



**MITSUBISHI
ELECTRIC**

Changes for the Better

NUMERICAL CONTROL (CNC)

**MITSUBISHI
CNC**



The Best Partner for Your Success

The Best Partner for Your Success

This is the MITSUBISHI CNC business philosophy.

All the staffs who are committed to MITSUBISHI CNC business wish to be “the best partner for customers aiming at global and future-oriented development”.

We will continue our efforts with the aim that our CNCs be great help to the customers.

Technologies for the Next Generation

Advanced Technologies for the Next Generation

With the sophisticated technologies we have developed as a total factory automation manufacturer, we attain advanced machining control and contribute to the highest accuracy and productivity of manufacturing worldwide. MITSUBISHI CNCs change machine tools, machining and manufacturing.

Solutions for the Future

Optimum Solutions for the Future

As a global CNC provider as well as the best partner, we provide optimum technologies and supports for the users making a step toward the future. MITSUBISHI CNCs create new values in cooperation with the users.

Support for the Day-to-day Comfort

Solid Support for Day-to-day Comfort

Providing prompt responses, solid technologies and user-friendly supports, we continuously improve our after-sales service quality for users in the world so that they choose MITSUBISHI CNCs again.



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(Note) The contents of this catalog includes optional specifications. Refer to specification manuals for details.

Technologies for the Next Generation

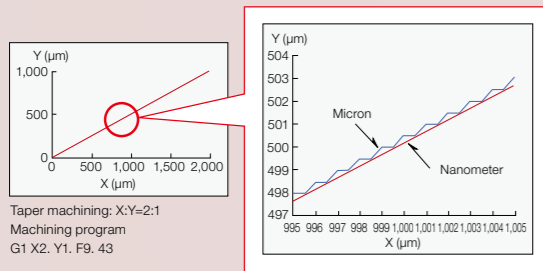
With the sophisticated technologies we have developed as a total factory automation manufacturer, we attain advanced machining control and contribute to the highest accuracy and productivity of manufacturing worldwide.

MITSUBISHI CNCs change machine tools, machining and manufacturing.

High-accuracy Machining with Complete Nano Control



The complete nano control enables all processing in nanometers, from NC operation to servo processing. This advanced machining control technology supports next-generation ultra-precision machining.

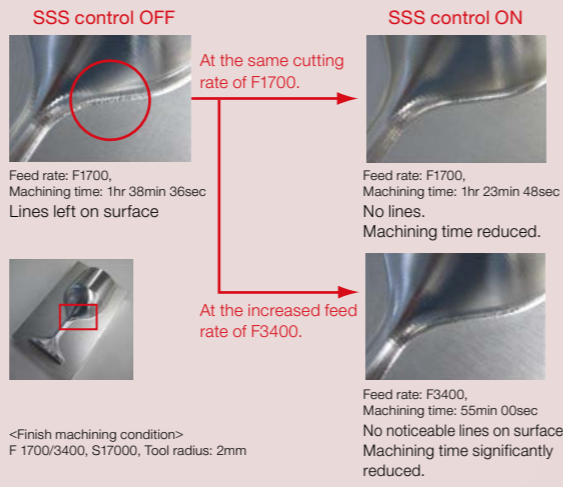


Interpolation path under nanometer control

High-quality Machining with Balanced Accuracy and Speed



SSS control ensures high machining stability and quality with virtually no effects resulting from cutting shape or speed. Smooth surfaces can be achieved even when small steps exist in a path, and machining time can be reduced by 5 to 30% relative to conventional systems.



Die/Mold Machining Time Reduced



Complete nano control enables high-speed and high-accuracy machining at a maximum fine-segment feed rate of 168kBPM. (BPM: Block per Minute)

High-speed and High-accuracy Control

Machining speed attained with 0.1mm-pitch NC program

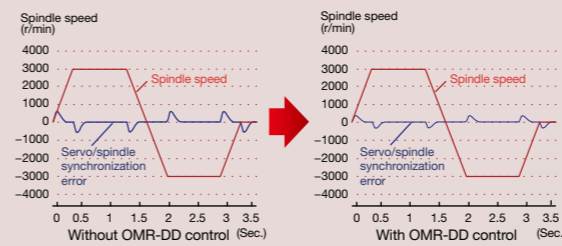
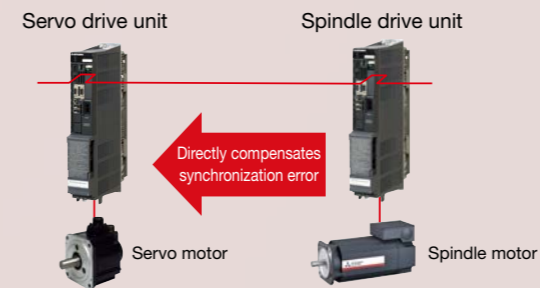


High-speed and High-accuracy Tapping



A high-speed error-compensation function is used for controlling the spindle and servo, enabling accurate tapping.

OMR-DD Control (Optimum Machine Response Direct Drive)

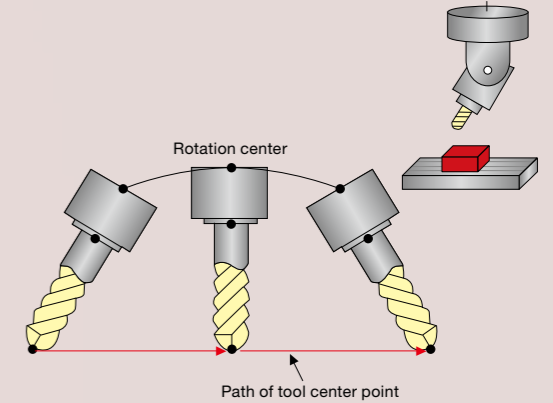


High-grade 5-Axis Machining Control Technology



High-accuracy machining is realized by controlling each axis so that the tool center point moves linearly at a commanded feed rate even if the rotary axis moves in linear interpolation.

Tool Center Point Control

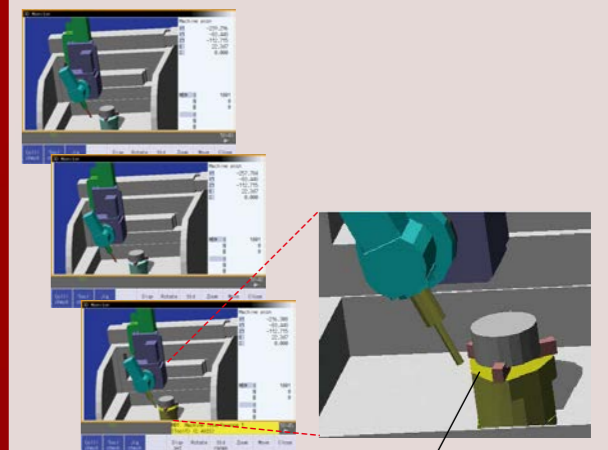


Prevention of Interferences in Machine



When a possibility of interference is detected on a machine model, the motor decelerates to a stop before interfering. The part to interfere is displayed in a different color.

3D Machine Interference Check



Motor decelerates to a stop before interfering. The part to interfere changes in color.



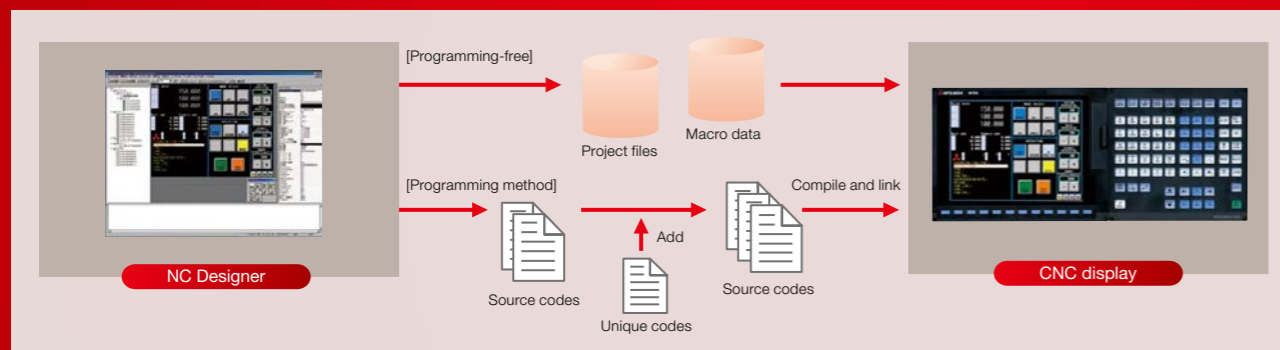
Solutions for the Future

As a global CNC provider as well as the best partner, we provide optimum technologies and supports for the users making a step toward the future.
MITSUBISHI CNCs create new values in cooperation with the users.

Original Screen Design Environment

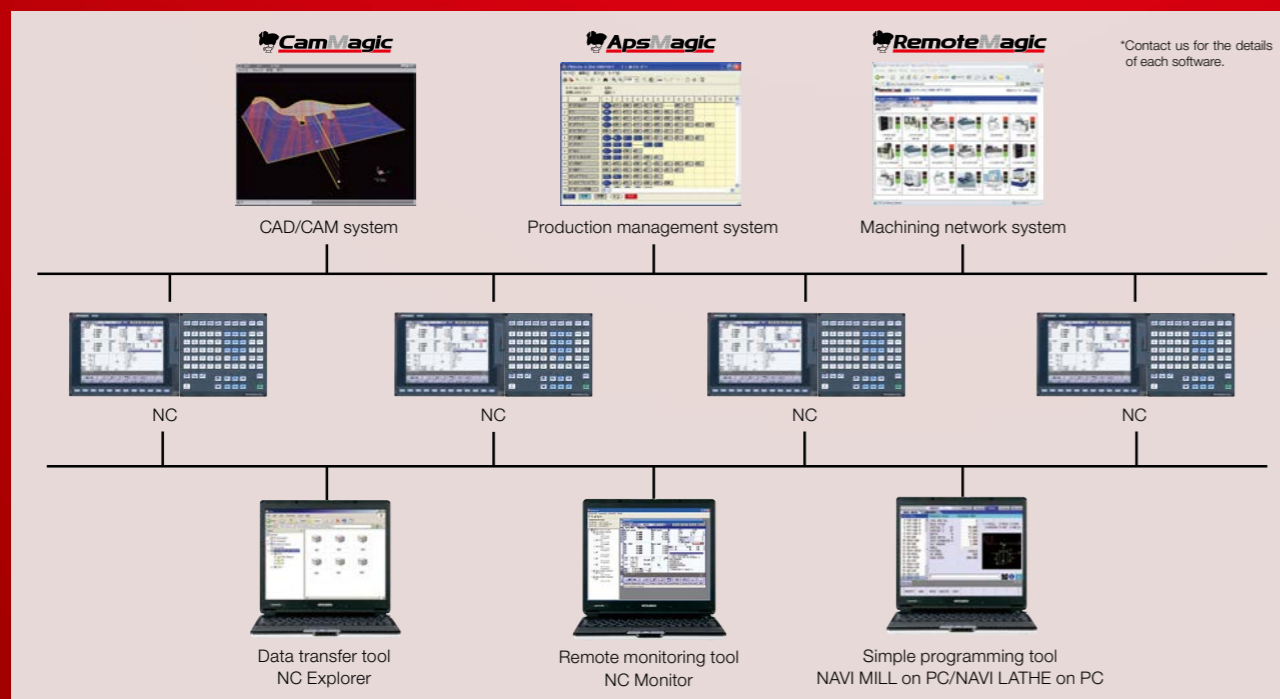
Custom
CNC
Solution

- Well-developed screen design tools help bring out the uniqueness of CNCs.
- NC Designer, which helps create original screens easily, enables users to add unique customized screens that meet machine tool characteristics.
- Two types of designing methods are available: a programming-free method in which automatic programming is carried out upon laying out switches, buttons and data display frames, etc. and a programming method that enables higher-level processing.



Manufacturing Support Software

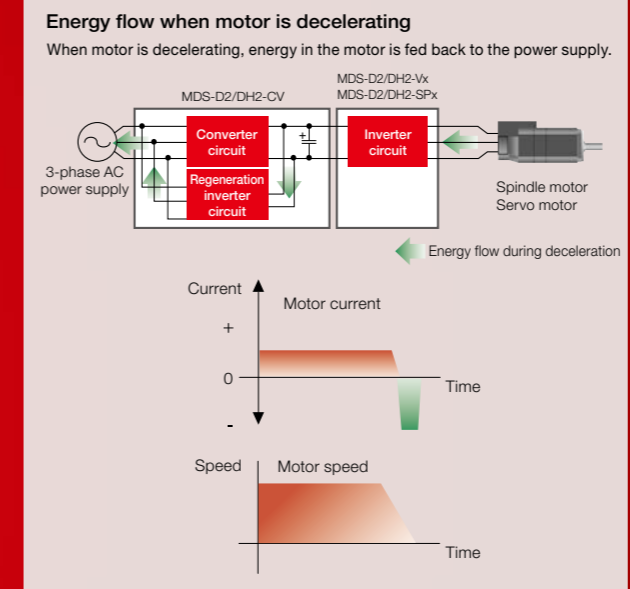
We provide optimal solutions for manufacturing sites by combining various software.



Energy Savings

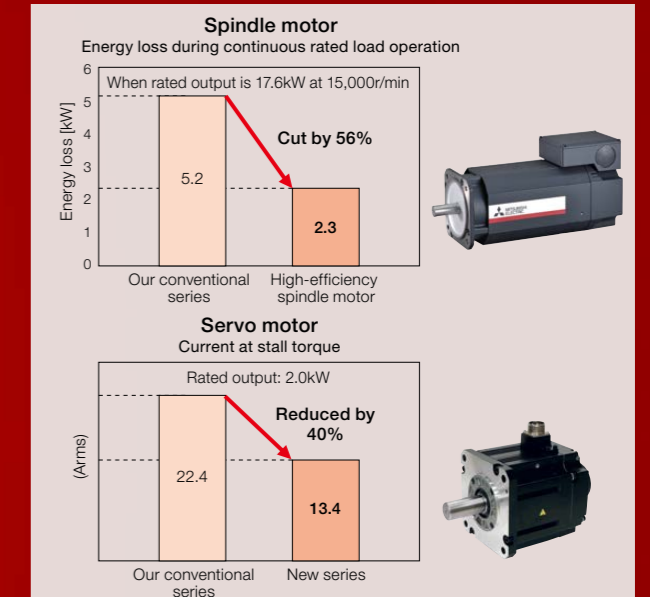
Drive units

Application of the power regeneration system which allows energy generated during deceleration to be efficiently used as a power supply. Use of low-loss power devices enables reductions in loss of power.



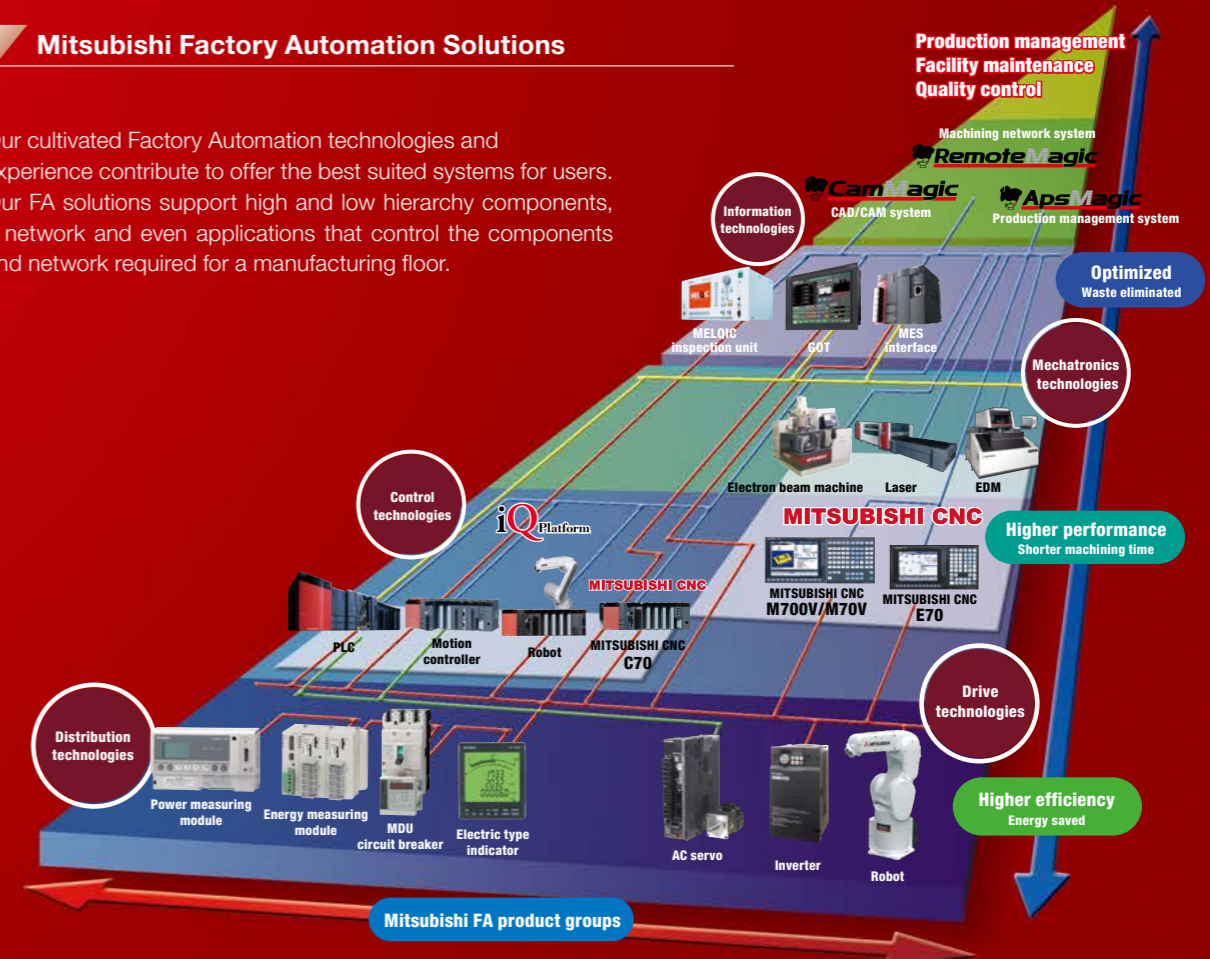
Spindle motors/Servo motors

Energy loss of spindle motors during high-speed operation has been substantially reduced. Drive current of servo motors has also been reduced by downsizing the motors while increasing the torque.



Mitsubishi Factory Automation Solutions

- Our cultivated Factory Automation technologies and experience contribute to offer the best suited systems for users.
- Our FA solutions support high and low hierarchy components, a network and even applications that control the components and network required for a manufacturing floor.

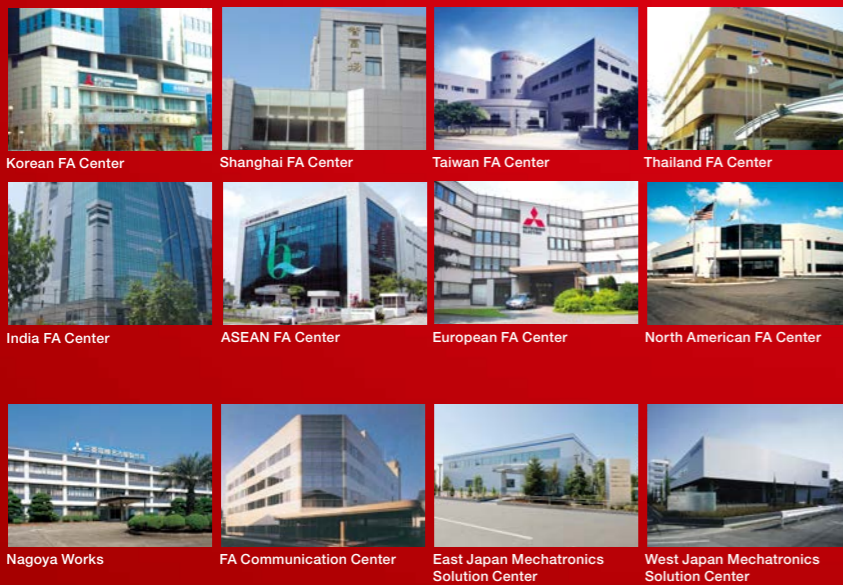


Support for the Day-to-day Comfort

Providing prompt responses, solid technologies and user-friendly supports, we continuously improve our after-sales service quality for users in the world so that they choose MITSUBISHI CNCs again.

Global Service & Support Network

We provide satisfying after-sales services worldwide, aiming to be your best partner.



We have established FA Centers that manage service centers and service satellites in each area to enhance our service quality by providing trainings for engineers and enhancing service parts and repair facilities.

After-sales Service

Maintenance service

Our service centers boasting high-quality customer service system are located in various regions around the world to provide secured and reliable services for the users. We offer wide range of services such as giving prompt and precise advices and suggestions, and on-site repairs, etc.



Part supply

As each service center keeps maintenance parts in stock, the down time after a failure can be minimized. We are making our efforts to provide utmost services that allow users to use their CNC machine tools more securely.



One-year maintenance contract

We provide maintenance services after expiration of warranty period in one-year units. Should there be any failure, our engineer in the closest service center will be at your support immediately.

Training

We provide trainings on both basic and advanced operations using actual machines. Individually tailored training programs and on-site lessons are also available. Please contact us for details.



Displays in 17 Languages

Supports 17 languages.

Supported languages

- Japanese
- Portuguese
- English
- Hungarian
- German
- Dutch
- Italian
- Swedish
- French
- Turkish
- Spanish
- Polish
- Chinese (traditional)
- Russian
- Chinese (simplified)
- Czech
- Korean

High-quality

Our top priority is to provide users with high-performance and high-quality products. We are making the best efforts to improve quality and reliability in every process from planning, development, designing and manufacturing through operation after delivery.



Nagoya Works



FA Development Center



Product Line

Advanced product lines take your machine to the next level

High-grade Mitsubishi CNC M700V Series, Equipped with Advanced Complete Nano Control

- The latest RISC-CPU is installed to achieve advanced complete nano control
- High-accuracy machining with complete nano control
- Easy operability that significantly reduces machining setup time



Global Standard Mitsubishi CNC M70V Series, Pursuing High Speed and Accuracy

- Enhanced machining accuracy and reduced tact time
- Easy and advanced operation contributing to setup time reduction
- Compact size



Simple CNC E70 Series, Offering Easy Operability and High Cost Performance

- Simple operations free operators from burden
- With the latest hardware installed, this CNC realizes high cost performance



iQ Platform Compatible CNC C70 Series Incorporated with Mitsubishi's State-of-the-Art Technologies

- Compatible with the Mitsubishi FA integrated solution, "iQ Platform"
- High-performance CNC integrated with high-speed PLC offers high-speed control to reduce cycle time
- A wide variety of FA products helps construct flexible lines



*Customized screen

Drive Units

High-performance Servo/Spindle Drive Units

MDS-D2/DH2 Series

- With the fastest current control cycle, basic performance is drastically enhanced (high-gain control). A combination of high-speed servo motor and high-accuracy detector helps enhance overall drive performance.
- A high-efficiency fin and low-loss power module have enabled unit downsizing. A line of drive units driving a maximum of two spindles is available, contributing 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)



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.
- High-speed optical communication enables a shorter position interpolation cycle and direct communication between drives, promoting further high-speed and high-accuracy machining.
- 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)



(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 260,000 p/rev.



Linear Servo Motor LM-F Series

- Use in clean environments is possible since no ball screws are used and therefore contamination from grease is not an issue.
- Elimination of transmission mechanisms which include backlash, enables smooth and quiet operation even at high speeds.
- Dimensions:
Length: 290 to 1,010 [mm]
Width: 120 to 240 [mm]



Direct Drive Servo Motor TM-RB Series

- High-torque direct-drive combined motor with a high-gain control system provides quick acceleration and positioning, which makes rotation smoother.
- Suitable for a rotary axis that drives a table or spindle head.
- Range:
Maximum torque: 36 to 1,280 [N·m]



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]



High-performance Spindle Motor SJ-V Series

- A vast range of spindle motors is available, all ready to support diversified machine tool needs.
- Product line:
Normal SJ-V Series 0.75 to 55 [kW]
Wide-range constant output SJ-V Series 5.5 to 18.5 [kW]
High-speed SJ-V-Z Series 2.2 to 22 [kW]
Hollow-shaft SJ-VS Series 5.5 to 18.5 [kW]



Low-inertia, High-speed New Type Spindle Motor SJ-DL Series

- Tapping machine-dedicated spindle motors have joined the new spindle motor line SJ-D Series in an effort to speed up drilling and tapping.
- The low-inertia reduces acceleration/deceleration time, resulting in higher productivity.
- Product line:
Low-inertia SJ-DL Series 0.75 to 7.5 [kW]



Low-inertia, High-speed Spindle Motor SJ-VL Series

- The spindle dedicated to tapping machines requiring faster drilling and tapping.
- The low-inertia reduces acceleration/deceleration time, resulting in higher productivity.
- Product line:
Low-inertia normal SJ-VL Series 3.0 to 11 [kW]
Low-inertia hollow shaft SJ-VLS Series 3.7 to 11 [kW]



Built-in Spindle Motor SJ-BG Series

- The optimized electrical design increases the continuous rated torque per unit volume compared to our conventional model, contributing to downsizing of the spindle unit.
- The mold with cooling jacket is available as an optional feature.



Tool Spindle Motor HF-KP/HF-SP 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]
Medium capacity HF-SP Series 2.2 to 4 [kW]



M700V Series

High-grade Mitsubishi CNC M700V Series, equipped with advanced complete nano control

Latest RISC-CPU achieves Advanced Complete Nano Control

- The latest RISC-CPU and high-speed optical servo network are installed, achieving high-speed and high-accuracy control, nano control and 5-axis machining
- Functions can be easily expanded by adding an expansion unit
- Ultrahigh-speed PLC engine reduces cycle time

High-accuracy Machining with Complete Nano Control

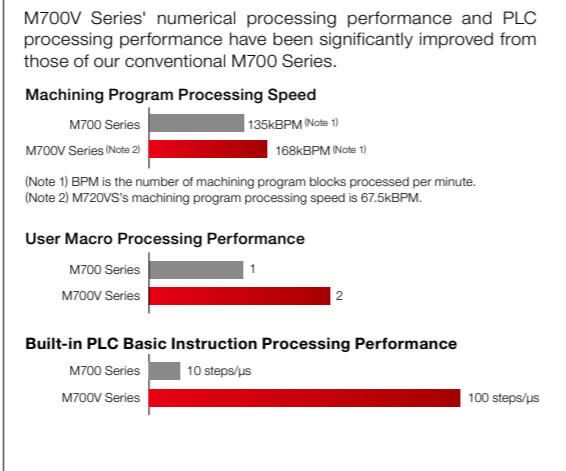
- Combination of "complete nano control" that processes everything from NC operation to servo control processing in nanometers, a state-of-the-art technology "SSS control" and "OMR control" makes it possible to achieve ultrahigh-quality machining
- High-speed and high-accuracy machining at 168k blocks per minute is possible

Easy Operability that Significantly Reduces Machining Setup Time

- NC screen design has been renewed to strongly support operations from machining setup to monitoring
- The NC screen displays machining program check and machining states visually by using 3D display

Windows®XP-based Model Added to the Product Line

- Since Windows®XP is installed in M720VW, M730VW and M750VW, they facilitate developing such as MTB's original CAM function and data managing function that can enhance the operability



Main Specifications

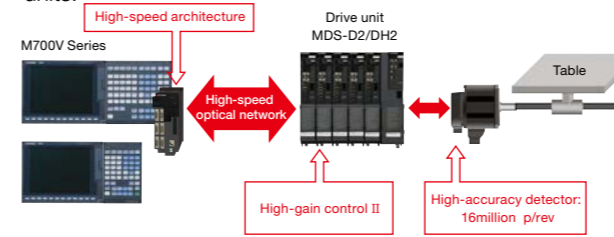
Specifications	Model name	Machining center system			Lathe system			Machining center system			Lathe system		
		M720VS	M730VS	M750VS	M720VS	M730VS	M750VS	M720VW	M730VW	M750VW	M720VW	M730VW	M750VW
Number of control axes													
Maximum number of control axes (NC axes + spindles + PLC axes)		12	16		12	16		12	16		12	16	
Maximum number of NC axes (in total for all the part systems)		8	16		12	16		8	16		12	16	
Maximum number of spindles		4			4			4			4		
Maximum number of PLC axes		6			6			6			6		
Maximum number of PLC indexing axes		4	6		4	6		4	6		4	6	
Maximum number of simultaneous contour control axes		4	8		4	8		4	8		4	8	
Maximum number of NC axes per part system		6	8		6	8		6	8		6	8	
Maximum number of part systems		2			2			2			2		
CF card in control unit mode		—			—			Available			Available		
Front IC card mode		Available			Available			Available			Available		
Hard disk mode		—			—			Available			Available		
Least command increment		0.1μm	1nm		0.1μm	1nm		0.1μm	1nm		0.1μm	1nm	
Least control increment		1nm			1nm			1nm			1nm		
Maximum program capacity		2,000KB (5,120m)			2,000KB (5,120m)			2,000KB (5,120m)			2,000KB (5,120m)		
Maximum PLC program capacity		128,000 steps			128,000 steps			128,000 steps			128,000 steps		
Display		8.4-type/10.4-type/10.4-type touch panel/15-type (selectable)						10.4-type/10.4-type touch panel/15-type/15-type touch panel (selectable)					
Keyboard		Sheet keys/clear keys (selectable)						Clear keys					
Windows® XP		—						Available					
MITSUBISHI CNC machine operation panel		Compatible						Compatible					

* Maximum specifications including optional specifications are listed.

Complete Nano Control



All operations from program values to servo commands are done in nanometer units. Interpolation is at the nano-unit level even when program commands are in micrometer units.

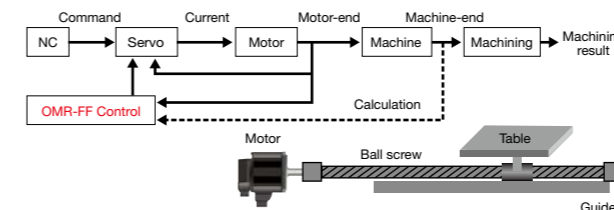


OMR-FF Control

Optimum Feed Forward



Unlike conventional control, which simply matches the motor path to the commands, OMR control calculates the machine's status based on a model and applies correction to motor control in order to match not the motor position, but the machine tool position to the commands.

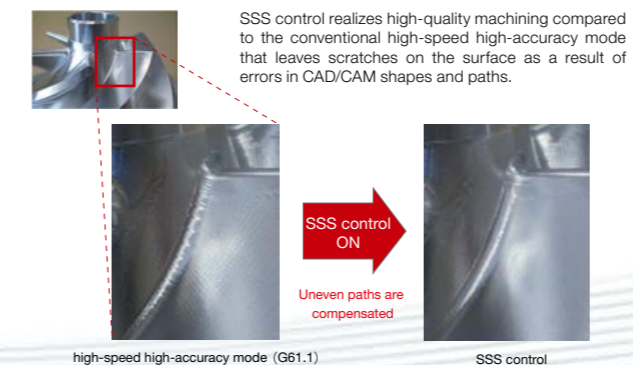


SSS Control (Machining Center System)

Super Smooth Surface



SSS control is now available for the most basic function of five-axis simultaneous interpolation control, tool center point control. It compensates uneven paths output from CAM to smoothly joint the tool center points' path. In addition, rotary axis pre-filter is available to move the rotary axis smoothly, which achieves high-grade cutting in five-axis simultaneous machining.



high-speed high-accuracy mode (G61.1)

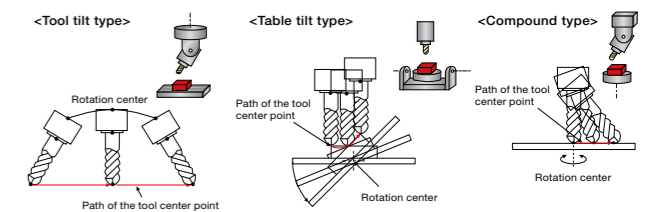
SSS control

Tool Center Point Control (Machining Center System)

*M750VS, M750VW only

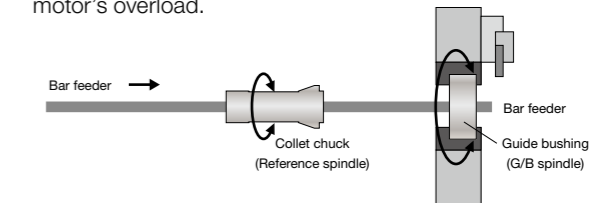


High-accuracy machining is realized by controlling each axis so that the tool center point moves linearly at a commanded feed rate even if the rotary axis moves in linear interpolation.



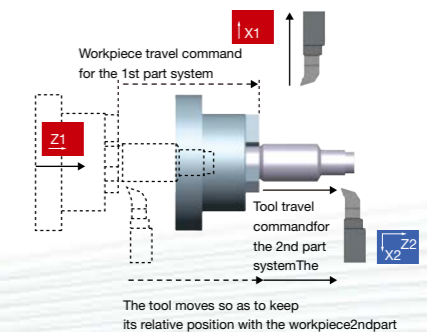
Guide Bushing Spindle Synchronization Control (Lathe System)

This function is for a machine with a spindle motor to rotate a guide bushing: This function allows the guide bushing spindle motor (G/B spindle) to synchronize with a reference spindle motor (Reference spindle). The position error compensation function reduces the spindle's vibration due to the workpiece's torsion, and the motor's overload.



Control Axis Superimposition (Lathe System)

- This function enables machining using a certain part system simultaneously with that of another part system by superimposing their movements.
- This is effective when machining in multiple part systems is executed simultaneously. It allows for an axis to shift its coordinate system relative to the system using the axis.



The tool moves so as to keep its relative position with the workpiece 2nd part

M70V Series

Global standard Mitsubishi CNC pursuing high speed and accuracy

Enhanced Machining Accuracy and Reduced Tact Time

- The minimum command unit of 0.1 μ m and minimum internal interpolation unit of 1nm allow highly accurate and smooth machining
- High-speed error compensation function is incorporated in spindle and servo controls, which enables high-speed and high-accuracy tapping, etc
- The high-speed PLC engine enhances the operation speed, contributing to cycle time reduction

Easy and Advanced Operation Contributing to Setup Time Reduction

- This CNC is equipped with pop-up screens that prevent operators from being bothered with screen hierarchy, and guiding function that displays guidance on operations, programs and alarms
- Ethernet interface is installed as standard; thus, program management can be easily realized
- A compact flash installed in front of the display allows storing of large-capacity NC programs and easy management of maintenance data
- Simple programming functions NAVI MILL and NAVI LATHE are installed

Compact Size Achieved

- Unit dimensions have been downsized by integrating a display with CNC control part, contributing to downsizing of control panel
- High visibility TFT color LCD is used. 8.4-type and 10.4-type displays are available



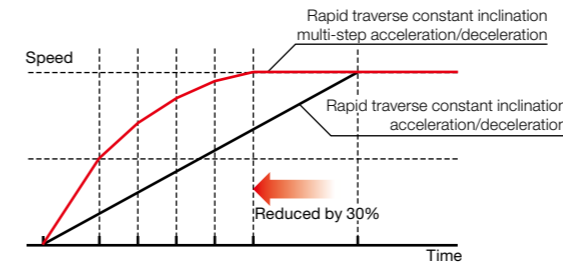
Main Specifications

Specifications	Model name	Machining center system		Lathe system	
		M70V TypeB	M70V TypeA	M70V TypeB	M70V TypeA
Number of control axes	Maximum number of control axes (NC axes + PLC axes + spindle)	9	11	9	11
	Maximum number of NC axes (in total for all the part systems)	5	8	5	9
	Maximum number of spindles	2	2	3	4
	Maximum number of PLC axes	6	6	6	6
	Maximum number of simultaneous contour control axes	4	4	4	4
Maximum number of part systems		1	2	1	2
Least command increment		0.1 μ m			
Least control increment		1nm			
Maximum program capacity		500KB [1,280m]	2,000KB [5,120m]	500KB [1,280m]	2,000KB [5,120m]
Maximum PLC program capacity		20,000 steps	32,000 steps	20,000 steps	32,000 steps
Display		8.4-type/10.4-type/10.4-type touch panel (selectable)			
Keyboard		Sheet keys/clear keys (selectable)			
HMI customization function		NC Designer			
MITSUBISHI CNC machine operation panel		Compatible			

* Maximum specifications including optional specifications are listed.

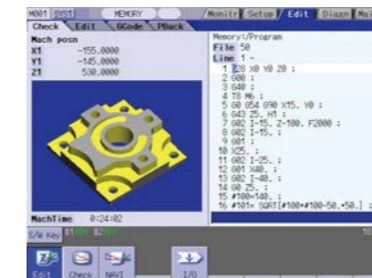
Rapid Traverse Constant Inclination Multi-step Acceleration/Deceleration Function (Machining Center System) High Speed Performance

- Rapid traverse acceleration/deceleration is performed according to the motor's torque characteristics.
- As the motor's characteristics can be utilized optimally, positioning time is reduced, and cycle time is improved.



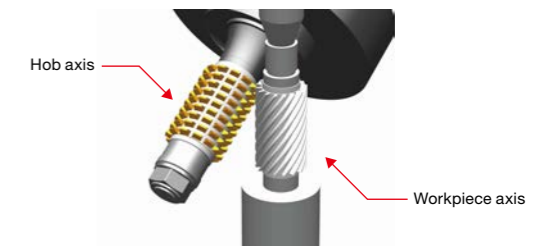
3D solid program check (Machining Center System) TypeA only

The added 3D solid model check function allows more realistic cutting check.



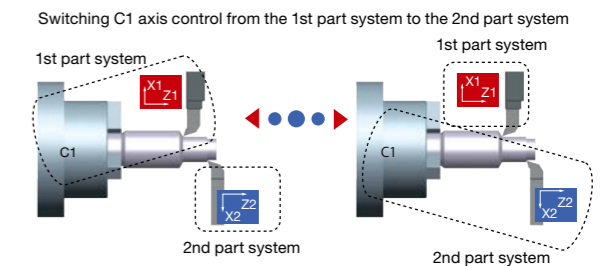
Hobbing (Lathe System) TypeA only

- G code format is available for hobbing.
- A spur gear can be machined by synchronously rotating the hob axis and the workpiece axis in a constant ratio. A heli-cal gear can be machined by compensating the workpiece axis according to the gear torsion angle for the Z axis movement.



Mixed Control(cross axis control) (Lathe System) TypeA only

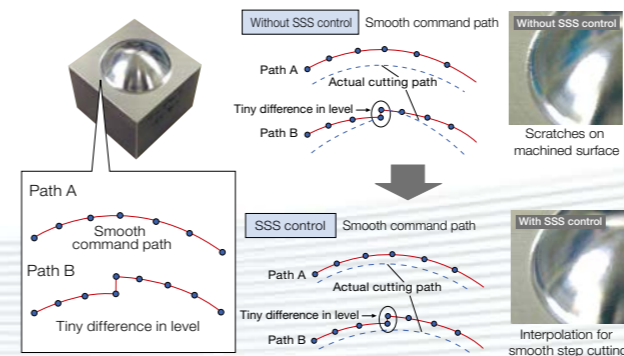
The control axes of each part system can be exchanged using a program command. This enables the axis defined as the axis of the 1st part system to be operated as the axis of the 2nd part system.



SSS Control(Machining Center System) SSS Control

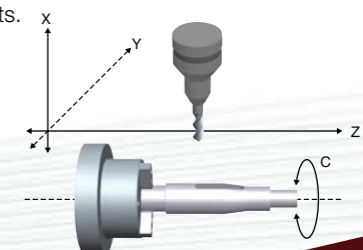
Super Smooth Surface TypeA only

By judging shapes in large from commanded paths, unnecessary deceleration is reduced even when fine steps exist; thereby, realizing smooth and deviation free die-mold machining. Machining time can be shorter by 5 to 30% relative to our conventional system, especially more effective at a higher feed rate. (Note) Additional hardware is required.



Polar Coordinate Interpolation(Lathe System)

- This function converts the commands programmed for the orthogonal coordinate axes into linear axis movements (tool movements) and rotary axis movements (workpiece rotation) to control the contours.
- It is useful for tasks such as cutting linear cutouts on the outside diameter of the workpiece and grinding camshafts.



E70 Series

Simple CNC Offering Easy Operability and High Cost Performance

Simple operations free operators from burden

- This CNC has the same screen structure as of M700V and M70V Series, allowing easy operations.
- Switching between milling and lathe systems is accomplished simply by changing the parameter.
- Various support tools help reduce initial setup time including the time for developing ladder programs and customized screens.

With the latest hardware installed, this CNC realizes high cost performance

- CNC control part integrated with a display provides compact size and high cost performance.
- Ethernet interface is installed as standard; thus, program management can be easily realized.
- Compatible with analog output, this CNC allows a spindle motor to be driven by an inverter.



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	2
	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 Designer	
MITSUBISHI CNC machine operation panel		Compatible	

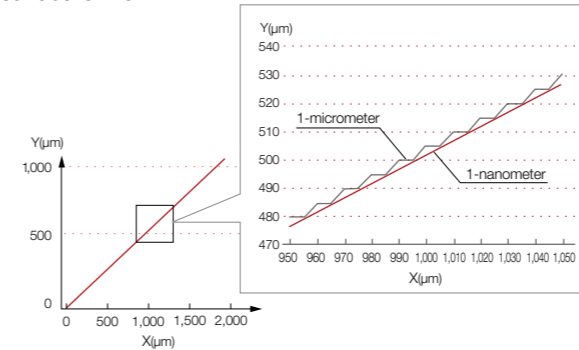
* Maximum specifications including optional specifications are listed.

Nano Control



Interpolation calculation accuracy improved

Even with one-micron-unit commands in the machining program, interpolation is in nanometer units. As the calculation accuracy of a block intersection is improved, lines on the surface is finer.

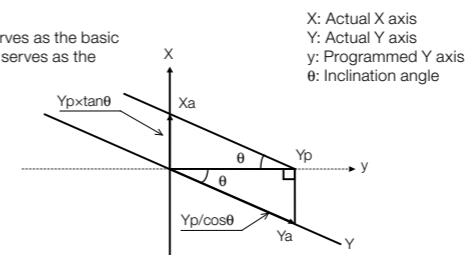


Inclined Axis Control (Lathe System)

- 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.

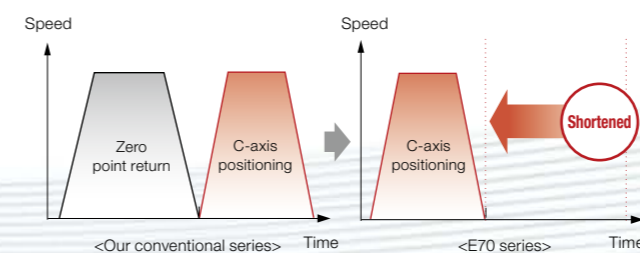
<Example of use>

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



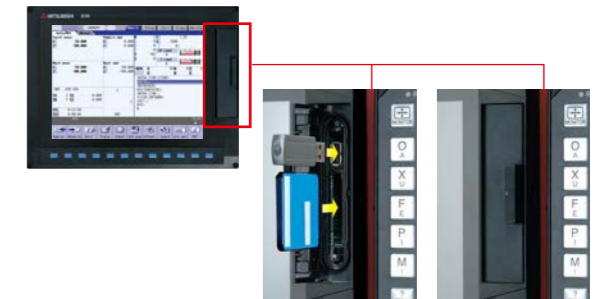
Spindle/C-axis Control

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



Memory Card/USB Memory Interface

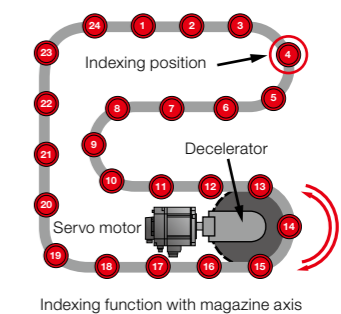
A compact flash memory card (CF card) /USB memory interface is located on the front of the display. In using CF card, the card slot can be completely covered by a lid so as to prevent foreign materials from entering (IP67).



PLC Axis

Indexing function

By setting the number of stations required for the application, the drive automatically sets up equal intervals between each station. Positioning of the axis is only possible by commanding the station number.



MITSUBISHI CNC Machine Operation Panel

PLC program samples have been prepared for the basic key layout, enabling the creation of suitable PLC programs for your machine simply by adding interface components with machine. Refer to the product brochure for details.



Example when combined with an 8.4-type display

User-friendly

for M700V Series & M70V Series & E70 Series

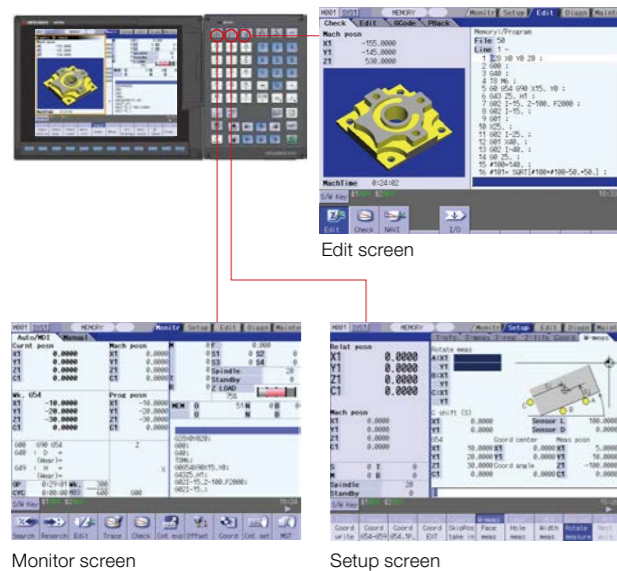
Human Machine Interface allowing easier and more visible use

HMI for Easier and More Visible Use

(HMI:Human Machine Interface)

Screen structure linking to the operation processes

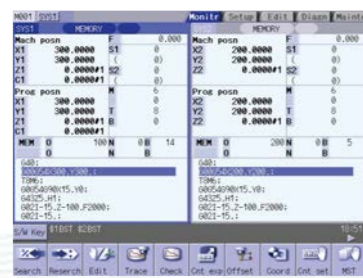
Operation processes are divided into three steps, "Monitor", "Setup" and "Edit", and necessary information is aggregated into three screens. These screens can be displayed by touching a single button on the keyboard.



Monitor screen Setup screen

2-part system display

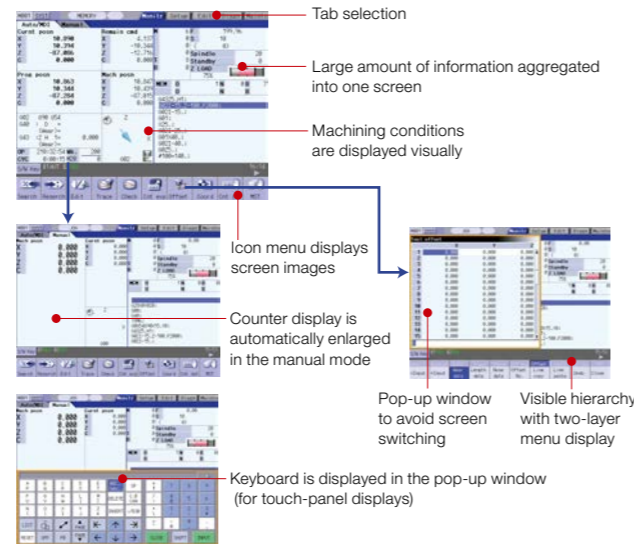
The Monitor screen of the 2nd part system can be displayed together with the 1st part system. Switching screens is not necessary.



2-part system display

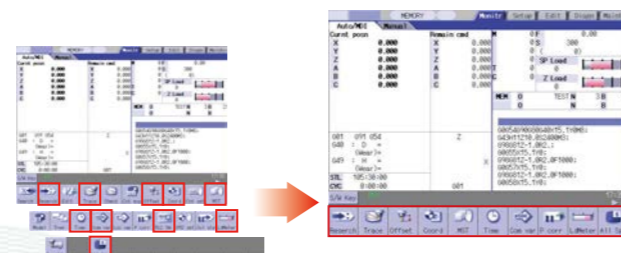
Pop-up screens

Tabs allow the user to select necessary operations from the operation menu, and pop-up screens allow the user to access desired information while the original screen remains displayed. For displays with a touch panel, a keyboard can be displayed on the screen.



Menu customization function

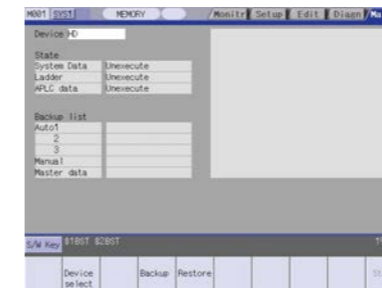
Menu keys on the bottom of the screen can be freely arranged. Frequently used menu keys can be put together on the first page.



Operation Support

Manual/Automatic backup function

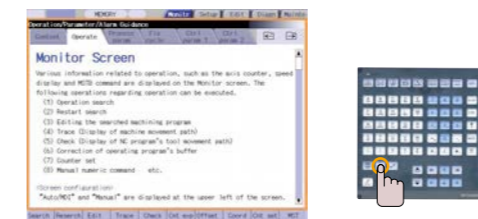
- Batch-backup of the NC data into the memory card/USB memory inserted in the front interface of the display is possible. For the built-in hard disk type M700V Series, backup in the hard disk is also possible.
- Data is automatically backed-up at a certain interval set by the parameter.



Manual/automatic backup function

Guidance function

By pressing the help button, guidance (operation procedure /parameter descriptions/alarm descriptions/G code format) regarding the currently displayed screen will be shown.



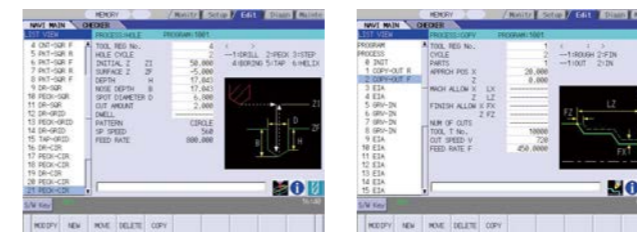
Simple Programming Functions with Simple Machining Menu

NAVI MILL (Machining center system) / NAVI LATHE (Lathe system)

* M700V Series, M70V Series only



- 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.
- This function also supports inclined surface machining.

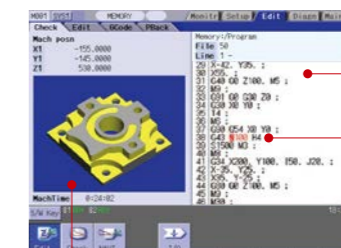


NAVI MILL (Machining center system)

NAVI LATHE (Lathe system)

Program input error warning function

- The added 3D solid model check function allows more realistic cutting check.¹
- This function helps an operator to input and check programs. Errors are indicated when a decimal point is omitted.²



Integration of program check and editing functions

Decimal point omitted: A decimal point has been left out of the address data

Program check based on a 3D solid model

¹ Available with M700V Series, M70V TypeA (M System) only.
² Available with M700V Series only.

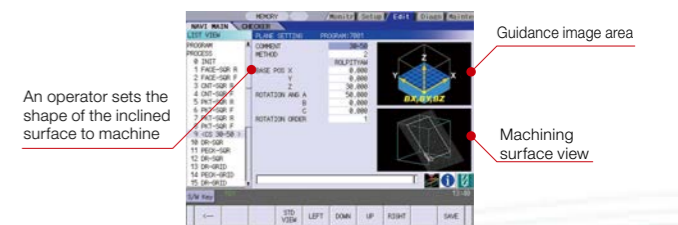
Menu list

Menu list buttons are newly introduced. With these buttons, the screen desired for display can be called up directly. The selected screen's function outline is also displayed.



Shortcut icons to each screen

Outline of the selected function appears



An operator sets the shape of the inclined surface to machine

Guidance image area

Machining surface view

C70 Series

iQ Platform-compatible CNC, providing the largest effect on TCO reduction

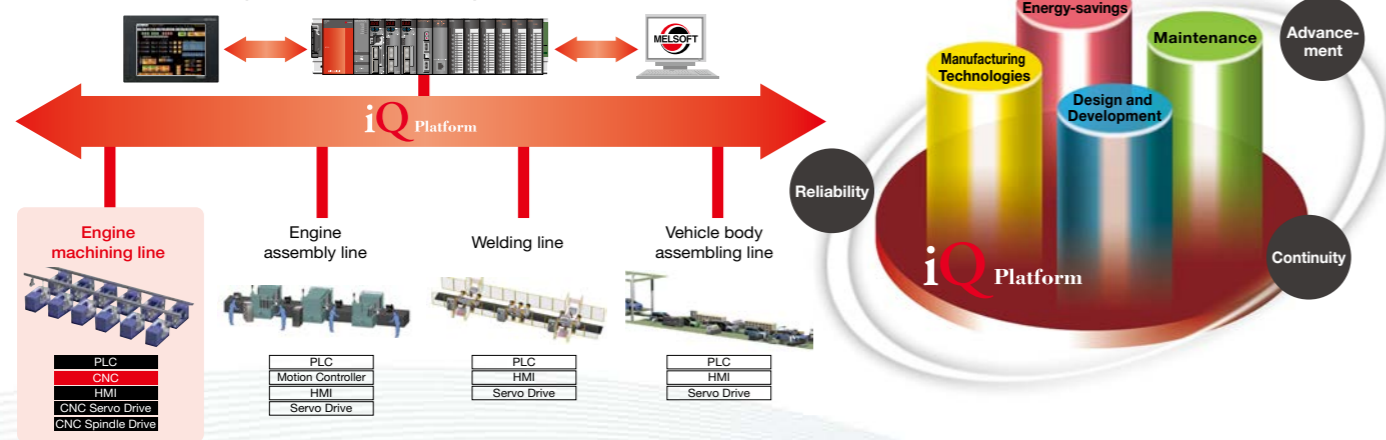
- A CNC structured in building block method on iQ Platform
- Compact and high-speed CNC CPU module "Q173NCCPU" equipped with the multi-axis and multi-part system control
- Ultrahigh-speed connection between ultrahigh-speed PLC CPU module MELSEC QnUD (H) CPU and CNC CPU
- Variety of modules for power supply, input/output interface, network and measurement are available
- "Mitsubishi Graphic Operation Terminal GOT2000/GOT1000", an easily customizable HMI with high performance and multiple functions
- Compatible with MELSOFT, easy-to-use engineering tools with multiple functions



Main Specifications

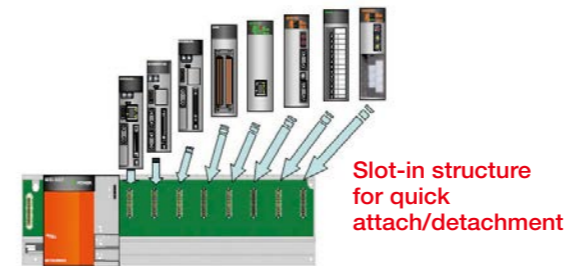
Specifications	Model name C70	
	Machining center system	Lathe system
Number of control axes	Number of basic control axes (NC axes)	3
	Maximum number of control axes (NC axes + spindles + PLC axes)	16
	Maximum number of NC axes (total for part systems)	16
	Maximum number of spindles	7
	Maximum number of PLC axes	8
	Number of simultaneous contouring control axes	4
Number of control part systems	Maximum number of NC axes in a part system	8
	Standard number of part systems	1
	Maximum number of part systems	7
PLC function	Program capacity [K steps]	Select from among 30/40/60/100/130/260
	Maximum number of files to store	124/252
	Number of input/output points	4,096

iQ Platform makes it possible to structure optimum controllers for various lines.



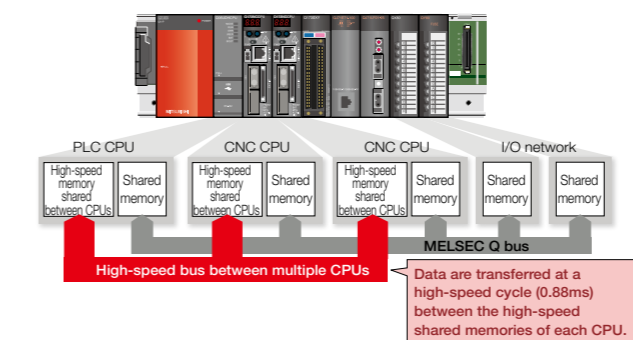
Building Block Type

- Variety of network modules for Mitsubishi PLC MELSEC-Q Series are available.
- Motion controllers and robots are compatible with iQ Platform, enabling system expansion.



Ultrahigh-speed network between CNC CPUs and PLC CPUs

For data transfer between CNC CPUs and PLC CPUs, we have newly developed a dedicated high-speed bus. Data are transferred at a high-speed cycle (0.88ms) between the high-speed shared memories of each CPU, so each CPU speed can be fully utilized.



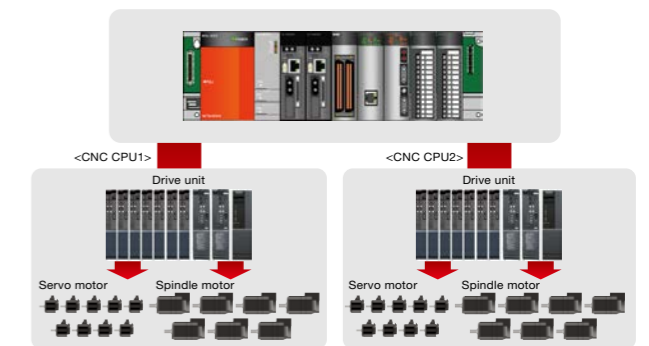
Q PLC

Sequence processing time is widely accelerated, including 3.5 times faster basic instruction performance compared to our conventional one. Reduced scan time also reduces the tact time.

■ Basic command performance	Q PLC	Approx. 3.5 times
	Conventional PLC	
■ Floating-point arithmetic performance	Q PLC	Approx. 13 times
	Conventional PLC	
■ PCMIIX value	Q PLC	Approx. 6 times
	Conventional PLC	

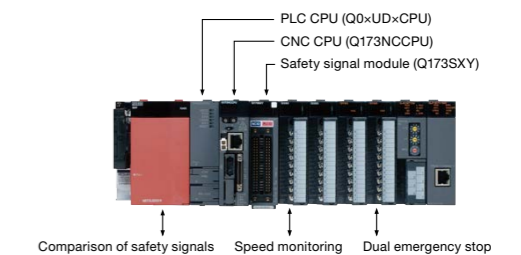
Multi-axis, Multi-part System Control

One CNC CPU module up to 7 part systems and 16 axes. Up to two CNC CPU modules can be installed on iQ Platform.



Safety Observation Function

This function enables safety signal comparison, speed observation and duplexed emergency stop. This function complies with the European safety standard EN ISO 13849-1 PL d.



GOT Displays

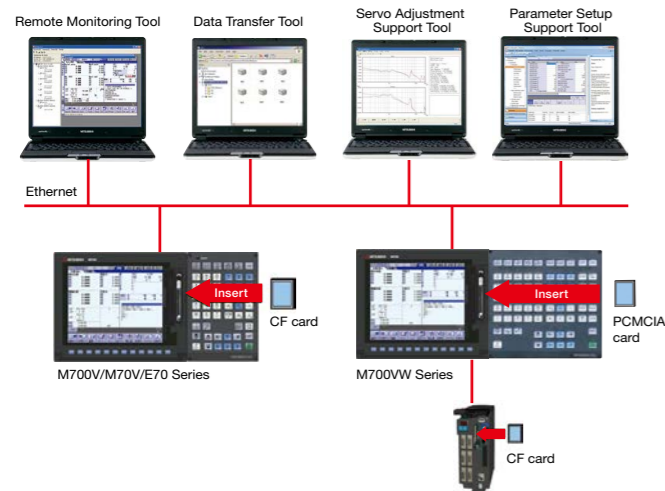
- Customized screens can be easily developed with the GOT Screen Design Software (GT Works3). It is possible to operate a machine via a touch panel instead of a conventional machine operation panel.
- NC Monitor is installed in SVGA and XGA models as standard, which enables setting of each NC data and editing of machining programs, etc.



*Customized screen image

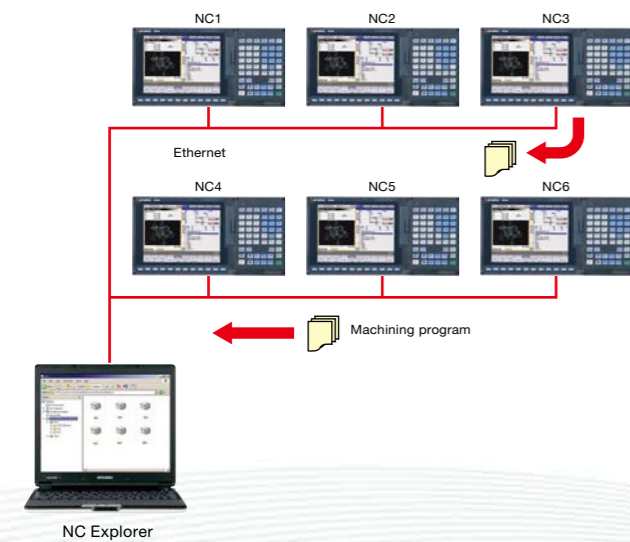
User Support Tools/Development Tools

User Support Tools Provide an Improved CNC Environment
Rich Development Tools Help Bring out the Uniqueness of CNCs



NC Explorer M700V M70V E70 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.



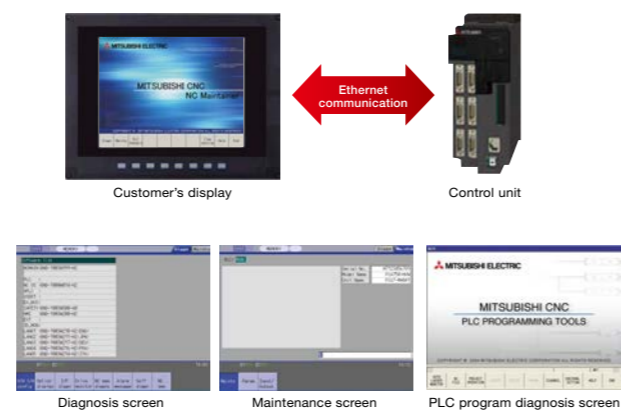
NC Trainer/NC Trainer plus M700V M70V E70 MITSUBISHI CNC Training Tool

- NC Trainer is an application for operating the screens of MITSUBISHI CNC M700V/M70V/E70 Series and machining programs. This application can be used for learning operating CNC and checking the operations of the machining programs.
- NC Trainer plus can also be used for checking the PLC program and custom screens.



NC Maintainer M700VW

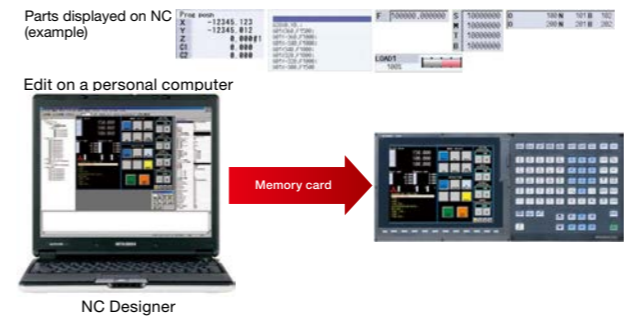
A software tool for a personal computer to carry out maintenance (such as parameter setting, NC diagnosis and PLC program diagnosis) of MITSUBISHI CNC on customer's display.



* An operation check is required in combination with software installed on the display.

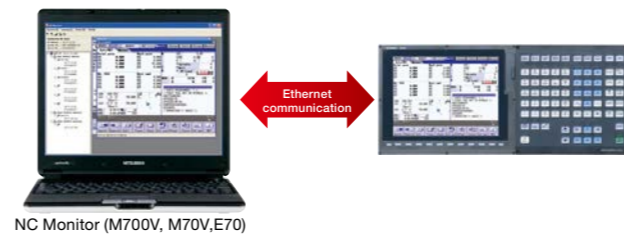
NC Designer M700V M70V E70 Screen Design Tool

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



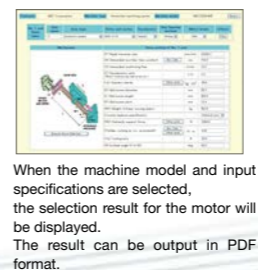
NC Monitor M700V M70V E70 /Remote Monitor Tool C70 Remote Monitoring Tool

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. Remote Monitor Tool (C70) is free of charge. please contact us.



Servo Selection Tool M700V M70V E70 C70

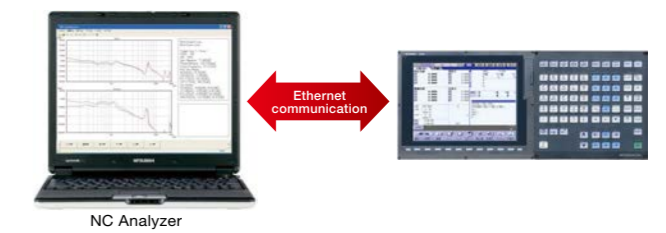
By selecting the machine configuration model and inputting the machine specifications, the optimal servo motor meeting specifications can be selected. Other selection functions which fully support drive system selection are also available. This tool is free of charge. Please contact us.



<Main functions>
Servo motor capacity selection, regenerative resistor capacity selection, spindle acceleration/deceleration time calculation, power supply capacity selection, power supply facility capacity calculation, etc.

NC Analyzer M700V M70V E70 C70 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



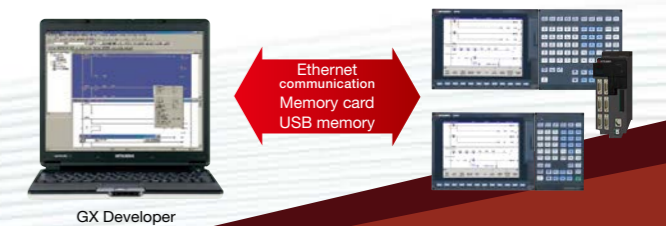
NC Configurator2 M700V M70V E70 C70 Parameter Setup Support Tool

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.)



GX Developer M700V M70V E70 C70 Sequence Programming Tool

The MELSEC programming tool, offering a wide array of functions and easy use, allows for convenient program design and debugging. Linking with a simulator or other utility allows for the efficient creation of desired programs.



Automation Related Products

PLC | MELSEC-Q Series Universal Model



Introducing the high-speed QCPU (QnUDVCP) for faster processing of large data volumes.

- ◎Realize high-speed, high-accuracy machine control with various iQ Platform compatible controllers and multiple CPUs.
- ◎Easily connect to GOTs and Programming tools using built-in Ethernet port.
- ◎25 models from 10k step small capacity to 1000k step large capacity, are available.
- ◎Seamless communication and flexible integration at any network level.

Product Specifications

Program capacity	10k steps to 1000k steps
Number of I/O points [X/Y], number of I/O device points [X/Y]	256 points to 4096 points/8192 points
Basic instruction processing speed (LD instruction)	120 ns to 1.9 ns
External connection interface	USB (all models equipped), Ethernet, RS-232, memory card, extended SRAM cassette
Function module	I/O, analog, high-speed counter, positioning, simple motion, temperature input, temperature control, network module
Module extension style	Building block type
Network	Ethernet, CC-Link IE controller network, CC-Link IE field network, CC-Link, CC-Link/LT, MELSECNET/H, SSCNET III (/H), AnyWire, RS-232, RS-422

Magnetic Starter | MS-T Series



Exceed your expectations.

- ◎10A frame model is over 16% smaller with a width of just 36mm!!
- ◎New integrated terminal covers.
- ◎Reduce your coil inventory by up to 50%.
- ◎Be certified to the highest international levels while work is ongoing to gain other country.

Product specifications

Frame	10 A to 32 A
Applicable standards	Certification to various standards including IEC, JIS, CE, UL, TÜV, CCC.
Terminal cover	Standard terminal cover improves safety, simplifies ordering, and reduces inventory, etc.
Improved wiring	Wiring and operability are improved with streamlining wiring terminal BC specifications.
Operation coil rating	Wide range of operation coil ratings reduces number of coil types from 14 (N Series) to 7 types and simplifies selection.
Option units	Diverse lineup includes Auxiliary Contact Block, Operation Coil Surge Absorber Unit, Mechanical Interlock Unit.

Robot | MELFA F Series



High speed, high precision and high reliability industrial robot

- ◎Compact body and slim arm design, allowing operating area to be expanded and load capacity increased.
- ◎The fastest in its class using high performance motors and unique driver control technology.
- ◎Improved flexibility for robot layout design considerations.
- ◎Optimal motor control tuning set automatically based on operating position, posture, and load conditions.

Product Specifications

Degrees of freedom	Vertical:6 Horizontal:4
Installation	Vertical:Floor-mount, ceiling mount, wall mount (Range of motion for J1 is limited) Horizontal:Floor-mount
Maximum load capacity	Vertical:2-20kg Horizontal:3-20kg
Maximum reach radius	Vertical:504-1503mm Horizontal:350-1,000mm

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.

* Trademarks
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 Other company and product names that appear in this manual are trademarks or registered trademarks of the respective companies.

Global Service Network

Overseas Service Network

AMERICA

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500 CORPORATE WOODS PARKWAY, VERNON HILLS, ILLINOIS 60061, U.S.A.
TEL: +1-847-478-2500 / FAX: +1-847-478-2650

Michigan Service Satellite
ALLEGAN, MICHIGAN 49010, U.S.A.
TEL: +1-847-478-2500 / FAX: +1-847-478-2650

Ohio Service Satellite
LIMA, OHIO 45801, U.S.A.
TEL: +1-847-478-2500 / FAX: +1-847-478-2650
CINCINNATI, OHIO 45201, U.S.A.
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Minnesota Service Satellite
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TEL: +1-847-478-2500 / FAX: +1-847-478-2650

West Region Service Center
16900 VALLEY VIEW AVE., LAMIRADA, CALIFORNIA 90638, U.S.A.
TEL: +1-714-699-2625 / FAX: +1-847-478-2650

Northern CA Satellite
SARATOGA, CALIFORNIA 95070, U.S.A.
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Pennsylvania Service Satellite
PITTSBURG, PENNSYLVANIA 15644, U.S.A.
TEL: +1-732-560-4500 / FAX: +1-732-560-4531

Connecticut Service Satellite
TORRINGTON, CONNECTICUT 06790, U.S.A.
TEL: +1-732-560-4500 / FAX: +1-732-560-4531

South Region Service Center
1845 SATTELITE BOULEVARD STE. 450, DULUTH, GEORGIA 30097, U.S.A.
TEL: +1-678-258-4529 / FAX: +1-678-258-4519

Texas Service Satellites
GRAPEVINE, TEXAS 76051, U.S.A.
TEL: +1-678-258-4529 / FAX: +1-678-258-4519
HOUSTON, TEXAS 77001, U.S.A.
TEL: +1-678-258-4529 / FAX: +1-678-258-4519

Tennessee Service Satellite
Nashville, Tennessee, 37201, U.S.A.
TEL: +1-678-258-4529 / FAX: +1-678-258-4519

Florida Service Satellite
WEST MELBOURNE, FLORIDA 32904, U.S.A.
TEL: +1-678-258-4529 / FAX: +1-678-258-4519

Canada Region Service Center
4299 14TH AVENUE MARKHAM, ONTARIO L3R 0J2, CANADA
TEL: +1-905-475-7728 / FAX: +1-905-475-7935

Canada Service Satellite
EDMONTON, ALBERTA T5A 0A1, CANADA
TEL: +1-905-475-7728 FAX: +1-905-475-7935

Mexico Region Service Center
MARIANO ESCOBEDO 69 TLALNEPANTLA, 54030 EDO. DE MEXICO
TEL: +52-55-3067-7500 / FAX: +52-55-9171-7649

Monterrey Service Satellite
MONTERREY, N.L., 64720, MEXICO
TEL: +52-81-8365-4171

BRAZIL

MELCO CNC do Brasil Comércio e Serviços S.A
Brazil Region Service Center
ACESSO JOSE SARTORELLI, KM 2.1 CEP 18550-000, BOITUVA-SP, BRAZIL
TEL: +55-15-3363-9900 / FAX: +55-15-3363-9911

EUROPE

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