



Changes for the Better

MITSUBISHI CNC
NC Specification Selection Guide
E70 / M70V / M700V Series

A large, dark, blurred background image showing the interior of a CNC machine with various components and light trails.


E70 / *M70V* / *M700V*
series / *series* / *series*

BNP-A1225-A[ENG]

for a greener tomorrow




Product lines




E70 series

E70 Series




M70V series

M70V Series





M700V series

M700VS Series



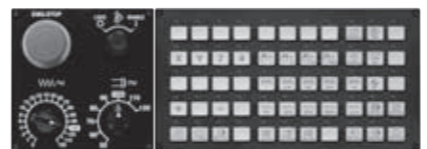
M700VW Series

Soft Ware

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



Manual pulse generator

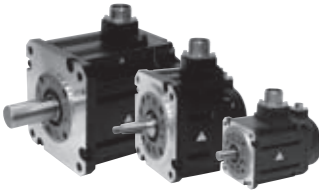


RIO 1

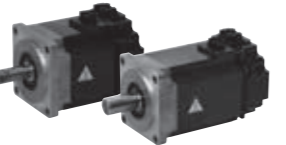


RIO 2


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


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

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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)			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)					
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	9	12	16		12	16	
	Max. number of spindles	2	3	4	4	6		4	6	
	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]	-	-	-	-	-	-	-	-	-	
High-speed machining mode II Max. [kBPM]	-	-	-	-	-	-	-	-	-	
High-speed high-accuracy control 1 Max. [kBPM] (1st part system only)	-	-	-	-	-	-	-	-	-	
High-speed high-accuracy control 2 Max. [kBPM] (limited to 1-part system configuration)	-	-	-	-	-	-	-	-	-	
High-accuracy control 1 (1st part system only)	-	-	-	-	-	-	-	-	-	
SSS Control (1st part system only) (Super Smooth Surface)	-	-	-	-	-	-	-	-	-	
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)						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									

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 P87

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

STEP 7 Decide the hardware options P7,P13,P111

- 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 P127

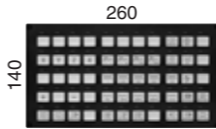
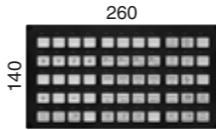

- Check the screen development tool (when screen customization is required)

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

	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

	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

E70 Series				
Display	FCU7-DU120-13 8.4-type			
Keyboard	FCU7-KB024 sheet keys FCU7-KB025 sheet keys for lathe system <ONG layout>			
M70V/M700VS Series				
Display	FCU7-DU120-12 (M70V) FCU7-DU120-11 (M700VS) 8.4-type	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
Keyboard	FCU7-KB024 sheet keys FCU7-KB025 sheet keys for lathe system <ONG layout>	Keyboard	FCU7-KB044 sheet keys <ONG layout>	FCU7-KB046 clear keys <ONG layout>
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
Keyboard	FCU7-KB041 clear keys <ABC layout>	FCU7-KB043 clear keys <ABC layout>	FCU7-KB045 clear keys <Full keyboard>	FCU7-KB047 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 Sink output	FCU7-DX710	DI: 64-points 24V/0V common type Occupied stations (fixed): 1, 2, 7, 8	DO: 64-points sink type RIO3 extensible stations: 3, 4, 5, 6	MPG:2ch	-	○	○	-	
		FCU7-DX720	DI: 96-points 24V/0V common type Occupied stations (fixed): 1, 2, 3, 7, 8	DO: 80-points sink type RIO3 extensible stations: 4, 5, 6	AO: 1 point MPG:2ch	-	○	○	-	
		FCU7-DX730	DI: 96-points 24V/0V common type Occupied stations (fixed): 1, 2, 3, 7, 8	DO: 96-points sink type RIO3 extensible stations: 3, 4, 5, 6	MPG: 2ch	-	○	○	-	
	DO Source output	FCU7-DX621	DI: 64-points 24V/0V common type Occupied stations (fixed): 1, 2, 3, 7, 8	DO: 48-points source type RIO3 extensible stations: 4, 5, 6	AO: 1 point MPG:2ch	○	-	-	-	
		FCU7-DX711	DI: 64-points 24V/0V common type Occupied stations (fixed): 1, 2, 7, 8	DO: 64-points source type RIO3 extensible stations: 3, 4, 5, 6	MPG:2ch	○	○	○	-	
		FCU7-DX721	DI: 96-points 24V/0V common type Occupied stations (fixed): 1, 2, 3, 7, 8	DO: 80-points source type RIO3 extensible stations: 4, 5, 6	AO: 1 point MPG:2ch	○	○	○	-	
FCU7-DX731	DI: 96-points 24V/0V common type Occupied stations (fixed): 1, 2, 3, 7, 8	DO: 96-points source type RIO3 extensible stations: 4, 5, 6	MPG:2ch	○	○	○	-			
[Operation panel I/O unit]										
DI 24V/0V common input	DO Sink output	FCU7-DX670	DI: 32-points 24V/0V common type Occupied stations DI/DO: Select 1 station from between 1 and 6	DO: 32-points sink type RIO3 extensible stations: Unselected stations between 1 and 6	MPG:3ch	-	-	-	○	
		FCU7-DX770	DI: 64-points 24V/0V common type Occupied stations DI/DO: Select 2 stations from between 1 and 6	DO: 64-points sink type RIO3 extensible stations: Unselected stations between 1 and 6	MPG:3ch	-	-	-	○	
	DO Source output	FCU7-DX671	DI: 32-points 24V/0V common type Occupied stations DI/DO: Select 1 station from between 1 and 6	DO: 32-points source type RIO3 extensible stations: Unselected stations between 1 and 6	MPG:3ch	-	-	-	○	
		FCU7-DX771	DI: 64-points 24V/0V common type Occupied stations DI/DO: Select 2 stations from between 1 and 6	DO: 64-points source type RIO3 extensible stations: Unselected stations between 1 and 6	MPG:3ch	-	-	-	○	
[Remote I/O unit]										
DI 24V/0V common input	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		-	○	○	○
		FCUA-DX140	DI: 32-points 24V/0V common type (photo coupler insulation) DO: 32-points sink type (non-insulation)	AI: 4 points	Number of occupied stations: 2		-	○	○	○
	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		○	○	○	○
		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	○	○	○	○
[Scan I/O card]										
Sink type	HR347	Scan DI/DO = 64 points/64 points	DI/DO = 32 points/32 points			-	○	○	○	
Source type	HR357	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-01-229	Input 5VDC	100pulse/rev			○	○	○	○	
12V Manual pulse generator	HD60	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					○	○	○	○
	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)					-	○*	-	-
Function expansion	FCU7-HN722	Full option (Graphic check/trace rotary axis drawing, SSS control)					-	○*	-	-

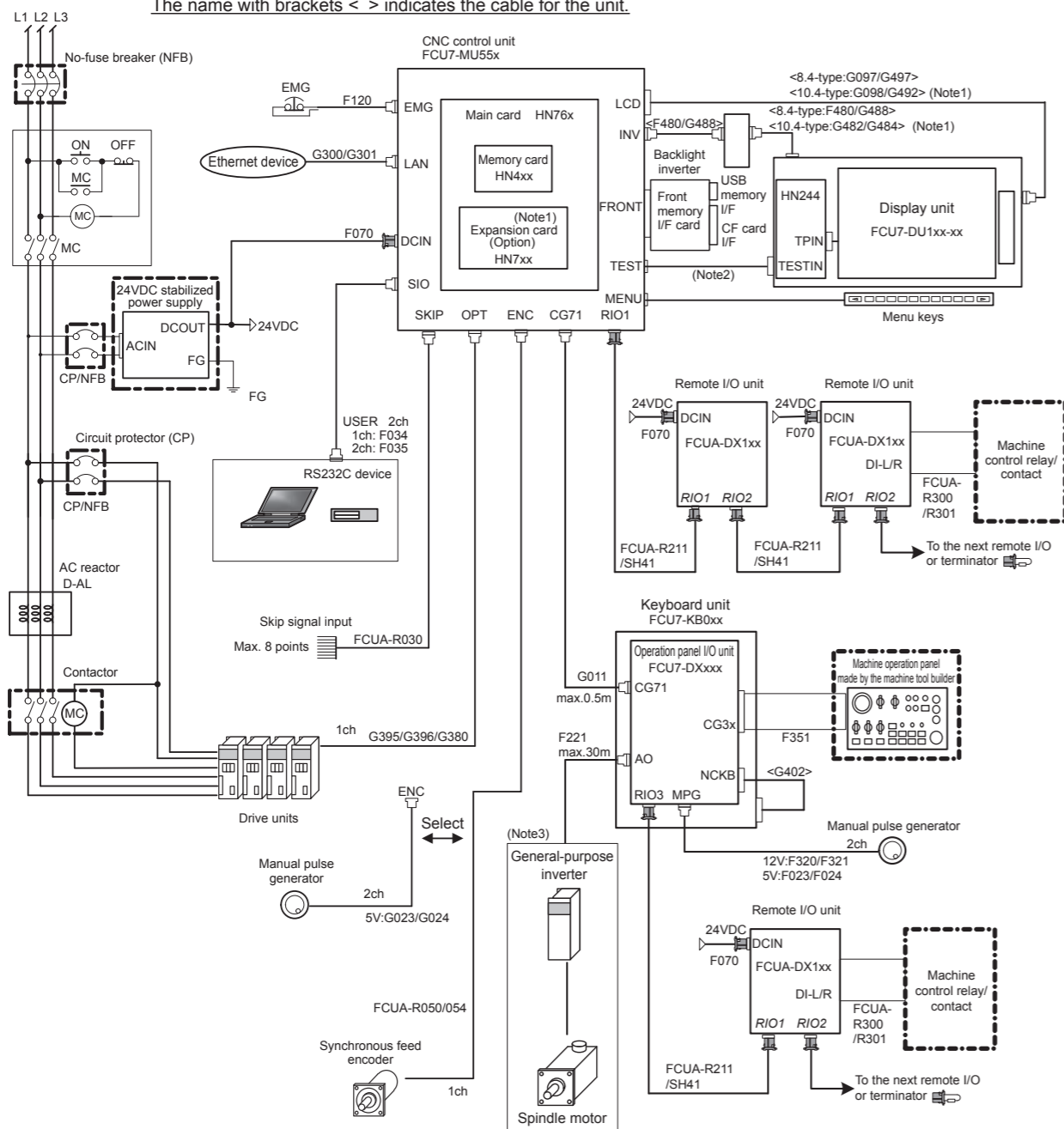
DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals

*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)

CNC system General Connection Diagram


E70/M70V Series

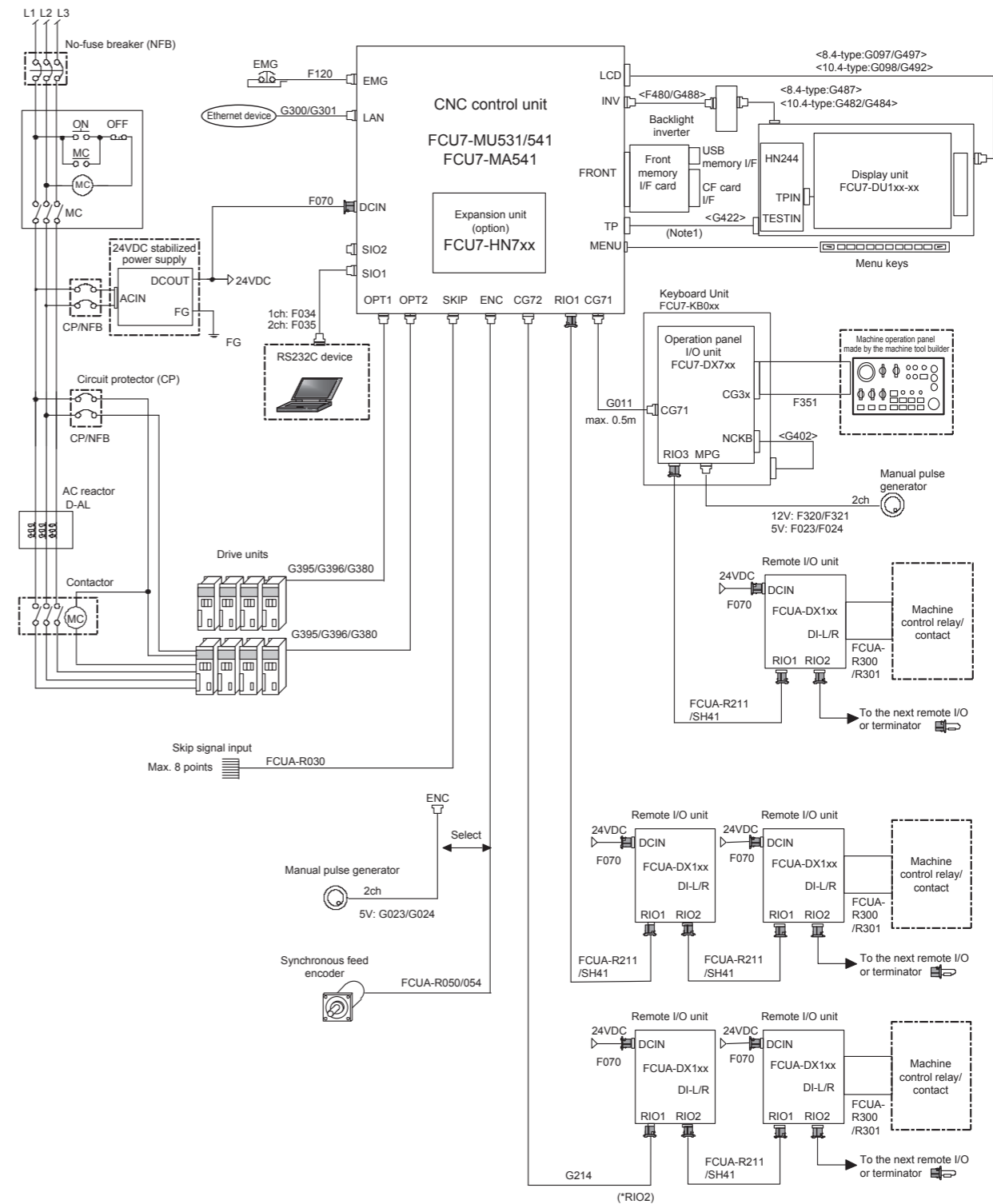
 Dotted lines indicate the sections prepared by the machine tool builder.
The name with brackets < > indicates the cable for the unit.



- (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.

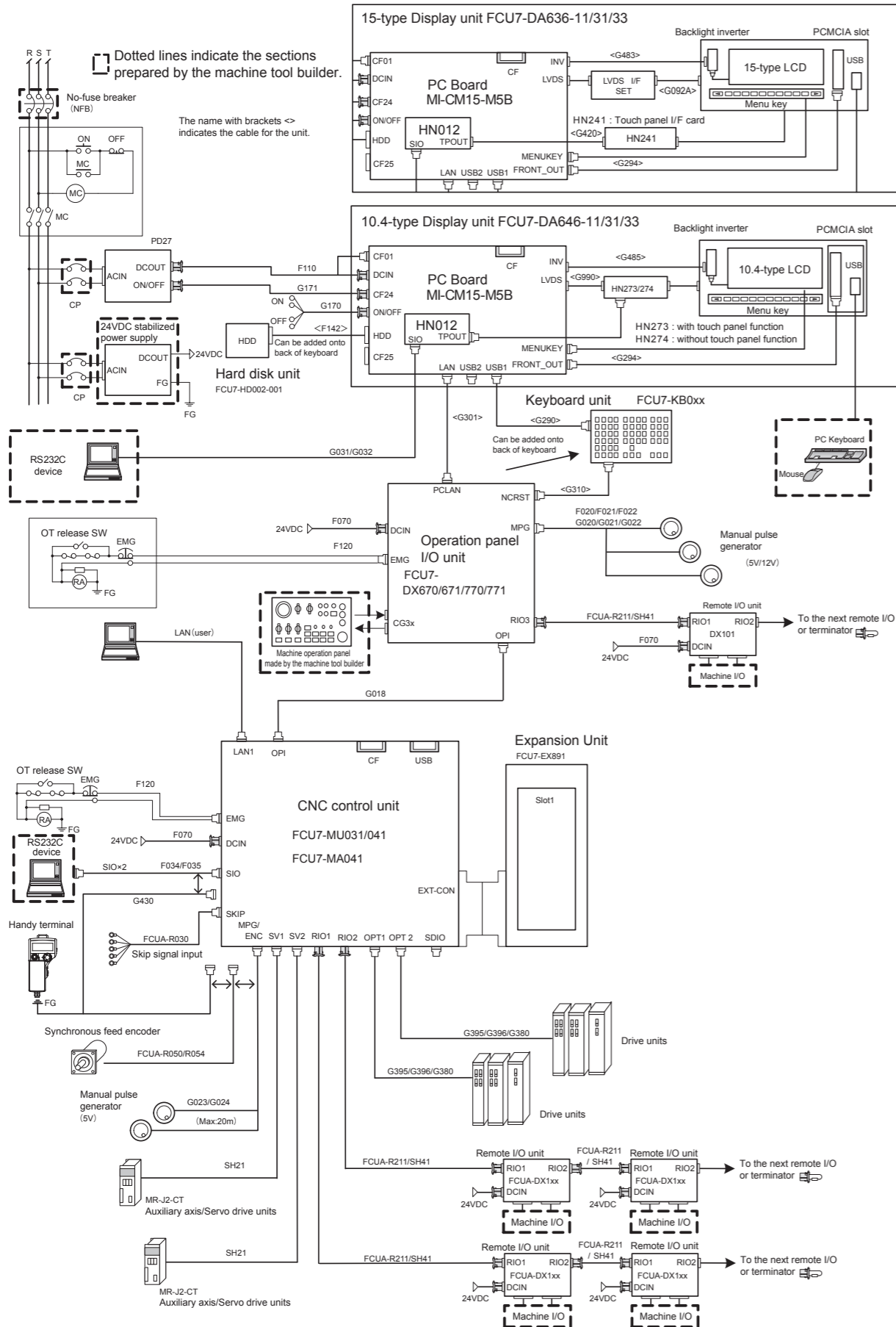
M700VS Series

 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

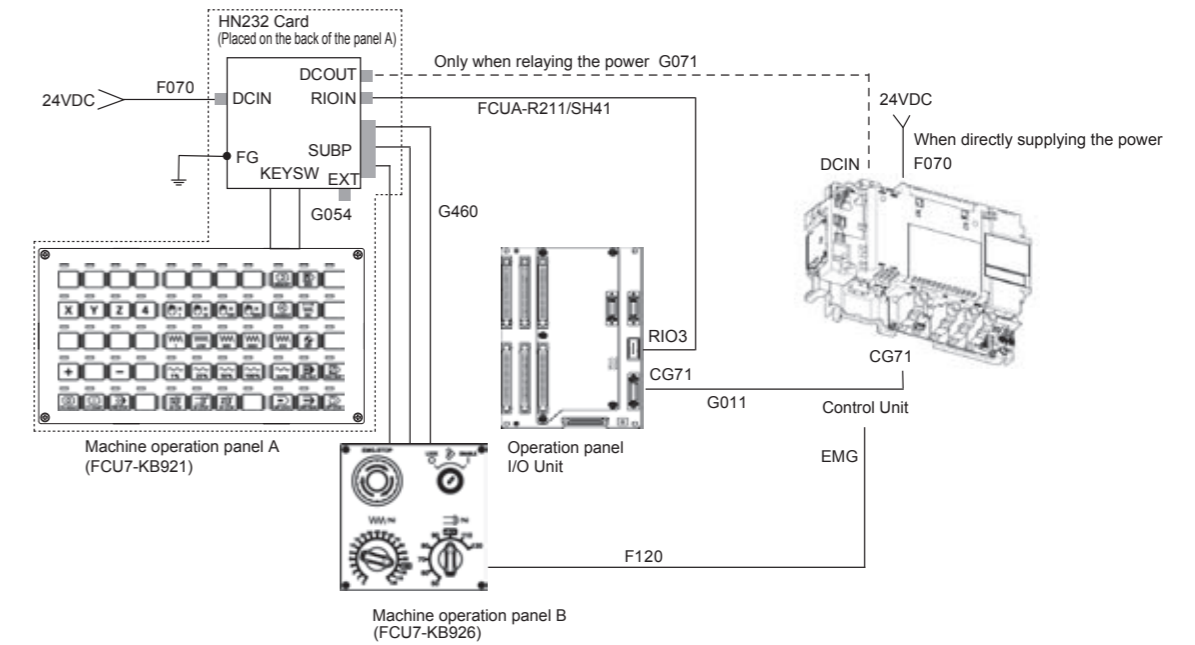


(Note 1) For a connection of the MITSUBISHI CNC Machine Operation Panel, refer to "Connection of MITSUBISHI CNC Machine Operation Panel" to be described.
 (Note 2) For connections of the drive units, refer to "Drive system System configuration drawing" to be described.

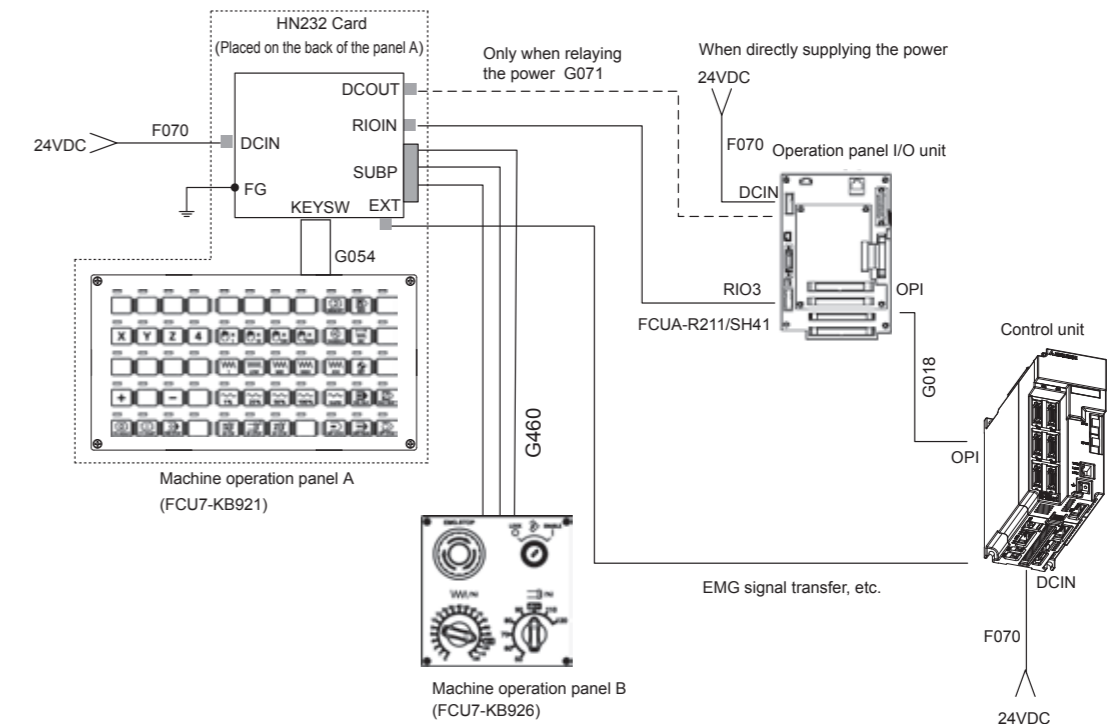
Connection of MITSUBISHI CNC Machine Operation Panel

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				
(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				
(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				
(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				
(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				
(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				
(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				
(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				
(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				
(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				

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				
(14) Manual pulse generator cable (5V) : 1ch (for connection to operation panel I/O unit)	G020 L2M	2		-	-	○
	G021 L2M	2				
	G022 L2M	2				
	G023 L1M	1				
	G023 L2M	2				
	G023 L3M	3				
(15) Manual pulse generator cable (5V) : 2ch (for connection to operation panel I/O unit)	G023 L5M	5		○	○	○
	G023 L8M	8				
	G023 L10M	10				
	G023 L15M	15				
	G023 L20M	20				
	G024 L1M	1				
(16) Manual pulse generator cable (5V) : 3ch (for connection to operation panel I/O unit)	G024 L2M	2		○	○	○
	G024 L3M	3				
	G024 L5M	5				
	G024 L8M	8				
	G024 L10M	10				
	G024 L15M	15				
(17) Manual pulse generator cable (5V) : 1ch (for connection to control unit)	G024 L20M	20		○	○	○
	F034 L0.5M	0.5				
	F034 L1M	1				
	F034 L2M	2				
	F034 L3M	3				
	F034 L5M	5				
(18) Manual pulse generator cable (5V) : 2ch (for connection to control unit)	F034 L8M	8		○	○	○
	F034 L10M	10				
	F035 L0.5M	0.5				
	F035 L1M	1				
	F035 L2M	2				
	F035 L3M	3				
(19) RS232C I/F cable : 1ch (for control unit)	F035 L5M	5		-	-	○
	F035 L8M	8				
	F035 L10M	10				
	G031 L0.5M	0.5				
	G031 L1M	1				
	G031 L2M	2				
(20) RS232C I/F cable : 2ch (for control unit)	G031 L3M	3		-	-	○
	G031 L5M	5				
	G031 L7M	7				
	G031 L10M	10				
	G031 L15M	15				
	G032 L0.5M	0.5				
(21) RS232C I/F cable : 1ch (for display unit)	G032 L1M	1		-	-	○
	G032 L2M	2				
	G032 L3M	3				
	G032 L5M	5				
	G032 L7M	7				
	G032 L10M	10				
(22) RS232C I/F cable : 2ch (for display unit)	G032 L15M	15		○	○	-
	F221 L1M	1				
	F221 L2M	2				
	F221 L3M	3				
	F221 L5M	5				
	F221 L8M	8				
(23) Analog output cable	F221 L10M	10		○	○	○
	F221 L15M	15				
	F221 L20M	20				
	FCUA-R211-0.3M	0.3				
	FCUA-R211-1M	1				
	FCUA-R211-2M	2				
(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-R211-3M	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				

CNC system Cables List

	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)	LAN cross cable (Shielded cable is recommended when the length will be 1m or more)	G300 L1M	1		○	○	○
		G300 L3M	3				
		G300 L5M	5				
		G300 L10M	10				
(32)	LAN straight cable (Shielded cable is recommended when the length will be 1m or more)	G301 L1M	1		○	○	○
(33)	SKIP input cable	FCUA-R030-3M	3		○	○	○
		FCUA-R030-7M	7				
(34)	Analog input/output cable (for remote I/O unit)	FCUA-R031-2M	2		-	-	○
		FCUA-R031-3M	3				
		FCUA-R031-7M	7				
(35)	Synchronous encoder - control unit (straight, with connector)	FCUA-R050-5M	5		○	○	○
(36)	Synchronous encoder - control unit (right angle, with connector)	FCUA-R054-3M	3		○	○	○
		FCUA-R054-5M	5				
		FCUA-R054-10M	10				
		FCUA-R054-15M	15				
		FCUA-R054-20M	20				
(37)	Remote I/O cable NC for RIO2 - remote I/O unit	G214 L1M	1		-	○	-
		G214 L5M	5				
		G214 L10M	10				
		G214 L20M	20				
(38)	Cable for connection to handy terminal	G430-L3M	3		-	-	○
		G430-L5M	5				
		G430-L10M	10				
(39)	Terminator for emergency stop interface	G123	-		-	-	○
(40)	Terminator for remote I/O interface	R-TM	-	One terminator is required to be installed at the final end of remote IO unit. 	○	○	○
(41)	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. 	-	-	○
(42)	Cable for hard disk (comes with the hard disk)	F142	0.5		-	-	○
(43)	USB cable for keyboard (comes with the keyboard unit)	G290	0.7		-	-	○
(44)	Cable for NC reset (comes with the operation I/O unit)	G310	0.1		-	-	○

Cable connector sets for CNC

	Application	Type	Contents	Supported model			
				E70/M70V	M700VS	M700VW	
(1)	Control unit - General I/O units Control unit - SVJ	FCUA-CS000	Connector (3M) 10120-3000VE × 2pcs. 	Connector case (3M) 10320-52F0-008 × 2pcs. 	○	○	○
(2)	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. 	○	○	○
(3)	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. 	○	○	○
(4)	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. 	○	○	○
(5)	Emergency stop connector	005057-9403 0016020103* × 3pcs.	Connector (MOLEX) 005057-9403 × 1pc. 	Gold contact (MOLEX) 0016020103 × 3pcs. 	○	○	○
(6)	Remote I/O communication connector	FCUA-CN211	Connector (Tyco Electronics) 1-178288-3 × 1pc. 	Gold contact (Tyco Electronics) 1-175218-2 × 3pcs. 	○	○	○
(7)	24VDC power supply connector	FCUA-CN220	Connector (Tyco Electronics) 2-178288-3 × 1pc. 	Tin contact (Tyco Electronics) 1-175218-5 × 3pcs. 	○	○	○
(8)	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

Class	Machining center system									Lathe system		
	E70 Series	M70V Series TypeB	M70V Series TypeA	M700VS Series			M700VW Series			E70 Series	M70V Series	
				M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		TypeB	TypeA
1 Control axes												
1 Control axes												
1	Number of basic control axes (NC axes)	○ 3	○ 3	○ 3	○ 3	○ 3	○ 3	○ 3	○ 3	○ 2	○ 2	○ 2
2	Max. number of axes (NC axes + Spindles + PLC axes)	6	9	11	12	16	16	12	16	16	6	9
1	Max. number of NC axes (in total for all the part systems)	3	5	8	8	16	16	8	16	16	3	5
2	Max. number of spindles	1	2	2	4	4	4	4	4	2	3	4
3	Max. number of PLC axes	2	6	6	6	6	6	6	6	2	6	6
3	Max. number of auxiliary axes	-	-	-	-	-	-	4	6	6	-	-
4	Max. number of PLC indexing axes	1	4	4	4	6	6	4	6	6	4	4
5	Number of simultaneous contouring control axes	3	4	4	4	4	8	4	4	8	3	4
6	Max. number of NC axes in a part system	3	5	8	6	8	8	6	8	8	3	5
2 Control part system												
1	Standard number of part systems	1	1	1	1	1	1	1	1	1	1	1
2	Max. number of part systems	○ 1	○ 1	○ 2	○ 2	○ 2	○ 2	○ 2	○ 2	○ 1	○ 1	○ 2
3 Control axes and operation modes												
1	Tape (RS-232C input) mode	○	○	○	○	○	○	○	○	○	○	○
2	Memory mode	○	○	○	○	○	○	○	○	○	○	○
3	MDI mode	○	○	○	○	○	○	○	○	○	○	○
4	High-speed program server mode											
1	CF card in control unit	-	-	-	-	-	-	△	△	△	-	-
5	IC card mode (Front IC card mode)	○	○	○	△	△	△	△	△	△	○	○
6	Hard disk mode	-	-	-	-	-	-	△	△	△	-	-
2 Input command												
1 Data increment												
1	Least command increment											
1	Least command increment 1μm	○	○	○	○	○	○	○	○	○	○	○
2	Least command increment 0.1μm	○	○	○	△	△	△	△	△	△	○	○
3	Least command increment 0.01μm (10nm)	-	-	-	△	△	△	-	△	△	-	-
4	Least command increment 0.001μm (1nm)	-	-	-	-	△	△	-	△	△	-	-
2	Least control increment											
1	Least control increment 0.01μm (10nm)	○	○	○	○	○	○	○	○	○	○	○
2	Least control increment 0.001μm (1nm)	○	○	○	○	○	○	○	○	○	○	○
3	Indexing increment	-	-	-	○	○	○	○	○	○	-	-
2 Unit system												
1	Inch/Metric changeover	○	○	○	△	△	△	△	△	△	○	○
2	Input command increment tenfold	○	○	○	○	○	○	○	○	-	-	-
3 Program format												
1 Program format												
1	Format 1 for Lathe	-	-	-	-	-	-	-	-	○	○	○
2	Format 2 for Lathe	-	-	-	-	-	-	-	-	-	○	○
3	Special format for lathe	-	-	-	-	-	-	-	-	-	○	○
4	Format 1 for Machining center	○	○	○	○	○	○	○	○	-	-	-
5	Format 2 for Machining center (M2 format)	-	○	○	○	○	○	○	○	-	-	-
6	MITSUBISHI CNC special format	-	-	-	-	-	-	-	-	-	○	○
4 Command value												
1	Decimal point input I, II	○	○	○	○	○	○	○	○	○	○	○
2	Absolute/Incremental command	○	○	○	○	○	○	○	○	○	○	○
3	Diameter/Radius designation	-	-	-	-	-	-	-	-	○	○	○
3 Positioning/Interpolation												
1 Positioning												
1	Positioning	○	○	○	○	○	○	○	○	○	○	○
2	Unidirectional positioning	○	○	○	△	△	△	△	△	△	-	-
2 Linear/Circular interpolation												
1	Linear interpolation	○	○	○	○	○	○	○	○	○	○	○
2	Circular interpolation (Center/Radius designation)	○	○	○	○	○	○	○	○	○	○	○
3	Helical interpolation	○	○	○	△	△	△	△	△	△	○	○
4	Spiral/Conical interpolation	-	-	○	△	△	△	△	△	-	-	-
5	Cylindrical interpolation	-	○	○	△	△	△	△	△	-	○	○
6	Polar coordinate interpolation	-	-	-	△	△	△	△	△	-	○	○
7	Milling interpolation	-	-	-	-	-	-	-	-	-	-	○
8	Hypothetical axis interpolation	-	-	-	△	△	△	△	△	-	-	-

S/W ver.J0

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
○ 2	○ 2	○ 2	○ 2	○ 2	○ 2	
12	16	16	12	16	16	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.
12	16	16	12	16	16	The PLC axis can be controlled using a sequence program.
4	6	6	4	6	6	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.
6	6	6	6	6	6	
-	-	-	4	6	6	Auxiliary axis: This can be connected to the channel (SV2) for J2-CT.
4	6	6	4	6	6	The number of PLC axes available to be used as indexing axis.
4	4	8	4	4	8	Number of axes with which simultaneous interpolation control is possible.
6	8	8	6	8	8	Max. number of NC axes possible to control in the same part system.
1	1	1	1	1	1	One part system is the standard.
○ 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.
○	○	○	○	○	○	
○	○	○	○	○	○	In this mode, operation is performed using the machining program data from the RS-232C interface built in the CNC unit. Machining programs stored in the memory of the CNC module are run.
○	○	○	○	○	○	MDI data stored in the memory of the CNC unit are executed.
-	-	-	△	△	△	Machining programs stored in a compact flash (CF) card can be operated by installing the CF card in the control unit.
△	△	△	△	△	△	Machining programs stored in a PCMCIA/CF card can be operated by installing the PCMCIA/CF card on the front of the control unit.
-	-	-	△	△	△	Machining programs stored in the hard disk can be operated.
○	○	○	○	○	○	
○	○	○	○	○	○	The data increment handled in the controller includes the input setting increment and command increment. Each type is set with parameters.
○	○	○	○	○	○	Possible to command in increments of 0.001mm (linear axis) and 0.001° (rotary axis).
△	△	△	△	△	△	Possible to command in increments of 0.0001mm (linear axis) and 0.0001° (rotary axis).
-	△	△	-	△	△	Possible to command in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis).
-	△	△	-	△	△	Possible to command in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis).
○	○	○	○	○	○	The least control increment determines the CNC's internal operation accuracy.
○	○	○	○	○	○	Possible to control in increments of 0.00001mm (linear axis) and 0.00001° (rotary axis).
○	○	○	○	○	○	Possible to control in increments of 0.000001mm (linear axis) and 0.000001° (rotary axis).
○	○	○	○	○	○	This function limits the command value for the rotary axis.
△	△	△	△	△	△	The unit systems of the data handled in the controller include the metric system and inch system. The type can be designated with a parameter and a machining program.
-	-	-	-	-	-	The program's command increment can be multiplied by an arbitrary scale with the parameter designation. This function is valid when a decimal point is not used for the command increment.
○	○	○	○	○	○	
○	○	○	○	○	○	G code (program) format
○	○	○	○	○	○	G code list for the lathe system
○	○	○	○	○	○	The G-code list is selected by parameter.
○	○	○	○	○	○	(Prepared for a specific machine tool builder)
-	-	-	-	-	-	G code list for the machining center system
-	-	-	-	-	-	The G-code list is selected by parameter.
○	○	○	○	○	○	The formats of the fixed cycle for turning machining (G77 to G79), compound type fixed cycle for turning machining (G71 to G76) and fixed cycle for drilling (G80 to G89) can be switched to the MITSUBISHI CNC special formats.
○	○	○	○	○	○	
○	○	○	○	○	○	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.
○	○	○	○	○	○	When axis coordinate data are issued in a machining program command, either the incremental command method, which commands a relative distance from the current position, or the absolute command method, which commands a movement to a designated position in a predetermined coordinate system, can be selected.
○	○	○	○	○	○	The designation method of an axis command value can be changed over with parameters between the radius designation or diameter designation. When the diameter designation is selected, the scale of the length of the selected axis is doubled. (moves only half (1/2) the commanded amount)
○	○	○	○	○	○	
○	○	○	○	○	○	This function carries out positioning at high speed using a rapid traverse rate with the travel command value given in the program.
-	-	-	-	-	-	The G code command always moves the tool to the final position in the direction determined by parameters.
○	○	○	○	○	○	Linear interpolation is a function that moves a tool linearly by the travel command value supplied in the program at the cutting feedrate designated by the F code.
○	○	○	○	○	○	This function moves a tool along a circular arc on the plane selected by the travel command value supplied in the program.
△	△	△	△	△	△	With this function, any two of three axes intersecting orthogonally are made to perform circular interpolation while the third axis performs linear interpolation in synchronization with the arc rotation. This control can be exercised to machine large-diameter screws or 3-dimensional cams.
-	-	-	-	-	-	This function interpolates arcs where the start point and end point are not on the circumference of the same circle into spiral shapes.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
-	-	-	-	-	-	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.

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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
3 Curve interpolation												
2	Exponential interpolation	-	-	-	△	△	△	△	△	△	-	-
3	Spline interpolation (1st part system only)	-	-	○	△	△	△	△	△	△	-	-
4	NURBS interpolation	-	-	-	-	△	△	-	△	△	-	-
5	3-dimensional circular interpolation	-	-	-	-	△	△	-	△	△	-	-
4 Feed												
1 Feed rate												
1	Rapid traverse rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
2	Cutting feed rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
3	Manual feed rate (m/min)	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
4	Rotary axis command speed tenfold	○	○	○	○	○	○	○	○	○	○	○
2 Feed rate input methods												
1	Feed per minute	○	○	○	○	○	○	○	○	○	○	○
2	Feed per revolution	○	○	○	△	△	△	△	△	△	○	○
3	Inverse time feed	-	-	○	△	△	△	△	△	△	-	-
4	F 1-digit feed	○	○	○	○	○	○	○	○	○	○	○
5	Manual speed command	○	○	○	△	△	△	△	△	△	○	○
3 Override												
1	Rapid traverse override	○	○	○	○	○	○	○	○	○	○	○
2	Cutting feed override	○	○	○	○	○	○	○	○	○	○	○
3	2nd cutting feed override	○	○	○	○	○	○	○	○	○	○	○
4	Override cancel	○	○	○	○	○	○	○	○	○	○	○
4 Acceleration/Deceleration												
1	Automatic acceleration/deceleration after interpolation	○	○	○	○	○	○	○	○	○	○	○
2	Rapid traverse constant inclination acceleration/deceleration	○	○	○	○	○	○	○	○	○	○	○
3	Rapid traverse constant inclination multi-step acceleration/deceleration (1st part system only)	-	○	○	△	△	△	△	△	△	-	-
5 Thread cutting												
1	Thread cutting (Lead/Thread number designation)	○	○	○	△	△	△	△	△	△	○	○
2	Variable lead thread cutting	-	-	-	-	-	-	-	-	-	○	○
3 Synchronous tapping												
1	Synchronous tapping cycle	○	○	○	△	△	△	△	△	△	○	○
2	Pecking tapping cycle	-	○	○	△	△	△	△	△	△	-	○
3	Deep-hole tapping cycle	-	○	○	△	△	△	△	△	△	-	○
4	Chamfering	-	-	-	-	-	-	-	-	-	○	○
6	Circular thread cutting	-	-	-	-	-	-	-	-	-	-	-
8	High-speed synchronous tapping (OMR-DD)	-	○	○	○	○	○	○	○	○	-	○
6 Manual feed												
1	Manual rapid traverse	○	○	○	○	○	○	○	○	○	○	○
2	Jog feed	○	○	○	○	○	○	○	○	○	○	○
3	Incremental feed	○	○	○	○	○	○	○	○	○	○	○
4	Handle feed	○	○	○	○	○	○	○	○	○	○	○
5	Manual feed rate B	○	○	○	○	○	○	○	○	○	○	○
6	Manual feed rate B surface speed control	-	-	-	△	△	△	△	△	△	-	-
7 Dwell												
1	Dwell (Time-based designation)	○	○	○	○	○	○	○	○	○	○	○
5 Program memory/editing												
1 Memory capacity												
1	Memory capacity (number of programs stored)											
1	15kB[40m] (64 programs)	-	-	-	○	○	○	○	○	○	-	-
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	○	○	○	○	○	○	○	○	○	○	○
2	Background editing	○	○	○	○	○	○	○	○	○	○	○

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Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
△	△	△	△	△	△	With this function, the rotary axis movement is changed into exponential functions vis-a-vis the linear axis movements.
-	-	-	-	-	-	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.
-	-	-	-	-	-	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.
-	-	-	-	-	-	An arc shape determined by three points (start point, intermediate point, end point) designated in the three-dimensional space can be machined.
1000	1000	1000	1000	1000	1000	The rapid traverse rate can be set independently for each axis using parameters.
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.
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.
○	○	○	○	○	○	This function multiplies the rotary axis' command speed by ten during initial inching.
○	○	○	○	○	○	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).
○	○	○	○	○	○	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).
-	-	-	-	-	-	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.
○	○	○	○	○	○	The feedrate registered by parameter in advance can be assigned by designating a single digit, following address F.
△	△	△	△	△	△	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.
○	○	○	○	○	○	Override can be applied to manual or automatic rapid traverse using the external input signal.
○	○	○	○	○	○	Override can be applied to the feedrate command designated in the machining program using the external input signal.
○	○	○	○	○	○	Override can be further applied as a second-stage override to the feedrate after the cutting feed override has been applied.
○	○	○	○	○	○	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).
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
-	-	-	-	-	-	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	By commanding the lead increment/decrement amount per thread rotation, variable lead thread cutting can be performed.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
○	○	○	○	○	○	Chamfering can be enabled during the thread cutting cycle by using external signals.
△	△	△	△	△	△	Circular thread in which the lead is in longitudinal direction can be cut.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	The tool can be moved in the axis direction (+ or -) in which the machine is to be moved at the per-minute feedrate.
○	○	○	○	○	○	The tool can be moved for the designated amount (incremental value) in the axis direction each time the jog switch is pressed.
○	○	○	○	○	○	The machine can be moved in very small amounts by rotating the manual pulse generator.
○	○	○	○	○	○	Manual feedrate B is a function that sets an arbitrary axis feedrate from the user PLC separately from the manual feedrate.
-	-	-	-	-	-	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.
○	○	○	○	○	○	The G code command temporarily stops machine movements and sets the machine in the stand-by status for the time designated in the program.
○	○	○	○	○	○	
△	△	△	△	△	△	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.
△	△	△	△	△	△	
○	○	○	○	○	○	This function enables program editing such as correction, deletion and addition.
○	○	○	○	○	○	This function enables one machining program to be created or edited while another program is running.

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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
3 Buffer correction	○	○	○	○	○	○	○	○	○	○	○	○
6 Operation and display												
1 Structure of operation/display panel												
1 Color display (8.4-type LCD TFT)	□	□	□	□	□	□	-	-	-	□	□	□
2 Color display (10.4-type LCD TFT)	-	□	□	□	□	□	-	-	-	-	□	□
3 Color display (10.4-type LCD TFT/WindowsXPe)	-	-	-	-	-	-	□	□	□	-	-	-
4 Color display (15-type LCD TFT/WindowsXPe)	-	-	-	-	-	-	-	□	□	-	-	-
5 Color touch-panel display (10.4-type LCD TFT/WindowsXPe)	-	-	-	-	-	-	□	□	□	-	-	-
6 Color touch-panel display (10.4-type LCD TFT)	-	□	□	□	□	□	-	-	-	-	□	□
7 Color touch-panel display (15-type LCD TFT/WindowsXPe)	-	-	-	-	-	-	□	□	□	-	-	-
2 Operation methods and functions												
1 Operation input	○	○	○	○	○	○	○	○	○	○	○	○
2 Absolute value/incremental value setting	○	○	○	○	○	○	○	○	○	○	○	○
5 Displayed part system switch	-	-	○	○	○	○	○	○	○	-	-	○
6 Menu list	○	○	○	○	○	○	○	○	○	○	○	○
7 Display switch by operation mode	○	○	○	○	○	○	○	○	○	○	○	○
8 External signal display switch	-	-	○	○	○	○	○	○	○	-	-	○
10 Screen saver, backlight OFF	○	○	○	○	○	○	○	○	○	○	○	○
11 Parameter/Operation guidance	○*	○	○	○	○	○	○	○	○	○*	○	○
12 Alarm guidance	○*	○	○	△	△	△	△	△	△	○*	○	○
13 Machining program input mistake check warning	-	-	-	△	△	△	△	△	△	-	-	-
15 Screen Capture	○	○	○	○	○	○	-	-	-	○	○	○
16 User selectable menu configuration	○	○	○	○	○	○	○	○	○	○	○	○
17 PC-NC network automatic connection	-	-	-	-	-	-	○	○	○	-	-	-
18 Device open parameter	-	○	○	○	○	○	○	○	○	-	○	○
19 SRAM open parameter	-	○	○	○	○	○	○	○	○	-	○	○
20 MTB selectable menu configuration	○	○	○	○	○	○	○	○	○	○	○	○
3 Display methods and contents												
1 Status display	○	○	○	○	○	○	○	○	○	○	○	○
2 Clock display	○	○	○	○	○	○	○	○	○	○	○	○
3 Monitor screen display	○	○	○	○	○	○	○	○	○	○	○	○
4 Setup screen display	○	○	○	○	○	○	○	○	○	○	○	○
5 Edit screen display	○	○	○	○	○	○	○	○	○	○	○	○
6 Diagnosis screen display	○	○	○	○	○	○	○	○	○	○	○	○
7 Maintenance screen display	○	○	○	○	○	○	○	○	○	○	○	○
8 Additional languages												
1 Japanese	□	□	□	○	○	○	○	○	○	□	□	□
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	○	○	○	○	○	○	○	○	○	○	○	○
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	○	○	○	○	○	○	○	○	○	○	○	○

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Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
○	○	○	○	○	○	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.
□	□	□	-	-	-	The setting and display unit consists of the setting part and the keyboard part. Refer to "Displays & Keyboards" described previously for the details.
□	□	□	-	-	-	
-	-	-	□	□	□	
-	-	-	□	□	□	
-	-	-	□	□	□	
□	□	□	-	-	-	
○	○	○	○	○	○	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.
○	○	○	○	○	○	When setting the data, the absolute/incremental setting can be selected from the menu.
○	○	○	○	○	○	The part system displayed on the screen can be changed.
○	○	○	○	○	○	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.
○	○	○	○	○	○	The screen display changes when the screen mode selection switch is changed.
○	○	○	○	○	○	The screen display changes with the signal from PLC.
○	○	○	○	○	○	The screen saver function protects the display unit by turning the backlight OFF after the length of time specified in a parameter.
○	○	○	○	○	○	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.
△	△	△	△	△	△	Guidance is displayed for the alarm currently issued. * E70 requires add-on guidance data.
△	△	△	△	△	△	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.
○	○	○	-	-	-	This function allows to output a bitmap file of a screen displayed on the setting and display unit.
○	○	○	○	○	○	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.
-	-	-	○	○	○	This function supports to restore the connection when the network connection fails between the display unit and the control unit.
○	○	○	○	○	○	This function can set or change the user backed up area of the PLC device from the NC screen.
○	○	○	○	○	○	This function can set or change the SRAM open area for machine tool builders from the NC screen.
○	○	○	○	○	○	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.
○	○	○	○	○	○	The status of the program currently being executed is indicated.
○	○	○	○	○	○	The clock is built in, and the date (year, month, date) and time (hour, minute, second) are displayed.
○	○	○	○	○	○	Various information related to operation, such as the axis counter, speed display and MSTB command are displayed.
○	○	○	○	○	○	Tool/workpiece related settings, user parameter settings, MDI editing, counter setting, manual numeric command issuing and pallet program registration (option) can be carried out.
○	○	○	○	○	○	Machining program editing (addition, deletion, change) and checking, simple program creation, and machining program input/output can be carried out.
○	○	○	○	○	○	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.
○	○	○	○	○	○	Parameter setting and display, and NC data input/output, etc., can be carried out.
○	○	○	○	○	○	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.
○	○	○	○	○	○	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
△/□	△/□	△/□	△/□	△/□	△/□	
○	○	○	○	○	○	Certain kinds of data handled by the NC system can be input and output between the NC system's memory and external devices.
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	Port 1 and 2 are available with the RS-232C interface. The connection point for a connector depends on the product model.

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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
2 IC card I/F												
1 I/F for IC card in control unit [up to 2GByte]	○	○	○	○	○	○	○	○	○	○	○	○
2 Front IC card I/F [up to 2GByte]	○	○	○	○	○	○	○	○	○	○	○	○
3 Ethernet I/F	○	○	○	○	○	○	○	○	○	○	○	○
4 Hard disk I/F	○	○	○	○	○	○	△	△	△	○	○	○
6 USB memory I/F [up to 2GByte]	○	○	○	○	○	○	△	△	△	○	○	○
3 Computer link												
1 Computer link B	○	○	○	△	△	△	△	△	△	○	○	○
4 Others												
1 Handy terminal connection	○	○	○	○	○	○	△	△	△	○	○	○
8 Spindle, Tool and Miscellaneous functions												
1 Spindle functions (S)												
1 Spindle control functions												
1 Spindle digital I/F	○	○	○	○	○	○	○	○	○	○	○	○
2 Spindle analog I/F	○	○	○	○	○	○	○	○	○	○	○	○
3 Coil switch	○	○	○	○	○	○	○	○	○	○	○	○
4 Automatic coil switch	○	○	○	○	○	○	○	○	○	○	○	○
5 Encoder input I/F	○	○	○	△	△	△	△	△	△	○	○	○
2 S code output	○	○	○	○	○	○	○	○	○	○	○	○
3 Constant surface speed control	○	○	○	△	△	△	△	△	△	○	○	○
4 Spindle override	○	○	○	○	○	○	○	○	○	○	○	○
5 Multiple-spindle control												
1 Multiple-spindle control I	○	○	○	○	○	○	○	○	○	○	○	○
2 Multiple-spindle control II	○	○	○	△	△	△	△	△	△	○	○	○
6 Spindle orientation	○	○	○	○	○	○	○	○	○	○	○	○
7 Spindle position control (Spindle/C axis control)	○	○	○	△	△	△	△	△	△	○	○	○
8 Spindle synchronization												
1 Spindle synchronization I	○	○	○	○	○	○	○	○	○	○	○	○
2 Spindle synchronization II	○	○	○	○	○	○	○	○	○	○	○	○
3 Guide bushing spindle synchronization	○	○	○	○	○	○	○	○	○	○	○	○
9 Tool spindle synchronization I (Polygon)												
1 Tool spindle synchronization I A (Spindle-Spindle, Polygon)	○	○	○	○	○	○	○	○	○	○	○	○
2 Tool spindle synchronization I B (Spindle-Spindle, Polygon)	○	○	○	○	○	○	○	○	○	○	○	○
3 Tool spindle synchronization I C (Spindle-NC axis, Polygon)	○	○	○	○	○	○	○	○	○	○	○	○
10 Tool spindle synchronization II (Hobbing)	○	○	○	○	○	○	○	○	○	○	○	○
11 Spindle speed clamp	○	○	○	○	○	○	○	○	○	○	○	○
2 Tool functions (T)												
1 Tool functions (T command)	○	○	○	○	○	○	○	○	○	○	○	○
3 Miscellaneous functions (M)												
1 Miscellaneous functions	○	○	○	○	○	○	○	○	○	○	○	○
2 Multiple M codes in 1 block	○	○	○	○	○	○	○	○	○	○	○	○
3 M code independent output	○	○	○	○	○	○	○	○	○	○	○	○
4 Miscellaneous function finish	○	○	○	○	○	○	○	○	○	○	○	○
5 M code output during axis traveling	○	○	○	○	○	○	○	○	○	○	○	○
4 2nd miscellaneous functions (B)												
1 2nd miscellaneous functions	○	○	○	○	○	○	○	○	○	○	○	○
9 Tool compensation												
1 Tool length/Tool position												
1 Tool length compensation	○	○	○	○	○	○	○	○	○	○	○	○
2 Tool position offset	○	○	○	○	○	○	○	○	○	○	○	○
3 Tool compensation for additional axes	○	○	○	○	○	○	○	○	○	○	○	○
2 Tool radius												
1 Tool radius compensation	○	○	○	○	○	○	○	○	○	○	○	○
2 3-dimensional tool radius compensation	○	○	○	△	△	△	△	△	△	○	○	○
3 Tool nose radius compensation (G40/41/42)	○	○	○	○	○	○	○	○	○	○	○	○
4 Automatic decision of nose radius compensation direction (G46/40)	○	○	○	○	○	○	○	○	○	○	○	○
5 Tool radius compensation diameter designation	○	○	○	○	○	○	○	○	○	○	○	○

S/W ver.J0

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
○	○	○	○	○	○	Interface card to use CF card can be attached inside the NC control unit.
○	○	○	○	○	○	Interface card to use PCMCIA card can be attached in front of the NC control unit.
○	○	○	○	○	○	Ethernet interface card can be attached onto the NC unit.
○	○	○	△	△	△	A hard disk drive can be mounted.
○	○	○	△	△	△	A USB memory can be mounted.
△	△	△	△	△	△	Computer link B is a function to receive/send data between the host computer and the CNC.
○	○	○	△	△	△	Machine operations, such as setup operations, are possible at hand by using a handy terminal.
○	○	○	○	○	○	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.
○	○	○	○	○	○	This interface is used to connect the digital spindle (AC spindle motor and spindle drive unit).
○	○	○	○	○	○	Spindle control can be executed using an analog spindle instead of the digital spindle.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
△	△	△	△	△	△	With this function, arbitrary pulse can be input by parameters set in R register.
○	○	○	○	○	○	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.
△	△	△	△	△	△	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).
○	○	○	○	○	○	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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	This function controls the spindles in a machine tool equipped with several spindles.
△	△	△	△	△	△	With this function, commands to the spindle are performed with one S command, and a signal from the PLC determines which spindle is selected.
○	○	○	○	○	○	This function stops the spindle rotation at a certain position.
△	△	△	△	△	△	This function enables one spindle drive unit to be also used as the C axis (rotary axis) using an external signal.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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).
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	This function controls the workpiece (spindle) and tool (NC axis) so that they synchronously rotate at the commanded ratio, allowing polygon machining.
△	△	△	△	△	△	This function is to cut the gear with a hob (hob cutter).
○	○	○	○	○	○	The spindle rotation speed is clamped between max. rotation speed and min. rotation speed.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	Up to four sets of M commands can be issued in a block.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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).
△	△	△	△	△	△	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	The nose radius compensation direction is automatically determined from the tool tip and the specified movement vector.
○	○	○	○	○	○	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.

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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	
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	-	-	-	-	△	△	-	△	△	-	-	-
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	-	○	○	△	△	△	△	△	-	○	○	○
4	Program restart	○	○	○	△	△	△	△	△	○	○	○	○
5	Automatic operation start												
1	Automatic operation start	○	○	○	○	○	○	○	○	○	○	○	○

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Lathe system						General explanation	
M700VS Series			M700VW Series				
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		
○	○	○	○	○	○	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 "f" (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 "f" 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.	
△	△	△	△	△	△	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.	
○	○	○	○	○	○	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).	

CNC system E70/M70V/M700V Series Specifications List

○: 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
6 NC reset	○	○	○	○	○	○	○	○	○	○	○	○
7 Feed hold	○	○	○	○	○	○	○	○	○	○	○	○
8 Search & Start	○	○	○	○	○	○	○	○	○	○	○	○
4 Interrupt operation												
1 Manual interruption	○	○	○	○	○	○	○	○	○	○	○	○
2 Automatic operation handle interruption	○	○	○	○	○	○	○	○	○	○	○	○
3 Manual absolute switch	○	○	○	○	○	○	○	○	○	○	○	○
4 Thread cutting cycle retract	-	-	-	-	-	-	-	-	-	-	○	○
5 Tapping retract	○	○	○	○	○	○	○	○	○	○	○	○
6 Manual numerical value command	○	○	○	○	○	○	○	○	○	○	○	○
7 Arbitrary reverse run	-	-	○	△	△	△	△	△	△	-	-	-
8 MDI interruption	○	○	○	○	○	○	○	○	○	○	○	○
9 Simultaneous operation of manual and automatic modes	○	○	○	○	○	○	○	○	○	○	○	○
10 Simultaneous operation of JOG and handle modes	○	○	○	○	○	○	○	○	○	○	○	○
11 Reference position retract	○	○	○	○	○	○	○	○	○	○	○	○
12 Tool retract and return	-	-	-	-	△	△	-	△	△	-	-	-
13 Skip retract	-	○	○	△	△	△	△	△	△	-	-	-
14 PLC interruption	-	○	○	△	△	△	△	△	△	-	○	○
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
2 Figure rotation	-	-	-	△	△	△	△	△	△	-	-	-
3 Scaling	○	○	○	△	△	△	△	△	△	-	-	-
4 Axis name switch	-	-	-	-	-	-	-	-	-	-	○	○
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
2 Machine tool builder macro	-	○	○	△	△	△	△	△	△	-	○	○
3 Macro interruption	○	○	○	△	△	△	△	△	△	○	○	○
4 Variable command												
1 100 sets	-	-	-	○	○	○	○	○	○	-	-	-
2 200 sets	○	-	-	△	△	△	△	△	△	○	-	-
3 300 sets	-	-	-	△	△	△	△	△	△	-	-	-
4 600 sets	-	-	-	△	△	△	△	△	△	-	○	-
5 700 sets	-	○	○	△	△	△	△	△	△	-	-	○
6 8000 sets	-	-	△* (HN754)	△	△	△	△	△	△	-	-	△* (HN754)
7 (50+50xnumber of part systems) sets	-	-	-	○	○	○	○	○	○	-	-	-
8 (100+100xnumber of part systems) sets	-	-	-	△	△	△	△	△	△	-	-	-
9 (200+100xnumber of part systems) sets	-	-	-	△	△	△	△	△	△	-	-	-
10 (500+100xnumber of part systems) sets	-	-	-	△	△	△	△	△	△	-	-	-
11 (600+100xnumber of part systems) sets	-	-	-	△	△	△	△	△	△	-	-	○
12 (7900+100xnumber of part systems) sets	-	-	△* (HN754)	△	△	△	△	△	△	-	-	△* (HN754)
3 Fixed cycle												
1 Fixed cycle for drilling	○	○	○	○	○	○	○	○	○	○	○	○
2 Fixed cycle for drilling (Type II)	-	-	-	-	-	-	-	-	-	○	○	○
3 Special fixed cycle	○	○	○	△	△	△	△	△	△	-	-	-
4 Fixed cycle for turning machining	-	-	-	-	-	-	-	-	-	○	○	○
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	-	○	○	△	△	△	△	△	△	-	-	-
4 Mirror image												
1 Mirror image by parameter setting	-	○	○	○	○	○	○	○	○	-	○	○
2 Mirror image by external input	-	○	○	○	○	○	○	○	○	-	○	○
3 Mirror image by G code	○	○	○	○	○	○	○	○	○	-	-	-
4 Mirror image for facing tool posts	-	-	-	-	-	-	-	-	-	-	-	○
5 T code mirror image for facing tool posts	-	-	-	-	-	-	-	-	-	-	-	○

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
○	○	○	○	○	○	This function enables the controller to be reset.
○	○	○	○	○	○	When the feed hold signal is set to ON during automatic operation, the machine feed is immediately decelerated and stopped.
○	○	○	○	○	○	If the "Search & Start" signal is input when the memory mode is selected, the designated machining program is searched and executed from the beginning.
○	○	○	○	○	○	Manual interrupt is a function that enables manual operations to be performed during automatic operation.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
△	△	△	△	△	△	This function suspends the thread cutting cycle if a feed hold signal has been input during thread cutting cycle.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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].
-	-	-	-	-	-	This function allows a program to run the executed blocks backward after the block stop in the automatic operation.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.)
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
-	-	-	-	-	-	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.
-	-	-	-	-	-	This function is used to return in the direction opposite the travel direction when the skip signal is input during G31 command.
△	△	△	△	△	△	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.
○ 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.
-	-	-	-	-	-	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.
-	-	-	-	-	-	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.
○	○	○	○	○	○	The axis name switch function switches the name of a command axis and a control axis.
△ 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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	By inputting a user macro interrupt signal from the PLC, the program being currently executed is interrupted and other programs can be called instead.
○	○	○	○	○	○	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
○	○	○	○	○	○	
○	○	○	○	○	○	
-	-	-	-	-	-	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.
○	○	○	○	○	○	
△	△	△	△	△	△	
△	△	△	△	△	△	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.
-	-	-	-	-	-	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.
○	○	○	○	○	○	
○	○	○	○	○	○	A parameter is used to designate the axis for which the mirror image function is to be executed before the machining program is run.
-	-	-	-	-	-	Signals from an external device (PLC) request the mirror image operation either during or before the execution of a machining program.
-	-	-	-	-	-	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.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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 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 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)	-	-	-	-	-	-	-	-	-	-	-	○	
4 Control axis superimposition	-	-	-	-	-	-	-	-	-	-	-	-	
5 Control axis synchronization across part systems	-	-	-	-	-	-	-	-	-	-	-	○	
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)	-	○	○	○	○	○	○	○	○	-	-	-	
12 Direct command mode	-	-	-	-	-	-	-	-	-	-	-	-	
4 Programming support functions													
1 Playback	○	○	○	△	△	△	△	△	△	-	-	-	
3 Simple programming	-	○	○	△	△	△	△	△	△	-	○	○	
4 G code guidance	○*	○	○	△	△	△	△	△	△	○*	○	○	

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Lathe system							General explanation
M700VS Series			M700VW Series				
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		
△	△	△	△	△	△	△	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.
△	△	△	△	△	△	△	This function enables to superimpose on and control an axis in a part system with an axis in another part system.
△	△	△	△	△	△	△	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.
△	△	△	△	△	△	△	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.
-	-	-	-	-	-	-	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.
-	-	-	-	-	-	-	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. * 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.
-	△	△	-	△	△	△	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.
△	△	△	△	△	△	△	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.

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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	
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													
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	-	-	-	△	△	△	△	△	△	-	-	-	
3 Others													
1 Programmable current limitation													
1 Programmable current limitation	○	○	○	△	△	△	△	△	△	○	○	○	
2 Auto power off													
2 Auto power off	-	-	-	○	○	○	○	○	○	-	-	-	
15 Safety and maintenance													
1 Safety switches													
1 Emergency stop													
1 Emergency stop	○	○	○	○	○	○	○	○	○	○	○	○	
2 Data protection key													
2 Data protection key	○	○	○	○	○	○	○	○	○	○	○	○	

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Lathe system							General explanation
M700VS Series			M700VW Series				
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		
○	○	○	○	○	○	○	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, cone 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 caused 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 registers 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 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 and 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
△	△	△	△	△	△	△	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.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	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.

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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
2 Display for ensuring safety												
1 NC warning	○	○	○	○	○	○	○	○	○	○	○	○
2 NC alarm	○	○	○	○	○	○	○	○	○	○	○	○
3 Operation stop cause	○	○	○	○	○	○	○	○	○	○	○	○
4 Emergency stop cause	○	○	○	○	○	○	○	○	○	○	○	○
5 Thermal detection	○	○	○	○	○	○	○	○	○	○	○	○
6 Battery alarm/warning	○	○	○	○	○	○	○	○	○	○	○	○
3 Protection												
1 Stroke end (Over travel)	○	○	○	○	○	○	○	○	○	○	○	○
2 Stored stroke limit												
1 Stored stroke limit I / II	○	○	○	○	○	○	○	○	○	○	○	○
2 Stored stroke limit I B	-	○	○	△	△	△	△	△	△	-	○	○
3 Stored stroke limit II B	-	○	○	△	△	△	△	△	△	-	○	○
4 Stored stroke limit I C	-	○	○	△	△	△	△	△	△	-	○	○
3 Stroke check before travel	-	○	○	△	△	△	△	△	△	-	-	-
4 Chuck/Tailstock barrier check	-	-	-	-	-	-	-	-	-	○	○	○
5 Interlock	○	○	○	○	○	○	○	○	○	○	○	○
6 External deceleration	○	○	○	○	○	○	○	○	○	○	○	○
8 3D Machine Interference check	-	-	-	-	-	-	-	△	△	-	-	-
9 Door interlock												
1 Door interlock I	○	○	○	○	○	○	○	○	○	○	○	○
2 Door interlock II	○	○	○	○	○	○	○	○	○	○	○	○
10 Parameter lock	○	○	○	○	○	○	○	○	○	○	○	○
11 Program protection (Edit lock B, C)	○	○	○	○	○	○	○	○	○	○	○	○
12 Program display lock	○	○	○	○	○	○	○	○	○	○	○	○
13 Safety observation	○	○	○	△	△	△	△	△	△	○	○	○
14 Vertical axis pull-up	○	○	○	○	○	○	○	○	○	○	○	○
4 Maintenance and troubleshooting												
1 Operation history	○	○	○	○	○	○	○	○	○	○	○	○
2 Data sampling	○	○	○	○	○	○	○	○	○	○	○	○
3 NC data backup	○	○	○	○	○	○	○	○	○	○	○	○
5 Servo turning support tool												
1 MS Configurator (Need to prepare separate S/W)	-	○	○	○	○	○	○	○	○	-	○	○
2 NC Analyzer (Need to purchase separate S/W)	○	○	○	○	○	○	○	○	○	○	○	○
6 Automatic backup	○	○	○	○	○	○	○	○	○	○	○	○
7 System setup	○	○	○	○	○	○	○	○	○	○	○	○
11 Application error detection	-	-	-	-	-	-	○	○	○	-	-	-
12 NC Maintainer (Need separate PC S/W)	-	-	-	-	-	-	△	△	△	-	-	-
13 Parameter setup support tool												
1 NC Configurator2 (Need separate PC S/W)	○	○	○	○	○	○	○	○	○	○	○	○
16 Drive system												
1 Servo/Spindle												
1 Feed axis												
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)												
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)	-	○	○	○	○	○	○	○	○	-	○	○

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Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	The stop cause of automatic operation is shown on the display.
○	○	○	○	○	○	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.
○	○	○	○	○	○	When overheating is detected in the control unit, an overheat signal is output at the same time as the alarm is displayed.
○	○	○	○	○	○	When it is time to change the batteries, an alarm and warning are displayed.
○	○	○	○	○	○	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.
○	○	○	○	○	○	This function sets the areas prohibited for the tool to enter. There are multiple types of prohibitions according to the prohibited range and method.
△	△	△	△	△	△	
△	△	△	△	△	△	
△	△	△	△	△	△	
-	-	-	-	-	-	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	This function reduces the feedrate to the deceleration speed set by the parameter when the external deceleration input signal has been set to ON.
-	-	-	-	-	-	When a possible collision is detected in a machine model registered beforehand, the motor decelerates to a stop and avoids collision.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	This function is used to prohibit the changing of machine parameters.
○	○	○	○	○	○	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.
○	○	○	○	○	○	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.
△	△	△	△	△	△	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.
○	○	○	○	○	○	This function prevents the tool from breakage, through pulling up the cutting tool during emergency stop or instantaneous power interruption at low cutting speed.
○	○	○	○	○	○	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.
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	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)
○	○	○	○	○	○	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.
○	○	○	○	○	○	With this function, system data, ladder program and custom software can be automatically backed up in case of system failure.
○	○	○	○	○	○	System setup function enables automatic settings for the NC's initial startup just by inputting the minimum required items.
-	-	-	○	○	○	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.
-	-	-	△	△	△	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.
○	○	○	○	○	○	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.
○	○	○	○	○	○	CNC-dedicated drive units, spindle motors, and servo motors are used.
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	
○	○	○	○	○	○	

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

CNC system E70/M70V/M700V Series Specifications List

○: 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
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)	○	○	○	○	○	○	○	○	○	○	○	○
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	○	○	○	○	○	○	○	○	○	○	○	○
2 PLC functions												
1 Built-in PLC basic function	○	○	○	○	○	○	○	○	○	○	○	○
2 PLC exclusive instruction	○	○	○	○	○	○	○	○	○	○	○	○
3 PLC support functions												
1 Alarm message display	○	○	○	○	○	○	○	○	○	○	○	○
2 Operator message display	○	○	○	○	○	○	○	○	○	○	○	○
3 Memory switch (PLC switch)												
1 PLC switch 32 points	○	○	○	○	○	○	○	○	○	○	○	○
2 PLC switch 64 points	○	○	○	○	○	○	○	○	○	○	○	○
4 Load meter display	○	○	○	○	○	○	○	○	○	○	○	○
5 User PLC version display	○	○	○	○	○	○	○	○	○	○	○	○
6 Multi-ladder program register and execution	○	○	○	○	○	○	○	○	○	○	○	○
7 Ladder program writing during RUN	○	○	○	○	○	○	○	○	○	○	○	○
8 PLC protection	○	○	○	○	○	○	○	○	○	○	○	○
4 Built-in PLC capacity												
1 Standard PLC capacity	8000	20000	32000	64000	64000	64000	64000	64000	64000	8000	20000	32000
2 Large PLC capacity	○	○	○	○	○	○	○	○	○	○	○	○
5 Machine contact input/output I/F	○	○	○	○	○	○	○	○	○	○	○	○
6 Ladder monitor	○	○	○	○	○	○	○	○	○	○	○	○
7 PLC development												
1 On-board development	○	○	○	○	○	○	○	○	○	○	○	○
2 MELSEC development tool (GX Developer) (Need separate PC SW)	○	○	○	○	○	○	○	○	○	○	○	○
8 PLC parameter												
1 PLC constant (150 points)	○	○	○	○	○	○	○	○	○	○	○	○
2 PLC constant extension (Up to 755 points)	○	○	○	○	○	○	○	○	○	○	○	○
10 Pallet program registration	○	○	○	○	○	○	○	○	○	○	○	○
11 Additional PLC engine	○	○	○	○	○	○	○	○	○	○	○	○
2 Machine construction												
1 Servo OFF	○	○	○	○	○	○	○	○	○	○	○	○
2 Axis detachment	○	○	○	○	○	○	○	○	○	○	○	○
3 Synchronous control	○	○	○	○	○	○	○	○	○	○	○	○
4 Inclined axis control	○	○	○	○	○	○	○	○	○	○	○	○
5 Position switch	○24	○24	○24	○24	○24	○24	○24	○24	○24	○24	○24	○24
7 Index table indexing	○	○	○	○	○	○	○	○	○	○	○	○
8 Auxiliary axis control (J2-CT)	○	○	○	○	○	○	○	○	○	○	○	○
9 Tool length compensation along the tool axis	○	○	○	○	○	○	○	○	○	○	○	○
10 Tool handle feed & interruption	○	○	○	○	○	○	○	○	○	○	○	○
11 Tool center coordinate display	○	○	○	○	○	○	○	○	○	○	○	○
12 Tool center point control	○	○	○	○	○	○	○	○	○	○	○	○
13 Inclined surface machining command	○	○	○	○	○	○	○	○	○	○	○	○
14 Tool radius compensation for 5-axis machining	○	○	○	○	○	○	○	○	○	○	○	○
15 Workpiece installation error compensation	○	○	○	○	○	○	○	○	○	○	○	○

Lathe system							General explanation
M700VS Series			M700VW Series				
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW		
○	○	○	○	○	○	○	CNC-dedicated drive units, spindle motors, and servo motors are used.
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	
○	○	○	○	○	○	○	An exclusive sequence program that controls various signals between the controller and the machine to realize the operations applicable to each machine can be created and built in.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	PLC-dedicated instruction is provided for some limited applications, enabling a complex machining process, which is difficult to carry out only by the basic instructions and function instructions.
○	○	○	○	○	○	○	The contents of the alarms which have occurred during sequence (user PLC) processing can be displayed on the setting and display unit.
○	○	○	○	○	○	○	When some conditions occur where you wish to inform a messages to the operator, an operator message can be displayed separately from the alarm message.
○	○	○	○	○	○	○	PLC switches can be set on the setting and display unit screen, and the ON/OFF control executed.
○	○	○	○	○	○	○	A load meter can be displayed on the setting and display unit.
○	○	○	○	○	○	○	The user PLC version can be displayed in the software list on the Software Configuration screen.
○	○	○	○	○	○	○	This function stores and executes more than one sequence program.
○	○	○	○	○	○	○	Ladder program can be edited while PLC is running.
○	○	○	○	○	○	○	A keyword can be set to protect the sequence programs stored in the CNC.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	This function enables the operating status of the sequence circuit to be checked on the controller's setting and display unit.
○	○	○	○	○	○	○	On-board refers generically to the PLC related operations carried out with the CNC unit. The Mitsubishi CNC on-board realizes functions and operations similar to the MELSEC Series ladder development tool (GX Developer).
○	○	○	○	○	○	○	This function enables the data of the PLC contained inside the NC system to be developed and debugged using the GX Developer.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	Pallet program function assists the machining setups as it allows machining programs to be registered for each pallet of the auto pallet changer.
○	○	○	○	○	○	○	This function improves the performance of processing PLC programs.
○	○	○	○	○	○	○	When the servo OFF signal (per axis) is input, the corresponding axis is set in the servo OFF state. When the moving axis is mechanically clamped, this function is designed to prevent the servo motor from being overloaded by the clamping force.
○	○	○	○	○	○	○	This function enables the control axis to be released from control.
○	○	○	○	○	○	○	The synchronous control is a control method whereby both 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.
○	○	○	○	○	○	○	Even when the control axes in a machine are mounted at an angle other than 90 degrees, this function enables it to be programmed and controlled in the same way as with an orthogonal axis.
○	○	○	○	○	○	○	Instead of a dog switch on a machine's axis, a hypothetical dog switch is established using a parameter to set a coordinate position to show the axis name and the hypothetical dog position. When the machine reaches the position, a signal is output to the PLC interface.
○	○	○	○	○	○	○	The indexing of the index table can be performed by setting the index axes.
○	○	○	○	○	○	○	The MR-J2-CT drive unit for positioning and indexing can be connected for auxiliary axis control.
○	○	○	○	○	○	○	(1) Changing the tool length compensation along the tool axis and compensation amount Even if the tool axis direction is not the Z axis direction because the rotary axis is rotated, the tool can be compensated in the tool axis direction. (2) Machine configuration The tool length compensation along the tool axis is carried out in respect to the direction of the tool nose axis (rotary axis).
○	○	○	○	○	○	○	This function makes it possible to move the axis with the manual pulse generator in the tool axis direction, tool diameter direction X and tool diameter direction Y in the hypothetical coordinate system over the tool axis.
○	○	○	○	○	○	○	The tool center coordinates, handle interrupt amount (tool axis movement) and tool center point speed are displayed during the tool center point control function, tool length compensation along the tool axis function, and tool handle feed & interrupt function (tool axis direction handle feed, tool handle interrupt, tool diameter direction handle feed, nose center rotation handle feed).
○	○	○	○	○	○	○	This function controls so that the position command in a machining program is at the tool center point in the coordinate system (table coordinate system) which rotates together with the workpiece.
○	○	○	○	○	○	○	An arbitrary spatial plane defined with this function can be machined using normal program commands.
○	○	○	○	○	○	○	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.
○	○	○	○	○	○	○	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.

CNC system E70/M70V/M700V Series Specifications List

○: Standard △: Option □: Selection

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
16 Manual feed for 5-axis machining	-	-	-	△	△	△	△	△	△	-	-	-
17 R-Navi	-	-	-	△	△	△	△	△	△	-	-	-
3 PLC operation												
1 Arbitrary feed in manual mode	○	○	○	○	○	○	○	○	○	○	○	○
2 Circular feed in manual mode	-	-	-	△	△	△	△	△	△	-	-	-
3 PLC axis control	○	○	○	△	△	△	△	△	△	○	○	○
5 PLC axis indexing	○	○	○	△	△	△	△	△	△	○	○	○
4 PLC interface												
1 CNC control signal	○	○	○	○	○	○	○	○	○	○	○	○
2 CNC status signal	○	○	○	○	○	○	○	○	○	○	○	○
3 PLC window	○	○	○	△	△	△	△	△	△	○	○	○
4 External search	○	○	○	△	△	△	△	△	△	○	○	○
5 Machine contact I/O												
1 Additional DI/DO (DI:32/DO:32)	□	□	□	□	□	□	□	□	□	□	□	□
2 Additional DI/DO (DI:64/DO:64)	□	□	□	□	□	□	□	□	□	□	□	□
3 Remote I/O 32/32	□	□	□	□	□	□	□	□	□	□	□	□
4 Remote I/O 64/48	□	□	□	□	□	□	□	□	□	□	□	□
5 MITSUBISHI CNC machine operation panel	△	△	△	△	△	△	△	△	△	△	△	△
6 External PLC link												
3 CC-Link (Master/Slave)	-	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN746)	□ (HN576/HN577)	□ (HN576/HN577)	□ (HN576/HN577)	-	□ (HN746)	□ (HN746)
4 PROFIBUS-DP (Master)	-	-	-	-	-	-	□ (HN571)	□ (HN571)	□ (HN571)	-	-	-
5 DeviceNet (Master)	-	-	-	□ (HN747)	□ (HN747)	□ (HN747)	-	-	-	-	-	-
6 FL-net	-	-	-	□ (HN747)	□ (HN747)	□ (HN747)	-	-	-	-	-	-
7 Installing S/W for machine tools												
1 Customization (NC Designer) (Need separate PC S/W)	○	○	○	△	△	△	△	△	△	○	○	○
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)
2 Customization workpiece data size [MByte]	1	3	3	6	6	6	6	6	6	1	3	3
2 User-defined key	-	-	-	○	○	○	○	○	○	-	-	-
3 EZSocket I/F (Need separate PC S/W)	○	○	○	○	○	○	○	○	○	○	○	○
4 APLC release (Need separate PC S/W)	○	○	○	△	△	△	△	△	△	○	○	○
8 Others												
1 System lock	○	○	○	△	△	△	△	△	△	○	○	○
2 CNC Remote Operation Tool												
1 NC Monitor (Need separate PC S/W)	-	○	○	○	○	○	○	○	○	-	○	○
2 NC Explorer (Need to prepare separate S/W)	-	○	○	○	○	○	○	○	○	-	○	○
3 Automatic operation lock	-	○	○	○	○	○	○	○	○	-	○	○

S/W ver.J0

Lathe system						General explanation
M700VS Series			M700VW Series			
M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	
-	-	-	-	-	-	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.
-	-	-	-	-	-	This provides easy setup of index machining (multiple/inclined surface machining) using a rotary axis.
○	○	○	○	○	○	This function enables the feed directions and feed rates of the control axes to be controlled using commands from the user PLC.
△	△	△	△	△	△	By specifying a hypothetical coordinate on the machine coordinate from the user PLC, oblique linear interpolation or circular interpolation is executed with jog/handle feed, manual rapid traverse or incremental feed of either X axis or Y axis.
△	△	△	△	△	△	This function allows independent axes to be controlled with PLC-based commands, separately from the NC control axes.
△	△	△	△	△	△	By setting positioning points (stations) in advance, positioning control can be performed simply by designating a positioning point No. (station No.).
○	○	○	○	○	○	Control commands to the CNC system are assigned from the PLC. Input signals with skip inputs that respond at high speed can also be used.
○	○	○	○	○	○	The status signals are output from the CNC system. They can be utilized by referencing them from the PLC.
△	△	△	△	△	△	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.
△	△	△	△	△	△	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.
□	□	□	□	□	□	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.
□	□	□	□	□	□	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.
△	△	△	△	△	△	It is a machine operation panel supplied by Mitsubishi. Its keyboard layout can be changed according to the specifications of the machine.
□ (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.
-	-	-	□ (HN571)	□ (HN571)	□ (HN571)	The slave stations that support the PROFIBUS-DP communication can be connected to input/output device.
□ (HN747)	□ (HN747)	□ (HN747)	-	-	-	MELSEC-Q series I/O intelligent function unit can be connected with NC.
□ (HN747)	□ (HN747)	□ (HN747)	-	-	-	
△	△	△	△	△	△	
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.
6	6	6	6	6	6	
○	○	○	○	○	○	This function allows an arbitrary character string to be assigned to a key and makes it easy to input a typical character string.
○	○	○	○	○	○	This middleware makes it easy to develop applications having the Windows interface.
△	△	△	△	△	△	APLC (Advanced Programmable Logic Controller) release is a function that allows the user-generated C language module to be called from the NC. Control operations that are difficult to express in a sequence program can be created with the C language.
△	△	△	△	△	△	This function locks the operations of the NC if the release code is not entered before the specified time limit.
○	○	○	○	○	○	NC Monitor is a PC software tool that monitors information in the NC unit connected with the Ethernet.
○	○	○	○	○	○	NC Explorer is a software tool to operate the machining data files of each NC unit connected with a host personal computer by Ethernet connection from the Explorer on the host personal computer.
○	○	○	○	○	○	Automatic operation lock function prevents the falsification of APLC (C language module) by a third party.

Servo Motors

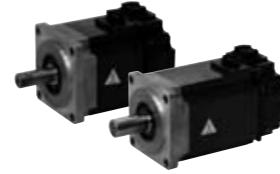
■ HF Series

- Medium-inertia, high-accuracy and high-speed motors
- High-inertia machine accuracy is ensured. Suitable for machines requiring quick acceleration.
- Range: 0.5 to 9 [kW]
- Maximum speed: 4,000 or 5,000 [r/min]
- Supports three types of detectors with a resolution of 260,000, 1 million or 16 million p/rev.



■ HF-KP Series

- Small-capacity, low-inertia motors
- Suitable for an auxiliary axis that require high-speed positioning
- Range: 0.1 to 0.75[kW]
- Maximum speed: 6,000 [r/min]
- Supports a detector with a resolution of 260,000p/rev.



■ Direct Drive Servo Motor TM-RB Series

- High-torque direct-drive combined motor with a high-gain control system provides quick acceleration and positioning, which makes rotation smoother.
- Suitable for a rotary axis that drives a table or spindle head.
- Compared with a conventional rotary axis with a deceleration gear, this motor has higher accuracy and is maintenance-free, having no wear or backlash.
- Range: Maximum torque: 36 to 1,280 [N·m]



■ Linear Servo Motor LM-F Series

- Use in clean environments is possible since no ball screws are used and therefore contamination from grease is not an issue.
- Elimination of transmission mechanisms which include backlash, enables smooth and quiet operation even at high speeds.
- Dimensions: Length: 290 to 1,010 [mm] Width: 120 to 240 [mm]



Spindle Motors

■ High-performance New Type Spindle Motor SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.
- High-speed-specification bearings are equipped as standard, achieving higher-speed, lower vibration and improved durability.

Product line:

Normal	SJ-D Series	3.7 to 11 [kW]
Compact & light	SJ-DJ Series	5.5 to 15 [kW]
Low-inertia	SJ-DL Series	0.75 to 7.5 [kW]



■ High-performance Spindle Motor SJ-V Series

- A vast range of spindle motors is available, including standard, high-speed and wide-range output units, all ready to support diversified machine tool needs.

Product line:

Normal	SJ-V Series	0.75 to 55 [kW]
Wide-range constant output	SJ-V Series	5.5 to 18.5 [kW]
High-speed	SJ-V-Z Series	2.2 to 22 [kW]
Hollow-shaft	SJ-VS Series	5.5 to 18.5 [kW]



■ Low-inertia, High-speed Spindle Motor SJ-VL Series

- The spindle dedicated to tapping machines requiring faster drilling and tapping.
- The low-inertia reduces acceleration/deceleration time, resulting in higher productivity. In addition, when driven by a multi-hybrid drive (MDS-DM2-SPV Series), this motor contributes to downsizing of the cabinet, and energy savings.
- Hollow-shaft specifications are also available.

Product line:

Low-inertia normal	SJ-VL Series	3.0 to 11 [kW]
Low-inertia hollow shaft	SJ-VLS Series	3.7 to 11 [kW]



■ Built-in Spindle Motor

- Electricity loss is minimized by providing better efficiency during high-speed rotation.
- Stator coil-end size has been reduced, realizing a shorter overall motor length.
- As feedback communication is serial, the resolution is significantly enhanced (Max. 4 million p/rev)
- The adjustment PCB has been eliminated to achieve adjustment-free conditions. The standard gap has been reduced to 0.3mm.



■ Tool Spindle Motor (HF-KP/HF-SP Series)

- Taking advantage of the characteristics of a servo motor such as smallness and high-output, this motor serves as a compact and high-output spindle motor which is capable of high-speed rotation (6,000r/min). This motor contributes to downsizing of spindles, such as the rotary tool spindle.
- Product line: Small capacity HF-KP Series 0.4 to 0.9 [kW] Medium capacity HF-SP Series 2.2 to 4 [kW]



■ IPM Spindle Motor

- In answer to demands for downsizing and higher efficiency, an IPM motor has been introduced for further energy savings.
- A reduction in acceleration/deceleration time contributes to shorter cycle times.



Drive Units

■ High-performance Servo/Spindle Drive Units MDS-D2/DH2 Series

- With the fastest current control cycle, basic performance is drastically enhanced (high-gain control). A combination of high-speed servo motor and high-accuracy detector helps enhance overall drive performance.
- A high-efficiency fin and low-loss power module have enabled unit downsizing. A line of drive units driving a maximum of two spindles is available, contributing to a reduction in control panel size.
- STO (safe torque off) is now available. (Note)



■ All-in-one compact drive units MDS-DJ Series

- Ultra-compact drive units with built-in power supplies contribute to reducing control panel size.
- A high-efficiency fin and low-loss power module have enabled unit downsizing, which also leads to a reduction in control panel size.
- STO (safe torque off) is now available. (Note)



■ Multi-hybrid Drive Units MDS-DM2 Series

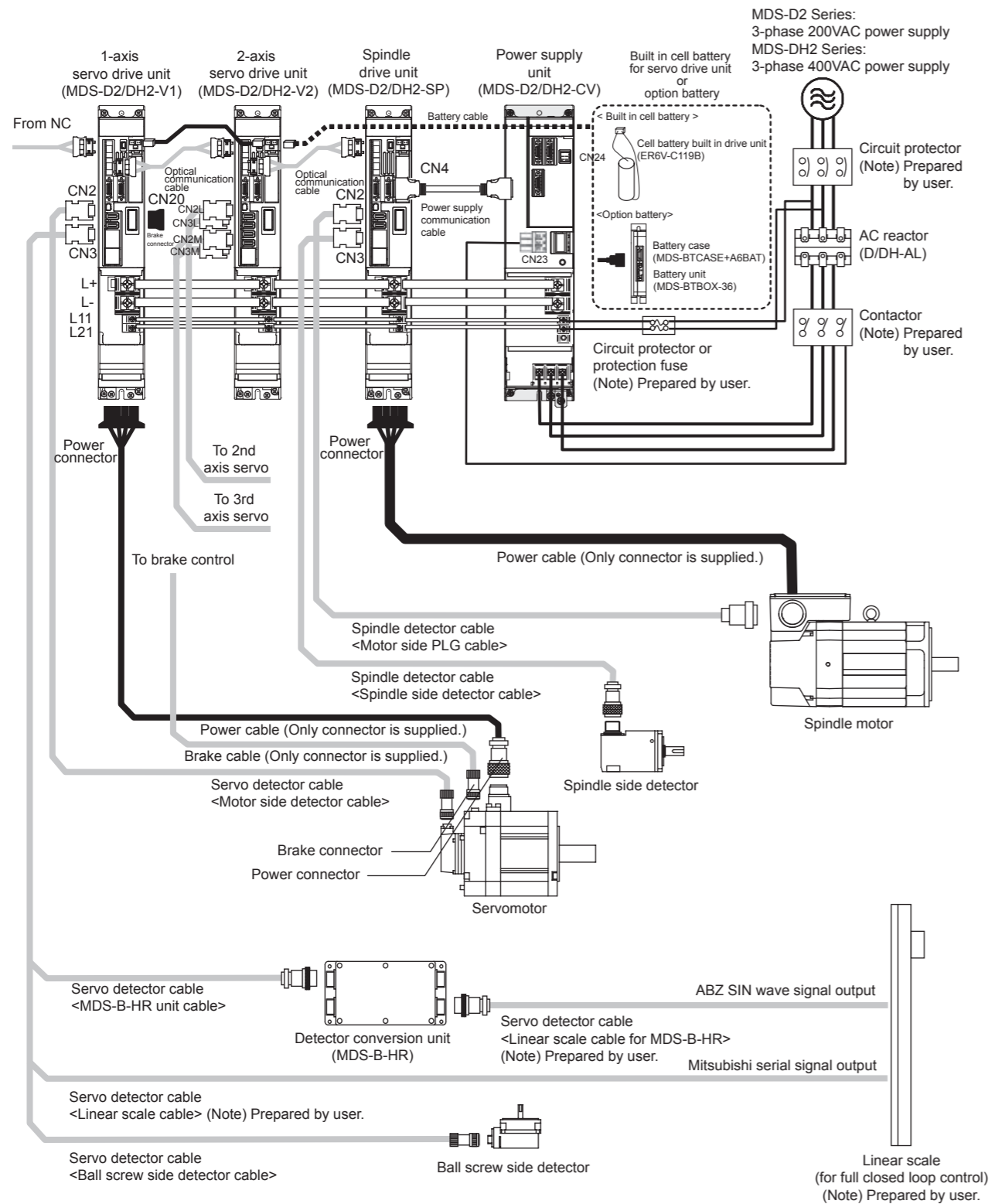
- A line of high-performance multi-hybrid drive units are available. The multi-hybrid drive unit drives a maximum of three servo axes and one spindle, supporting the downsizing of units and offering technical advantages.
- A power regeneration system that efficiently uses energy during deceleration as power contributes to highly-frequent acceleration/deceleration and energy savings.
- STO (safe torque off) is now available. (Note)



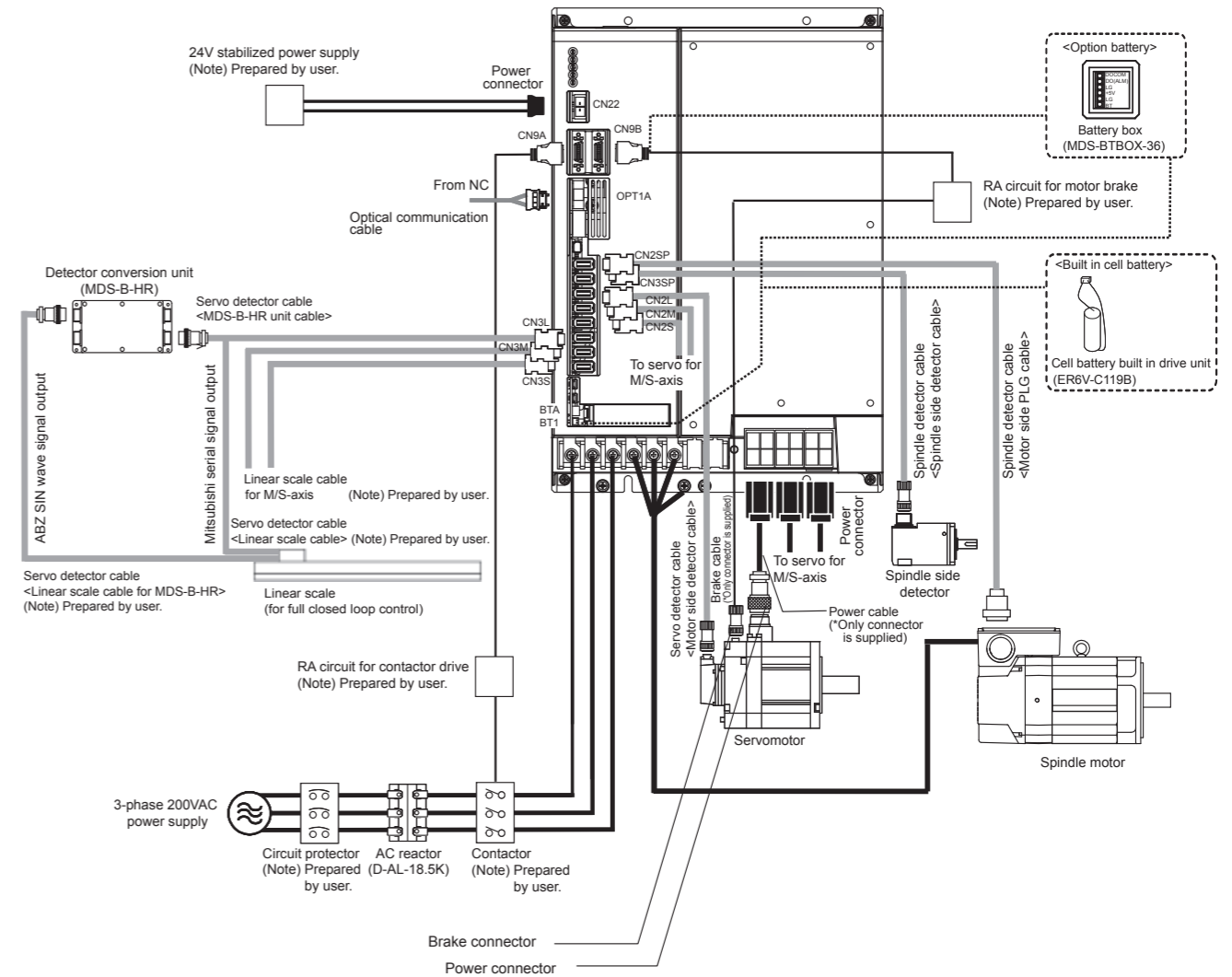
(Note) Please contact us for availability of STO as a whole system.

Drive system System configuration

MDS-D2/DH2 Series



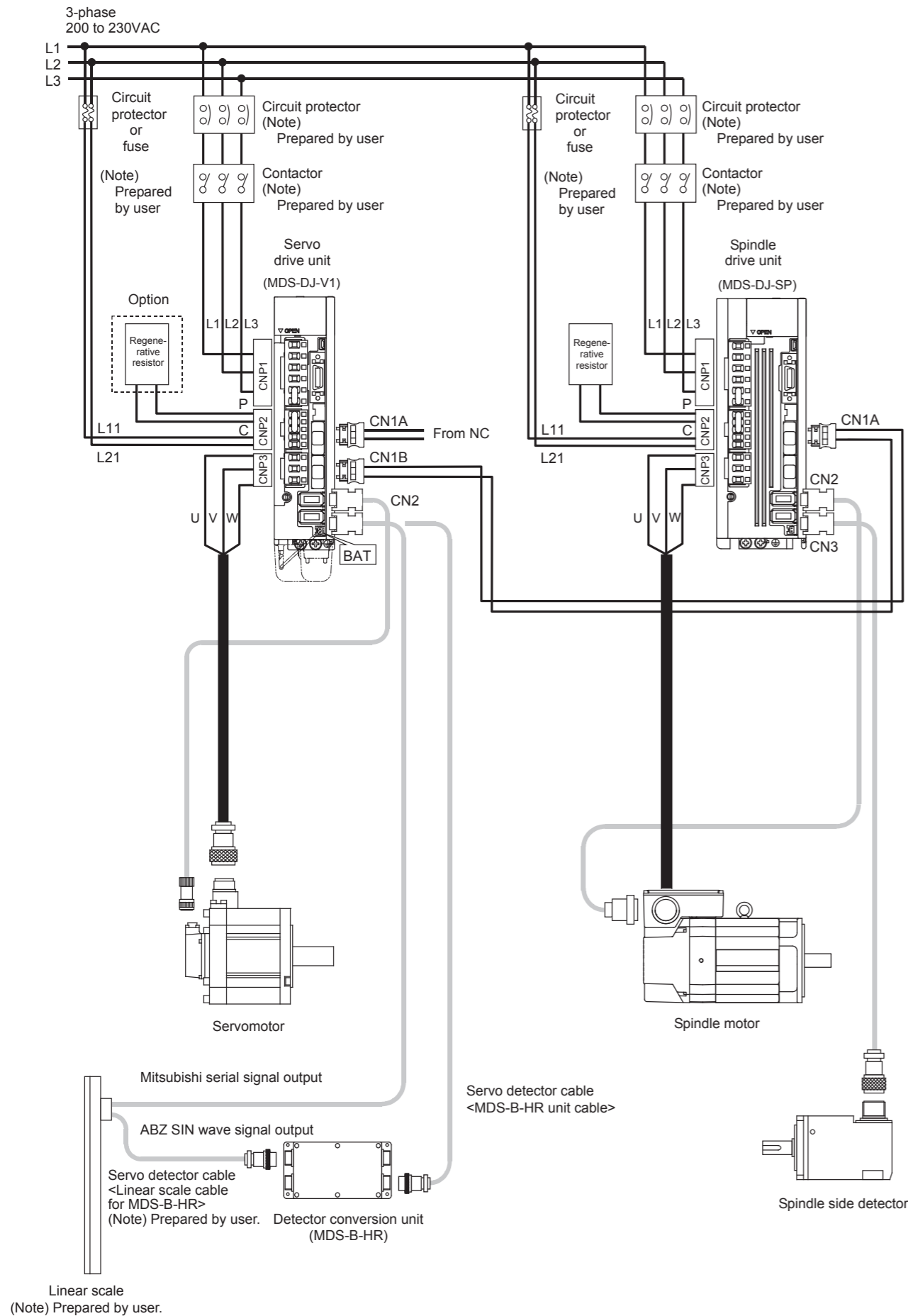
MDS-DM2 Series



Drive system System configuration

Drive system System configuration

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
	Software Version	A0	A0	A0	A0
1 Base control functions	1-1 Full closed loop control	●	●	●	●
	1-2 Position command synchronous control	●	●	●	●
	1-3 Speed command synchronous control	●	●	●	●
	1-4 Distance-coded reference position control	●	●	●	●
2 Servo control function	2-1 Torque limit function (stopper function)	●	●	●	●
	2-2 Variable speed loop gain control	●	●	●	●
	2-3 Gain changeover for synchronous tapping control	●	●	●	●
	2-4 Speed loop PID changeover control	●	●	●	●
	2-5 Disturbance torque observer	●	●	●	●
	2-6 Smooth High Gain control (SHG control)	●	●	●	●
	2-7 High-speed synchronous tapping control (OMR-DD control)	●	●	●	●
	2-8 Dual feedback control	●	●	●	●
	2-9 HAS control	●	●	●	●
	2-10 OMR-FF control	●	●	●	●
3 Compensation control function	3-1 Jitter compensation	●	●	●	●
	3-2 Notch filter	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1	Variable frequency: 4 Fixed frequency: 1
	3-3 Adaptive tracking-type notch filter	●	●	●	●
	3-4 Overshooting compensation	●	●	●	●
	3-5 Machine end compensation control	●	●	●	●
	3-6 Lost motion compensation type 2	●	●	●	●
	3-7 Lost motion compensation type 3	●	●	●	●
	3-8 Lost motion compensation type 4	●	●	●	●
4 Protection function	4-1 Deceleration control at emergency stop	●	●	●	●
	4-2 Vertical axis drop prevention/pull-up control	●	●	●	●
	4-3 Earth fault detection	●	●	●	●
	4-4 Collision detection function	●	●	●	●
	4-5 SLS (Safely Limited Speed) function	●	●	●	●
5 Sequence function	4-6 Fan stop detection	●	●	●	●
	4-9 STO (Safe Torque Off) function	●	●	●	●
	5-2 Motor brake control function (Note 1)	●	●	●	●
6 Diagnosis function	5-4 Specified speed output	●	●	●	●
	5-5 Quick READY ON sequence	●	●	●	●
	6-1 Monitor output function	●	●	●	●
	6-2 Machine resonance frequency display function	●	●	●	●
	6-3 Machine inertia display function	●	●	●	●
	6-4 Motor temperature display function (Only for linear or DDM)	●	●	●	●

(Note 1) For the multi-axis 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.

<Spindle specification>

	Function name	MDS-D2-SP	MDS-DH2-SP	MDS-D2-SP2	MDS-DM2-SPV2/3, SPHV3	MDS-DJ-SP	
	Software Version	A0	A0	A0	A0	A0	
1 Base control functions	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	
	3-3 Adaptive tracking-type notch filter	●	●	●	●	●	
4 Protection function	3-4 Overshooting compensation	●	●	●	●	●	
	3-6 Lost motion compensation type 2	●	●	●	●	●	
	3-9 Spindle motor temperature compensation function	●	●	●	●	●	
	4-1 Deceleration control at emergency stop	●	●	●	●	●	
	4-3 Earth fault detection	●	●	●	●	●	
5 Sequence function	4-4 Collision detection function	●	●	●	●	●	
	4-5 SLS (Safely Limited Speed) function	●	●	●	●	●	
	4-6 Fan stop detection	●	●	●	●	●	
6 Diagnosis function	4-9 STO (Safe Torque Off) function	●	●	●	●	●	
	5-4 Specified speed output	●	●	●	●	●	
	5-5 Quick READY ON sequence	●	●	●	●	●	
	6-1 Monitor output function	●	●	●	●	●	
	6-2 Machine resonance frequency display function	●	●	●	●	●	
	6-3 Machine inertia display function	●	●	●	●	●	
	6-4 Motor temperature display function	●	●	●	●	●	
	6-5 Load monitor output function	●	●	●	●	●	
	6-6 Open loop control function	●	●	●	●	●	

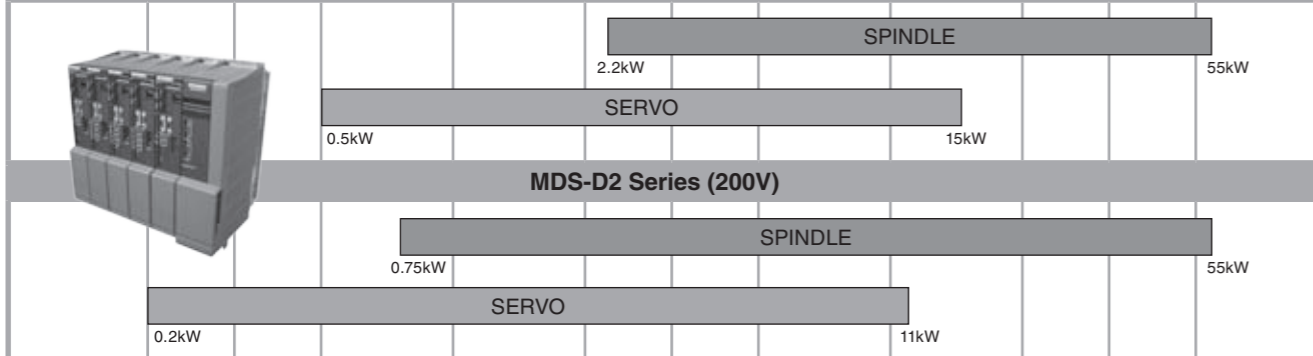
Power Supply specification

<Power Supply specification>

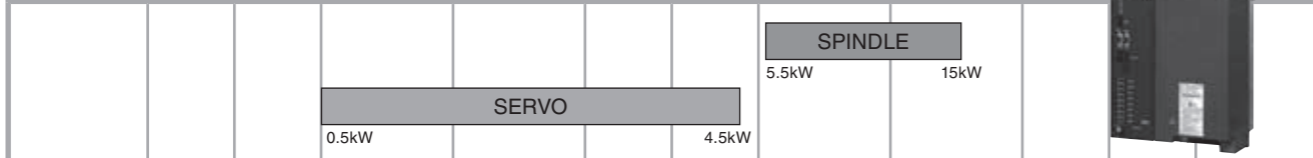
	Function name	MDS-D2-CV	MDS-DH2-CV	MDS-DM2-SPVx, SPHV3 built-in converter	MDS-DJ-V1 built-in converter	MDS-DJ-SP built-in converter
	Software Version	A0	A0	A0	A0	A0
1 Base control functions	1-14 Power regeneration control	●	●	●	●	●
	1-15 Resistor regeneration control	-	-	-	-	-
4 Protection function	4-6 Fan stop detection	●	●	●	●	●
	4-7 Open-phase detection	●	●	●	●	●
	4-8 Contactor weld detection	●	●	●	●	●
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 voltage display function	●	●	●	-	-

MITSUBISHI CNC DRIVE SYSTEM LINES

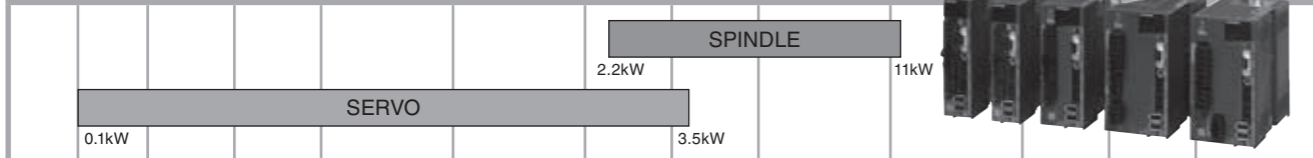
Drive unit to realize complete nano control MDS-DH2 Series (400V)



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



Compact drive unit MDS-DJ Series



Compatible motors' rated capacity

200V HF servo motor

<HF Series>

HF ① ② ③ - ④

① Rated 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.

② Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

③ Shaft end structure

Symbol	Shaft end structure
S	Straight
T	Taper

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

④ Detector

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

① Rated 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.

② Magnetic brake

Symbol	Magnetic brake
None	None
B	With magnetic brake

③ Detector

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

(Note) There is no detector specification symbol for the HF-KP series.

The detector specification is A48 only.

(Note) Detector A51 and A74/A74N can not be used with the HF-KP series.

200V Direct-drive motor

<TM-RB Series>

Primary side [coil side]

TM-RBP ① ② ③

Secondary side [magnet side]

TM-RBS ① ② ③

① Rated torque

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

② Stator dimensions

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

③ Rated rotation speed

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

200V Linear servo motor

<LM-F Series>

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

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

① Width

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

② Length

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

③ Rated 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

① Width

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

② Length

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

① Motor Series		② Short-time (or %ED) rated output		③ Maximum rotation speed		⑤ Detector		⑥ Option ^(Note)	
Symbol	Motor Series	Symbol	Short-time rated output	Indicates the hundreds place and higher order digits.		Symbol	Type	Symbol	Option
None	Normal specifications	0.75	0.75 kW			None	Type 1	None	Standard (flange type, without oil seal, without key, coil changeover unavailable, air-cooling, solid shaft)
J	Compact & lightweight specifications	1.5	1.5 kW			T	Type 2	C	With key
L	Low-inertia specifications	3.7	3.7 kW					J	Oil seal
		5.5	5.5 kW					X	Reversed cooling air
		7.5	7.5 kW						
		11	11 kW						
		15	15 kW						

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

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

200V SJ-V spindle motor

<SJ-V/VL Series> SJ- ① ② ③ ④ - ⑤ ⑥ T

① Motor Series		④ Short-time rated output (Standard specification)		⑤ Specification code	
Symbol	Motor Series	Symbol	Short-time rated output	The SJ-V/VL Series is indicated with a specification code (01 to 99).	
V	Medium inertia Series	0.75	0.75 kW		
VL	Low inertia Series	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		

② Coil changeover

Symbol	Coil changeover
None	Unavailable
K	Available

③ Shaft configuration

Symbol	Shaft configuration
None	Standard
S	Hollow shaft

⑥ Special 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

① Voltage		③ Motor size		④ Specification code		⑤ Overheat protection sensor		⑥ Coil changeover	
Symbol	Voltage	Symbol	Stator outline	Specification code (01 to 99)		Symbol	Overheat protection sensor	Symbol	Coil changeover
2	200V	0	φ 110			T	Thermistor	None	Unavailable
4	400V	1	φ 128					D	Available (Δ-2//Δ)
		2	φ 160					K	Available (Λ-Δ)
		3	φ 180						
		4	φ 210						
		5	φ 230						
		6	φ 255						
		7	φ 300						
		9	φ 370						
		A	φ 90						
		B	φ 115						

* 400V is available by special order.

② Number of poles

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

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

<SJ-PMB Series> SJ- ① PMB ② ③ ④ - ⑤

① Voltage		② Continuous rated torque		④ Overheat protection sensor		⑤ Design management No.	
Symbol	Voltage	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]		Symbol	Overheat protection sensor	Indicates with 2 digits number or alphabetic characters Example) 00, A1	
None	200V			T	Thermistor		
4	400V						

* 400V is available by special order.

③ Base rotation speed
Indicates the thousands and the hundreds places (the ten places are rounded off.) Example) 03 : 250 to 349 [r/min] 15 : 1450 to 1549 [r/min]

200V Tool spindle motor

<HF-KP Series>

HF-KP ① J ② W09

① Rated 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.

② Option

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

<HF-SP Series>

HF-SP ① J ② W09

① Rated 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.

② Option

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

<HF Series>

HF ① ② - ③

① Rated 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.

② Shaft end structure

Symbol	Shaft end structure
S	Straight

③ Detector

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

① Rated 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.

② Magnetic brakes

Symbol	Magnetic brakes
None	None
B	With magnetic brakes

③ Shaft end structure

Symbol	Shaft end structure
S	Straight
T	Taper

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

④ Detector

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

① Motor Series

Symbol	Motor Series
V	Medium-inertia Series

② Coil changeover

Symbol	Coil changeover
None	Unavailable

③ Shaft configuration

Symbol	Axis configuration
None	Standard
S	Hollow shaft

④ Short time rated output (Standard 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

⑤ Specification code

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

⑥ Special 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
	2-axis type MDS-D2-V2-	-	2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)
	3-axis type MDS-D2-V3-	-	202020 (L, M, S)	202020 (L, M, S)	202020 (L, M, S)	202020 (L, M, S)
	Multi axis integrated type MDS-DM2-SPV2-SPV3-	-	-	-	-	-
Regenerative resistor type MDS-DJ-V1-	10	10	15	30	30	30
Output	[N · m] 15					
Stall torque	10					
Max. torque	5					
	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 · cm ²] 0.088 0.23 0.42 1.43 2.6 5.1					
Motor inertia with a brake	[kg · cm ²] 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)	[mm]					
(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 A48 only.						
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) 1,000,000 [p/rev] (A51) 260,000 [p/rev] (A48)					
	DJ	D2, DJ	D2, 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		
	2-axis type MDS-D2-V2-	4020 (L) 4040 (L, M) 8040 (M)	4020 (L) 4040 (L, M) 8040 (M)	-	8040 (L) 8080 (L, M) 16080 (M)		
	3-axis type MDS-D2-V3-	404040 (L, M, S)	404040 (L, M, S)	404040 (L, M, S)	-		
	Multi axis integrated type MDS-DM2-SPV2-SPV3-SPHV3-	xxx80 (L, M)* xxx80 (L, M, S)* 20080 (L, M, S)	xxx80 (L, M)* xxx80 (L, M, S)* 20080 (L, M, S)	- xxx80 (L, M, S)* 200120 (L, M, S)	xxx80 (L, M)* xxx80 (L, M, S)* 200120 (L, M, S)	- xxx80 (L, M, S)* 200120 (L, M, S)	
Regenerative resistor type MDS-DJ-V1-	30	40	-	80	80		
Output	[N · m] 50						
Stall torque	40						
Max. torque	30						
	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 · cm ²] 6.1 11.9 17.8 23.7 38.3						
Motor inertia with a brake	[kg · cm ²] 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)	[mm]						
(Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.							
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) 1,000,000 [p/rev] (A51) 260,000 [p/rev] (A48)						
	D2	D2	-	D2	D2		
	D2	D2	D2-V3	D2	D2		
	DM2, DJ	DM2, DJ	DM2, DJ	DM2, DJ	DJ		

*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 (L, M)	2020 (L, M) 4020 (M)	-	4020 (L) 4040 (L, M) 8040 (M)	8040 (L) 8080 (L, M) 16080 (M)
	3-axis type	MDS-D2-V3-	-	-	202020 (L, M, S) 404040 (L, M, S)	404040 (M, S)	404040 (L)	-
	Multi axis integrated type	SPV2-	-	-	-	-	xxx80 (L, M)*	xxx80 (L, M)*
		SPV3-	-	200120 (L, M, S)	-	-	xxx80 (L, M, S)*	xxx80 (L, M, S)* 200120 (L, M, S)
SPHV3-		-	-	-	-	20080 (L, M, S)	20080 (L, M, S)	
Regenerative resistor type	MDS-DJ-V1-	100	-	40	-	40	80	
Output	Stall torque	[N · m]						
	Max. torque	[N · m]						
Rated output	[kW]							
Maximum rotation speed	[r/min]							
Motor inertia	[kg · cm ²]							
Motor inertia with a brake	[kg · cm ²]							
Degree of protection	(The shaft-through portion is excluded.)							
Outline dimension drawing	[mm]							
(Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.								
Flange fitting diameter	[mm]							
Shaft diameter	[mm]							
Mass (with a brake)	[kg]							
Absolute position detector compatible drive unit	[p/rev]							

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 (L, M)	160160W (L, M)	-	2020 (L, M) 4040 (L, M) 8040 (M)	-	4020 (L) 4040 (L, M) 8040 (M)
	3-axis type	MDS-D2-V3-	-	-	-	202020 (L, M, S) 404040 (L, M, S)	404040 (M, S)	404040 (L)	-
	Multi axis integrated type	SPV2-	-	-	-	-	-	-	xxx80 (L, M)*
		SPV3-	-	200120 (L, M, S)	-	-	-	-	xxx80 (L, M, S)*
SPHV3-		-	-	-	-	-	-	20080 (L, M, S)	
Regenerative resistor type	MDS-DJ-V1-	-	-	-	-	40	-	40	
Output	Stall torque	[N · m]							
	Max. torque	[N · m]							
Rated output	[kW]								
Maximum rotation speed	[r/min]								
Motor inertia	[kg · cm ²]								
Motor inertia with a brake	[kg · cm ²]								
Degree of protection	(The shaft-through portion is excluded.)								
Outline dimension drawing	[mm]								
(Note) The total length will be 3.5mm longer when using an A51 or A74/A74N detector.									
Flange fitting diameter	[mm]								
Shaft diameter	[mm]								
Mass (with a brake)	[kg]								
Absolute position detector compatible drive unit	[p/rev]								

*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 (L, M) 8040 (M)	8040 (L) 8080 (L, M) 16080 (M)	8040 (L) 8080 (L, M) 16080 (M)	16080 (L) 160160 (L, M)
	3-axis type	MDS-D2-V3-	404040 (L, M, S)	-	-	-
Regenerative resistor type	MDS-DJ-V1-	40	80	80	100	
Output	Rated torque (liquid-cooling)	[N · m]				
	Max. torque	[N · m]				
Rated output	[W]					
Maximum rotation speed	[r/min]					
Motor inertia	[kg · cm ²]					
Protection level	IP00					
Outline dimension drawing	[mm]					
Mass [kg]	Primary side (coil)		3.9	7.1	10	13
	Secondary side (magnet)		1.7	3.7	5	7
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 (L, M)	160160 (L, M)	-	-
	Regenerative resistor type	MDS-DJ-V1-	-	-	-	-
Output	Rated torque (liquid-cooling)	[N · m]				
	Max. torque	[N · m]				
Rated output	[W]					
Maximum rotation speed	[r/min]					
Motor inertia	[kg · cm ²]					
Protection level	IP00					
Outline dimension drawing	[mm]					
Mass [kg]	Primary side (coil)		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 (L, M) 8040 (M)	8040 (L) 8080 (L, M) 16080 (M)	16080 (L) 160160 (L, M)	8040 (L) 8080 (L, M) 16080 (M)				
	3-axis type	MDS-D2-V3-	404040 (L, M, S)	-	-	-				
	Regenerative resistor type	MDS-DJ-V1-	40	80	-	80				
Thrust force [N]										
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				
Protection level			IP00	IP00	IP00	IP00				
Outline dimension drawing [mm]			Primary side	Secondary side	Primary side	Secondary side	Primary side	Secondary side	Primary side	Secondary side
			9		18		27		14	
	Mass [kg]		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-FP4D-24M-1WW0	LM-FP4F-36M-1WW0	LM-FP4H-48M-1WW0	LM-FP5H-60M-1WW0				
	Secondary side type		LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS40-□-1WW0	LM-FS50-□-1WW0				
Compatible drive unit	1-axis type	MDS-D2-V1-	160	320	320	200 (Note 2)				
	2-axis type	MDS-D2-V2-	16080 (L) 160160 (L, M)	-	-	-				
	Regenerative resistor type	MDS-DJ-V1-	-	-	-	-				
	Thrust force [N]									
Rated thrust force	[N]		2400	3600	4800	6000				
Maximum speed (Note 1)	[m/s]		2.0	2.0	2.0	2.0				
Magnetic attraction force	[N]		18000	27000	36000	45000				
Protection level			IP00	IP00	IP00	IP00				
Outline dimension drawing [mm]			Primary side	Secondary side	Primary side	Secondary side	Primary side	Secondary side	Primary side	Secondary side
			28		42		56		67	
	Mass [kg]		13.5 (480mm) 16.0 (576mm)		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 (Dual-axis drive unit)

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 (L, M) 16080 (M)	16080 (L) 160160 (L, M)	-			
	Regenerative resistor type	MDS-DJ-V1-	-	-	-			
	Thrust force [N]							
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			
Protection level			IP00	IP00	IP00			
Outline dimension drawing [mm]			Primary side	Secondary side	Primary side	Secondary side	Primary side	Secondary side
			9x2		18x2		27x2	
	Mass [kg]		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 (L, M)	-		
	Regenerative resistor type	MDS-DJ-V1-	-	-		
	Thrust force [N]					
Rated thrust force	[N]		2400	4800		
Maximum speed (Note 1)	[m/s]		2.0	2.0		
Magnetic attraction force (per motor)	[N]		9000	18000		
Protection level			IP00	IP00		
Outline dimension drawing [mm]			Primary side	Secondary side	Primary side	Secondary side
			14x2		28x2	
	Mass [kg]		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
	2-axis type	MDS-D2-SP2-	8040 (L) 8080 (L, M) 16080S (M)	8040 (L) 8080 (L, M) 16080S (M)	8040 (L) 8080 (L, M) 16080S (M)	16080S (L) 16080S (L)
	Multi axis integrated type	MDS-DM2-SPV2- SPV3-	-	10080	10080	10080
	Regenerative resistor type	MDS-DJ-SP-	80	100	100	120
Output						
Acceleration/Deceleration	<input type="checkbox"/>					
Short-time rating	<input type="checkbox"/>					
Continuous rating	<input type="checkbox"/>					
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 · m ²]	0.0074	0.013	0.013	0.023	0.023
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-DJ Series (Compact & lightweight specifications)

Motor type		SJ-DJ5.5/100-01	SJ-DJ5.5/120-01	SJ-DJ5.5/120-02
Compatible drive unit	1-axis type	MDS-D2-SP-	80	80
	2-axis type	MDS-D2-SP2-	8040 (L) 8080 (L, M) 16080S (M)	8040 (L) 8080 (L, M) 16080S (M)
	Multi axis integrated type	MDS-DM2-SPV2- SPV3-	10080	10080
	Regenerative resistor type	MDS-DJ-SP-	100	100
Output				
Acceleration/Deceleration	<input type="checkbox"/>			
%ED rating	<input type="checkbox"/>			
Short-time rating	<input type="checkbox"/>			
Continuous rating	<input type="checkbox"/>			
Base rotation speed	[r/min]	1500	1500	1500
Max. rotation speed in constant output range	[r/min]	2000	2000	2000
Maximum rotation speed	[r/min]	4500	4500	4500
Continuous rated torque	[N · m]	17.7	17.7	17.7
Motor inertia	[kg · m ²]	0.0074	0.0074	0.0074
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	26

Motor type		SJ-D11/80-01	SJ-D11/100-01	SJ-D5.5/120-02
Compatible drive unit	1-axis type	MDS-D2-SP-	160	-
	2-axis type	MDS-D2-SP2-	16080S (L)	16080S (L)
	Multi axis integrated type	MDS-DM2-SPV2- SPV3-	16080	16080
	Regenerative resistor type	MDS-DJ-SP-	160	160
Output				
Acceleration/Deceleration	<input type="checkbox"/>			
%ED rating	<input type="checkbox"/>			
Short-time rating	<input type="checkbox"/>			
Continuous rating	<input type="checkbox"/>			
Base rotation speed	[r/min]	1500	1500	2800
Max. rotation speed in constant output range	[r/min]	4500	4500	8000
Maximum rotation speed	[r/min]	8000	10000	12000
Continuous rated torque	[N · m]	47.7	47.7	12.6
Motor inertia	[kg · m ²]	0.031	0.031	0.0074
Outline dimension drawing (flange type)	[mm]			
Flange fitting diameter	[mm]	φ 180	φ 180	φ 150
Shaft diameter	[mm]	φ 48	φ 48	φ 28
Mass	[kg]	64	64	26

Motor type		SJ-DJ7.5/100-01	SJ-DJ11/100-01	SJ-DJ15/80-01
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- SPV3-	10080	16080
	Regenerative resistor type	MDS-DJ-SP-	120	160
Output				
%ED rating	<input type="checkbox"/>			
Short-time rating	<input type="checkbox"/>			
Continuous rating	<input type="checkbox"/>			
Base rotation speed	[r/min]	1500	1500	1500
Max. rotation speed in constant output range	[r/min]	2000	2000	2000
Maximum rotation speed	[r/min]	4500	4500	4000
Continuous rated torque	[N · m]	26.3	35.8	52.5
Motor inertia	[kg · m ²]	0.013	0.023	0.031
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) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

(Note 1) %ED is a load time ratio of operating time relative to a 10-minute cycle time. At 25%ED, for example, the operating time is 2.5 minutes and non-operation time is 7.5 minutes of a 10-minute cycle time.
(Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

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
	2-axis type	MDS-D2-SP2-	2020 (L, M) 4020 (M)	4020 (L) 4040S (L, M) 8040 (M)
	Multi axis integrated type	SPV2-	-	-
		SPV3-	-	-
Regenerative resistor type	MDS-DJ-SP-	-	-	
Output				
Acceleration/Deceleration	<input type="checkbox"/>			
Short-time rating	<input type="checkbox"/>			
Continuous rating	<input type="checkbox"/>			
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 · m ²]	0.011	0.019	0.0046
Outline dimension drawing (flange type)	[mm]			
		130 SQ. 264	130 SQ. 317	174 SQ. 377
Flange fitting diameter	[mm]	φ 110	φ 110	φ 150
Shaft diameter	[mm]	φ 22	φ 22	φ 28
Mass	[kg]	10	14	30

SJ-V Series (Standard specification)

Motor type		SJ-V2.2-01T	SJ-V7.5-03ZT	SJ-V11-13ZT	SJ-V15-01ZT
Compatible drive unit	1-axis type	MDS-D2-SP-	40	160	200
	2-axis type	MDS-D2-SP2-	4020 (L) 4040S (L, M) 8040 (M)	16080S (L)	-
	Multi axis integrated type	SPV2-	-	16080	20080
		SPV3-	-	16080	20080
Regenerative resistor type	MDS-DJ-SP-	40	160 *1	-	
Output					
Short-time rating	<input type="checkbox"/>				
Continuous rating	<input type="checkbox"/>				
Base rotation speed	[r/min]	1500	1500	1500	1500
Max. rotation speed in constant output range	[r/min]	6000	10000	6000	4500
Maximum rotation speed	[r/min]	10000	12000	8000	8000
Continuous rated torque	[N · m]	9.5	35	47.7	70
Motor inertia	[kg · m ²]	0.00675	0.0245	0.03	0.0575
Outline dimension drawing (Flange type)	[mm]				
		174 SQ. 300	204 SQ. 440	204 SQ. 490	250 SQ. 469.5
Flange fitting diameter	[mm]	φ 150	φ 180	φ 180	φ 230
Shaft diameter	[mm]	φ 28	φ 32	φ 48	φ 48
Mass	[kg]	25	60	70	110

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

Motor type		SJ-DL5.5/200-01T	SJ-DL7.5/150-01T
Compatible drive unit	1-axis type	MDS-D2-SP-	160
	2-axis type	MDS-D2-SP2-	16080S (L)
	Multi axis integrated type	SPV2-	-
		SPV3-	16080
Regenerative resistor type	MDS-DJ-SP-	-	
Output			
Acceleration/Deceleration	<input type="checkbox"/>		
Short-time rating	<input type="checkbox"/>		
Continuous rating	<input type="checkbox"/>		
Base rotation speed	[r/min]	2500	1500
Max. rotation speed in constant output range	[r/min]	20000	8000
Maximum rotation speed	[r/min]	20000	15000
Continuous rated torque	[N · m]	14.1	35.0
Motor inertia	[kg · m ²]	0.0046	0.016
Outline dimension drawing (flange type)	[mm]		
		174 SQ. 377	204 SQ. 489
Flange fitting diameter	[mm]	φ 150	φ 180
Shaft diameter	[mm]	φ 28	φ 32
Mass	[kg]	30	56

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

Motor type		SJ-V15-09ZT	SJ-V18.5-01ZT	SJ-V18.5-04ZT	SJ-V22-01ZT	SJ-V22-04ZT
Compatible drive unit	1-axis type	MDS-D2-SP-	200	200	240	240
	2-axis type	MDS-D2-SP2-	-	-	-	-
	Multi axis integrated type	SPV2-	-	-	-	-
		SPV3-	-	-	-	-
Regenerative resistor type	MDS-DJ-SP-	20080	-	-	-	
Output						
30 min rating	<input type="checkbox"/>					
Continuous rating	<input type="checkbox"/>					
Base rotation speed	[r/min]	1500	1500	1500	1500	1500
Max. rotation speed in constant output range	[r/min]	6000	4500	6000	4500	6000
Maximum rotation speed	[r/min]	8000	8000	8000	8000	8000
Continuous rated torque	[N · m]	70	95.5	95.5	118	118
Motor inertia	[kg · m ²]	0.0575	0.0575	0.0575	0.08	0.08
Outline dimension drawing (Flange type)	[mm]					
		250 SQ. 469.5	250 SQ. 469.5	250 SQ. 469.5	250 SQ. 539.5	250 SQ. 539.5
Flange fitting diameter	[mm]	φ 230	φ 230	φ 230	φ 230	φ 230
Shaft diameter	[mm]	φ 48	φ 48	φ 48	φ 55	φ 55
Mass	[kg]	110	110	110	135	135

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

SJ-V Series (Standard specification)

Motor type	SJ-V26-01ZT		SJ-V37-01ZT		SJ-V45-01ZT		SJ-V55-01ZT		
Compatible drive unit	1-axis type	MDS-D2-SP-	320		400		640		
	2-axis type	MDS-D2-SP2-	-		-		-		
	Multi axis integrated type	MDS-DM2-	-		-		-		
	Regenerative resistor type	MDS-DJ-SP-	-		-		-		
Output	30 min rating								
	Continuous rating	22		30		37		45	
Base rotation speed	[r/min]	1500		1150		1500		1150	
Max. rotation speed in constant output range	[r/min]	6000		3450		4500		3450	
Maximum rotation speed	[r/min]	8000		6000		6000		4500	
Continuous rated torque	[N · m]	140		249		236		374	
Motor inertia	[kg · m ²]	0.0925		0.34		0.34		0.8475	
Outline dimension drawing (Flange type)	[mm]								
		585.5		700		700		724	
Flange fitting diameter	[mm]	φ 230		φ 300		φ 300		φ 450	
Shaft diameter	[mm]	φ 55		φ 60		φ 60		φ 75	
Mass	[kg]	155		300		300		450	

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

SJ-V Series (High-speed specification)

Motor type	SJ-VL2.2-02ZT *1		SJ-V3.7-02ZT		SJ-V11-06ZT		SJ-V11-08ZT		
Compatible drive unit	1-axis type	MDS-D2-SP-	40		80		200		
	2-axis type	MDS-D2-SP2-	4020 (L), 4040S (L, M), 8040 (M)		8040 (L), 8080 (L, M), 16080S (M)		-		
	Multi axis integrated type	MDS-DM2-	-		-		20080		
	Regenerative resistor type	MDS-DJ-SP-	80 *2		-		-		
Output	15 min rating								
	Continuous rating	1.5		2.2		5.5		7.5	
Base rotation speed	[r/min]	3000		3000		1500		1500	
Max. rotation speed in constant output range	[r/min]	15000		12000		12000		8000	
Maximum rotation speed	[r/min]	15000		15000		12000		8000	
Continuous rated torque	[N · m]	4.77		7.0		35.0		47.7	
Motor inertia	[kg · m ²]	0.0024		0.00675		0.0245		0.03	
Outline dimension drawing (Flange type)	[mm]								
		325		300		440		490	
Flange fitting diameter	[mm]	φ 110		φ 150		φ 180		φ 180	
Shaft diameter	[mm]	φ 22		φ 28		φ 32		φ 48	
Mass	[kg]	20		25		60		70	

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

*2 The maximum rotation speed is 12000r/min.

Motor type	SJ-V22-06ZT		SJ-V18.5-04ZT		SJ-V30-02ZT		
Compatible drive unit	1-axis type	MDS-D2-SP-	240		320		
	2-axis type	MDS-D2-SP2-	-		-		
	Multi axis integrated type	MDS-DM2-	-		-		
	Regenerative resistor type	MDS-DJ-SP-	-		-		
Output	30 min rating						
	Continuous rating	11		15		18.5	
Base rotation speed	[r/min]	1500		1500		1500	
Max. rotation speed in constant output range	[r/min]	8000		6000		8000	
Maximum rotation speed	[r/min]	8000		8000		8000	
Continuous rated torque	[N · m]	70.0		95.5		118	
Motor inertia	[kg · m ²]	0.0575		0.0575		0.08	
Outline dimension drawing (Flange type)	[mm]						
		469.5		469.5		539.5	
Flange fitting diameter	[mm]	φ 230		φ 230		φ 230	
Shaft diameter	[mm]	φ 48		φ 48		φ 55	
Mass	[kg]	110		110		135	

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

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-SPV3-SPV3-	16080	16080	-	-
	Regenerative resistor type MDS-DJ-SP-	-	-	20080	-
Output	30 min rating				
	Continuous rating				
Base rotation speed	[r/min]	750	750	750	750
Max. rotation speed in constant output range	[r/min]	6000	6000	6000	6000
Maximum rotation speed	[r/min]	6000	6000	6000	6000
Continuous rated torque	[N · m]	47.1	70.0	95.5	115
Motor inertia	[kg · m ²]	0.03	0.0575	0.0575	0.08
Outline dimension drawing (Flange type)	[mm]				
		490	469.5	469.5	539.5
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

SJ-VL Series (Low-inertia specification)

Motor type		SJ-VL11-05FZT-S01 *1	SJ-VL11-07ZT *1
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-SPV3-	16080 *2	16080
	Regenerative resistor type MDS-DJ-SP-	160 *3	160 *3
Output	Acceleration/Deceleration		
	Short-time rating		
Base rotation speed	[r/min]	5000	1500
Max. rotation speed in constant output range	[r/min]	20000	12000
Maximum rotation speed	[r/min]	20000	12000
Continuous rated torque	[N · m]	2.8	35
Motor inertia	[kg · m ²]	0.0024	0.018
Outline dimension drawing (Flange type)	[mm]		
		130 SQ. 325	204 SQ. 490
Flange fitting diameter	[mm]	φ 110	φ 180
Shaft diameter	[mm]	φ 22	φ 48
Mass	[kg]	20	70

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

*3 The maximum rotation speed is 12000r/min.

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

*4 The output can be changed by parameter.

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

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-SPV2-SPV3-SPV3-	-	-	-
	Regenerative resistor type MDS-DJ-SP-	-	-	-
Output	Short-time rating			
	Continuous rating			
Base rotation speed	[r/min]	750	500	330
Max. rotation speed in constant output range	[r/min]	6000	3500	750
Maximum rotation speed	[r/min]	6000	4500	750
Continuous rated torque	[N · m]	140	239	310
Motor inertia	[kg · m ²]	0.08	0.3075	0.34
Outline dimension drawing (Flange type)	[mm]			
		539.5	631	700
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) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B4A01T	SJ-2B4002T	SJ-2B4004T	SJ-2B4003T	SJ-2B4B01T	SJ-2B4112T
Compatible spindle drive unit	MDS-D2-SP-	80	20	40	40	160	40
Output Acceleration/Deceleration Short-time rating Continuous rating							
	Continuous base rotation speed [r/min]	5000	3000	3000	3000	5500	2500
	Maximum rotation speed [r/min]	10000	10000	15000	12000	10000	10000
	Continuous rated torque [N · m]	1.91	1.27	2.39	4.77	3.82	5.73
Rotor inertia [kg · m ²]	0.00020	0.00078	0.00078	0.00138	0.00163	0.00168	
Outline dimension drawing [mm]							
	Mass						
	Stator [kg]	1.9	2.2	2.2	3.9	3.0	4.1
	Rotor [kg]	0.5	0.9	0.9	1.7	1.5	1.7

Built-in spindle motor type (Note 1)		SJ-2B4111T	SJ-2B4105T	SJ-2B4102T	SJ-2B4201T	SJ-2B4218T	SJ-2B4202T
Compatible spindle drive unit	MDS-D2-SP-	80	80	80	40	80	80
Output Short-time rating Continuous rating							
	Continuous base rotation speed [r/min]	6000	3000	1500	1500	1500	1500
	Maximum rotation speed [r/min]	10000	15000	15000	15000	10000	15000
	Continuous rated torque [N · m]	5.89	7.00	7.00	9.55	9.55	14.0
Rotor inertia [kg · m ²]	0.00168	0.003	0.00425	0.005	0.005	0.0068	
Outline dimension drawing [mm]							
	Mass						
	Stator [kg]	4.1	7.4	10	7.1	7.1	10
	Rotor [kg]	1.7	3.0	4.3	2.9	2.9	4.1

(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.

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B4207T	SJ-2B4215T	SJ-2B4203T	SJ-2B4211T	SJ-2B4219T	SJ-2B4310T
Compatible spindle drive unit	MDS-D2-SP-	160	200	80	160	160	80
Output Acceleration/Deceleration Short-time rating Continuous rating							
	Continuous base rotation speed [r/min]	3000	1500	1500	1500	1500	1750
	Maximum rotation speed [r/min]	10000	15000	15000	10000	15000	8000
	Continuous rated torque [N · m]	17.5	23.6	23.6	23.6	23.6	20.2
Rotor inertia [kg · m ²]	0.0068	0.0085	0.0088	0.0088	0.0088	0.0128	
Outline dimension drawing [mm]							
	Mass						
	Stator [kg]	10	13	13	13	13	15
	Rotor [kg]	4.1	5.1	5.2	5.2	5.2	5.6

Built-in spindle motor type (Note 1)		SJ-2B4301T	SJ-2B4327T	SJ-2B4340T
Compatible spindle drive unit	MDS-D2-SP-	160	160	200
Output Acceleration/Deceleration Short-time rating Continuous rating				
	Continuous base rotation speed [r/min]	1100	1700	1500
	Maximum rotation speed [r/min]	12000	8000	8000
	Continuous rated torque [N · m]	32.1	30.9	47.7
Rotor inertia [kg · m ²]	0.0128	0.0175	0.0175	
Outline dimension drawing [mm]				
	Mass			
	Stator [kg]	15	20	20
	Rotor [kg]	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.

Drive system Spindle motor 200V Built-in spindle motor

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	kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil		
	Short-time rating (30min)		Short-time rating (10min) (30min)		Short-time rating (15min)		Short-time rating (15min)		Short-time rating (15min)		Short-time rating (15min)		
	Continuous base rotation speed [r/min]	1000	2100	1000	2000	2000	4700	2000	4700	2000	4700	12000	
Maximum rotation speed [r/min]	2100	12000	2000	12000	5200	12000	5200	12000	5200	12000	12000		
Continuous rated torque [N · m]	52.5	25.0	52.5	26.3	52.5	30.5	52.5	30.5	52.5	30.5	30.5		
Rotor inertia [kg · m ²]	0.0175		0.0175		0.0175		0.0175		0.0175		0.0175		
Outline dimension drawing [mm]													
Mass	Stator [kg]	20		20		20		20		20		20	
	Rotor [kg]	7.6		7.6		7.6		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	kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil		
	Short-time rating (30min)		Short-time rating (30min)		Short-time rating (30min)		Short-time rating (30min)		Short-time rating (15min)		Short-time rating (15min)		
	Continuous base rotation speed [r/min]	680	1250	1000	1600	1500	2570	1500	2570	1500	2570	3500	
Maximum rotation speed [r/min]	3000	12000	2500	12000	3500	12000	3500	12000	3500	12000	12000		
Continuous rated torque [N · m]	77.2	42.0	71.6	44.8	95.5	68.7	95.5	68.7	95.5	68.7	68.7		
Rotor inertia [kg · m ²]	0.0225		0.0225		0.0225		0.0225		0.0225		0.0225		
Outline dimension drawing [mm]													
Mass	Stator [kg]	26		26		26		26		26		26	
	Rotor [kg]	9.8		9.8		9.8		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.
 (Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B4304TK		SJ-2B4318TK		SJ-2B4412T						
Compatible spindle drive unit		MDS-D2-SP-		320		160						
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating	kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil					
	Short-time rating (30min)		Short-time rating (15min)		Short-time rating (15min)		Short-time rating (30min)					
	Continuous base rotation speed [r/min]	450	750	1200	2500	1500	1500	1500				
Maximum rotation speed [r/min]	1500	12000	3000	12000	10000	10000	10000					
Continuous rated torque [N · m]	117	70.0	119	70.7	23.6	23.6	23.6					
Rotor inertia [kg · m ²]	0.028		0.028		0.0193		0.0193					
Outline dimension drawing [mm]												
Mass	Stator [kg]	33		33		15		15				
	Rotor [kg]	12		12		6.2		6.2				

Built-in spindle motor type (Note 1)		SJ-2B4501TK		SJ-2B6611TK		SJ-2B4502TK						
Compatible spindle drive unit		MDS-D2-SP-		200		320						
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating	kW Low-speed coil		kW High-speed coil		kW Low-speed coil		kW High-speed coil					
	Short-time rating (30min)		Short-time rating (15min)		Short-time rating (15min)		Short-time rating (30min)					
	Continuous base rotation speed [r/min]	700	1320	500	1030	525	1050	525				
Maximum rotation speed [r/min]	2250	10000	1500	6000	3000	10000	3000					
Continuous rated torque [N · m]	102	54.3	143	69.5	136	68.2	136					
Rotor inertia [kg · m ²]	0.08		0.102		0.105		0.105					
Outline dimension drawing [mm]												
Mass	Stator [kg]	29		37		37		37				
	Rotor [kg]	18		19		24		24				

(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.

SJ-B Series

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									
		Continuous base rotation speed [r/min]	550	1193	1250	3000	440	1000	
		Maximum rotation speed [r/min]	2000	8000	3500	10000	1500	6000	
Continuous rated torque [N · m]	191	88.0	168	70.0	239	105			
Rotor inertia [kg · m ²]	0.133		0.105		0.173				
Outline dimension drawing [mm]									
	Mass	Stator [kg]	49	55	63	Rotor [kg]	25	24	33

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									
		Continuous base rotation speed [r/min]	475	1250	600	1200	720	1500	
		Maximum rotation speed [r/min]	2000	10000	1500	6000	2000	10000	
Continuous rated torque [N · m]	221	115	239	119	245	118			
Rotor inertia [kg · m ²]	0.135		0.173		0.135				
Outline dimension drawing [mm]									
	Mass	Stator [kg]	48	63	71	Rotor [kg]	31	33	31

(Note 1) Please contact your Mitsubishi Electric dealer for the special products not listed above.
 (Note 2) These dimensions are the dimensions after machine machining.
 (Note 3) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SJ-B Series

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									
		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 · m ²]	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 %ED rating Short-time rating Continuous rating									
		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 · m ²]	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.

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B6721TK		SJ-2B6702TK		SJ-2B6704TK		
Compatible spindle drive unit	MDS-D2-SP-	320		320		320		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Continuous base rotation speed [r/min]		500	1500	480	1100	475	1200
	Maximum rotation speed [r/min]		1500	6000	2000	6000	1150	6000
	Continuous rated torque [N · m]		353	140	298	130	302	175
Rotor inertia [kg · m ²]		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-2B6709TK		SJ-2B6802TK		SJ-2B6905TK		
Compatible spindle drive unit	MDS-D2-SP-	400		640		320		
Output %ED rating Short-time rating Continuous rating								
	Continuous base rotation speed [r/min]		350	1000	400	650	420	1000
	Maximum rotation speed [r/min]		1500	6000	1000	3200	1500	4000
	Continuous rated torque [N · m]		409	210	716	441	500	210
Rotor inertia [kg · m ²]		0.37		0.675		0.853		
Outline dimension drawing [mm]								
Mass	Stator [kg]	83		116		110		
	Rotor [kg]	49		72		70		

(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.

SJ-B Series

Built-in spindle motor type (Note 1)		SJ-2B6904TK		SJ-2B6908TK		SJ-2B6906TK		
Compatible spindle drive unit	MDS-D2-SP-	640		320		400		
Output Acceleration/Deceleration %ED rating Short-time rating Continuous rating								
	Continuous base rotation speed [r/min]		600	1028	175	450	175	600
	Maximum rotation speed [r/min]		1500	3000	1000	3300	1000	3300
	Continuous rated torque [N · m]		477	279	819	467	819	477
Rotor inertia [kg · m ²]		0.853		1.105		1.105		
Outline dimension drawing [mm]								
Mass	Stator [kg]	110		143		143		
	Rotor [kg]	70		91		91		

Built-in spindle motor type (Note 1)		SJ-2B6914TK		
Compatible spindle drive unit	MDS-D2-SP-	640		
Output Acceleration/Deceleration Short-time rating Continuous rating				
	Continuous base rotation speed [r/min]		240	470
	Maximum rotation speed [r/min]		1000	3300
	Continuous rated torque [N · m]		995	508
Rotor inertia [kg · m ²]		1.105		
Outline dimension drawing [mm]				
Mass	Stator [kg]	143		
	Rotor [kg]	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.

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						
Continuous base rotation speed [r/min]		1500	1200	3000	750	1800
Maximum rotation speed [r/min]		10000	3000	8000	1800	6000
Continuous rated torque [N · m]		22.3	43.8	17.5	140	58.4
Rotor inertia [kg · m ²]		0.006	0.0162		0.0633	
Outline dimension drawing	[mm]					
Mass	Stator [kg]	4.4	14.0		30	
	Rotor [kg]	3.7	8.0		15	

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

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

MEMO

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 2-axis type (Note 2) MDS-D2-SP2-2020 (L, M) 4020 (M) Regenerative resistor type MDS-DJ-SP-20	20 2020 (L, M) 4020 (M) 20	20 2020 (L, M) 4020 (M) 20
Output	[N · m]		
Rated torque	0.64	0.80	1.43
Max. torque	2.50	5.00	6.50
Rated output	0.40	0.50	0.90
Maximum rotation speed	6000	6000	6000
Motor inertia	0.24	0.42	1.43
Protection level (The shaft-through portion is excluded.)	IP67	IP67	IP67
Outline dimension drawing			
Flange fitting diameter	φ 50	φ 50	φ 70
Shaft diameter	φ 14	φ 14	φ 19
Mass	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 2-axis type (Note 2) MDS-D2-SP2-8040 (L) 8080 (L, M) 16080S (M) Regenerative resistor type MDS-DJ-SP-	160 16080S (L)
Output	[N · m]	
Rated torque	3.50	6.37
Max. torque	22.0	50.0
Rated output	2.2	4.0
Maximum rotation speed	6000	6000
Motor inertia	11.9	23.7
Protection level (The shaft-through portion is excluded.)	IP67	IP67
Outline dimension drawing		
Flange fitting diameter	φ 110	φ 110
Shaft diameter	φ 24	φ 24
Mass	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) A 2-axis spindle drive unit (MDS-D2-SP2) drives two tool spindle motors only. A spindle motor other than tool spindle motor is not usable.

(Note 3) 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							
Compatible spindle drive unit	HF75	HF105	HF54	HF104	HF154	HF224	HF204	HF354
	1-axis type MDS-D2-SP-20	20	20	40	40	80	80	80
2-axis type MDS-D2-SP2-2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)	4020 (L) 4040S (L, M) 8040 (M)	4020 (L) 4040S (L, M) 8040 (M)	8040 (L) 16080S (M) 8080 (L, M)	8040 (L) 16080S (M) 8080 (L, M)	8040 (L) 16080S (M) 8080 (L, M)	16080S (L) 16080 (L)
Output	[N · m]							
Rated torque	1.8	2.4	1.6	3.2	4.8	7.0	6.4	11.1
Max. torque	8.0	11.0	13.0	23.3	42.0	46.5	47.0	90.0
Rated output	0.75	1.0	0.5	1.0	1.5	2.2	2.0	3.5
Rated rotation speed	4000				3000			
Maximum rotation speed	4000				3000			
Motor inertia	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)								
Flange fitting diameter	φ 80	φ 80	φ 110	φ 110	φ 110	φ 110	φ 114.3	φ 114.3
Shaft diameter	φ 14	φ 14	φ 24	φ 24	φ 24	φ 24	φ 35	φ 35

Tool spindle motor type	HF Series					
	HF □-A48					
Compatible spindle drive unit	HF123	HF223	HF303	HF453	HF703	HF903
	1-axis type MDS-D2-SP-20	20	40	80	160	160
2-axis type MDS-D2-SP2-2020 (L, M) 4020 (M)	2020 (L, M) 4020 (M)	4020 (L) 4040S (L, M) 8040 (M)	8040 (L) 16080S (M) 8080 (L, M)	16080S (L)	16080S (L)	-
Output	[N · m]					
Rated torque	5.7	10.5	14.3	14.3	22.3	28.7
Max. torque	17.0	32.0	64.0	122.0	152.0	208.0
Rated output	1.2	2.2	3.0	4.5	7.0	9.0
Rated rotation speed	2000			3000		
Maximum rotation speed	2000			3000		
Motor inertia	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)						
Flange fitting diameter	φ 110	φ 110	φ 114.3	φ 114.3	φ 114.3	φ 180
Shaft diameter	φ 24	φ 24	φ 35	φ 35	φ 35	φ 42

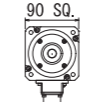
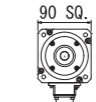
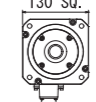
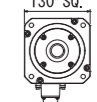
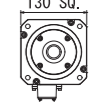
(Note 1) The above characteristics values are representative values. The maximum current and maximum torque are the values when combined with the drive unit.

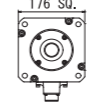
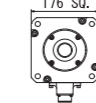
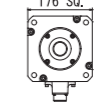
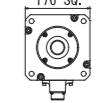
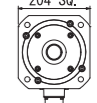
(Note 2) A 2-axis spindle drive unit (MDS-D2-SP2) drives two tool spindle motors only. A spindle motor other than tool spindle motor is not usable.

(Note 3) 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 (L, M) 2010 (M)	1010 (L, M) 2010 (M)	2010 (L) 2020 (L, M) 4020 (M)	2010 (L) 2020 (L, M) 4020 (M)	4020 (L) 4040 (L, M) 8040 (M)
Output	Stall torque	2.0	3.0	2.9	5.9	9.0
	Maximum torque	8.0	11.0	13.0	23.3	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 · cm ²]	2.6	5.1	6.1	11.9	17.8
Motor inertia with brake	[kg · cm ²]	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)	[mm]					
	(Note) The total length will be 3.5mm longer when using an A51 or A74N detector.	126.5	162.5	118.5	140.5	162.5
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)	DH2	DH2	DH2	DH2	DH2
	260,000 [p/rev] (A48)					

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 (L, M) 8040 (M)	8040 (L) 8080 (L, M) 8080W (L, M)	8040 (L) 8080 (L, M) 8080W (L, M)	8080W (L, M)	-
Output	Stall torque	13.7	22.5	37.2	49.0	58.8
	Maximum torque	47.0	90.0	122.0	152.0	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 · cm ²]	38.3	75.0	112.0	154.0	196.0
Motor inertia with brake	[kg · cm ²]	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)	[mm]					
	(Note) The total length will be 3.5mm longer when using an A51 or A74N detector.	143.5	183.5	223.5	263.5	330
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)	DH2	DH2	DH2	DH2	DH2
	260,000 [p/rev] (A48)					

(Note 1) Use the HF-H motor in combination with the MDS-DH2 Series drive unit compatible with the 400VAC input. This motor is not compatible with the conventional MDS-B/C1/CH Series.

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

Drive system Spindle motor 400V SJ-4-V Series

SJ-4-V Series (Standard)

Spindle motor type	SJ-4-V2.2-03T	SJ-4-V3.7-03T	SJ-4-V5.5-07T	SJ-4-V7.5-12T	SJ-4-V11-18T	SJ-4-V15-18T
Compatible spindle drive unit	MDS-DH2-SP-20	MDS-DH2-SP-20	MDS-DH2-SP-40	MDS-DH2-SP-40	MDS-DH2-SP-80	MDS-DH2-SP-100
Output						
Base rotation speed [r/min]	1500					
Maximum rotation speed [r/min]	10000		8000		6000	
Continuous rated torque [N·m]	9.5	14.0	23.5	35.0	47.7	70.0
Inertia [kg·m ²]	0.007	0.009	0.015	0.025	0.03	0.06
Outline dimension drawing (flange type) [mm]	174 SQ, 300	174 SQ, 330	174 SQ, 425	204 SQ, 440	204 SQ, 490	250 SQ, 469.5
Flange fitting diameter [mm]	φ 150	φ 150	φ 150	φ 180	φ 180	φ 230
Shaft diameter [mm]	φ 28	φ 28	φ 28	φ 32	φ 48	φ 48
Mass [kg]	25	30	49	60	70	110

Spindle motor type	SJ-4-V18.5-14T	SJ-4-V22-15T	SJ-4-V26-08T	SJ-4-V37-04T	SJ-4-V45-02T	SJ-4-V55-03T
Compatible spindle drive unit	MDS-DH2-SP-100	MDS-DH2-SP-160	MDS-DH2-SP-160	MDS-DH2-SP-200	MDS-DH2-SP-320	MDS-DH2-SP-320
Output						
Base rotation speed [r/min]	1500					
Maximum rotation speed [r/min]	6000					
Continuous rated torque [N·m]	95.5	118	140	249	236	374
Inertia [kg·m ²]	0.06	0.08	0.10	0.31	0.55	0.85
Outline dimension drawing (flange type) [mm]	250 SQ, 469.5	250 SQ, 539.5	250 SQ, 585.5	320 SQ, 631	320 SQ, 700	480 SQ, 724
Flange fitting diameter [mm]	φ 230	φ 230	φ 230	φ 300	φ 300	φ 450
Shaft diameter [mm]	φ 48	φ 55	φ 55	φ 60	φ 60	φ 75
Mass [kg]	110	135	155	280	390	450

(Note 1) The rated output is guaranteed at the rated input voltage (380 to 440VAC 50Hz / 380 to 480VAC 60Hz) to the power supply unit. If the input voltage fluctuates and drops below 380VAC, the rated output may not be attained.
 (Note 2) 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 (High-speed)

Spindle motor type	SJ-4-V3.7-05ZT	SJ-4-V7.5-13ZT	SJ-4-V11-22ZT	SJ-4-V11-23ZT	SJ-4-V22-18ZT	SJ-4-V30-15ZT
Compatible spindle drive unit	MDS-DH2-SP-20	MDS-DH2-SP-80	MDS-DH2-SP-100	MDS-DH2-SP-100	MDS-DH2-SP-160	MDS-DH2-SP-160
Output						
Base rotation speed [r/min]	3000			1500		
Maximum rotation speed [r/min]	15000		12000		8000	
Continuous rated torque [N·m]	7.0	35.0	35.0	47.7	70.0	118
Inertia [kg·m ²]	0.007	0.025	0.025	0.03	0.06	0.08
Outline dimension drawing (flange type) [mm]	174 SQ, 300	204 SQ, 440	204 SQ, 440	204 SQ, 490	250 SQ, 469.5	250 SQ, 539.5
Flange fitting diameter [mm]	φ 150	φ 180	φ 180	φ 180	φ 230	φ 230
Shaft diameter [mm]	φ 28	φ 32	φ 32	φ 48	φ 48	φ 55
Mass [kg]	25	60		70	125	155

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

Spindle motor type	SJ-4-V11-18T	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	MDS-DH2-SP-80	MDS-DH2-SP-100	MDS-DH2-SP-160	MDS-DH2-SP-160
Output					
Base rotation speed [r/min]	750				
Maximum rotation speed [r/min]	6000				
Continuous rated torque [N·m]	47.1	70.0	95.5	115	140
Inertia [kg·m ²]	0.03	0.06	0.06	0.08	0.08
Outline dimension drawing (flange type) [mm]	204 SQ, 490	250 SQ, 469.5	250 SQ, 469.5	250 SQ, 539.5	250 SQ, 539.5
Flange fitting diameter [mm]	φ 180	φ 230	φ 230	φ 230	φ 230
Shaft diameter [mm]	φ 48	φ 48	φ 48	φ 55	φ 55
Mass [kg]	70	110		135	

(Note 1) The rated output is guaranteed at the rated input voltage (380 to 440VAC 50Hz / 380 to 480VAC 60Hz) to the power supply unit. If the input voltage fluctuates and drops below 380VAC, the rated output may not be attained.
 (Note 2) Only the combination designated in this manual can be used for the motor and drive unit. Always use the designated combination.

SJ-4-VS Series (Hollow shaft)

Spindle motor type		SJ-4-VS7.5-13ZT	SJ-4-VS22-18ZT	SJ-4-VS30-15ZT
Compatible spindle drive unit	MDS-DH2-SP-	80	160	160
Output 30 min rating Continuous rating				
	Base rotation speed [r/min]	1500	1500	1500
Maximum rotation speed [r/min]	12000	8000	8000	
Continuous rated torque [N · m]	35.0	70.0	118	
Inertia [kg · m ²]	0.025	0.058	0.08	
Outline dimension drawing (flange type) [mm]				
	Flange fitting diameter [mm]	φ 180	φ 230	φ 230
Shaft diameter [mm]	φ 32	φ 48	φ 55	
Mass [kg]	65	115	140	

(Note 1) The rated output is guaranteed at the rated input voltage (380 to 440VAC 50Hz / 380 to 480VAC 60Hz) to the power supply unit. If the input voltage fluctuates and drops below 380VAC, the rated output may not be attained.

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

MEMO

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	45	55
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%					
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%					
	Current [A]	MAX. 0.2					
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)	70 (35/35)
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%						
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%						
	Current [A]	MAX. 0.2						
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)
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%
	Current [A]	MAX. 0.2
Control method	Sine wave PWM control method	
Dynamic brakes	Built-in	
Machine end detector	Not 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
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%								
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%								
	Current [A]	MAX. 0.2								
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)	61 (41/20)
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%				
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%				
	Current [A]	MAX. 0.2				
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]	3.7	7.5	11.0	18.5	30.0	37.0	45.0	55.0
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%						
	Rated current [A]	15	26	35	65	107	121	200
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%						
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%						
	Current [A]	MAX. 0.2						
Regeneration method	Power regeneration method							
Cooling method	Forced wind cooling							
Mass [kg]	4.0	4.0	6.0	6.0	10.0	10.0	10.0	25.5
Unit outline dimension drawing	A2	A2	B1	B1	D1	D1	D2	F1

AC reactor

AC reactor model	D-AL-7.5K	D-AL-11K	D-AL-18.5K	D-AL-30K	D-AL-37K	D-AL-45K	D-AL-55K
Compatible power supply unit type	MDS-D2-CV-						
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
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%						
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%						
	Current [A]	MAX. 0.1						
Control method	Sine wave PWM control method							
Dynamic brakes	Built-in				External (MDS-D-DBU)			
Degree of protection	IP20 (cover 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)
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%							
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%							
	Current [A]	MAX. 0.1							
Control method	Sine wave PWM control method - Current control method								
Dynamic brakes	Built-in								
Degree of protection	IP20								
Cooling method	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
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%						
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%						
	Current [A]	MAX. 0.1						
Control method	Sine wave PWM control method							
Degree of protection	IP20 (cover 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.

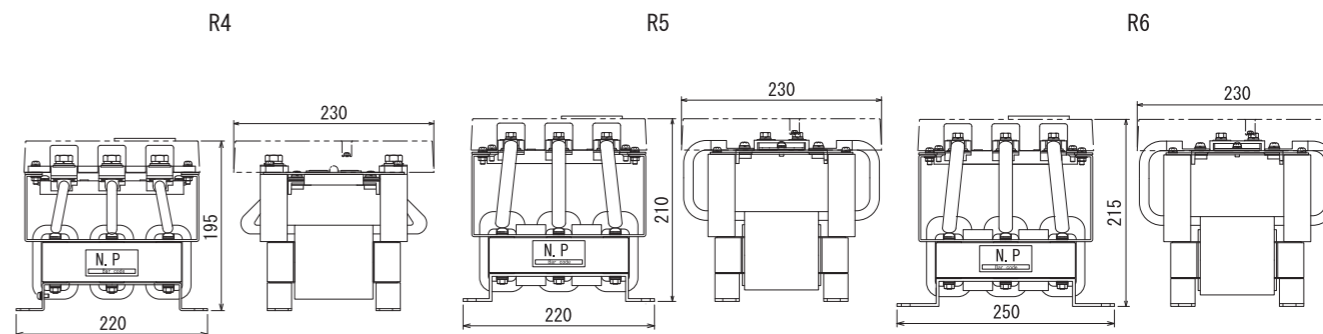
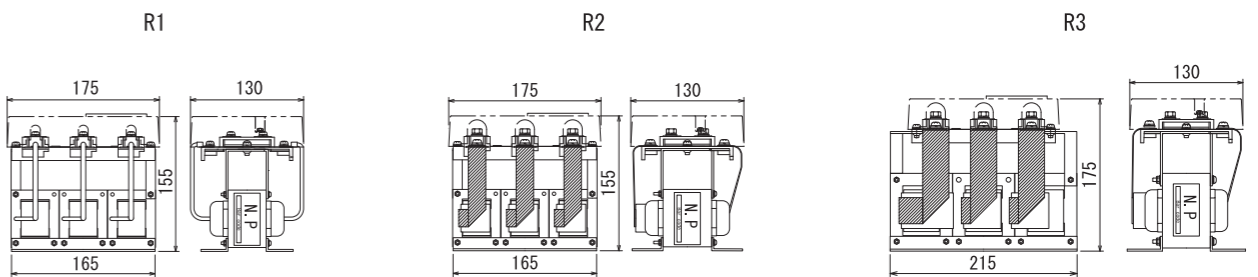
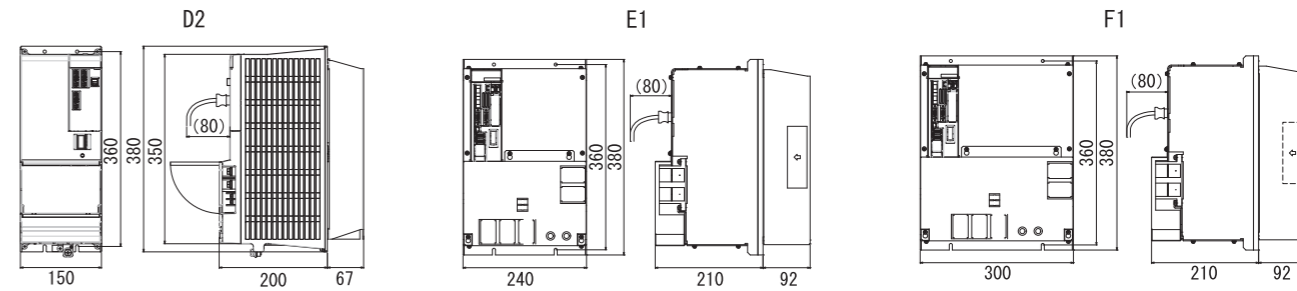
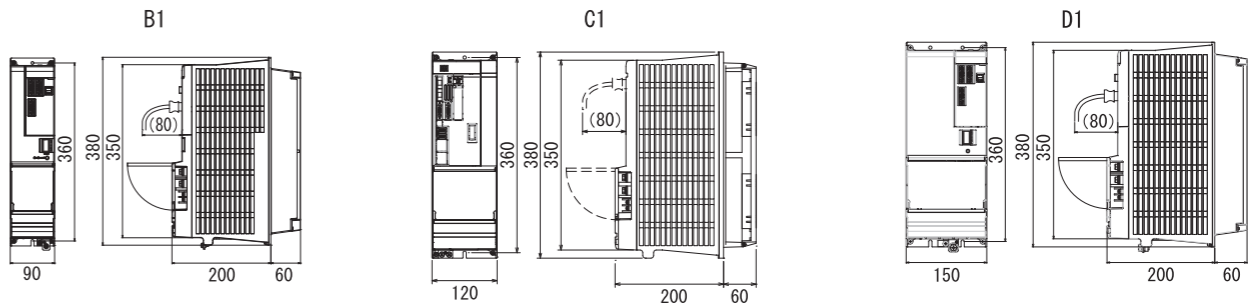
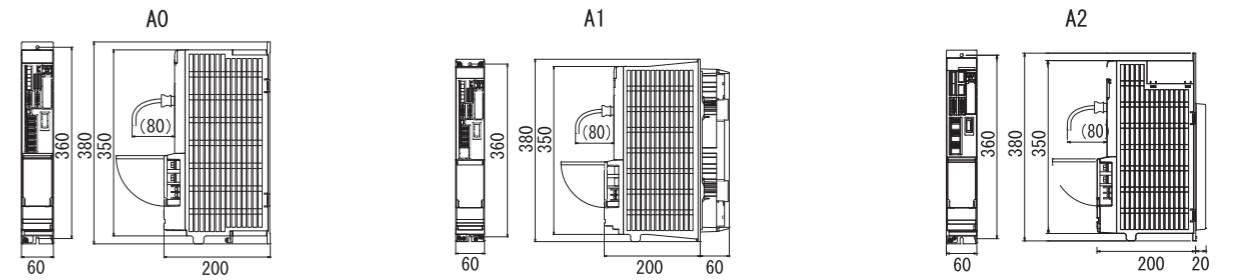
Power supply unit

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 voltage fluctuation rate: between +10% and -15%							
	Rated current [A]	5.2	13	18	35	61	70	85	106
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%							
Control power input	Voltage [V]	380 to 440AC (50Hz) / 380 to 480AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%							
	Current [A]	MAX. 0.1							
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]



MDS-DM2 Series

Multi-hybrid drive

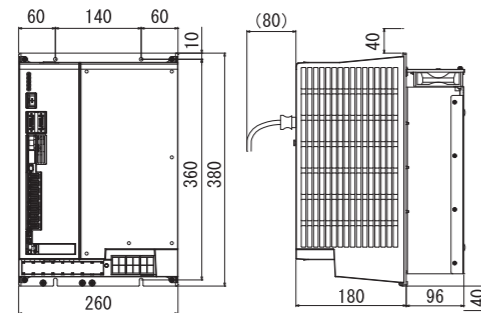
Drive unit type	MDS-DM2-SPV2-10080	MDS-DM2-SPV2-16080	MDS-DM2-SPV2-20080	
Drive unit category	2-axis servo, 1-axis spindle (with converter)			
Nominal maximum current (spindle/servo) [A]	100/80×2	160/80×2	200/80×2	
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%		
	Rated current [A]	33	43	55
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%		
Control power input	Voltage [V]	24DC Tolerable voltage fluctuation rate: between +10% and -10%		
	Current [A]	MAX. 4		
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 voltage fluctuation rate: between +10% and -15%				
	Rated current [A]	38	48	60	65	60
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +3% and -3%				
Control power input	Voltage [V]	24DC Tolerable voltage fluctuation rate: between +10% and -10%				
	Current [A]	MAX. 4				
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

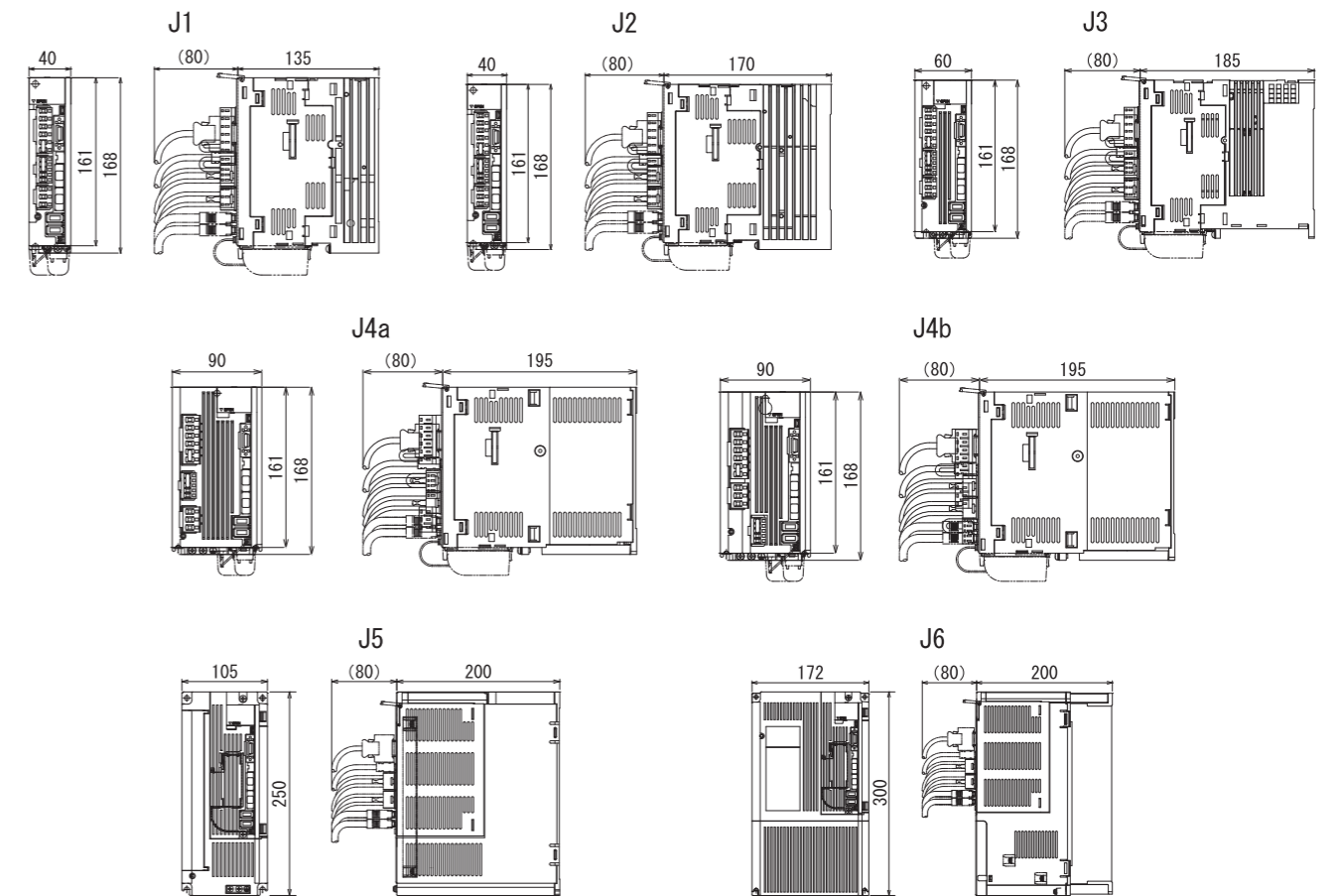
Drive unit type	MDS-DJ-V1-10	MDS-DJ-V1-15	MDS-DJ-V1-30	MDS-DJ-V1-40	MDS-DJ-V1-80	MDS-DJ-V1-100	
Drive unit category	1-axis servo (with converter)						
Rated output [kW]	0.3	0.4	0.7	1.0	2.0	3.5	
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%					
	Rated current [A]	1.5	2.9	3.8	5.0	10.5	16.0
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +5% and -5%					
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%					
	Current [A]	MAX. 0.2					
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	

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)						
Rated output [kW]	0.75	2.2	3.7	5.5	7.5	11.0	
Power input	Rated voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%					
	Rated current [A]	2.6	9.0	10.5	16.0	26.0	35.4
	Frequency [Hz]	50/60 Tolerable frequency fluctuation: between +5% and -5%					
Control power input	Voltage [V]	200AC (50Hz) / 200 to 230AC (60Hz) Tolerable voltage fluctuation rate: between +10% and -15%					
	Current [A]	MAX. 0.2					
Control method	Sine wave PWM control method						
Regeneration method	Power regeneration method						
Cooling method	Forced wind cooling						
Mass [kg]	1.4	2.1	2.1	4.6	4.6	6.5	
Unit outline dimension drawing	J3	J4a	J4b	J5	J5	J6	

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.

$$\text{Spindle motor rated output} = \text{MAX (continuous rated output, short-time rated output} \times \text{short-time rated output coefficient } \alpha)$$

(Note) For the spindle motor rated output, use the larger one of "continuous rated output" and "short-time rated output \times short-time rated output coefficient α ".

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.

(b) Spindle rated output

The spindle rated output is calculated from the following expression.

$$\text{Spindle rated output} = \text{Spindle motor rated output} \times \text{motor output coefficient } \beta \text{ of the combined spindle drive unit}$$

For the spindle motor rated output of the above expression, use the value calculated in (a).

For the motor output coefficient 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.

$$\text{Spindle maximum momentary output} = \text{MAX (short-time rated output} \times \text{1.2, output at acceleration/deceleration} \times \text{1.2)}$$

(Note) For the spindle rated output, use the larger one of "short-time rated output \times 1.2" and "output at acceleration/deceleration \times 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

MDS-D2-V1/V2 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 HF-KP	23	43	73
Rated output (kW)	0.2	0.4	0.75
Maximum momentary output (kW)	0.72	1.72	2.85

MDS-D2-V3 Series

Motor HF	75	105	54	104	154	123	223 (M, S)	223 (L)	142	302 (M, S)	302 (L)
Rated output (kW)	0.75	1.0	0.5	1.0	1.5	1.2	2.1	2.2	1.4	2.2	3.0
Maximum momentary output (kW)	2.6	3.6	2.3	5.0	8.0	4.0	7.5	7.5	3.8	7.4	7.4

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

MDS-DH2 Series

Motor HF-H	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

(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

$$\text{Power supply unit rated capacity} > \Sigma (\text{Spindle rated output}) + (\text{Servo motor rated output})$$

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

$$\text{Power supply unit rated capacity} > \Sigma (\text{Spindle rated output}) + 0.7 \Sigma (\text{Servo motor rated output})$$

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

$$\begin{aligned} \text{Maximum momentary rated capacity of power supply unit} &\geq \\ &\Sigma (\text{Spindle maximum momentary output}) + \Sigma (\text{Maximum momentary output of servo motor} \\ &\text{accelerating / decelerating simultaneously}) \end{aligned}$$

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

- 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

- For "HF903 (9.0kW) + HF104 (1.0kW)", $0.7 \times (9.0 + 1.0) = 7.0 < 9.0$ is applied. So, do the calculation with applying "9.0kW" to the total sum of the servo motor's rated output.
- For "HF903 (9.0kW) + HF903 (9.0kW)", $0.7 \times (9.0 + 9.0) = 12.6 > 9.0$ 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

- For "HF-H903 (9.0kW) + HF-H104 (1.0kW)", $0.7 \times (9.0 + 1.0) = 7.0 < 9.0$ is applied. So, do the calculation with applying "9.0kW" to the total sum of the servo motor's rated output.
- For "HF-H903 (9.0kW) + HF-H903 (9.0kW)", $0.7 \times (9.0 + 9.0) = 12.6 > 9.0$ is applied. So, do the calculation with applying "12.6kW" to the total sum of the servo motor's rated output.

CAUTION

- When reducing the time constant replacing the conventional motor with the HF, HF-KP or HF-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.
- When the large capacity drive unit (MDS-D2-SP-400/640, MDS-DH2-SP-200/320/450, 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.
- 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.

$$\text{Spindle rate output required for power supply} = \text{MAX (Spindle motor continuous rated output, Spindle motor output at accelerating / decelerating, Spindle motor short-time output)} \times \text{motor output coefficient } \beta \text{ of combined spindle drive unit}$$

(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 β 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 86 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

$$\text{Rated capacity required for power supply} = \Sigma (\text{Spindle rate output required for power supply}) + (\text{servo motor rate output required for power supply})$$

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

$$\text{Rated capacity required for power supply} = \Sigma (\text{Spindle rate output required for power supply}) + 0.7 \Sigma (\text{servo motor rate output required for power supply})$$

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

$$\text{Power supply capacity (kVA)} = \Sigma \{(\text{Required rated capacity calculated in the item (3) (kW)} / \text{Capacity of selected power supply unit (kW)}) \times \text{Power supply capacity base value (kVA)}\}$$

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-V1/V2 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			$0.7 \times (3.5 \times 3) + 22$ = 29.35kW < 31kW (D2-CV-300)	$(18 \times 3) + 26.4$ = 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) = $(29.35 / 30) \times 43 = 42.1$ (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			$0.7 \times (4.5 \times 2 + 3.5 \times 2) + 15$ = 26.2kW < 31kW (D2-CV-300)	$22 \times 2 + 18 \times 2 + 18$ = 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) = $(26.2 / 37) \times 53 = 37.5$ (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			$0.7 \times (3.5 + 2.0 \times 2) + 16.5$ = 21.75kW < 31kW (D2-CV-300)	$18 + 8 \times 2 + 18$ = 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) = $(21.75 / 30) \times 43 = 31.2$ (kVA)

MDS-D2-V3 Series

Axis name	Motor	Drive unit	Rated output	Maximum momentary output
X-axis	HF223	(MDS-D2-V3-404040)	2.1kW	7.5kW
Y-axis	HF223	(MDS-D2-V3-404040)	2.1kW	7.5kW
Z-axis	HF302B	(MDS-D2-V3-404040)	3.0kW	7.4kW
Spindle	Spindle motor 22kW	MDS-D2-SP-320 (Output coefficient 1.0)	22kW	26.4kW
Total			$0.7 \times (2.1 \times 2 + 3.0) + 22$ = 27.04kW < 31kW (D2-CV-300)	$(7.5 \times 2 + 7.4) + 26.4$ = 48.8kW < 92kW (D2-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) = $(27.04 / 30) \times 43 = 38.8$ (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			$0.7 \times (3.5 \times 3) + 22$ = 29.35kW < 31kW (DH2-CV-300)	$(18 \times 3) + 26.4$ = 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) = $(29.35 / 30) \times 43 = 42.0$ (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			$0.7 \times (4.5 \times 2 + 3.5 \times 2) + 15$ = 26.2kW < 31kW (DH2-CV-300)	$22 \times 2 + 18 \times 2 + 18$ = 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) = $(26.2 / 30) \times 43 = 37.6$ (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			$0.7 \times (3.5 + 2.0 \times 2) + 16.5$ = 21.75kW < 31kW (DH2-CV-300)	$18 + 8 \times 2 + 18$ = 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-370.
Required power supply capacity (kVA) = $(21.75 / 30) \times 43 = 31.2$ (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) EIB series (HEIDENHAIN)	Rectangular wave signal Mitsubishi serial signal	- -	
		LS187C, LS487C (HEIDENHAIN)	SIN wave signal	MDS-B-HR-11 (P) (MITSUBISHI ELECTRIC) EIB series (HEIDENHAIN)	Mitsubishi serial signal	(Required) Note	Distance-coded reference scale
		Various scale	SIN wave signal	MDS-B-HR-11 (P) (MITSUBISHI ELECTRIC) EIB series (HEIDENHAIN)	Mitsubishi serial signal	(Required) Note	Distance-coded reference scale is also available
	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 end detector
		SR77, SR87 (MAGNESCALE)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		LC193M, LC493M (HEIDENHAIN)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not required	
		AT343, AT543, AT545 (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	
		SIN wave signal output	MPS Series (MME Corp.)	SIN wave signal	ADB-20J60 (MME Corp.)	Mitsubishi serial signal	Required

(Note) 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.

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) EIB series (HEIDENHAIN)	Mitsubishi serial signal	(Required) Note
Absolute position detector	Mitsubishi serial signal output	MBA405W Series (MITSUBISHI ELECTRIC)	Mitsubishi serial signal	-	Mitsubishi serial signal	Not 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
	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) 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.

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 two axes integrated type drive unit (MDS-D2/DH2-V2) 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	For MDS-D2/DH2-V1 x 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.

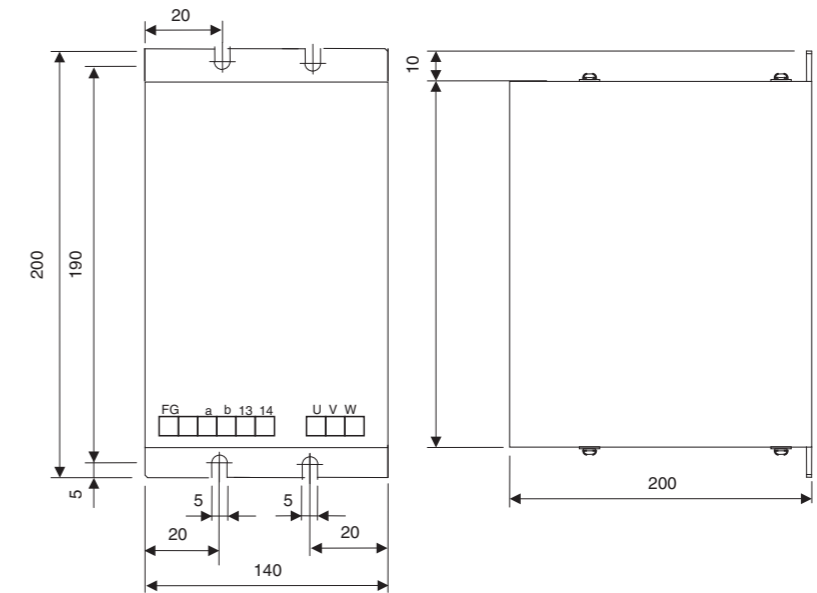
(Note) The rectangular wave signal output scale speed command synchronous control is not available.

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	2kg

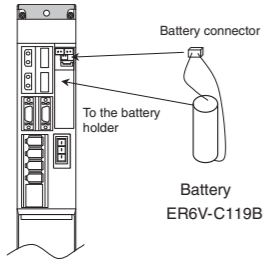
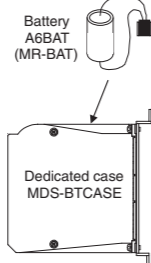

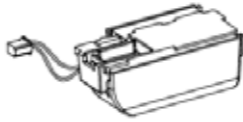
Outline dimension drawing MDS-D-DBU



[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	
Battery model name	ER6V-C119B (Note 1)	
Nominal voltage	ER6V 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
Battery model name	A6BAT (MR-BAT)
Nominal voltage	ER17330V 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	ER6V	
Nominal voltage	3.6V	
Number of connectable axes	1 axis	
Data save time in battery replacement	Approx. 20000 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.

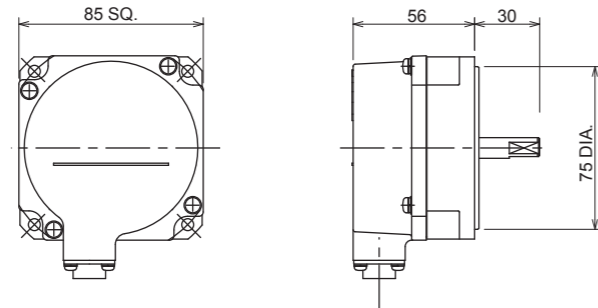
Ball screw side detector OSA105ET2A, OSA166ET2NA

Specifications

Detector type		OSA105ET2A	OSA166ET2NA
Electrical characteristics	Detector resolution	1,000,000pulse/rev	16,000,000pulse/rev
	Detector 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 kg·m ² or less	
	Shaft friction torque	0.1Nm or less	
	Shaft angle acceleration	4×10 ⁴ rad/s ² or less	
	Tolerable continuous rotation speed	4000r/min	
Mechanical configuration	Shaft amplitude (position 15mm from end)	0.02mm or less	
	Tolerable load (thrust direction/radial direction)	9.8N/19.8N	
	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]

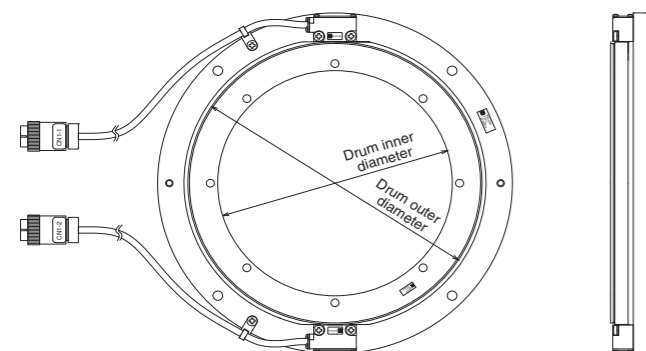
Twin-head magnetic detector (MBA Series)

Specifications

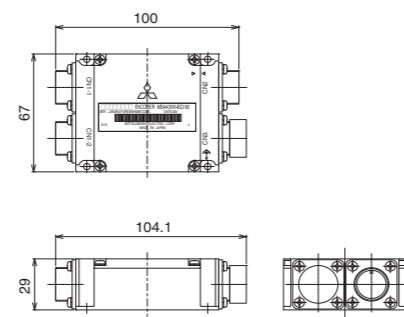
Detector type		MBA405W-BE082	MBA405W-BF125	MBA405W-BG160
Electrical characteristics	Detector resolution	4,000,000 pulse/rev		
	Detector method	Absolute position method (battery backup method)		
	Tolerable rotation speed at power off	3000r/min	2000r/min	1500r/min
	Accuracy (Typ)	±4 seconds	±3 seconds	±2 seconds
	Wave number within one rotation	512 waves	768 waves	1024 waves
	Detector output data	Serial data		
Mechanical characteristics for rotation	Power consumption	0.2A or less		
	Inertia	0.5×10 ⁻³ kg·m ²	2.4×10 ⁻³ kg·m ²	8.7×10 ⁻³ kg·m ²
	Tolerable 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	IP67		
	Outline dimension	φ 140mm×21.5mm	φ 190mm×23.5mm	φ 242mm×25.5mm

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 x: Control not possible

Spindle control item	Control specifications	Without spindle side detector		With spindle side detector	
		Without spindle side detector	With spindle side detector	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 x: Control not possible

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

(Note 1) Control not possible when connected with the V-belt.

(Note 2) Control not possible when connected with other than the gears.

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)

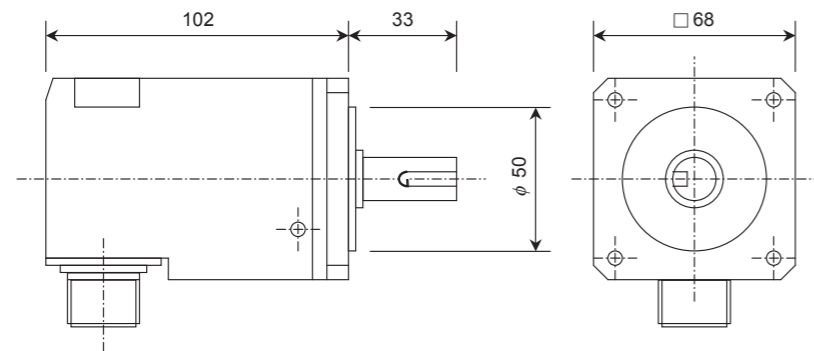
When a spindle and motor are connected with a V-belt, or connected with a gear ratio other than 1:1, use this spindle side detector to detect the position and speed of the spindle. Also use this detector when orientation control and synchronous tap control, etc are executed under the above conditions.

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 ⁴ rad/s ² or less	10 ⁴ rad/s ² or less
	Tolerable continuous rotation speed	6000r/min	8000r/min
Mechanical configuration	Bearing maximum non-lubrication time	20000h/6000r/min	20000h/8000r/min
	Shaft amplitude (position 15mm from end)	0.02mm or less	0.02mm or less
	Tolerable load (thrust direction/radial direction)	10kg/20kg Half of value during operation	10kg/20kg Half of value during operation
	Mass	1.5kg	1.5kg
Compatible model	Degree of protection	IP54	
	Squareness of flange to shaft	0.05mm or less	
	Flange matching eccentricity	0.05mm or less	
	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



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

[Unit : mm]

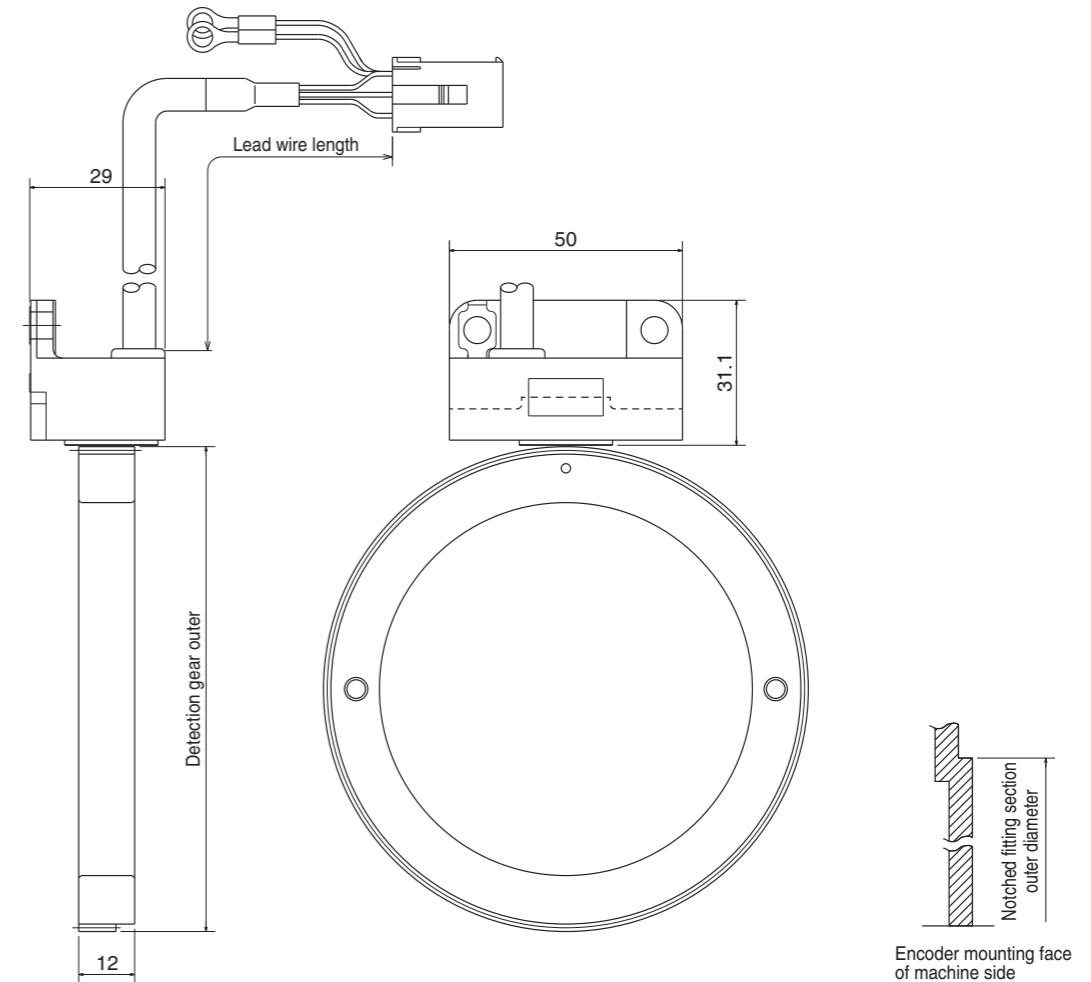
Spindle side PLG serial output detector (TS5690, MU1606 Series)

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

Sensor	Series type xx (The end of the type name)	TS5690N64xx					TS5690N12xx					TS5690N25xx				
		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



Encoder mounting face of machine side

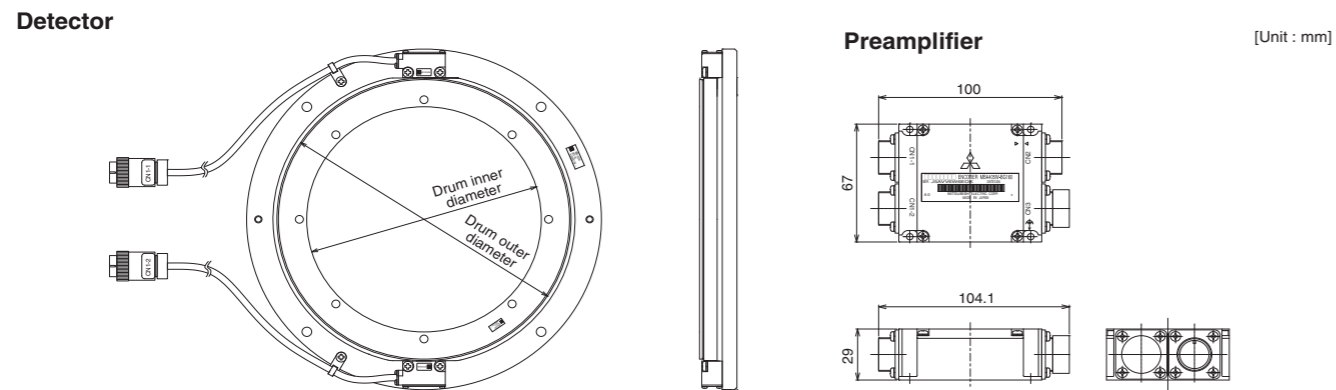
[Unit : mm]

■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 (Typ)	±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	IP67		
Outline dimension	φ 140mm×21.5mm	φ 190mm×23.5mm	φ 242mm×25.5mm	

Outline dimension drawing



■Spindle side accuracy serial output detector (ERM280, MPC1 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	MPC1 series
Interface unit type	EIB192M C4 1200	EIB192M C6 2048	ADB-20J20
	EIB392M C4 1200	EIB392M C6 2048	
Minimum detection resolution	0.0000183° (19,660,800p/rev)	0.0000107° (33,554,432p/rev)	0.00005° (7,200,000p/rev)
Tolerable maximum speed	20000r/min	11718r/min	10000r/min
Compatible model	D2/DH2	○	○
	DM2	○	○
	DJ	○	○

Detector interface unit

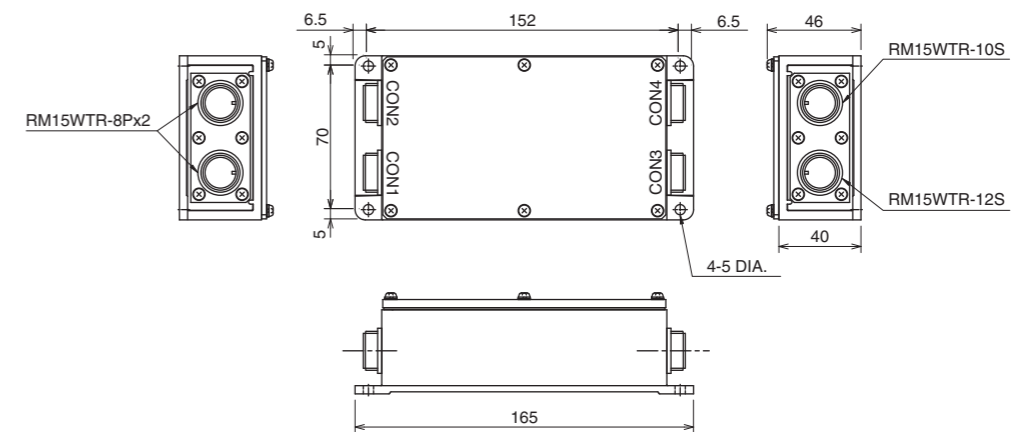
■Serial output interface unit for ABZ analog detector MDS-B-HR

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 (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



■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	0.000183° (19,660,800p/rev)	0.000107° (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	0.000183° (19,660,800p/rev)	0.000107° (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	3,600r/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)

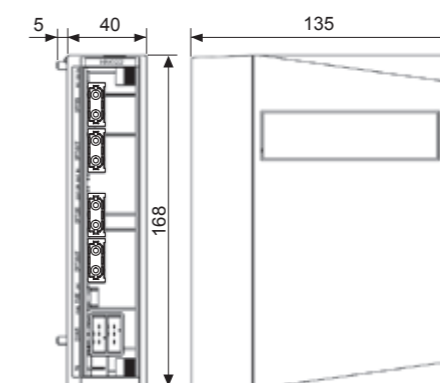
When the distance of the optical communication cable between NC control unit and drive unit is over 30m (M700V/M70V/E70 Series: maximum 30m, M700/M70/C70 Series: maximum 20m), the communication can be performed by relaying the optical signal.

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 clamp 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
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 x3	GZG200W39 OHMK x3	GZG300W39 OHMK x3	GZG200W20 OHMK x3	GZG300W20 OHMK x3
	Regenerative capacity	30W	100W	300W	300W	500W	300W	500W
		Resistance value	40Ω	40Ω	40Ω	13Ω	13Ω	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					○	○

Corresponding servo drive unit	Standard built-in regenerative resistor	External option regenerative resistor						
		FCUA-RB22	FCUA-RB37	FCUA-RB55	FCUA-RB75/2 (1 unit)	R-UNIT2	FCUA-RB55 2 units connected in parallel	FCUA-RB75/2 2 units connected in parallel
	Parameter setting value	2400h	2500h	2600h	2700h	2900h	2E00h	2D00h
	Mass	0.8kg	1.2kg	2.2kg	2.2kg	4.4kg	4.4kg	4.4kg
	Unit outline dimension	30mm×60mm×215mm	30mm×60mm×335mm	40mm×80mm×400mm	40mm×80mm×400mm	355mm×105mm×114mm	40mm×80mm×400mm	40mm×80mm×400mm
		W5	W5	W6	W6	W7	W6	W6
	Regenerative capacity	155W	185W	340W	340W	700W	680W	680W
		Resistance value	40Ω	25Ω	20Ω	30Ω	15Ω	10Ω
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					○	○

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.

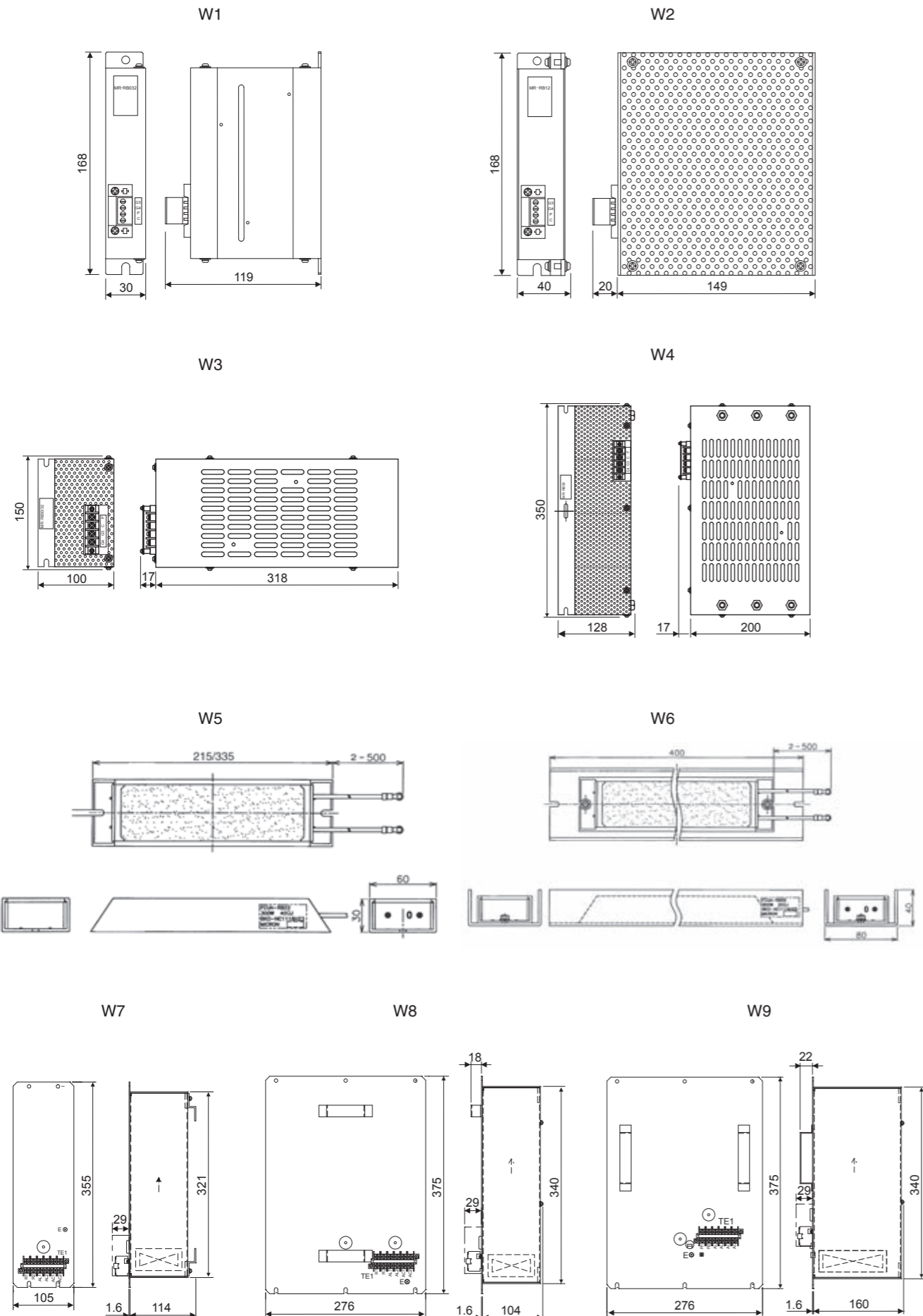
Corresponding spindle drive unit		External option regenerative resistor			
		MR-RB12	MR-RB32	MR-RB30	MR-RB50
	Parameter setting value	1300h	1400h	1500h	1600h
	Mass	0.8kg	2.9kg	2.9kg	5.6kg
	Unit outline dimension	168mm×40mm×149mm	150mm×100mm×318mm	150mm×100mm×318mm	350mm×128mm×200mm
		W2	W3	W3	W4
	External option regenerative resistor	GZG200W39OHMK	GZG200W120 OHMKx3	GZG200W39 OHMKx3	GZG300W39 OHMKx3
	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	-				

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	-				

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	-				○	○			

External option regenerative resistor unit

[Unit : mm]



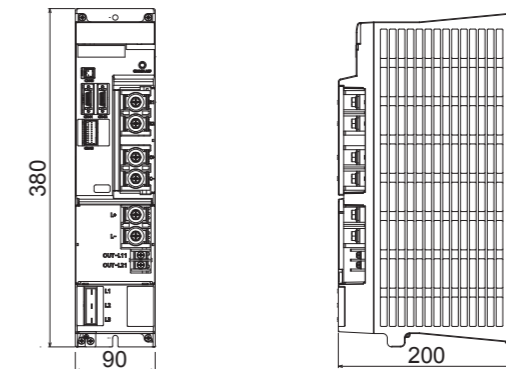
Power backup unit MDS-D/DH-PFU

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

Specifications

Power backup unit type		MDS-DH-PFU	MDS-D-PFU
AC Input	Rated voltage [V]	AC380 to 480 (50/60Hz) Tolerable voltage fluctuation rate between +10% and -10%	AC200 to 230(50/60Hz) Tolerable voltage fluctuation rate between +10% and -15%
	Frequency [Hz]	50/60 Tolerable frequency fluctuation between +3% and -3%	
	Rated current [A]	2	4
DC Input/Output	Rated voltage [V]	DC513 to 648	DC270 to 300
	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 Quasi-AC380 to 480 (50Hz)	Single-phase Quasi-AC200 to 240 (50Hz)
	Current [A]	MAX 2	
	Maximum number of drive units to connect	6 units (except for the power supply unit)	
	Switching time	Within 100ms after AC input instantaneous interruption	
Degree of protection	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)
	IP20 [except for the terminal block and connector area]		
Cooling method	Natural-cooling		
Mass [kg]	4		

Outline dimension drawing



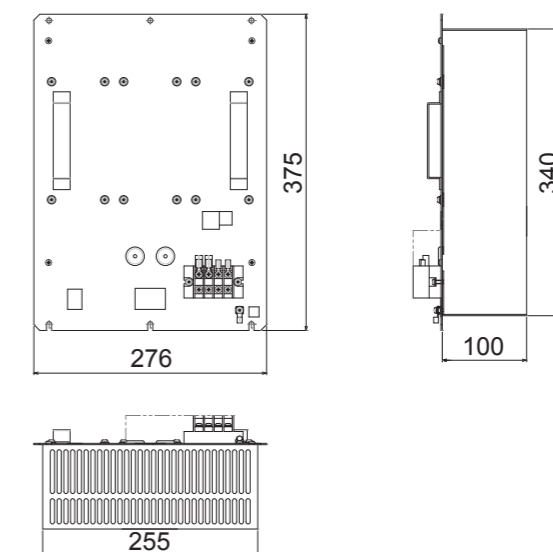
[Unit : mm]

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	
Mass [kg]	10	

Outline dimension drawing



[Unit : mm]

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				
	V1	V2	V3	Drive unit side	Motor side		Drive unit side	Motor side		
					Straight	Right angle		Straight	Right angle	
HF Series	HF75	20	2020 (L, M) 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	40	4020 (L) 4040 (L, M) 8040 (M)	404040		CNP22-22S (16) Applicable cable outline φ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ 12.5 to 16 (mm)			
	HF54									
	HF104									
	HF223	80	8040 (L) 8080 (L, M)	404040	CNU1S (AWG10)	CNP18-10S (14) Applicable cable outline φ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ 10.5 to 14 (mm)			
	HF302									
	HF154	-	16080 (M)	-	CNU1S (AWG10)	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	80	8040 (L) 8080 (L, M)	404040	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)			
	HF204	80	8040 (L) 8080 (L, M)	404040	CNU1S (AWG10)	CNP32-17S (23) Applicable cable outline φ 22 to 23.8 (mm)	CNP32-17L (23) Applicable cable outline φ 22 to 23.8 (mm)			
	HF303	80	8040 (L) 8080 (L, M)	404040	CNU1S (AWG14)					
	HF354	160	16080 (L) 160160 (L, M)	-	Terminal block connection					
	HF453	160	16080 (L) 160160 (L, M)	-	CNU1S (AWG10)					
	HF703	160W	160160W (L, M)	-	Terminal block connection					
HF903	320	-	-							

Servo motor type	Drive unit type MDS-D2-			Power Cable		Brake cable				
	V1	V2	V3	Drive unit side	Motor side		Drive unit side	Motor side		
					Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft		Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	
HF-KP Series	HF-KP23JW04-S6	20	2020 (L, M) 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								
	V1	V2	V3	Cable				Single connector		Ball screw side detector		
				Detector: A48		Detector: A51/A74N		Drive unit side	Motor side			
				Straight	Right angle	Straight	Right angle		Straight	Right angle		
HF Series	HF75	20	2020 (L, M) 4020 (M)	202020 404040	CNU2S (AWG18)	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-7P-□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)	CNV2E-6P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30
	HF105											
	HF123											
	HF142	40	4020 (L) 4040 (L, M) 8040 (M)	404040								
	HF54											
	HF104											
	HF223	80	8040 (L) 8080 (L, M)	404040								
	HF302											
	HF154	-	16080 (M)	-								
	HF224	80	8040 (L) 8080 (L, M)	404040								
	HF204	80	8040 (L) 8080 (L, M)	404040								
	HF303	80	8040 (L) 8080 (L, M)	404040								
	HF354	160	16080 (L) 160160 (L, M)	-								
	HF453	160	16080 (L) 160160 (L, M)	-								
	HF703	160W	160160W (L, M)	-								
HF903	320	-	-									

Servo motor type	Drive unit type MDS-D2-			Servo detector cable						
	V1	V2	V3	Cable (Direct connection type)		Cable (Relay type)		Ball screw side detector		
				Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Drive unit side	Motor side			
				Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft			
HF-KP Series	HF-KP23JW04-S6	20	2020 (L, M) 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 (L, M)	CNU1S (AWG10)	
		-	16080S (M)	Terminal block connection	
	SJ-D5.5/100-01	80	-	CNU1S (AWG14)	
		-	8040 (L) 8080 (L, M)	CNU1S (AWG10)	
		-	16080S (M)	Terminal block connection	
	SJ-D5.5/120-01	80	-	CNU1S (AWG14)	
		-	8040 (L) 8080 (L, M)	CNU1S (AWG10)	
		-	16080S (M)	Terminal block connection	
	SJ-D7.5/100-01	160	-	Terminal block connection	
		-	16080S (L)	Terminal block connection	
	SJ-D7.5/120-01	160	-	Terminal block connection	
		-	16080S (L)	Terminal block connection	
	SJ-D11/80-01	160	-	Terminal block connection	
-		16080S (L)	Terminal block connection		
SJ-D11/100-01	160	-	Terminal block connection		
	-	16080S (L)	Terminal block connection		
SJ-D5.5/120-02	160 200	-	Terminal block connection		
	-	16080S (L)	Terminal block connection		
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	80	-	CNU1S (AWG14)	
		-	8040 (L) 8080 (L, M)	CNU1S (AWG10)	
		-	16080S (M)	Terminal block connection	
	SJ-DJ5.5/120-01	80	-	CNU1S (AWG14)	
		-	8040 (L) 8080 (L, M)	CNU1S (AWG10)	
	SJ-DJ7.5/100-01	160	16080S (L)	Terminal block connection	
		200	-	Terminal block connection	
SJ-DJ15/80-01	200	-	Terminal block connection		
	-	16080S (L)	Terminal block connection		
SJ-DL Series (Low-inertia)	SJ-DL0.75/100-01T	20	-	CNU1S (AWG14)	
		-	2020 (L, M) 4020 (M)		
	SJ-DL1.5/100-01T	40	-	CNU1S (AWG10)	
		-	4020 (L) 4040S (L, M)		
	SJ-DL5.5/150-01T	160	-	Terminal block connection	
		-	16080S (L)		
	SJ-DL5.5/200-01T	160	-	Terminal block connection	
		-	16080S (L)		
SJ-DL7.5/150-01T	160	-	Terminal block connection		
	-	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 (L, M)	CNU1S (AWG14)	Terminal block connection		
		-	8040 (M)	CNU1S (AWG10)			
		-	16080S (M)	Terminal block connection			
	SJ-V3.7-01T	80	-	CNU1S (AWG14)			
		-	8040 (L)	CNU1S (AWG10)			
		-	16080S (M)	Terminal block connection			
	SJ-V5.5-01ZT	80	-	CNU1S (AWG14)			
		-	8080 (L, M)	CNU1S (AWG10)			
	SJ-V7.5-01ZT	SJ-V7.5-01ZT	160	16080S (L)		Terminal block connection	
							SJ-V7.5-03ZT
		SJ-V11-01ZT	200	-			Terminal block connection
		SJ-V15-01ZT	200	-			Terminal block connection
		SJ-V18.5-01ZT	240	-			Terminal block connection
SJ-V22-01ZT		320	-	Terminal block connection			
					SJ-V22-04ZT		
SJ-V26-01ZT	400	-	Terminal block connection				
				SJ-V26-01ZT			
SJ-V37-01ZT	640	-	Terminal block connection				
				SJ-V37-01ZT			
SJ-V45-01ZT	640	-	Terminal block connection				
				SJ-V45-01ZT			
SJ-V55-01ZT	640	-	Terminal block connection				
				SJ-V55-01ZT			
SJ-V Series (High-speed)	SJ-VL2.2-02ZT	40	4020 (L) 4040S (L, M)	CNU1S (AWG14)			
		-	8040 (M)	CNU1S (AWG10)			
		-	16080S (M)	Terminal block connection			
	SJ-V3.7-02ZT	-	-	8040 (L) 8080 (L, M)	CNU1S (AWG10)		
						16080S (M)	
	SJ-V11-06ZT	200	-	Terminal block connection			
					SJ-V11-08ZT		
SJ-V22-06ZT							
SJ-V18.5-04ZT							
SJ-V30-02ZT							
SJ-V Series (Wide range constant output)	SJ-V11-01T	160	16080S (L)	Terminal block connection			
					SJ-V11-09T		
	SJ-V15-03T	200	-		Terminal block connection		
						SJ-V18.5-03T	
	SJ-V22-05T	320	-		Terminal block connection		
						SJ-V22-09T	
SJ-VK22-19ZT	320	-	Terminal block connection				
				SJ-VK22-19ZT			
SJ-VL Series (Low-inertia)	SJ-VL11-05FZT-S01	160	16080S (L)	Terminal block connection			
					SJ-VL11-07ZT		

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				
	SPV2	SPV3	SPHV3	Drive unit side	Motor side		Drive unit side	Motor side			
				For CN31(L/M/S)	Straight	Right angle		Straight	Right angle		
HF Series	HF54	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)	CNP22-22S (16) Applicable cable outline φ 12.5 to 16 (mm)	CNP22-22L (16) Applicable cable outline φ 12.5 to 16 (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)
	HF104										
	HF223										
	HF302	10080 16080 20080	20080		CNP18-10S (14) Applicable cable outline φ 10.5 to 14 (mm)	CNP18-10L (14) Applicable cable outline φ 10.5 to 14 (mm)		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										
	HF224										
	HF204										
	HF303	10080 16080 20080 200120	-		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										
	HF453										

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

Servo motor type	Drive unit type MDS-DM2-			Servo detector cable						
	SPV2	SPV3	SPHV3	Cable		Single connector				
				Straight	Right angle	Drive unit side	Motor side			
				Straight	Right angle	Straight	Right angle	Right angle		
HF Series	HF54	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	10080 16080 20080	20080						-	-
	HF154									
	HF224									
	HF204									
	HF303	10080 16080 20080 200120	-						-	-
	HF354									
	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																	
	SPV2	SPV3	SPHV3	Drive unit side	Motor side	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												
				Drive unit side	Detector side	Drive unit side	Detector side	Straight	Right angle	Drive unit side													
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-D11/80-01																						
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	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-DJ5.5/120-01																						
	SJ-DJ5.5/120-02																						
	SJ-DJ7.5/100-01																						
	SJ-DJ11/100-01																						
SJ-DL Series (Low-inertia)	SJ-DL5.5/150-01T	16080	16080	-	-	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-DL7.5/150-01T	-	-																				
SJ-V Series (Standard)	SJ-V5.5-01ZT	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-V7.5-01ZT																						
	SJ-V7.5-03ZT	16080	16080																				
	SJ-V11-01ZT	20080	20080			-	-																
	SJ-V15-01ZT																						
SJ-V15-09ZT	-	-	20080																				
SJ-V Series (High-speed)	SJ-V11-06ZT	20080	20080	-	-	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-V11-08ZT	-	-	20080																			
SJ-V Series (Wide range constant output)	SJ-V11-01T	16080	16080	-	-										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-V11-09T																						
	SJ-V15-03T																						
SJ-VL Series (Low-inertia)	SJ-VL11-05FZT-S01	16080	16080	-	-	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-VL11-07ZT																						

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

Servo motor type	Drive unit type MDS-DJ-V1-	Drive unit side	Power Cable		Brake Cable		
			Motor side		Motor side		
			Straight	Right angle	Straight	Right angle	
HF Series	HF75	30	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)	CNP10-R2S (6) Applicable cable outline φ 4.0 to 6.0 (mm)	CNP10-R2L (6) Applicable cable outline φ 4.0 to 6.0 (mm)
	HF105						
	HF123						
	HF142	40					
	HF54						
	HF104	40					
	HF223						
	HF302						
	HF154	80					
	HF224						
HF204							
HF303							
HF354	100						

Servo motor type	Drive unit type MDS-DJ-V1-	Drive unit side	Power Cable		Brake Cable		
			Motor side		Motor side		
			Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	
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			15			
	HF-KP43JW04-S6	30					
	HF-KP73JW04-S6						

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

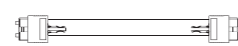


Servo motor type	Drive unit type MDS-DJ-V1-	Servo detector cable									
		Motor side detector cable				Ball screw side detector					
		Cable		Single connector		Cable		Single connector			
		Straight	Right angle	Drive unit side	Motor side	Straight	Right angle	Straight	Right angle		
HF Series	HF75	30	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNE10-R10S (9) Applicable cable outline φ 6.0 to 9.0 (mm)	CNE10-R10L (9) Applicable cable outline φ 6.0 to 9.0 (mm)	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9) 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										
	HF142	40									
	HF54										
	HF104	40									
	HF223										
	HF302										
	HF154	80									
	HF224										
HF204											
HF303											
HF354	100										

Servo motor type	Drive unit type MDS-DJ-V1-	Servo detector cable									
		Motor side detector cable				Ball screw side detector					
		Cable (Direct connection type)		Cable (Relay type)		Cable		Single connector			
		Lead out in direction of motor shaft	Lead out in opposite direction of motor shaft	Drive unit side	Motor side	Straight	Right angle	Straight	Right angle		
HF-KP Series	HF-KP13J-S17	10	CNP2E-K1P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNP2E-K2P-□M □ : Length (m) 2, 3, 5, 7, 10 Compatible with only IP65	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP22J-K1P-0.3M Length : 0.3 (m) Compatible with only IP65	CNP22J-K2P-0.3M Length : 0.3 (m) Compatible with only IP65	CNP2E-8P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP2E-9P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNE10-R10S (9) 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	30									
	HF-KP73JW04-S6										

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

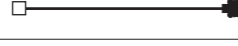




Spindle motor type	Drive unit type MDS-DJ-SP-	When connecting to a spindle motor	Spindle detector cable									
			Power Cable		When connecting to a spindle motor		When connecting to a spindle side detector					
			Drive unit side	Motor side	Motor side PLG cable		Spindle side accuracy detector TS5690 cable		Spindle side detector OSE-1024 cable			
			Cable	Single connector	Cable	Single connector	Cable	Single connector	Cable	Single connector		
SJ-D Series (Standard)	SJ-D3.7/100-01	80	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	120										
	SJ-D7.5/100-01	160										
	SJ-D11/80-01	160										
	SJ-D11/100-01	160										
SJ-DJ Series (Compact & lightweight)	SJ-DJ5.5/100-01	100	Terminal block connection	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP2E-1-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)	CNEPGS	CNP3EZ-2P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNP3EZ-3P-□M □ : Length (m) 2, 3, 4, 5, 7, 10, 15, 20, 25, 30	CNU2S (AWG18)
	SJ-DJ5.5/120-01	120										
	SJ-DJ7.5/100-01	120										
	SJ-DJ11/100-01	160										
	SJ-V Series (Standard)	SJ-V2.2-01T										
SJ-V3.7-01T	80											
SJ-V5.5-01ZT	100											
SJ-V7.5-01ZT	120											
SJ-V7.5-03ZT	160											
SJ-V Series (High-speed)	SJ-VL2.2-02ZT	80	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-V Series (Wide range constant output)	SJ-V11-01T	160										
SJ-VL Series (Low-inertia)	SJ-VL11-05FZT-S01		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-VL11-07ZT											

<Optical communication cable>




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

(Note1) For details on the optical communication cable, refer to the section "Optical communication cable specification".


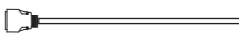
<Battery cable and connector>

Item	Model	Length (m)	Contents	Compatible model							
				D2/DH2	DM2	DJ					
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									
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.	DG23-10M	10		○	○	-					
	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									
	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
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	-	-		○	-	-



<Power supply communication cable and connector>

Item	Model	Length (m)	Contents	Compatible model			
				D2/DH2	DM2	DJ	
For CN24	External emergency stop input connector	CNU24S (AWG18)	-		○	-	-
For CN41	Power backup unit 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							

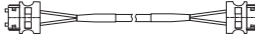

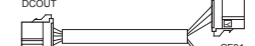
<Power backup unit connector>

Item	Model	Length (m)	Contents	Compatible model	
				D-PFU	DH-PFU
For CN43	Power backup unit connector	-		○	○
For TE1	Power backup unit power connector	-		○	○

<STO input connector>

Item	Model	Length (m)	Contents	Compatible model		
				D2/DH2	DM2	DJ
For CN8	STO input connector	-		○	○	○
				STO short-circuit connector	These connectors are supplied for each drive unit.	

<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	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				
			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															
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 CN2/3	Relay type (Note)				For HF-KP (Servo) Motor side detector relay cable (motor side) 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								
									For motor detector/ Ball screw side detector	Motor side detector connector/ Ball screw side detector connector				CNE10-R10S (9)	-	○	○	○
														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 CN3	MDS-B-HR unit cable	CNV2E-HP-2M	2		○	-	○
		CNV2E-HP-3M	3				
		CNV2E-HP-4M	4				
		CNV2E-HP-5M	5				
		CNV2E-HP-7M	7				
		CNV2E-HP-10M	10				
		CNV2E-HP-15M	15				
		CNV2E-HP-20M	20				
		CNV2E-HP-25M	25				
		CNV2E-HP-30M	30				
For MDS-B-HR unit	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)	-																
		For motor brake	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										
								For motor brake	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>

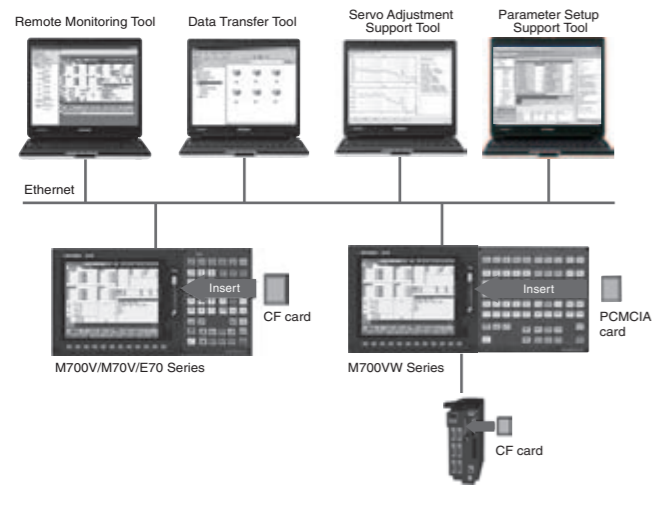
Item	Model	Length (m)	Contents	Compatible model			
				D2/DH2	DM2	DJ	
For motor power	Power connector for <200V Series> HF75, 105, 54, 104, 154, 224, 123, 223, 142 <400V Series> HF-H54, 75, 104, 105, 154 Applicable cable outline ϕ 10.5 to 14mm	-		○	○	○	
							CNP18-10S (14)
	Power connector for <200V Series> HF204, 354, 303, 453, 302 <400V Series> HF-H204, 354, 453, 703 Applicable cable outline ϕ 12.5 to 16mm	-	-		○	○	○
	Power connector for <200V Series> HF703, 903 <400V Series> HF-H903 Applicable cable outline ϕ 22 to 23.8mm	-	-		○	-	-
	Power cable for <200V Series> HF-KP Lead out in direction of motor shaft	MR-PWS1CBL2M-A1-H	2		○	-	○
		MR-PWS1CBL3M-A1-H	3				
	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-PWS1CBL2M-A2-H	2		○	-	○
		MR-PWS1CBL3M-A2-H	3				
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)
For CN31 L/M/S	Power connector for MDS-DM2 Series Applicable cable outline ϕ 1.25 to 5.5mm	-		-	○	-	
							RCN31S RCN31M
For CN22	Control power connector for MDS-DM2 Series Applicable cable outline ϕ 1.25 to 2.2mm	-		-	○	-	

<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: 0.8mm ² to 2.1mm ² 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) 1.25mm ² to 5.5mm ² (For CNP2) 0.14mm ² to 2.1mm ² Finish outside diameter: (For CNP1, for CNP3) to ϕ 4.7mm (For CNP2) to ϕ 3.9mm ²	-		-	-	○				
							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												
For spindle motor	Motor side PLG connector Spindle side accuracy detector TS5690 connector			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 CN2/3	Spindle detector drive unit side connector	-						○	○	○	
													CNU2S (AWG18)



NC Trainer/NC Trainer plus M700V M70V E70 (Plan) (Plan)

MITSUBISHI CNC Training Tool

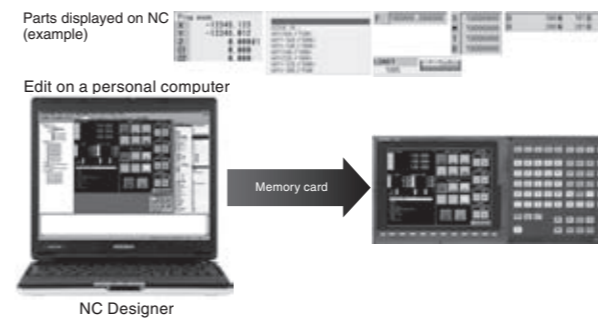
- NC Trainer is an application for operating the screens of MITSUBISHI CNC M700V/M70V/E70 Series and machining programs. This application can be used for learning operating CNC and checking the operations of the machining programs.
- NC Trainer plus can also be used for checking the PLC program and custom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



NC 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)

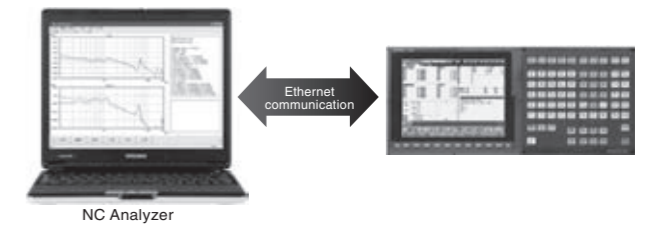


NC Analyzer M700V M70V E70

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.

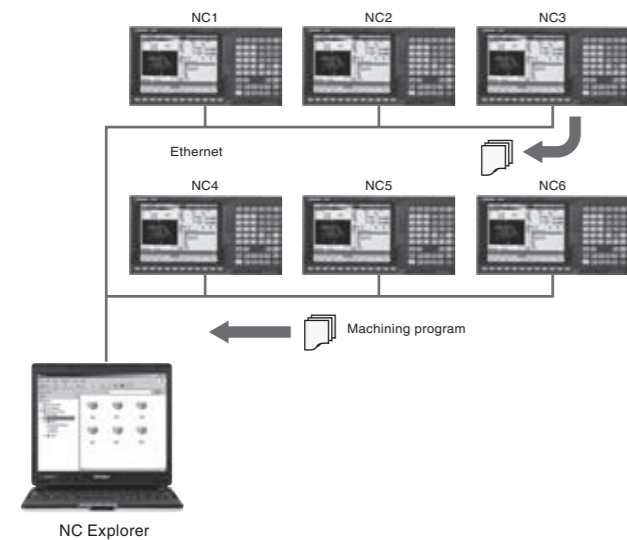
<Main functions>
Bode diagram measurement display, speed loop gain adjustment, position loop gain adjustment, notch filter setting, acceleration/deceleration time constant adjustment, circularity adjustment and servo waveform measurement



NC Explorer M700V M70V E70 (Plan)

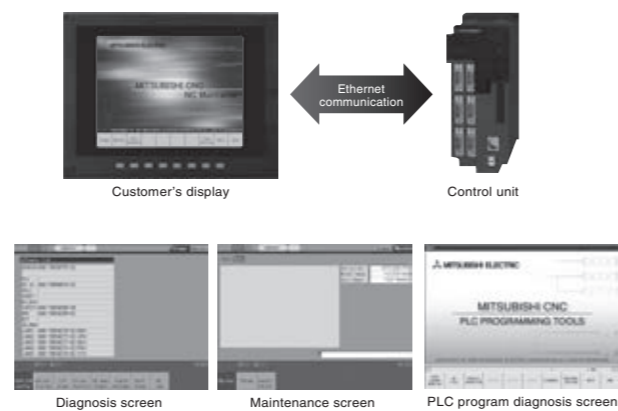
Data Transfer Tool

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 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.

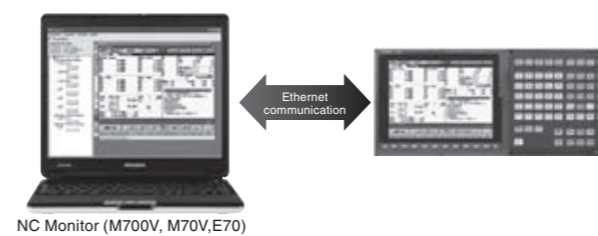


* An operation check is required in combination with software installed on the display.

NC Monitor M700V M70V E70 (Plan)

Remote Monitoring Tool

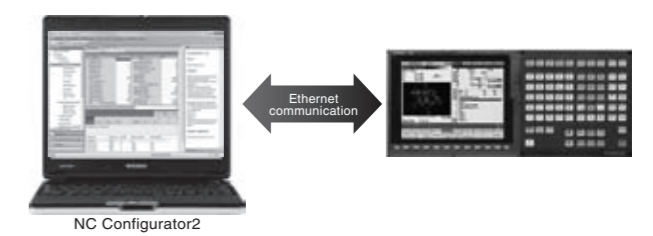
An identical NC display screen can be displayed on a personal computer. By connecting a personal computer to the NC unit when necessary, various data can be checked and set using the same HMI as the standard NC screen.



NC 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.)



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.



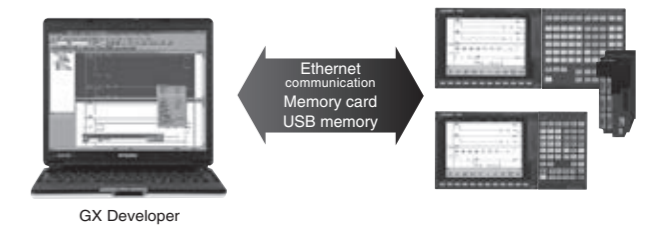
When the machine model and input specifications are selected, the selection result for the motor will be displayed. The result can be output in PDF format.

<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.



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* CompactFlash and CF are either trademarks or registered trademarks of SanDisk Corporation in the United States and/or other countries.

* MELSEC is a registered trademark of Mitsubishi Electric Corporation in Japan and/or other countries.

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 **Safety Warning**

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

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



for a greener tomorrow

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.



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BNP-A1225-A[ENG]
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