

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.

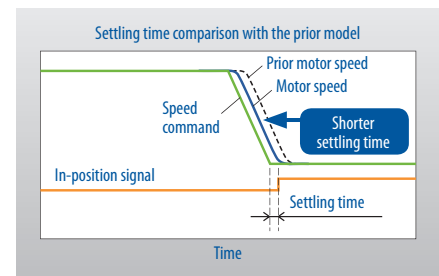
Mitsubishi Electric is introducing the new MR-JE series high performance servo amplifiers and servo motors. Combining proven reliability with a 2.0 kHz high-frequency response and an energy-saving design, they offer the best-in-class performance with the setup ease of advanced one-touch tuning. Fully 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.

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

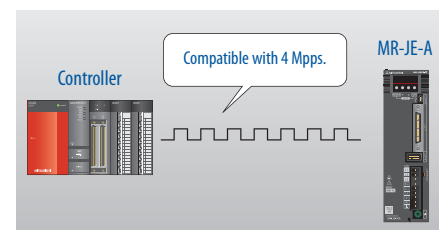
MR-JE-A having a general-purpose interface is compatible with the maximum command pulse frequency of 4 Mpps, enabling smooth operation.



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.

■ **Accurate positioning**

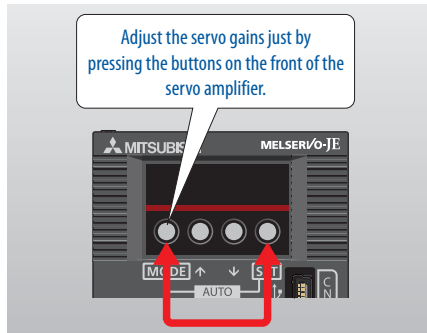
The servo motor equipped with an incremental encoder of 131072 pulses/rev (17-bit) enables high accuracy positioning and smooth rotation.



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.



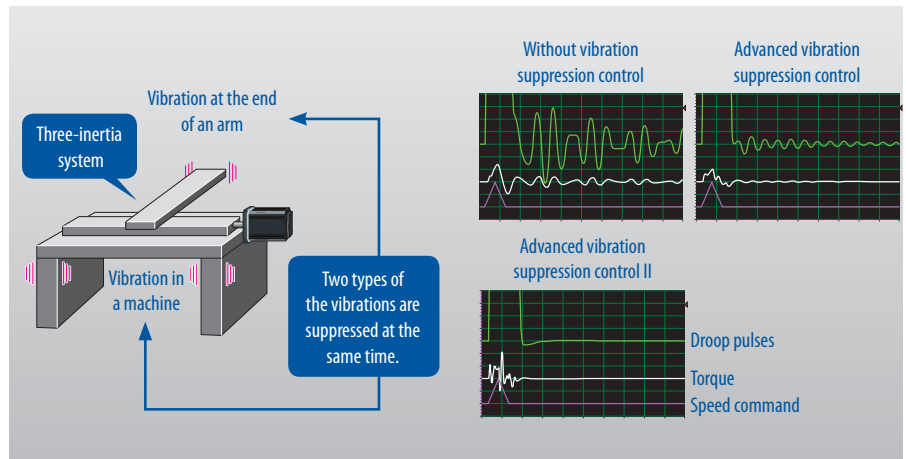
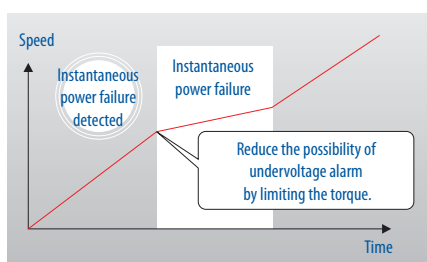
■ Effective low frequency vibration suppression

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

High tolerance against Instantaneous Power Failure

The improved 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.



Effective low frequency vibration suppression

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.

Eco-friendly performance

■ Efficient utilization of regenerative energy

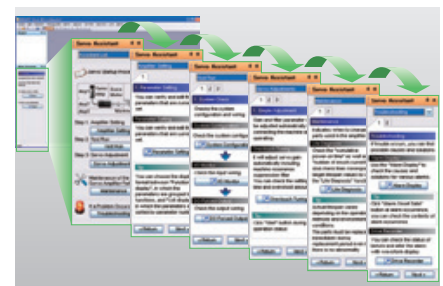
Additionally, because the control circuit and the main circuit use a common power supply, the regenerative energy is also used for the control circuit, reducing waste in energy consumption.

■ 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.

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 0.1 kW | 20A 0.2 kW | 40A 0.4 kW | 70A 0.7 kW | 100A 1 kW | 200A 2 kW | 300A 3 kW |
|-----------------------------------|--------------------------------|--|---------------|---------------|---------------|--------------------------------|--------------|--------------|
| Power supply input | Voltage/frequency ^① | 3-phase or 1-phase 200–240 V AC, 50/60 Hz | | | | 3-phase 200–240 V AC, 50/60 Hz | | |
| Control method | | Sinusoidal PWM control/current control system | | | | | | |
| Dynamic brake | | Built-in ^② | | | | | | |
| 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) | | | | | | |
| 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 | 2.1 | 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" for the permissible load to motor inertia ratio.

| Servo motor series | Speed [rpm] | Rated output capacity [Nm] | Rated torque [Nm] | Type | Feature | Amplifier assignment MR-JE | | | | | | | |
|--------------------|------------------------------|----------------------------|-------------------|----------------------------|---------------------------------|----------------------------|-----|-----|-----|------|------|------|--|
| | | | | | | 10A | 20A | 40A | 70A | 100A | 200A | 300A | |
| HF-KN | Rated: 3000 Maximum: 4500 | 0.1 | 0.32 | HF-KN13(B) | Low inertia, small capacity | ● | | | | | | | |
| | | 0.2 | 0.64 | HF-KN23K(B) | | | ● | | | | | | |
| | | 0.4 | 1.3 | HF-KN43K(B) | | | | ● | | | | | |
| | | 0.7 | 2.4 | HF-KN73(B)JK | | | | | ● | | | | |
| HF-SN | Rated: 2000 Maximum: 3000 | 0.5 | 2.4 | HF-SN52(B)JK | Medium inertia, medium capacity | | | | ● | | | | |
| | | 1 | 4.8 | HF-SN102(B)JK | | | | | ● | | | | |
| | | 1.5 | 7.2 | HF-SN152(B)JK | | | | | | ● | | | |
| | | 2 | 9.6 | HF-SN202(B)JK | | | | | | | ● | | |
| | | 3 | 14.3 | HF-SN302(B)JK ^① | | | | | | | | ● | |

(B) = with electromagnetic brake

① Maximum speed: 2500

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