MITSUBISHI ELECTRIC

New Product Release

SV0512-4E

General-Purpose AC Servo
MELSERVO-J3

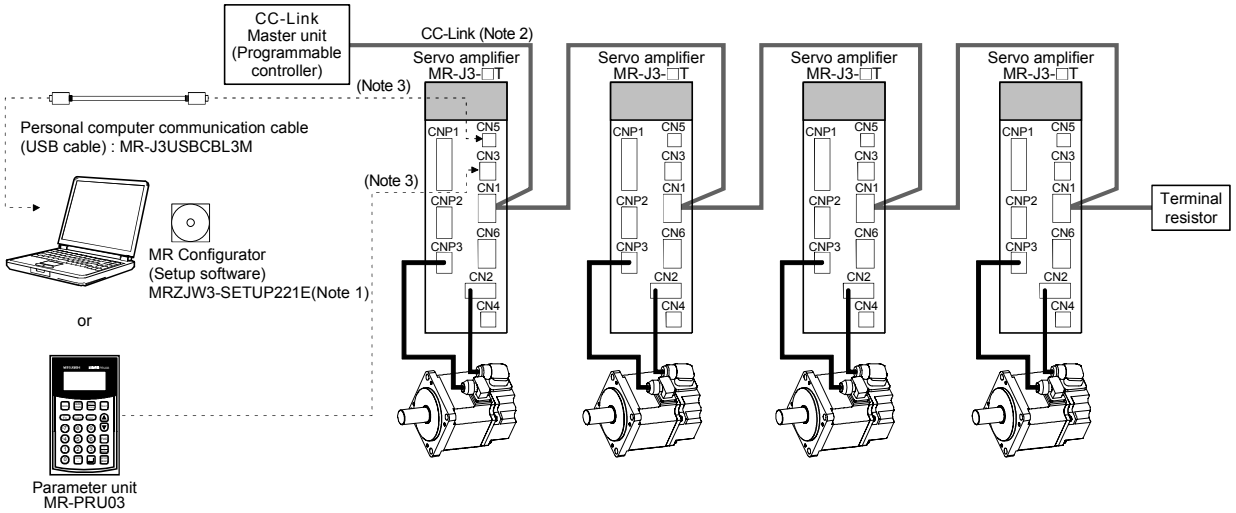
CC-Link Compatible AC Servo Amplifier <MR-J3-T type> with Built-in Positioning Function

CC-Link compatible servo amplifier, MR-J3-T type, has now been introduced into the MELSERVO-J3 series. The MR-J3-T is available with less wiring works and more compact size as compared to MR-J2S series.
Positioning operation can be performed just by setting position data (target positions), servo motor speeds, and acceleration/ deceleration time constant, etc. to point tables as if setting them in parameters. The AC servo can be used as the field network's drive source.
This servo amplifier is the most appropriate when configuring a simple positioning system without programs or simplifying a system. Also, by using MR Configurator (setup software) together with the servo amplifier, easier operation with advanced functions can be possible.

■ Features

- Using the servo amplifier with built-in positioning function, the position data and speed data, etc. can be set via the CC-Link. (Applicable CC-Link version: Ver.1.10)
- Start, stop and monitor displays can be set via the CC-Link.
- Serial communication reduces wiring.
- AC servo distributed control system can be easily structured.
- Parameter unit, MR-PRU03 (optional), makes parameter setting and operation monitoring easier.
- DIO command positioning is possible by using extension IO unit, MR-J3-D01 (optional) (Available soon). (Total digital input: 34 points. Total digital output: 19 points.)

■ System configuration



Notes: 1. The MRZJW3-SETUP221E software version B1 or above is planned to be compatible with MR-J3-T type.
2. When using only remote device stations, up to 42 servo amplifiers can be connected as 1 station occupied, and up to 32 servo amplifiers as 2 stations occupied.
3. USB interface (CN5 connector) and RS-422 interface (CN3 connector) are mutually exclusive. They cannot be used at the same time.

■ Servo amplifier specifications

Servo amplifier MR-J3-			10T	20T	40T	60T	70T	100T	200T	350T	500T	700T	11KT	15KT	22KT	10T1	20T1	40T1
Main circuit power supply	Voltage / frequency		3-phase 200 to 230VAC 50/60Hz or 1-phase 200 to 230VAC 50/60Hz					3-phase 200 to 230VAC 50/60Hz								1-phase 100 to 120VAC 50/60Hz		
	Permissible voltage fluctuation		For 3-phase 200 to 230VAC: 3-phase 170 to 253VAC For 1-phase 200 to 230VAC: 1-phase 170 to 253VAC					3-phase 170 to 253VAC								1-phase 85 to 132VAC		
	Permissible frequency fluctuation		±5% maximum															
Control circuit power supply	Voltage / frequency		1-phase 200 to 230VAC 50/60Hz													1-phase 100 to 120VAC 50/60Hz		
	Permissible voltage fluctuation		1-phase 170 to 253VAC													1-phase 85 to 132VAC		
	Permissible frequency fluctuation		±5% maximum															
	Power consumption (W)		30								45					30		
Interface power supply			24VDC ±10% (required current capacity: 150mA (Note 1))															
Control system			Sine-wave PWM control / current control system															
Dynamic brake			Built-in											External option		Built-in		
Safety features			Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), servo motor overheat protection, encoder fault protection, regeneration fault protection, undervoltage / sudden power outage protection, overspeed protection, excess error protection															
Command interface			CC-Link communication (Ver.1.10), DIO command (extension IO unit MR-J3-D01 (optional) is required), or RS-422 communication															
Command method	Remote register		Possible with CC-Link communication when 2 stations occupied															
	Point table No. input		Possible with CC-Link communication, DIO command or RS-422 communication CC-Link communication (when 1 station occupied): 31 points CC-Link communication (when 2 stations occupied): 255 points DIO command: 255 points (extension IO unit MR-J3-D01 (optional) is required.) RS-422 communication: 255 points															
	Point table data input		Possible with CC-Link communication or RS-422 communication															
Operation mode	Automatic operation mode	Point table	Point table No. input or point table data input system. Each positioning operation based on position and speed data.															
		Automatic continuous operation	Speed changing operation (2 to 255 speeds), automatic continuous positioning operation (2 to 255 points)															
	Manual operation mode (JOG)		Inches upon contact input, CC-Link communication or RS-422 communication based on speed data set by a parameter.															
	Home position return mode	Dog system	Returns to home position upon Z phase pulse count after passing through near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Count system	Returns to home position upon encoder pulse count after touching near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Data set system	Returns to home position without dog. Sets any position as home position using manual operation, etc. Home position address settable															
		Stopper system	Returns to home position upon hitting end of stroke. Direction for return to home position selectable, home position address settable															
		Ignore home (Servo-on position as home position)	Uses position where the servo on signal (SON) turns ON as home position. Home position address settable															
		Dog system rear end reference	Returns to home position with respect to the rear end of a near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Count system front end reference	Returns to home position with respect to the front end of a near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Dog cradle system	Returns to home position upon the first Z phase pulse with respect to the front end of a near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Dog system adjacent Z phase reference	Returns to home position upon the Z phase pulse right before a near-point dog with respect to the front end of a near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Dog system front end reference	Returns to home position to the front end of a near-point dog with respect to the front end of a near-point dog. Direction for return to home position selectable, home position shift amount and home position address settable, Automatic retreat on dog back to home position and automatic stroke retreat function															
		Dog less Z phase reference	Returns to home position to the first Z phase pulse with respect to the first Z phase pulse. Direction for return to home position selectable, home position shift amount and home position address settable															
	Automatic positioning to home position function		High-speed automatic positioning to a defined home position															
Structure			Self-cooling, open (IP00)					Fan cooling, open (IP00)								Self-cooling, open (IP00)		
Environment	Ambient temperature (Note 2)		0 to 55°C (32 to 131°F) (non freezing), storage: -20 to 65°C (-4 to 149°F) (non freezing)															
	Ambient humidity		90% RH maximum (non condensing), storage: 90% RH maximum (non condensing)															
	Atmosphere		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust															
	Elevation / Vibration		1000m or less above sea level / 5.9m/s^2 maximum															
Mass (kg [lb])			0.8 (1.8)	0.8 (1.8)	1.0 (2.2)	1.0 (2.2)	1.4 (3.1)	1.4 (3.1)	2.3 (5.1)	2.3 (5.1)	4.6 (10)	6.2 (14)	18 (40)	18 (40)	19 (42)	0.8 (1.8)	0.8 (1.8)	1.0 (2.2)

Notes: 1. 150mA is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.

2. The MR-J3-350T or smaller servo amplifier can be installed closely. In this case, keep the ambient temperature within 0 to 45°C (32 to 113°F), or use them with 75% or less of the effective load rate.

■ Command methods

The following three types of command methods are available.

Remote register (Note)	Sets position data and servo motor speed data directly to the remote register, and then executes positioning.
Point table No. input	Specifies position data and servo motor speed data set previously with the point table No., and then executes positioning.
Point table data input	Sets position data and servo motor speed data to the point table, and then executes positioning.

Note: Setting range and description for the position data and servo motor speed data are same as for the point table. Refer to the <Point table> below.

<Point table>: The following two types of point tables are available.

(1) Absolute value command method:

Moves to the address (absolute value) based on the home position.

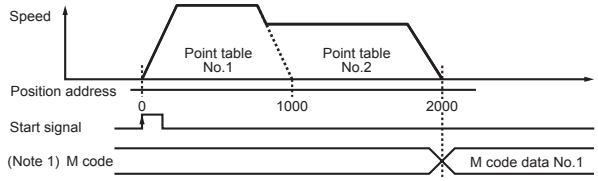
Item	Setting range	Unit	Description
Position data	-999999 to 999999	$X10^{STM}\mu m$	**Using as the absolute value command method** Sets the address. STM is the ratio to the data. **Using as the incremental value command method** Sets the movement amount. STM is the ratio to the data.
Servo motor speed	0 to permissible	r/min	Sets the command speed for the servo motor used for positioning.
Acceleration time constant	0 to 20000	ms	Sets the acceleration time constant. (Note 2)
Deceleration time constant	0 to 20000	ms	Sets the deceleration time constant. (Note 2)
Dwell time	0 to 20000	ms	Runs the next point table after the set dwell time.
Auxiliary function	0 to 3	-	**Using as the absolute value command method** 0: Positions and stops (waits for start signal). 1: Continues operation for the next point table without stopping. **Using as the incremental value command method** 2: Positions and stops (waits for start signal). 3: Continues operation for the next point table without stopping.
M code (Note 1)	0 to 99	-	Sets output code when positioning completes.

(Example of setting point table data)

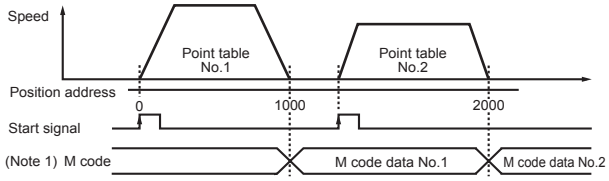
Point table No.	Position data	Servo motor speed	Accele-ration time constant	Decele-ration time constant	Dwell time	Auxiliary function	M code
1	1000	2000	200	200	0	1	1
2	2000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	3000	3000	100	100	0	2	99

If the point table No.1's auxiliary function is 1 or 3, continuous positioning is carried out based on the point table as shown in the " ●Auxiliary function 1 or 3" below.
If the point table No.1's auxiliary function is 0 or 2, a start signal must be issued as shown in " ●Auxiliary function 0 or 2" below.

● Auxiliary function 1 or 3



● Auxiliary function 0 or 2



(2) Incremental value command method:

Moves from the current value according to the set position data.

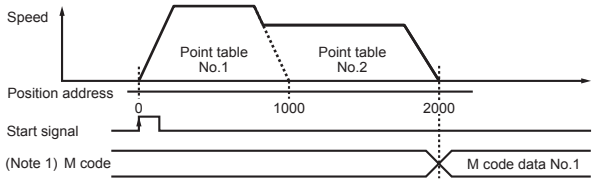
Item	Setting range	Unit	Description
Position data	0 to 999999	$X10^{STM}\mu m$	Sets the movement amount.
Servo motor speed	0 to permissible	r/min	Sets the command speed for the servo motor used for positioning.
Acceleration time constant	0 to 20000	ms	Sets the acceleration time constant. (Note 2)
Deceleration time constant	0 to 20000	ms	Sets the deceleration time constant. (Note 2)
Dwell time	0 to 20000	ms	Runs the next point table after the set dwell time.
Auxiliary function	0, 1	-	0: Positions and stops (waits for start signal). 1: Continues operation for the next point table without stopping.
M code (Note 1)	0 to 99	-	Sets output code when positioning completes.

(Example of setting point table data)

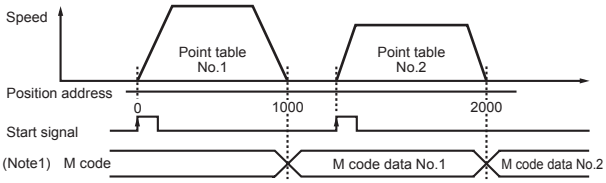
Point table No.	Position data	Servo motor speed	Accele-ration time constant	Decele-ration time constant	Dwell time	Auxiliary function	M code
1	1000	2000	200	200	0	1	1
2	1000	1600	100	100	0	0	2
:	:	:	:	:	:	:	:
255	500	3000	100	100	0	0	99

If the point table No.1's auxiliary function is 1, continuous positioning is carried out based on the point table as shown in the " ●Auxiliary function 1" below.
If the point table No.1's auxiliary function is 0, a start signal must be issued as shown in " ●Auxiliary function 0" below.

● Auxiliary function 1



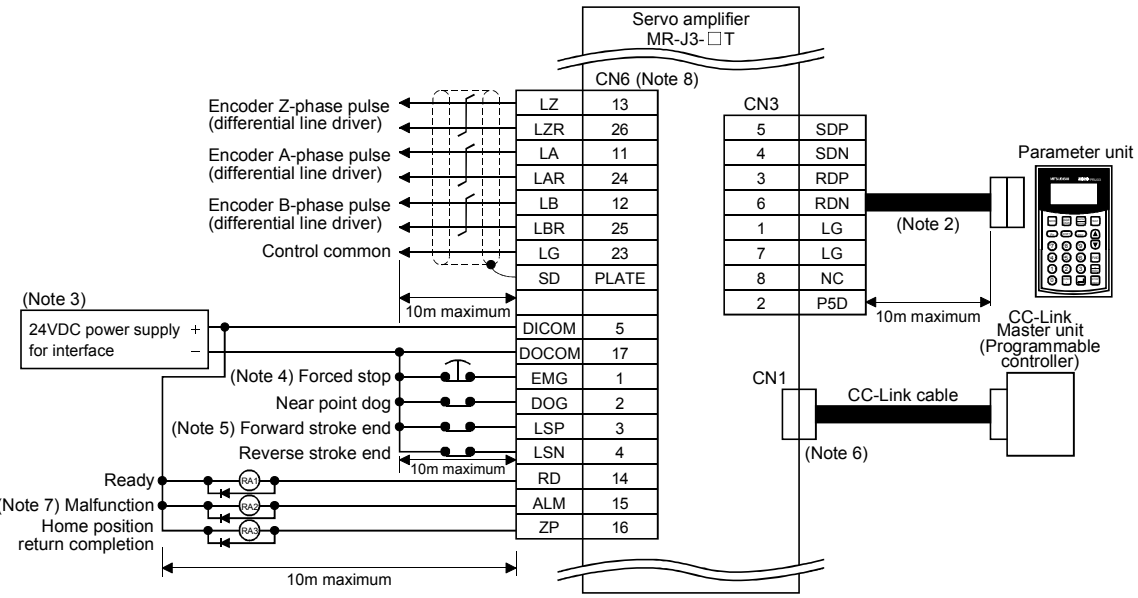
● Auxiliary function 0



Notes: 1. When using M code, extension IO unit MR-J3-D01 (optional, available soon) is required.
M code is digital output from MR-J3-D01. Remote output is not possible.
2. S-pattern acceleration/deceleration time constant is set by parameters.

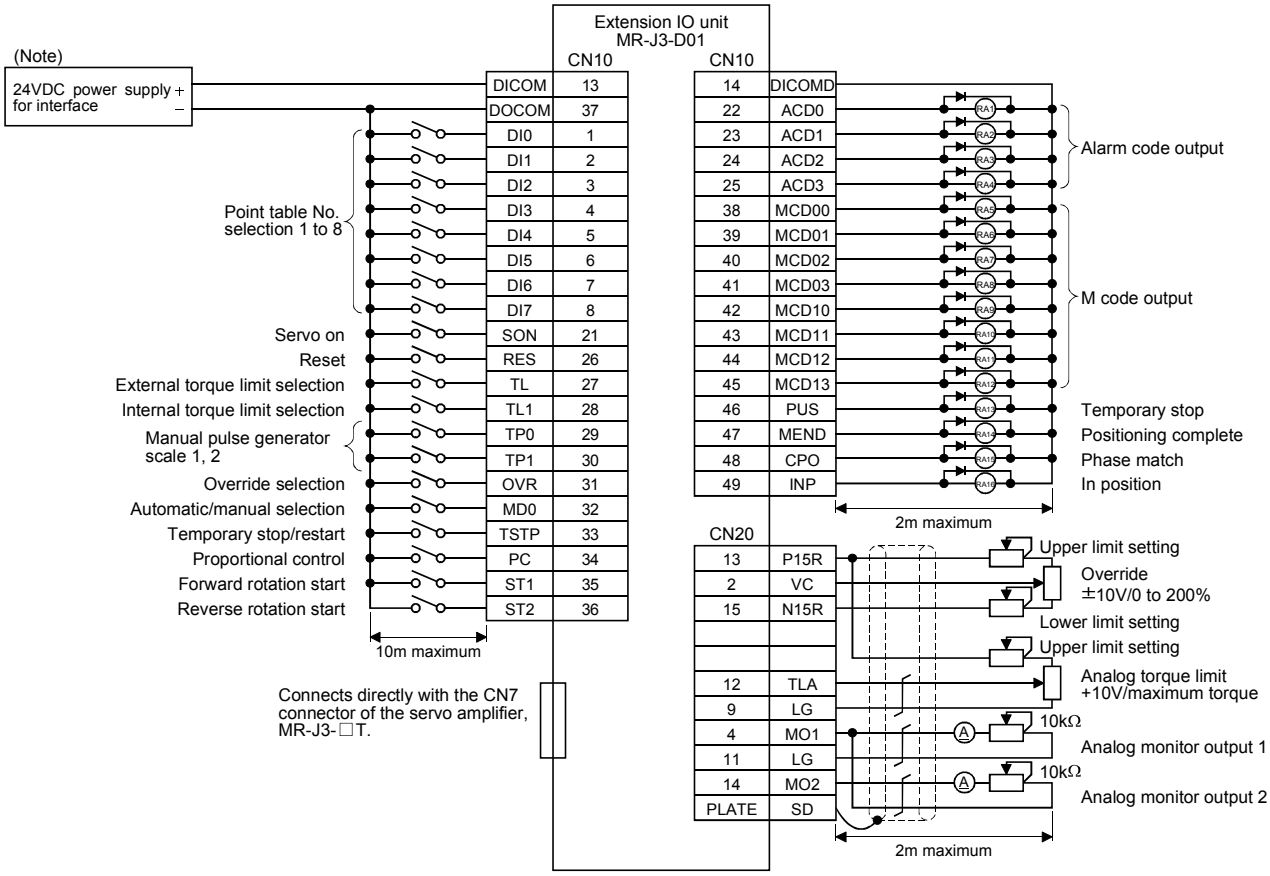
■ Standard wiring diagram

●Connection of control signals (Note 1)



Notes: 1. Connections other than shown in the diagram are same as for MR-J3-A type. Refer to "MELSERVO-J3 catalog".
2. Use a commercial LAN cable (EIA568 compatible). A personal computer can be connected using RS-422/RS-232 conversion cable. Refer to the section, Ordering Information for Customers in "MELSERVO-J3 catalog" for the conversion cable.
3. Use the power supply 24VDC±10% (required current capacity: 150mA). 150mA is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.
4. Connect the forced stop EMG (b contact) or validate the forced stop signal with the parameter No.PD01.
5. Close the stroke end signals LSP and LSN (b contact) or validate the stroke end signals with the parameter No.PD01 when operating.
6. The CN1 connector is used only when operated with CC-Link communication. Manufacture a CC-Link cable using the CN1 connector supplied with the servo amplifier.
7. Malfunction signal (ALM) is turned on during normal operation when no alarms have been triggered.
8. Use the optional connector, MR-J2CMP2 for the CN6 connector.

●DIO command positioning with MR-J3-D01 (optional: Available soon)

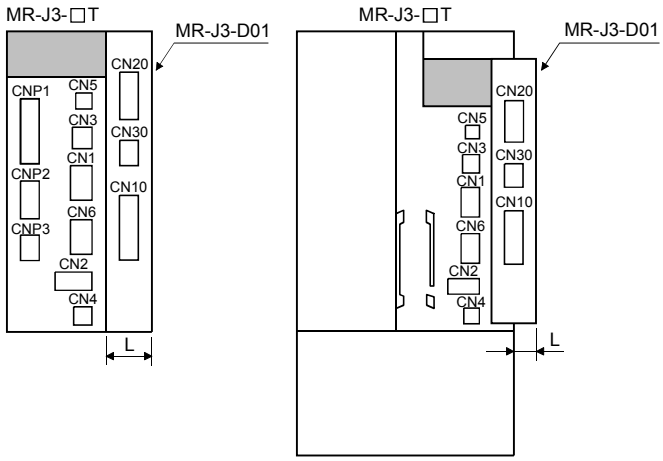


Note: Use the power supply 24VDC±10% (required current capacity: 800mA). 800mA is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.
DICOM and DOCOM of MR-J3-□T, and DICOM and DOCOM of MR-J3-D01 (optional) are not connected internally. Connect them externally.

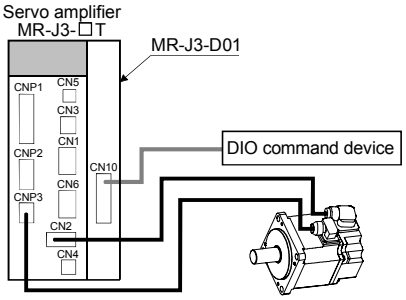
■ Extension IO unit MR-J3-D01 (Available soon)

●Dimensions when the extension IO unit is installed

● MR-J3-10T(1) to 350T ● MR-J3-500T, 700T



●System configuration



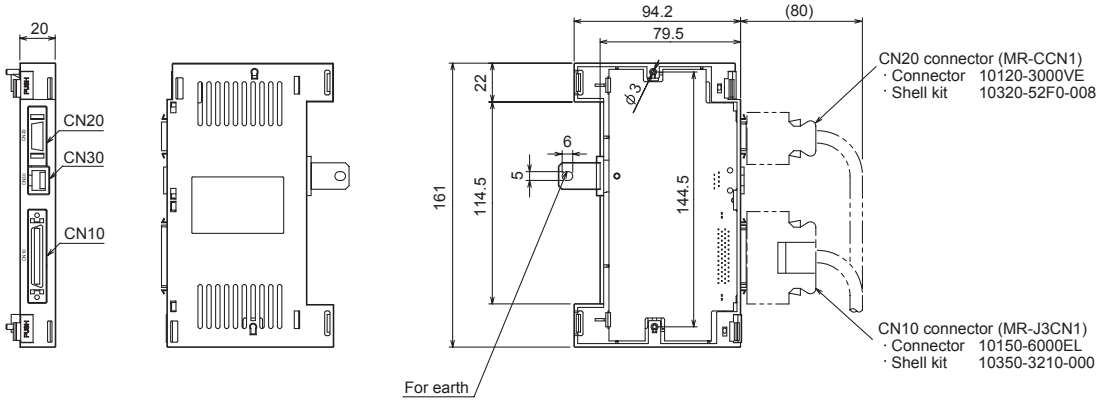
Model	Variable dimensions (mm)
	L
MR-J3-10T(1) to 100T	20
MR-J3-200T, 350T	15
MR-J3-500T, 700T	10

Note: For MR-J3-11KT to 22KT, MR-J3-D01 can be built into the servo amplifier.

●Specifications

Item		Description
Model		MR-J3-D01
Function		Extension digital input/output, extension analog input/output, extension RS-422 communication
Digital input		30 points, photocoupler insulation 24VDC (external supply), sink/source compatible, internal limit resistance: 5.6kΩ
Digital output		16 points, photocoupler insulation, open collector, 24VDC (external supply), sink/source compatible, Permissible current: 40mA maximum, inrush current: 100mA maximum
Analog input		3ch, 0 to ±10VDC, internal resistance: 12kΩ (12 bits)
Analog output		2ch, 0 to ±12VDC, maximum output current: 1mA (12 bits)
Communication interface		RS-422 communication
P15 output		Usable as analog power supply Permissible current: 30mA
Structure		Self-cooling, open (IP00)
Environment	Ambient temperature	0 to 55°C (32 to 131°F) (non freezing), storage: -20 to 65°C (-4 to 149°F) (non freezing)
	Ambient humidity	90% RH maximum (non condensing), storage: 90% RH maximum (non condensing)
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust
	Elevation	1000m or less above sea level
	Vibration	5.9m/s^2 maximum
Mass (g [lb])		140 (0.31)

●Dimensions



(Unit: mm)

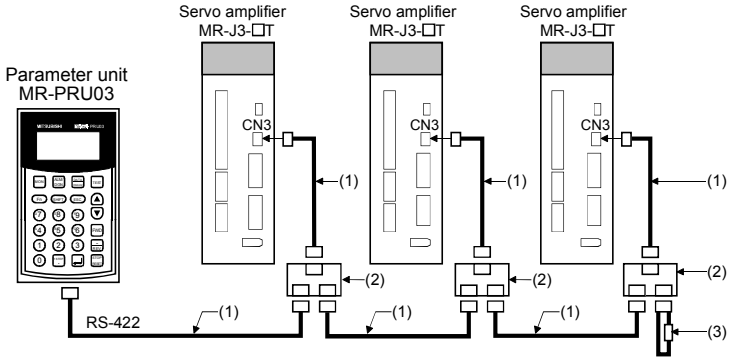
■ Parameter unit MR-PRU03

The parameter unit with a 16 characters × 4 lines display, is available as an option.

<Full scale Parameter unit (MR-PRU03)>

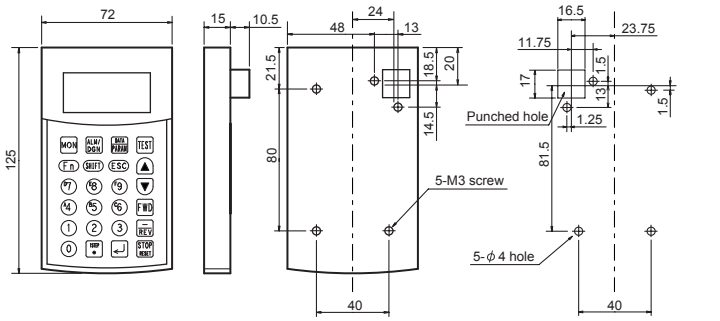
●Wiring and communication method

- RS-422 communication
- Connectable up to 32 axes with multi-drop system



(1) : Use 10BASE-T cable (EIA568 compatible), etc.
Keep the distance between the branch connector and servo amplifier as short as possible.
(2) : Branch connector: BMJ-8 (HACHIKO ELECTRIC CO., LTD) is recommended.
(3) : Connect a terminal resistor 150Ω.

●Dimensions



(Unit: mm)

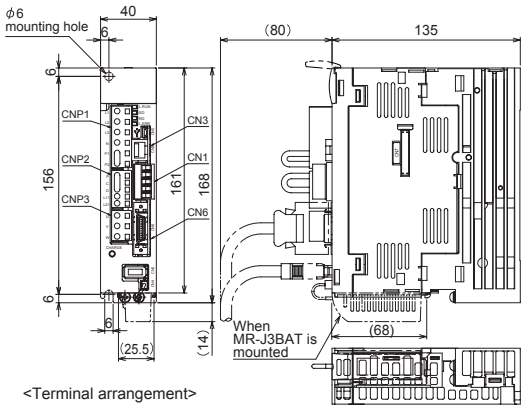
●Specifications

Item		Description
Model		MR-PRU03
Power supply		Receives power from the servo amplifier
Functions	Parameter mode	Basic setting parameters, gain/filter parameters, extension setting parameters, input/output setting parameters
	Monitor mode	Current position, command position, command remaining distance, override, point table No., cumulative feedback pulses, droop pulses, regenerative load ratio, effective load ratio, peak load ratio, instantaneous torque, within one revolution position, ABS counter, servo motor speed, bus voltage, load inertia moment ratio
	Diagnosis mode	External input/output display, output signal forced output, motor information
	Alarm mode	Current alarm, alarm history
	Test operation mode	JOG operation, positioning operation, DO forced output, motor-less operation, single-step feed
	Point table mode	Position data, servo motor speed, acceleration/deceleration time constant, dwell time, auxiliary function, M code reference
Display		LCD system (16 characters×4 lines)
Environment	Ambient temperature in operation	-10 to 55°C (14 to 131°F) (non freezing)
	Ambient temperature in operation	90%RH maximum (non condensing)
	Storage temperature	-20 to 65°C (-4 to 149°F) (non freezing)
	Storage humidity	90%RH maximum (non condensing)
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust
Mass (g [lb])		130 (0.29)

■ Servo amplifier dimensions

(Unit: mm)

● MR-J3-10T, 10T1 (Note1, 2)
● MR-J3-20T, 20T1 (Note1, 2)



<Terminal arrangement>

CNP1	CNP1	CNP2	CNP3
L1	L1	P	U
	L2	C	V
L2	L3	D	W
N	N	L11	
P1	P1	L21	
P2	P2		

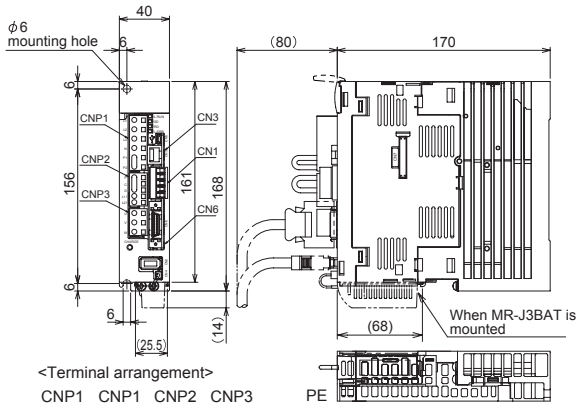
For 1-phase 100VAC / For 3-phase 200VAC or 1-phase 200VAC

PE

<Terminal screw size>
PE : M4

<Mounting screw size>
M5

● MR-J3-40T, 40T1 (Note1, 2)
● MR-J3-60T (Note1, 2)



<Terminal arrangement>

CNP1	CNP1	CNP2	CNP3
L1	L1	P	U
	L2	C	V
L2	L3	D	W
N	N	L11	
P1	P1	L21	
P2	P2		

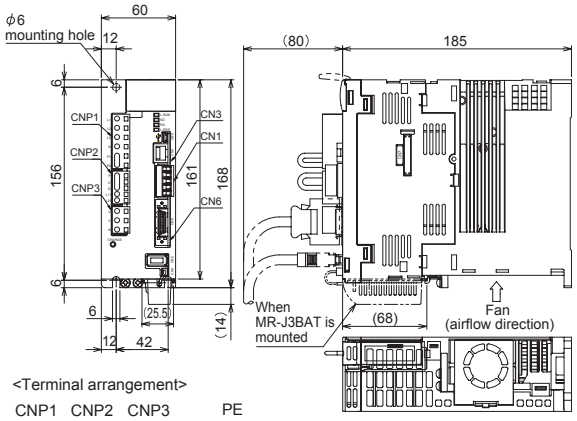
For 1-phase 100VAC / For 3-phase 200VAC or 1-phase 200VAC

PE

<Terminal screw size>
PE : M4

<Mounting screw size>
M5

● MR-J3-70T (Note1, 2)
● MR-J3-100T (Note1, 2)



<Terminal arrangement>

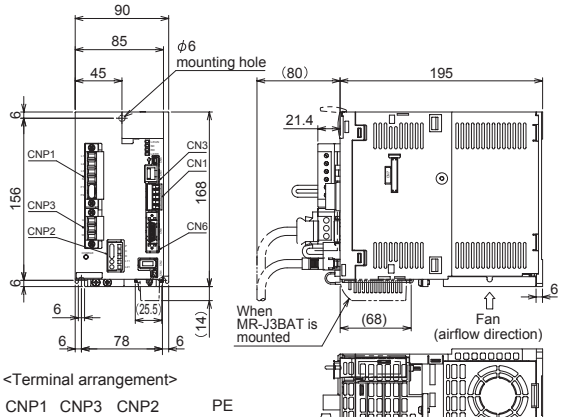
CNP1	CNP2	CNP3
L1	P	U
L2	C	V
L3	D	W
N	L11	
P1	L21	
P2		

PE

<Terminal screw size>
PE : M4

<Mounting screw size>
M5

● MR-J3-200T (Note1, 2)
● MR-J3-350T (Note1, 2)



<Terminal arrangement>

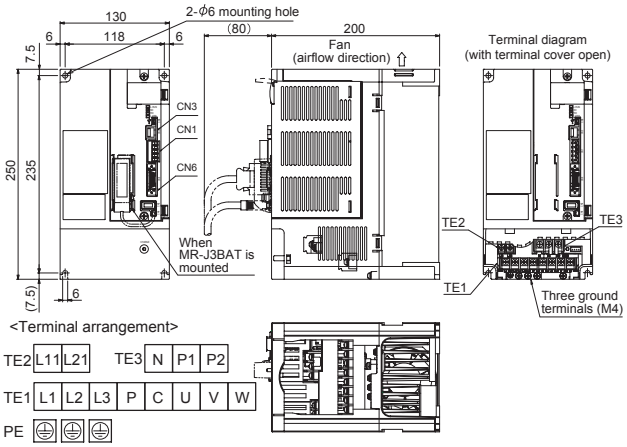
CNP1	CNP3	CNP2
L1	U	P
L2	V	C
L3	W	D
N		L11
P1		L21
P2		

PE

<Terminal screw size>
PE : M4

<Mounting screw size>
M5

● MR-J3-500T (Note2)



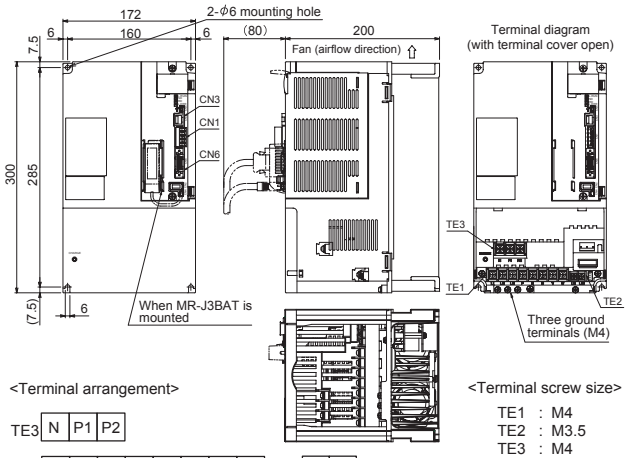
<Terminal arrangement>

TE2	L11	L21	TE3	N	P1	P2			
TE1	L1	L2	L3	P	C	U	V	W	
PE	⏚	⏚	⏚						

<Terminal screw size>
TE1 : M4
TE2 : M3.5
TE3 : M4
PE : M4

<Mounting screw size>
M5

● MR-J3-700T (Note2)



<Terminal arrangement>

TE3	N	P1	P2								
TE1	L1	L2	L3	P	C	U	V	W	TE2	L11	L21
PE	⏚	⏚	⏚								

<Terminal screw size>
TE1 : M4
TE2 : M3.5
TE3 : M4
PE : M4

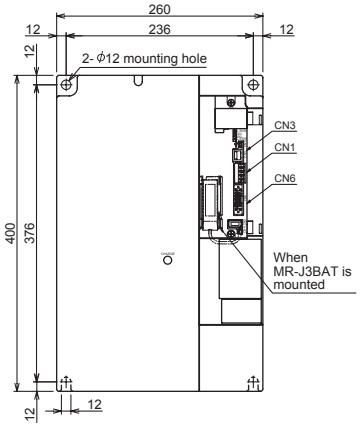
<Mounting screw size>
M5

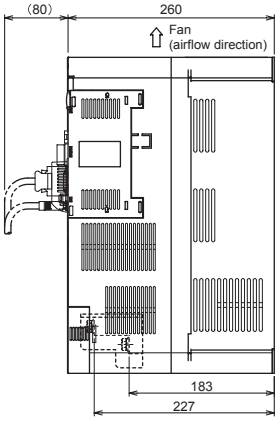
Notes: 1. The connectors CNP1, CNP2 and CNP3 (insertion type) are supplied with the servo amplifier.
2. The connector CN1 is supplied with the servo amplifier.

■ Servo amplifier dimensions

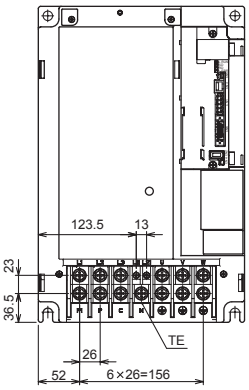
(Unit: mm)

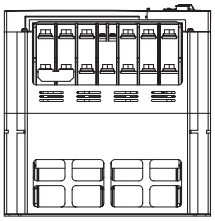
- MR-J3-11KT (Note)
- MR-J3-15KT (Note)
- MR-J3-22KT (Note)





Terminal diagram (with terminal cover open)





<Terminal arrangement>

				L11	L21		
TE	L1	L2	L3			U	V	W
	P1	P	C	N	⏚	⏚	⏚

<Terminal screw size>

Terminals \ Model	MR-J3-11KT,15KT	MR-J3-22KT
L1,L2,L3,U,V,W, P1,P,C,N,⏚	M6	M8
L11,L21	M4	M4

<Mounting screw size>

M10

Note: The connector CN1 is supplied with the servo amplifier.