MITSUBISHI ELECTRIC

Changes for the Better

Numerical Control (CNC)

Specifications Manual (Hardware)

M800/M80/E80/C80 Series

IB-1501506(ENG)-G

Introduction

This manual describes the specifications of Mitsubishi Electric CNC.
Supported models are as follows:

Supported models	Abbreviations in this manual
M800W Series	M850W, M830W
M800S Series	M850S, M830S
M80W Series	M80W
M80 Series	M80 TypeA, M80 TypeB
E80 Series	E80 TypeA, E80 TypeB
C80 Series	C80

Abbreviations in this manual are as follows:

Abbreviations	Supported models
M800, M800 Series	M800W Series/M800S Series
M80, M80 Series	M80W Series/M80 Series
M800/M80, M800/M80 Series	M800W Series/M800S Series/M80W Series/M80 Series
M8, M8 Series	M800W Series/M800S Series/M80W Series/M80 Series/E80 Series

To safely use this CNC unit, thoroughly study the "Precautions for Safety" on the next page before use.
Be sure to keep this manual always at hand.

⚠ CAUTION

⚠ **The items that are not described in this manual must be interpreted as "not possible".**

⚠ **This manual is written on the assumption that all the applicable functions are included. Some of them, however, may not be available for your NC system.**
Refer to the specifications issued by the machine tool builder before use.

⚠ **Some screens and functions may differ depending on each NC system (or version), and some functions may not be possible. Please confirm the specifications before starting to use.**

⚠ **Do not connect NC system to the Internet-connected network.**

⚠ **To maintain the safety of the NC system against unauthorized access from external devices via the network, take appropriate measures.**

General precautions
(1) When the contents of this manual is updated, the version (A, B, ...) on the cover will be incremented.

Also refer to the manuals on "Manual List" as necessary.

Manual List

Manuals related to M800/M80/E80/C80 Series are listed as follows.
These manuals are written on the assumption that all optional functions are added to the targeted model.
Some functions or screens may not be available depending on the machine or specifications set by MTB. (Confirm the specifications before use.)
The manuals issued by MTB take precedence over these manuals.

Manual	IB No.	Purpose and Contents
M800/M80/E80 Series Instruction Manual	IB-1501274	• Operation guide for NC • Explanation for screen operation, etc.
C80 Series Instruction Manual	IB-1501453	• Operation guide for NC • Explanation for screen operation, etc.
M800/M80/E80/C80 Series Programming Manual (Lathe System) (1/2)	IB-1501275	• G code programming for lathe system • Basic functions, etc.
M800/M80/E80/C80 Series Programming Manual (Lathe System) (2/2)	IB-1501276	• G code programming for lathe system • Functions for multi-part system, high-accuracy function, etc.
M800/M80/E80/C80 Series Programming Manual (Machining Center System) (1/2)	IB-1501277	• G code programming for machining center system • Basic functions, etc.
M800/M80/E80/C80 Series Programming Manual (Machining Center System) (2/2)	IB-1501278	• G code programming for machining center system • Functions for multi-part system, high-accuracy function, etc.
M800/M80/E80 Series Alarm/Parameter Manual	IB-1501279	• Alarms • Parameters
C80 Series Alarm/Parameter Manual	IB-1501560	• Alarms • Parameters

Manuals for MTBs (NC)

Manual	IB No.	Purpose and Contents
M800/M80/E80/C80 Series Specifications Manual (Function)	IB-1501505	• Model selection • Outline of various functions
M800/M80/E80/C80 Series Specifications Manual (Hardware)	IB-1501506	• Model selection • Specifications of hardware unit
M800W/M80W Series Connection and Setup Manual	IB-1501268	• Detailed specifications of hardware unit • Installation, connection, wiring, setup (startup/adjustment)
M800S/M80/E80 Series Connection and Setup Manual	IB-1501269	• Detailed specifications of hardware unit • Installation, connection, wiring, setup (startup/adjustment)
C80 Series Connection and Setup Manual	IB-1501452	• Detailed specifications of hardware unit • Installation, connection, wiring, setup (startup/adjustment)
M800/M80/E80 Series PLC Development Manual	IB-1501270	• Electrical design • I/O relation (assignment, setting, connection), field network • Development environment (PLC on-board, peripheral development environment), etc.
M800/M80/E80 Series PLC Programming Manual	IB-1501271	• Electrical design • Sequence programming • PLC support functions, etc.
M800/M80/E80/C80 Series PLC Interface Manual	IB-1501272	• Electrical design • Interface signals between NC and PLC
M800/M80/E80 Series Maintenance Manual	IB-1501273	• Cleaning and replacement for each unit • Other items related to maintenance
C80 Series Maintenance Manual	IB-1501454	• Cleaning and replacement for each unit • Other items related to maintenance

Manuals for MTBs (drive section)

Manual	IB No.	Contents
MDS-E/EH Series Specifications Manual	IB-1501226	• Specifications for power supply regeneration type
MDS-E/EH Series Instruction Manual	IB-1501229	• Instruction for power supply regeneration type
MDS-EJ/EJH Series Specifications Manual	IB-1501232	• Specifications for regenerative resistor type
MDS-EJ/EJH Series Instruction Manual	IB-1501235	• Instruction for regenerative resistor type
MDS-EM/EMH Series Specifications Manual	IB-1501238	• Specifications for multi-hybrid, power supply regeneration type
MDS-EM/EMH Series Instruction Manual	IB-1501241	• Instruction for multi-hybrid, power supply regeneration type
DATA BOOK	IB-1501252	• Specifications of servo drive unit, spindle drive unit, motor, etc.

Manuals for MTBs (Others)

Manual	No.	Purpose and Contents
GOT2000 Series User's Manual (Hardware)	SH-081194	• Outline of hardware such as part names, external dimensions, installation, wiring, maintenance, etc. of GOTs
GOT2000 Series User's Manual (Utility)	SH-081195	• Outline of utilities such as screen display setting, operation method, etc. of GOTs
GOT2000 Series User's Manual (Monitor)	SH-081196	• Outline of each monitor function of GOTs
GOT2000 Series Connection Manual (Mitsubishi Electric Products)	SH-081197	• Outline of connection types and connection method between GOT and Mitsubishi Electric connection devices
GT Designer3 (GOT2000) Screen Design Manual	SH-081220	• Outline of screen design method using screen creation software GT Designer3

■ For M800/M80/E80 Series

Manual	No.	Purpose and Contents
GOT2000/GOT1000 Series CC-Link Communication Unit User's Manual	IB-0800351	• Explanation for handling CC-Link communication unit (for GOT2000 series/GOT1000 series)
GX Developer Version 8 Operating Manual (Startup)	SH-080372E	• Explanation for system configuration, installation, etc. of PLC development tool GX Developer
GX Developer Version 8 Operating Manual	SH-080373E	• Explanation for operations using PLC development tool GX Developer
GX Converter Version 1 Operating Manual	IB-0800004E	• Explanation for operations using data conversion tool GX Converter
GX Works2 Installation Instructions	BCN-P5999-0944	• Explanation for the operating environment and installation method of GX Works2
GX Works2 Version 1 Operating Manual (Common)	SH-080779ENG	• Explanation for the system configuration of GX Works2 and the functions common to Simple project and Structured project such as parameter setting, operation method for the online function
GX Works2 Version 1 Operating Manual (Simple Project)	SH-080780ENG	• Explanation for methods for such as creating and monitoring programs in Simple project of GX Works2
GX Works2 Version 1 Operating Manual (Simple Project, Function Block)	SH-080984ENG	• Explanation for methods for such as creating function blocks, pasting function blocks to sequence programs, and operating FB library in Simple project of GX Works2
GX Works2 Version 1 Operating Manual (Structured Project)	SH-080781ENG	• Explanation for methods for such as creating and monitoring programs in Structured project of GX Works2
GX Works3 Installation Instructions	BCN-P5999-0391	• Explanation for the operating environment and installation method of GX Works3
MELSEC-Q CC-Link System Master/ Local Module User's Manual	SH-080394E	• Explanation for system configuration, installation, wiring, etc. of master/local modules for CC-Link system
GOT2000 Series Connection Manual (Non-Mitsubishi Electric Products 1)	SH-081198ENG	• Explanation for connection types and connection method between GOT and other company's devices
GOT2000 Series Connection Manual (Non-Mitsubishi Electric Products 2)	SH-081199ENG	
GOT2000 Series Connection Manual (Microcomputers, MODBUS/ Fieldbus Products, Peripherals)	SH-081200ENG	• Explanation for connection types and connection method between GOT and microcomputers, MODBUS/fieldbus products, peripherals
GT SoftGOT2000 Version1 Operating Manual	SH-081201ENG	• Explanation for system configuration, screen configuration and operation method of monitoring software GT SoftGOT2000

■ For C80 Series

Manual	No.	Purpose and Contents
MELSEC iQ-R Module Configuration Manual	SH-081262	• Outline of system configuration, specifications, installation, wiring, maintenance, etc.
MELSEC iQ-R CPU Module User's Manual (Startup)	SH-081263	• Outline of specifications, procedures before operation, troubleshooting, etc. for CPU module
MELSEC iQ-R CPU Module User's Manual (Application)	SH-081264	• Outline of memory, functions, devices, parameters, etc. for CPU module
MELSEC iQ-R CC-Link IE Field Network User's Manual (Application)	SH-081259	• Explanation for functions, parameter settings, programming, troubleshooting, etc. of the CC-Link IE Field Network function
QCPU User's Manual (Hardware Design, Maintenance and Inspection)	SH-080483	• Outline of specifications, necessary knowledge to configure the system and maintenance-related descriptions for Q series CPU module, etc.
GX Works3 Operating Manual	SH-081215	• Outline of functions, programming, etc.

Reference Manual for MTBs

Manual	No.	Purpose and Contents
M800/M80 Series Smart safety observation Specification manual	BNP-C3072-022	• Explanation for smart safety observation function
C80 Series Smart safety observation Specification manual	BNP-C3077-022	
M800/M80 Series CC-Link (Master/ Local) Specification manual	BNP-C3072-089	• Explanation for CC-Link
M800/M80 Series PROFIBUS-DP Specification manual	BNP-C3072-118	• Explanation for PROFIBUS-DP communication function
M800/M80 Series Interactive cycle insertion (Customization) Specification manual	BNP-C3072-121-0003	• Explanation for interactive cycle insertion
M800/M80 Series EtherNet/IP Specifications manual	BNP-C3072-263	• Explanation for EtherNet/IP
M800/M80 Series CC-Link IE Field (Master/local) Specifications manual	BNP-C3072-283	• Explanation for CC-Link IE Field
M800/M80 Series GOT Connection Specifications manual	BNP-C3072-314	• Explanation for GOT connection
M800/M80 Series CC-Link IE Field Basic Specifications manual	BNP-C3072-337	• Explanation for CC-Link IE Field Basic

Precautions for Safety

Always read this manual, related manuals and attached documents before installation, operation, programming, maintenance or inspection to ensure correct use. Understand all the conditions described in this manual before using the unit. We rank the safety precautions into "DANGER", "WARNING" and "CAUTION" for the manuals issued by Mitsubishi, including this manual.

⚠ **DANGER** **When there is a great risk that the user could be subject to fatalities or serious injuries if handling is mistaken.**
⚠ **WARNING** **When the user could be subject to fatalities or serious injuries if handling is mistaken.**
⚠ **CAUTION** **When the user could be subject to injuries or when physical damage could occur if handling is mistaken.**

Note that even items ranked as " ⚠ CAUTION", may lead to major results depending on the situation. In any case, important information that must always be observed is described.

The following signs indicate prohibition and compulsory.

	**This sign indicates prohibited behavior (must not do).** **For example,  indicates "Keep fire away".**
	**This sign indicated a thing that is pompously (must do).** **For example,  indicates "it must be grounded".**

The meaning of each pictorial sign is as follows.

 **CAUTION**	 **CAUTION rotated object**	 **CAUTION HOT**	 **Danger Electric shock risk**	 **Danger explosive**
 **Prohibited**	 **Disassembly is prohibited**	 **KEEP FIRE AWAY**	 **General instruction**	 **Earth ground**

⚠ DANGER

Not applicable in this manual.

⚠ WARNING

Not applicable in this manual.

⚠ CAUTION

1. Items related to product and manual

- ⚠ **The items that are not described in this manual must be interpreted as "not possible".**
- ⚠ **This manual is written on the assumption that all the applicable functions are included. Some of them, however, may not be available for your NC system.**
  Refer to the specifications issued by the machine tool builder before use.
- ⚠ **Some screens and functions may differ depending on the NC system (or its version), and some functions may not be possible. Please confirm the specifications before use.**
- ⚠ **Do not connect NC system to the Internet-connected network.**
- ⚠ **To maintain the safety of the NC system against unauthorized access from external devices via the network, take appropriate measures.**

2. Items related to start up and maintenance

- ⚠ **Follow the power specifications (input voltage range, frequency range, momentary power failure time range) described in this manual.**
- ⚠ **Follow the environment conditions (ambient temperature, humidity, vibration, atmosphere) described in this manual.**
- ❗ **Follow the remote type machine contact input/output interface described in this manual. (Connect a diode in parallel with the inductive load or connect a protective resistor in serial with the capacitive load, etc.)**
- ⚠ **If the parameter is used to set the temperature rise detection function to invalid, overheating may occur, thereby disabling control and possibly resulting in the axes running out of control, which in turn may result in machine damage and/or bodily injury or destruction of the unit. It is for this reason that the detection function is normally left "valid" for operation.The parameter for the temperature rise detection function will be validated forcibly when the NC unit is turned ON.**

Treatment of waste

The following two laws will apply when disposing of this product. Considerations must be made to each law. The following laws are in effect in Japan. Thus, when using this product overseas, the local laws will have a priority. If necessary, indicate or notify these laws to the final user of the product.

(1) Requirements for "Law for Promotion of Effective Utilization of Resources"
   (a) Recycle as much of this product as possible when finished with use.
   (b) When recycling, often parts are sorted into steel scraps and electric parts, etc., and sold to scrap contractors. Mitsubishi recommends sorting the product and selling the members to appropriate contractors.

(2) Requirements for "Law for Treatment of Waste and Cleaning"
   (a) Mitsubishi recommends recycling and selling the product when no longer needed according to item (1) above. The user should make an effort to reduce waste in this manner.
   (b) When disposing a product that cannot be resold, it shall be treated as a waste product.
   (c) The treatment of industrial waste must be commissioned to a licensed industrial waste treatment contractor, and appropriate measures, including a manifest control, must be taken.
   (d) Batteries correspond to "primary batteries", and must be disposed of according to local disposal laws.

Disposal

(Note) This symbol mark is for EU countries only.
This symbol mark is according to the directive 2006/66/EC Article 20 Information for end-users and Annex II.

Your MITSUBISHI ELECTRIC product is designed and manufactured with high quality materials and components which can be recycled and/or reused.
This symbol means that batteries and accumulators, at their end-of-life, should be disposed of separately from your household waste.
If a chemical symbol is printed beneath the symbol shown above, this chemical symbol means that the battery or accumulator contains a heavy metal at a certain concentration. This will be indicated as follows:
Hg: mercury (0,0005%), Cd: cadmium (0,002%), Pb: lead (0,004%)
In the European Union there are separate collection systems for used batteries and accumulators.
Please, dispose of batteries and accumulators correctly at your local community waste collection/recycling centre.

Please, help us to conserve the environment we live in!

Trademarks

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本製品の取扱いについて

(日本語 /Japanese)
本製品は工業用 (クラス A) 電磁環境適合機器です。販売者あるいは使用者はこの点に注意し、住商業環境以外での使用をお願いいたします。

Handling of our product

(English)
This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

본 제품의 취급에 대해서

(한국어 /Korean)
이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 가정외의 지역에 서 사용하는 것을 목적으로 합니다 .

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 Loss in Opportunity and Secondary Loss from Warranty Liability

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.

CONTENTS

M800W/M80W Series Hardware 1

1 System Basic Configuration (M800W/M80W Series) 3
1.1 System Basic Configuration Drawing 4

2 General Connection Diagram (M800W/M80W Series) 5
2.1 General Connection Diagram [M800W] 6
2.1.1 M800W, Windows-based Display (15-type) 6
2.1.2 M800W, Windows-based Display (19-type) 7
2.1.3 M800W, Non-Windows-based Display (10.4-type / 15-type) 8
2.2 General Connection Diagram [M80W] 9
2.2.1 M80W, Windows-based Display (15-type) 9
2.2.2 M80W, Windows-based Display (19-type) 10
2.2.3 M80W, Non-Windows-based Display (8.4-type /10.4-type /15-type) 11

3 List of Configuration (M800W/M80W Series) 13
3.1 Control Unit [M800W] 14
3.2 Control Unit [M80W] 14
3.3 Display Unit [M800W] 15
3.4 Display Unit [M80W] 15
3.5 Personal Computer Unit 16
3.6 Graphic Control Unit [M800W] 16
3.7 Keyboard Unit [M800W] 16
3.8 Keyboard Unit [M80W] 16
3.9 Operation Panel I/O Unit 17
3.10 Remote I/O Unit 18
3.11 Function Expansion Unit 18
3.12 Communication Expansion Unit 18
3.13 Side Memory I/F Unit 19
3.14 Manual Pulse Generator 19
3.15 Synchronous Feed Encoder 19
3.16 MITSUBISHI CNC Machine Operation Panel 19
3.17 Handy Terminal 19
3.18 Cable Connector Sets 20
3.19 Thermistor Sets 20
3.20 Genuine Memory Card 20
3.21 Durable Parts 20
3.22 Replacements 20
3.23 List of Cables 21
3.24 System Type 22

4 General Specifications (M800W/M80W Series) 23
4.1 Environment Conditions [M800W] 24
4.1.1 Environment Conditions inside the Operation Panel 24
4.1.2 Environment Conditions inside the Control Panel 26
4.1.3 24VDC Stabilized Power Supply Selecting Conditions 28
4.2 Environment Conditions [M80W] 29
4.2.1 Environment Conditions inside the Operation Panel 29
4.2.2 Environment Conditions inside the Control Panel 31
4.2.3 24VDC Stabilized Power Supply Selecting Conditions 33
4.3 Control Unit [M800W] 34
4.3.1 M830W(FCU8-MU042) / M850W(FCU8-MA041) 34
4.4 Control Unit [M80W] 36
4.4.1 FCU8-MU044 36
4.5 Display Unit [M800W] 38
4.5.1 10.4-type (FCU8-DU141-31) 38
4.5.2 15-type (FCU8-DU181-31) 39
4.5.3 15-type (FCU8-DU181-34) 41
4.5.4 19-type (FCU8-DU191-75) 43
4.5.5 19-type (FCU8-DU192-75) 45
4.6 Display Unit [M80W] 47
4.6.1 8.4-type (FCU8-DU121-12) 47

4.6.2 10.4-type (FCU8-DU141-32) 48
4.6.3 15-type (FCU8-DU181-32) 49
4.6.4 15-type (FCU8-DU181-36) 51
4.6.5 19-type (FCU8-DU191-77) 53
4.6.6 19-type (FCU8-DU192-77) 55
4.7 Personal Computer Unit 57
4.7.1 Personal Computer Unit (FCU8-PC231) 57
4.7.2 Built-in Disk of the Display Unit (FCU8-CF001-001) 57
4.8 Graphic Control Unit 58
4.8.1 FCU8-GC211 58
4.9 Keyboard Unit 59
4.9.1 Keyboard for 8.4-type Display Unit (FCU8-KB026) 59
4.9.2 Keyboard for 8.4-type Display Unit (FCU8-KB028) 60
4.9.3 Keyboard for 8.4-type Display Unit (FCU8-KB029) 61
4.9.4 Keyboard for 10.4-type Display Unit (FCU8-KB041) 62
4.9.5 Keyboard for 10.4-type Display Unit (FCU8-KB046) 63
4.9.6 Keyboard for 10.4-type Display Unit (FCU8-KB047) 64
4.9.7 Keyboard for 10.4-type Display Unit (FCU8-KB048) 65
4.9.8 Keyboard for 15-type Display Unit (FCU8-KB083) 66
4.10 Operation Panel I/O Unit 67
4.10.1 List of Units 67
4.10.2 FCU8-DX830 / FCU8-DX834 / FCU8-DX837 / FCU8-DX730 68
4.11 Remote I/O Unit 71
4.11.1 List of Units 71
4.11.2 FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX651/ FCU8-DX408 / FCU8-DX409 72
4.12 Function Expansion Unit 79
4.12.1 Encoder (Manual Pulse Generator) I/F Expansion (FCU8-EX544) 79
4.13 Communication Expansion Unit 80
4.13.1 CC-Link (FCU8-EX561) 80
4.13.2 PROFIBUS-DP (FCU8-EX563) 81
4.13.3 CC-Link IE Field (FCU8-EX564) 82
4.13.4 EtherNet/IP (FCU8-EX565) 83
4.13.5 FL-net (FCU8-EX568) 84
4.14 Side Memory I/F Unit 85
4.15 Manual Pulse Generator 86
4.15.1 5V Manual Pulse Generator (UFO-01-2Z9) 86
4.15.2 12V Manual Pulse Generator (HD60C) 87
4.16 Synchronous Feed Encoder 88
4.16.1 Synchronous Feed Encoder (OSE-1024-3-15-68) 88
4.17 MITSUBISHI CNC Machine Operation Panel 90
4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB926) 90
4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB941) 93
4.18 Handy Terminal 94
4.19 Thermistor 96
4.19.1 Thermistor(PT3C-51F-M2) 96
4.20 Exclusive SD Cards for MITSUBISHI CNC 97
4.21 Specifications and Precautions of USB/SD/LAN Interface 98
4.21.1 USB Interface (Personal Computer Unit, Side Memory I/F Unit) 98
4.21.2 SD Interface (Control Unit, Side Memory I/F Unit) 99
4.21.3 LAN Interface (Control Unit, Personal Computer Unit) 99

M800S/M80/E80 Series Hardware 101

1 System Basic Configuration (M800S/M80/E80 Series) 103
1.1 System Basic Configuration Drawing 104

2 General Connection Diagram (M800S/M80/E80 Series) 105
2.1 General Connection Diagram [M800S] 106
2.2 General Connection Diagram [M80] 108
2.2.1 Connecting a Spindle Drive Unit 108
2.2.2 Connecting a Pulse-controlled Inverter 112
2.3 General Connection Diagram [E80] 113
2.3.1 Connecting a Spindle Drive Unit 113
2.3.2 Connecting a Pulse-controlled Inverter 115

3 List of Configuration (M800S/M80/E80 Series) 117
3.1 Control Unit [M800S] 118
3.2 Control Unit [M80] 118
3.3 Control Unit [E80] 118
3.4 Display Unit [M800S] 119
3.5 Display Unit [M80] 119
3.6 Display Unit [E80] 119
3.7 Keyboard Unit [M800S] 119
3.8 Keyboard Unit [M80] 120
3.9 Keyboard Unit [E80] 120
3.10 Operation Panel I/O Unit 121
3.11 Remote I/O Unit [M800S/M80] 122
3.12 Remote I/O Unit [E80] 123
3.13 Function Expansion Unit [M80] 123
3.14 Communication Expansion Unit 123
3.15 Manual Pulse Generator 124
3.16 Synchronous Feed Encoder 124
3.17 MITSUBISHI CNC Machine Operation Panel [M800S/M80] 124
3.18 MITSUBISHI CNC Machine Operation Panel [E80] 125
3.19 Handy Terminal 125
3.20 Cable Connector Sets 125
3.21 Thermistor Sets 126
3.22 Genuine Memory Card 126
3.23 Durable Parts 126
3.24 Replacements 126
3.25 List of Cables 127
3.26 System Type 128

4 General Specifications (M800S/M80/E80 Series) 129
4.1 Environment Conditions [M800S] 130
4.1.1 Installation Environment Conditions 130
4.1.2 24VDC Stabilized Power Supply Selecting Conditions 133
4.2 Environment Conditions [M80] 134
4.2.1 Installation Environment Conditions 134
4.2.2 24VDC Stabilized Power Supply Selecting Conditions 137
4.3 Environment Conditions [E80] 138
4.3.1 Installation Environment Conditions 138
4.3.2 24VDC Stabilized Power Supply Selecting Conditions 141
4.4 Control Unit [M800S] 142
4.4.1 FCU8-MU542 / FCU8-MA542 / FCU8-MU541 / FCU8-MA541 142
4.5 Control Unit [M80] 143
4.5.1 FCU8-MU511 / FCU8-MU512 / FCU8-MU501 / FCU8-MU502 143
4.6 Control Unit [E80] 144
4.6.1 FCU8-MU513 / FCU8-MU514 144
4.7 Display Unit [M800S] 145
4.7.1 10.4-type (FCU8-DU141-31) 145
4.7.2 15-type (FCU8-DU181-31) 147
4.8 Display Unit [M80] 149
4.8.1 8.4-type (FCU8-DU121-12) 149
4.8.2 10.4-type (FCU8-DU141-32) 151
4.8.3 15-type (FCU8-DU181-32) 153

4.9 Display Unit [E80] 155
4.9.1 8.4-type (FCU8-DU121-13) 155
4.10 Keyboard Unit 157
4.10.1 Keyboard for 8.4-type Display Unit (FCU8-KB026) 157
4.10.2 Keyboard for 8.4-type Display Unit (FCU8-KB028) 158
4.10.3 Keyboard for 8.4-type Display Unit (FCU8-KB029) 159
4.10.4 Keyboard for 10.4-type Display Unit (FCU8-KB041) 160
4.10.5 Keyboard for 10.4-type Display Unit (FCU8-KB046) 161
4.10.6 Keyboard for 10.4-type Display Unit (FCU8-KB047) 162
4.10.7 Keyboard for 10.4-type Display Unit (FCU8-KB048) 163
4.10.8 Keyboard for 15-type Display Unit (FCU8-KB083) 164
4.10.9 Keyboard for 8.4-type Display Unit (FCU8-KB024) 165
4.10.10 Keyboard for 8.4-type Display Unit (FCU8-KB025) 166
4.11 Operation Panel I/O Unit 167
4.11.1 List of Units 167
4.11.2 FCU8-DX731 / FCU8-DX750 / FCU8-DX760 / FCU8-DX761 / FCU8-DX834 168
4.12 Remote I/O Unit 172
4.12.1 List of Units 172
4.12.2 FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX651/ FCU8-DX408 / FCU8-DX409 173
4.13 Function Expansion Unit 180
4.13.1 Functional Safety Expansion Unit (FCU8-EX133) 180
4.14 Communication Expansion Unit 181
4.14.1 CC-Link (FCU8-EX561) 181
4.14.2 PROFIBUS-DP (FCU8-EX563) 182
4.14.3 CC-Link IE Field (FCU8-EX564) 183
4.14.4 EtherNet/IP (FCU8-EX565) 184
4.14.5 FL-net (FCU8-EX568) 185
4.14.6 Option Relay Unit (FCU8-EX702) 186
4.14.7 Option Relay Unit (FCU8-EX703) 187
4.15 Manual Pulse Generator 188
4.15.1 5V Manual Pulse Generator (UFO-01-2Z9) 188
4.15.2 12V Manual Pulse Generator (HD60C) 189
4.16 Synchronous Feed Encoder 190
4.16.1 Synchronous Feed Encoder (OSE-1024-3-15-68) 190
4.17 MITSUBISHI CNC Machine Operation Panel 192
4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB926) 192
4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB941) 195
4.18 Handy Terminal 196
4.19 Thermistor 198
4.19.1 Thermistor(PT3C-51F-M2) 198
4.20 Exclusive SD Cards for MITSUBISHI CNC 199
4.21 Specifications and Precautions of USB/SD/LAN Interface 200
4.21.1 USB Interface (Memory I/F card) 200
4.21.2 SD Interface (Memory I/F card) 201
4.21.3 LAN Interface (Control Unit) 201

C80 Series Hardware 203

1 System Basic Configuration (C80 Series) 205
1.1 System Basic Configuration Drawing 206

2 General Connection Diagram (C80 Series) 207

3 List of Configuration (C80 Series) 209
3.1 CNC Control Unit 210
3.2 GOT 220
3.2.1 GT27 220
3.2.2 GT25 222
3.3 Peripheral Device 223
3.4 Dual Signal Module 223
3.5 List of Q Series Units (for RQ extension base unit) 224

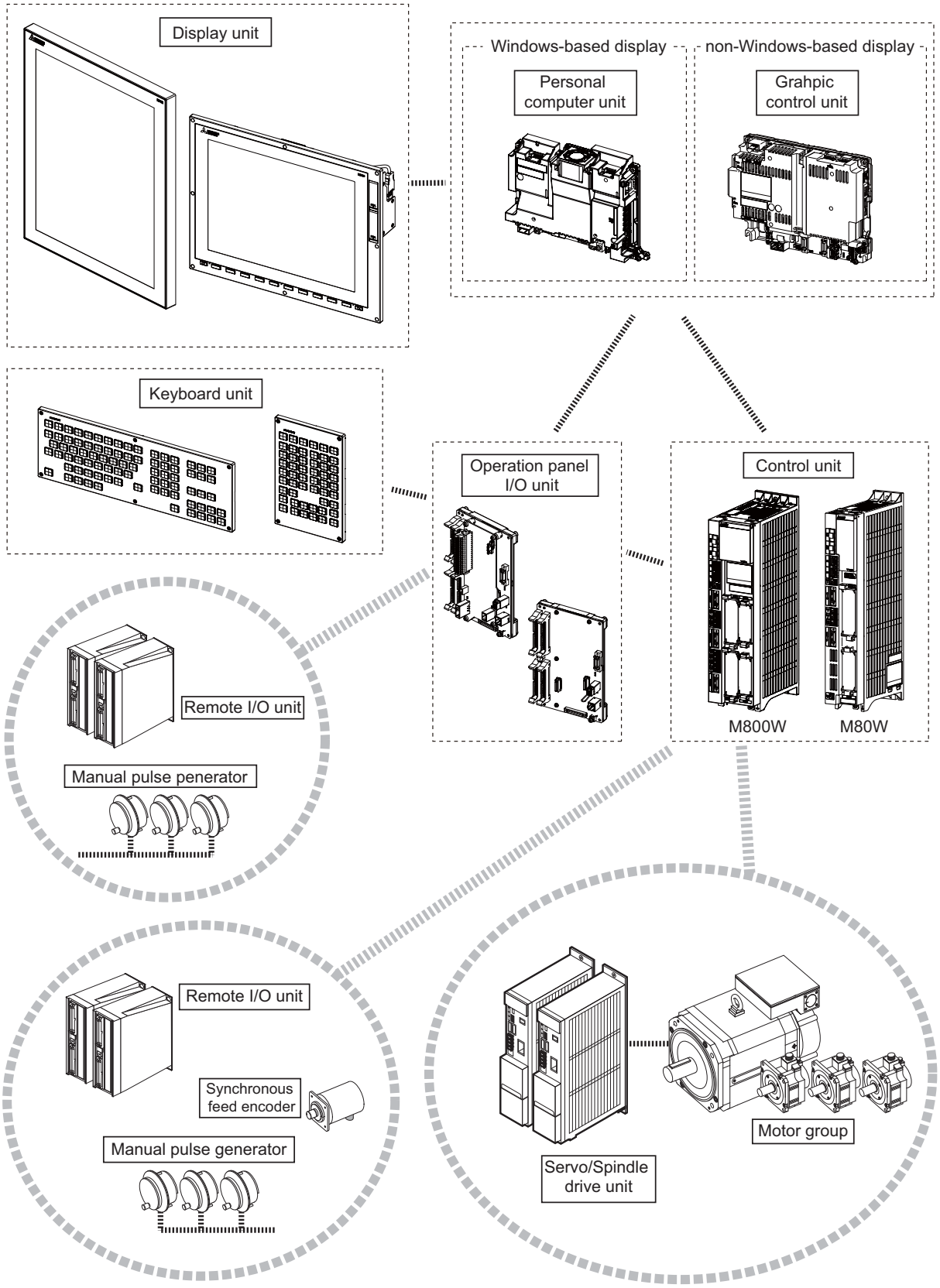
4 General Specifications (C80 Series) 227
4.1 Installation Environment Conditions 228
4.2 Base Unit 229
4.2.1 Basic Base Unit 229
4.2.2 Extension Base Unit 230
4.2.3 RQ Extension Base Unit 232
4.3 Power Supply 233
4.3.1 R61P/R62P/R63P/R64P 233
4.3.2 Q61P/Q63P/Q64PN 237
4.4 PLC CPU 242
4.5 CNC CPU Module 247
4.6 Dual Signal Module 251
4.7 Signal Splitter 256
4.8 Manual Pulse Generator 258
4.8.1 5V Manual Pulse Generator (UFO-01-2Z9) 258
4.8.2 12V Manual Pulse Generator (HD60C) 259
4.9 Recommended Terminal Block for Dual Signal Module 259
4.10 GOT (Panel Cut Dimensions) 260

M800W/M80W Series
Hardware

1

System Basic Configuration (M800W/M80W Series)

1.1 System Basic Configuration Drawing



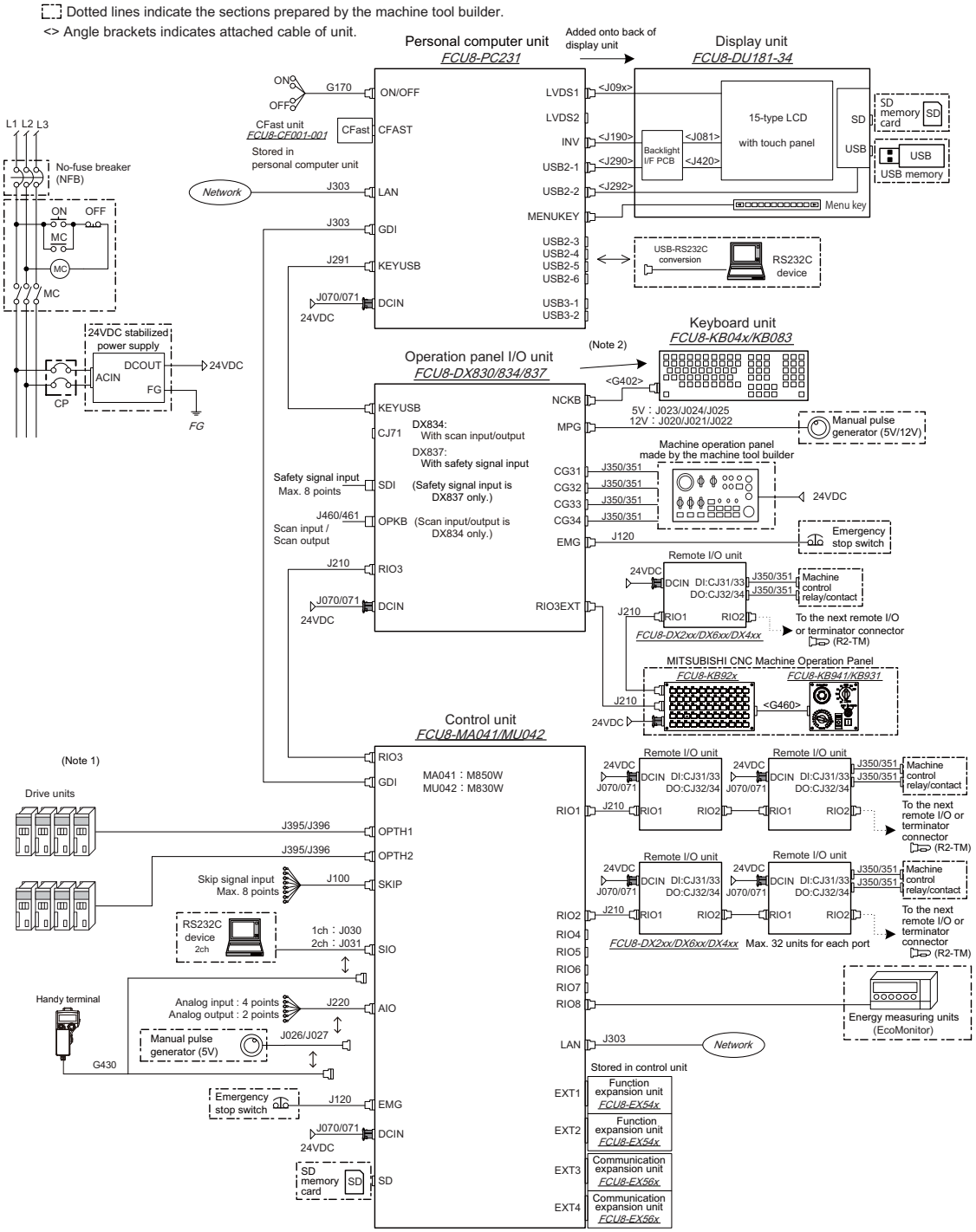
(Note) For the drive unit configuration, refer to the Instruction Manual of the drive unit you use.

2

General Connection Diagram (M800W/M80W Series)

2.1 General Connection Diagram [M800W]

2.1.1 M800W, Windows-based Display (15-type)

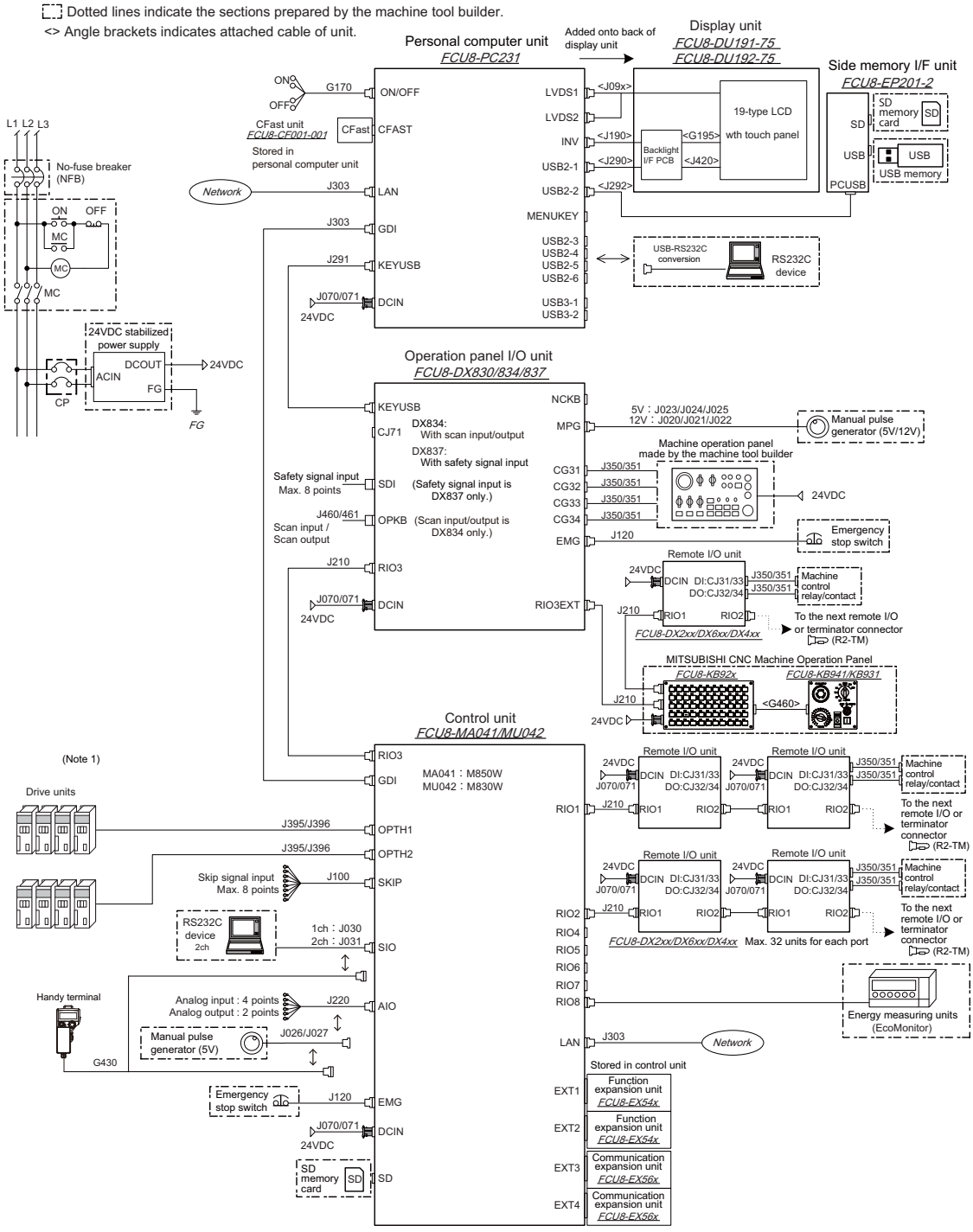


(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit.

(Note 3) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

2.1.2 M800W, Windows-based Display (19-type)

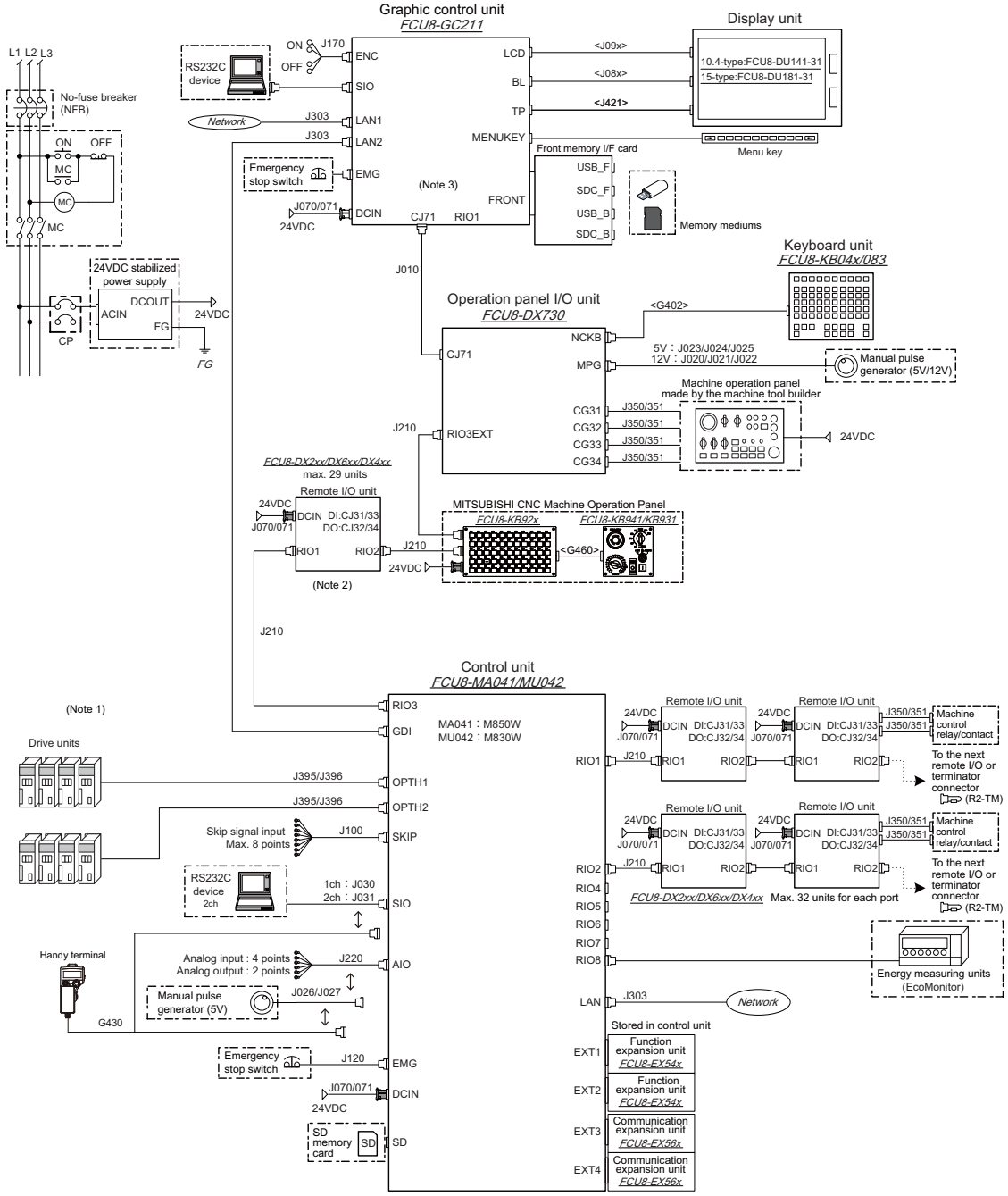


(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

2.1.3 M800W, Non-Windows-based Display (10.4-type / 15-type)

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

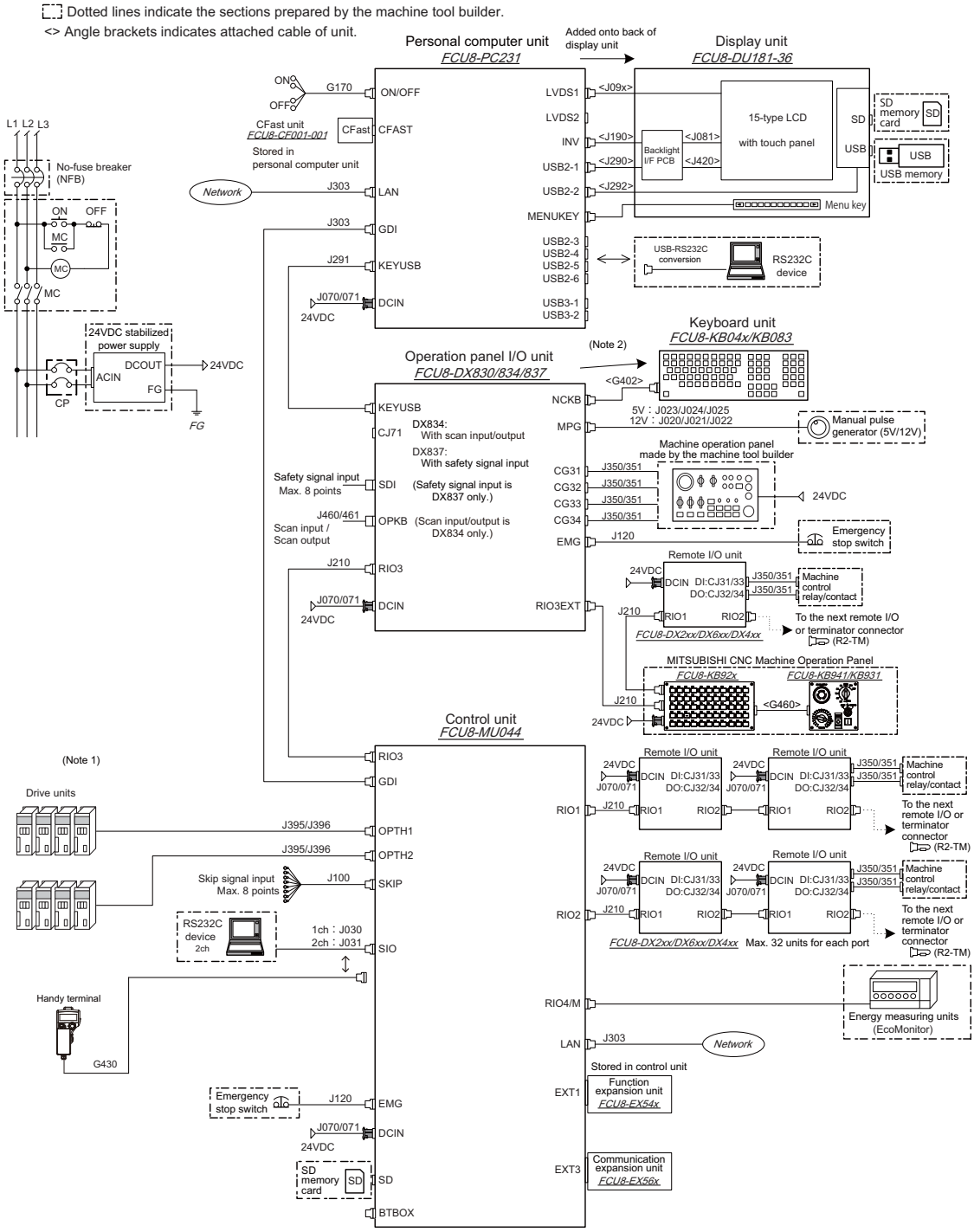
(Note 2) When connecting a remote I/O unit to the 3rd RIO channel, insert it between the control unit and operation panel I/O unit.

(Note 3) There is no need to connect a terminator R2-TM to the graphic control unit.

(Note 4) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

2.2 General Connection Diagram [M80W]

2.2.1 M80W, Windows-based Display (15-type)



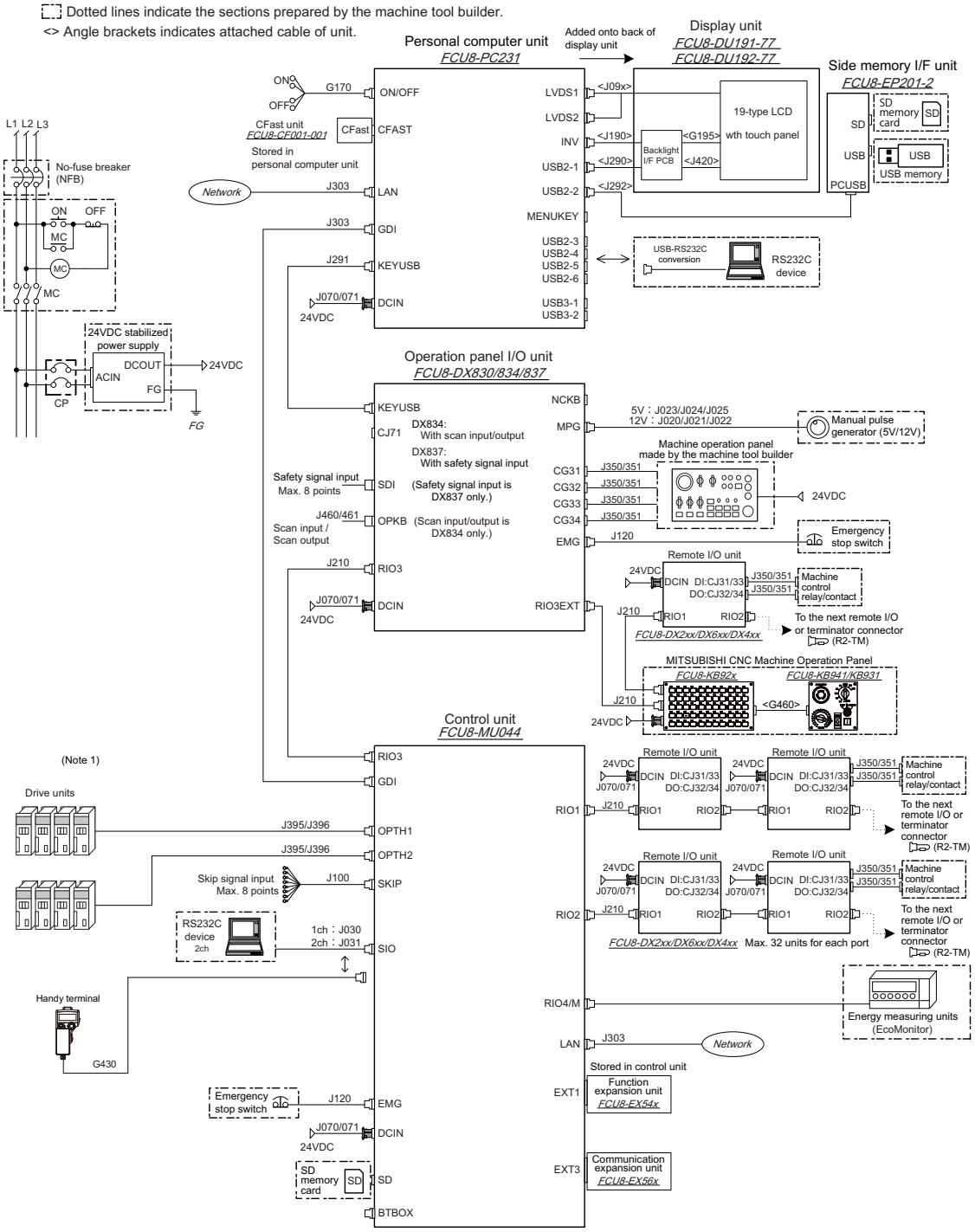
(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) When using a keyboard unit, install the operation panel I/O unit on the back of the keyboard unit.

(Note 3) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(Note 4) When the handle of handy terminal is used, connect ENC connector of G430 cable to MPG connector of the operation panel I/O unit.
Because the pin assignment of ENC connector of G430 is different from that of MPG connector of the operation panel I/O unit, conversion is required.
The conversion cable needs to be prepared by the MTB.

2.2.2 M80W, Windows-based Display (19-type)



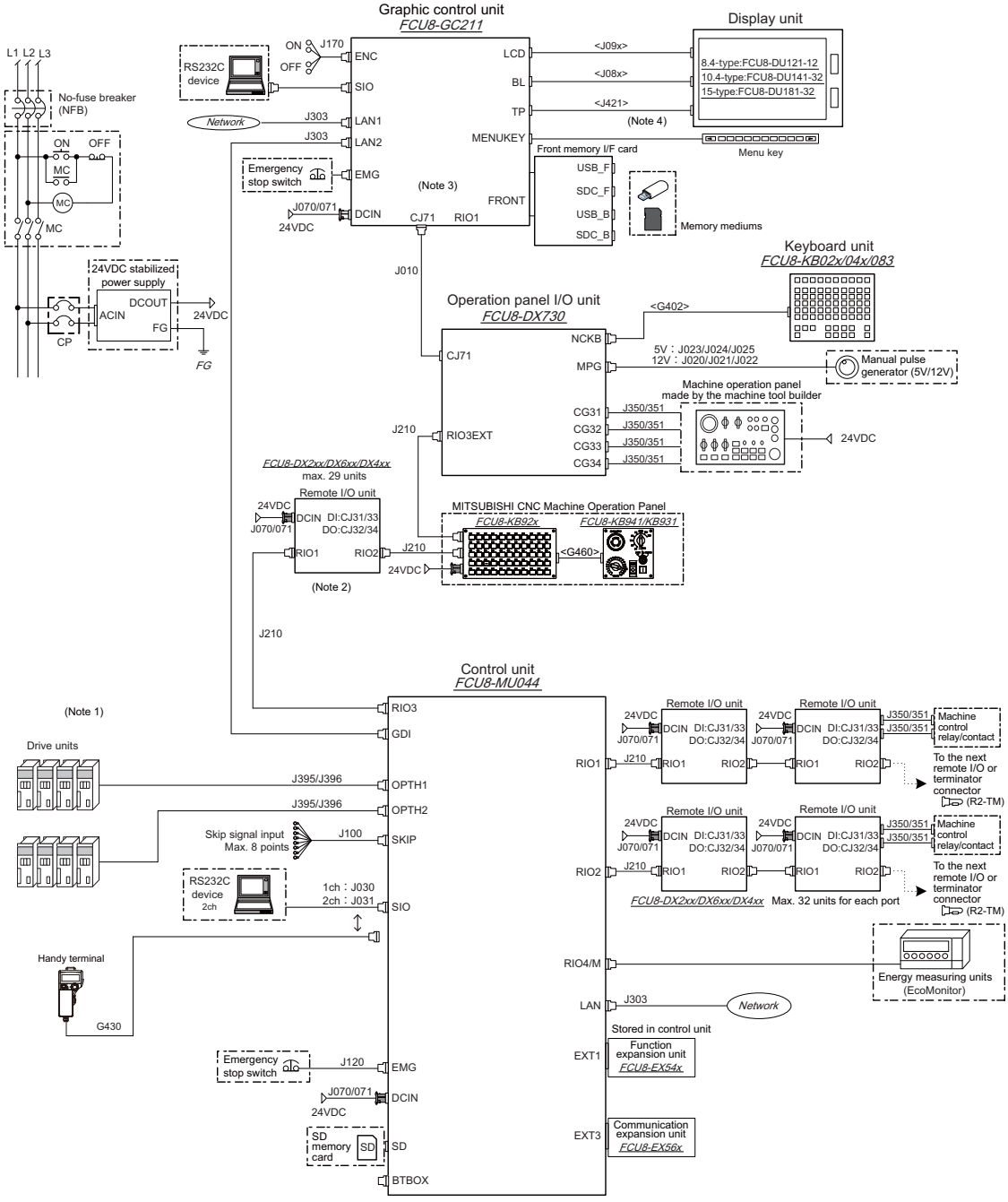
(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(Note 3) When the handle of handy terminal is used, connect ENC connector of G430 cable to MPG connector of the operation panel I/O unit.
Because the pin assignment of ENC connector of G430 is different from that of MPG connector of the operation panel I/O unit, conversion is required.
The conversion cable needs to be prepared by the MTB.

2.2.3 M80W, Non-Windows-based Display (8.4-type /10.4-type /15-type)

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) When connecting a remote I/O unit to the 3rd RIO channel, insert it between the control unit and operation panel I/O unit.

(Note 3) There is no need to connect a terminator R2-TM to the graphic control unit.

(Note 4) For the 8.4-type display unit, TP connector is not used.

(Note 5) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(Note 6) When the handle of handy terminal is used, connect ENC connector of G430 cable to MPG connector of the operation panel I/O unit.
Because the pin assignment of ENC connector of G430 is different from that of MPG connector of the operation panel I/O unit, conversion is required.
The conversion cable needs to be prepared by the MTB.

3

List of Configuration (M800W/M80W Series)

3.1 Control Unit [M800W]

Classification	Type	Components	Remarks
NC functions For M830W	FCU8-MU042	Main CPU card (non-compliant) 7SEG card SDHC: 1ch Back panel card Unit lid (Resin molded article) etc.	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order. G123 cable for EMG is supplied.
NC functions For M850W	FCU8-MA041	Main CPU card (compliant) 7SEG card SDHC: 1ch Back panel card Unit lid (Resin molded article) etc.	This unit is not compliant with Export Trade Control Order, and it is compliant with Foreign Exchange Order. G123 cable for EMG is supplied.

3.2 Control Unit [M80W]

Classification	Type	Components	Remarks
NC functions For M80W	FCU8-MU044	Main CPU card (non-compliant) 7SEG card SDHC: 1ch Back panel card Unit lid (Resin molded article) etc.	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order. G123 cable for EMG is supplied.

3.3 Display Unit [M800W]

Classification	Type	Components	Remarks
10.4-type color TFT touch panel (VGA:640*480)	FCU8-DU141-31	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit (non-Windows-based display)
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-31	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit (non-Windows-based display)
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-34	LCD panel Backlight I/F PCB Menu keys Escutcheon Base metal plate Cable Screw cap set	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Front side memory I/F is normally equipped with the display unit (Windows-based display)
19-type color TFT touch panel (SXGA:1024*1280)	FCU8-DU191-75	LCD panel Backlight I/F PCB Escutcheon Base metal plate Cable	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Side memory I/F unit is separately prepared. (Windows-based display)
19-type color TFT touch panel (SXGA:1280*1024)	FCU8-DU192-75	LCD panel Backlight I/F PCB Escutcheon Base metal plate Cable	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Side memory I/F unit is separately prepared. (Windows-based display)

3.4 Display Unit [M80W]

Classification	Type	Components	Remarks
8.4-type color TFT (VGA:640*480)	FCU8-DU121-12	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit (non-Windows-based display)
10.4-type color TFT touch panel (VGA:640*480)	FCU8-DU141-32	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit (non-Windows-based display)
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-32	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit (non-Windows-based display)
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-36	LCD panel Backlight I/F PCB Menu keys Escutcheon Base metal plate Cable Screw cap set	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Front side memory I/F is normally equipped with the display unit (Windows-based display)
19-type color TFT touch panel (SXGA:1024*1280)	FCU8-DU191-77	LCD panel Backlight I/F PCB Escutcheon Base metal plate Cable	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Side memory I/F unit is separately prepared. (Windows-based display)
19-type color TFT touch panel (SXGA:1280*1024)	FCU8-DU192-77	LCD panel Backlight I/F PCB Escutcheon Base metal plate Cable	Personal computer unit is prepared at the same time. Built-in disk of the display unit is prepared at the same time. Side memory I/F unit is separately prepared. (Windows-based display)

3.5 Personal Computer Unit

Classification	Type	Components	Remarks
Personal Computer Unit	FCU8-PC231	PC board PC cooling FAN Unit lid (Resin molded article) etc.	
Built-in Disk of the Display Unit	FCU8-CF001-001	Windows OS / data storage	Windows8

3.6 Graphic Control Unit [M800W]

Classification	Type	Components	Remarks
Graphic control unit	FCU8-GC211	Base control card Front-side memory I/F card	(Note) This unit occupies the 13th and 14th RIO stations.

3.7 Keyboard Unit [M800W]

Classification	Type	Components	Remarks
Keyboard for 10.4-type display unit Clear keys	FCU8-KB041	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB046	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB047	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB048	Escutcheon, key switch G402 cable Screw cap set	ABC layout (for M system/L system)
Keyboard for 15-type display unit Clear keys	FCU8-KB083	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)

3.8 Keyboard Unit [M80W]

Classification	Type	Components	Remarks
Keyboard for 8.4-type display unit Clear keys	FCU8-KB026	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 8.4-type display unit Clear keys	FCU8-KB028	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 8.4-type display unit Clear keys	FCU8-KB029	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB041	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB046	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB047	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB048	Escutcheon, key switch G402 cable Screw cap set	ABC layout (for M system/L system)
Keyboard for 15-type display unit Clear keys	FCU8-KB083	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)

3.9 Operation Panel I/O Unit

Classification	Type	Components	Remarks
DI 24V/0V common input [64 points] DO Source output [64 points]	FCU8-DX830	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points] Scan input [64 points] Scan output [64 points]	FCU8-DX834	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Scan input: 64 points Scan output: 64 points Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points] Safety DI 24V/0V common input [8 points]	FCU8-DX837	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Safety DI: 8-points 0V common type Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points]	FCU8-DX730	Base card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Graphic control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1, 2, 7 to 12, 20 to 22 RIO extensible stations: 3 to 6, 15 to 19, 23 to 64 (13 and 14 are occupied by the graphic control unit.) (Note) J010 cable is required for connection with the graphic control unit. (for non-Windows-based display)

(Note) DI: Digital input signals, DO: Digital output signals

3.10 Remote I/O Unit

Classification	Type	Components	Remarks
DI 24V/0V common input [32 points] DO Source output [32 points]	FCU8-DX220	Base card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Number of occupied stations: 1
DI 24V/0V common input [64 points] DO Source output [48 points]	FCU8-DX230	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) Number of occupied stations: 2
DI 24V/0V common input DO Source output [48 points] AO Analog output [1 point]	FCU8-DX231	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Number of occupied stations: 2
AI Analog input [4 points] AO Analog output [1 point]	FCU8-DX202	Base card RIO 2.0 connector set	AI : 4 points AO: 1 point Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213	Base card RIO 2.0 connector set	DI: 16-points 0V common type (3mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213-1	Base card RIO 2.0 connector set	DI: 16-points 0V common type (9mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (3mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654-1	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (9mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
DI 24V/0V common input [32points] DO Source output [32 points] Safety DI 0V common input [8 points] (Note 1) Safety relay output [4 points] (Note 2)	FCU8-DX651	Base card Add-on card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Safety DI: 8-points 0V common type Safety relay: 4-points (non-voltage contact) Relay contact welding detection Number of occupied stations: 3 (Note 1) Safety DI uses 16 points of terminal because of the duplication wiring. (Note 2) Safety relay output uses 8 points of terminal because of the duplication wiring.
Thermistor input [12 points]	FCU8-DX408	Base card RIO 2.0 connector set	Thermistor input: 12 points Number of occupied stations: 3
Multi-analog input [4 points] (Note 3)	FCU8-DX409	Base card RIO 2.0 connector set	Multi-analog input: 4 points (Note 3) Voltage input, current input, thermocouple input and resistance temperature detector input are selected for each CH. Number of occupied stations: 4

(Note) DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals

3.11 Function Expansion Unit

Classification	Type	Components	Remarks
Encoder (manual pulse generator) I/F expansion unit	FCU8-EX544	Encoder I/F PCB	Encoder input 1ch 5V manual pulse generator input 2ch

3.12 Communication Expansion Unit

Classification	Type	Components	Remarks
CC-Link expansion unit	FCU8-EX561	CC-Link I/F PCB	CC-Link 1ch
PROFIBUS-DP master unit	FCU8-EX563	PROFIBUS-DP I/F PCB	PROFIBUS-DP 1ch
CC-Link IE Field Master/local unit	FCU8-EX564	Base card Add-on card	CC-Link IE Field 2ch
EtherNet/IP Scanner/adapter unit	FCU8-EX565	Base card Add-on card	EtherNet/IP 1ch (Only LAN1, LAN2 cannot be used)
FL-net expansion unit	FCU8-EX568	Base card Add-on card	FL-net 1ch (Only LAN1, LAN2 cannot be used)

3.13 Side Memory I/F Unit

Classification	Type	Components	Remarks
Side Memory I/F Unit	FCU8-EP201-2	Side memory I/F PCB J292 cable Structural member	SDHC 1ch USB2.0 1ch USB communication (between side memory I/F PCB and personal computer) Unit lid (resin molded article), metal plate, etc. Exclusive for 19-type display unit

3.14 Manual Pulse Generator

Classification	Type	Components	Remarks
5V Manual Pulse Generator	UFO-01-2Z9	UFO-01-2Z9 (Produced by NIDEC NEMICON)	Input 5VDC 100pulse/rev
12V Manual Pulse Generator	HD60C	HD60C	Input 12VDC 25pulse/rev

3.15 Synchronous Feed Encoder

Classification	Type	Components	Remarks
Synchronous feed encoder	OSE1024-3-15-68	OSE1024-3-15-68	Input 5VDC 1024pulse/rev 6000r/min, 68-square flange
Synchronous feed encoder	OSE1024-3-15-68-8	OSE1024-3-15-68-8	Input 5VDC 1024pulse/rev 8000r/min ,68-square flange
Synchronous feed encoder	OSE1024-3-15-160	OSE1024-3-15-160	Input 5VDC 1024pulse/rev 6000r/min, 160-square flange

3.16 MITSUBISHI CNC Machine Operation Panel

Classification	Type	Components	Remarks
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB921	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification A)
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB922	Escutcheon, key switch control card G054 cable, Screw cap set	Custom specification key layout (55 keys) (Clear key top cover sold separately)
Main panel B (For 10.4-type display unit)	FCU8-KB923	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification A)
Main panel B (For 10.4-type display unit)	FCU8-KB924	Escutcheon, key switch control card G054 cable, Screw cap set	Custom specification key layout (55 keys) (Clear key top cover sold separately)
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB925	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification B)
Main panel B (For 10.4-type display unit)	FCU8-KB926	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification B)
Sub panel A (Common for all display units)	FCU8-KB931	Escutcheon Emergency stop switch, Override switch ON/OFF switch, Screw cap set	MITSUBISHI standard switch specification (Standard specification A)
Sub panel A (Common for all display units)	FCU8-KB941	Escutcheon Emergency stop switch, Override switch ON/OFF switch, Screw cap set	MITSUBISHI standard switch specification (Standard specification B)
Clear key top set	N030C975G51 / N030C975G55	Clear key top cover (20 pcs/60 pcs)	
Set of labels for M7 standard key layout	N939A169G51	Labels for M7 standard key layout (1 sheet)	

3.17 Handy Terminal

Classification	Type	Components	Remarks
Handy Terminal	HG1T-SB12UH- MK1346-L5		

3.18 Cable Connector Sets

Classification	Type	Components	Remarks
General I/O units (For SKIP,SIO,MPG,AIO)	FCUA-CS000	Connector (10120-3000PE,2pcs), Shell kit (10320-52F0-008,2pcs)	
Emergency stop connector (For EMG)	005057-9403 0016020103 x 3 pcs.	Connector (50-57-9403), Contact (0016020103,3pcs.)	
Connector kit for RIO 2.0 unit	RIO2 CON	Connector (1-1318119-3,2pcs.), Contact (1318107-1,8pcs.), Connector (2-178288-3), Contact (1-175218-5,3pcs)	
24VDC power supply connector (For DCIN)	FCUA-CN220	Connector (2-178288-3), Contact (1-175218-5,3pcs)	
DI/DO connector (For operation panel I/O unit) (For remote I/O unit)	7940-6500SC x 4pcs. 3448-7940 x 4pcs.	Connector (7940-6500SC,4pcs.), Strain relief (3448-7940,4pcs.)	
ON/OFF switch connector	005057-9404 0016020103 x 4pcs.	Connector (50-57-9404), Contact (0016020103,4pcs.)	
THERMISTOR connector	37104-2165-000FL 10P	Connector (37104-2165-000FL,10pcs.)	

3.19 Thermistor Sets

Classification	Type	Components	Remarks
Thermistor	PT3C-51F-M2 10P	Thermistor (PT3C-51F-M2,10pcs.)	

3.20 Genuine Memory Card

Classification	Type	Components	Remarks
Exclusive SD cards for MITSUBISHI CNC 1GB	FCU8-SD001G	FCU8-SD001G	1GB capacity
Exclusive SD cards for MITSUBISHI CNC 4GB	FCU8-SD004G	FCU8-SD004G	4GB capacity

3.21 Durable Parts

Durable parts	Part type
Battery for control unit	Q6BAT BKO-C10811H03
Cooling fan for personal computer unit	109P0424H3103

(Note) Contact the Service Center, Sales Office or dealer for repairs or part replacement.

3.22 Replacements

Replacements	Part type	Manufacturer
Protection fuse for operation panel I/O	LM50	Daito Communication Apparatus Co., Ltd.
Protection fuse for FCU8-DX220/230/231	LM50	Daito Communication Apparatus Co., Ltd.
Protection fuse for FCU8-DX213/654/213-1/654-1	MP63	Daito Communication Apparatus Co., Ltd.
Pair of SD/USB covers for display unit	N031C089G51	-

3.23 List of Cables

[Cable relating to NC]

Type	Application	Available cable length (m)	Max. cable length
FCUA-R050-xM	Synchronous encoder - control unit (straight, with connector) (for FCU8-EX544)	5	30m
FCUA-R054-xM	Synchronous encoder - control unit (right angle, with connector) (for FCU8-EX544)	3, 5, 10, 15, 20	30m
G071 LxM	24VDC relay cable for MITSUBISHI CNC machine operation panel	0.12, 0.5, 1	1m
G123	Cable for emergency stop release	-	-
G170 LxM	ON/OFF switch cable (ON/OFF switch - Personal computer unit) (for windows-based display)	1, 2, 3, 5, 10, 15	15m
G430 LxM	Cable for connection to handy terminal	3, 5, 10	10m
G460 LxM	Cable for MITSUBISHI CNC machine operation panel (Cable between main panel and sub panel)	0.5	0.5m
J010 LxM	Operation panel I/O interface cable (for non-Windows-based display)	0.5, 1	1m
J020 LxM	Manual pulse generator cable (12V): 1ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J021 LxM	Manual pulse generator cable (12V): 2ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J022 LxM	Manual pulse generator cable (12V): 3ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J023 LxM	Manual pulse generator cable (5V): 1ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J024 LxM	Manual pulse generator cable (5V): 2ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J025 LxM	Manual pulse generator cable (5V): 3ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J026 LxM	Manual pulse generator cable (5V): 1ch (for connection to control unit)	1, 2, 3, 5, 7, 10, 15, 20	20m (*)
J027 LxM	Manual pulse generator cable (5V): 2ch (for connection to control unit)	1, 2, 3, 5, 7, 10, 15, 20	20m (*)
J030 LxM	RS-232C I/F cable: 1ch	1, 2, 3, 5, 7, 10	15m (*)
J031 LxM	RS-232C I/F cable: 2ch	1, 2, 3, 5, 7, 10	15m (*)
J070 LxM	24VDC power cable	1, 2, 3, 5, 7, 10, 15	15m
J071 LxM	24VDC power cable (for long distance)	20	20m
J100 LxM	SKIP input cable	1, 2, 3, 5, 7, 10, 15, 20	20m
J120 LxM	Emergency stop cable	1, 2, 3, 5, 7, 10, 15, 20, 30	30m
J121 LxM	Emergency stop cable for MITSUBISHI CNC machine operation panel	1, 2, 3, 5, 7, 10, 15, 20, 30	30m
J170 LxM	ON/OFF switch cable (ON/OFF switch - Graphic control unit) (for non-Windows-based display)	1, 2, 3, 5, 10, 15	15m
J210 LxM	Remote I/O 2.0 communication cable	0.3, 1, 2, 3, 5, 7, 10, 15, 20, 30	50m (*)
J220 LxM	Analog output cable (for M800W)	2, 3, 7	30m
J221 LxM	Analog input/output cable (for remote I/O unit)	2, 3, 7	30m
J291 LxM	Connection cable between personal computer unit and operation panel I/O unit	0.15, 0.5, 1	1m
J303 LxM	LAN straight cable	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J350 LxM	DI/DO cable (connectors at both ends)	1, 2, 3, 5	50m
J351 LxM	DI/DO cable (connector at one end)	3	50m
J460 LxM	DI/DO cable (connectors at both ends)	1, 2, 3, 5	50m
J461 LxM	DI/DO cable (connector at one end)	3	50m
R2-TM	Terminator for remote I/O interface	-	-

(Note 1) "x" in type columns indicate cable length (unit: m).

(Note 2) Lengths indicated with an asterisk (*) in the max. cable length column indicate the maximum cable length when connecting via other unit.

[Cable Relating to Drive Unit]

Type	Application	Available cable length (m)	Max. cable length
CNP2E-1-xM	Motor side PLG cable Spindle side accuracy encoder TS5690 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNP3EZ-2P-xM	Spindle side encoder cable OSE-1024 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNP3EZ-3P-xM	Spindle side encoder cable OSE-1024 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-8P-xM	For HG/HG-H,HQ/HQ-H Motor side encoder cable (for D48/D51/D74)	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-9P-xM	For HG/HG-H,HQ/HQ-H Motor side encoder cable (for D48/D51/D74)	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-D-xM	MDS-B-SD unit cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-HP-xM	MDS-B-HR unit cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
DG30-xM	Battery cable (For drive unit - Battery box, For drive unit - drive unit)	0.3, 0.5, 1, 2, 3, 5, 7, 10	10m
G380 LxM	Optical communication cable For wiring between drive units (outside panel)	5, 10, 12, 15, 20, 25, 30	30m
J395 LxM	Optical communication cable For wiring between drive units (outside panel) For wiring between NC-drive units	3, 5, 7, 10	10m
J396 LxM	Optical communication cable For wiring between drive units (inside panel)	0.2, 0.3, 0.5, 1, 2, 3, 5	10m
MR-BKS1CBLxMA1-H	<200V Series> Brake cable for HG96 Lead out in direction of motor shaft	2, 3, 5, 7, 10	10m
MR-BKS1CBLxMA2-H	<200V Series> Brake cable for HG96 Lead out in opposite direction of motor shaft	2, 3, 5, 7, 10	10m
MR-BT6V2CBL LxM	Battery cable (MDS-EJ/EJH) (For drive unit - drive unit)	0.3, 1	1m
MR-D05UDL3M-B	STO cable	3	3m
MR-PWS1CBLxMA1-H	<200V Series> Power cable for HG96 Lead out in direction of motor shaft	2, 3, 5, 7, 10	10m
MR-PWS1CBLxMA2-H	<200V Series> Power cable for HG96 Lead out in opposite direction of motor shaft	2, 3, 5, 7, 10	10m
SH21 LxM	Power supply communication cable Power backup unit communication cable	0.35, 0.5, 1, 2, 3	30m

(Note 1) "x" in type columns indicate cable length (unit: m).

(Note 2) Lengths indicated with an asterisk (*) in the max. cable length column indicate the maximum cable length when connecting via other unit.

3.24 System Type

Series	Model name	System type	Control unit
M800W Series	M850W	FCA850U	FCU8-MA041-001
	M830W	FCA830U	FCU8-MU042-001
M80W Series	M80W	FCA80U	FCU8-MU044-001

4

General Specifications (M800W/M80W Series)

4.1 Environment Conditions [M800W]

4.1.1 Environment Conditions inside the Operation Panel

Item	Unit name		Display unit	Personal computer unit	Graphic control unit
	Type		FCU8-DU141-31 : (10.4-type) FCU8-DU181-31 : (15-type) FCU8-DU181-34 : (15-type) FCU8-DU191-75 : (19-type) FCU8-DU192-75 : (19-type)	FCU8-PC231	FCU8-GC211
General Specifications	Ambient temperature	During operation	0 to 58°C		
		During storage	-20 to 60°C		
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)		
		Short term	10 to 95% RH (with no dew condensation) (Note 1)		
	Vibration resistance		4.9m/s^2 [0.5G] or less		
	Shock resistance		29.4m/s^2 [3G] or less		
	Working atmosphere		No corrosive gases, dust or oil mist		
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level		
	Power supply voltage		FCU8-DU141-31 : 12VDC/5VDC/3.3VDC FCU8-DU181-31 : 12VDC/5VDC/3.3VDC FCU8-DU181-34 : 12VDC/5VDC/3.3VDC FCU8-DU191-75 : 12VDC/5VDC FCU8-DU192-75 : 12VDC/5VDC	24VDC	24VDC
			(Supply from personal computer unit or graphic control unit)		
	Current consumption		24V 2.2A		24V 2.5A
	Maximum heating value	(W)	FCU8-DU141-31 : 10 FCU8-DU181-31 : 14 FCU8-DU181-34 : 18 FCU8-DU191-75 : 21 FCU8-DU192-75 : 21	32	12
	Mass	(kg)	FCU8-DU141-31 : 1.7 FCU8-DU181-31 : 4 FCU8-DU181-34 : 4 FCU8-DU191-75 : 5.7 FCU8-DU192-75 : 5.7	1.2	1.1
	Outline dimension W×H or W×H×D	(mm)	FCU8-DU141-31 : 290×220 FCU8-DU181-31 : 400×320 FCU8-DU181-34 : 290×220 FCU8-DU191-75 : 365×440 FCU8-DU192-75 : 440×365	220×182×53.5	239.1×173.4×75

(Note 1) "Short term" means within one month.

(Note 2) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 3) When the display unit is mounted on an incline, the inclination angle to place the unit should follow below.
10.4 or 15-type display unit: the inclination should be 30 degrees or less from the vertical direction.
19-type display unit: the inclination should be 60 degrees or less from the vertical direction.

Item	Unit name		Keyboard unit	Operation panel I/O unit		Machine operation panel
	Type		FCU8-KB041/KB046 : (10.4-type) FCU8-KB047 : (10.4-type/vertical arrangement) FCU8-KB048 : (10.4-type) FCU8-KB083 : (15-type/vertical arrangement)	FCU8-DX830/ DX834/DX837	FCU8-DX730	FCU8-KB921/KB922/ KB925 FCU8-KB923/KB924/ KB926 FCU8-KB931/KB941
General Specifications	Ambient temperature	During operation	0 to 58°C			
		During storage	-20 to 60°C			
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)			
		Short term	10 to 95% RH (with no dew condensation) (Note 1)			
	Vibration resistance		4.9m/s^2 [0.5G] or less			
	Shock resistance		29.4m/s^2 [3G] or less			
	Working atmosphere		No corrosive gases, dust or oil mist			
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level			
	Power supply voltage		5VDC (Supply from Operation Panel I/O Unit)	24VDC	5VDC, 3.3VDC (Supply from Graphic Control Unit)	24VDC (Note 7)
	Current consumption		- (Note 2)	24V 0.3A (Note 3)	- (Note 3,4)	0.3A (Note 7)
	Maximum heating value	(W)	1	8 (Note 5)	4 (Note 5)	7.2
	Mass	(kg)	FCU8-KB041/KB046 : 0.8 FCU8-KB047 : 1.3 FCU8-KB048 : 1.4 FCU8-KB083 : 1.5	0.4	0.3	FCU8-KB921/KB922/ KB925 : 1.1 FCU8-KB923/KB924/ KB926 : 1.2 FCU8-KB931/KB941 : 0.5
	Outline dimension W×H	(mm)	FCU8-KB041/KB046 : 140×220 FCU8-KB047 : 290×160 FCU8-KB048 : 230×220 FCU8-KB083 : 400×140	116×179		FCU8-KB921/KB922/ KB925 : 260×140 FCU8-KB923/KB924/ KB926 : 290×140 FCU8-KB931/KB941 : 140×140

(Note 1) "Short term" means within one month.
(Note 2) The current consumption of the keyboard unit is included in that of the operation panel I/O unit or the graphic control unit.
(Note 3) Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.
(Note 4) The current consumption of FCU8-DX730 is included in that of the graphic control unit.
(Note 5) For the heating value of the I/O circuit, calculate with the number of points used.
(Note 6) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.
(Note 7) 24V power input is not required for FCU8-KB931/KB941.

4.1.2 Environment Conditions inside the Control Panel

Item	Unit name		Control unit
	Type		FCU8-MU042 FCU8-MA041
General Specifications	Ambient temperature	During operation	0 to 55°C
		During storage	-20 to 60°C
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)
		Short term	10 to 95% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 [0.5G] or less
	Shock resistance		29.4m/s^2 [3G] or less
	Working atmosphere		No corrosive gases, dust or oil mist
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Power supply voltage		24VDC
	Current consumption		1.5A
	Maximum heating value	(W)	16
	Mass	(kg)	2.0
	Outline dimension W×H×D	(mm)	90×380×180

(Note 1) "Short term" means within one month.

(Note 2) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

Item	Unit name		Remote I/O unit					
	Type		FCU8-DX220/ DX230/ DX231	FCU8-DX202	FCU8-DX213/ DX213-1/ DX654/ DX654-1	FCU8-DX408	FCU8-DX409	FCU8-DX651
General Specifications	Ambient temperature	During operation	0 to 58°C					
		During storage	-20 to 60°C					
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)					
		Short term	10 to 95% RH (with no dew condensation) (Note 1)					10 to 85% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 or less					
	Shock resistance		29.4m/s^2 or less					
	Working atmosphere		No corrosive gases, dust or oil mist					
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level					
	Power supply voltage		24VDC					
	Current consumption		3.5A (Note 2)	0.3A	0.3A (Note 3)	0.1A	0.2A	3.7A (Note 2)
	Maximum heating value	(W)	8 (Note 4)			3	6 (Note 6)	8 (Note 4)
	Mass	(kg)	0.4			0.2	0.3	0.8
	Outline dimension W×H×D	(mm)	40×175×133	40×175×119	40×175×130	40×175×109	40×175×115	172×100×115

(Note 1) "Short term" means roughly within one month.

(Note 2) This value includes the maximum value of DO external load current (3.2A).

(Note 3) This value does not include DO external load current.

(Note 4) For the heating value of the I/O circuit, calculate with the number of points used.

(Note 5) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 6) The maximum value including the heating value of analog input circuit.

4.1.3 24VDC Stabilized Power Supply Selecting Conditions

Consider the following characteristics for the stabilized power supply, and select the power supply that complies with laws, regulations, or safety standards of the country where the machine will be installed.

Item		Specifications	Remarks
Output	**Voltage**	24VDC	When the stabilized power supply and 24VDC input unit are distant, select the stabilized power supply which is possible to set output voltage 24VDC or more allowing for the influence of voltage down by the cable.
	Voltage fluctuation	±5%	
	Current	-	Calculate the current value as a reference of maximum current consumption for the unit which uses the power supply.
	Ripple noise	0.2V (P-P)	
	Output holding time	min 20ms	Output holding time is decided by loading ratio; however, the stabilized power supply which complies with the specification on the left must be selected during maximum loading.
	Overcurrent output shutoff function	-	Use a power supply having the overcurrent output shutoff function.

⚠ CAUTION

1. Using a stabilized power supply without overcurrent protection may cause the unit's failure due to miswiring of 24V.

4.2 Environment Conditions [M80W]

4.2.1 Environment Conditions inside the Operation Panel

Item	Unit name		Display unit	Personal computer unit	Graphic control unit
	Type		FCU8-DU121-12 : (8.4-type) FCU8-DU141-32 : (10.4-type) FCU8-DU181-32 : (15-type) FCU8-DU181-36 : (15-type) FCU8-DU191-77 : (19-type) FCU8-DU192-77 : (19-type)	FCU8-PC231	FCU8-GC211
General Specifications	Ambient temperature	During operation	0 to 58°C		
		During storage	-20 to 60°C		
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)		
		Short term	10 to 95% RH (with no dew condensation) (Note 1)		
	Vibration resistance		4.9m/s^2 [0.5G] or less		
	Shock resistance		29.4m/s^2 [3G] or less		
	Working atmosphere		No corrosive gases, dust or oil mist		
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level		
	Power supply voltage		FCU8-DU121-12 : 12VDC/3.3VDC FCU8-DU141-32 : 12VDC/5VDC/3.3VDC FCU8-DU181-32 : 12VDC/5VDC/3.3VDC FCU8-DU181-36 : 12VDC/5VDC/3.3VDC FCU8-DU191-77 : 12VDC/5VDC FCU8-DU192-77 : 12VDC/5VDC (Supply from personal computer unit or graphic control unit)	24VDC	24VDC
	Current consumption		24V 2.2A		24V 2.5A
	Maximum heating value	(W)	FCU8-DU121-12 : 6 FCU8-DU141-32 : 10 FCU8-DU181-32 : 14 FCU8-DU181-36 : 18 FCU8-DU191-77 : 21 FCU8-DU192-77 : 21	32	12
	Mass	(kg)	FCU8-DU121-12 : 1.2 FCU8-DU141-32 : 1.7 FCU8-DU181-32 : 4 FCU8-DU181-36 : 4 FCU8-DU191-77 : 5.7 FCU8-DU192-77 : 5.7	1.2	1.1
	Outline dimension W×H or W×H×D	(mm)	FCU8-DU121-12 : 260×200 FCU8-DU141-32 : 290×220 FCU8-DU181-32 : 400×320 FCU8-DU181-36 : 400×320 FCU8-DU191-77 : 365×440 FCU8-DU192-77 : 440×365	220×182×53.5	239.1×173.4×75

(Note 1) "Short term" means within one month.

(Note 2) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 3) When the display unit is mounted on an incline, the inclination angle to place the unit should follow below.
8.4, 10.4, or 15-type display unit: the inclination should be 30 degrees or less from the vertical direction.
19-type display unit: the inclination should be 60 degrees or less from the vertical direction.

Item	Unit name		Keyboard unit	Operation panel I/O unit		Machine operation panel
	Type		FCU8-KB026/KB028 : (8.4-type) FCU8-KB029 : (8.4-type/ vertical arrangement) FCU8-KB041/KB046 : (10.4-type) FCU8-KB047 : (10.4-type/vertical arrangement) FCU8-KB048 : (10.4-type) FCU8-KB083 : (15-type/ vertical arrangement)	FCU8-DX830/ DX834/DX837	FCU8-DX730	FCU8-KB921/KB922/ KB925 FCU8-KB923/KB924/ KB926 FCU8-KB931/KB941
General Specifications	Ambient temperature	During operation	0 to 58°C			
		During storage	-20 to 60°C			
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)			
		Short term	10 to 95% RH (with no dew condensation) (Note 1)			
	Vibration resistance		4.9m/s^2 [0.5G] or less			
	Shock resistance		29.4m/s^2 [3G] or less			
	Working atmosphere		No corrosive gases, dust or oil mist			
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level			
	Power supply voltage		5VDC (Supply from Operation Panel I/O Unit)	24VDC	5VDC, 3.3VDC (Supply from Graphic Control Unit)	24VDC (Note 7)
	Current consumption		- (Note 2)	24V 0.3A (Note 3)	- (Note 3,4)	0.3A (Note 7)
	Maximum heating value	(W)	1	8 (Note 5)	4 (Note 5)	7.2
	Mass	(kg)	FCU8-KB026/KB028 : 0.75 FCU8-KB029 :1.0 FCU8-KB041/KB046 : 0.8 FCU8-KB047 : 1.3 FCU8-KB048 : 1.4 FCU8-KB083 : 1.5	0.4	0.3	FCU8-KB921/KB922/ KB925 : 1.1 FCU8-KB923/KB924/ KB926 : 1.2 FCU8-KB931/KB941 : 0.5
	Outline dimension W×H	(mm)	FCU8-KB026/KB028 : 140×200 FCU8-KB029 : 260×140 FCU8-KB041/KB046 : 140×220 FCU8-KB047 : 290×160 FCU8-KB048 : 230×220 FCU8-KB083 : 400×140	116×179		FCU8-KB921/KB922/ KB925 : 260×140 FCU8-KB923/KB924/ KB926 : 290×140 FCU8-KB931/KB941 : 140×140

(Note 1) "Short term" means within one month.

(Note 2) The current consumption of the keyboard unit is included in that of the operation panel I/O unit or the graphic control unit.

(Note 3) Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

(Note 4) The current consumption of FCU8-DX730 is included in that of the graphic control unit.

(Note 5) For the heating value of the I/O circuit, calculate with the number of points used.

(Note 6) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 7) 24V power input is not required for FCU8-KB931/KB941.

4.2.2 Environment Conditions inside the Control Panel

Item	Unit name		Control unit
	Type		FCU8-MU044
General Specifications	Ambient temperature	During operation	0 to 55°C
		During storage	-20 to 60°C
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)
		Short term	10 to 95% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 [0.5G] or less
	Shock resistance		29.4m/s^2 [3G] or less
	Working atmosphere		No corrosive gases, dust or oil mist
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level
	Power supply voltage		24VDC
	Current consumption		1.25A
	Maximum heating value	(W)	16
	Mass	(kg)	2.0
	Outline dimension W×H×D	(mm)	60×380×180

(Note 1) "Short term" means within one month.

(Note 2) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

Item	Unit name		Remote I/O unit					
	Type		FCU8-DX220/ DX230/ DX231	FCU8-DX202	FCU8-DX213/ DX213-1/ DX654/ DX654-1	FCU8-DX408	FCU8-DX409	FCU8-DX651
General Specifications	Ambient temperature	During operation	0 to 58°C					
		During storage	-20 to 60°C					
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)					
		Short term	10 to 95% RH (with no dew condensation) (Note 1)					10 to 85% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 or less					
	Shock resistance		29.4m/s^2 or less					
	Working atmosphere		No corrosive gases, dust or oil mist					
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level					
	Power supply voltage		24VDC					
	Current consumption		3.5A (Note 2)	0.3A	0.3A (Note 3)	0.1A	0.2A	3.7A (Note 2)
	Maximum heating value	(W)	8 (Note 4)			3	6 (Note 6)	8 (Note 4)
	Mass	(kg)	0.4			0.2	0.3	0.8
	Outline dimension W×H×D	(mm)	40×175×133	40×175×119	40×175×130	40×175×109	40×175×115	172×100×115

(Note 1) "Short term" means roughly within one month.
(Note 2) This value includes the maximum value of DO external load current (3.2A).
(Note 3) This value does not include DO external load current.
(Note 4) For the heating value of the I/O circuit, calculate with the number of points used.
(Note 5) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.
(Note 6) The maximum value including the heating value of analog input circuit.

4.2.3 24VDC Stabilized Power Supply Selecting Conditions

Consider the following characteristics for the stabilized power supply, and select the power supply that complies with laws, regulations, or safety standards of the country where the machine will be installed.

Item		Specifications	Remarks
Output	**Voltage**	24VDC	When the stabilized power supply and 24VDC input unit are distant, select the stabilized power supply which is possible to set output voltage 24VDC or more allowing for the influence of voltage down by the cable.
	Voltage fluctuation	±5%	
	Current	-	Calculate the current value as a reference of maximum current consumption for the unit which uses the power supply.
	Ripple noise	0.2V (P-P)	
	Output holding time	min 20ms	Output holding time is decided by loading ratio; however, the stabilized power supply which complies with the specification on the left must be selected during maximum loading.
	Overcurrent output shutoff function	-	Use a power supply having the overcurrent output shutoff function.

⚠ CAUTION

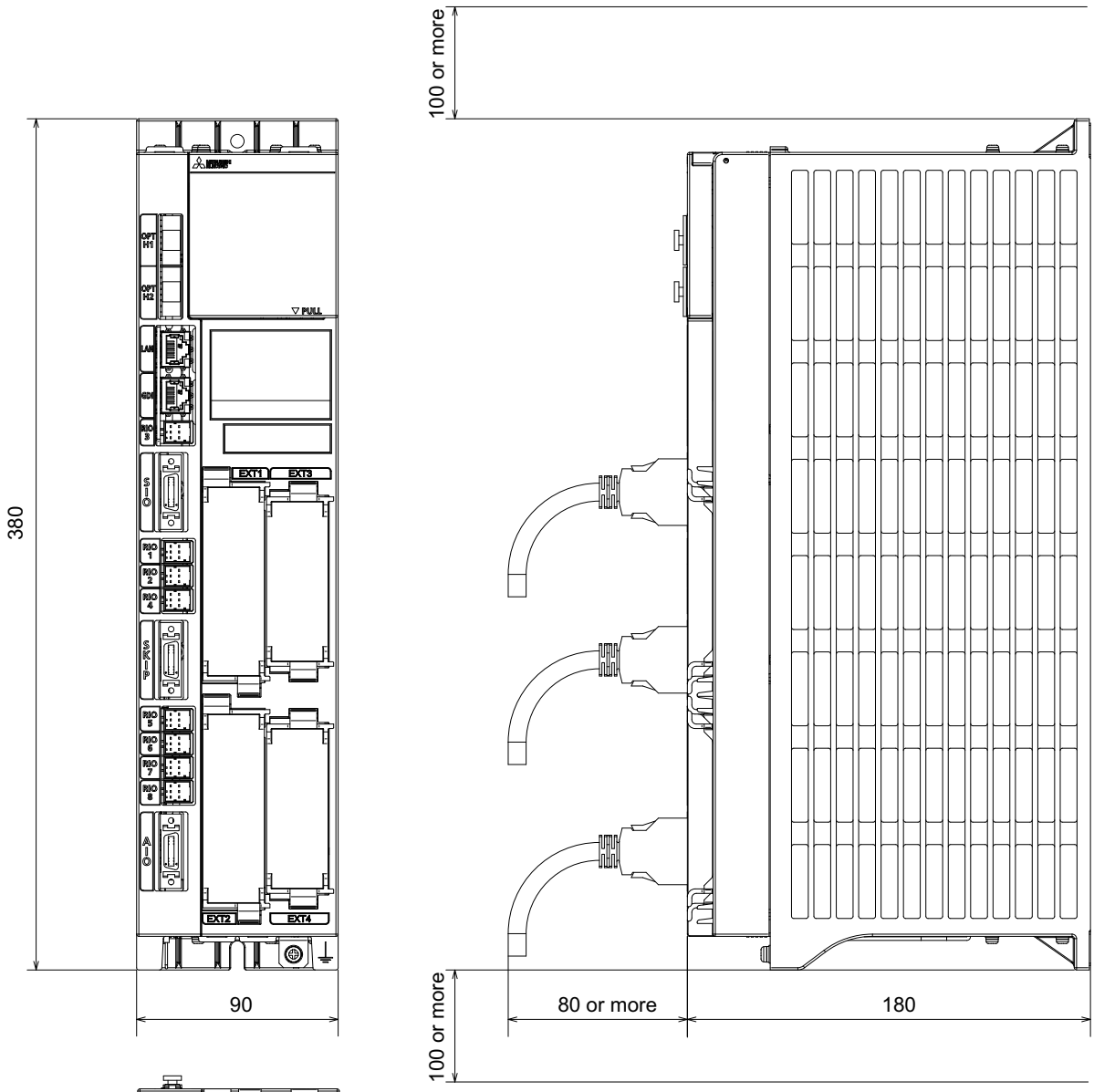
1. Using a stabilized power supply without overcurrent protection may cause the unit's failure due to miswiring of 24V.

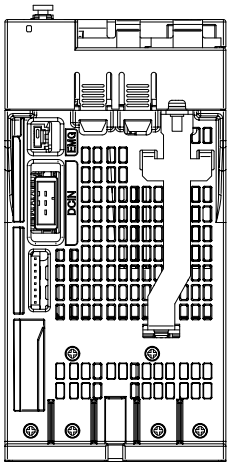
4.3 Control Unit [M800W]

4.3.1 M830W(FCU8-MU042) / M850W(FCU8-MA041)

[Outline dimension]

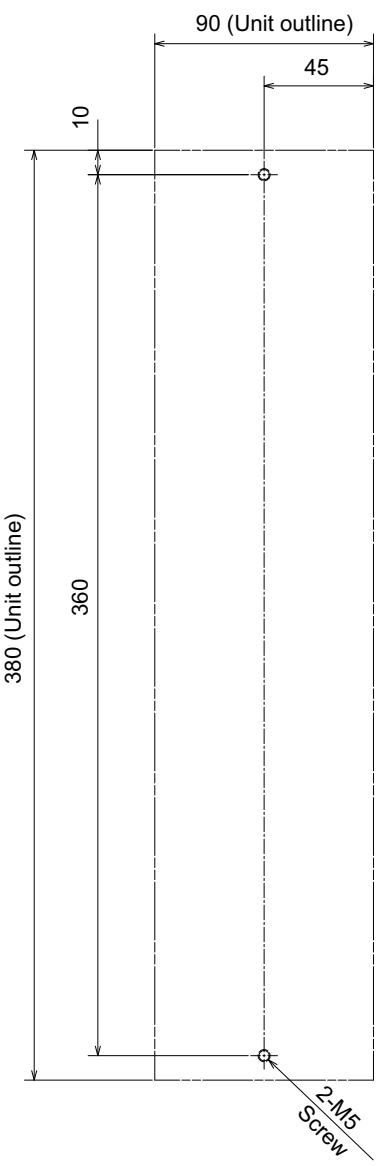
[mm]





[Installation dimension]

[mm]

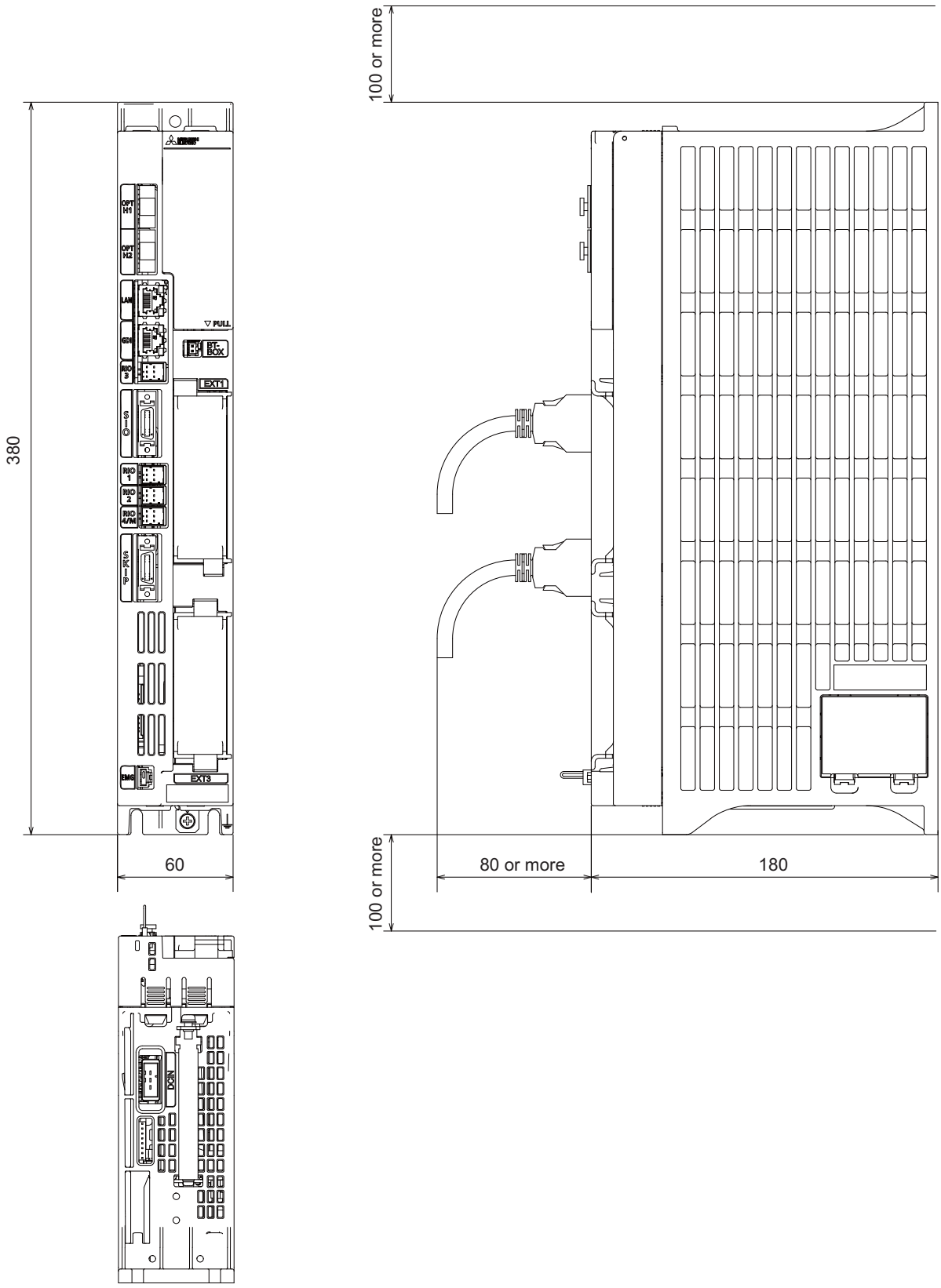


4.4 Control Unit [M80W]

4.4.1 FCU8-MU044

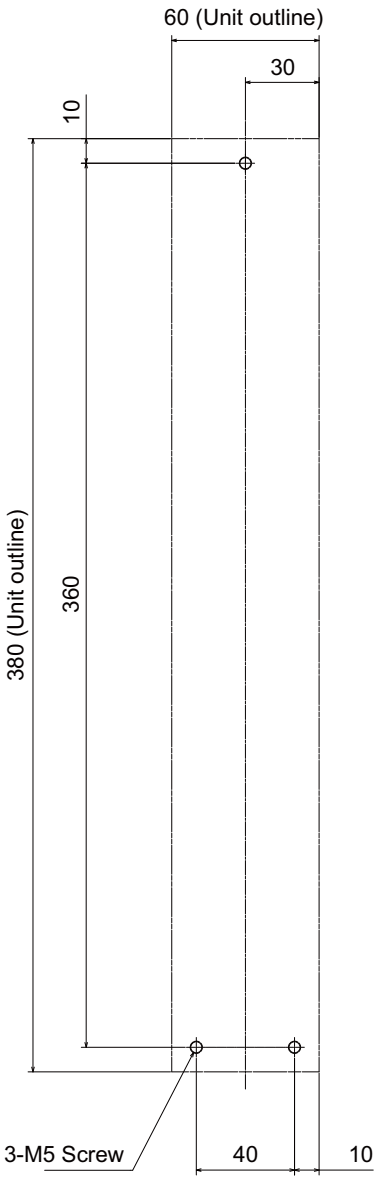
[Outline dimension]

[mm]



[Installation dimension]

[mm]

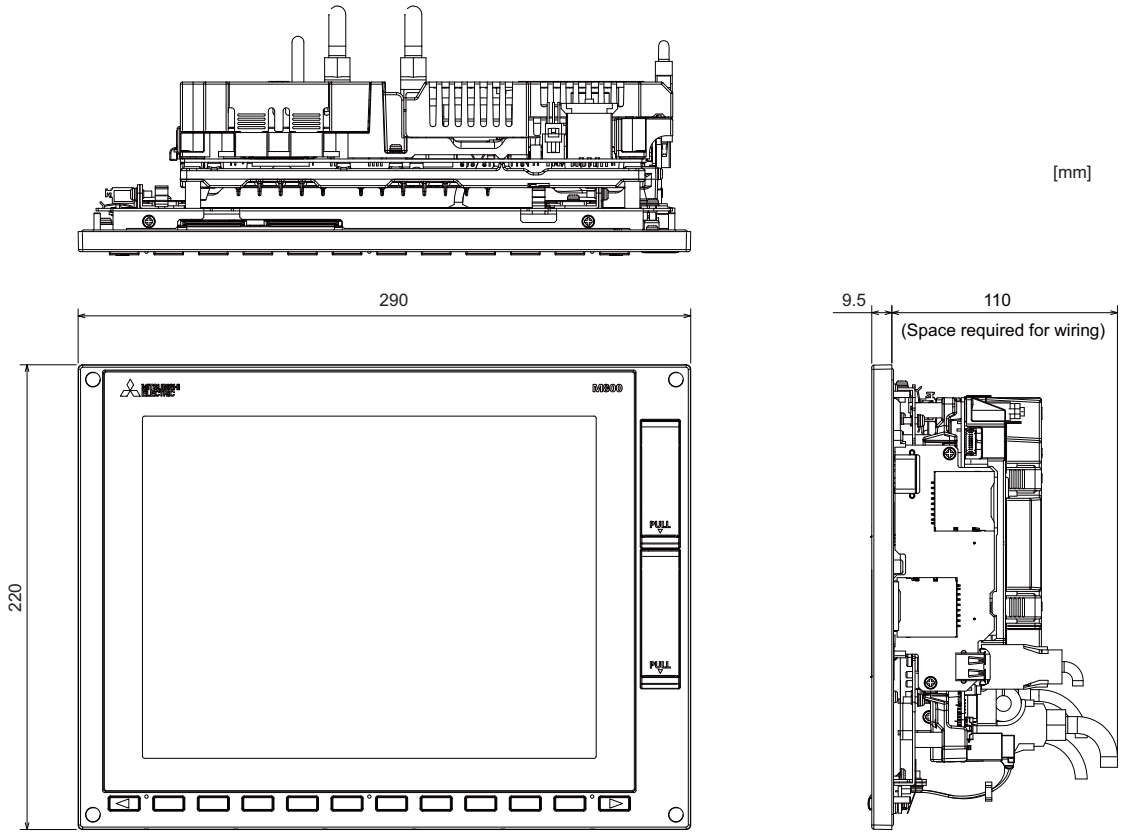


4.5 Display Unit [M800W]

4.5.1 10.4-type (FCU8-DU141-31)

[Outline dimension]

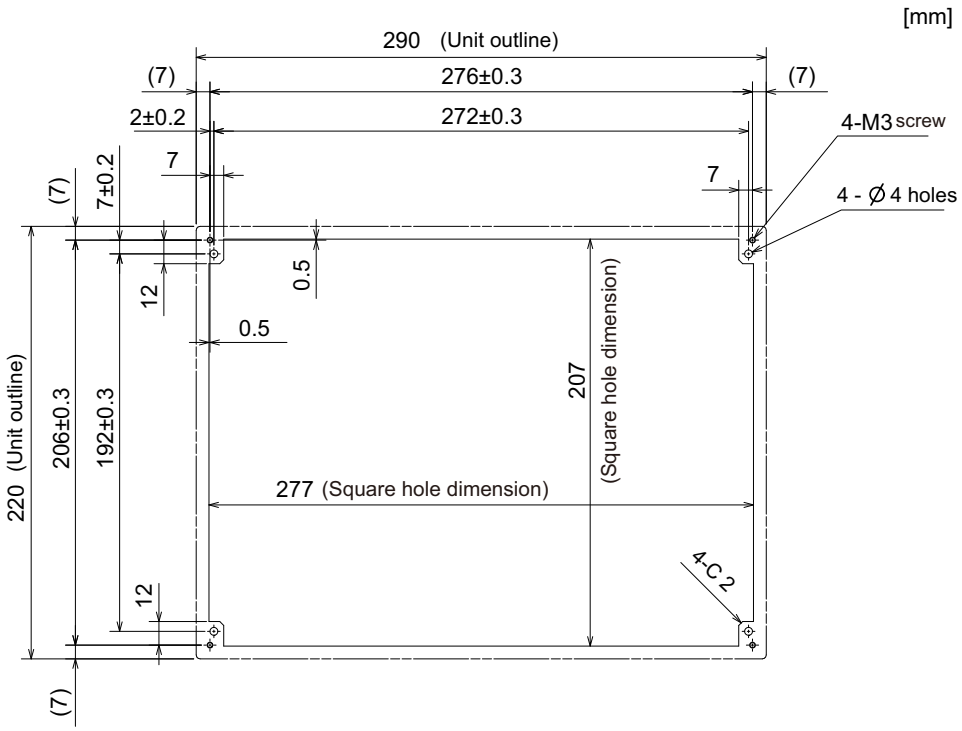
[mm]



(Note) The figure above shows the state with the graphic control unit mounted.

[Panel cut dimension]

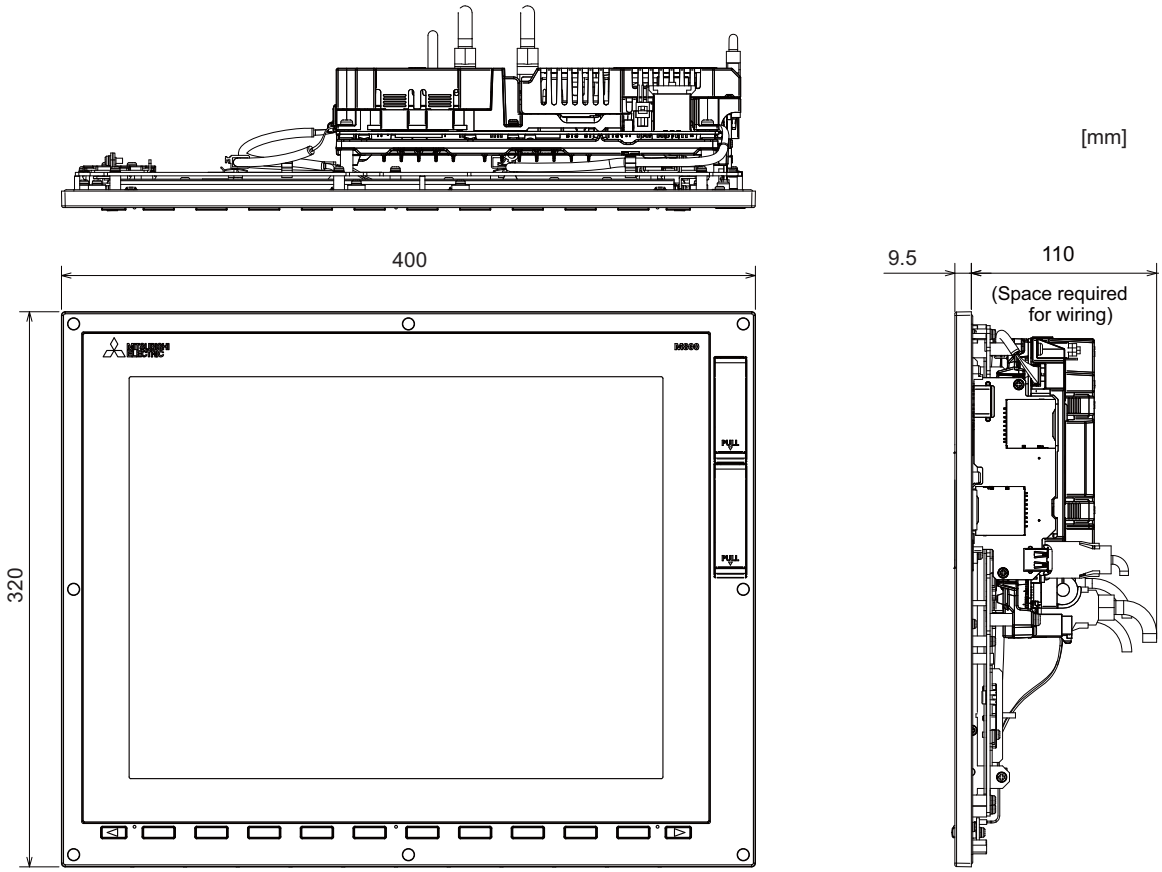
[mm]



4.5.2 15-type (FCU8-DU181-31)

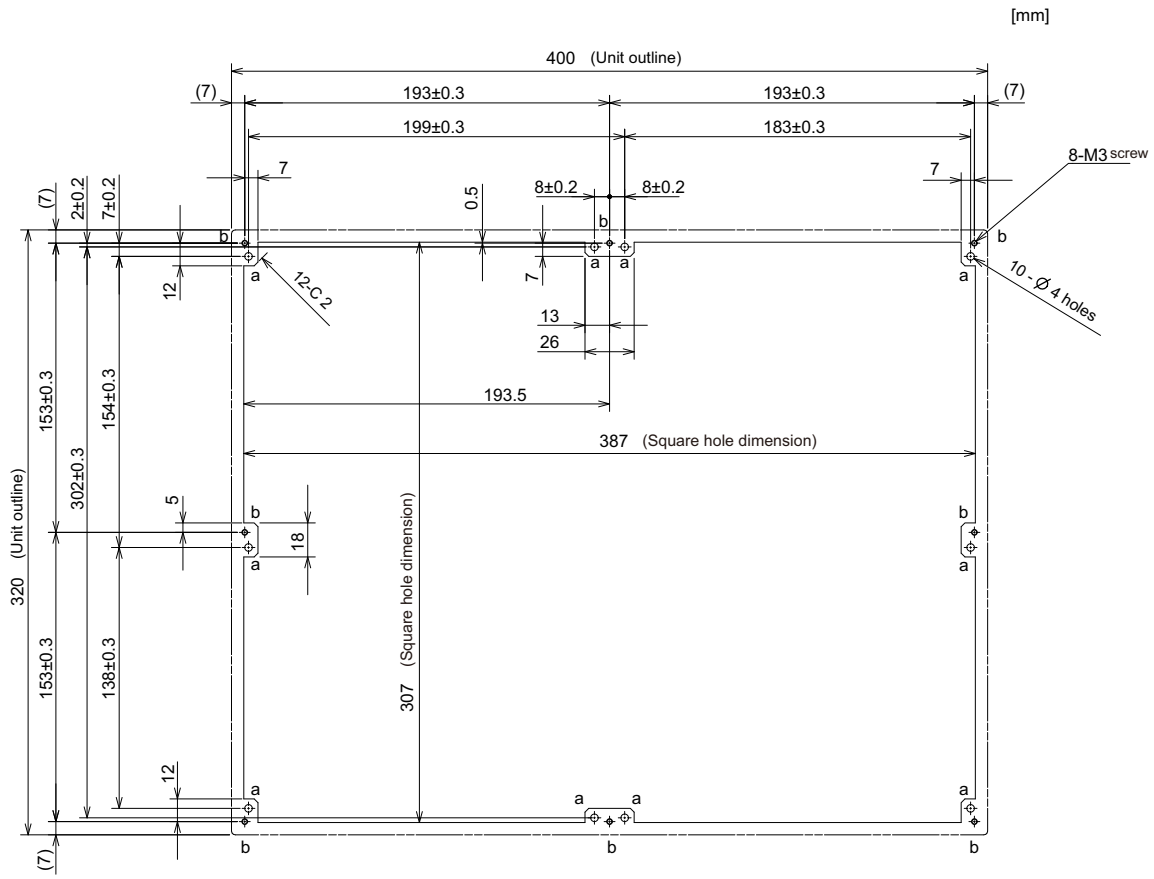
[Outline dimension]

[mm]



(Note) The figure above shows the state with the graphic control unit mounted.

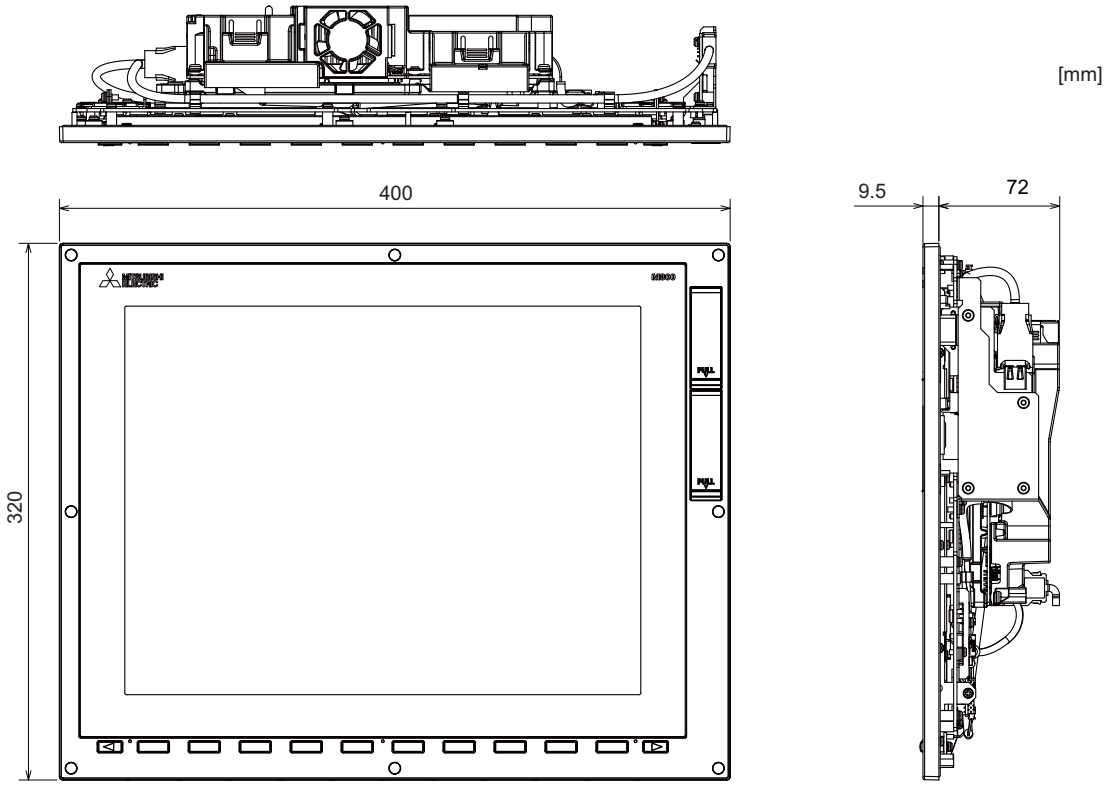
[Panel cut dimension]



4.5.3 15-type (FCU8-DU181-34)

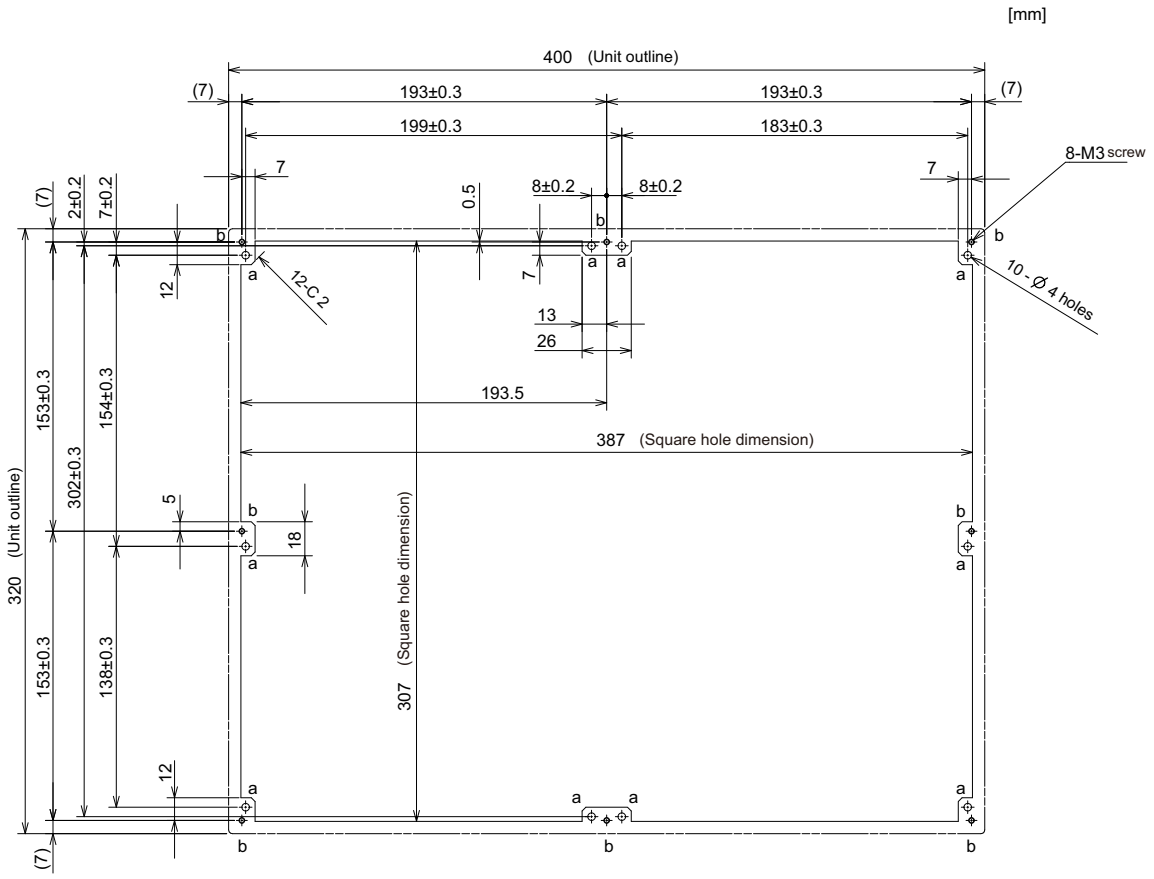
[Outline dimension]

[mm]



(Note) The figure above shows the state with the personal computer unit mounted.

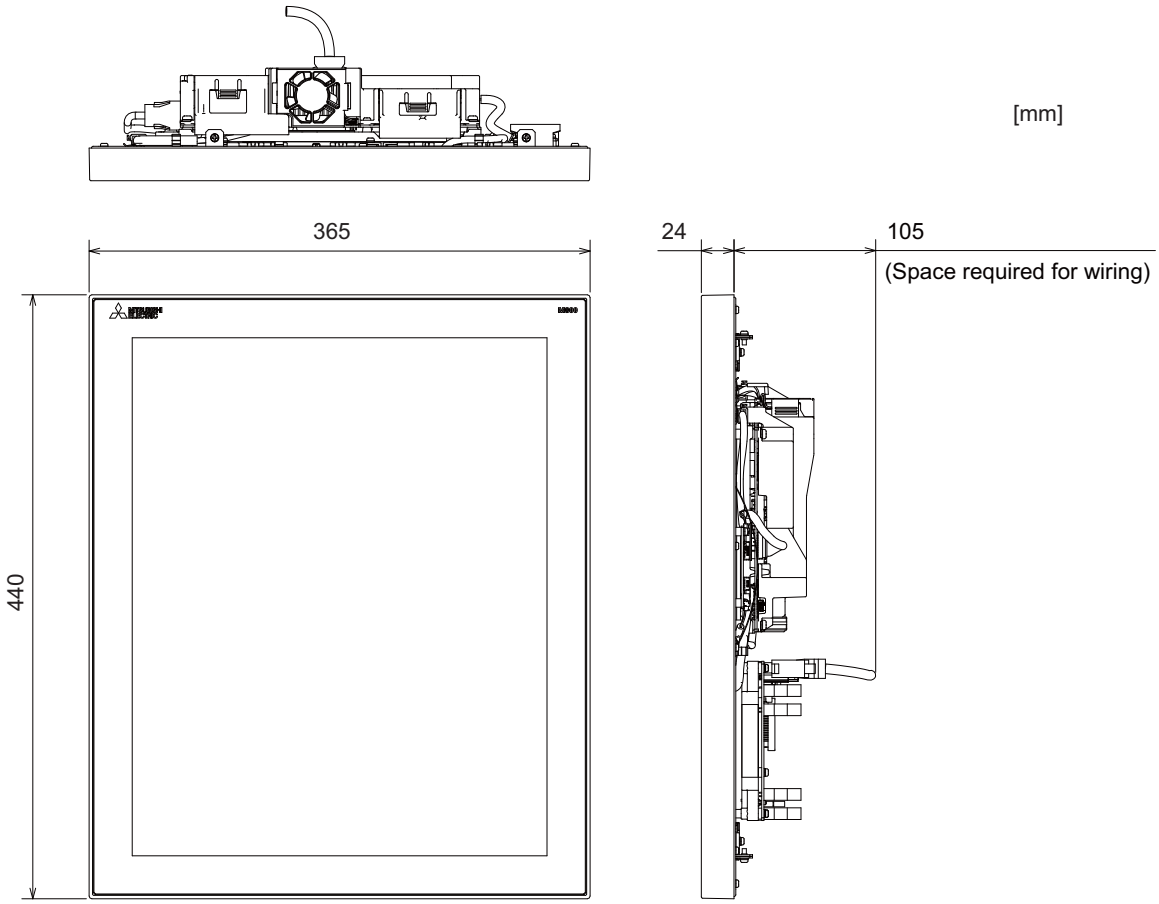
[Panel cut dimension]



4.5.4 19-type (FCU8-DU191-75)

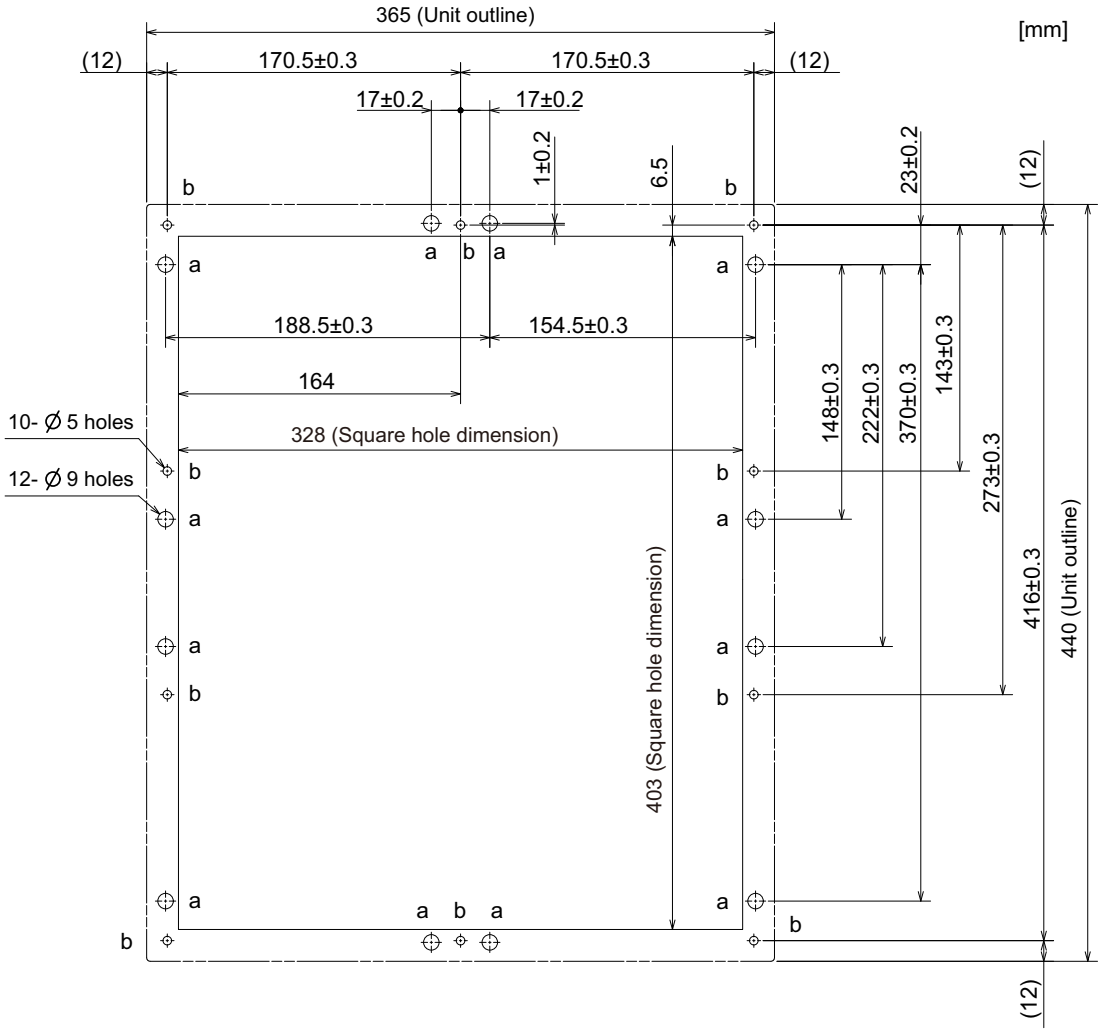
[Outline dimension]

[mm]



(Note) The figure above shows the state with the personal computer unit and the operation panel I/O unit mounted.

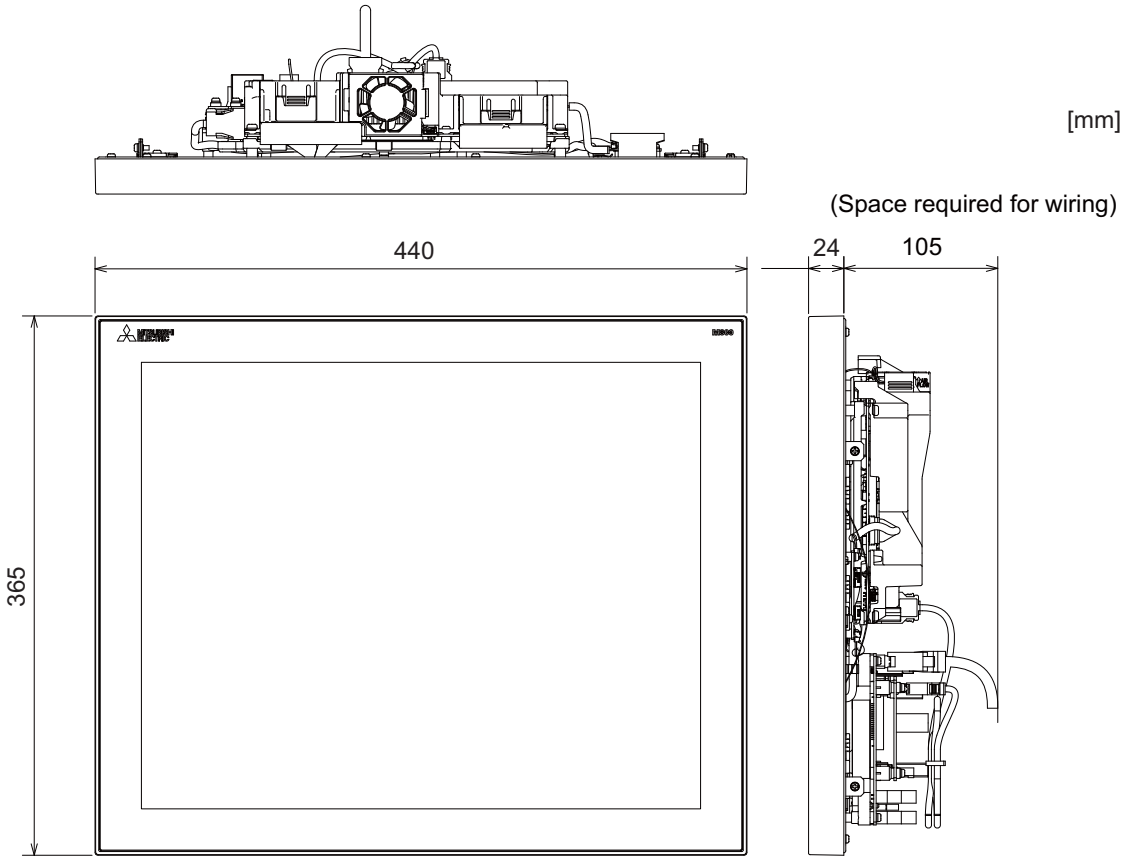
[Panel cut dimension]



4.5.5 19-type (FCU8-DU192-75)

[Outline dimension]

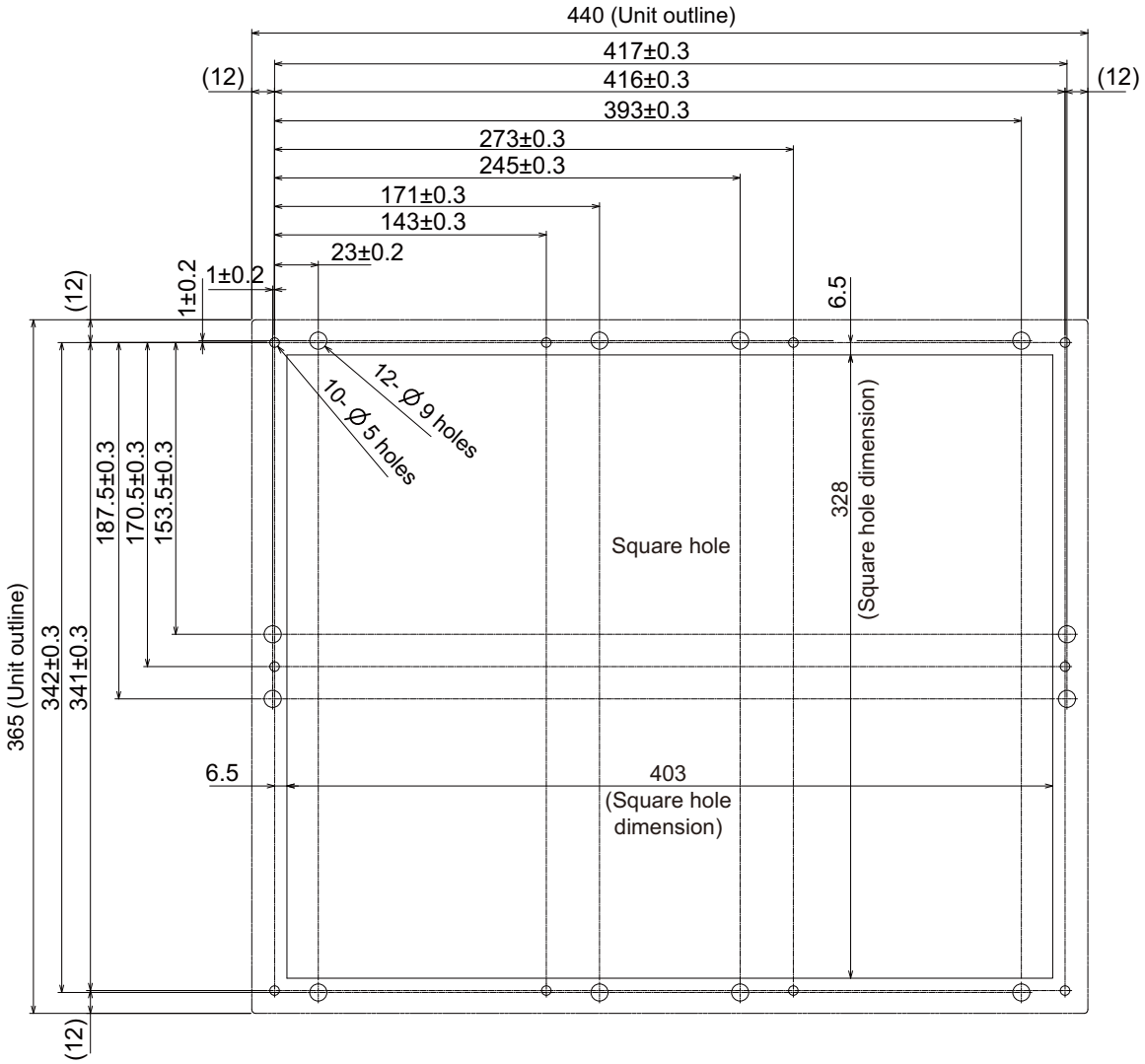
[mm]



(Note) The figure above shows the state with the personal computer unit and the operation panel I/O unit mounted.

[Panel cut dimension]

[mm]

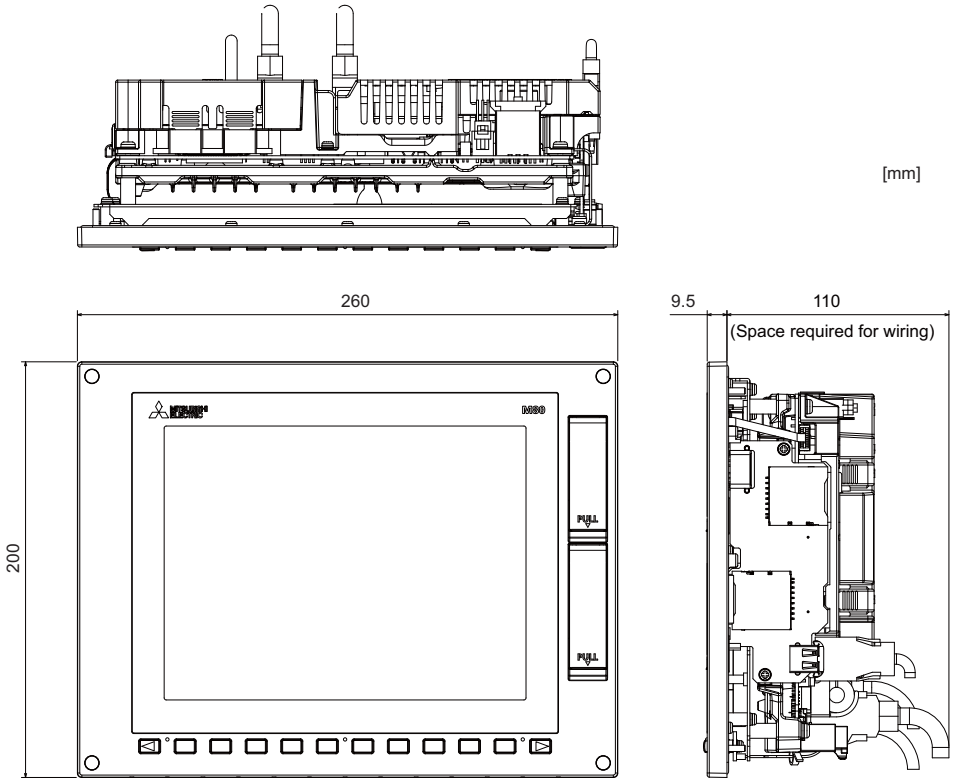


4.6 Display Unit [M80W]

4.6.1 8.4-type (FCU8-DU121-12)

[Outline dimension]

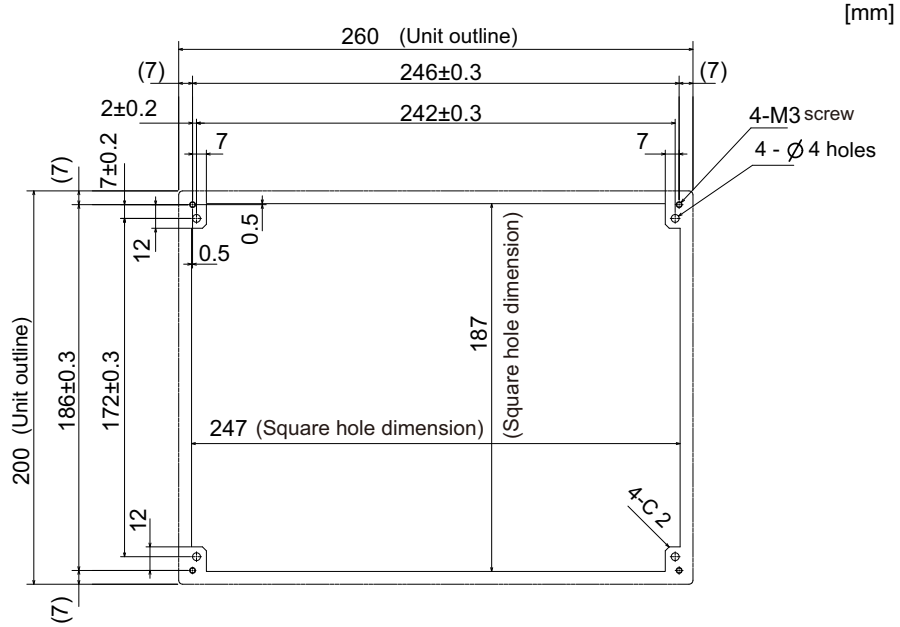
[mm]



(Note 1) The 8.4-type display unit is incompatible with the touchscreen.
(Note 2) The figure above shows the state with the graphic control unit mounted.

[Panel cut dimension]

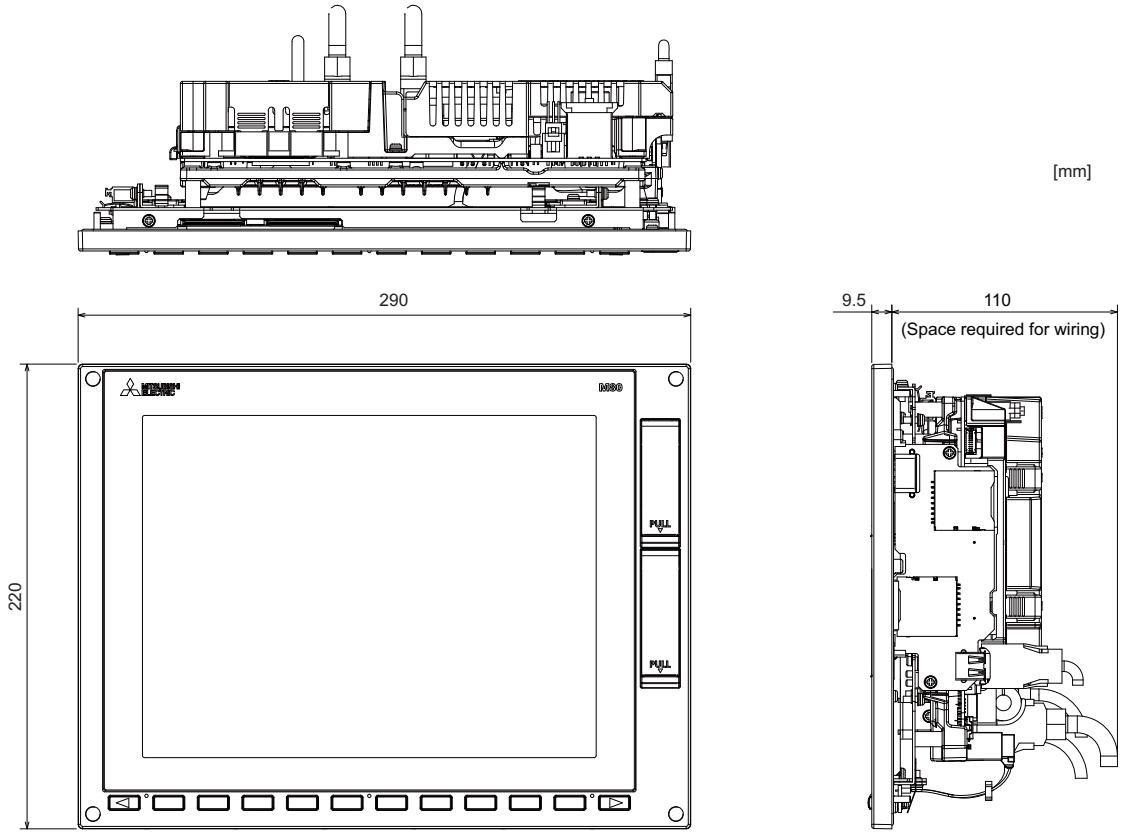
[mm]



4.6.2 10.4-type (FCU8-DU141-32)

[Outline dimension]

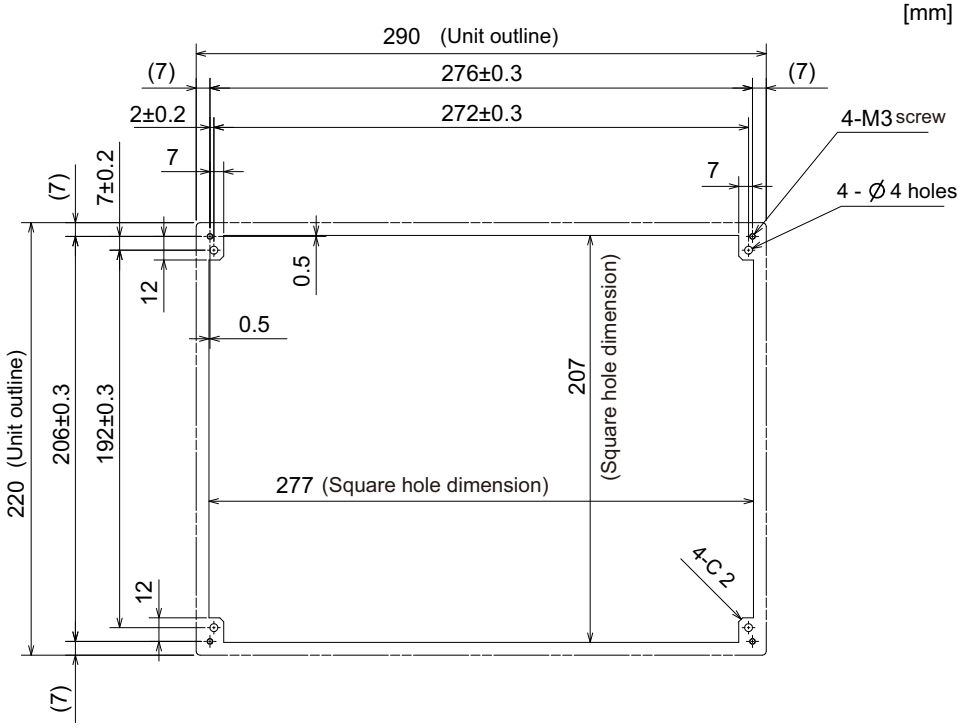
[mm]



(Note) The figure above shows the state with the graphic control unit mounted.

[Panel cut dimension]

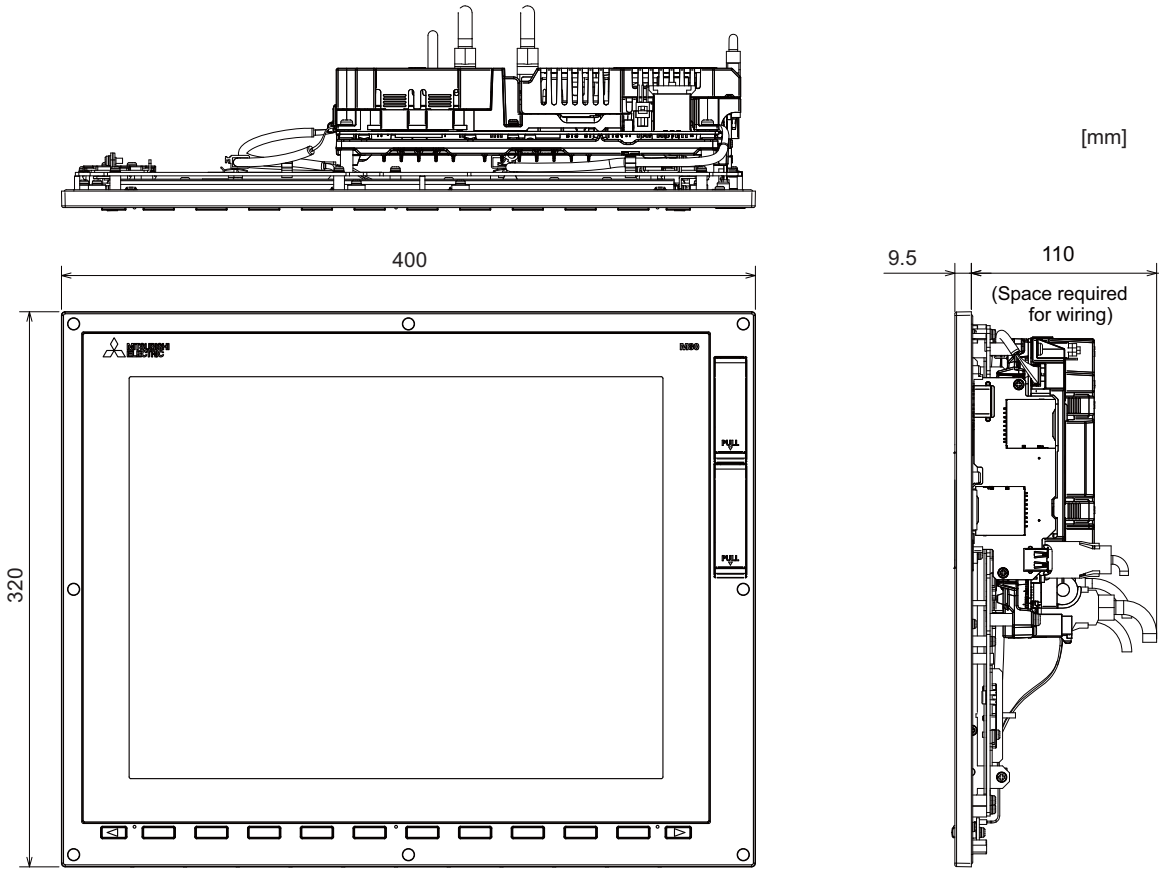
[mm]



4.6.3 15-type (FCU8-DU181-32)

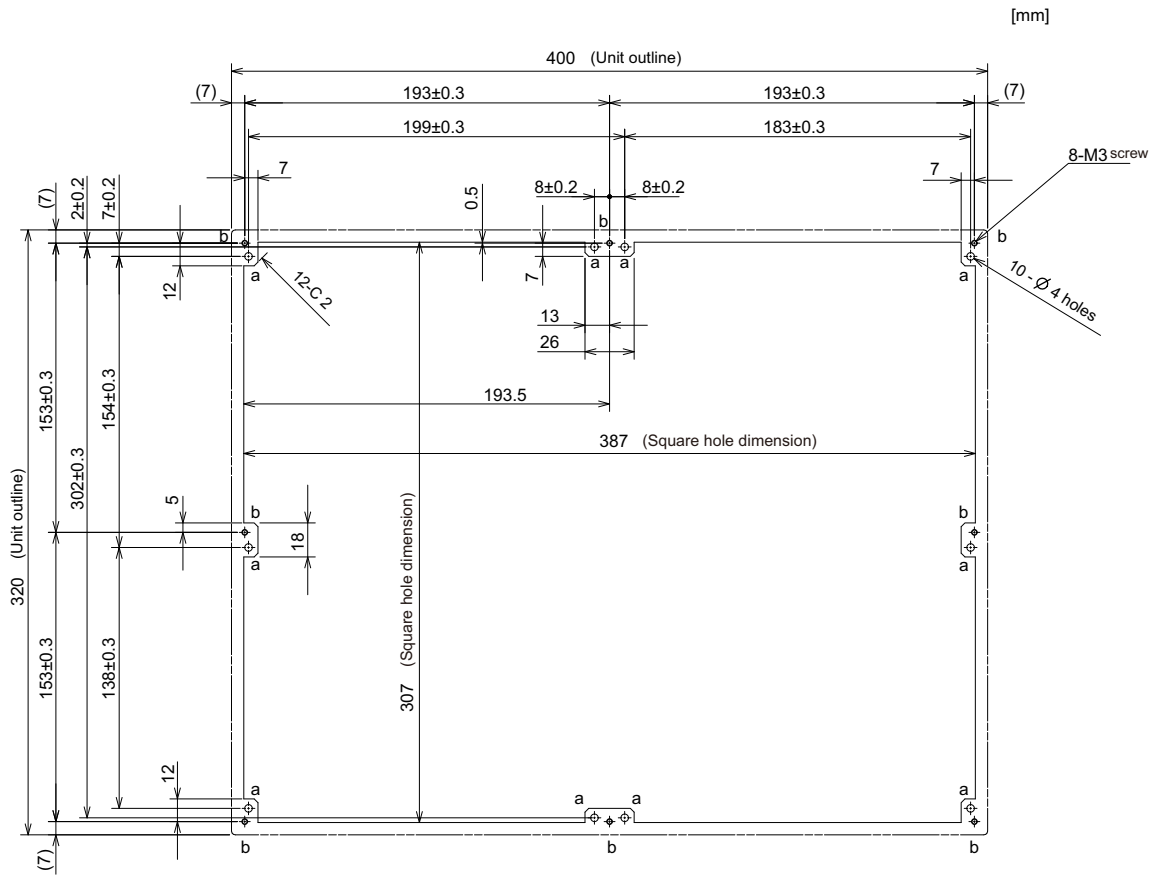
[Outline dimension]

[mm]



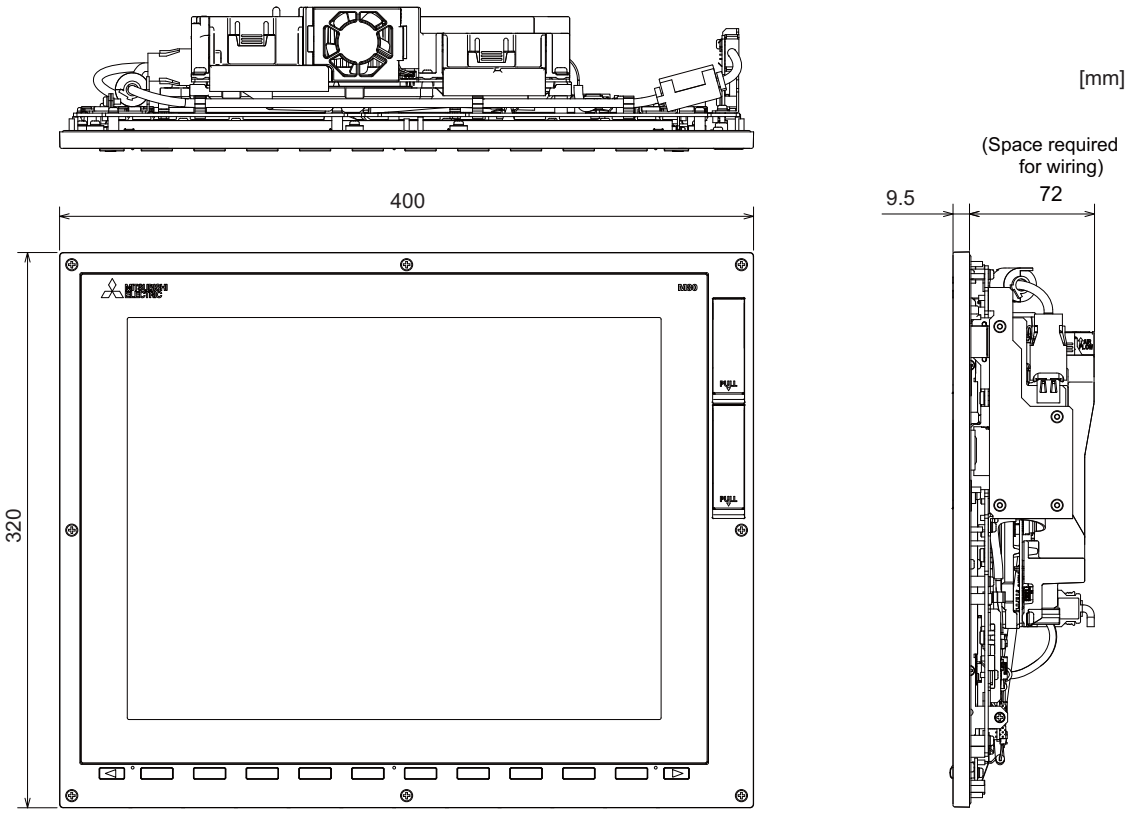
(Note) The figure above shows the state with the graphic control unit mounted.

[Panel cut dimension]



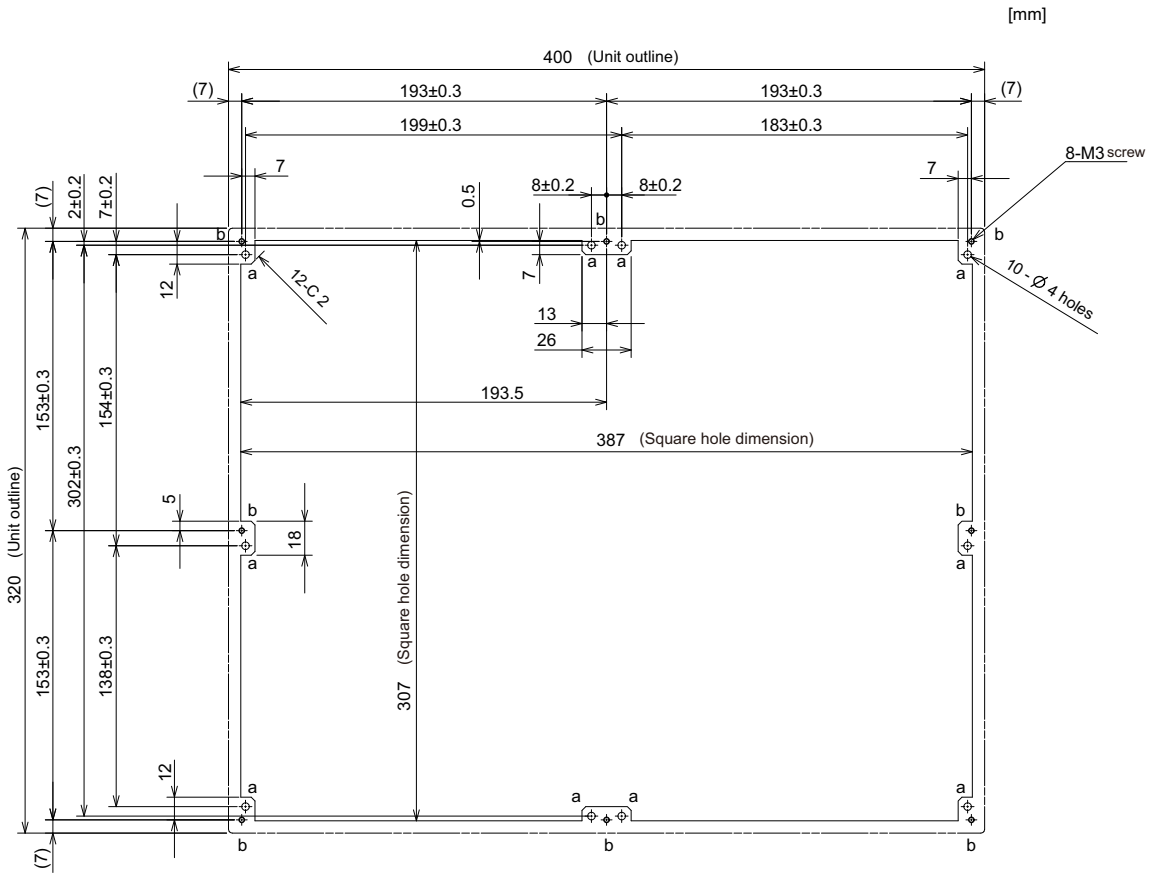
4.6.4 15-type (FCU8-DU181-36)

[Outline dimension]



(Note) The figure above shows the state with the personal computer unit mounted.

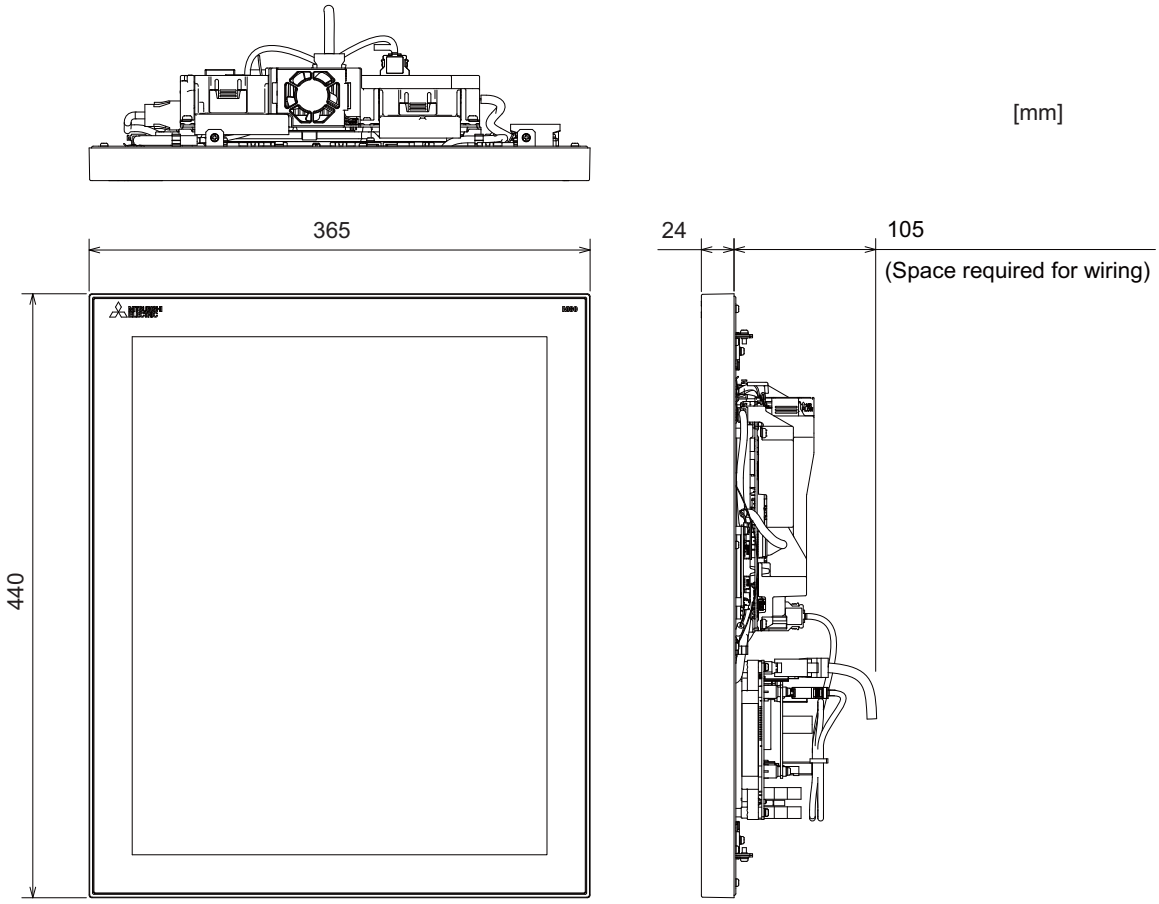
[Panel cut dimension]



4.6.5 19-type (FCU8-DU191-77)

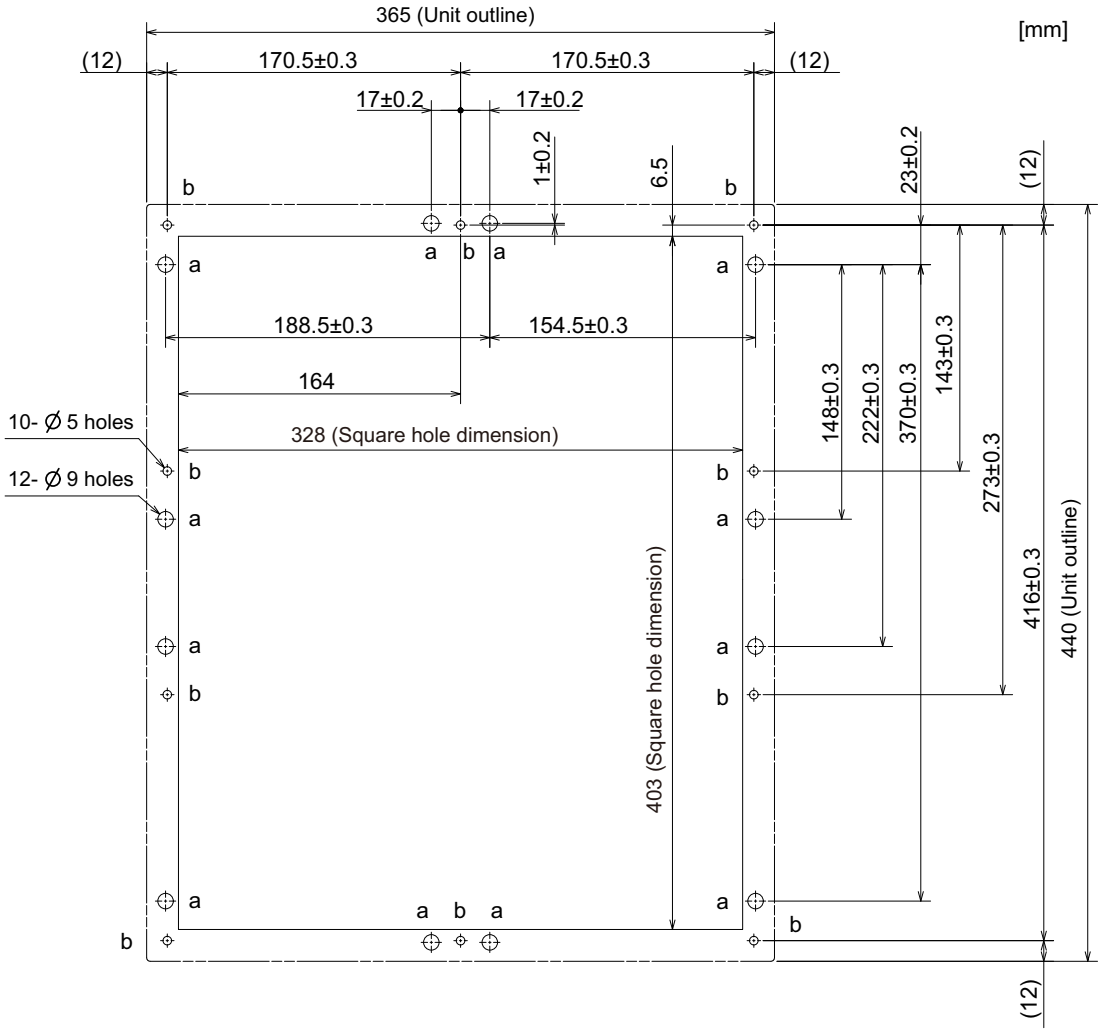
[Outline dimension]

[mm]



(Note) The figure above shows the state with the personal computer unit and the operation panel I/O unit mounted.

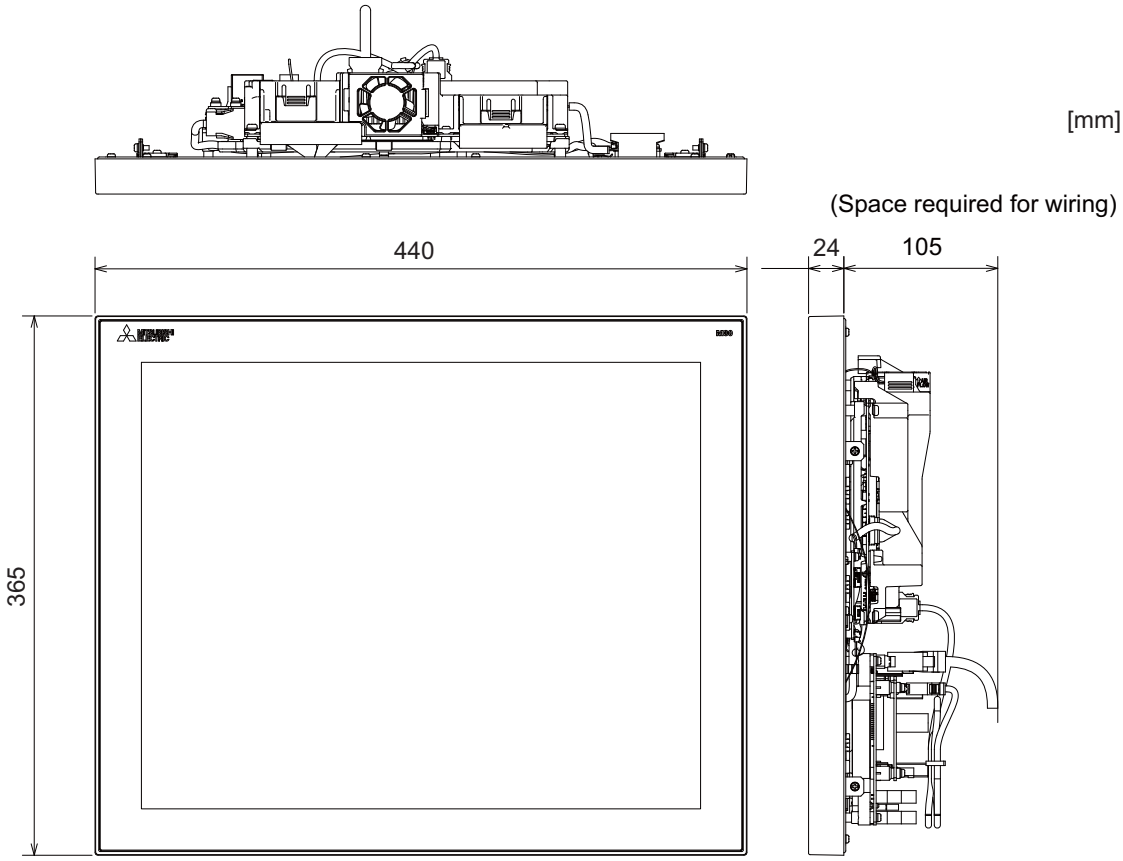
[Panel cut dimension]



4.6.6 19-type (FCU8-DU192-77)

[Outline dimension]

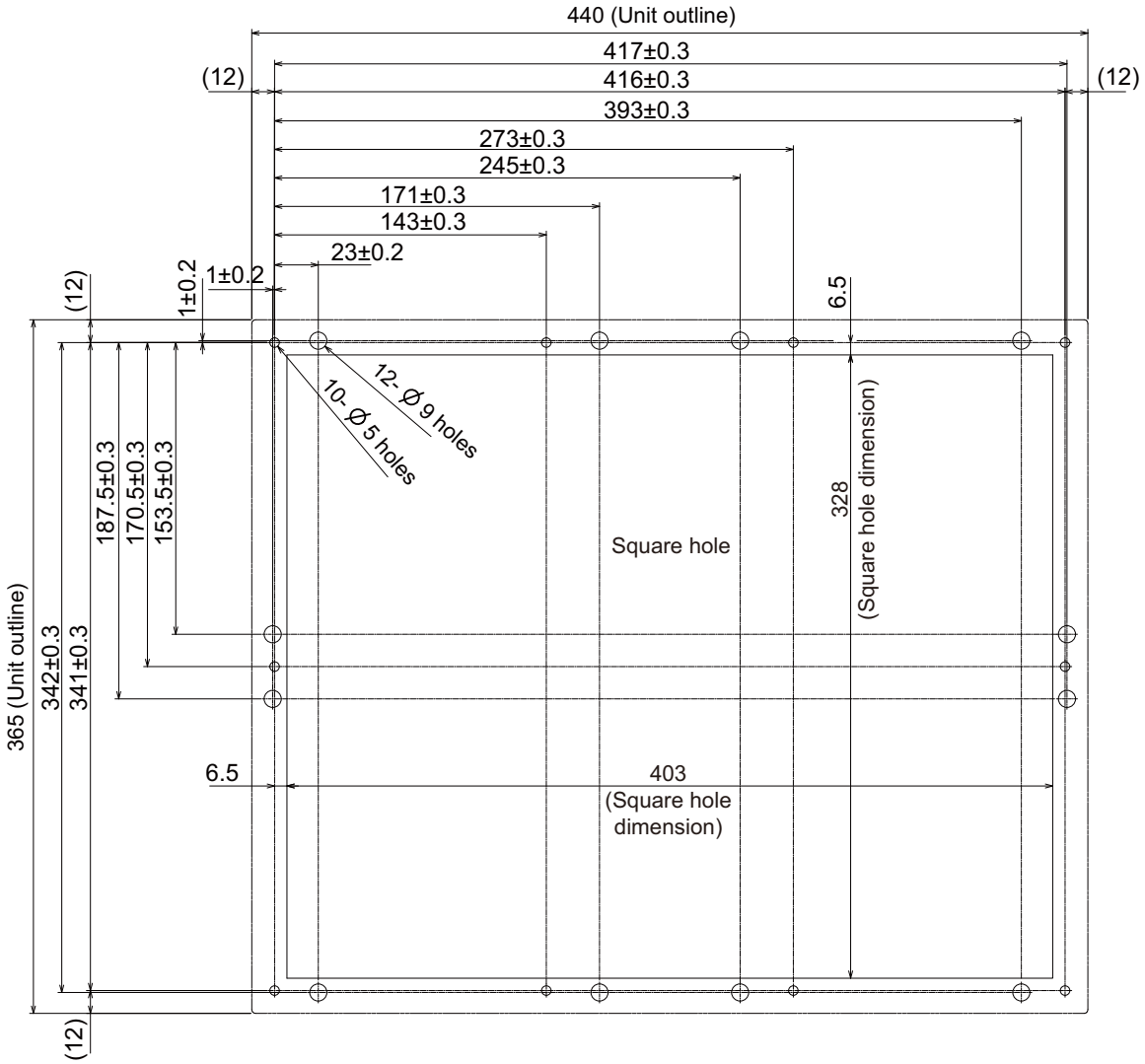
[mm]



(Note) The figure above shows the state with the personal computer unit and the operation panel I/O unit mounted.

[Panel cut dimension]

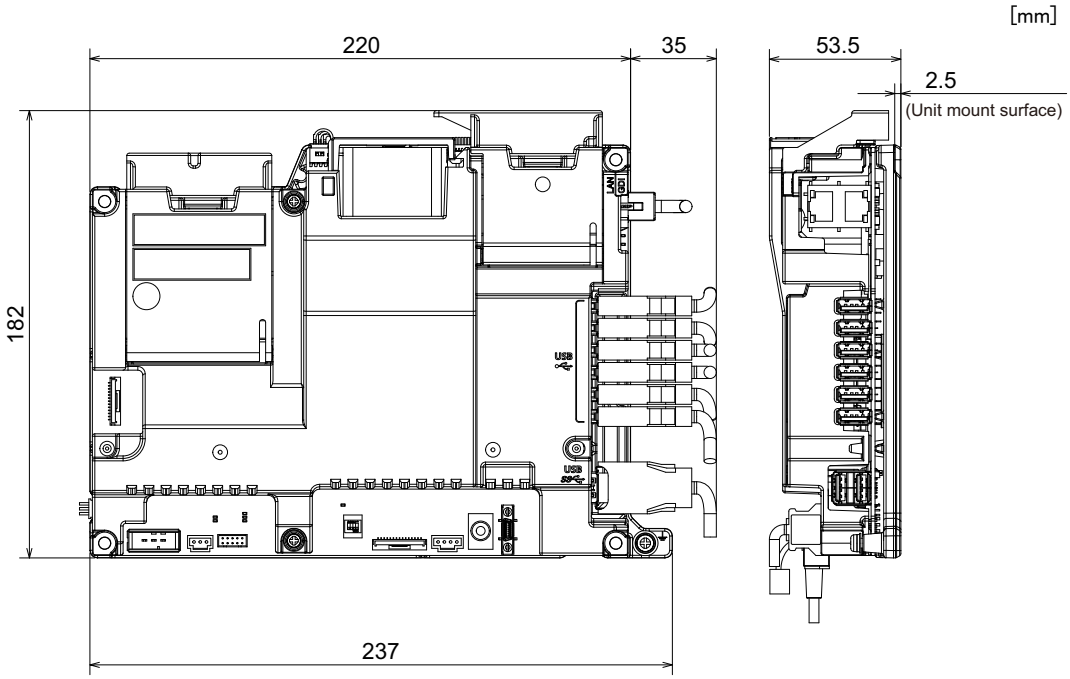
[mm]



4.7 Personal Computer Unit

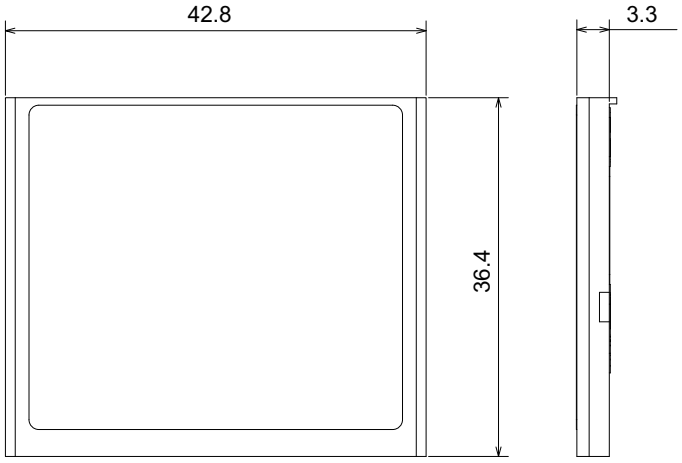
4.7.1 Personal Computer Unit (FCU8-PC231)

[Outline dimension]



4.7.2 Built-in Disk of the Display Unit (FCU8-CF001-001)

[Outline dimension]

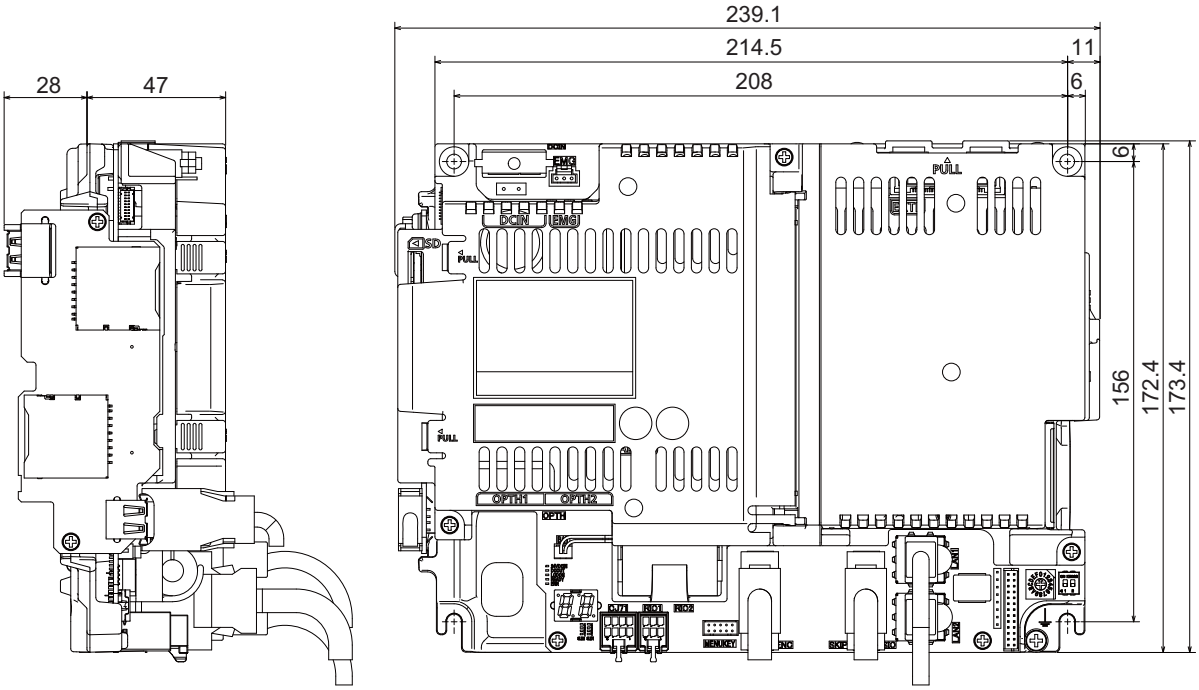


4.8 Graphic Control Unit

4.8.1 FCU8-GC211

[Outline dimension]

[mm]



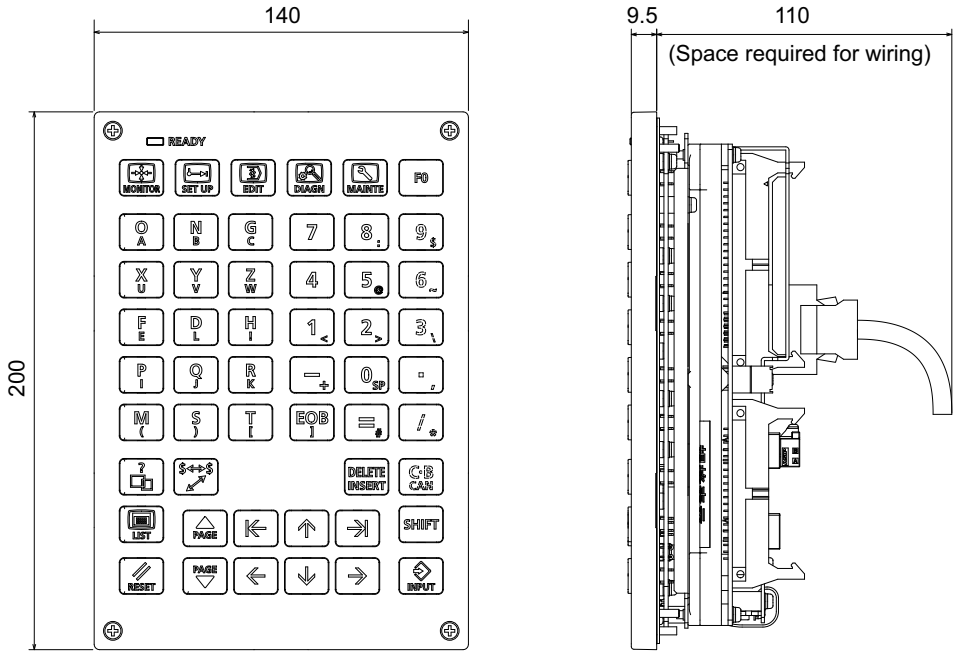
(Note) Refer to the following chapter for the space required for wiring.
"4.5 Display Unit [M800W]"
"4.6 Display Unit [M80W]"

4.9 Keyboard Unit

4.9.1 Keyboard for 8.4-type Display Unit (FCU8-KB026)

[Outline dimension]

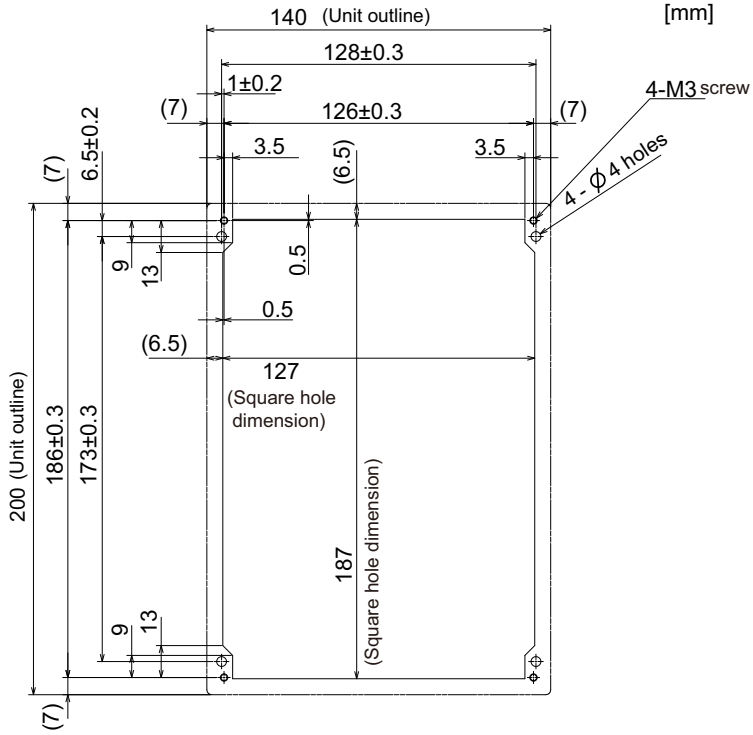
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

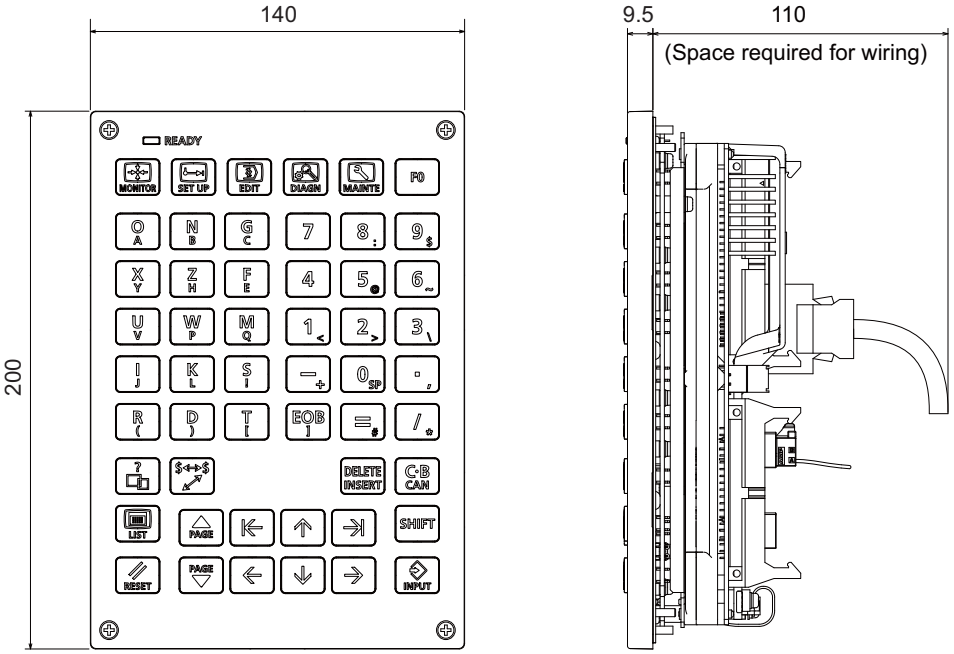
[mm]



4.9.2 Keyboard for 8.4-type Display Unit (FCU8-KB028)

[Outline dimension]

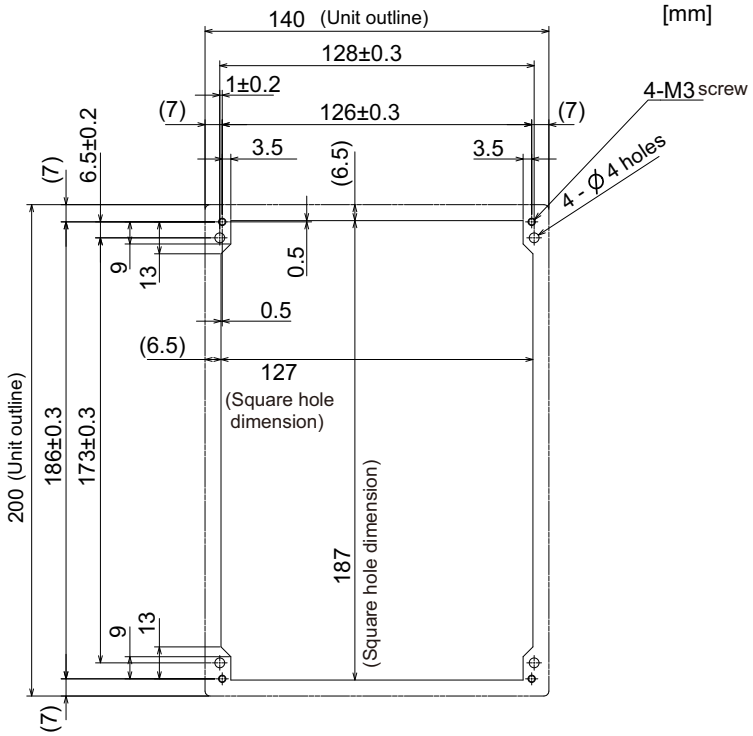
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

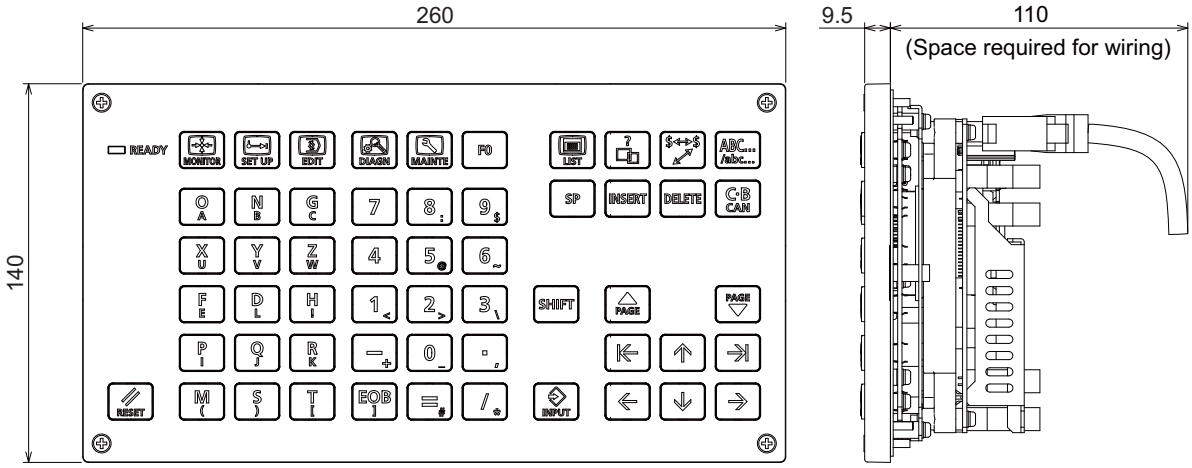
[mm]



4.9.3 Keyboard for 8.4-type Display Unit (FCU8-KB029)

[Outline dimension]

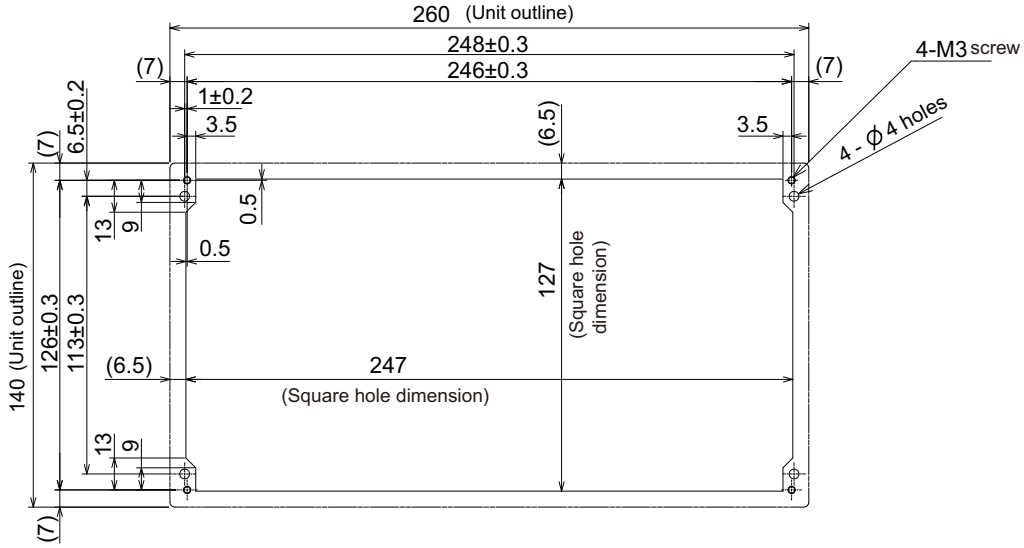
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

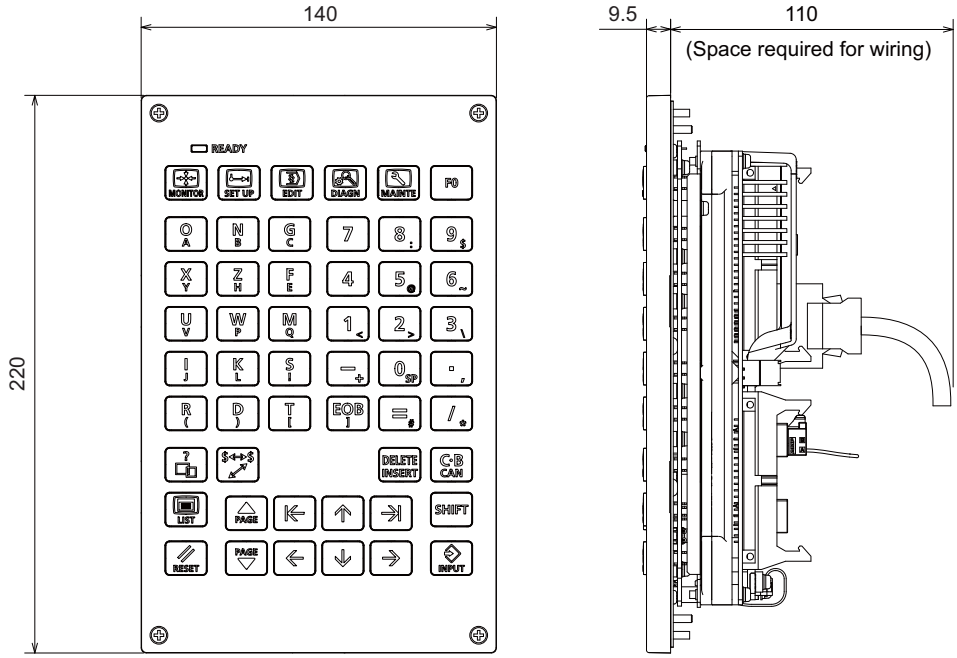
[mm]



4.9.4 Keyboard for 10.4-type Display Unit (FCU8-KB041)

[Outline dimension]

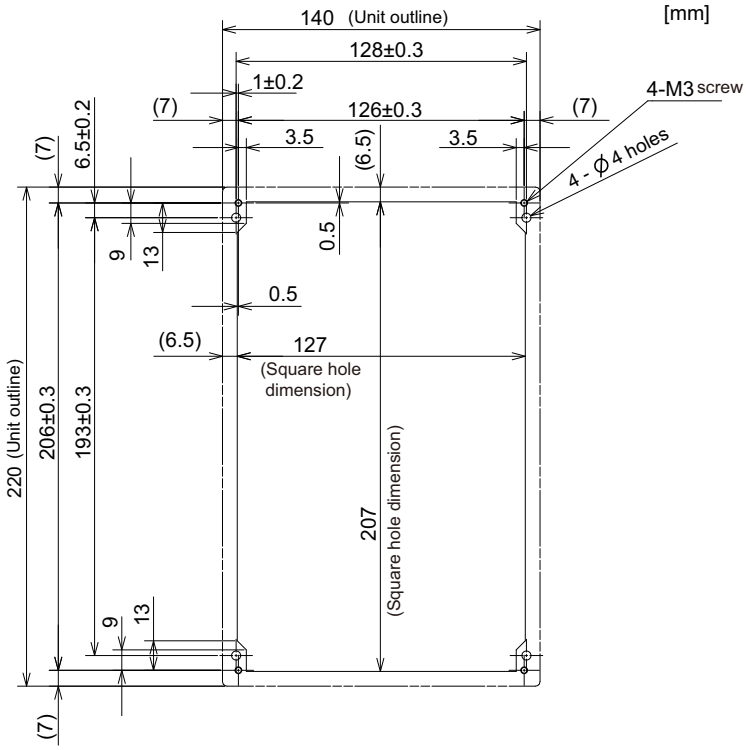
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

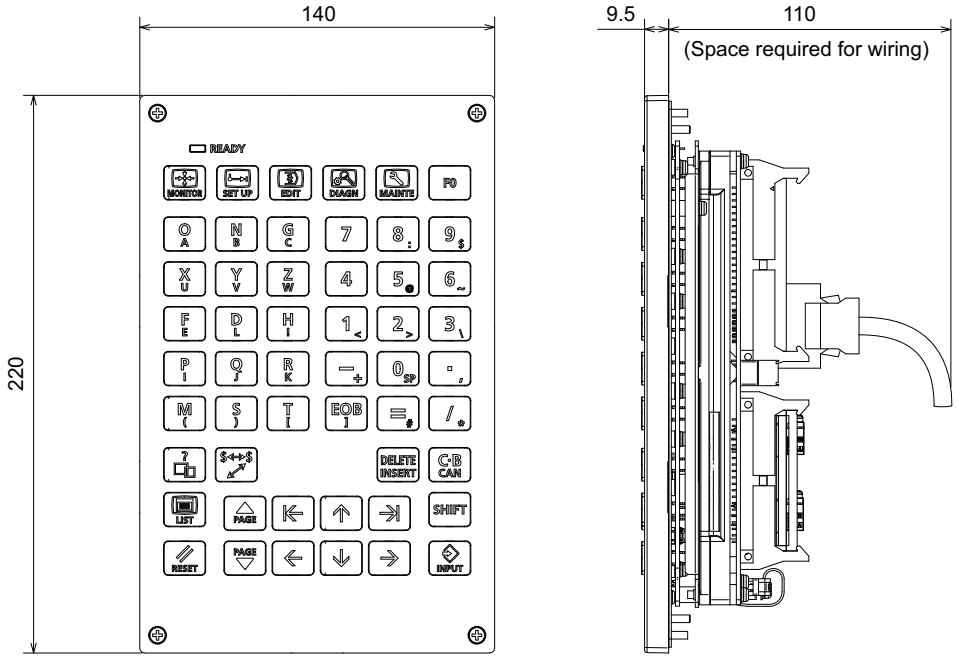
[mm]



4.9.5 Keyboard for 10.4-type Display Unit (FCU8-KB046)

[Outline dimension]

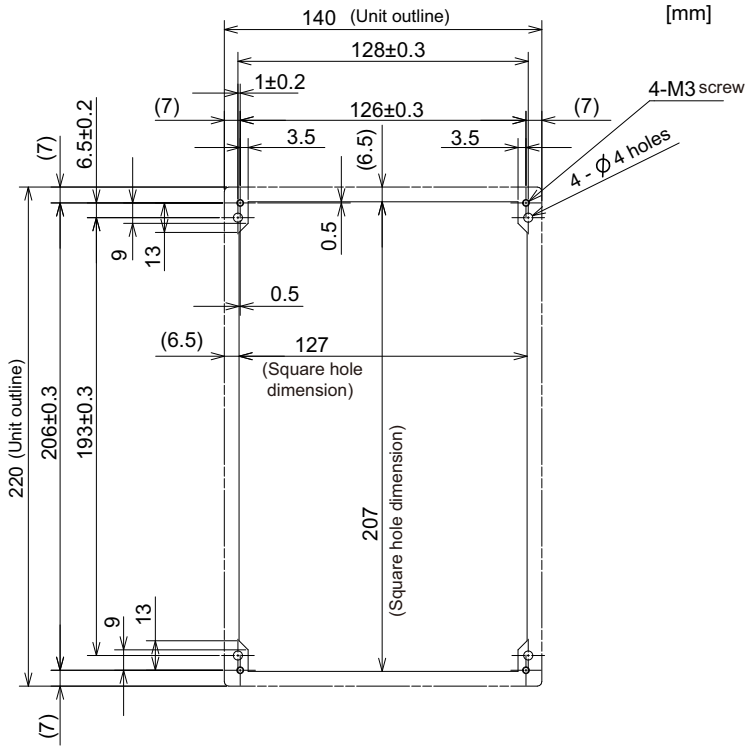
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

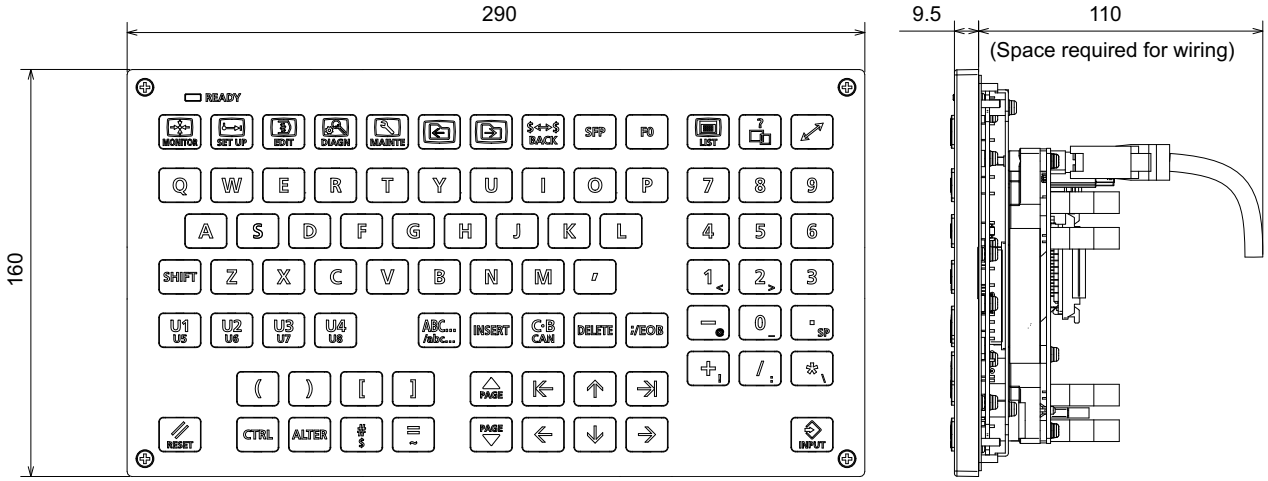
[mm]



4.9.6 Keyboard for 10.4-type Display Unit (FCU8-KB047)

[Outline dimension]

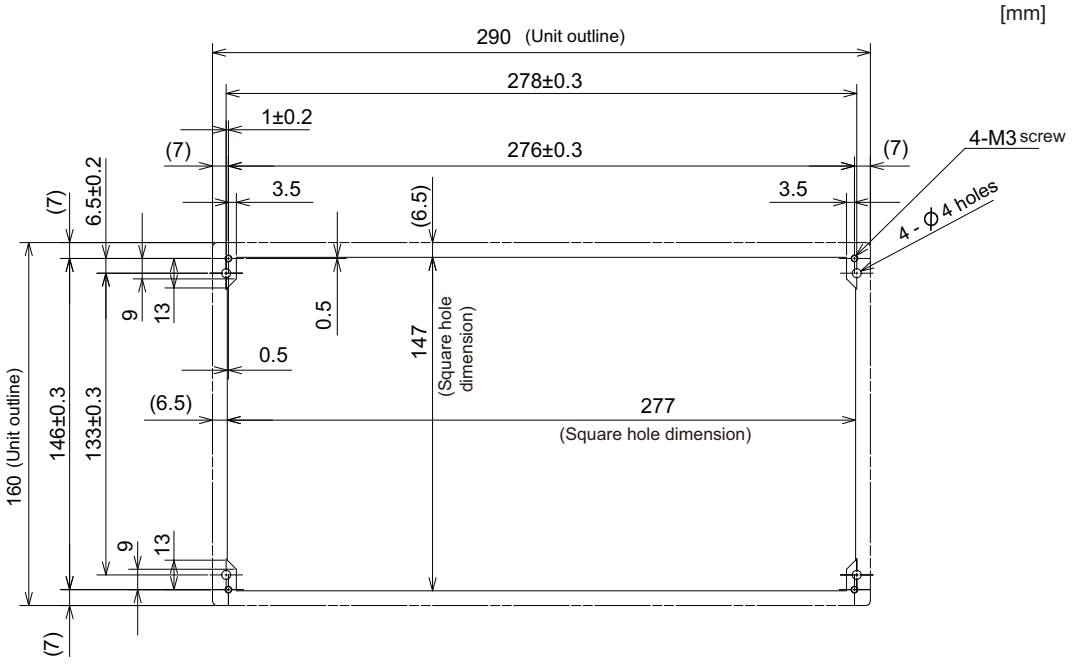
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

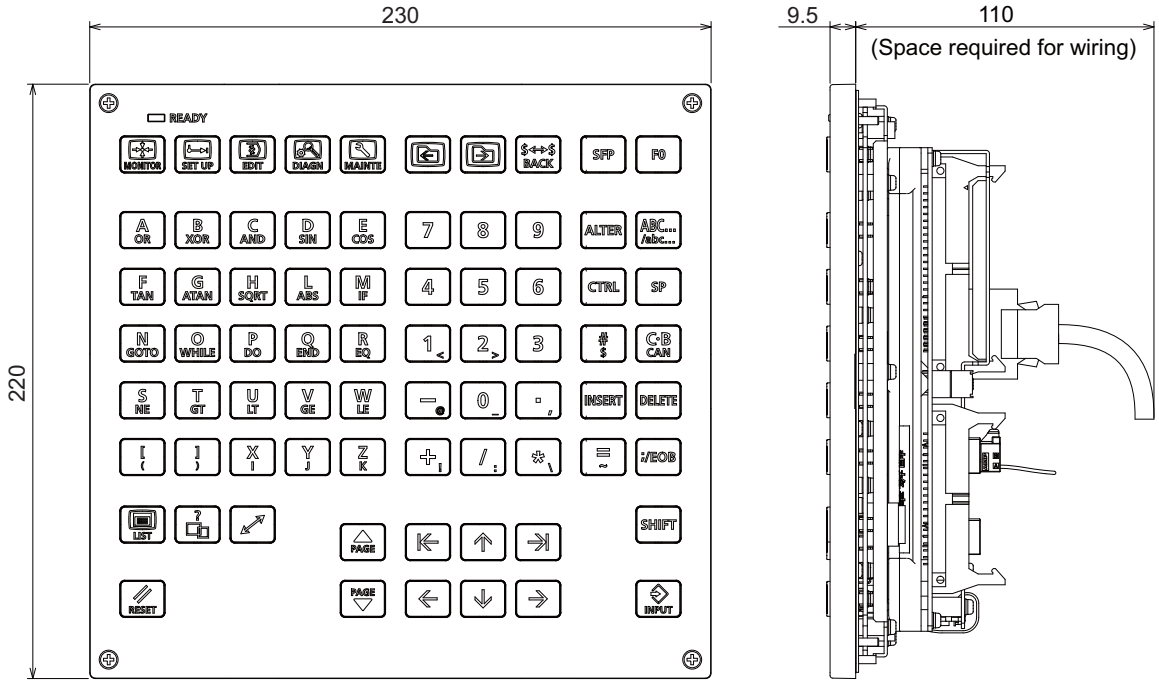
[mm]



4.9.7 Keyboard for 10.4-type Display Unit (FCU8-KB048)

[Outline dimension]

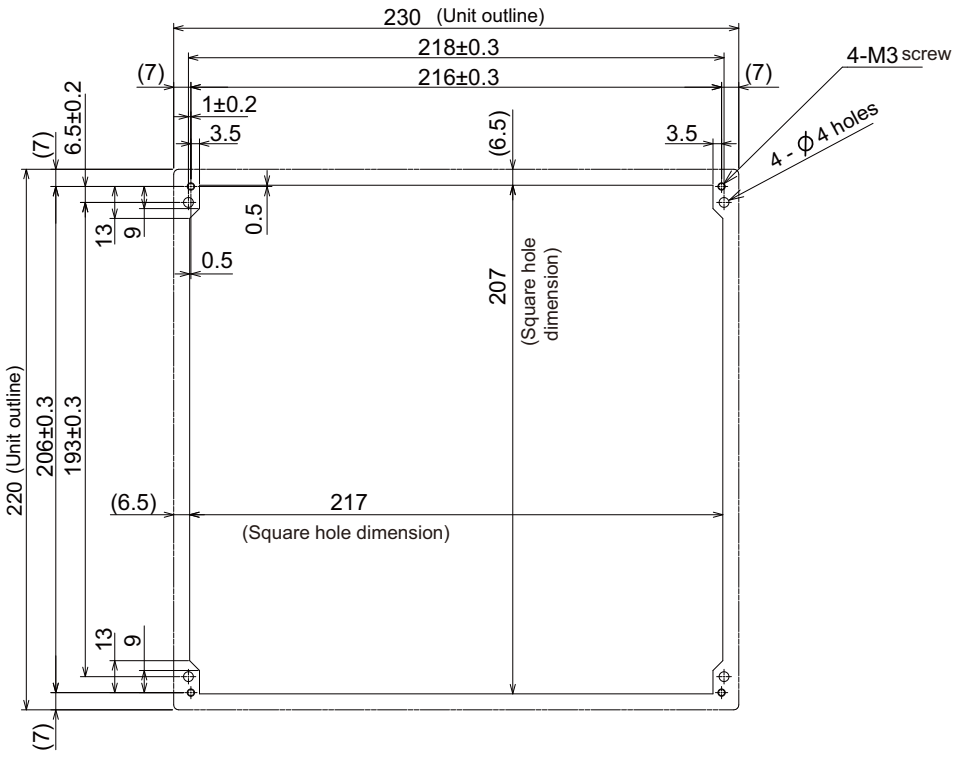
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

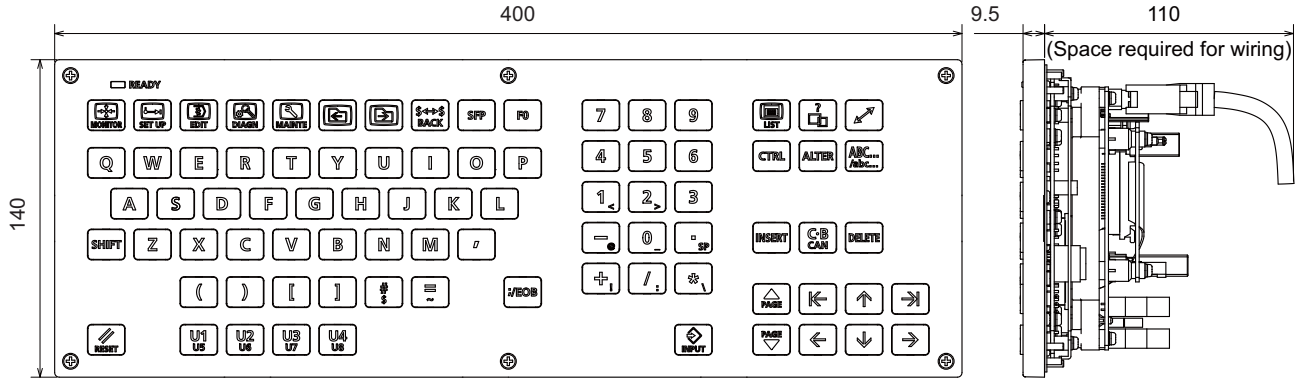
[mm]



4.9.8 Keyboard for 15-type Display Unit (FCU8-KB083)

[Outline dimension]

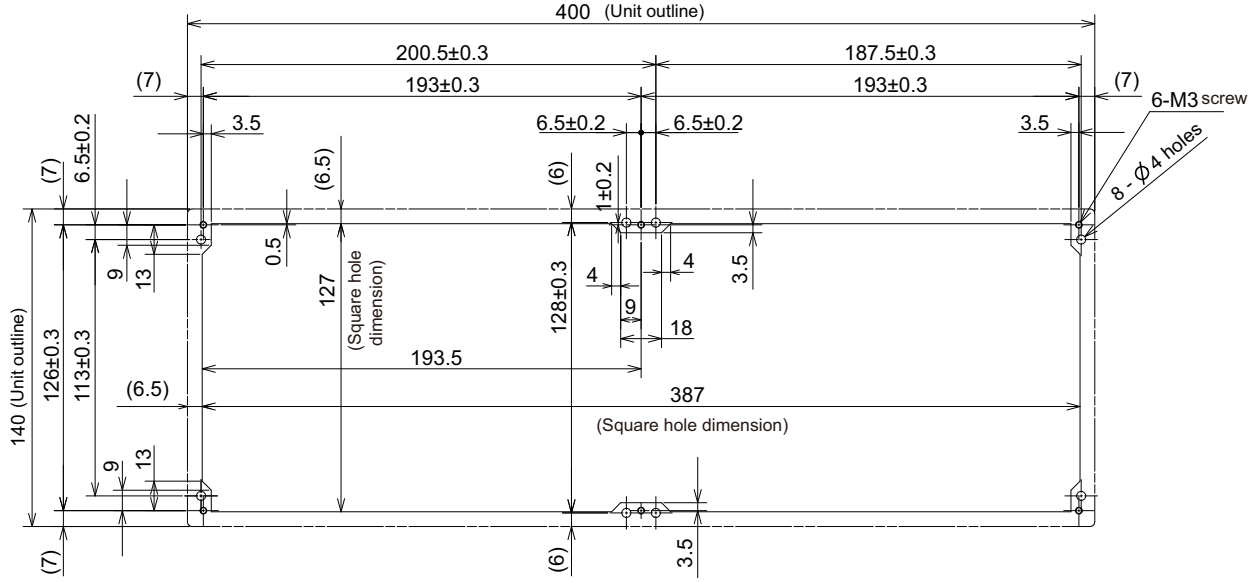
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

[mm]



4.10 Operation Panel I/O Unit

4.10.1 List of Units

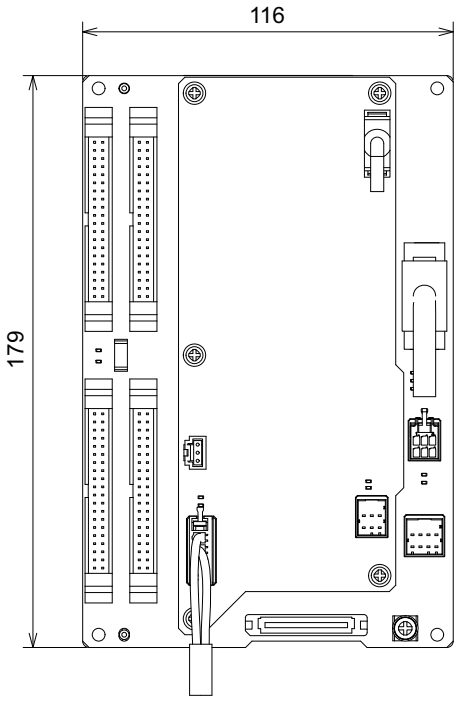
Classification	Type	Components	Remarks
DI 24V/0V common input [64 points] DO Source output [64 points]	FCU8-DX830	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points] Scan input [64 points] Scan output [64 points]	FCU8-DX834 (Note)	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Scan input: 64 points Scan output: 64 points Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points] Safety DI 24V/0V common input [8 points]	FCU8-DX837	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Safety DI: 8-points 0V common type Manual pulse generator input: 3ch Display unit I/F Keyboard unit I/F Emergency stop input Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64 (Note) J291 cable is required for connection with the personal computer unit. (for windows-based display)
DI 24V/0V common input [64 points] DO Source output [64 points]	FCU8-DX730	Base card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Graphic control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1, 2, 7 to 12, 20 to 22 RIO extensible stations: 3 to 6, 15 to 19, 23 to 64 (13 and 14 are occupied by the graphic control unit.) (Note) J010 cable is required for connection with the graphic control unit. (for non-Windows-based display)

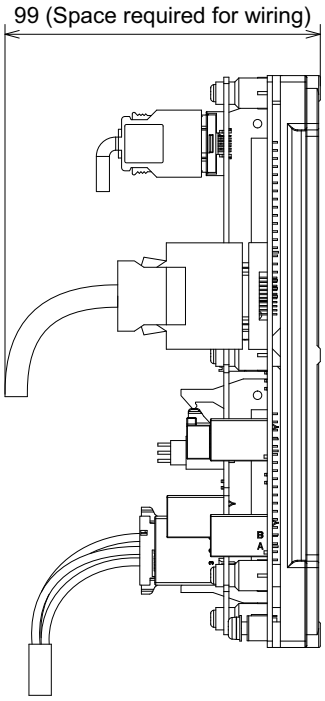
(Note) The connection method of DO (CG32/CG34) of FCU8-DX834 is different from other operation panel I/O units. Be careful not to connect to a wrong connector. See the descriptions mentioned in the later section for more specific explanation on connections.

4.10.2 FCU8-DX830 / FCU8-DX834 / FCU8-DX837 / FCU8-DX730

[Outline dimension : FCU8-DX830]

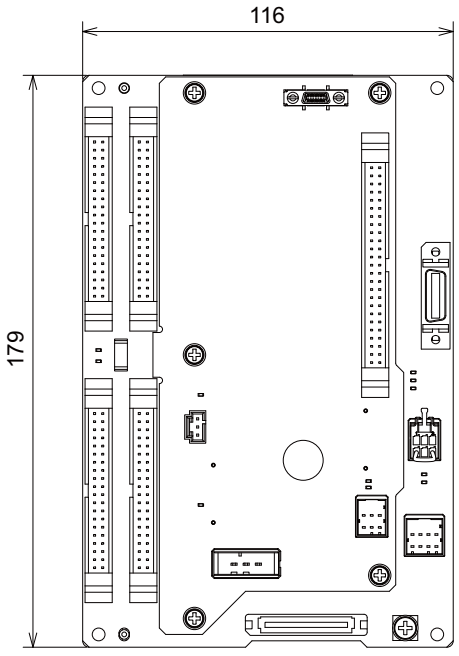
[mm]

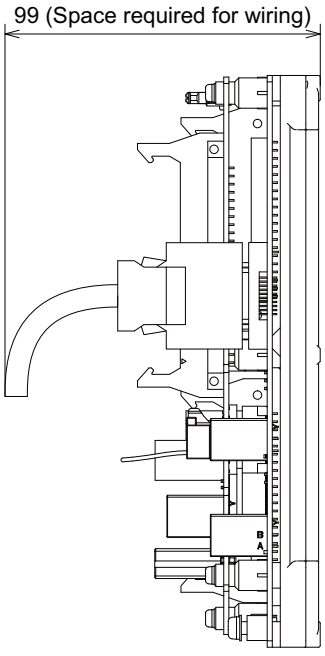




[Outline dimension : FCU8-DX834]

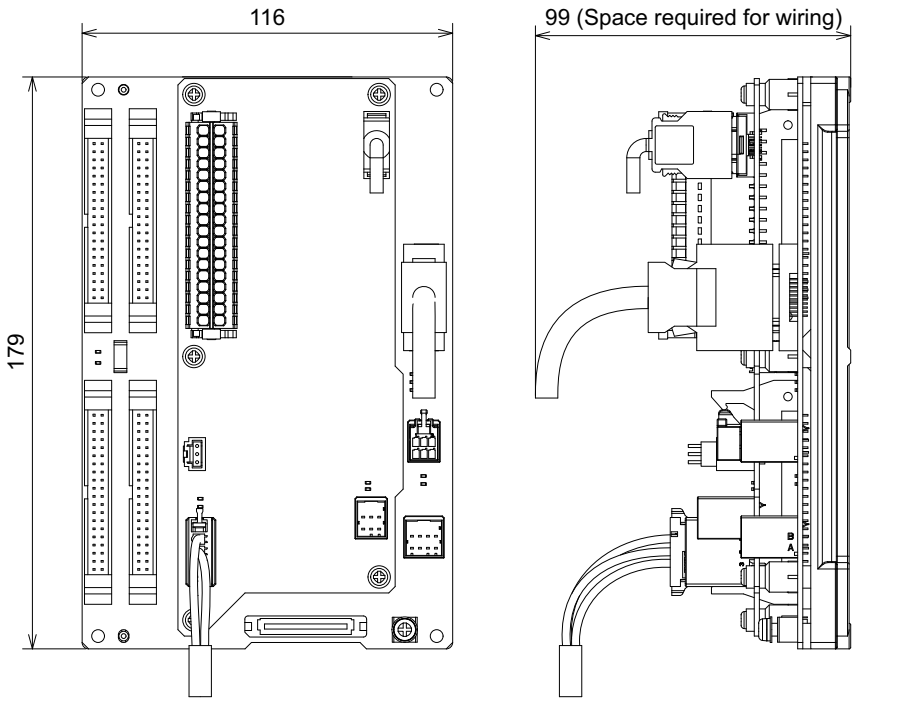
[mm]





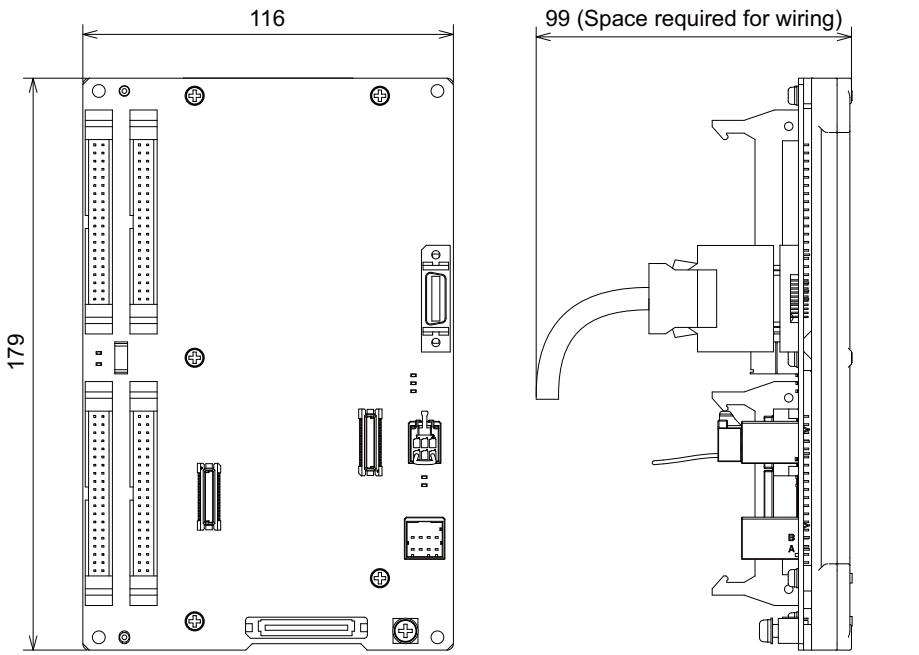
[Outline dimension : FCU8-DX837]

[mm]

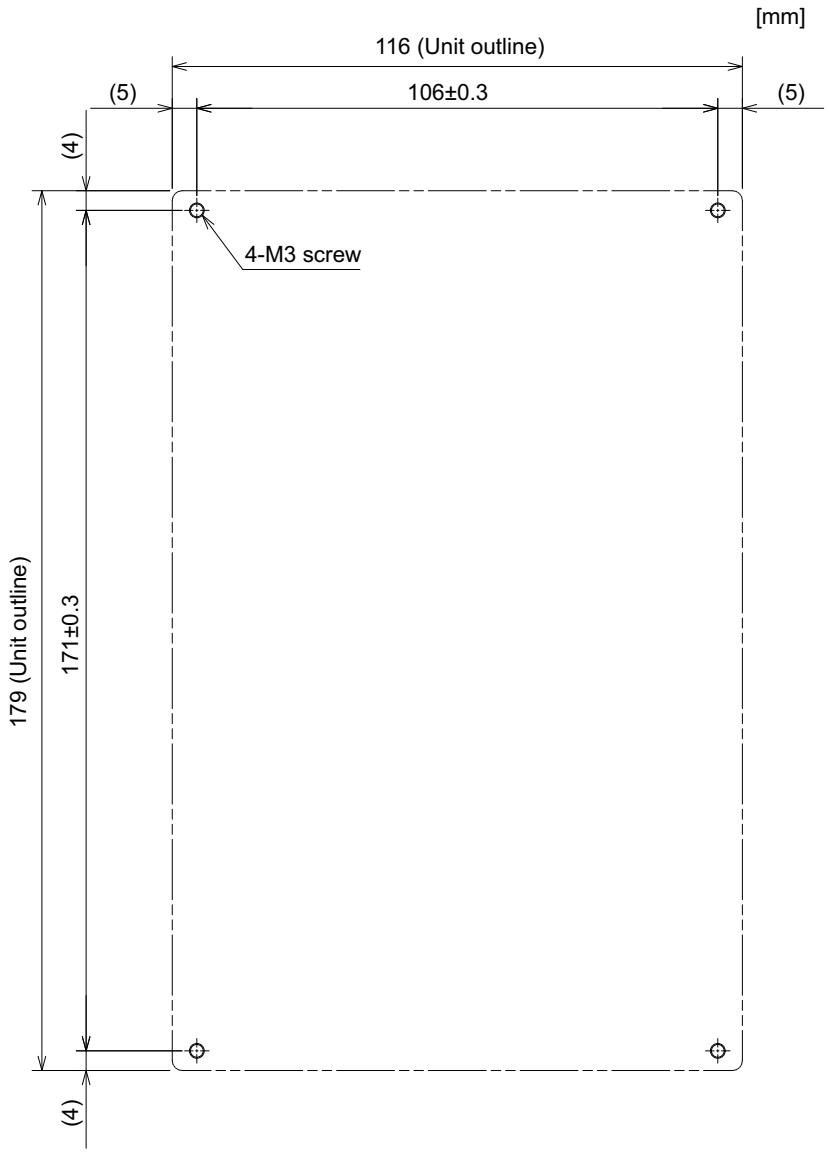


[Outline dimension : FCU8-DX730]

[mm]



[Installation dimension : FCU8-DX830 / FCU8-DX834 / FCU8-DX837 / FCU8-DX730]



(Note) The unit thickness of the fixed part with screws is 16.6mm.
Select the fixing screws having the length suitable for the thickness.

4.11 Remote I/O Unit

Types of signals described on the list of units can be input/output from the remote I/O unit (FCU8-DXxxx) according to the type and No. of contacts. Remote I/O units are used by being connected to the control unit or the operation panel I/O unit.
Multiple remote I/O units can be used as long as the total number of occupied stations is 64 or less.

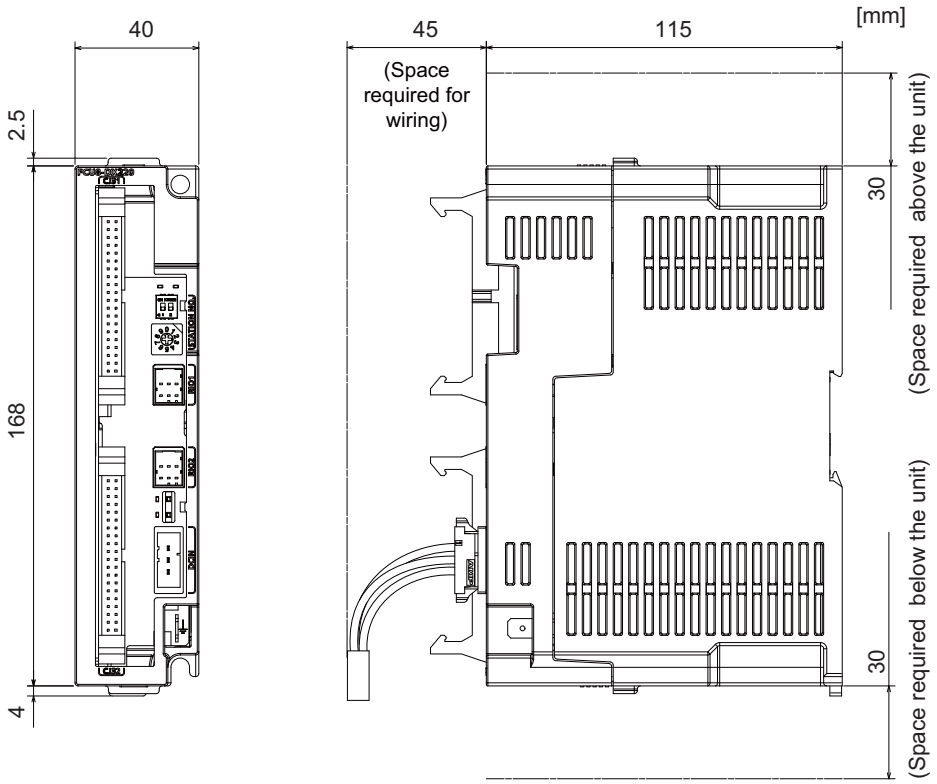
(Note) The maximum connectable number of remote I/O units is 32.

4.11.1 List of Units

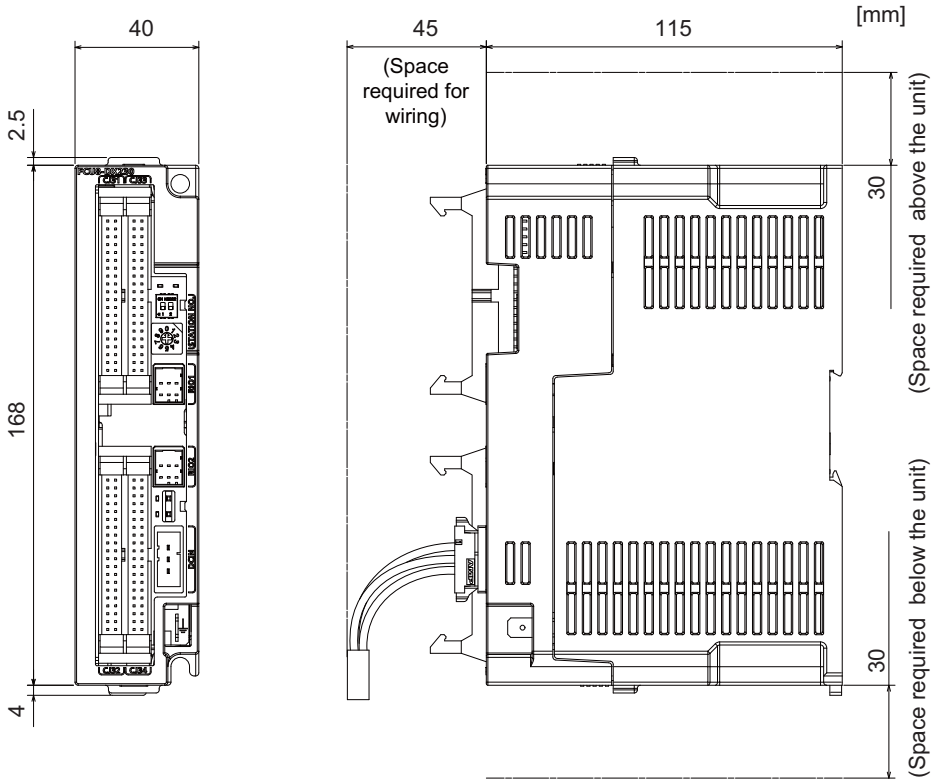
Classification	Type	Components	Remarks
DI 24V/0V common input [32 points] DO Source output [32 points]	FCU8-DX220	Base card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Number of occupied stations: 1
DI 24V/0V common input [64 points] DO Source output [48 points]	FCU8-DX230	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) Number of occupied stations: 2
DI 24V/0V common input DO Source output [48 points] AO Analog output [1 point]	FCU8-DX231	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Number of occupied stations: 2
AI Analog input [4 points] AO Analog output [1 point]	FCU8-DX202	Base card RIO 2.0 connector set	AI : 4 points AO: 1 point Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213	Base card RIO 2.0 connector set	DI: 16-points 0V common type (3mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213-1	Base card RIO 2.0 connector set	DI: 16-points 0V common type (9mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (3mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654-1	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (9mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
DI 24V/0V common input [32points] DO Source output [32 points] Safety DI 0V common input [8 points] (Note 1) Safety relay output [4 points] (Note 2)	FCU8-DX651	Base card Add-on card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Safety DI: 8-points 0V common type Safety relay: 4-points (non-voltage contact) Relay contact welding detection Number of occupied stations: 3 (Note 1) Safety DI uses 16 points of terminal because of the duplication wiring. (Note 2) Safety relay output uses 8 points of terminal because of the duplication wiring.
Thermistor input [12 points]	FCU8-DX408	Base card RIO 2.0 connector set	Thermistor input: 12 points Number of occupied stations: 3
Multi-analog input [4 points] (Note 3)	FCU8-DX409	Base card RIO 2.0 connector set	Multi-analog input: 4 points (Note 3) Voltage input, current input, thermocouple input and resistance temperature detector input are selected for each CH. Number of occupied stations: 4

4.11.2 FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX651/ FCU8-DX408 / FCU8-DX409

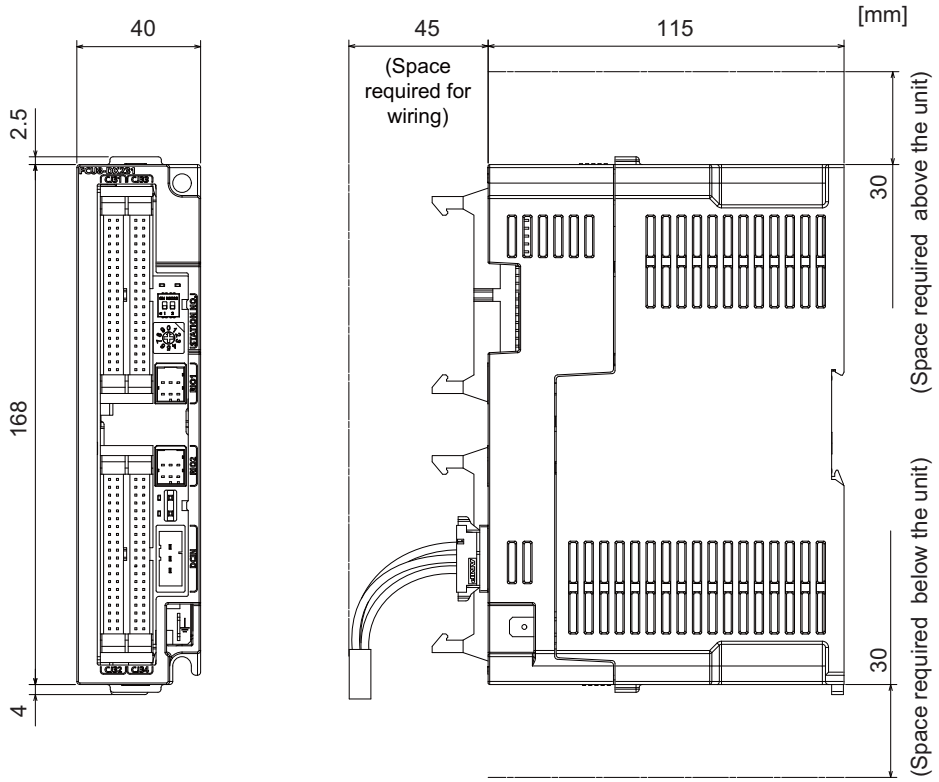
[Outline dimension : FCU8-DX220]



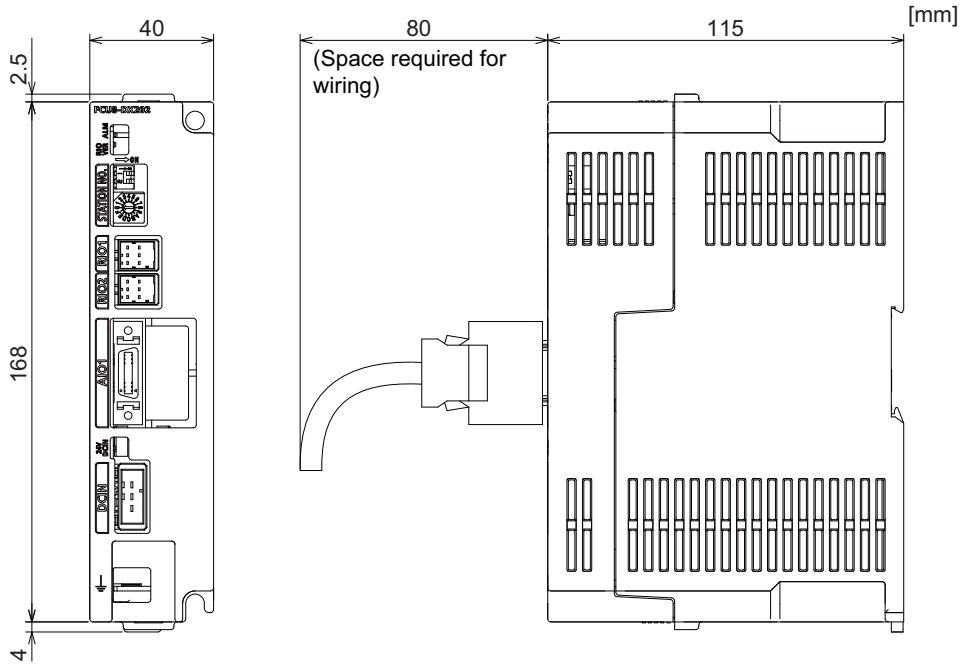
[Outline dimension : FCU8-DX230]



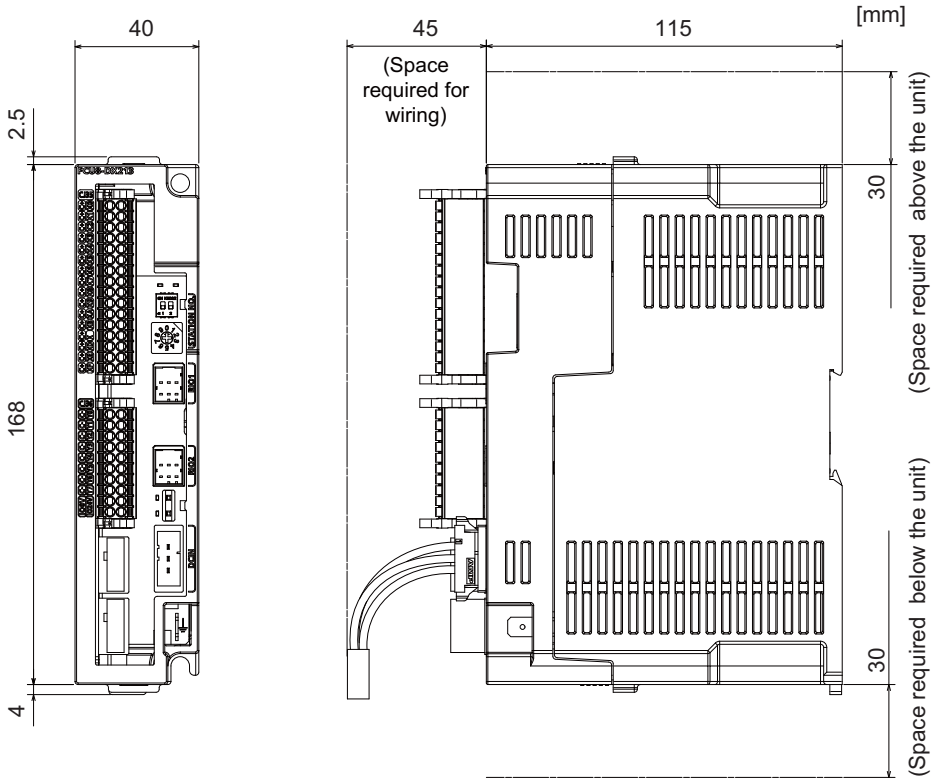
[Outline dimension : FCU8-DX231]



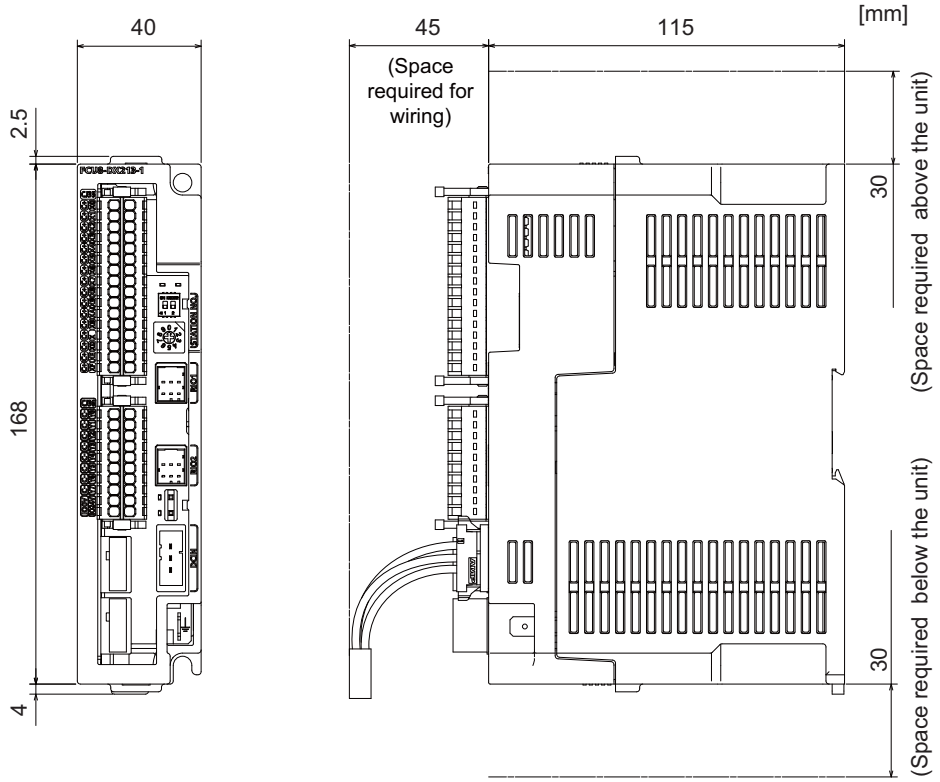
[Outline dimension : FCU8-DX202]



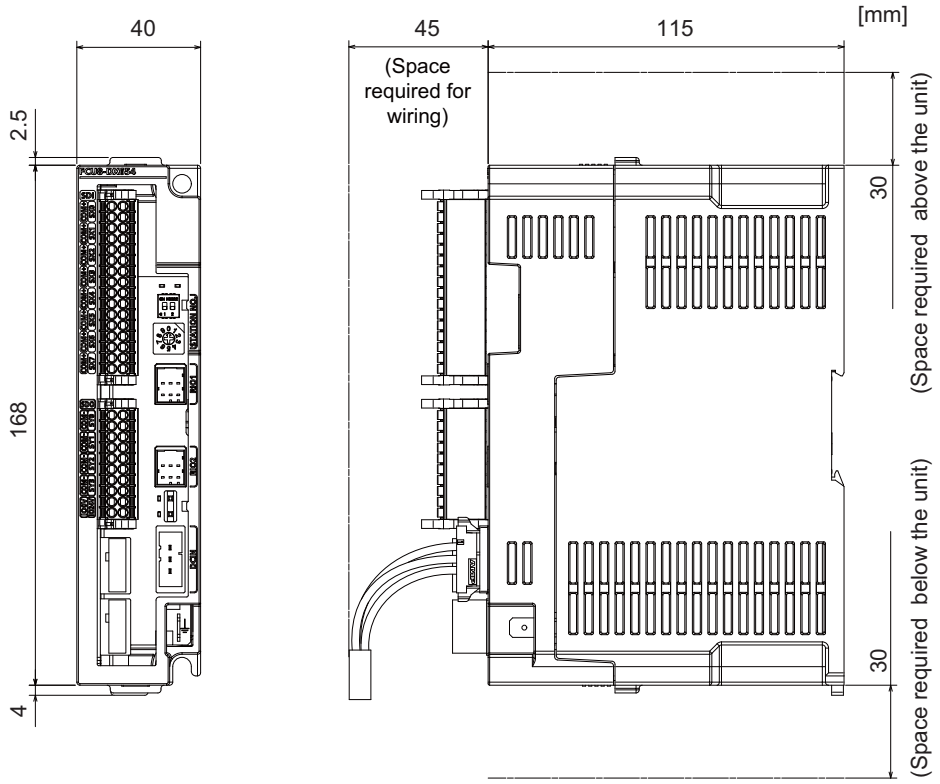
[Outline dimension : FCU8-DX213]



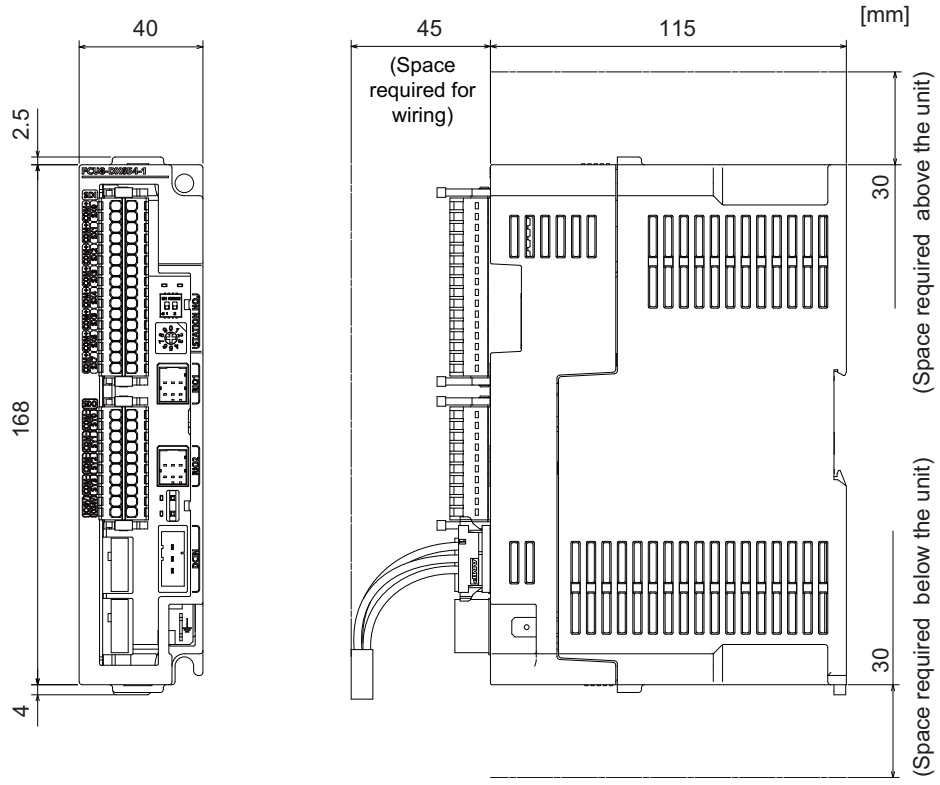
[Outline dimension : FCU8-DX213-1]



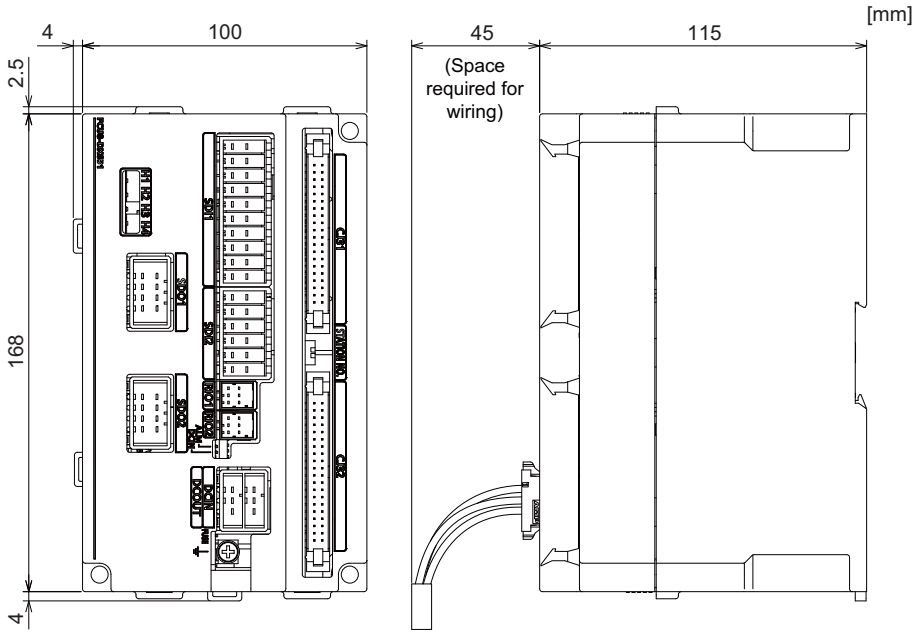
[Outline dimension : FCU8-DX654]



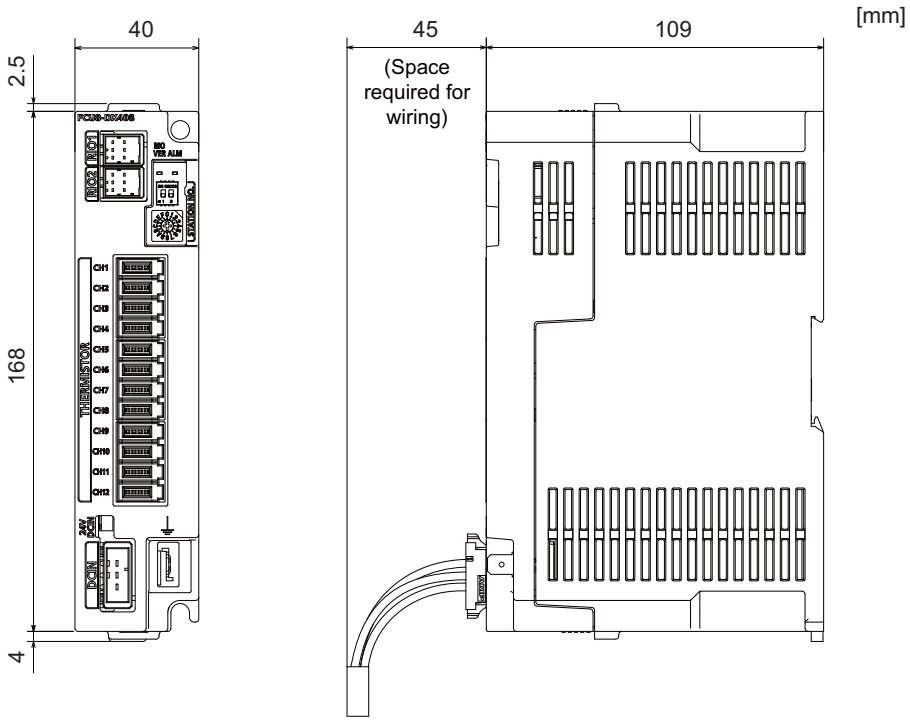
[Outline dimension : FCU8-DX654-1]



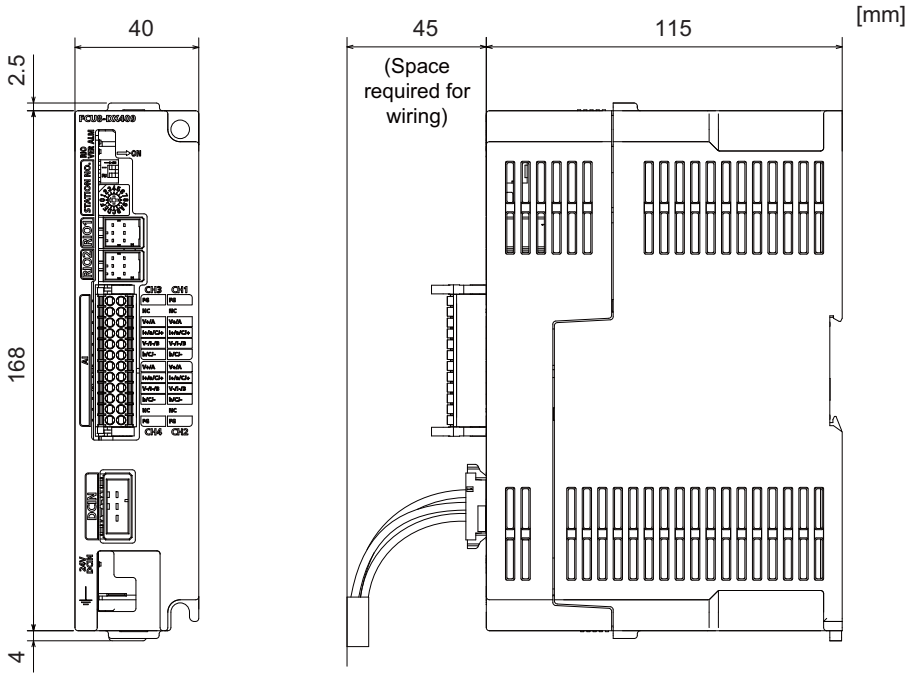
[Outline dimension : FCU8-DX651]



[Outline dimension : FCU8-DX408]

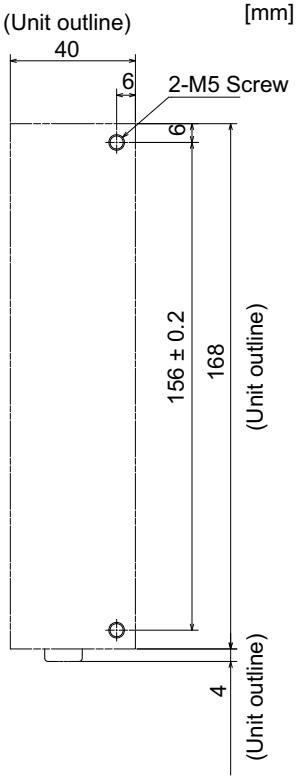


[Outline dimension : FCU8-DX409]



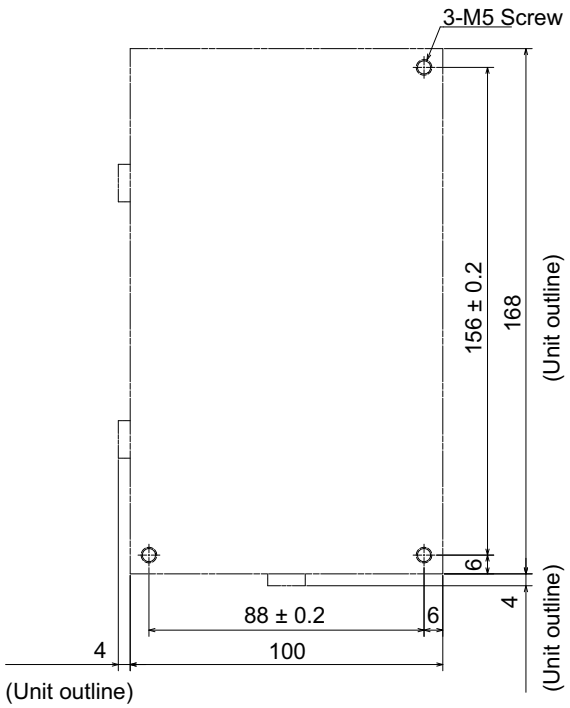
[Installation dimension : FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX408 / FCU8-DX409]

[mm]



[Installation dimension : FCU8-DX651]

[mm]

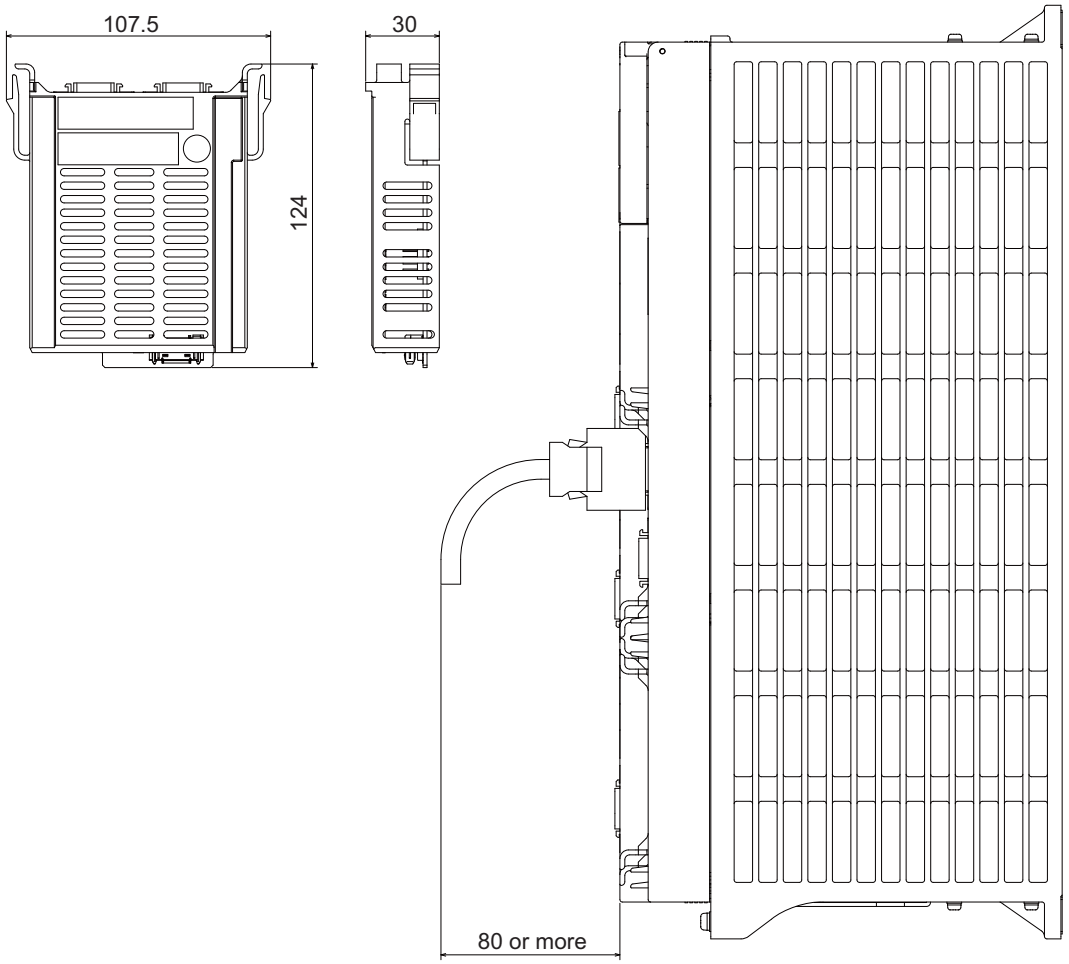


4.12 Function Expansion Unit

4.12.1 Encoder (Manual Pulse Generator) I/F Expansion (FCU8-EX544)

[Outline dimension]

[mm]

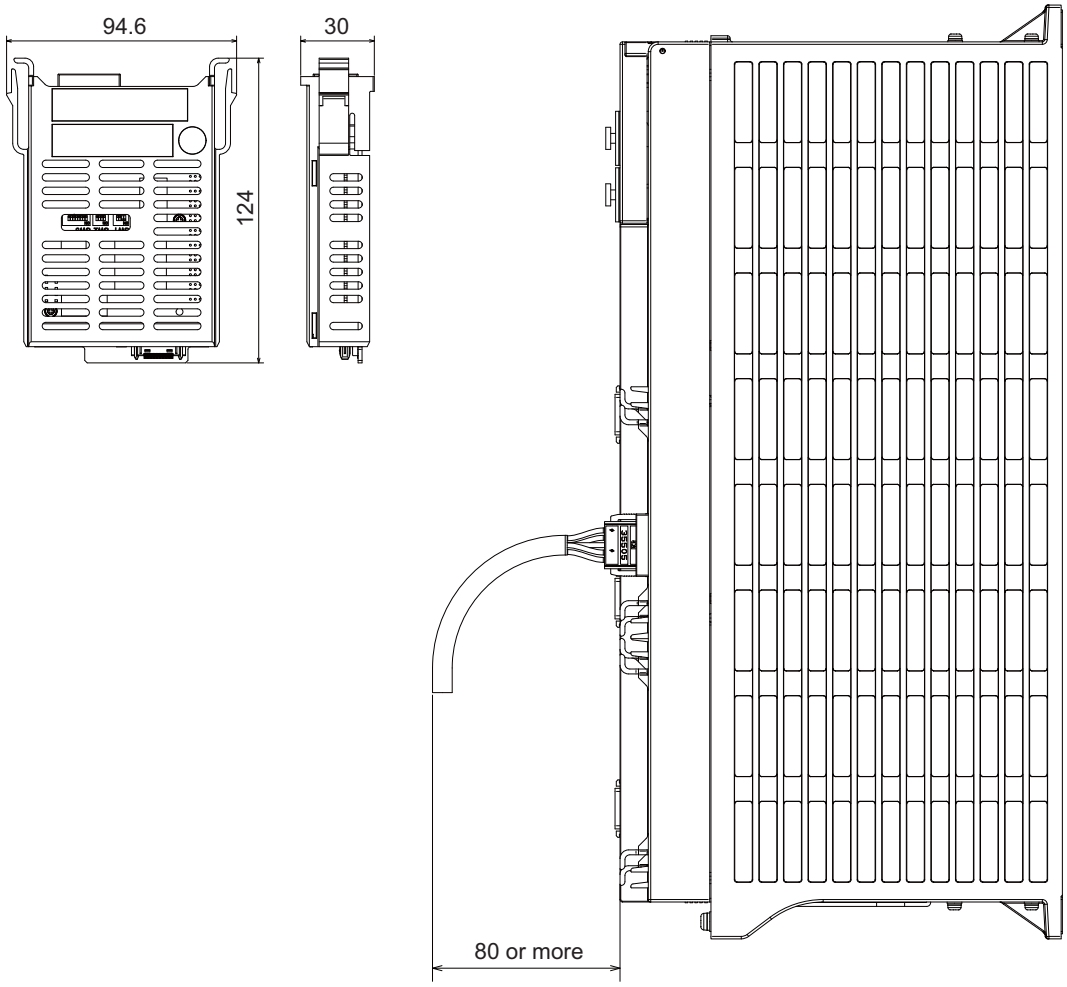


4.13 Communication Expansion Unit

4.13.1 CC-Link (FCU8-EX561)

[Outline dimension]

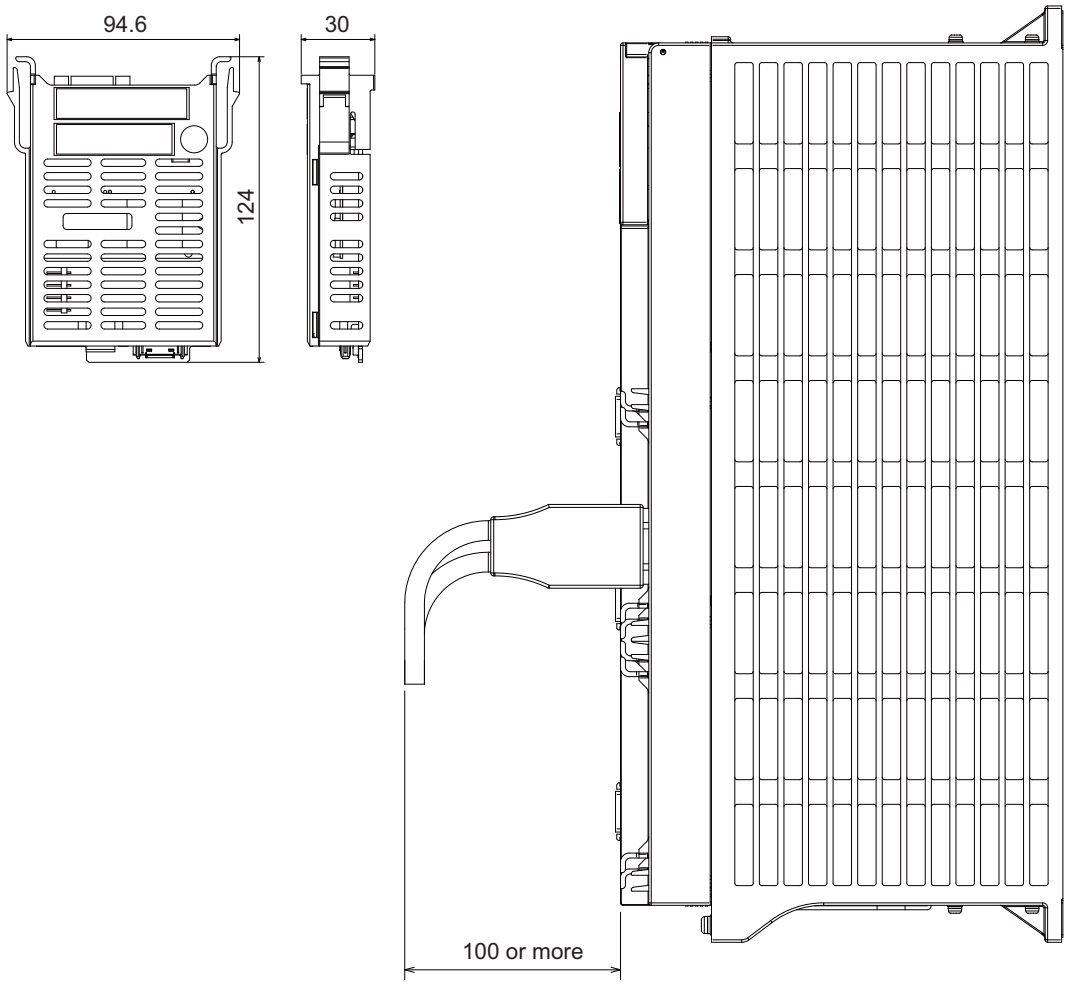
[mm]



4.13.2 PROFIBUS-DP (FCU8-EX563)

[Outline dimension]

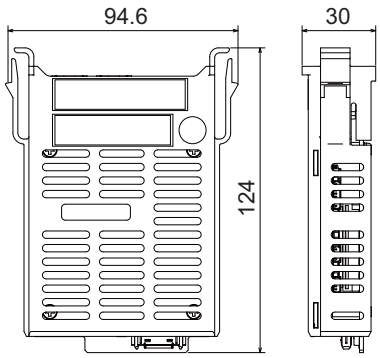
[mm]

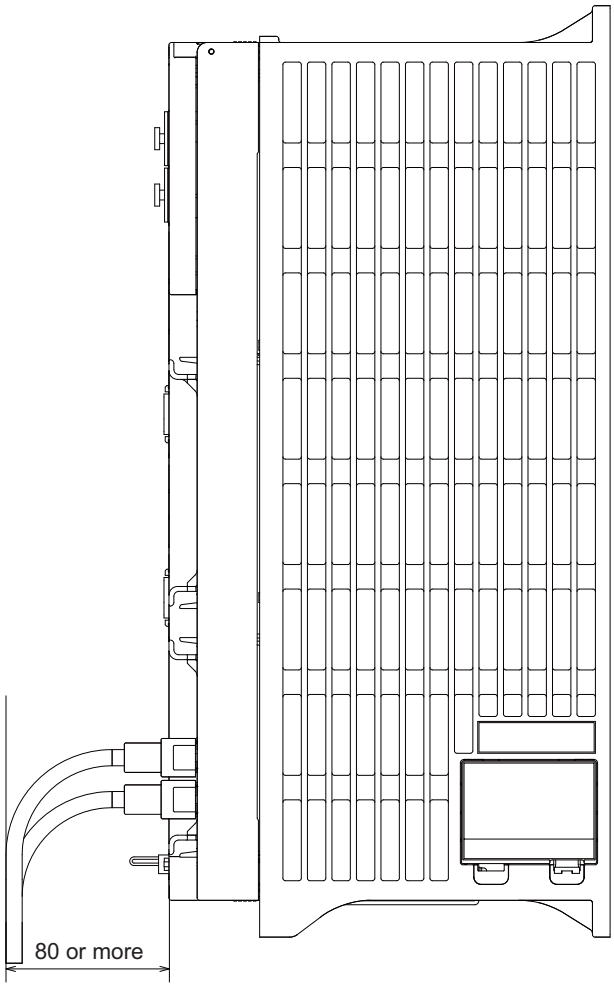


4.13.3 CC-Link IE Field (FCU8-EX564)

[Outline dimension]

[mm]

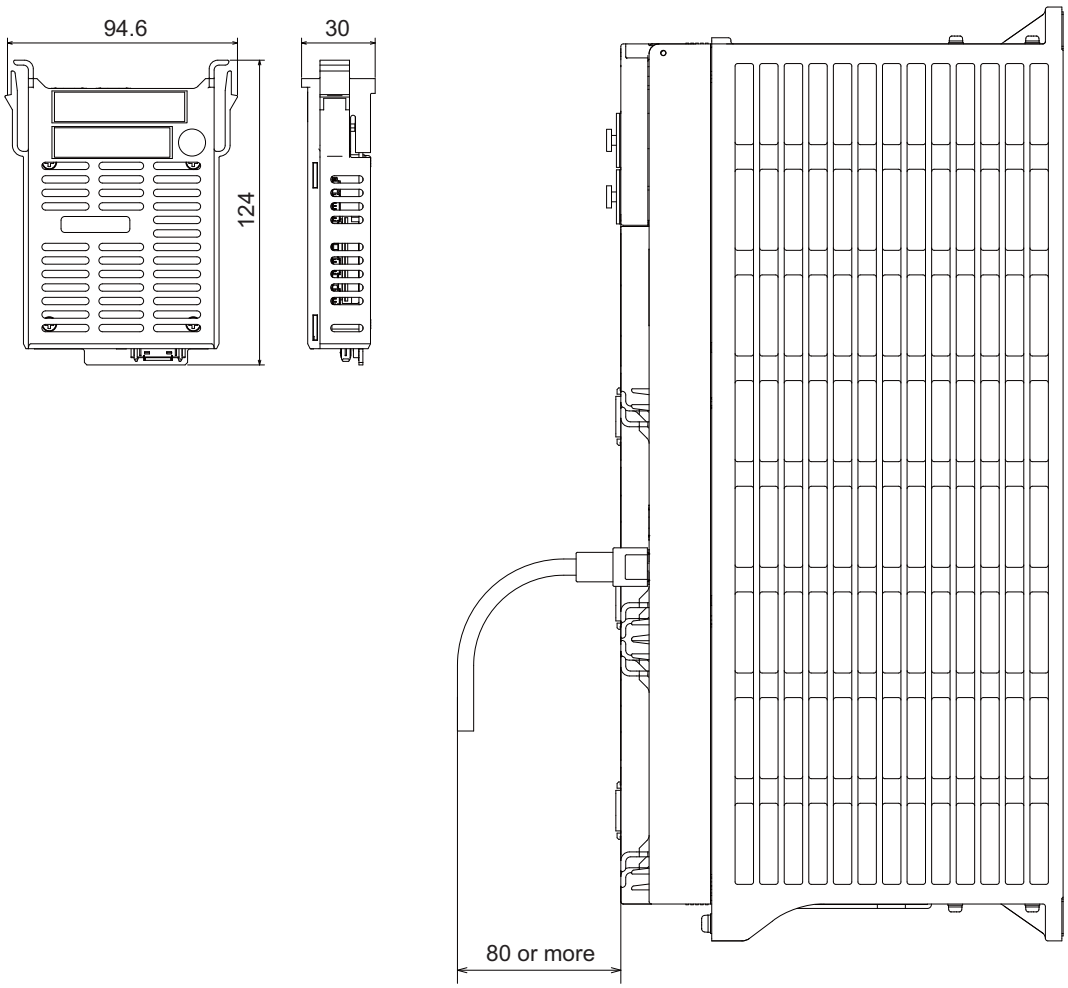




4.13.4 EtherNet/IP (FCU8-EX565)

[Outline dimension]

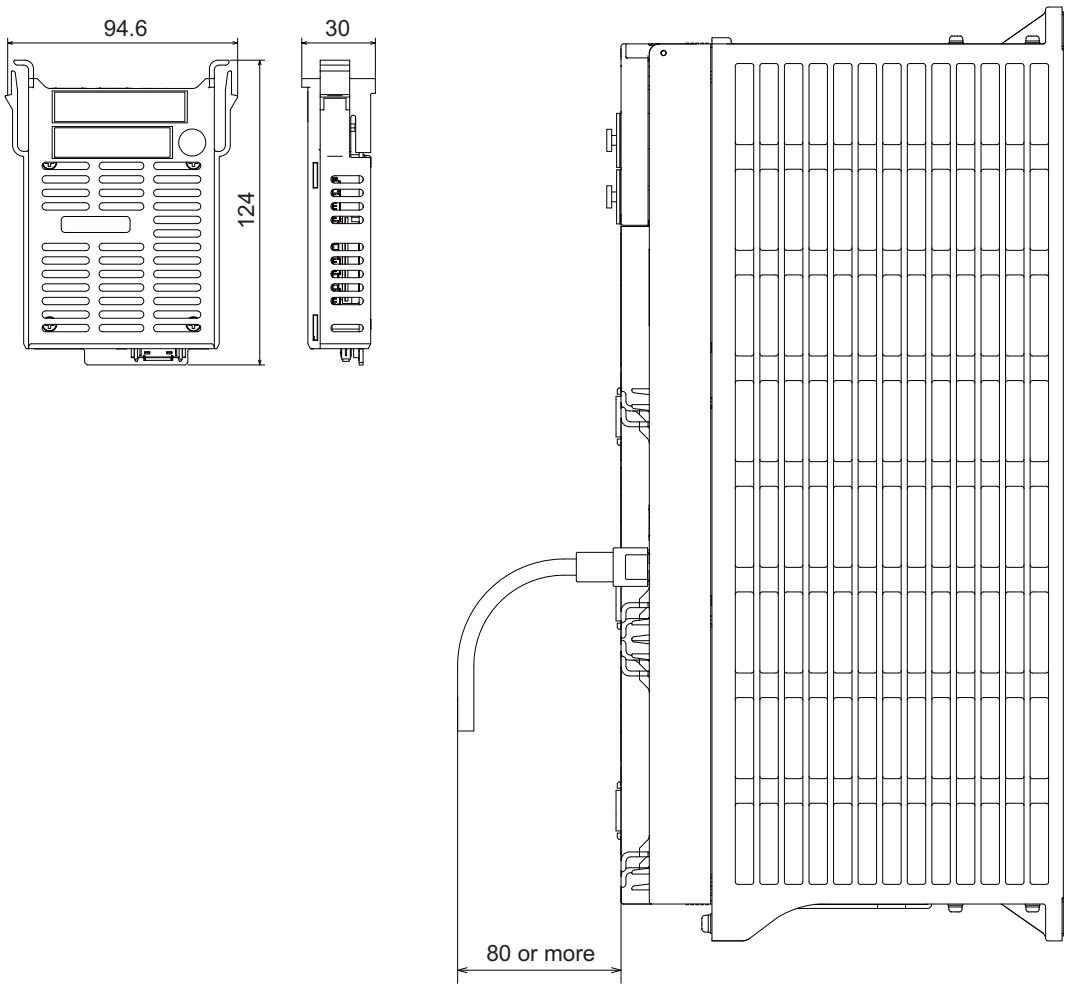
[mm]



4.13.5 FL-net (FCU8-EX568)

[Outline dimension]

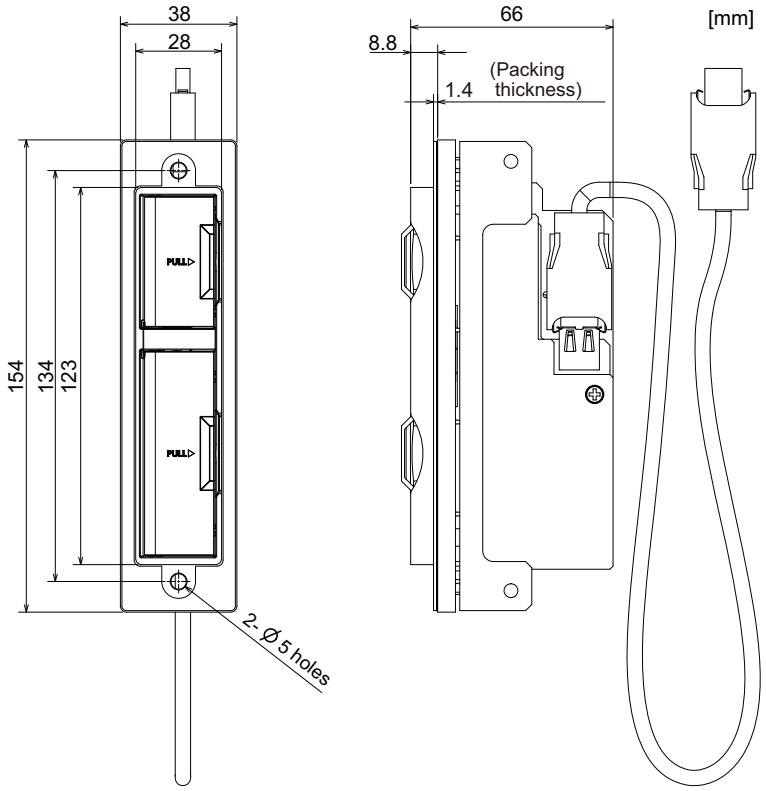
[mm]



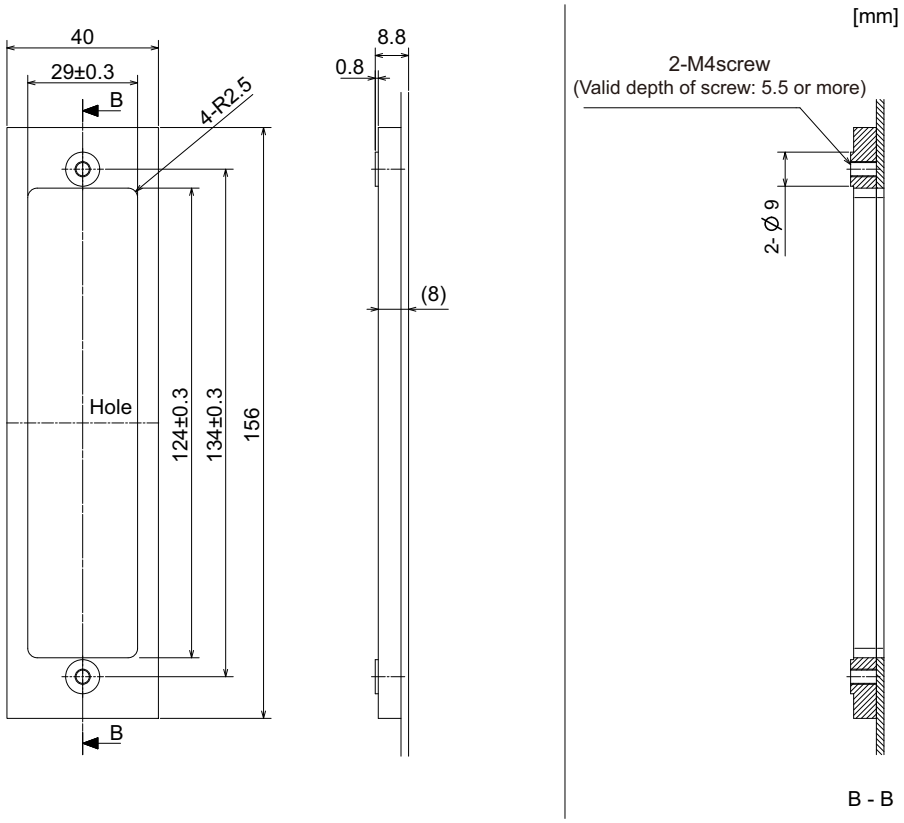
4.14 Side Memory I/F Unit

(Note) Side memory I/F unit is only for 19-type display unit.

[Outline dimension]



[Installation dimension]



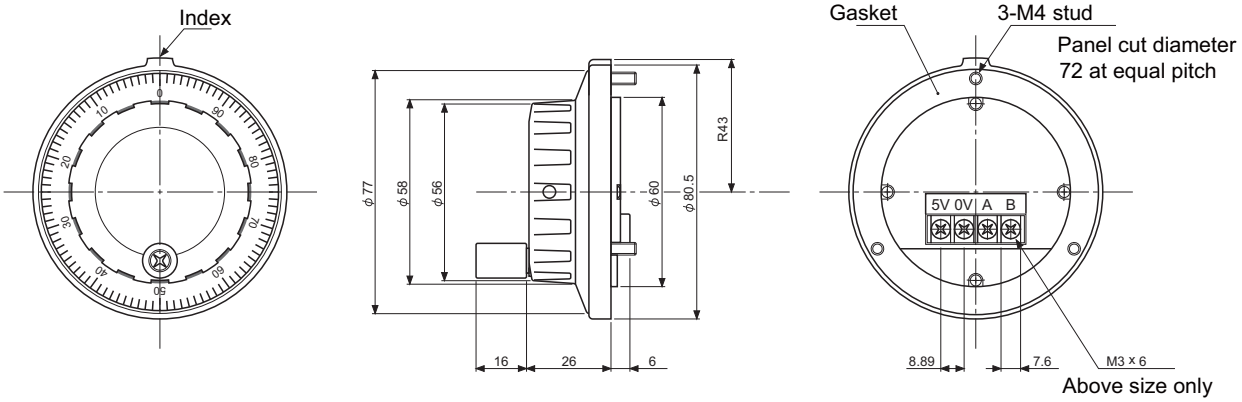
4.15 Manual Pulse Generator

4.15.1 5V Manual Pulse Generator (UFO-01-2Z9)

100 pulse/rev

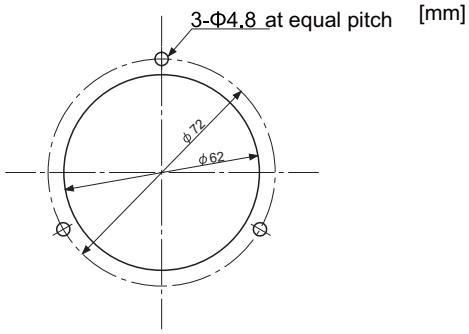
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]



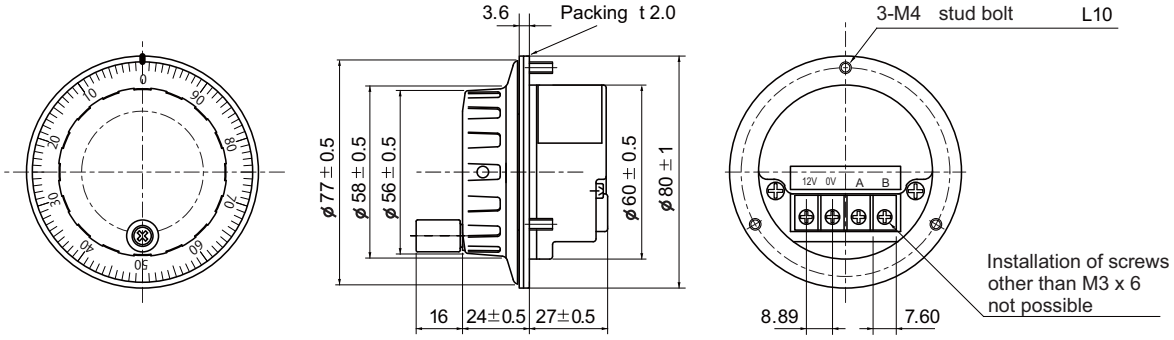
Produced by NIDEC NEMICON CORPORATION

4.15.2 12V Manual Pulse Generator (HD60C)

25 pulse/rev

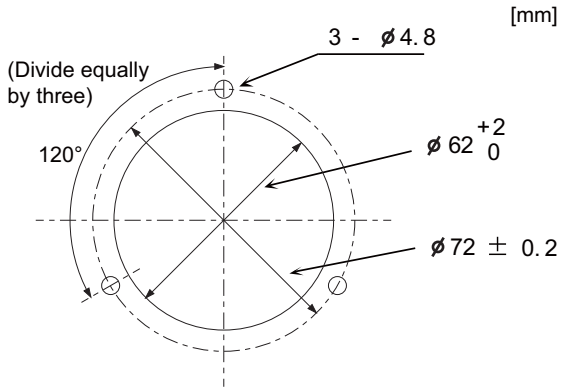
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]

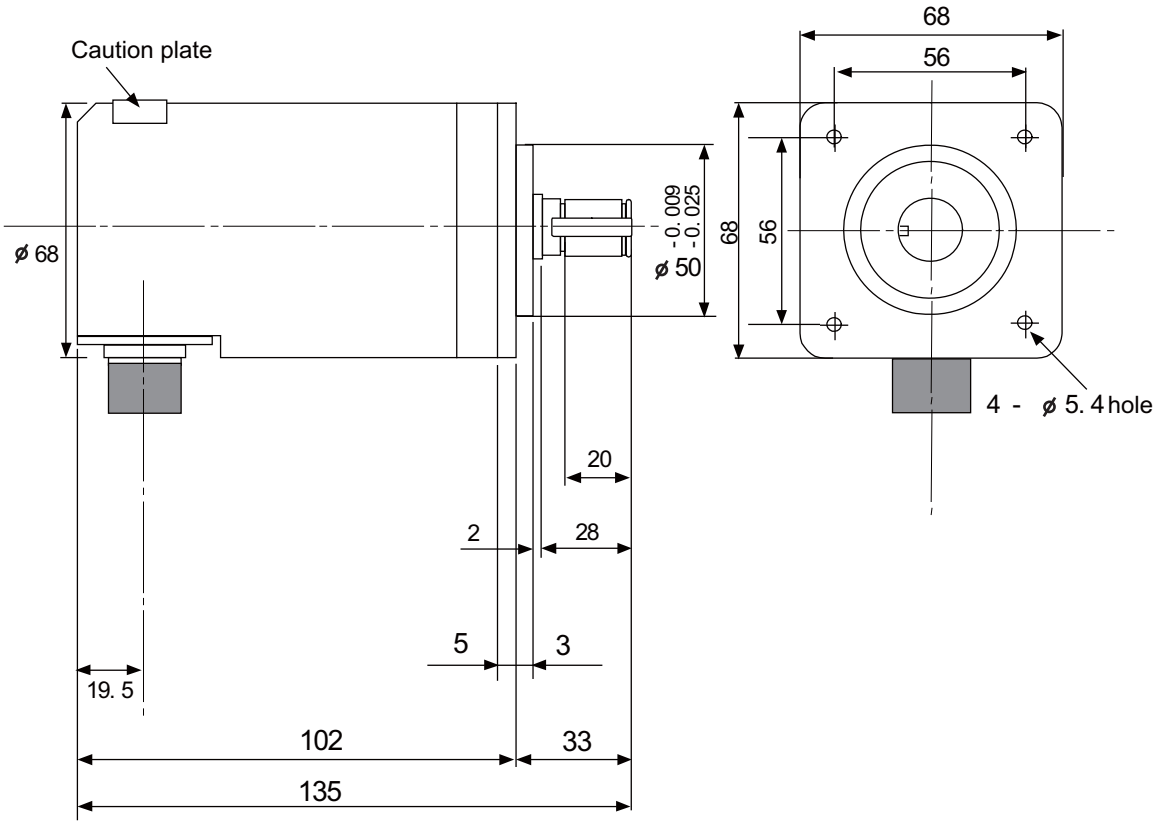


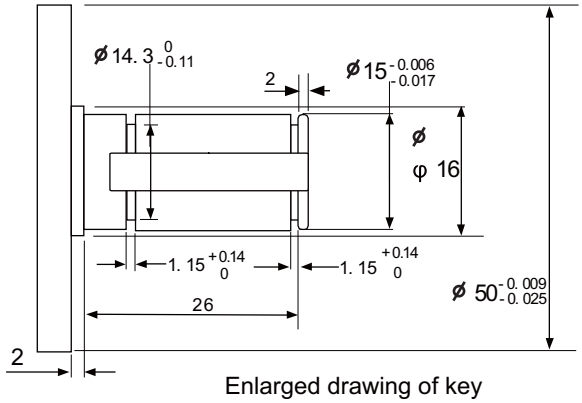
4.16 Synchronous Feed Encoder

4.16.1 Synchronous Feed Encoder (OSE-1024-3-15-68)

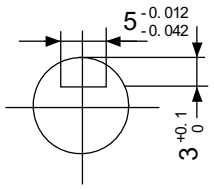
[Outline dimension]

[mm]



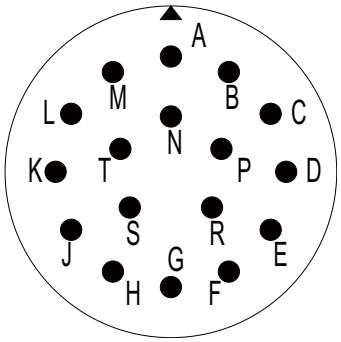


Enlarged drawing of key



Cross section BB
Valid depth of key groove is 21mm

[Connector]



Connector pin assignment

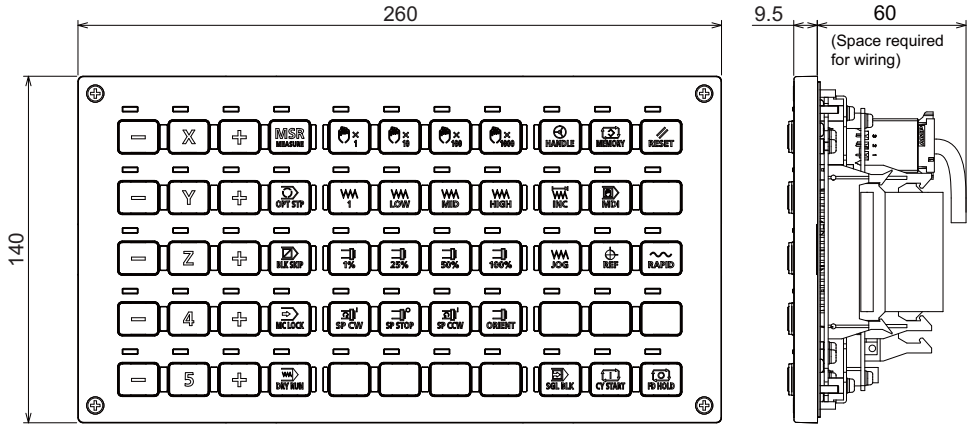
Pin	Function	Pin	Function
A	A phase	**K**	0V
B	Z phase	**L**	-
C	B phase	**M**	-
D	-	**N**	A phase reverse
E	Case grounding	**P**	Z phase reverse
F	-	**R**	B phase reverse
G	-	**S**	-
H	+5V	**T**	-
J	-		

4.17 MITSUBISHI CNC Machine Operation Panel

4.17.1 Main Panel A , B
(FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB926)

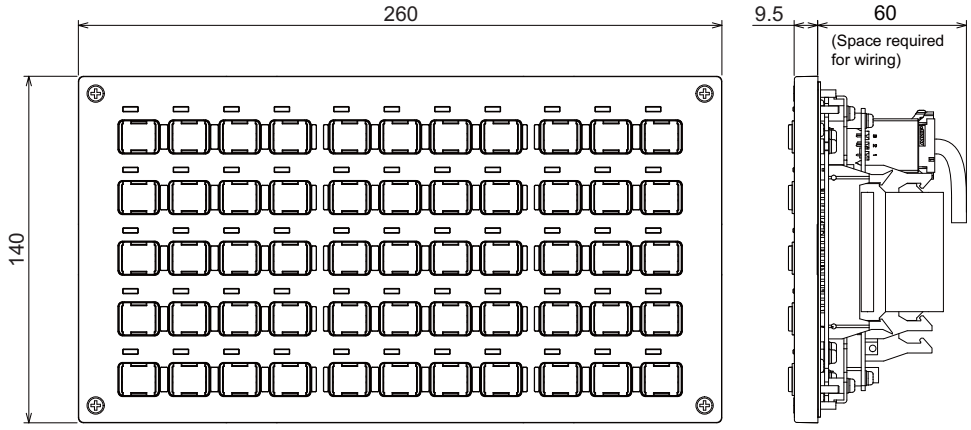
[Outline dimension : FCU8-KB921]

[mm]



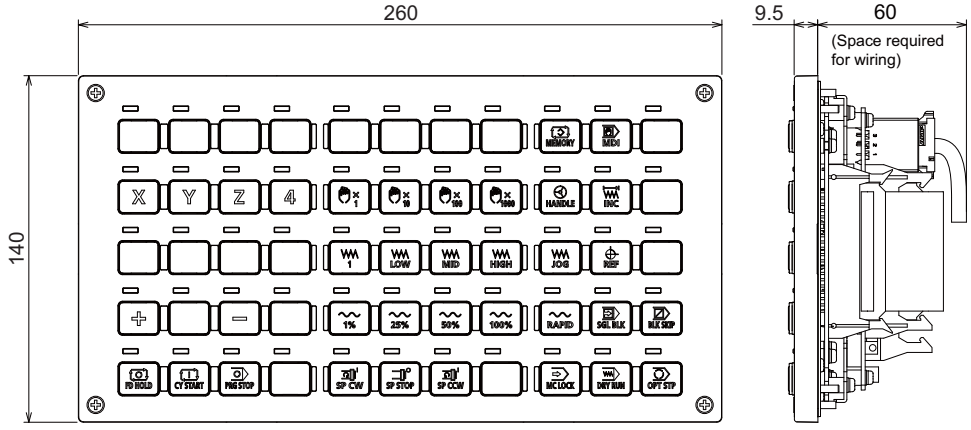
[Outline dimension : FCU8-KB922]

[mm]



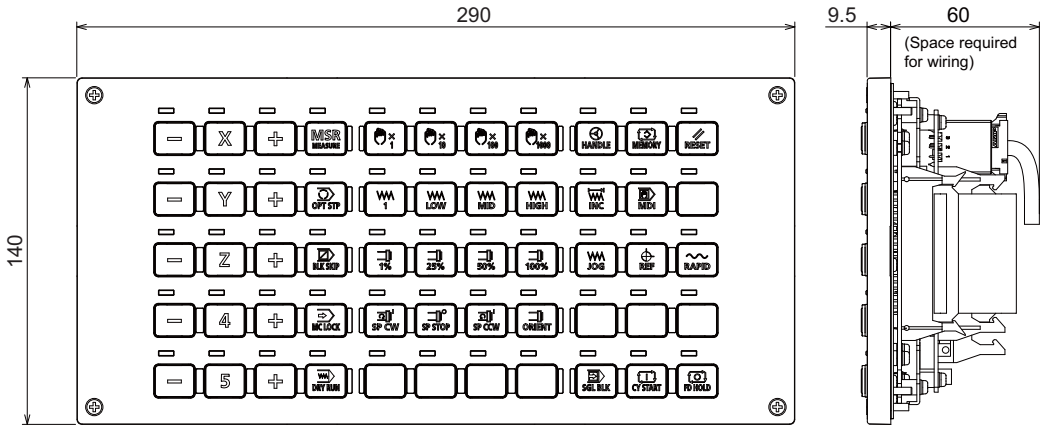
[Outline dimension : FCU8-KB925]

[mm]



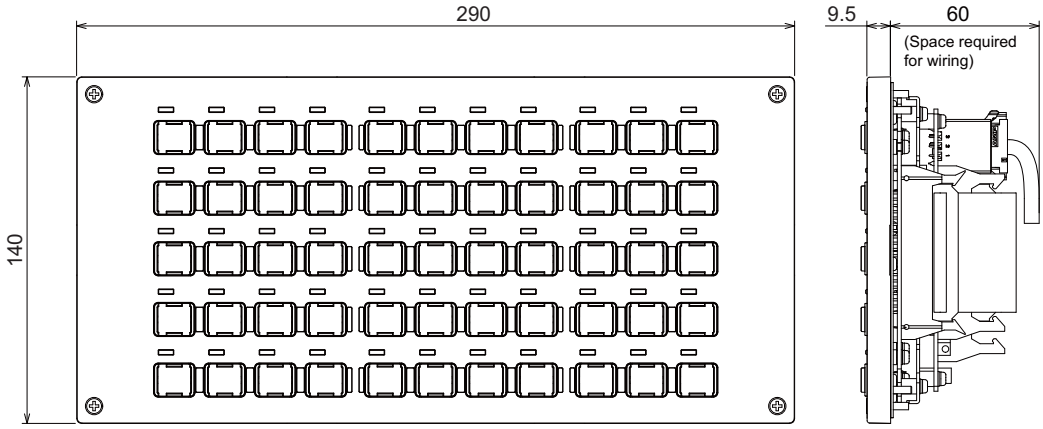
[Outline dimension : FCU8-KB923]

[mm]



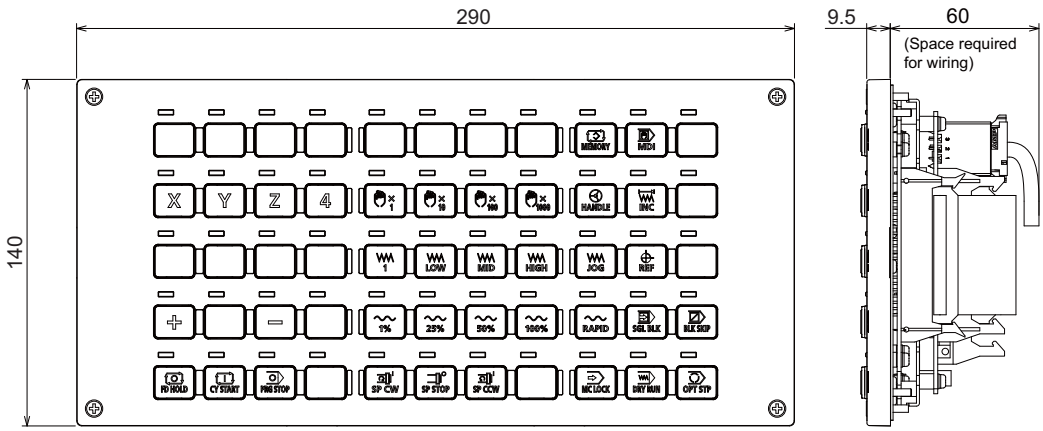
[Outline dimension : FCU8-KB924]

[mm]



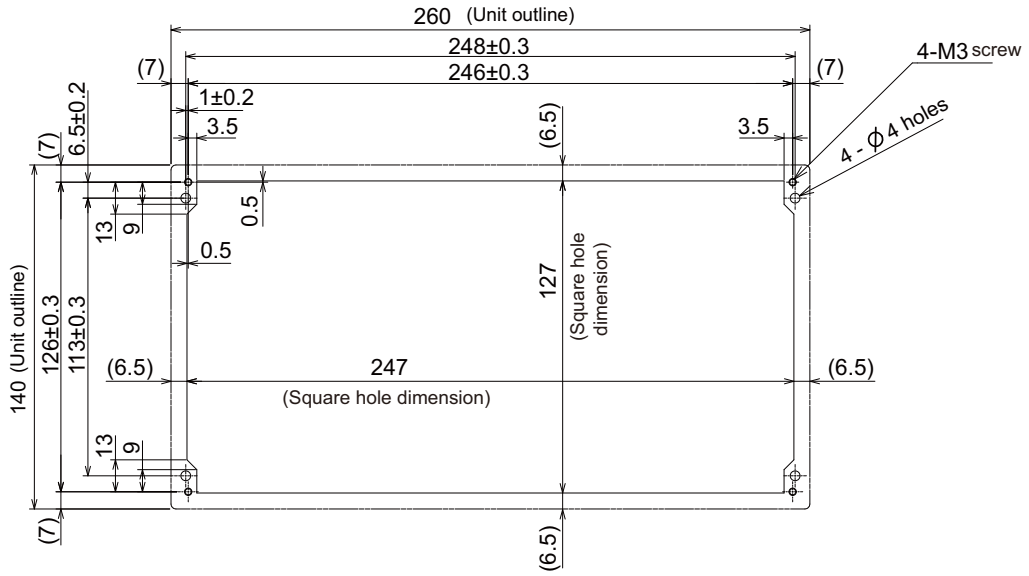
[Outline dimension : FCU8-KB926]

[mm]



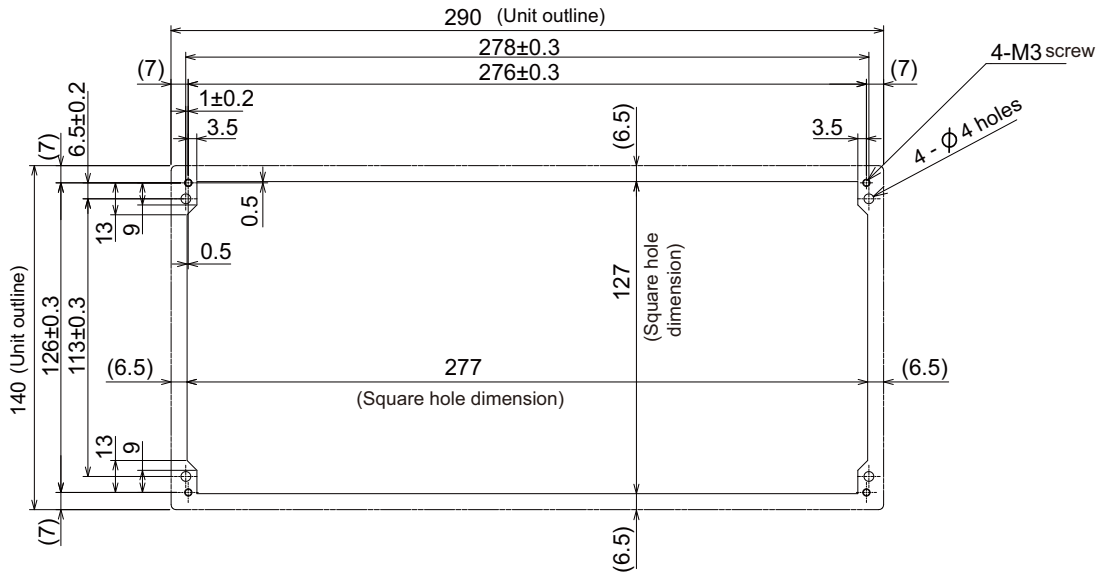
[Panel cut dimension : FCU8-KB921 / FCU8-KB922 / FCU8-KB925]

[mm]



[Panel cut dimension : FCU8-KB923 / FCU8-KB924 / FCU8-KB926]

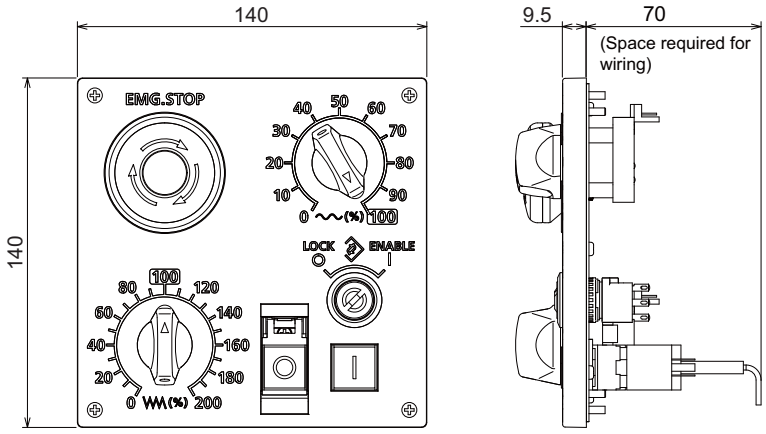
[mm]



4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB941)

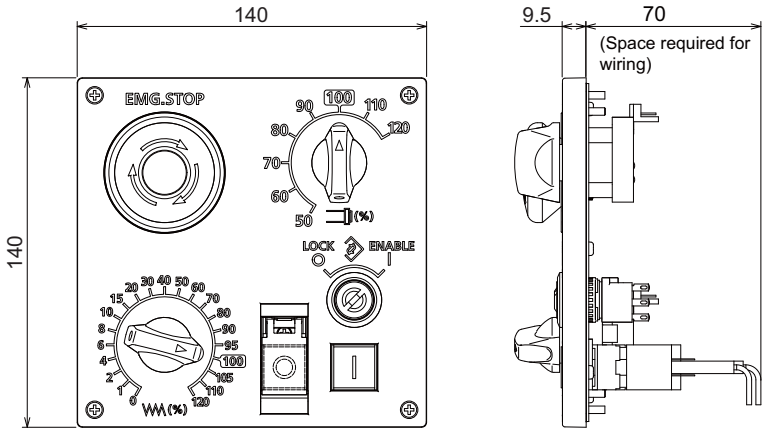
[Outline dimension : FCU8-KB931]

[mm]



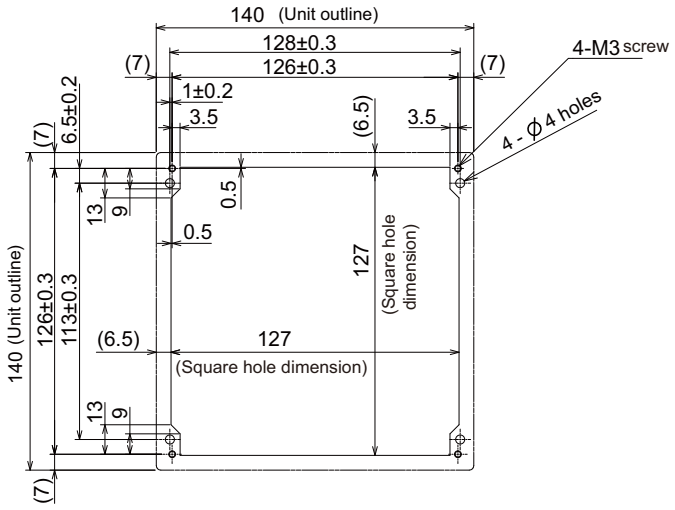
[Outline dimension : FCU8-KB941]

[mm]



[Panel cut dimension : FCU8-KB931 / FCU8-KB941]

[mm]

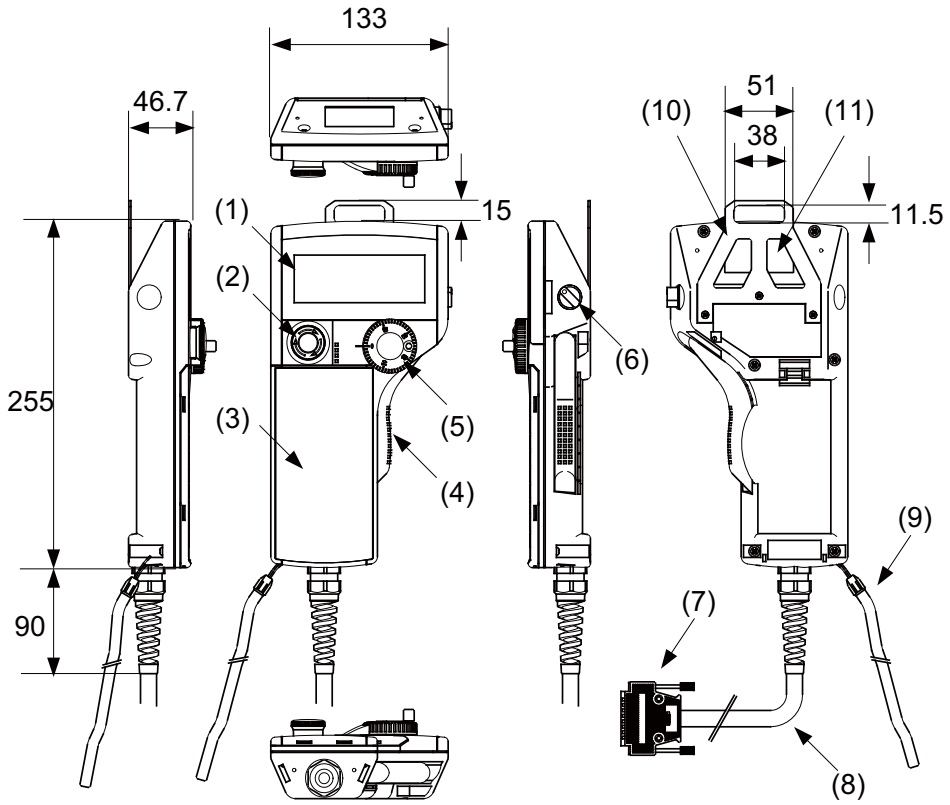


4.18 Handy Terminal

Item	Unit name		Handy terminal
	Type		HG1T-SB12UH-MK1346-L5
General Specifications	Ambient temperature	During operation	0 to 40 ℃
		During storage	-20 to 60 ℃
	Ambient humidity		Long term: 10 to 75% RH (with no dew condensation)
			Short term: 10 to 95% RH (with no dew condensation) (Note 1)
	Vibration resistance	During operation	9.8m/s^2 [1.0G] or less, 10 to 55Hz
	Shock resistance	During storage	98m/s^2 [10.0G] or less
	Working atmosphere		No corrosive gases, dust or oil mist
Power specifications	Power voltage		24VDC±5% Ripple noise 240mV (P-P)
	Current consumption	(max.)	0.2A
	Instantaneous stop tolerance time		24VDC: 4ms or less
Others	Heating value		4W (max.)
	Mass		0.6kg

(Note 1) "Short term" means within one month.
(Note 2) The unit is an IP65F equivalent.

Dimension and names of parts



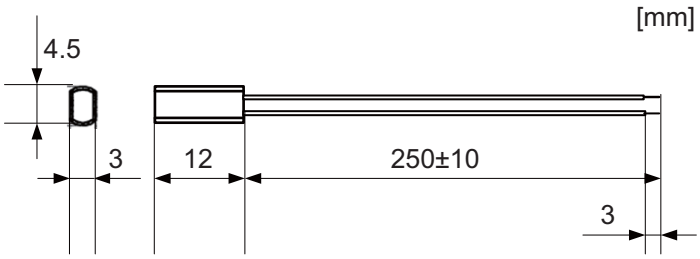
No.	Name	Function/ Specification		No.	Name	Function/ Specification
(1)	LCD	Monochrome display with backlight 192(W) × 64(H) dots		(7)	HOST	Host interface connector (DDK: 17JE-23250-02(D8A6))
(2)	SW1	Emergency stop switch Contact rating/ Contact: 24VDC, 1A Contact configuration: 2b contacts (IDEC Corporation: HA1E-V2S2VR)		(8)	-	Host interface cable (5m)
(3)	-	Membrane switch (Note)		(9)	-	Simplified hand strap (IDEC Corporation: HG9Z-PS1)
(4)	SW2	Enable switch Contact rating/ Contact: 24VDC, 50mA Contact configuration: 3 position contact × 2 (OFF-ON-OFF) (IDEC Corporation: HE3B-M2)		(10)	-	Panel hanging fitting (IDEC Corporation: HG9Z-TK1)
(5)	SW4	Manual pulse generator Output: Open collector 4.7kΩ pull-up resistor is connected. (TOKYO SOKUTEIKIZAI CO., LTD: RE19PH50C16RR)		(11)	-	Serial number plate
(6)	SW6	Selector switch				

(Note) Do not press multiple switches simultaneously: When three or more switches are pressed simultaneously, unpressed switches are also detected as pressed ones.

4.19 Thermistor

4.19.1 Thermistor(PT3C-51F-M2)

[Outline dimension]



Made by SHIBAURA ELECTRONICS Co., Ltd.

Ambient temperature	-10 to + 190 ℃
Insulation resistance	100MΩ or more at 500VDC [between case and lead wire]

4.20 Exclusive SD Cards for MITSUBISHI CNC

Item		FCU8-SD001G	FCU8-SD004G
Capacity		1GB	4GB
NAND Flash		SLC (Note 1)	
Ambient temperature	During operation	-25 ℃ to +85 ℃	
	During storage	-40 ℃ to +85 ℃	
Ambient humidity	During operation	5% to 95%RH (with no dew condensation)	
	During storage	5% to 95%RH (with no dew condensation)	

(Note 1) SLC stands for Single Level Cell, and it stores one bit data in each memory cell.
This provides longer life span and high product reliability in comparison with MLC (Multi Level Cell), which is commonly applied to SD cards.

(Note 2) Do not touch the terminal part with fingers, etc. when handling the SD cards.
The contermination of the terminal part of SD card causes a contact failure or a trouble.

4.21 Specifications and Precautions of USB/SD/LAN Interface

4.21.1 USB Interface (Personal Computer Unit, Side Memory I/F Unit)

Standards	USB3.0	USB2.0
Data transfer speed (Note)	Super Speed (5Gbps) High Speed (480Mbps) Full Speed (12Mbps) Low Speed (1.5Mbps)	High Speed (480Mbps) Full Speed (12Mbps) Low Speed (1.5Mbps)
Power supply to USB device	Supply voltage: 5V ± 5% Supply current: Max. 900mA/port	Supply voltage: 5V ± 5% Supply current: Max. 500mA/port (However, max. 200mA/port for side memory I/F unit)
Number of free ports	Personal computer unit × 2	Personal computer unit × 4, Side memory I/F unit × 1
Max. cable length	3m (During Super Speed. 5m for up to High Speed)	5m

(Note 1) Data transfer speed is the theoretical value on the standard, and the actual speed will be inferior to the value listed above. The transfer speed may be restrained depending on the specification of the connected device.

(Note 2) Side memory I/F unit is only for 19-type display unit.

(Note 3) Do not connect devices other than the USB memory to the front memory I/F of the graphic control unit.

(1) Precautions for use of commercially available USB keyboards and mice(Only for the display unit with the computer.)

MITUBISHI will not provide performance guarantee and maintenance for commercially available USB keyboards and mice. In case of using one of them, careful performance check must be required by the machine tool builder. Commercially available devices may not be compatible with MITSUBISHI units or suitable FA environment for temperature- or noise-wise.

Commercially available USB keyboards/mice are susceptible to noise, etc., and may cause a malfunction in the unit that may lead to an accident. Do not use them while the machine is operated.

(2) Precautions for use of other commercially available USB devices(Only for the display unit with the computer.)

When connecting a commercially available USB device that requires power exceeding the maximum current, select the one of which power can be supplied from an outside source.

MITSUBISHI will not provide performance guarantee and maintenance for commercially available USB printer, USB floppy disk, USB memory, USB hub, USB-CD drive, USB-DVD drive, and other USB devices. Commercially available devices may not be compatible with MITSUBISHI units or suitable FA environment for temperature- or noise-wise.

In the case of using one of them, careful performance check must be required by the machine tool builder, and necessary noise countermeasures, such as executing EMI countermeasures or adding the ferrite cores, must be taken.

(3) Precautions for insertion/removal of USB memory

When inserting/removing an USB memory, turn the MITUBISHI device's power OFF. Do not pull out the USB memory or turn OFF the power during access to the USB memory. Failure to observe this could cause the memory contents to be erased.

When Inserting/removing a USB memory, be sure to have enough interval to perform that (about 10 seconds or more).

In case of emergency, always perform backups by having your important data duplicate, etc. as MITUBISHI will not guarantee the broken or lost data.

(4) Precaution for operation with front-side USB memory

A USB memory to be used has to be supported USB2.0 Hi-Speed (480Mbps).

When connecting the USB memory, connect it directly without using the extension cable or USB hub.

Machine vibration may cause the USB memory to fall out depending on environment. Therefore, the operation with the front-side USB memory is required to be performed on your own responsibility.

4.21.2 SD Interface (Control Unit, Side Memory I/F Unit)

Standards	**SD/SDHC (Note)**
Transfer speed	According to the connecting SD card
Capacity	32GB
Number of free ports	Control unit × 1, Side memory I/F unit × 1

(Note 1) SDXC is not supported.

(Note 2) Side memory I/F unit is only for 19-type display unit.

(1) Precautions for use of commercially available SD card

MITUBISHI will not provide performance guarantee and maintenance for commercially available SD card, mini SD card or micro SD card (requires converting adapter). In case of using one of them, careful performance check must be required by the machine tool builder.

Commercially available devices may not be compatible with MITSUBISHI units or suitable FA environment for temperature- or noise-wise.

(2) Precautions for insertion/removal of SD card

When inserting/removing an SD card, turn the MITUBISHI device's power OFF. Do not pull out the card or turn OFF the power during access to the SD card. Failure to observe this could cause the memory contents to be erased.

In case of emergency, always perform backups by having your important data duplicate, etc. as MITUBISHI will not guarantee the broken or lost data.

4.21.3 LAN Interface (Control Unit, Personal Computer Unit)

Standards	**1000BASE-T / 100BASE-TX / 10BASE-T**
Data transfer speed (Note)	1000Mbps / 100Mbps / 10Mbps
Number of free ports	Control unit × 1, Personal computer unit × 1
Max. cable length	100m

(Note 1) Data transfer speed is the theoretical value on the standard, and the actual speed will be inferior to the value listed above. The transfer speed may be restrained depending on the specification of the connected device.

(Note 2) When using half-duplex communication, the response time may become long depending on the opposite device.

Use full-duplex communication to connect with the opposite device via a switching HUB.

(1) Precautions for selection of LAN cable

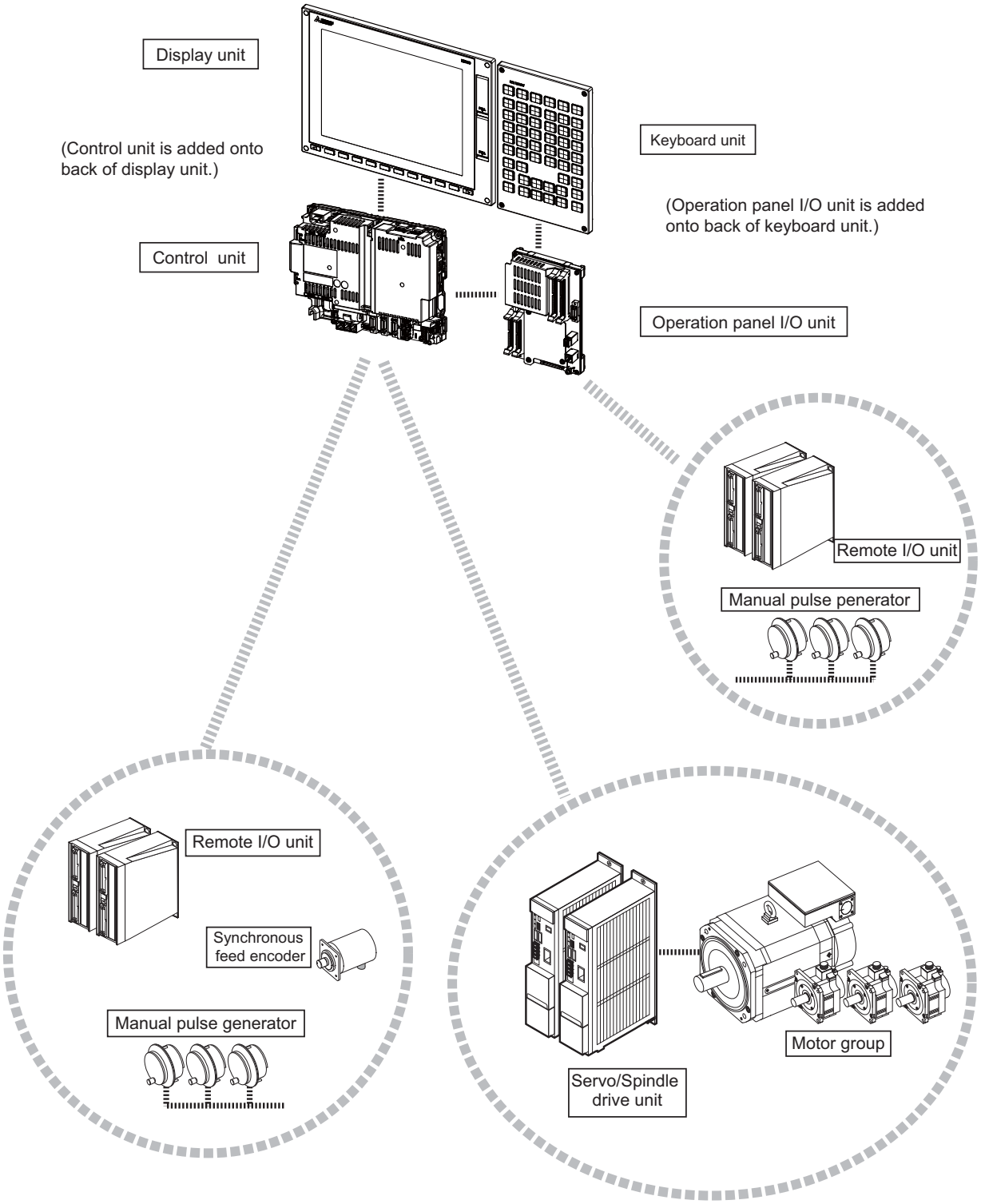
Make sure to select the LAN cables which are "category 5e or above" and "shielded". Cable wire material with double shielded, which is appropriate for FA environment., is recommended.

M800S/M80/E80 Series
Hardware

1

System Basic Configuration (M800S/M80/E80 Series)

1.1 System Basic Configuration Drawing



(Note) For the drive unit configuration, refer to the Instruction Manual of the drive unit you use.

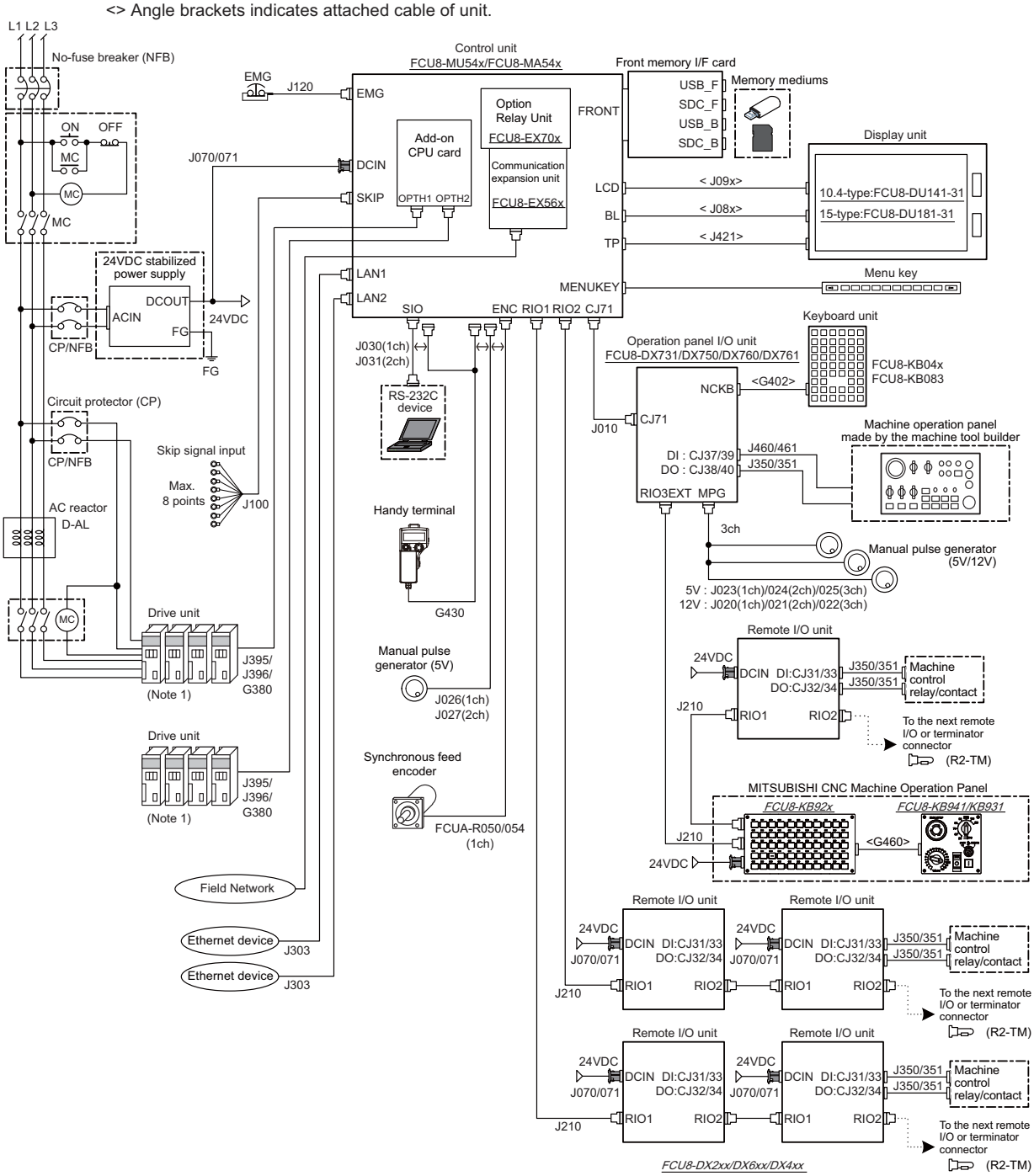
2

General Connection Diagram (M800S/M80/E80 Series)

2.1 General Connection Diagram [M800S]

(1) Operation panel I/O unit: FCU8-DX731/DX750/DX760/DX761

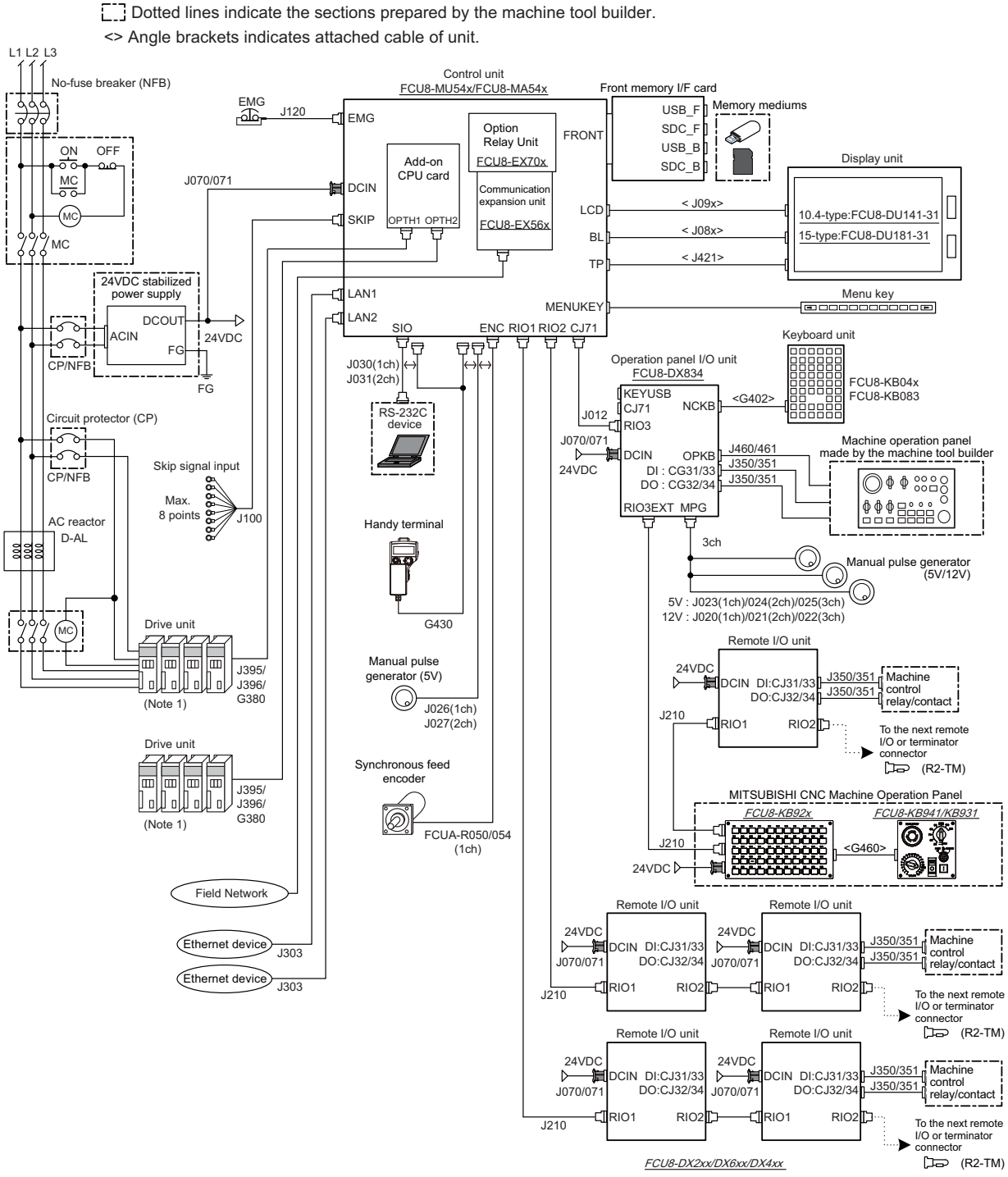
Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(2) Operation panel I/O unit: FCU8-DX834



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

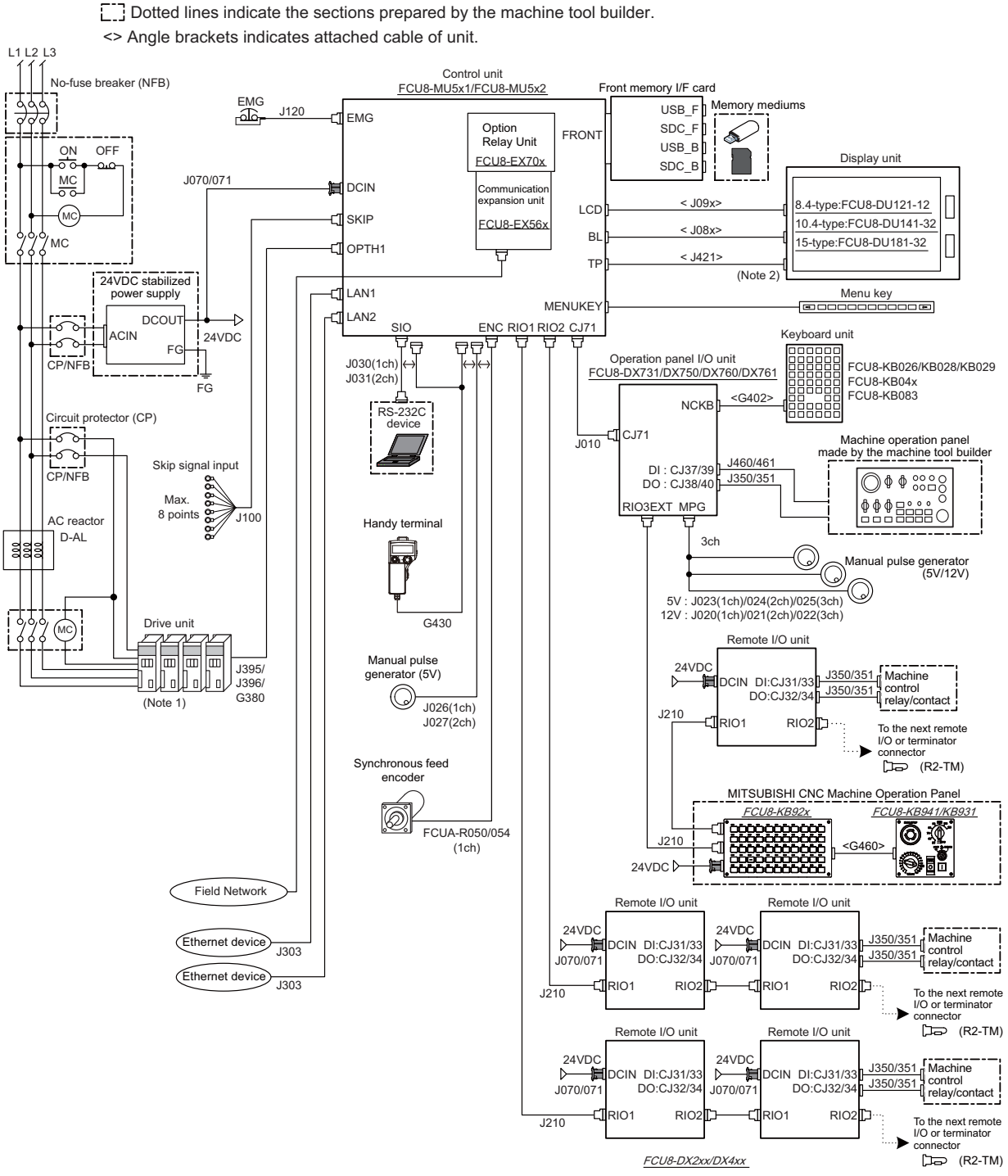
(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

2.2 General Connection Diagram [M80]

2.2.1 Connecting a Spindle Drive Unit

(1) Operation panel I/O unit: FCU8-DX731/DX750/DX760/DX761

(a) Without smart safety observation



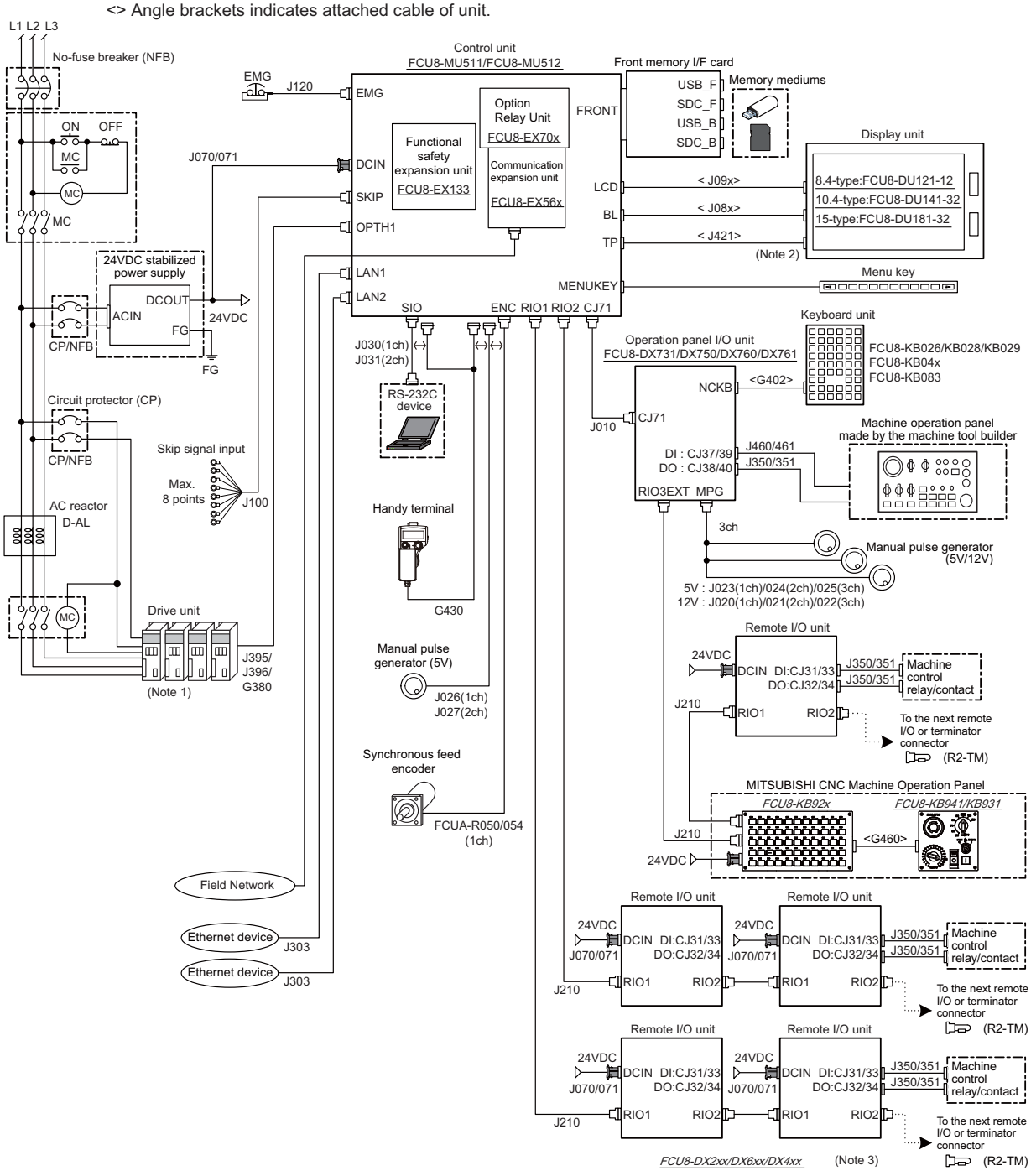
(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the 8.4-type display unit, TP connector is not used.

(Note 3) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(b) With smart safety observation

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.

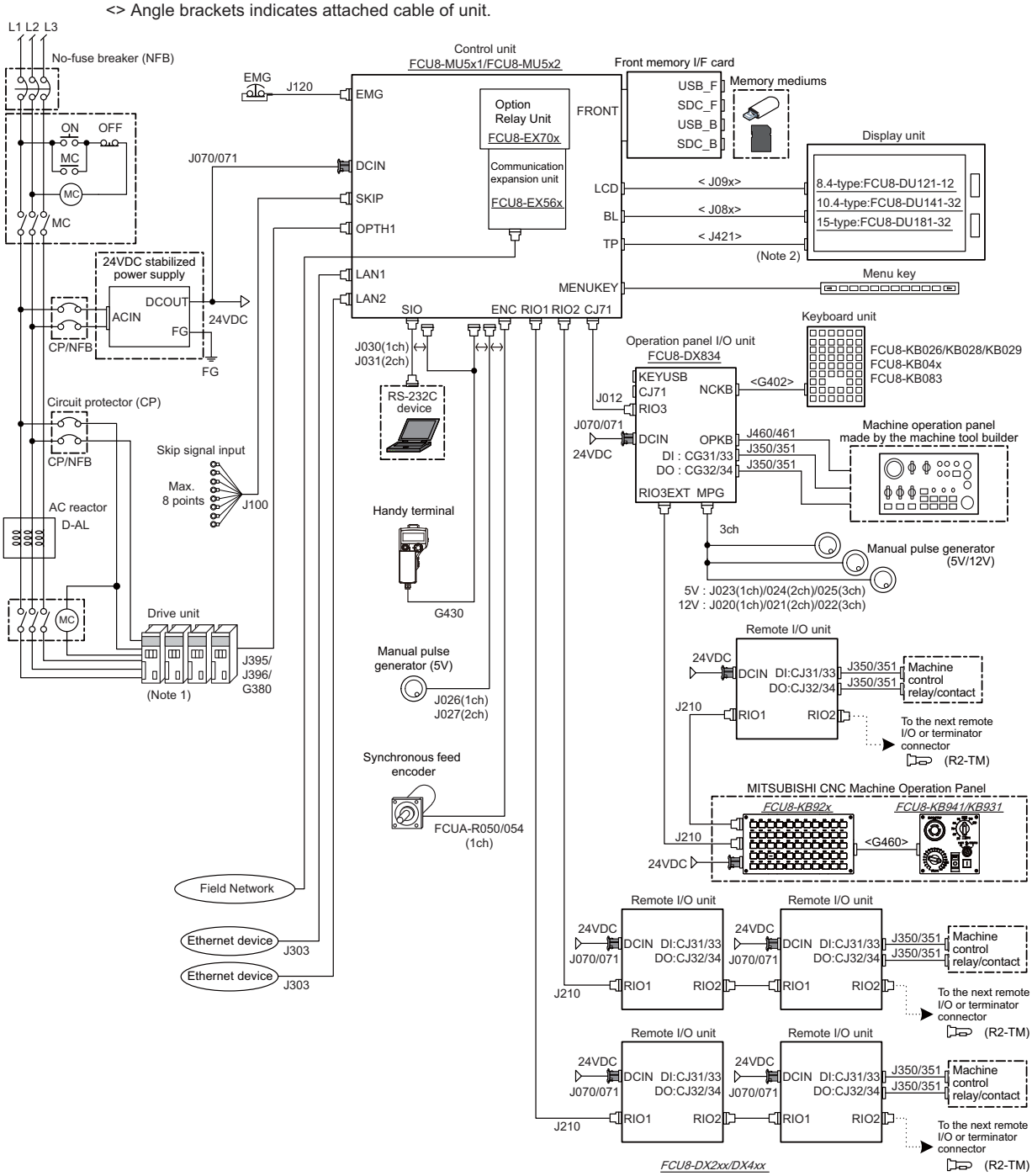


(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.
(Note 2) For the 8.4-type display unit, TP connector is not used.
(Note 3) The safety remote I/O unit is available only when the functional safety expansion unit is mounted.
(Note 4) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(2) Operation panel I/O unit: FCU8-DX834

(a) Without smart safety observation

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



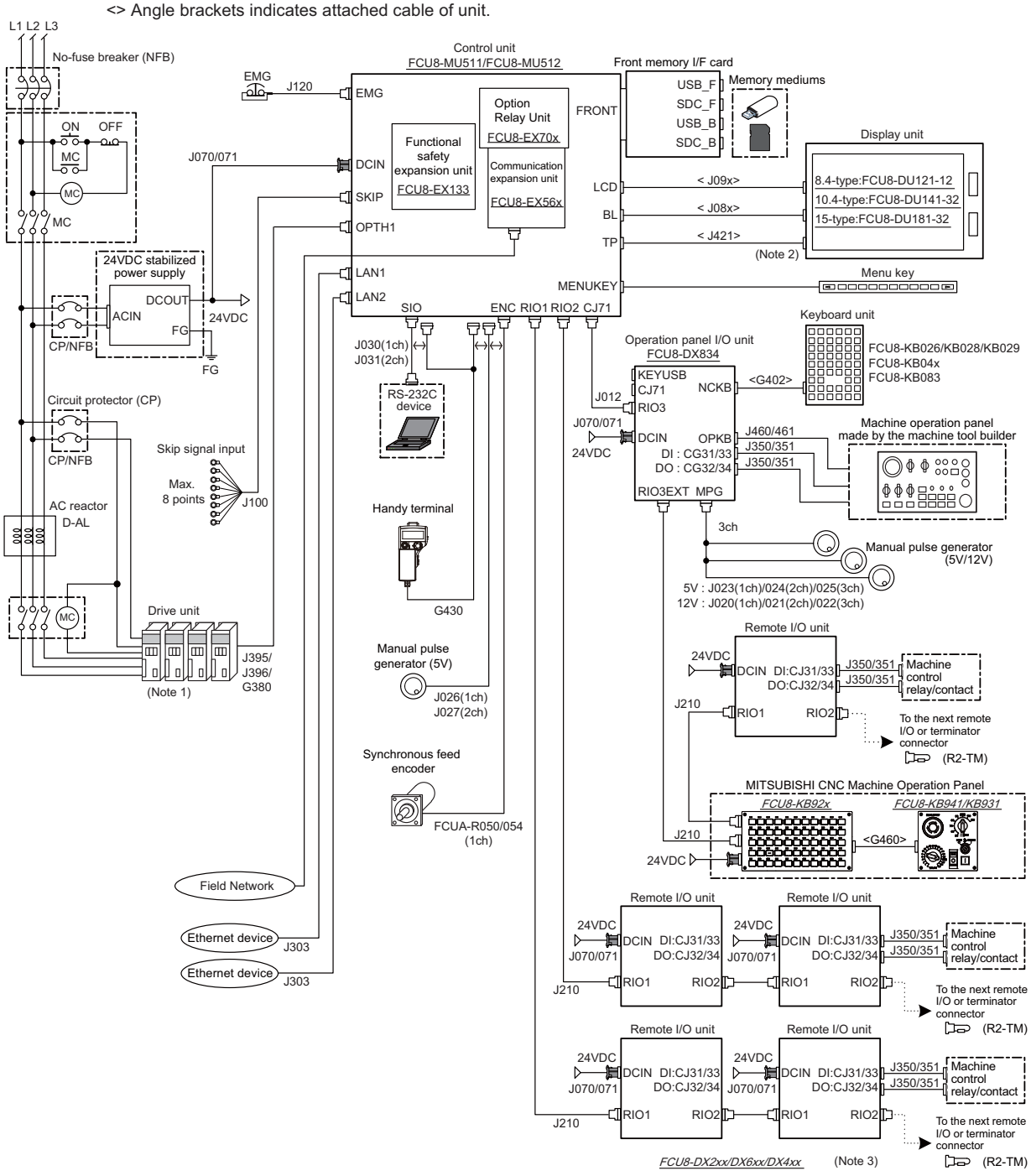
(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the 8.4-type display unit, TP connector is not used.

(Note 3) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(b) With smart safety observation

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.
(Note 2) For the 8.4-type display unit, TP connector is not used.
(Note 3) The safety remote I/O unit is available only when the functional safety expansion unit is mounted.
(Note 4) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

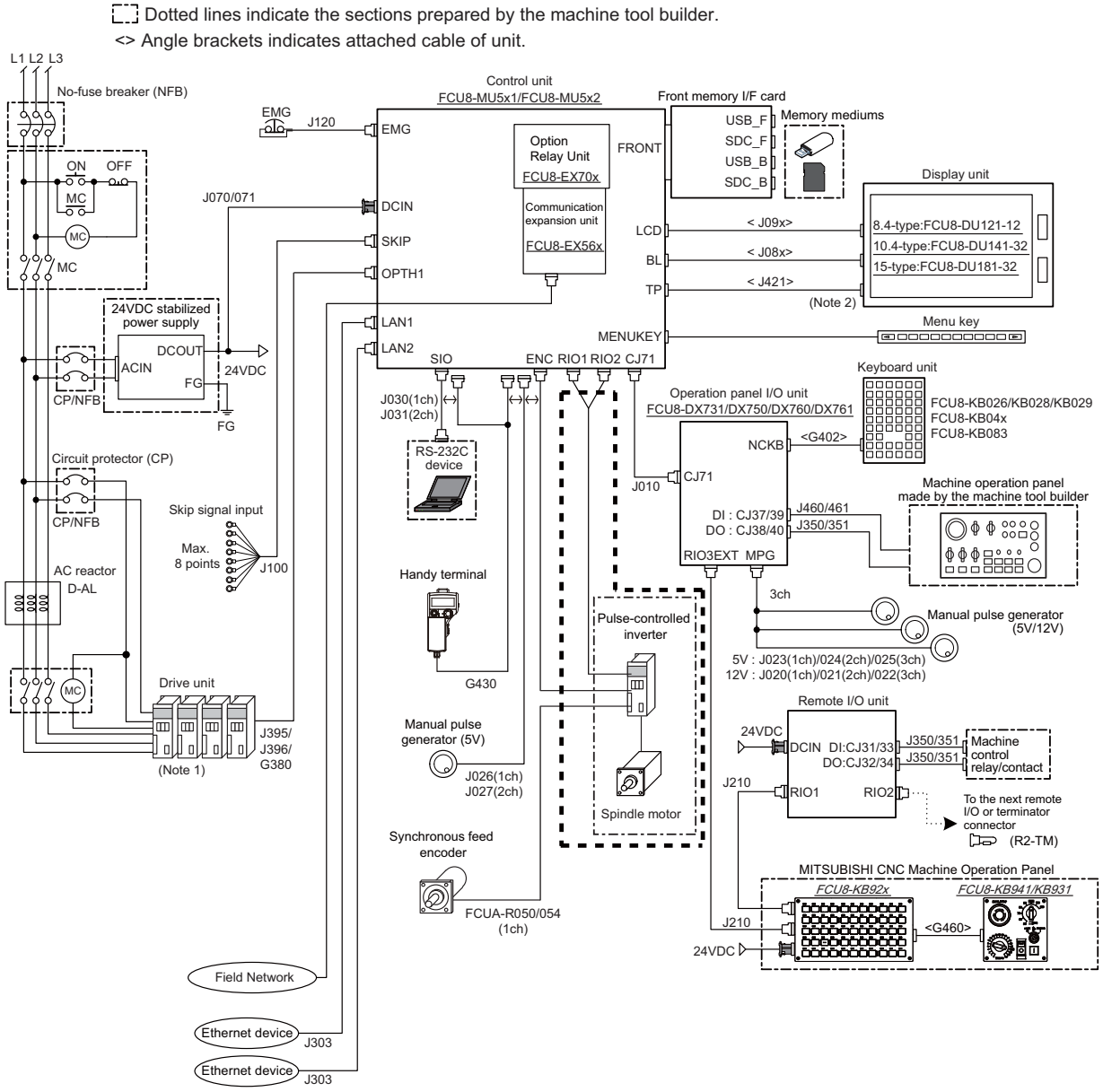
2.2.2 Connecting a Pulse-controlled Inverter

Pulse-controlled inverter refers to an inverter capable of controlling spindle operation through pulse train input.

The figure above is an example when the pulse-controlled inverter is connected to the following unit.
- Operation panel I/O unit: FCU8-DX731/DX750/DX760/DX761
- Without smart safety observation

The connection surrounded by a thick dotted line is required to connect the pulse-controlled inverter.

(Note) When the pulse-controlled inverter is connected, the remote I/O unit cannot be connected to the either of the RIO1 connector or the RIO2 connector.

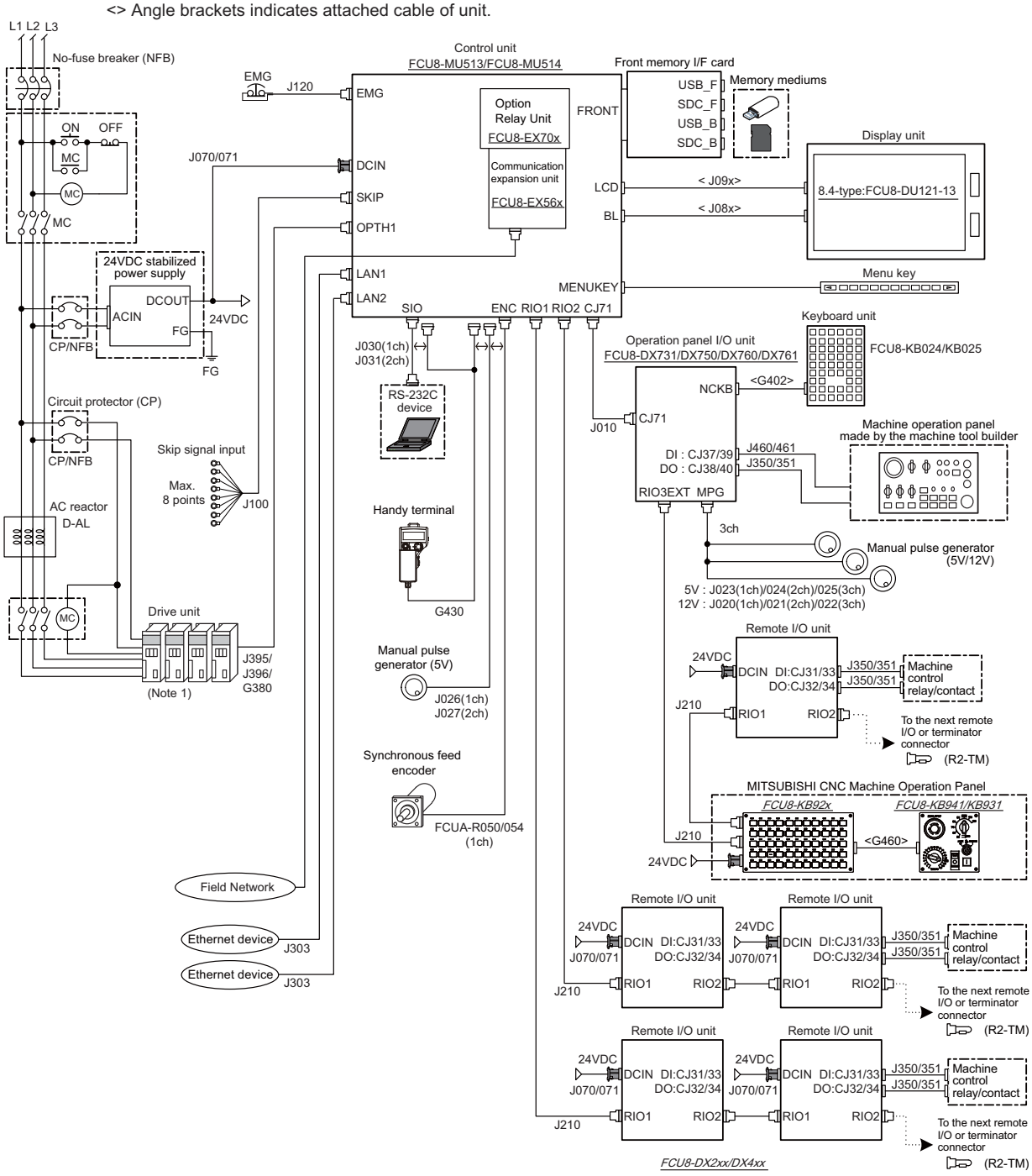


2.3 General Connection Diagram [E80]

2.3.1 Connecting a Spindle Drive Unit

(1) Operation panel I/O unit: FCU8-DX731/DX750/DX760/DX761

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.

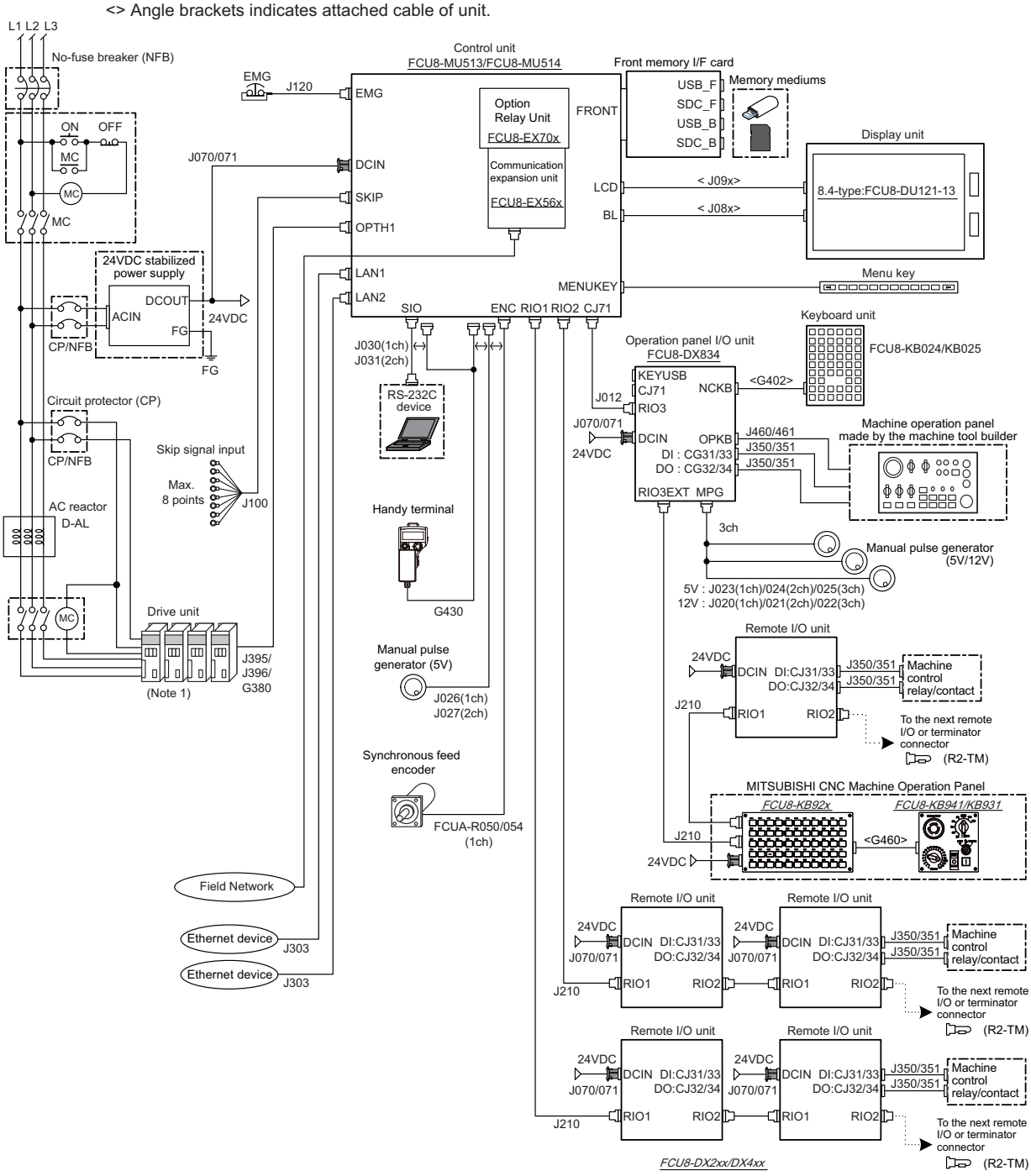


(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.

(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

(2) Operation panel I/O unit: FCU8-DX834

Dotted lines indicate the sections prepared by the machine tool builder.
<> Angle brackets indicates attached cable of unit.



(Note 1) For information on how to connect the drive unit, refer to the drive unit's manual.
(Note 2) For the connection of MITSUBISHI CNC machine operation panel, refer to the chapter "Connection of MITSUBISHI CNC Machine Operation Panel".

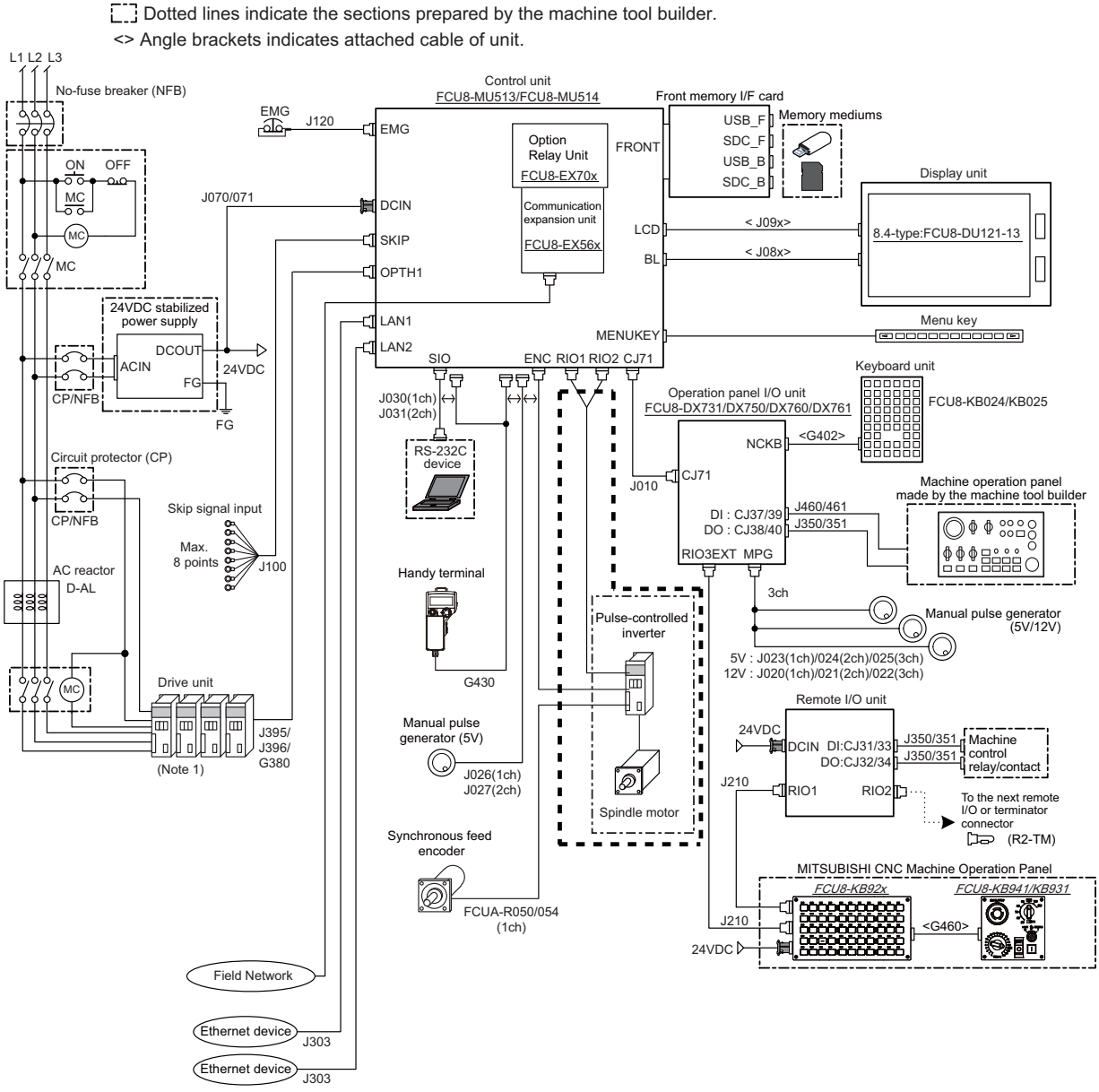
2.3.2 Connecting a Pulse-controlled Inverter

Pulse-controlled inverter refers to an inverter capable of controlling spindle operation through pulse train input.

The figure above is an example when the pulse-controlled inverter is connected to the following unit.
- Operation panel I/O unit: FCU8-DX731/DX750/DX760/DX761

The connection surrounded by a thick dotted line is required to connect the pulse-controlled inverter.

(Note) When the pulse-controlled inverter is connected, the remote I/O unit cannot be connected to the either of the RIO1 connector or the RIO2 connector.



3

List of Configuration (M800S/M80/E80 Series)

3.1 Control Unit [M800S]

Classification	Type	Components	Remarks
NC functions and display controller For M830S	FCU8-MU542	Base control card Add-on CPU card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For M850S	FCU8-MA542	Base control card Add-on CPU card Front-side memory I/F card	This unit is not compliant with Export Trade Control Order, and it is compliant with Foreign Exchange Order.
NC functions and display controller For M830S	FCU8-MU541	Base control card Add-on CPU card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For M850S	FCU8-MA541	Base control card Add-on CPU card Front-side memory I/F card	This unit is not compliant with Export Trade Control Order, and it is compliant with Foreign Exchange Order.

3.2 Control Unit [M80]

Classification	Type	Components	Remarks
NC functions and display controller For M80 TypeB	FCU8-MU511	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For M80 TypeA	FCU8-MU512	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For M80 TypeB	FCU8-MU501	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For M80 TypeA	FCU8-MU502	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.

3.3 Control Unit [E80]

Classification	Type	Components	Remarks
NC functions and display controller For E80 TypeB	FCU8-MU513	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.
NC functions and display controller For E80 TypeA	FCU8-MU514	Base control card Front-side memory I/F card	This unit is not compliant with both Export Trade Control Order and Foreign Exchange Order.

3.4 Display Unit [M800S]

Classification	Type	Components	Remarks
10.4-type color TFT touch panel (VGA:640*480)	FCU8-DU141-31	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-31	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit

3.5 Display Unit [M80]

Classification	Type	Components	Remarks
8.4-type color TFT (VGA:640*480)	FCU8-DU121-12	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit
10.4-type color TFT touch panel (VGA:640*480)	FCU8-DU141-32	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit
15-type color TFT touch panel (XGA:1024*768)	FCU8-DU181-32	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit

3.6 Display Unit [E80]

Classification	Type	Components	Remarks
8.4-type color TFT (VGA:640*480)	FCU8-DU121-13	LCD panel Menu keys Escutcheon Base metal plate Cable Screw cap set	Front side memory I/F is normally equipped with the control unit

3.7 Keyboard Unit [M800S]

Classification	Type	Components	Remarks
Keyboard for 10.4-type display unit Clear keys	FCU8-KB041	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB046	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB047	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB048	Escutcheon, key switch G402 cable Screw cap set	ABC layout (for M system/L system)
Keyboard for 15-type display unit Clear keys	FCU8-KB083	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)

3.8 Keyboard Unit [M80]

Classification	Type	Components	Remarks
Keyboard for 8.4-type display unit Clear keys	FCU8-KB026	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 8.4-type display unit Clear keys	FCU8-KB028	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 8.4-type display unit Clear keys	FCU8-KB029	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB041	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB046	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB047	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)
Keyboard for 10.4-type display unit Clear keys	FCU8-KB048	Escutcheon, key switch G402 cable Screw cap set	ABC layout (for M system/L system)
Keyboard for 15-type display unit Clear keys	FCU8-KB083	Escutcheon, key switch G402 cable Screw cap set	Full keyboard (for M system/L system) (in tandem)

3.9 Keyboard Unit [E80]

Classification	Type	Components	Remarks
Keyboard for 8.4-type display unit Sheet keys	FCU8-KB024	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for M system/L system, XYZ)
Keyboard for 8.4-type display unit Sheet keys	FCU8-KB025	Escutcheon, key switch G402 cable Screw cap set	ONG layout (for L system, XZF)

3.10 Operation Panel I/O Unit

Classification	Type	Components	Remarks
DI 24V/0V common input [64 points] DO Source output [48 points] AO Analog output [1 point]	FCU8-DX731	Base card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Manual pulse generator input: 2ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1, 3, 7 to 12, 20 to 22 RIO extensible stations: 2, 4 to 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [64 points]	FCU8-DX750	Base card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 3, 7 to 12, 20 to 22 RIO extensible stations: 4 to 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [96 points]	FCU8-DX760	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 96-points source type (200mA/point) Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 12, 20 to 22 RIO extensible stations: 5, 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [64 points] AI Analog input [1 point] AO Analog output [1 point]	FCU8-DX761	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 64-points source type (200mA/point) AI: 1 point AO: 1 point Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 5, 7 to 12, 20 to 22 RIO extensible stations: 6, 13 to 19, 23 to 64
DI 24V/0V common input [64 points] DO Source output [64 points] Scan input [64 points] Scan output [64 points]	FCU8-DX834	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Scan input: 64 points Scan output: 64 points Manual pulse generator input: 3ch Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64

(Note) DI: Digital input signals, DO: Digital output signals

3.11 Remote I/O Unit [M800S/M80]

Classification	Type	Components	Remarks
DI 24V/0V common input [32 points] DO Source output [32 points]	FCU8-DX220	Base card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Number of occupied stations: 1
DI 24V/0V common input [64 points] DO Source output [48 points]	FCU8-DX230	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) Number of occupied stations: 2
DI 24V/0V common input DO Source output [48 points] AO Analog output [1 point]	FCU8-DX231	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Number of occupied stations: 2
AI Analog input [4 points] AO Analog output [1 point]	FCU8-DX202	Base card RIO 2.0 connector set	AI : 4 points AO: 1 point Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213	Base card RIO 2.0 connector set	DI: 16-points 0V common type (3mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213-1	Base card RIO 2.0 connector set	DI: 16-points 0V common type (9mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (3mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654-1	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (9mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
DI 24V/0V common input [32points] DO Source output [32 points] Safety DI 0V common input [8 points] (Note 1) Safety relay output [4 points] (Note 2)	FCU8-DX651	Base card Add-on card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Safety DI: 8-points 0V common type Safety relay: 4-points (non-voltage contact) Relay contact welding detection Number of occupied stations: 3 (Note 1) Safety DI uses 16 points of terminal because of the duplication wiring. (Note 2) Safety relay output uses 8 points of terminal because of the duplication wiring.
Thermistor input [12 points]	FCU8-DX408	Base card RIO 2.0 connector set	Thermistor input: 12 points Number of occupied stations: 3
Multi-analog input [4 points] (Note 3)	FCU8-DX409	Base card RIO 2.0 connector set	Multi-analog input: 4 points (Note 3) Voltage input, current input, thermocouple input and resistance temperature detector input are selected for each CH. Number of occupied stations: 4

(Note) DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals

3.12 Remote I/O Unit [E80]

Classification	Type	Components	Remarks
DI 24V/0V common input [32 points] DO Source output [32 points]	FCU8-DX220	Base card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Number of occupied stations: 1
DI 24V/0V common input [64 points] DO Source output [48 points]	FCU8-DX230	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) Number of occupied stations: 2
DI 24V/0V common input DO Source output [48 points] AO Analog output [1 point]	FCU8-DX231	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Number of occupied stations: 2
AI Analog input [4 points] AO Analog output [1 point]	FCU8-DX202	Base card RIO 2.0 connector set	AI : 4 points AO: 1 point Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213	Base card RIO 2.0 connector set	DI: 16-points 0V common type (3mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213-1	Base card RIO 2.0 connector set	DI: 16-points 0V common type (9mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
Thermistor input [12 points]	FCU8-DX408	Base card RIO 2.0 connector set	Thermistor input: 12 points Number of occupied stations: 3
Multi-analog input [4 points] (Note 3)	FCU8-DX409	Base card RIO 2.0 connector set	Multi-analog input: 4 points (Note 3) Select voltage input, current input, thermocouple and resistance temperature detector input for each ch. Number of occupied stations: 4

(Note) DI: Digital input signals, DO: Digital output signals, AI: Analog input signals, AO: Analog output signals

3.13 Function Expansion Unit [M80]

Classification	Type	Components	Remarks
Functional safety expansion unit	FCU8-EX133	Add-on card	Smart safety observation

3.14 Communication Expansion Unit

Classification	Type	Components	Remarks
CC-Link expansion unit	FCU8-EX561	CC-Link I/F PCB	CC-Link 1ch
PROFIBUS-DP master unit	FCU8-EX563	PROFIBUS-DP I/F PCB	PROFIBUS-DP 1ch
CC-Link IE Field Master/local unit	FCU8-EX564	Base card Add-on card	CC-Link IE Field 2ch
EtherNet/IP Scanner/adapter unit	FCU8-EX565	Base card Add-on card	EtherNet/IP 1ch (Only LAN1, LAN2 cannot be used)
FL-net expansion unit	FCU8-EX568	Base card Add-on card	FL-net 1ch (Only LAN1, LAN2 cannot be used)

Classification	Type	Components	Remarks
Option Relay Unit	FCU8-EX702	Relay PCB	For communication expansion unit 1 slot
Option Relay Unit	FCU8-EX703	Relay PCB	For communication expansion unit 2 slots

(Note) To use the communication expansion unit, the option relay unit (FCU8-EX70x) is required.

3.15 Manual Pulse Generator

Classification	Type	Components	Remarks
5V Manual Pulse Generator	UFO-01-2Z9	UFO-01-2Z9 (Produced by NIDEC NEMICON)	Input 5VDC 100pulse/rev
12V Manual Pulse Generator	HD60C	HD60C	Input 12VDC 25pulse/rev

3.16 Synchronous Feed Encoder

Classification	Type	Components	Remarks
Synchronous feed encoder	OSE1024-3-15-68	OSE1024-3-15-68	Input 5VDC 1024pulse/rev 6000r/min, 68-square flange
Synchronous feed encoder	OSE1024-3-15-68-8	OSE1024-3-15-68-8	Input 5VDC 1024pulse/rev 8000r/min ,68-square flange
Synchronous feed encoder	OSE1024-3-15-160	OSE1024-3-15-160	Input 5VDC 1024pulse/rev 6000r/min, 160-square flange

3.17 MITSUBISHI CNC Machine Operation Panel [M800S/M80]

Classification	Type	Components	Remarks
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB921	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification A)
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB922	Escutcheon, key switch control card G054 cable, Screw cap set	Custom specification key layout (55 keys) (Clear key top cover sold separately)
Main panel B (For 10.4-type display unit)	FCU8-KB923	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification A)
Main panel B (For 10.4-type display unit)	FCU8-KB924	Escutcheon, key switch control card G054 cable, Screw cap set	Custom specification key layout (55 keys) (Clear key top cover sold separately)
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB925	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification B)
Main panel B (For 10.4-type display unit)	FCU8-KB926	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification B)
Sub panel A (Common for all display units)	FCU8-KB931	Escutcheon Emergency stop switch, Override switch ON/OFF switch, Screw cap set	MITSUBISHI standard switch specification (Standard specification A)
Sub panel A (Common for all display units)	FCU8-KB941	Escutcheon Emergency stop switch, Override switch ON/OFF switch, Screw cap set	MITSUBISHI standard switch specification (Standard specification B)
Clear key top set	N030C975G51 / N030C975G55	Clear key top cover (20 pcs/60 pcs)	
Set of labels for M7 standard key layout	N939A169G51	Labels for M7 standard key layout (1 sheet)	

3.18 MITSUBISHI CNC Machine Operation Panel [E80]

Classification	Type	Components	Remarks
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB922	Escutcheon, key switch control card G054 cable, Screw cap set	Custom specification key layout (55 keys) (Clear key top cover sold separately)
Main panel A (For 8.4-type/15-type display unit)	FCU8-KB925	Escutcheon, key switch control card G054 cable, Screw cap set	MITSUBISHI standard key layout (55 keys) (Standard specification B)
Sub panel A (Common for all display units)	FCU8-KB941	Escutcheon Emergency stop switch, Override switch ON/OFF switch, Screw cap set	MITSUBISHI standard switch specification (Standard specification B)
Clear key top set	N030C975G51 / N030C975G55	Clear key top cover (20 pcs/60 pcs)	
Set of labels for M7 standard key layout	N939A169G51	Labels for M7 standard key layout (1 sheet)	

3.19 Handy Terminal

Classification	Type	Components	Remarks
Handy Terminal	HG1T-SB12UH-MK1346-L5		

3.20 Cable Connector Sets

Classification	Type	Components	Remarks
General I/O units (For SKIP,SIO,MPG,AIO)	FCUA-CS000	Connector (10120-3000PE,2pcs), Shell kit (10320-52F0-008,2pcs)	
Emergency stop connector (For EMG)	005057-9403 0016020103 x 3 pcs.	Connector (50-57-9403), Contact (0016020103,3pcs.)	
Connector kit for RIO 2.0 unit	RIO2 CON	Connector (1-1318119-3,2pcs.), Contact (1318107-1,8pcs.), Connector (2-178288-3), Contact (1-175218-5,3pcs)	
24VDC power supply connector (For DCIN)	FCUA-CN220	Connector (2-178288-3), Contact (1-175218-5,3pcs)	
DI/DO connector (For operation panel I/O unit) (For remote I/O unit)	7940-6500SC x 4pcs. 3448-7940 x 4pcs.	Connector (7940-6500SC,4pcs.), Strain relief (3448-7940,4pcs.)	FCU8-DX731
DI connector (For operation panel I/O unit)	7950-6500SC x 2pcs. 3448-7950 x 2pcs.	Connector (7950-6500SC,2pcs.), Strain relief (3448-7950,2pcs.)	FCU8-DX750/760/761
Connector for CJ71	2-1318119-4 1318107-1 x 8pcs.	Connector (2-1318119-4), Contact (1318107-1,8pcs.)	
THERMISTOR connector	37104-2165-000FL 10P	Connector (37104-2165-000FL,10pcs.)	

3.21 Thermistor Sets

Classification	Type	Components	Remarks
Thermistor	PT3C-51F-M2 10P	Thermistor (PT3C-51F-M2,10pcs.)	

3.22 Genuine Memory Card

Classification	Type	Components	Remarks
Exclusive SD cards for MITSUBISHI CNC 1GB	FCU8-SD001G	FCU8-SD001G	1GB capacity
Exclusive SD cards for MITSUBISHI CNC 4GB	FCU8-SD004G	FCU8-SD004G	4GB capacity

3.23 Durable Parts

Durable parts	Part type
Battery for control unit	Q6BAT

(Note) Contact the Service Center, Sales Office or dealer for repairs or part replacement.

3.24 Replacements

Replacements	Part type	Manufacturer
Protection fuse for operation panel I/O	LM50	Daito Communication Apparatus Co., Ltd.
Protection fuse for FCU8-DX220/230/231/651	LM50	Daito Communication Apparatus Co., Ltd.
Protection fuse for FCU8-DX213/654/213-1/654-1	MP63	Daito Communication Apparatus Co., Ltd.
Pair of SD/USB covers for display unit	N031C089G51	-

3.25 List of Cables

[Cable relating to NC]

Type	Application	Available cable length (m)	Max. cable length
FCUA-R050-xM	Synchronous encoder - control unit (straight, with connector)	5	30m
FCUA-R054-xM	Synchronous encoder - control unit (right angle, with connector)	3, 5, 10, 15, 20	30m
G071 LxM	24VDC relay cable for MITSUBISHI CNC machine operation panel	0.12, 0.5, 1	1m
G123	Cable for emergency stop release	-	-
G430 LxM	Cable for connection to handy terminal	3, 5, 10	10m
G460 LxM	Cable for MITSUBISHI CNC machine operation panel (Cable between main panel and sub panel)	0.5	0.5m
J010 LxM	Operation panel I/O interface cable	0.5, 1	1m
J012 LxM	Operation panel I/O interface cable (for FCU8-DX834)	0.5, 1	1m
J020 LxM	Manual pulse generator cable (12V): 1ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J021 LxM	Manual pulse generator cable (12V): 2ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J022 LxM	Manual pulse generator cable (12V): 3ch	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J023 LxM	Manual pulse generator cable (5V): 1ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J024 LxM	Manual pulse generator cable (5V): 2ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J025 LxM	Manual pulse generator cable (5V): 3ch	1, 2, 3, 5, 7, 10, 15, 20	20m
J026 LxM	Manual pulse generator cable (5V): 1ch (for connection to control unit)	1, 2, 3, 5, 7, 10, 15, 20	20m (*)
J027 LxM	Manual pulse generator cable (5V): 2ch (for connection to control unit)	1, 2, 3, 5, 7, 10, 15, 20	20m (*)
J030 LxM	RS-232C I/F cable: 1ch	1, 2, 3, 5, 7, 10	15m (*)
J031 LxM	RS-232C I/F cable: 2ch	1, 2, 3, 5, 7, 10	15m (*)
J070 LxM	24VDC power cable	1, 2, 3, 5, 7, 10, 15	15m
J071 LxM	24VDC power cable (for long distance)	20	20m
J100 LxM	SKIP input cable	1, 2, 3, 5, 7, 10, 15, 20	20m
J120 LxM	Emergency stop cable	1, 2, 3, 5, 7, 10, 15, 20, 30	30m
J121 LxM	Emergency stop cable for MITSUBISHI CNC machine operation panel	1, 2, 3, 5, 7, 10, 15, 20, 30	30m
J210 LxM	Remote I/O 2.0 communication cable	0.3, 1, 2, 3, 5, 7, 10, 15, 20, 30	50m (*)
J221 LxM	Analog input/output cable (for remote I/O unit)	2, 3, 7	30m
J224 LxM	Analog input/output cable (for operation panel I/O unit)	1, 2, 3, 5, 7, 10, 15, 20	30m
J225 LxM	Analog output cable (for operation panel I/O unit)	1, 2, 3, 5, 7, 10, 15, 20	30m
J303 LxM	LAN straight cable	1, 2, 3, 5, 7, 10, 15, 20, 30	50m
J350 LxM	DI/DO cable (connectors at both ends)	1, 2, 3, 5	50m
J351 LxM	DI/DO cable (connector at one end)	3	50m
J460 LxM	DI/DO cable (connectors at both ends)	1, 2, 3, 5	50m
J461 LxM	DI/DO cable (connector at one end)	3	50m
R2-TM	Terminator for remote I/O interface	-	-

(Note 1) "x" in type columns indicate cable length (unit: m).

(Note 2) Lengths indicated with an asterisk (*) in the max. cable length column indicate the maximum cable length when connecting via other unit.

[Cable Relating to Drive Unit]

Type	Application	Available cable length (m)	Max. cable length
CNP2E-1-xM	Motor side PLG cable Spindle side accuracy encoder TS5690 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNP3EZ-2P-xM	Spindle side encoder cable OSE-1024 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNP3EZ-3P-xM	Spindle side encoder cable OSE-1024 cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-8P-xM	For HG/HG-H,HQ/HQ-H Motor side encoder cable (for D48/D51/D74)	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-9P-xM	For HG/HG-H,HQ/HQ-H Motor side encoder cable (for D48/D51/D74)	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-D-xM	MDS-B-SD unit cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
CNV2E-HP-xM	MDS-B-HR unit cable	2, 3, 4, 5, 7, 10, 15, 20, 25, 30	30m
DG30-xM	Battery cable (For drive unit - Battery box, For drive unit - drive unit)	0.3, 0.5, 1, 2, 3, 5, 7, 10	10m
G380 LxM	Optical communication cable For wiring between drive units (outside panel)	5, 10, 12, 15, 20, 25, 30	30m
J395 LxM	Optical communication cable For wiring between drive units (outside panel) For wiring between NC-drive units	3, 5, 7, 10	10m
J396 LxM	Optical communication cable For wiring between drive units (inside panel)	0.2, 0.3, 0.5, 1, 2, 3, 5	10m
MR-BKS1CBLxMA1-H	<200V Series> Brake cable for HG96 Lead out in direction of motor shaft	2, 3, 5, 7, 10	10m
MR-BKS1CBLxMA2-H	<200V Series> Brake cable for HG96 Lead out in opposite direction of motor shaft	2, 3, 5, 7, 10	10m
MR-BT6V2CBL LxM	Battery cable (MDS-EJ/EJH) (For drive unit - drive unit)	0.3, 1	1m
MR-D05UDL3M-B	STO cable	3	3m
MR-PWS1CBLxMA1-H	<200V Series> Power cable for HG96 Lead out in direction of motor shaft	2, 3, 5, 7, 10	10m
MR-PWS1CBLxMA2-H	<200V Series> Power cable for HG96 Lead out in opposite direction of motor shaft	2, 3, 5, 7, 10	10m
SH21 LxM	Power supply communication cable Power backup unit communication cable	0.35, 0.5, 1, 2, 3	30m

(Note 1) "x" in type columns indicate cable length (unit: m).

(Note 2) Lengths indicated with an asterisk (*) in the max. cable length column indicate the maximum cable length when connecting via other unit.

3.26 System Type

Series	Model name	System type	Control unit	Display unit
M800S Series	M850S	FCA850H-8S	FCU8-MA542-001	FCU8-DU181-31 (15-type color LCD touchscreen)
		FCA850H-4S		FCU8-DU141-31 (10.4-type color LCD touchscreen)
	M830S	FCA830H-8S	FCU8-MU542-001	FCU8-DU181-31 (15-type color LCD touchscreen)
		FCA830H-4S		FCU8-DU141-31 (10.4-type color LCD touchscreen)
M80 Series	M80 TypeA	FCA80H-8A	FCU8-MU512-001	FCU8-DU181-32 (15-type color LCD touchscreen)
		FCA80H-4A		FCU8-DU141-32 (10.4-type color LCD touchscreen)
		FCA80P-2A		FCU8-DU121-12 (8.4-type color LCD)
	M80 TypeB	FCA80H-8B	FCU8-MU511-001	FCU8-DU181-32 (15-type color LCD touchscreen)
		FCA80H-4B		FCU8-DU141-32 (10.4-type color LCD touchscreen)
		FCA80P-2B		FCU8-DU121-12 (8.4-type color LCD)
E80 Series	E80 TypeA	FCA80P-2EA	FCU8-MU514-001	FCU8-DU121-13 (8.4-type color LCD)
	E80 TypeB	FCA80P-2EB	FCU8-MU513-001	FCU8-DU121-13 (8.4-type color LCD)

4

General Specifications (M800S/M80/E80 Series)

4.1 Environment Conditions [M800S]

4.1.1 Installation Environment Conditions

Item	Unit name		Control unit	Display unit
	Type		FCU8-MU542/MA542 FCU8-MU541/MA541	FCU8-DU141-31 : (10.4-type) FCU8-DU181-31 : (15-type)
General Specifications	Ambient temperature	During operation	0 to 58°C	
		During storage	-20 to 60°C	
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)	
		Short term	10 to 95% RH (with no dew condensation) (Note 1)	
	Vibration resistance		4.9m/s^2 or less	
	Shock resistance		29.4m/s^2 or less	
	Working atmosphere		No corrosive gases, dust or oil mist	
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level	
	Power supply voltage		24VDC	FCU8-DU141-31 : 12VDC/5VDC/3.3VDC FCU8-DU181-31 : 12VDC/5VDC/3.3VDC
				(Supply from Control Unit)
	Current consumption		24V 2.5A	- (Note 2)
	Maximum heating value	(W)	16	FCU8-DU141-31 : 10 FCU8-DU181-31 : 14
	Mass	(kg)	1.1	FCU8-DU141-31 : 1.7 FCU8-DU181-31 : 4
	Outline dimension W×H×D or W×H	(mm)	239.1×173.4×75	FCU8-DU141-31 : 290×220 FCU8-DU181-31 : 400×320

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the display unit is included in that of the control unit.

(Note 3) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 4) When the display unit is mounted on an incline, the inclination angle to place the unit should be 30 degrees or less from the vertical direction.

Item	Unit name		Keyboard unit	Operation panel I/O unit		Machine operation panel
	Type		FCU8-KB041/KB046 : (10.4-type) FCU8-KB047 : (10.4-type/vertical arrangement) FCU8-KB048 : (10.4-type) FCU8-KB083 : (15-type/vertical arrangement)	FCU8-DX731 FCU8-DX750 FCU8-DX760 FCU8-DX761	FCU8-DX834	FCU8-KB921/KB922/KB925 FCU8-KB923/KB924/KB926 FCU8-KB931/KB941
General Specifications	Ambient temperature	During operation	0 to 58°C			
		During storage	-20 to 60°C			
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)			
		Short term	10 to 95% RH (with no dew condensation) (Note 1)			
	Vibration resistance		4.9m/s^2 or less			
	Shock resistance		29.4m/s^2 or less			
	Working atmosphere		No corrosive gases, dust or oil mist			
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level			
	Power supply voltage		5VDC (Supply from Control Unit)	5VDC/3.3VDC	24VDC	24VDC (Note 5)
	Current consumption		- (Note 2)		24V 0.3A (Note 6)	0.3A (Note 5)
	Maximum heating value	(W)	1	4 (Note 3)	8 (Note 3)	7.2
	Mass	(kg)	FCU8-KB041/KB046 : 0.8 FCU8-KB047 : 1.3 FCU8-KB048 : 1.4 FCU8-KB083 : 1.5	FCU8-DX731 : 0.3 FCU8-DX750 : 0.4 FCU8-DX760 : 0.5 FCU8-DX761 : 0.5	0.4	FCU8-KB921/KB922/KB925 : 1.1 FCU8-KB923/KB924/KB926 : 1.2 FCU8-KB931/KB941 : 0.5
	Outline dimension W×H	(mm)	FCU8-KB041/KB046 : 140×220 FCU8-KB047 : 290×160 FCU8-KB048 : 230×220 FCU8-KB083 : 400×140	116×179		FCU8-KB921/KB922/KB925 : 260×140 FCU8-KB923/KB924/KB926 : 290×140 FCU8-KB931/KB941 : 140×140

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the keyboard unit and the operation panel I/O unit (control section) are included in that of the control unit. Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

(Note 3) For the heating value of the I/O circuit, calculate with the number of points used.

(Note 4) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 5) 24V power input is not required for FCU8-KB931/KB941.

(Note 6) Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

Item	Unit name		Remote I/O unit					
	Type		FCU8-DX220/ DX230/ DX231	FCU8-DX202	FCU8-DX213/ DX213-1/ DX654/ DX654-1	FCU8-DX408	FCU8-DX409	FCU8-DX651
General Specifications	Ambient temperature	During operation	0 to 58°C					
		During storage	-20 to 60°C					
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)					
		Short term	10 to 95% RH (with no dew condensation) (Note 1)					10 to 85% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 or less					
	Shock resistance		29.4m/s^2 or less					
	Working atmosphere		No corrosive gases, dust or oil mist					
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level					
	Power supply voltage		24VDC					
	Current consumption		3.5A (Note 2)	0.3A	0.3A (Note 3)	0.1A	0.2A	3.7A (Note 2)
	Maximum heating value	(W)	8 (Note 4)			3	6 (Note 6)	8 (Note 4)
	Mass	(kg)	0.4			0.2	0.3	0.8
	Outline dimension W×H×D	(mm)	40×175×133	40×175×119	40×175×130	40×175×109	40×175×115	172×100×115

(Note 1) "Short term" means roughly within one month.
(Note 2) This value includes the maximum value of DO external load current (3.2A).
(Note 3) This value does not include DO external load current.
(Note 4) For the heating value of the I/O circuit, calculate with the number of points used.
(Note 5) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.
(Note 6) The maximum value including the heating value of analog input circuit.

4.1.2 24VDC Stabilized Power Supply Selecting Conditions

Consider the following characteristics for the stabilized power supply, and select the power supply that complies with laws, regulations, or safety standards of the country where the machine will be installed.

Item		Specifications	Remarks
Output	**Voltage**	24VDC	When the stabilized power supply and 24VDC input unit are distant, select the stabilized power supply which is possible to set output voltage 24VDC or more allowing for the influence of voltage down by the cable.
	Voltage fluctuation	±5%	
	Current	-	Calculate the current value as a reference of maximum current consumption for the unit which uses the power supply.
	Ripple noise	0.2V (P-P)	
	Output holding time	min 20ms	Output holding time is decided by loading ratio; however, the stabilized power supply which complies with the specification on the left must be selected during maximum loading.
	Overcurrent output shutoff function	-	Use a power supply having the overcurrent output shutoff function.

⚠ CAUTION

1. Using a stabilized power supply without overcurrent protection may cause the unit's failure due to miswiring of 24V.

4.2 Environment Conditions [M80]

4.2.1 Installation Environment Conditions

Item	Unit name		Control unit	Display unit
	Type		FCU8-MU511/MU512 FCU8-MU501/MU502	FCU8-DU121-12 : (8.4-type) FCU8-DU141-32 : (10.4-type) FCU8-DU181-32 : (15-type)
General Specifications	Ambient temperature	During operation	0 to 58°C	
		During storage	-20 to 60°C	
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)	
		Short term	10 to 95% RH (with no dew condensation) (Note 1)	
	Vibration resistance		4.9m/s^2 or less	
	Shock resistance		29.4m/s^2 or less	
	Working atmosphere		No corrosive gases, dust or oil mist	
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level	
	Power supply voltage		24VDC	FCU8-DU121-12 : 12VDC/3.3VDC FCU8-DU141-32 : 12VDC/5VDC/3.3VDC FCU8-DU181-32 : 12VDC/5VDC/3.3VDC
				(Supply from Control Unit)
	Current consumption		24V 2.5A	- (Note 2)
	Maximum heating value	(W)	12	FCU8-DU121-12 : 6 FCU8-DU141-32 : 10 FCU8-DU181-32 : 14
	Mass	(kg)	1.1	FCU8-DU121-12 : 1.2 FCU8-DU141-32 : 1.7 FCU8-DU181-32 : 4
	Outline dimension W×H×D or W×H	(mm)	239.1×173.4×75	FCU8-DU121-12 : 260×200 FCU8-DU141-32 : 290×220 FCU8-DU181-32 : 400×320

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the display unit is included in that of the control unit.

(Note 3) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 4) When the display unit is mounted on an incline, the inclination angle to place the unit should be 30 degrees or less from the vertical direction.

Item	Unit name		Keyboard unit	Operation panel I/O unit		Machine operation panel
	Type		FCU8-KB026/KB028 : (8.4-type) FCU8-KB029 : (8.4-type/vertical arrangement) FCU8-KB041/KB046 : (10.4-type) FCU8-KB047 : (10.4-type/vertical arrangement) FCU8-KB048 : (10.4-type) FCU8-KB083 : (15-type/vertical arrangement)	FCU8-DX731 FCU8-DX750 FCU8-DX760 FCU8-DX761	FCU8-DX834	FCU8-KB921/KB922/KB925 FCU8-KB923/KB924/KB926 FCU8-KB931/KB941
General Specifications	Ambient temperature	During operation	0 to 58°C			
		During storage	-20 to 60°C			
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)			
		Short term	10 to 95% RH (with no dew condensation) (Note 1)			
	Vibration resistance		4.9m/s^2 or less			
	Shock resistance		29.4m/s^2 or less			
	Working atmosphere		No corrosive gases, dust or oil mist			
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level			
	Power supply voltage		5VDC (Supply from Control Unit)	5VDC/3.3VDC	24VDC	24VDC (Note 5)
	Current consumption		- (Note 2)		24V 0.3A (Note 6)	0.3A (Note 5)
	Maximum heating value	(W)	1	4 (Note 3)	8 (Note 3)	7.2
	Mass	(kg)	FCU8-KB026/KB028 : 0.75 FCU8-KB029 :1.0 FCU8-KB041/KB046 : 0.8 FCU8-KB047 : 1.3 FCU8-KB048 : 1.4 FCU8-KB083 : 1.5	FCU8-DX731 : 0.3 FCU8-DX750 : 0.4 FCU8-DX760 : 0.5 FCU8-DX761 : 0.5	0.4	FCU8-KB921/KB922/KB925 : 1.1 FCU8-KB923/KB924/KB926 : 1.2 FCU8-KB931/KB941 : 0.5
	Outline dimension W×H	(mm)	FCU8-KB026/KB028 : 140×200 FCU8-KB029 : 260×140 FCU8-KB041/KB046 : 140×220 FCU8-KB047 : 290×160 FCU8-KB048 : 230×220 FCU8-KB083 : 400×140	116×179		FCU8-KB921/KB922/KB925 : 260×140 FCU8-KB923/KB924/KB926 : 290×140 FCU8-KB931/KB941 : 140×140

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the keyboard unit and the operation panel I/O unit (control section) are included in that of the control unit. Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

(Note 3) For the heating value of the I/O circuit, calculate with the number of points used.

(Note 4) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 5) 24V power input is not required for FCU8-KB931/KB941.

(Note 6) Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

Item	Unit name		Remote I/O unit					
	Type		FCU8-DX220/ DX230/ DX231	FCU8-DX202	FCU8-DX213/ DX213-1/ DX654/ DX654-1	FCU8-DX408	FCU8-DX409	FCU8-DX651
General Specifications	Ambient temperature	During operation	0 to 58°C					
		During storage	-20 to 60°C					
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)					
		Short term	10 to 95% RH (with no dew condensation) (Note 1)					10 to 85% RH (with no dew condensation) (Note 1)
	Vibration resistance		4.9m/s^2 or less					
	Shock resistance		29.4m/s^2 or less					
	Working atmosphere		No corrosive gases, dust or oil mist					
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level					
	Power supply voltage		24VDC					
	Current consumption		3.5A (Note 2)	0.3A	0.3A (Note 3)	0.1A	0.2A	3.7A (Note 2)
	Maximum heating value	(W)	8 (Note 4)			3	6 (Note 6)	8 (Note 4)
	Mass	(kg)	0.4			0.2	0.3	0.8
	Outline dimension W×H×D	(mm)	40×175×133	40×175×119	40×175×130	40×175×109	40×175×115	172×100×115

(Note 1) "Short term" means roughly within one month.
(Note 2) This value includes the maximum value of DO external load current (3.2A).
(Note 3) This value does not include DO external load current.
(Note 4) For the heating value of the I/O circuit, calculate with the number of points used.
(Note 5) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.
(Note 6) The maximum value including the heating value of analog input circuit.

4.2.2 24VDC Stabilized Power Supply Selecting Conditions

Consider the following characteristics for the stabilized power supply, and select the power supply that complies with laws, regulations, or safety standards of the country where the machine will be installed.

Item		Specifications	Remarks
Output	**Voltage**	24VDC	When the stabilized power supply and 24VDC input unit are distant, select the stabilized power supply which is possible to set output voltage 24VDC or more allowing for the influence of voltage down by the cable.
	Voltage fluctuation	±5%	
	Current	-	Calculate the current value as a reference of maximum current consumption for the unit which uses the power supply.
	Ripple noise	0.2V (P-P)	
	Output holding time	min 20ms	Output holding time is decided by loading ratio; however, the stabilized power supply which complies with the specification on the left must be selected during maximum loading.
	Overcurrent output shutoff function	-	Use a power supply having the overcurrent output shutoff function.

⚠ CAUTION

1. Using a stabilized power supply without overcurrent protection may cause the unit's failure due to miswiring of 24V.

4.3 Environment Conditions [E80]

4.3.1 Installation Environment Conditions

Item	Unit name		Control unit	Display unit
	Type		FCU8-MU513 FCU8-MU514	FCU8-DU121-13 : (8.4-type)
General Specifications	Ambient temperature	During operation	0 to 58°C	
		During storage	-20 to 60°C	
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)	
		Short term	10 to 95% RH (with no dew condensation) (Note 1)	
	Vibration resistance		4.9m/s^2 or less	
	Shock resistance		29.4m/s^2 or less	
	Working atmosphere		No corrosive gases, dust or oil mist	
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level	
	Power supply voltage		24VDC	12VDC/3.3VDC (Supply from Control Unit)
	Current consumption		24V 2.5A	- (Note 2)
	Maximum heating value	(W)	12	6
	Mass	(kg)	1.1	FCU8-DU121-12 : 1.2 FCU8-DU141-32 : 1.7 FCU8-DU181-32 : 4
	Outline dimension W×H×D or W×H	(mm)	239.1×173.4×75	260×200

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the display unit is included in that of the control unit.

(Note 3) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 4) When the display unit is mounted on an incline, the inclination angle to place the unit should be 30 degrees or less from the vertical direction.

Item	Unit name		Keyboard unit	Operation panel I/O unit		Machine operation panel
	Type		FCU8-KB024 FCU8-KB025	FCU8-DX731 FCU8-DX750 FCU8-DX760 FCU8-DX761	FCU8-DX834	FCU8-KB922/KB925 FCU8-KB941
General Specifications	Ambient temperature	During operation	0 to 58°C			
		During storage	-20 to 60°C			
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)			
		Short term	10 to 95% RH (with no dew condensation) (Note 1)			
	Vibration resistance		4.9m/s^2 or less			
	Shock resistance		29.4m/s^2 or less			
	Working atmosphere		No corrosive gases, dust or oil mist			
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level			
	Power supply voltage		5VDC	5VDC/3.3VDC	24VDC	24VDC (Note 5)
			(Supply from Control Unit)			
	Current consumption		- (Note 2)		24V 0.3A (Note 6)	0.3A (Note 5)
	Maximum heating value	(W)	1	4 (Note 3)	8 (Note 3)	7.2
	Mass	(kg)	0.75	FCU8-DX731 : 0.3 FCU8-DX750 : 0.4 FCU8-DX760 : 0.5 FCU8-DX761 : 0.5	0.4	FCU8-KB922/KB925 : 1.1 FCU8-KB941 : 0.5
	Outline dimension W×H	(mm)	140×200	116×179		FCU8-KB922/KB925 : 260×140 FCU8-KB941 : 140×140

(Note 1) "Short term" means roughly within one month.

(Note 2) The current consumption of the keyboard unit and the operation panel I/O unit (control section) are included in that of the control unit. Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

(Note 3) For the heating value of the I/O circuit, calculate with the number of points used.

(Note 4) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.

(Note 5) 24V power input is not required for FCU8-KB941.

(Note 6) Current consumption for the I/O circuit needs to be separately calculated based on the number of points used and its load.

Item	Unit name		Remote I/O unit				
	Type		FCU8-DX220/ DX230/ DX231	FCU8-DX202	FCU8-DX213/ DX213-1	FCU8-DX408	FCU8-DX409
General Specifications	Ambient temperature	During operation	0 to 58°C				
		During storage	-20 to 60°C				
	Ambient humidity	Long term	10 to 75% RH (with no dew condensation)				
		Short term	10 to 95% RH (with no dew condensation) (Note 1)				
	Vibration resistance		4.9m/s^2 or less				
	Shock resistance		29.4m/s^2 or less				
	Working atmosphere		No corrosive gases, dust or oil mist				
	Altitude		Operation/Storage: 1000 meters or less above sea level, Transportation: 13000 meters or less above sea level				
	Power supply voltage		24VDC				
	Current consumption		3.5A (Note 2)	0.3A	0.3A (Note 3)	0.1A	0.2A
	Maximum heating value	(W)	8 (Note 4)			3	6 (Note 6)
	Mass	(kg)	0.4			0.2	0.3
	Outline dimension W×H×D	(mm)	40×175×133	40×175×119	40×175×130	40×175×109	40×175×115

(Note 1) "Short term" means roughly within one month.
(Note 2) This value includes the maximum value of DO external load current (3.2A).
(Note 3) This value does not include DO external load current.
(Note 4) For the heating value of the I/O circuit, calculate with the number of points used.
(Note 5) For the whole NC system, consider the characteristics of the drive units when the altitude is more than 1000 meters above sea level. Refer to the manual of drive unit for details.
(Note 6) The maximum value including the heating value of analog input circuit.

4.3.2 24VDC Stabilized Power Supply Selecting Conditions

Consider the following characteristics for the stabilized power supply, and select the power supply that complies with laws, regulations, or safety standards of the country where the machine will be installed.

Item		Specifications	Remarks
Output	**Voltage**	24VDC	When the stabilized power supply and 24VDC input unit are distant, select the stabilized power supply which is possible to set output voltage 24VDC or more allowing for the influence of voltage down by the cable.
	Voltage fluctuation	±5%	
	Current	-	Calculate the current value as a reference of maximum current consumption for the unit which uses the power supply.
	Ripple noise	0.2V (P-P)	
	Output holding time	min 20ms	Output holding time is decided by loading ratio; however, the stabilized power supply which complies with the specification on the left must be selected during maximum loading.
	Overcurrent output shutoff function	-	Use a power supply having the overcurrent output shutoff function.

⚠ CAUTION

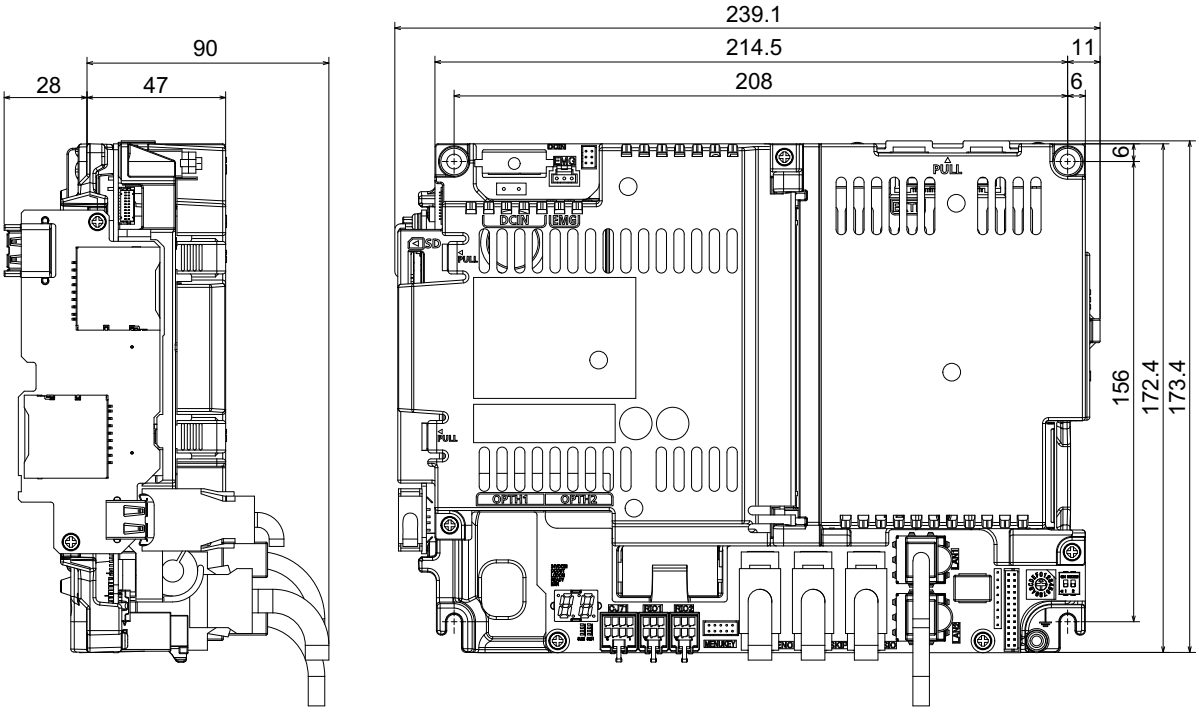
1. Using a stabilized power supply without overcurrent protection may cause the unit's failure due to miswiring of 24V.

4.4 Control Unit [M800S]

4.4.1 FCU8-MU542 / FCU8-MA542 / FCU8-MU541 / FCU8-MA541

[Outline dimension]

[mm]

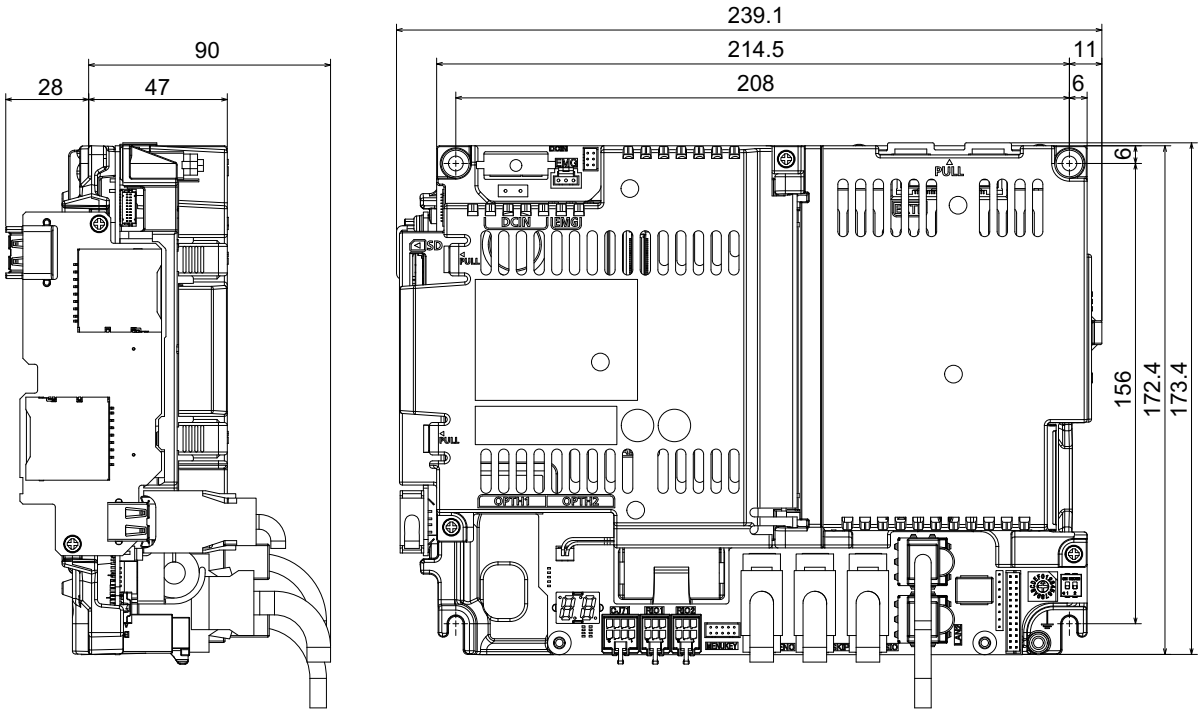


4.5 Control Unit [M80]

4.5.1 FCU8-MU511 / FCU8-MU512 / FCU8-MU501 / FCU8-MU502

[Outline dimension]

[mm]

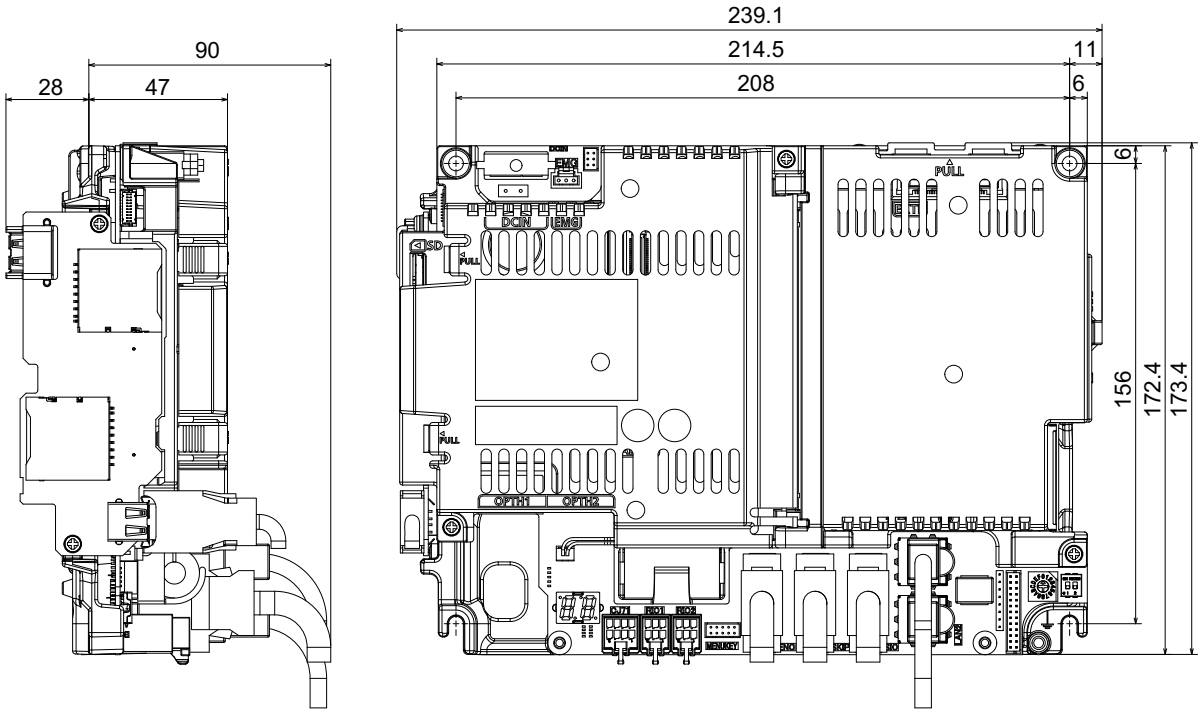


4.6 Control Unit [E80]

4.6.1 FCU8-MU513 / FCU8-MU514

[Outline dimension]

[mm]

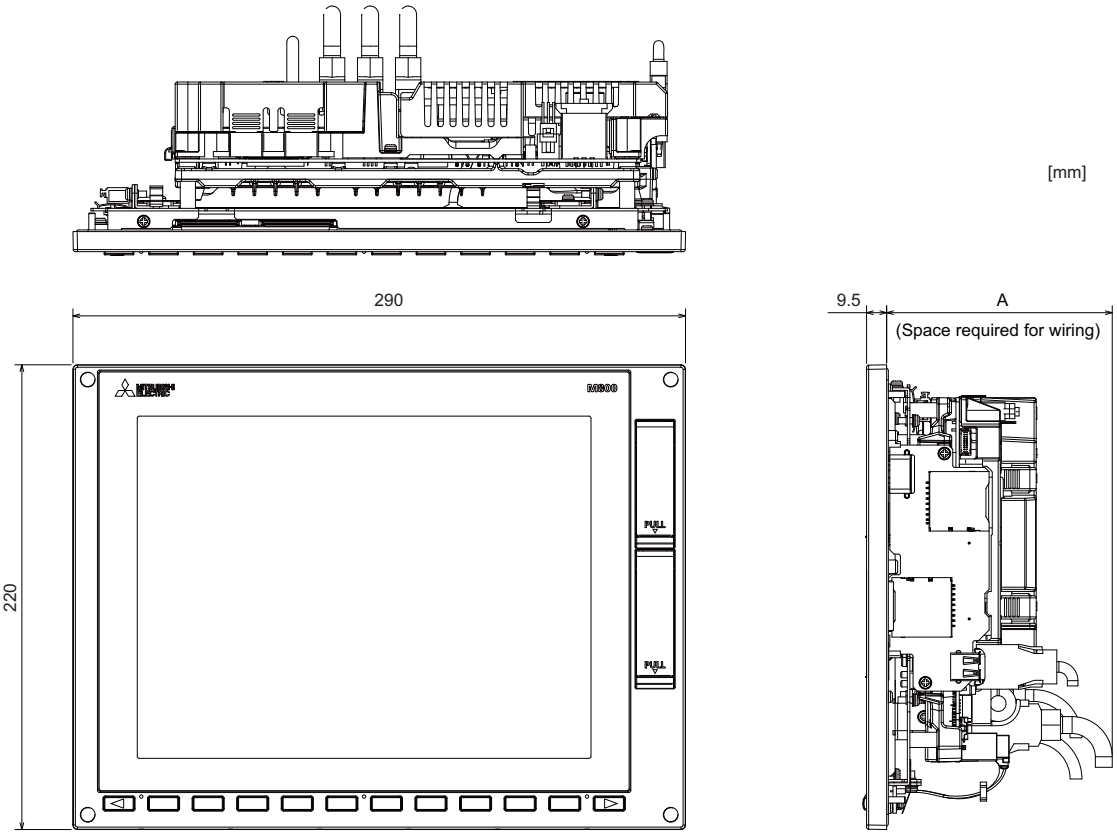


4.7 Display Unit [M800S]

4.7.1 10.4-type (FCU8-DU141-31)

[Outline dimension]

[mm]

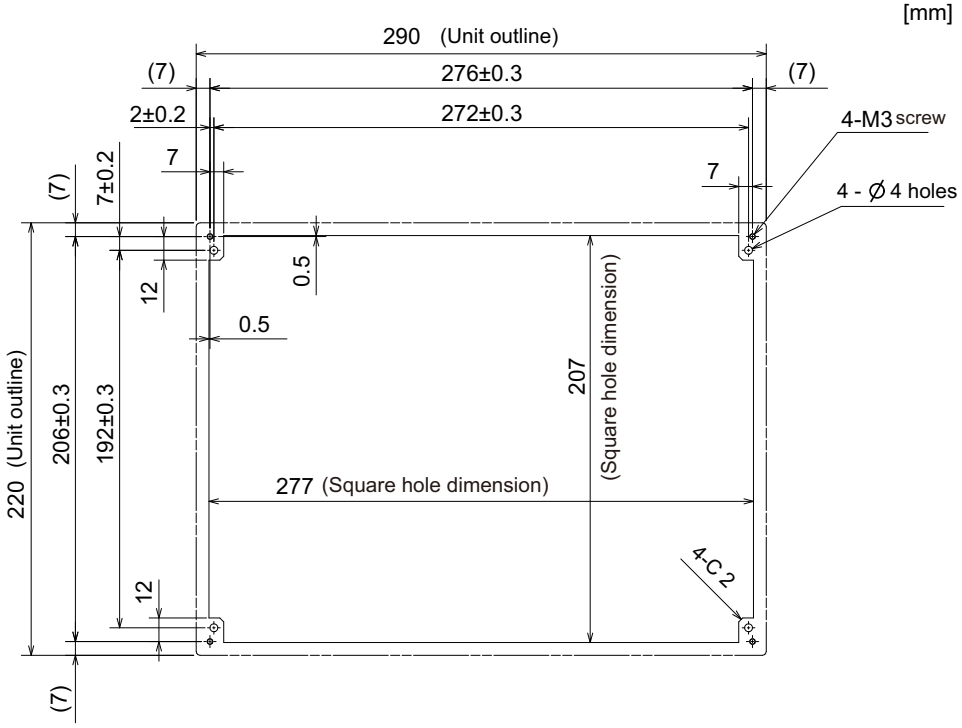


	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note) The figure above shows the state with the control unit mounted.

[Panel cut dimension]

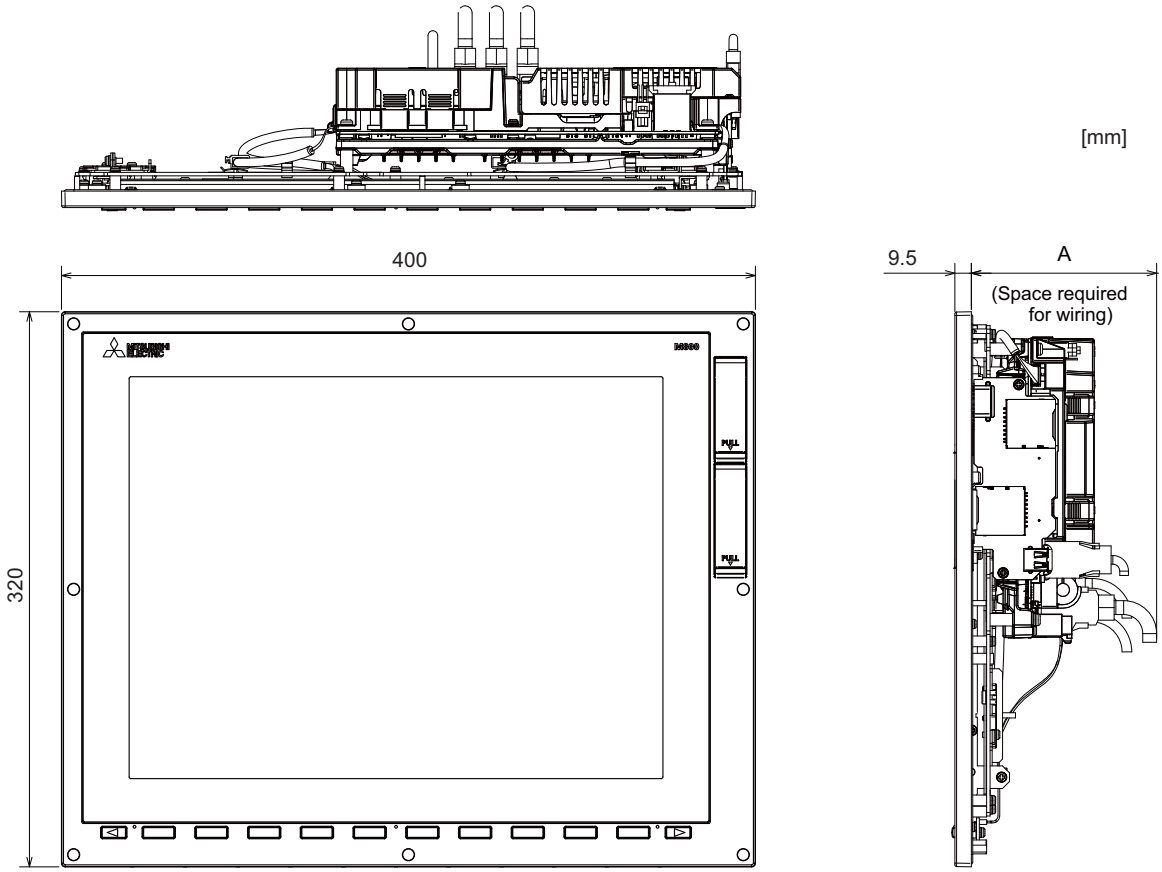
[mm]



4.7.2 15-type (FCU8-DU181-31)

[Outline dimension]

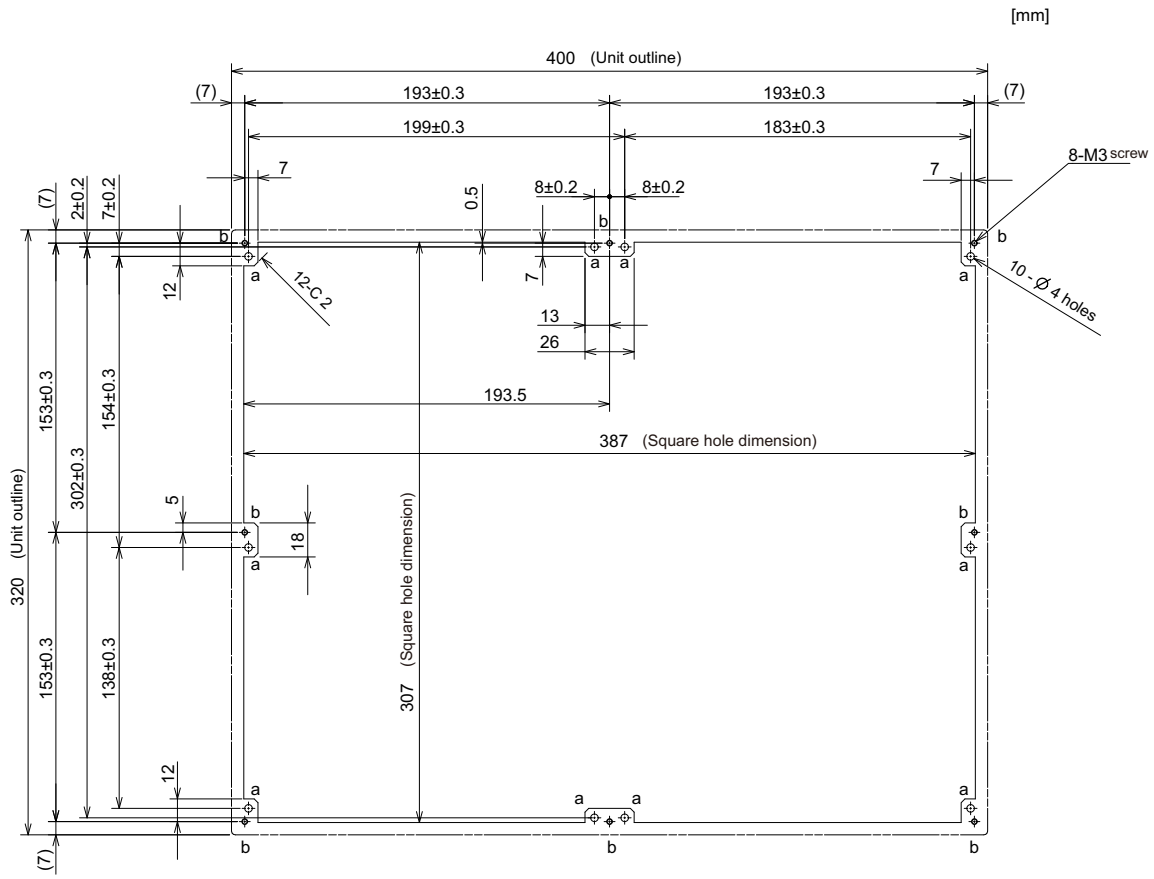
[mm]



	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note) The figure above shows the state with the control unit mounted.

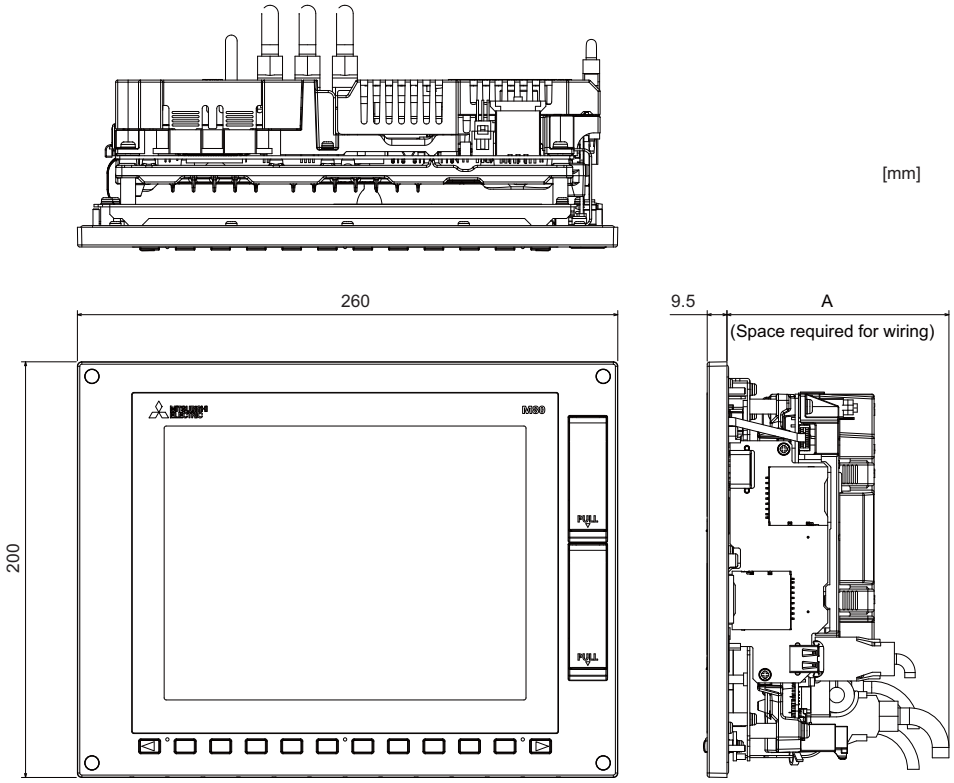
[Panel cut dimension]



4.8 Display Unit [M80]

4.8.1 8.4-type (FCU8-DU121-12)

[Outline dimension]

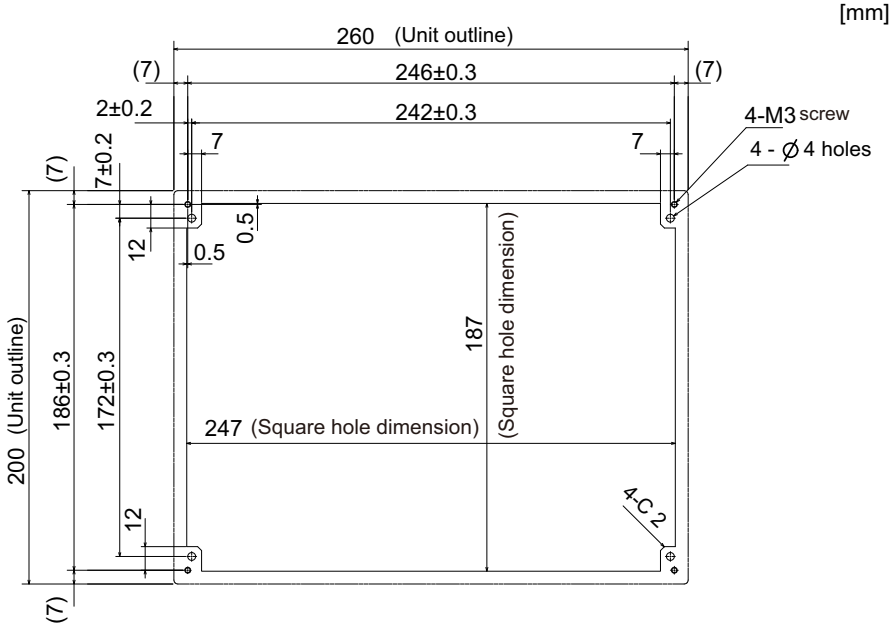


	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note 1) The 8.4-type display unit is incompatible with the touchscreen.
(Note 2) The figure above shows the state with the control unit mounted.

[Panel cut dimension]

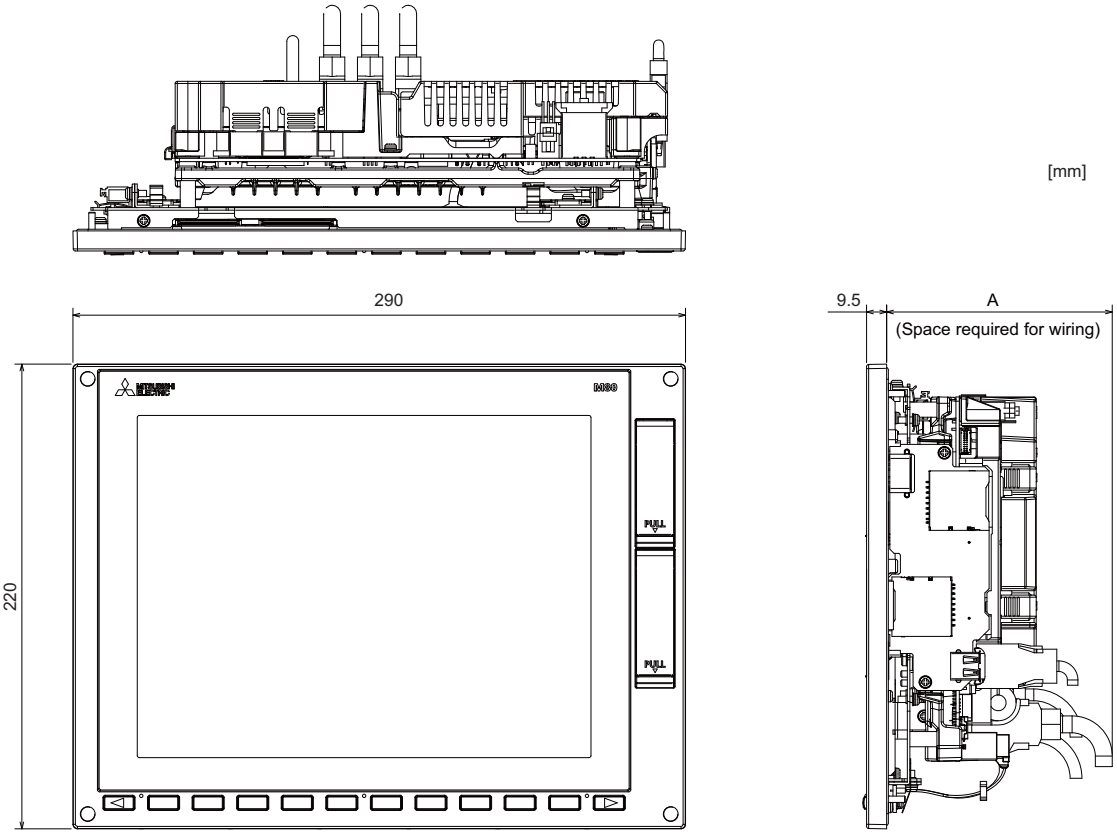
[mm]



4.8.2 10.4-type (FCU8-DU141-32)

[Outline dimension]

[mm]

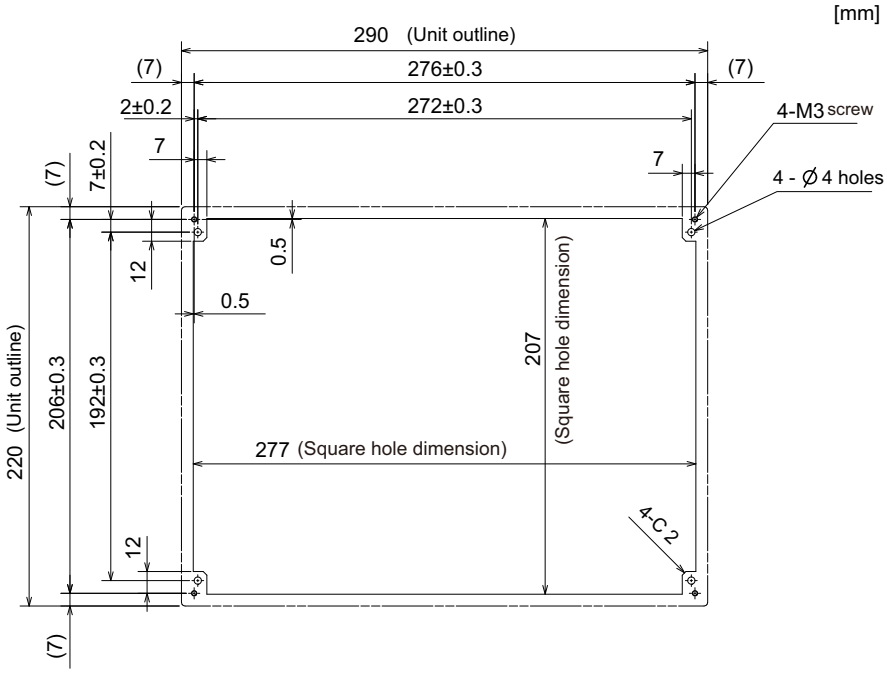


	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note) The figure above shows the state with the control unit mounted.

[Panel cut dimension]

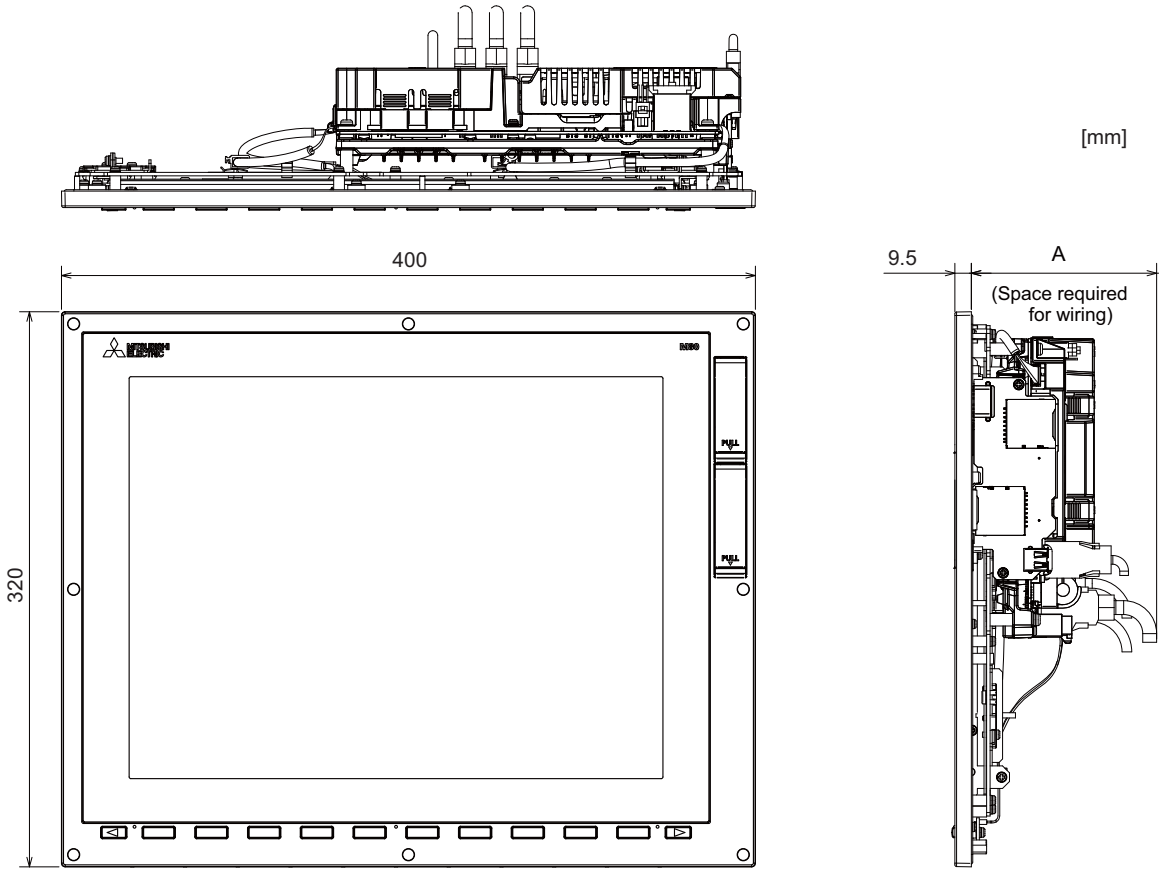
[mm]



4.8.3 15-type (FCU8-DU181-32)

[Outline dimension]

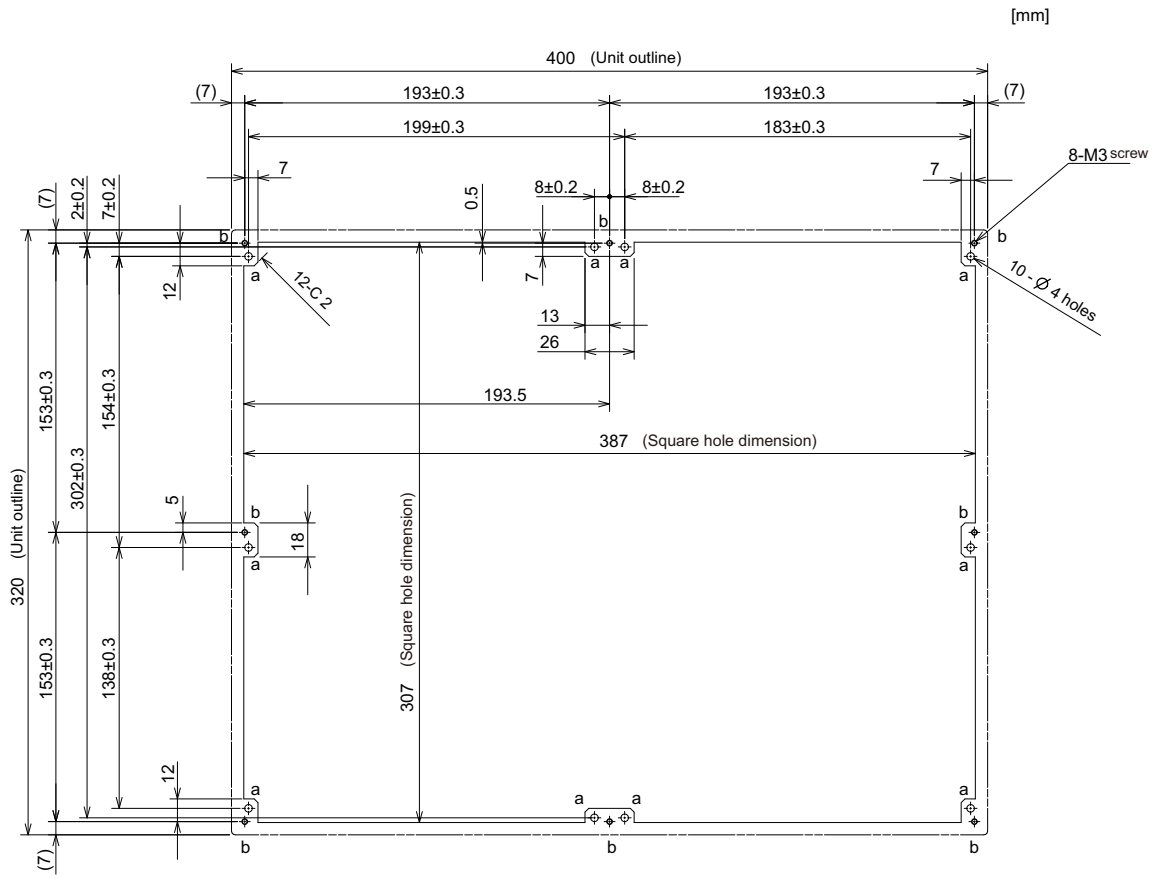
[mm]



	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note) The figure above shows the state with the control unit mounted.

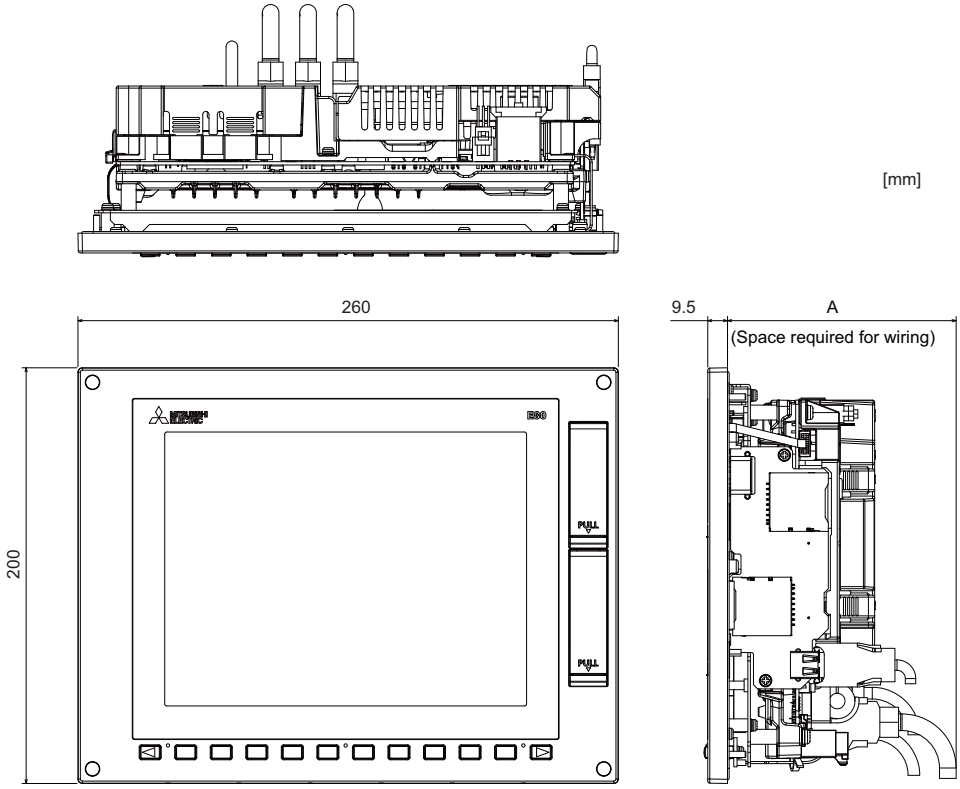
[Panel cut dimension]



4.9 Display Unit [E80]

4.9.1 8.4-type (FCU8-DU121-13)

[Outline dimension]



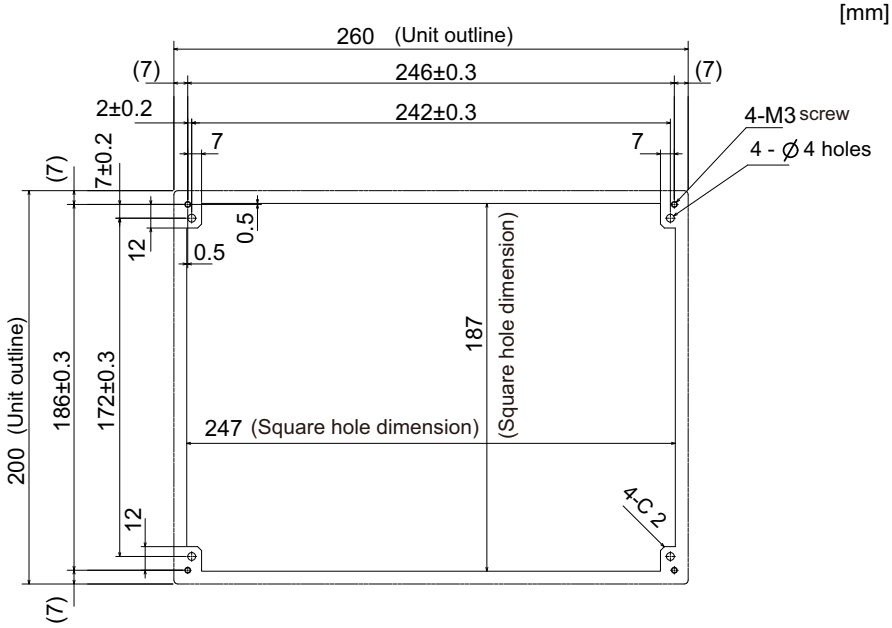
	Option relay unit not mounted	Option relay unit, FCU8-EX702 mounted	Option relay unit, FCU8-EX703 mounted
A (Space required for wiring)	110		114

(Note 1) The 8.4-type display unit is incompatible with the touchscreen.

(Note 2) The figure above shows the state with the control unit mounted.

[Panel cut dimension]

[mm]

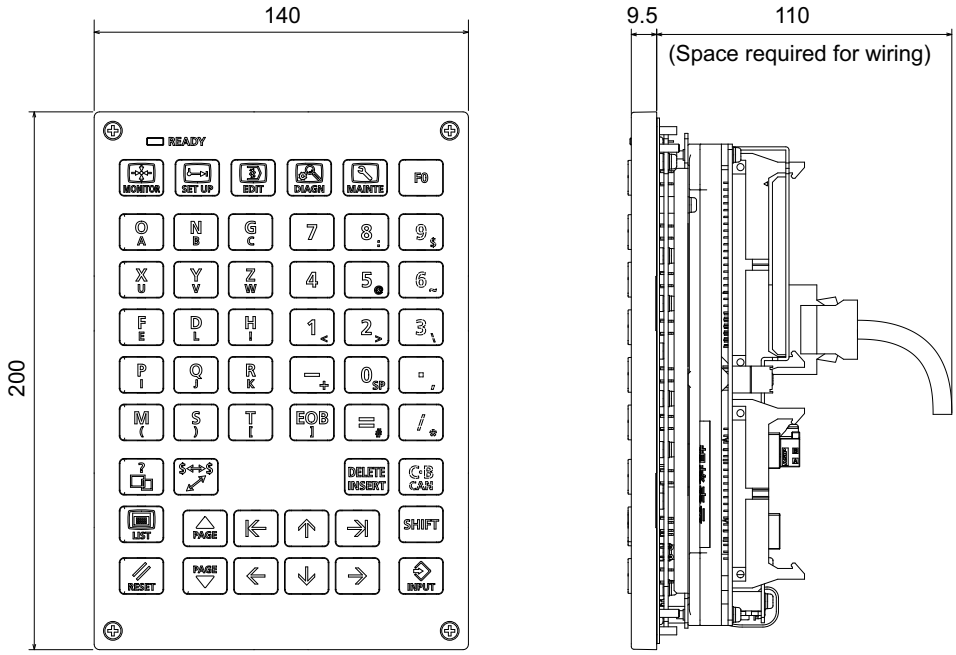


4.10 Keyboard Unit

4.10.1 Keyboard for 8.4-type Display Unit (FCU8-KB026)

[Outline dimension]

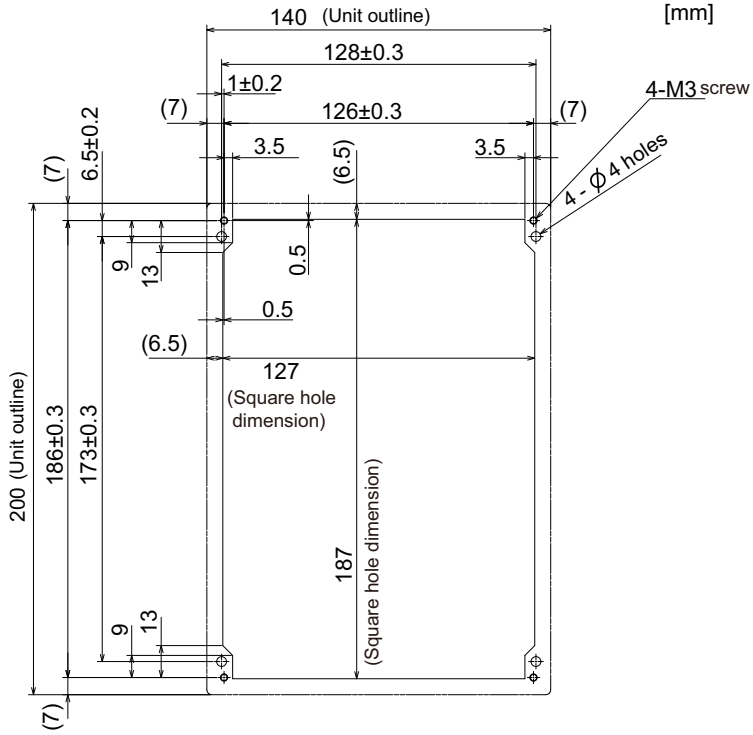
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

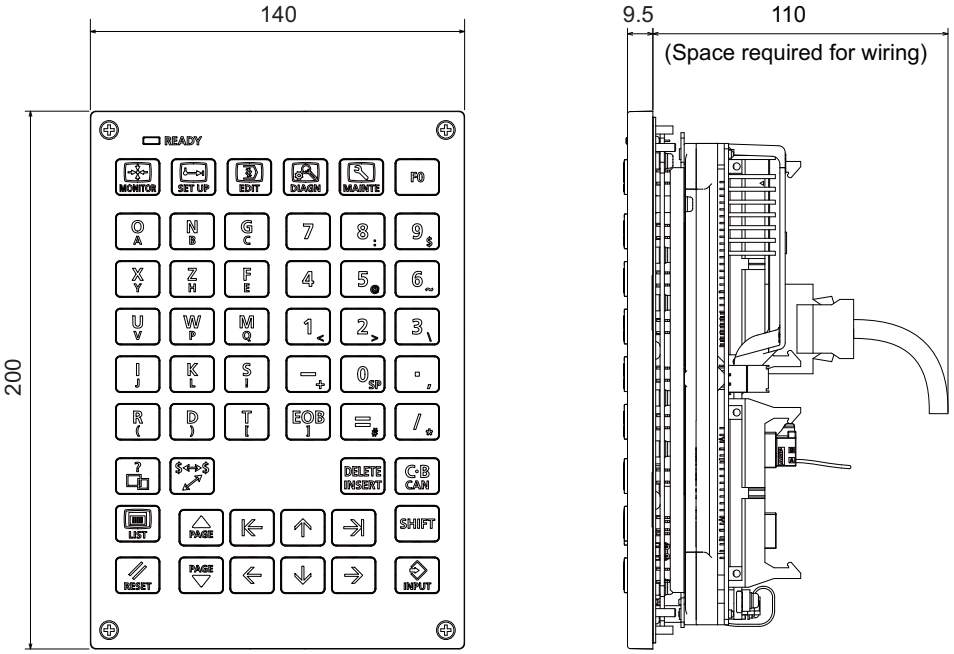
[mm]



4.10.2 Keyboard for 8.4-type Display Unit (FCU8-KB028)

[Outline dimension]

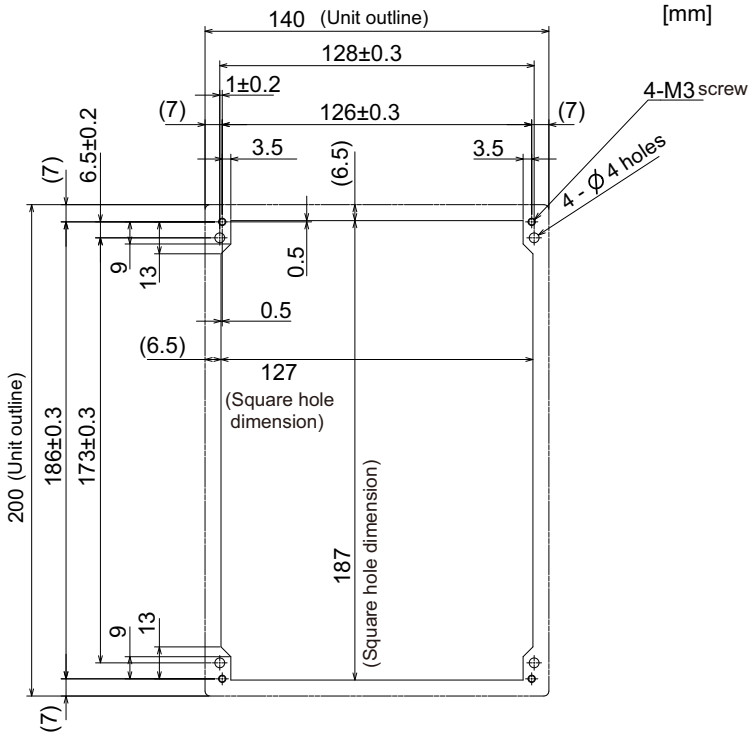
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

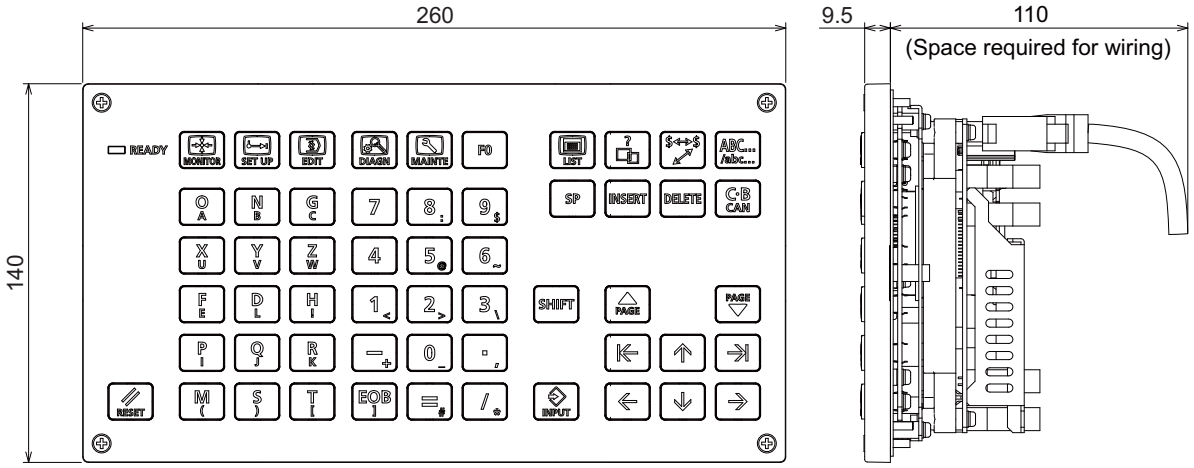
[mm]



4.10.3 Keyboard for 8.4-type Display Unit (FCU8-KB029)

[Outline dimension]

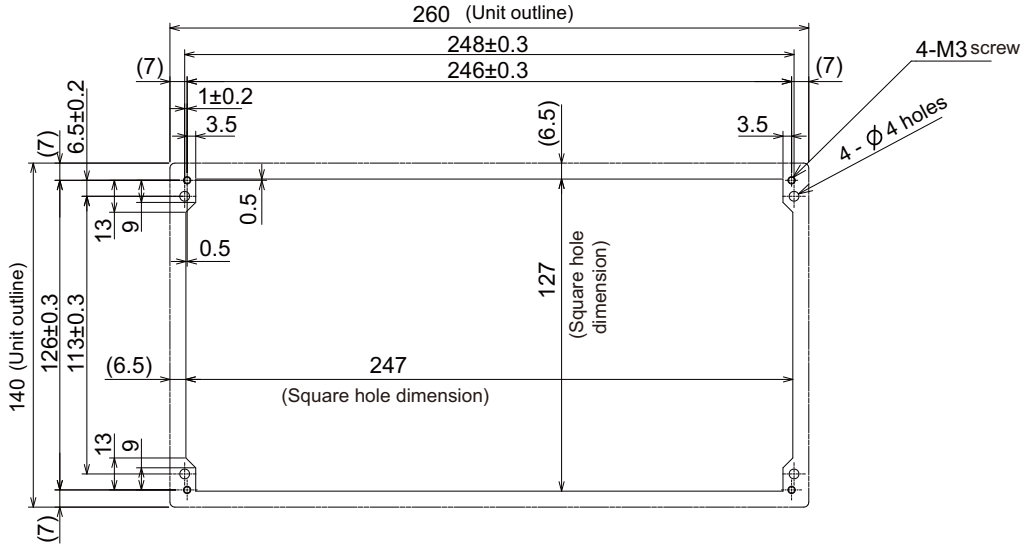
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

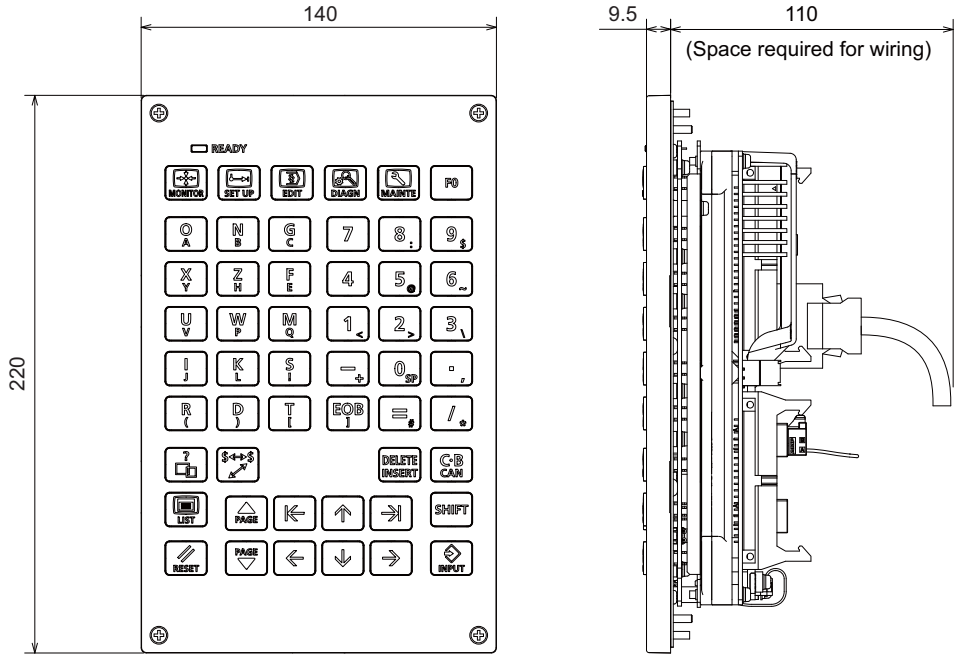
[mm]



4.10.4 Keyboard for 10.4-type Display Unit (FCU8-KB041)

[Outline dimension]

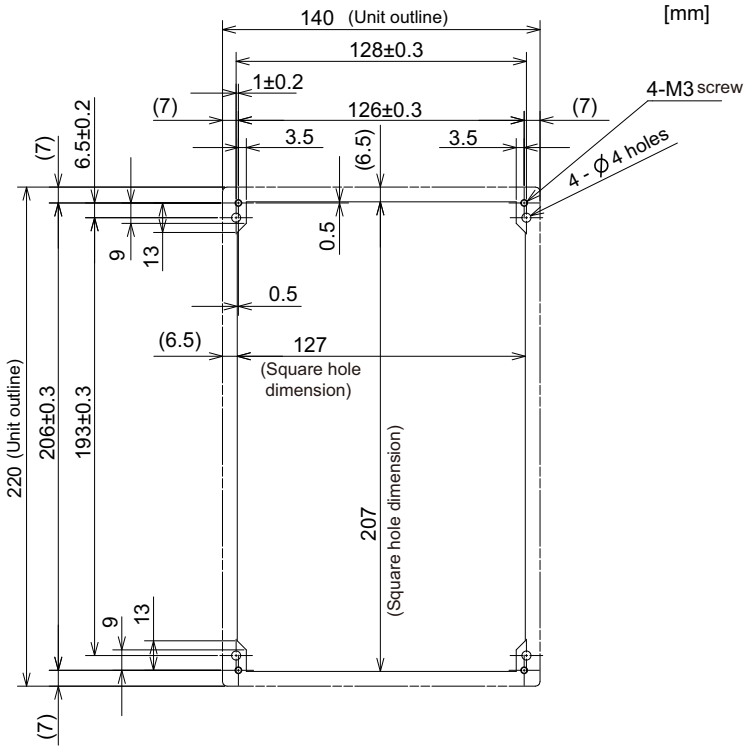
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

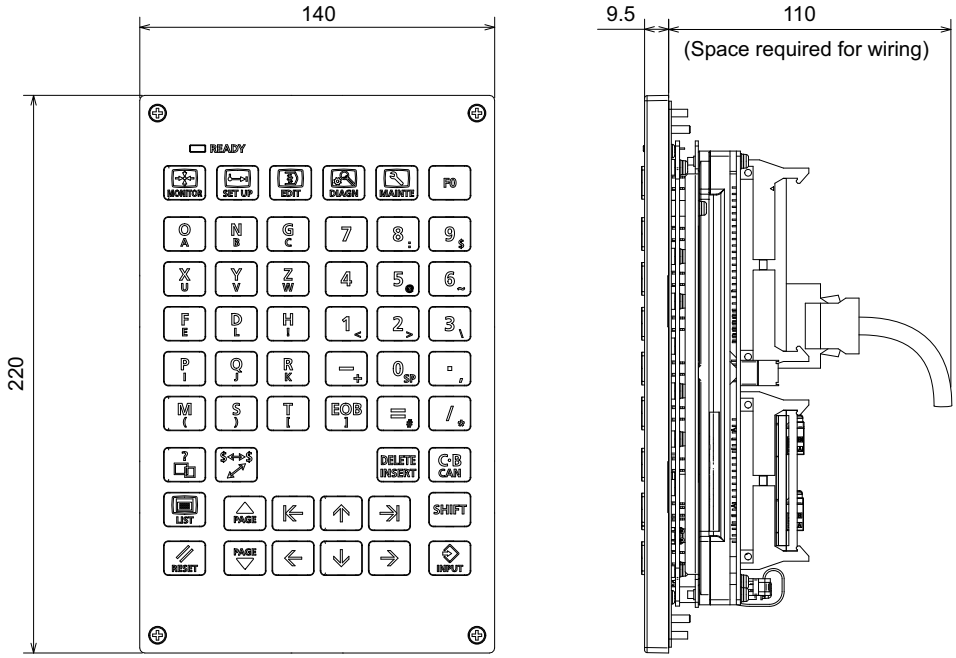
[mm]



4.10.5 Keyboard for 10.4-type Display Unit (FCU8-KB046)

[Outline dimension]

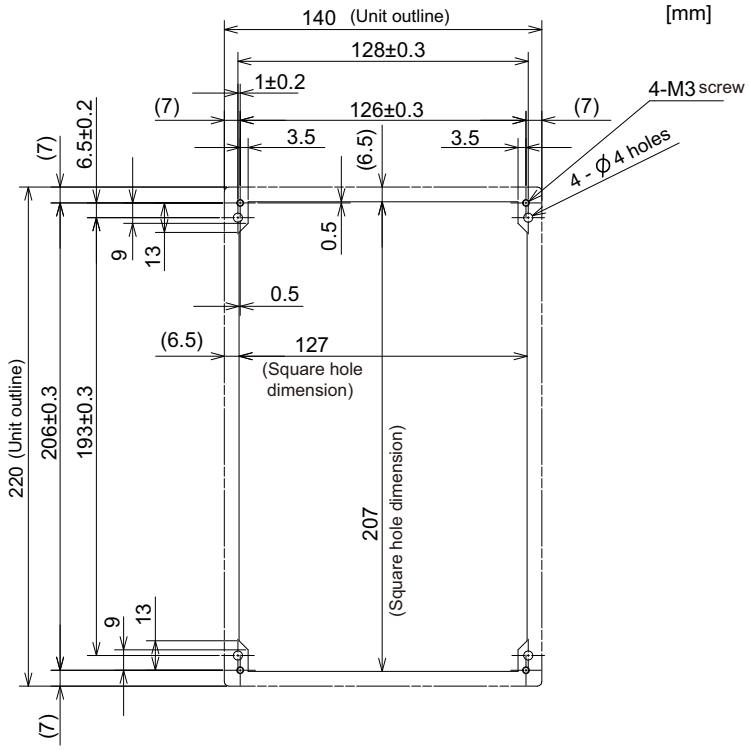
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

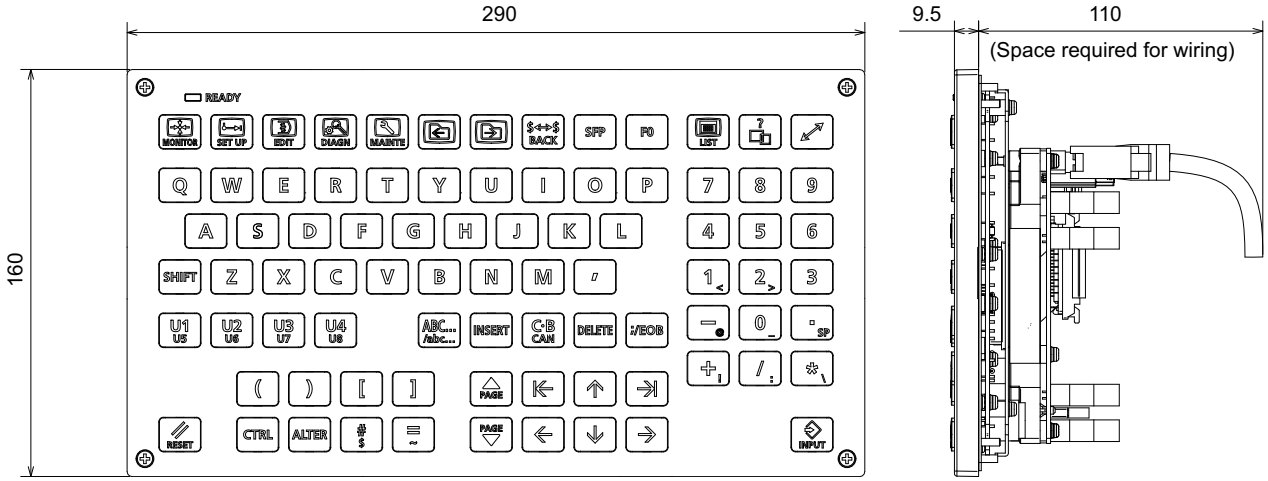
[mm]



4.10.6 Keyboard for 10.4-type Display Unit (FCU8-KB047)

[Outline dimension]

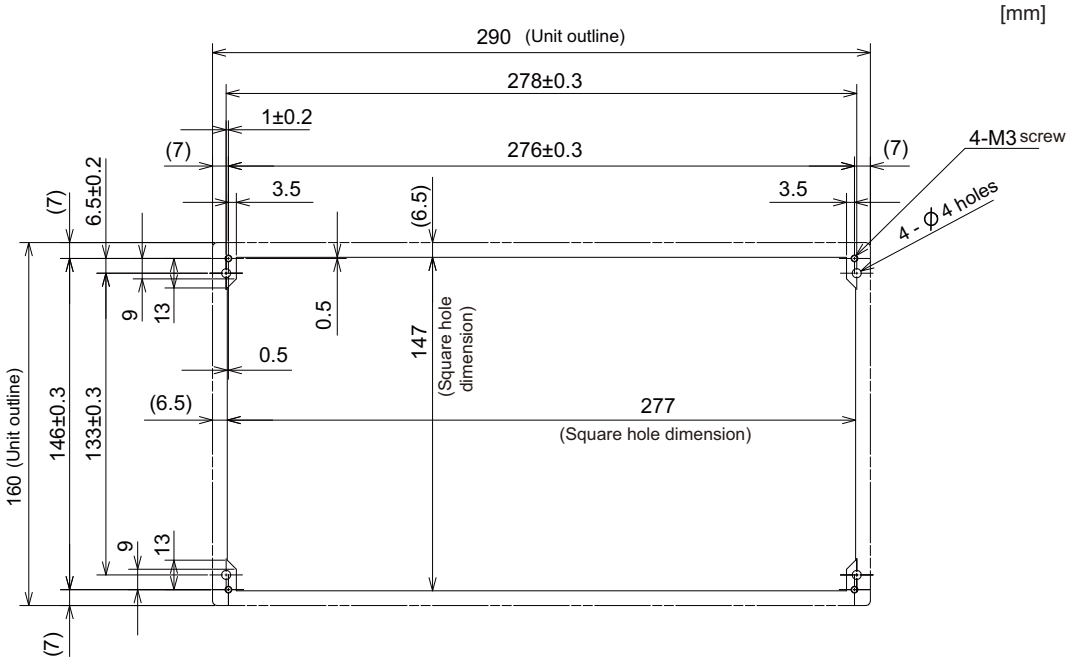
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

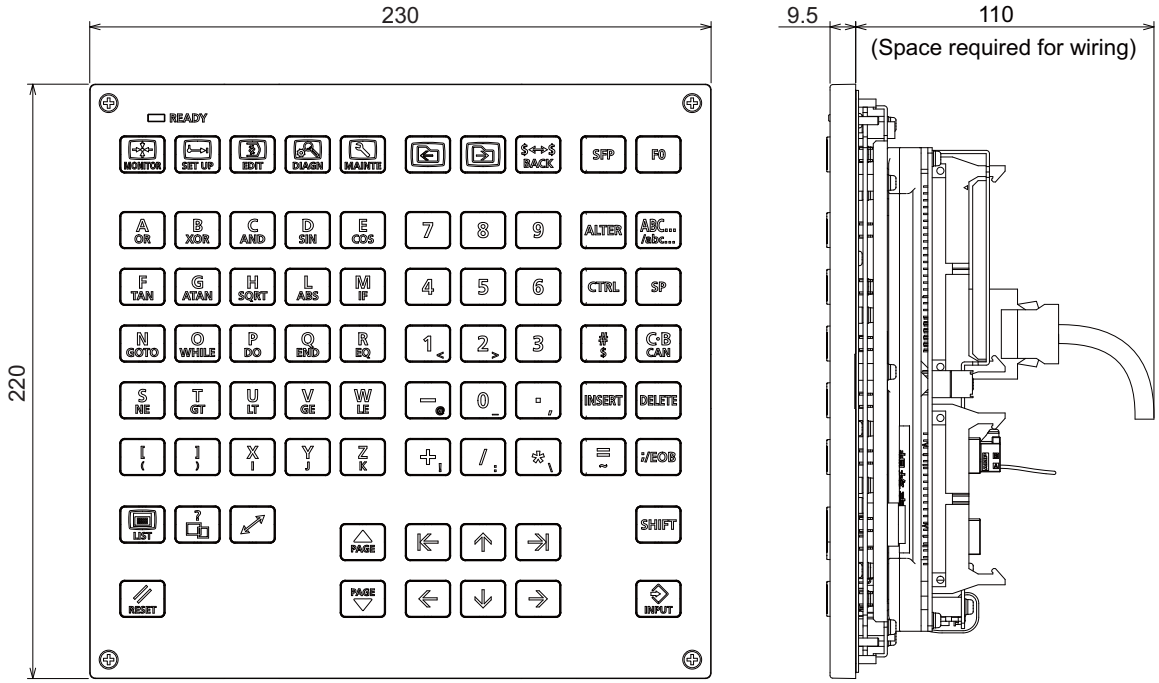
[mm]



4.10.7 Keyboard for 10.4-type Display Unit (FCU8-KB048)

[Outline dimension]

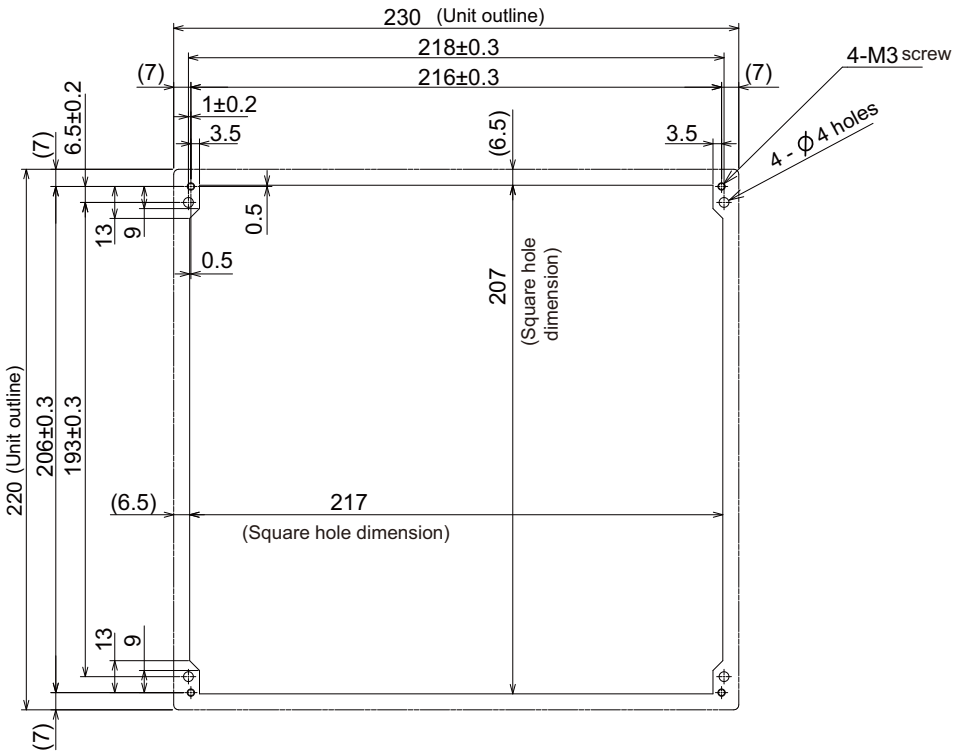
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

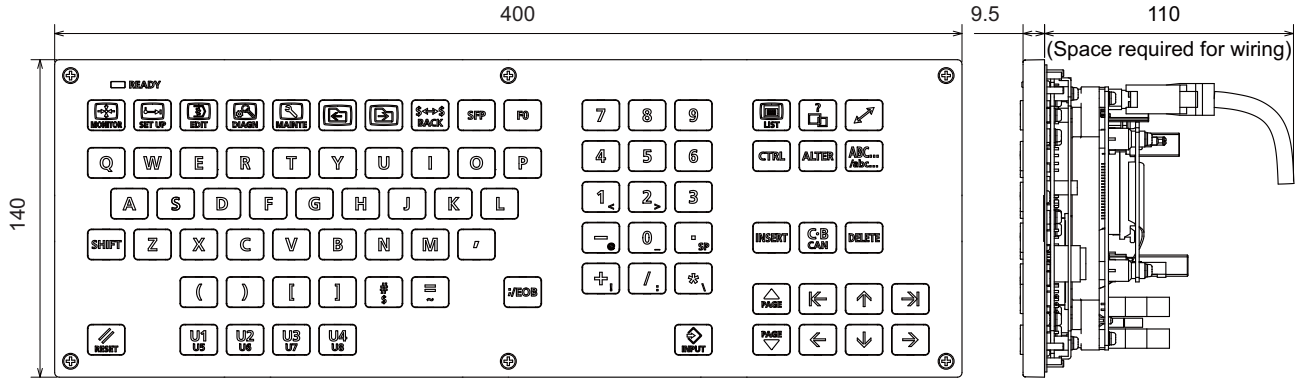
[mm]



4.10.8 Keyboard for 15-type Display Unit (FCU8-KB083)

[Outline dimension]

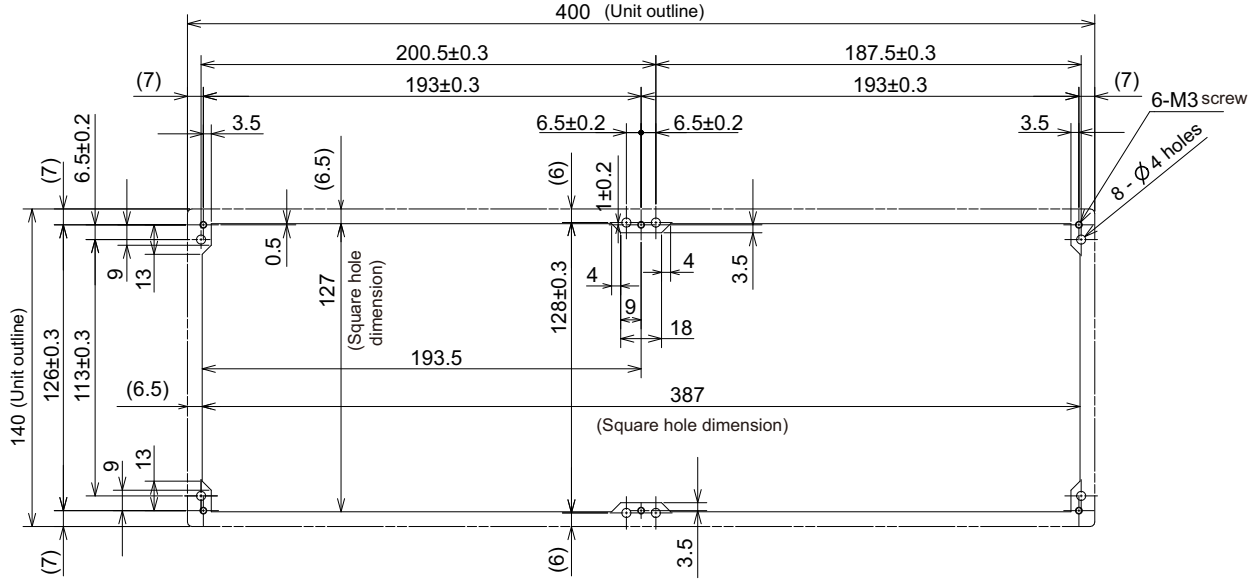
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

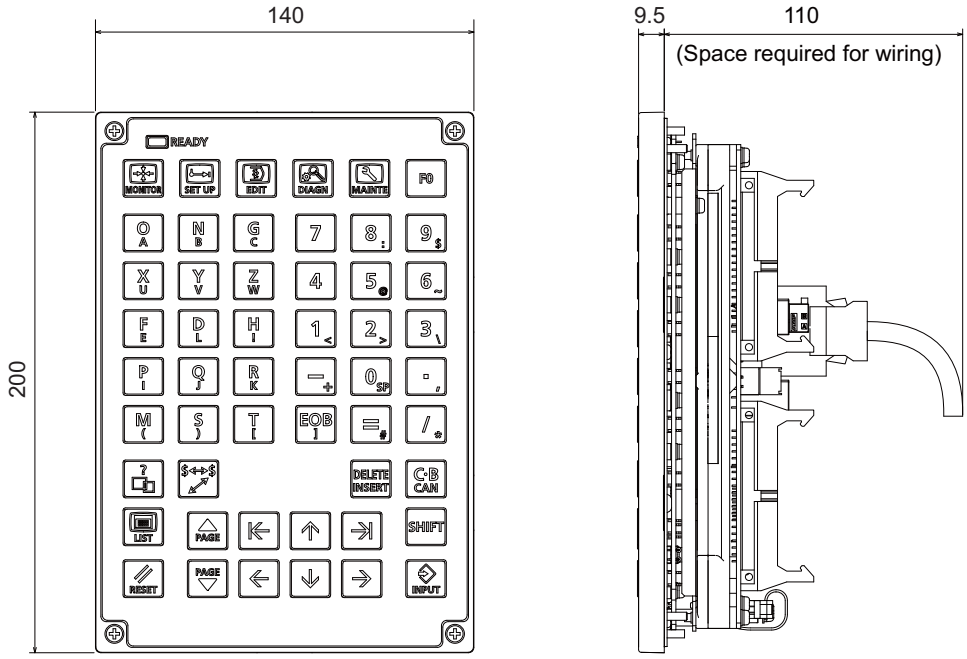
[mm]



4.10.9 Keyboard for 8.4-type Display Unit (FCU8-KB024)

[Outline dimension]

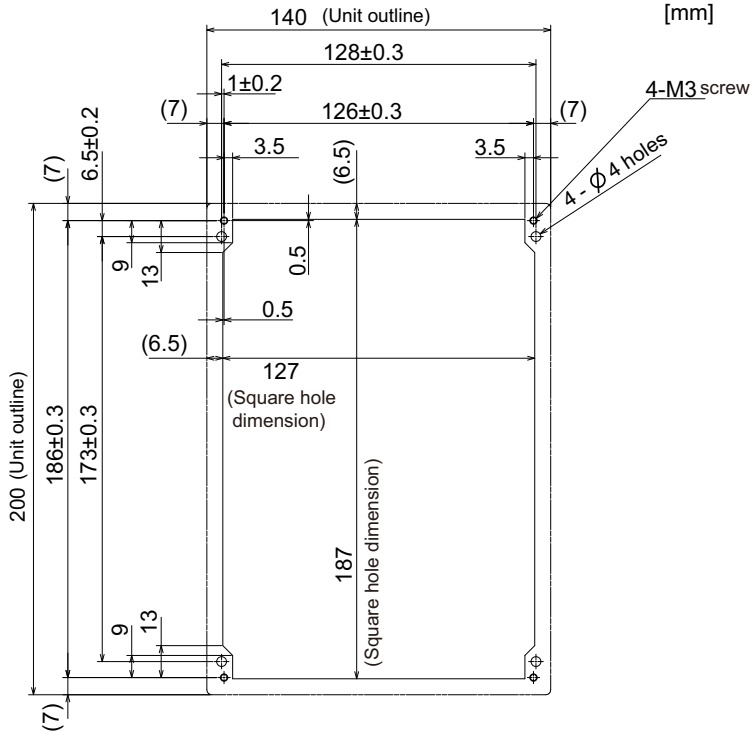
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

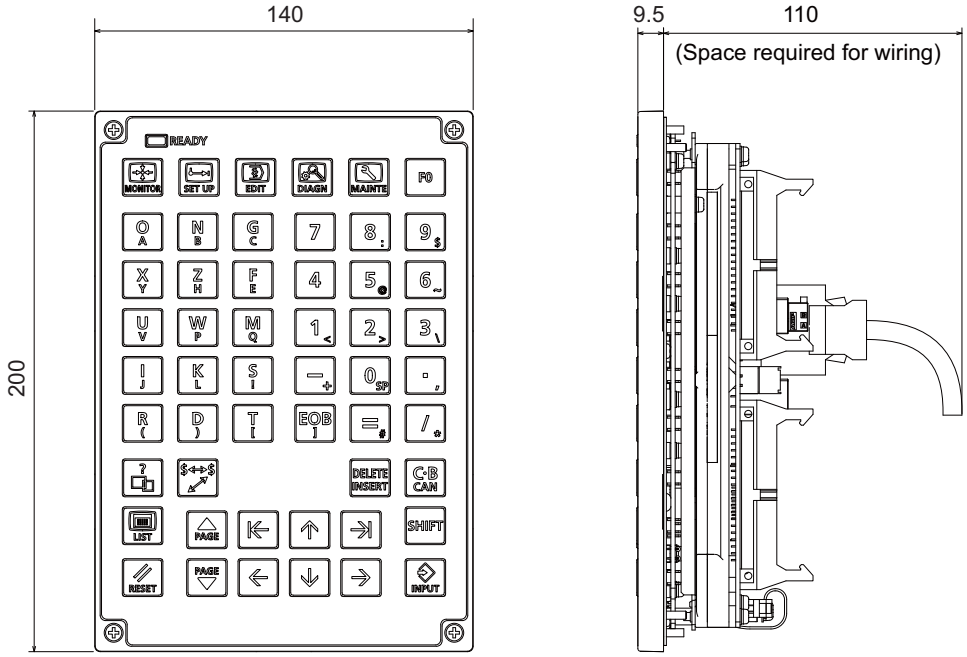
[mm]



4.10.10 Keyboard for 8.4-type Display Unit (FCU8-KB025)

[Outline dimension]

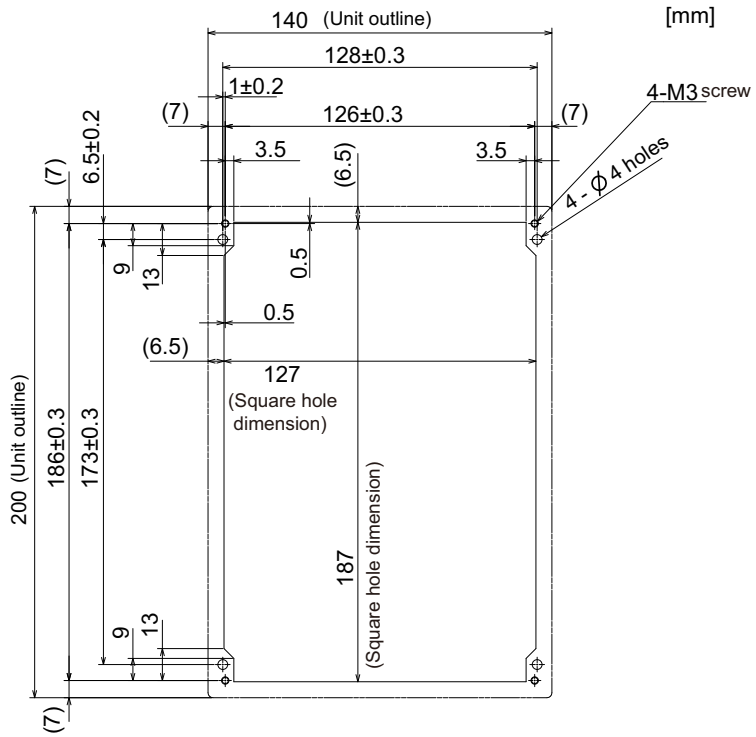
[mm]



(Note) The above side view shows the state with the operation panel I/O unit mounted.

[Panel cut dimension]

[mm]



4.11 Operation Panel I/O Unit

4.11.1 List of Units

Classification	Type	Components	Remarks
DI 24V/0V common input [64 points] DO Source output [48 points] AO Analog output [1 point]	FCU8-DX731 (Note 1)	Base card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Manual pulse generator input: 2ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1, 3, 7 to 12, 20 to 22 RIO extensible stations: 2, 4 to 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [64 points]	FCU8-DX750	Base card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 64-points source type (200mA/point) Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 3, 7 to 12, 20 to 22 RIO extensible stations: 4 to 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [96 points]	FCU8-DX760	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 96-points source type (200mA/point) Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 12, 20 to 22 RIO extensible stations: 5, 6, 13 to 19, 23 to 64
DI 24V/0V common input [96 points] DO Source output [64 points] AI Analog input [1 point] AO Analog output [1 point]	FCU8-DX761	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 96-points 24V/0V common type DO: 64-points source type (200mA/point) AI: 1 point AO: 1 point Manual pulse generator input: 3ch Control unit I/F Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 5, 7 to 12, 20 to 22 RIO extensible stations: 6, 13 to 19, 23 to 64
DI 24V/0V common input [64 points] DO Source output [64 points] Scan input [64 points] Scan output [64 points]	FCU8-DX834 (Note 2)	Base card Add-on card RIO 2.0 terminator connector (R2-TM)	DI: 64-points 24V/0V common type DO: 64-points source type (200mA/point) Scan input: 64 points Scan output: 64 points Manual pulse generator input: 3ch Keyboard unit I/F Remote I/O 2.0 I/F RIO occupied stations (fixed): 1 to 4, 7 to 14, 20 to 22 RIO extensible stations: 5, 6, 15 to 19, 23 to 64

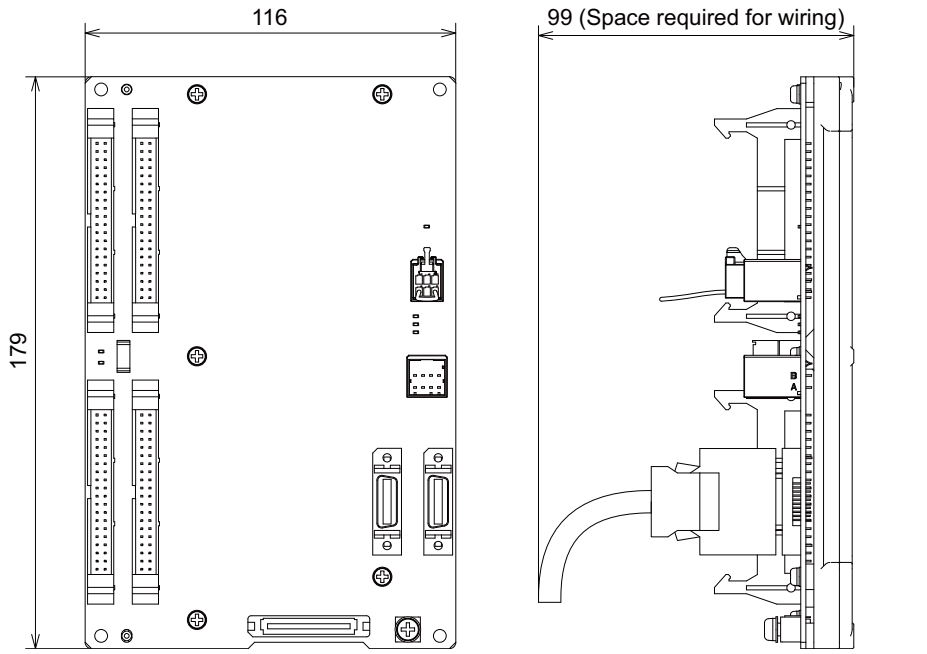
(Note 1) The form of the CG31/CG32/CG35/CG36 connectors on FCU8-DX731 are the same as that of CJ38/CJ40/CJ42 connectors on other units.
Be careful not to connect to a wrong connector.
See the descriptions below for more specific explanation on connections.

(Note 2) The connection method of DO (CG32/CG34) of FCU8-DX834 is different from other operation panel I/O units. Be careful not to connect to a wrong connector. See the descriptions mentioned in the later section for more specific explanation on connections.

4.11.2 FCU8-DX731 / FCU8-DX750 / FCU8-DX760 / FCU8-DX761 / FCU8-DX834

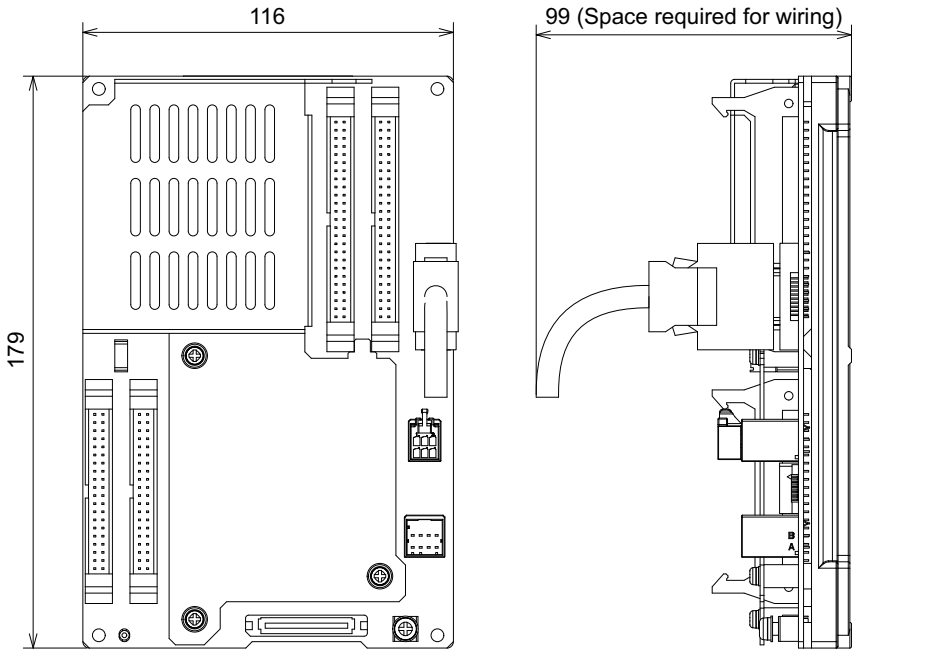
[Outline dimension : FCU8-DX731]

[mm]



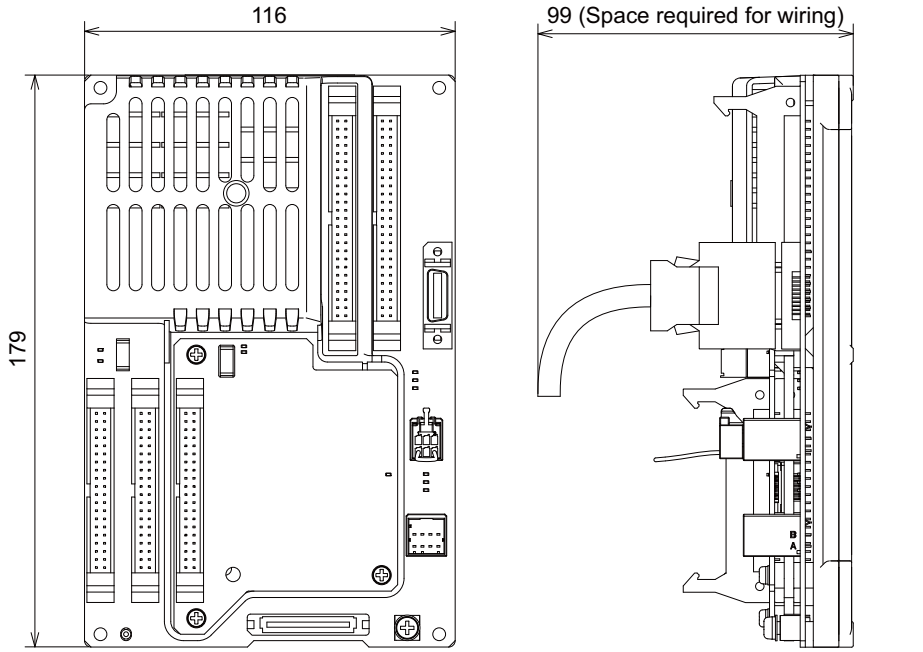
[Outline dimension : FCU8-DX750]

[mm]



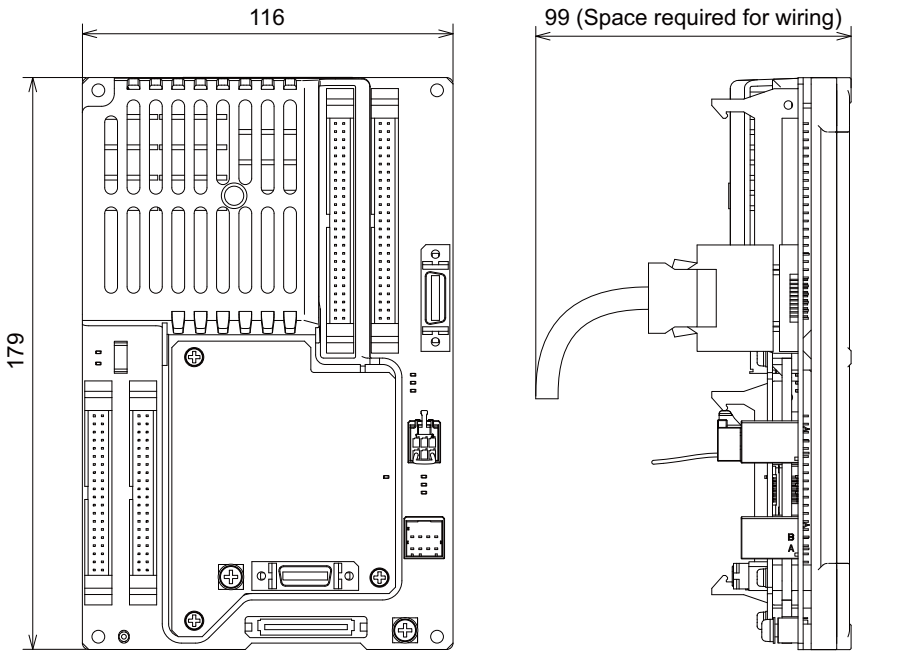
[Outline dimension : FCU8-DX760]

[mm]



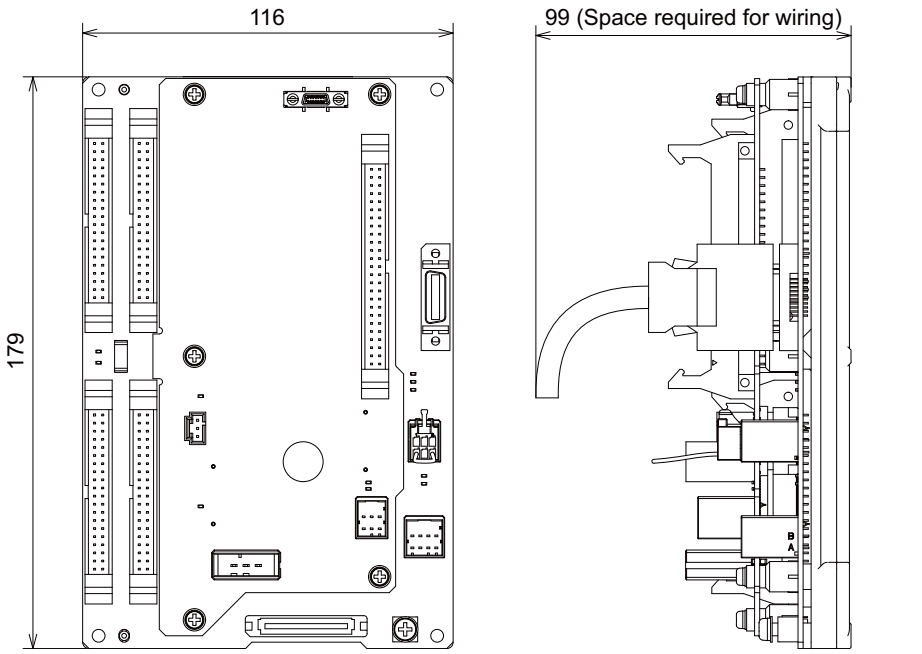
[Outline dimension : FCU8-DX761]

[mm]

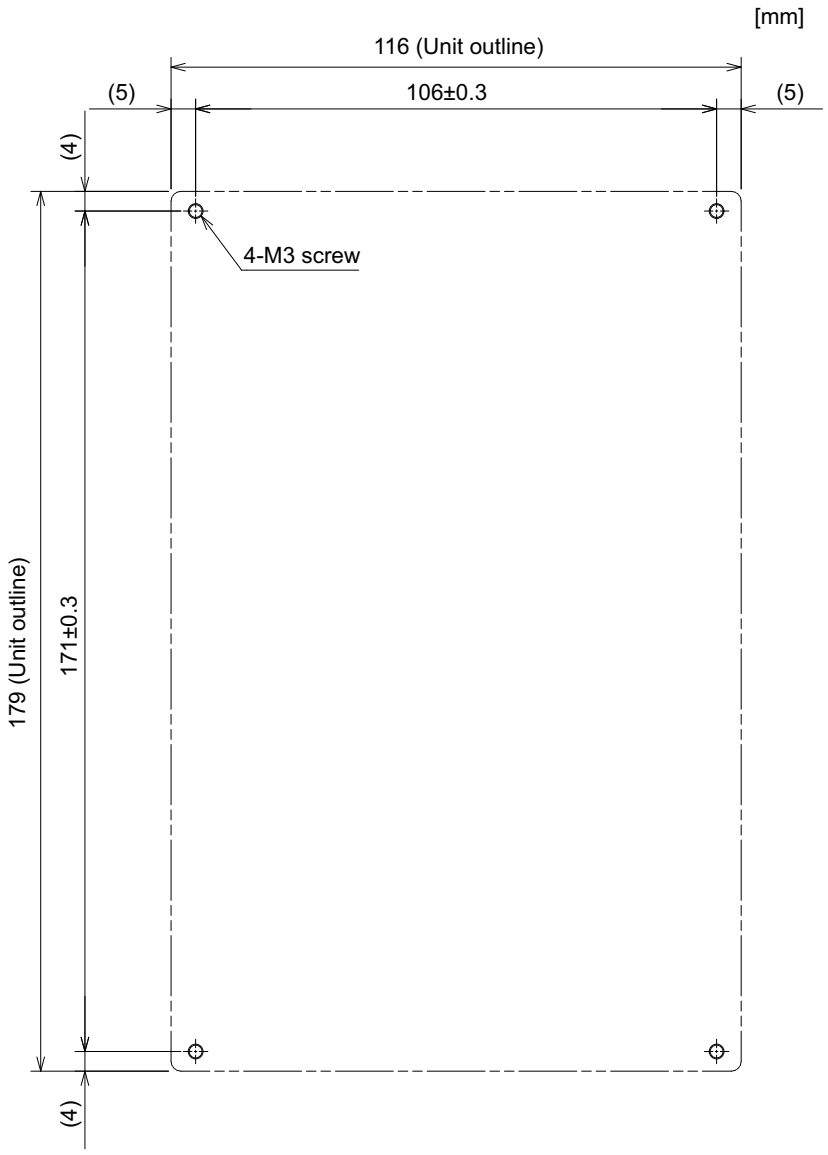


[Outline dimension : FCU8-DX834]

[mm]



[Installation dimension: FCU8-DX731 / FCU8-DX750 / FCU8-DX760 / FCU8-DX761 / FCU8-DX834]



(Note) The unit thickness of the fixed part with screws is 16.6mm.
Select the fixing screws having the length suitable for the thickness.

4.12 Remote I/O Unit

Types of signals described on the list of units can be input/output from the remote I/O unit (FCU8-DXxxx) according to the type and No. of contacts. Remote I/O units are used by being connected to the control unit or the operation panel I/O unit.
Multiple remote I/O units can be used as long as the total number of occupied stations is 64 or less.

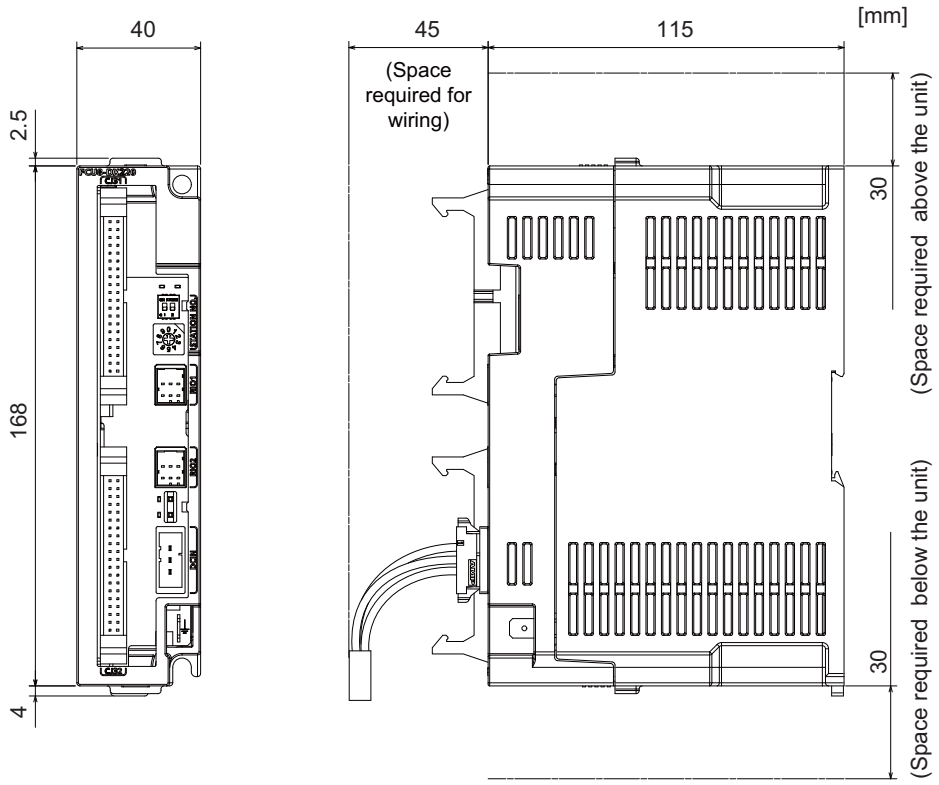
(Note) The maximum connectable number of remote I/O units is 32.

4.12.1 List of Units

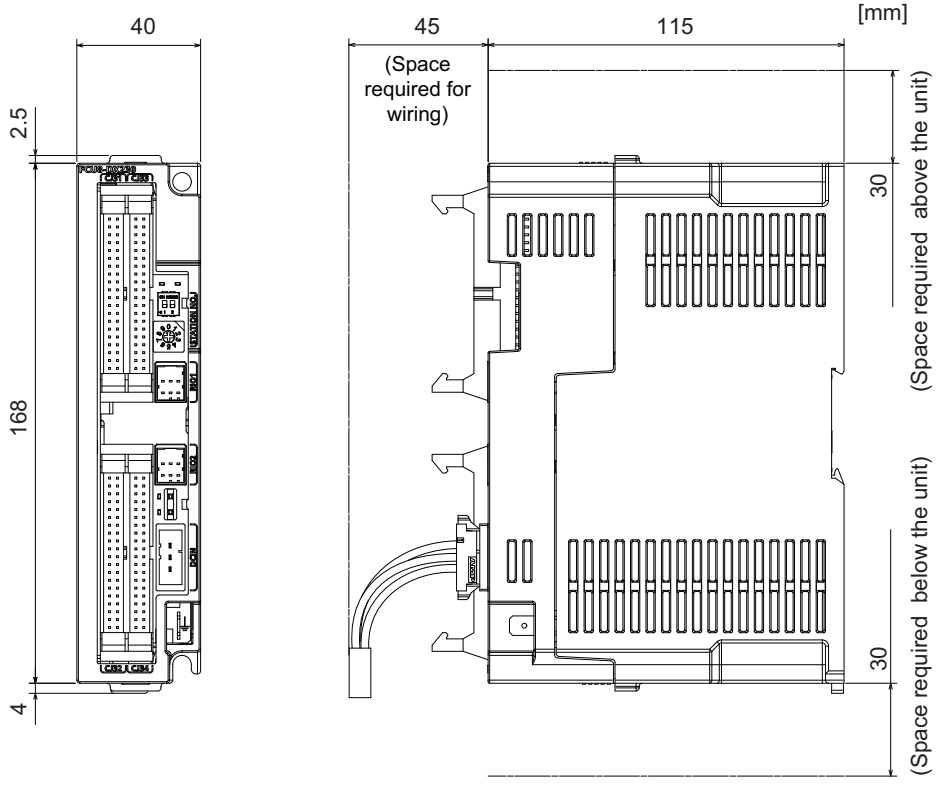
Classification	Type	Components	Remarks
DI 24V/0V common input [32 points] DO Source output [32 points]	FCU8-DX220	Base card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Number of occupied stations: 1
DI 24V/0V common input [64 points] DO Source output [48 points]	FCU8-DX230	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) Number of occupied stations: 2
DI 24V/0V common input DO Source output [48 points] AO Analog output [1 point]	FCU8-DX231	Base card RIO 2.0 connector set	DI: 64-points 24V/0V common type DO: 48-points source type (200mA/point) AO: 1 point Number of occupied stations: 2
AI Analog input [4 points] AO Analog output [1 point]	FCU8-DX202	Base card RIO 2.0 connector set	AI : 4 points AO: 1 point Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213	Base card RIO 2.0 connector set	DI: 16-points 0V common type (3mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
DI 0V common input [16 points] DO Source output (large capacity) [8 points]	FCU8-DX213-1	Base card RIO 2.0 connector set	DI: 16-points 0V common type (9mA/point) DO: 8-points source type (2A/point) Number of occupied stations: 1
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (3mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
Safety DI 0V common input [8 points] Safety DO Source output (large capacity) [4 points]	FCU8-DX654-1	Base card RIO 2.0 connector set	Safety DI: 8-points 0V common type (9mA/point) Safety DO: 4-points source type (2A/point) Number of occupied stations: 2
DI 24V/0V common input [32points] DO Source output [32 points] Safety DI 0V common input [8 points] (Note 1) Safety relay output [4 points] (Note 2)	FCU8-DX651	Base card Add-on card RIO 2.0 connector set	DI: 32-points 24V/0V common type Do: 32-points source type (200mA/point) Safety DI: 8-points 0V common type Safety relay: 4-points (non-voltage contact) Relay contact welding detection Number of occupied stations: 3 (Note 1) Safety DI uses 16 points of terminal because of the duplication wiring. (Note 2) Safety relay output uses 8 points of terminal because of the duplication wiring.
Thermistor input [12 points]	FCU8-DX408	Base card RIO 2.0 connector set	Thermistor input: 12 points Number of occupied stations: 3
Multi-analog input [4 points] (Note 3)	FCU8-DX409	Base card RIO 2.0 connector set	Multi-analog input: 4 points (Note 3) Voltage input, current input, thermocouple input and resistance temperature detector input are selected for each CH. Number of occupied stations: 4

4.12.2 FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX651/ FCU8-DX408 / FCU8-DX409

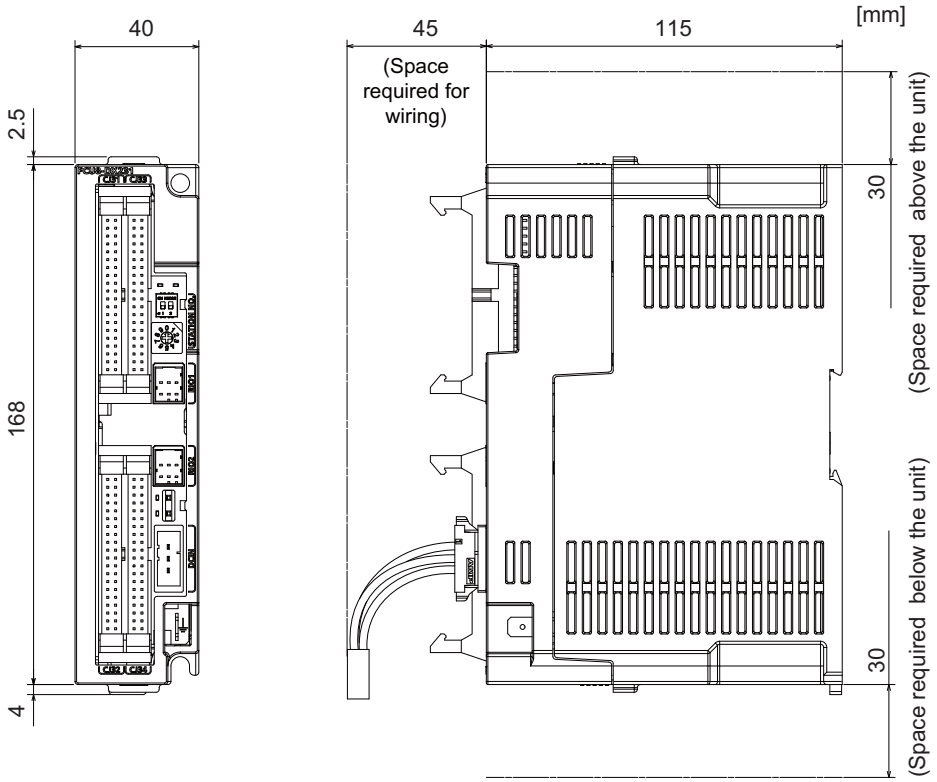
[Outline dimension : FCU8-DX220]



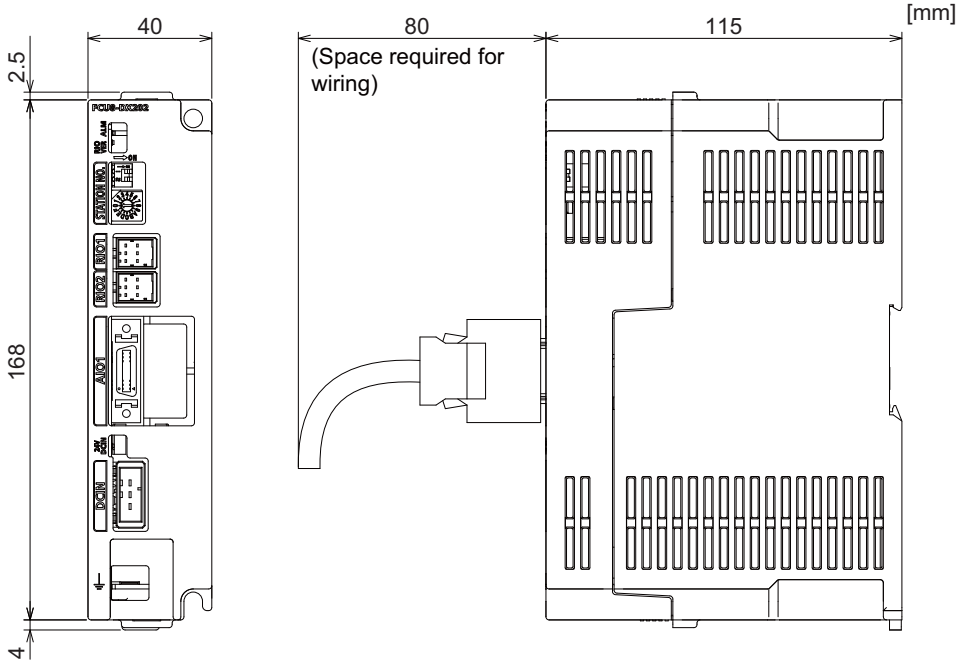
[Outline dimension : FCU8-DX230]



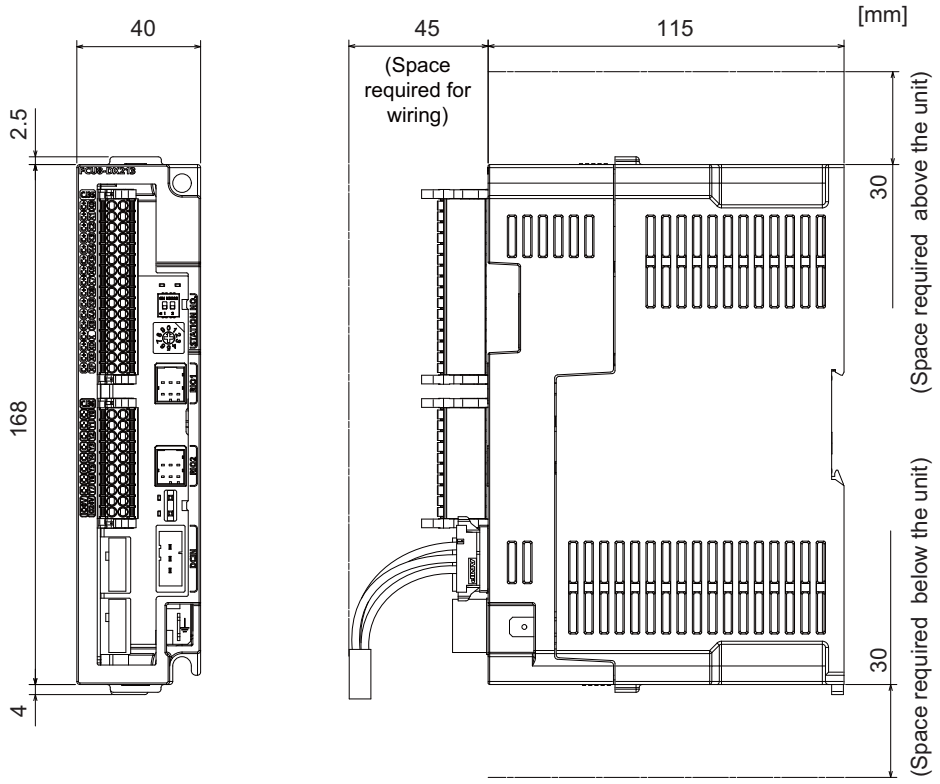
[Outline dimension : FCU8-DX231]



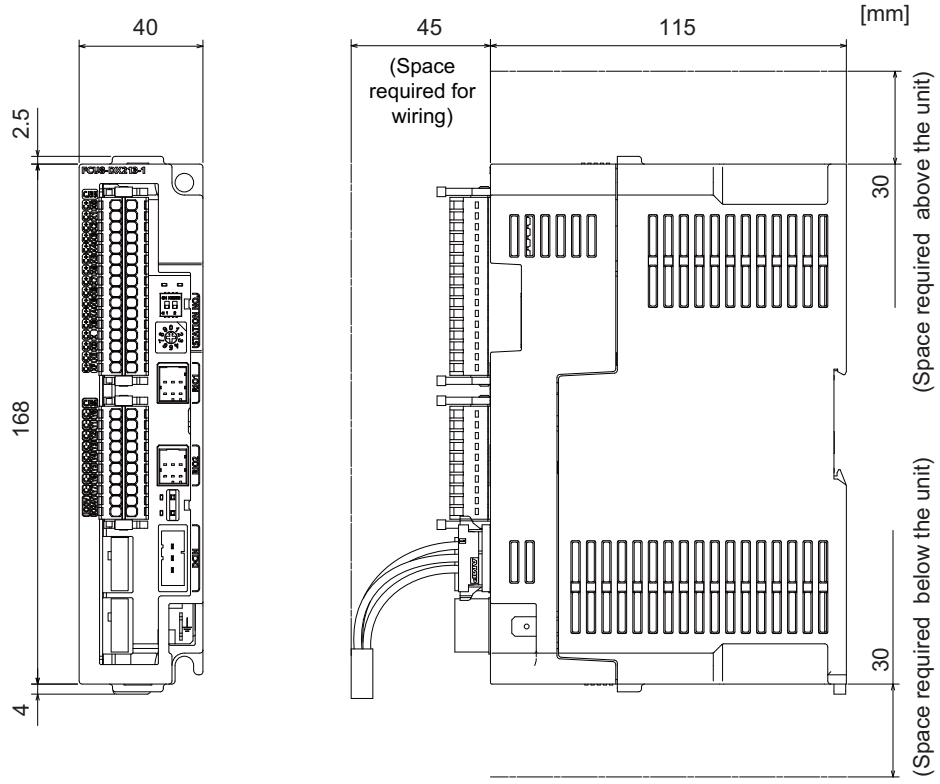
[Outline dimension : FCU8-DX202]



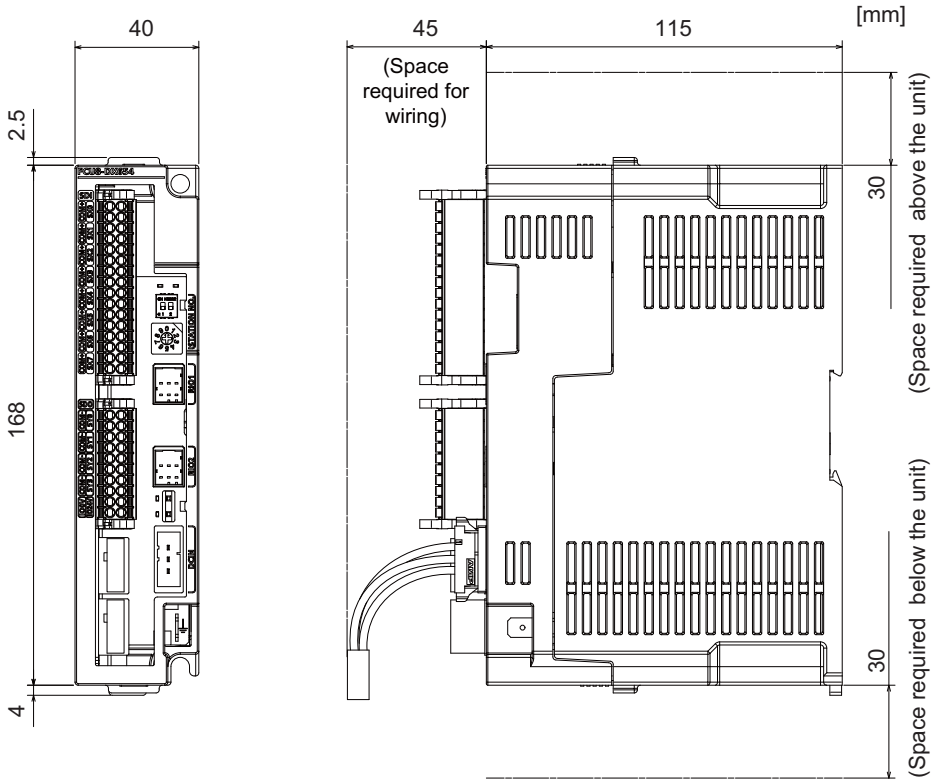
[Outline dimension : FCU8-DX213]



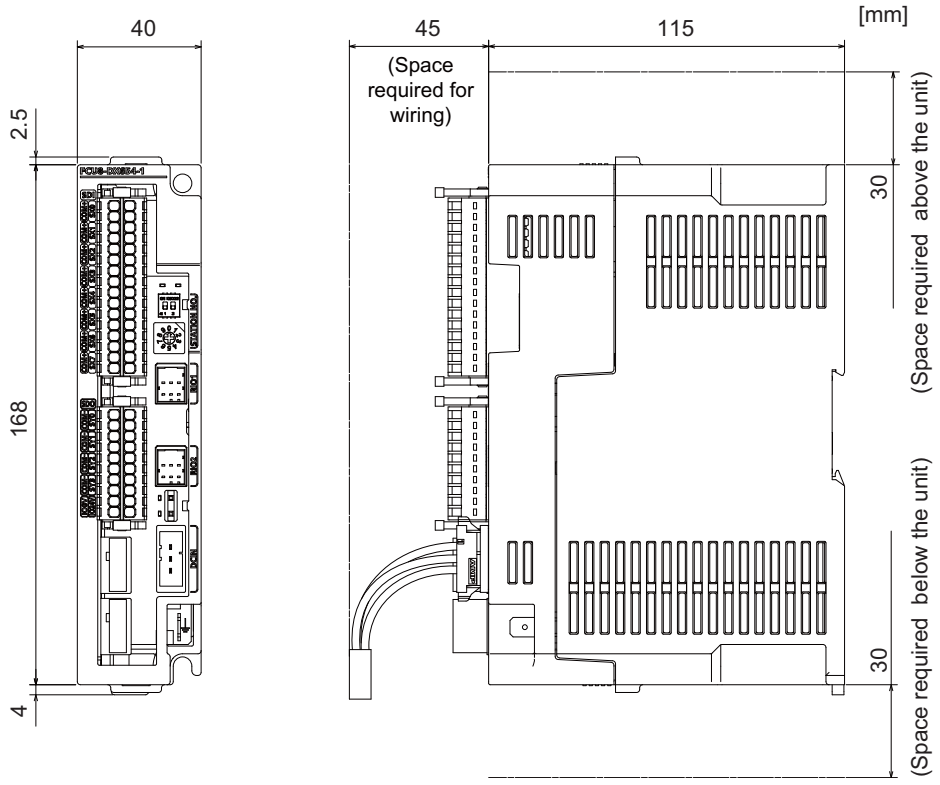
[Outline dimension : FCU8-DX213-1]



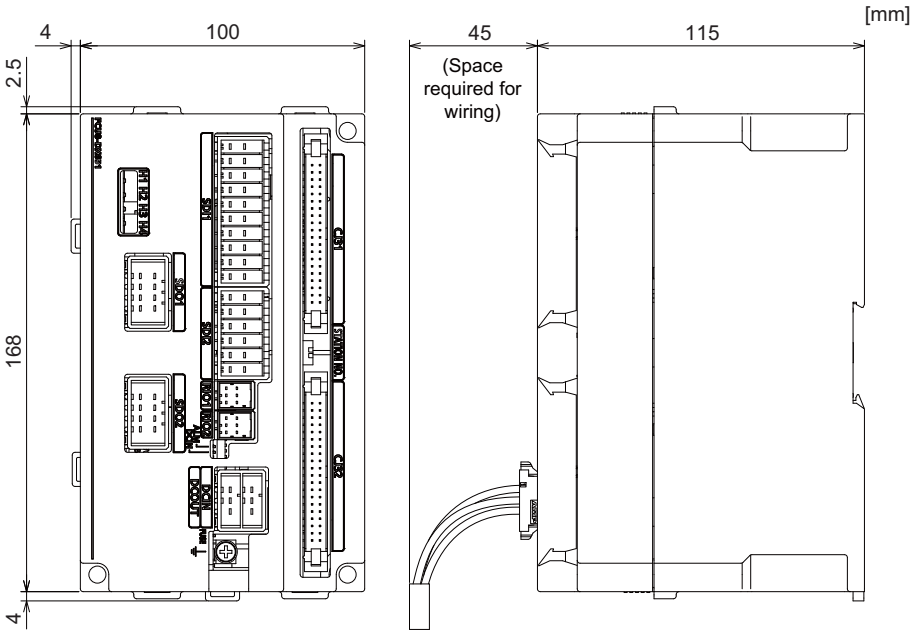
[Outline dimension : FCU8-DX654]



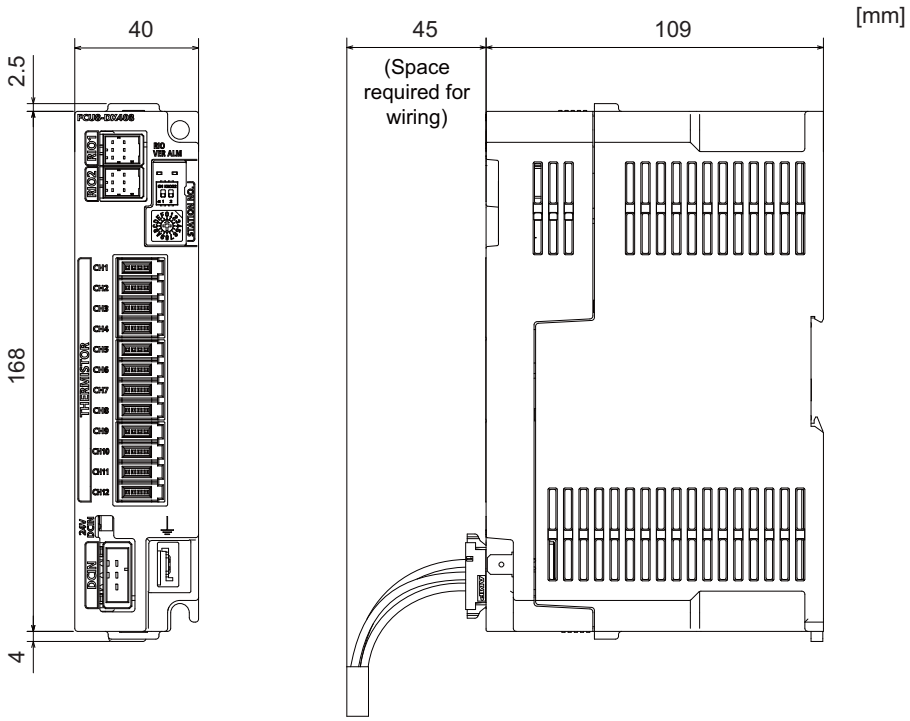
[Outline dimension : FCU8-DX654-1]



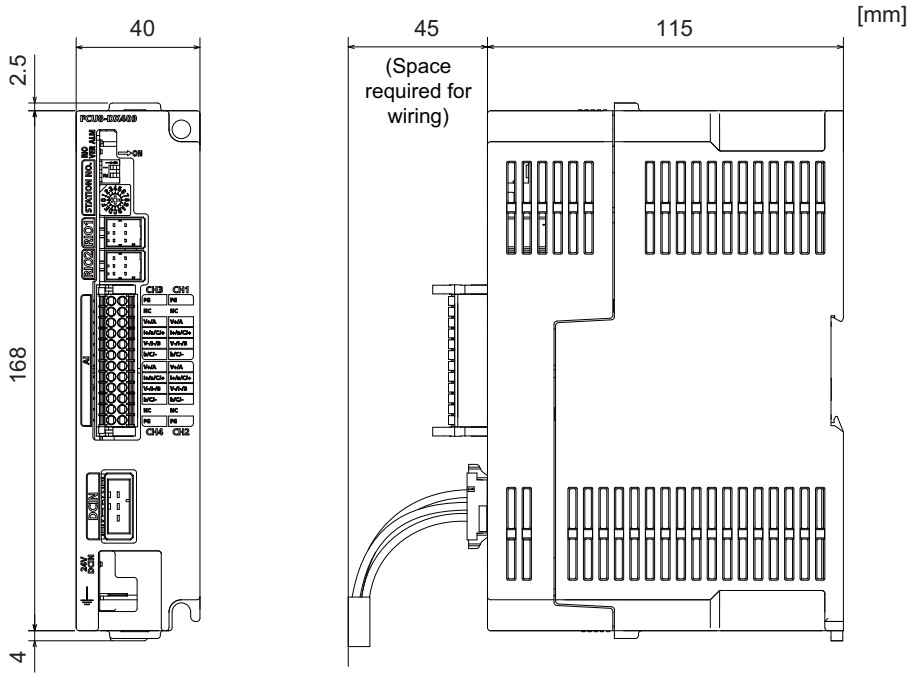
[Outline dimension : FCU8-DX651]



[Outline dimension : FCU8-DX408]

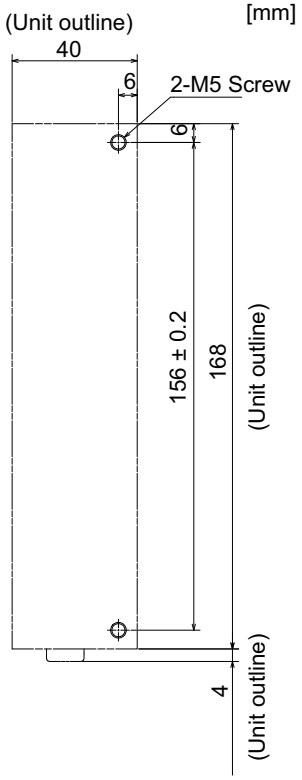


[Outline dimension : FCU8-DX409]



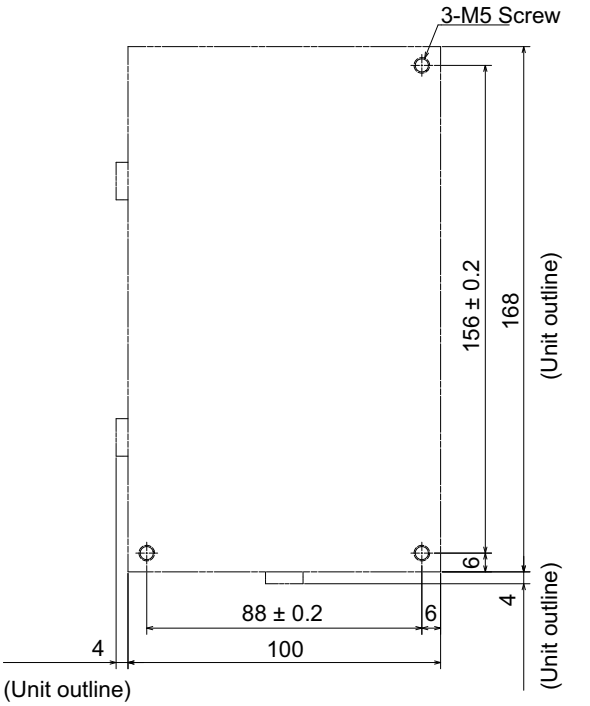
[Installation dimension : FCU8-DX220 / FCU8-DX230 / FCU8-DX231 / FCU8-DX202 / FCU8-DX213 / FCU8-DX213-1 / FCU8-DX654 / FCU8-DX654-1 / FCU8-DX408 / FCU8-DX409]

[mm]



[Installation dimension : FCU8-DX651]

[mm]

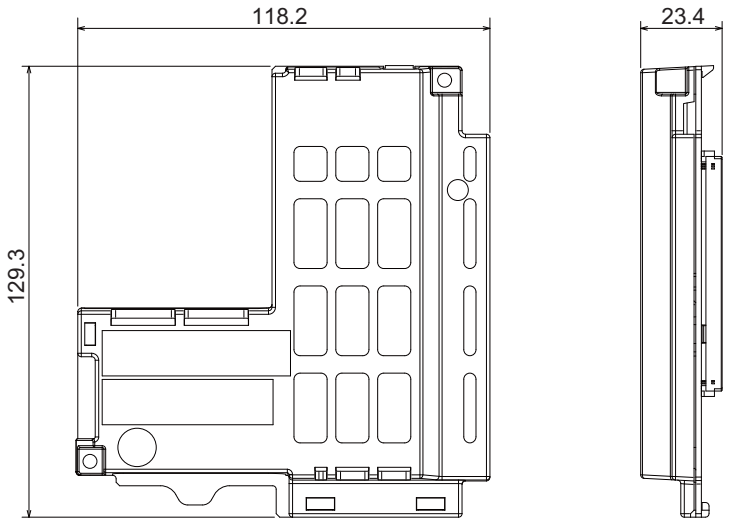


4.13 Function Expansion Unit

4.13.1 Functional Safety Expansion Unit (FCU8-EX133)

[Outline dimension]

[mm]

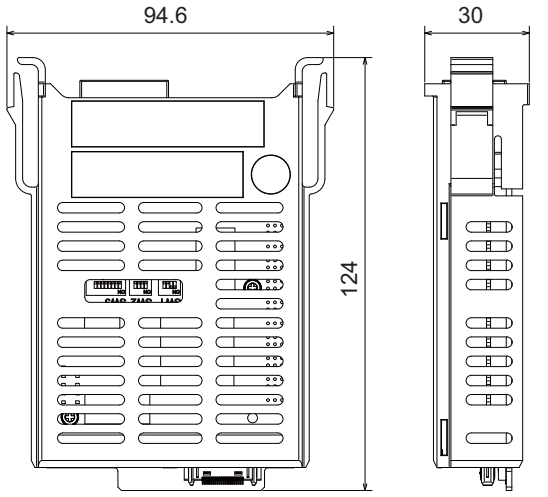


4.14 Communication Expansion Unit

4.14.1 CC-Link (FCU8-EX561)

[Outline dimension]

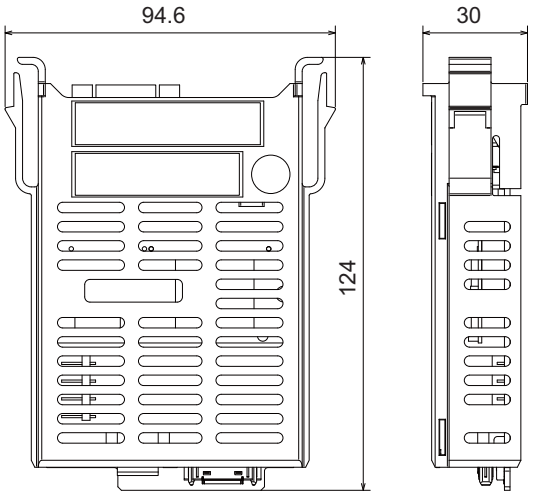
[mm]



4.14.2 PROFIBUS-DP (FCU8-EX563)

[Outline dimension]

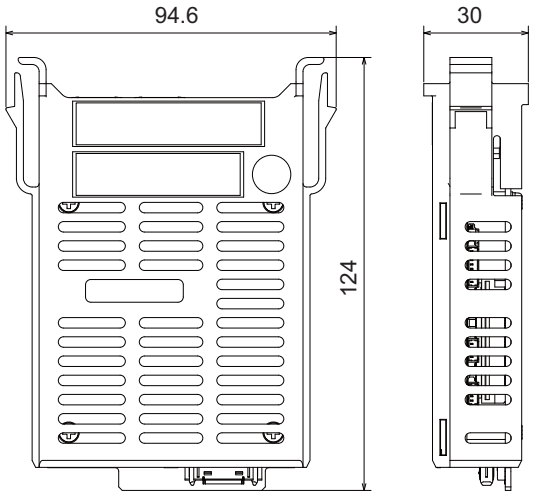
[mm]



4.14.3 CC-Link IE Field (FCU8-EX564)

[Outline dimension]

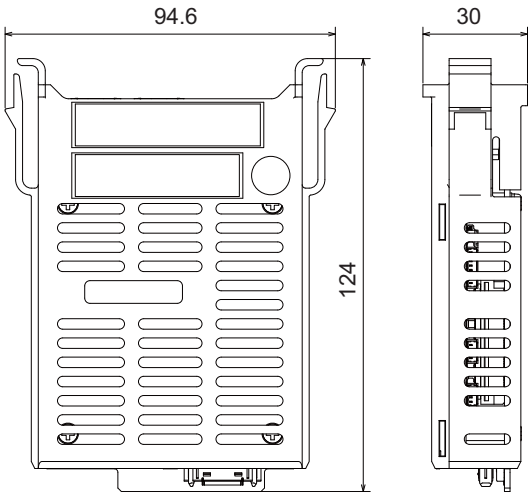
[mm]



4.14.4 EtherNet/IP (FCU8-EX565)

[Outline dimension]

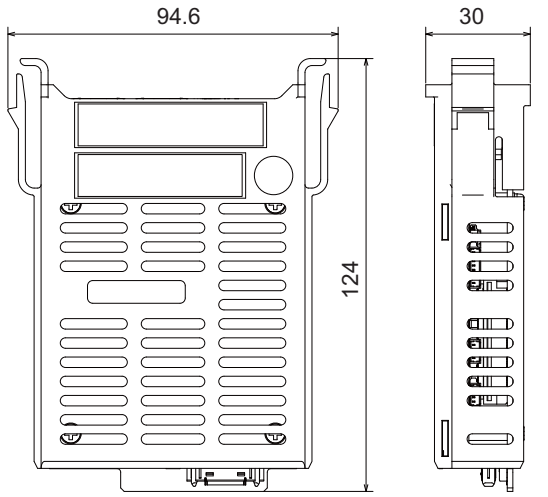
[mm]



4.14.5 FL-net (FCU8-EX568)

[Outline dimension]

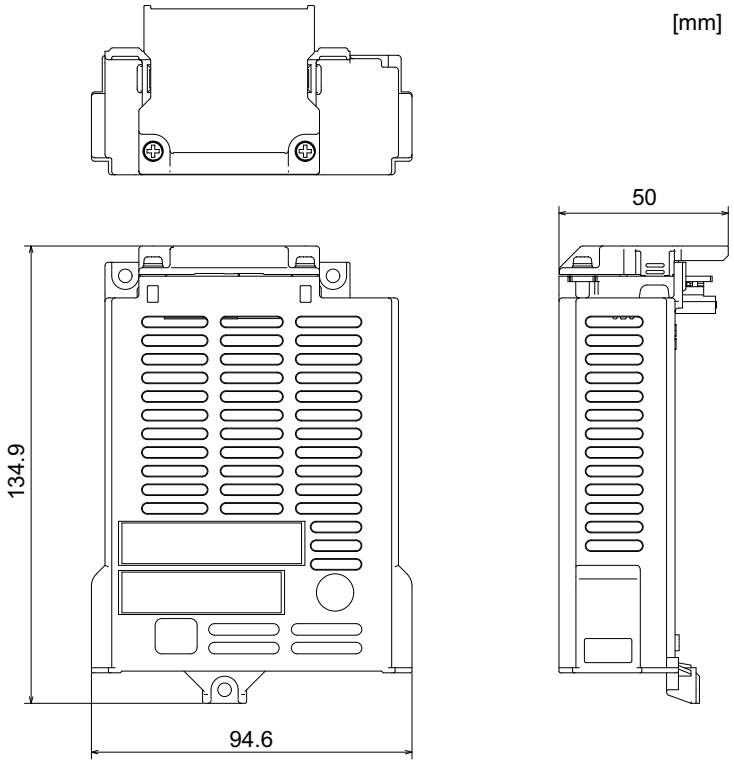
[mm]



4.14.6 Option Relay Unit (FCU8-EX702)

[Outline dimension]

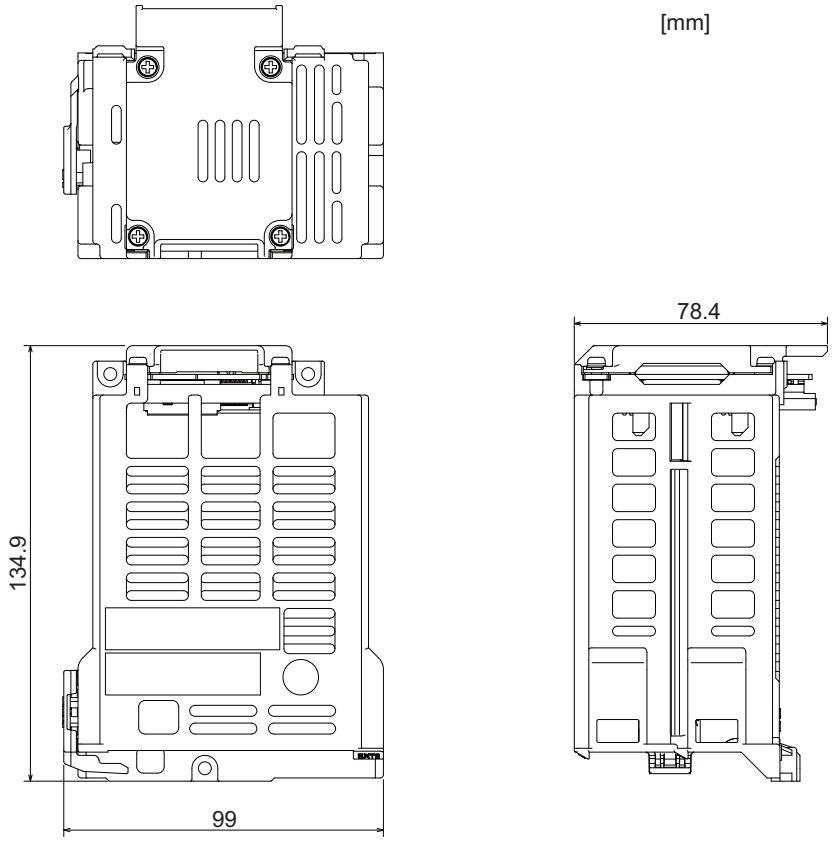
[mm]



4.14.7 Option Relay Unit (FCU8-EX703)

[Outline dimension]

[mm]



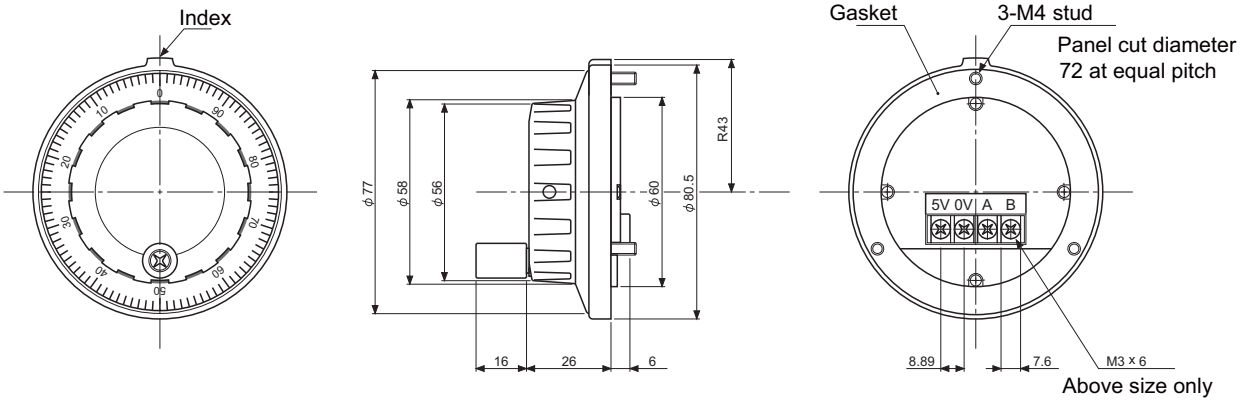
4.15 Manual Pulse Generator

4.15.1 5V Manual Pulse Generator (UFO-01-2Z9)

100 pulse/rev

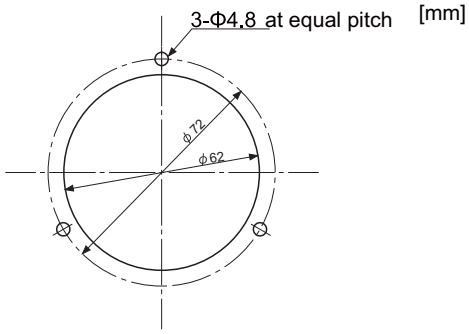
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]



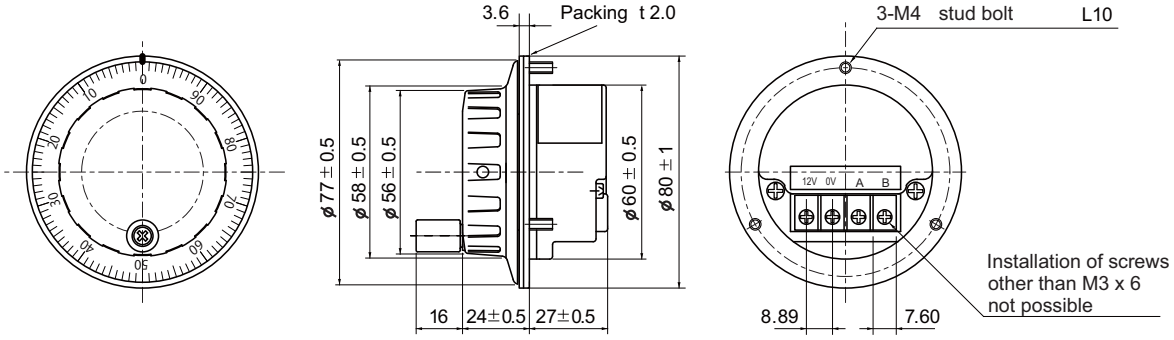
Produced by NIDEC NEMICON CORPORATION

4.15.2 12V Manual Pulse Generator (HD60C)

25 pulse/rev

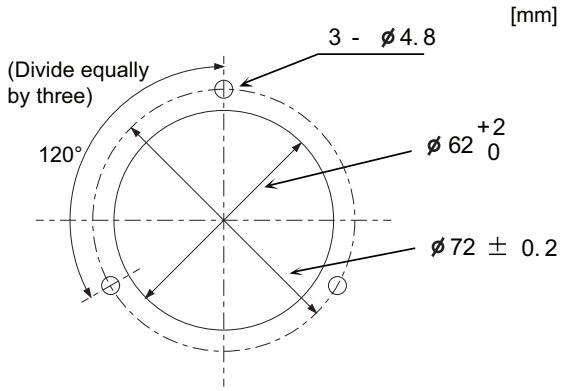
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]

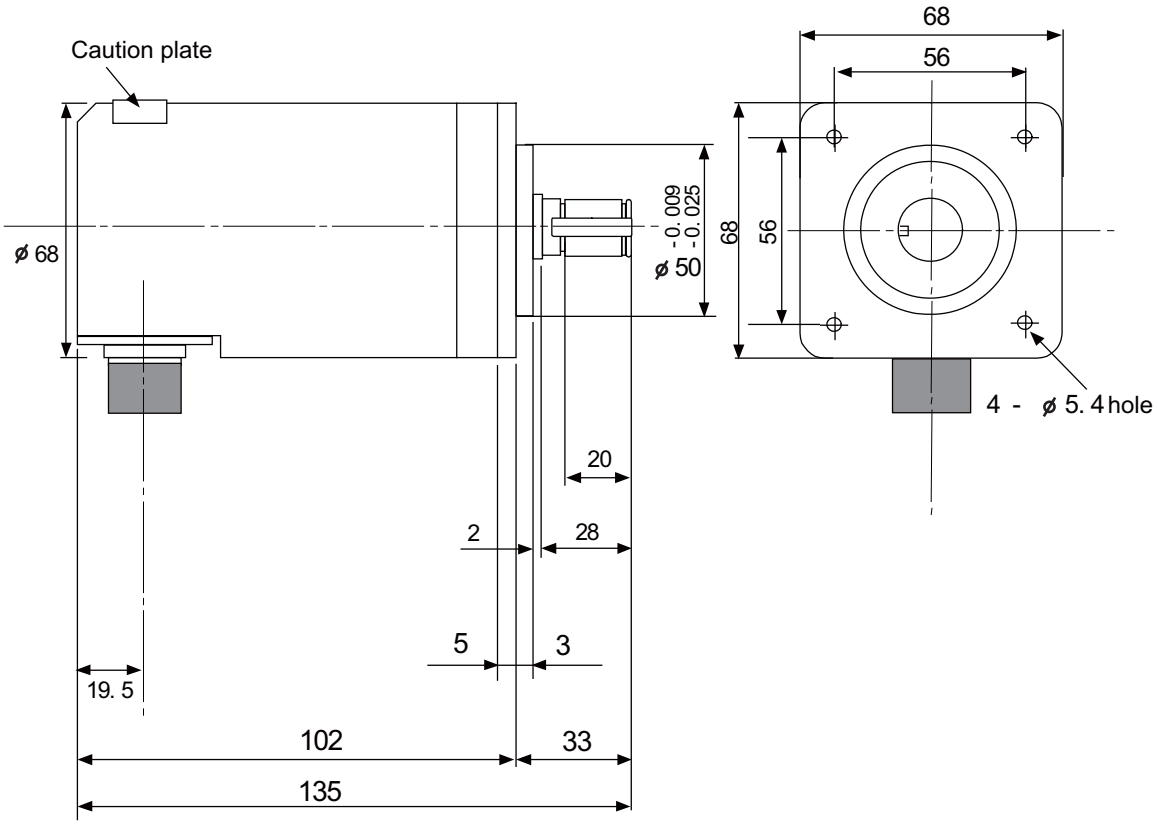


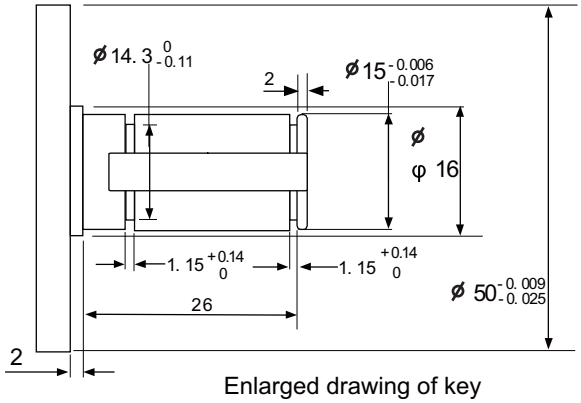
4.16 Synchronous Feed Encoder

4.16.1 Synchronous Feed Encoder (OSE-1024-3-15-68)

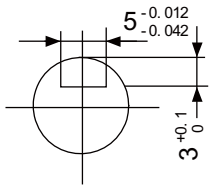
[Outline dimension]

[mm]



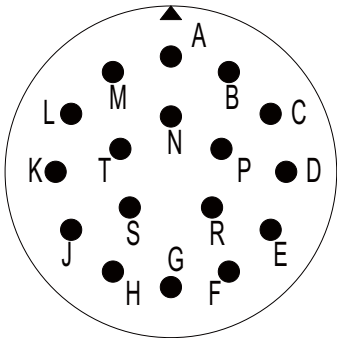


Enlarged drawing of key



Cross section BB
Valid depth of key groove is 21mm

[Connector]



Connector pin assignment

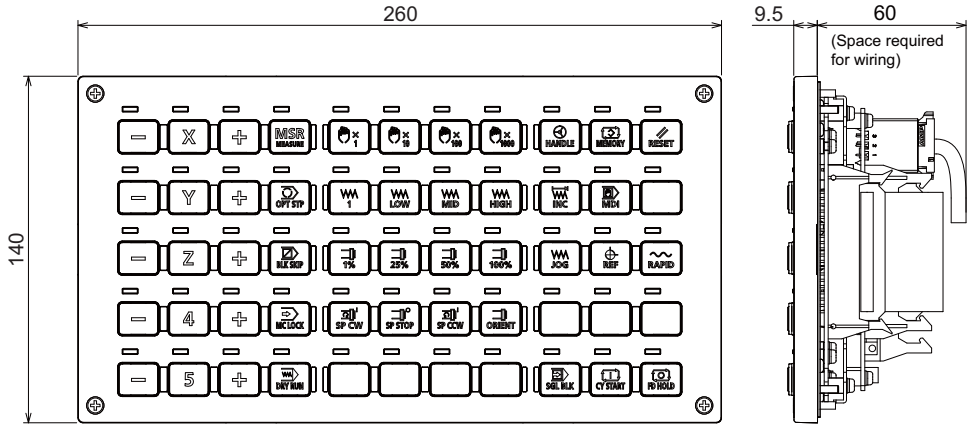
Pin	Function	Pin	Function
A	A phase	**K**	0V
B	Z phase	**L**	-
C	B phase	**M**	-
D	-	**N**	A phase reverse
E	Case grounding	**P**	Z phase reverse
F	-	**R**	B phase reverse
G	-	**S**	-
H	+5V	**T**	-
J	-		

4.17 MITSUBISHI CNC Machine Operation Panel

4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB926)

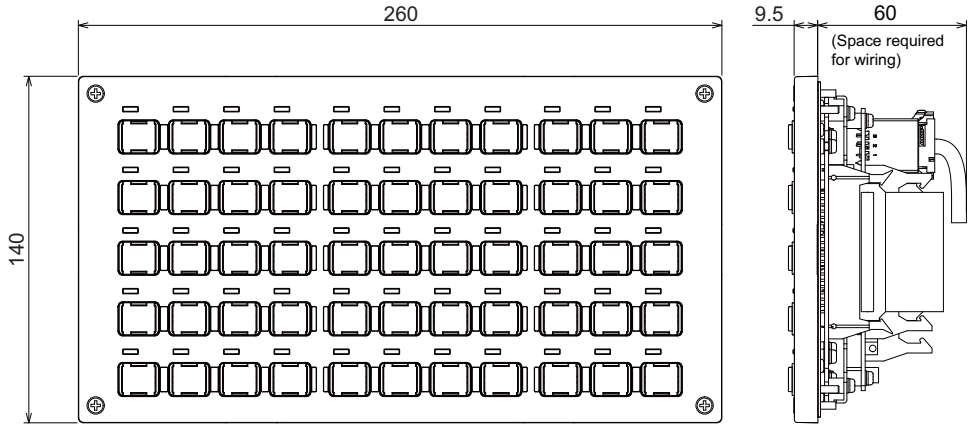
[Outline dimension : FCU8-KB921]

[mm]



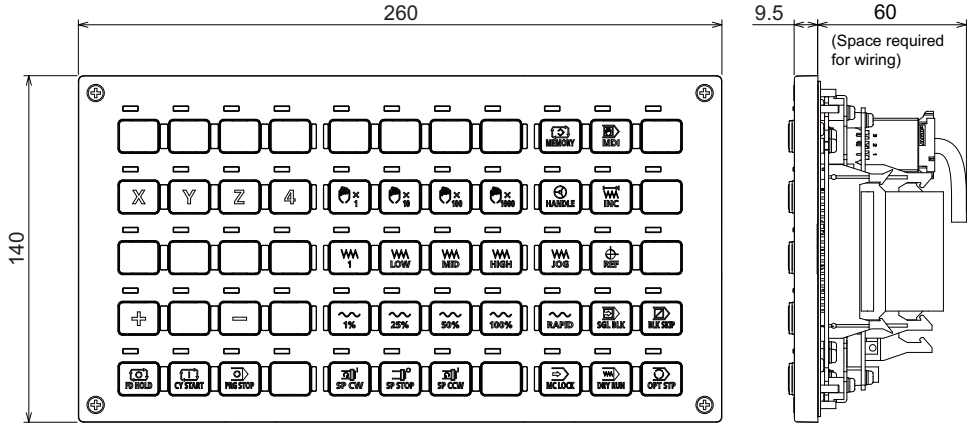
[Outline dimension : FCU8-KB922]

[mm]



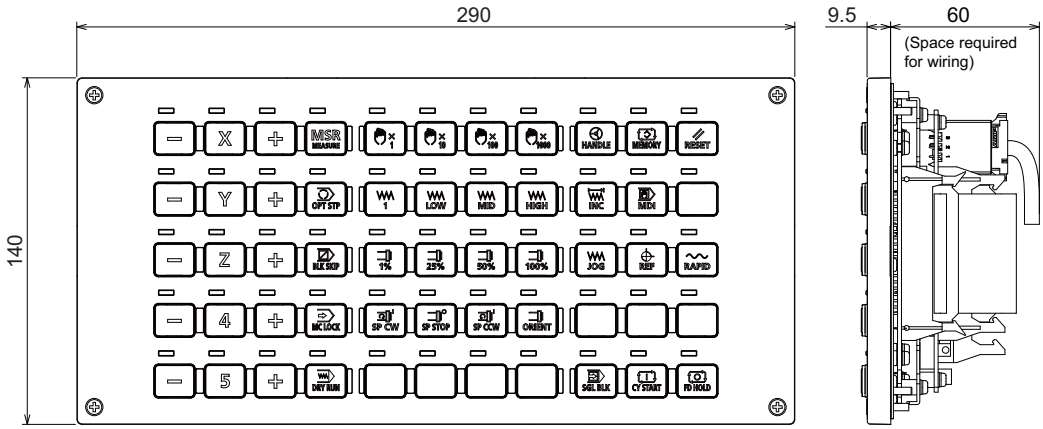
[Outline dimension : FCU8-KB925]

[mm]



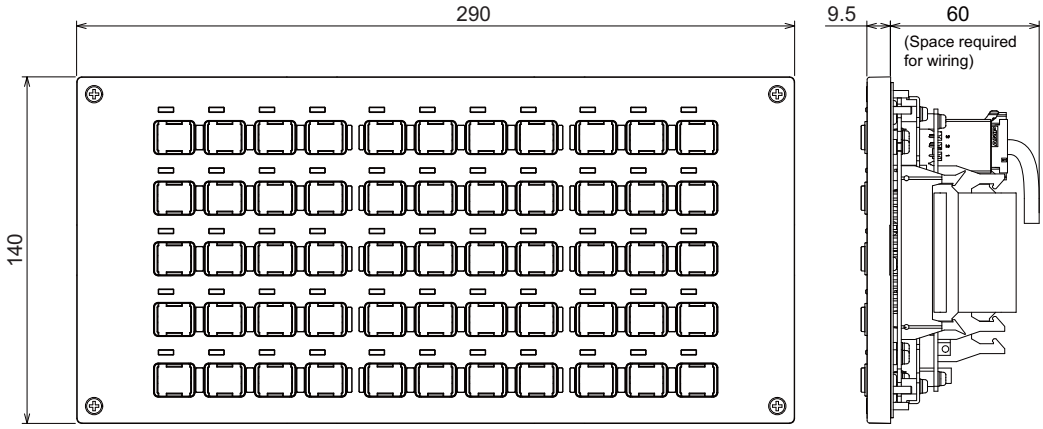
[Outline dimension : FCU8-KB923]

[mm]



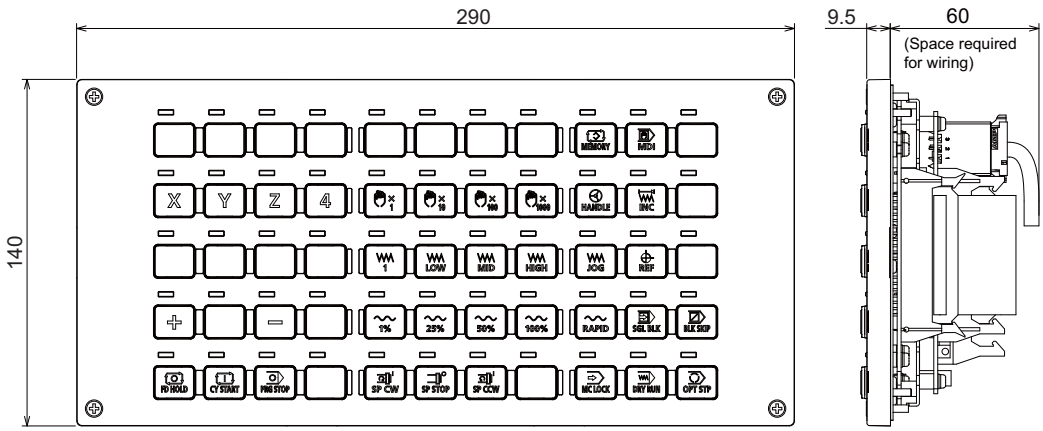
[Outline dimension : FCU8-KB924]

[mm]



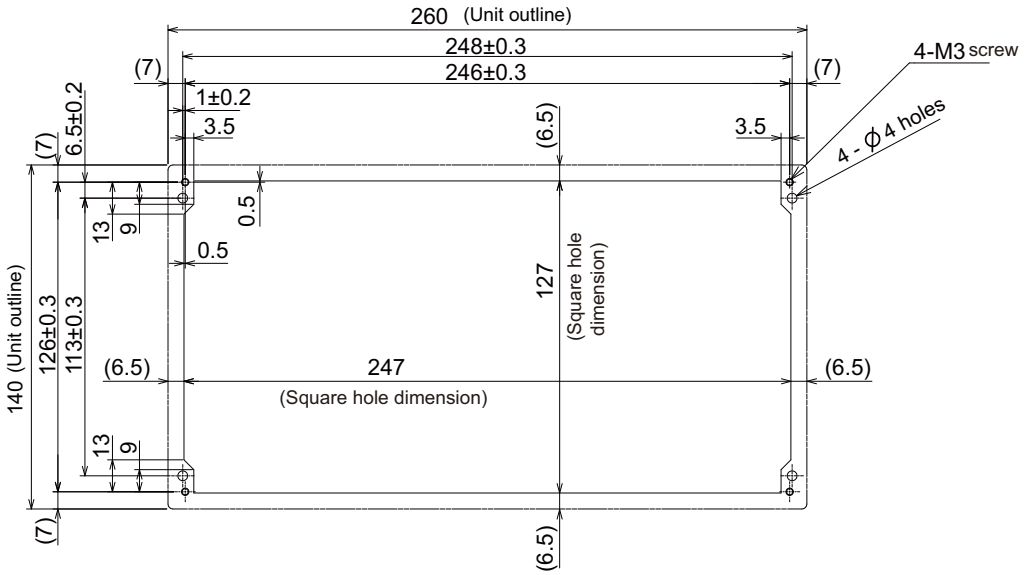
[Outline dimension : FCU8-KB926]

[mm]



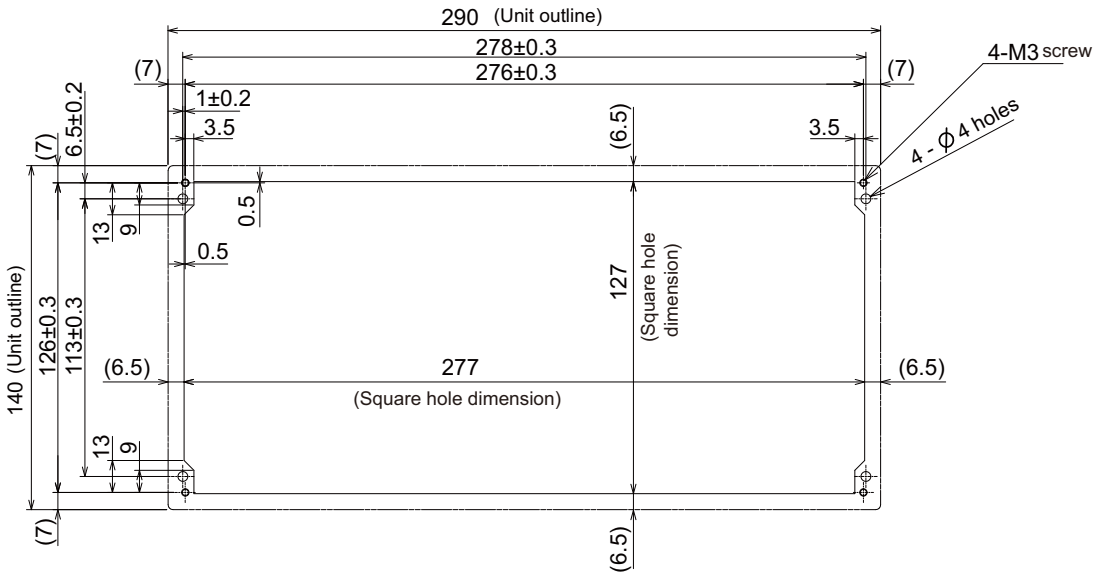
[Panel cut dimension : FCU8-KB921 / FCU8-KB922 / FCU8-KB925]

[mm]



[Panel cut dimension : FCU8-KB923 / FCU8-KB924 / FCU8-KB926]

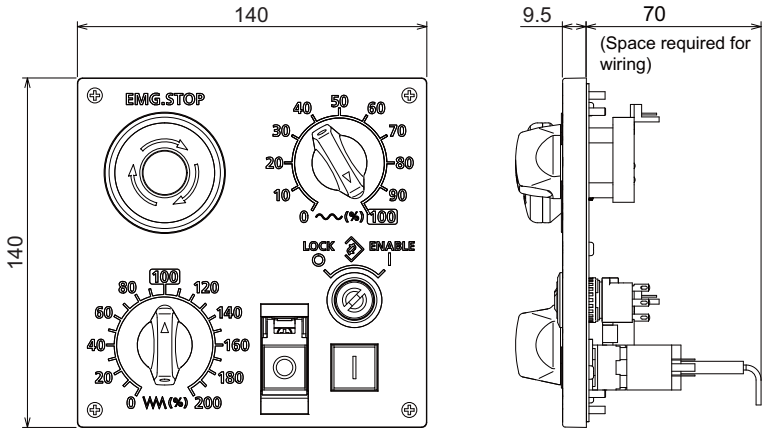
[mm]



4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB941)

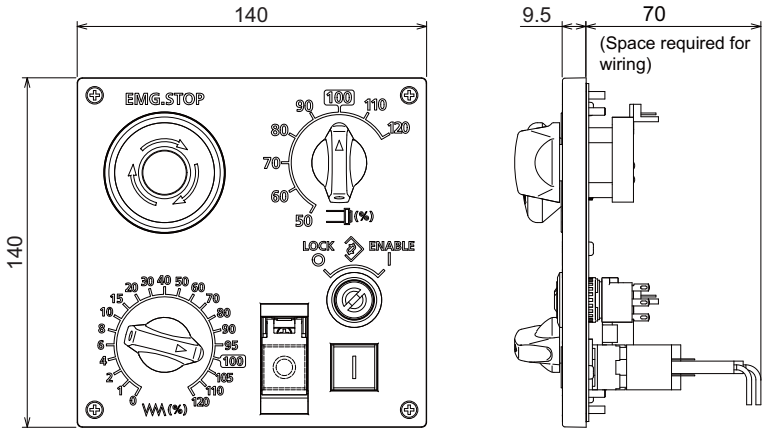
[Outline dimension : FCU8-KB931]

[mm]



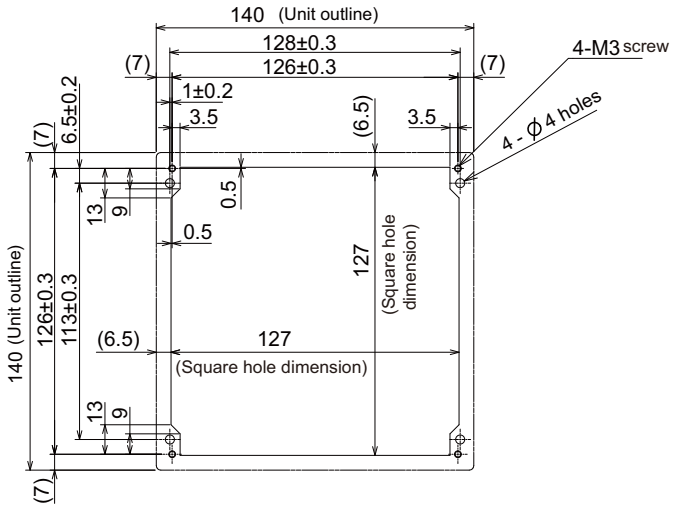
[Outline dimension : FCU8-KB941]

[mm]



[Panel cut dimension : FCU8-KB931 / FCU8-KB941]

[mm]

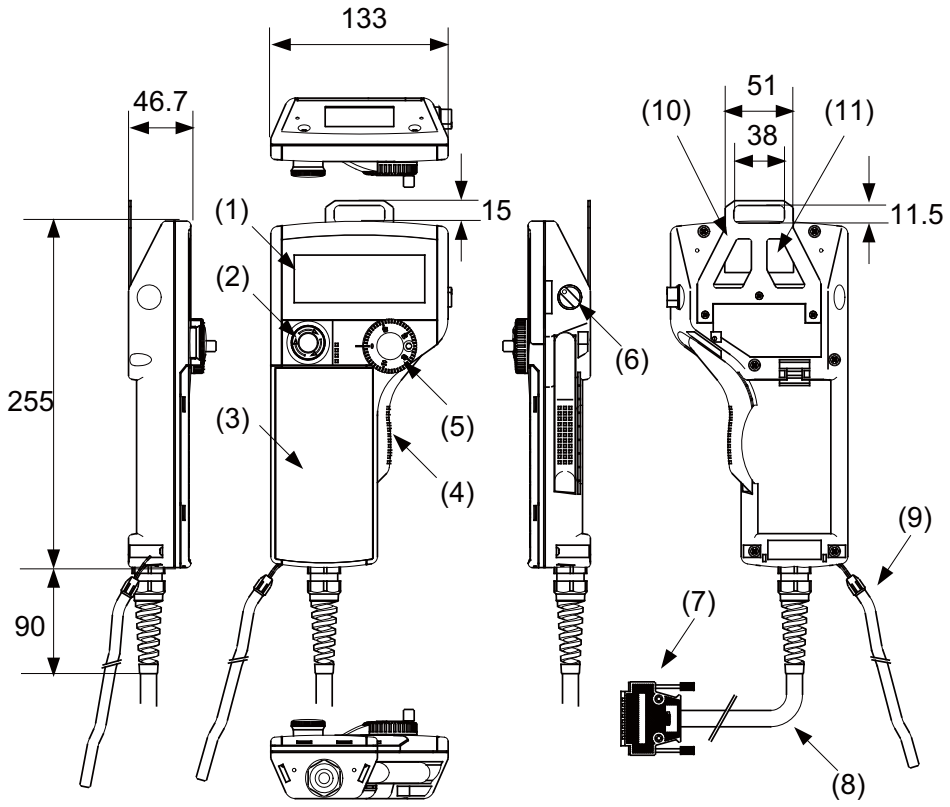


4.18 Handy Terminal

Item	Unit name		Handy terminal
	Type		HG1T-SB12UH-MK1346-L5
General Specifications	Ambient temperature	During operation	0 to 40 ℃
		During storage	-20 to 60 ℃
	Ambient humidity		Long term: 10 to 75% RH (with no dew condensation)
			Short term: 10 to 95% RH (with no dew condensation) (Note 1)
	Vibration resistance	During operation	9.8m/s^2 [1.0G] or less, 10 to 55Hz
	Shock resistance	During storage	98m/s^2 [10.0G] or less
	Working atmosphere		No corrosive gases, dust or oil mist
Power specifications	Power voltage		24VDC±5% Ripple noise 240mV (P-P)
	Current consumption	(max.)	0.2A
	Instantaneous stop tolerance time		24VDC: 4ms or less
Others	Heating value		4W (max.)
	Mass		0.6kg

(Note 1) "Short term" means within one month.
(Note 2) The unit is an IP65F equivalent.

Dimension and names of parts



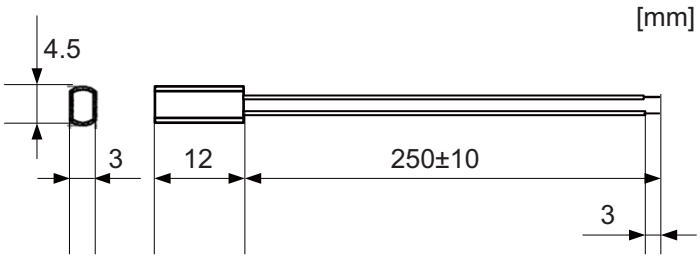
No.	Name	Function/ Specification		No.	Name	Function/ Specification
(1)	LCD	Monochrome display with backlight 192(W) × 64(H) dots		(7)	HOST	Host interface connector (DDK: 17JE-23250-02(D8A6))
(2)	SW1	Emergency stop switch Contact rating/ Contact: 24VDC, 1A Contact configuration: 2b contacts (IDEC Corporation: HA1E-V2S2VR)		(8)	-	Host interface cable (5m)
(3)	-	Membrane switch (Note)		(9)	-	Simplified hand strap (IDEC Corporation: HG9Z-PS1)
(4)	SW2	Enable switch Contact rating/ Contact: 24VDC, 50mA Contact configuration: 3 position contact × 2 (OFF-ON-OFF) (IDEC Corporation: HE3B-M2)		(10)	-	Panel hanging fitting (IDEC Corporation: HG9Z-TK1)
(5)	SW4	Manual pulse generator Output: Open collector 4.7kΩ pull-up resistor is connected. (TOKYO SOKUTEIKIZAI CO., LTD: RE19PH50C16RR)		(11)	-	Serial number plate
(6)	SW6	Selector switch				

(Note) Do not press multiple switches simultaneously: When three or more switches are pressed simultaneously, unpressed switches are also detected as pressed ones.

4.19 Thermistor

4.19.1 Thermistor(PT3C-51F-M2)

[Outline dimension]



Made by SHIBAURA ELECTRONICS Co., Ltd.

Ambient temperature	-10 to + 190 ℃
Insulation resistance	100MΩ or more at 500VDC [between case and lead wire]

4.20 Exclusive SD Cards for MITSUBISHI CNC

Item		FCU8-SD001G	FCU8-SD004G
Capacity		1GB	4GB
NAND Flash		SLC (Note 1)	
Ambient temperature	During operation	-25 ℃ to +85 ℃	
	During storage	-40 ℃ to +85 ℃	
Ambient humidity	During operation	5% to 95%RH (with no dew condensation)	
	During storage	5% to 95%RH (with no dew condensation)	

(Note 1) SLC stands for Single Level Cell, and it stores one bit data in each memory cell.
This provides longer life span and high product reliability in comparison with MLC (Multi Level Cell), which is commonly applied to SD cards.

(Note 2) Do not touch the terminal part with fingers, etc. when handling the SD cards.
The contermination of the terminal part of SD card causes a contact failure or a trouble.

4.21 Specifications and Precautions of USB/SD/LAN Interface

4.21.1 USB Interface (Memory I/F card)

	M800S / M80
Standards	USB2.0
Data transfer speed (Note)	High Speed (480Mbps) Full Speed (12Mbps) Low Speed (1.5Mbps)
Power supply to USB device	Supply voltage: 5V ± 5% Supply current: Max. 500mA/port
Number of free ports	Front X 1
Max. cable length	5m

(Note 1) Data transfer speed is the theoretical value on the standard, and the actual speed will be inferior to the value listed above. The transfer speed may be restrained depending on the specification of the connected device.

(Note 2) Do not connect the devices other than the USB memory.

(1) Precautions for insertion/removal of USB memory

When inserting/removing an USB memory, turn the MITUBISHI device's power OFF. Do not pull out the USB memory or turn OFF the power during access to the USB memory. Failure to observe this could cause the memory contents to be erased.

When Inserting/removing a USB memory, be sure to have enough interval to perform that (about 10 seconds or more).

In case of emergency, always perform backups by having your important data duplicate, etc. as MITUBISHI will not guarantee the broken or lost data.

(2) Precaution for operation with front-side USB memory

A USB memory to be used has to be supported USB2.0 Hi-Speed (480Mbps).

When connecting the USB memory, connect it directly without using the extension cable or USB hub.

Machine vibration may cause the USB memory to fall out depending on environment. Therefore, the operation with the front-side USB memory is required to be performed on your own responsibility.

4.21.2 SD Interface (Memory I/F card)

	M800S / M80
Standards	SD/SDHC (Note)
Transfer speed	According to the connecting SD card
Capacity	32GB
Number of free ports	Front X 1, Rear X 1

(Note) SDXC is not supported.

(1) Precautions for use of commercially available SD card

MITUBISHI will not provide performance guarantee and maintenance for commercially available SD card, mini SD card or micro SD card (requires converting adapter). In case of using one of them, careful performance check must be required by the machine tool builder.

Commercially available devices may not be compatible with MITSUBISHI units or suitable FA environment for temperature- or noise-wise.

(2) Precautions for insertion/removal of SD card

When inserting/removing an SD card, turn the MITUBISHI device's power OFF. Do not pull out the card or turn OFF the power during access to the SD card. Failure to observe this could cause the memory contents to be erased.

In case of emergency, always perform backups by having your important data duplicate, etc. as MITUBISHI will not guarantee the broken or lost data.

4.21.3 LAN Interface (Control Unit)

	M800S/M80
Standards	100BASE-TX / 10BASE-T
Data transfer speed (Note 1)	100Mbps / 10Mbps
Number of free ports	Control unit × 2

(Note 1) Data transfer speed is the theoretical value on the standard, and the actual speed will be inferior to the value listed above. The transfer speed may be restrained depending on the specification of the connected device.

(Note 2) When using half-duplex communication, the response time may become long depending on the connected device.

Use full-duplex communication to connect with the opposite device via a switching HUB.

(1) Precautions for selection of LAN cable

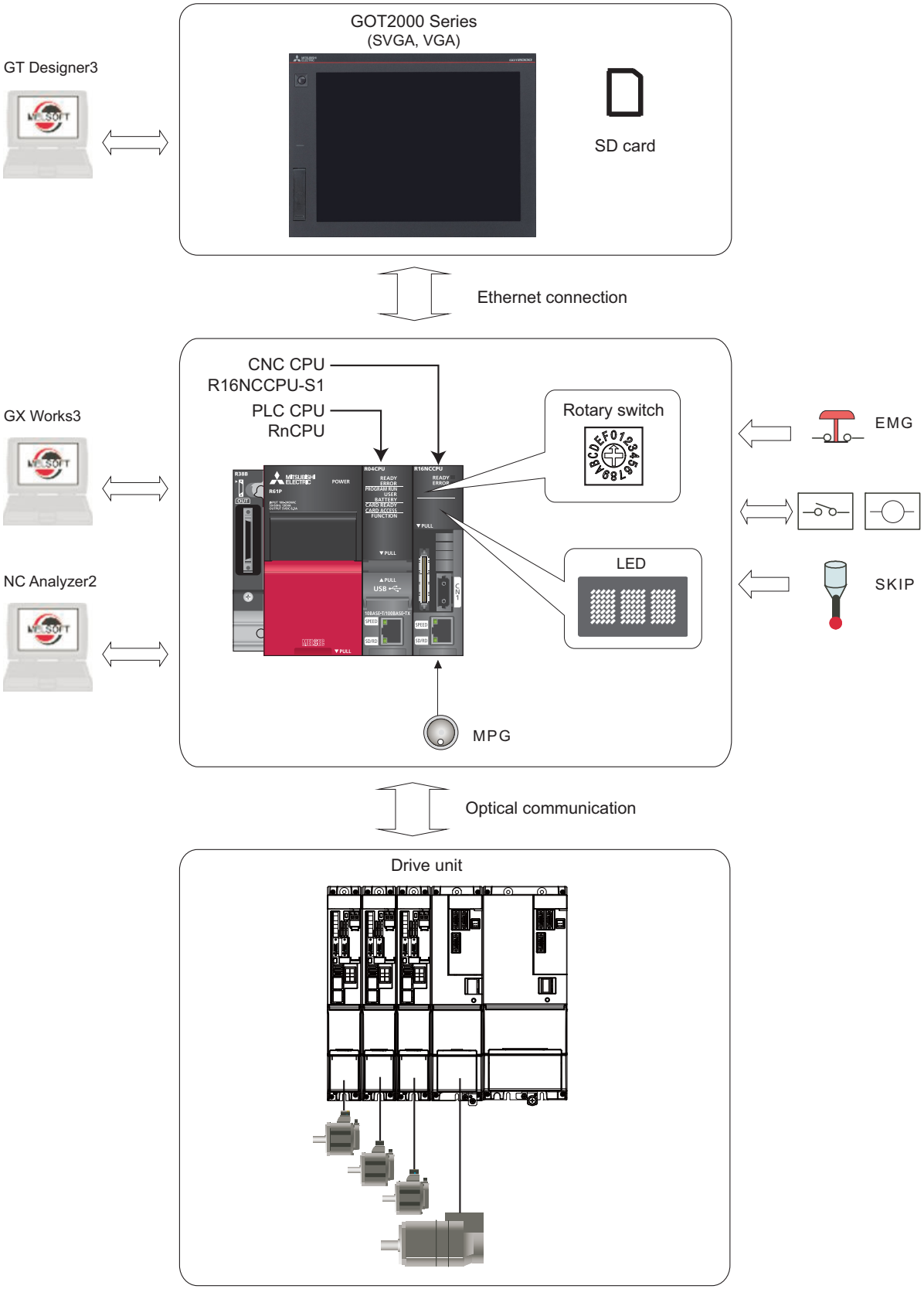
Make sure to select the LAN cables which are "category 5e or above" and "shielded". Cable wire material with double shielded, which is appropriate for FA environment., is recommended.

C80 Series
Hardware

1

System Basic Configuration (C80 Series)

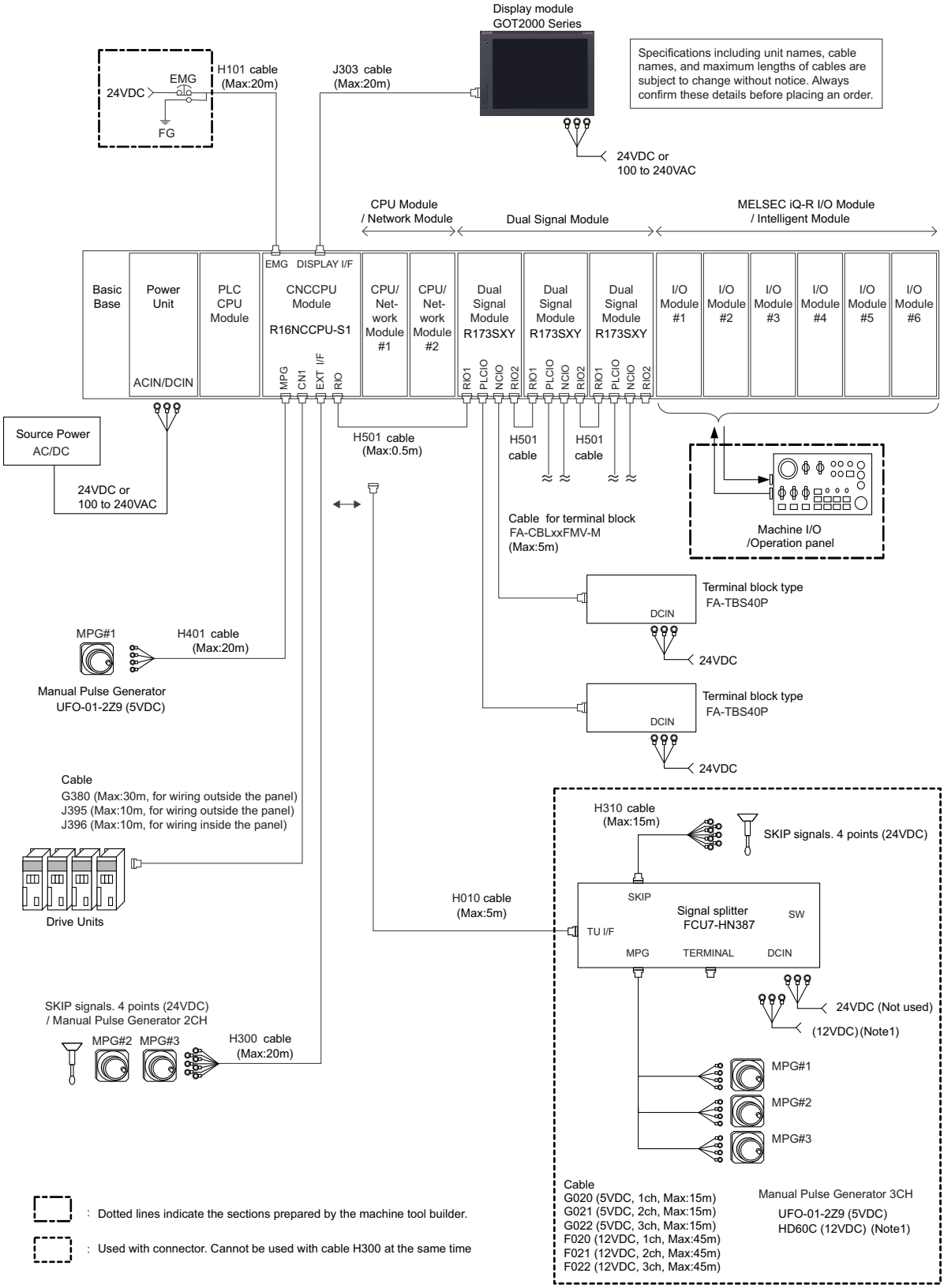
1.1 System Basic Configuration Drawing



(Note) The supported versions of the GT Designer3 are as follows:
SVGA: Version 1.155M or later
VGA: Version 1.165X or later
GX Works3 Version 1.025B or later is required.

2

General Connection Diagram (C80 Series)



(Note 1) HD60C (12VDC) requires another power source 12VDC.

(Note 2) A CPU module can be mounted on the CPU slot of the base unit or the slot No. 0 to 6. A slot between CPU modules can be left empty for reservation. Note that you cannot mount an I/O module or intelligent function module on a slot between CPU modules.

3

List of Configuration (C80 Series)

3.1 CNC Control Unit

(1) Basic base

Model name	Remarks	Reference
R35B	5 slots: for mounting MELSEC iQ-R series module	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)
R38B	8 slots: for mounting MELSEC iQ-R series module	
R312B	12 slots: for mounting MELSEC iQ-R series module	

(2) Power supply

Model name	Remarks	Reference
R61P	AC power supply module input: AC100 to 240V, output: DC5V/6.5A	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)
R62P	AC power supply module input: AC100 to 240V, output: DC5V/3.5A, DC24V/0.6A	
R63P	DC power supply module input: DC24V, output: DC5V/6.5A	
R64P	AC power supply module input: AC100 to 240V, output: DC5V/9A	

(3) PLC CPU

Model name	Remarks	Reference
R04CPU	Program capacity: 40k steps, Elementary operation processing speed (LD command): 0.98ns	MELSEC iQ-R CPU Module User's Manual (Startup) (SH(NA)-081263) MELSEC iQ-R CPU Module User's Manual (Application) (SH(NA)-081264)
R08CPU	Program capacity: 80k steps, Elementary operation processing speed (LD command): 0.98ns	
R16CPU	Program capacity: 160k steps, Elementary operation processing speed (LD command): 0.98ns	
R32CPU	Program capacity: 320k steps, Elementary operation processing speed (LD command): 0.98ns	
R120CPU	Program capacity: 1200k steps, Elementary operation processing speed (LD command): 0.98ns	

(4) CNC CPU module

Model name	Remarks
R16NCCPU-S1	CNC CPU module

(5) Input module

(a) AC

Model name	Remarks	Reference
RX10	AC input: 16 points, AC100 to 120V (50/60Hz)	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)

(b) DC (positive/negative common type)

Model name	Remarks	Reference
RX40C7	DC input: 16 points, DC24V, 7.0mA	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)
RX41C4	DC input: 32 points, DC24V, 4.0mA	
RX42C4	DC input: 64 points, DC24V, 4.0mA	
RX41C4-TS	DC input, 32 points, DC24V, 4.0mA, Spring clamp terminal block	

(6) Analog input module

(a) Voltage input module

Model name	Remarks	Reference
R60ADV8	Voltage input module: 8CH DC-10 to 10V/-32000 to 32000 80μs/CH	MELSEC iQ-R Analog-Digital Converter Module User's Manual (Startup) (SH(NA)-081232) MELSEC iQ-R Analog-Digital Converter Module User's Manual (Application) (SH(NA)-081233)

(b) Current input module

Model name	Remarks	Reference
R60ADI8	Current input module: 8CH DC0 to 20mA/0 to 32000 80μs/CH	MELSEC iQ-R Analog-Digital Converter Module User's Manual (Startup) (SH(NA)-081232) MELSEC iQ-R Analog-Digital Converter Module User's Manual (Application) (SH(NA)-081233)

(c) Voltage/current input module

Model name	Remarks	Reference
R60AD4	Voltage/current input module: 4CH DC-10 to 10V/-32000 to 32000、DC0 to 20mA/0 to 32000 80μs/CH	MELSEC iQ-R Analog-Digital Converter Module User's Manual (Startup) (SH(NA)-081232) MELSEC iQ-R Analog-Digital Converter Module User's Manual (Application) (SH(NA)-081233)

(7) Output module

(a) Relay

Model name	Remarks	Reference
RY10R2	Relay output: 16 points, DC24V/2A, AC240V/2A	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)

(b) Triac

Model name	Remarks	Reference
RY20S6	Triac output, 16 points: 100-240 VAC / 0.6A	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)

(c) Transistor (sink type)

Model name	Remarks	Reference
RY40NT5P	Transistor (sink type) output: 16 points, DC12 to 24V, 0.5A	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)
RY41NT2P	Transistor (sink type) output: 32 points, DC12 to 24V, 0.2A	
RY42NT2P	Transistor (sink type) output: 64 points, DC12 to 24V, 0.2A	

(d) Transistor (independent)

Model name	Remarks	Reference
RY40PT5P	Transistor (source type) output: 16 points, DC12 to 24V, 0.5A	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)
RY41PT1P	Transistor (source type) output: 32 points, DC12 to 24V, 0.1A	
RY42PT1P	Transistor (source type) output: 64 points, DC12 to 24V, 0.1A	
RY41PT1P-TS	Transistor (source type) output: 32 points, DC12 to 24V, 0.1A, Spring clamp terminal block	

(8) Analog output module

Voltage output module

Model name	Remarks	Reference
R60DAV8	Voltage output module: 8CH -32000 to 32000/DC-10 to 10V 80μs/CH	MELSEC iQ-R Digital-Analog Converter Module User's Manual (Startup) (SH(NA)-081235) MELSEC iQ-R Digital-Analog Converter Module User's Manual (Application) (SH(NA)-081237)

(b) Current output module

Model name	Remarks	Reference
R60DAI8	Current input module: 8CH 0 to 32000/DC0 to 20mA 80μs/CH	MELSEC iQ-R Digital-Analog Converter Module User's Manual (Startup) (SH(NA)-081235) MELSEC iQ-R Digital-Analog Converter Module User's Manual (Application) (SH(NA)-081237)

(c) Voltage/current output module

Model name	Remarks	Reference
R60DA4	Voltage/current input module: 4CH DC-10 to 10V/-32000 to 32000、DC0 to 20mA/0 to 32000 80μs/CH	MELSEC iQ-R Digital-Analog Converter Module User's Manual (Startup) (SH(NA)-081235) MELSEC iQ-R Digital-Analog Converter Module User's Manual (Application) (SH(NA)-081237)

(9) Temperature adjustment

(a) Thermocouple

Model name	Remarks	Reference
R60TCTRT2TT2 (R60TCTT4)	4 channels Thermocouple (K,J,T,B,S,E,R,N,U,L,PL Ⅱ,W5Re/W26Re) Platinum RTD (Pt100,JPt100) Without heater disconnection detection Sampling period: 250ms/4channels, 500ms/4channels 18-point terminal block Channels are isolated Heating and cooling control	Temperature Control Module User's Manual (Startup) (SH(NA)-081535) Temperature Control Module User's Manual (Application) (SH(NA)-081536)
R60TCTRT2TT2BW (R60TCTT4BW)	4 channels Thermocouple (K,J,T,B,S,E,R,N,U,L,PL Ⅱ,W5Re/W26Re) Platinum RTD (Pt100,JPt100) With heater disconnection detection Sampling period: 250ms/4channels, 500ms/4channels 2 units of 18-point terminal block Channels are isolated Heating and cooling control	

(b) Platinum RTD

Model name	Remarks	Reference
R60TCRT4	4 channels Platinum RTD (Pt100,JPt100) Without heater disconnection detection Sampling period: 250ms/4channels, 500ms/4channels 18-point terminal block Channels are isolated Heating and cooling control	Temperature Control Module User's Manual (Startup) (SH(NA)-081535) Temperature Control Module User's Manual (Application) (SH(NA)-081536)
R60TCRT4BW	4 channels Platinum RTD (Pt100,JPt100) With heater disconnection detection Sampling period: 250ms/4channels, 500ms/4channels 2 units of 18-point terminal block Channels are isolated Heating and cooling control	

(10) High-speed counter module

Model name	Remarks	Reference
RD62P2	DC5/12/24V, input: 2CH Maximum counting speed: 200kpulse/s External output: transistor (sink type)	MELSEC iQ-R High-Speed Counter Module User's Manual (Startup) (SH(NA)-081239) MELSEC iQ-R High-Speed Counter Module User's Manual (Application) (SH(NA)-081241)
RD62D2	Differential-input: 2CH Maximum counting speed: 8Mpulse/s External output: transistor (sink type)	
RD62P2E	DC5/12/24V, input: 2CH Maximum counting speed: 200kpulse/s External output: transistor (source type)	

(11) Ethernet

Model name	Remarks	Reference
RJ71EN71	1Gbps/100Mbps/10Mbps: 2 ports Multi-network supported (Ethernet/CC-Link IE Field Network, CC-Link IE Controller Network (twisted pair cable))	MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) (SH(NA)-081256) MELSEC iQ-R Ethernet User's Manual (Application) (SH(NA)-081257) MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application) (SH(NA)-081258) MELSEC iQ-R CC-Link IE Field Network User's Manual (Application) (SH(NA)-081259)

(12) Serial communication

Model name	Remarks	Reference
RJ71C24	Max. 230.4kbps RS-232:1CH、RS-422/485:1CH	MELSEC iQ-R Serial Communication Module User's Manual (Startup) (SH(NA)-081250) MELSEC iQ-R Serial Communication Module User's Manual (Application) (SH(NA)-081251)
RJ71C24-R2	Max. 230.4kbps RS-232:2CH	
RJ71C24-R4	Max. 230.4kbps RS-422/485:2CH	

(13) MES interface module

Model name	Remarks	Reference
RD81MES96	1000BASE-T/100BASE-TX/10BASE-T Database dynamic link (MX ME Interface-R is separately required.)	MELSEC iQ-R MES Interface Module User's Manual (Startup) (SH(NA)-081422) MELSEC iQ-R MES Interface Module User's Manual (Application) (SH(NA)-081423)

(14) CC-Link

Model name	Remarks	Reference
RJ61BT11	Max. 10Mbps master/local station CC-Link Ver.2 supported	MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Startup) (SH(NA)-081269) MELSEC iQ-R CC-Link System Master/Local Module User's Manual (Application) (SH(NA)-081270)

(15) CC-Link IE controller network

Model name	Remarks	Reference
RJ71GP21-SX	1Gbps optical fiber cable control/normal station	MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) (SH(NA)-081256) MELSEC iQ-R CC-Link IE Controller Network User's Manual (Application) (SH(NA)-081258)

(16) CC-Link IE Field Network

Model name	Remarks	Reference
RJ71GF11-T2	1Gbps master/local station	MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup) (SH(NA)-081256) MELSEC iQ-R CC-Link IE Field Network User's Manual (Application) (SH(NA)-081259)

(17) Extension base

Model name	Remarks	Reference
R65B	5 slots: for mounting MELSEC iQ-R series module	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)
R68B	8 slots: for mounting MELSEC iQ-R series module	
R612B	12 slots: for mounting MELSEC iQ-R series module	

(18) RQ extension base

Model name	Remarks	Reference
RQ65B	5 slots: for mounting MELSEC Q series module	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)
RQ68B	8 slots: for mounting MELSEC Q series module	
RQ612B	12 slots: for mounting MELSEC Q series module	

(19) Spring clamp terminal block

Model name	Remarks	Reference
Q6TE-18SN	For 16 points I/O modules, 0.3 to 1.5mm^2 (AWG22 to 16)	I/O Module Type Building Block User's Manual (SH(NA)-080042)

(20) Connector/terminal block converter module

Model name	Remarks	Reference
A6TBX70	For positive common type input modules (3-wire type)	I/O Module Type Building Block User's Manual (SH(NA)-080042)
A6TBXY36	For positive common type input modules and sink type output modules (standard type)	
A6TBXY54	For positive common type input modules and sink type output modules (2-wire type)	

(21) Cable

(a) Cables for CNC CPU

Cable type	Application	Max. length	Standard cable length (m)	Remarks
F020	Manual pulse generator: 1ch	45m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	12V power supply type can be used. For Signal splitter
F021	Manual pulse generator: 2ch	45m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	
F022	Manual pulse generator: 3ch	45m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	
G020	Manual pulse generator: 1ch	15m	0.5, 1, 2, 3, 5, 7, 10, 15	5V power supply type can be used. For Signal splitter
G021	Manual pulse generator: 2ch	15m	0.5, 1, 2, 3, 5, 7, 10, 15	
G022	Manual pulse generator: 3ch	15m	0.5, 1, 2, 3, 5, 7, 10, 15	
H010	Signal splitter connection	5m	0.5, 1, 2, 3, 5	
H101	Emergency stop	20m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	
H300	SKIP/manual pulse generator input	20m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	
H310	SKIP connection	15m	0.5, 1, 2, 3, 5, 7, 10, 15	For Signal splitter
H401	Manual pulse generator: 1ch for 5V	20m	0.5, 1, 2, 3, 5, 7, 10, 15, 20	
H501	Dual-signal module communication	0.5m	0.1, 0.2, 0.3, 0.5	
J303	Display module communication (Straight)	20m	1, 2, 3, 5, 7, 10, 15, 20	

(Note) The Standard cable length column shows the lengths of the cable available from MITSUBISHI.

(b) Cable for connector and terminal block changeover unit

Model name	Remarks	Reference
AC05TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 0.5m	I/O Module Type Building Block User's Manual (SH(NA)-080042)
AC10TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 1m	
AC20TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 2m	
AC30TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 3m	
AC50TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 5m	
AC80TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 8m (Common current not exceeding 0.5A)	
AC100TB	For A6TBXY36/A6TBXY54/A6TBX70 (positive common/sink type modules) 10m (Common current not exceeding 0.5A)	

(c) Cable for drive unit

Cable type	Application	Max. length	Standard cable length (m)
CNP2E-1-xM	Motor side PLG cable Spindle side accuracy encoder TS5690 cable	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNP3EZ-2P-xM	Spindle side encoder cable OSE-1024 cable	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNP3EZ-3P-xM	Spindle side encoder cable OSE-1024 cable	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNV2E-8P-xM	Motor side encoder cable for HG/HG-H, HQ/HQ-H (For D48/D51/D74)	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNV2E-9P-xM	Motor side encoder cable for HG/HG-H, HQ/HQ-H (For D48/D51/D74)	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNV2E-D-xM	MDS-B-SD unit cable	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
CNV2E-HP-xM	MDS-B-HR unit cable	30m	2, 3, 4, 5, 7, 10, 15, 20, 25, 30
DG30-xM	Battery cable (drive unit - battery box, drive unit - drive unit)	10m	0.3, 0.5, 1, 2, 3, 5, 7, 10
G380 LxM	Optical communication cable for wiring between drive units (outside panel)	30m	5, 10, 12, 15, 20, 25, 30
J395 LxM	Optical communication cable for wiring between drive units (outside panel) for wiring between NC-drive units	10m	3, 5, 7, 10
J396 LxM	Optical communication cable for wiring between drive units (inside panel)	10m	0.2, 0.3, 0.5, 1, 2, 3, 5
MR-BKS1CBLxMA1-H	<200V Series> Brake cable for HG96 Lead out in direction of motor shaft	10m	2, 3, 5, 7, 10
MR-BKS1CBLxMA2-H	<200V Series> Brake cable for HG96 Lead out in opposite direction of motor shaft	10m	2, 3, 5, 7, 10
MR-BT6V2CBL LxM	Battery cable (MDS-EJ/EJH) (drive unit - drive unit)	1m	0.3, 1
MR-D05UDL3M-B	STO cable	3m	3
MR-PWS1CBLxMA1-H	<200V Series> Power cable for HG96 Lead out in direction of motor shaft	10m	2, 3, 5, 7, 10
MR-PWS1CBLxMA2-H	<200V Series> Power cable for HG96 (Note) It can not be used with HF-KP13. Lead out in opposite direction of motor shaft	10m	2, 3, 5, 7, 10
SH21 LxM	Power supply communication cable Power backup unit communication cable	30m	0.35, 0.5, 1, 2, 3

(Note 1) The Standard cable length column shows the lengths of the cable available from MITSUBISHI.

(Note 2) "x" in type columns indicate cable length (unit: m).

(22) Relay terminal unit

(a) Unit

Model name	Remarks	Reference
A6TE2-16SRN	40 pin connector For 24VDC Transistor output unit (sink type module)	Relay Terminal Module User's Manual (Hardware) A6TE2-16SRN (IB(NA)-66833)

(b) Cable

Model name	Remarks	Reference
AC06TE	For A6TE2-16SRN 0.6m For 32 points (1 connector), one of this cable and two units of the relay terminal unit are used	Relay Terminal Module User's Manual (Hardware) A6TE2-16SRN (IB(NA)-66833)
AC10TE	For A6TE2-16SRN 1m For 32 points (1 connector), one of this cable and two units of the relay terminal unit are used	
AC30TE	For A6TE2-16SRN 3m For 32 points (1 connector), one of this cable and two units of the relay terminal unit are used	
AC50TE	For A6TE2-16SRN 5m For 32 points (1 connector), one of this cable and two units of the relay terminal unit are used	
AC100TE	For A6TE2-16SRN 10m For 32 points (1 connector), one of this cable and two units of the relay terminal unit are used	

(23) Extension cable

Model name	Remarks	Reference
RC06B	0.6m cable for connecting the extension base/the RQ extension base with the basic base	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)
RC12B	1.2m cable for connecting the extension base/the RQ extension base with the basic base	
RC30B	3m cable for connecting the extension base/the RQ extension base with the basic base	
RC50B	5m cable for connecting the extension base/the RQ extension base with the basic base	

(24) Connector

Model name	Remarks	Reference
A6CON1	Soldering type 32 point-connector (40-pin connector)	I/O Module Type Building Block User's Manual (SH(NA)-080042)
A6CON2	Crimp-contact type 32 point-connector (40-pin connector)	
A6CON3	Flat cable pressure displacement type 32-point connector (40-pin connector)	
A6CON4	Soldering type 32 point-connector (40-pin connector; two-way cable can be mounted)	

(25) CC-Link Remote I/O unit

(a) Thread terminal block type

Model name	Remarks	Reference
AJ65SBTB1-16D	Input 16 points: 24VDC (positive/negative common shared type), 1-wire, terminal block type, response time: 1.5 ms	CC-Link System Compact Type Remote I/O Module User's Manual (SH(NA)-4007)
AJ65SBTB1-32D	Input 32 points: 24VDC (positive/negative common shared type), 1-wire, terminal block type, response time: 1.5 ms	
AJ65SBTB1-16TE	Output 16 points: 12/24VDC (0.1A), transistor output (source type), 1-wire, terminal block type	
AJ65SBTB1-32TE1	Output 32 points: 12/24VDC (0.5A), transistor output (source type), 1-wire, terminal block type	

(b) Waterproof connector type

Model name	Remarks	Reference
AJ65FBTA4-16DE	Input 16 points: 24VDC (negative common), 4-wire, super-slim waterproof type, response time: 1.5 ms	CC-Link System Compact Type Remote I/O Module User's Manual (SH(NA)-4007)
AJ65FBTA2-16TE	Output 16 points: 12/24VDC (1.0A), transistor output (source type), 2-wire, super-slim waterproof type	

(26) I/O mixed unit

(a) DC input/transistor output

Model name	Remarks	Reference
RH42C4NT2P	DC input: 32 points, DC24V, 4.0mA Transistor (sink type) output: 32 points, DC12 to 24V, 0.2A	MELSEC iQ-R I/O Module User's Manual (SH(NA)-081247)

(27) SD memory card

Model name	Remarks	Reference
NZ1MEM-2GBSD	2G byte	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)

(28) Extended SRAM cassette

Model name	Remarks	Reference
NZ2MC-1MBS	1M byte	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)

3.2 GOT

3.2.1 GT27

(1) GOT

(a) GT2715

Model name	Remarks	Reference
GT2715-XTBA	15-type XGA [1024×768 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM):57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version(GOT2000) 1.117X or later.	GT27 General Description (IB(NA)-0800502)

(b) GT2712

Model name	Remarks	Reference
GT2712-STBA	12.1-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM):57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	GT27 General Description (IB(NA)-0800502)
GT2712-STBD	12.1-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 24VDC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	

(c) GT2710

Model name	Remarks	Reference
GT2710-STBA	10.4-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM):57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	GT27 General Description (IB(NA)-0800502)
GT2710-STBD	10.4-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 24VDC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	
GT2710-VTBA	10.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM):57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	GT27 General Description (IB(NA)-0800502)
GT2710-VTBD	10.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 24VDC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	

(d) GT2708

Model name	Remarks	Reference
GT2708-STBA	8.4-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	GT27 General Description (IB(NA)-0800502)
GT2708-STBD	8.4-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 24VDC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155M or later.	
GT2708-VTBA	8.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 100-240VAC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	GT27 General Description (IB(NA)-0800502)
GT2708-VTBD	8.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors <Multimedia and video/RGB and multi-touch supported> 24VDC, user memory, storage memory (ROM): 57MB, operation memory (RAM): 128MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	

(e) GT2705

Model name	Remarks	Reference
GT2705-VTBD	5.7-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors <Multi-touch supported> 24VDC, user memory, storage memory (ROM): 32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	GT27 General Description (IB(NA)-0800502)

(2) SD card

Model name	Remarks	Reference
NZ1MEM-2GBSD	2GB SD memory card for GOT	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)

(3) Protection sheet

Model name	Remarks	Reference
GT27-15PSCC	Protection sheet for 15-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	GOT2000 Series Protective Sheet for GT27/GT25/GT23 User's Manual (IB(NA)-0800499)
GT25-12PSCC	Protection sheet for 12.1-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	
GT25-10PSCC	Protection sheet for 10.4-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	
GT25-08PSCC	Protection sheet for 8.4-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	
GT25-05PSCC	Protection sheet for 5.7-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	

3.2.2 GT25

(1) GOT

(a) GT2512

Model name	Remarks	Reference
GT2512-STBA	12.1-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors 100-240VAC, user memory, storage memory (ROM):32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155X or later.	GT25 General Description (IB(NA)-0800537)
GT2512-STBD	12.1-type SVGA [800×600 dots] TFT color liquid crystal display, 65536 colors 24VDC, user memory, storage memory (ROM): 32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.155X or later.	

(b) GT2510

Model name	Remarks	Reference
GT2510-VTBA	10.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors 100-240VAC, user memory, storage memory (ROM):32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	GT25 General Description (IB(NA)-0800537)
GT2510-VTBD	10.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors 24VDC, user memory, storage memory (ROM): 32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	

(c) GT2508

Model name	Remarks	Reference
GT2508-VTBA	8.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors 100-240VAC, user memory, storage memory (ROM): 32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	GT25 General Description (IB(NA)-0800537)
GT2508-VTBD	8.4-type VGA［640×480 dots] TFT color liquid crystal display, 65536 colors 24VDC, user memory, storage memory (ROM): 32MB, operation memory (RAM): 80MB ・Requiring GT Designer3 Version1 (GOT2000) 1.165X or later.	

(d) GT25 Handy GOT

Model name	Remarks	Reference
GT2506HS-VTBD	Display section: 6.5" VGA, TFT color liquid crystal display, 65536 colors, panel color: black, power supply: 24 V DC ・Requiring GT Works3 Version1.195D or later	GT25 Handy GOT General Description (GT2506HS-V) (JY997D72901)

(2) SD card

Model name	Remarks	Reference
NZ1MEM-2GBSD	2GB SD memory card for GOT	MELSEC iQ-R Module Configuration Manual (SH(NA)-081262)

(3) Protection sheet

Model name	Remarks	Reference
GT25-12PSCC	Protection sheet for 12.1-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	GOT2000 Series Protective Sheet for GT27/GT25/GT23 User's Manual (IB(NA)-0800499)
GT25-10PSCC	Protection sheet for 10.4-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	
GT25-08PSCC	Protection sheet for 8.4-type (Clear, 5 sheets) Surface treatment: clear, sheet color: clear, USB environment resistant cover part: with opening, the number of sheets in a set: 5 sheets	

3.3 Peripheral Device

(1) Signal splitter

Model name	Remarks
FCU7-HN387	Manual pulse generator is required for 2 or 3 axes specifications

(2) FL-net (OPCN-2) Interface module

Model name	Remarks
ER-1FL2-T	10BASE-T, 100BASE-TX

(3) Manual pulse generator

Model name	Remarks
UFO-01-2Z9	5V specifications
HD60C	12V specifications, for connection to operation panel I/O module 12V power supply is separately required.

3.4 Dual Signal Module

(1) Dual signal module

Model name	Remarks
R173SXY	I/O duplication monitoring module (Maximum 3 modules)

(2) Terminal block

Model name	Remarks
FA-TBS40P	Terminal block converter module (Arrangement : MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED) UL supported.
FA-LTB40P	Terminal block converter module (Arrangement : MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED)

(3) Cable

Model name	Remarks
FA-CBL ☐☐ FMV-M	Cable for terminal block converter module (Cable length ☐☐ = 05:0.5m, 10:1m, 20:2m, 30:3m, 50:5m) (Arrangement: MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED)

3.5 List of Q Series Units (for RQ extension base unit)

(1) Extension base

Model name	Remarks	Reference
Q63B	3 slots; for mounting Q series modules including power supply module	QCPU User's Manual (Hardware Design, Maintenance and Inspection) (SH(NA)-080483ENG)
Q65B	5 slots; for mounting Q series modules including power supply module	
Q68B	8 slots; for mounting Q series modules including power supply module	
Q612B	12 slots; for mounting Q series modules including power supply module	
Q52B	2 slots; for mounting Q series modules including power supply module	
Q55B	5 slots; for mounting Q series modules including power supply module	

(2) Extension cable

Model name	Remarks	Reference
QC05B	0.45m Cable	QCPU User's Manual (Hardware Design, Maintenance and Inspection) (SH(NA)-080483ENG)
QC06B	0.6m Cable	
QC12B	1.2m Cable	
QC30B	3m Cable	
QC50B	5m Cable	
QC100B	10m Cable	

(3) Power supply

Model name	Remarks	Reference
Q61P	Input power supply: 100 to 240VAC, output power supply: 5VDC, output current: 6A	QCPU User's Manual (Hardware Design, Maintenance and Inspection) (SH(NA)-080483ENG)
Q63P	Input voltage: 24VDC, output voltage: 5VDC, output current: 6A	
Q64PN	Input voltage: 100 to 240VAC, output voltage: 5VDC, output current: 8.5A	

(4) Output module

(a) Transistor (independent)

Model name	Remarks	Reference
QY68A	8 points, 5 to 24VDC OFF-time leakage current: 0.1mA Response time: 10ms, Sink/source type 18-point terminal block, Surge killer provided All points isolated	I/O Module Type Building Block User's Manual (SH(NA)-080042)

(5) Analog output module

(a) Voltage/current output module

Model name	Remarks	Reference
Q62DA-FG	2 channels Input (resolution): 0 to 12000; -12000 to 12000; -16000 to 16000 Output: -12 to 12VDC, 0 to 22mADC Conversion speed: 10ms/2channels 18-point terminal block, Channels are isolated	Channel Isolated Digital-Analog Converter Module User's Manual (SH(NA)-080281)

(6) MELSECNET/H

(a) SI/QSI optical interface

Model name	Remarks	Reference
QJ71LP21-25	SI/QSI/H-PCF/Broad-band H-PCF optical cable, Double loop PLC to PLC network (control/normal station)/Remote I/O net (remote master station)	Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) (SH(NA)-080049) Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) (SH(NA)-080124) For QnA/Q4AR MELSECNET/10 Network System Reference Manual (IB(NA)-66690)

(b) Coaxial interface

Model name	Remarks	Reference
QJ71BR11	3C-2V/5C-2V coaxial cable, Single bus PLC to PLC network (control/normal station)/ Remote I/O net (remote master station)	Q Corresponding MELSECNET/H Network System Reference Manual (PLC to PLC network) (SH(NA)-080049) Q Corresponding MELSECNET/H Network System Reference Manual (Remote I/O network) (SH(NA)-080124) For QnA/Q4AR MELSECNET/10 Network System Reference Manual (IB(NA)-66690)

(7) FL-net (OPCN-2)

(a) Ver.2.00

Model name	Remarks	Reference
QJ71FL71-T-F01	10BASE-T/100BASE-TX	FL-net(OPCN-2) Interface Module User's Manual (SH(NA)-080350E)

(8) AS-i

Model name	Remarks	Reference
QJ71AS92	Master station, AS-Interface Specification Version 2.11 supported	AS-i Master Module User's Manual (Hardware) (IB(NA)-0800122E)

(9) DeviceNet

Model name	Remarks	Reference
QJ71DN91		

4

General Specifications (C80 Series)

For the specifications of GOT, I/O unit, etc. refer to the manuals listed in "List of Configuration".
For the drive unit specifications, refer to the specification manual for the drive unit you are using

4.1 Installation Environment Conditions

C80, which is an open equipment, must be installed within a sealed metal control panel (IP54 or higher).
C80 must also be used and stored under the conditions listed in the table of specifications below.

<table>
<tr><th>Item</th><th colspan="6">Specification</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="6">0 to 55 ℃ (-13 to 167°F)</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="6">-25 to 75 ℃ (-13 to 167°F)</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="6">5 to 95%RH non-condensing</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="6">5 to 95%RH non-condensing</td></tr>
<tr><td rowspan="5">Vibration resistance</td><td rowspan="5">Compliant with JIS B 3502 and IEC 61131-2</td><td></td><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td rowspan="2">Under intermittent vibration</td><td>5 to 8.4Hz</td><td>-</td><td>3.5mm</td><td rowspan="2">10 times each in X, Y, Z directions (For 80 min.)</td></tr>
<tr><td>8.4 to 150Hz</td><td>9.8m/s^2</td><td>-</td></tr>
<tr><td rowspan="2">Under continuous vibration</td><td>5 to 8.4Hz</td><td>-</td><td>1.75mm</td><td rowspan="2">-</td></tr>
<tr><td>8.4 to 150Hz</td><td>4.9m/s^2</td><td>-</td></tr>
<tr><td>Shock resistance</td><td colspan="6">147m/s^2, 3 times in each of 3 directions X, Y, Z</td></tr>
<tr><td>Operating ambience</td><td colspan="6">No corrosive gases nor inflammable gases</td></tr>
<tr><td>Operating altitude</td><td colspan="6">2000m (6561.68ft.) or less (Note 3)</td></tr>
<tr><td>Installation location</td><td colspan="6">Inside control panel</td></tr>
<tr><td>Overvoltage category (Note 1)</td><td colspan="6">II or less</td></tr>
<tr><td>Pollution level (Note 2)</td><td colspan="6">2 or less</td></tr>
</table>

(Note 1) This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities.
The surge withstand voltage for the equipment up to the rated 300V is 2500V.

(Note 2) This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

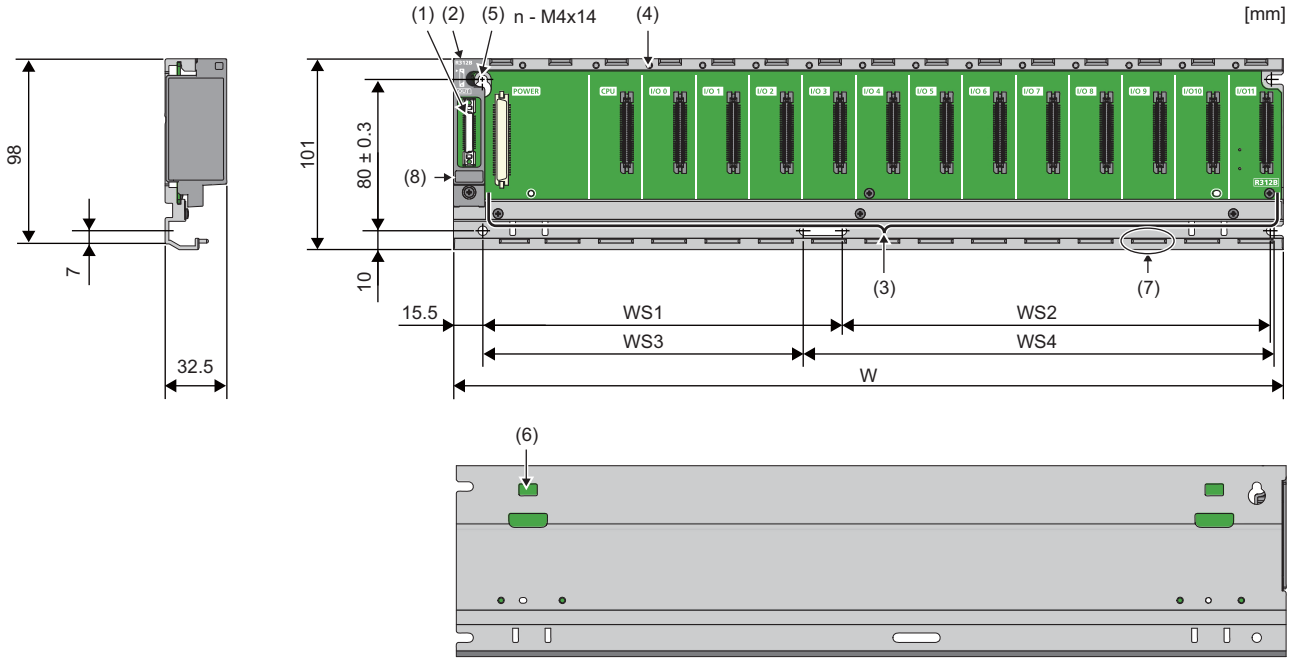
(Note 3) Do not use or store C80 under pressure higher than the atmospheric pressure of altitude 0m. Doing so can cause an operation failure.

(Note 4) The following environment conditions are also required for the layout design.

- No large amount of conductible dust, iron filings, oil mist, salt, or organic solvents
- No direct sunlight
- No strong electrical or magnetic fields
- No direct vibrations nor shocks on C80

4.2 Base Unit

4.2.1 Basic Base Unit



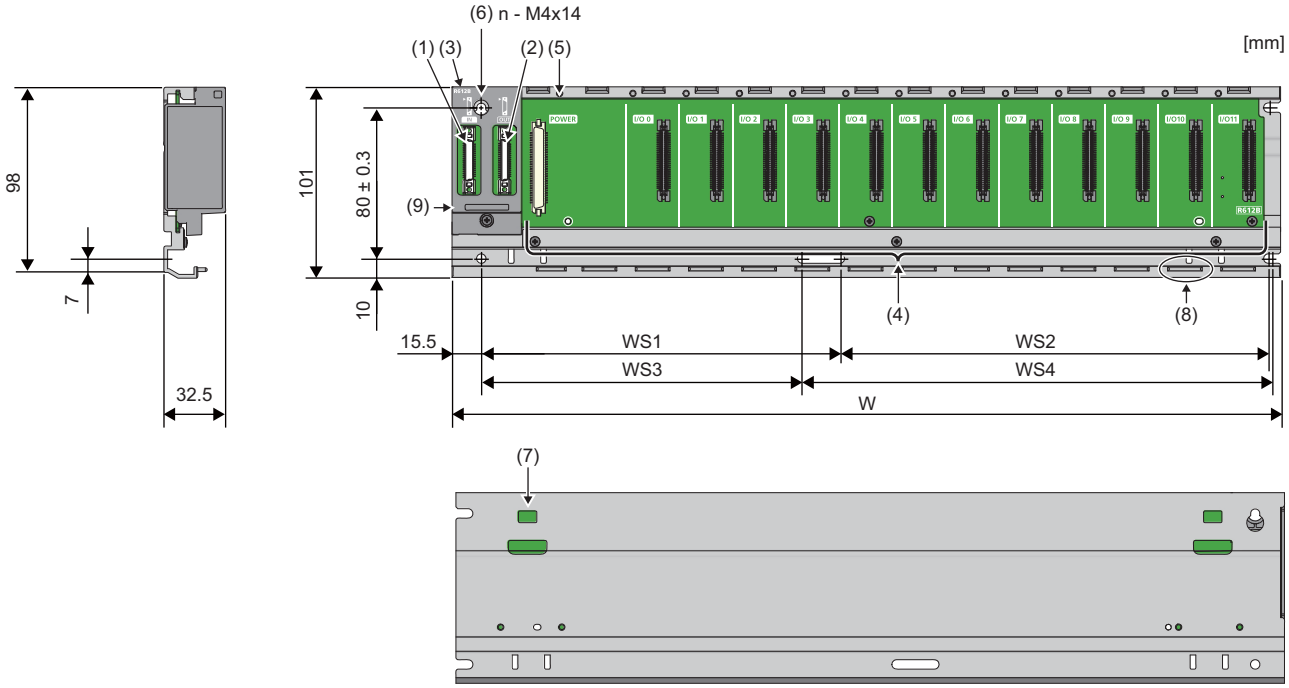
	R35B	R38B	R312B
n	4	5	5
W	245	328	439
WS1	-	190±0.3	190±0.3
WS2	-	116±0.3	227±0.3
WS3	-	(170)	(170)
WS4	-	(138)	(249)
WS1+WS2	222.5±0.3	-	-
WS3+WS4	(224.5)	-	-

[mm]

Number	Name	Description
(1)	Extension cable connector (OUT)	A connector for connecting to an extension base unit. A MELSEC iQ-R series extension cable is connected here. When no cable is connected, attach the supplied extension connector cover to prevent entry of foreign matter such as dust.
(2)	Extension connector cover	A protective cover for the extension cable connector.
(3)	Module connector	A connector for mounting MELSEC iQ-R series modules. Attach the supplied connector cover or the blank cover module (RG60) to the connector(s) where no module is mounted to prevent entry of foreign matter such as dust.
(4)	Module fixing hole	A screw hole to fix a module to the base unit (M3×12 screw)
(5)	Base unit installation hole	A hole to install a base unit to a control panel. (M4 screw)
(6)	DIN rail adapter mounting hole	A hole to mount a DIN rail adapter.
(7)	Guide	A guide to mount a module to the base unit.
(8)	Production information marking	Shows the production information (16 digits) of the module.

4.2.2 Extension Base Unit

(1) R65B/R68B/RQ612B

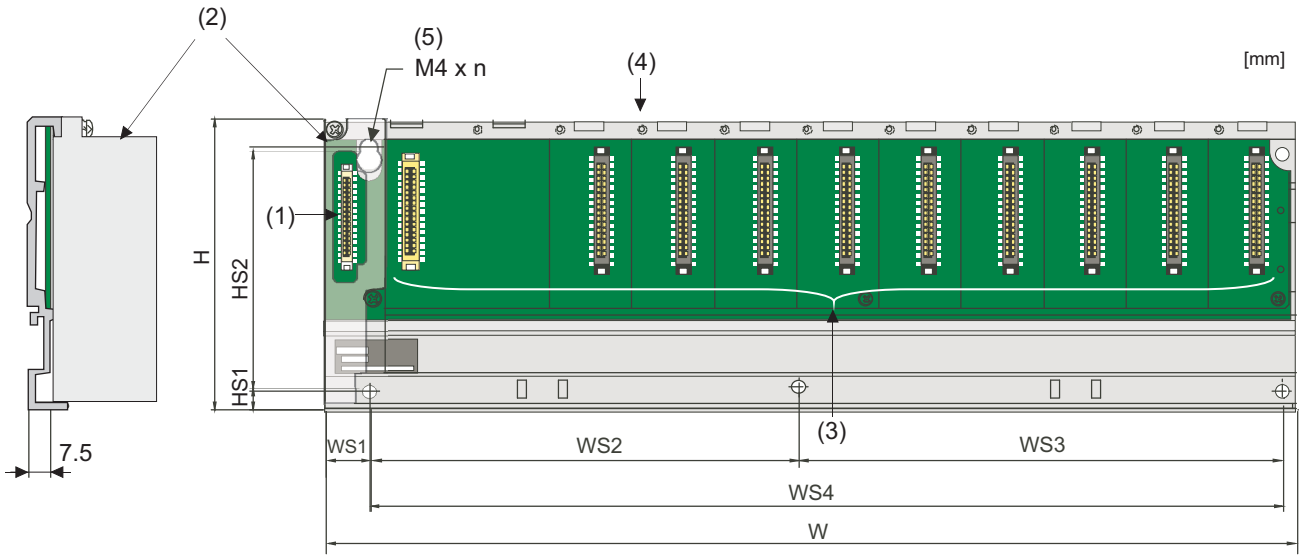


	R65B	R68B	R612B
n	4	5	5
W	245	328	439
WS1	-	190±0.3	190±0.3
WS2	-	116±0.3	227±0.3
WS3	-	(170)	(170)
WS4	-	(138)	(249)
WS1+WS2	222.5±0.3	-	-
WS3+WS4	(224.5)	-	-

[mm]

No.	Name	Description
(1)	Extension cable connector (IN)	A connector for connecting to a base unit (upper level). A MELSEC iQ-R series extension cable is connected here.
(2)	Extension cable connector (OUT)	A connector for connecting to a base unit (lower level). A MELSEC iQ-R series extension cable is connected here. When no cable is connected, attach the supplied extension connector cover to prevent entry of foreign matter such as dust.
(3)	Extension connector cover	A protective cover for the extension cable connector.
(4)	Module connector	A connector for mounting MELSEC iQ-R series modules. The CPU module and remote head module cannot be mounted on an extension base unit. Attach the supplied connector cover or the blank cover module (RG60) to the connector(s) where no module is mounted to prevent entry of foreign matter such as dust.
(5)	Module fixing hole	A screw hole to fix a module to the base unit. (M3×12 screw)
(6)	Base unit installation hole	A hole to install a base unit to a control panel. (M4 screw)
(7)	DIN rail adapter mounting hole	A hole to mount a DIN rail adapter.
(8)	Guide	A guide to mount a module to the base unit.
(9)	Production information marking	Shows the production information (16 digits) of the module.

(2) Q63B/Q65B/Q68B/Q612B/Q52B/Q55B

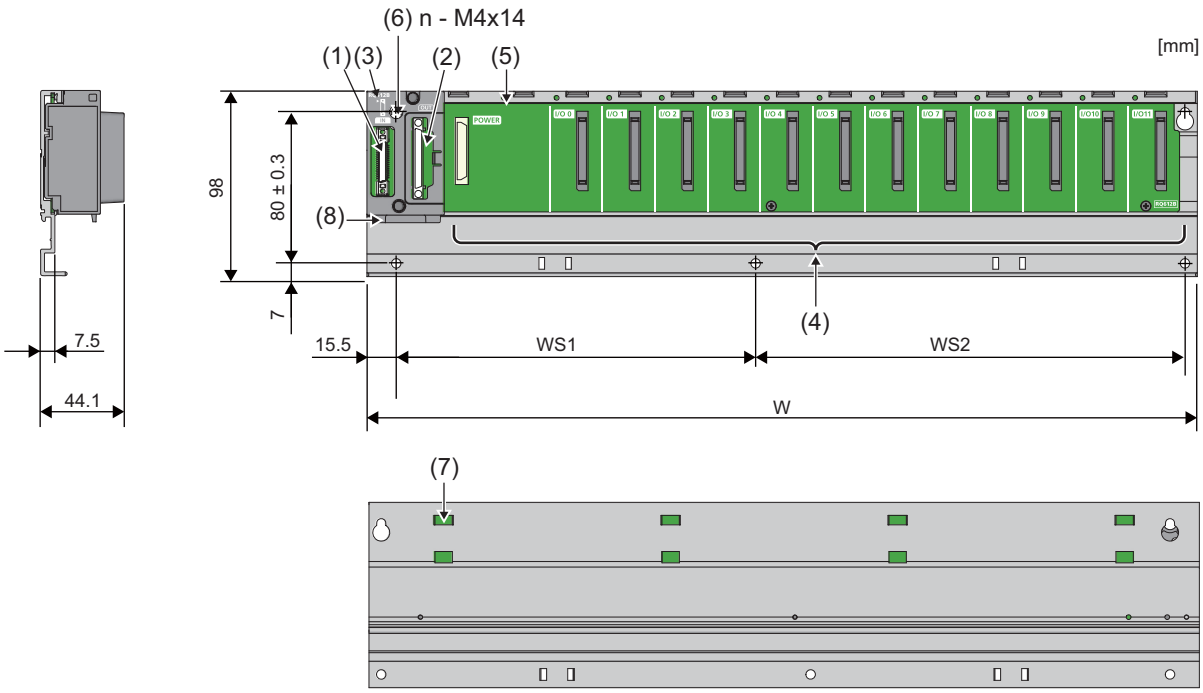


	Q63B	Q65B	Q68B	Q612B	Q52B	Q55B
n	4	4	5	5	4	4
W	189	245	328	439	106	189
WS1	15.5					
WS2	-	-	190±0.3	190±0.3	-	-
WS3	-	-	116±0.3	227±0.3	-	-
WS4	167±0.3	222.5±0.3	-	-	83.5±0.3	167±0.3
H	98					
HS1	7					
HS2	80±0.3					

[mm]

No.	Name	Application
(1)	Extension cable connector	Connector to which the extension cables are connected for sending and receiving signals from the extension base unit.
(2)	Base cover	Protective cover of extension cable connector. Before an extension cable is connected, the area of the base cover surrounded by the groove under the word "OUT" on the base cover must be removed with a tool such as nippers.
(3)	Module connector	Connector for installing the Q series power supply module, CPU module, I/O modules, and intelligent function module. Attach the supplied connector cover or the blank cover module (QG60) to the connector(s) where no module is mounted to prevent entry of foreign matter such as dust.
(4)	Module fixing screw hole	Screw hole for fixing the module to the base unit. Screw size: M3x12
(5)	Base fixing hole	Hole for fixing this base unit onto the panel of the control panel. (for M4 screw)

4.2.3 RQ Extension Base Unit



	RQ65B	RQ68B	RQ612B
n	4	5	5
W	245	328	439
WS1	-	190±0.3	190±0.3
WS2	-	116±0.3	227±0.3
WS1+WS2	222.5±0.3	-	-

[mm]

No.	Name	Description
(1)	Extension cable connector (IN)	A connector for connecting to a MELSEC iQ-R series base unit (upper level). A MELSEC iQ-R series extension cable is connected here.
(2)	Extension cable connector (OUT)	A connector for connecting to a MELSEC-Q series base unit (lower level). A MELSEC-Q series extension cable is connected here. When no cable is connected, attach the supplied extension connector cover to prevent entry of foreign matter such as dust.
(3)	Extension connector cover	A protective cover for the extension cable connector.
(4)	Module connector	A connector for mounting the MELSEC-Q series unit. The CPU module cannot be mounted on the extension base unit. Attach the supplied connector cover or the blank cover module (QG60) to the connector(s) where no module is mounted to prevent entry of foreign matter such as dust.
(5)	Module fixing hole	A screw hole to fix a module to the base unit. (M3×12 screw)
(6)	Base unit installation hole	A hole to install a base unit to a control panel. (M4 screw)
(7)	DIN rail adapter mounting hole	A hole to mount a DIN rail adapter.
(8)	Production information marking	Shows the production information (16 digits) of the module.

4.3 Power Supply

4.3.1 R61P/R62P/R63P/R64P

Specifications

Item		AC input power supply module			DC input power supply module
		R61P	R62P	R64P	R63P
Input power supply voltage (*1)		100 to 240VAC (85 to 264VAC)			24VDC (15.6 to 31.2VDC)
Input frequency		50/60Hz±5%			-
Input voltage distortion factor		Within 5%			-
Maximum input apparent power		130VA	120VA	160VA	-
Maximum input power		-			50W
Inrush current (*2)		20A, 8ms or less			100A, 1ms or less
Rated output current	5VDC	6.5A	3.5A	9A	6.5A
	24VDC	-	0.6A	-	-
Overcurrent protection (*3)	5VDC	7.1A or higher	3.8A or higher	10.0A or higher	7.1A or higher
	24VDC	-	0.66A or higher	-	-
Overvoltage protection (*4)	5VDC	5.5 to 6.5V			
Efficiency		76% or more			70% or more
Allowable momentary power failure time (*5)		Within 20ms			Within 10ms
Withstand voltage		2300VACrms per minute (altitude 0 to 2000m), Between the combined "line input/LG terminals" and the "FG terminal and output"			510VAC per minute (altitude 0 to 2000m), between primary terminal and 5VDC terminal
Insulation resistance		10MΩ or higher by 500VDC insulation resistance tester (between the combined "line input/LG terminals" and the "FG terminal and output", the line input and LG terminals, the output and FG terminals)			
Noise withstand level		• Noise voltage 1500Vp-p, noise width 1μs, noise frequency 25 to 60Hz (noise simulator condition) • Noise immunity test IEC 61000-4-4: 2kV			
Fuse		Built-in (user-unchangeable)			
Contact output section	Application	ERR contact			
	Rated switching voltage/current	24VDC, 0.5A			
	Minimum switching load	5VDC, 1mA			
	Response time	Off → on: 10ms or less On → off: 12ms or less			
	Life time	Mechanical: 20 million times or more Electrical: Rated switching voltage/current, 100 thousand times or more			
	Surge suppressor	None			
	Fuse	None			
Terminal screw size		M4 (M3.5 for +24V and 24G terminals of the R62P)			
Applicable wire size		0.75 to 2mm2			
Applicable solderless terminal		RAV1.25-4, RAV2-4, thickness of 0.8mm or less, up to two solderless terminal connections per terminal (for the +24V and 24G terminals of the R62P: RAV1.25-3.5, RAV2-3.5, thickness of 0.8mm or less, up to two solderless terminal connections per terminal)			
Applicable tightening torque		M4 screw: 1.02 to 1.38N·m M3.5 screw: 0.66 to 0.89N·m			
External dimensions	Height	106mm (Base unit mounting side: 98mm)			
	Width	54.6mm			
	Depth	110mm			
Mass		0.41kg	0.45kg	0.46kg	0.41kg

(*1) Input power supply voltage

Input power supply voltage is a voltage required for the power supply module to operate normally. If the voltage is out of the specified range, an error is detected and the system may stop.

(*2) Inrush current

Inrush current is the maximum, instantaneous input current drawn into the circuits immediately after power-on. If power is supplied to the system immediately after shut-off, an inrush current of more than the specified value may flow.

Wait for five seconds or more after shut-off, and supply power to the system again.

When selecting a fuse or a breaker for the external circuit, consider blowouts, sensing property, and specified value of inrush current.

(*3) Overcurrent protection

The function of this protection is to shut off the circuit to stop the system if a current exceeding the specification value flows into a circuit of 5VDC or 24VDC.

With overcurrent protection activated, the LED of the power supply module goes off or lights dim green due to a voltage drop.

To restart the system, shut off the power and eliminate the cause of the problem, such as insufficient current or short-circuit. After the cause is eliminated, wait for a few minutes, and supply power to the system again. When the output current is back to normal, the system starts initially.

(*4) Overvoltage protection

The function of this protection is to shut off the circuit to stop the system if an overvoltage exceeding the specified value is applied to a 5VDC circuit.

With overvoltage protection activated, the POWER LED of the power supply module turns off.

To restart the system, shut off the power, wait for a few minutes, and supply power to the system again. Then, the system starts initially.

If the system does not restart and the POWER LED remains off, replace the power supply module.

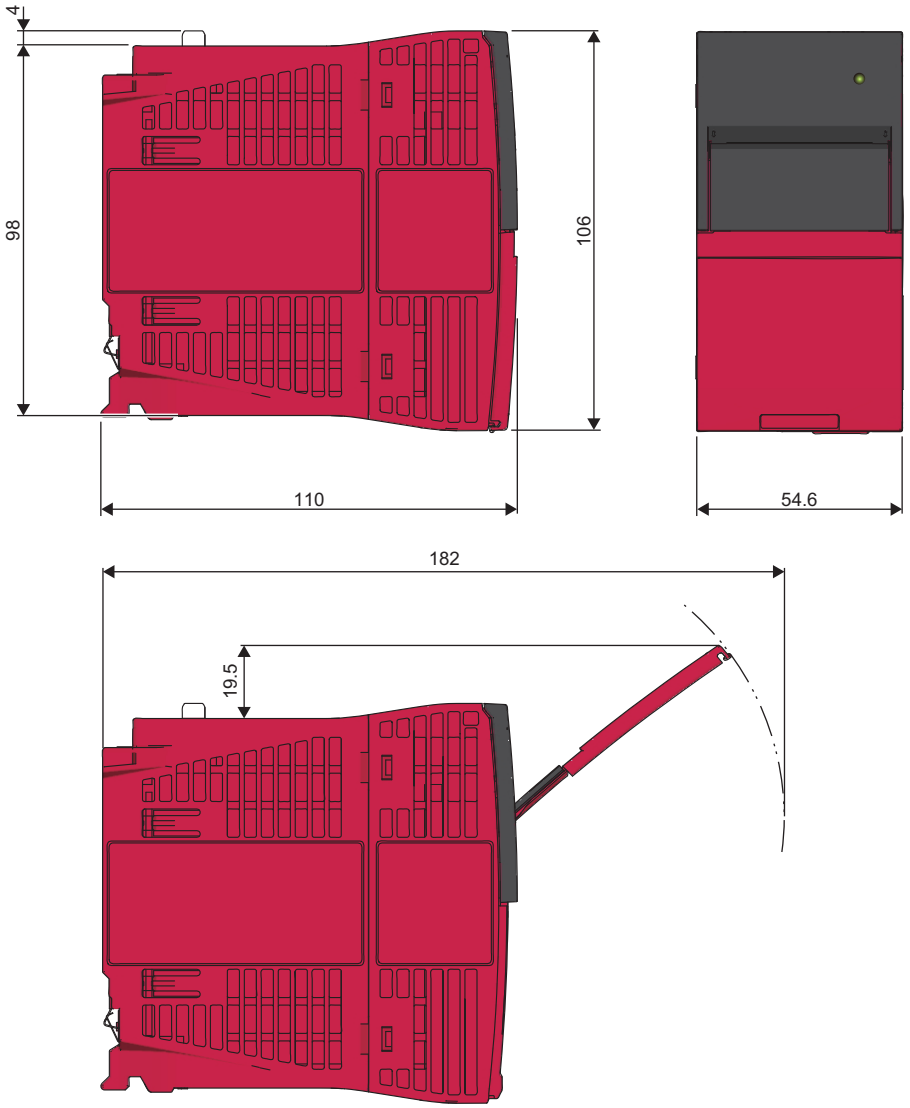
(*5) Allowable momentary power failure time

The system detects an input voltage down and stops its operation when a momentary power failure occurs. Allowable momentary power failure time is a period of time that the system can continue its operation even after the power failure.

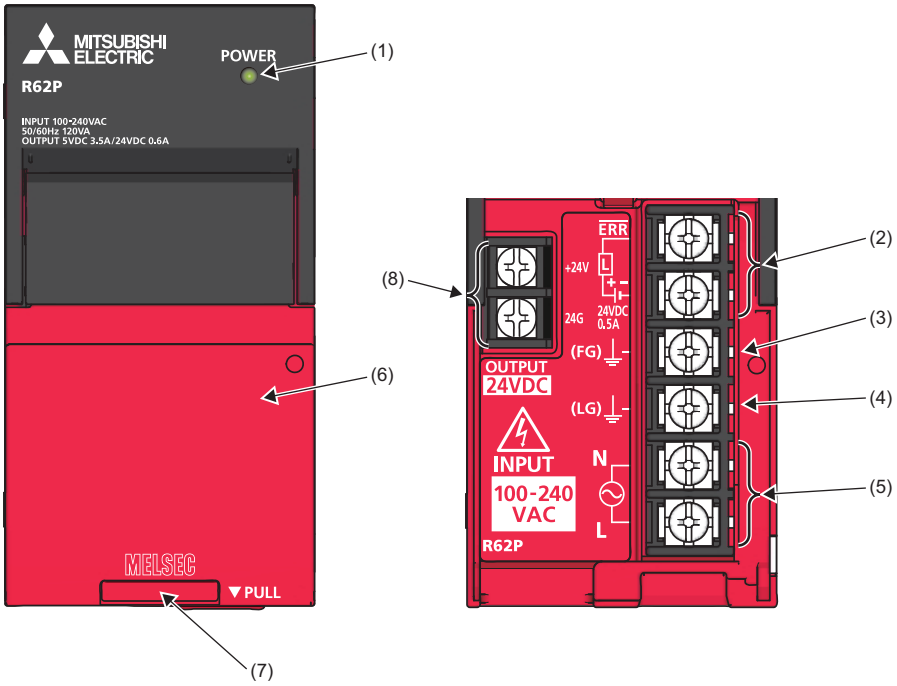
If power fails exceeding this period of time, the system can either continue its operation or start initially, depending on the load of the power supply module. When the system continues its operation, the operation will be the same as that of the system returned within the allowable momentary power failure time.

Outline dimension

[mm]



Names of parts



No.	Name	Description
(1)	POWER LED	Indicates the operating status of the power supply module. On: Normal operation Off: Power-off, power failure, or hardware failure
(2)	$\overline{\text{ERR}}$ contact	[When mounting the module on the main base unit] The contact turns on when the entire system operates normally. (M4 screw) This contact turns off (opens) in the following cases: • When the power supply module fails • When the power is not supplied • When a stop error (including reset) occurs in the CPU module • When the fuse is blown In a multiple CPU system, the contact turns off when a stop error occurs in any of the CPU modules. When the remote head module is mounted, this contact turns off when moderate or major error (including reset) occurs. [When mounting the module on the extension base unit] The contact is off at all times. When the module is mounted on a redundant power supply extension base unit, the following operation is performed: • The contact turns on when the power supply module operates normally. (M4 screw) • This contact turns off (opens) when the power supply module fails, the power is not supplied, or the fuse is blown.
(3)	FG terminal (*1)	A ground terminal connected to the shield pattern of the printed circuit board. This terminal is a functional ground terminal. (M4 screw)
(4)	LG terminal (*1)	A ground terminal for the power supply input filter. This terminal is a functional ground terminal. For AC input, the terminal has one-half the potential of the input voltage. (M4 screw)
(5)	Power input terminal	A power input terminal for the power supply module. The power supply to be connected differs depending on a power supply module. (M4 screw) (Refer to the specifications list.)
(6)	Terminal cover	A protective cover for the terminal block.
(7)	Production information marking	Shows the production information (16 digits) of the module.
(8)(*2)	+24V terminal and 24G terminal	Used for a device that requires a supply of 24VDC. (M3.5 screw) The power is supplied to a device through the external wiring.

(*1) Individually ground the FG and LG terminals with a ground resistance of 100 ohms or less.
(*2) Only the R62P has these terminals.

4.3.2 Q61P/Q63P/Q64PN

Specifications

Item		Q61P
Base loading position		Q series power supply module loading slot
Applicable base unit		Q63B, Q65B, Q68B, Q612B
Input power supply		100 to 240VAC+10%-15% (85 to 264VAC)
Input frequency		50/60Hz±5%
Input voltage distortion factor		Within 5%
Maximum input apparent power		130VA
Inrush current		Within 20A 8ms (*4)
Rated output current	5VDC	6A
	24VDC	-
Overcurrent protection (*1)	5VDC	6.6A or higher
	24VDC	-
Overvoltage protection (*2)	5VDC	5.5 to 6.5V
Efficiency		70% or more
Permissible instantaneous power off time (*3)		Within 20ms
Withstand voltage		Across inputs/LG and outputs/FG 2830VAC rms/3 cycles (Altitude: 2000m)
Insulation resistance		Across inputs and outputs (LG and FG separated), across inputs for LG/FG, across outputs for LG/FG 10MΩ or more by insulation resistance tester (500VDC)
Noise withstand level		By noise simulator of 1500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency Noise voltage IEC61000-4-4, 2kV
Operation display		LED display (Normal: ON (Green), Error: OFF)
Fuse		Built-in (Unchangeable by user)
Contact output section	Application	ERR contact
	Rated switching voltage/current	24VDC, 0.5A
	Minimum switching load	5VDC, 1mA
	Response time	OFF to ON:10ms or less, ON to OFF:12ms or less
	Life time	Mechanical: 20 million times or more Electrical: 100 thousand times or more at rated switching voltage/current
	Surge suppressor	None
	Fuse	None
Terminal screw size		M3.5 screw
Applicable size of wire		0.75 to 2mm ^{2}
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5
Applicable tightening torque		0.66 to 0.89N·m
Mass [kg]		0.4

Item		Q63P	Q64PN
Base loading position		Q series power supply module loading slot	
Applicable base unit		Q63B, Q65B, Q68B, Q612B	
Input power supply		24VDC+30%-35% (15.6 to 31.2VDC)	100 to 240VAC+10%-15% (85 to 264VAC)
Input frequency		-	50/60Hz±5%
Input voltage distortion factor		-	Within 5%
Maximum input apparent power		45W	160VA
Input current		at 24VDC input: 1.82A or less at 15.6VDC input: 2.8A or less	at 100VAC input: 1.3A or less at 200VAC input: 0.75A or less
Repetitive peak current		-	4A or less
Inrush current		100A 1ms or less (at 24VDC input)	Within 20A 8ms (*4)
Rated output current	5VDC	6A	8.5A
	24VDC	-	-
Overcurrent protection (*1)	5VDC	6.6A or higher	9.9A or higher
	24VDC	-	-
Overvoltage protection (*2)	5VDC	5.5 to 6.5V	
Efficiency		70% or more	
Permissible instantaneous power off time (*3)		Within 10ms (at 24VDC input)	Within 20ms
Withstand voltage		500VAC across primary and 5VDC	Across inputs/LG and outputs/FG 2,830VAC rms/3 cycles (Altitude: 2,000m (6,561.68ft.))
Insulation resistance		10MΩ or more (measured with an insulation resistance tester)	Input and LG batched, output and FG batched, batch input-LG, batch output-FG 10MΩ or m ore by insulation resistance tester (500VDC)
Noise withstand level		By noise simulator of 500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency	By noise simulator of 1,500Vp-p noise voltage, 1μs noise width and 25 to 60Hz noise frequency Noise voltage IEC61000-4-4, 2kV
Operation display		LED display (Normal: ON (Green), Error: OFF)	LED display (Normal: ON (Green), Error: OFF)
Fuse		Built-in (Unchangeable by user)	
Contact output section	Application	ERR contact	
	Rated switching voltage/current	24VDC, 0.5A	
	Minimum switching load	5VDC, 1mA	
	Response time	OFF to ON: 10ms or less, ON to OFF: 12ms or less	
	Life time	Mechanical: 20 million times or more Electrical: 100 thousand times or more at rated switching voltage/current	
	Surge suppressor	None	
	Fuse	None	
Terminal screw size		M3.5 screw	
Applicable size of wire		0.75 to 2mm ^{2}	
Applicable solderless terminal		RAV1.25-3.5, RAV2-3.5	
Applicable tightening torque		0.66 to 0.89N·m	
Mass [kg]		0.33	0.47

(*1) Overcurrent protection

The overcurrent protection device shuts off the 5V, 24VDC circuit and stops the system if the current flowing in the circuit exceeds the specified value.

The LED of the power supply module is turned off or lights up in dim green when voltage is lowered.

If this device is activated, switch the input power supply off and eliminate the cause such as insufficient current capacity or short. Then, a few minutes later, switch it on to restart the system.

The initial start for the system takes place when the current value becomes normal.

(*2) Overvoltage protection

The overvoltage protection device shuts off the 5VDC circuit and stops the system if a voltage of 5.5VDC or more is applied to the circuit.

When this device is activated, the power supply module LED is switched OFF.

To restart the system, switch the input power OFF, then a few minutes later ON.

The initial start for the system will take place.

The power supply module must be changed if the system is not booted and the LED remains OFF.

(*3) Permissible instantaneous power off time

(1) For AC input power supply

An instantaneous power failure lasting less than 20ms will cause AC down to be detected, but operation will continue.

An instantaneous power failure lasting in excess of 20ms may cause the operation to continue or initial start to take place depending on the power supply load.

Further, when the AC supply of the AC input module is the same as that of the power supply module, it prevents the sensor connected to the AC input module, which is ON at power-off, from turning OFF by switching off the power supply.

However, if only the AC input module is connected to the AC line, which is connected to the power supply, detection of the AC down for the power supply module may be delayed by the capacitor in the AC input module. Thus, connect a load of approx. 30mA per AC input module to the AC line.

(2) For DC input power supply

An instantaneous power failure lasting less than 10ms* will cause 24VDC down to be detected, but operation will continue.

An instantaneous power failure lasting in excess of 10ms* may cause the operation to continue or initial start to take place depending on the power supply load. * : This is for a 24VDC input. This is 10ms or less for less than 24VDC.

(*4) Inrush current

When power is switched on again immediately (within 5 seconds) after power-off, an inrush current of more than the specified value (2ms or less) may flow. Reapply power 5 seconds after power-off.

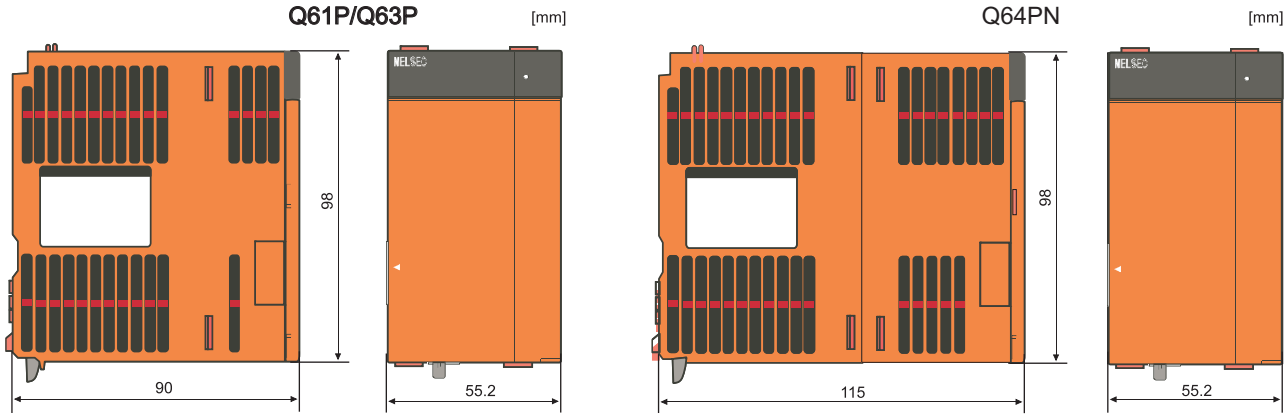
When selecting a fuse and breaker in the external circuit, take account of the blow out, detection characteristics and above matters.

(*5) Operation indication

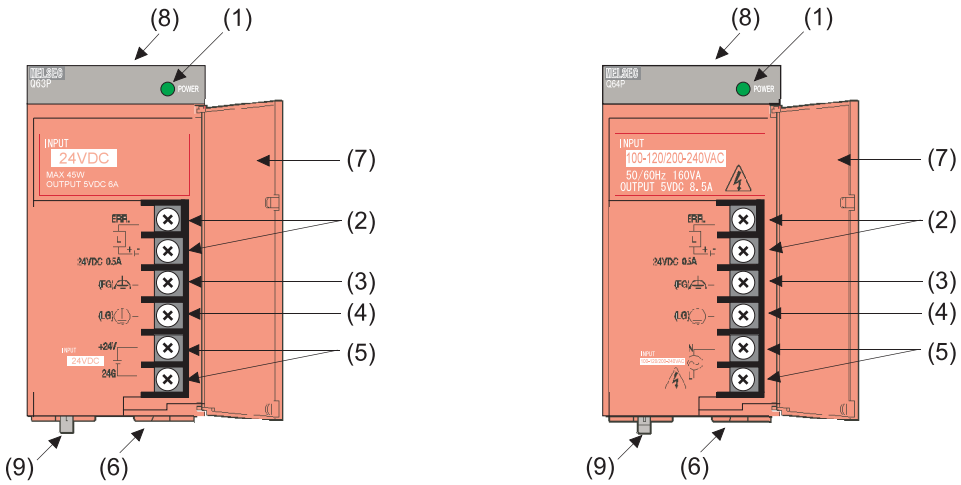
During the operation, do not allow the input voltage to change from 200VAC level (170 to 264VAC) to 100VAC level (85 to 132VAC).

(If changed, the POWER LED of the module turns off and the system operation stops.)

Outline dimension



Names of parts



(1) POWER LED

Q61P/Q64PN

ON (green):

Normal (5VDC output, instantaneous power failure within 20ms)

OFF:

- The power supply module is out of order while AC power supply is ON. (5VDC error, internal circuit failure, blown fuse)
- Over current protection or over voltage protection operated.
- AC power supply is not ON (including power failure and an instantaneous power failure of more than 20ms)

Q63P

ON (green):

Normal (5VDC output, instantaneous power failure within 10ms)

OFF:

- The power supply module is out of order while DC power supply is ON. (5VDC error, internal circuit failure, blown fuse)
- Over current protection or over voltage protection operated.
- DC power supply is not ON (including power failure and an instantaneous power failure of more than 10ms)

(2) ERR terminal

Q61P/Q64PN

- Turned ON when the whole system operates normally.
- This terminal turns OFF (opens) when the AC power is not input, a stop error (including a reset) occurs in the CPU module, or the fuse is blown.
- In a Multiple CPU system configuration, turned OFF when a stop error occurs in any of the CPU modules.
- Normally OFF when loaded in an extension base unit.

Q63P

- Turned ON when the whole system operates normally.
- This terminal turns OFF (opens) when the DC power is not input, a stop error (including a reset) occurs in the CPU module, or the fuse is blown.
- In a Multiple CPU system configuration, turned OFF when a stop error occurs in any of the CPU modules.
- Normally OFF when loaded in an extension base unit.

(3) FG terminal

Ground terminal connected to the shield pattern of the printed circuit board.

(4) LG terminal

- Grounding for the power supply filter.
- This terminal has potential of 1/2 of the input voltage for AC input (Q61P, Q64PN and Q64P).
- This is also a protective earth terminal (PE).

(5) Power input terminals

- Power input terminals connected to a power supply of 100VAC or 200VAC. (Q64PN)
- Power input terminals connected to a power supply of 24VDC. (Q63P)
- Power input terminals connected to a power supply of 100-200VAC. (Q61P)

(6) Terminal screw

M3.5 x 7 screw

(7) Terminal cover

Protective cover of the terminal block

(8) Module fixing screw hole

Used to fix the module to the base unit.
M3 x 12 screw (user-prepared) (Tightening torque: 0.36 to 0.48 N·m)

(9) Module loading lever

Used to load the module into the base unit.

(Note 1) Q63P is dedicated for inputting a voltage of 24VDC. Q63P may break down unless connected to 24VDC for inputting or with reversed polarity.

(Note 2) Ensure that the earth terminals LG and FG are grounded. (Ground resistance: 100 or less) Since the LG terminals have potential of 1/2 input voltage, the operator may receive an electric shock when touching metal parts.

(Note 3) When Q61P, Q63P, Q64PN or Q64P is loaded on the extension base unit, a system error cannot be detected by the ERR terminal. (ERR terminal is always OFF.)

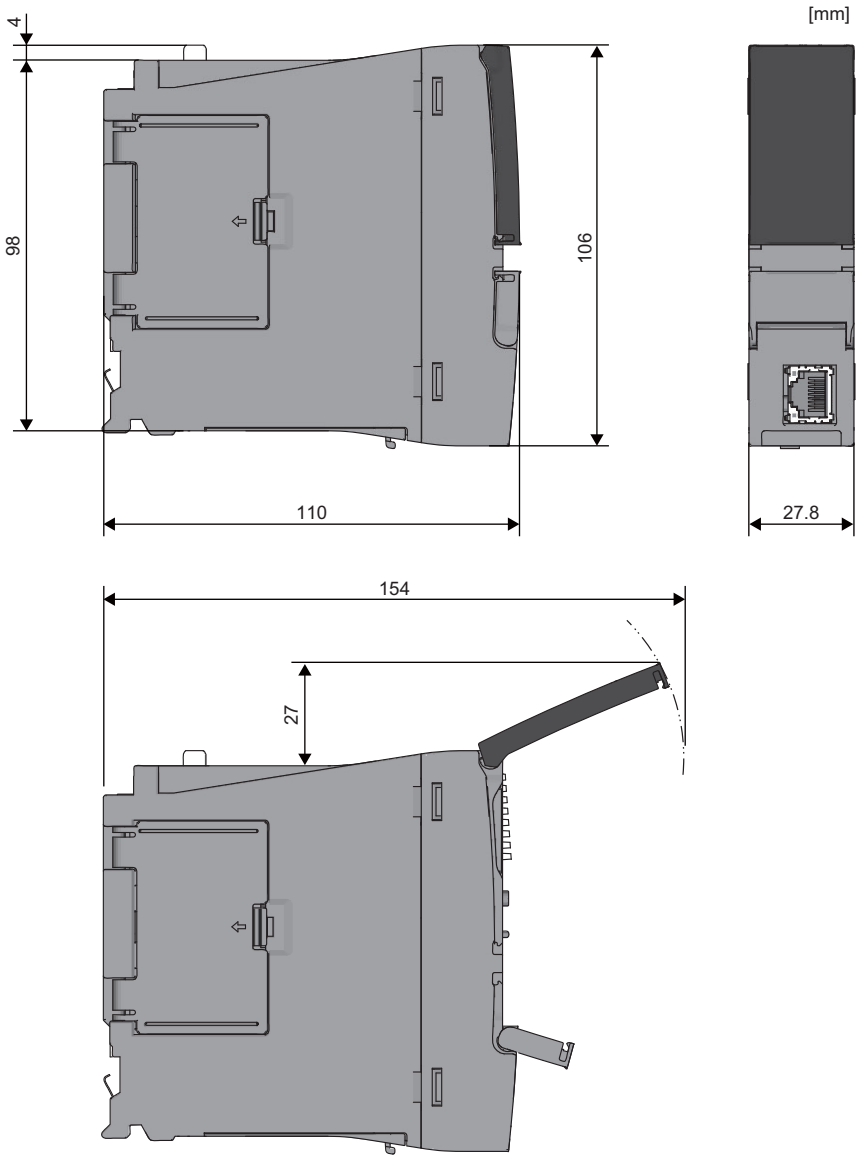
4.4 PLC CPU

For the further details than the following descriptions, refer to the following manuals:

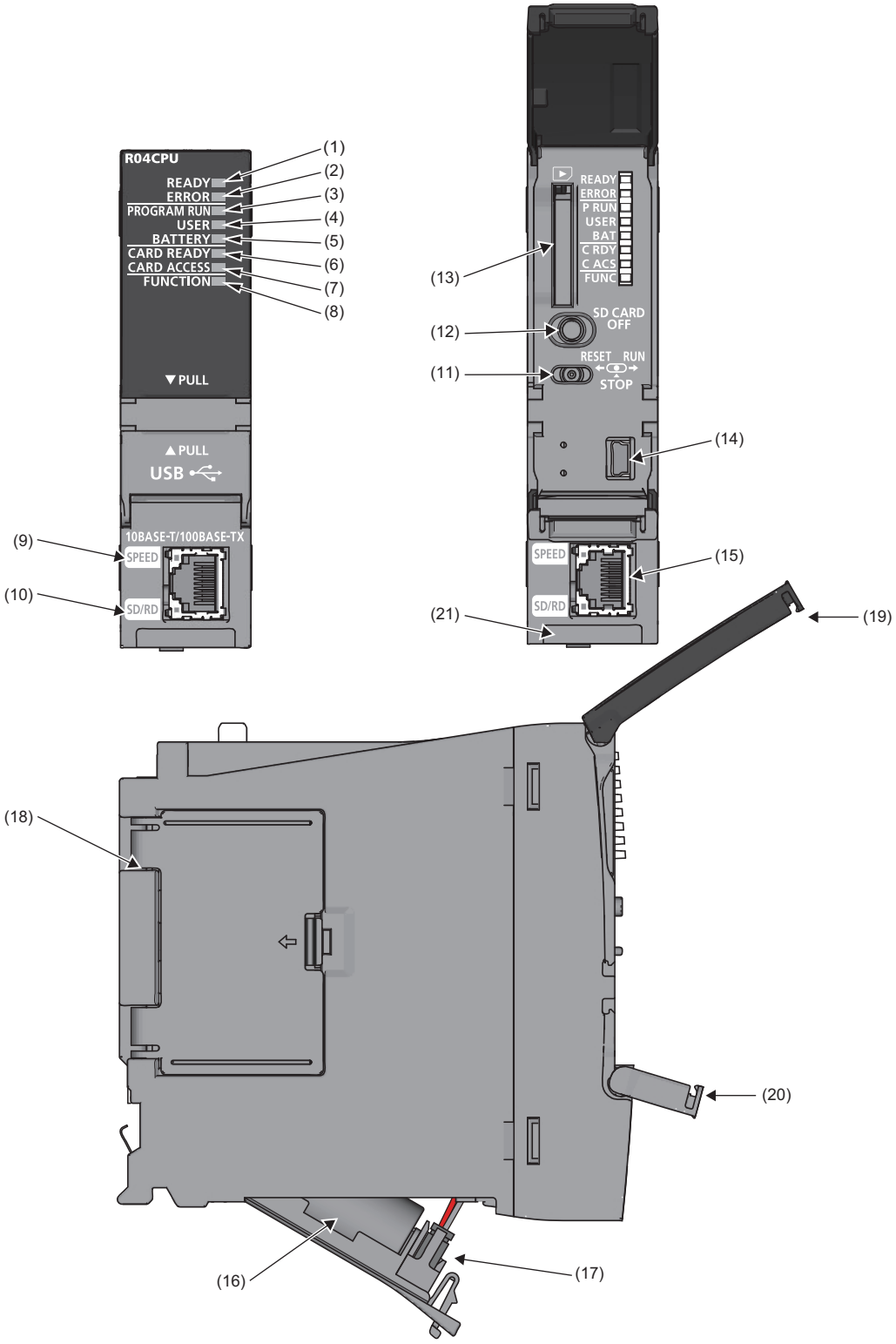
MELSEC iQ-R CPU Module User's Manual (Startup) (SH(NA)-081263)

MELSEC iQ-R CPU Module User's Manual (Application) (SH(NA)-081264)

Outline dimension



Names of parts



Number	Name	Details
(1)	READY LED	Indicates the operating status of the CPU module and the error level. [READY LED-ERROR LED status] On-off: Normal operation On-on: Minor error On-flashing: Moderate error Flashing-on: Minor error (Changing module online) Flashing (every 2s)-off: Initial processing Flashing (every 400ms)-off: Changing module online Off-on/flashing: Major error
(2)	ERROR LED	
(3)	PROGRAM RUN LED	Indicates the operating status of the program. On: Being executed (RUN state) Flashing: Being suspended (PAUSE state) Off: Stopped (STOP state) or stop error
	PROGRAM RUN LED (When the Process CPU is used in redundant mode)	Indicates the operating status of the program. (a) Control system (CTRL LED of the redundant function module: On) On: Being executed (RUN state) Flashing: Being suspended (PAUSE state) Off: Stopped (STOP state) or stop error (b) Standby system (SBY LED of the redundant function module: On) [Backup mode] On: Being executed (programs being executed in both systems) Flashing: Being suspended (PAUSE state) (programs being executed in both systems) Off: Stopped (STOP state/RUN state/PAUSE state) (no program being executed in both systems) or stop error [Separate mode] On: Being executed (RUN state) Flashing: Being suspended (PAUSE state) or waiting for state transition to RUN (same as STOP state) Off: Stopped (STOP state) or stop error (c) Systems not determined Flashing: Waiting for state transition to RUN by switch operation (same as STOP state) Off: Under normal operation
(4)	USER LED	Indicates the status of the annunciator (F). On: Annunciator (F) ON Off: Normal operation
(5)	BATTERY LED	Indicates the battery status. Flashing: Battery low Off: Normal operation
(6)	CARD READY LED	Indicates the availability of the SD memory card. On: Available Flashing: Ready Off: Not available or not inserted
(7)	CARD ACCESS LED	Indicates the access status of the SD memory card. On: Being accessed Off: Not accessed
(8)	FUNCTION LED	Indicates the status of the function being executed.
(9)	SPEED LED	Refer to the following. MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)
(10)	SD/RD LED	
(11)	RUN/STOP/RESET switch	A switch for controlling the operating status of the CPU module. RUN: Executes the program. STOP: Stops the program. RESET: Resets the CPU module. (Keep the switch in the RESET position for approximately one second.) Operate the RUN/STOP/RESET switch with your fingers. To prevent the switch from being damaged, do not use any tool such as a screwdriver.
(12)	SD memory card access control switch	A switch for disabling access to the SD memory card to remove it from the CPU module.
(13)	SD memory card slot	A slot where an SD memory card is inserted.
(14)	USB port (*1)	A connector for a USB-compatible peripheral. (connector type: miniB)
(15)	Ethernet port	Refer to the following. MELSEC iQ-R Ethernet/CC-Link IE User's Manual (Startup)
(16)	Battery	A backup battery to hold clock data and to use the backup power function for the device/label memory.
(17)	Battery connector pin	A pin for connecting a lead wire of the battery. To save the battery, the lead wire is disconnected from the connector before shipment.

Number	Name	Details
(18)	Cassette cover	A cover for the connector where an extended SRAM cassette is inserted. To use an extended SRAM cassette, open the cover, and insert the cassette.
(19)	LED cover	A cover for the LED indicators, SD memory card slot, and switches. Open this cover and insert or remove an SD memory card or set the RUN/STOP/RESET switch. Otherwise, keep the cover closed to prevent entry of foreign matter such as dust.
(20)	USB cover	A cover for the USB port. Open this cover and connect a USB-compatible peripheral. Otherwise, keep the cover closed to prevent entry of foreign matter such as dust.
(21)	Production information marking	Shows the production information (16 digits) of the module.

(*1) When a cable is connected to the USB connector at all times, clamp the cable. It prevents a poor connection, moving, and disconnection by unintentional pulling.

Battery life

There are two types of values for describing a battery life: actual service value and guaranteed value.

• Actual service value: The battery life estimated based on the value actually measured by Mitsubishi under a storage ambient temperature of 40 ℃. This value varies depending on the characteristics and variation of the components, and should be referred to as a reference value.

• Guaranteed value: Refers to the battery life at 70℃ guaranteed by Mitsubishi in a storage ambient temperature of 70 ℃ based on the characteristics of the memory device provided by the component manufacturer.

[Actual service value (reference value)]

Extended SRAM cassette	Power-on time ratio (*1)	Actual service value when used with the R04CPU		Actual service value when used with the R08CPU, R16CPU, R32CPU, or R120CPU	
		Q6BAT	Q7BAT	Q6BAT	Q7BAT
Not used, used (1MB type), used (2MB type), used (4MB type), used (8MB type)	0 to 100%	43800 hours (5.00 years)	43800 hours (5.00 years)	43800 hours (5.00 years)	43800 hours (5.00 years)
Used (16MB type) (*2)	0%	30100 hours (3.43 years)		25500 hours (2.91 years)	
	30%	43000 hours (4.90 years)		36400 hours (4.15 years)	
	50 to 100%	43800 hours (5.00 years)		43800 hours (5.00 years)	

[Guaranteed value]

Extended SRAM cassette	Power-on time ratio (*1)	Guaranteed value when used with the R04CPU		Guaranteed value when used with the R08CPU, R16CPU, R32CPU, or R120CPU	
		Q6BAT	Q7BAT	Q6BAT	Q7BAT
Not used	0%	31700 hours (3.61 years)	43800 hours (5.00 years)	30600 hours (3.49 years)	43800 hours (5.00 years)
	30%	43800 hours (5.00 years)		43700 hours (4.98 years)	
	50 to 100%			43800 hours (5.00 years)	
Used (1MB type)	0%	22000 hours (2.51 years)		21500 hours (2.45 years)	
	30%	31400 hours (3.58 years)		30700 hours (3.50 years)	
	50%	43800 hours (5.00 years)		43000 hours (4.90 years)	
	70 to 100%			43800 hours (5.00 years)	
Used (2MB type)	0%	19600 hours (2.23 years)		19100 hours (2.18 years)	43100 hours (4.92 years)
	30%	28000 hours (3.19 years)		27200 hours (3.10 years)	43800 hours (5.00 years)
	50%	39200 hours (4.47 years)		38200 hours (4.36 years)	
	70 to 100%	43800 hours (5.00 years)		43800 hours (5.00 years)	
Used (4MB type)	0%	15300 hours (1.74 years)	39600 hours (4.52 years)	15000 hours (1.71 years)	36200 hours (4.13 years)
	30%	21800 hours (2.48 years)	43800 hours (5.00 years)	21400 hours (2.44 years)	43800 hours (5.00 years)
	50%	30600 hours (3.49 years)		30000 hours (3.42 years)	
	70 to 100%	43800 hours (5.00 years)		43800 hours (5.00 years)	
Used (8MB type)	0%	10100 hours (1.15 years)	26900 hours (3.07 years)	10000 hours (1.14 years)	24800 hours (2.83 years)
	30%	14400 hours (1.64 years)	38400 hours (4.38 years)	14200 hours (1.62 years)	35400 hours (4.04 years)
	50%	20200 hours (2.30 years)	43800 hours (5.00 years)	20000 hours (2.28 years)	43800 hours (5.00 years)
	70%	33600 hours (3.83 years)		33300 hours (3.80 years)	
	100%	43800 hours (5.00 years)		43800 hours (5.00 years)	
Used (16MB type) (*2)	0%	6400 hours (0.73 years)	16100 hours (1.83 years)	6400 hours (0.73 years)	16000 hours (1.82 years)
	30%	9100 hours (1.03 years)	23000 hours (2.62 years)	9100 hours (1.03 years)	22800 hours (2.62 years)
	50%	12800 hours (1.46 years)	32200 hours (3.67 years)	12800 hours (1.46 years)	32000 hours (3.65 years)
	70%	21300 hours (2.43 years)	43800 hours (5.00 years)	21300 hours (2.43 years)	43800 hours (5.00 years)
	100%	43800 hours (5.00 years)		43800 hours (5.00 years)	

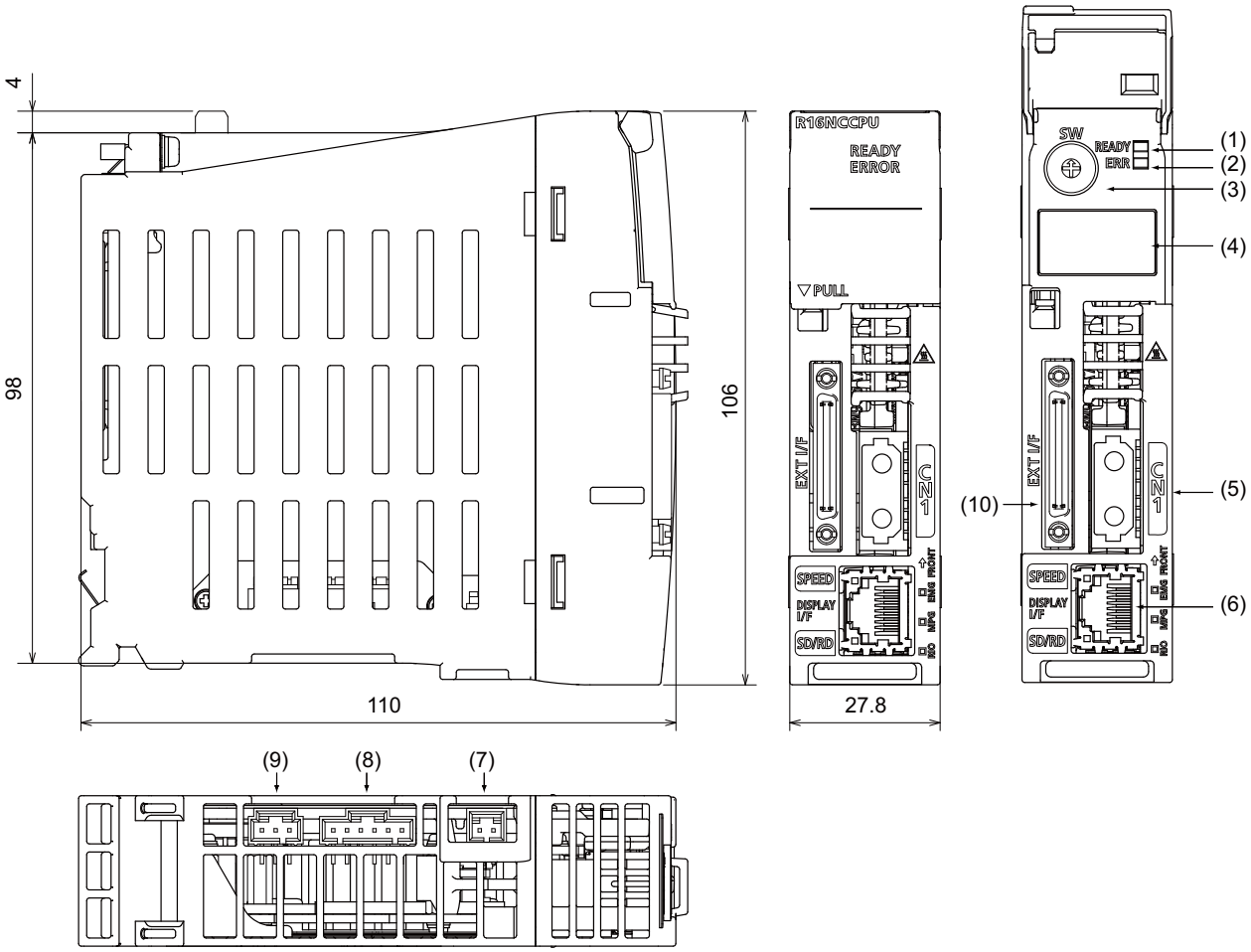
(*1) The power-on time ratio indicates the ratio of the programmable controller power-on time to 24 hours. (If the total power-on time is 12 hours, the ratio will be 50%. If the total power-on time is 6 hours, the ratio will be 25%.)

(*2) To use the extended SRAM cassette (16MB type) with the RnCPU, check the version of the CPU module and engineering tool.

4.5 CNC CPU Module

Dimension and Names of parts

[mm]



(1) READY LED

(2) ERROR LED

The operating state and the error state of CNC CPU will be displayed.

READY LED	ERROR LED	Operating state
Not lit	Not lit	Power OFF or hardware failure
Flashing	Not lit	Initializing
Lit	Not lit	Under normal operation
Lit	Flashing	Occurrence of a moderate error
Not lit	Lit or flashing	Occurrence of a severe error

(3) SW

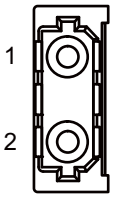
Rotary switch for maintenance (usually set to "0")

(4) Dot matrix LED

The operating state and the error information will be displayed. (3 digits)

(5) CN1

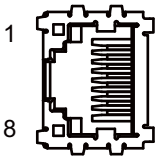
Connector for servo/spindle drive unit



1	IN	RD
2	OUT	TD

(6) DISPLAY I/F

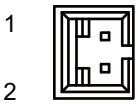
Connector for display (GOT)



1	OUT	TD+
2	OUT	TD-
3	IN	RD+
4		CMTR
5		CMTR
6	IN	RD-
7		CMIT
8		CMIT

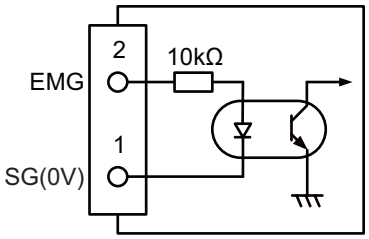
(7) EMG

Connector for the emergency stop signal input



70553-0001
(MOLEX)

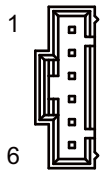
1		SG(0V)
2	IN	EMG



Input type: Current sinking/sourcing
Insulation method: Optocoupler insulation
Input voltage: 24VDC (+10%, -15%, ripple ratio within 5%)
OFF voltage/current : 17.5VDC or more / 3.0mA or less
ON voltage/current : 1.8VDC or less / 0.18mA or less
Input resistance: Approximate 10kΩ
Response time (OFF -> ON or ON -> OFF): 1ms
Applicable size of wire : 0.3mm^2

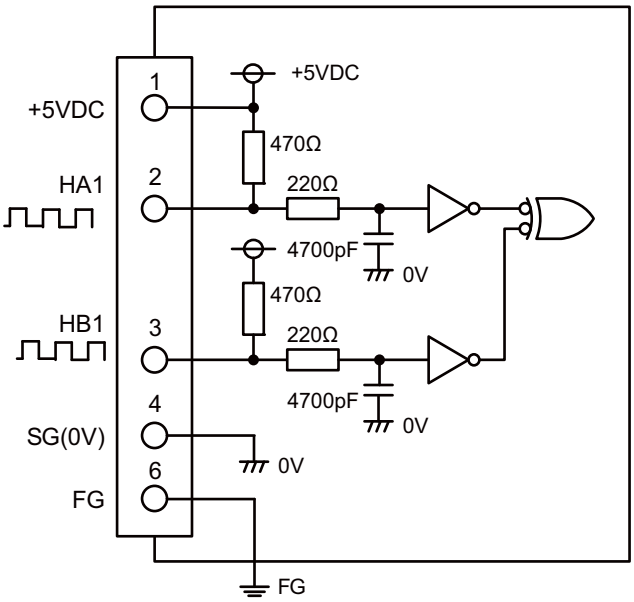
(8) MPG

Connector for 5V manual pulse generator

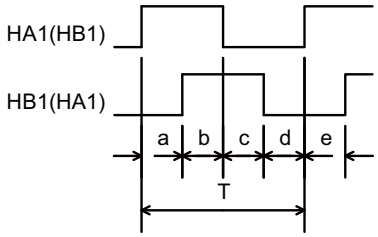


70553-0005
(MOLEX)

1	OUT	5VDC
2	IN	HA1
3	IN	HB1
4	OUT	SG(0V)
5		-
6		FG



Input pulse signal type: 90°phase difference between HA1 and HB1
Max. input pulse frequency: 5kHz
Number of pulses per rotation: 100pulse/rev
Input signal voltage: H level 3.5V to 5.25V, L level 0V to 0.5V
For pulse generators
Power voltage for pulse generators : 5VDC±10%
Max. output current: 100mA



a.b.c.d.e: HA1 or HB1 rising edge (falling edge) phase difference = T/4 ± T/10
T: Ha1 or HB1 phase cycle (Min. 10 μ s)

(9) RIO

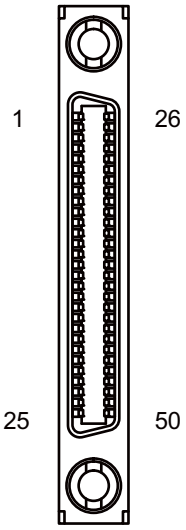
Connector for Dual signal module

70553-0002
(MOLEX)

1	IN/OUT	RXTXH
2	IN/OUT	RXTXL
3		SG(0V)

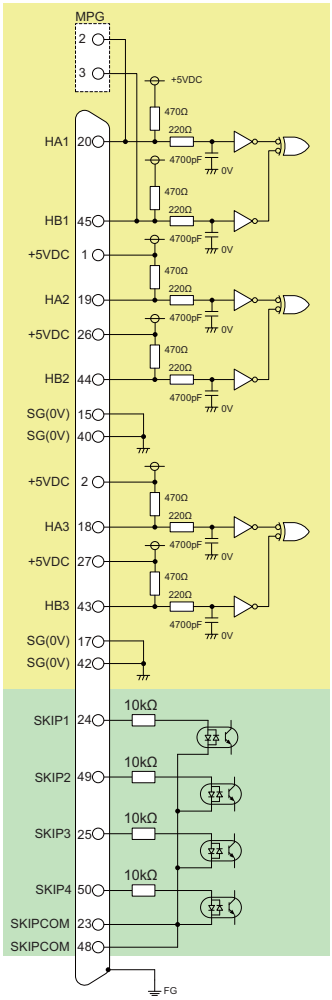
(10) EXT I/F

Connector for the expansion connection of skip signal/ 5V manual pulse generator



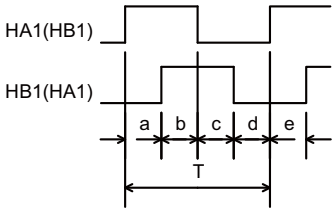
HDR-EC50LFDT1-SDL+
(HONDA)

1	OUT	5VDC	26	OUT	5VDC
2	OUT	5VDC	27	OUT	5VDC
3	OUT	SG(0V)	28	OUT	SG(0V)
4	(Reserve)		29	OUT	SG(0V)
11			30	(Reserve)	
			36		
12	OUT	SG(0V)	37	OUT	SG(0V)
13		(Reserve)	38		(Reserve)
14		(Reserve)	39		(Reserve)
15	OUT	SG(0V)	40	OUT	SG(0V)
16		(Reserve)	41		(Reserve)
17	OUT	SG(0V)	42	OUT	SG(0V)
18	IN	HA3	43	IN	HB3
19	IN	HA2	44	IN	HB2
20	IN	HA1	45	IN	HB1
21		(Reserve)	46		(Reserve)
22		(Reserve)	47		(Reserve)
23	IN	SKIPCOM	48	IN	SKIPCOM
24	IN	SKIP1	49	IN	SKIP2
25	IN	SKIP3	50	IN	SKIP4



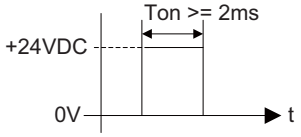
---Manual pulse generator I/F specification----
Input pulse signal type: 90°phase difference between HA1 and HB1.
Max. input pulse frequency : 5kHz
Number of pulses per rotation: 100pulse/rev
Input signal voltage : H level 3.5V to 5.25V, L level 0V to 0.5V
Output power voltage : +5VDC -10% -10%
Max. output current : 100mA

(Note) The connector MPG and EXT I/F have input pins for HA1 and HB1. Use either of the connectors. Use either of the connectors.



a.b.c.d.e: HA1 or HB1 rising edge (falling edge) phase difference = T/4 ± T/10
T: Ha1 or HB1 phase cycle (Min. 10µs)

---SKIP I/F specification---
Input ON voltage : 18V or more to 25.2V or less
Input ON current : 2mA or more
Input OFF voltage : 4V or less
Input OFF current : 0.4mA or less
Input signal holding time (Ton) : 2ms or more
Internal response time : 0.08ms or less



(Note) NC recognizes input signals of 2ms or more as the valid skip signals. If machine contacts (relay, etc.) are used, malfunctions will occur due to chattering. Use semiconductor contacts (transistor, etc.).

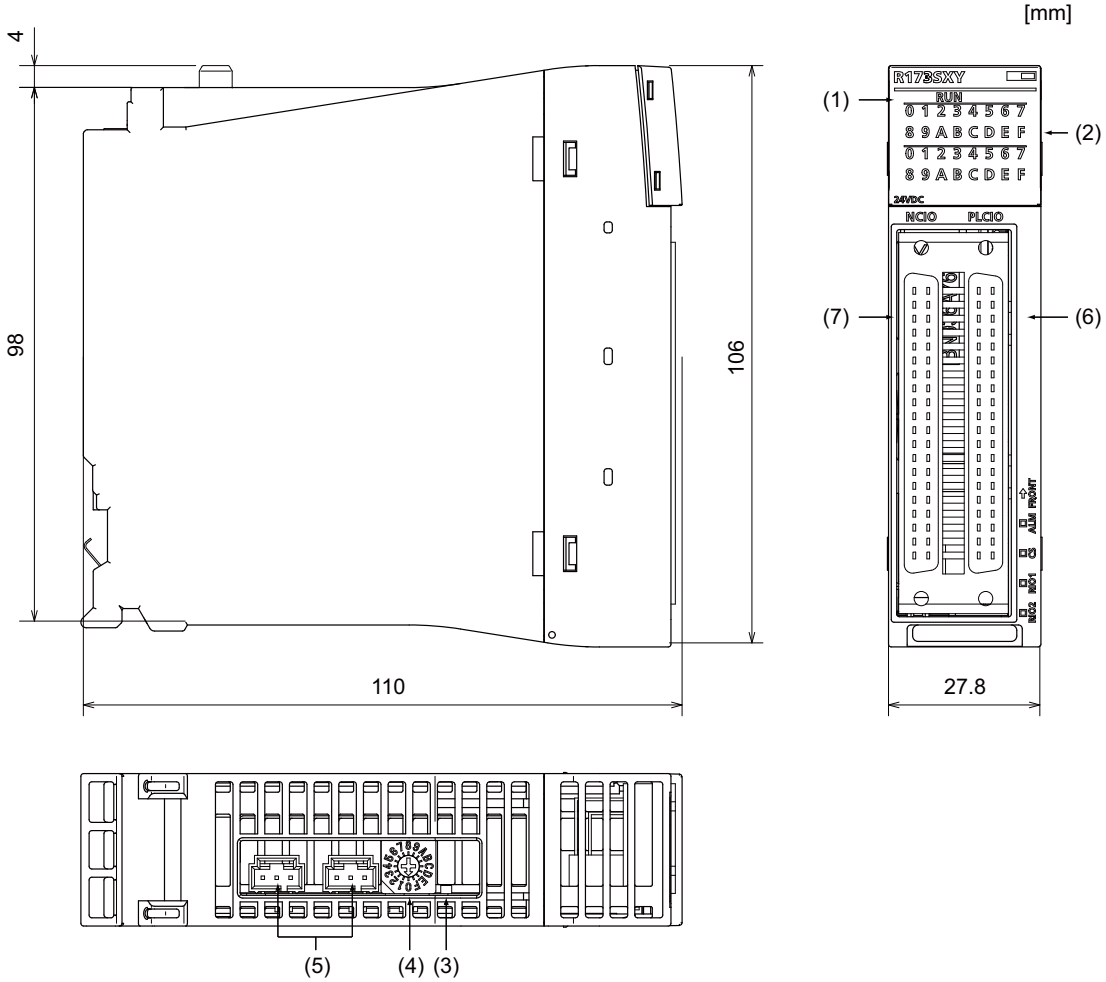
4.6 Dual Signal Module

Use the dual signal module within the following specifications.

Items		Specifications
		R173SXY
Number of input points		32 points x 2 systems (32 points for PLC CPU control + 32 points for CNC CPU control, 20 points x 2 systems for safety input, 12 points x 2 systems for feedback input for output)
Input insulation method		Optocoupler insulation
Rated input voltage		24VDC (+20/-15%, ripple ratio within 5%)
Rated input current		Approximate 4mA
Input derating		Refer to the derating figure
ON voltage/ON current		19V or more/3mA or more
OFF voltage/OFF current		4V or less / 1.7mA or less
Input resistance		Approximate 5.6kΩ
Input response time		1ms
Input common method		32 points/common (Common terminal 1A01, 1A02, 2A01, 2A02) (Each part-system has a different common.)
Input type		Type 1, Current sinking
Number of output points		12 points x 2 systems
Output insulation method		Optocoupler insulation
Rated load voltage		24VDC (+20/-15%)
Maximum load current		(0.1A x 8 points, 0.2A x 4 points) x 2 systems Common current: 1.6A or less for each connector
Utilization category		DC12/DC13
Maximum rush current		0.7A,10ms or less (1.4A, 10ms or less for 0.2A output pin)
OFF-time leakage current		0.1mA or less
ON-time maximum voltage drop		0.1VDC(TYP.)0.1A, 0.2VDC(MAX.)0.1A
Output response time		1ms or less (at rated load and resistance load)
Output common method		12 points/common (Common terminal 1B01, 1B02, 2B01, 2B02) (Each part-system has a different common.)
Output		Current sourcing
Surge suppressor		Zener diode
Fuse		Not provided
External power supply	Voltage	24VDC (+20/-15%, ripple ratio within 5%)
	Electric current	40mA
Protection		Provided (thermal protection and short circuit protection) Thermal protection works for each 2 points. Short circuit protection works for each 1 point. (1 to 3A/point)
Withstand voltage		560VAC rms/3cycles (at 2000m elevation)
Insulation resistance		10MΩ or more (measured with an insulation resistance tester)
Noise withstand level		Simulator noise 500Vp-p, Noise width 1μs measured with a noise simulator with noise frequency 25 to 60Hz
		First transient noise IEC61000-4-4: 1kV
Protection degree		IP2X
Number of I/O occupational points		32 points (with I/O assignments as 32 points I/O mixed unit)
Operation display		ON display (LED) and 32 input points display for PLC CPU control
External connection method		40-pin connector
Applicable size of wire		$0.3mm^2$ (for A6CON1 and A6CON4)
Connector for external wiring		A6CON1, A6CON2, A6CON3, A6CON4 (sold separately)
Terminal block changeover unit		FA-LTB40P (Cable FA-CBL ☐☐ FMV-M)
5VDC internal power dissipation		200mA (TYP. when all points are ON)
Mass		0.14kg

Names of parts

[mm]



(1) RUN LED

Shows the operating state of the dual signal module.

(2) LED

Shows the input signal state of PLCIO (part-system 2).

(3) ALM LED

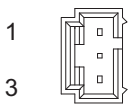
Shows the communication state with the CNC CPU module.

(4) RSW

Rotary switch for station No. setting Set within the range of 0 to 2.

(5) RIO1/RIO2

Connector for connecting the CNC CPU module and the 2nd or subsequent dual signal module.

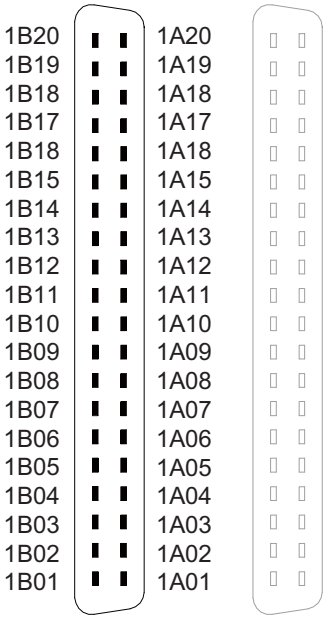


1	IN/OUT	RXTXH
2	IN/OUT	RXTXL
3		SG(V)

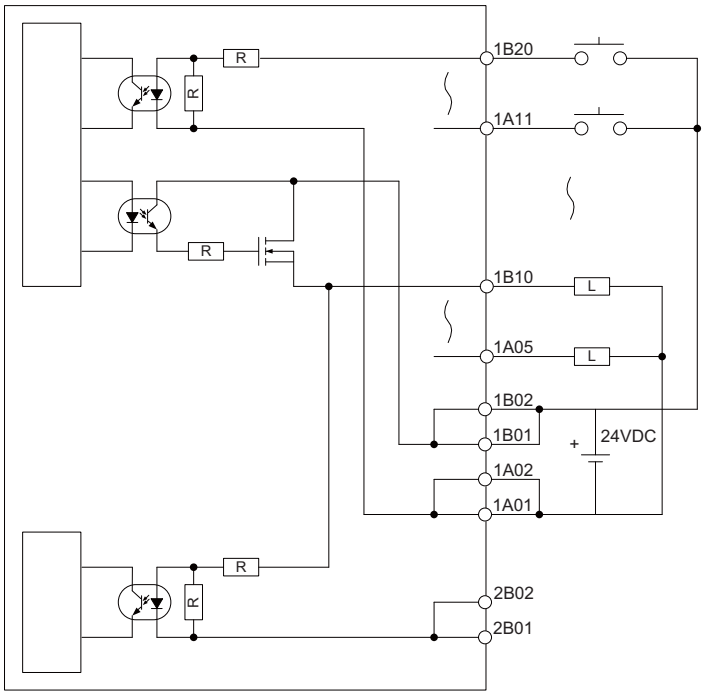
70553-0005
(MOLEX)

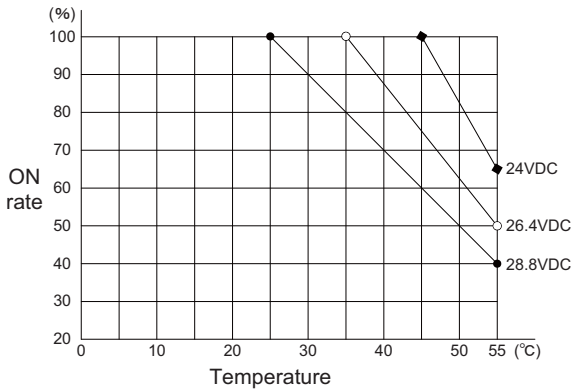
(6) NCIO

Part-system 1 I/O signal connector



1B20	IN	NC-X00	**1A20**	IN	NC-X10
1B19	IN	NC-X01	**1A19**	IN	NC-X11
1B18	IN	NC-X02	**1A18**	IN	NC-X12
1B17	IN	NC-X03	**1A17**	IN	NC-X13
1B16	IN	NC-X04	**1A16**	IN	NC-X14
1B15	IN	NC-X05	**1A15**	IN	NC-X15
1B14	IN	NC-X06	**1A14**	IN	NC-X16
1B13	IN	NC-X07	**1A13**	IN	NC-X17
1B12	IN	NC-X08	**1A12**	IN	NC-X18
1B11	IN	NC-X09	**1A11**	IN	NC-X19
1B10(*)	IN/OUT	NC-Y0A/PC-X0A	**1A10(*)**	IN/OUT	NC-Y1A/PC-X1A
1B09(*)	IN/OUT	NC-Y0B/PC-X0B	**1A09(*)**	IN/OUT	NC-Y1B/PC-X1B
1B08	IN/OUT	NC-Y0C/PC-X0C	**1A08**	IN/OUT	NC-Y1C/PC-X1C
1B07	IN/OUT	NC-Y0D/PC-X0D	**1A07**	IN/OUT	NC-Y1D/PC-X1D
1B06	IN/OUT	NC-Y0E/PC-X0E	**1A06**	IN/OUT	NC-Y1E/PC-X1E
1B05	IN/OUT	NC-Y0F/PC-X0F	**1A05**	IN/OUT	NC-Y1F/PC-X1F
1B04		---	**1A04**		---
1B03		---	**1A03**		---
1B02		24VDC(COM1)	**1A02**		0V(COM2)
1B01		24VDC(COM1)	**1A01**		0V(COM2)





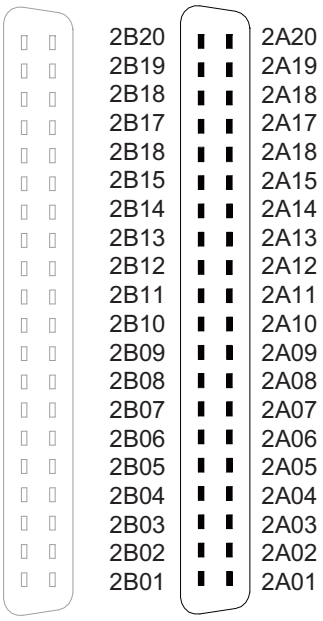
(Note 1) Output pins with (*) allow 0.2A output. Other pins have 0.1A output.

(Note 2) Pins with signal names "NC-Y0A" and "NC-X0A" are the output signals controlled by CNC CPU. When any of the signals is output to Y0A, the signal is input to X0A as a feedback signal.

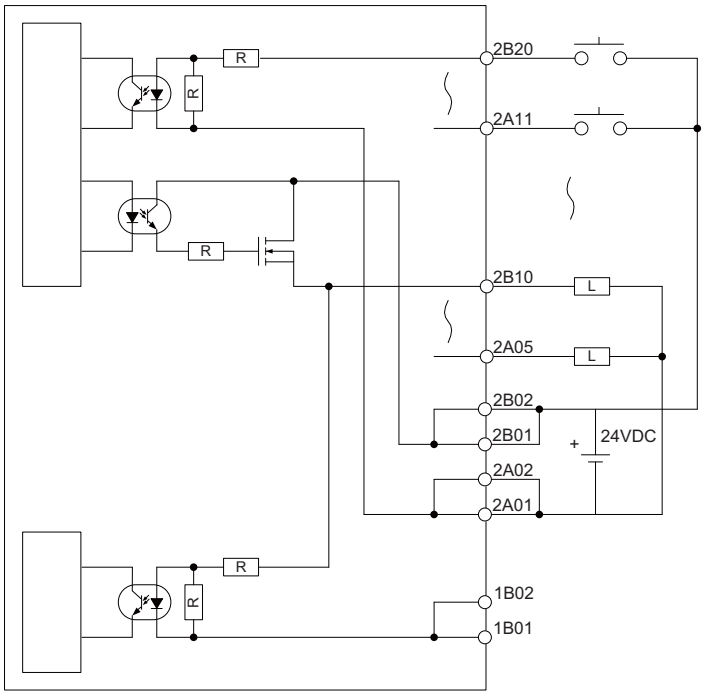
(Note 3) The device Nos. written above are for the assignment on hardware. These Nos. are different from the device Nos. to be actually used.

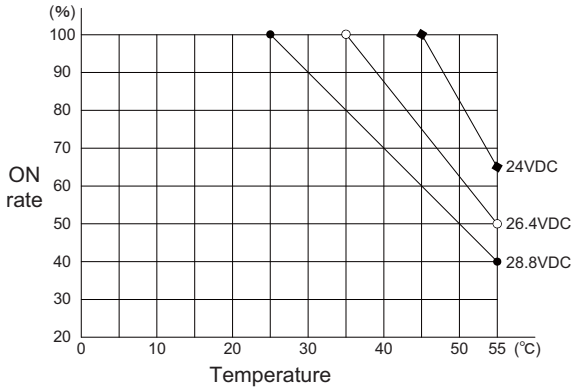
(7) PLCIO

Part-system 2 I/O signal connector



2B20	IN	PC-X00		**2A20**	IN	PC-X10
2B19	IN	PC-X01		**2A19**	IN	PC-X11
2B18	IN	PC-X02		**2A18**	IN	PC-X12
2B17	IN	PC-X03		**2A17**	IN	PC-X13
2B16	IN	PC-X04		**2A16**	IN	PC-X14
2B15	IN	PC-X05		**2A15**	IN	PC-X15
2B14	IN	PC-X06		**2A14**	IN	PC-X16
2B13	IN	PC-X07		**2A13**	IN	PC-X17
2B12	IN	PC-X08		**2A12**	IN	PC-X18
2B11	IN	PC-X09		**2A11**	IN	PC-X19
2B10(*)	IN/OUT	PC-Y0A/NC-X0A		**2A10(*)**	IN/OUT	PC-Y1A/NC-X1A
2B09(*)	IN/OUT	PC-Y0B/NC-X0B		**2A09(*)**	IN/OUT	PC-Y1B/NC-X1B
2B08	IN/OUT	PC-Y0C/NC-X0C		**2A08**	IN/OUT	PC-Y1C/NC-X1C
2B07	IN/OUT	PC-Y0D/NC-X0D		**2A07**	IN/OUT	PC-Y1D/NC-X1D
2B06	IN/OUT	PC-Y0E/NC-X0E		**2A06**	IN/OUT	PC-Y1E/NC-X1E
2B05	IN/OUT	PC-Y0F/NC-X0F		**2A05**	IN/OUT	PC-Y1F/NC-X1F
2B04		---		**2A04**		---
2B03		---		**2A03**		---
2B02		24VDC(COM1)		**2A02**		0V(COM2)
2B01		24VDC(COM1)		**2A01**		0V(COM2)





(Note 1) Output pins with (*) allow 0.2A output. Other pins have 0.1A output.

(Note 2) The device Nos. written above are for the assignment on hardware. These Nos. are different from the device Nos. to be actually used.

<Cable side connector type>

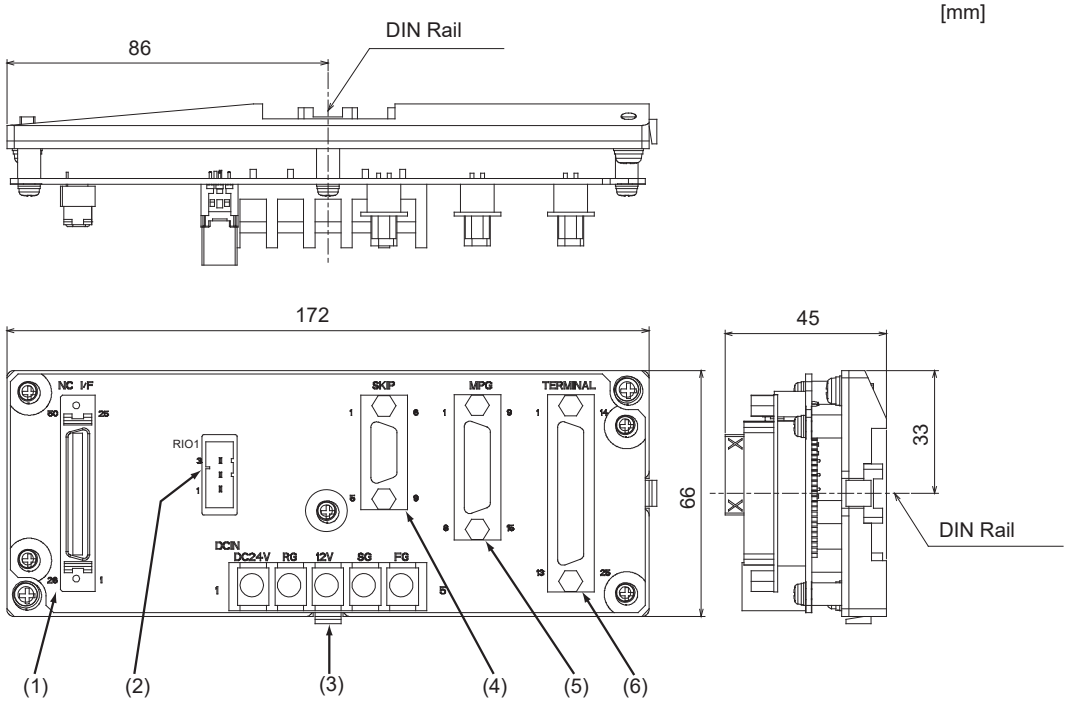
Connector type	Pressure displacement type	Crimp-contact type	Soldering type
Connector	FCN-367J040-AU/F	FCN-363J040	FCN-361J040-AU
Contact	-	AWG#24 to #28: FCN-363J-AU AWG#22 to #26: FCN-363J-AU/S	-
Case	-	FCN-360C040-B FCN-360C040-D (Wide-mouthed type) FCN-360C040-E (Long screw type)	
		-	FCN-360C040-H/E (Side-mouthed type) FCN-360C040-J1 (Sloped-mouth cover) FCN-360C040-J2 (Thin sloped-mouth cover)
Manufacturer	FUJITSU Component		

4.7 Signal Splitter

(Note) Signal splitter allows DIN rail installation only.

Dimension and Names of parts

[mm]



(1) NC I/F

Connector for CNC CPU

(2) RIO1

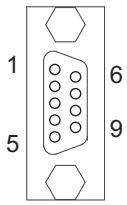
(Not used)

(3) DCIN

Terminal block for power supply (Used for the 12V power supply type manual pulse generator)

(4) SKIP

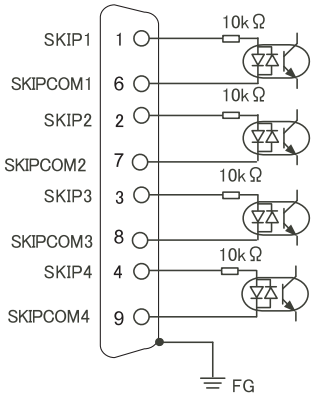
Connector for skip signal



D-SUB 9pin

1	IN	SKIP1
2	IN	SKIP2
3	IN	SKIP3
4	IN	SKIP4
5		---

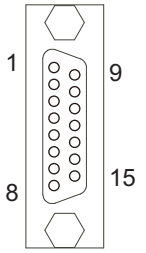
6	IN	COM1
7	IN	COM2
8	IN	COM3
9	IN	COM4



---SKIP I/F specification---
Input ON voltage: 18V or more to 25.2V or less
Input ON current: 6mA or more
Input OFF voltage: 4V or less
Input OFF current: 2mA or less
Input signal holding time (Ton): 2ms or more
Internal response time: 0.08ms or less
(Note) NC recognizes input signals of 2ms or more as the valid skip signals. If machine contacts (relay, etc.) are used, malfunctions will occur due to chattering. Use semiconductor contacts (transistor, etc.).

(5) MPG

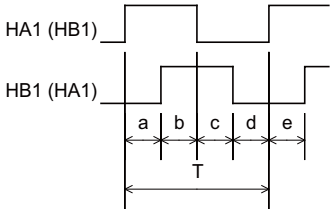
5V/12V Connector for manual pulse generator



D-SUB 15pin

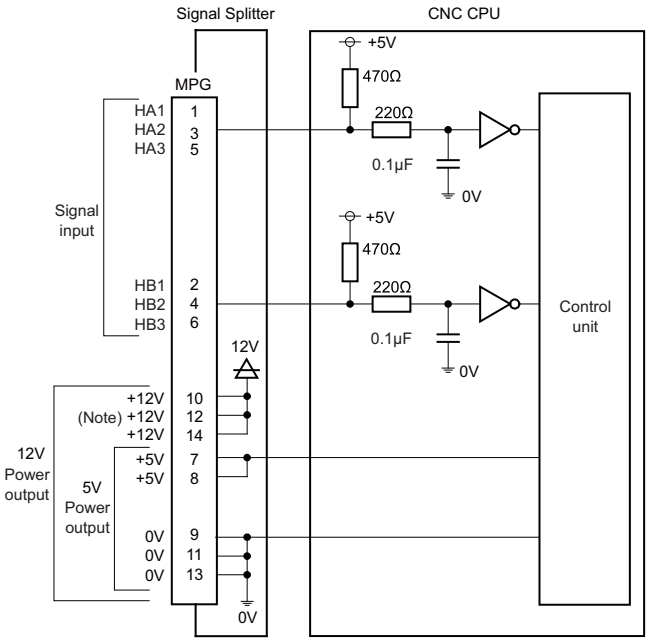
1	IN	HA1	9	OUT	SG(0V)
2	IN	HB1	10	OUT	+12VDC
3	IN	HA2	11	OUT	SG(0V)
4	IN	HB2	12	OUT	+12VDC
5	IN	HA3	13	OUT	SG(0V)
6	IN	HB3	14	OUT	+12VDC
7	OUT	+5VDC	15		---
8	OUT	+5VDC			

	5V manual pulse generator (UFO-01-2Z9) input conditions	12V manual pulse generator (HD60C) input conditions
Input pulse signal type	HA1 and HB1 phases (with phase difference 90°) (Refer to the waveform below.)	
Input signal voltage	H level 3.5V to 5.25V L level 0V to 0.5V	
Max. input pulse frequency	5kHz	
Pulse generators power supply voltage	5VDC±10%	12VDC±10%
Current consumption	100mA or less	
Number of pulses per rotation	100 pulse/rev	25 pulse/rev



a.b.c.d.e: HA1 or HB1 rising edge (falling edge) phase difference = T/4 ± T/10

T: HA1 or HB1 cycle (Min. 10 μ s)



(Note) 12V power is separately required to connect 12V manual pulse generator.
(Refer to "6.9 Connecting the Manual Pulse Generator".)

(6) TERMINAL

(Not used)

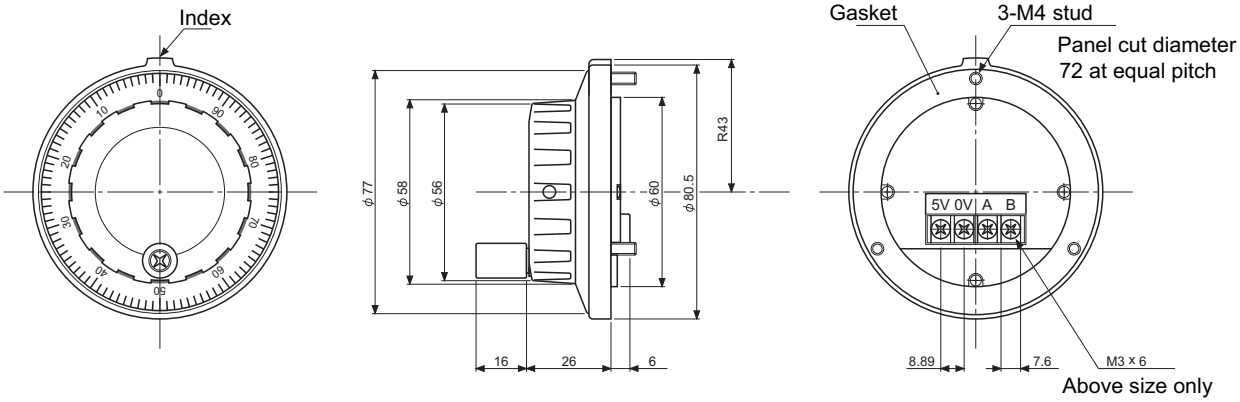
4.8 Manual Pulse Generator

4.8.1 5V Manual Pulse Generator (UFO-01-2Z9)

100 pulse/rev

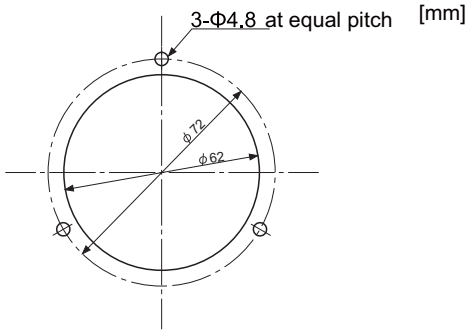
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]



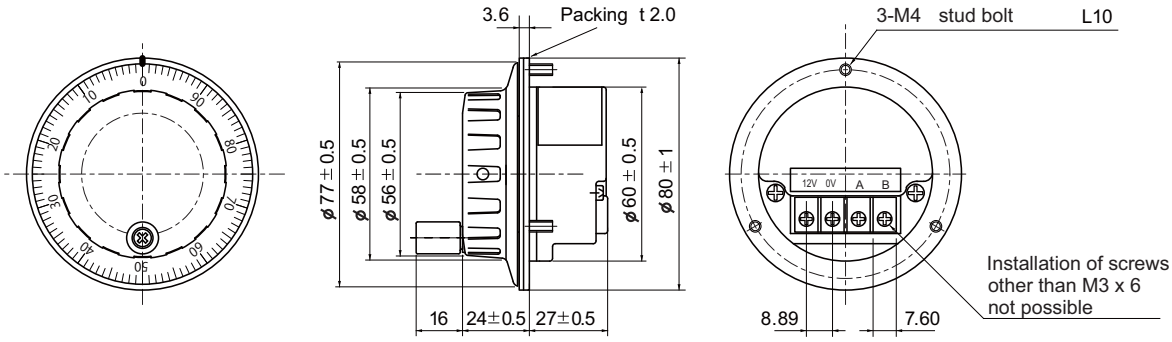
Produced by NIDEC NEMICON CORPORATION

4.8.2 12V Manual Pulse Generator (HD60C)

25 pulse/rev

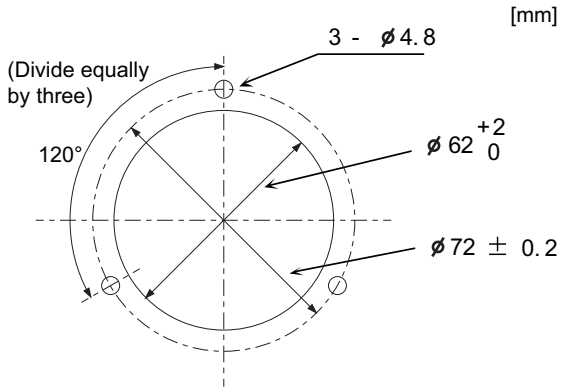
[Outline dimension]

[mm]



[Panel cut dimension]

[mm]

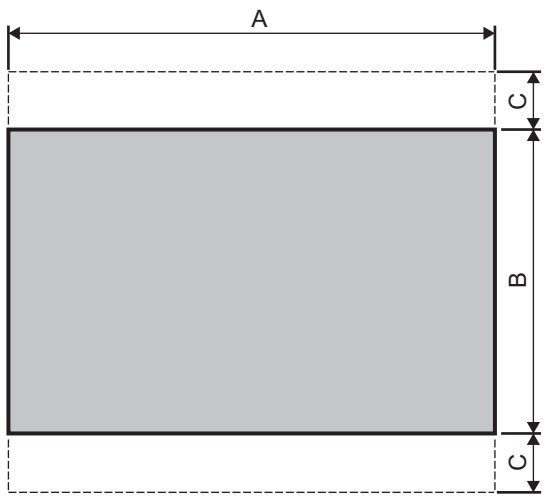


4.9 Recommended Terminal Block for Dual Signal Module

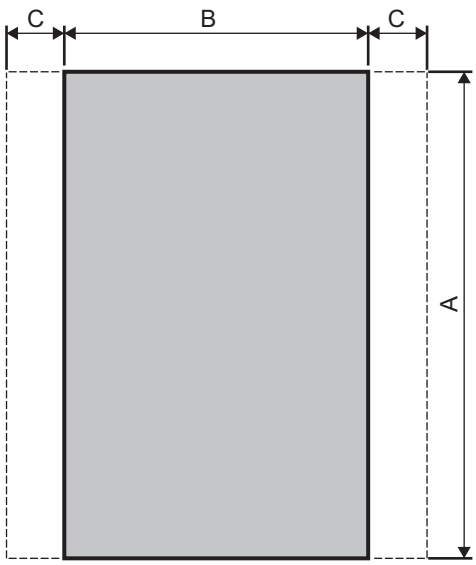
Terminal block converter module FA-TBS40P or FA-LTB40P, produced by MITSUBISHI ELECTRIC ENGINEERING, is recommended to connect the dual signals to the dual signal module. Use the connection cable FA-CBL □□ FMV-M produced by MITSUBISHI ELECTRIC ENGINEERING.
[MITSUBISHI ELECTRIC ENGINEERING: http://www.mee.co.jp]

4.10 GOT (Panel Cut Dimensions)

Make an installation hole on the control panel with the dimensions as shown below.



Horizontal



Vertical

Unit: mm

Model	A	B	C	Panel thickness
GT2715-X	383.5^{+2}_{0}	282.5^{+2}_{0}	10 or More	1.6 to 4
GT2712-S	302^{+2}_{0}	200^{+2}_{0}		
GT2710-S,GT2710-V	289^{+2}_{0}	228^{+2}_{0}		
GT2708-S,GT2708-V	227^{+2}_{0}	176^{+2}_{0}		
GT2705-V	153^{+2}_{0}	121^{+2}_{0}		
GT2512-S	302^{+2}_{0}	228^{+2}_{0}		
GT2510-V	289^{+2}_{0}	200^{+2}_{0}		
GT2508-V	227^{+2}_{0}	176^{+2}_{0}		

The C dimension shows the measurements for installing fittings on the control panel.

Revision History

Date of revision	Manual No.	Revision details
Sep. 2017	IB(NA)1501506-A	The first edition was created excerpting from General specifications pages in "M800/ M80/C80 Series Specifications Manual" (IB-1501267(ENG)-G). "M800W/M80W Series Hardware" was created integrating "M800W Series General Specifications" and "M80W Series General Specifications". "M800S/M80 Series Hardware" was created integrating "M800S Series General Specifications" and "M80 Series General Specifications". The chapter title "C80 Series General Specifications" was changed to "C80 Series Hardware". Other contents were added/revised/deleted according to specification.
Dec. 2017	IB(NA)1501506-B	The descriptions of M800 Series/M80 Series were revised in response to S/W version C7. "M800W/M80W Series Hardware" The following units were added. FCU8-KB922 (MITSUBISHI CNC Machine operation panel) FCU8-KB924 (MITSUBISHI CNC Machine operation panel) The following cable was deleted. CNV2E-MB (Cable for MBE405W/MBA405W) The following contents were changed. 3.16 MITSUBISHI CNC Machine Operation Panel 3.23 List of Cables 4.1.1 Environment Conditions inside the Operation Panel 4.2.1 Environment Conditions inside the Operation Panel 4.15.2 12V Manual Pulse Generator (HD60C) 4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 , FCU8-KB923 / FCU8-KB924) "M800S/M80 Series Hardware" The following units were added. FCU8-KB922 (MITSUBISHI CNC Machine operation panel) FCU8-KB924 (MITSUBISHI CNC Machine operation panel) The following cable was deleted. CNV2E-MB (Cable for MBE405W/MBA405W) The following contents were changed. 3.13 MITSUBISHI CNC Machine Operation Panel 3.20 List of Cables 4.1.1 Installation Environment Conditions 4.2.1 Installation Environment Conditions 4.8.2 FCU8-DX750 / FCU8-DX760 / FCU8-DX761 4.12.2 12V Manual Pulse Generator (HD60C) 4.14.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 , FCU8-KB923 / FCU8-KB924) Other contents were added/revised/deleted according to specification.

Date of revision	Manual No.	Revision details
Mar.2018	IB(NA)1501506-C	The descriptions were revised in response to MITSUBISHI CNC E80 Series. "M800W/M80W Series Hardware" The following units were added. FCU8-DX409 (Remote I/O unit) FCU8-EX564 (Communication expansion unit) FCU8-KB925 (MITSUBISHI CNC Machine operation panel) FCU8-KB926 (MITSUBISHI CNC Machine operation panel) FCU8-KB941 (MITSUBISHI CNC Machine operation panel) The following chapters were added. 4.13.3 CC-Link IE Field (FCU8-EX564) The following contents were changed. 3.10 Remote I/O Unit 3.12 Communication Expansion Unit 3.16 MITSUBISHI CNC Machine Operation Panel 4.1.1 Environment Conditions inside the Operation Panel 4.1.2 Environment Conditions inside the Control Panel 4.2.1 Environment Conditions inside the Operation Panel 4.2.2 Environment Conditions inside the Control Panel 4.11 Remote I/O Unit 4.13.1 CC-Link (FCU8-EX561) 4.13.2 PROFIBUS-DP (FCU8-EX563) 4.13.4 EtherNet/IP (FCU8-EX565) 4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB92) 4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB94) (Continue to the next page)

Date of revision	Manual No.	Revision details
Mar.2018	IB(NA)1501506-C	(Continued from the previous page) "M800S/M80/E80 Series Hardware" The following units were added. FCU8-MU513 (Control unit) FCU8-MU514 (Control unit) FCU8-DU121-13 (Display unit) FCU8-KB024 (Keyboard unit) FCU8-KB025 (Keyboard unit) FCU8-DX731 (Operation panel I/O unit) FCU8-DX409 (Remote I/O unit) FCU8-EX564 (Communication expansion unit) FCU8-KB925 (MITSUBISHI CNC Machine operation panel) FCU8-KB926 (MITSUBISHI CNC Machine operation panel) FCU8-KB941 (MITSUBISHI CNC Machine operation panel) The following cable was added. J225 (Analog output cable) The following chapters were added. 2.3 General Connection Diagram [E80] 3.3 Control Unit [E80] 3.6 Display Unit [E80] 3.9 Keyboard Unit [E80] 3.12 Remote I/O Unit [E80] 3.18 MITSUBISHI CNC Machine Operation Panel [E80] 4.3 Environment Conditions [E80] 4.6 Control Unit [E80] 4.9 Display Unit [E80] 4.10.9 Keyboard for 8.4-type Display Unit (FCU8-KB024) 4.10.10 Keyboard for 8.4-type Display Unit (FCU8-KB025) 4.14.3 CC-Link IE Field (FCU8-EX564) The following contents were changed. 2 General Connection Diagram 3.10 Operation Panel I/O Unit 3.11 Remote I/O Unit [M800S/M80] 3.14 Communication Expansion Unit 3.17 MITSUBISHI CNC Machine Operation Panel [M800S/M80] 3.20 Cable Connector Sets 3.25 List of Cables 4.1.1 Installation Environment Conditions 4.2.1 Installation Environment Conditions 4.10 Keyboard Unit 4.11 Operation Panel I/O Unit 4.12 Remote I/O Unit 4.14.1 CC-Link (FCU8-EX561) 4.14.2 PROFIBUS-DP (FCU8-EX563) 4.14.4 EtherNet/IP (FCU8-EX565) 4.17.1 Main Panel A , B (FCU8-KB921 / FCU8-KB922 / FCU8-KB925 , FCU8-KB923 / FCU8-KB924 / FCU8-KB926) 4.17.2 Sub Panel A (FCU8-KB931 / FCU8-KB941) Other contents were added/revised/deleted according to specification.

Date of revision	Manual No.	Revision details
Sep. 2018	IB(NA)1501506-D	The descriptions were revised corresponding to S/W version B0 of MITSUBISHI CNC C80 series. "C80 Series Hardware" Added the following chapter. 4.10 GOT (Panel Cut Dimensions) Changed the following contents. 3.1 CNC Control Unit 4.6 Dual Signal Module Other mistakes were corrected.
Apr. 2019	IB(NA)1501506-E	The descriptions of M800 Series/M80 Series/E80 Series were revised in response to S/W version E0. "M800W/M80W Series Hardware" The following contents were changed. 2.1.1 M800W, Windows-based Display (15-type) 2.1.2 M800W, Windows-based Display (19-type) 2.1.3 M800W, Non-Windows-based Display (10.4-type / 15-type) 2.2.1 M80W, Windows-based Display (15-type) 2.2.2 M80W, Windows-based Display (19-type) 2.2.3 M80W, Non-Windows-based Display (8.4-type /10.4-type /15-type) 3.9 Operation Panel I/O Unit 3.18 Cable Connector Sets 3.22 Replacements 4.10 Operation Panel I/O Unit 4.10.1 List of Units 4.10.2 FCU8-DX830 / FCU8-DX837 / FCU8-DX730 "M800S/M80/E80 Series Hardware" The following contents were changed. 2.1 General Connection Diagram [M800S] 2.2 General Connection Diagram [M80] 2.3 General Connection Diagram [E80] 3.10 Operation Panel I/O Unit 3.14 Communication Expansion Unit 3.20 Cable Connector Sets 3.24 Replacements 4.11.1 List of Units 4.11.2 FCU8-DX731 / FCU8-DX750 / FCU8-DX760 / FCU8-DX761 Other mistakes were corrected.
Sep. 2019	IB(NA)1501506-F	The descriptions of M800 Series/M80 Series/E80 Series were revised in response to S/W version E1. "M800W/M80W Series Hardware" The following units were added. FCU8-DX834 (Operation panel I/O unit) FCU8-EX568 (FL-net expansion unit) The following cable was added. J460 (DI/DO cable) J461 (DI/DO cable) (Continue to the next page)

Date of revision	Manual No.	Revision details
Sep. 2019	IB(NA)1501506-F	(Continued from the previous page) The following chapters were added. 3.24 System Type 4.13.5 FL-net (FCU8-EX568) The following contents were changed. 2.1.1 M800W, Windows-based Display (15-type) 2.1.2 M800W, Windows-based Display (19-type) 2.2.1 M80W, Windows-based Display (15-type) 2.2.2 M80W, Windows-based Display (19-type) 3.9 Operation Panel I/O Unit 3.12 Communication Expansion Unit 3.23 List of Cables 4.1.1 Environment Conditions inside the Operation Panel 4.2.1 Environment Conditions inside the Operation Panel 4.5.1 10.4-type (FCU8-DU141-31) 4.5.2 15-type (FCU8-DU181-31) 4.5.3 15-type (FCU8-DU181-34) 4.5.4 19-type (FCU8-DU191-75) 4.5.5 19-type (FCU8-DU192-75) 4.6.1 8.4-type (FCU8-DU121-12) 4.6.2 10.4-type (FCU8-DU141-32) 4.6.3 15-type (FCU8-DU181-32) 4.6.4 15-type (FCU8-DU181-36) 4.6.5 19-type (FCU8-DU191-77) 4.6.6 19-type (FCU8-DU192-77) 4.10 Operation Panel I/O Unit 4.10.1 List of Units 4.10.2 FCU8-DX830 / FCU8-DX834 / FCU8-DX837 / FCU8-DX730 "M800S/M80/E80 Series Hardware" The following units were added. FCU8-DX834 (Operation panel I/O unit) FCU8-EX568 (FL-net expansion unit) The following cable was added. J012 (Operation panel I/O interface cable) The following chapters were added. 2.3.1 Connecting a Spindle Drive Unit 2.3.2 Connecting a Pulse-controlled Inverter 3.26 System Type 4.14.5 FL-net (FCU8-EX568) (Continue to the next page)

Date of revision	Manual No.	Revision details
Sep. 2019	IB(NA)1501506-F	(Continued from the previous page) The following contents were changed. 2.1 General Connection Diagram [M800S] 2.2 General Connection Diagram [M80] 2.3 General Connection Diagram [E80] 3.10 Operation Panel I/O Unit 3.14 Communication Expansion Unit 3.25 List of Cables 4.1.1 Installation Environment Conditions 4.2.1 Installation Environment Conditions 4.3.1 Installation Environment Conditions 4.4.1 FCU8-MU542 / FCU8-MA542 / FCU8-MU541 / FCU8-MA541 4.6.1 FCU8-MU513 / FCU8-MU514 4.7.1 10.4-type (FCU8-DU141-31) 4.7.2 15-type (FCU8-DU181-31) 4.8.1 8.4-type (FCU8-DU121-12) 4.8.2 10.4-type (FCU8-DU141-32) 4.8.3 15-type (FCU8-DU181-32) 4.9.1 8.4-type (FCU8-DU121-13) 4.11 Operation Panel I/O Unit 4.11.1 List of Units 4.11.2 FCU8-DX731 / FCU8-DX750/ FCU8-DX760 / FCU8-DX761 / FCU8-DX834 Other mistakes were corrected.
Jan. 2020	IB(NA)1501506-G	The descriptions were revised in response to S/W version F0 of M800/M80/E80 Series. The descriptions were revised in response to S/W version B5 of C80 Series. "M800S/M80/E80 Series Hardware" The following chapters were added. 2.2.1 Connecting a Spindle Drive Unit 2.2.2 Connecting a Pulse-controlled Inverter The following contents were changed. 2.3.2 Connecting a Pulse-controlled Inverter "C80 Series Hardware" The following contents were changed. 3.1 CNC Control Unit 3.2.1 GT27 3.2.2 GT25 3.3 Peripheral Device 4.5 CNC CPU Module 4.10 GOT (Panel Cut Dimensions) Other mistakes were corrected.

Global Service Network

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Rajkot Service Satellite

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Notice

Every effort has been made to keep up with software and hardware revisions in the contents described in this manual. However, please understand that in some unavoidable cases simultaneous revision is not possible. Please contact your Mitsubishi Electric dealer with any questions or comments regarding the use of this product.

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