The most sophisticated drive applications increasingly chosen by the world

MELSERVO
World-class quality, performance, and system development potential. Achieve these possibilities with Mitsubishi Servo Systems.

World-class quality and performance. Backed by the rock-solid system service capabilities of Mitsubishi Electric as a comprehensive FA supplier, MELSERVO products are playing critical roles in the growing success of manufacturers all over the world. Providing sophistication to the world. Moving toward sophisticated drive applications. We, Mitsubishi Electric, offer to our customers global sales support and service systems.
Mitsubishi Electric Corporation was established in 1921 as a manufacturer of transformers, motors, and products like electric fans. Over the years Mitsubishi Electric has expanded its business areas from Japan’s first mainline electric locomotives to integrated manufacturing of elevators and escalators, transistorized computers, and Japan’s first satellite. Today, Mitsubishi Electric is one of the world’s leading electrical and electronic manufacturers, covering everything from household appliances to outer space equipment, and is developing world-class business operations in five areas: (1) Energy and electric systems such as turbine generators, large display devices, and elevators; (2) Industrial mechatronics systems such as programmable controllers, servos, and car multimedia products; (3) Information communication systems such as wireless communication devices, satellites, and network security systems; (4) Electronic devices such as power modules, and high-frequency, optical, and LCD devices; and (5) Home appliances such as LCD televisions, room air conditioners, and refrigerators. Mitsubishi Electric's corporate statement, “Changes for the Better”, expresses its commitment to enhancing the quality of society, industry and life, and contributing to an even better tomorrow.
Expanding Our Business From Homes to Outer Space

With Our Corporate Statement - “Changes for the Better”

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Mitsubishi FA Business

E&eco-F@ctory achieves factory-wide optimization through effective utilization of energy information.

In an e&eco-F@ctory, production and energy information are analyzed to ensure factory-wide energy optimization. Furthermore, the different situations of energy use by different units are accurately analyzed by providing total solutions.

Mitsubishi Electric strives to be the best in customer satisfaction by offering FA products that meet customer demands throughout the world. As a comprehensive FA supplier, Mitsubishi Electric will continue to expand our product lines including controllers, driving devices, mechatronics, and production control, we have continuously developing our technologies in factory automation control, drive, and information technology. In the 80 years since starting with general-purpose motors, the Factory Automation system Group of Mitsubishi Electric has developed extensive lineup of control products and equipment network. Furthermore, we are among the first to offer not only product line-up but also energy conservation support devices such as MELSEC-Q compatible CC-Link/LT and Safety remote I/O products, and solutions to optimize the factory from an energy perspective.

Transforming a factory into an e&eco-F@ctory means visualizing and linking together for thorough energy management. e&eco-F@ctory achieves factory-wide optimization through computerization and optimization.

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Mitsubishi Electric strives to be the best in customer satisfaction by providing total solutions.

In the 80 years since starting with general-purpose motors, the Factory Automation system Group of Mitsubishi Electric has developed mechatronics products and supported the manufacturing economies of Japan, China, other parts of Asia and the rest of the world. While developing our technologies in factory automation control, drive control, mechatronics, and production control, we have continuously expanded our product lines including controllers, driving devices, mechatronics products, and power distribution control products. Furthermore, we are among the first to offer not only product components but also an innovative manufacturing environment through e&eco-F@ctory and iQ Platform.

As a comprehensive FA supplier, Mitsubishi Electric will continue to offer FA products that meet customer demands throughout the world.

e&eco-F@ctory achieves factory-wide optimization through effective utilization of energy information.

Transforming a factory into an e&eco-F@ctory means optimizing the factory from an energy perspective. In an e&eco-F@ctory, production and energy information are “visualized” and linked together for thorough energy management. Furthermore, the different situations of energy use by different production lines are accurately assessed, and their energy use is analyzed to ensure factory-wide energy optimization.
## History

<table>
<thead>
<tr>
<th>Year</th>
<th>Servo amplifier</th>
<th>Industry Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>MR-A/S0</td>
<td>● Launch of Mitsubishi’s first servo amplifier</td>
</tr>
<tr>
<td>1985</td>
<td>MR-SA/SC/SD</td>
<td>● Most advanced servo (at the time)</td>
</tr>
<tr>
<td>1990</td>
<td>MR-H</td>
<td>● First to introduce a completely digital servo</td>
</tr>
<tr>
<td>1995</td>
<td>MR-J2</td>
<td>● Launched super-miniaturized series</td>
</tr>
</tbody>
</table>

### Servo motor

- **Linear**
  - Core type: ● 0.5 to 22kW (HA-SAL)
  - Coreless type: ● 0.5 to 22kW (HA-LH)
  - ● 6 to 55kW (HA-LF/LFS)

- **Rotary**
  - Large capacity: ● 0.2 to 7kW (HA-A)
  - ● 0.2 to 22kW (HA-SA)
  - ● 0.5 to 7kW (HA-SH)
  - ● 0.5 to 7kW (HC-SF/SFS)

- **Small capacity**
  - ● 50 to 600W (HA-SQ/SC)
  - ● 50 to 600W (HA-FE/FH)
  - ● 50 to 750W (HC-KF/KFS)

### Direct drive motor

### Motion controller

### Servo system controller

- **Simple motion module**
  - ● A-series compatible AD75M

- **Positioning module**
  - ● High-speed (5Mbps×2) ● Centralized parameter management ● ABS standard SSCNET

### Network

- **Field network**
  - ● 10Mbps CC-Link

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Mitsubishi Electric continuously strives for cutting-edge technology. Passing our technologies and experiences from one generation to the next, products were at their zenith. In 1987, Mitsubishi Electric announced MELSERVO-SA, the first completely digital hardware logic product at a time when analog products were at their zenith. Since then, we have pioneered servo technology in Japan with innovations like “model adaptive control” and “real time auto-tuning.”

Carrying that heritage forward, we aim to not only continue offering servo systems rated highest for customer satisfaction but also to achieve global acclaim for these products.
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<tr>
<th>Year</th>
<th>Product</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>MR-J3</td>
<td>- 2-axis type&lt;br&gt;- MR-J3W&lt;br&gt;- Networking&lt;br&gt;- Diagnostic functions&lt;br&gt;- Improvement of productivity (Per unit time, per unit area)&lt;br&gt;- Ease of startup&lt;br&gt;- Widened scope of servo application&lt;br&gt;- Continuous thrust 600 to 6000N&lt;br&gt;- LM-H&lt;br&gt;- LM-K, KA&lt;br&gt;- LM-T&lt;br&gt;- LM-U&lt;br&gt;- LM-U2&lt;br&gt;- 0.5 to 55kW&lt;br&gt;- HA-LP&lt;br&gt;- 0.5 to 15kW&lt;br&gt;- HF-JP&lt;br&gt;- 0.5 to 2kW&lt;br&gt;- HF-SE&lt;br&gt;- 5 to 750W&lt;br&gt;- HF-KE&lt;br&gt;- Rated torque: 2 to 240N·m&lt;br&gt;- Q-series PLC compatible&lt;br&gt;- Multi-CPU Scaled-up&lt;br&gt;- Multi-axis synchronous&lt;br&gt;- High-speed (50Mbps×2)&lt;br&gt;- High-reliability (optical communication)</td>
</tr>
<tr>
<td>2005</td>
<td>MR-JN</td>
<td>- One-touch servo&lt;br&gt;- MR-J3W&lt;br&gt;- Continuous thrust 120 to 2400N&lt;br&gt;- LM-H2&lt;br&gt;- LM-K2&lt;br&gt;- 0.5 to 2kW&lt;br&gt;- HF-SN&lt;br&gt;- 50 to 750W&lt;br&gt;- HF-KP/MP&lt;br&gt;- Rated torque: 2 to 240N·m&lt;br&gt;- Single Axis Motion Controller&lt;br&gt;- Built-in PLC&lt;br&gt;- Q170/MCPU&lt;br&gt;- Q173D/172DCPU&lt;br&gt;- MR-MQ100&lt;br&gt;- QD75M&lt;br&gt;- MR-J3/SCCNET III compatible&lt;br&gt;- Multi-axis (16 axes)&lt;br&gt;- LD77MH&lt;br&gt;- SSCNET III&lt;br&gt;- QD75MH&lt;br&gt;- MD74MH&lt;br&gt;- Multi-axis (16 axes)&lt;br&gt;- High-speed processing (50Mbps×2)&lt;br&gt;- High-reliability (optical communication)</td>
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</table>
Mitsubishi Electric servo systems have built a track record of outstanding performance across a broad range of fields including liquid crystals and clean conveyors. Going beyond servo amplifiers and motors, Mitsubishi Electric offers system level solutions that include programmable controllers, motion controllers, and networks to satisfy a broad scope of needs.
Servo Application Examples

Industry leading performance. MELSERVO supports various system configurations.

Material handling

Mitsubishi Electric servos support a wide variety of distribution and material handling systems. High-speed material handling and high-accuracy positioning with our servos promote efficiency and labor-savings in your production and handling line.

Automobile manufacturing lines

Motion control using linear and circular interpolation and electronic cams in various types of processing lines support automobile manufacturing by boosting the productivity and flexibility of the assembly line.

Automobile manufacturing lines

In addition to the high-speed and high-accuracy positioning control, linear servos and a broad array of other actuators play important roles in the manufacturing of constantly evolving flat panel displays.

LCD manufacturing systems

In addition to the high-speed and high-accuracy positioning control, linear servos and a broad array of other actuators play important roles in the manufacturing of constantly evolving flat panel displays.

Mitsubishi Electric provides high-accuracy synchronous system solutions for the paper feeding, printing, cutting, and assembly functions within the printing process. We make high-speed, high-quality printing possible.

Printing machines

Various shapes of works are molded with high precision by motion control using electronic cams and by high-response servos with high-precision encoders.

Molding machines

High-performance servos enable fast and accurate positioning, and support high-speed handling of works. We promote the sophisticated machining capabilities that are a key part of the world's most advanced manufacturing.

Machine tools

Mitsubishi Electric servos satisfy the textile industry's specific needs of multiobjective production and quality improvement. Our latest technologies enhance the uniformity of quality and production speed.

Knitting and embroidery machines

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Our Total Solution for Your Satisfaction

Mitsubishi Servo Systems

Mitsubishi Electric has always set a new standard in servo technology with products such as the MELSERVO-J3 servo amplifier, which achieved the highest level of speed and accuracy, and SSCNET III, one of the industry’s fastest* servo system controller networks. For years, we have accumulated technologies and experiences as a total supplier for factory automation systems. In addition to a broad range of component products, we provide a whole range of solutions best suited for your system by integrating our products. The Mitsubishi Electric servo system is the answer to your application needs throughout the world.

* Based on Mitsubishi Electric research as of May 2011.
Mitsubishi Electric’s integrated FA solution for achieving seamless information collaboration between information systems and control systems, and enabling lateral integration of production sites.
From multi-axis and high-speed systems to simple positioning

Our extensive product lines cover advanced controllers for the iQ Platform/SSCNET III; a stand-alone motion controller in which a power supply module, a PLC, and a motion controller are integrated; and a simple motion module.

**iQ Platform/SSCNET III compatible Motion Controller**

**Q173DCPU/Q172DCPU**

High-speed control of up to 14k words per 0.88ms is achieved through high-speed data transfer with a PLC, newly equipped with a multi-CPU high-speed bus.

- The high-speed communication cycle between multi-CPU is synchronized with motion control and reduces control losses.
- A motion operation performance is doubled (0.44ms/6 axes) from the prior model, resulting in a shorter operation tact time.
- Commands to the servo amplifier are issued as fast as a 0.44ms cycle, enabling high-precision synchronous control, and speed and position controls.
- This controller is equipped with various motion functions such as interpolation functions, speed control, electronic cam, tracking control, etc.

<table>
<thead>
<tr>
<th>Operation cycle</th>
<th>SV13</th>
<th>SV22</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. 32 axes</td>
<td>0.44ms/1 to 6 axes</td>
<td>0.44ms/1 to 4 axes</td>
</tr>
<tr>
<td>Max. 8 axes</td>
<td>0.88ms/7 to 18 axes</td>
<td>0.44ms/5 to 8 axes</td>
</tr>
</tbody>
</table>

**Stand-alone Motion Controller**

**Q170MCPU**

A power supply module, a PLC and a motion controller are integrated into one module. This controller also features built-in interfaces for an incremental synchronous encoder and a mark sensor. Thus, space-saving is possible without worrying about model selections.

- Compact size of 52(W) x 178(H) x 135(D) mm.
- Overall system can be made further compact by combining the controller with 2-axis servo amplifier *MR-J3W* which has uniform mounting dimensions.
- The MELSEC Q series module, available in more than 100 types, can be mounted on the expansion base which does not require a power supply module, allowing the system to be expanded freely.
- This controller has the same basic motion performance as the iQ Platform compatible controller.

**Single Axis Motion Controller**

**MR-MQ100**

This is a high-functional compact motion controller with built-in interfaces for incremental synchronous encoder and mark detection signal.

- By connecting with SSCNET III compatible servo amplifier, broad range of motors can be used, including rotary/linear servo motors and direct drive motors.
- Synchronous control with standard speed is possible by connecting an incremental synchronous encoder.
- Graphic operation terminal (GOT) can be connected via RS-422 communication interface as well as Ethernet interface.
- This motion controller receives and sends input/output signals (Input: 16 points, Output: 16 points) and analog input/output data (A/D: 2 points, D/A: 2 points) from/to MR-J3-D01 extension IO unit, and uses them for control.

**Controller SSCNET III compatible, pulse train output**
**L series PLC compatible Simple Motion Module**

**LD77MH4/LD77MH16**
This MELSEC L series compatible module is capable of positioning and also achieves highly advanced motion control including speed, torque, synchronous and cam controls with operations similar to a positioning module.

**Q series PLC compatible Positioning Module**

**QD75MH_environment**
This SSCNET III compatible positioning module is available as a 1, 2 or 4-axis model. It is equipped with various positioning functions. ◎1-axis/2-axis/4-axis control

**QD75P/QD75D**
This pulse train output compatible module is available as QD75P / QD75D for open collector or QD75D for differential pulse train output. ◎1-axis/2-axis/4-axis control

**QD74MH**
This SSCNET III compatible positioning module is perfect for systems using many axes for simple positioning. It is equipped with various positioning functions. ◎8/16-axis control

**QD70P/QD70D**
This pulse train output compatible module is available as QD70P / QD70D for open collector or QD70D for differential pulse train. This module is perfect for systems using many axes for simple control. ◎4/8-axis control

**FX series PLC compatible Positioning Module**

**FX3u-32MT/ES**
Equipped with the industry’s highest standard of high-speed processing and positioning functions, this PLC helps achieve a system with high cost-performance. ◎3-axis control

**FX2n-10GM/20GM**
This positioning module is used independently or with the FX PLC. The 20GM model supports 2-axis interpolation control. ◎1-axis/2-axis control

**FX3u-20SSC-H**
This SSCNET III compatible positioning block has various functions including real-time monitoring of servo information, and achieves reduced wiring by using fiber-optic cables. ◎2-axis control

**FX2n-1PG-E/10PG**
This pulse train output block is used with the FX PLC. The 10PG model is capable of high-speed and high-precision positioning at a maximum of 1MHz high-speed pulse. ◎1-axis control
Servo Amplifier

From the industry’s top level high-speed, high-accuracy servos to one-touch servos and 2-axis models

In addition to the high-end MELSERVO-J3 series, a variety of models to match various applications is available. The Mitsubishi servo amplifiers support motors from rotary servo motors to linear servo motors and direct drive motors, and greatly enhance system performance.

Industry leading level of speed and accuracy with easy and useful functions

**MELSERVO-J3 Series**

2.1kHz* speed frequency response is achieved. Compatible servo motors are equipped with a high-resolution absolute encoder of 262,144/rev (18-bit) as standard.

This high-end MELSERVO amplifier model greatly reduces the positioning time with the fast motor speed and high-speed frequency response. Precise adjustments can be completed with a variety of advanced functions.* *Available only with MR-J3-A(B)/BSafety.

**MR-J3-A**

General-purpose interface compatible

Pulse train and analog input, etc., are provided as a standard for the command interface. The control mode can be switched accordingly for position, speed or torque control.

<table>
<thead>
<tr>
<th>Command interface</th>
<th>Control mode</th>
<th>Power specifications</th>
<th>Capacity range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command interface</td>
<td>Pulse train/Analog/RS-422 multi-drop</td>
<td>1-phase 100VAC/3-phase 200VAC/3-phase 400VAC</td>
<td>100W to 55kW</td>
</tr>
</tbody>
</table>

**MR-J3-B**

SSCNET III compatible

A complete synchronous system for SSCNET III can be configured using 0.44ms cycle high-speed serial communication between the controller and the servo amplifier.

<table>
<thead>
<tr>
<th>Command interface</th>
<th>Control mode</th>
<th>Power specifications</th>
<th>Capacity range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command interface</td>
<td>Position/Speed/Torque</td>
<td>1-phase 100VAC/3-phase 200VAC/3-phase 400VAC</td>
<td>100W to 55kW</td>
</tr>
</tbody>
</table>

**MR-J3-B-RJ004**

SSCNET III compatible/Linear servo compatible

This model supports high-accuracy operation of linear servo motors. A fully closed loop control system using position feedback signals from a load-side encoder such as a linear encoder can be configured.

<table>
<thead>
<tr>
<th>Command interface</th>
<th>Control mode</th>
<th>Power specifications</th>
<th>Capacity range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command interface</td>
<td>Position/Fully closed loop control</td>
<td>3-phase 200VAC/3-phase 400VAC</td>
<td>200W to 22kW</td>
</tr>
</tbody>
</table>

*Available only with MR-J3-A(B)/BSafety.
Servo Amplifier

MR-J3- control is also supported. by using the optional module
is provided as a safety function.

SSCNET III compatible/Drive safety compatible/
achieving the industry leading level of control
MELSERVO-J3 Series

From the industry’s top level high-speed, high-accuracy servos to
or torque control.

Pulse train and analog input,

MR-J3-

response. Precise adjustments can be completed with a variety of advanced functions. * Available only with MR-J3-A/B(-RJ006)/BSafety.

262,144p/rev (18-bit) as standard.

2.1kHz* speed frequency response is achieved. Compatible servo motors are equipped with a high-resolution absolute encoder of

Power specifications

Command interface

Control mode

Speed command

Prior motor speed

Settling time

Position/Speed/Torque

100W to 55kW

*** Available only with MR-J3-A/B(-RJ006)/BSafety.

MR-J3-

SSCNET III compatible/Direct drive motor compatible

One unit of the servo amplifier operates any combination of
two rotary/linear servos or
direct drive motors. Mounting
space can be reduced
approximately 17% to 25% as
compared to that of 2 units of
MR-J3 series servo amplifiers.

Two servo motors are operated by a common power supply. Thus, the
regenerative energy can be used effectively depending on the
operation conditions.

Wiring can be reduced by using common SSCNET III cables, control
circuit power supply cables and main circuit power supply cables for
the two axes.

"One-touch servo" small body, easy operation and high functionality
MELSERVO-J3N Series

MR-JN-

A

General purpose interface compatible/ built-in positioning function

User-friendly servo with easy operation
MR-E Super Series

MR-E-

A/AG-QW003/-KH003

General purpose interface compatible

Pulse train interface or analog input interface can be selected
according to your application. Signal interface is available in
source or sink.

[Easy to use!] ☐ No personal computer is required for servo tuning.
Servo is adjusted just by pressing the button on the front of the servo
amplifier. ☑ The "tough drive function" allows operation to continue
without stopping the system even if the load or the power fluctuates
temporarily or if the machine resonance frequency changes.

[Easy to incorporate!] ☐ Optimal models can be selected by using a
dedicated software. ☑ 200W or larger servo amplifiers has an integrated
regenerative resistor as a standard, reducing wiring and spaces.

[Easy to set up!] ☐ Setup the servo amplifier easily by using the
display panel and buttons on the front of the servo amplifier.

[Easy to maintain!] ☐ The separated power supplies for main and
circuit controls enable easy maintenance. ☑ The fan-less style eliminates
the need to replace the fan.

User-friendly servo with easy operation
MR-E Super Series

MR-E-

A/AG-QW003/-KH003

General purpose interface compatible

Pulse train interface or analog input interface can be selected
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- Source interface

<table>
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<tr>
<th>Command interface</th>
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<th>Analog input</th>
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</thead>
<tbody>
<tr>
<td>Control mode</td>
<td>Position/Speed/Torque</td>
<td>Speed/Torque</td>
</tr>
<tr>
<td>Power specifications</td>
<td>3-phase 200VAC, 1-phase 230VAC</td>
<td>3-phase 200VAC, 1-phase 230VAC</td>
</tr>
<tr>
<td>Capacity range</td>
<td>100W to 2kW</td>
<td>100W to 2kW</td>
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</table>

- Sink interface

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<tr>
<th>Command interface</th>
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</table>

*1: Internal speed only
A wide range of capacities and series for various system applications

### Rotary Servo Motor

**HF series**

- **HF-KN/HF-KP**
  - Small capacity, low inertia.
  - Perfect for general-purpose industrial machines.
  - Examples of use: Inseters, Mounters, Printers, PCB drilling machines, in-circuit testers, Label printers, Knitting and embroidery machines, Ultra-compact robots and robot hand sections

- **HF-MP**
  - Small capacity, ultra-low inertia.
  - Perfect for high-throughput operations.
  - Examples of use: Inseters, Mounters, Printers, PCB drilling machines, in-circuit testers, Label printers, Knitting and embroidery machines, Ultra-compact robots and robot hand sections

- **HF-SN/HF-SP**
  - Medium capacity, medium inertia.
  - Perfect for high-throughput positioning or high acceleration/deceleration operations.
  - Examples of use: In-circuit testers, Labelers, Bonders, Index table for machine tools

- **HF-JP**
  - Medium to large capacity, low inertia.
  - Perfect for high-throughput positioning or high acceleration/deceleration operations.
  - Examples of use: Food packaging machines, Injection molding machines, Large press machines

**HC series**

- **HC-LP**
  - Medium to large capacity, low inertia.
  - Perfect for general-purpose industrial machines.
  - Examples of use: Roll feeders, Ultra-compact robots and robots hand sections

- **HC-RP**
  - Medium capacity, ultra-low inertia.
  - Perfect for high-frequency operation.
  - Examples of use: Roll feeders, Ultra-compact robots and robots hand sections

- **HC-UP**
  - Medium capacity, flat type.
  - Perfect for applications with limited mounting space.
  - Examples of use: In-circuit testers, Labelers, Bonders, Index table for machine tools

**HC-UP**

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated speed (r/min)</th>
<th>Maximum speed (r/min)</th>
<th>Rated torque (N·m)</th>
<th>Maximum torque (N·m)</th>
<th>Applicable servo amplifier</th>
<th>Encoder resolution (ppr)</th>
<th>IP protection rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>HF-KP</td>
<td>3000</td>
<td>6000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HF-MP</td>
<td>3000</td>
<td>6000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HF-SP</td>
<td>1000</td>
<td>1500</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HC-LP</td>
<td>2000</td>
<td>3000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HC-RP</td>
<td>3000</td>
<td>4500</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HC-UP</td>
<td>2000</td>
<td>3000/2500</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HF-JP</td>
<td>3000</td>
<td>6000/5000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HA-LP</td>
<td>1500</td>
<td>2000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HC-KN</td>
<td>3000</td>
<td>4500</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
<tr>
<td>HC-SN</td>
<td>2000</td>
<td>3000</td>
<td>0.35</td>
<td>0.58</td>
<td>MR-J3/J3W</td>
<td>122144</td>
<td>IP65</td>
</tr>
</tbody>
</table>

**HA series**

- **HA-LP**
  - Medium to large capacity, low inertia.
  - Suitable for large capacity fields of large systems.
  - Examples of use: Injection molding machines, Semiconductor manufacturing devices, Large material handling systems, Press machines

### Core type

- **Coreless type**
  - Suitable for high-speed operation
  - Core type suitable for high-speed operation

### Performance

- **Rated speed**
  - Maximum speed
  - Rated torque
  - Maximum torque

### Encoder resolution

- **122144 ppr**

### IP protection rating

- **IP65**

---

*1: The shaft-through portion is excluded. *2: Some models are not supported.
Suitable for linear motion systems requiring high speed and accuracy

**Linear Servo Motor**

- Supporting maximum speed of 2m/s and maximum thrust of 150N to 18000N. Small size and high thrust are achieved by increasing the winding density and by optimizing core and magnet geometries using electromagnetic field analysis.
- High accuracy tandem synchronous control is achieved by using a motion controller and a SSCNET III compatible linear servo amplifier.
- Diverse product lines include core type with magnetic attraction counter-force in addition to core, coreless, liquid-cooling core types.

**LM-H2 series**
Core type suitable for space-saving. The magnetic attraction force contributes to high rigidity.

**LM-F series**
Core type compact linear servo motor. The integrated liquid-cooling system doubles the continuous thrust. The magnetic attraction force contributes to high rigidity.

**LM-U2 series**
Coreless type without cogging resulting in small speed fluctuation. The structure with no magnetic attraction force extends life of the linear guides.

**LM-K2 series**
Core type with magnetic attraction counter-force. The magnetic attraction counter-force structure extends life of the linear guides and contributes to lowering audible noise.

**Application chart**

**Series** | **Maximum speed (m/min)** | **Magnetic attraction force (N)** | **Continuous thrust (N)** | **Maximum thrust (N)** | **Applicable servo amplifier** | **IP rating**
--- | --- | --- | --- | --- | --- | ---
LM-H2 | 2 | 500 to 7000 | Core type with large thrust LM-F series | | | |
LM-U2 | 2 | 0 | Core type LM-H2 series | | | |
LM-F | 2 | 4500 to 45000 | Coreless type LM-U2 series | | | |
LM-K2 | 2 | 0 | Coreless type LM-H2 series | | | |

**Direct Drive Motor**

**TM-RFM series**

- Industry leading level of compact size and thinness contributes to compact construction and a low center of gravity for enhanced machine stability.
- High torque intensity is achieved with the latest technologies of magnetic designs and windings. The minimal torque ripple enables extremely smooth rotation.
- The motor is equipped with a high-resolution 20-bit absolute encoder, enabling higher accuracy systems.
- The hollow shaft with diameter of 20mm to 104mm allows cables and air tubing to pass through.

**For compact and simplified machine driving part with high-accuracy control**

**Series** | **Motor outer diameter (mm)** | **Rated speed (m/min)** | **Rated torque (Nm)** | **Maximum torque (Nm)** | **Applicable servo amplifier** | **IP rating**
--- | --- | --- | --- | --- | --- | ---
TM-RFM | Ø130 | 200 | 500 | Core type LM-H2 series | | |
 | Ø180 | 200 | 500 | Core type LM-H2 series | | |
 | Ø230 | 200 | 500 | Core type LM-H2 series | | |
 | Ø330 | 100 | 200 | Core type LM-H2 series | | |

*1: Connectors and gap between rotor and stator are excluded.
Network (SSCNET III)

A new-generation network opening the future of servos

SSCNET III is a high-speed, high-performance servo system controller network employing fiber optic cable. Machine performance can be substantially improved by using SSCNET III with the MR-J3 which achieves high speed (maximum of 6,000r/min with HF-KP servo motor) and high accuracy (encoder resolution of 262,144p/rev).

**Improve communication speed and command communication cycle.**
The communication speed is 50Mbps full duplex (equivalent to 100Mbps one way). The high-speed serial communication with cycle times as fast as 0.44ms improves synchronous, speed and position controls of the servo system.

**Create high-performance system with synchronous communication.**
Synchronous start or high-precision interpolation is difficult with conventional pulse train commands which operate asynchronously. With SSCNET III which enables complete synchronous communication, a high performance can be attained with systems requiring accurate synchronization.

**Reduce wiring.**
By using SSCNET III, wiring can be reduced as compared to the conventional pulse train command.

**Extend wiring distances.**
Long-distance wiring up to 800m* per system is possible, increasing the freedom of system design. The power supply cable between the servo amplifier and motor can be shortened by dispersing the controller and servo amplifier.

* 50m × 16 axes when long-distance cables are used.
SSCNET III is a high-speed, high-performance servo system controller network employing fiber optic cable. A new-generation network opening the future of servos.

**Improve noise immunity.**

Immunity against noise from power cables or external devices can be improved by adopting fiber-optic cables. Fast and highly reliable communication allows high speed and accuracy drive and enables multi-axis, large-scale systems to be configured.

**Simplify central control and reduce adjustment time.**

Large amounts of data can be exchanged in real-time between the controller and the servo amplifiers. Speed on each axis, etc., can be monitored on the controller side, and the servo amplifier parameters can be adjusted* when the motion controller is used.

* Using “MR Configurator2” with a personal computer connected to the controller.

---

**SSCNET III (optical communication method) noise resistance**

- **Motion network (other brand)**
  - External noise
  - External noise

- **SSCNET III**
  - Servo amplifier
  - Motor cable
  - Network cable
  - Motor cable

- **Operates correctly without being affected by external noise.**
- **Fiber-optic cables do not conduct electricity, thus noise does not affect the communication signals and CPU.**
- **Noise causes electric communication signals which pass through the metal cable to malfunction or enters the servo amplifier and causes the CPU to malfunction.**
- **Apply radiated noise when network cable and motor cable are in proximity.**
- **No communication error occurs.**

---

**System configuration with SSCNET III**

- **Servo parameter adjustment/setting**
- **Status monitor (digital oscilloscope)**
- **Controller in a cabinet**
- **Controller in a cabinet**

---

**The SSCNET Partner Association (SNP) acting to spread SSCNET throughout the world.**

The SSCNET Partner Association (SNP) carries activities to introduce the advanced servo system controller network “SSCNET III” and compatible products to many users. In cooperation with partner corporations, SNP widely promotes the performance attainable with “SSCNET III” and aims to make “SSCNET III” a more global servo system controller network.

---

**Transition of number of SSCNET nodes introduced**

<table>
<thead>
<tr>
<th>(No. of nodes)</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>09 (Fiscal year)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>500,000</td>
<td>1,000,000</td>
<td>1,500,000</td>
<td>1,800,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Main membership benefits**

- Access to the latest trends and information on motion network SSCNET and Mitsubishi Electric FA businesses
- Participation in partner meetings in Japan and overseas
- Expanding business opportunities
- Introduction of member products and SSCNET compatible products to various tools and media

* SNP membership requires no joining fees or annual dues.
What is a motion controller?
This controller executes advanced motion control such as synchronous operation, position tracking, tandem operation and advanced S-curve acceleration/deceleration by using a variety of positioning programs.

What is a simple motion module?
Various control systems including synchronous, cam and torque controls which used to be enabled only by a motion controller are now made possible by this motion module with operations similar to the positioning module.

What is a positioning module?
This module easily performs linear interpolation and independent positioning just by writing positioning data to the buffer memory using a sequence program.

Comparison of controller functions
Select an optimum controller from a diverse product line to match the required system functions, performance and tact time.

Controller modules connectable to SSCNET III compatible servo amplifier

Differences of motion controller, simple motion module and positioning module

<table>
<thead>
<tr>
<th>Motion controller</th>
<th>Q170MCPU, Q173DCPU, Q172DCPU, MR-MQ100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced motion control</td>
<td></td>
</tr>
<tr>
<td>Dedicated functions</td>
<td></td>
</tr>
<tr>
<td>• Haptic interpolation</td>
<td></td>
</tr>
<tr>
<td>• Speed control with fixed position stop</td>
<td></td>
</tr>
<tr>
<td>• Position follow-up control</td>
<td></td>
</tr>
<tr>
<td>Diverse positioning programs</td>
<td></td>
</tr>
<tr>
<td>• Motion SFC</td>
<td></td>
</tr>
<tr>
<td>• Dedicated languages</td>
<td></td>
</tr>
<tr>
<td>• Mechanical support/language</td>
<td></td>
</tr>
<tr>
<td>• EIA language (G code)</td>
<td></td>
</tr>
<tr>
<td>Applied functions</td>
<td></td>
</tr>
<tr>
<td>• Tandem operation</td>
<td></td>
</tr>
<tr>
<td>• Advanced synchronous operation</td>
<td></td>
</tr>
<tr>
<td>• Simulator</td>
<td></td>
</tr>
<tr>
<td>• Advanced S-curve acceleration/deceleration</td>
<td></td>
</tr>
</tbody>
</table>

| Simple motion module |
| LD77MH |
| Motion control like positioning |
| Motion control |
| • Synchronous control and cam control |
| • Phase compensation |
| • Torque control |
| • Speed control |
| • Simple cam creation function |
| • Amplifier-less operation |
| Simple motion setting tools |
| • Data setting assistant |
| • Digital oscilloscope |
| • Automatic command speed calculation |
| • Automatic sub arc calculation |
| • Cam data list |

Positioning module
QD75MH
- Unlimited length feed
- Circular interpolation
- Teaching function (condition start and wait start)
- Restart
- Block start

High-speed multi-axis positioning module
QD74MH
- Maximum of 16 axes
- Operation cycle of 0.88 ms

Basic functions
- Linear interpolation (1 to 4-axis interpolation)
- Electronic gears
- Software stroke limit function
- Home position return
- Absolute position system
- JOG operation

Positioning modules capable of pulse train connection

1 2 3 4 8 Number of axes
FX-series-10PG/10GM
FX-series-32MT/ES
QD75P/QD76DX
QD70P/QD70D

Number of axes
1 2 3 4 8
FX-series-10PG/10GM
FX-series-32MT/ES
QD75P/QD76DX
QD70P/QD70D
What is a simple motion module?

Controller modules connectable to SSCNET III compatible servo amplifier

Select an optimum controller from a diverse product line to match the required system functions, performance and tact time.

Differences of motion controller, simple motion module and positioning module

- Motion controller
  - Synchronous, cam and torque
  - Using a variety of positioning acceleration/deceleration by operation and advanced S-curve as synchronous operation,
  - Advanced motion control such as PLC controllers

- Simple motion module
  - Maximum of 16 axes
  - Operation cycle of 0.88 ms
  - High-speed multi-axis positioning module
  - Dedicated language

- Positioning module
  - EIA language (G code)
  - Dedicated languages
  - Motion SFC


dedicated software

Operating System Software Packages for Motion Controller

Conveyor assembly use

Motion SFC compatible SV13

Dedicated language

- Electronic component assembly
  - Paint applicators
  - Chip mounters

- Inverters
  - Water slicers

- Molders
  - Bonding machines

- Conveying equipment
  - X-Y tables

Circular interpolation

- Speed control

- Constant speed control

- Switching

- Fixed pitch feed

- Linear interpolation

- Speed control with fixed position stop

- Teaching

Servo Amplifier Lines

A diverse product line of servo amplifiers is available including the easy-to-use one-touch servo MR-JN series to the industry's top level high-end servo MR-J3 series.

Operating System Software Packages for Motion Controller

Conveyor assembly use

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- Teaching

Servo Amplifier Lines

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Software

Fully supporting all your needs from model selection, system design, startup to maintenance with diverse software

MELSOFT is FA integrated engineering software that demonstrate their abilities in various FA scenes including “designing”, “debugging and startup” and “operation and maintenance” to facilitate all aspects from specification review to daily data collection. MELSOFT offers an extensive software collection to efficiently support quick operation and maintenance of an optimal servo system.

Reduce total cost of ownership of motion systems. iQ Platform compatible motion controller engineering software MELSOFT MT Works2

This motion controller engineering software for iQ Platform provides comprehensive supports for motion CPU design and maintenance.

Intuitive settings and programming functions on a graphical screen, and useful functions such as a digital oscilloscope and simulator contribute to lowering total cost of ownership of motion system.

Workspace control
Display the entire project including created programs and parameters in a tree.

Intuitive system settings
Set servo amplifiers and modules graphically and easily, and check the settings in a glance.

Mechanical system program editing
Just drag and drop mechanical modules as an image of your machine, and set parameters. Complicated synchronous control can be achieved.

Motion SFC program editing
Describe machine operation procedures with a flow chart style.

Motion simulator
Simulate the motion SFC program debugging mode and the digital oscilloscope function on your personal computer without an actual machine.

Various test operation functions
Perform basic startup in the test mode without a program.

Powerful monitor functions
Monitor the motion SFC program and the motion controller operations, and perform batch error monitor.

Digital oscilloscope
Data synchronized with the motion controller’s operation cycle is collected and displayed as a waveform. Check the operation during startup and adjustment, and find out causes of problems easily.
**Integrated engineering for seamless collaboration among FA devices**

"MELSOFT iQ Works" is an integrated engineering environment developed based on the FA integration concept "iQ Platform" proposed early on by Mitsubishi Electric. Seamless collaboration among FA devices from PLC, motion controller to HMI reduces total cost of ownership of engineering drastically.

---

**Easily set simple motions.**

**PLC engineering software  MELSOFT GX Works2**

- **Positioning data setting**
  - Set positioning data easily with the data setting assistant function.

- **Synchronous control setting**
  - Easily set synchronous control in which machine components such as gears, shaft, reduction gears or cam are interchanged by software just by setting parameters.

- **Cam data setting**
  - Set cam data with a high degree of freedom easily. Cam data can also be displayed as thumbnails.

- **Digital oscilloscope function**
  - Collect data from a simple motion synchronized with the control cycle and display it as waveforms. Startups are performed efficiently.

---

**Easily set up servos.**

**Servo setup software  MR Configurator2**

- **Servo assistant function**
  - Easily setup servo amplifier including parameter setting, test operation and servo adjustment just by following guidance displays.

- **Parameter setting function**
  - Set parameters by selecting from a drop-down list. The parameters can be listed or visually displayed.

- **Monitor function**
  - Monitor operation information in real time on the "Display all" window. Assigning input/output signals and monitoring ON/OFF status are also possible on the "I/O monitor" window.

- **Graph function**
  - Measure waveform of the 3ch analog and 4ch digital servo data. Startup and maintenance are performed efficiently.

---

**Select an optimum servo motor for system.**

**Capacity selection software**

- **Advanced gain search**
  - Perform advanced servo adjustments to maximize the system performance with the ease of following a flow chart.

---

**Select optimal servo amplifier, servo motor and optional regeneration unit just by entering machine’s constants and operation patterns.**

- Select from two operation patterns, position and speed control modes.
- Display feed rate and torque in the selection process graphically.
Since its establishment as Mitsubishi Electric’s first electric-motor mass-production factory in 1924, the Nagoya Works has continuously expanded the lines of FA and mechatronics products it handles. Today, the Nagoya Works develops and manufactures servo system products including not only servo amplifiers, servo motors, and motion controllers but also programmable controllers, networks, software, and solutions.

To guarantee the high quality and performance of MELSERVO, Mitsubishi Electric has built a cooperative system of three facilities - Shinshiro Factory, a branch factory of Nagoya Works; Mitsubishi Electric Dalian Industrial Products Co., Ltd., a manufacturing base; and Nagoya Works at the core. Mitsubishi Electric responds to customer needs throughout the world by uniting technologies and know-hows of these facilities.

Nagoya Works
Since its establishment as Mitsubishi Electric’s first electric-motor mass-production factory in 1924, the Nagoya Works has continuously expanded the lines of FA and mechatronics products it handles. Today, the Nagoya Works develops and manufactures servo system products including not only servo amplifiers, servo motors, and motion controllers but also programmable controllers, networks, software, and solutions.

Number of employees 2,250 *As of 2010
Site area 306,000m²
Gross floor space 221,000m² *(Excluding satellite factories)

Shinshiro Factory
Shinshiro Factory was established in 1974 as a branch factory of Nagoya Works. From its establishment, the factory has been supplying various types of servo motors, in which the newest mechatronics technologies and system technologies are integrated. Moreover, Shinshiro Factory has introduced e-F@ctory, the FA integrated solution, to the processing line for motor shafts, which include a lot of special components. Thus, the productivity of the production line has been improved, and the factory is now able to handle a variety of and a small lot of products in a short period of task time.

Number of employees 110 *As of 2010
Site area 137,000m²
Gross floor space 40,000m²

MDI manufactures high-quality AC servos, small-size circuit breakers, EDMs, inverters, and NCs mainly for distribution in the Chinese market.

AC servo manufacturing facility in China.
Mitsubishi Electric Dalian Industrial Products Co., Ltd.
Established in 1994 as Mitsubishi Electric’s local manufacturing facility in Dalian, China, MDI manufactures high-quality AC servos, small-size circuit breakers, EDMs, inverters, and NCs mainly for distribution in the Chinese market.

Number of employees 660 *As of 2010
Site area 66,000m²
Gross floor space 43,957.7m²
e&eco-F@ctory implementation at the Nagoya Works

Here, we have linked production floor systems and equipment to information systems via MES. Mitsubishi Electric’s e&eco-F@ctory solutions make production performance and energy consumption visible and are at work in the servo motor factory at the Nagoya Works where they are being used to boost capacity utilization and product quality, and reduce energy consumption. We use this facility as a model e&eco-F@ctory to which we welcome approximately 4,500 visitors a year.

Unique approach to guarantee MELSERVO quality

Manufacturing key parts in-house to maximize quality.

Encoders play an important role in servo systems. To guarantee the quality of the encoders, we manufacture these parts in our factory by incorporating our own technologies

Painstaking quality assurance through the application of cutting-edge testing equipment.

- X-ray scanners
- Ultrasonic Probing Devices
- EMC center (large electromagnetic environment experiment room)
- LSI testers
- Equipment for highly accelerated life tests (HALT)
Mitsubishi Electric has assembled world-class R&D capabilities to offer the world a unique set of servo systems.

To spread advanced servo systems to the world as quickly as possible, Mitsubishi Electric has established FA-related development centers at its Nagoya Works, and in North America and Europe. Furthermore, we have established strong connections between our Advanced Technology R&D Center, which pushes technology development beyond the limits of FA, and Information Technology R&D Center. We are moving forward with the development of new products that reflect the latest technological directions and customer input.

Japan (Nagoya Works)

Integrating product-development ability as a comprehensive FA supplier.

FA Development Center

One thousand engineers of controllers and drives, including people from our affiliated companies work here. We are advancing the synergy of Mitsubishi’s FA products. Enhancing the compatibility among the products by sharing the development technologies each other. Moreover, engineers share and use technological data and development knowledge with overseas bases and partners, as well through high-speed network communication environments accessible twenty-four hours a day. In addition, planning, development, and prototyping stages are virtualized by information technology to reduce development period and to enhance development quality.

The advanced base for advantage of technology and development of industrial mechatronics products.

Mechatronics Development Center

The Mechatronics Development Center is the development base of mechatronics products. This development center has established advanced machining technology to achieve ultra-fine machining at the accuracy level as high as nanometer, improving development efficiency and reducing development time by seamlessly linking itself with relevant technological organizations. The Mechatronics Development Center is also utilized for joint development projects with our customers, leading creation of products corresponding to new ways of usage and new markets.
One thousand engineers of controllers and drives, including people from our affiliated companies work here. We are advancing the synergy of Mitsubishi's FA products. Enhancing the compatibility among the products by sharing the development technologies each other. Moreover, engineers share and use technological data and development knowledge with overseas bases and partners, as well through high-speed network communication environments accessible twenty-four hours a day. In addition, planning, development, and prototyping stages are virtualized by information technology to reduce development period and to enhance development quality.

To spread advanced servo systems to the world as quickly as possible, Mitsubishi Electric has established FA-related development centers at its Nagoya Works, and in North America and Europe. Furthermore, we have established strong connections between our Advanced Technology R&D Center, which pushes technology development beyond the limits of FA, and Information Technology R&D Center. We are moving forward with the development of new products that reflect the latest technological directions and customer input.

Integrating product-development ability as a comprehensive FA supplier.

**Advanced Technology R&D Center**
This is the base for the most advanced technology in relation to the whole business of Mitsubishi Electric Corporation, advancing development of common basic technologies and new products and forwarding research and development projects to initiate future business.

**Information Technology R&D Center**
Here, research and development of basic technology is advanced in the fields of information, communication, multimedia, and light and radio wave to activate creation of new business. Moreover, the Information Technology R&D Center is playing a role in finding a technology for a future top-runner business and in refreshing existing business with achievements of research and development in the field of information technology.

**Overseas**

**Mitsubishi Electric Europe Development Center (EDC)**
Since its establishment in 1996, EDC has been observing the latest FA market and technical trends in Europe by tying up with the European sales offices. We utilize the latest technologies into our new products to meet customer's requirement.

**Mitsubishi Electric North American Development Center (NADC)**
Since 1998, NADC has been making Research & Development as well as Marketing for our next-generation FA products in cooperation with our North American sales offices.
Mitsubishi Electric servo systems are developed according to our internationally recognized quality assurance system. Mitsubishi Electric FA Centers support you by maximizing the performance and reliability of our servo systems throughout the world. We provide everything from technical consulting services to training and after-sales service.
Globally acknowledged Mitsubishi Electric servo systems
Our global network fully supports you.

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<table>
<thead>
<tr>
<th>Area</th>
<th>Overseas Operating Firms</th>
<th>FA Center</th>
<th>Satellite</th>
<th>Bases providing our products</th>
<th>Countries (Regions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe and Middle East</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>146</td>
<td>39</td>
</tr>
<tr>
<td>China</td>
<td>13</td>
<td>4</td>
<td>12</td>
<td>171</td>
<td>2</td>
</tr>
<tr>
<td>Asia</td>
<td>10</td>
<td>6</td>
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*As of 2010
Our expert engineers answer questions about Mitsubishi Electric FA products, offer advice on their use, and propose optimal systems and devices. They also provide consulting services on operations and applications that suit local needs.

### Global all-around support

Across the globe, FA Centers provide customers with local assistance for purchasing Mitsubishi Electric products and with after-sales service. To enable national branch offices and local representatives to work together in responding to local needs, we have developed a service network in 27 locations (including satellite offices) throughout the world.

### Technical Consultations

Our expert engineers answer questions about Mitsubishi Electric FA products, offer advice on their use, and propose optimal systems and devices. They also provide consulting services on operations and applications that suit local needs.

### Training

We provide practical training for equipment operations and programming using a variety of actual equipment. We support engineers in developing the skills needed on the site.

### After-sales Service

With cutting edge information processing and communication technologies, we provide repairs, on-site engineering support and sales of replacement parts. We also have showrooms where you can experience the latest FA devices with our dedicated engineers.

### Contact to FA Center

<table>
<thead>
<tr>
<th>FA Center</th>
<th>Address</th>
<th>Phone</th>
<th>Fax Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shanghai FA Center</td>
<td>Mitsubishi Electric Automation (CHINA) Ltd. No.1386 Hongqiao Road, Mitsubishi Electric Automation Center 3F, Shanghai, China Tel: 86-21-2322-3030 Fax: 86-21-2322-3000</td>
<td></td>
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<tr>
<td>Beijing FA Center</td>
<td>Mitsubishi Electric Automation (CHINA) Ltd. Beijing Office 9F, Office Tower 1, Henderson Centre, 18 Jiangoumennei Avenue, Dongcheng District, Beijing, China Tel: 86-10-6518-8830 Fax: 86-10-6518-3907</td>
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<td>Tianjin FA Center</td>
<td>Mitsubishi Electric Automation (CHINA) Ltd. Tianjin Office U/nl 2003-2004B, Tianjin City Tower, No.35, You Yi Road, He Xi District, Tianjin Tel: 86-22-2813-1015 Fax: 86-22-2813-1017</td>
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<tr>
<td>Guangzhou FA Center</td>
<td>Mitsubishi Electric Automation (CHINA) Ltd. Guangzhou Office Rm.1609, North Tower, The Hub Center, No.1068, Xin Gang East Road, Haizhu District, Guangzhou, China Tel: 86-20-8923-6730 Fax: 86-20-8923-6715</td>
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<tr>
<td>Taiwan FA Center</td>
<td>Setsuyo Enterprise Co., Ltd. 3F., No.105, Wugong 3rd, Wugu Dist, New Taipei City 24889, Taiwan, R.O.C Tel: 886-2-2299-9917 Fax: 86-2-2299-9963</td>
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<td>Korean FA Center</td>
<td>Mitsubishi Electric Automation Korea Co., Ltd. (Service) B1F, 2F, 1480-6, Gayang-Dong, Gangseo-Gu, Seoul, 157-200, Korea Tel: 82-2-3660-9630 Fax: 82-2-3663-0475</td>
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<tr>
<td>Thailand FA Center</td>
<td>Mitsubishi Electric (Thailand) Co., Ltd. Bang-Chan Industrial Estate No:111, Soi Senthai 54, T.Kannayao, A.Kannayao, Bankok10230, Thailand Tel: 66-2906-3238 Fax: 66-2906-3239</td>
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<tr>
<td>ASEAN FA Center</td>
<td>Mitsubishi Electric Asia Pte. Ltd. ASEAN Factory Automation Centre 307 Alexandra Road #05-0100, Mitsubishi Electric Building, Singapore Tel: 65-6470-2480 Fax: 65-6476-7439</td>
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<tr>
<td>India FA Center</td>
<td>Mitsubishi Electric India Pvt. Ltd. India Factory Automation Centre 2nd Floor, DLF Building No.98, DLF Cyber City Phase III, Gurgaon 122002, Haryana, India Tel: 91-124-4630300 Fax: 91-124-4630399</td>
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<tr>
<td>Brazil FA Center</td>
<td>MELCO-TEC Representacao Comercial e Assessoria Tecnica Ltda. Av. Paulaista, 1439, Cenqueria Cesar - Sao Paulo Brazil - CEP 01311-200 Tel: 55-11-3146-2200 Fax: 55-11-3146-2217</td>
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<tr>
<td>European FA Center</td>
<td>Mitsubishi Electric Europe B.V. Polish Branch Jl. Krakowska 50, 32-083 Balice, Poland Tel: 48-12-630-4700 Fax: 48-12-630-4701</td>
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<td>German FA Center</td>
<td>Mitsubishi Electric Europe B.V. - German Branch Gothaer Strasse 8, D-40880 Ratingen, Germany Tel: 49-2102-486-0 Fax: 49-2102-486-1120</td>
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<td>Czech Republic FA Center</td>
<td>Mitsubishi Electric Europe B.V. - o.s. Czech office Avenir Business Park, Radicka 714/113a, 158 00 Praha5, Czech Republic Tel: 420-251-551-470 Fax: 420-251-551-471</td>
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<td>UK FA Center</td>
<td>Mitsubishi Electric Europe B.V. UK Branch Travelers Lane, Hatfield, Hertfordshire, AL10 8XB, UK. Tel: 44-1707-27-6100 Fax: 44-1707-27-8695</td>
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<td>Russian FA Center</td>
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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.

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.