



**MITSUBISHI
ELECTRIC**

Changes for the Better

FACTORY AUTOMATION

NUMERICAL CONTROL (CNC) E70 Series



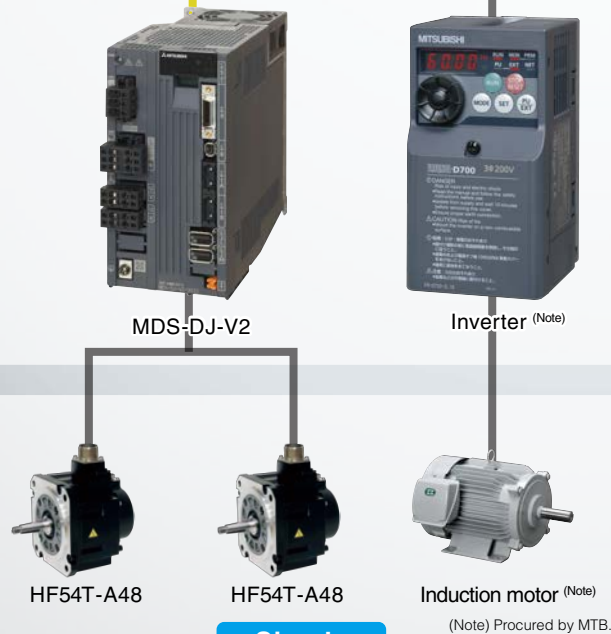
New CNC best suited to simple lathes/milling machines

New



New MDS-DJ Series STO (safe torque off) drives available

MDS-DM2 Series Multi-hybrid drive unit



Simple

High-grade

¹ LED backlight life: Approx. 70000 hours (specified value)
² Compared with our existing products (energy savings using LED backlight)

[Examples of connections using E70 Series]

E70 series

Seeking easier usability and higher cost efficiency, we have brought out the E70 Series, a new standard CNC series that succeeds the high performance and high operability of the M70V Series.

While employing the screen configuration of the M700V and M70V Series, the E70 Series offers even more compact dimensions and less wiring.

With the latest hardware installed, the E70 Series is best suited to simple lathes and milling machines.

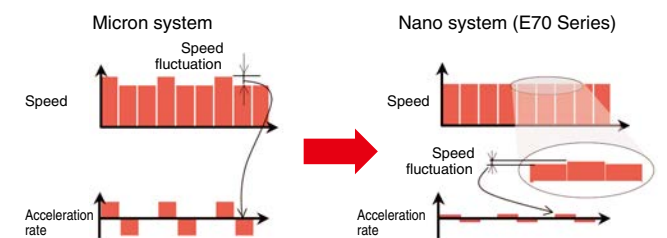
Simple Operability

- Screen design equivalent to M700V/M70V Series, offering simple operability.
- Switching between lathe and milling systems is accomplished simply by changing a parameter.
- Multiple display languages available for global use, which can be selected by parameter setting.
- A pop-up window shows your desired information without closing the original window.



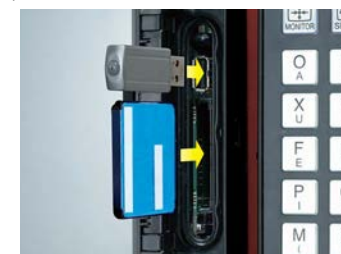
High Cost Effectiveness

- Very smooth cutting surface achieved with one-nanometer position interpolation.*
 - Up to 20 sequence programs can be registered with the built-in PLC function.
 - A wide array of development support tools such as NC Designer2 is available.
 - Ultra-compact drive units with built-in power supplies contribute to reducing control panel size.
- *Least command increment is 0.1µm



Compact Size and Less Wiring

- The control unit is integrated into the back side of the display to realize compact size.
- Ethernet* is available as standard specification, enabling input/output of machining programs and parameters by connecting the NC to a personal computer.
- Front CF card/USB memory interface in the display as standard specification.
- Analog output offered as standard specification to enable the use of a spindle drive with an inverter.



MITSUBISHI CNC Machine Operation Panel

- The display and keyboard are the same color, providing consistency in design.
- The key layout can be customized according to machine specifications.
- The sequence program samples have been prepared for the basic key layout.
- Wiring has been reduced by connecting the panel with the NC via a remote I/O link.

*Refer to the product brochure for details.



Example when combined

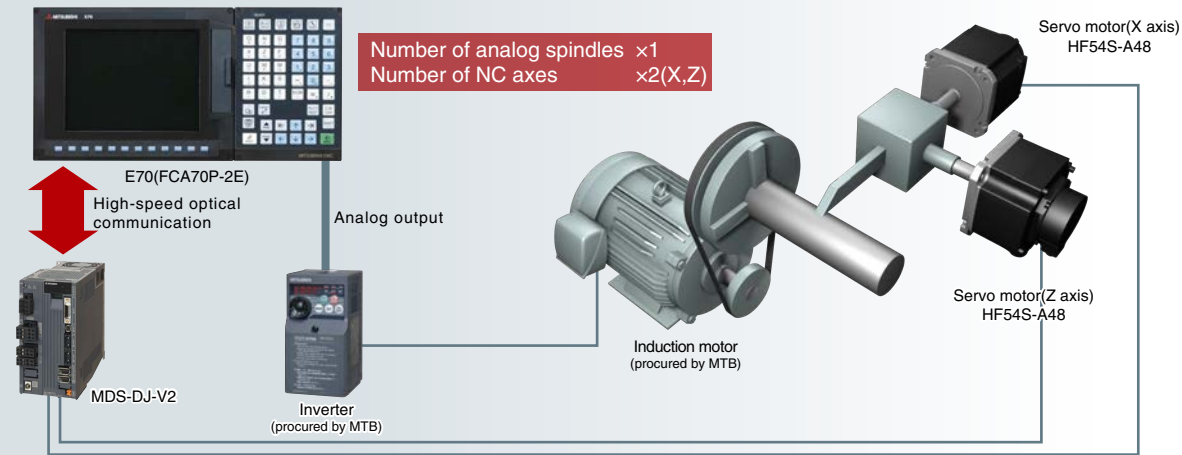
* Ethernet is a registered trademark of Xerox Corporation in the United States and/or other countries.
* CompactFlash and CF are either trademarks or registered trademarks of SanDisk Corporation in the United States and/or other countries.

Simple & Easy System Configuration Example

Simple & Easy Functions & Usability

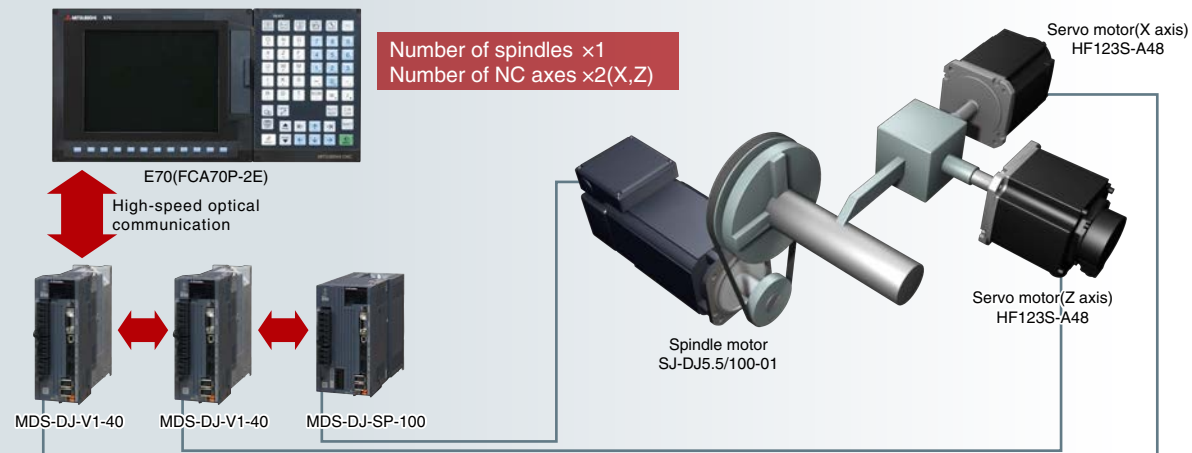
Simple, small lathe (with analog spindle)

Cost effective configuration to control the spindle with an inverter using analog output.



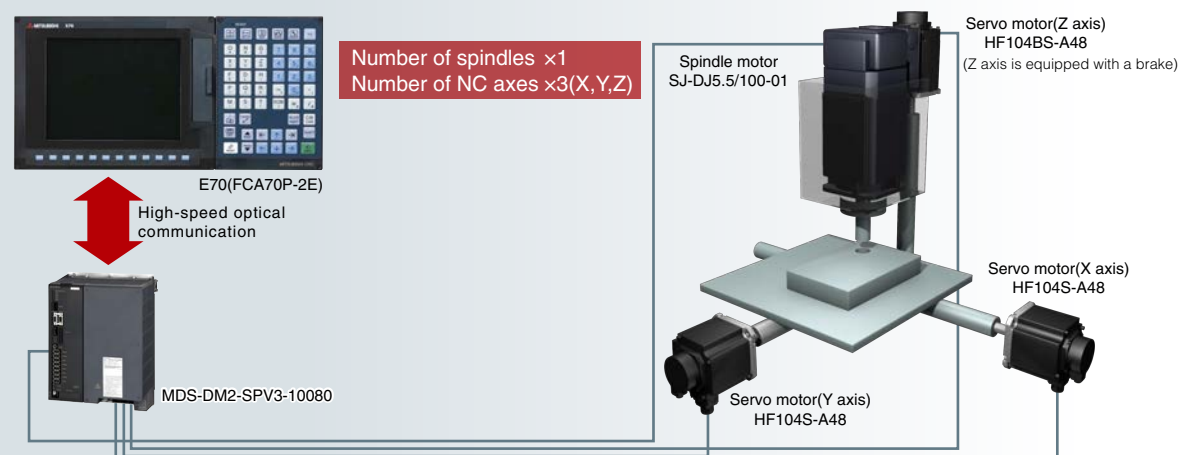
Simple, small lathe (Drive unit: MDS-DJ Series)

Space-saving, cost effective configuration using MDS-DJ Series: Ultra-compact drive unit series with built-in power supply.



Small milling machine (Drive unit: MDS-DM2 Series)

Space-saving, wire-saving configuration to control three servo axes, one spindle and converters with one MDS-DM2 Series drive unit.

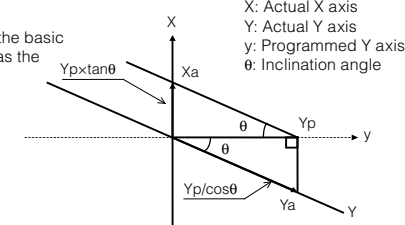


Inclined Axis Control (lathe system)

- Even when the control axes configuring a machine are mounted at an angle other than 90 degrees, this function enables it to be programmed and controlled in the same way as with an orthogonal axis.
- The inclination angle is set using a parameter, and axes are controlled using the movement amounts of the axes which are obtained through conversion and compensation using this angle.

<Example of use>

When the X axis serves as the basic axis and the Y axis serves as the inclined axis



New

NAVI LATHE(for lathe) / NAVI MILL(for machining center)

Simple programming function

- Programs are automatically created for each process when an operator selects machining process and inputs data on screen. A tool path can be graphically drawn for the program check.

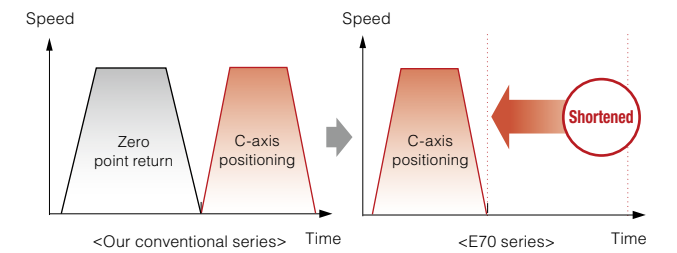


NAVI LATHE (Lathe system)

NAVI MILL (Machining center system)

Spindle/C-axis Control

The spindle's constant position loop control has eliminated the zero point return time when switching from the spindle to C-axis.



System Lock Function

This function allows machine tool builders to set the expiration date for machine use.

If the cancel code is not entered by the specified deadline, the system forcibly turns OFF the Servo ready completion signal, placing the machine in an inoperable status.

*We will pay no compensation for any detriment that may arise from an illegal unlock.



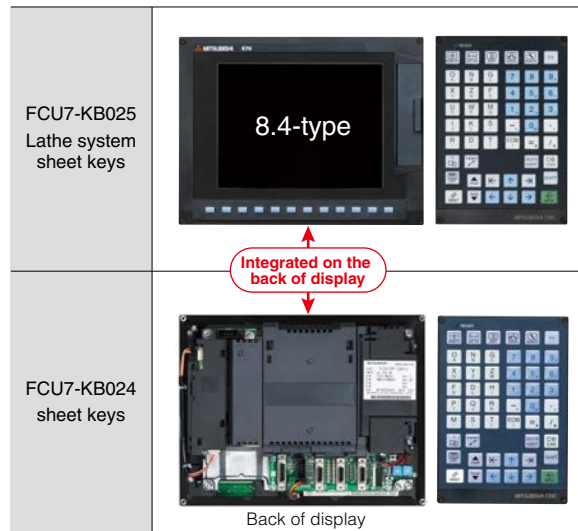
Main Specifications

Specifications	Model name	Milling system	Lathe system
Number of control axes	Maximum number of control axes (NC axes + PLC axes + spindle)	6	6
	Maximum number of NC axes (in total for all the part systems)	3	3
	Maximum number of spindles	1	2
	Maximum number of PLC axes	2	3
	Maximum number of simultaneous contour control axes	3	3
Maximum number of part systems		1	1
Least command increment		0.1 μm	
Least control increment		1nm	
Maximum program capacity		230kB [600m]	
Maximum PLC program capacity		8,000 steps	
Display		8.4-type	
Keyboard		Sheet keys	
HMI customization function		NC Designer2	
MITSUBISHI CNC machine operation panel		Compatible	

* Maximum specifications including optional specifications are listed.

Refer to the specifications manuals.

Control Unit, Display & Keyboards



The control unit is integrated into the back side of the display.

MITSUBISHI CNC Machine Operation Panel

		[mm]
FCU7-KB921	Key switch 55 points, LED 55 points MITSUBISHI standard key layout	
FCU7-KB926	Rotary switches (spindle override, cutting override) Select switch (memory protection) Emergency stop push-button	

-The internal components of the machine operation panel are protected against water and oil (IP65F).
-Refer to the product brochure for details.

Drive Units

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

- Ultra-compact drive units with built-in power supplies contribute to reducing control panel size. The 2-axis type is added for further downsizing.
- A high-efficiency fin and low-loss power module have enabled unit downsizing, which also leads to a reduction in control panel size.
- STO (safe torque off) is now available. (Note)



Multi-hybrid Drive Units MDS-DM2 Series

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



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

Servo Motors

Medium-inertia Motor HF Series

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



Low-inertia Motor HF-KP Series

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



Spindle Motors

High-performance New Type Spindle Motor SJ-D Series

- Motor energy loss has been significantly reduced by optimizing the magnetic circuit.
- Product line:

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



Tool Spindle Motor HF-KP Series

- Taking advantage of the characteristics of a servo motor such as smallness and high-output, this motor serves as a compact and high-output spindle motor which is capable of high-speed rotation (6,000r/min). This motor contributes to downsizing of spindles, such as the rotary tool spindle.
- Product line:

Small capacity	HF-KP Series	0.4 to 0.9 [kW]
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NC Designer2

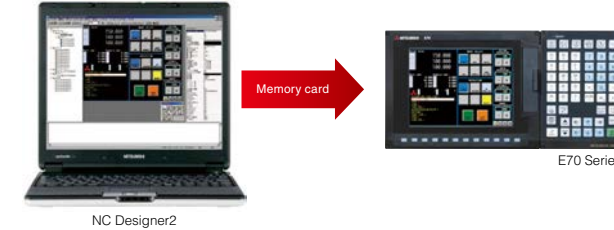
Screen Design Tool

- By laying out ready-made standard parts, you can easily create original screens without programming.
- Using the C language source generation function of NC Designer2, customized functions can be added by programming in C language. (Dedicated development environment necessary)

Parts displayed on NC (example)



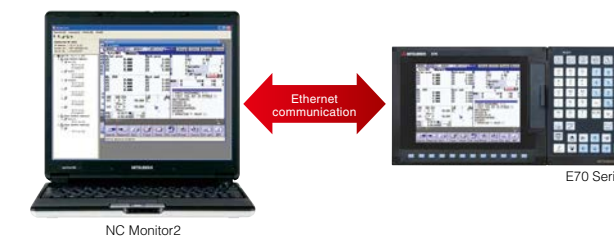
Edit on a personal computer



NC Monitor2

Remote Monitoring Tool

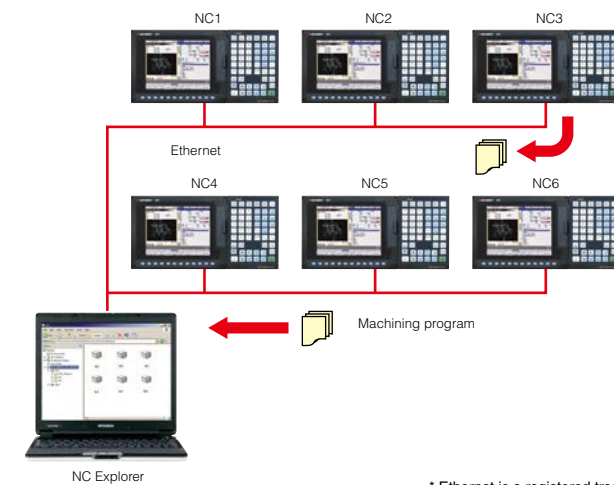
An identical NC display screen can be displayed on a personal computer. By connecting a personal computer to the NC unit when necessary, various data can be checked and set using the same HMI as the standard NC screen.



NC Explorer

Data Transfer Tool

By connecting the NC and host personal computer via Ethernet, data such as machining programs can easily be shared. This tool is free of charge. Please contact us.



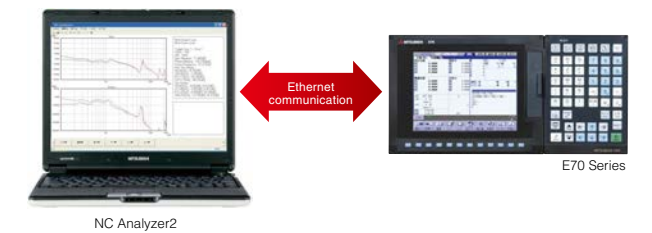
NC Analyzer2

Servo Adjustment Support Tool

Servo parameters can be automatically adjusted by activating the motor using machining programs for adjustment or vibration signals, and measuring/analyzing the machine characteristics.

<Main functions>

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



NC Configurator2

Parameter Setup Support Tool

The NC data file necessary for NC control and machine operation (such as parameters, tool data and common variables) can be edited on a personal computer. Please contact us to purchase a full function version. (A limited function version is also available free of charge.)



NC Trainer2/NC Trainer2 plus

MITSUBISHI CNC Training Tool

- NC Trainer is an application for operating the screens of M700V/M70V/E70 Series CNCs and machining programs. This application can be used for learning how to operate CNCs and checking the operations of machining programs.
- NC Trainer2 plus can also be used for checking PLC programs and custom screens.



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Global Partner. Local Friend.

WARRANTY

Please confirm the following product warranty details before using MITSUBISHI CNC.

1. Warranty Period and Coverage

Should any fault or defect (hereafter called "failure") for which we are liable occur in this product during the warranty period, we shall provide repair services at no cost through the distributor from which the product was purchased or through a Mitsubishi Electric service provider. Note, however that this shall not apply if the customer was informed prior to purchase of the product that the product is not covered under warranty. Also note that we are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit is replaced.

[Warranty Term]

The term of warranty for this product shall be twenty-four (24) months from the date of delivery of product to the end user, provided the product purchased from us in Japan is installed in Japan (but in no event longer than thirty (30) months, including the distribution time after shipment from Mitsubishi Electric or its distributor).

Note that, for the case where the product purchased from us in or outside Japan is exported and installed in any country other than where it was purchased; please refer to "2. Service in overseas countries" as will be explained.

[Limitations]

- (1) The customer is requested to conduct an initial failure diagnosis by him/herself, as a general rule. It can also be carried out by us or our service provider upon the customer's request and the actual cost will be charged.
- (2) This warranty applies only when the conditions, method, environment, etc., of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual, user's manual, and the caution label affixed to the product, etc.
- (3) Even during the term of warranty, repair costs shall be charged to the customer in the following cases:
 - (a) a failure caused by improper storage or handling, carelessness or negligence, etc., or a failure caused by the customer's hardware or software problem
 - (b) a failure caused by any alteration, etc., to the product made by the customer without Mitsubishi Electric's approval
 - (c) a failure which may be regarded as avoidable, if the customer's equipment in which this product is incorporated is equipped with a safety device required by applicable laws or has any function or structure considered to be indispensable in the light of common sense in the industry
 - (d) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
 - (e) any replacement of consumable parts (including a battery, relay and fuse)

- (f) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning, and natural disasters
- (g) a failure which is unforeseeable under technologies available at the time of shipment of this product from our company
- (h) any other failures which we are not responsible for or which the customer acknowledges we are not responsible for

2. Service in Overseas Countries

If the customer installs the product purchased from us in his/her machine or equipment, and export it to any country other than where he/she bought it, the customer may sign a paid warranty contract with our local FA center.

This falls under the case where the product purchased from us in or outside Japan is exported and installed in any country other than where it was purchased.

For details please contact the distributor from which the customer purchased the product.

3. Exclusion of Responsibility for Compensation against Loss of Opportunity, Secondary Loss, etc.

Whether during or after the term of warranty, we assume no responsibility for any damages arising from causes for which we are not responsible, any losses of opportunity and/or profit incurred by the customer due to a failure of this product, any damages, secondary damages or compensation for accidents arising under specific circumstances that either foreseen or unforeseen by Mitsubishi Electric, any damages to products other than this product, or compensation for any replacement work, readjustment and startup test run of on-site machines or any other operations conducted by the customer.

4. Changes in Product Specifications

Specifications shown in our catalogs, manuals or technical documents are subject to change without notice.

5. Product Application

- (1) For the use of this product, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in the product, and a backup or fail-safe function should operate on an external system to the product when any failure or malfunction occurs.
- (2) Mitsubishi CNC is designed and manufactured solely for applications to machine tools to be used for industrial purposes.

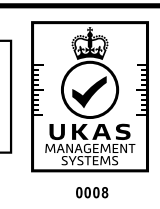
Do not use this product in any applications other than those specified above, especially those which are substantially influential on the public interest or which are expected to have significant influence on human lives or properties.



Safety Warning

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

Mitsubishi Electric Corporation Industrial Mechatronics Systems Works is a factory certified for ISO 14001 (standards for environmental management systems) and ISO 9001 (standards for quality assurance management systems)



MITSUBISHI ELECTRIC CORPORATION

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