the automatic operation mode (tape, memory and MDI).
4 Acceleration/Deceleration													
1 Automatic acceleration/deceleration after interpolation	○	○	○	○	○	○	○	○	○	○	○	○	Acceleration/deceleration is automatically applied to all commands. The acceleration/deceleration patterns can be selected using a parameter from the following types: linear acceleration/deceleration, soft acceleration/deceleration, exponent function acceleration/deceleration and exponent function acceleration/linear deceleration.
2 Rapid traverse constant inclination acceleration/deceleration	○	○	○	○	○	○	○	○	○	○	○	○	This function performs acceleration/deceleration at a constant inclination during linear acceleration/deceleration in the rapid traverse mode. Compared to the method of acceleration/deceleration after interpolation, the constant inclination acceleration/deceleration method enables improved cycle time.
3 Rapid traverse constant inclination multi-step acceleration/deceleration (1st part system only)	–	○	○	△	△	△	△	△	△	–	–	–	This function carries out the acceleration/deceleration according to the torque characteristic of the motor in the rapid traverse mode during automatic operation. (This function is not available in manual operation.) The rapid traverse constant inclination multi-step acceleration/deceleration method makes for improved cycle time because the positioning time is shortened by using the motor ability to the maximum.
5 Thread cutting													
1 Thread cutting (Lead/Thread number designation)	○	○	○	△	△	△	△	△	△	○	○	○	Thread cutting with a designated lead can be performed. Inch threads are cut by designating the number of threads per inch with the E address.
2 Variable lead thread cutting	–	–	–	–	–	–	–	–	–	○	○	○	By commanding the lead increment/decrement amount per thread rotation, variable lead thread cutting can be performed.
3 Synchronous tapping													
1 Synchronous tapping cycle	○	○	○	△	△	△	△	△	△	○	○	○	This function performs tapping through synchronized control of the spindle and servo axis. This eliminates the need for floating taps and enables tapping to be conducted at a highly accurate tapping depth.
2 Pecking tapping cycle	–	○	○	△	△	△	△	△	△	–	○	○	The load applied to the tool can be reduced by designating the depth of cut per pass and cutting the workpiece to the hole bottom with a multiple number of passes.
3 Deep-hole tapping cycle	–	○	○	△	△	△	△	△	△	–	○	○	In the deep-hole tapping, the load applied to the tool can be reduced by designating the depth of cut per pass and cutting the workpiece to the hole bottom with a multiple number of passes.
4 Chamfering	–	–	–	–	–	–	–	–	–	○	○	○	Chamfering can be enabled during the thread cutting cycle by using external signals.
6 Circular thread cutting	–	–	–	–	–	–	–	–	–	–	–	–	Circular thread in which the lead is in longitudinal direction can be cut.
8 High-speed synchronous tapping (OMR-DD)	–	○	○	○	○	○	○	○	○	–	○	○	The servo axis directly detects and compensates the spindle's delay in tracking by using the communication between drive units over the high-speed optical servo network. By minimizing the synchronization error, the accuracy of the synchronous tapping is increased.
6 Manual feed													
1 Manual rapid traverse	○	○	○	○	○	○	○	○	○	○	○	○	The tool can be moved at the rapid traverse rate for each axis separately. Override can also be applied to the rapid traverse rate by means of the rapid traverse override function.
2 Jog feed	○	○	○	○	○	○	○	○	○	○	○	○	The tool can be moved in the axis direction (+ or –) in which the machine is to be moved at the per-minute feedrate.
3 Incremental feed	○	○	○	○	○	○	○	○	○	○	○	○	The tool can be moved for the designated amount (incremental value) in the axis direction each time the jog switch is pressed.
4 Handle feed	○	○	○	○	○	○	○	○	○	○	○	○	The machine can be moved in very small amounts by rotating the manual pulse generator.
5 Manual feed rate B	○	○	○	○	○	○	○	○	○	○	○	○	Manual feedrate B is a function that sets an arbitrary axis feedrate from the user PLC separately from the manual feedrate.
6 Manual feed rate B surface speed control	–	–	–	△	△	△	△	△	△	–	–	–	When machining with the manual feedrate B function by moving the orthogonal axis while rotating the rotary table, the table rotation speed is controlled according to the distance from the rotation center.
7 Dwell													
1 Dwell (Time-based designation)	○	○	○	○	○	○	○	○	○	○	○	○	The G code command temporarily stops machine movements and sets the machine in the stand-by status for the time designated in the program.
5 Program memory/editing													
1 Memory capacity													
1 Memory capacity (number of programs stored)													
1 15kB[40m] (64 programs)	–	–	–	○	○	○	○	○	○	–	–	–	Machining programs are stored in the NC memory, data server or external memory devices (front IC card, memory card, hard disk, etc.). (Note) For a multi-part system, the specifications shown here is the total for all part systems. * M70V TypeA requires a memory expansion unit FCU7-HN754.
2 30kB[80m] (128 programs)	–	–	–	△	△	△	△	△	△	–	–	–	
3 60kB[160m] (200 programs)	–	–	–	△	△	△	△	△	△	–	–	–	
4 125kB[320m] (200 programs)	–	–	–	△	△	△	△	△	△	–	–	–	
5 230kB[600m] (400 programs)	○	–	–	△	△	△	△	△	△	○	–	–	
6 500kB[1280m] (1000 programs)	–	○	○	△	△	△	△	△	△	–	○	○	
7 1000kB[2560m] (1000 programs)	–	–	–	△	△	△	△	△	△	–	–	–	
8 2000kB[5120m] (1000 programs)	–	–	△* (HN754)	△	△	△	△	△	△	–	–	△* (HN754)	
2 Editing													
1 Program editing	○	○	○	○	○	○	○	○	○	○	○	○	This function enables program editing such as correction, deletion and addition.
2 Background editing	○	○	○	○	○	○	○	○	○	○	○	○	This function enables one machining program to be created or edited while another program is running.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system			Lathe system						General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		M700VS Series			M700VW Series			
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
3 Buffer correction	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	During automatic operation (including memory, tape, Hard disk (HD), IC card, Memory card or Data Server (DS) operation) or MDI operation, this function initiates single block stop and enables the next command to be corrected or changed.
6 Operation and display																			
1 Structure of operation/display panel																			
1 Color display (8.4-type LCD TFT)	□	□	□	□	□	□	–	–	–	□	□	□	□	□	□	–	–	–	The setting and display unit consists of the setting part and the keyboard part. Refer to “Displays & Keyboards” described previously for the details.
2 Color display (10.4-type LCD TFT)	–	□	□	□	□	□	–	–	–	–	□	□	□	□	□	–	–	–	
3 Color display (15-type LCD TFT)	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	–	–	–	
4 Color display (10.4-type LCD TFT/WindowsXPe)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
5 Color display (15-type LCD TFT/WindowsXPe)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
6 Color touch-panel display (10.4-type LCD TFT/ WindowsXPe)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
7 Color touch-panel display (10.4-type LCD TFT)	–	□	□	□	□	□	–	–	–	–	□	□	□	□	□	–	–	–	
8 Color touch-panel display (15-type LCD TFT/ WindowsXPe)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
2 Operation methods and functions																			
1 Operation input	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	In addition to the method of directly inputting numeric data, a method to input the operation results using four basic arithmetic operators and function symbols can be used for specific data settings.
2 Absolute value/Incremental value setting	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When setting the data, the absolute/incremental setting can be selected from the menu.
5 Displayed part system switch	–	–	○	○	○	○	○	○	○	–	–	○	○	○	○	○	○	○	The part system displayed on the screen can be changed.
6 Menu list	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The menu list function displays the menu configuration of each screen as a list, making it possible to directly select the menu for other screens.
7 Display switch by operation mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The screen display changes when the screen mode selection switch is changed.
8 External signal display switch	–	–	○	○	○	○	○	○	○	–	–	○	○	○	○	○	○	○	The screen display changes with the signal from PLC.
10 Screen saver, backlight OFF	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The screen saver function protects the display unit by turning the backlight OFF after the length of time specified in a parameter.
11 Parameter/Operation guidance	○*	○	○	○	○	○	○	○	○	○*	○	○	○	○	○	○	○	○	This function displays the details of the parameters or the operation methods according to the state of the screen currently displayed. * E70 requires add-on guidance data.
12 Alarm guidance	○*	○	○	△	△	△	△	△	△	○*	○	○	△	△	△	△	△	△	Guidance is displayed for the alarm currently issued. * E70 requires add-on guidance data.
13 Machining program input mistake check warning	–	–	–	△	△	△	△	△	△	–	–	–	△	△	△	△	△	△	If an illegal input is found in the decimal point after the current cursor position, the cursor will move to that position, and a warning message will appear.
15 Screen Capture	○	○	○	○	○	○	–	–	–	○	○	○	○	○	○	–	–	–	This function allows to output a bitmap file of a screen displayed on the setting and display unit.
16 User selectable menu configuration	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function allows to change the display order of the main menu in the “Monitor”, “Setup” and “Edit” screens, and to change display/non-display selection.
17 PC-NC network automatic connection	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	○	○	○	This function supports to restore the connection when the network connection fails between the display unit and the control unit.
18 Device open parameter	–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	This function can set or change the user backed up area of the PLC device from the NC screen.
19 SRAM open parameter	–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	This function can set or change the SRAM open area for machine tool builders from the NC screen.
20 MTB selectable menu configuration	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Menu items on the “Monitor”, “Setup” and “Edit” screens (of MITSUBISHI standard format) can be moved within a screen or hidden as desired. The custom screen menu items added by machine tool builders, on the contrary, cannot be moved or hidden.
3 Display methods and contents																			
1 Status display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The status of the program currently being executed is indicated.
2 Clock display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The clock is built in, and the date (year, month, date) and time (hour, minute, second) are displayed.
3 Monitor screen display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Various information related to operation, such as the axis counter, speed display and MSTB command are displayed.
4 Setup screen display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Tool/workpiece related settings, user parameter settings, MDI editing, counter setting, manual numeric command issuing and pallet program registration (option) can be carried out.
5 Edit screen display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Machining program editing (addition, deletion, change) and checking, simple program creation, and machining program input/ output can be carried out.
6 Diagnosis screen display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The following operations related to the CNC diagnosis can be carried out. (1) Display the hardware and software configuration. (2) Display the CNC options. (3) Diagnose the PLC interface. (4) Display the drive unit information. (5) Display the alarm message / alarm history list etc.
7 Maintenance screen display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Parameter setting and display, and NC data input/output, etc., can be carried out.
8 Additional languages																			
1 Japanese	□	□	□	○	○	○	○	○	○	□	□	□	○	○	○	○	○	○	Available display languages. (Note) In E70/M70V/M700VS Series, the guidance can be displayed in English and another two languages selected from the available languages.
2 English	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
3 German	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
4 Italian	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
5 French	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
6 Spanish	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
7 Chinese																			
1 Traditional Chinese characters	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
2 Simplified Chinese characters	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
8 Korean	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
9 Portuguese	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
10 Hungarian	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
11 Dutch	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
12 Swedish	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
13 Turkish	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
14 Polish	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
15 Russian	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
16 Czech	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	□	□	□	△/□	△/□	△/□	△/□	△/□	△/□	
7 Input/Output functions and devices																			
1 Input/Output data																			
1 Machining program input/output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Certain kinds of data handled by the NC system can be input and output between the NC system's memory and external devices.
2 Tool offset data input/output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
3 Common variable input/output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
4 Parameter input/output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
5 History data output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
7 System configuration data output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
2 Input/Output I/F																			
1 RS-232C I/F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Port 1 and 2 are available with the RS-232C interface. The connection point for a connector depends on the product model.

○: Standard △: Option □: Selection

S/W ver.K1

Class	Machining center system									Lathe system			General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	
2 IC card I/F													
1 I/F for IC card in control unit [up to 2GByte]	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	○	○	○	Interface card to use CF card can be attached inside the NC control unit.
2 Front IC card I/F [up to 2GByte]	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Interface card to use PCMCIA card can be attached in front of the NC control unit.
3 Ethernet I/F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Ethernet interface card can be attached onto the NC unit.
4 Hard disk I/F	–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	–	△	△	△	A hard disk drive can be mounted.
6 USB memory I/F [up to 2GByte]	○	○	○	○	○	○	△	△	△	○	○	○	○	○	○	○	△	△	△	A USB memory can be mounted.
3 Computer link																				
1 Computer link B	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	△	Computer link B is a function to receive/send data between the host computer and the CNC.
4 Others																				
1 Handy terminal connection	–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	–	△	△	△	Machine operations, such as setup operations, are possible at hand by using a handy terminal.
8 Spindle, Tool and Miscellaneous functions																				
1 Spindle functions (S)																				
1 Spindle control functions																				The spindle rotation speed is determined in consideration of the override and gear ratio for the S command given in automatic operation or with manual numerical commands, and the spindle is rotated.
1 Spindle digital I/F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This interface is used to connect the digital spindle (AC spindle motor and spindle drive unit).
2 Spindle analog I/F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Spindle control can be executed using an analog spindle instead of the digital spindle.
3 Coil switch	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Constant output characteristics can be achieved across a broad spectrums down to the low-speed ranges by switching the spindle motor connections. This is a system under which commands are assigned from the PLC.
4 Automatic coil switch	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Constant output characteristics can be achieved across a broad spectrums down to the low-speed ranges by switching the spindle motor connections. This is a system under which the CNC module switches the coils automatically in accordance with the motor speed.
5 Encoder input I/F	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	△	With this function, arbitrary pulse can be input by parameters set in R register.
2 S code output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When an 8-digit number following address S (S0 to S±99999999) is commanded, signed 32-bit binary data and start signal, or non-signed 32-bit binary data and start signal will be output to the PLC.
3 Constant surface speed control	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	△	With radial direction cutting, this function enables the spindle speed to be changed in accordance with changes in the radial direction coordinates and the workpiece to be cut with the cutting point always kept at a constant speed (constant surface speed).
4 Spindle override	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function applies override to the rotation speed of a spindle or milling spindle assigned by the machining program command during automatic operation or by manual operation.
5 Multiple-spindle control																				Multiple-spindle control is a function that controls all the spindles except the first spindle (main spindle) in a machine tool equipped with the second, third and fourth spindles (sub-spindles) in addition to the first spindle.
1 Multiple-spindle control Ⅰ	–	–	–	–	–	–	–	–	–	○	○	○	△	△	△	△	△	△	△	This function controls the spindles in a machine tool equipped with several spindles.
2 Multiple-spindle control Ⅱ	–	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	△	With this function, commands to the spindle are performed with one S command, and a signal from the PLC determines which spindle is selected.
6 Spindle orientation	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function stops the spindle rotation at a certain position.
7 Spindle position control (Spindle/C axis control)	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	△	This function enables one spindle drive unit to be also used as the C axis (rotary axis) using an external signal.
8 Spindle synchronization																				
1 Spindle synchronization Ⅰ	–	–	–	–	–	–	–	–	–	–	○	○	△	△	△	△	△	△	△	In a machine with two or more spindles, this function controls the rotation speed and phase of one selected spindle (synchronized spindle) in synchronization with the rotation of the other selected spindle (basic spindle). There are two methods for giving commands: G code and PLC.
2 Spindle synchronization Ⅱ	–	–	–	–	–	–	–	–	–	–	○	○	△	△	△	△	△	△	△	
3 Guide bushing spindle synchronization	–	–	–	–	–	–	–	–	–	–	–	–	△	△	△	△	△	△	△	This function is used for a machine with a spindle motor to rotate a guide bushing. It synchronizes the guide bushing spindle (G/B spindle) with the spindle motor used as a reference (basic spindle).
9 Tool spindle synchronization Ⅰ (Polygon)																				
1 Tool spindle synchronization Ⅰ A (Spindle-Spindle, Polygon)	–	–	–	–	–	–	–	–	–	–	○	○	△	△	△	△	△	△	△	With a machine equipped with two or more spindles under serial connection control, this function enables spindle-spindle polygon machining (IA) by controlling the workpiece spindle rotation in synchronization with the rotary tool spindle rotation. The rotary tool spindle and workpiece spindle are designated from the spindles subject to serial connection control.
2 Tool spindle synchronization Ⅰ B (Spindle-Spindle, Polygon)	–	–	–	–	–	–	–	–	–	–	○	○	△	△	△	△	△	△	△	With a machine equipped with two or more spindles under serial connection control, this function enables spindle-spindle polygon machining (IB) by controlling the rotary tool spindle rotation in synchronization with the workpiece spindle rotation. The rotary tool spindle and workpiece spindle are designated from the spindles subject to serial connection control.
3 Tool spindle synchronization Ⅰ C (Spindle-NC axis, Polygon)	–	–	–	–	–	–	–	–	–	–	–	○	△	△	△	△	△	△	△	This function controls the workpiece (spindle) and tool (NC axis) so that they synchronously rotate at the commanded ratio, allowing polygon machining.
10 Tool spindle synchronization Ⅱ (Hobbing)	–	–	–	–	–	–	–	–	–	–	–	○	△	△	△	△	△	△	△	This function is to cut the gear with a hob (hob cutter).
11 Spindle speed clamp	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The spindle rotation speed is clamped between max. rotation speed and min. rotation speed.
2 Tool functions (T)																				
1 Tool functions (T command)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The tool function is commanded with an 8-digit number following the address T (T0 to T99999999) to specify the tool No. In the controller for a lathe, the tool compensation (tool length compensation, tool nose wear compensation) Nos. are also indicated.
3 Miscellaneous functions (M)																				
1 Miscellaneous functions	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Miscellaneous function, or M function, is used to command auxiliary functions for NC, such as rotating the spindle forward/backward or stopping it, as well as turning the cooling oil ON/OFF.
2 Multiple M codes in 1 block	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Up to four sets of M commands can be issued in a block.
3 M code independent output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When the M00, M01, M02 or M30 command is issued during an automatic operation (tape, memory, MDI) or by a manual numerical command, the signal of this function is output. It is turned OFF after the miscellaneous function finishes or by the reset & rewind signal.
4 Miscellaneous function finish	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	These signals inform the CNC system that a miscellaneous function (M), spindle function (S), tool function (T) or 2nd miscellaneous function (A, B, C) has been issued, and that the PLC that has received it has completed the required operation. They include miscellaneous function finish signal 1 (FIN1) and miscellaneous function finish signal 2 (FIN2).
5 M code output during axis traveling	–	–	–	–	–	–	–	–	–	–	–	○	△	△	△	△	△	△	△	This function controls the timing at which miscellaneous functions are output, and it outputs a miscellaneous function when the axis reaches the designated position movement.
6 Miscellaneous Function Command High-speed Output	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function shortens a processing time per miscellaneous function.
4 2nd miscellaneous functions (B)																				
1 2nd miscellaneous functions	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The code data and start signals are output when an 8-digit number is assigned following the address code A, B or C — whichever does not duplicate the axis name being used.
9 Tool compensation																				
1 Tool length/Tool position																				
1 Tool length compensation	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	These commands make it possible to control the axis movement by offsetting the position of the end point of the travel command by the amount set in the tool compensation screen.
2 Tool position offset	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	This function uses commands to control the movement by changing the end point positions of the movement commands to positions which have been extended or reduced for a tool compensation amount.
3 Tool compensation for additional axes	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	The tool compensation for a lathe is valid for the X and Z axes. If an additional axis (Y axis) is added, the tool compensation will be validated for the additional axis.
2 Tool radius																				
1 Tool radius compensation	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	This function provides tool radius compensation. Through a combination of the G command and D address assignment, the actual tool center path is compensated either inside or outside the programmed path by an amount equivalent to the tool radius.
2 3-dimensional tool radius compensation	–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	–	This command serves the function of compensating the spherical radius of ball end mills. It compensates the actual tool center path to be either more outside or inside the programmed path by an amount equivalent to the tool radius amount in accordance with the 3-dimensional vectors.
3 Tool nose radius compensation (G40/41/42)	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	The tool nose of the specified tool No. is assumed to be a half circle of the radius R, and compensation is applied so that the half circle touches the programmed path.
4 Automatic decision of nose radius compensation direction (G46/40)	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	The nose radius compensation direction is automatically determined from the tool tip and the specified movement vector.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system		
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series	
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA
5 Tool radius compensation diameter designation	–	○	○	○	○	○	○	○	○	–	–	–
3 Tool offset amount												
1 Number of tool offset sets												
1 20 sets	–	–	–	–	–	–	–	–	–	–	–	–
2 40 sets	–	–	–	○	○	○	○	○	○	–	–	–
3 80 sets	–	–	–	–	–	–	–	–	–	○	○	○
4 200 sets	○	–	–	△	△	△	△	△	△	–	–	–
5 400 sets	–	○	○	△	△	△	△	△	△	–	–	–
6 999 sets	–	–	–	–	△	△	–	△	△	–	–	–
7 (99 × number of part systems) sets	–	–	–	–	–	–	–	–	–	–	–	–
2 Offset memory												
1 Tool shape/wear offset amount	○	○	○	○	○	○	○	○	○	○	○	○
10 Coordinate system												
1 Coordinate system type and setting												
1 Machine coordinate system	○	○	○	○	○	○	○	○	○	○	○	○
2 Coordinate system setting	○	○	○	○	○	○	○	○	○	○	○	○
3 Automatic coordinate system setting	○	○	○	○	○	○	○	○	○	○	○	○
4 Workpiece coordinate system selection												
1 Workpiece coordinate system selection (6 sets)	○	○	○	○	○	○	○	○	○	○	○	○
2 Extended workpiece coordinate system selection (48 sets) G54.1P1 to P48	○	○	○	△	△	△	△	△	△	○	○	○
3 Extended workpiece coordinate system selection (96 sets) G54.1P1 to P96	–	–	–	–	△	△	–	△	△	–	–	–
4 Extended workpiece coordinate system selection (300 sets) G54.1P1 to P300	–	–	–	–	△	△	–	△	△	–	–	–
5 External workpiece coordinate offset	○	○	○	○	○	○	○	○	○	○	○	○
6 Workpiece coordinate system preset (G92.1)	–	–	–	△	△	△	△	△	△	○	○	○
7 Local coordinate system	○	○	○	○	○	○	○	○	○	○	○	○
8 Coordinate system for rotary axis	○	○	○	○	○	○	○	○	○	○	○	○
9 Plane selection	○	○	○	○	○	○	○	○	○	○	○	○
10 Origin set/Origin cancel	○	○	○	○	○	○	○	○	○	○	○	○
11 Counter set	○	○	○	○	○	○	○	○	○	○	○	○
2 Return												
1 Manual reference position return	○	○	○	○	○	○	○	○	○	○	○	○
2 Automatic 1st reference position return	○	○	○	○	○	○	○	○	○	○	○	○
3 2nd, 3rd, 4th reference position return	○	○	○	○	○	○	○	○	○	○	○	○
4 Reference position check	○	○	○	○	○	○	○	○	○	○	○	○
5 Absolute position detection	○	○	○	△	△	△	△	△	△	○	○	○
6 Tool exchange position return	○	○	○	○	○	○	○	○	○	○	○	○
11 Operation support functions												
1 Program control												
1 Optional block skip	○	○	○	○	○	○	○	○	○	○	○	○
2 Optional block skip addition	–	○	○	△	△	△	△	△	△	–	○	○
3 Single block	○	○	○	○	○	○	○	○	○	○	○	○
2 Program test												
1 Dry run	○	○	○	○	○	○	○	○	○	○	○	○
2 Machine lock	○	○	○	○	○	○	○	○	○	○	○	○
3 Miscellaneous function lock	○	○	○	○	○	○	○	○	○	○	○	○
4 Graphic check												
1 Graphic check	○	○	○	△	△	△	△	△	△	○	○	○
2 3D solid program check	–	–	○	△	△	△	△	△	△	–	–	–
3 Graphic check rotary axis drawing	–	–	–	–	–	–	–	–	–	–	–	△* (HN721/HN722)
5 Graphic trace												
1 Graphic trace	○	○	○	△	△	△	△	△	△	○	○	○
2 Graphic trace rotary axis drawing	–	–	–	–	–	–	–	–	–	–	–	△* (HN721/HN722)
6 Machining time computation	○	○	○	○	○	○	○	○	○	○	○	○
3 Program search/start/stop												
1 Program search	○	○	○	○	○	○	○	○	○	○	○	○
2 Sequence number search	○	○	○	○	○	○	○	○	○	○	○	○
3 Verification stop	–	○	○	△	△	△	△	△	△	–	○	○

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
–	–	–	–	–	–	Tool diameter designation handles the compensation amount as diameter value and compensates the amount set in the tool compensation amount screen when tool radius compensation (G41/G42) is commanded.
○	○	○	○	○	○	The number of configurable sets of tool data such as tool length compensation and tool radius compensation.
–	–	–	–	–	–	
△	△	△	△	△	△	
–	–	–	–	–	–	
–	–	–	–	–	–	
–	–	–	–	–	–	
△	△	△	△	△	△	
○	○	○	○	○	○	This function registers the tool shape compensation and wear compensation amounts.
						This shows the coordinate systems handled by the NC. The points that can be commanded with the movement command are points in the local coordinate system or machine coordinate system.
○	○	○	○	○	○	The machine coordinate system is used to express the prescribed positions (such as the tool change position and stroke end position) that are specific to each machine, and it is automatically set immediately upon completion of the first dog-type reference position return after power ON, or immediately after power ON if the absolute position specifications apply.
○	○	○	○	○	○	By issuing a G code, the program coordinate system (zero point of program) can be changed in the workpiece coordinate system.
○	○	○	○	○	○	After turning the power ON, even without executing the reference position return, the basic machine coordinate system and the workpiece coordinate system are set automatically.
○	○	○	○	○	○	When multiple workpieces with the same shape are to be machined, these commands enable the same shape to be machined by executing a single machining program in the coordinate system of each workpiece.
△	△	△	△	△	△	In addition to the six workpiece coordinate systems G54 to G59, 48/96 sets of workpiece coordinate systems can be used by assigning G54.1Pn command.
–	–	–	–	–	–	
–	–	–	–	–	–	
○	○	○	○	○	○	An external workpiece coordinate offset that serves as a reference for all the workpiece coordinate systems is available outside the workpiece coordinates. By setting the external workpiece coordinate offset, the external workpiece coordinate system can be shifted, and all the workpiece coordinate systems can be simultaneously shifted by an amount equivalent to the offset.
△	△	△	△	△	△	This function presets the workpiece coordinate system, which has been shifted by the programmed command or the manual operation, as the workpiece coordinate system which has been offset by the programmed command (G92.1) from the machine zero point by an amount equivalent to the workpiece coordinate offset amount.
○	○	○	○	○	○	This function is for assigning another coordinate system in the workpiece coordinate system currently selected. This enables the workpiece coordinate system to be changed temporarily.
○	○	○	○	○	○	The rotary axis includes the rotating type (short-cut valid/invalid) or the linear type (workpiece coordinate position linear type, all coordinate position linear type). The workpiece coordinate position range is 0 to 359.999° for the rotating type, and 0 to 99999.999° for the linear type.
○	○	○	○	○	○	By issuing a G code, it is possible to specify the planes for the arc, tool radius compensation, coordinate rotation and other commands.
○	○	○	○	○	○	Origin set is a function that shifts the coordinate system so that the current position is set as the zero point in the workpiece coordinate system containing the workpiece coordinate system's offset value. Origin cancel is a function that manually cancels all deviated amounts, and shifts to the designated zero point with the workpiece offset.
○	○	○	○	○	○	The relative position counter can be set to an arbitrary value from the setting and display unit screen.
○	○	○	○	○	○	This function enables the tool to be returned manually to a position specific to the machine (reference position).
○	○	○	○	○	○	By commanding the G code during an automatic operation, the 1st reference position return is executed. If an intermediate point is commanded, a positioning is made to the point at rapid traverse rate, then each axis returns to its 1st reference position.
○	○	○	○	○	○	As in the automatic 1st reference position return, by commanding the G code during an automatic operation, an axis returns to a certain position specific to the machine (2nd/3rd/4th reference position).
○	○	○	○	○	○	By issuing a G code, a machining program where the tool is programmed to start off from the reference position and return to the reference position can be checked if the tool will return successfully to the reference position.
△	△	△	△	△	△	With this function, a battery stores the relation of the actual machine position and the machine coordinate kept in the CNC even during the power OFF, and an automatic operation is enabled without executing a reference position return.
○	○	○	○	○	○	By specifying the tool change position in a parameter and also assigning a tool change position return command in a machining program, the tool can be changed at the most appropriate position.
○	○	○	○	○	○	When "/" (slash code) is programmed at the head of a block, and the optional block skip input signal from the external source is turned ON for automatic operation, the block with the "/" code is skipped.
△	△	△	△	△	△	When "/n (n:1 to 9)" is programmed at the head of a block, and the optional block skip input n signal from the external source is turned ON for automatic operation, the block with the "/n" code is skipped.
○	○	○	○	○	○	The commands for automatic operation can be executed one block at a time (block stop) by turning ON the single block input signal.
○	○	○	○	○	○	F code feed commands for automatic operation can be switched to the manual feedrate data of the machine operation board by turning ON the dry run input signal.
○	○	○	○	○	○	When the machine lock input signal is set to ON, the CNC operations can be executed without actually moving the NC axis.
○	○	○	○	○	○	When the "External input" signal or "Miscellaneous function lock" signal is turned ON, the output signals of M, S, T, and B (2nd miscellaneous function) will not be output to the PLC. This is useful when checking only travel commands in a program check.
△	△	△	△	△	△	This function traces the programmed movement path without executing an automatic operation. It enables three-dimensional drawing and also rotary axis drawing. By using this function, machining programs can be checked before they are actually run. * M70V TypeA requires a function expansion unit FCU7-HN721/HN722.
–	–	–	–	–	–	
△	△	△	△	△	△	
△	△	△	△	△	△	This function traces the machine tool's machine positions. It draws the movement path of an actual automatic or manual operation, and the tool tip movement path. The function also monitors the machine operations during machining. It enables the drawing of a rotary axis as well. * M70V TypeA requires a function expansion unit FCU7-HN721/HN722.
△	△	△	△	△	△	
○	○	○	○	○	○	This function analyzes the machining program without moving the axis and calculates the approximate time required for machining.
○	○	○	○	○	○	This function specifies the program No. of the program to run automatically and calls the program.
○	○	○	○	○	○	Blocks can be indexed by setting the program No., sequence No. and block No. of the program to run automatically.
△	△	△	△	△	△	This function enables the single block stop status to be established at any block without having to turn the SINGLE BLOCK switch ON.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system			General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	
4 Program restart	○	○	○	△	△	△	△	△	△	○	○	○	When a machining program is to be resumed after suspended midway due to tool damage or for some other reason, this function searches the program and the block to resume and enables machining to be resumed from the block.
5 Automatic operation start	○	○	○	○	○	○	○	○	○	○	○	○	With the input of the automatic operation start signal (change from ON to OFF), automatic operation of the program that was found by an operation search is started by the controller (or the halted program is restarted).
6 NC reset	○	○	○	○	○	○	○	○	○	○	○	○	This function enables the controller to be reset.
7 Feed hold	○	○	○	○	○	○	○	○	○	○	○	○	When the feed hold signal is set to ON during automatic operation, the machine feed is immediately decelerated and stopped.
8 Search & Start	○	○	○	○	○	○	○	○	○	○	○	○	If the “Search & Start” signal is input when the memory mode is selected, the designated machining program is searched and executed from the beginning.
4 Interrupt operation													
1 Manual interruption	○	○	○	○	○	○	○	○	○	○	○	○	Manual interrupt is a function that enables manual operations to be performed during automatic operation.
2 Automatic operation handle interruption	○	○	○	○	○	○	○	○	○	○	○	○	The handle command can interrupt and be superimposed onto a command without suspending automatic operation to move the machine by rotating the manual pulse generator during automatic operation.
3 Manual absolute switch	○	○	○	○	○	○	○	○	○	○	○	○	The program absolute positions are updated by an amount equivalent to the distance by which the tool is moved manually when the manual absolute switch signal is turned ON.
4 Thread cutting cycle retract	–	–	–	–	–	–	–	–	–	–	○	○	This function suspends the thread cutting cycle if a feed hold signal has been input during thread cutting cycle.
5 Tapping retract	○	○	○	○	○	○	○	○	○	○	○	○	If tapping is interrupted by a reset or emergency stop signal that is input during tapping and the tap is left engaged inside the workpiece, the tap tool engaged inside the workpiece can be rotated in the reverse direction so that it will be disengaged by inputting the tap retract signal.
6 Manual numerical value command	○	○	○	○	○	○	○	○	○	○	○	○	On the screen of the setting and display unit, the M, S and T (and B when 2nd miscellaneous function is valid) commands can be executed by setting numerical values and pressing [INPUT].
7 Arbitrary reverse run	–	–	○	△	△	△	△	△	△	–	–	–	This function allows a program to run the executed blocks backward after the block stop in the automatic operation.
8 MDI interruption	○	○	○	○	○	○	○	○	○	○	○	○	This function enables MDI programs to be executed during automatic operation in the single block stop status. When the modal status is changed in a MDI program, the modal status in the automatic operation mode is also changed.
9 Simultaneous operation of manual and automatic modes	○	○	○	○	○	○	○	○	○	○	○	○	This function enables manual operations to be performed during automatic operation by selecting an automatic operation mode (tape, MDI or memory) and manual mode (handle, step, jog or manual reference position return) simultaneously. (Arbitrary feed based on the PLC is also possible.)
10 Simultaneous operation of JOG and handle modes	○	○	○	○	○	○	○	○	○	○	○	○	When executing the jog feed and handle feed, both these feeds are available without changing the mode each time by inputting the jog mode signal and simultaneous operation of jog and handle modes signal to the control unit.
11 Reference position retract	○	○	○	○	○	○	○	○	○	○	○	○	When the retract signal is turned ON during the automatic and manual operation, this function can retract the tool immediately to a set reference position.
12 Tool retract and return	–	–	–	–	△	△	–	△	△	–	–	–	Even if the machining program's operation is halted and the tool is retracted to change the tool or check the workpiece, etc., the tool can be returned to the halted point (machining halted point) and resume machining.
13 Skip retract	–	○	○	△	△	△	△	△	△	–	–	–	This function is used to return in the direction opposite the travel direction when the skip signal is input during G31 command.
14 PLC interruption	–	○	○	△	△	△	△	△	△	–	○	○	The interrupt program set with the R register is executed with the signals from the PLC during single block stop in program operation or during the manual mode.
12 Program support functions													
1 Machining method support functions													
1 Program													
1 Subprogram control	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	○ 8 layers	When the same pattern is repeated during machining, the machining pattern is registered as one subprogram, which can be called from the main program as required, thereby realizing the same machining easily. This enables the efficient use of programs.
2 Figure rotation	–	–	–	△	△	△	△	△	△	–	–	–	If the same pattern is used repeatedly on a concentric circle, one of the rotary machining patterns can be registered as a subprogram. When the subprogram is called from the main program, if the rotation center is designated, a path similar to the rotary phase can be easily created on the concentric circle. This simplifies the creation of a program.
3 Scaling	○	○	○	△	△	△	△	△	△	–	–	–	The shape commanded by a program can be extended or reduced to the desired size by applying a scale factor to the movement axis command position.
4 Axis name switch	–	–	–	–	–	–	–	–	–	–	○	○	The axis name switch function switches the name of a command axis and a control axis.
2 Macro program													
1 User macro	○ 4 layers	○ 4 layers	○ 4 layers	△ 4 layers	△ 4 layers	△ 4 layers	△ 4 layers	△ 4 layers	△ 4 layers	○ 4 layers	○ 4 layers	○ 4 layers	In order to execute one integrated function, a group of control and arithmetic instructions can be used and registered as a macro program.
2 Machine tool builder macro	–	○	○	△	△	△	△	△	△	–	○	○	This function enables macro programs exclusively designed for use by a specific machine tool builder to be registered in addition to the regular user macro programs.
3 Macro interruption	○	○	○	△	△	△	△	△	△	○	○	○	By inputting a user macro interrupt signal from the PLC, the program being currently executed is interrupted and other programs can be called instead.
4 Variable command													
1 100 sets	–	–	–	○	○	○	○	○	○	–	–	–	Programming can be made flexible and versatile by designating variables instead of directly assigning numbers to addresses in programs and by supplying the values of those variables as required when running the programs. Arithmetic operations (adding, subtracting, multiplying and dividing) can also be conducted for the variables. * M70V TypeA requires a memory expansion unit FCU7-HN754.
2 200 sets	○	–	–	△	△	△	△	△	△	○	–	–	
3 300 sets	–	–	–	△	△	△	△	△	△	–	–	–	
4 600 sets	–	–	–	△	△	△	△	△	△	–	○	–	
5 700 sets	–	○	○	△	△	△	△	△	△	–	–	○	
6 8000 sets	–	–	△* (HN754)	△	△	△	△	△	△	–	–	△* (HN754)	
7 (50+50×number of part systems) sets	–	–	–	○	○	○	○	○	○	–	–	–	
8 (100+100×number of part systems) sets	–	–	–	△	△	△	△	△	△	–	–	–	
9 (200+100×number of part systems) sets	–	–	–	△	△	△	△	△	△	–	–	–	
10 (500+100×number of part systems) sets	–	–	–	△	△	△	△	△	△	–	–	–	
11 (600+100×number of part systems) sets	–	–	○	△	△	△	△	△	△	–	–	○	
12 (7900+100×number of part systems) sets	–	–	△* (HN754)	△	△	△	△	△	△	–	–	△* (HN754)	
3 Fixed cycle													
1 Fixed cycle for drilling	○	○	○	○	○	○	○	○	○	○	○	○	These functions enable drilling, tapping and other hole machining cycles to be assigned in a simple 1-block program. Special fixed cycles must always be used in combination with fixed cycles.
2 Fixed cycle for drilling (Type Ⅱ)	–	–	–	–	–	–	–	–	–	○	○	○	
3 Special fixed cycle	○	○	○	△	△	△	△	△	△	–	–	–	
4 Fixed cycle for turning machining	–	–	–	–	–	–	–	–	–	○	○	○	The shape normally programmed in several blocks for rough cutting, etc. in the turning machining can be commanded in one block. This function is useful for simplifying machining programs.
5 Compound type fixed cycle for turning machining	–	–	–	–	–	–	–	–	–	○	○	○	
6 Compound type fixed cycle for turning machining (Type Ⅱ)	–	–	–	–	–	–	–	–	–	○	○	○	
7 Small-diameter deep-hole drilling cycle	–	○	○	△	△	△	△	△	△	–	–	–	In deep hole drilling, cutting and retract are repeated and the workpiece is machined multiple times. In addition, when PLC signals are input during cutting, the cutting for the time concerned is skipped. In this way, the load applied to the tool is reduced.
4 Mirror image													
1 Mirror image by parameter setting	–	○	○	○	○	○	○	○	○	–	○	○	A parameter is used to designate the axis for which the mirror image function is to be executed before the machining program is run.
2 Mirror image by external input	–	○	○	○	○	○	○	○	○	–	○	○	Signals from an external device (PLC) request the mirror image operation either during or before the execution of a machining program.
3 Mirror image by G code	○	○	○	○	○	○	○	○	○	–	–	–	Using a program for the left or right side of an image, this function can machine the other side of the image when a left/right symmetrical shape is to be cut.
4 Mirror image for facing tool posts	–	–	–	–	–	–	–	–	–	–	–	○	With machines in which the base tool post and the facing tool post are integrated in one post, this function enables the programs prepared for cutting at the base side to be executed by the tools on the facing side as well.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system		
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series	
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA
5 5 T code mirror image for facing tool posts	–	–	–	–	–	–	–	–	–	–	–	○
5 Coordinate system operation												
1 Coordinate rotation by program	○	○	○	△	△	△	△	△	△	–	–	○
2 Coordinate rotation by parameter	–	–	–	△	△	△	△	△	△	–	–	–
3 3-dimensional coordinate conversion	–	–	–	△	△	△	△	△	△	–	–	–
6 Dimension input												
1 Corner chamfering/Corner R	○	○	○	△	△	△	△	△	△	○	○	○
2 Linear angle command	○	○	○	△	△	△	△	△	△	○	○	○
3 Geometric command	○	○	○	△	△	△	△	△	△	○	○	○
4 Polar coordinate command	–	○	○	△	△	△	△	△	△	–	–	–
7 Axis control												
1 Chopping												
1 1 Chopping	–	○	○	△	△	△	△	△	△	–	○	○
2 Normal line control	–	–	○	△	△	△	△	△	△	–	–	–
3 Circular cutting	○	○	○	△	△	△	△	△	△	–	–	–
8 Multi-part system control												
1 Timing synchronization between part systems	–	–	○	○	○	○	○	○	○	–	–	○
2 Start point designation timing synchronization	–	–	○	○	○	○	○	○	○	–	–	○
3 Mixed control (cross axis control)												
1 Mixed Control (Cross Axis Control) Ⅰ	–	–	–	–	–	–	–	–	–	–	–	○
2 Mixed Control (Cross Axis Control) Ⅱ	–	–	–	–	–	–	–	–	–	–	–	○
4 Control axis superimposition												
1 Control Axis Superimposition Ⅰ	–	–	–	–	–	–	–	–	–	–	–	–
2 Control Axis Superimposition Ⅱ	–	–	–	–	–	–	–	–	–	–	–	–
5 Control axis synchronization across part systems												
1 Control Axis Synchronization Across Part System Ⅰ	–	–	–	–	–	–	–	–	–	–	–	○
2 Control Axis Synchronization Across Part System Ⅱ	–	–	–	–	–	–	–	–	–	–	–	○
6 Balance cut	–	–	–	–	–	–	–	–	–	–	–	○
7 Common memory for part systems	–	–	–	–	–	–	–	–	–	–	–	○
8 2-part system synchronous thread cutting	–	–	–	–	–	–	–	–	–	–	–	○
9 Multi-part system program management	–	–	○	○	○	○	○	○	○	–	–	○
9 Data input by program												
1 Parameter input by program	○	○	○	△	△	△	△	△	△	○	○	○
2 Compensation data input by program	○	○	○	△	△	△	△	△	△	○	○	○
10 Machining modal												
1 Tapping mode	○	○	○	○	○	○	○	○	○	○	○	○
2 Cutting mode	○	○	○	○	○	○	○	○	○	○	○	○
2 Machining accuracy support functions												
1 Automatic corner override	○	○	○	○	○	○	○	○	○	○	○	○
2 Deceleration check												
1 Exact stop check mode	○	○	○	○	○	○	○	○	○	○	○	○
2 Exact stop check	○	○	○	○	○	○	○	○	○	○	○	○
3 Error detection	○	○	○	○	○	○	○	○	○	○	○	○
4 Programmable in-position check	○	○	○	○	○	○	○	○	○	○	○	○
3 High-speed and high-accuracy functions[kBPM:k Block per Minute]												
1 High-speed machining mode Ⅰ (G5P1) Max. [kBPM]	–	○ 8.4	○ 16.8	△ 16.8	△ 16.8	△ 16.8	△ 16.8	△ 16.8	△ 16.8	–	–	–
2 High-speed machining mode Ⅱ (G5P2) Max. [kBPM]	–	–	○ 33.7	△ 67.5	△ 168	△ 168	△ 67.5	△ 168	△ 168	–	–	–
3 High-speed high-accuracy control 1 (G5.1Q1) Max. [kBPM] (1st part system only)	–	○ 16.8	○ 16.8	△ 16.8	△ 33.7	△ 33.7	△ 16.8	△ 33.7	△ 33.7	–	–	–
4 High-speed high-accuracy control 2 (G5P10000) Max. [kBPM] (limited to 1-part system configuration)	–	–	○ 33.7	△ 67.5	△ 168	△ 168	△ 67.5	△ 168	△ 168	–	–	–
5 High-accuracy control1 (G61.1/G08) (1st part system only)	–	○	○	△	△	△	△	△	△	–	–	–
6 High-accuracy spline interpolation1 (G61.2) (1st part system only)	–	–	○	△	△	△	△	△	△	–	–	–
8 SSS control												
1 SSS control (1st part system only)	–	–	△* (HN722)	△	△	△	△	△	△	–	–	–
9 High-accuracy acceleration/deceleration time constant extension (1st part system only)	–	–	–	△	△	△	△	△	△	–	–	–
10 Machining condition selection Ⅰ (1st part system only)	–	○	○	○	○	○	○	○	○	–	–	–

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
△	△	△	△	△	△	When tools that correspond to tool Nos. 1 to 64 are selected (T commands) but these are the tool Nos. for which the facing tool post mirror image function has already been designated with a parameter, the status equivalent to G68 (facing tool post mirror image ON) is established.
△	△	△	△	△	△	When it is necessary to machine a complicated shape at a position that has been rotated with respect to the coordinate system, you can machine a rotated shape by programming the shape prior to rotation on the local coordinate system, and then specifying the parallel shift amount and rotation angle by means of this coordinate rotation command.
–	–	–	–	–	–	If a deviation occurs between the workpiece alignment line and the machine coordinate system's coordinate axis when the workpiece is mounted, the machine can be controlled to rotate the machining program coordinates according to the workpiece alignment line deviation.
–	–	–	–	–	–	With the 3-dimensional coordinate conversion function, a new coordinate system can be defined by rotating and moving in parallel the zero point in respect to the X, Y and Z axes of the currently set workpiece coordinate system.
△	△	△	△	△	△	This function executes corner processing by automatically inserting a straight line or arc in the commanded amount between two consecutive travel blocks.
△	△	△	△	△	△	The end point coordinates are automatically calculated by assigning one element (one component of the selected plane) of the end point coordinates and the linear angle.
○	○	○	○	○	○	When it is difficult to find the intersection point of two straight lines with a continuous linear interpolation command, this point can be calculated automatically by programming the command for the angle of the straight lines.
–	–	–	–	–	–	With this function, the end point position is commanded with the radius and angle.
△	△	△	△	△	△	This function continuously raises and lowers the chopping axis independently of program operation. During the grinding operation, chopping can produce a better surface accuracy than using abrasive grain.
–	–	–	–	–	–	This function controls the swiveling of the C axis (rotary axis) so that the tool is always pointing in the normal line direction for the X and Y axes movement commands during program operation.
–	–	–	–	–	–	In circular cutting, a system of cutting steps are performed; first, the tool departs from the center of the circle, and by cutting along the inside circumference of the circle, it draws a complete circle, then it returns to the center of the circle.
○	○	○	○	○	○	The multi-axis, multi-part system compound control CNC system can simultaneously run multiple machining programs independently. This function is used in cases when, at some particular point during operation, the operations of different part systems are to be synchronized or in cases when the operation of only one part system is required.
○	○	○	○	○	○	The synchronizing point can be placed in the middle of a block by designating the start point.
△	△	△	△	△	△	This function enables any axis to be replaced with another axis between part systems. There are two methods for giving commands: G code and PLC.
△	△	△	△	△	△	
△	△	△	△	△	△	This function enables to superimpose on and control an axis in a part system with an axis in another part system. There are two methods for giving commands: G code and PLC.
△	△	△	△	△	△	
△	△	△	△	△	△	Synchronization control enables an arbitrary control axis in another part system to move in synchronization with the movement command assigned to an arbitrary control axis. There are two methods for giving commands: G code and PLC.
△	△	△	△	△	△	
△	△	△	△	△	△	The deflection can be minimized by holding tools simultaneously from both sides of the workpiece and using them in synchronization to machine the workpiece (balance cutting). In addition, since the workpiece is machined by two tools, the machining time is reduced.
○	○	○	○	○	○	For a machine with multiple part systems, the common variables and tool compensation memory which exist for each part system can be made common to all part systems by setting the parameters.
△	△	△	△	△	△	This function performs synchronous thread cutting for the same spindle using the 1st and 2nd part systems.
○	○	○	○	○	○	Separate programs, used in each part system, can be managed under a common name in a multi-part system.
△	△	△	△	△	△	The parameters set from the display can be changed using machining programs.
△	△	△	△	△	△	The value of the workpiece coordinate systems selected can be set or changed using program commands. The tool compensation amounts, that are set from the display can be input using program commands.
○	○	○	○	○	○	When tapping mode commands are issued, the CNC system is set to the internal control modes required for tapping.
○	○	○	○	○	○	When a cutting mode command is issued, the CNC system is set to the cutting mode that enables a smoothly cut surface.
○	○	○	○	○	○	To prevent machining surface distortion due to increase in the cutting load when cutting corners, this function automatically applies an override on the cutting feedrate so that the cutting amount is not increased for a set time at the corner.
○	○	○	○	○	○	This function decelerates and stops a motor before executing the next block, which reduces the impact on the machine caused by a rapid change of feedrate, and prevents a corner from being machined round.
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
–	–	–	–	–	–	This function runs a machining program that approximates a free curve with fine segments at a high speed.
–	–	–	–	–	–	
–	–	–	–	–	–	This function runs machining programs, in which free-form curved surfaces have been approximated by fine segments, at a high speed and with a high accuracy. If the 2nd part system simultaneous high-accuracy option is valid, 2nd part system can be performed at the same time.
–	–	–	–	–	–	
–	–	–	–	–	–	This function controls the operation so the lag will be eliminated in control systems and servo systems. With this function, improved machining accuracy can be realized, especially during high-speed machining, and machining time can be reduced. If the 2nd part system simultaneous high-accuracy option is valid, 2nd part system can be performed at the same time.
–	–	–	–	–	–	This function automatically generates spline curves that smoothly pass through rows of dots designated by a fine-segment machining program, and performs interpolation for the paths along the curves.
–	–	–	–	–	–	With SSS (Super Smooth Surface) control, the large area path information is used instead of just the angle between the blocks. Thus, optimum speed control that is not adversely affected by minute steps or waviness is possible. This enables machining with a fewer scratches and streaks on the cutting surface compared to the normal high-accuracy control function. If the 2nd part system simultaneous high-accuracy option is valid, 2nd part system can be performed at the same time. * M70V TypeA requires a function expansion unit FCU7-HN722.
–	–	–	–	–	–	This extends the upper limit of cutting feed time constant from 5,000[ms] to 30,000[ms] for acceleration/deceleration before interpolation.
–	–	–	–	–	–	The machining condition parameter set which consists of parameters related to the high-accuracy control can be configured in advance for each machining application (such as part machining or die machining) or machining process (such as rough or finishing), and it can be switched according to the purpose.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system		
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series	
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA
12 Direct command mode	–	–	–	–	–	–	–	–	–	–	–	–
13 High-accuracy Control in 2 Part Systems	–	–	–	△	△	△	△	△	△	–	–	–
4 Programming support functions												
1 Playback	○	○	○	△	△	△	△	△	△	–	–	–
3 Simple programming	–	○	○	△	△	△	△	△	△	–	○	○
4 G code guidance	○*	○	○	△	△	△	△	△	△	○*	○	○
13 Machine accuracy compensation												
1 Static accuracy compensation												
1 Backlash compensation	○	○	○	○	○	○	○	○	○	○	○	○
2 Memory-type pitch error compensation	○	○	○	△	△	△	△	△	△	○	○	○
3 Memory-type relative position error compensation	○	○	○	△	△	△	△	△	△	○	○	○
4 External machine coordinate system compensation	○	○	○	△	△	△	△	△	△	○	○	○
5 Circular error radius compensation	–	○	○	△	△	△	△	△	△	–	○	○
6 Ball screw thermal expansion compensation	–	○	○	△	△	△	△	△	△	–	○	○
7 Machine rotation center error compensation	–	–	–	–	△	△	–	△	△	–	–	–
8 Position-dependent gradually increasing-type backlash compensation	–	○	○	△	△	△	△	△	△	–	○	○
9 Two-way pitch error compensation	–	○	○	△	△	△	△	△	△	–	○	○
2 Dynamic accuracy compensation												
1 Smooth high-gain (SHG) control	○	○	○	○	○	○	○	○	○	○	○	○
2 Dual feedback	○	○	○	○	○	○	○	○	○	○	○	○
3 Lost motion compensation	○	○	○	○	○	○	○	○	○	○	○	○
4 OMR Ⅱ (Backlash with filter)	–	○	○	△	△	△	△	△	△	–	○	○
6 OMR-FF	–	–	–	△	△	△	△	△	△	–	–	–
7 Distance-coded reference position detection	–	–	–	△	△	△	△	△	△	–	–	–
14 Automation support functions												
1 Measurement												
1 Skip												
1 Skip	○	○	○	△	△	△	△	△	△	○	○	○
2 Multiple-step skip	○	○	○	△	△	△	△	△	△	○	○	○
4 PLC skip	–	○	○	△	△	△	△	△	△	–	○	○
5 Speed change skip	–	–	–	△	△	△	△	△	△	–	–	–
2 Automatic tool length measurement	○	○	○	△	△	△	△	△	△	○	○	○
3 Manual tool length measurement 1	○	○	○	△	△	△	△	△	△	○	○	○
4 Manual tool length measurement 2	○	○	○	△	△	△	△	△	△	○	○	○
5 Workpiece coordinate offset measurement	–	–	–	–	–	–	–	–	–	–	○	○
6 Workpiece position measurement	–	○	○	△	△	△	△	△	△	–	–	–
7 Rotation measurement	–	○	○	△	△	△	△	△	△	–	–	–
2 Tool life management												
1 Tool life management												
1 Tool life management Ⅰ	○	○	○	△	△	△	△	△	△	○	○	○
2 Tool life management Ⅱ	○	○	○	△	△	△	△	△	△	○	○	○
3 Tool life management Ⅲ	○	○	○	△	△	△	△	△	△	–	–	–
2 Number of tool life management sets												
1 80 sets	–	–	–	–	–	–	–	–	–	○	○	○
2 200 sets	○	○	○	△	△	△	△	△	△	–	–	–
3 400 sets	–	–	–	△	△	△	△	△	△	–	–	–
4 600 sets	–	–	–	△	△	△	△	△	△	–	–	–
5 800 sets	–	–	–	△	△	△	△	△	△	–	–	–
6 1000 sets	–	–	–	△	△	△	△	△	△	–	–	–

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
–	△	△	–	△	△	By reducing the load applied during the NC program analysis and interpolation to the minimum possible level, the machining programs expressed in fine segments are executed at a high processing speed.
–	–	–	–	–	–	The high-accuracy control can be operated in two part systems at the same time. (Note) One or more of the options High-accuracy control, High-speed high-accuracy control 1 or High-speed high-accuracy control 2 must be combined with this function to implement high-accuracy or high-speed high-accuracy control.
△	△	△	△	△	△	This function enables creation of a program while proceeding with sample machining by manual (handle or job) feed or mechanical handle feed.
△	△	△	△	△	△	Create a part program by using NAVI MILL (for machining center system) or NAVI LATHE (for lathe system).
△	△	△	△	△	△	G code guidance is a function to display illustration of the contents or movements of the commanded format for the G code currently under editing. This is used when creating or editing a machining program. * E70 requires add-on guidance data.
○	○	○	○	○	○	This function compensates the error (backlash) produced when the direction of the machine system is reversed.
△	△	△	△	△	△	Machine accuracy can be improved by compensating the errors in the screw pitch intervals among the mechanical errors (production errors, wear, etc.) of the feed screws.
△	△	△	△	△	△	Machine accuracy can be improved by compensating the relative error between machine axes, such as a production error or aging.
△	△	△	△	△	△	The coordinate system can be shifted by inputting a compensation amount from the PLC. This compensation amount will not appear on the counters (all counters including machine position).
△	△	△	△	△	△	With commands designated during arc cutting, this function compensates movement toward the inside of the arcs caused by a factor such as servo delay.
△	△	△	△	△	△	This compensates the axis feed error caused by a ball screw's thermal expansion, etc. using the values set by the PLC.
–	–	–	–	–	–	In a machine with a rotary axis, there may be a case where the actual rotation center deviates from the programmed rotation center. (In other words, "machine rotation center error" may be observed.) Higher accuracy machining can be realized by compensating this error.
△	△	△	△	△	△	With this function, the gradually increasing-type lost motion which depends on the distance from the point where the machine movement direction is reversed can be compensated by controlling the variation of backlash compensation amount according to the distance from the direction reversal point.
△	△	△	△	△	△	Two-way pitch error compensation function is used to compensate the pitch error in each direction by setting the pitch error compensation amount when moving in the positive and negative direction.
○	○	○	○	○	○	This is a high-response and stable position control method using the servo system. SHG control realizes an approximately three-fold position loop gain compared to the conventional control method.
○	○	○	○	○	○	Use position feedback with a motor-side detector in ranges with high acceleration to enable stable control. In ranges with low acceleration, use position feedback with the machine-side detector (scale). This will make it possible to increase the position loop gain. A machine-side detector (scale) is separately required.
○	○	○	○	○	○	This function compensates the error in protrusion shapes caused by lost motion at the arc quadrant changeover section during circular cutting.
△	△	△	△	△	△	The OMR (Optimal Machine Response) control function estimates the machine or motor model (moment of inertia, clone friction, viscosity coefficient, etc.) that can cause a path error (deviation of the actual tool path from the programmed path). High-accuracy machining is achieved by carrying out feed forward control based on that model. This allows error cased by quadrant protrusions during circular interpolation or quadrants on the inner side of the path to be greatly reduced. OMR-Ⅱ is a function that focuses on the quadrant protrusions, and improves the path error with this. Quadrant path compensation is included in OMR-Ⅱ.
–	–	–	–	–	–	OMR-FF control enables fine control by generating feed forward inside the drive unit and can realize the strict feedback control to the program command than the conventional high-speed accuracy control.
△	△	△	△	△	△	This is a function where a distance-coded reference scale is used to establish the reference point in the relative position detection system.
△	△	△	△	△	△	When the external skip signal is input during linear interpolation using the G31 command, machine feeding is stopped immediately and the remaining distance is discarded to execute the commands in the next block.
△	△	△	△	△	△	This function realizes skipping by designating a combination of skip signals for each skip command.
△	△	△	△	△	△	This function enables skip operations to be performed by signals which are input from the user PLC.
△	△	△	△	△	△	This function is used to change the feed rate or to stop the movement by inputting the skip signal during the linear interpolation.
△	△	△	△	△	△	This function moves the tool in the direction of the tool measurement position by the commanded value between the measurement start position and measurement position. It stops the tool as soon as it reaches the sensor and calculates the difference between the coordinates where the tool has stopped and the command coordinates. It registers this difference as the tool length compensation amount for that tool.
△	△	△	△	△	△	Simple measurement of the tool length is done without a sensor.
△	△	△	△	△	△	[M system] When the tool is positioned at the reference position, this function measures the distance from the reference position to the tool tip and registered it as the tool length compensation amount. [L system] A device with a built-in touch sensor is used. Simply by causing the tool nose to touch the touch sensor in manual feed, the tool compensation amount can be calculated and stored in tool compensation amount memory.
△	△	△	△	△	△	The external workpiece coordinate offset data for the Z axis can be set by cutting the workpiece face by means of manual operations and inputting the workpiece measurement signal.
–	–	–	–	–	–	The workpiece position measurement function is used to measure each axis' coordinate by installing a sensor on the spindle and the sensor contacting the workpiece with the manual feed or handle feed. The surface, hole center and width center coordinates are calculated from the measured coordinates, and those calculated results are set in the workpiece coordinate offset.
–	–	–	–	–	–	The offset of the rotary coordinate system (rotation center and rotation angle) is measured, and the results are set to the workpiece coordinate system offset (rotation center) and the parameters.
△	△	△	△	△	△	The tool usage is monitored by accumulating each tool's usage time or the frequency of use.
△	△	△	△	△	△	[M system] A spare tool change function is added to the tool life management Ⅰ. [L system] The life of each tool (time and frequency) is controlled, and when the life is reached, a spare tool of the same type is selected from the same group.
–	–	–	–	–	–	The tool usage is monitored by accumulating each tool's usage time and the frequency of use. This function is not controlled by the group No.
△	△	△	△	△	△	The max. sets of tools available for tool life management
–	–	–	–	–	–	
–	–	–	–	–	–	
–	–	–	–	–	–	
–	–	–	–	–	–	
–	–	–	–	–	–	

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system			Lathe system						General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		M700VS Series			M700VW Series			
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
3 Others																			
1 Programmable current limitation	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	This function allows the current limit value of the NC axis to be changed to a desired value in the program, and is used for the workpiece stopper, etc.
2 Auto power off	–	–	–	○	○	○	○	○	○	–	–	–	○	○	○	○	○	○	Auto power OFF function notifies that the control unit's power can be turned OFF after shutting the display unit down by entering “automatic power OFF request” signal from user PLC to NC.
4 Load monitoring Ⅰ	–	–	–	△	△	△	△	△	△	–	–	–	△	△	△	△	△	△	This function aims at detecting tool wear or degradation by detecting and monitoring the actual load (current value) on spindle and NC axes on a real time basis.
15 Safety and maintenance																			
1 Safety switches																			
1 Emergency stop	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	All operations are stopped by the emergency stop signal input and, at the same time, the drive section is stopped and the movement of the machine is stopped.
2 Data protection key	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	With the input from the user PLC, it is possible to prohibit the parameter setting or deletion, and the program edit from the setting and display unit.
2 Display for ensuring safety																			
1 NC warning	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Warnings are output by the CNC system. When one of these warnings occurs, a warning number is output to the PLC and a description of the warning appears on the screen. Operation can be continued without taking further action.
2 NC alarm	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The alarms are output by the CNC system. When one of these alarms occurs, an alarm number is output to the PLC, and a description of the alarm appears on the screen. Operation cannot be continued without taking remedial action.
3 Operation stop cause	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The stop cause of automatic operation is shown on the display.
4 Emergency stop cause	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When the “EMG” (emergency stop) message is displayed in the operation status area of the display, the cause of the emergency stop can be confirmed.
5 Thermal detection	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When overheating is detected in the control unit, an overheat signal is output at the same time as the alarm is displayed.
6 Battery alarm/warning	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When it is time to change the batteries, an alarm and warning are displayed.
3 Protection																			
1 Stroke end (Over travel)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Limit switches and dogs are attached to the machine, and when a limit switch has kicked a dog, the movement of the machine is stopped by the signal input from the limit switch.
2 Stored stroke limit																			
1 Stored stroke limit Ⅰ/Ⅱ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function sets the areas prohibited for the tool to enter. There are multiple types of prohibitions according to the prohibited range and method.
2 Stored stroke limit ⅠB	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	
3 Stored stroke limit ⅡB	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	
4 Stored stroke limit ⅠC	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	
3 Stroke check before travel	–	○	○	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	By commanding, from the program, the boundary for prohibiting machine entry as a coordinate position in the machine coordinate system, entry into the inner side of that boundary can be prohibited.
4 Chuck/Tailstock barrier check	–	–	–	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	By limiting the tool nose point movement range, this function prevents the tool from colliding with the chuck or tail stock because of a programming error.
5 Interlock	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The machine movement will decelerate and stop as soon as the interlock signal, serving as the external input, is turned ON. When the interlock signal is turned OFF, the machine starts moving again.
6 External deceleration	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function reduces the feedrate to the deceleration speed set by the parameter when the external deceleration input signal has been set to ON.
8 3D Machine Interference check	–	–	–	–	–	–	–	△	△	–	–	–	–	–	–	–	–	–	When a possible collision is detected in a machine model registered beforehand, the motor decelerates to a stop and avoids collision.
9 Door interlock																			
1 Door interlock Ⅰ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Under the CE marking scheme of the European safety standards (machine directive), the opening of any protection doors while a machine is moving is prohibited.
2 Door interlock Ⅱ	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	When the door open signal is input from the PLC, this function first decelerates, stops all the control axes, establishes the ready OFF status, and then shuts off the drive power inside the servo drive units so that the motors are no longer driven.
10 Parameter lock	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function is used to prohibit the changing of machine parameters.
11 Program protection (Edit lock B, C)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The edit lock function B or C inhibits machining program B or C (group by machining program numbers) from being edited or erased when these programs require protection.
12 Program display lock	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function allows the display of only a target program (label address 9000) to be disabled for the program display in the monitor screen, etc.
13 Safety observation	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	The safety observation function ensures safe access to the machine's working parts (e.g. for adjustment or preparation) without shutting off the power, which reduces the time required to restart the machine.
14 Vertical axis pull-up	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function prevents the tool from breakage, through pulling up the cutting tool during emergency stop or instantaneous power interruption at low cutting speed.
4 Maintenance and troubleshooting																			
1 Operation history	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This is a maintenance function which is useful for tracing down the history and NC operation information and analyzing problems, etc. This information is saved in the history data file, and can be displayed on the screen and output to a file.
2 Data sampling	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The NC data sampling function samples the NC internal data (speed output from NC to drive unit, and feedback data from the drive unit, etc.). This data can be output as text data.
3 NC data backup	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The NC data back up function backs up the NC parameters, etc., on an HD or IC card. The data can also be restored.
5 Servo turning support tool																			
1 MS Configurator (Note 1)	–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	With this function, the servo parameters can be automatically adjusted by connecting the CNC and MS Configurator, which is an application that runs on a regular personal computer. (available for free download from the MITSUBISHI CNC website)
2 NC Analyzer (Note 2)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	With this function, the servo parameters can be automatically adjusted by connecting the CNC and NC Analyzer, which is an application that runs on a regular personal computer.
6 Automatic backup	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	With this function, system data, ladder program and custom software can be automatically backed up in case of system failure.
7 System setup	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	System setup function enables automatic settings for the NC's initial startup just by inputting the minimum required items.
11 Application error detection	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	○	○	○	Application error detection function observes applications such as MITSUBISHI standard screen or custom screen. When an error such as screen lock is detected, this function saves information and data in the log to investigate the causes easily.
12 NC Maintainer (Note 3)	–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	△	△	△	This software tool runs on a personal computer to perform maintenance (parameter setting, NC diagnosis, ladder diagnosis, etc.) for the MITSUBISHI CNCs with customer-supplied display units.
13 Parameter setup support tool																			
1 NC Configurator2 (Note 4)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This software tool runs on a personal computer to edit the NC data files required for NC control and machine operations such as parameters, tool data and common variables.
16 Drive system																			
1 Servo/Spindle																			
1 Feed axis																			

(Note 1) This tool is free of charge. Please contact us.
(Note 2) Please contact us to purchase this tool.
(Note 3) This function is an option. The separate software is required.
(Note 4) Please contact us to purchase a full function version. A limited function version is also available free of charge.

○: Standard △: Option □: Selection

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Class	Machining center system									Lathe system			Lathe system						General explanation
	E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		M700VS Series			M700VW Series			
		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
5 MDS-D2-V1/D2-V2/D2-V3 (200V)																			
1 Servo motor: HF□□-A48 (260kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
2 Servo motor: HF□□-A51 (1000kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
3 Servo motor: HF□□-A74 (16000kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
6 Servo motor: HF-KP□□JW04 (260kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
6 MDS-DH2-V1/DH2-V2 (400V)																			
1 Servo motor: HF□□-A48 (260kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
2 Servo motor: HF-H□□-A51 (1000kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
3 Servo motor: HF-H□□-A74 (16000kp/rev)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
7 MDS-DJ-V1(200V)																			CNC-dedicated drive units, spindle motors, and servo motors are used.
1 Servo motor: HF□□-A48 (260kp/rev)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
2 Servo motor: HF□□-A51 (1000kp/rev)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
3 Servo motor: HF-KP□□JW04 (260kp/rev)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
8 MDS-DM2-SPV2/SPV3 (200V)																			
1 Servo motor: HF□□-A48 (260kp/rev)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
2 Servo motor: HF□□-A51 (1000kp/rev)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
2 Spindle																			
6 MDS-D2-SP (200V)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
7 MDS-DH2-SP (400V)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
8 MDS-D2-SP2 (200V)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
9 MDS-DJ-SP (200V)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
10 MDS-DM2-SPV2/SPV3/SPHV3 (200V)	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
3 Auxiliary axis																			
1 Indexing/Positioning servo:MR-J2-CT	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
1 Servo motor: HC-SF/HC-RF (16kp/rev)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	CNC-dedicated drive units, spindle motors, and servo motors are used.
2 Servo motor: HA-FF/HC-MF (8kp/rev)	–	–	–	–	–	–	□	□	□	–	–	–	–	–	–	□	□	□	
4 Power supply																			
3 Power supply: MDS-D2-CV (200V)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
4 Power supply: MDS-DH2-CV (400V)	–	□	□	□	□	□	□	□	□	–	□	□	□	□	□	□	□	□	
5 AC reactor for power supply	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
6 Ground plate	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
17 Machine support functions																			
1 PLC																			
1 Built-in PLC processing mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
2 PLC functions																			
1 Built-in PLC basic function	○	○	○	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○	○	○	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	○ * Index qualification is available.	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.
2 PLC exclusive instruction	–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	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.
3 PLC support functions																			
1 Alarm message display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The contents of the alarms which have occurred during sequence (user PLC) processing can be displayed on the setting and display unit.
2 Operator message display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
3 Memory switch (PLC switch)																			
1 PLC switch 32 points	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	PLC switches can be set on the setting and display unit screen, and the ON/OFF control executed.
2 PLC switch 64 points	–	–	–	△	△	△	△	△	△	–	–	–	△	△	△	△	△	△	
4 Load meter display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	A load meter can be displayed on the setting and display unit.
5 User PLC version display	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The user PLC version can be displayed in the software list on the Software Configuration screen.
6 Multi-ladder program register and execution	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function stores and executes more than one sequence program.
7 Ladder program writing during RUN	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Ladder program can be edited while PLC is running.
8 PLC protection	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	A keyword can be set to protect the sequence programs stored in the CNC.
4 Built-in PLC capacity																			
1 Standard PLC capacity	○ 8000	○ 20000	○ 32000	○ 64000	○ 64000	○ 64000	○ 64000	○ 64000	○ 64000	○ 8000	○ 20000	○ 32000	○ 64000	○ 64000	○ 64000	○ 64000	○ 64000	○ 64000	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.
2 Large PLC capacity	–	–	–	△ 128000	△ 128000	△ 128000	△ 128000	△ 128000	△ 128000	–	–	–	△ 128000	△ 128000	△ 128000	△ 128000	△ 128000	△ 128000	
5 Machine contact input/output I/F	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The operation panel I/O unit or the remote I/O unit is selected based on the types of signals (sink/source) available for input or output and the number of contacts required.
6 Ladder monitor	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function enables the operating status of the sequence circuit to be checked on the controller's setting and display unit.
7 PLC development																			
1 On-board development	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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).
2 MELSEC development tool (GX Developer) (Need separate PC S/W)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function enables the data of the PLC contained inside the NC system to be developed and debugged using the GX Developer.
8 PLC parameter																			
1 PLC constant (150 points)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
2 PLC constant extension (Up to 755 points)	–	–	–	○	○	○	○	○	○	–	–	–	○	○	○	○	○	○	
10 Pallet program registration	–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	Pallet program function assists the machining setups as it allows machining programs to be registered for each pallet of the auto pallet changer.
11 Additional PLC engine	–	–	○	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	This function improves the performance of processing PLC programs.
2 Machine construction																			
1 Servo OFF	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
2 Axis detachment	○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	This function enables the control axis to be released from control.
3 Synchronous control	–	○	○	△	△	△	△	△	△	–	○	○	△	△	△	△	△	△	The synchronous control is a control method whereby both primary and secondary axes are controlled with the same travel command by designating the travel command for the primary axis also to the secondary axis. This function is assumed to be used in such equipment as large machine tools, which drive one axis with two servo motors.
4 Inclined axis control	–	–	–	–	–	–	–	–	–	○	○	○	△	△	△	△	△	△	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.

○: Standard △: Option □: Selection

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Class			Machining center system									Lathe system			Lathe system						General explanation
			E70 Series	M70V Series		M700VS Series			M700VW Series			E70 Series	M70V Series		M700VS Series			M700VW Series			
				TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
5	Position switch		○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	○ 24	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.
7	Index table indexing		–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	The indexing of the index table can be performed by setting the index axes.
8	Auxiliary axis control (J2-CT)		–	–	–	–	–	–	△	△	△	–	–	–	–	–	–	△	△	△	The MR-J2-CT drive unit for positioning and indexing can be connected for auxiliary axis control.
9	Tool length compensation along the tool axis		–	–	–	–	△	△	–	△	△	–	–	–	–	–	–	–	–	–	(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).
10	Tool handle feed & interruption		–	–	–	–	△	△	–	△	△	–	–	–	–	–	–	–	–	–	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.
11	Tool center coordinate display		–	–	–	–	–	△	–	–	△	–	–	–	–	–	–	–	–	–	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).
12	Tool center point control		–	–	–	–	–	△	–	–	△	–	–	–	–	–	–	–	–	–	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.
13	Inclined surface machining command		–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	An arbitrary spatial plane defined with this function can be machined using normal program commands.
14	Tool radius compensation for 5-axis machining		–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	This function is to compensate the tool radius in a 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.
15	Workpiece installation error compensation		–	–	–	–	–	△	–	–	△	–	–	–	–	–	–	–	–	–	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.
16	Manual feed for 5-axis machining		–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	By selecting the hypothetical coordinate system to be machined, the axis can be moved with manual feed (JOG, HANDLE or INCREMENTAL) in the coordinate system with this function.
17	R-Navi		–	–	–	△	△	△	△	△	△	–	–	–	–	–	–	–	–	–	This provides easy setup of index machining (multiple/inclined surface machining) using a rotary axis.
3	PLC operation																				
1	Arbitrary feed in manual mode		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This function enables the feed directions and feed rates of the control axes to be controlled using commands from the user PLC.
2	Circular feed in manual mode		–	–	–	△	△	△	△	△	△	–	–	–	△	△	△	△	△	△	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.
3	PLC axis control		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	This function allows independent axes to be controlled with PLC-based commands, separately from the NC control axes.
5	PLC axis indexing		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	By setting positioning points (stations) in advance, positioning control can be performed simply by designating a positioning point No. (station No.).
4	PLC interface																				
1	CNC control signal		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	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.
2	CNC status signal		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	The status signals are output from the CNC system. They can be utilized by referencing them from the PLC.
3	PLC window		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	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.
4	External search		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	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.
5	Machine contact I/O																				
1	Additional DI/DO (DI:32/DO:32)		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	The number of DI/DO points that can be equipped on the machine operation panel is 64/64 as standard, and 96/96 at maximum.
2	Additional DI/DO (DI:64/DO:64)		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
3	Remote I/O 32/32		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	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 eight or less.
4	Remote I/O 64/48		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	
5	MITSUBISHI CNC machine operation panel		△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	It is a machine operation panel supplied by Mitsubishi. Its keyboard layout can be changed according to the specifications of the machine.
6	External PLC link																				
3	CC-Link (Master/Slave)		–	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN576/HN577)	□ (HN576/HN577)	□ (HN576/HN577)	–	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN576/HN577)	□ (HN576/HN577)	□ (HN576/HN577)	NC unit can be directly connected to the network to serve as the master/local station of the MELSEC CC-Link.
4	PROFIBUS-DP (Master)		–	–	–	–	–	–	□ (HN571)	□ (HN571)	□ (HN571)	–	–	–	–	–	–	□ (HN571)	□ (HN571)	□ (HN571)	The slave stations that support the PROFIBUS-DP communication can be connected to input/output device.
5	DeviceNet (Master)		–	–	–	□ (HN747)	□ (HN747)	□ (HN747)	–	–	–	–	–	–	□ (HN747)	□ (HN747)	□ (HN747)	–	–	–	MELSEC-Q series I/O intelligent function unit can be connected with NC.
6	FL-net		–	–	–	□ (HN747)	□ (HN747)	□ (HN747)	–	–	–	–	–	–	□ (HN747)	□ (HN747)	□ (HN747)	–	–	–	
7	Installing S/W for machine tools																				
1	Customization (NC Designer) (Note 2)		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	
1	Customization data storage capacity [MByte]		1	3 △6 (HN754)	3 △6 (HN754)	6	6	6	Depending on hard disk space	Depending on hard disk space	Depending on hard disk space	1	3 △6 (HN754)	3 △6 (HN754)	6	6	6	Depending on hard disk space	Depending on hard disk space	Depending on hard disk space	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.
2	Customization workpiece data size [MByte]		1	3	3	6	6	6	6	6	6	1	3	3	6	6	6	6	6	6	
2	User-defined key		–	–	–	○	○	○	○	○	○	–	–	–	○	○	○	○	○	○	This function allows an arbitrary character string to be assigned to a key and makes it easy to input a typical character string.
3	EZSocket I/F (Note 2)		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	This middleware makes it easy to develop applications having the Windows interface.
4	APLC release (Note 2)		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	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.
8	Others																				
1	System lock		○	○	○	△	△	△	△	△	△	○	○	○	△	△	△	△	△	△	This function locks the operations of the NC if the release code is not entered before the specified time limit.
2	CNC Remote Operation Tool																				
1	NC Monitor (Note 2)		–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	NC Monitor is a PC software tool that monitors information in the NC unit connected with the Ethernet.
2	NC Explorer (Note 1)		–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	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.
3	Automatic operation lock		–	○	○	○	○	○	○	○	○	–	○	○	○	○	○	○	○	○	Automatic operation lock function prevents the falsification of APLC (C language module) by a third party.

(Note 1) This tool is free of charge. Please contact us.
(Note 2) Please contact us to purchase this tool.

•Drive units

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).

PWM Converter MDS-EX-CVP Series

- Product of the PWM converter series which has a stabilizing DC voltage function and boost function. MDS-EX-CVP series reduces the output deceleration of the spindle motor and improves output in the high-speed range.
- Only 400V system power supply unit is available.

•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 11 [kW]
- Maximum rotation speed: 2,000 to 6,000 [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 or 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 motors

High-output, High-speed 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 to 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]
- Maximum speed: 10,000 to 24,000 [r/min]

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: 3.7 to 26 [kW]
- Maximum speed: 8,000 to 12,000 [r/min]

High-torque Spindle Motors SJ-DN Series

- Higher torque characteristics than those of SJ-D series with the same output. This series has made it possible to drive with the small-capacity multi-hybrid drive unit.
- Suitable for heavy cutting. This helps to improve productivity.
- Range: 7.5 to 18.5 [kW]
- Maximum speed: 8,000 [r/min]

Compact, Lightweight Spindle Motors SJ-DJ Series

- Spindle motors that are smaller and lighter than those of SJ-D series with the same output. This helps to further downsize machines.
- Range: 5.5 to 15 [kW]
- Maximum speed: 8,000 to 12,000 [r/min]

High-output high-torque IPM spindle motor SJ-DM Series

- The use of magnets allows for a higher output and torque, leading to a reduced cycle time.
- SJ-DM Series can provide torque characteristics comparable to the former SJ-D Series of the next frame number.
- Maximum rotation speed: 12,000 [r/min]

Built-in Spindle Motors SJ-BG Series

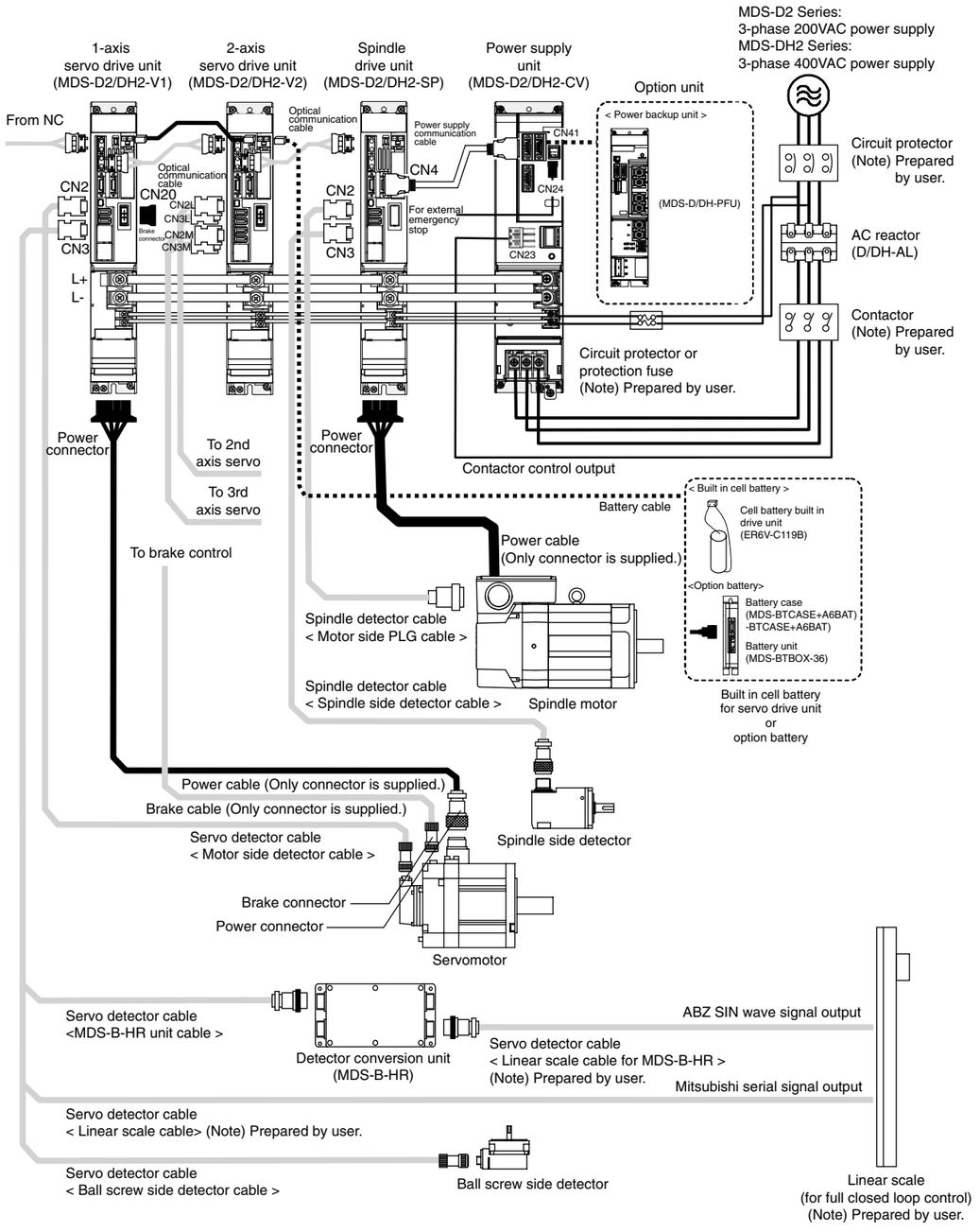
- The electrical design has been optimized to increase the continuous rated torque per unit volume, contributing to the downsizing of spindle units.
- Options for mold specification and cooling jacket specification are prepared.

Tool Spindle Motors HG-JR Series

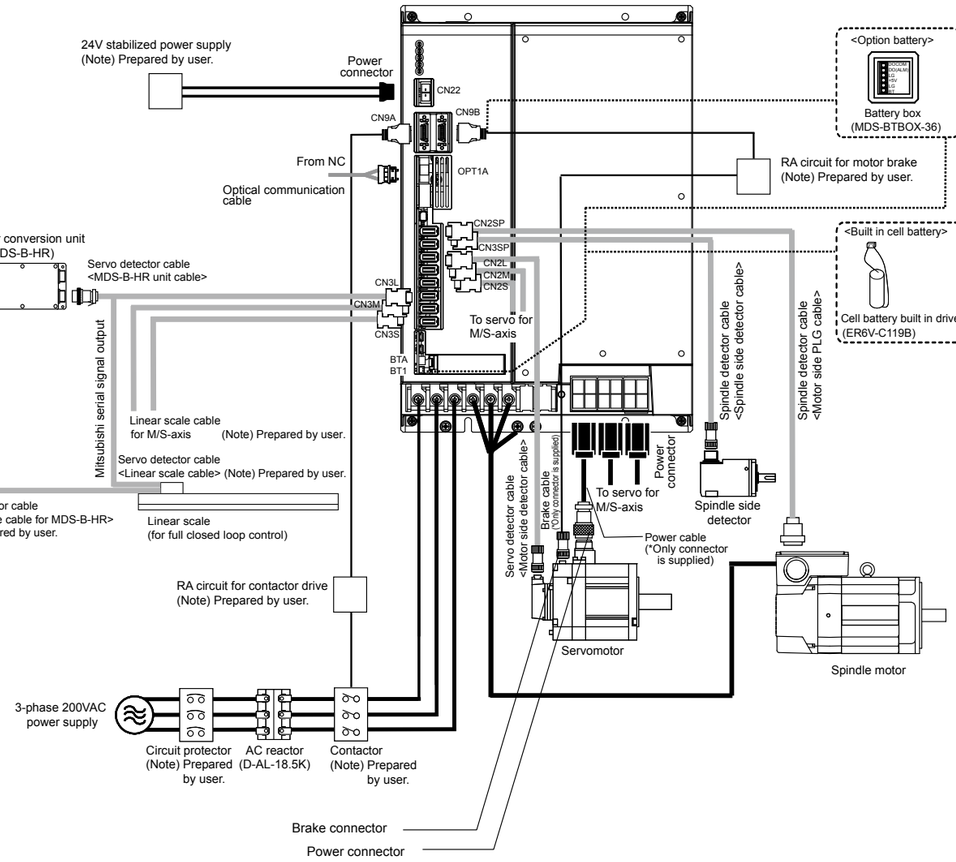
- Compact tool spindle motors are designed to have the small, high-output characteristics of servo motors yet offer high-speed rotation (8,000r/min). These motors contribute to downsizing spindle size, like rotary tool spindles.
- Range: 0.75 to 1.5 [kW]
- Maximum rotation speed: 8,000 [r/min]
- Small-sized 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 Electric CNC's dedicated drive unit and motor.

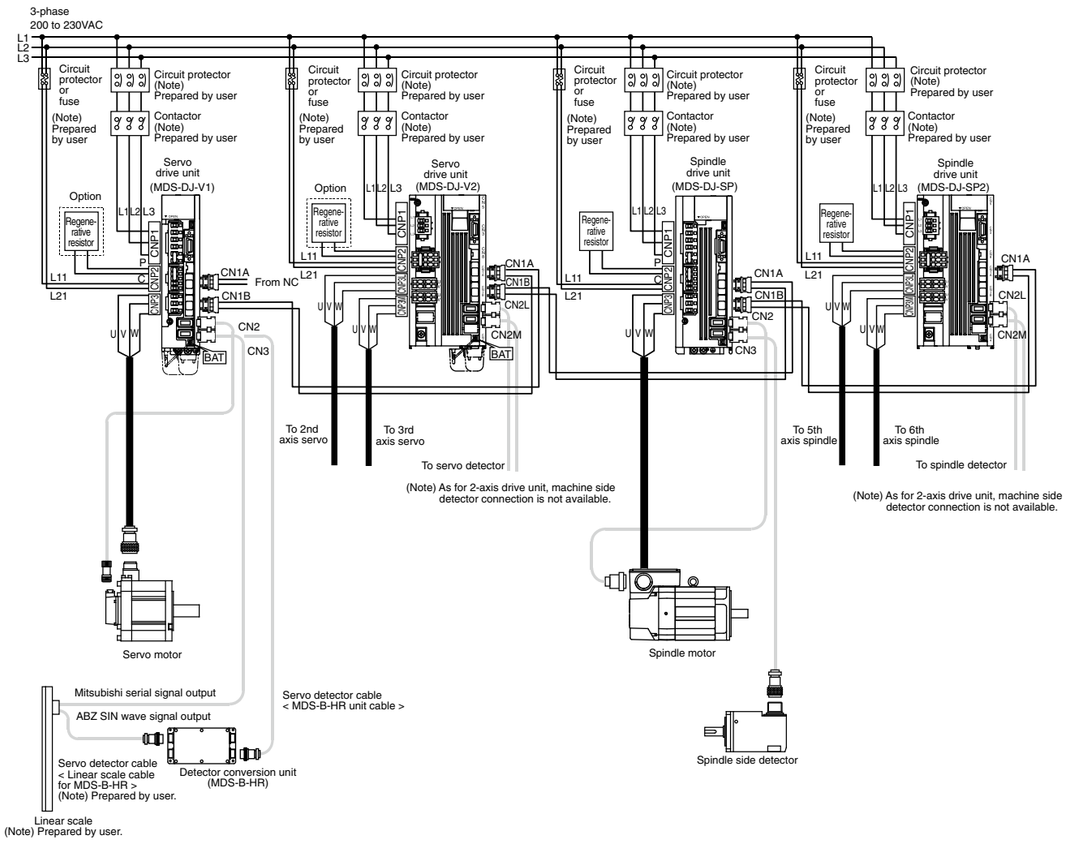
MDS-D2/DH2 Series



MDS-DM2 Series



MDS-DJ Series



Servo / Spindle specifications

<Servo specification>

	Function name	MDS-D2-V1/V2/V3	MDS-DH2-V1/V2	MDS-DM2 -SPV2/3, SPHV3	MDS-DJ-V1	MDS-DJ-V2
	Software Version	A5	A5	A5	A5	A5
1 Base control functions	1.1 Full closed loop control	●	●	●	●	–
	1.2 Position command synchronous control	●	●	●	●	●
	1.3 Speed command synchronous control	● (Note 2)	●	–	–	–
	1.4 Distance-coded reference position control	●	●	●	●	–
2 Servo control function	2.1 Torque limit function (stopper function)	●	●	●	●	●
	2.2 Variable speed loop gain control	●	●	●	●	●
	2.3 Gain changeover for synchronous tapping control	●	●	●	●	●
	2.4 Speed loop PID changeover control	●	●	●	●	●
	2.5 Disturbance torque observer	●	●	●	●	●
	2.6 Smooth High Gain control (SHG control)	●	●	●	●	●
	2.7 High-speed synchronous tapping control (OMR-DD control)	●	●	●	●	●
	2.8 Dual feedback control	●	●	●	●	–
	2.9 HAS control	●	●	●	●	●
	2.10 OMR-FF control	●	●	●	●	●
3 Compensation control function	3.1 Jitter compensation	●	●	●	●	●
	3.2 Notch filter	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	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	●	●	●	●	●
	4.6 Fan stop detection	●	●	●	●	●
	4.9 STO (Safe Torque Off) function	●	●	●	●	●
5 Sequence function	5.2 Motor brake control function (Note 1)	●	●	●	●	●
	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	●	●	●	●	●

(Note 1) For the multiaxis drive unit, a control by each axis is not available.
It is required to turn the servo of all axes OFF in the drive unit in order to enable a motor brake output.
(Note 2) Always set L-axis as primary axis and M-axis as secondary axis for the speed command synchronous control using MDS-D2-V3.
Other settings cause the initial parameter error alarm.

<Spindle specification>

	Function name	MDS-D2-SP	MDS-DH2-SP	MDS-D2-SP2	MDS-DM2 -SPV2/3, SPHV3	MDS-DJ-SP	MDS-DJ-SP2
	Software Version	A4	A4	A4	A4	A4	A4
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	●	●	–	●	●	–
2 Spindle control functions	2.1 Torque limit function	●	●	●	●	●	●
	2.2 Variable speed loop gain control	●	●	●	●	●	●
	2.5 Disturbance torque observer	●	●	●	●	●	●
	2.6 Smooth High Gain control (SHG control)	●	●	●	●	●	●
	2.7 High-speed synchronous tapping control (OMR-DD control)	●	●	●	●	●	●
	2.8 Dual feedback control	●	●	●	●	●	–
	2.11 Control loop gain changeover	●	●	●	●	●	●
	2.12 Spindle output stabilizing control	●	●	●	●	●	●
	2.13 High-response spindle acceleration/deceleration function	●	●	●	●	●	●
3 Compensation control function	3.1 Jitter compensation	●	●	●	●	●	●
	3.2 Notch filter	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1
	3.3 Adaptive tracking-type notch filter	●	●	●	●	●	●
	3.4 Overshooting compensation	●	●	●	●	●	●
	3.6 Lost motion compensation type 2	●	●	●	●	●	●
	3.9 Spindle motor temperature compensation function	●	●	●	●	●	●
4 Protection function	4.1 Deceleration control at emergency stop	●	●	●	●	●	●
	4.3 Earth fault detection	●	●	●	●	●	●
	4.5 SLS (Safely Limited Speed) function	●	●	●	●	●	●
	4.6 Fan stop detection	●	●	●	●	●	●
	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	●	●	●	●	●	●

Power Supply specification

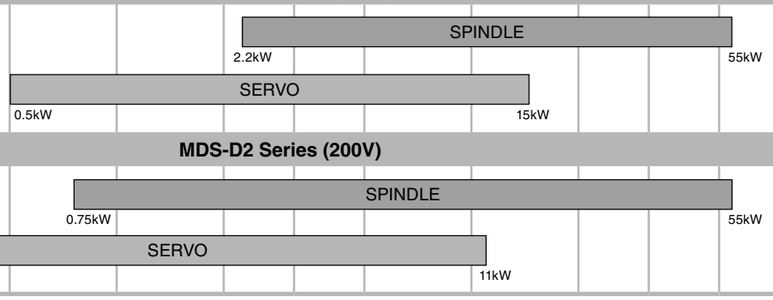
<Power Supply specification>

	Function name	MDS-D2-CV	MDS-DH2-CV	MDS-DM2-SPV2/3,SPHV3 built-in converter	MDS-DJ-V1/V2 built-in converter	MDS-DJ-SP/SP2 built-in converter
	Software Version	A3	A3	A1	A5	A4
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	●	●	●	●	●
	4.10 Deceleration and stop function at power failure (Note)	●	●	–	–	–
5 Sequence function	5.1 Contactor control function	●	●	●	●	●
	5.3 External emergency stop function	●	●	●	●	●
	5.5 High-speed ready ON sequence	●	●	●	–	–
6 Diagnosis function	6.7 Power supply diagnosis display function	●	●	●	–	–

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

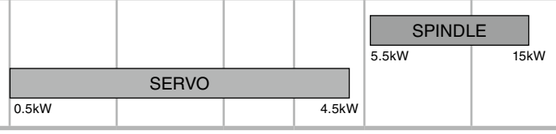
MITSUBISHI CNC DRIVE SYSTEM LINES

Drive unit to realize complete nano control MDS-DH2 Series (400V)

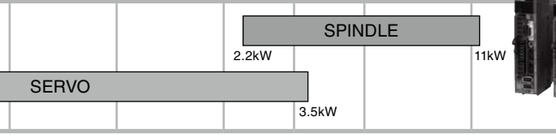


MDS-D2 Series (200V)

Multi-hybrid drive unit MDS-DM2 Series (servo+spindle)



Compact drive unit MDS-DJ Series



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

200V HF servo motor

<HF Series>

HF ① ② ③ – ④

①Rated output and maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size (mm)
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.

②Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

③Shaft 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.

④Detector

Symbol	Detection method	Detector resolution
A48	Absolute position	260,000 p/rev
A51		1,000,000 p/rev
A74/A74N		16,000,000 p/rev

* A74 falls under the Export Trade Control Ordinance and Foreign Trade Ordinance.

<HF-KP Series>

HF-KP13 ② J-S17

Rated output	Max. rotation speed	Flange size (mm)
0.1 kW	6000 r/min	40 SQ.

* The motor-end detector has absolute position specifications, but is not equipped with the capacitor for data backup. Thus, absolute position is lost immediately after disconnection of the detector cable.

HF-KP ① ② JW04-S6

①Rated output and maximum rotation speed

Symbol	Rated output	Max. rotation speed	Flange size (mm)
23	0.2 kW	6000 r/min	60 SQ.
43	0.4 kW	6000 r/min	60 SQ.
73	0.75 kW	6000 r/min	80 SQ.

②Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

③Detector

Symbol	Detection method	Detector resolution
None	Absolute position	260,000 p/rev

(Note) The detector for HF-KP Series is fixed.

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

①Rated 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

②Stator dimensions

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

③Rated rotation speed

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

200V Linear servo motor

<LM-F Series>

Primary side [coil side] LM-FP ① ② – ③ M-1WW0

①Width

Symbol	Width (nominal)
2	120 mm
4	200 mm
5	240 mm

②Length

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

③Rated thrust

Symbol	Rated thrust
06	600 N
12	1200 N
18	1800 N
24	2400 N
36	3600 N
48	4800 N
60	6000 N

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

①Width

Symbol	Width (nominal)
2	120 mm
4	200 mm
5	240 mm

②Length

Symbol	Length (nominal)
480	480 mm
576	576 mm

200V SJ-D spindle motor

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

①Motor Series

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

②Short-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

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

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

⑤Detector

Symbol	Type
None	Type 1
T	Type 2

⑥Option (Note)

Symbol	Option
None	Standard (flange type, without oil seal, without key, coil changeover unavailable, air-cooling, solid shaft)
C	With key
J	Oil seal
S	Hollow shaft
X	Reversed cooling air

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

200V SJ-V spindle motor

<SJ-V/VL Series> SJ- ① ② ③ ④ – ⑤ ⑥ T

①Motor Series

Symbol	Motor Series
V	Medium inertia Series
VL	Low inertia Series

②Coil changeover

Symbol	Coil changeover
None	Unavailable
K	Available

③Shaft configuration

Symbol	Shaft configuration
None	Standard
S	Hollow shaft

④Short-time rated output (Normal 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

⑤Specification code

The SJ-V/VLSeries is indicated with a specification code (01 to 99).

⑥Special specifications

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

200V Built-in spindle motor

<SJ-B Series> SJ- ① B ② ③ ④ ⑤ ⑥

①Voltage

Symbol	Voltage
2	200V
4	400V

* 400V is available by special order.

②Number of poles

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

③Motor size

Symbol	Stator outline
0	ϕ 110
1	ϕ 128
2	ϕ 160
3	ϕ 180
4	ϕ 210
5	ϕ 230
6	ϕ 255
7	ϕ 300
9	ϕ 370
A	ϕ 90
B	ϕ 115

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

④Specification code
Specification code (01 to 99)

⑤Overheat protection sensor

Symbol	Overheat protection sensor
T	Thermistor

⑥Coil changeover

Symbol	Coil changeover
None	Unavailable
D	Available (Δ-2//Δ)
K	Available ($\curlywedge$-Δ)

<SJ-PMB Series> SJ- ① PMB ② ③ ④ – ⑤

①Voltage

Symbol	Voltage
None	200V
4	400V

* 400V is available by special order.

②Continuous 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]

③Base 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]

④Overheat protection sensor

Symbol	Overheat protection sensor
T	Thermistor

⑤Design 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

<HF-KP Series>

HF-KP ① J ② W09

①Rated output · Maximum rotation speed

Symbol	Rated output	Maximum 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.

②Option

Symbol	Option
None	Without keyway
K	With keyway (with key)

<HF-SP Series>

HF-SP ① J ② W09

①Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
226	2.2 kW	6000 r/min	130 SQ.
406	4.0 kW	6000 r/min	130 SQ.

②Option

Symbol	Option
None	Without keyway
K	With keyway (without key)

<HF Series>

HF ① ② – ③

①Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
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.
123	1.2 kW	2000 r/min	130 SQ.
223	2.2 kW	2000 r/min	130 SQ.
303	3.0 kW	2000 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.

②Shaft end structure

Symbol	Shaft end structure
S	Straight

③Detector

Symbol	Resolution
A48	260,000 p/rev

(Note) Detector A51 and A74N can not be used with the tool spindle motor.

400V HF-H servo motor

<HF-H Series>

HF-H ① ② ③ – ④

①Rated output · Maximum rotation speed

Symbol	Rated output	Maximum rotation speed	Flange size (mm)
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.
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.

②Magnetic brakes

Symbol	Magnetic brakes
None	None
B	With magnetic brakes

③Shaft 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.

④Detector

Symbol	Detector	Resolution
A48	Absolute position	260,000 p/rev
A51		1,000,000 p/rev
A74N		16,000,000 p/rev

400V SJ-4-V spindle motor

<SJ-V Series>

SJ-4- ① ② ③ ④ – ⑤ ⑥ T

①Motor Series

Symbol	Motor Series
V	Medium-inertia Series

②Coil changeover

Symbol	Coil changeover
None	Unavailable

③Shaft configuration

Symbol	Axis configuration
None	Standard
S	Hollow shaft

④Short time rated output (Normal specification)

Symbol	Short time rated output
2.2	2.2 kW
3.7	3.7 kW
5.5	5.5 kW
7.5	7.5 kW
11	11 kW
15	15 kW
18.5	18.5 kW
22	22 kW
26	26 kW
37	37 kW
45	45 kW
55	55 kW

⑤Specification code

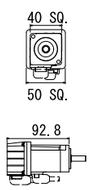
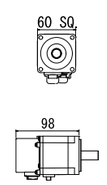
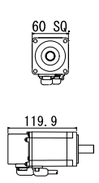
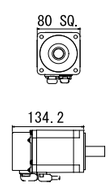
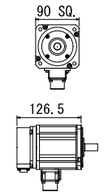
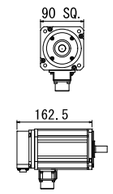
The SJ-4-V Series is indicated with a specification code (01 to 99).

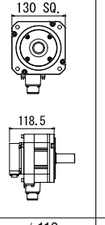
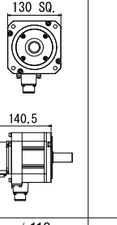
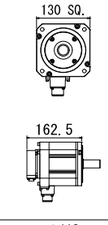
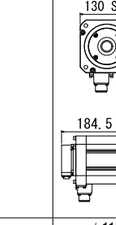
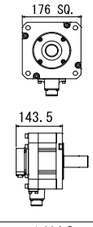
⑥Special specification

Symbol	Special specification
None	Standard
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.

HF Series

Motor type			HF-KP13□J-S17	HF-KP23□JW04-S6	HF-KP43□JW04-S6	HF-KP73□JW04-S6	HF75	HF105
Compatible drive unit	1-axis type	MDS-D2-V1-	–	20	20	20	20	20
	2-axis type	MDS-D2-V2-	–	2020 4020 (M)	2020 4020 (M)	2020 4020 (M)	2020 4020 (M)	2020 4020 (M)
	3-axis type	MDS-D2-V3-	–	202020	202020	202020	202020 404040	202020 404040
	Multi axis integrated type	MDS-DM2- SPV2-	–	–	–	–	–	–
		SPV3-	–	–	–	–	–	–
	Regenerative resistor type	MDS-DJ- V1-	10	10	15	30	30	30
		V2-	–	–	–	3030	3030	3030
Output Stall torque Max. torque		[N · m]	15 10 5 0 0.32 0.95	0.64 1.9	1.3 3.8	2.4 7.2	2.0 8.0	3.0 11.0
Rated output		[kW]	0.1	0.2	0.4	0.75	0.75	1.0
Maximum rotation speed		[r/min]	6000	6000	6000	6000	5000	5000
Motor inertia		[kg · cm²]	0.088	0.23	0.42	1.43	2.6	5.1
Motor inertia with a brake		[kg · cm²]	0.090	0.31	0.50	1.63	2.8	5.3
Degree of protection (The shaft-through portion is excluded.)			IP65	IP65	IP65	IP65	IP67	IP67
Outline dimension drawing (Without a brake, Straight shaft, A48 detector) (Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector. (Note) The detector specification for the HF-KP series is fixed.		[mm]						
Flange fitting diameter		[mm]	ϕ 30	ϕ 50	ϕ 50	ϕ 70	ϕ 80	ϕ 80
Shaft diameter		[mm]	ϕ 8	ϕ 14	ϕ 14	ϕ 19	ϕ 14	ϕ 14
Mass (with a brake)		[kg]	0.66 (0.96)	1.2 (1.8)	1.7 (2.3)	2.9 (4.1)	2.5 (3.9)	4.3 (5.7)
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N)		–	–	–	–	D2	D2
	1,000,000 [p/rev] (A51)		–	–	–	–	D2, DJ	D2, DJ
	260,000 [p/rev] (A48)		DJ	D2, DJ	D2, DJ	D2, DJ		

Motor type			HF54	HF104	HF154		HF224	HF204	
Compatible drive unit	1-axis type	MDS-D2-V1-	40	40	–	80	80	–	80
	2-axis type	MDS-D2-V2-	4020 (L) 4040 8040 (M)	4020 (L) 4040 8040 (M)	–	8040 (L) 8080 16080 (M)	8040 (L) 8080 16080 (M)	–	8040 (L) 8080 16080 (M)
	3-axis type	MDS-D2-V3-	404040	404040	404040	–	–	–	–
	Multi axis integrated type	MDS-DM2- SPV2-	xxx80*	xxx80*	–	xxx80*	xxx80*	–	xxx80*
		SPV3-	xxx80*	xxx80*	–	xxx80* 200120	xxx80* 200120	–	xxx80* 200120
		SPHV3-	20080	20080	–	20080	20080	–	20080
	Regenerative resistor type	MDS-DJ- V1-	30	40	–	80	80	80	–
		V2-	3030	–	–	–	–	–	–
Output Stall torque Max. torque		[N · m]	50 40 30 20 10 0 2.9 13.0	5.9 23.3	7.0 23.7	9.0 42.0	12.0 46.5	13.7 42.0	13.7 47.0
Rated output		[kW]	0.5	1.0	1.5		2.2	2.0	
Maximum rotation speed		[r/min]	4000	4000	4000		4000	4000	
Motor inertia		[kg · cm²]	6.1	11.9	17.8		23.7	38.3	
Motor inertia with a brake		[kg · cm²]	8.3	14.1	20.0		25.9	48.0	
Degree of protection (The shaft-through portion is excluded.)			IP67	IP67	IP67		IP67	IP67	
Outline dimension drawing (Without a brake, Straight shaft, A48 detector) (Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.		[mm]							
Flange fitting diameter		[mm]	ϕ 110	ϕ 110	ϕ 110		ϕ 110	ϕ 114.3	
Shaft diameter		[mm]	ϕ 24	ϕ 24	ϕ 24		ϕ 24	ϕ 35	
Mass (with a brake)		[kg]	4.8 (6.8)	6.5 (8.5)	8.3 (10.3)		10.0 (12.0)	12.0 (18.0)	
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N)		D2	D2	D2-V3	D2	D2	–	D2
	1,000,000 [p/rev] (A51)		D2 DM2, DJ	D2 DM2, DJ		D2 DM2, DJ	D2 DM2, DJ	DJ	D2 DM2
	260,000 [p/rev] (A48)								

*Refer to "MDS-DM2 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.

HF Series

Motor type			HF354			HF123	HF223		HF303
Compatible drive unit	1-axis type	MDS-D2-V1-	–	–	160	20	–	40	80
	2-axis type	MDS-D2-V2-	–	–	16080 (L) 160160 160160W	2020 (L, M) 4020 (M)	–	4020 (L) 4040 8040 (M)	8040 (L) 8080 16080 (M)
	3-axis type	MDS-D2-V3-	–	–	–	202020 404040	404040 (M, S)	404040 (L)	–
	Multi axis integrated type	MDS-DM2- SPV2-	–	–	–	–	–	xxx80*	xxx80*
		MDS-DM2- SPV3-	–	200120	–	–	–	xxx80*	xxx80* 200120
		MDS-DM2- SPHV3-	–	–	–	–	–	20080	20080
	Regenerative resistor type	MDS-DJ-V1-	100	–	–	40	–	40	80
Output Stall torque Max. torque		[N · m]	22.5 / 65.0	22.5 / 75.0	22.5 / 90.0	7.0 / 17.0	10.0 / 32.0	12.0 / 32.0	22.5 / 64.0
Rated output		[kW]	3.5			1.2	2.1	2.2	3.0
Maximum rotation speed		[r/min]	3500	4000		3000	3000		3000
Motor inertia		[kg · cm²]	75.0			11.9	23.7		75.0
Motor inertia with a brake		[kg · cm²]	84.7			14.1	25.9		84.7
Degree of protection (The shaft-through portion is excluded.)			IP67			IP67	IP67		IP67
Outline dimension drawing (Without a brake, Straight shaft, A48 detector) (Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.		[mm]	176 SQ. / 183.5			130 SQ. / 140.5	130 SQ. / 184.5		176 SQ. / 183.5
Flange fitting diameter		[mm]	ϕ 114.3			ϕ 110	ϕ 110		ϕ 114.3
Shaft diameter		[mm]	ϕ 35			ϕ 24	ϕ 24		ϕ 35
Mass (with a brake)		[kg]	19.0 (25.0)			6.5 (8.5)	10.0 (12.0)		19.0 (25.0)
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N)		–	–	D2	D2	–	D2	D2
	1,000,000 [p/rev] (A51)		DJ	DM2		D2, DJ	D2-V3	D2 DM2, DJ	D2 DM2, DJ
	260,000 [p/rev] (A48)								

Motor type			HF453		HF703	HF903	HF142	HF302	
Compatible drive unit	1-axis type	MDS-D2-V1-	–	160	160W	320	20	–	40
	2-axis type	MDS-D2-V2-	–	16080 (L) 160160 160160W	160160W	–	2020 4020 (M)	–	4020 (L) 4040 8040 (M)
	3-axis type	MDS-D2-V3-	–	–	–	–	202020 404040	404040 (M, S)	404040 (L)
	Multi axis integrated type	MDS-DM2- SPV2-	–	–	–	–	–	–	xxx80*
		MDS-DM2- SPV3-	200120	–	–	–	–	–	xxx80*
		MDS-DM2- SPHV3-	–	–	–	–	–	–	20080
	Regenerative resistor type	MDS-DJ-V1-	–	–	–	–	40	–	40
Output Stall torque Max. torque		[N · m]	37.2 / 90.0	37.2 / 122.0	49.0 / 152.0	58.8 / 208.0	11.0 / 26.5	15.6 / 50.0	20.0 / 50.0
Rated output		[kW]	4.5		7.0	9.0	1.4	2.2	3.0
Maximum rotation speed		[r/min]	3500		3000	3000	2000	2000	
Motor inertia		[kg · cm²]	112.0		154.0	196.0	17.8	75.0	
Motor inertia with a brake		[kg · cm²]	121.7		163.7	205.7	20.0	84.7	
Degree of protection (The shaft-through portion is excluded.)			IP67		IP67	IP67	IP67	IP67	
Outline dimension drawing (Without a brake, Straight shaft, A48 detector) (Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.		[mm]	176 SQ. / 223.5		176 SQ. / 263.5	204 SQ. / 330	130 SQ. / 162.5	176 SQ. / 183.5	
Flange fitting diameter		[mm]	ϕ 114.3		ϕ 114.3	ϕ 180	ϕ 110	ϕ 114.3	
Shaft diameter		[mm]	ϕ 35		ϕ 35	ϕ 42	ϕ 24	ϕ 35	
Mass (with a brake)		[kg]	26.0 (32.0)		32.0 (38.0)	45.0 (51.0)	8.3 (10.3)	19.0 (25.0)	
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N)		–		D2	D2	D2	D2	
	1,000,000 [p/rev] (A51)		DM2	D2			D2, DJ	D2-V3	D2, DM2, DJ
	260,000 [p/rev] (A48)								

*Refer to “MDS-DM2 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.

TM-RB Series

Direct-drive motor type	Primary side type		TM-RBP012C20	TM-RBP036E20	TM-RBP048G20	TM-RBP105G10
	Secondary side type		TM-RBS012C20	TM-RBS036E20	TM-RBS048G20	TM-RBS105G10
Compatible drive unit	1-axis type	MDS-D2-V1-	40	80	80	160
	2-axis type	MDS-D2-V2-	4020 (L) 4040 8040 (M)	8040 (L) 8080 16080 (M)	8040 (L) 8080 16080 (M)	16080 (L) 160160
	3-axis type	MDS-D2-V3-	404040	–	–	–
	Regenerative resistor type	MDS-DJ-V1-	40	80	80	100
Output Rated torque (liquid-cooling) Max. torque		[N · m]	12 / 36	36 / 108	48 / 144	105 / 260
Rated output		[W]	252	754	1005	1100
Maximum rotation speed		[r/min]	500	500	500	250
Motor inertia		[kg · cm²]	22	127	280	395
Degree of protection			IP00	IP00	IP00	IP00
Outline dimension drawing		[mm]	76 / DIA 56 / DIA 130	91 / DIA 100 / DIA 180	80 / DIA 130 / DIA 230	105 / DIA 130 / DIA 230
Mass	Primary side (coil)	[kg]	3.9	7.1	10	13
	Secondary side (magnet)		1.7	3.7	5	7

Direct-drive 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-D2-V1-	160	160	320	320W
	2-axis type	MDS-D2-V2-	16080 (L) 160160	160160	–	–
	Regenerative resistor type	MDS-DJ-V1-	–	–	–	–
Output Rated torque (liquid-cooling) Max. torque		[N · m]	105 / 260	150 / 375	340 / 850	500 / 1280
Rated output		[W]	2199	3141	7120	10471
Maximum rotation speed		[r/min]	500	500	400	400
Motor inertia		[kg · cm²]	395	510	2778	3538
Degree of protection			IP00	IP00	IP00	IP00
Outline dimension drawing		[mm]	105 / DIA 130 / DIA 230	130 / DIA 130 / DIA 230	154 / DIA 205 / DIA 330	191 / DIA 205 / DIA 330
Mass	Primary side (coil)	[kg]	13	16	33	41
	Secondary side (magnet)		7	9	20	26

(Note 1) The detector 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.

LM-F Series

Linear servo motor type	Primary side type		LM-FP2B-06M-1WW0	LM-FP2D-12M-1WW0	LM-FP2F-18M-1WW0	LM-FP4B-12M-1WW0
	Secondary side type		LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS40-□-1WW0
Compatible drive unit	1-axis type	MDS-D2-V1-	40	80	160	80
	2-axis type	MDS-D2-V2-	4020 (L) 4040 8040 (M)	8040 (L) 8080 16080 (M)	16080 (L) 160160	8040 (L) 8080 16080 (M)
	3-axis type	MDS-D2-V3-	404040	–	–	–
	Regenerative resistor type	MDS-DJ-V1-	40	80	–	80
Thrust force Continuous (natural-cooling) Continuous (liquid-cooling) Maximum	[N] 6000 5000 4000 3000 2000 1000 0		300 600 1800	600 1200 3600	900 1800 5400	600 1200 3600
Rated thrust force	[N]		600	1200	1800	1200
Maximum speed (Note 1)	[m/s]		2.0	2.0	2.0	2.0
Magnetic attraction force	[N]		4500	9000	13500	9000
Degree of protection			IP00	IP00	IP00	IP00
Outline dimension drawing	[mm]		Primary side / Secondary side 290, 1000, 480, 576, 50, 120, 19.5, 120	Primary side / Secondary side 530, 1000, 480, 576, 50, 120, 19.5, 120	Primary side / Secondary side 770, 1000, 480, 576, 50, 120, 19.5, 120	Primary side / Secondary side 290, 1000, 480, 576, 50, 200, 19.5, 200
Mass	[kg]	Primary side (coil)	9	18	27	14
		Secondary side (magnet)	7.1 (480mm) 9.0 (576mm)	7.1 (480mm) 9.0 (576mm)	7.1 (480mm) 9.0 (576mm)	13.5 (480mm) 16.0 (576mm)

Linear servo motor type	Primary side type		LM-FP4F-36M-1WW0	LM-FP4H-48M-1WW0	LM-FP5H-60M-1WW0
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS50-□-1WW0
Compatible drive unit	1-axis type	MDS-D2-V1-	320	320	200 (Note 2)
	2-axis type	MDS-D2-V2-	–	–	–
	Regenerative resistor type	MDS-DJ-V1-	–	–	–
Thrust force Continuous (natural-cooling) Continuous (liquid-cooling) Maximum	[N] 20000 15000 10000 5000 0		1800 3600 10800	2400 4800 14400	3000 6000 18000
Rated thrust force	[N]		3600	4800	6000
Maximum speed (Note 1)	[m/s]		2.0	2.0	2.0
Magnetic attraction force	[N]		27000	36000	45000
Degree of protection			IP00	IP00	IP00
Outline dimension drawing	[mm]		Primary side / Secondary side 770, 1000, 480, 576, 50, 200, 19.5, 200	Primary side / Secondary side 1010, 1000, 480, 576, 50, 200, 19.5, 200	Primary side / Secondary side 1010, 1000, 480, 576, 50, 240, 125, 240
Mass	[kg]	Primary side (coil)	42	56	67
		Secondary side (magnet)	13.5 (480mm) 16.0 (576mm)	13.5 (480mm) 16.0 (576mm)	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) 400V specifications
(Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

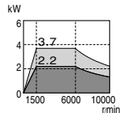
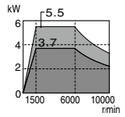
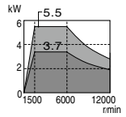
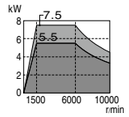
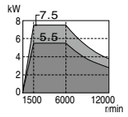
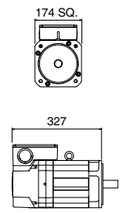
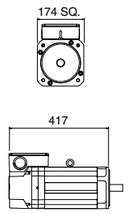
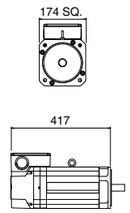
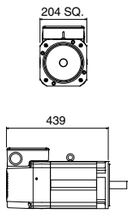
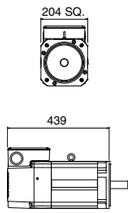
LM-F Series (One unit and two motor)

Linear servo motor type	Primary side type		LM-FP2B-06M-1WW0	LM-FP2D-12M-1WW0	LM-FP2F-18M-1WW0
	Secondary side type		LM-FS20-□-1WW0	LM-FS20-□-1WW0	LM-FS20-□-1WW0
Compatible drive unit	1-axis type	MDS-D2-V1-	80	160	320
	2-axis type	MDS-D2-V2-	8040 (L) 8080 16080 (M)	16080 (L) 160160	–
	Regenerative resistor type	MDS-DJ-V1-	80	–	–
Thrust force Continuous (natural-cooling) Continuous (liquid-cooling) Maximum	[N] 12000 10000 8000 6000 4000 2000 0		600 1200 3600	1200 2400 7200	1800 3600 10800
Rated thrust force	[N]		1200	2400	3600
Maximum speed (Note 1)	[m/s]		2.0	2.0	2.0
Magnetic attraction force (per motor)	[N]		4500	9000	13500
Degree of protection			IP00	IP00	IP00
Outline dimension drawing	[mm]		Primary side / Secondary side 290, 1000, 480, 576, 50, 120, 19.5, 120	Primary side / Secondary side 530, 1000, 480, 576, 50, 120, 19.5, 120	Primary side / Secondary side 770, 1000, 480, 576, 50, 120, 19.5, 120
Mass	[kg]	Primary side (coil)	9×2	18×2	27×2
		Secondary side (magnet)	7.1 (480mm) 9.0 (576mm)	7.1 (480mm) 9.0 (576mm)	7.1 (480mm) 9.0 (576mm)

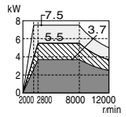
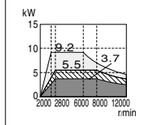
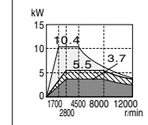
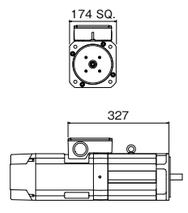
Linear servo motor type	Primary side type		LM-FP4B-12M-1WW0	LM-FP4D-24M-1WW0
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0
Compatible drive unit	1-axis type	MDS-D2-V1-	160	320
	2-axis type	MDS-D2-V2-	160160	–
	Regenerative resistor type	MDS-DJ-V1-	–	–
Thrust force Continuous (natural-cooling) Continuous (liquid-cooling) Maximum	[N] 16000 14000 12000 10000 8000 6000 4000 2000 0		1200 2400 7200	2400 4800 14400
Rated thrust force	[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
Degree of protection	[mm]		Primary side / Secondary side 290, 1000, 480, 576, 50, 200, 19.5, 200	Primary side / Secondary side 530, 1000, 480, 576, 50, 200, 19.5, 200
Mass	[kg]	Primary side (coil)	14×2	28×2
		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.

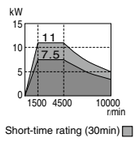
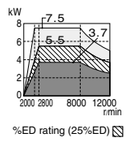
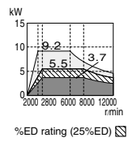
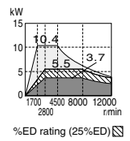
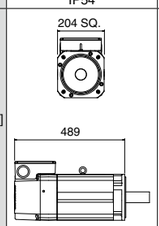
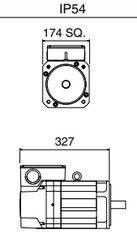
SJ-D Series (Normal specifications)

Motor type			SJ-D3.7/100-01	SJ-D5.5/100-01	SJ-D5.5/120-01	SJ-D7.5/100-01	SJ-D7.5/120-01
Compatible drive unit	1-axis type	MDS-D2-SP-	80	80	80	160	160
	2-axis type	MDS-D2-SP2-	8040 (L) 8080 16080S (M)	8040 (L) 8080 (L, M) 16080S (M)	8040 (L) 8080 16080S (M)	16080S (L)	16080S (L)
	Multi axis integrated type	MDS-DM2-SPV2-	–	10080	10080	10080	10080
		MDS-DM2-SPV3-	–	10080	10080	10080	10080
	Regenerative resistor type	MDS-DJ-SP-	80	100	100	120	120
Output Short-time rating □ Continuous rating ■			 Short-time rating (15min) □	 Short-time rating (30min) ■	 Short-time rating (30min) ■	 Short-time rating (30min) ■	 Short-time rating (30min) ■
Standard output during acceleration/deceleration		[kW]	3.7	5.5	5.5	7.5	7.5
Actual acceleration/deceleration output (Note 2)		[kW]	4.44	6.6	6.6	9	9
Base rotation speed		[r/min]	1500	1500	1500	1500	1500
Max. rotation speed in constant output range		[r/min]	6000	6000	6000	6000	6000
Maximum rotation speed		[r/min]	10000	10000	12000	10000	12000
Continuous rated torque		[N · m]	14.0	23.6	23.6	35.0	35.0
Motor inertia		[kg · m²]	0.0074	0.013	0.013	0.023	0.023
Degree of protection (The shaft-through portion is excluded.)			IP54	IP54	IP54	IP54	IP54
Outline dimension drawing (flange type)		[mm]					
Flange fitting diameter		[mm]	ϕ 150	ϕ 150	ϕ 150	ϕ 180	ϕ 180
Shaft diameter		[mm]	ϕ 28	ϕ 28	ϕ 28	ϕ 32	ϕ 32
Mass		[kg]	26	39	39	53	53

SJ-D Series (Hollow shaft specifications)

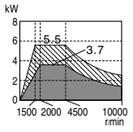
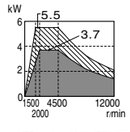
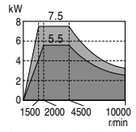
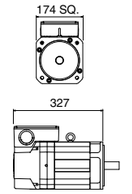
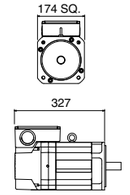
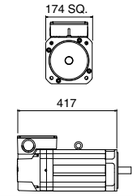
Motor type			SJ-D5.5/120-02T-S		
Compatible drive unit	1-axis type	MDS-D2-SP-	–	160	200
	2-axis type	MDS-D2-SP2-	–	16080S(L)	–
	Multi axis integrated type	MDS-DM2-SPV2-	10080	16080	20080
		MDS-DM2-SPV3-	10080	16080	20080
	Regenerative resistor type	MDS-DJ-SP-	–	–	–
Output Acceleration/Deceleration □ %ED rating ▨ Short-time rating □ Continuous rating ■			 %ED rating (25%ED) ▨	 %ED rating (25%ED) ▨	 %ED rating (25%ED) ▨
Standard output during acceleration/deceleration		[kW]	7.5	9.2	10.4
Actual acceleration/deceleration output (Note 2)		[kW]	9	11.04	12.48
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 · m²]	0.0075		
Degree of protection(The shaft-through portion is excluded.)			IP54		
Outline dimension drawing (flange type)		[mm]			
Flange fitting diameter		[mm]	ϕ150		
Shaft diameter		[mm]	ϕ28		
Mass		[kg]	24		

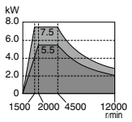
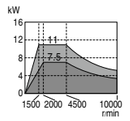
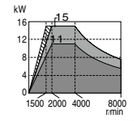
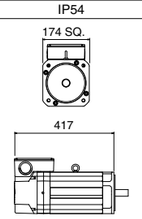
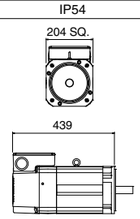
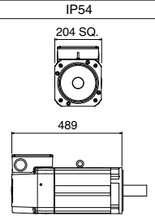
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
(Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

Motor type			SJ-D11/100-01	SJ-D5.5/120-02		
Compatible drive unit	1-axis type	MDS-D2-SP-	160	–	160	200
	2-axis type	MDS-D2-SP2-	16080S (L)	–	16080S (L)	–
	Multi axis integrated type	MDS-DM2-SPV2-	16080	10080	16080	20080
		MDS-DM2-SPV3-	16080	10080	16080	20080
	Regenerative resistor type	MDS-DJ-SP-	160	–	–	–
Output Acceleration/Deceleration □ %ED rating ▨ Short-time rating □ Continuous rating ■			 Short-time rating (30min) ■	 %ED rating (25%ED) ▨	 %ED rating (25%ED) ▨	 %ED rating (25%ED) ▨
Standard output during acceleration/deceleration		[kW]	11	7.5	9.2	10.4
Actual acceleration/deceleration output (Note 2)		[kW]	13.2	9	11.04	12.48
Base rotation speed		[r/min]	1500	2800		
Max. rotation speed in constant output range		[r/min]	4500	8000		
Maximum rotation speed		[r/min]	10000	12000		
Continuous rated torque		[N · m]	47.7	12.6		
Motor inertia		[kg · m²]	0.031	0.0074		
Degree of protection(The shaft-through portion is excluded.)			IP54	IP54		
Outline dimension drawing (flange type)		[mm]				
Flange fitting diameter		[mm]	ϕ 180	ϕ 150		
Shaft diameter		[mm]	ϕ 48	ϕ 28		
Mass		[kg]	64	26		

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

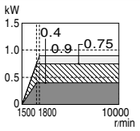
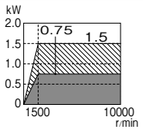
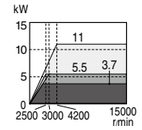
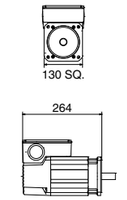
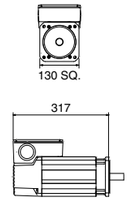
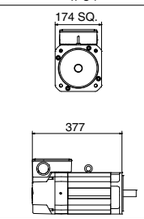
SJ-DJ Series (Compact & lightweight specifications)

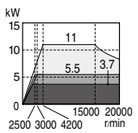
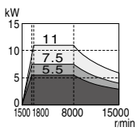
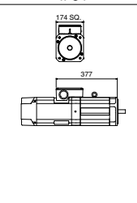
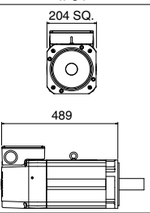
Motor type				SJ-DJ5.5/100-01	SJ-DJ5.5/120-01	SJ-DJ7.5/100-01
Compatible drive unit	1-axis type	MDS-D2-SP-		80	80	160
	2-axis type	MDS-D2-SP2-		8040 (L) 8080 (L, M) 16080S (M)	8040 (L) 8080 16080S (M)	16080S (L)
	Multi axis integrated type	MDS-DM2-	SPV2-	10080	10080	10080
			SPV3-	10080	10080	10080
	Regenerative resistor type	MDS-DJ-SP-		100	100	120
Output %ED rating Short-time rating Continuous rating				 %ED rating (25%ED)	 %ED rating (25%ED)	 Short-time rating (15min)
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		[r/min]	1500	1500	1500
	Continuous		[r/min]	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 · m²]	0.0074	0.0074	0.013
Degree of protection(The shaft-through portion is excluded.)				IP54	IP54	IP54
Outline dimension drawing (flange type)			[mm]			
Flange fitting diameter			[mm]	ϕ 150	ϕ 150	ϕ 150
Shaft diameter			[mm]	ϕ 28	ϕ 28	ϕ 28
Mass			[kg]	26	26	39

Motor type				SJ-DJ7.5/120-01	SJ-DJ11/100-01	SJ-DJ15/80-01
Compatible drive unit	1-axis type	MDS-D2-SP-		160	160	200
	2-axis type	MDS-D2-SP2-		16080S(L)	16080S (L)	–
	Multi axis integrated type	MDS-DM2-	SPV2-	10080	16080	20080
			SPV3-	10080	16080	20080
	Regenerative resistor type	MDS-DJ-SP-		120	160	–
Output %ED rating Short-time rating Continuous rating				 Short-time rating (15min)	 Short-time rating (15min)	 %ED rating (15%ED) Short-time rating (15min)
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		[r/min]	1500	1500	1500
	Continuous		[r/min]	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 · m²]	0.013	0.023	0.031
Degree of protection(The shaft-through portion is excluded.)				IP54	IP54	IP54
Outline dimension drawing (flange type)			[mm]			
Flange fitting diameter			[mm]	ϕ 150	ϕ 180	ϕ 180
Shaft diameter			[mm]	ϕ 28	ϕ 32	ϕ 48
Mass			[kg]	39	53	64

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

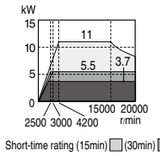
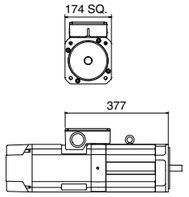
SJ-DL Series (Low-inertia specification)

Motor type				SJ-DL0.75/100-01	SJ-DL1.5/100-01	SJ-DL5.5/150-01T
Compatible drive unit	1-axis type	MDS-D2-SP-		20	40	160
	2-axis type	MDS-D2-SP2-		2020 4020 (M)	4020 (L) 4040S 8040 (M)	16080S (L)
	Multi axis integrated type	MDS-DM2-	SPV2-	–	–	16080
			SPV3-	–	–	16080
			SPHV3-	–	–	–
	Regenerative resistor type	MDS-DJ-SP-		–	–	–
Output Acceleration/Deceleration Short-time rating Continuous rating				 Short-time rating (10min)	 Short-time rating (10min)	 Short-time rating (15min) (30min)
Standard output during acceleration/deceleration			[kW]	0.9	1.5	11
Actual acceleration/deceleration output (Note 2)			[kW]	1.08	1.8	13.2
Base rotation speed			[r/min]	1500	1500	2500
Max. rotation speed in constant output range			[r/min]	10000	10000	15000
Maximum rotation speed			[r/min]	10000	10000	15000
Continuous rated torque			[N · m]	2.55	4.77	14.1
Motor inertia			[kg · m²]	0.011	0.019	0.0046
Degree of protection(The shaft-through portion is excluded.)				IP54	IP54	IP54
Outline dimension drawing (flange type)			[mm]			
Flange fitting diameter			[mm]	ϕ 110	ϕ 110	ϕ 150
Shaft diameter			[mm]	ϕ 22	ϕ 22	ϕ 28
Mass			[kg]	10	14	30

Motor type				SJ-DL5.5/200-01T	SJ-DL7.5/150-01T
Compatible drive unit	1-axis type	MDS-D2-SP-		160	160
	2-axis type	MDS-D2-SP2-		16080S (L)	16080S (L)
	Multi axis integrated type	MDS-DM2-	SPV2-	–	16080
			SPV3-	–	16080
			SPHV3-	–	–
	Regenerative resistor type	MDS-DJ-SP-		–	–
Output Acceleration/Deceleration Short-time rating Continuous rating				 Short-time rating (15min) (30min)	 Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	11	11
Actual acceleration/deceleration output (Note 2)			[kW]	13.2	13.2
Base rotation speed			[r/min]	2500	1500
Max. rotation speed in constant output range			[r/min]	20000	8000
Maximum rotation speed			[r/min]	20000	15000
Continuous rated torque			[N · m]	14.1	35.0
Motor inertia			[kg · m²]	0.0046	0.016
Degree of protection(The shaft-through portion is excluded.)				IP54	IP54
Outline dimension drawing (flange type)			[mm]		
Flange fitting diameter			[mm]	ϕ 150	ϕ 180
Shaft diameter			[mm]	ϕ 28	ϕ 32
Mass			[kg]	30	56

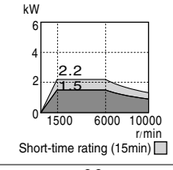
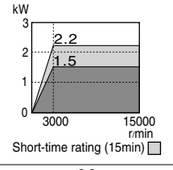
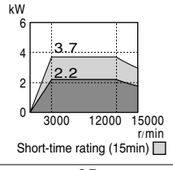
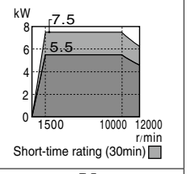
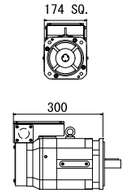
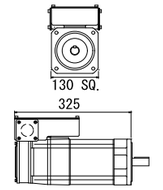
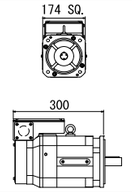
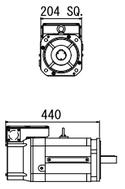
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
(Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

SJ-DL Series (Hollow shaft specifications)

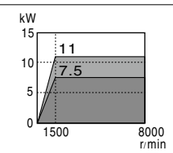
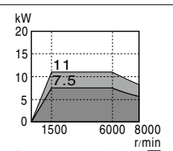
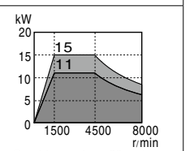
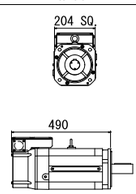
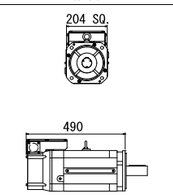
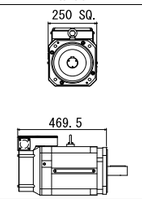
Motor type				SJ-DL5.5/200-01T-S
Compatible drive unit	1-axis type	MDS-D2-SP-		160
	2-axis type	MDS-D2-SP2-		16080S(L)
	Multi axis integrated type	MDS-DM2-	SPV2-	–
			SPV3-	–
			SPHV3-	–
	Regenerative resistor type	MDS-DJ-SP-		–
Output Acceleration/Deceleration □ Short-time rating □■ Continuous rating ■				
Standard output during acceleration/deceleration [kW]				11
Actual acceleration/deceleration output (Note 2) [kW]				13.2
Base rotation speed [r/min]				2500
Max. rotation speed in constant output range [r/min]				20000
Maximum rotation speed [r/min]				20000
Continuous rated torque [N · m]				14.1
Motor inertia [kg · m²]				0.0046
Degree of protection(The shaft-through portion is excluded.)				IP54
Outline dimension drawing (flange type) [mm]				
Flange fitting diameter [mm]				ϕ 150
Shaft diameter [mm]				ϕ 22
Mass [kg]				28

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

SJ-V Series (Normal specification)

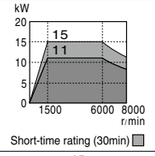
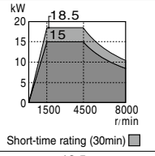
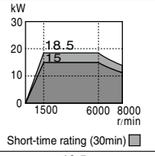
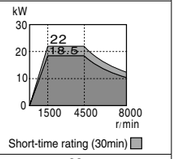
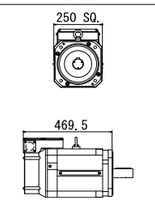
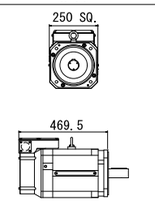
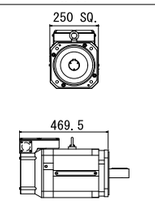
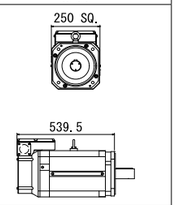
Motor type				SJ-V2.2-01T	SJ-VL2.2-02ZT *1	SJ-V3.7-02ZT	SJ-V7.5-03ZT
Compatible drive unit	1-axis type	MDS-D2-SP-		40	40	80	160
	2-axis type	MDS-D2-SP2-		4020 (L) 4040S 8040 (M)	4020 (L) 4040S 8040 (M)	8040 (L) 8080 16080S (M)	16080S (L)
	Multi axis integrated type	MDS-DM2-	SPV2-	–	–	–	16080
			SPV3-	–	–	–	16080
			SPHV3-	–	–	–	–
	Regenerative resistor type	MDS-DJ-SP-		40	80 *2	–	160 *1
Output Short-time rating □■ Continuous rating ■							
Standard output during acceleration/deceleration [kW]				2.2	2.2	3.7	7.5
Actual acceleration/deceleration output (Note 2) [kW]				2.64	2.64	4.44	9
Base rotation speed [r/min]				1500	3000	3000	1500
Max. rotation speed in constant output range [r/min]				6000	15000	12000	10000
Maximum rotation speed [r/min]				10000	15000	15000	12000
Continuous rated torque [N · m]				9.5	4.77	7.0	35
Motor inertia [kg · m²]				0.00675	0.0024	0.00675	0.0245
Degree of protection				IP44	IP44	IP44	IP44
Outline dimension drawing (Flange type) [mm]							
Flange fitting diameter [mm]				ϕ 150	ϕ 110	ϕ 150	ϕ 180
Shaft diameter [mm]				ϕ 28	ϕ 22	ϕ 28	ϕ 32
Mass [kg]				25	20	25	60

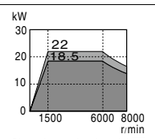
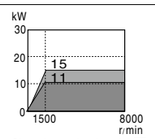
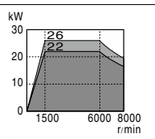
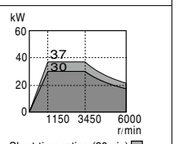
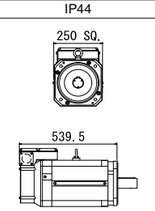
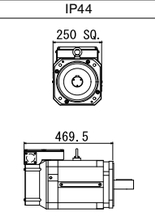
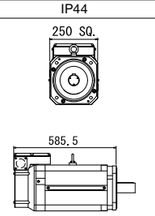
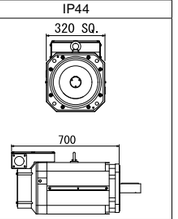
*1 The maximum rotation speed is 10000r/min.

Motor type				SJ-V11-08ZT	SJ-V11-13ZT	SJ-V15-01ZT
Compatible drive unit	1-axis type	MDS-D2-SP-		200	200	200
	2-axis type	MDS-D2-SP2-		–	–	–
	Multi axis integrated type	MDS-DM2-	SPV2-	–	20080	20080
			SPV3-	–	20080	20080
			SPHV3-	20080		
	Regenerative resistor type	MDS-DJ-SP-		–	–	–
Output Short-time rating □ Continuous rating ■						
Standard output during acceleration/deceleration [kW]				11	11	15
Actual acceleration/deceleration output (Note 2) [kW]				13.2	13.2	18
Base rotation speed [r/min]				1500	1500	1500
Max. rotation speed in constant output range [r/min]				8000	6000	4500
Maximum rotation speed [r/min]				8000	8000	8000
Continuous rated torque [N · m]				47.7	47.7	70
Motor inertia [kg · m²]				0.03	0.03	0.0575
Degree of protection				IP44	IP44	IP44
Outline dimension drawing (Flange type) [mm]						
Flange fitting diameter [mm]				ϕ 180	ϕ 180	ϕ 230
Shaft diameter [mm]				ϕ 48	ϕ 48	ϕ 48
Mass [kg]				70	70	110

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

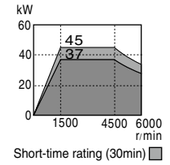
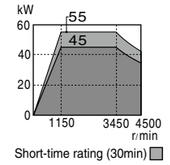
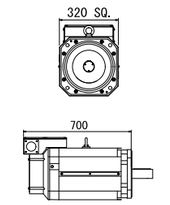
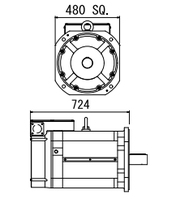
SJ-V Series (Normal specification)

Motor type				SJ-V15-09ZT	SJ-V18.5-01ZT	SJ-V18.5-04ZT	SJ-V22-01ZT
Compatible drive unit	1-axis type	MDS-D2-SP-		200	200	240	240
	2-axis type	MDS-D2-SP2-		–	–	–	–
	Multi axis integrated type	MDS-DM2-	SPV2-	–	–	–	–
			SPV3-	–	–	–	–
			SPHV3-	20080	–	–	–
	Regenerative resistor type	MDS-DJ-SP-		–	–	–	–
Output Short-time rating Continuous rating							
				Short-time rating (30min)	Short-time rating (30min)	Short-time rating (30min)	Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	15	18.5	18.5	22
Actual acceleration/deceleration output (Note 2)			[kW]	18	22.2	22.2	26.4
Base rotation speed			[r/min]	1500	1500	1500	1500
Max. rotation speed in constant output range			[r/min]	6000	4500	6000	4500
Maximum rotation speed			[r/min]	8000	8000	8000	8000
Continuous rated torque			[N · m]	70	95.5	95.5	118
Motor inertia			[kg · m²]	0.0575	0.0575	0.0575	0.08
Degree of protection				IP44	IP44	IP44	IP44
Outline dimension drawing (Flange type)			[mm]				
Flange fitting diameter			[mm]	ϕ 230	ϕ 230	ϕ 230	ϕ 230
Shaft diameter			[mm]	ϕ 48	ϕ 48	ϕ 48	ϕ 55
Mass			[kg]	110	110	110	135

Motor type				SJ-V22-04ZT	SJ-V22-06ZT	SJ-V26-01ZT	SJ-V37-01ZT
Compatible drive unit	1-axis type	MDS-D2-SP-		320	240	320	400
	2-axis type	MDS-D2-SP2-		–	–	–	–
	Multi axis integrated type	MDS-DM2-	SPV2-	–		–	–
			SPV3-	–		–	–
			SPHV3-	–	–	–	–
	Regenerative resistor type	MDS-DJ-SP-		–	–	–	–
Output Short-time rating Continuous rating							
				Short-time rating (30min)	Short-time rating (30min)	Short-time rating (30min)	Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	22	15	26	37
Actual acceleration/deceleration output (Note 2)			[kW]	26.4	18	31.2	44.4
Base rotation speed			[r/min]	1500	1500	1500	1150
Max. rotation speed in constant output range			[r/min]	6000	8000	6000	3450
Maximum rotation speed			[r/min]	8000	8000	8000	6000
Continuous rated torque			[N · m]	118	70.0	140	249
Motor inertia			[kg · m²]	0.08	0.0575	0.0925	0.34
Degree of protection				IP44	IP44	IP44	IP44
Outline dimension drawing (Flange type)			[mm]				
Flange fitting diameter			[mm]	ϕ 230	ϕ 230	ϕ 230	ϕ 300
Shaft diameter			[mm]	ϕ 55	ϕ 48	ϕ 55	ϕ 60
Mass			[kg]	135	110	155	300

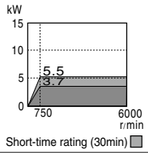
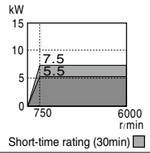
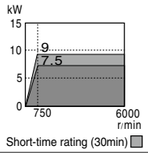
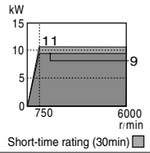
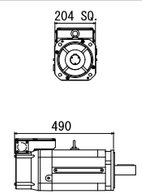
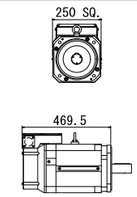
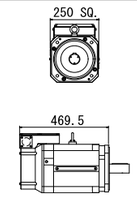
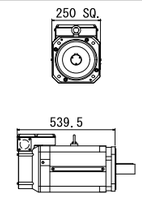
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
(Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

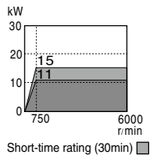
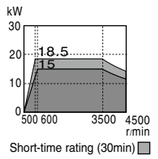
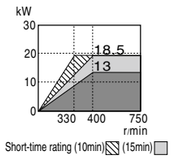
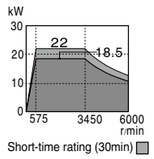
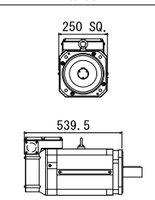
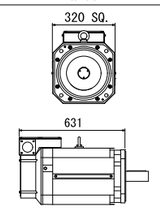
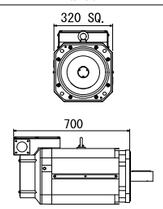
SJ-V Series (Normal specification)

Motor type			SJ-V45-01ZT	SJ-V55-01ZT
Compatible drive unit	1-axis type	MDS-D2-SP-	640	640
	2-axis type	MDS-D2-SP2-	–	–
	Multi axis integrated type	MDS-DM2-	–	–
	Regenerative resistor type	MDS-DJ-SP-	–	–
Output Short-time rating Continuous rating			 Short-time rating (30min)	 Short-time rating (30min)
Standard output during acceleration/deceleration		[kW]	45	55
Actual acceleration/deceleration output (Note 2)		[kW]	54	66
Base rotation speed		[r/min]	1500	1150
Max. rotation speed in constant output range		[r/min]	4500	3450
Maximum rotation speed		[r/min]	6000	4500
Continuous rated torque		[N · m]	236	374
Motor inertia		[kg · m²]	0.34	0.8475
Degree of protection			IP44	IP44
Outline dimension drawing (Flange type)		[mm]		
Flange fitting diameter		[mm]	ϕ 300	ϕ 450
Shaft diameter		[mm]	ϕ 60	ϕ 75
Mass		[kg]	300	450

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

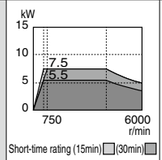
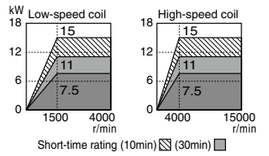
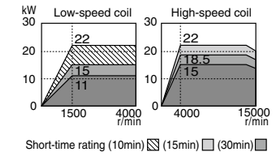
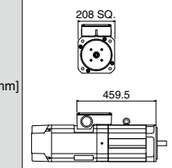
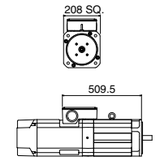
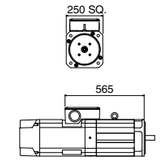
SJ-V Series (Wide range constant output specification)

Motor type				SJ-V11-01T	SJ-V11-09T	SJ-V15-03T	SJ-V18.5-03T
Compatible drive unit	1-axis type	MDS-D2-SP-		160	160	200	240
	2-axis type	MDS-D2-SP2-		16080S (L)	16080S (L)	–	–
	Multi axis integrated type	MDS-DM2-	SPV2-	16080	16080	–	–
			SPV3-	16080	16080	–	–
			SPHV3-	–	–	20080	–
	Regenerative resistor type	MDS-DJ-SP-		–	–	–	–
Output Short-time rating Continuous rating				 Short-time rating (30min)	 Short-time rating (30min)	 Short-time rating (30min)	 Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	5.5	7.5	9	11
Actual acceleration/deceleration output (Note 2)			[kW]	6.6	9	10.8	13.2
Base rotation speed			[r/min]	750	750	750	750
Max. rotation speed in constant output range			[r/min]	6000	6000	6000	6000
Maximum rotation speed			[r/min]	6000	6000	6000	6000
Continuous rated torque			[N · m]	47.1	70.0	95.5	115
Motor inertia			[kg · m²]	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]	ϕ 180	ϕ 230	ϕ 230	ϕ 230
Shaft diameter			[mm]	ϕ 48	ϕ 48	ϕ 48	ϕ 55
Mass			[kg]	70	110	110	135

Motor type				SJ-V22-05T	SJ-V22-09T	SJ-VK22-19ZT	
Compatible drive unit	1-axis type	MDS-D2-SP-		320	320	320	
	2-axis type	MDS-D2-SP2-		–	–	–	
	Multi axis integrated type	MDS-DM2-		–	–	–	
	Regenerative resistor type	MDS-DJ-SP-		–	–	–	
Output Short-time rating Continuous rating				 Short-time rating (30min)	 Short-time rating (30min)	 Short-time rating (10min) (15min)	 Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	15	18.5	18.5	22
Actual acceleration/deceleration output (Note 2)			[kW]	18	22.2	22.2	26.4
Base rotation speed			[r/min]	750	500	330	575
Max. rotation speed in constant output range			[r/min]	6000	3500	750	3450
Maximum rotation speed			[r/min]	6000	4500	750	6000
Continuous rated torque			[N · m]	140	239	310	307.3
Motor inertia			[kg · m²]	0.08	0.31	0.34	
Degree of protection				IP44	IP44	IP44	
Outline dimension drawing (Flange type)			[mm]				
Flange fitting diameter			[mm]	ϕ 230	ϕ 300	ϕ 300	
Shaft diameter			[mm]	ϕ 55	ϕ 60	ϕ 60	
Mass			[kg]	135	280	300	

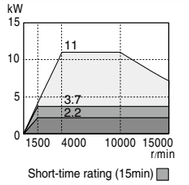
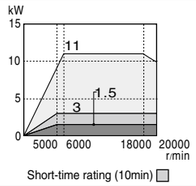
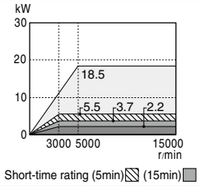
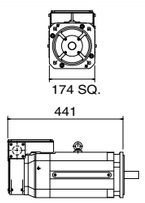
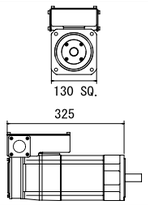
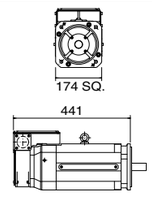
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
(Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

SJ-V Series (Hollow shaft specifications)

Motor type				SJ-VS7.5-14FZT	SJ-VKS26-09FZT		SJ-VKS30-16FZT	
Compatible drive unit	1-axis type	MDS-D2-SP-		160	320		320	
	2-axis type	MDS-D2-SP2-		16080S(L)	–		–	
	Multi axis integrated type	MDS-DM2-	SPV2-	–	–		–	
			SPV3-	–	–		–	
	Regenerative resistor type	MDS-DJ-SP-		–	–		–	
Output Short-time rating Continuous rating				 Short-time rating (15min) (30min)	 Short-time rating (10min) (30min)		 Short-time rating (10min) (15min) (30min)	
Standard output during acceleration/deceleration			[kW]	7.5	15		22	
Actual acceleration/deceleration output (Note 2)			[kW]	9	18		26.4	
Base rotation speed			[r/min]	1500	1500	4000	1500	3000
Max. rotation speed in constant output range			[r/min]	10000	4000	15000	4500	13600
Maximum rotation speed			[r/min]	15000	4000	15000	4500	15000
Continuous rated torque			[N · m]	35	47.7	17.9	70	47.7
Motor inertia			[kg · m²]	0.0248	0.03		0.0575	
Degree of protection				IP44	IP44		IP44	
Outline dimension drawing (Flange type)			[mm]					
Flange fitting diameter			[mm]	ϕ 180	ϕ 180		ϕ 230	
Shaft diameter			[mm]	ϕ 32	ϕ 38		ϕ 48	
Mass			[kg]	60	75		130	

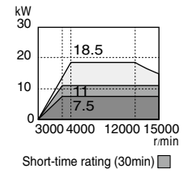
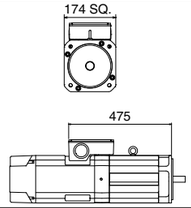
(Note 1) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.
(Note 2) Actual acceleration/deceleration output is 1.2-fold of "Standard output during acceleration/deceleration" or "Short time rated output".

SJ-VL Series (Low-inertia specification)

Motor type				SJ-VL11-02FZT	SJ-VL11-05FZT-S01 *1	SJ-VL18.5-05FZT
Compatible drive unit	1-axis type	MDS-D2-SP-		160	160	240
	2-axis type	MDS-D2-SP2-		16080S (L)	16080S (L)	–
	Multi axis integrated type	MDS-DM2-	SPV2-	16080	16080 *2	–
			SPV3-	16080	16080 *2	–
	Regenerative resistor type	MDS-DJ-SP-		–	160 *3	–
Output Acceleration/Deceleration Short-time rating Continuous rating				 Short-time rating (15min)	 Short-time rating (10min)	 Short-time rating (5min) (15min)
Standard output during acceleration/deceleration			[kW]	11	11	18.5
Actual acceleration/deceleration output (Note 2)			[kW]	13.2	13.2	22.2
Base rotation speed			[r/min]	1500	5000	3000
Max. rotation speed in constant output range			[r/min]	15000	20000	15000
Maximum rotation speed			[r/min]	15000	20000	15000
Continuous rated torque			[N · m]	14.0	2.8	7.0
Motor inertia			[kg · m²]	0.003	0.0024	0.00525
Degree of protection				IP44	IP44	IP44
Outline dimension drawing (Flange type)			[mm]			
Flange fitting diameter			[mm]	ϕ 150	ϕ 110	ϕ 150
Shaft diameter			[mm]	ϕ 28	ϕ 22	ϕ 28
Mass			[kg]	42	20	40

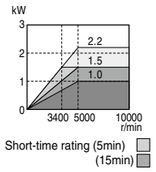
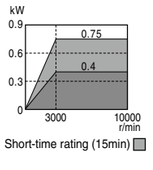
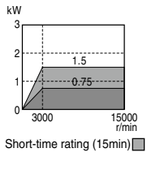
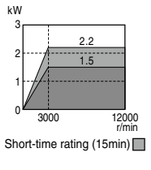
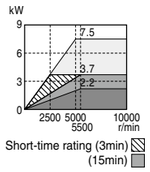
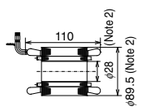
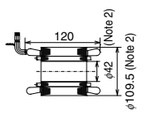
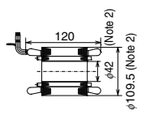
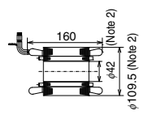
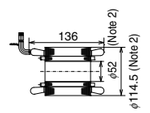
*1 The acceleration/deceleration frequency is limited by the regenerative resistor.
*2 The maximum rotation speed is 15000r/min.
*3 The maximum rotation speed is 12000r/min.
*4 The output can be changed by parameter.
(Note 1) Only the combination designated in this manual can be used for the motor and 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".

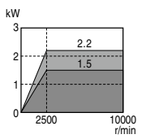
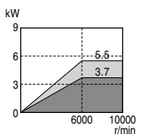
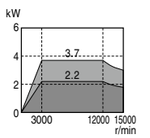
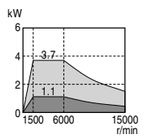
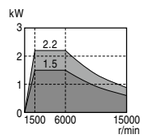
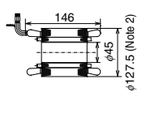
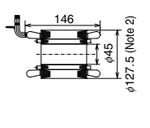
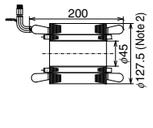
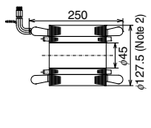
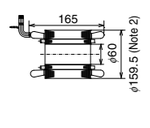
SJ-VL Series (Hollow shaft specifications)

Motor type				SJ-VLS15-11FZT
Compatible drive unit	1-axis type	MDS-D2-SP-		200
	2-axis type	MDS-D2-SP2-		–
	Multi axis integrated type	MDS-DM2-	SPV2-	–
			SPV3-	–
	Regenerative resistor type	MDS-DJ-SP-		–
Output Acceleration/Deceleration Short-time rating Continuous rating				 Short-time rating (30min)
Standard output during acceleration/deceleration			[kW]	18.5
Actual acceleration/deceleration output (Note 2)			[kW]	22.2
Base rotation speed			[r/min]	3000
Max. rotation speed in constant output range			[r/min]	15000
Maximum rotation speed			[r/min]	15000
Continuous rated torque			[N · m]	23.9
Motor inertia			[kg · m²]	0.0085
Degree of protection				IP44
Outline dimension drawing (Flange type)			[mm]	
Flange fitting diameter			[mm]	ϕ 150
Shaft diameter			[mm]	ϕ 28
Mass			[kg]	50

(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".

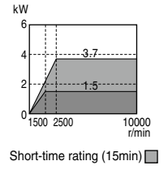
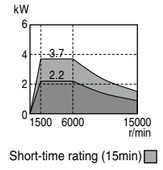
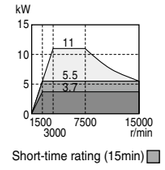
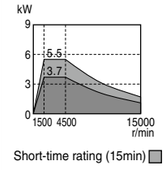
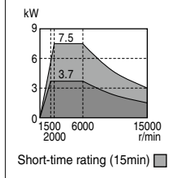
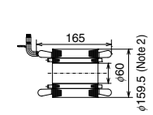
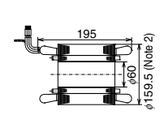
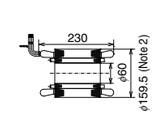
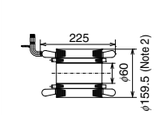
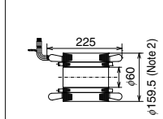
SJ-B Series

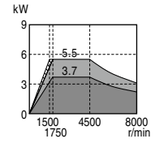
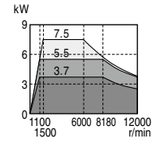
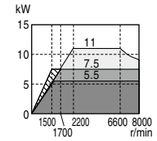
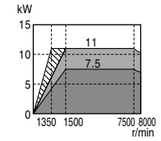
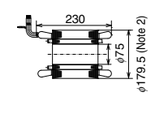
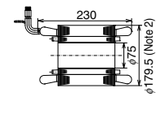
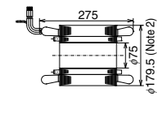
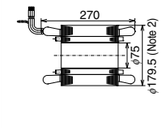
Built-in spindle motor type (Note 1)		SJ-2B4A01T	SJ-2B4002T	SJ-2B4004T	SJ-2B4003T	SJ-2B4B01T
Compatible spindle drive unit	MDS-D2-SP-	80	20	40	40	160
Output Acceleration/Deceleration Short-time rating Continuous rating		 Short-time rating (5min) (15min)	 Short-time rating (15min)	 Short-time rating (15min)	 Short-time rating (15min)	 Short-time rating (3min) (15min)
Standard output during acceleration/deceleration [kW]		2.2	0.75	1.5	2.2	7.5
Actual acceleration/deceleration output (Note 4) [kW]		2.64	0.9	1.8	2.64	9
Continuous base rotation speed [r/min]		5000	3000	3000	3000	5500
Maximum rotation speed [r/min]		10000	10000	15000	12000	10000
Continuous rated torque [N · m]		1.91	1.27	2.39	4.77	3.82
Rotor inertia [kg · m²]		0.00020	0.00078	0.00078	0.00138	0.00163
Outline dimension drawing [mm]						
Mass	Stator [kg]	1.9	2.2	2.2	3.9	3.0
	Rotor [kg]	0.5	0.9	0.9	1.7	1.5

Built-in spindle motor type (Note 1)		SJ-2B4112T	SJ-2B4111T	SJ-2B4105T	SJ-2B4102T	SJ-2B4201T
Compatible spindle drive unit	MDS-D2-SP-	40	80	80	80	40
Output Short-time rating Continuous rating		 Short-time rating (15min)	 Short-time rating (10min)	 Short-time rating (15min)	 Short-time rating (10min)	 Short-time rating (15min)
Standard output during acceleration/deceleration [kW]		2.2	5.5	3.7	3.7	2.2
Actual acceleration/deceleration output (Note 4) [kW]		2.64	6.6	4.44	4.44	2.64
Continuous base rotation speed [r/min]		2500	6000	3000	1500	1500
Maximum rotation speed [r/min]		10000	10000	15000	15000	15000
Continuous rated torque [N · m]		5.73	5.89	7.00	7.00	9.55
Rotor inertia [kg · m²]		0.00168	0.00168	0.003	0.00425	0.005
Outline dimension drawing [mm]						
Mass	Stator [kg]	4.1	4.1	7.4	10	7.1
	Rotor [kg]	1.7	1.7	3.0	4.3	2.9

(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".

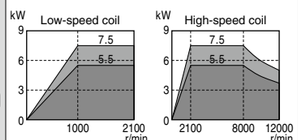
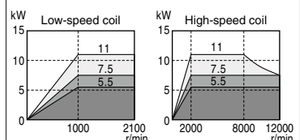
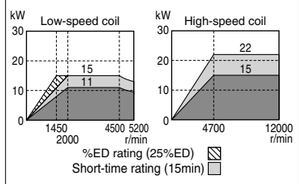
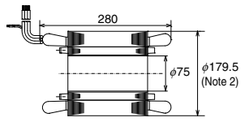
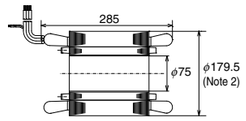
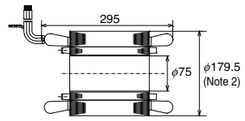
SJ-B Series

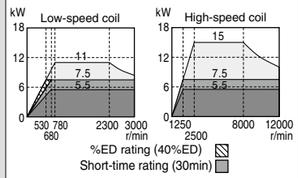
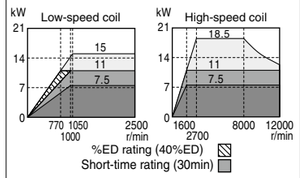
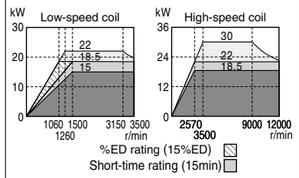
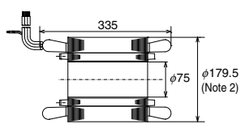
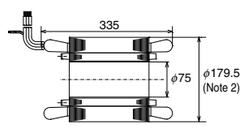
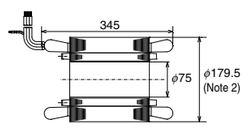
Built-in spindle motor type (Note 1)		SJ-2B4218T	SJ-2B4202T	SJ-2B4215T	SJ-2B4203T	SJ-2B4219T
Compatible spindle drive unit	MDS-D2-SP-	80	80	200	80	160
Output Acceleration/Deceleration Short-time rating Continuous rating		 Short-time rating (15min)	 Short-time rating (15min)	 Short-time rating (15min)	 Short-time rating (15min)	 Short-time rating (15min)
Standard output during acceleration/deceleration [kW]		3.7	3.7	11	5.5	7.5
Actual acceleration/deceleration output (Note 4) [kW]		4.44	4.44	13.2	6.6	9
Continuous base rotation speed [r/min]		1500	1500	1500	1500	1500
Maximum rotation speed [r/min]		10000	15000	15000	15000	15000
Continuous rated torque [N · m]		9.55	14.0	23.6	23.6	23.6
Rotor inertia [kg · m²]		0.005	0.0068	0.0085	0.0088	0.0088
Outline dimension drawing [mm]						
Mass	Stator [kg]	7.1	10	13	13	13
	Rotor [kg]	2.9	4.1	5.1	5.2	5.2

Built-in spindle motor type (Note 1)		SJ-2B4310T	SJ-2B4301T	SJ-2B4327T	SJ-2B4340T
Compatible spindle drive unit	MDS-D2-SP-	80	160	160	200
Output Acceleration/Deceleration Short-time rating Continuous rating		 Short-time rating (15min) (30min)	 Short-time rating (30min)	 Short-time rating (15min) (30min)	 Short-time rating (15min) (30min)
Standard output during acceleration/deceleration [kW]		5.5	7.5	11	11
Actual acceleration/deceleration output (Note 4) [kW]		6.6	9	13.2	13.2
Continuous base rotation speed [r/min]		1750	1100	1700	1500
Maximum rotation speed [r/min]		8000	12000	8000	8000
Continuous rated torque [N · m]		20.2	32.1	30.9	47.7
Rotor inertia [kg · m²]		0.0128	0.0128	0.0175	0.0175
Outline dimension drawing [mm]					
Mass	Stator [kg]	15	15	20	20
	Rotor [kg]	5.6	5.6	7.6	7.6

(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

Built-in spindle motor type (Note 1)		SJ-2B4313TK		SJ-2B4323TK		SJ-2B4325TK	
Compatible spindle drive unit	MDS-D2-SP-	160		200		240	
Output %ED rating Short-time rating Continuous rating							
Standard output during acceleration/deceleration [kW]		7.5	7.5	11	11	15	22
Actual acceleration/deceleration output (Note 4) [kW]		9	9	13.2	13.2	18	26.4
Continuous base rotation speed [r/min]		1000	2100	1000	2000	2000	4700
Maximum rotation speed [r/min]		2100	12000	2000	12000	5200	12000
Continuous rated torque [N · m]		52.5	25.0	52.5	26.3	52.5	30.5
Rotor inertia [kg · m²]		0.0175		0.0175		0.0175	
Outline dimension drawing [mm]							
Mass	Stator [kg]	20		20		20	
	Rotor [kg]	7.6		7.6		7.6	

Built-in spindle motor type (Note 1)		SJ-2B4303TK		SJ-2B4326TK		SJ-2B4311TK	
Compatible spindle drive unit	MDS-D2-SP-	200		240		320	
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating							
Standard output during acceleration/deceleration [kW]		11	15	15	18.5	22	30
Actual acceleration/deceleration output (Note 4) [kW]		13.2	18	18	22.2	26.4	36
Continuous base rotation speed [r/min]		680	1250	1000	1600	1500	2570
Maximum rotation speed [r/min]		3000	12000	2500	12000	3500	12000
Continuous rated torque [N · m]		77.2	42.0	71.6	44.8	95.5	68.7
Rotor inertia [kg · m²]		0.0225		0.0225		0.0225	
Outline dimension drawing [mm]							
Mass	Stator [kg]	26		26		26	
	Rotor [kg]	9.8		9.8		9.8	

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

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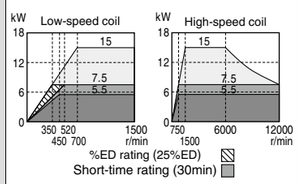
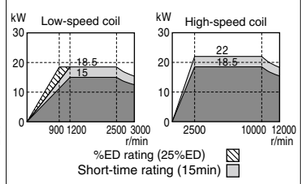
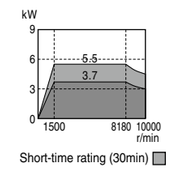
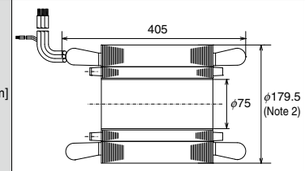
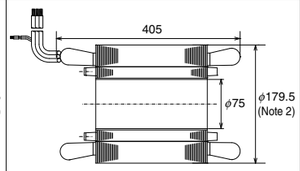
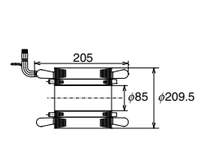
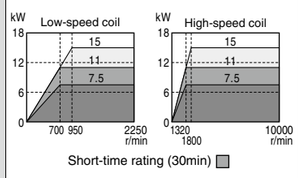
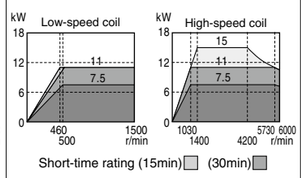
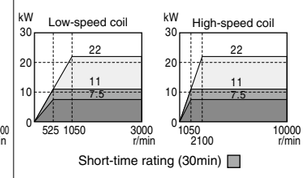
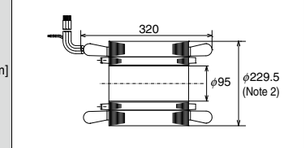
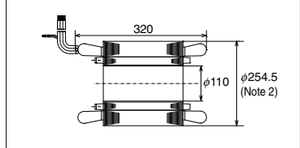
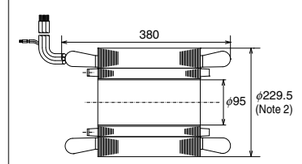
Built-in spindle motor type (Note 1)		SJ-2B4304TK		SJ-2B4318TK		SJ-2B4412T
Compatible spindle drive unit	MDS-D2-SP-	320		320		160
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating					
Standard output during acceleration/deceleration [kW]		15	15	18.5	22	5.5
Actual acceleration/deceleration output (Note 4) [kW]		18	18	22.2	26.4	6.6
Continuous base rotation speed [r/min]		450	750	1200	2500	1500
Maximum rotation speed [r/min]		1500	12000	3000	12000	10000
Continuous rated torque [N · m]		117	70.0	119	70.7	23.6
Rotor inertia [kg · m²]		0.028		0.028		0.0193
Outline dimension drawing [mm]					
Mass	Stator [kg]	33		33		15
	Rotor [kg]	12		12		6.2

Built-in spindle motor type (Note 1)		SJ-2B4501TK		SJ-2B6611TK		SJ-2B4502TK	
Compatible spindle drive unit	MDS-D2-SP-	200		200		320	
Output Acceleration/Deceleration Short-time rating Continuous rating					
Standard output during acceleration/deceleration [kW]		15	15	11	15	22	22
Actual acceleration/deceleration output (Note 4) [kW]		18	18	13.2	18	26.4	26.4
Continuous base rotation speed [r/min]		700	1320	500	1030	525	1050
Maximum rotation speed [r/min]		2250	10000	1500	6000	3000	10000
Continuous rated torque [N · m]		102	54.3	143	69.5	136	68.2
Rotor inertia [kg · m²]		0.08		0.102		0.105	
Outline dimension drawing [mm]					
Mass	Stator [kg]	29		37		37	
	Rotor [kg]	18		19		24	

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

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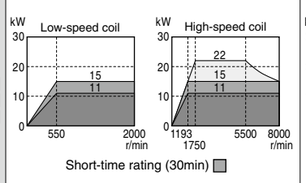
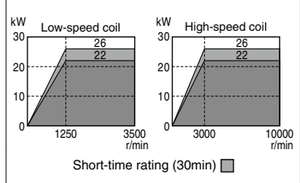
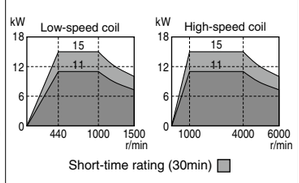
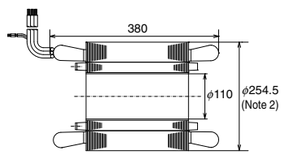
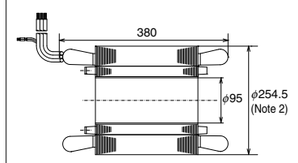
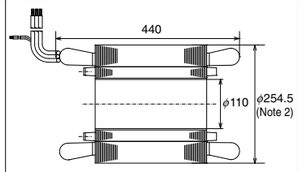
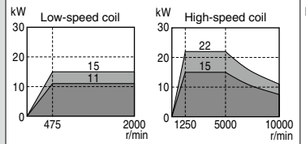
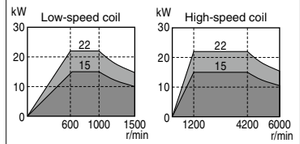
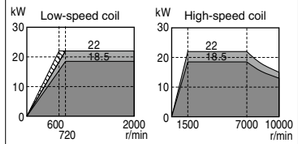
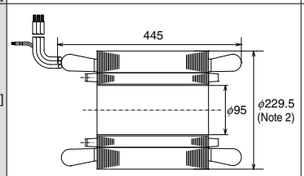
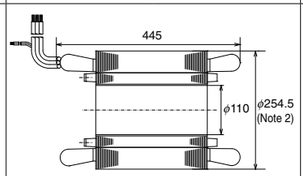
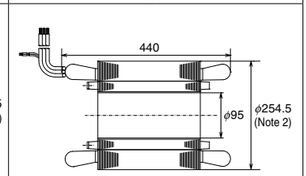
Built-in spindle motor type (Note 1)		SJ-2B6602TK		SJ-2B4601TK		SJ-2B6605TK	
Compatible spindle drive unit	MDS-D2-SP-	320		320		240	
Output Acceleration/Deceleration □ Short-time rating ■ Continuous rating ■							
		Short-time rating (30min) ■		Short-time rating (30min) ■		Short-time rating (30min) ■	
Standard output during acceleration/deceleration [kW]		15	22	26	26	15	15
Actual acceleration/deceleration output (Note 4) [kW]		18	26.4	31.2	31.2	18	18
Continuous base rotation speed [r/min]		550	1193	1250	3000	440	1000
Maximum rotation speed [r/min]		2000	8000	3500	10000	1500	6000
Continuous rated torque [N · m]		191	88.0	168	70.0	239	105
Rotor inertia [kg · m²]		0.133		0.105		0.173	
Outline dimension drawing [mm]							
Mass	Stator [kg]	49		55		63	
	Rotor [kg]	25		24		33	

Built-in spindle motor type (Note 1)		SJ-2B4503TK		SJ-2B6603TK		SJ-2B4602TK	
Compatible spindle drive unit	MDS-D2-SP-	320		320		320	
Output %ED rating ▨ Short-time rating □ Continuous rating ■							
		Short-time rating (30min) ■		Short-time rating (30min) ■		%ED rating (40%ED) ▨ Short-time rating (30min) ■	
Standard output during acceleration/deceleration [kW]		15	22	22	22	22	22
Actual acceleration/deceleration output (Note 4) [kW]		18	26.4	26.4	26.4	26.4	26.4
Continuous base rotation speed [r/min]		475	1250	600	1200	720	1500
Maximum rotation speed [r/min]		2000	10000	1500	6000	2000	10000
Continuous rated torque [N · m]		221	115	239	119	245	118
Rotor inertia [kg · m²]		0.135		0.173		0.135	
Outline dimension drawing [mm]							
Mass	Stator [kg]	48		63		71	
	Rotor [kg]	31		33		31	

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(Note 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".

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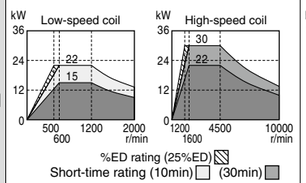
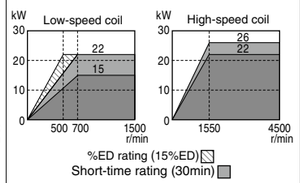
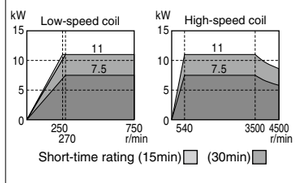
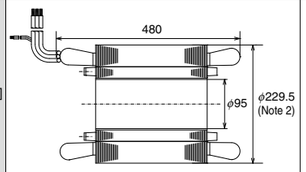
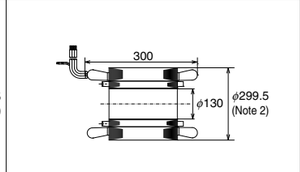
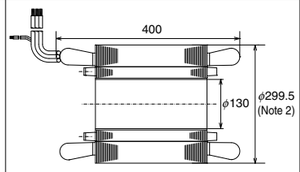
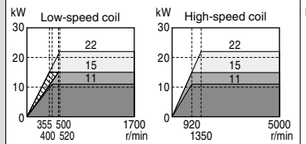
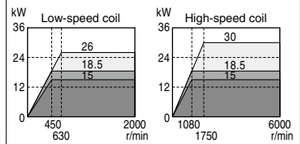
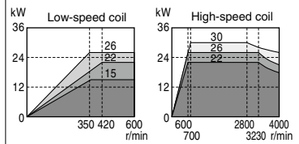
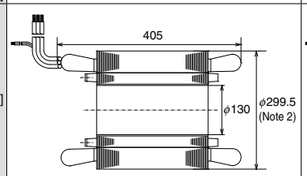
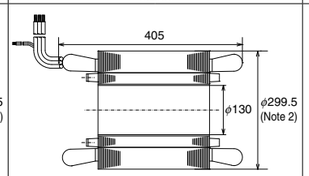
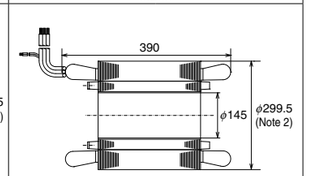
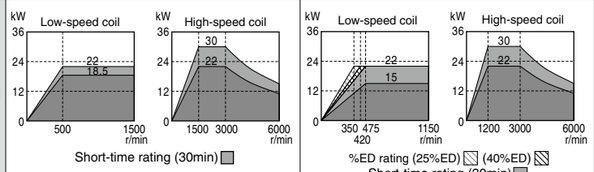
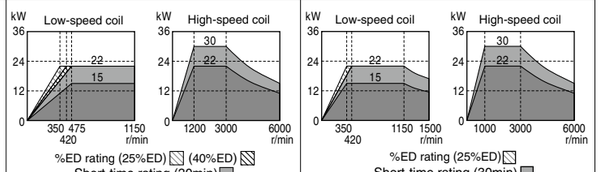
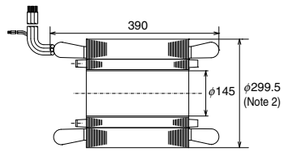
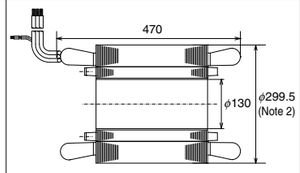
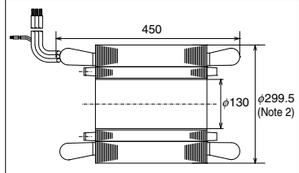
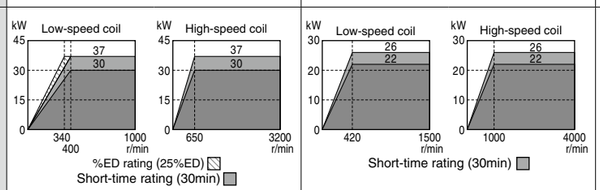
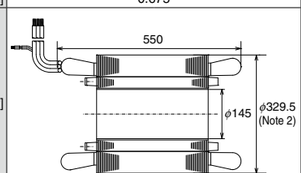
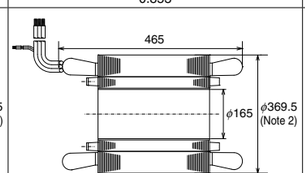
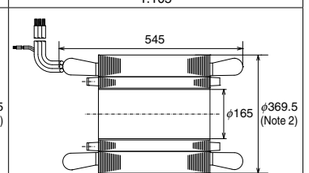
Built-in spindle motor type (Note 1)		SJ-2B4511TK		SJ-2B6720TK		SJ-2B6705TK	
Compatible spindle drive unit	MDS-D2-SP-	320		320		200	
Output %ED rating ▨ Short-time rating □ Continuous rating ■							
		%ED rating (25%ED) ▨ Short-time rating (10min) □ (30min) ■		%ED rating (15%ED) ▨ Short-time rating (30min) ■		Short-time rating (15min) □ (30min) ■	
Standard output during acceleration/deceleration [kW]		22	30	22	26	11	11
Actual acceleration/deceleration output (Note 4) [kW]		26.4	36	26.4	31.2	13.2	13.2
Continuous base rotation speed [r/min]		600	1600	700	1550	270	540
Maximum rotation speed [r/min]		2000	10000	1500	4500	750	4500
Continuous rated torque [N · m]		239	131	205	136	265	133
Rotor inertia [kg · m²]		0.15		0.20		0.288	
Outline dimension drawing [mm]							
Mass	Stator [kg]	54		45		65	
	Rotor [kg]	34		26		38	

Built-in spindle motor type (Note 1)		SJ-2B6711TK		SJ-2B6706TK		SJ-2B6716TK	
Compatible spindle drive unit	MDS-D2-SP-	320		400		400	
Output Acceleration/Deceleration □ %ED rating ▨ Short-time rating □ Continuous rating ■							
		%ED rating (25%ED) ▨ Short-time rating (30min) ■		Short-time rating (30min) ■		Short-time rating (10min) □ (30min) ■	
Standard output during acceleration/deceleration [kW]		22	22	26	30	26	30
Actual acceleration/deceleration output (Note 4) [kW]		26.4	26.4	31.2	36	31.2	36
Continuous base rotation speed [r/min]		400	920	450	1080	350	600
Maximum rotation speed [r/min]		1700	5000	2000	6000	600	4000
Continuous rated torque [N · m]		263	114	318	133	409	350
Rotor inertia [kg · m²]		0.280		0.288		0.283	
Outline dimension drawing [mm]							
Mass	Stator [kg]	65		65		70	
	Rotor [kg]	37		38		35	

(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".

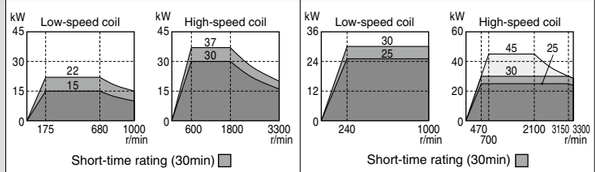
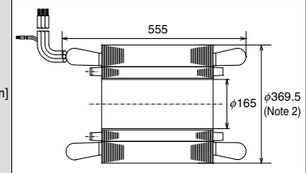
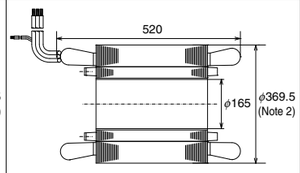
SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B6721TK		SJ-2B6704TK		SJ-2B6709TK	
Compatible spindle drive unit	MDS-D2-SP-	320		320		400	
Output Acceleration/Deceleration □ %ED rating ▨ ▨ Short-time rating ■ Continuous rating ■							
Standard output during acceleration/deceleration [kW]		22	30	22	30	22	30
Actual acceleration/deceleration output (Note 4) [kW]		26.4	36	26.4	36	26.4	36
Continuous base rotation speed	[r/min]	500	1500	475	1200	350	1000
Maximum rotation speed	[r/min]	1500	6000	1150	6000	1500	6000
Continuous rated torque	[N · m]	353	140	302	175	409	210
Rotor inertia	[kg · m²]	0.283		0.37		0.37	
Outline dimension drawing	[mm]						
Mass	Stator [kg]	70		83		83	
	Rotor [kg]	35		49		49	

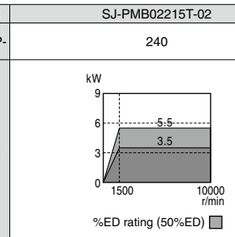
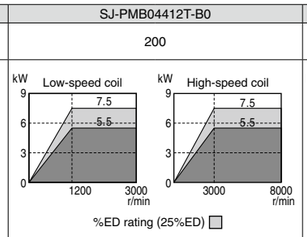
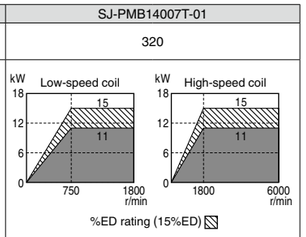
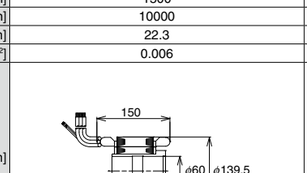
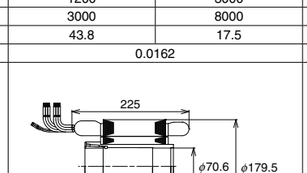
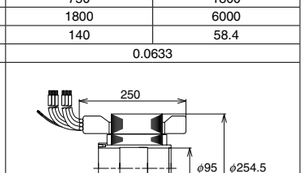
Built-in spindle motor type (Note 1)		SJ-2B6802TK		SJ-2B6905TK		SJ-2B6908TK	
Compatible spindle drive unit	MDS-D2-SP-	640		320		320	
Output %ED rating ▨ ▨ Short-time rating ■ Continuous rating ■							
Standard output during acceleration/deceleration [kW]		37	37	26	26	22	30
Actual acceleration/deceleration output (Note 4) [kW]		44.4	44.4	31.2	31.2	26.4	36
Continuous base rotation speed	[r/min]	400	650	420	1000	175	450
Maximum rotation speed	[r/min]	1000	3200	1500	4000	1000	3300
Continuous rated torque	[N · m]	716	441	500	210	819	467
Rotor inertia	[kg · m²]	0.675		0.853		1.105	
Outline dimension drawing	[mm]						
Mass	Stator [kg]	116		110		143	
	Rotor [kg]	72		70		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".

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B6906TK		SJ-2B6914TK	
Compatible spindle drive unit	MDS-D2-SP-	400		640	
Output Acceleration/Deceleration □ 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 · m²]	1.105		1.105	
Outline dimension drawing	[mm]				
Mass	Stator [kg]	143		143	
	Rotor [kg]	91		91	

SJ-PMB Series

Built-in spindle motor type (Note 1)		SJ-PMB02215T-02	SJ-PMB04412T-B0		SJ-PMB14007T-01	
Compatible spindle drive unit	MDS-D2-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 · m²]	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".

HF-KP Series (Small capacity)

Motor type			HF-KP46J□W09	HF-KP56J□W09	HF-KP96J□W09
Compatible drive unit	1-axis type	MDS-D2-SP-	20	20	20
	2-axis type (Note 2)	MDS-D2-SP2-	2020 4020 (M)	2020 4020 (M)	2020 4020 (M)
	Regenerative resistor type	MDS-DJ-SP-	20	20	20
		SP2-	2020	2020	2020
Output Rated torque Max. torque		[N · m]	0.64 / 2.50	0.80 / 5.00	1.43 / 6.50
Rated output		[kW]	0.40	0.50	0.90
Maximum rotation speed		[r/min]	6000	6000	6000
Motor inertia		[kg · cm²]	0.24	0.42	1.43
Degree of protection(The shaft-through portion is excluded.)			IP67	IP67	IP67
Outline dimension drawing		[mm]	60, 118.7	60, 140.6	80, 149.1
Flange fitting diameter		[mm]	ϕ 50	ϕ 50	ϕ 70
Shaft diameter		[mm]	ϕ 14	ϕ 14	ϕ 19
Mass		[kg]	1.2	1.7	2.9

HF-SP Series (Medium capacity)

Motor type			HF-SP226J□W09	HF-SP406J□W09
Compatible drive unit	1-axis type	MDS-D2-SP-	80	160
	2-axis type (Note 2)	MDS-D2-SP2-	8040 (L) 8080 16080S (M)	16080S (L)
	Regenerative resistor type	MDS-DJ-SP-	–	–
Output Rated torque Max. torque		[N · m]	3.50 / 22.0	6.37 / 50.0
Rated output		[kW]	2.2	4.0
Maximum rotation speed		[r/min]	6000	6000
Motor inertia		[kg · cm²]	11.9	23.7
Degree of protection (The shaft-through portion is excluded.)			IP67	IP67
Outline dimension drawing		[mm]	130, 140.5	130, 184.5
Flange fitting diameter		[mm]	ϕ 110	ϕ 110
Shaft diameter		[mm]	ϕ 24	ϕ 24
Mass		[kg]	6.8	10

(Note 1) This motor produces heat of about 100°C during high-speed rotation even when no load is connected. Mount the motor on a machine-side flange which has an appropriate size for sufficient heat dissipation.
(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

HF Series

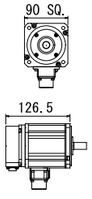
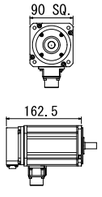
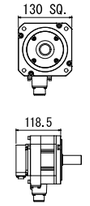
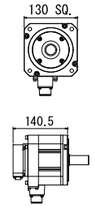
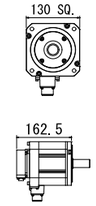
Tool spindle motor type			HF Series HF □-A48							
			HF75	HF105	HF54	HF104	HF154	HF224	HF204	HF354
Compatible spindle drive unit	1-axis type	MDS-D2-SP-	20	20	40	40	80	80	80	160
	2-axis type	MDS-D2-SP2-	2020 4020 (M)	2020 4020 (M)	4020 (L) 4040S 8040 (M)	4020 (L) 4040S 8040 (M)	8040 (L) 16080S (M) 8080	8040 (L) 16080S (M) 8080	8040 (L) 16080S (M) 8080	16080S (L) 16080 (L)
	Regenerative resistor type	MDS-DJ-SP-	20	20	20	40	80	80	80	–
		SP2-	2020	2020	2020	–	–	–	–	–
Output Rated torque Max. torque		[N · m]	1.8 / 7.0	2.4 / 8.1	1.6 / 12.1	3.2 / 23.3	4.8 / 33.9	7.0 / 46.5	6.4 / 46.5	11.1 / 74.5
Rated output		[kW]	0.75	1.0	0.5	1.0	1.5	2.2	2.0	3.5
Rated rotation speed		[r/min]	4000		3000					
Maximum rotation speed		[r/min]	4000		3000					
Motor inertia		[kg · cm²]	2.6	5.1	6.1	11.9	17.8	23.7	38.3	75.0
Degree of protection			IP67 (The shaft-through portion is excluded.)							
Outline dimension drawing (flange type)		[mm]	90 SQ., 126.5	90 SQ., 162.5	130 SQ., 118.5	130 SQ., 140.5	130 SQ., 162.5	130 SQ., 184.5	176 SQ., 143.5	176 SQ., 183.5
Flange fitting diameter		[mm]	ϕ 80	ϕ 80	ϕ 110	ϕ 110	ϕ 110	ϕ 110	ϕ 114.3	ϕ 114.3
Shaft diameter		[mm]	ϕ 14	ϕ 14	ϕ 24	ϕ 24	ϕ 24	ϕ 24	ϕ 35	ϕ 35

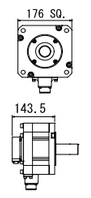
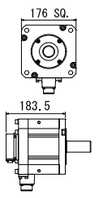
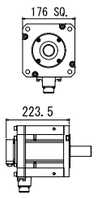
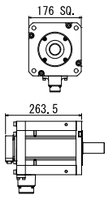
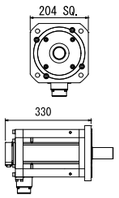
Tool spindle motor type			HF Series HF □-A48					
			HF123	HF223	HF303	HF453	HF703	HF903
Compatible spindle drive unit	1-axis type	MDS-D2-SP-	20	40	80	160	160	320
	2-axis type	MDS-D2-SP2-	2020 4020 (M)	4020 (L) 4040S 8040 (M)	8040 (L) 16080S (M) 8080	16080S (L)	16080S (L)	–
	Regenerative resistor type	MDS-DJ-SP-	20	40	80	–	–	–
		SP2-	2020	–	–	–	–	–
Output Rated torque Max. torque		[N · m]	5.7 / 17.0	10.5 / 32.0	14.3 / 64.0	14.3 / 89.3	22.3 / 116.5	28.7 / 171.0
Rated output		[kW]	1.2	2.2	3.0	4.5	7.0	9.0
Rated rotation speed		[r/min]	2000			3000		
Maximum rotation speed		[r/min]	2000			3000		
Motor inertia		[kg · cm²]	11.9	23.7	75.0	112.0	154.0	196.0
Degree of protection			IP67 (The shaft-through portion is excluded.)					
Outline dimension drawing (flange type)		[mm]	130 SQ., 140.5	130 SQ., 184.5	176 SQ., 183.5	176 SQ., 223.5	176 SQ., 263.5	204 SQ., 330
Flange fitting diameter		[mm]	ϕ 110	ϕ 110	ϕ 114.3	ϕ 114.3	ϕ 114.3	ϕ 180
Shaft diameter		[mm]	ϕ 24	ϕ 24	ϕ 35	ϕ 35	ϕ 35	ϕ 42

(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.

MEMO

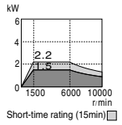
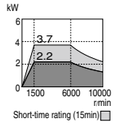
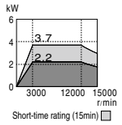
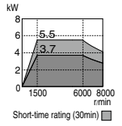
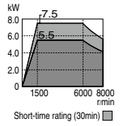
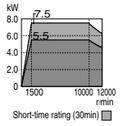
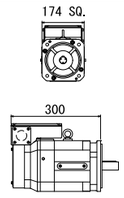
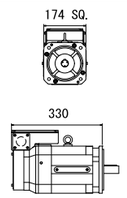
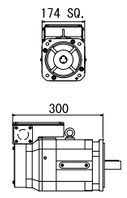
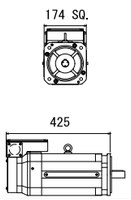
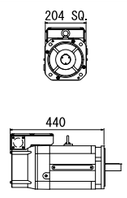
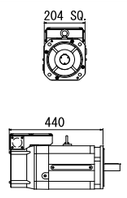
HF-H Series

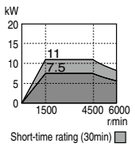
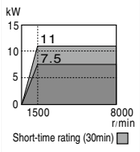
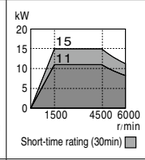
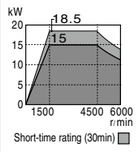
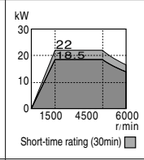
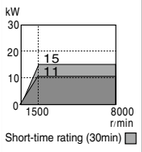
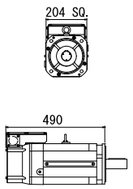
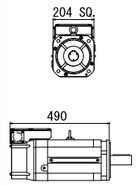
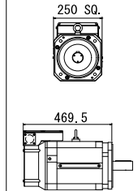
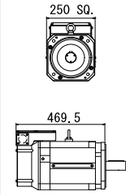
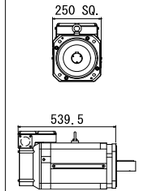
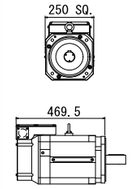
Servo motor type		HF-H75	HF-H105	HF-H54	HF-H104	HF-H154
Compatible servo drive unit	1-axis type MDS-DH2-V1-	10	10	20	20	40
	2-axis type MDS-DH2-V2-	1010 2010 (M)	1010 2010 (M)	2010 (L) 2020 4020 (M)	2010 (L) 2020 4020 (M)	4020 (L) 4040 8040 (M)
Output Stall torque Maximum torque	[N · m]	2.0 / 8.0	3.0 / 11.0	2.9 / 13.0	5.9 / 23.3	9.0 / 42.0
Rated output	[kW]	0.75	1.0	0.5	1.0	1.5
Maximum rotation speed	[r/min]	5000		4000		
Motor inertia	[kg · cm²]	2.6	5.1	6.1	11.9	17.8
Motor inertia with brake	[kg · cm²]	2.8	5.3	8.3	14.1	20.0
Degree of protection		IP67 (The shaft-through portion is excluded.)				
Outline dimension drawing (flange type) (Note) The total length will be 3.5mm longer when using an A51 or A74N detector.	[mm]					
Flange fitting diameter	[mm]	ϕ 80	ϕ 80	ϕ 110	ϕ 110	ϕ 110
Shaft diameter	[mm]	ϕ 14	ϕ 14	ϕ 24	ϕ 24	ϕ 24
Mass (with a brake)	[kg]	2.5 (3.9)	4.3 (5.7)	4.8 (6.8)	6.5 (8.5)	8.3 (10.3)
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N) 1,000,000 [p/rev] (A51) 260,000 [p/rev] (A48)	DH2	DH2	DH2	DH2	DH2

Servo motor type		HF-H204	HF-H354	HF-H453	HF-H703	HF-H903
Compatible servo drive unit	1-axis type MDS-DH2-V1-	40	80	80	80W	160
	2-axis type MDS-DH2-V2-	4020 (L) 4040 8040 (M)	8040 (L) 8080 8080W	8040 (L) 8080 8080W	8080W	–
Output Stall torque Maximum torque	[N · m]	13.7 / 47.0	22.5 / 90.0	37.2 / 122.0	49.0 / 152.0	58.8 / 208.0
Rated output	[kW]	2.0	3.5	4.5	7.0	9.0
Maximum rotation speed	[r/min]	4000		3500	3000	
Motor inertia	[kg · cm²]	38.3	75.0	112.0	154.0	196.0
Motor inertia with brake	[kg · cm²]	48.0	84.7	121.7	163.7	205.7
Degree of protection		IP67 (The shaft-through portion is excluded.)				
Outline dimension drawing (flange type) (Note) The total length will be 3.5mm longer when using an A51 or A74N detector.	[mm]					
Flange fitting diameter	[mm]	ϕ 114.3	ϕ 114.3	ϕ 114.3	ϕ 114.3	ϕ 180
Shaft diameter	[mm]	ϕ 35	ϕ 35	ϕ 35	ϕ 35	ϕ 42
Mass (with a brake)	[kg]	12.0 (18.0)	19.0 (25.0)	26.0 (32.0)	32.0 (38.0)	45.0 (51.0)
Absolute position detector compatible drive unit	16,000,000 [p/rev] (A74/A74N) 1,000,000 [p/rev] (A51) 260,000 [p/rev] (A48)	DH2	DH2	DH2	DH2	DH2

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

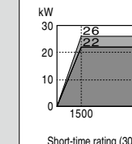
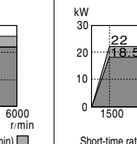
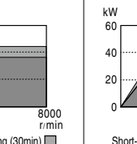
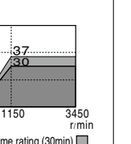
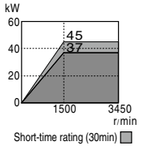
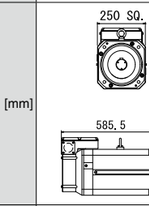
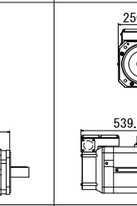
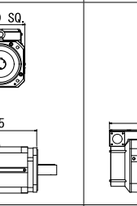
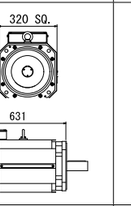
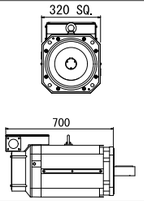
SJ-4-V Series (Normal)

Spindle motor type		SJ-4-V2.2-03T	SJ-4-V3.7-03T	SJ-4-V3.7-05ZT	SJ-4-V5.5-07T	SJ-4-V7.5-12T	SJ-4-V7.5-13ZT
Compatible spindle drive unit	MDS-DH2-SP-	20	20	20	40	40	80
Output Short-time rating □□ Continuous rating ■		 Short-time rating (15min)□	 Short-time rating (15min)□	 Short-time rating (15min)□	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■
Standard output during acceleration/deceleration [kW]		2.2	3.7	3.7	5.5	7.5	7.5
Actual acceleration/deceleration output (Note 2) [kW]		2.64	4.44	4.44	6.6	9	9
Base rotation speed	[r/min]	1500		3000	1500		
Maximum rotation speed	[r/min]	10000		15000	8000		12000
Continuous rated torque	[N · m]	9.5	14.0	7.0	23.5	35.0	35.0
Inertia	[kg · m^2]	0.007	0.009	0.007	0.015	0.025	0.025
Degree of protection		IP44	IP44	IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]						
Flange fitting diameter	[mm]	ϕ 150	ϕ 150	ϕ 150	ϕ 150	ϕ 180	ϕ 180
Shaft diameter	[mm]	ϕ 28	ϕ 28	ϕ 28	ϕ 28	ϕ 32	ϕ 32
Mass	[kg]	25	30	25	49	60	60

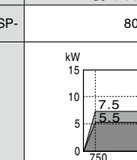
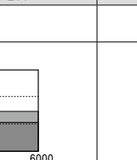
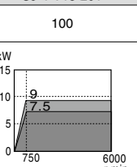
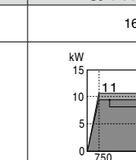
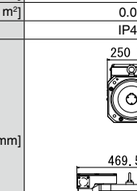
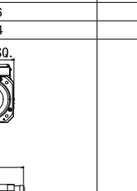
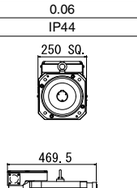
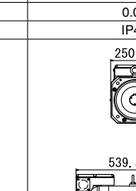
Spindle motor type		SJ-4-V11-18T	SJ-4-V11-23ZT	SJ-4-V15-18T	SJ-4-V18.5-14T	SJ-4-V22-15T	SJ-4-V22-18ZT
Compatible spindle drive unit	MDS-DH2-SP-	80	100	100	100	160	160
Output Short-time rating □ Continuous rating ■		 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■
Standard output during acceleration/deceleration [kW]		11	11	15	18.5	22	15
Actual acceleration/deceleration output (Note 2) [kW]		13.2	13.2	18	22.2	26.4	18
Base rotation speed	[r/min]	1500					
Maximum rotation speed	[r/min]	6000	8000	6000			8000
Continuous rated torque	[N · m]	47.7	47.7	70.0	95.5	118	70.0
Inertia	[kg · m^2]	0.03	0.03	0.06	0.06	0.08	0.06
Degree of protection		IP44	IP44	IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]						
Flange fitting diameter	[mm]	ϕ 180	ϕ 180	ϕ 230	ϕ 230	ϕ 230	ϕ 230
Shaft diameter	[mm]	ϕ 48	ϕ 48	ϕ 48	ϕ 48	ϕ 55	ϕ 48
Mass	[kg]	70	70	110	110	135	125

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

SJ-4-V Series (Normal)

Spindle motor type		SJ-4-V26-08T	SJ-4-V30-15ZT	SJ-4-V37-04T	SJ-4-V45-02T	SJ-4-V55-03T
Compatible spindle drive unit	MDS-DH2-SP-	160	160	200	320	320
Output Continuous rating ■ Short-time rating ■		 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■
Standard output during acceleration/deceleration [kW]		26	22	37	45	55
Actual acceleration/deceleration output (Note 2) [kW]		31.2	26.4	44.4	54	66
Base rotation speed	[r/min]	1500		1150	1500	1150
Maximum rotation speed	[r/min]	6000	8000	3450		
Continuous rated torque	[N · m]	140	118	249	236	374
Inertia	[kg · m^2]	0.10	0.08	0.31	0.55	0.85
Degree of protection		IP44	IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]					
Flange fitting diameter	[mm]	ϕ 230	ϕ 230	ϕ 300	ϕ 300	ϕ 450
Shaft diameter	[mm]	ϕ 55	ϕ 55	ϕ 60	ϕ 60	ϕ 75
Mass	[kg]	155	155	280	390	450

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

Spindle motor type		SJ-4-V11-21T	SJ-4-V15-20T	SJ-4-V18.5-17T	SJ-4-V22-16T
Compatible spindle drive unit	MDS-DH2-SP-	80	100	160	160
Output Short-time rating ■ Continuous rating ■		 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■	 Short-time rating (30min)■
Standard output during acceleration/deceleration [kW]		7.5	9	11	15
Actual acceleration/deceleration output (Note 2) [kW]		9	10.8	13.2	18
Base rotation speed	[r/min]	750			
Maximum rotation speed	[r/min]	6000			
Continuous rated torque	[N · m]	70.0	95.5	115	140
Inertia	[kg · m^2]	0.06	0.06	0.08	0.08
Degree of protection		IP44	IP44	IP44	IP44
Outline dimension drawing (flange type)	[mm]				
Flange fitting diameter	[mm]	ϕ 230	ϕ 230	ϕ 230	ϕ 230
Shaft diameter	[mm]	ϕ 48	ϕ 48	ϕ 55	ϕ 55
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.

MDS-D2 Series

1-axis servo drive unit

Drive unit type		MDS-D2-V1-20	MDS-D2-V1-40	MDS-D2-V1-80	MDS-D2-V1-160	MDS-D2-V1-160W	MDS-D2-V1-320	MDS-D2-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 311DC						
	Rated current [A]	7	7	14	30	35	45	55
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%						
	Current [A]	MAX. 0.2						
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%						
Control method		Sine wave PWM control method						
Dynamic brakes		Built-in						External
Machine end detector		Compatible						
Cooling method		Forced wind 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-D2-V2-2020	MDS-D2-V2-4020	MDS-D2-V2-4040	MDS-D2-V2-8040	MDS-D2-V2-8080	MDS-D2-V2-16080	MDS-D2-V2-160160	MDS-D2-V2-160160W
Drive unit category		2-axis servo							
Nominal maximum current (peak) [A]		20/20	40/20	40/40	80/40	80/80	160/80	160/160	160/160
Power input	Rated voltage [V]	270 to 311DC							
	Rated current [A]	14 (7/7)	14 (7/7)	14 (7/7)	21 (14/7)	28 (14/14)	44 (30/14)	60 (30/30)	70 (35/35)
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.2							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%							
Control method		Sine wave PWM control method							
Dynamic brakes		Built-in							
Machine end detector		Compatible							
Cooling method		Forced wind cooling							
Mass [kg]		4.5	4.5	4.5	4.5	4.5	5.2	5.2	6.3
Unit outline dimension drawing		A1	A1	A1	A1	A1	B1	B1	C1

3-axis servo drive unit

Drive unit type		MDS-D2-V3-202020	MDS-D2-V3-404040
Drive unit category		3-axis servo	
Nominal maximum current (peak) [A]		20/20/20	40/40/40
Power input	Rated voltage [V]	270 to 311DC	
	Rated current [A]	21 (7/7/7)	21 (7/7/7)
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%	
	Current [A]	MAX. 0.2	
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%	
Control method		Sine wave PWM control method	
Dynamic brakes		Built-in	
Machine end detector		Compatible	
Cooling method		Forced wind cooling	
Mass [kg]		3.8	3.8
Unit outline dimension drawing		A0	A0

MDS-D2 Series

1-axis spindle drive unit

Drive unit type		MDS-D2-SP-20	MDS-D2-SP-40	MDS-D2-SP-80	MDS-D2-SP-160	MDS-D2-SP-200	MDS-D2-SP-240	MDS-D2-SP-320	MDS-D2-SP-400	MDS-D2-SP-640
Drive unit category		1-axis spindle								
Nominal maximum current (peak) [A]		20	40	80	160	200	240	320	400	640
Power input	Rated voltage [V]	270 to 311DC								
	Rated current [A]	7	13	20	41	76	95	140	150	210
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%								
	Current [A]	MAX. 0.2								
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%								
Control method		Sine wave PWM control method								
Cooling method		Forced wind cooling								
Mass [kg]		3.8	3.8	3.8	4.5	5.8	6.5	7.5	16.5	16.5
Unit outline dimension drawing		A1	A1	A1	B1	C1	D1	D2	E1	F1

2-axis spindle drive unit

Drive unit type		MDS-D2-SP2-2020	MDS-D2-SP2-4020	MDS-D2-SP2-4040S	MDS-D2-SP2-8040	MDS-D2-SP2-8080	MDS-D2-SP2-16080S
Drive unit category		2-axis spindle					
Nominal maximum current (peak) [A]		20/20	40/20	40/40	80/40	80/80	160/80
Power input	Rated voltage [V]	270 to 311DC					
	Rated current [A]	14 (7/7)	20 (13/7)	26 (13/13)	33 (20/13)	40 (20/20)	61 (41/20)
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%					
	Current [A]	MAX. 0.2					
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%					
Control method		Sine wave PWM control method					
Cooling method		Forced wind cooling					
Mass [kg]		4.5	4.5	4.5	5.2	6.5	5.2
Unit outline dimension drawing		A1	A1	A1	B1	C1	B1

Power supply unit

Power supply unit type		MDS-D2-CV-37	MDS-D2-CV-75	MDS-D2-CV-110	MDS-D2-CV-185	MDS-D2-CV-300	MDS-D2-CV-370	MDS-D2-CV-450	MDS-D2-CV-550
Rated output [kW]		under development		11.0	18.5	30.0	37.0	45.0	55.0
Power input	Rated voltage [V]			200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%					
	Rated current [A]			35	65	107	121	148	200
Control power input	Voltage [V]			200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%					
	Current [A]			MAX. 0.2					
	Frequency [Hz]			50/60 Tolerable fluctuation: between +3% and -3%					
Regeneration method				Power regeneration method					
Cooling method				Forced wind cooling					
Mass [kg]				6.0	6.0	10.0	10.0	10.0	25.5
Unit outline dimension drawing				B1	B1	D1	D1	D2	F1

AC reactor

AC reactor model		D-AL-7.5K	D-AL-11K	D-AL-18.5K	D-AL-30K	D-AL-37K	D-AL-45K	D-AL-55K
Compatible power supply unit type	MDS-D2-CV-	37, 75	110	185	300	370	450	550
Rated capacity [kW]		7.5	11	18.5	30	37	45	55
Rated voltage [V]		200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%						
Rated current [A]		27	40	66	110	133	162	200
Frequency [Hz]		50/60 Tolerable fluctuation: between +3% and -3%						
Mass [kg]		4.2	3.7	5.3	6.1	8.6	9.7	11.5
Unit outline dimension drawing		R1	R1	R2	R2	R3	R3	R4

MDS-DH2 Series

1-axis servo drive unit

Drive unit type		MDS-DH2-V1-10	MDS-DH2-V1-20	MDS-DH2-V1-40	MDS-DH2-V1-80	MDS-DH2-V1-80W	MDS-DH2-V1-160	MDS-DH2-V1-160W	MDS-DH2-V1-200
Drive unit category		1-axis servo							
Nominal maximum current (peak) [A]		10	20	40	80	80	160	160	200
Power input	Rated voltage [V]	513 to 648DC							
	Rated current [A]	0.9	1.6	2.9	6.0	8.0	11.9	16.7	39.0
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%							
Control method		Sine wave PWM control method							
Dynamic brakes		Built-in						External (MDS-D-DBU)	
Degree of protection		IP20 ([over all] / IP00 [Terminal block TE1])							
Cooling method		Forced wind cooling							
Mass [kg]		3.8	3.8	3.8	3.8	4.5	5.8	7.5	16.5
Unit outline dimension drawing		A1	A1	A1	A1	B1	C1	D1	E1

2-axis servo drive unit

Drive unit type		MDS-DH2-V2-1010	MDS-DH2-V2-2010	MDS-DH2-V2-2020	MDS-DH2-V2-4020	MDS-DH2-V2-4040	MDS-DH2-V2-8040	MDS-DH2-V2-8080	MDS-DH2-V2-8080W
Drive unit category		2-axis servo							
Nominal maximum current (peak) [A]		10/10	20/10	20/20	40/20	40/40	80/40	80/80	80/80
Power input	Rated voltage [V]	513 to 648DC							
	Rated current [A]	1.8 (0.9/0.9)	2.5 (1.6/0.9)	3.2 (1.6 /1.6)	4.5 (2.9/1.6)	5.8 (2.9/2.9)	8.9 (6.0/2.9)	12 (6.0/6.0)	16 (8.0/8.0)
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%							
Control method		Sine wave PWM control method · Current control method							
Dynamic brakes		Built-in							
Degree of protection		IP20							
Cooling method		Forced wind cooling							
Mass [kg]		3.8	3.8	3.8	3.8	3.8	5.2	5.2	6.3
Unit outline dimension drawing		A1	A1	A1	A1	A1	B1	B1	C1

1-axis spindle drive unit

Drive unit type		MDS-DH2-SP-20	MDS-DH2-SP-40	MDS-DH2-SP-80	MDS-DH2-SP-100	MDS-DH2-SP-160	MDS-DH2-SP-200	MDS-DH2-SP-320	MDS-DH2-SP-480
Drive unit category		1-axis spindle							
Nominal maximum current (peak) [A]		20	40	80	100	160	200	320	480
Power input	Rated voltage [V]	513 to 648DC							
	Rated current [A]	10	15	21	38	72	82	119	150
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%							
	Current [A]	MAX. 0.1							
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%							
Control method		Sine wave PWM control method							
Degree of protection		IP20 ([over all] / IP00 [Terminal block TE1])							
Cooling method		Forced wind cooling							
Mass [kg]		3.8	4.5	4.5	5.8	7.5	16.5	16.5	22.5
Unit outline dimension drawing		A1	A1	B1	C1	D1	E1	E1	F1

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

Power supply unit

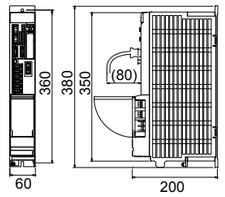
Power supply unit type		MDS-DH2-CV-37	MDS-DH2-CV-75	MDS-DH2-CV-110	MDS-DH2-CV-185	MDS-DH2-CV-300	MDS-DH2-CV-370	MDS-DH2-CV-450	MDS-DH2-CV-550	MDS-DH2-CV-750
Rated output [kW]		3.7	7.5	11.0	18.5	30.0	37.0	45.0	55.0	75.0
Power input	Rated voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%								
	Rated current [A]	5.2	13	18	35	61	70	85	106	130
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%								
	Current [A]	MAX. 0.1								
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%								
Main circuit method		Converter with power regeneration circuit								
Cooling method		Forced wind cooling								
Mass [kg]		6.0	6.0	6.0	6.0	10.0	10.0	10.0	25.5	25.5
Unit outline dimension drawing		B1	B1	B1	B1	D1	D1	D1	F1	F1

AC reactor

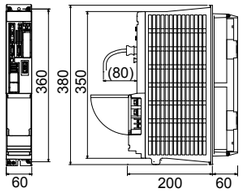
AC reactor model		DH-AL-7.5K	DH-AL-11K	DH-AL-18.5K	DH-AL-30K	DH-AL-37K	DH-AL-45K	DH-AL-55K	DH-AL-75K
Compatible power supply unit type	MDS-DH2-CV-	37, 75	110	185	300	370	450	550	750
Rated capacity [kW]		7.5	11	18.5	30	37	45	55	75
Rated voltage [V]		380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable fluctuation: between +10% and -15%							
Rated current [A]		14	21	37	65	75	85	106	142
Frequency [Hz]		50/60 Tolerable fluctuation: between +3% and -3%							
Mass [kg]		4.0	3.7	5.3	6.0	8.5	9.8	10.5	13.0
Unit outline dimension drawing		R1	R1	R2	R2	R3	R3	R5	R6

[Unit : mm]

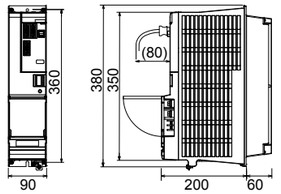
A0



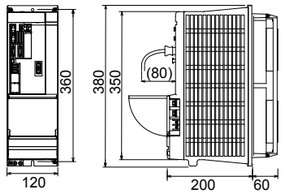
A1



B1



C1



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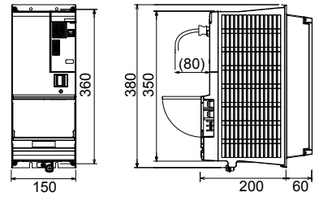

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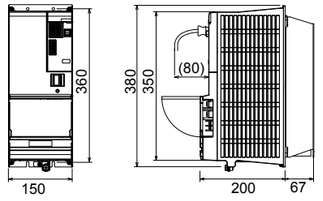

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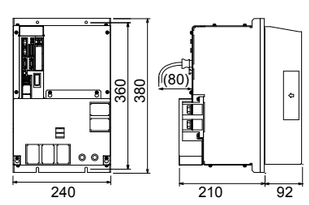
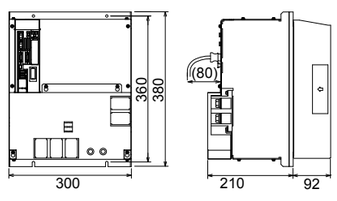
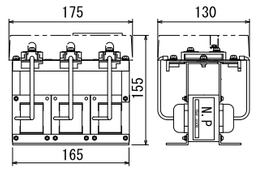


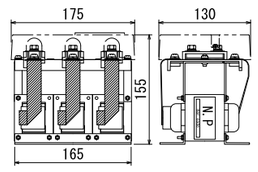
F1



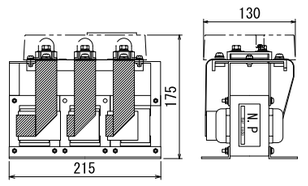
R1



R2



R3



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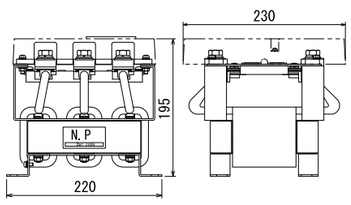
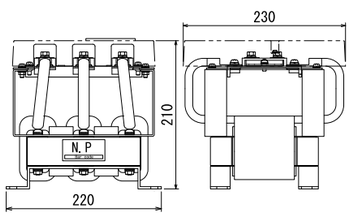
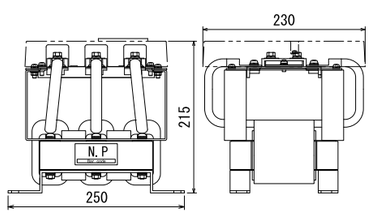


R5



R6



MDS-DM2 Series

Multi-hybrid drive

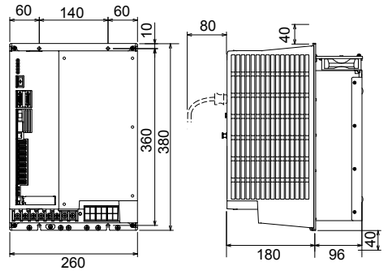
Drive unit type		MDS-DM2-SPV2-10080	MDS-DM2-SPV2-16080	MDS-DM2-SPV2-20080
Drive unit category		2-axis servo, 1-axis spindle (with converter)		
Nominal maximum current (spindle/servo) [A]		100/80×2	160/80×2	200/80×2
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%		
	Rated current [A]	33	43	55
Control power input	Voltage [V]	24DC Tolerable fluctuation: between +10% and -10%		
	Current [A]	MAX. 4		
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%		
Control method		Sine wave PWM control method		
Regeneration method		Power regeneration method		
Dynamic brakes (servo)		Built-in		
Machine end detector (servo)		Compatible		
Cooling method		Forced wind cooling		
Mass [kg]		14.5	14.5	14.5

Drive unit type		MDS-DM2-SPV3-10080	MDS-DM2-SPV3-16080	MDS-DM2-SPV3-20080	MDS-DM2-SPV3-200120	MDS-DM2-SPHV3-20080
Drive unit category		3-axis servo, 1-axis spindle (with converter)				
Nominal maximum current (spindle/servo) [A]		100/80×3	160/80×3	200/80×3	200/120×3	200/80×3
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%				
	Rated current [A]	38	48	60	65	60
Control power input	Voltage [V]	24DC Tolerable fluctuation: between +10% and -10%				
	Current [A]	MAX. 4				
	Frequency [Hz]	50/60 Tolerable fluctuation: between +3% and -3%				
Control method		Sine wave PWM control method				
Regeneration method		Power regeneration method				
Dynamic brakes (servo)		Built-in				
Machine end detector (servo)		Compatible				
Cooling method		Forced wind cooling				
Mass [kg]		15	15	15	15	15

Unit outline dimension drawing

Drive unit MDS-DM2-SP□V□-□

[Unit : mm]



MDS-DJ Series

All-in-one compact servo drive unit

Drive unit type		MDS-DJ-V1-10	MDS-DJ-V1-15	MDS-DJ-V1-30	MDS-DJ-V1-40	MDS-DJ-V1-80	MDS-DJ-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]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%					
	Rated current [A]	1.5	2.9	3.8	5.0	10.5	16.0
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) 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 detector		Compatible					
Cooling method		Natural cooling		Forced wind cooling			
Mass [kg]		0.8	1.0	1.4	2.3	2.3	2.3
Unit outline dimension drawing		J1	J2	J3	J4a	J4a	J4b

Drive unit type		MDS-DJ-V2-3030
Drive unit category		2-axis servo (with converter)
Nominal maximum current (peak) [A]		30/30
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%
	Rated current [A]	3.8/3.8
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%
	Current [A]	50/60 Tolerable fluctuation: between +5% and -5%
	Frequency [Hz]	MAX. 0.4
Control method		Sine wave PWM control method
Regeneration method		Power regeneration method
Dynamic brakes		Built-in
Machine end detector		Not compatible
Cooling method		Forced wind cooling
Mass [kg]		1.5
Unit outline dimension drawing		JW1

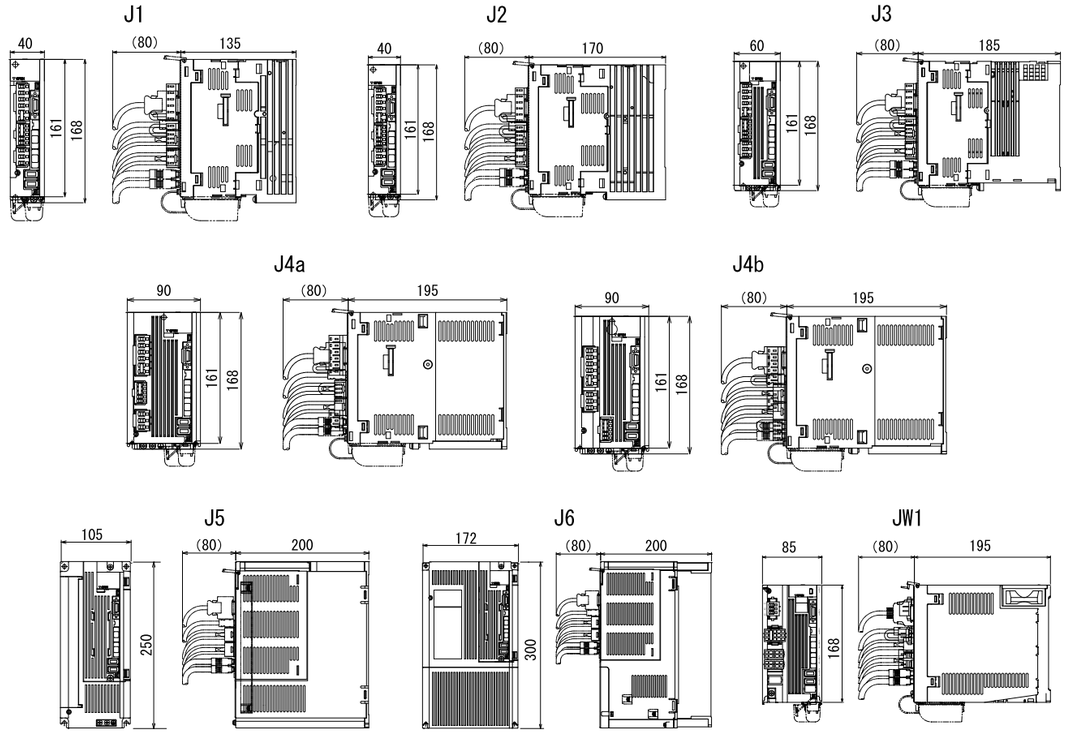
All-in-one compact spindle drive unit

Drive unit type		MDS-DJ-SP-20	MDS-DJ-SP-40	MDS-DJ-SP-80	MDS-DJ-SP-100	MDS-DJ-SP-120	MDS-DJ-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]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%					
	Rated current [A]	2.6	9.0	10.5	16.0	26.0	35.4
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) 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					
Cooling method		Forced wind cooling					
Mass [kg]		1.4	2.1	2.3	4.0	4.0	6.2
Unit outline dimension drawing		J3	J4a	J4b	J5	J5	J6

Drive unit type		MDS-DJ-SP2-2020
Drive unit category		2-axis spindle (with converter)
Nominal maximum current (peak) [A]		20/20
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%
	Rated current [A]	2.6/2.6
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable fluctuation: between +10% and -15%
	Current [A]	50/60 Tolerable fluctuation: between +5% and -5%
	Frequency [Hz]	MAX. 0.4
Control method		Sine wave PWM control method
Regeneration method		Power regeneration method
Cooling method		Forced wind cooling
Mass [kg]		1.5
Unit outline dimension drawing		JW1

Unit outline dimension drawing

[Unit : mm]



Selection of the power supply unit

For the power supply unit, calculate the spindle motor output and servo motor output each, and select the capacity satisfying the required rated capacity and the maximum momentary output.
Use of “Servo selection software” is recommended as a tool.

■Calculation of spindle output

The spindle rated output and spindle maximum momentary rated output are calculated.

(1) Calculation of spindle rated output

The spindle rated output is calculated according to the following procedure.

(a) Spindle motor rated output

The spindle motor rated output is calculated from the following expression.

Spindle motor rated output =
MAX (continuous rated output, short-time rated output × short-time rated output coefficient α, %ED rated output × %ED rated output coefficient β)

(Note) For the spindle motor rated output, use the maximum value of "continuous rated output", "short-time rated output × short-time rated output coefficient α", and "%ED rated output × %ED rated output coefficient β".

For the spindle short-time rated output coefficient α, use the value in the following table.

List of short-time rated output time and short-time rated output coefficient

Short-time rated output time	Short-time rated output coefficient α	Short-time rated output time	Short-time rated output coefficient α
1 minute	0.2	5 minutes	0.7
2 minutes	0.4	6 to 7 minutes	0.8
3 minutes	0.5	8 to 9 minutes	0.9
4 minutes	0.6	10 minutes or more	1.0

(Note 1) Select the set time for the short-time rated output of your spindle motor from the list.
E.g.) When the set time for the short-time rated output is “1/12h”, it means “5 minutes”.
(Note 2) For the motor with coil changeover specification, select the set time for the short-time rated output of the high-speed coil.

For the %ED rated output coefficient β, use the value in the following table.

List of %ED rated output time and %ED rated output coefficient

%ED rated output time	%ED rated output coefficient β
More than or equal to 10% but less than 20%	0.7
More than or equal to 20% but less than 30%	0.9
More than or equal to 30%	1.0

(b) Spindle rated output

The spindle rated output is calculated from the following expression.

Spindle rated output
=Spindle motor rated output × motor output coefficient γ of the combined spindle drive unit

For the spindle motor rated output of the above expression, use the value calculated in **(a)**.
For the motor output coefficient γ of the combined spindle drive unit, use the value corresponding to the used spindle drive unit in the following table.

Motor output coefficient list of combined spindle drive unit

MDS-D2 Series

Spindle motor rated output	Combined spindle drive unit MDS-D2-SP-								
	20	40	80	160	200	240	320	400	640
~ 1.5kW	1.00	1.15	1.25	–	–	–	–	–	–
~ 2.2kW	–	1.00	1.15	1.30	–	–	–	–	–
~ 3.7kW	–	1.00	1.05	1.20	–	–	–	–	–
~ 5.5kW	–	–	1.00	1.10	1.20	–	–	–	–
~ 7.5kW	–	–	–	1.00	1.15	1.20	–	–	–
~ 11.0kW	–	–	–	1.00	1.05	1.10	1.15	–	–
~ 15.0kW	–	–	–	–	1.00	1.05	1.10	–	–
~ 18.5kW	–	–	–	–	1.00	1.00	1.05	1.10	–
~ 22kW	–	–	–	–	–	1.00	1.00	1.05	1.15
~ 26kW	–	–	–	–	–	–	1.00	1.00	1.10
~ 30kW	–	–	–	–	–	–	1.00	1.00	1.05
~ 37kW	–	–	–	–	–	–	–	1.00	1.05
~ 45kW	–	–	–	–	–	–	–	–	1.0
~ 55kW	–	–	–	–	–	–	–	–	1.0

MDS-DH2 Series

Spindle motor rated output	Combined spindle drive unit MDS-DH2-SP-							
	20	40	80	100	160	200	320	480
~ 2.2kW	1.00	1.15	1.30	–	–	–	–	–
~ 3.7kW	1.00	1.05	1.20	–	–	–	–	–
~ 5.5kW	–	1.00	1.10	1.20	–	–	–	–
~ 7.5kW	–	–	1.00	1.15	–	–	–	–
~ 11.0kW	–	–	1.00	1.05	1.15	–	–	–
~ 15.0kW	–	–	–	1.00	1.10	–	–	–
~ 18.5kW	–	–	–	1.00	1.05	1.10	–	–
~ 22kW	–	–	–	–	1.00	1.05	1.15	–
~ 26kW	–	–	–	–	1.00	1.00	1.10	1.20
~ 30kW	–	–	–	–	1.00	1.00	1.05	1.15
~ 37kW	–	–	–	–	–	1.00	1.05	1.10
~ 45kW	–	–	–	–	–	–	1.00	1.05
~ 55kW	–	–	–	–	–	–	1.00	1.00
~ 75kW	–	–	–	–	–	–	–	1.00

POINT

[1] When the spindle motor applies to the wide range constant output specification or the high-torque specification, the spindle rated output may become large.
[2] The spindle rated output is calculated from the motor output coefficient of the spindle drive unit used in combination with the spindle motor.

(2) Calculation of spindle maximum momentary output

The spindle maximum momentary output is calculated from the following expression.

Spindle maximum momentary output
=MAX (short-time rated output × 1.2, output at acceleration/deceleration × 1.2)

(Note) For the spindle rated output, use the larger one of “short-time rated output × 1.2” and “output at acceleration/deceleration × 1.2”.

■Calculation of servo motor output

(1) Selection with rated output

(2) Selection with maximum momentary output

For the rated output and maximum momentary output of the servo motor, use the value corresponding to the servo motor in the following table.

Data for servo motor output selection

200V series

Motor HF	75	105	54	104	154	224	204	354
Rated output (kW)	0.75	1.0	0.5	1.0	1.5	2.2	2.0	3.5
Maximum momentary output (kW)	2.6	3.6	2.3	5.0	9.0	12.3	8.0	18.0

Motor HF	123	223	303	453	703	903	142	302
Rated output (kW)	1.2	2.2	3.0	4.5	7.0	9.0	1.4	3.0
Maximum momentary output (kW)	4.0	7.5	12.0	22.0	28.0	41.0	3.8	7.4

Motor HP	54	104	154	224	204	354	454	704	903	1103
Rated output (kW)	0.5	1.0	1.5	2.2	2.0	3.5	4.5	7.0	9.0	11.0
Maximum momentary output (kW)	2.3	4.3	8.0	11.0	11.0	15.0	21.0	27.0	33.0	50.0

Motor HF-KP	23	43	73
Rated output (kW)	0.2	0.4	0.75
Maximum momentary output (kW)	0.72	1.72	2.85

400V series

Motor HF	75	105	54	104	154	204	354	453	703	903
Rated output (kW)	0.75	1.0	0.5	1.0	1.5	2.0	3.5	4.5	7.0	9.0
Maximum momentary output (kW)	2.6	3.6	2.3	5.0	9.0	8.0	18.0	22.0	28.0	41.0

Motor HP-H	54	104	154	224	204	354	454	704	903	1103
Rated output (kW)	0.5	1.0	1.5	2.2	2.0	3.5	4.5	7.0	9.0	11.0
Maximum momentary output(kW)	2.3	4.3	8.0	11.0	11.0	15.0	21.0	27.0	33.0	50.0

Motor HC-H	1502S-S10
Rated output (kW)	15.0
Maximum momentary output (kW)	59.0

(Note) The maximum momentary output in this table is reference data for selecting the power supply unit and is not data which guarantees the maximum output.

■Selection of the power supply unit

Select the power supply unit from the total sum of the rate output and the maximum momentary output.

(1) Calculation of required rated output

(a) When there is only one servo motor axis

Power supply unit rated capacity > Σ (Spindle rated output) + (Servo motor rated output)

(b) When there are two or more servo motor axes

Power supply unit rated capacity > Σ (Spindle rated output) + 0.7 Σ (Servo motor rated output)

Substitute the output calculated from **(1)** of “Calculation of spindle output” and **(1)** of “Calculation of servo motor output” to the expression **(a)** and **(b)**, and calculate the total sum of the spindle rated output and servo motor rated output. According to this, select the power supply unit satisfying the rated capacity from the following table.

(2) Calculation of required maximum momentary output

Maximum momentary rated capacity of power supply unit ≧
Σ (Spindle maximum momentary output) + Σ (Maximum momentary output of servo motor accelerating / decelerating simultaneously)

Substitute the output calculated from **(2)** of “Calculation of spindle output” and **(2)** of “Calculation of servo motor output” to the above expression, and calculate the total sum of the “spindle maximum momentary output” and “output of servo motor accelerating / decelerating simultaneously”. According to this, select the power supply unit satisfying the maximum momentary rated capacity from the following table.

(3) Selection of power supply unit

Select the power supply unit of which the capacity is larger than that selected in the item **(1)** and **(2)**.

Power supply unit rated capacity and maximum momentary rated capacity

MDS-D2 Series

Unit	MDS-D2-CV-	37	75	110	185	300	370	450	550
Rated capacity (kW)		4.2	8	11.5	19	31	38	46	56
Maximum momentary rated capacity (kW)		16	23	39	60	92	101	125	175

MDS-DH2 Series

Unit	MDS-DH2-CV-	37	75	110	185	300	370	450	550	750
Rated capacity (kW)		4.2	8	11.5	19	31	38	46	56	76
Maximum momentary rated capacity (kW)		16	23	39	60	92	101	125	175	180

⚠CAUTION

1. When two or more servo motor axes are connected, do the calculation with the largest rated capacity of the servo motor if a value obtained by multiplying the total sum of the servo motor rated output by “0.7” is smaller than the largest rated capacity of the servo motors.

   Example: HF Series
   (1) For “HF903 (9.0kW) + HF104 (1.0kW)”, “0.7 × (9.0 + 1.0) = 7.0 < 9.0” is applied. So, do the calculation with applying “9.0kW” to the total sum of the servo motor’s rated output.
   (2) For “HF903 (9.0kW) + HF903 (9.0kW)”, “0.7 × (9.0 + 9.0) = 12.6 > 9.0” is applied. So, do the calculation with applying “12.6kW” to the total sum of the servo motor’s rated output.

   Example: HF-H Series
   (1) For “HF-H903 (9.0kW) + HF-H104 (1.0kW)”, “0.7 × (9.0 + 1.0) =7.0 < 9.0” is applied. So, do the calculation with applying “9.0kW” to the total sum of the servo motor’s rated output.
   (2) For “HF-H903 (9.0kW) + HF-H903 (9.0kW)”, “0.7 × (9.0 + 9.0) = 12.6 > 9.0” is applied. So, do the calculation with applying “12.6kW” to the total sum of the servo motor’s rated output.

2. When reducing the time constant replacing the conventional motor with the HF,HP,HF-KP,HF-H,HP-H or HC-H Series motor, the power supply capacity may rise because the motor maximum momentary output increases more than the conventional motor. Therefore, make sure to check the selection with maximum momentary rated capacity.

3. When the large capacity drive unit (MDS-D2-SP-400/640, MDS-DH2-SP-200/320/480, MDS-DH2-V1-200) is connected to the power supply unit, always install the drive unit proximally in the left side of the power supply unit and connect PN terminal with the dedicated DC connection bar.

4. When using two large capacity drive units or more, the power supply unit is required for each drive unit.

■Required capacity of power supply

For the power supply capacity, calculate the required spindle rated output and servo motor rated output each, and select the power supply capacity satisfying them.

(1) Spindle rate output required for power supply

The spindle rate output required for power supply is calculated from the following expression.

Spindle rate output required for power supply =
MAX (Spindle motor continuous rated output, Spindle motor output at accelerating / decelerating, Spindle motor short-time output) × motor output coefficient γ of combined spindle drive unit

(Note) For the spindle rate output required for the power supply, multiply the largest one of “spindle motor continuous rate output”, “spindle motor output at acceleration/deceleration” and “spindle motor short time output” by the motor output coefficient γ of the combined spindle drive unit. For the motor output coefficient of the combined spindle drive unit, use the value corresponding to the used spindle drive unit in the table on page 90 of **(1)** of “Calculation of spindle output”.

(2) Servo motor rate output required for power supply

For the servo motor rate output required for power supply, use the value calculated in **(1)** of “Calculation of servo motor output”.

(3) Calculation of rate output required for power supply

(a) When there is only one servo motor axis

Rated capacity required for power supply =
Σ (Spindle rate output required for power supply) + (servo motor rate output required for power supply)

(b) When there are two or more servo motor axes

Rated capacity required for power supply =
Σ (Spindle rate output required for power supply) + 0.7 Σ (servo motor rate output required for power supply)

Substitute the output calculated from the item **(1)** and **(2)** to the expression **(a)** and **(b)**, and calculate the rated capacity required for the power supply.

(4) Calculation of required power supply

Power supply capacity (kVA) =
Σ {(Required rated capacity calculated in the item (3) (kW) / Capacity of selected power supply unit (kW)) × Power supply capacity base value (kVA)}

The power supply capacity base value corresponding to the capacity of the selected power supply unit is as the following table.

MDS-D2 Series

Unit	MDS-D2-CV-	37	75	110	185	300	370	450	550
Power supply capacity base value (kVA)		5.3	11.0	16.0	27.0	43.0	53.0	64.0	78.0

MDS-DH2 Series

Unit	MDS-DH2-CV-	37	75	110	185	300	370	450	550	750
Power supply capacity base value (kVA)		5.3	11.0	16.0	27.0	43.0	53.0	64.0	78.0	107.0

■Example for power supply unit and power supply facility capacity

MDS-D2 Series

(Example 1)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X-axis	HF354	(MDS-D2-V2-160160)	3.5kW	18kW
Y-axis	HF354	(MDS-D2-V2-160160)	3.5kW	18kW
Z-axis	HF354	(MDS-D2-V1-160)	3.5kW	18kW
Spindle	Spindle motor 22kW	MDS-D2-SP-320 (Output coefficient 1.0)	22kW	26.4kW
Total			0.7 × (3.5 × 3) + 22 = 29.35kW < 31kW (D2-CV-300)	(18 × 3) + 26.4 = 80.4kW < 92kW (D-CV-300)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-D2-CV-300.
Required power supply capacity (kVA) = (29.35 / 30) × 43 = 42.1 (kVA)

(Example 2)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X1-axis	HF453	(MDS-D2-V2-160160)	4.5kW	22kW
X2-axis	HF453	(MDS-D2-V2-160160)	4.5kW	22kW
Y-axis	HF354	(MDS-D2-V2-160160)	3.5kW	18kW
Z-axis	HF354	(MDS-D2-V2-160160)	3.5kW	18kW
Spindle	Spindle motor 15kW	MDS-D2-SP-200 (Output coefficient 1.0)	15kW	18kW
Total			0.7 × (4.5 × 2 + 3.5 × 2) + 15 = 26.2kW < 31kW (D2-CV-300)	22 × 2 + 18 × 2 + 18 = 98.0kW < 101kW (D2-CV-370)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-D2-CV-370.
Required power supply capacity (kVA) = (26.2 / 37) × 53 = 37.5 (kVA)

(Example 3)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X-axis	HF354	MDS-D2-V1-160	3.5kW	18kW
Y-axis	HF204	MDS-D2-V2-8080	2.0kW	8kW
Z-axis	HF204	MDS-D2-V2-8080	2.0kW	8kW
Spindle	Spindle motor 15kW (High-torque motor)	MDS-D2-SP-320 (Output coefficient 1.1)	16.5kW	18kW
Total			0.7 × (3.5 + 2.0 × 2) + 16.5 = 21.75kW < 31kW (D2-CV-300)	18 + 8 × 2 + 18 = 52kW < 60kW (D2-CV-185)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-D2-CV-300.
Required power supply capacity (kVA) = (21.75 / 30) × 43 = 31.2 (kVA)

MDS-DH2 Series

(Example 1)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X-axis	HF-H354	(MDS-DH2-V2-8080)	3.5kW	18kW
Y-axis	HF-H354	(MDS-DH2-V2-8080)	3.5kW	18kW
Z-axis	HF-H354	(MDS-DH2-V1-80)	3.5kW	18kW
Spindle	Spindle motor 22kW	MDS-DH2-SP-160 (Output 22kW)	22kW	26.4kW
Total			0.7 × (3.5 × 3) + 22 = 29.35kW < 31kW (DH2-CV-300)	(18 × 3) + 26.4 = 80.4kW < 92kW (DH2-CV-300)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-DH2-CV-300.
Required power supply capacity (kVA) = (29.35 / 30) × 43 = 42.0 (kVA)

(Example 2)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X1-axis	HF-H453	(MDS-DH2-V2-8080)	4.5kW	22kW
X2-axis	HF-H453	(MDS-DH2-V2-8080)	4.5kW	22kW
Y-axis	HF-H354	(MDS-DH2-V2-8080)	3.5kW	18kW
Z-axis	HF-H354	(MDS-DH2-V2-8080)	3.5kW	18kW
Spindle	Spindle motor 15kW	MDS-DH2-SP-100 (Output coefficient 1.0)	15kW	18kW
Total			0.7 × (4.5 × 2 + 3.5 × 2) + 15 = 26.2kW < 31kW (DH-CV-300)	22 × 2 + 18 × 2 + 18 = 98.0kW < 101kW (DH2-CV-370)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-DH2-CV-370.
Required power supply capacity (kVA) = (26.2 / 30) × 43 = 37.6 (kVA)

(Example 3)

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X-axis	HF-H354	MDS-DH2-V1-160	3.5kW	18kW
Y-axis	HF-H204	MDS-DH2-V2-8080	2.0kW	8kW
Z-axis	HF-H204	MDS-DH2-V2-8080	2.0kW	8kW
Spindle	Spindle motor 15kW (High-torque motor)	MDS-DH2-SP-320 (Output coefficient 1.1)	16.5kW	18kW
Total			0.7 × (3.5 + 2.0 × 2) + 16.5 = 21.75kW < 31kW (DH2-CV-300)	18 + 8 × 2 + 18 = 52kW < 60kW (DH2-CV-185)

The power supply unit satisfying the total of the rate output and the maximum momentary output is MDS-DH2-CV-300.
Required power supply capacity (kVA) = (21.75 / 30) × 43 = 31.2 (kVA)

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 detector to be used			Detector signal output	Interface unit	Drive unit input signal	Battery option	Remarks
Incremental detector	Rectangular wave signal output	SR74, SR84 (MAGNESCALE)	Rectangular wave signal	–	Rectangular wave signal	–	
		Various scale	Rectangular wave signal	–	Rectangular wave signal	–	
	SIN wave signal output	LS187, LS487 (HEIDENHAIN)	SIN wave signal	IBV series (HEIDENHAIN)	Rectangular wave signal	–	
				EIB series (HEIDENHAIN)	Mitsubishi serial signal	–	
		LS187C, LS487C (HEIDENHAIN)	SIN wave signal	MDS-B-HR-11 (P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note	Distance-coded reference scale (Note 2)
				EIB series (HEIDENHAIN)			
		Various scale	SIN wave signal	MDS-B-HR-11 (P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note	Distance-coded reference scale is also available (Note 2)
				EIB series (HEIDENHAIN)			
	Mitsubishi serial signal output	SR75, SR85 (MAGNESCALE)	Mitsubishi serial signal	–	Mitsubishi serial signal	–	
Absolute position detector	Mitsubishi serial signal output	OSA105ET2A OSA166ET2NA (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	–	Mitsubishi serial signal	Required	Ball screw side detector
		SR77, SR87 (MAGNESCALE)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
		LC195M, LC495M,LC215M (HEIDENHAIN)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
		LC193M, LC493M (HEIDENHAIN)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
		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	MPS Series (MME Corp.)	SIN wave signal	ADB-20J60 (MME Corp.)	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 M700V Series for the distance-coded reference scale.

Full closed loop control for rotary axis

Machine side detector to be used			Detector signal output	Interface unit	Output signal	Battery option	Remarks
Incremental detector	Rectangular wave signal output	Various scale	Rectangular wave signal	–	Rectangular wave signal	–	
	SIN wave signal output	ERM280 Series (HEIDENHAIN)	SIN wave signal	EIB series (HEIDENHAIN)	Mitsubishi serial signal	–	
		Various scale	SIN wave signal	MDS-B-HR-11 (P) (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	(Required) Note	Distance-coded reference scale is also available (Note 2)
				EIB series (HEIDENHAIN)			
Absolute position detector	Mitsubishi serial signal output	MBA405W Series (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	–	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	
		RCN727M, RCN827M (HEIDENHAIN)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
		RA Series (Renishaw)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
		HAM Series (FAGOR)	Mitsubishi serial signal	–	Mitsubishi serial signal	Not required	
	SIN wave signal output	MPRZ Series (MME Corp.)	SIN wave signal	ADB-20J71 (MME Corp.)	Mitsubishi serial signal	Not required	
		MPI Series (MME Corp.)	SIN wave signal	ADB-20J60 (MME Corp.)	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 M700V Series for the distance-coded reference scale.

■System establishment in the synchronous control

Position command synchronous control

The synchronous control is all executed in the NC, and the each servo is controlled as an independent axis. Therefore, preparing special options for the synchronous control is not required on the servo side.

Speed command synchronization control

The common position control in two axes is performed by one linear scale. Basically, the multi axis integrated type drive unit (MDS-D2/DH2-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 detector to be used	For MDS-D2/DH2-V2/V3	For MDS-D2/DH2-V1 × 2 units	Remarks
SIN wave signal output scale	MDS-B-HR-11 (P) (Serial conversion)	MDS-B-HR-12 (P) (Serial conversion/signal division)	
Mitsubishi serial signal output scale	–	MDS-B-SD (Signal division)	Including the case that an interface unit of the scale manufacturer is used with SIN wave output scale.

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

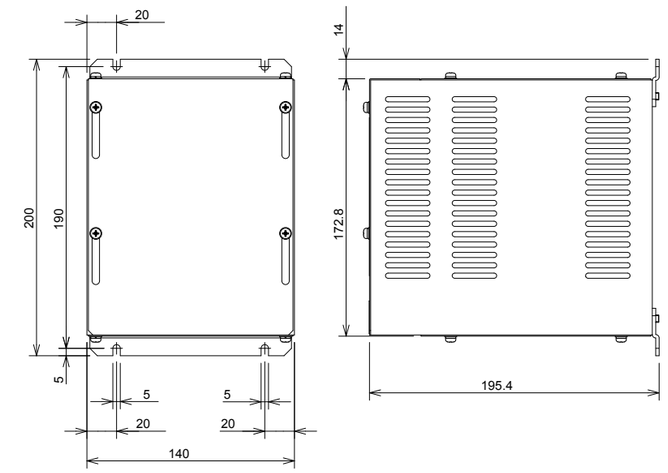
■Dynamic brake unit (MDS-D-DBU)

Specifications

Type	MDS-D-DBU
Coil specifications	24VDC 160mA
Wire size	5.5mm^2 or more (For IV wire)
Compatible drive unit	MDS-D2-V1-320W, MDS-DH2-V1-160W, MDS-DH2-V1-200
Mass	3kg

Outline dimension drawing

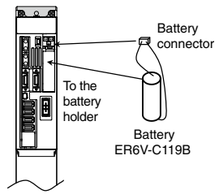
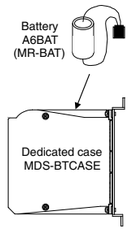
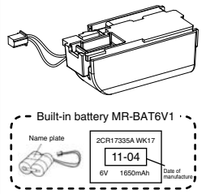
MDS-D-DBU



[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		ER6V-C119B	A6BAT (MR-BAT)	MDS-BTBOX-36	MR-BAT6V1SET
Installation type		Drive unit with battery holder type	Dedicated case type	Unit and battery integration type	Drive unit with battery holder type
Hazard class		Not applicable	Not applicable (24 or less)	Not applicable	Not applicable
Number of connectable axes		Up to 3 axes	Up to 8 axes (When using dedicated case)	Up to 8 axes	1 axis
Battery change		Possible	Possible	Possible	Possible
Appearance					
Compatible model	D2/DH2	○	○	○	–
	DM2	○	○	○	–
	DJ	–	–	–	○

■Cell battery (ER6V-C119B)

Specifications

Battery option type		Cell battery
		ER6V-C119B (Note 1)
Battery model name		ER6V
Nominal voltage		3.6V
Number of connectable axes		Up to 3 axes (Note 3)
Battery continuous backup time		Up to 2 axes: Approx. 10000 hours 3 axes connected: Approx. 6600 hours
Back up time from battery warning to alarm occurrence (Note 2)		Up to 2 axes: Approx. 100 hours 3 axes connected: Approx. 60 hours
Compatible model	D2/DH2	○
	DM2	○
	DJ	–

(Note 1) ER6V-C119B 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 detector OSA166ET2NA/OSA105ET2A, both ball screw side detector and motor side detector need to be backed up by a battery, so the number of load shaft should be two.

■Cell battery (A6BAT)

Always use the cell battery (A6BAT) in combination with the dedicated case (MDS-BTCASE).

Specifications

Battery option type	Cell battery
	A6BAT (MR-BAT)
Battery model name	ER17330V
Nominal voltage	3.6V
Number of connectable axes	1 axis / (per 1 battery)
Data save time in battery replacement	Approx.10000 hours
Back up time from battery warning to alarm occurrence (Note)	Approx. 80 hours

(Note) 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.

Specifications of the dedicated case MDS-BTCASE

Type		MDS-BTCASE
Number of batteries installed		Up to 8 A6BATs (MR-BATs) (Install either 2, 4, 6 or 8 A6BATs (MR-BATs))
Number of connectable axes		Max. 8 axes (It varies depending on the number of batteries installed.) When A6BAT (MR-BAT)×2, 1 to 2 axis/axes When A6BAT (MR-BAT)×4, 3 to 4 axes When A6BAT (MR-BAT)×6, 5 to 6 axes When A6BAT (MR-BAT)×8, 7 to 8 axes
Compatible model	D2/DH2	○
	DM2	○
	DJ	–

■Battery box (MDS-BTBOX-36)

Specifications

Battery option type		Battery box
		MDS-BTBOX-36
Battery model name		size-D alkaline batteries LR20×4 pieces (Note1)
Nominal voltage		3.6V (Unit output), 1.5V (Isolated battery)
Number of connectable axes		Up to 8 axes
Battery continuous backup time		Approx. 10000 hours (when 8 axes are connected, cumulative time in non-energized state) (Note2)
Back up time from battery warning to alarm occurrence		Approx. 336 hours (when 8 axes are connected) (Note2)
Compatible model	D2/DH2	○
	DM2	○
	DJ	–

(Note 1) Install commercially-available alkaline dry batteries into MDS-BTBOX-36. The batteries should be procured by customers.
(Note 2) These backup periods are estimated based on the JIS standard, assuming that the product is used at a room temperature. The actual backup period may vary depending on the batteries (type and storage period after production, etc.) and the operating environment. Thus, regard these values only as a guide.

■Converged battery option

When using the following battery options, the wiring between units which configure an absolute position system is required.

Battery option type	Installation type	Battery charge
A6BAT (MR-BAT)	Dedicated case type (built-in MDS-BTCASE)	Possible
MDS-BTBOX-36	Unit and battery integration type	Possible

■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		Up to 2 axes
Data save time in battery replacement		Up to 2 axes: Approx. 10000 hours
Back up time from battery warning to alarm occurrence (Note 2)		Approx. 100 hours
Compatible model	D2/DH2	–
	DM2	–
	DJ	○

(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.

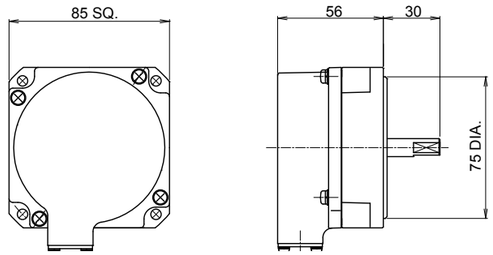
■Ball screw side detector OSA105ET2A, OSA166ET2NA

Specifications

Detector type		OSA105ET2A	OSA166ET2NA
Electrical characteristics	Detector resolution	1,000,000pulse/rev	16,000,000pulse/rev
	Detection method	Absolute position method (battery backup method)	
	Tolerable rotation speed at power off (Note)	500r/min	
	Detector output data	Serial data	
	Power consumption	0.3A	
Mechanical characteristics for rotation	Inertia	0.5×10^{-4}kgm^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/19.8N	
	Mass	0.6kg	
	Degree of protection	IP65 (The shaft-through portion is excluded.)	
	Recommended coupling	bellows coupling	
Compatible model	D2/DH2	○	○
	DM2	○	–
	DJ	○	–

Outline dimension drawing

OSA105ET2A/OSA166ET2NA



[Unit : mm]

■Twin-head magnetic detector (MBA Series)

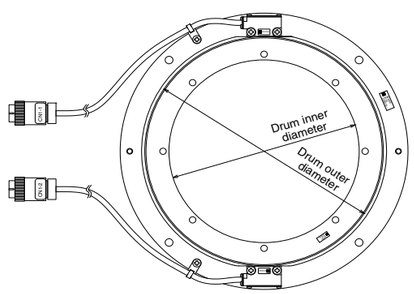
Specifications

Detector type		MBA405W-BE082	MBA405W-BF125	MBA405W-BG160
Electrical characteristics	Detector 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
	Detector output data	Serial data		
	Power consumption	0.2A or less		
Mechanical characteristics for rotation	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	ϕ 82mm	ϕ 125mm	ϕ 160mm
	Drum outer diameter	ϕ 100mm	ϕ 150.3mm	ϕ 200.6mm
	Drum mass	0.2kg	0.46kg	1.0kg
	Degree of protection (*3)	IP67		
	Outline dimension	ϕ 140mm×21.5mm	ϕ 190mm×23.5mm	ϕ 242mm×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 detector within the accuracy range specified herein. Even when the accuracy of the detector 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.

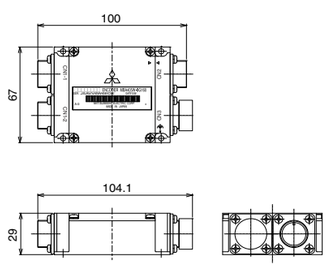
Outline dimension drawing

Detector



Preamplifier

[Unit : mm]



Spindle options

According to the spindle control to be adopted, select the spindle side detector 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 ×: Control not possible

Spindle control item	Control specifications	Without spindle side detector	With spindle side detector
Spindle control	Normal cutting control	●	This normally is not used for novariable speed control.
	Constant surface speed control (lathe)	●	
	Thread cutting (lathe)	●	
Orientation control	1-point orientation control	●	
	Multi-point orientation control	●	
	Orientation indexing	●	
Synchronous tap control	Standard synchronous tap	●	
	Synchronous tap after zero point return	●	
Spindle synchronous control	Without phase alignment function	●	
	With phase alignment function	●	
C-axis control	C-axis control	● (Note)	●

(Note) When spindle and motor are coupled with a 1:1 gear ratio, use of a spindle side detector 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 ×: Control not possible

Spindle control item	Control specifications	Without spindle side detector	With spindle side detector		
			TS5690/ERM280/ MPCI/MBE405W Series	OSE-1024	Proximity switch
Spindle control	Normal cutting control	●	●	●	–
	Constant surface speed control (lathe)	● (Note 1)	●	●	×
	Thread cutting (lathe)	×	●	●	×
Orientation control	1-point orientation control	×	●	●	● (Note 3)
	Multi-point orientation control	×	●	●	×
	Orientation indexing	×	●	●	×
Synchronous tap control	Standard synchronous tap	● (Note 2)	●	●	×
	Synchronous tap after zero point return	×	●	●	×
Spindle synchronous control	Without phase alignment function	● (Note 1)	●	●	×
	With phase alignment function	×	●	●	×
C-axis control	C-axis control	×	●	×	×

(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.

Cautions for connecting the spindle end with an OSE-1024 detector

[1] Confirm that the gear ratio (pulley ratio) of the spindle end to the detector is 1:1.
[2] Use a timing belt when connecting by a belt.

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

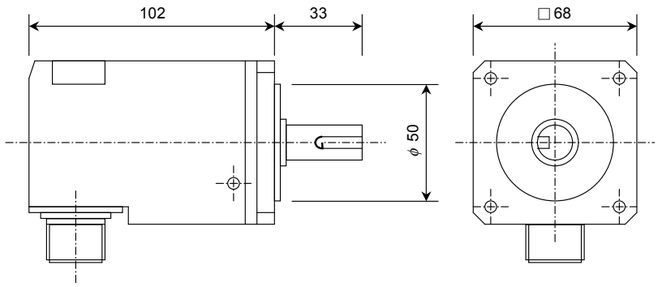
When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side detector to detect the position and speed of the spindle. Also use this detector when orientation control and synchronous tap control, etc are executed under the above conditions.

Specifications

Detector type		OSE-1024-3-15-68	OSE-1024-3-15-68-8
Mechanical characteristics for rotation	Inertia	0.1×10^{-4}kgm^2 or less	0.1×10^{-4}kgm^2 or less
	Shaft friction torque	0.98Nm or less	0.98Nm or less
	Shaft angle acceleration	10^4rad/s^2 or less	10^4rad/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	D2/DH2	○	○
	DM2	○	○
	DJ	○	○

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

Outline dimension drawing



[Unit : mm]

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

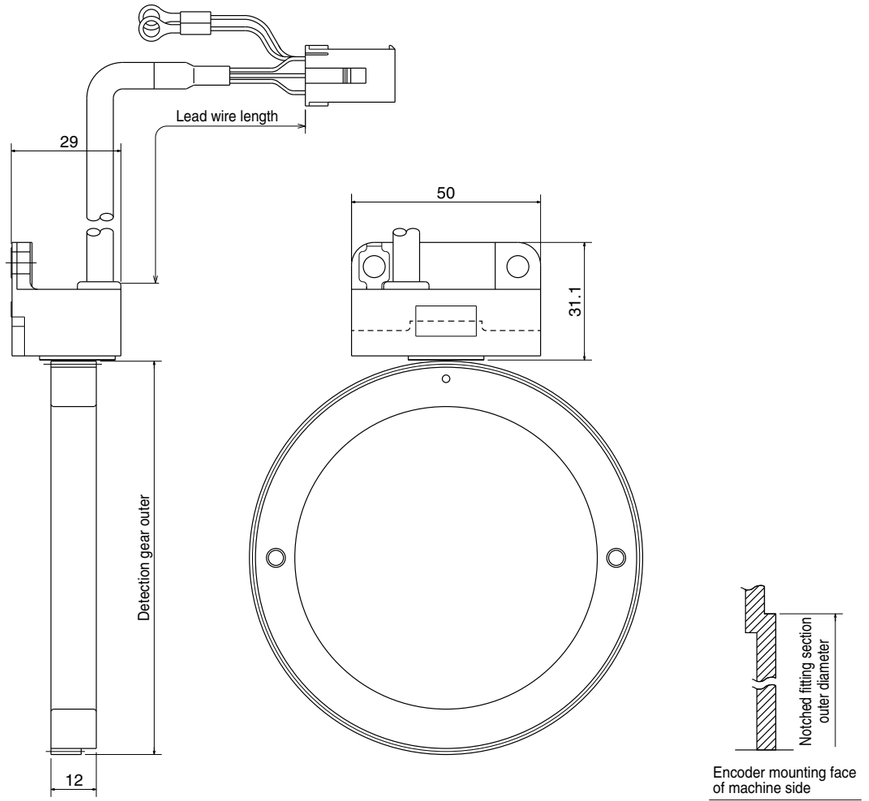
■Spindle side PLG serial output detector (TS5690, MU1606 Series)

This detector is used when a more accurate synchronous tapping control or C-axis control than OSE detector is performed to the spindle which is not directly-connected to the spindle motor.

Specifications

	Series type		TS5690N64xx					TS5690N12xx					TS5690N25xx				
Sensor	xx (The end of the type name)		10	20	30	40	60	10	20	30	40	60	10	20	30	40	60
	Length of lead	[mm]	400 ±10	800 ±20	1200 ±20	1600 ±30	2000 ±30	400 ±10	800 ±20	1200 ±20	1600 ±30	2000 ±30	400 ±10	800 ±20	1200 ±20	1600 ±30	2000 ±30
Detection gear	Type		MU1606N601					MU1606N709					MU1606N805				
	The number of teeth		64					128					256				
	Outer diameter	[mm]	ϕ52.8					ϕ104.0					ϕ206.4				
	Inner diameter	[mm]	ϕ40H5					ϕ80H5					ϕ140H5				
	Thickness	[mm]	12					12					14				
	Shrink fitting	[mm]	0.020 to 0.040					0.030 to 0.055					0.050 to 0.085				
Notched fitting section	Outer diameter	[mm]	ϕ72.0					ϕ122.0					ϕ223.6				
	Outer diameter tolerance	[mm]	+0.010 to +0.060					-0.025 to +0.025					-0.025 to +0.025				
The number of output pulse	A/B phase		64					128					256				
	Z phase		1					1					1				
Detection resolution		[p/rev]	2 million					4 million					8 million				
Absolute accuracy at stop			150"					100"					95"				
Tolerable speed		[r/min]	40,000					20,000					10,000				
Signal output			Mitsubishi high-speed serial														
Compatible model	D2/DH2		○					○					○				
	DM2		○					○					○				
	DJ		○					○					○				

Outline dimension drawing



[Unit : mm]

■Twin-head magnetic detector (MBE Series)

Specifications

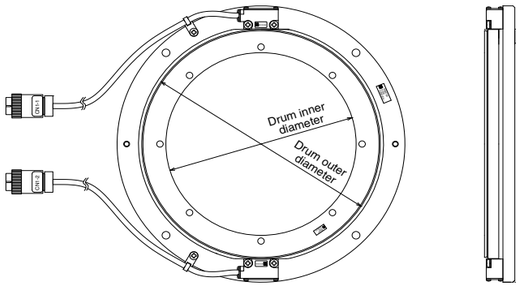
Detector type		MBE405W-BE082	MBE405W-BF125	MBE405W-BG160
Electrical characteristics	Detector resolution	4,000,000 pulse/rev		
	Detection method	Incremental		
	Accuracy (*1) (*2)	±4 seconds	±3 seconds	±2 seconds
	Wave number within one rotation	512 waves	768 waves	1024 waves
	Detector output data	Serial data		
	Power consumption	0.2A or less		
Mechanical characteristics for rotation	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	15000 r/min	10000 r/min	8000 r/min
Mechanical configuration	Drum inner diameter	ϕ 82mm	ϕ 125mm	ϕ 160mm
	Drum outer diameter	ϕ 100mm	ϕ 150.3mm	ϕ 200.6mm
	Drum mass	0.2kg	0.46kg	1.0kg
	Degree of protection (*3)	IP67		
	Outline dimension	ϕ 140mm×21.5mm	ϕ 190mm×23.5mm	ϕ 242mm×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 detector within the accuracy range specified herein. Even when the accuracy of the detector 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.

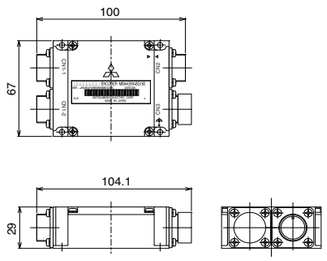
Outline dimension drawing

[Unit : mm]

Detector



Preamplifier



■Spindle side accuracy serial output detector (ERM280, MPCI Series)

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

Manufacturer		HEIDENHAIN		MHI MACHINE TOOL ENGINEERING CO., LTD
Detector type		ERM280 1200	ERM280 2048	MPCI 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	D2/DH2	○		○
	DM2	○		○
	DJ	○		○

Detector interface unit

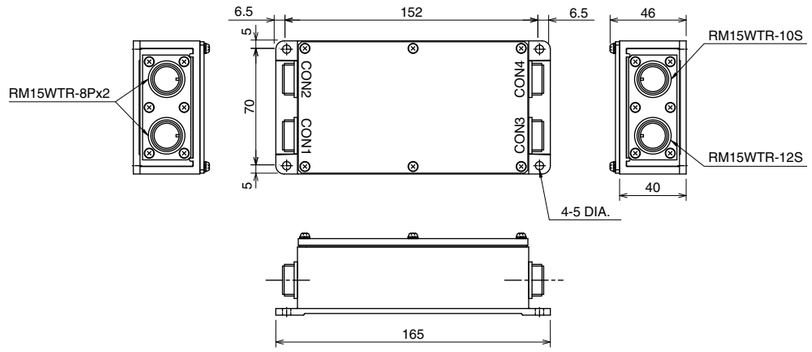
■Serial output interface unit for ABZ analog detector MDS-B-HR

This unit superimposes the scale analog output raw waves, and generates high resolution position data. Increasing the detector resolution is effective for the servo high-gain. MDS-B-HR-12 (P) is used for the synchronous control system that 1-scale 2-drive operation is possible.

Specifications

Type		MDS-B-HR-11	MDS-B-HR-12	MDS-B-HR-11P	MDS-B-HR-12P
Compatible scale (example)		LS186 / LS486/LS186C / LS486C (HEIDENHAIN)			
Signal 2-division function		×	○	×	○
Analog signal input specifications		A-phase, B-phase, Z-phase (Amplitude 1Vp-p)			
Compatible frequency		Analog raw waveform max. 200kHz			
Scale resolution		Analog raw waveform/512 division			
Input/output communication style		High-speed serial communication I/F, RS485 or equivalent			
Tolerable power voltage		5VDC±5%			
Maximum heating value		2W			
Mass		0.5kg or less			
Degree of protection		IP65		IP67	
Compatible model	D2/DH2	○	○	○	○
	DM2	○	–	○	–
	DJ	○	○	○	○

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 detector and high-speed serial linear scale. This unit is used to carry out synchronized control of the motor with two MDS-D2/ DH2-V1 drive units.

Specifications

Type		MDS-B-SD
Compatible servo drive unit		MDS-D2/DH2-V1-□
Input/output communication style		High-speed serial communication I/F, RS485 or equivalent
Tolerable power voltage		5VDC±10%
Maximum heating value		4W
Mass		0.5kg or less
Degree of protection		IP20
Compatible model	D2/DH2	○
	DM2	–
	DJ	○

■Serial output interface unit for ABZ analog detector 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 detector		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	D2/DH2	○	○	○
	DM2	○	○	○
	DJ	○	○	○

■Serial output interface unit for ABZ analog detector 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 detector		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	D2/DH2	○	○	○
	DM2	○	○	○
	DJ	○	○	○

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

Specifications

Type		ADB-20J20	ADB-20J60		ADB-20J71
Manufacturer		MHI MACHINE TOOL ENGINEERING CO., LTD			
Maximum response speed		10,000r/min	3,600m/min	5,000r/min	10,000r/min
Output signal		Mitsubishi high-speed serial signal			
Compatible detector		MPCI series	MPS series	MPI series	MPRZ series
Minimum detection resolution		0.00005° (7,200,000p/rev)	0.05μm	0.000025° (1,440,000p/rev)	0.000043° (8,388,608p/rev)
Degree of protection		IP20			
Outline dimension		190mm×160mm×40mm			
Mass		0.9kg			
Compatible model	D2/DH2	○	○	○	○
	DM2	○	○	○	○
	DJ	○	○	○	○

Drive unit option

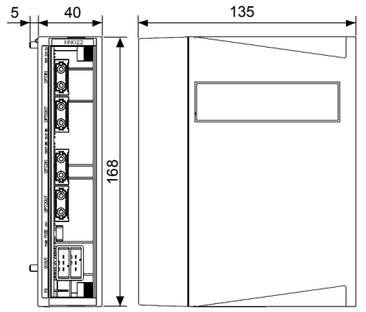
■Optical communication repeater unit (FCU7-EX022)

When the distance of the optical communication cable between NC control unit and drive unit is over 30m (M700V/M70V/E70 Series: maximum 30m, M700/M70/C70 Series: maximum 20m), the communication can be performed by relaying the optical signal.
Using up to two units, relay of the total length of up to 90m can be performed.

Specifications

Type		FCU7-EX022
DC24V input	Input voltage	24V±10% (21.6V to 26.4V)
	Inrush current	35A
	Power consumption	10W
	Consumption current	0.4A
Optical interface	Channel number	2 channels
	Connectable number	Maximum 2
Dimension	Dimension	(depth)135mm × (width)40mm × (height)168mm
	Mounting method	Screw cramp with M5 2 screw cramps
Mass		0.42kg
Compatible model	D2/DH2	○
	DM2	○
	DJ	○

Outline dimension drawing



[Unit : mm]]

■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-D2		MDS-DH2		
Large capacity drive unit		MDS-D2-SP-400 MDS-D2-SP-640	MDS-D2-SP-400 MDS-D2-SP-640	MDS-DH2-SP-200 MDS-DH2-SP-320 MDS-DH2-SP-480	MDS-DH2-V1-200 MDS-DH2-SP-200 MDS-DH2-SP-320	MDS-DH2-V1-200
Power supply unit		MDS-D2-CV-300 MDS-D2-CV-370 MDS-D2-CV-450	MDS-D2-CV-550	MDS-DH2-CV-550 MDS-DH2-CV-750	MDS-D2-CV-300 MDS-D2-CV-370 MDS-D2-CV-450	MDS-DH2-CV-185
Required connection bar		D-BAR-B1006	D-BAR-A1010 (Two-parts set)	DH-BAR-A0606 (Two-parts set)	DH-BAR-B0606	DH-BAR-C0606
Compatible model	D2/DH2	○	○	○	○	○
	DM2	–	–	–	–	–
	DJ	–	–	–	–	–

■Side protection cover (D-COVER-1)

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
	Parameter setting value		1200h	1300h	1400h	1500h	1600h	1700h	1800h
	Mass		0.5kg	0.8kg	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	350mm× 128mm× 200mm	150mm× 100mm× 318mm	350mm× 128mm× 200mm
			W1	W2	W3	W3	W4	W3	W4
	External option regenerative resistor		–	–	GZG200W120 OHMK ×3	GZG200W39 OHMK ×3	GZG300W39 OHMK ×3	GZG200W20 OHMK ×3	GZG300W20 OHMK ×3
	Regenerative capacity		30W	100W	300W	300W	500W	300W	500W
		Resistance value	40Ω	40Ω	40Ω	13Ω	13Ω	6.7Ω	6.7Ω
MDS-DJ-V1-10	10W	100Ω	○	○					
MDS-DJ-V1-15	10W	100Ω	○	○					
MDS-DJ-V1-30	20W	40Ω	○	○	○				
MDS-DJ-V1-40	100W	13Ω				○	○		
MDS-DJ-V1-80	100W	9Ω						○	○
MDS-DJ-V1-100	100W	9Ω						○	○
MDS-DJ-V2-3030	100W	9/				○	○		

Corresponding servo drive unit	Standard built-in regenerative resistor		External option regenerative resistor					
			FCUA-RB22	FCUA-RB37	FCUA-RB55	R-UNIT2	FCUA-RB55 2 units connected in parallel	FCUA-RB75/2 2 units connected in parallel
	Parameter setting value		2400h	2500h	2600h	2900h	2E00h	2D00h
	Mass		0.8kg	1.2kg	2.2kg	4.4kg	4.4kg	4.4kg
	Unit outline dimension		30mm× 60mm× 215mm	30mm× 60mm× 335mm	40mm× 80mm× 400mm	355mm× 105mm× 114mm	40mm× 80mm× 400mm	40mm× 80mm× 400mm
			W5	W5	W6	W7	W6	W6
	Regenerative capacity		155W	185W	340W	700W	680W	680W
		Resistance value	40Ω	25Ω	20Ω	15Ω	10Ω	15Ω
MDS-DJ-V1-10	10W	100Ω						
MDS-DJ-V1-15	10W	100Ω						
MDS-DJ-V1-30	20W	40Ω	○					
MDS-DJ-V1-40	100W	13Ω		○	○	○		○
MDS-DJ-V1-80	100W	9Ω				○	○	○
MDS-DJ-V1-100	100W	9Ω					○	
MDS-DJ-V2-3030	100W	9/		○	○			

Combination with servo 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
	Parameter setting value	1300h	1400h	1500h	1600h
	Mass	0.8kg	2.9kg	2.9kg	5.6kg
	Unit outline dimension	168mm× 40mm× 149mm	150mm× 100mm× 318mm	150mm× 100mm× 318mm	350mm× 128mm× 200mm
		W2	W3	W3	W4
	External option regenerative resistor	GZG200W39OHMK	GZG200W120 OHMK×3	GZG200W39 OHMK×3	GZG300W39 OHMK×3
	Regenerative capacity	100W	300W	300W	500W
	Resistance value	40Ω	40Ω	13Ω	13Ω
MDS-DJ-SP-20	–	○	○		
MDS-DJ-SP-40	–			○	○
MDS-DJ-SP-80	–			○	○
MDS-DJ-SP-100	–			○	○
MDS-DJ-SP-120	–				○
MDS-DJ-SP-160	–				
MDS-DJ-SP2-2020	–			○	○

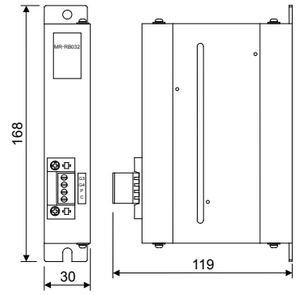
Corresponding spindle drive unit		External option regenerative resistor			
		FCUA-RB22	FCUA-RB37	FCUA-RB55	FCUA-RB75/2 (1 unit)
	Parameter setting value	2400h	2500h	2600h	2700h
	Mass	0.8kg	1.2kg	2.2kg	2.2kg
	Unit outline dimension	30mm× 60mm× 215mm	30mm× 60mm× 335mm	40mm× 80mm× 400mm	40mm× 80mm× 400mm
		W5	W5	W6	W6
	Regenerative capacity	155W	185W	340W	340W
	Resistance value	40Ω	25Ω	20Ω	30Ω
MDS-DJ-SP-20	–	○	○		
MDS-DJ-SP-40	–	○	○	○	○
MDS-DJ-SP-80	–		○	○	○
MDS-DJ-SP-100	–			○	
MDS-DJ-SP-120	–				
MDS-DJ-SP-160	–				
MDS-DJ-SP2-2020	–	○	○	○	

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
	Parameter setting value	2800h	2900h	2A00h	2B00h	2C00h	2E00h	2D00h
	Mass	4.3kg	4.4kg	10.8kg	11.0kg	15.0kg	4.4kg	4.4kg
	Unit outline dimension	355mm× 105mm× 114mm	355mm× 105mm× 114mm	375mm× 276mm× 104mm	375mm× 276mm× 104mm	375mm× 276mm× 160mm	40mm× 80mm× 400mm	40mm× 80mm× 400mm
		W7	W7	W8	W8	W9	W6	W6
	Regenerative capacity	700W	700W	2100W	2100W	3100W	680W	680W
	Resistance value	30Ω	15Ω	15Ω	10Ω	10Ω	10Ω	15Ω
MDS-DJ-SP-20	–							
MDS-DJ-SP-40	–	○	○	○				○
MDS-DJ-SP-80	–	○	○	○	○	○	○	○
MDS-DJ-SP-100	–		○	○	○	○	○	○
MDS-DJ-SP-120	–		○	○	○	○	○	○
MDS-DJ-SP-160	–				○	○		
MDS-DJ-SP2-2020	–							

External option regenerative resistor unit

[Unit : mm]

W1



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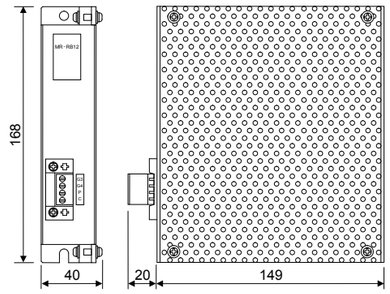

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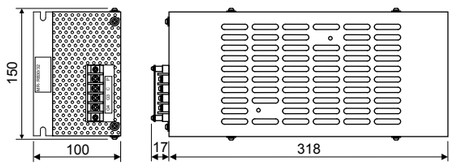
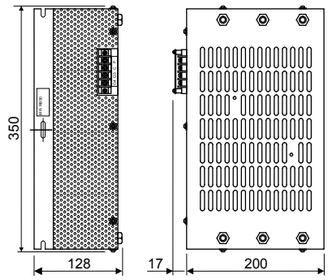


W4



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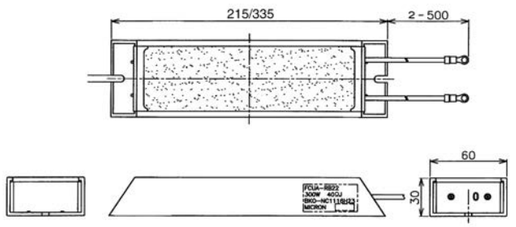
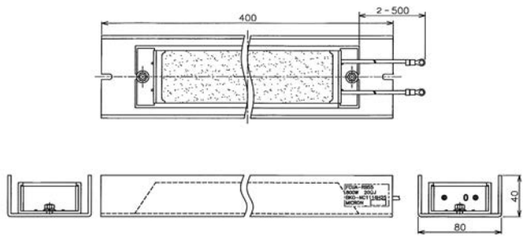
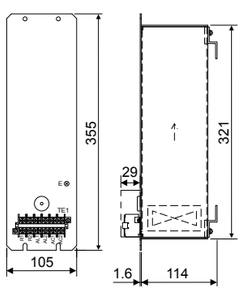


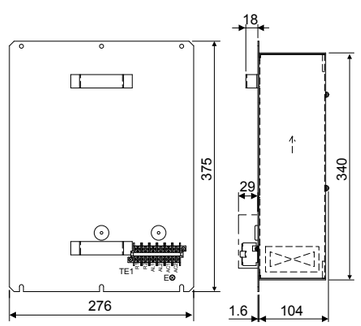
W6



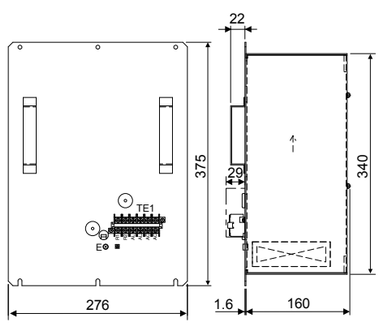
W7



W8



W9



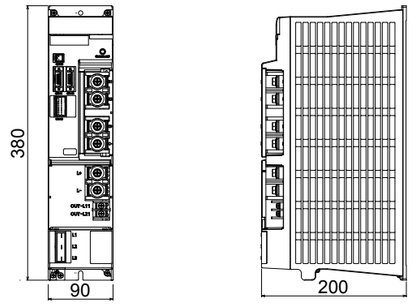
■Power backup unit MDS-D/DH-PFU

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]	AC380 to 480 (50/60Hz) Tolerable fluctuation : between +10% and -10%	AC200 to 230 (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]	DC513 to 648	DC270 to 311
	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 (AC380V input, at maximum number of drive units to connect)	75ms or more (AC200V input, at maximum number of drive units to connect)
Degree of protection			IP20 [except for the terminal block and connector area]	
Cooling method			Natural-cooling	
Mass		[kg]	4	

Outline dimension drawing



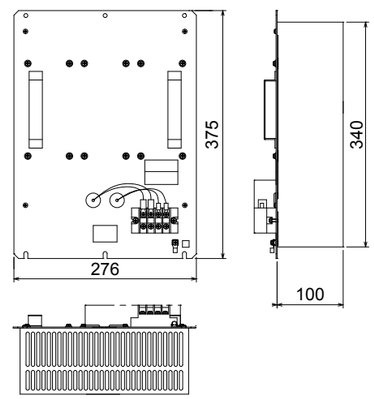
[Unit : mm]

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

Specifications

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

Outline dimension drawing



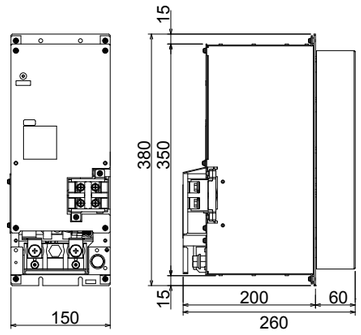
[Unit : mm]

■Capacitor unit MDS-D/DH-CU

Specifications

Capacitor unit type			MDS-DH-CU	MDS-D-CU
Compatible capacitor unit type			MDS-DH-PFU	MDS-D-PFU
Capacity		[μF]	7000	28000
DC Input/Output	Rated voltage	[V]	DC513 to 648	DC270 to 311
Cooling method			Natural-cooling	Natural-cooling
Mass		[kg]	11	11

Outline dimension drawing



[Unit : mm]

MEMO

MDS-D2 Series Power Cable and Brake Cable for Servo Motor Selection List

Servo motor type		Drive unit type MDS-D2-			Power Cable			Brake cable		
					Drive unit side	Motor side		Drive unit side	Motor side	
		V1	V2	V3		Straight	Right angle		Straight	Right angle
HF Series	HF75	20	2020 4020 (M)	202020 404040	CNU1S (AWG14)	CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNU20S (AWG14)	CNB10-R2S (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)	CNB10-R2L (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)
	HF105									
	HF123									
	HF142									
	HF54	40	4020 (L) 4040 8040 (M)	404040						
	HF104									
	HF223									
	HF302					CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)			
	HF154	80	8040 (L) 8080			CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)			
		–	16080 (M)	–	CNU1S (AWG10)					
	HF224	80	8040 (L) 8080	–	CNU1S (AWG14)					
		–	16080 (M)	–	CNU1S (AWG10)					
	HF204	80	8040 (L) 8080	–	CNU1S (AWG14)	CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)			
		–	16080 (M)	–	CNU1S (AWG10)					
	HF303	80	8040 (L) 8080	–	CNU1S (AWG14)					
		–	16080 (M)	–	CNU1S (AWG10)					
	HF354	160	16080 (L) 160160	–						
		–	160160W	–	Terminal block connection					
	HF453	160	16080 (L) 160160	–	CNU1S (AWG10)					
		–	160160W		Terminal block connection					
	HF703	160W	160160W	–		CNP32-17S (23) Applicable cable outline ϕ 22 to 23.8 (mm)	CNP32-17L (23) Applicable cable outline ϕ 22 to 23.8 (mm)			
	HF903	320	–	–						

Servo motor type		Drive unit type MDS-D2-			Power Cable			Brake cable		
					Drive unit side	Motor side		Drive unit side	Motor side	
		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
HF-KP Series	HF-KP23JW04-S6	20	2020 4020 (M)	202020	CNU1S (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	CNU20S (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
	HF-KP43JW04-S6									
	HF-KP73JW04-S6									

MDS-D2 Series Detector Cable and Connector for Servo Motor Selection List

Servo motor type		Drive unit type MDS-D2-			Servo detector cable						
					Motor side detector cable						Ball screw side detector
					Cable				Single connector		
					Detector: A48		Detector: A51/A74N		Drive unit side	Motor side	
		V1	V2	V3	Straight	Right angle	Straight	Right angle		Straight	Right angle
HF Series	HF75	20	2020 4020 (M)	202020 404040	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	CNV2E-6P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30 CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV2E-7P-□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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNV2E-6P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30
	HF105										
	HF123										
	HF142										
	HF54	40	4020 (L) 4040 8040 (M)	404040							
	HF104										
	HF223										
	HF302										
	HF154	80	8040 (L) 8080								
		–	16080 (M)	–							
	HF224	80	8040 (L) 8080	–							
		–	16080 (M)	–							
	HF204	80	8040 (L) 8080	–							
		–	16080 (M)	–							
	HF303	80	8040 (L) 8080	–							
		–	16080 (M)	–							
	HF354	160	16080 (L) 160160	–							
		–	160160W	–							
	HF453	160	16080 (L) 160160	–							
		–	160160W	–							
	HF703	160W	160160W	–							
	HF903	320	–	–							

Servo motor type		Drive unit type MDS-D2-			Servo detector cable						
					Motor side detector cable						Ball screw side detector
					Cable (Direct connection type)		Cable (Relay type)				
							Drive unit side	Motor side			
		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		
HF-KP Series	HF-KP23JW04-S6	20	2020 4020 (M)	202020	CNV2E-K1P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNV2E-K2P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNV2E-6P-□M □ : Length (m) 15, 20, 25, 30	CNV22J-K1P-0.3M	CNV22J-K2P-0.3M		CNV2E-6P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30
	HF-KP43JW04-S6										
	HF-KP73JW04-S6										

MDS-D2 Series Power Cable for Spindle Motor Selection List

Spindle motor type		Drive unit type MDS-D2-		Power Cable	
		SP	SP2	Drive unit side	Motor side
SJ-D Series (Standard)	SJ-D3.7/100-01	80	–	CNU1S (AWG14)	Terminal block connection
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-D5.5/100-01	80	–	CNU1S (AWG14)	
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-D5.5/120-01	80	–	CNU1S (AWG14)	
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-D7.5/100-01	160	–		
		–	16080S (L)		
	SJ-D7.5/120-01	160	–		
		–	16080S (L)		
	SJ-D11/100-01	160	–		
		–	16080S (L)		
	SJ-D5.5/120-02	160 200	–		
		–	16080S (L)		
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	80	–	CNU1S (AWG14)	
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-DJ5.5/120-01	80	–	CNU1S (AWG14)	
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-DJ7.5/100-01	160	16080S (L)		
	SJ-DJ11/100-01				
	SJ-DJ15/80-01	200	–		
SJ-DL Series (Low-inertia)	SJ-DL0.75/100-01T	20	–	CNU1S (AWG14)	
		–	2020 4020 (M)		
	SJ-DL1.5/100-01T	40	–		
		–	4020 (L) 4040S		
			8040 (M)	CNU1S (AWG10)	
	SJ-DL5.5/150-01T	160	–	Terminal block connection	
		–	16080S (L)		
	SJ-DL5.5/200-01T	160	–		
		–	16080S (L)		
	SJ-DL7.5/150-01T	160	–		
		–	16080S (L)		

Spindle motor type		Drive unit type MDS-D2-		Power Cable	
		SP	SP2	Drive unit side	Motor side
SJ-V Series (Standard)	SJ-V2.2-01T	40	4020 (L) 4040S	CNU1S (AWG14)	Terminal block connection
		–	8040 (M)	CNU1S (AWG10)	
	SJ-VL2.2-02ZT	40	4020 (L) 4040S	CNU1S (AWG14)	
		–	8040 (M)	CNU1S (AWG10)	
	SJ-V3.7-02ZT	80	–	CNU1S (AWG14)	
		–	8040 (L) 8080	CNU1S (AWG10)	
			16080S (M)	Terminal block connection	
	SJ-V7.5-03ZT	160	16080S (L)		
	SJ-V11-08ZT	200	–		
	SJ-V11-13ZT				
	SJ-V15-01ZT				
	SJ-V15-09ZT				
	SJ-V18.5-01ZT				
	SJ-V22-01ZT	240			
	SJ-V22-06ZT				
	SJ-V22-04ZT	320			
	SJ-V26-01ZT				
	SJ-V37-01ZT	400			
	SJ-V45-01ZT	640			
	SJ-V55-01ZT				
SJ-V Series (Wide range constant output)	SJ-V11-01T	160	16080S (L)		
	SJ-V11-09T				
	SJ-V15-03T	200	–		
	SJ-V18.5-03T	240			
	SJ-V22-05T	320			
	SJ-V22-09T				
	SJ-VK22-19ZT				
SJ-VL Series (Low-inertia)	SJ-VL11-02FZT	160	16080S (L)		
	SJ-VL11-05FZT-S01				
	SJ-VL18.5-05FZT	240	–		

MDS-D2 Series Detector Cable and Connector for Spindle Motor Selection List

Spindle motor type		Drive unit type MDS-D2-		Spindle detector cable								
				When connecting to a spindle motor			When connecting to a spindle side detector					
				Motor side PLG cable			Spindle side accuracy detector TS5690 cable			Spindle side detector OSE-1024 cable		
				Cable	Single connector		Cable	Single connector		Cable		Single connector
		SP	SP2		Drive unit side	Detector side		Drive unit side	Detector side	Straight	Right angle	Drive unit side
SJ-D Series (Standard)	SJ-D3.7/100-01	80	–	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)
		–	8040 (L) 8080									
			16080S (M)									
	SJ-D5.5/100-01	80	–									
		–	8040 (L) 8080									
			16080S (M)									
	SJ-D5.5/120-01	80	–									
		–	8040 (L) 8080									
			16080S (M)									
	SJ-D7.5/100-01	160	–									
		–	16080S (L)									
	SJ-D7.5/120-01	160	–									
		–	16080S (L)									
	SJ-D11/100-01	160	–									
		–	16080S (L)									
	SJ-D5.5/120-02	160 200	–									
		–	16080S (L)									
SJ-DJ Series (Compact & lightweight specifications)	SJ-DJ5.5/100-01	80	–									
		–	8040 (L) 8080									
			16080S (M)									
	SJ-DJ5.5/120-01	80	–									
		–	8040 (L) 8080									
			16080S (M)									
	SJ-DJ7.5/100-01 SJ-DJ11/100-01	160	16080S (L)									
	SJ-DJ15/80-01	200	–									
SJ-DL Series (Low-inertia)	SJ-DL0.75/100-01T	20	–									
		–	2020 4020 (M)									
	SJ-DL1.5/100-01T	40	–									
		–	4020 (L) 4040S									
			8040 (M)									
	SJ-DL5.5/150-01T	160	–									
		–	16080S (L)									
	SJ-DL5.5/200-01T	160	–									
		–	16080S (L)									
	SJ-DL7.5/150-01T	160	–									
		–	16080S (L)									
SJ-V Series (Standard)	SJ-V2.2-01T	40	4020 (L) 4040S									
		–	8040 (M)									
	SJ-VL2.2-02ZT	40	4020 (L) 4040S									
		–	8040 (M)									
	SJ-V3.7-02ZT	80	–									
		–	8040 (L) 8080									
			16080S (M)									
	SJ-V7.5-03ZT	160	16080S (L)									
	SJ-V11-08ZT	200	–									
	SJ-V11-13ZT											
	SJ-V15-01ZT											
	SJ-V15-09ZT											
	SJ-V18.5-01ZT											
	SJ-V22-01ZT	240										
	SJ-V22-06ZT											
	SJ-V22-04ZT	320										
	SJ-V26-01ZT											
	SJ-V37-01ZT	400										
	SJ-V45-01ZT	640										
	SJ-V55-01ZT											
SJ-V Series (Wide range constant output)	SJ-V11-01T	160	16080S (L)									
	SJ-V11-09T											
	SJ-V15-03T	200	–									
	SJ-V18.5-03T	240										
	SJ-V22-05T	320										
	SJ-V22-09T											
	SJ-VK22-19ZT											
SJ-VL Series (Low-inertia)	SJ-VL11-02FZT	160	16080S (L)									
	SJ-VL11-05FZT-S01											
	SJ-VL18.5-05FZT	240	–									

MDS-D2 Series Power Cable for Tool Spindle Motor Selection List

Tool spindle motor type		Drive unit type MDS-D2-		Power Cable				
				Drive unit side	Motor side			
		SP	SP2		Straight	Right angle	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft
HF-KP Series	HF-KP46-JW09	20	2020 4020 (M)	CNU1S (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
	HF-KP56-JW09							
	HF-KP96-JW09							
HF-SP Series	HF-SP226-JW09	80	–		CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)	–	–
		–	8040 (L) 8080	CNU1S (AWG10)				
			16080S (M)	Terminal block connection				
	HF-SP406-JW09	160	16080S (L)					
HF Series	HF75-A48	20	2020 4020 (M)	CNU1S (AWG14)				
	HF105-A48							
	HF123-A48							
	HF54-A48 HF104-A48 HF223-A48	40	4020 (L) 4040S					
		–	8040 (M)	CNU1S (AWG10)				
	HF154-A48 HF224-A48 HF204-A48 HF303-A48	80	–	CNU1S (AWG14)				
		–	8040 (L)	CNU1S (AWG10)				
			8080					
			16080S (M)	Terminal block connection				
	HF354-A48	160	16080S (L)		CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)		
	HF453-A48							
	HF703-A48							
	HF903-A48	320	–		CNP32-17S (23) Applicable cable outline ϕ 22 to 23.8 (mm)	CNP32-17L (23) Applicable cable outline ϕ 22 to 23.8 (mm)		

MDS-D2 Series Detector Cable and Connector for Tool Spindle Motor Selection List

Tool spindle motor type		Drive unit type MDS-D2-		Spindle detector cable								
				When connecting to a tool spindle motor (HF-KP)			When connecting to a spindle side detector					
				Cable		Single connector	Spindle side accuracy detector TS5690 cable			Spindle side detector OSE-1024 cable		
						Drive unit side	Motor side			Cable	Single connector		Cable		Single connector
		SP	SP2	Straight	Right angle		Straight	Right angle		Drive unit side	Detector side	Straight	Right angle	Drive unit side
HF-KP Series	HF-KP46-JW09	20	2020 4020 (M)	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	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)
	HF-KP56-JW09													
	HF-KP96-JW09													

Tool spindle motor type		Drive unit type MDS-D2-		Spindle detector cable								
				When connecting to a tool spindle motor (HF/HF-SP)			When connecting to a spindle side detector					
				Cable		Single connector	Spindle side accuracy detector TS5690 cable			Spindle side detector OSE-1024 cable		
						Drive unit side	Motor side			Cable	Single connector		Cable		Single connector
		SP	SP2	Straight	Right angle		Straight	Right angle		Drive unit side	Detector side	Straight	Right angle	Drive unit side
HF-SP Series	HF-SP226-JW09	80	–	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	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)
		–	8040 (L) 8080											
			16080S (M)											
	HF-SP406-JW09	160	16080S (L)											
HF Series	HF75-A48	20	2020 4020 (M)											
	HF105-A48													
	HF123-A48													
	HF54-A48 HF104-A48 HF223-A48	40	4020 (L) 4040S											
		–	8040 (M)											
	HF154-A48 HF224-A48 HF204-A48 HF303-A48	80	–											
		–	8040 (L) 16080S (M) 8080											
	HF354-A48	160	16080S (L)											
	HF453-A48													
	HF703-A48													
	HF903-A48	320	–											

MDS-DM2 Series Power Cable and Brake Cable for Servo Motor Selection List

Servo motor type		Drive unit type MDS-DM2-			Power Cable			Brake cable		
					Drive unit side	Motor side		Drive unit side	Motor side	
		SPV2	SPV3	SPHV3	CN31(L/M/S)	Straight	Right angle		Straight	Right angle
HF Series	HF54	10080 16080 20080	10080 16080 20080	20080	RCN31S RCN31M Applicable cable outline ϕ 1.25 to 5.5 (mm)	CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNU20S (AWG14)	CNB10-R2S (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)	CNB10-R2L (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)
	HF104									
	HF223									
	HF302					CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)			
	HF154		10080 16080 20080 200120			CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)			
	HF224									
	HF204					CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)			
	HF303									
	HF354	–	200120	–						
	HF453	–		–						

MDS-DM2 Series Detector Cable and Connector for Servo Motor Selection List

Servo motor type		Drive unit type MDS-DM2-			Servo detector cable Motor side detector cable				
					Cable		Single connector		
							Drive unit side	Motor side	
		SPV2	SPV3	SPHV3	Straight	Right angle		Straight	Right angle
HF Series	HF54	10080 16080 20080	10080 16080 20080	20080	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)
	HF104								
	HF223								
	HF302								
	HF154		10080 16080 20080 200120						
	HF224								
	HF204								
	HF303								
	HF354	–	200120	–					
	HF453	–		–					

MDS-DM2 Series Power Cable, Detector Cable, and Connector for Spindle Motor Selection List

Spindle motor type		Drive unit type MDS-DM2-			Power Cable		Spindle detector cable								
							When connecting to a spindle motor			When connecting to a spindle side detector					
							Motor side PLG cable			Spindle side accuracy detector TS5690 cable		Spindle side detector OSE-1024 cable			
					Drive unit side	Motor side	Cable	Single connector		Cable	Single connector		Cable		Single connector
								Drive unit side	Detector side		Drive unit side	Detector side	Straight	Right angle	Drive unit side
		SPV2	SPV3	SPHV3											
SJ-D Series (Standard)	SJ-D5.5/100-01	10080	10080	–	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)
	SJ-D5.5/120-01														
	SJ-D7.5/100-01														
	SJ-D7.5/120-01														
	SJ-D11/100-01	16080	16080	–											
	SJ-D5.5/120-02	10080 16080 20080	10080 16080 20080	–											
SJ-DJ Series (Compact & lightweight specifications)	SJ-DJ5.5/100-01	10080	10080	–											
	SJ-DJ5.5/120-01														
	SJ-DJ7.5/100-01														
	SJ-DJ11/100-01	16080	16080	–											
	SJ-DJ15/80-01	20080	20080	–											
SJ-DL Series (Low-inertia)	SJ-DL5.5/150-01T	16080	16080	–											
	SJ-DL7.5/150-01T			–											
SJ-V Series (Standard)	SJ-V7.5-03ZT	16080	16080	–											
	SJ-V11-08ZT	–	–	20080											
	SJ-V11-13ZT	20080	20080	–											
	SJ-V15-01ZT														
	SJ-V15-09ZT	–	–	20080											
SJ-V Series (Wide range constant output)	SJ-V11-01T	16080	16080	–											
	SJ-V11-09T														
	SJ-V15-03T	–	–	20080											
SJ-VL Series (Low-inertia)	SJ-VL11-02FZT	16080	16080	–											
	SJ-VL11-05FZT-S01														

MDS-DJ Series Power Cable and Brake Cable for Servo Motor Selection List

Servo motor type		Drive unit type MDS-DJ-		Power Cable			Brake Cable	
				Drive unit side	Motor side		Motor side	
		V1	V2		Straight	Right angle	Straight	Right angle
HF Series	HF75	30	3030	Supplied for each drive unit	CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNB10-R2S (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)	CNB10-R2L (6) Applicable cable outline ϕ 4.0 to 6.0 (mm)
	HF105							
	HF123	40	–					
	HF142							
	HF54	30	3030					
	HF104	40	–					
	HF223							
	HF302				CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)		
	HF154	80	–		CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (mm)		
	HF224							
	HF204							
	HF303				CNP22-22S (16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)		
	HF354	100	–					

Servo motor type		Drive unit type MDS-DJ-		Power Cable			Brake Cable	
				Drive unit side	Motor side		Motor side	
		V1	V2		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
HF-KP Series	HF-KP13J-S17	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
	HF-KP23JW04-S6							
	HF-KP43JW04-S6	15	–					
	HF-KP73JW04-S6	30	3030					

MDS-DJ Series Detector Cable and Connector for Servo Motor Selection List

Servo motor type		Drive unit type MDS-DJ-		Servo detector cable								
				Motor side detector cable					Ball screw side detector			
				Cable		Single connector			Ball screw side detector OSA105-ET2			
						Drive unit side	Motor side		Cable		Single connector	
		V1	V2	Straight	Right angle		Straight	Right angle	Straight	Right angle	Straight	Right angle
HF Series	HF75	30	3030	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)
	HF105											
	HF123	40	–									
	HF142											
	HF54	30	3030									
	HF104	40	–									
	HF223											
	HF302											
	HF154	80	–									
	HF224											
	HF204											
	HF303											
	HF354	100	–									

Servo motor type		Drive unit type MDS-DJ-		Servo detector cable								
				Motor side detector cable					Ball screw side detector			
				Cable (Direct connection type)		Cable (Relay type)			Ball screw side detector OSA105-ET2			
							Motor side		Cable		Single connector	
		V1	V2	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Drive unit side	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Straight	Right angle	Straight	Right angle
HF-KP Series	HF-KP13J-S17	10	–	CNV2E-K1P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNV2E-K2P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNV2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNV22J-K1P-0.3M Length : 0.3 (m) Compatible with only IP65	CNV22J-K2P-0.3M Length : 0.3 (m) Compatible with only IP65	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)
	HF-KP23JW04-S6											
	HF-KP43JW04-S6	15	–									
	HF-KP73JW04-S6	30	3030									

MDS-DJ Series Power Cable, Detector Cable, and Connector for Spindle Motor Selection List

Spindle motor type		Drive unit type MDS-DJ-SP-	Power Cable		Spindle detector cable								
			When connecting to a spindle motor		When connecting to a spindle motor			When connecting to a spindle side detector					
					Motor side PLG cable			Spindle side accuracy detector TS5690 cable			Spindle side detector OSE-1024 cable		
			Drive unit side	Motor side	Cable	Single connector		Cable	Single connector		Cable		Single connector
						Drive unit side	Detector side		Drive unit side	Detector side	Straight	Right angle	Drive unit side
SJ-D Series (Standard)	SJ-D3.7/100-01	80	Supplied for each drive unit	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)
	SJ-D5.5/100-01	100											
	SJ-D5.5/120-01												
	SJ-D7.5/100-01	120											
	SJ-D7.5/120-01												
	SJ-D11/100-01	160											
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	100											
	SJ-DJ5.5/120-01												
	SJ-DJ7.5/100-01	120											
	SJ-DJ11/100-01	160											
SJ-V Series (Standard)	SJ-V2.2-01T	40	Supplied for each drive unit										
	SJ-VL2.2-02ZT	80											
	SJ-V7.5-03ZT	160	Terminal block connection										
SJ-VL Series (Low-inertia)	SJ-VL11-05FZT-S01	160	Terminal block connection										

MDS-DJ Series Power Cable, Detector Cable, and Connector for Tool Spindle Motor Selection List

Tool spindle motor type		Drive unit type MDS-DJ-		Power Cable			Spindle detector cable					
				Drive unit side	Motor side		Cable		Single connector			
									Drive unit side	Motor side		
		SP	SP2		Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Straight	Right angle		Straight	Right angle	
HF-KP Series	HF-KP46-JW09	20	2020	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	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) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	
	HF-KP56-JW09											
	HF-KP96-JW09											

Tool spindle motor type		Drive unit type MDS-DJ-		Power Cable			Spindle detector cable					
				Drive unit side	Motor side		Cable		Single connector			
									Drive unit side	Motor side		
		SP	SP2		Straight	Right angle	Straight	Right angle		Straight	Right angle	
HF Series	HF75-A48	20	2020	Supplied for each drive unit	CNP18-10S (14) Applicable cable outline ϕ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline ϕ 10.5 to 14 (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	CNU2S (AWG18)	CNE10-R10S (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline ϕ 6.0 to 9.0 (mm)	
	HF105-A48											
	HF123-A48											
	HF54-A48											
	HF104-A48	40	–									
	HF223-A48											
	HF154-A48	80	–									
	HF224-A48											
	HF204-A48				CNP22-22S(16) Applicable cable outline ϕ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline ϕ 12.5 to 16 (mm)						
	HF303-A48											

<Optical communication cable>

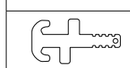
Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN1A/ CN1B/ OPT1A	Optical communication cable For wiring between drive units (inside panel)	G396 L0.3M	0.3		○	○	○
		G396 L0.5M	0.5				
		G396 L1M	1				
		G396 L2M	2				
		G396 L3M	3				
		G396 L5M	5				
	Optical communication cable For wiring between drive units (outside panel) For wiring between NC-drive units	G395 L3M	3		○	○	○
		G395 L5M	5				
		G395 L7M	7				
		G395 L10M	10				
	Optical communication cable For wiring between drive units (outside panel) For optical communication repeater unit	G380 L5M	5		○	○	○
		G380 L10M	10				
		G380 L12M	12				
		G380 L15M	15				
		G380 L20M	20				
		G380 L25M	25				
		G380 L30M	30				

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

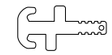
<Battery cable and connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For battery unit	Battery cable (For drive unit - battery unit)	DG21-0.3M	0.3		○	○	–
		DG21-0.5M	0.5				
		DG21-1M	1				
		DG21-5M	5				
	Battery cable (For drive unit -Battery box) (Note) The battery box side is connected using a bare conductor or a terminal bar.	DG23-0.3M	0.3		○	○	–
		DG23-0.5M	0.5				
		DG23-1M	1				
		DG23-2M	2				
		DG23-3M	3				
		DG23-5M	5				
		DG23-7M	7				
		DG23-10M	10				
	5V supply/DO output cable (For drive unit -Battery box) (Note) The battery box side is connected using a bare conductor or a terminal bar.	DG24-0.3M	0.3		○	○	–
		DG24-0.5M	0.5				
		DG24-1M	1				
		DG24-2M	2				
		DG24-3M	3				
		DG24-5M	5				
		DG24-7M	7				
		DG24-10M	10				
For drive unit	Battery cable (For drive unit - drive unit) (Note) This cable is required to supply the power from the battery unit to multiple drive units.	DG22-0.3M	0.3		○	○	–
		DG22-0.5M	0.5				
		DG22-1M	1				
		DG22-2M	2				
		DG22-3M	3				
		DG22-5M	5				
		DG22-7M	7				
		DG22-10M	10				
For CN9	Battery cable Connector set	FCUA-CS000	–		○	○	–

<Power supply communication cable and connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN4/9	Power supply communication cable	SH21	0.35 0.5 0.7 1 1.5 2 2.5 3 3.5 4 4.5 5 6 7 8 9 10 15 20 30		○	–	–
	Power supply communication cable connector set	FCUA-CS000	–		○	–	–
For CN23	Contactor control output connector Applicable cable outline: 0.85mm^2 to 3.5mm^2 Finish outside diameter: to ϕ 4.2mm	CNU23SCV2 (AWG14) These connectors are supplied for each power supply unit.	–		○	–	–
					○	–	–
For CN24	External emergency stop input connector	CNU24S (AWG24)	–		○	–	–

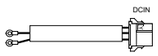
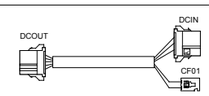
<Power backup unit connector>

Item		Model	Length (m)	Contents	Compatible model	
					D-PFU	DH-PFU
For CN41	Power supply communication cable	SH21	0.35 0.5 0.7 1 1.5 2 2.5 3 3.5 4 4.5 5 6 7 8 9 10 15 20 30		○	○
For CN43	Input/output connector for power backup unit	CNU43S (AWG22)	–		○	○
For TE1	Power connector for power backup unit	CNU01SPFU (AWG14)	–		○	○
			–		○	○

<STO input connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN8	STO cable	MR-D05UDL3M-B	–		○	○	○
	STO short-circuit connector	These connectors are supplied for each drive unit.	–	Required when not using dedicated wiring STO function. 	○	○	○

<Optical communication repeater unit>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For OPT1/2	Optical communication cable For wiring between drive unit and optical communication repeater unit/ For wiring between optical communication repeater units	G380 L5M	5		○	○	○
		G380 L10M	10				
		G380 L12M	12				
		G380 L15M	15				
		G380 L20M	20				
		G380 L25M	25				
		G380 L30M	30				
For DCIN	For optical communication repeater unit DC24V power cable	F070	0.5 1.5 3 5 8 10 15 20		○	○	○
For DCIN/ ACFAIL	For optical communication repeater unit/ For connecting Mitsubishi power unit PD25, PD27 DC24V power cable (power OFF detection)	F110	0.5 1.5 3 5 8 10 15		○	○	○

<Servo / tool spindle detector cable and connector>

Item			Model	Length (m)	Contents	Compatible model		
						D2/DH2	DM2	DJ
For CN2/3	For HF/HF-H, HF-KP (Tool spindle) Motor side detector cable (for A48/A51/ A74N)		CNV2E-8P-2M	2		○	○	○
			CNV2E-8P-3M	3				
			CNV2E-8P-4M	4				
			CNV2E-8P-5M	5				
			CNV2E-8P-7M	7				
			CNV2E-8P-10M	10				
			CNV2E-8P-15M	15				
			CNV2E-8P-20M	20				
			CNV2E-8P-25M	25				
			CNV2E-8P-30M	30				
			CNV2E-9P-2M	2		○	○	○
			CNV2E-9P-3M	3				
			CNV2E-9P-4M	4				
			CNV2E-9P-5M	5				
			CNV2E-9P-7M	7				
			CNV2E-9P-10M	10				
			CNV2E-9P-15M	15				
			CNV2E-9P-20M	20				
			CNV2E-9P-25M	25				
			CNV2E-9P-30M	30				
For CN2/3	Direct connection type	For HF-KP (Servo) Motor side detector cable Lead out in direction of motor shaft Compatible with only IP65	CNV2E-K1P-2M	2		○	–	○
			CNV2E-K1P-3M	3				
			CNV2E-K1P-5M	5				
			CNV2E-K1P-7M	7				
			CNV2E-K1P-10M	10				
		For HF-KP (Servo) Motor side detector cable Lead out in opposite direction of motor shaft Compatible with only IP65	CNV2E-K2P-2M	2		○	–	○
			CNV2E-K2P-3M	3				
			CNV2E-K2P-5M	5				
			CNV2E-K2P-7M	7				
			CNV2E-K2P-10M	10				
	Relay type (Note)	For HF-KP (Servo) Motor side detector relay cable (motor side) Lead out in direction of motor shaft Compatible with only IP65	CNV22J-K1P-0.3M	0.3		○	–	○
		For HF-KP (Servo) Motor side detector relay cable (motor side) Lead out in opposite direction of motor shaft Compatible with only IP65	CNV22J-K2P-0.3M	0.3		○	–	○
		For HF-KP (Servo) Motor side detector relay cable (Drive unit side)	CNV2E-8P-2M	2		○	–	○
			CNV2E-8P-3M	3				
			CNV2E-8P-4M	4				
			CNV2E-8P-5M	5				
			CNV2E-8P-7M	7				
			CNV2E-8P-10M	10				
			CNV2E-8P-15M	15				
			CNV2E-8P-20M	20				
			CNV2E-8P-25M	25				
			CNV2E-8P-30M	30				
For motor detector/ Ball screw side detector	Motor side detector connector/ Ball screw side detector connector		CNE10-R10S (9)	–		○	○	○
	Applicable cable outline ϕ 6.0 to 9.0mm		CNE10-R10L (9)	–		○	○	○

(Note) When using cable of 15m or longer, use relay cable.

<Servo / tool spindle detector cable and connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN2/3	MDS-B-HR unit cable	CNV2E-HP-2M	2		○	○	○
		CNV2E-HP-3M	3				
		CNV2E-HP-4M	4				
		CNV2E-HP-5M	5				
		CNV2E-HP-7M	7				
		CNV2E-HP-10M	10				
		CNV2E-HP-15M	15				
		CNV2E-HP-20M	20				
		CNV2E-HP-25M	25				
		CNV2E-HP-30M	30				
For MDS-B-HR unit	MDS-B-HR connector (For CON1,2: 1) (For CON3: 1) Applicable cable outline ϕ 8.5 to 11mm	CNEHRS (10)	–		○	○	○
For CN3	MDS-B-SD unit cable	CNV2E-D-2M	2		○	–	–
		CNV2E-D-3M	3				
		CNV2E-D-4M	4				
		CNV2E-D-5M	5				
		CNV2E-D-7M	7				
		CNV2E-D-10M	10				
		CNV2E-D-15M	15				
		CNV2E-D-20M	20				
		CNV2E-D-25M	25				
		CNV2E-D-30M	30				
For MDS-B-SD unit	MDS-B-SD connector (Two-piece set)	FCUA-CS000	–		○	–	–
For CN2/3	Detector connector	CNU2S (AWG18)	–		○	○	○

<Brake cable and connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For motor brake	Brake connector for <200V Series> HF <400V Series> HF-H brake connector Applicable cable outline ϕ 4.0 to 6.0mm	CNB10-R2S (6)	–		○	○	○
		CNB10-R2L (6)	–		○	○	○
	Brake cable for <200V Series> HF-KP Lead out in direction of motor shaft	MR-BKS1CBL 2M-A1-H	2		○	○	○
		MR-BKS1CBL 3M-A1-H	3				
		MR-BKS1CBL 5M-A1-H	5				
		MR-BKS1CBL 7M-A1-H	7				
		MR-BKS1CBL 10M-A1-H	10				
	Brake cable for <200V Series> HF-KP Lead out in opposite direction of motor shaft	MR-BKS1CBL 2M-A2-H	2		○	○	○
		MR-BKS1CBL 3M-A2-H	3				
		MR-BKS1CBL 5M-A2-H	5				
		MR-BKS1CBL 7M-A2-H	7				
		MR-BKS1CBL 10M-A2-H	10				
For CN20	Brake connector for motor brake control output	CNU20S (AWG14)	–		○	○	–

<Power cable>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For motor power	Power connector for <200V Series> HF75, 105, 54, 104, 154, 224, 123, 223, 142 <400V Series> HF-H54, 75, 104, 105, 154 Applicable cable outline ϕ 10.5 to 14mm	CNP18-10S (14)	–		○	○	○
		CNP18-10L (14)	–		○	○	○
	Power connector for <200V Series> HF204, 354, 303, 453, 302 <400V Series> HF-H204, 354, 453, 703 Applicable cable outline ϕ 12.5 to 16mm	CNP22-22S (16)	–		○	○	○
		CNP22-22L (16)	–		○	○	○
	Power connector for <200V Series> HF703, 903 <400V Series> HF-H903 Applicable cable outline ϕ 22 to 23.8mm	CNP32-17S (23)	–		○	–	–
		CNP32-17L (23)	–		○	–	–
	Power cable for <200V Series> HF-KP Lead out in direction of motor shaft	MR-PWS1CBL 2M-A1-H	2		○	–	○
		MR-PWS1CBL 3M-A1-H	3				
		MR-PWS1CBL 5M-A1-H	5				
		MR-PWS1CBL 7M-A1-H	7				
		MR-PWS1CBL 10M-A1-H	10				
	Power cable for <200V Series> HF-KP (Note) It can not be used with HF-KP13. Lead out in opposite direction of motor shaft	MR-PWS1CBL 2M-A2-H	2		○	–	○
		MR-PWS1CBL 3M-A2-H	3				
		MR-PWS1CBL 5M-A2-H	5				
		MR-PWS1CBL 7M-A2-H	7				
		MR-PWS1CBL 10M-A2-H	10				
For TE1	Power connector for MDS-D2-V1-20 to 80 MDS-D2-V2-2020 to 8080 MDS-D2-SP-20 to 40 MDS-D2-SP2-2020 to 4040 MDS-DH2-V1-10 to 80 MDS-DH2-V2-1010 to 8080 MDS-DH2-SP-20, 40 MDS-D2-V3-202020 to 404040	CNU1S (AWG14)	–		○	–	–
	Power connector for MDS-D2-V1-160 MDS-D2-V2-16080, 160160 MDS-D2-SP-80 MDS-D2-SP2-8040, 8080 MDS-DH2-V1-80, 80W MDS-DH2-V2-8080W MDS-DH2-SP-80	CNU1S (AWG10)	–		○	–	–
For CN31 L/M/S	Power connector for MDS-DM2 Series	RCN31S(AWG14, AWG16) (Note) For servo 80 RCN31M(AWG10, AWG12) (Note) For servo 120	–		–	○	–
For CN22	Control power connector for MDS-DM2 Series Applicable cable outline ϕ 1.25 to 2.2mm	RCN22	–		–	○	–

<Drive unit side main circuit connector>

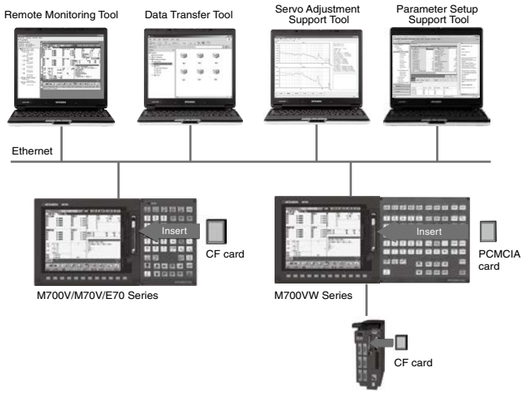
Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For drive unit	For MDS-DJ-V1-10, 15, 30 For MDS-DJ-SP-20 Applicable cable outline: 0.8mm² to 2.1mm² Finish outside diameter: to ϕ 3.9mm	These connectors are supplied for each drive unit.	–		–	–	○
			–		–	–	○
			–		–	–	○
			–		–	–	○
	For MDS-DJ-V1-40, 80, 100 For MDS-DJ-SP-40, 80 Applicable cable outline: (For CNP1, for CNP3) 1.25mm² to 5.5mm² (For CNP2) 0.14mm² to 2.1mm² Finish outside diameter: (For CNP1, for CNP3) to ϕ 4.7mm (For CNP2) to ϕ 3.9mm²	These connectors are supplied for each drive unit.	–		–	–	○
			–		–	–	○
			–		–	–	○
			–		–	–	○
	For MDS-DJ-V2-3030 For MDS-DJ-SP2-2020 Applicable cable size: (For CNP1) 1.25mm2 to 2.0mm2 (For CNP2) 1.25mm2 to 2.0mm2 (For CNP3) 1.25mm2 to 2.2mm2 Cable finish outside diameter: (For CNP1) to ϕ 4.2mm (For CNP2) to ϕ 3.8mm (For CNP3) to ϕ 3.8mm	These connectors are supplied for each drive unit.			–	–	○
					–	–	○
					–	–	○
					–	–	○

<Spindle detector cable and connector>

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN2	Motor side PLG cable Spindle side accuracy detector TS5690 cable	CNP2E-1-2M	2		○	○	○
		CNP2E-1-3M	3				
		CNP2E-1-4M	4				
		CNP2E-1-5M	5				
		CNP2E-1-7M	7				
		CNP2E-1-10M	10				
		CNP2E-1-15M	15				
		CNP2E-1-20M	20				
		CNP2E-1-25M	25				
		CNP2E-1-30M	30				
For CN3	Spindle side detector OSE-1024 cable	CNP3EZ-2P-2M	2		○	○	○
		CNP3EZ-2P-3M	3				
		CNP3EZ-2P-4M	4				
		CNP3EZ-2P-5M	5				
		CNP3EZ-2P-7M	7				
		CNP3EZ-2P-10M	10				
		CNP3EZ-2P-15M	15				
		CNP3EZ-2P-20M	20				
		CNP3EZ-2P-25M	25				
		CNP3EZ-2P-30M	30				
		CNP3EZ-3P-2M	2		○	○	○
		CNP3EZ-3P-3M	3				
		CNP3EZ-3P-4M	4				
		CNP3EZ-3P-5M	5				
		CNP3EZ-3P-7M	7				
		CNP3EZ-3P-10M	10				
		CNP3EZ-3P-15M	15				
		CNP3EZ-3P-20M	20				
		CNP3EZ-3P-25M	25				
		CNP3EZ-3P-30M	30				
For spindle motor	Motor side PLG connector Spindle side accuracy detector TS5690 connector	CNEPGS	–		○	○	○
	Spindle side detector OSE-1024 cable		–		○	○	○
	Applicable cable outline ϕ6.8 to 10mm		–		○	○	○
For CN2/3	Spindle detector drive unit side connector	CNU2S (AWG18)	–		○	○	○

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

Item		Model	Length (m)	Contents	Compatible model		
					D2/DH2	DM2	DJ
For CN2/3	Cable for MBE405W/MBA405W	CNV2E-MB-2M	2		○	○	○
		CNV2E-MB-3M	3				
		CNV2E-MB-4M	4				
		CNV2E-MB-5M	5				
		CNV2E-MB-7M	7				
		CNV2E-MB-10M	10				
		CNV2E-MB-15M	15				
		CNV2E-MB-20M	20				
	Connector for MBE405W/MBA405W	CNEMB2S (8)	–		○	○	○
For CN3 of preamplifier	Thermistor connector for MBE405W/ MBA405W	CNEMB3S (8)	–		○	○	○



NC Trainer/NC Trainer plus M700V M70V E70

MITSUBISHI CNC Training Tool

- NC Trainer is an application for operating the screens of MITSUBISHI CNC M700V/M70V/E70 Series and machining programs. This application can be used for learning operating CNC and checking the operations of the machining programs.
- NC Trainer plus can also be used for checking the PLC program and custom screens.


NC Trainer


NC Trainer plus

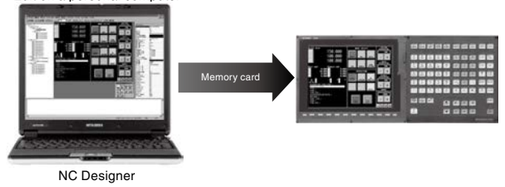
NC Designer M700V M70V E70

Screen Design Tool

- By laying out ready-made standard parts, you can easily create original screens without programming.
- Using the C language source generation function of NC Designer, customized functions can be added by programming in C language. (Dedicated development environment necessary)

Parts displayed on NC (example)

Edit on a personal computer



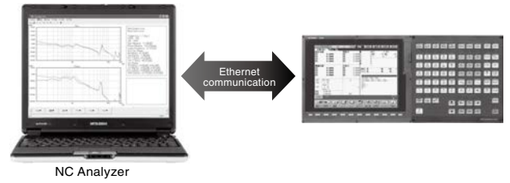
NC Designer

NC Analyzer M700V M70V E70

Servo Adjustment Support Tool

Servo parameters can be automatically adjusted by activating the motor using machining programs for adjustment or vibration signals, and measuring/analyzing the machine characteristics.

<Main functions>
Bode diagram measurement display, speed loop gain adjustment, position loop gain adjustment, notch filter setting, acceleration/deceleration time constant adjustment, circularity adjustment and servo waveform measurement

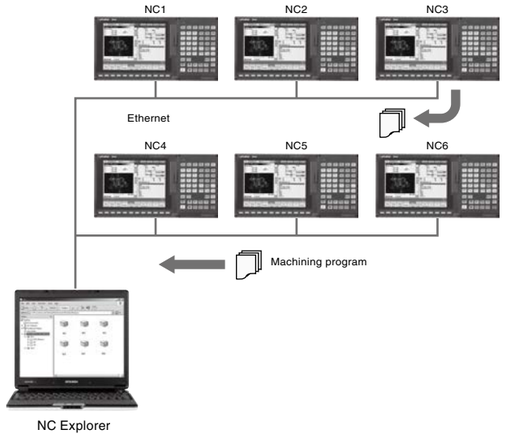


NC Analyzer

NC Explorer M700V M70V E70

Data Transfer Tool

By connecting the NC and host personal computer via Ethernet, data such as machining programs can easily be shared.
This tool is free of charge. Please contact us.



NC Explorer

NC Maintainer M700VW

A software tool for a personal computer to carry out maintenance (such as parameter setting, NC diagnosis and PLC program diagnosis) of MITSUBISHI CNC on customer's display.

Customer's display
Control unit

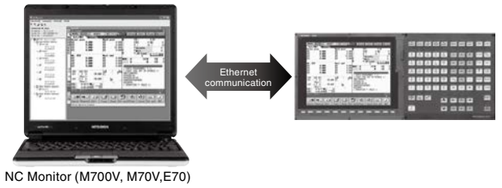
Diagnosis screen
Maintenance screen
PLC program diagnosis screen

* An operation check is required in combination with software installed on the display.

NC Monitor M700V M70V E70

Remote Monitoring Tool

An identical NC display screen can be displayed on a personal computer. By connecting a personal computer to the NC unit when necessary, various data can be checked and set using the same HMI as the standard NC screen.

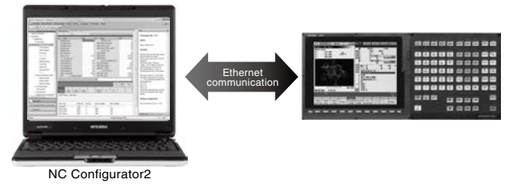


NC Monitor (M700V, M70V,E70)

NC Configurator2 M700V M70V E70

Parameter Setup Support Tool

The NC data file necessary for NC control and machine operation (such as parameters, tool data and common variables) can be edited on a personal computer.
Please contact us to purchase a full function version. (A limited function version is also available free of charge.)



NC Configurator2

Servo Selection Tool M700V M70V E70

By selecting the machine configuration model and inputting the machine specifications, the optimal servo motor meeting specifications can be selected. Other selection functions which fully support drive system selection are also available. This tool is free of charge. Please contact us.

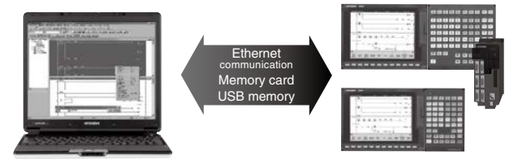

When the machine model and input specifications are selected, the selection result for the motor will be displayed.
The result can be output in PDF format.

<Main functions>
Servo motor capacity selection, regenerative resistor capacity selection, spindle acceleration/deceleration time calculation, power supply capacity selection, power supply facility capacity calculation, etc.

GX Developer M700V M70V E70

Sequence Programming Tool

The MELSEC programming tool, offering a wide array of functions and easy use, allows for convenient program design and debugging. Linking with a simulator or other utility allows for the efficient creation of desired programs.



GX Developer

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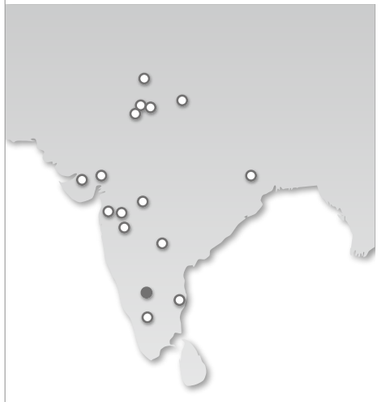

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