

# MR-JE

## Servo and Motion Control

High performance servo system  
easy to use for all machines



Top-class level speed frequency response of 2.0 kHz



High resolution encoder (131072 pls/rev) for high performance



Easy to use with one-touch tuning



Compliance to global standards

# Reliable performance and advanced ease-of-use



Apply servos to all machines with reliable basic performance and advanced ease-of-use!



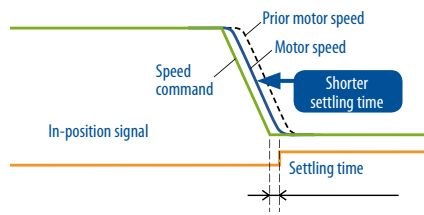
The MR-JE series satisfies the needs of advanced driving control systems.

Mitsubishi Electric is introducing the new MR-JE series high performance servo amplifiers and servo motors. Combining proven reliability with a 2.0 kHz high-frequency response and an energy-saving design, they offer the best-in-class performance with the setup ease of advanced one-touch tuning. Fully compliant with global standards and ready for deployment worldwide, the MR-JE series is the right servo solution for all kinds of machines and applications.

## Fast and accurate

### ■ Speed frequency response of 2.0 kHz

The top-level speed frequency response of 2.0 kHz shortens the settling time substantially, reducing the tact time of a machine.



Settling time comparison with the prior model

### ■ Max. command pulse frequency of 4 Mpps

MR-JE-A having a general-purpose interface which is compatible with the maximum command pulse frequency of 4 Mpps, enabling smooth operation.

### ■ High System Performance by SSCNETIII/H

MR-JE-B is compatible with SSCNETIII/H, the optical servo system controller network that enables a high-response and multi-axis system with high synchronous performance and less wiring. In addition, absolute position detection system can be configured easily with the MR-JE-B servo amplifiers.

### ■ Accurate positioning

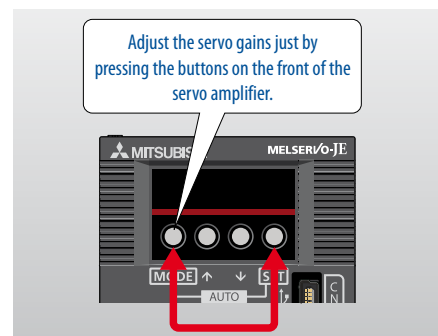
The servo motors are equipped with an incremental encoder of 131072 pulses/rev (17-bit) enables high accuracy positioning and smooth rotation.

By optimizing the combination of the number of motor poles and the number of slots, torque ripple during conduction is reduced to 1/4 as compared to the prior series. Smooth constant-velocity operation of a machine is achieved.

## Easy high-precision tuning

### ■ Servo adjustment with only one touch

Servo gains including machine resonance suppression filter, advanced vibration suppression control II, and robust filter are adjusted just by pressing the buttons on the front of the servo amplifier. Machine performance is utilized to the fullest using the advanced vibration suppression.



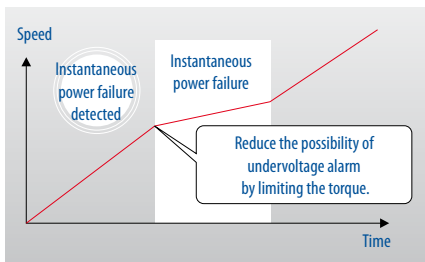
■ **Effective low frequency vibration suppression**

Due to vibration suppression algorithm which supports three-inertia system, two types of low frequency vibrations are suppressed at the same time. This function is effective in suppressing vibration at the end of an arm and in reducing residual vibration in a machine control function. Adjustment is performed on MR Configurator2.

**High tolerance against Instantaneous Power Failure**

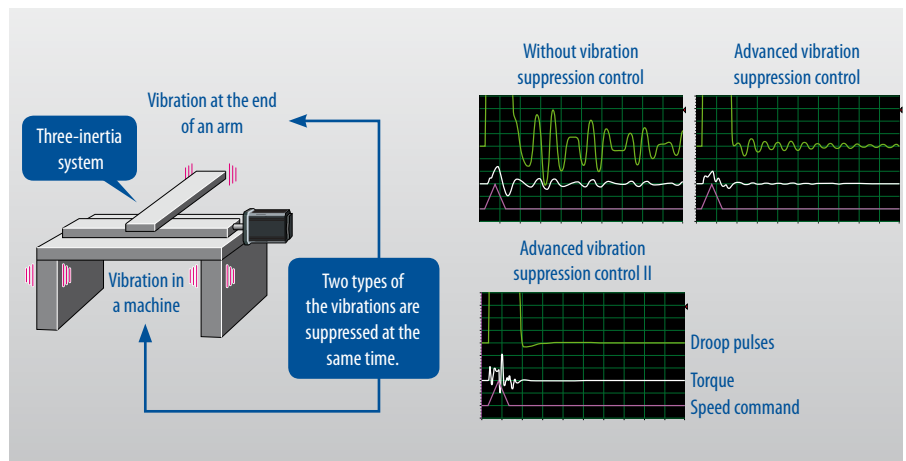
The tolerance against instantaneous power failure is improved as the capacity of the main circuit capacitor is increased by 20 % from the prior model, reducing machine downtime and improving productivity.

The possibility of undervoltage alarm is reduced by limiting the torque when instantaneous power failure is detected in the main circuit power supply.



**Easy monitoring and maintenance**

Servo data such as motor current and position command before and after the alarm occurrence are stored in non-volatile memory of the servo amplifier. This function allows you to check the monitor values and the waveform of the past 16 alarms in the alarm history ((analog 16 bits × 7 channels + digital 8 channels) × 256 points) on MR Configurator2. The data read on MR Configurator2 help you to analyze the cause of the alarm.



Effective low frequency vibration suppression

**Eco-friendly performance**

■ **Efficient utilization of regenerative energy**

Because the control circuit and the main circuit use a common power supply, the regenerative energy is also used for the control circuit, reducing waste in energy consumption.

■ **Power monitor supports energy saving**

The servo amplifier calculates the driving power, the regenerative energy, and the power consumption from the data such as speed and current. With MR Configurator2, the power consumption is monitored in real time. The Visualization of power consumption supports the energy conservation.

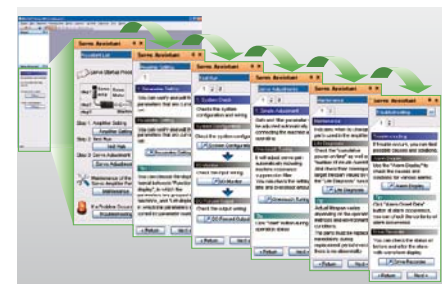
**Motion network connection**

MR-JE series servo amplifiers are available with a SSCNETIII/H interface (type MR-JE-B) and can be combined together with Simple Motion Modules which enable various motion commands including mark detection, electric cam and synchronous control.

Up to 16 axis servo amplifier axes can be connected per system and easily configured as a multi-axis system. With the technical advantages of SSCNETIII/H like deterministic and synchronized synchronization, machines like packaging or food processing machines can be realized.

**Simple start-up**

Tuning, monitor display, diagnosis, reading/writing parameters, and test operations are easily performed on a standard personal computer with MR Configurator2. This start-up support tool makes tuning and diagnostics quick and easy and includes powerful graphical machine analysis and simulation functions. A stable machine system, optimum control, and short setup time are the result.



Just follow the the guidance and setup is complete

**Global standards**

To satisfy growing needs in driving control throughout the world, the MR-JE series complies with global standards.

The digital inputs/outputs are compatible with both sink and source type connections.



# Specifications

Servo amplifier MR-JE Performance		10A/B <sup>③</sup> 0.1 kW	20A/B <sup>③</sup> 0.2 kW	40A/B <sup>③</sup> 0.4 kW	70A/B <sup>③</sup> 0.7 kW	100A/B <sup>③</sup> 1 kW	200A/B <sup>③</sup> 2 kW	300A/B <sup>③</sup> 3 kW
Power supply input	Voltage/frequency <sup>①</sup>	3-phase or 1-phase 200–240V AC, 50/60 Hz				3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz <sup>④</sup>		3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz
Control method		Sinusoidal PWM control/current control system						
Dynamic brake		Built-in <sup>②</sup>						
MR-JE-A	Position control mode	Maximum input pulse frequency		4 Mpps (when using differential receiver), 200 kpps (when using open-collector)				
		Positioning feedback pulse		Encoder resolution: 131072 pulses/rev				
		Torque limit		Set by parameters or external analog input (0–10 V DC/maximum torque)				
	Speed control mode	Control range		Analog speed command 1:2000, internal speed command 1:5000				
		Speed fluctuation rate		±0.01 % maximum (load fluctuation: 0–100 %), 0 % (power fluctuation: ±10 %) ±0.2 % maximum (ambient temperature: 25 °C ±10 °C) only when using analog speed command				
		Torque limit		Set by parameters or external analog input (0–10 V DC/maximum torque)				
Torque control mode	Analog torque command input		0–±8 V DC/maximum torque (input impedance: 10–12 kΩ)					
	Speed limit		Set by parameters or external analog input (0–±10 V DC/rated speed)					
MR-JE-B	SSCNETIII/H command communication cycle	0.444 ms, 0.888 ms						
Protective functions		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), encoder fault protection, regeneration fault protection, undervoltage/sudden power outage protection, overspeed protection, excess error protection						
Structure (IP)		Self-cooling, open (IP20)				Fan-cooling, open (IP20)		
Ambient temperature		Operation: 0–55 °C (no freezing); Storage: –20–65 °C (no freezing)						
Ambient humidity		Operation: 90 % RH maximum (no condensation); Storage: 90 % RH maximum (no condensation)						
Altitude		Elevation: 1000 m or less above sea level						
Weight	kg	0.8	0.8	0.8	1.5	1.5	2.1	2.1
Dimensions (WxHxD)	mm	50x156x135	50x156x135	50x156x135	70x156x185	70x156x185	90x156x195	90x156x195

① Rated output and speed of a servo motor are applicable when the servo amplifier, combined with the servo motor, is operated within the specified power supply voltage and frequency.  
 ② When using the built-in dynamic brake, refer to "MR-JE-A Servo Amplifier Instruction Manual" / "MR-JE-B Servo Amplifier Instruction Manual" for the permissible load to motor inertia ratio.  
 ③ Type A without network connection, type B with SSCNETIII/H interface.  
 ④ When 1-phase 200 V AC to 240 V AC power supply is used, use the servo amplifiers with 75 % or less of the effective load ratio.

Servo motor series	Speed [rpm]	Rated output capacity [kW]	Rated torque [Nm]	Type	Feature	Amplifier assignment MR-JE							
						10A/B <sup>⑤</sup>	20A/B <sup>⑤</sup>	40A/B <sup>⑤</sup>	70A/B <sup>⑤</sup>	100A/B <sup>⑤</sup>	200A/B <sup>⑤</sup>	300A/B <sup>⑤</sup>	
HG-KN	Rated: 3000 Maximum: 5000	0.1	0.32	HG-KN13(B)	Low inertia, small capacity	●							
		0.2	0.64	HG-KN23K(B)			●						
		0.4	1.3	HG-KN43K(B)				●					
HG-SN	Rated: 2000 Maximum: 3000	0.7	2.4	HG-KN73(B)JK	Medium inertia, medium capacity				●				
		0.5	2.4	HG-SN52(B)JK					●				
		1.0	4.8	HG-SN102(B)JK						●			
		1.5	7.2	HG-SN152(B)JK							●		
		2.0	9.6	HG-SN202(B)JK								●	
		3.0	14.3	HG-SN302(B)JK <sup>⑥</sup>								●	

(B) = with electromagnetic brake  
 ⑤ Type A without network connection, type B with SSCNETIII/H interface.  
 ⑥ Maximum speed: 2500 rpm

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