eco Chang



FACTORY AUTOMATION

MITSUBISHI CNC E80 Series



E80 Series

The CNC E80 Series boasts drastic improvements in performance and a higher accuracy than ever before. The simple and easy-to-use E80 Series helps in achieving a greater cost performance, and fits best with simple machine configurations.





Specifi E70 E80 T\ E80 TypeB Max. number of part syster Max. number of axes Max. number of NC axes Max. number of spindles



Leading design

Models for various machine

TypeA and TypeB models are available for

both machining centers and lathes. Select

the model with the specifications that suit the

TypeB supports machines with up to 3 axes.

TypeB controls 3 feed axes and 2 spindles as

standard. Select TypeA for configurations that

have a maximum of 3 spindles such as

TypeA supports the setup of a rotary table.

configurations

machine configuration best.

[Machining center system]

TypeA/TypeB

[Lathe system]

compound lathes.

Display Units and Keyboards The E80 Series adopts the M800/M80 Series design. The display unit and keyboard are only 9.5 mm thick, and their flat profile opens up new possibilities for machine design. There are 2 types of keyboard layouts, one for lathes and the other for milling.

CNC SYSTEM CONFIGURATIONS

E80 Series Display-integrated Control Unit & Keyboard



The Best Partner for Your Success

CNC SYSTEM CONFIGURATIONS

[Examples of E80 Series system configurations]

ENHANCED LATHE SYSTEM



Error at corner

Error at arc

X 200.000

The E80 Series comes with enhanced high-accuracy control functions for lathes with milling functions as standard. Functions such as the interactive cycle insertion function make programming easier, improving operability.



Pursuing usability The Simple Monitor Screen

The simple monitor screen puts all the essential information for mass production on one screen, making it simple to find information immediately. Information such as the selected tool and the remaining lifetime can be checked by viewing the tool icon.



E80A(L) E80B(L) E80A(M)

High-accuracy control OFF High-accuracy control ON

Reduce setup time Workpiece Coordinate System Shift

The same machining program can be used when the workpiece coordinate system does not match the actual workpiece coordinate system, or when the actual workpiece length is different. This function helps to create machining programs easier.

Improved machining accuracy High-accuracy Control

E80 Series high-accuracy control minimizes deviation of the actual tool path from the command path, improving the accuracy of the machining of corners and arcs.

EBOA(L) EBOB(L) EBOA(M) EBOB(M) Flexible of Diameter designation Radius designation Flexible commute the second se

X 100.000

Flexible commands Diameter/Radius Designation Switch

Flexible commands allow the user to switch between diameter/radius designation for each axis with the G-code at any time. Flexible commands are particularly useful for programs where turning and milling coexist.







3

LATHE SYSTEM

E80A(M) E80B(M)

Applicable to a wide array of machine specifications Synchronous Tapping with Analog I/F Spindle

Synchronous tapping can be performed with an analog-connected spindle such as an inverter without using a dedicated tool holder. The applicability to a wide array of machine specifications allows for more efficient machining.

Easier program creation Interactive Cycle Insertion

Create a machining program automatically simply by inserting a machining shape in a selected machining cycle. Interactive cycle insertion enables the user to create programs intuitively while referring to drawings on the screen, reducing the time required for program creation compared with G-code input.

Easier program creation Finish Shape View Programming

The finished shape is displayed in 3D while creating a machining program. Checking the finished shape in real-time during program creation allows the user to correct mistakes as they appear in the finished shape.

Easier program creation Program Check Operation

Check the machining program while viewing the actual operation of the machine. Also, forward run/reverse run operation can be checked meticulously at a desired feedrate (manual handle feed), making prototype checks more accurate and easier than before.

Program finalization 3D Solid Program Check

3D solid program check allows the user to check a finalized machining program against the 3D graphic of the final shape for the program.

Being able to perform a detailed check of the final shape before production on the actual machine is a major advantage.

ENHANCED MACHINING CENTER SYSTEM



The eSSS control function responds to the growing demand for high-quality machining even in basic machine configurations. The E80 Series reduces non-cutting time, improving productivity at production sites.





The simple monitor screen puts all the essential information for mass production on one screen, and is easy to view from

distance. The screen configurations (simple/normal), and the types of counters being displayed can be changed using the screen menu, making the customization of displays easier than before.



Reduce setup time Workpiece Position Measurement

The coordinate points can be measured on the workpiece measurement screen, and values automatically calculated from the measured coordinates are set. Manual measurements using jigs or dial gauges are no longer necessary.



Applicable to a wide array of machine specifications Synchronous Tapping with Analog I/F Spindle

Synchronous tapping can be performed with an analog-connected spindle such as an inverter without using a dedicated tool holder. The applicability to a wide array of machine specifications allows for more efficient machining.









MACHINING CENTER SYSTEM

Applicable to a wide array of machine specifications Multiple-axis Synchronization Control

This function enables the synchronous control of multiple Z axes. Synchronizing multiple axes enables the controlling of machines that perform the same operation over multiple axes such as multi-head machines. The tool length for each Z axis can be compensated individually, and it improves machining accuracy.

Contribute to high-accuracy machining OMR-FF Control

OMR-FF control adjusts the optimal position loop gain for each axis, leading to smoother and more accurate machining.

Contribute to high-quality machining eSSS Control^{*1}

When the tool passes through the corner portion at high acceleration and high speed, eSSS control determines the machining shape comprehensively, suppresses excessive feedrate change and vibration, and smoothens the operation.

This ensures consistent high-quality machining which is not affected by the quality of machining programs.

- *1 The control process of this function is equivalent to "SSS Control" (Super Smooth Surface Control) of the M800/M80 Series. Some of the relevant parameters are fixed for this
- function, however, "SSS Control" can be used by making some simple settings.

Easy operation, high quality Tolerance Control

This function obtains the optimum clamp speed for corners or curves based on the designated tolerance to perform operations. It also ensures smooth passing in corner sections within the tolerance range, which suppresses machine vibrations. The cycle time is reduced because the clamp speed can be increased to a higher speed than usual.

Simply set the amount of tolerance, and the machine operates at the optimal speed and tool path, making it easy to achieve a high-quality machined surface.

FACTORY-WIDE OPTIMIZATION







Enhanced traceability helps visualize factory-wide operation **MES Interface Library**

E80 Series CNC is equipped with the MES interface function, through which the CNC automatically sends SQL statements to the production control system database upon completion of cutting or occurrence of an alarm. This can significantly increase traceability throughout the factory. This transparency helps optimize production planning and management. Quality control can also be easier through visualization of alarm history and the production results based on the basic unit specific to each workpiece.

Moreover, when control is combined with the EcoMonitorLight power consumption monitor and the thermal sensor unit, operators can monitor not only CNC status, but also the energy consumed by the machines.

Remote confirmation of machine status **Email Notification to Operator**

This sends you an e-mail about machine condition automatically at the specified timing to a computer, tablet or smartphone. No dedicated line is needed, so you can set up easily.

Machine condition can be monitored at anytime, anywhere. This helps you to deal with emergent situations timely, leading to shorter downtime and higher productivity.

Wider compatibility with peripheral devices **Connection to Various of Field** Networks

By inserting an optional card in the slot on the back of the display unit, CNC can support CC-Link (master/local), PROFIBUS-DP (master), and EtherNet/IP connections, making it possible to connect with many peripheral devices through a wide range of field networks.

SPECIFICATIONS

	Max. number of axes (NC axes + Spindles + PLC axes)					
	Max. number of NC axes (in total for all part systems)					
Number of control axes	Max. number of spindles					
	Max. number of PLC axes					
	Number of simultaneous contouring control axes					
Max. number of part system	15					
Display unit-side High-spee	d program server mode					
Front-side SD card mode						
Least command increment						
Least control increment						
Program memory capacity (number of programs stored)					
Max. number of tool offset s	sets					
Built-in PLC capacity [numb	per of steps]					
Multi-program [number of p	orograms]					
Multi-project [number of pro	ojects stored]					
Macro program Variable con	mmand					
Machine tool builder macro						
Workpiece coordinate system shift						
3D solid program check						
Manual arbitrary reverse ru	n (program check operation)					
Interactive cycle insertion						
Diameter/Radius designation	on switch					
Synchronous tapping with a	analog I/F spindle					
Workpiece position measurement						
Simple inclined surface made	chining command					
High-accuracy control (G61	.1/G08)					
eSSS control						
Tolerance control						
OMR-FF						
Spindle-mode servo motor	control					
Finish shape view programm	ning					
Email notification to operate	or					
Operation history (detailed a	alarm history information)					
CC-Link (Master/Local)						
PROFIBUS-DP (Master)						
EtherNet/IP						
MES interface library						
EcoMonitorLight connection	n					
System lock						

(*1) Up to one rotary axis Trademarks

MELSEC, CC-Link, CC-Link/LT and CC-Link IE are either trademarks or registered trademarks of Mitsubishi Electric Corporation in Japan and/or other countries. Ethernet is a registered trademark of Xerox Corporation in the United States and/or other countries Microsoft® and Windows® are either trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. SD logo and SDHC logo are either registered trademarks or trademarks of LLC. PROFIBUS-DP is a trademark of Profibus International

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

SPECIFICATIONS

		E80 S	eries	es			
	Lathe	system	Machining center system				
	ТуреА	ТуреВ	ТуреА	ТуреВ			
	8	5	6	4			
	5	4	5 (*1)	3			
	3	2	1	1			
	3	3	2	0			
	4	4	4	3			
	01	01	01	01			
	0	0	0	0			
	0	0		0			
	0.1µm	0.1µm	0.1µm	1µm			
	1nm	1nm	1nm	1nm			
	230KB [600m] (400 programs)	230KB [600m] (400 programs)	500KB [1280m] (1000programs)	500KB [1280m] (1000programs)			
	99 sets	99 sets	200 sets	99 sets			
	○20000	○20000	○20000	○20000			
	○60	○60	○60	○60			
	<u></u> 1	01	01	01			
	600 sets	200 sets	600 sets	200 sets			
	0	0	0	0			
	0	0	-	-			
	0	0	0	0			
	0	0	-	-			
	0	0	0	0			
	0	0	-	-			
	0	0	0	0			
	-	-	0	0			
	-	-	0	-			
	0	0		-			
	0	0	0	-			
	0	0	0	-			
1	0	0	0	0			
	0	0	-	-			
	0	0	-	-			
	0	0		0			
	0	0	0	0			
	0	0	0	0			
	0	0		0			
	0	0	0	0			

DRIVE SYSTEM

Drive unit



High-performance Servo/ Spindle Drive Units MDS-E/EH Series

- •The servo control-dedicated core processor realizes improved control speed, leading to enhanced basic performance. When combined with a higher resolution motor sensor and advanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.
- •The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors.
- · Improved diagnostic and preventive-maintenance features.
- •Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.

Servo motors



Multi-hybrid Drive Units MDS-EM/EMH Series

•The multi-hybrid drive units are capable of driving a maximum of three servo axes and one spindle. This contributes to the downsizing of machines and offers technical advantages. •The motor power connector is equipped with an anti-misinsertion mechanism. This helps to eliminate connection errors. Safe Torque Off (STO) and Safe Brake Control

(SBC) are also incorporated as additional safety features. •Fan unit contributes to easier fan exchange. •MDS-EMH 400V system drive unit is available.



All-in-one **Compact Drive Units MDS-EJ/EJH Series**

·Ultra-compact drive units with built-in power supplies contribute to smaller control panel size

. The 2-axis type is added for further downsizing. •The servo control-dedicated core processor realizes an increase in control speed, leading to improved basic performance. When combined with a higher resolution motor sensor and enhanced high-speed optical communication, this drive contributes to high-speed, high-accuracy control.

• Safe Torque Off (STO) and Safe Brake Control (SBC) are also incorporated as additional safety features.

•MDS-EJH 400V system drive unit is available (Note 1).



Spindle motor





High-performance Spindle Motors SJ-D Series

·Motor energy loss has been significantly reduced by optimizing the magnetic circuit. •High-speed bearings are incorporated as a standard feature, helping to achieve higher speed, lower vibration and improved durability. ·Range:

Normal SJ-D Series 3.7 to 11 [kW] Compact & light SJ-DJ Series 5.5 to 15 [kW] •Maximum speed 10,000 or 12,000 [r/min]

High-output, High-torque Spindle Motors SJ-DG Series

•Addition of S3 rating (%ED rating) has improved output and torque acceleration/deceleration characteristics. ·Balance adjustment ring added to the counter-load side for fine tuning. Range S3 rating: 5.5 to 15 [kW]

•Maximum speed 10,000 or 12,000 [r/min]







Medium-inertia, High-accuracy, Linear **High-speed Motors HĞ Series**

- •Sensor resolution has been significantly improved. The servo motors, which boast smooth rotation and outstanding acceleration capabilities, are well-suited to serve as feed axes of machine tools. •Range: 0.2 to 9 [kW]
- •Maximum rotation speed:
- 4,000 or 5,000 [r/min]
- ·Safety support sensors are included as standard specification. Sensor connectors are screw-locked and have enhanced vibration resistance. Three sensor resolutions (i.e., 1, 4 and 67 million pulses/rev) are available. •This can also be used as a tool spindle motor. ·Small-sized connector allows horizontal cable connection, which helps to save space in machines. (Note 2)

Servo Motors LM-F Series

•Use in clean environments is possible since no ball screws are used, eliminating possible contamination from grease. •Elimination of transmission mechanisms, including backlash, enables smooth, quiet

operation even at high speeds. ·Range:

Maximum thrust: 900 to 18,000 [N·m]

Direct-drive Servo Motors TM-RB Series

•High-torque, direct-drive motors combined with high-gain control provide quick acceleration and positioning, which makes rotation smoother.

·Suitable for rotary axes that drive tables or spindle heads. Range:

Maximum torque: 36 to 1,280 [N·m]





Built-in **Spindle Motors SJ-BG Series**

•The electrical design has been optimized to increase the continuous rated torque per unit volume, contributing to the downsizing of spindle units. ·Options for mold specification and cooling

jacket specification are prepared.

spindles. •Product line: 0.75 to 1.5 [kW] •Maximum rotation speed: 8,000 [r/min] ·Small-sized connector allows horizontal cable connection, which helps to save space in machines. (Note 2)

HG-JR Series

(Note 1) For servo motors only (Note 2) Options supported. (Flange size 90SQ only) * Use Mitsubishi CNC's dedicated drive unit and motor.

DRIVE SYSTEM





Low-inertia, High-speed Spindle Motors **SJ-DL Series**

- •This series of spindle motors is dedicated to use in tapping machines that require faster drilling and tapping.
- •The latest design technologies have made it possible to attain lower vibration and greater rigidity even with the lighter weight.
- •Range 0.75 to 7.5 [kW]

Tool Spindle Motors

·Compact tool spindle motors are designed to have the small, high-output characteristics of servo motors yet offer high-speed rotation (8,000r/min). These motors contribute to downsizing spindle size, like rotary tool

For details on each software tool, refer to the software tools catalog (BNP-A1224).

SOFTWARE TOOLS *Scheduled for release

Process flow from machine design and development to operation and maintenance

	Machine design	Ele	ctrical circuitry design		Machine assembly and adjustment		Operation and maintenance
•NC	-related processes						
	Servo selection	(Custom screen creation		Parameter creation		Training
S 🔏	NC Servo Selection		NC Designer2	6	NC Configrator2		NC Trainer2
			Debug		Servo/spindle adjustment		Operation
		₽ _ e	NC Trainer2 plus		Machine adjustment		Maintenance
				4	NC Analyzer2	E	NC Explorer
						M	NC Monitor2

•Machine design



•Electrical circuitry design



MTB can customize screens easily. Two types of screen development methods are available; the interpreter system (programming without C++) for simple screen development, and the compiler system with a complex controller (programming with C++).

•Machine assembly and adjustment



[NC Configurator2]

NC parameters required for NC control or machine operation can be edited on a computer. It is also possible to create initial parameters simply by inputting the machine configuration. ងា

programming of the user PLC to be developed

the operations of customized screens.

by machine tool builders and debug it and check

•Machine assembly and adjustment



•Operation and maintenance



NC Monitor2

Application development support



SOFTWARE TOOLS

[NC Analyzer2]

Servo parameters can be adjusted automatically by measuring and analyzing machine characteristics. Measurement and analysis can be done by running a servo motor using the machining program for adjustment, or using the vibration signal. This function can sample various types of data.

[NC Trainer2]

NC Trainer2 plus supports customization development; it helps to program the ladder programming of the user PLC to be developed by machine tool builders and debug it and check the operations of customized screens.

[NC Explorer]

CNC machining data can be managed using Windows® Explorer on a computer when the computer is connected to multiple CNCs via Ethernet.

[NC Monitor2]

Taking advantage of connection with a factory network, CNC operation status can be monitored from remote locations. Several CNCs can be connected and monitored simultaneously.

[Mitsubishi CNC Communication Software (FCSB1224W000)]

This software provides a bunch of API functions. They facilitate development of an Windows application which requires connection and communication with Mitsubishi CNC^(*). You can use the common interfaces for any Mitsubishi CNC model, which leads to high efficiency in development.

(*) The compatible model is Mitsubishi CNCs after M700/M70.

Ethernet







E



GLOBAL SALES & SERVICE NETWORK

Providing reliable services in regions around the world - our Best Partner commitment to you





·France Service Center (Paris) France Service Satellite (Lyon) ·Italy Service Center (Milan) Italy Service Satellite (Padova) ·U.K. Service Center Spain Service Center ·Poland Service Center ·Hungary Service Center ·MITSUBISHI ELECTRIC TURKEY A.Ş Turkey Service Center Czech Republic Service Center (Service Partner) ·Russia Service Center (Service Partner) Sweden Service Center ·Bulgaria Service Center (Service Partner) Ukraine Service Center (Kharkov) (Service Partner) Belarus Service Center (Service Partner) ·South Africa Service Center (Service Partner)

0

00

0

0

0

00

00

0



KOREA ·MITSUBISHI ELECTRIC AUTOMATION KOREA CO., LTD. (KOREA FA CENTER) Korea Service Center TEL: +82-2-3660-9609 FAX: +82-2-3664-8668 ·Korea Daegu Service Satellite

Thailand FA Center

THAILAND ·MITSUBISHI ELECTRIC FACTORY AUTOMATION (THAILAND) CO., LTD. Thailand Service Center









Malaysia FA Center



Taichung FA Center

Tokyo Head Office

Nagoya Works

·MITSUBISHI ELECTRIC AUSTRALIA PTY. LTD. Oceania Service Center TEL: +61-2-9684-7269 FAX: +61-2-9684-7245

INDONESIA

·PT. MITSUBISHI ELECTRIC INDONESIA Indonesia Service Center (Cikarang) TEL: +62-21-2961-7797 FAX: +62-21-2961-7794

VIETNAM

MITSUBISHI ELECTRIC VIETNAM CO., LTD. Vietnam Ho Chi Minh Service Center TEL: +84-8-3910 5945 FAX: +84-8-3910 5946 Vietnam Hanoi Service Center

MALAYSIA

·MITSUBISHI ELECTRIC SALES MALAYSIA SDN. BHD. Malaysia Service Center (Kuala Lumpur Service Center) TEL: +60-3-7960-2628 FAX: +60-3-7960-2629 Johor Bahru Satellite

ASEAN

MITSUBISHI ELECTRIC ASIA PTE. LTD. (ASEAN FA CENTER) Singapore Service Center TEL: +65-6473-2308 FAX: +65-6476-7439 Philippines Service Center (Service Partner)



AMERICA (AMERICA FA CENTER) TEL: +1-847-478-2500 FAX: +1-847-478-2650





BRAZIL ·Mitsubishi Electric do Brasil Comércio e Servicos Ltda. Votorantim Office TEL: +55-15-3023-9000 JOVIMAQ - Joinville, SC Service Satellite

0







0

idia CNC Technical Center

INDIA ·MITSUBISHI ELECTRIC INDIA PVT., LTD. CNC Technical Center (Bangalore) TEL:+91-80-4655-2121

FAX:+91-80-4655-2147 ·Chennai Service Satellite ·Coimbatore Service Satellite ·Hyderabad Service Satellite North India Service Center (Gurgaon) ·Ludhiana Satellite ·Panth Nagar Service Satellite ·Delhi Service Satellite Jamshedpur Service Satellite West India Service Center (Pune) Kolhapur Service Satellite ·Aurangabad Service Satellite · Mumbai Service Satellite West India Service Center (Ahmedabad) Raikot Service Satellite

TEL: +886-4-2359-0688 FAX: +886-4-2359-0689 Taiwan Taipei Service Center Taiwan Tainan Service Center OCEANIA

TAIWAN

JAPAN

(Headquarters)

TEL:+81-52-722-6620

FAX:+81-52-722-6662

·MITSUBISHI ELECTRIC CORPORATION

(TOKYO HEAD OFFICE, NAGOYA WORKS)

·MITSUBISHI ELECTRIC MECHATRONICS

ENGINEERING CORPORATION





- Central Region Service Center (Chicago)



- Brazil Votorantim FA Center
- North America FA Center ·Minneapolis, MN Service Satellite Detroit, MI Service Satellite ·Grand Rapids, MI Service Satellite ·Lima, OH Service Satellite ·Cleveland, OH Service Satellite Indianapolis IN Service Satellite ·St. Louis, MO Service Satellite South/East Region Service Center (Georgia) ·Charleston, SC Service Satellite Charlotte NC Service Satellite ·Raleigh, NC Service Satellite ·Dallas, TX Service Satellite ·Houston, TX Service Satellite ·Hartford, CT Service Satellite ·Knoxville, TN Service Satellite Nashville, TN Service Satellite ·Baltimore, MD Service Satellite Pittsburg, PA Service Satellite Allentown, PA Service Satellite ·Svracuse, NY Service Satellite Tampa, FL Service Satellite ·Lafayette, LA Service Satellite Western Region Service Center (California) San Francisco, CA Service Satellite Seattle, WA Service Satellite ·Canada Region Service Center (Tronto) ·Edmonton, AB Service Satellite
 - ·Montreal, QC Service Satellite
 - ·Mexico Region Service Center (Queretaro)
 - ·Monterrey, NL Service Satellite ·Mexico City, DF Service Satellite

- ·MAQSERVICE Canoas, RS Service Satellite

MITSUBISHI ELECTRIC AUTOMATION MANUFACTURING Changshu) Co., LTD.

°0

0

0

0

Shanghai FA Center/I AM Showroom



·MITSUBISHI ELECTRIC AUTOMATION (CHINA) LTD. (CHINA FA CENTER) China Shanghai Service Center TEL: +86-21-2322-3030 FAX: +86-21-2322-3000*8422

- ·China Ningbo Service Partner ·China Wuxi Service Partner ·China Jinan Service Partner ·China Hangzhou Service Partner ·China Beijing Service Center ·China Beijing Service Partner ·China Tianjin Service Center ·China Chengdu Service Center -China Shenzhen Service Center ·China Xiamen Service Partner ·China DongGuang Service Partner
- ·China Dalian Service Center

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 machine tool builder is requested to conduct an initial failure diagnosis, as a general rule. It can also be carried out by us or our service provider upon the machine tool builder'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 Flectric'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.

- Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to:
- (1) Damages caused by any cause found not to be the responsibility of Mitsubishi.
- (2) Loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products.
- (3) Special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products.
- (4) Replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

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 Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO 9001(standards for quality assurance management systems)





MITSUBISHI ELECTRIC CORPORATION HEAD OFFICE: TOKYO BLDG., 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN