

mitsubishi

Q2A(S1)/Q3A/Q4ACPU

User's Manual (Hardware)

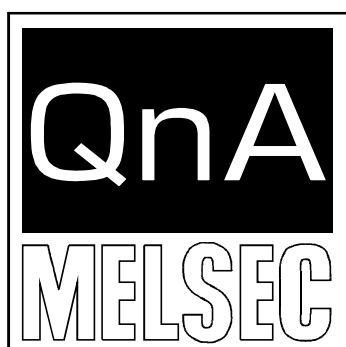
Mitsubishi Programmable Controller

User's Manual

(Hardware)

Thank you for purchasing the Mitsubishi programmable controller MELSEC-QnA series.

Prior to use, please read both this and relevant manuals thoroughly to fully understand the product.



MODEL	QNACPU-U(H/W)-E
MODEL CODE	13J820
IB-66607-I(0907)MEE	

● SAFETY PRECAUTIONS ●

(Be sure to read these instructions before use.)

Before using the product, read this and relevant manuals carefully and handle the product correctly with full attention to safety.

In this manual, ● SAFETY PRECAUTIONS ● are classified into 2 levels: "DANGER" and "CAUTION".




DANGER

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury and/or property damage.

Under some circumstances, failure to observe the  **CAUTION** level instructions may also lead to serious results.

Be sure to observe the instructions of both levels to ensure the safety.

Please keep this manual in a safe place for future reference and also pass this manual on to the end user.

[DESIGN PRECAUTIONS]

DANGER

- Create a safety circuit outside the PLC to ensure the whole system will operate safely even if an external power failure or a PLC failure occurs. Otherwise, incorrect output or malfunction may cause an accident.
 - (1) For an emergency stop circuit, protection circuit and interlock circuit that is designed for incompatible actions such as forward/reverse rotation or for damage prevention such as the upper/lower limit setting in positioning, any of them must be created outside the PLC.
 - (2) When the PLC detects the following error conditions, it stops the operation and turn off all the outputs.
 - The overcurrent protection device or overvoltage protection device of the power supply module is activated.
 - The PLC CPU detects an error such as a watchdog timer error by the self-diagnostics function.

In the case of an error of a part such as an I/O control part that cannot be detected by the PLC CPU, all the outputs may turn on. In order to make all machines operate safely in such a case, set up a fail-safe circuit or a specific mechanism outside the PLC.

Refer to "LOADING AND INSTALLATION" in this manual for example fail safe circuits.

[DESIGN PRECAUTIONS]

DANGER

- (3) Depending on the failure of the output module's relay or transistor, the output status may remain ON or OFF incorrectly. For output signals that may lead to a serious accident, create an external monitoring circuit.
- If load current more than the rating or overcurrent due to a short circuit in the load has flowed in the output module for a long time, it may cause a fire and smoke. Provide an external safety device such as a fuse.
 - Design a circuit so that the external power will be supplied after power-up of the PLC.

Activating the external power supply prior to the PLC may result in an accident due to incorrect output or malfunction.

- For the operation status of each station at a communication error in data link, refer to the respective data link manual.

The communication error may result in an accident due to incorrect output or malfunction.

- When controlling a running PLC (data modification) by connecting a peripheral device to the CPU module or a PC to a special function module, create an interlock circuit on sequence programs so that the whole system functions safely all the time.

Also, before performing any other controls (e.g. program modification, operating status change (status control)), read the manual carefully and ensure the safety.

In these controls, especially the one from an external device to a PLC in a remote location, some PLC side problem may not be resolved immediately due to failure of data communications.

To prevent this, create an interlock circuit on sequence programs and establish corrective procedures for communication failure between the external device and the PLC CPU.

- When setting up the system, do not allow any empty slot on the base unit. If any slot is left empty, be sure to use a blank cover (AG60) or a dummy module (AG62) for it.

When using the extension base unit, A52B, A55B or A58B, attach the included dustproof cover to the module in slot 0.

Otherwise, internal parts of the module may be flied in the short circuit test or when an overcurrent or overvoltage is accidentally applied to external I/O section.

CAUTION

- Do not install the control lines or communication cables together with the main circuit or power lines, or bring them close to each other. Keep a distance of 100mm (3.94inch) or more between them. Failure to do so may cause malfunctions due to noise.

[DESIGN PRECAUTIONS]



CAUTION

- If having read register R outside the allowable range with the MOV instruction, the file register data will be FFFFH. Using this as it is may cause malfunctions. Pay attention not to use any out-of-range file register when designing sequence programs. For instruction details, refer to the programming manual.
- When an output module is used to control the lamp load, heater, solenoid valve, etc., a large current (ten times larger than the normal one) may flow at the time that the output status changes from OFF to ON. Take some preventive measures such as replacing the output module with the one of a suitable current rating.

[INSTALLATION PRECAUTIONS]



CAUTION

- Use the PLC under the environment specified in the user's manual. Otherwise, it may cause electric shocks, fires, malfunctions, product deterioration or damage.
- Hold down the module loading lever at the module bottom, and securely insert the module fixing latch into the fixing hole in the base unit. Incorrect loading of the module can cause a malfunction, failure or drop. When using the PLC in the environment of much vibration, tighten the module with a screw. Tighten the screw in the specified torque range. Undertightening can cause a drop, short circuit or malfunction. Overtightening can cause a drop, short circuit or malfunction due to damage to the screw or module.
- Connect the extension cable to the connector of the base unit or module. Check the cable for incomplete connection after connecting it. Poor electrical contact may cause incorrect inputs and/or outputs.
- Insert the memory card and fully press it to the memory card connector. Check for incomplete connection after installing it. Poor electrical contact may cause malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module. Failure to do so may damage the module.
- Do not directly touch the conductive part or electronic components of the module. Doing so may cause malfunctions or a failure of the module.

[WIRING PRECAUTIONS]



DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring. Failure to do so may result in an electric shock or damage of the product.

[WIRING PRECAUTIONS]

DANGER

- Before energizing and operating the system after wiring, be sure to attach the terminal cover supplied with the product.
Failure to do so may cause an electric shock.

CAUTION

- Always ground the FG and LG terminals to the protective ground conductor.
Failure to do so may cause an electric shock or malfunctions.
- Wire the module correctly after confirming the rated voltage and terminal layout.
Connecting a power supply of a different voltage rating or incorrect wiring may cause a fire or failure.
- Do not connect multiple power supply modules to one module in parallel. The power supply modules may be heated, resulting in a fire or failure.
- Press, crimp or properly solder the connector for external connection with the specified tool.
Incomplete connection may cause a short circuit, fire or malfunctions.
- Tighten terminal screws within the specified torque range. If the screw is too loose, it may cause a short circuit, fire or malfunctions.
If too tight, it may damage the screw and/or the module, resulting in a short circuit or malfunctions.
- Carefully prevent foreign matter such as dust or wire chips from entering the module.
Failure to do so may cause a fire, failure or malfunctions.
- Install our PLC in a control panel for use.
Wire the main power supply to the power supply module installed in a control panel through a distribution terminal block.
Furthermore, the wiring and replacement of a power supply module have to be performed by a maintenance worker who acquainted with shock protection.
(For the wiring methods, refer to Q2ACPU(S1)/ Q3ACPU /Q4ACPU User's Manual)

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch any terminal during power distribution.
Doing so may cause an electric shock.
- Properly connect batteries. Do not charge, disassemble, heat or throw them into the fire and do not make them short-circuited and soldered. Incorrect battery handling may cause personal injuries or a fire due to exothermic heat, burst and/or ignition.

[STARTUP AND MAINTENANCE PRECAUTIONS]



DANGER

- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws.
Failure to do so may result in an electric shock.
If they are too loose, it may cause a short circuit or malfunctions.
If too tight, it may cause damage to the screws and/or module, resulting in an accidental drop of the module, short circuit or malfunctions.



CAUTION

- When performing online operations (especially, program modification, forced output or operating status change) by connecting a peripheral device to the running CPU module, read the manual carefully and ensure the safety.
Incorrect operation will cause mechanical damage or accidents.
- Do not disassemble or modify each of modules.
Doing so may cause failure, malfunctions, personal injuries and/or a fire.
- When using a wireless communication device such as a mobile phone, keep a distance of 25cm (9.84inch) or more from the PLC in all directions.
Failure to do so may cause malfunctions.
- Be sure to shut off all phases of the external power supply used by the system before mounting or removing the module.
Failure to do so may result in failure or malfunctions of the module.
- When replacing the fuse, use a fuse specified by the manufacturer.
Using the one for the high-rated current or an electric wire may cause a fire.
- Do not drop or apply any impact to the battery.
Doing so may damage the battery, resulting in electrolyte spillage inside the battery.
If any impact has been applied, discard the battery and never use it.
- Before handling modules, touch a grounded metal object to discharge the static electricity from the human body.
Failure to do so may cause failure or malfunctions of the module.

[DISPOSAL PRECAUTIONS]



CAUTION

- When disposing of this product, treat it as an industrial waste.
When disposing of batteries, separate them from other wastes according to the local regulations.
(For details of the Battery Directive in EU member states, refer to the Q2ACPU(S1)/Q3ACPU/Q4ACPU User's Manual.)

[TRANSPORTATION PRECAUTIONS]



CAUTION

- When transporting lithium batteries, make sure to treat them based on the transportation regulations. (Refer to Chapter 7 for details of the relevant models.)

REVISIONS

*The manual number is given on the bottom right of the front cover.

Print Date	*Manual Number	Revision
Jun., 1996	IB(NA) 66607-A	First edition
Sep., 1998	IB(NA) 66607-B	<div>Correction</div> <p>SAFETY PRECAUTIONS, Section 4.5.2</p> <div>Addition</div> <p>Specifications, Performance specifications, EMC standards, Low-Voltage instruction</p>
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Dec., 2003	IB(NA) 66607-D	<div>Partial corrections</div> <p>SAFETY PRECAUTIONS, Section 3.1, 3.1.3, 3.1.4, 3.1.5, 6.2</p>
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Jul., 2009	IB(NA) 66607-I	<div>Partial corrections</div> SAFETY PRECAUTIONS, Section 1.1, Chapter 3, Section 4.3.2, 6.3

Japanese Manual Version IB-68503-K

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This manual describes the operating precautions, input/output connections, and error codes relevant to Q2ACPU, Q2ACPU-S1, Q3ACPU, and Q4ACPU (hereafter, all are referred to simply as "QnACPU") operations.

Manuals :

The following table lists the manuals relevant to this product.

Please order it as necessary.

Detailed manuals

Manual Name	Manual No.
Q2ACPU(S1)/Q3ACPU/Q4ACPU User's Manual Discusses QnACPU performance, functions, and operation, and contains the specifications for the power supply, memory card, and base unit. (sold separately)	IB-66608 (13J821)

Related manuals

Manual Name	Manual No.
QnACPU Guidebook This manual is designed for first-time users of the QnACPU. It explains the procedures for all operations from program creation, to program writing to the CPU, and program debugging. It also explains how to use the QnACPU special features. (sold separately)	IB-66606 (13JF10)
QnACPU Programming Manual (Fundamentals) This manual explains the programming procedures required for program creation. It also explains the device names, parameters, and program types. (sold separately)	IB-66614 (13JF46)
QCPU(Q mode)/QnACPU Programming Manual (Common Instructions) This manual explains how to use the sequence instructions, basic instructions, and application instructions. (sold separately)	SH-080039 (13JF58)
QnACPU Programming Manual (Special Function Module) This manual explains the dedicated instructions used with special function modules. (sold separately)	SH-4013 (13JF56)
QnACPU Programming Manual (AD57 Instructions) This manual explains the dedicated instructions used to operate the AD57(S1) CRT controller module. (sold separately)	IB-66617 (13JF49)
QCPU(Q mode)/QnACPU Programming Manual (PID Control Instructions) This manual explains the dedicated instructions used to execute PID control. (sold separately)	SH-080040 (13JF59)
QCPU(Q mode)/QnACPU Programming module (SFC) This manual explains the system configuration, performance specifications, functions, programming, debugging error codes and others of MELSAP3. (sold separately)	SH-080041 (13JF60)
I/O module type Building block User's Manual This manual gives the specifications for building- block type I/O modules. (sold separately)	IB-66140 (13J643)

1. SPECIFICATIONS

1.1 SPECIFICATIONS

Table 1.1 General specification

Item	Specifications					
Ambient operating temperature	0 to 55 °C					
Ambient storage temperature	−20 to 75 °C					
Ambient operating humidity	10 to 90 % RH, No-condensing					
Ambient storage humidity	10 to 90 % RH, No-condensing					
Vibration resistance	Conforming to JIS B 3502, IEC 61131-2		Frequency	Acceleration	Amplitude	No. of sweeps
		Under intermittent vibration	10 to 57Hz	——	0.075mm (0.003in.)	10 times each in X, Y, Z directions
			57 to 150Hz	9.8m/s ²	——	
		Under continuous vibration	10 to 57Hz	——	0. 035mm (0.001in.)	——
			57 to 150Hz	4.9m/s ²	——	
Shock resistance	Conforming to JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions X, Y, Z)					
Operating ambience	No corrosive gases					
Operating elevation *3	2000m (6562ft.) max.					
Installation location	Control panel					
Over voltage category *1	II max.					
Pollution level *2	2 max.					
Equipment category	Class I					

- *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 voltage withstand level for up to the rated voltage of 300 V is 2500 V.
- *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.
- *3: Do not use or store the PLC in the environment when the pressure is higher than the atmospheric pressure at sea level. Otherwise, malfunction may result. To use the PLC in high-pressure environment, contact your nearest Mitsubishi representative.

❖ 2. PERFORMANCE SPECIFICATIONS ❖

2.1 QnACPU Module Performance Specifications

This section gives the Performance specifications of the QnACPU.

Table 2.1 Performance Specifications

Item		Model Name				Remark
		Q2ACPU	Q2ACPU-S1	Q3ACPU	Q4ACPU	
Control system		Repeated operation (using stored program)				
I/O control method		Refresh mode				Direct input using device names possible
Programming language		Language dedicated to sequence control				
		Relay symbol language, logic symbolic language, MELSAP-3 (SFC)				
Processing speed (sequence instruction)	LD	0.2 μs/step		0.15 μs/step	0.075 μs/step	
	MOV	0.6 μs/step		0.45 μs/step	0.225 μs/step	
Constant scan (program started at fixed time Intervals)		5 to 2000 ms (can be set in 5 ms units)				Set by parameter
Memory capacity		Capacity of the installed memory card (max. 2036 k bytes)				
Program capacity	Number of steps	Max. 28 k steps	Max. 60 k steps	Max. 92 k steps	Max. 124 k steps	
	Number of files	28 files	60 files	92 files	124 files	
Number of I/O device points		8192 points (X/Y0 to 1FFF)				Number of points that can be used in programs
Number of I/O points		512 points (X/Y0 to 1FF)	1024 points (X/Y0 to 3FF)	2048 points (X/Y0 to 7FF)	4096 points (X/Y0 to FFF)	Number of points actually accessible with I/O modules
Clock function		Year, month, date, hour, minute, second, day of week (automatic recognition of leap years) Accuracy -2.3 to +4.4 s (TYP. +1.8 s)/d at 0 °C Accuracy -1.1 to +4.4 s (TYP. +2.2 s)/d at 25°C Accuracy -9.6 to +2.7 s (TYP. -2.4 s)/d at 55 °C				
Allowable momentary power interruption time		Depends on the power supply module				

Table 2.1 Performance Specifications (Continued)

Item	Model Name				Remark
	Q2ACPU	Q2ACPU-S1	Q3ACPU	Q4ACPU	
Internal current consumption for 5 VDC	0.3 (0.4) A	0.3 (0.4) A	0.3 (0.4) A	0.6 (0.9) A	The numerical value in parentheses represents a function version "B" or later unit.
Weight	0.8 kg	0.8 kg	0.8 kg	0.8 kg	
External dimensions	250(H) (9.84) × 79.5(W) (3.13) × 121(D) (4.76) mm (inch)				

REMARK

Please check the rating plate of the CPU module for the function version "B".

<QnACPU>



Manufacturing
date

Function
Version

3. EMC DIRECTIVES AND LOW VOLTAGE DIRECTIVES

The products sold in the European countries have been required by law to comply with the EMC Directives and Low Voltage Directives of the EU Directives since 1996 and 1997, respectively.

The manufacturers must confirm by self-declaration that their products meet the requirements of these directives, and put the CE mark on the products.

(1) Authorized representative in Europe

Authorized representative in Europe is shown below.

Name: Mitsubishi Electric Europe BV

Address: Gothaer strase 8, 40880 Ratingen, Germany

3.1 Requirements for Compliance with EMC Directives

The EMC Directives specifies emission and immunity criteria and requires the products to meet both of them, i.e., not to emit excessive electromagnetic interference (emission): to be immune to electromagnetic interference outside (immunity).

Guidelines for complying the machinery including MELSEC-QnA series PLC with the EMC Directives are provided in Section 3.1.1 to 3.1.6 below.

The guidelines are created based on the requirements of the regulations and relevant standards, however, they do not guarantee that the machinery constructed according to them will not comply with the Directives.

Therefore, the manufacturer of the machinery must finally determine how to make it comply with the EMC Directives: if it is actually compliant with the EMC Directives.

3.1.1 EMC standards

When the PLC is installed following the directions given in this manual its EMC performance is compliant to the following standards and levels as required by the EMC directive.

Specifications	Test Item	Test Description	Standard Values
EN61000-6-4 (2001)	EN55011 *2 Radiated noise	Measure the emission released by the product.	30M-230 M Hz QP: 30dB μ V/m (30m measurement) *1 230M-1000MHz QP: 37dB μ V/m (30m measurement) *1
	EN55011 *2 Conduction noise	Measure the emission released by the product to the power line.	150k-500kHz QP: 79dB, Mean: 66dB*1 500k-30MHz QP: 73dB, Mean: 60dB *1
EN61131-2/A12 (2000)	EN61000-4-2 *2 Static electricity immunity	Immunity test by applying static electricity to the module enclosure.	4kV contact discharge 8kV air discharge
	EN61000-4-4 *2 First transient burst noise	Immunity test by applying burst noise to the power line and signal line.	2kV Power line 1kv Signal line
	EN61000-4-12 *2 Damped oscillatory wave	Immunity test in which a damped oscillatory wave is superimposed on the power line.	1kv
	EN61000-4-3 *2 Radiated electromagnetic field	Immunity test by applying a radiated electric field to the product.	10V/m, 26-1000MHz
EN61000-6-2 (2001)	EN61000-4-6 *2 Conduction noise	Immunity test by inducing an electromagnetic field in the power line signal line.	10 V/ms, 0.15-80MHZ, 80% AM modulation@1kHz

*1: QP: Quasi-peak value, Mean: Average value

*2: The PLC is an open type device (device installed to another device) and must be installed in a conductive control panel.

The tests for the corresponding items were performed while the PLC was installed inside the control panel.

3.1.2 Installation instructions for EMC Directive

The PLC is open equipment and must be installed within a control cabinet for use.* This not only ensures safety but also ensures effective shielding of PLC-generated electromagnetic noise.

* : Also, each network remote station needs to be installed inside the control panel.

However, the waterproof type remote station can be installed outside the control panel.

(1) Control cabinet

- (a) Use a conductive control cabinet.
- (b) When attaching the control cabinet's top plate or base plate, mask painting and weld so that good surface contact can be made between the cabinet and plate.
- (c) To ensure good electrical contact with the control cabinet, mask the paint on the installation bolts of the inner plate in the control cabinet so that contact between surfaces can be ensured over the widest possible area.
- (d) Earth the control cabinet with a thick wire so that a low impedance connection to ground can be ensured even at high frequencies.
- (e) Holes made in the control cabinet must be 10 cm (3.94 in.) diameter or less. If the holes are 10 cm (3.94 in.) or larger, radio frequency noise may be emitted.

In addition, because radio waves leak through a clearance between the control panel door and the main unit, reduce the clearance as much as practicable.

The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Our tests have been carried out on a panel having the damping characteristics of 37 dB max. and 30 dB mean (measured by 3 m method with 30 to 300 MHz).

(2) Connection of power and earth wires

Earthing and power supply wires for the PLC system must be connected as described below.

- (a) Provide an earthing point near the power supply module. Earth the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30 cm (11.18 in.) or shorter.) The LG and FG terminals function is to pass the noise generated in the PLC system to the ground, so an impedance that is as low as possible must be ensured. In addition, make sure to wire the ground cable short as the wires are used to relieve the noise, the wire itself carries large noise content and thus short wiring means that the wire is prevented from acting as an antenna.
- (b) The earth wire led from the earthing point must be twisted with the power supply wires. By twisting with the earthing wire, noise flowing from the power supply wires can be relieved to the earthing. However, if a filter is installed on the power supply wires, the wires and the earthing wire may not need to be twisted.

3.1.3 Cables

The cables pulled out of the control panel contain a high frequency noise component. On the outside of the control panel, therefore, they serve as antennas to emit noise.

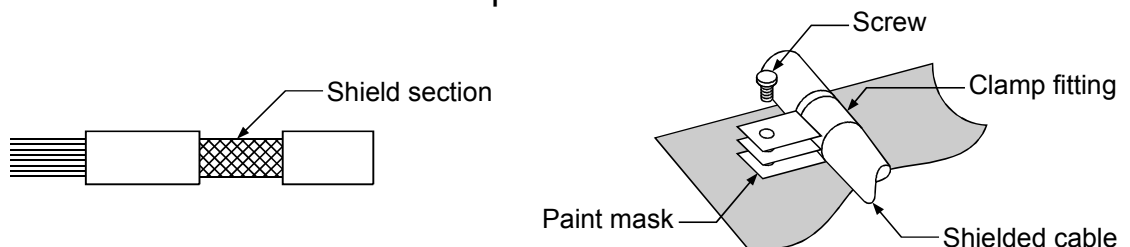
Ensure to use shielded cables for the cables, which are connected to the I/O modules, special modules and those pulled out to outside of the control panel. Mounting ferrite core is not required except some types of CPU however, noise emanated via the cable can be restrained using it.

The use of a shielded cable also increases noise resistance. The signal lines (including common line) connected to the PLC input/output modules and intelligent modules use shielded cables to assure noise resistance, as a condition, standardized on EN61131-2/A12 (2000).

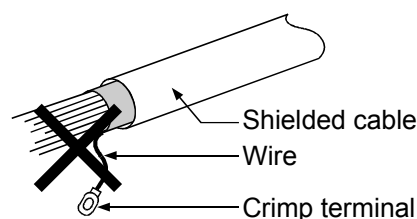
If a shielded cable is not used or not earthed correctly, the noise resistance will be less than the rated value

(1) Earthing of shielded of cables

- (a) Earth the shield of the shielded cable as near the unit as possible taking care so that the earthed cables are not induced electromagnetically by the cable to be earthed.
- (b) Take appropriate measures so that the shield section of the shielded cable from which the outer cover was partly removed for exposure is earthed to the control panel on an increased contact surface. A clamp may also be used as shown in the figure below. In this case, however, apply a cover to the painted inner wall surface of the control panel which comes in contact with the clamp.

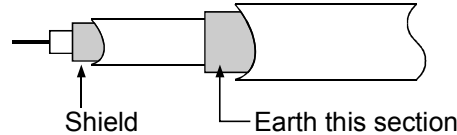


Note) The method of earthing by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



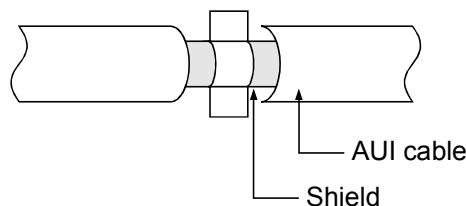
(2) MELSECNET (II) and MELSECNET/10 units

- (a) Use a double-shielded coaxial cable for the MELSECNET unit which uses coaxial cables. Noise in the range of 30 MHz or higher in radiation noise can be suppressed by the use of double-shielded coaxial cables (Mitsubishi Cable: 5C-2V-CCY). Earth the outer shield to the ground. The precautions on shielding to be followed are the same as those stated in item (1) above.

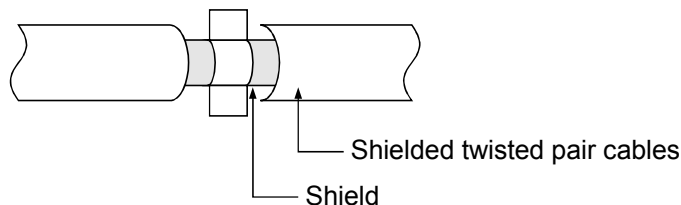


- (b) Ensure to attach a ferrite core to the double-shielded coaxial cable connected to the MELSECNET unit. In addition, position the ferrite core on each cable near the outlet of the control panel. TDK-make ZCAT3035 ferrite core is recommended.
- (3) Ethernet module
Precautions to be followed when AUI cables and coaxial cables are used are described below.

- (a) Ensure to earth also the AUI cables connected to the 10BASE5 connectors of the AJ71QE71-B5. Because the AUI cable is of the shielded type, as shown in the figure below, partly remove the outer cover of it, and earth the exposed shield section to the ground on the widest contact surface.



- (b) Use shielded twisted pair cables as the twisted pair cables*1 connected to the 10BASE-T connectors. For the shielded twisted pair cables, strip part of the outer cover and earth the exposed shield section to the ground on the widest contact surface as shown below.

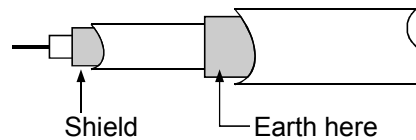


Refer to (1) for the earthing of the shield.

*1: Make sure to install a ferrite core for the cable.

As a ferrite core, ZCAT2035 manufactured by TDK is recommended.

- (c) Always use double-shielded coaxial cables as the coaxial cables*2 connected to the 10BASE2 connectors. Earth the double-shielded coaxial cable by connecting its outer shield to the ground.



Refer to (1) for the earthing of the shield.

*2: Make sure to install a ferrite core for the cable.

As a ferrite core, ZCAT2035 manufactured by TDK is recommended.

Ethernet is the registered trademark of XEROX, Co.,LTD
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(4) I/O and other communication cables

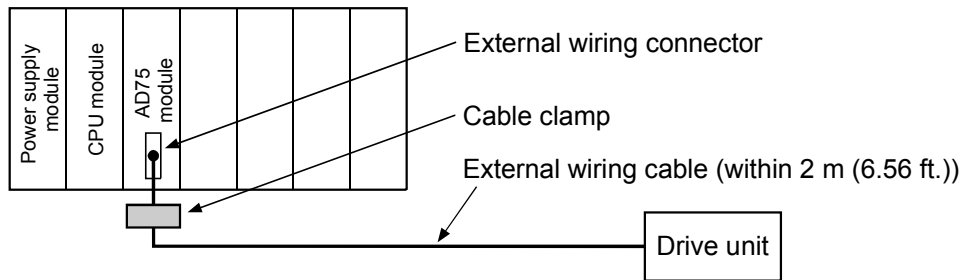
For the I/O signal lines (including common line) and other communication cables (RS-232, RS-422, etc), if extracted to the outside of the control panel, also ensure to earth the shield section of these lines and cables in the same manner as in item (1) above.

(5) Positioning Modules

Precautions to be followed when the machinery conforming to the EMC Directive is configured using the AD75P□-S3 are described below.

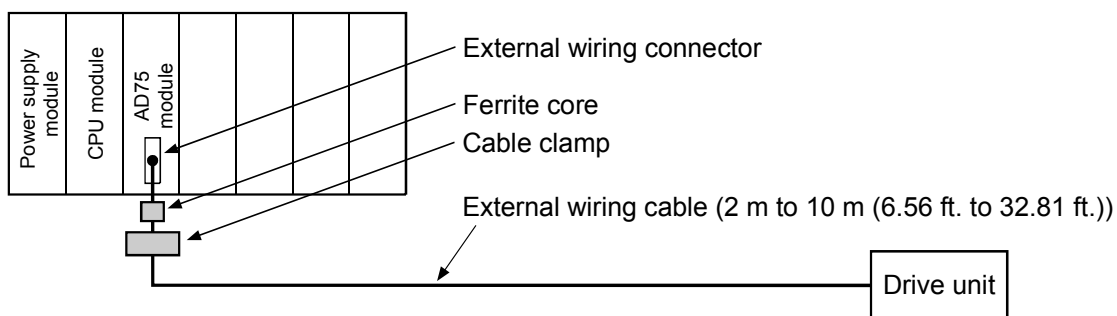
(a) When wiring with a 2 m (6.56 ft.) or less cable

- Ground the shield section of the external wiring cable with the cable clamp.
(Ground the shield at the closest location to the AD75 external wiring connector.)
- Wire the external wiring cable to the drive unit and external device with the shortest practicable length of cable.
- Install the drive unit in the same panel.



(b) When wiring with cable that exceeds 2 m (6.56 ft.), but is 10 m (32.81 ft.) or less

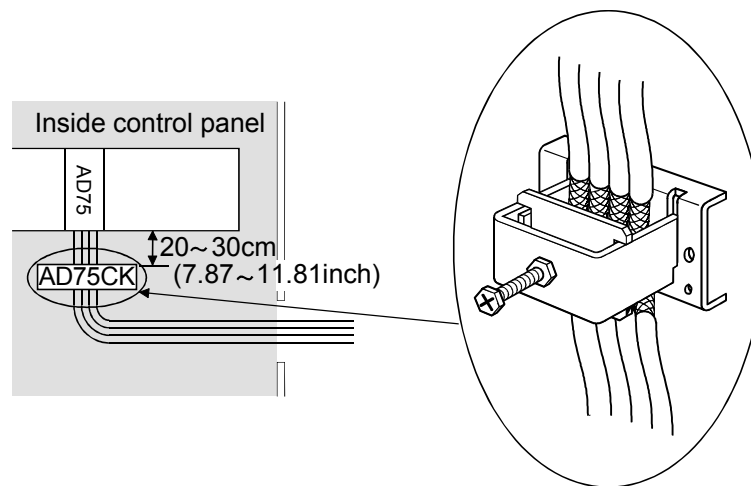
- Ground the shield section of the external wiring cable with the cable clamp.
(Ground the shield at the closest location to the AD75 external wiring connector.)
- Install a ferrite core.
- Wire the external wiring cable to the drive unit and external device with the shortest practicable length of cable.



(c) Ferrite core and cable clamp types and required quantities

- Cable clamp
Type : AD75CK (Mitsubishi Electric)
- Ferrite core
Type : ZCAT3035-1330 (TDK ferrite core)
- Required quantity

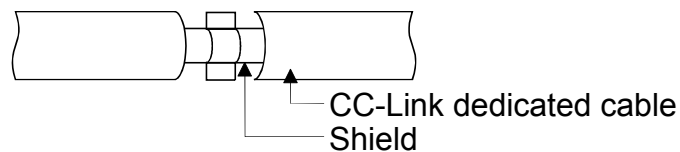
Cable length	Prepared part	Required Qty		
		1 axis	2 axes	3 axes
Within 2 m (6.56 ft.)	AD75CK	1	1	1
2 m (6.56 ft.) to 10m (32.81 ft.)	AD75CK	1	1	1
	ZCAT3035-1330	1	2	3



(6) CC-Link Module

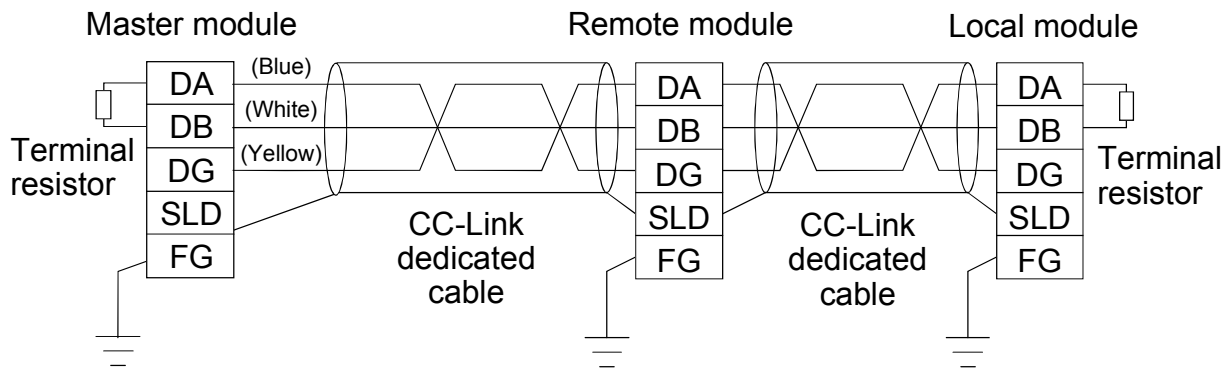
- (a) Be sure to ground the cable shield that is connected to the CC-Link module close to the exit of control panel or to any of the CC-Link stations within 30 cm (11.81 in.) from the module or stations.

The CC-Link dedicated cable is a shielded cable. As shown in the illustration below, remove a portion of the outer covering and ground as large a surface area of the exposed shield part as possible.



- (b) Always use the specified CC-Link dedicated cable.
- (c) The CC-Link module, the CC-Link stations and the FG line inside the control panel should be connected at the FG terminal as shown in the diagram below.

[Simplified diagram]



- (d) Power line connecting to the external power supply terminal (compliant with I/O power port of CE standard) should be 30m (98.43 ft.) or less.
Power line connecting to module power supply terminal (compliant with main power port of CE standard) should be 10m (32.81 ft.) or less.
- (e) A power line connecting to the analog input of the following modules should be 30cm or less.
- AJ65BT-64RD3
 - AJ65BT-64RD4
 - AJ65BT-68TD

3.1.4 Power supply module

The precautions required for each power supply module are described below. Always observe the items noted as precautions.

Model	Precautions
A61P, A61PN, A62P	Use not allowed
A63P	Use a CE-compliant 24VDC power supply in the control panel.
A61PEU, A62PEU	Make sure to short and ground the LG and FG terminals.

3.1.5 Base unit

The following table shows models of base units that are compatible with EMC instructions.

Type	Model name	Applicability
Main base unit	A38HBEU	Applicable
	A3□B, A38HB	Not applicable
Extension base unit	A5□B, A6□B	Applicable

3.1.6 Ferrite core

Use of ferrite cores is effective in reducing the conduction noise in the band of about 10 MHz and radiated noise in 30 to 100 MHz band.

It is recommended to attach ferrite cores when the shield of the shielded cable coming out of control panel does not work effectively, or when emission of the conduction noise from the power line has to be suppressed.*1 The ferrite cores used in our tests are TDK's ZCAT3035.

It should be noted that the ferrite cores should be fitted to the cables in the position immediately before they are pulled out of the enclosure. If the fitting position is improper, the ferrite will not produce any effect.

*1:To response with CE(EN61131-2/A12), make sure to mount 2 or more ferrite cores onto the power supply line. The mounting position should be as near the power supply module as possible.

Ferrite core

Type: ZCAT2235-1030A (TDK ferrite core)

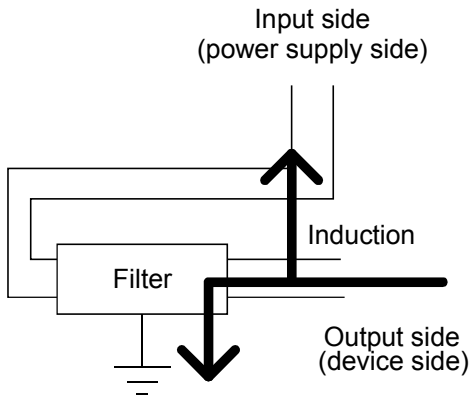
3.1.7 Noise filter (power supply line filter)

A noise filter is a component which has an effect on conducted noise. With the exception of some models, it is not required to fit the noise filter to the power supply line, but fitting it can further suppress noise. (The noise filter has the effect of reducing conducted noise of 10 M Hz or less.) Use any of the following noise filters (double π type filters) or equivalent.

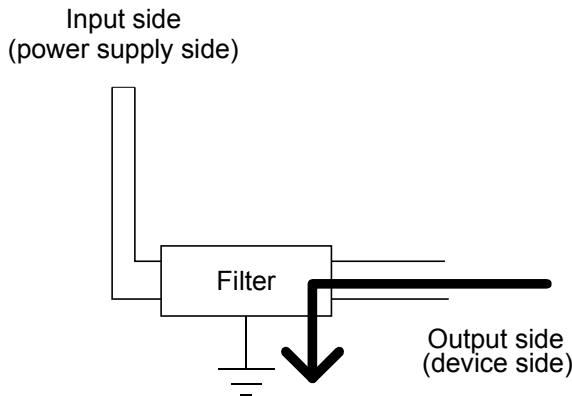
Model name	FN343-3/01	FN660-6/06	ZHC2203-11
Manufacturer	SCHAFFNER	SCHAFFNER	TDK
Rated current	3 A	6 A	3 A
Rated voltage	250 V		

The precautions required when installing a noise filter are described below.

- (1) Do not bundle the wires on the input side and output side of the noise filter. When bundled, the output side noise will be induced into the input side wires from which the noise was filtered.



(a) The noise will be included when the input and output wires are bundled.



(b) Separate and lay the input and output wires.

- (2) Earth the noise filter earthing terminal to the control cabinet with the shortest wire possible (approx. 10 cm (3.94 in.)).

3.2 Requirements for Compliance with Low Voltage Directives

The Low Voltage Directives apply to the electrical equipment operating from 50 to 1000VAC or 75 to 1500VDC; the manufacturer must ensure the adequate safety of the equipment.

Guidelines for installation and wiring of MELSEC-QnA series PLC are provided in Section 3.2.1 to 3.2.7 for the purpose of compliance with the EMC Directives. The guidelines are created based on the requirements of the regulations and relevant standards, however, they do not guarantee that the machinery constructed according to them will comply with the Directives.

Therefore, the manufacturer of the machinery must finally determine how to make it comply with the EMC Directives: if it is actually compliant with the EMC Directives.

3.2.1 Standard applied for MELSEC-QnA series PLC

The standard applied for MELSEC-QnA series PLC series is EN61010-1 safety of devices used in measurement rooms, control rooms, or laboratories.

For the modules which operate with the rated voltage of 50 VAC/75 VDC or above, we have developed new models that conform to the above standard. For the modules which operate with the rated voltage under 50 VAC/75 VDC, the conventional models can be used, because they are out of the low voltage directive application range.

3.2.2 Precautions when using the MELSEC-QnA series PLC

Module selection

(1) Power module

For a power module with rated input voltage of 100/200 VAC, select a model in which the internal part between the first order and second order is intensively insulated, because it generates hazardous voltage (voltage of 42.4 V or more at the peak) area.

For a power module with 24 VDC rated input, a conventional model can be used.

(2) I/O module

For I/O module with rated input voltage of 100/200 VAC, select a model in which the internal area between the first order and second order is intensively insulated, because it has hazardous voltage area.

For I/O module with 24 VDC rated input, a conventional model can be used.

(3) CPU module, memory cassette, base unit

Conventional models can be used for these modules, because they only have a 5 VDC circuit inside.

(4) Special function module

Conventional models can be used for the special modules including analog module, network module, and positioning module, because the rated voltage is 24 VDC or smaller.

(5) Display device

Use the CE-marked product.

3.2.3 Power supply

The insulation specification of the power module was designed assuming installation category II. Be sure to use the installation category II power supply to the PLC. The installation category indicates the durability level against surge voltage generated by a thunderbolt. Category I has the lowest durability; category IV has the highest durability.

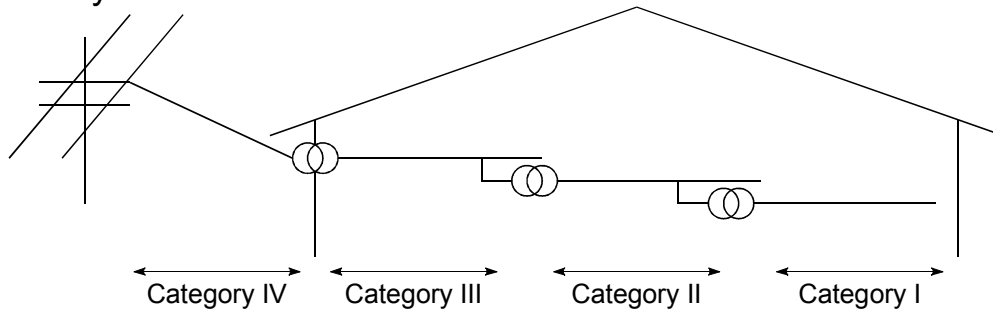


Figure 1. : Installation Category

Category II indicates a power supply whose voltage has been reduced by two or more levels of isolating transformers from the public power distribution.

3.2.4 Control panel

Because the PLC is an open device (a device designed to be stored within another module), be sure to use it after storing in the control panel.

(1) Electrical shock prevention

In order to prevent persons who are not familiar with the electric facility such as the operators from electric shocks, the control panel must have the following functions :

- (a) The control panel must be equipped with a lock so that only the personnel who has studied about the electric facility and have enough knowledge can open it.
- (b) The control panel must have a structure which automatically stops the power supply when the box is opened.
- (c) For electric shock protection, use IP20 or greater control panel.

(2) Dustproof and waterproof features

The control panel also has the dustproof and waterproof functions. Insufficient dustproof and waterproof features lower the insulation withstand voltage, resulting in insulation destruction. The insulation in our PLC is designed to cope with the pollution level 2, so use in an environment with pollution level 2 or below.

Pollution level 1 : An environment where the air is dry and conductive dust does not exist.

Pollution level 2 : An environment where conductive dust does not usually exist, but occasional temporary conductivity occurs due to the accumulated dust. Generally, this is the level for inside the control panel equivalent to IP54 in a control room or on the floor of a typical factory.

Pollution level 3 : An environment where conductive dust exists and conductivity may be generated due to the accumulated dust.
An environment for a typical factory floor.

Pollution level 4 : Continuous conductivity may occur due to rain, snow, etc. An outdoor environment.

As shown above, the PLC can realize the pollution level 2 when stored in a control panel equivalent to IP54.

3.2.5 Module installation


(1) Installing modules contiguously

In Q2AS series PLCs, the left side of each I/O module is left open. When installing an I/O module to the base, do not make any open slots between any two modules. If there is an open slot on the left side of a module with 100/200 VAC rating, the printed board which contains the hazardous voltage circuit becomes bare. When it is unavoidable to make an open slot, be sure to install the blank module (AG60).

3.2.6 Grounding

There are two kinds of grounding terminals as shown below. Either grounding terminal must be used grounded.

Be sure to ground the protective grounding for the safety reasons.

Protective grounding  : Maintains the safety of the PLC and improves the noise resistance.

Functional grounding  : Improves the noise resistance.

3.2.7 External wiring

(1) Module power supply and external power supply

For the remote module which requires 24VDC as module power supply, the 5/12/24/48VDC I/O module, and the intelligent function module (special function module) which requires the external power supply, use the 5/12/24/48VDC circuit which is doubly insulated from the hazardous voltage circuit or use the power supply whose insulation is reinforced.

(2) External devices

When a device with a hazardous voltage circuit is externally connected to the PLC, use a model whose circuit section of the interface to the PLC is intensively insulated from the hazardous voltage circuit.

(3) Intensive insulation

Intensive insulation refers to the insulation with the dielectric withstand voltage shown in Table 1.

Table 1 :Intensive Insulation Withstand Voltage
(Installation Category II, source: IEC664)

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50 μ s)
150 VAC or below	2500 V
300 VAC or below	4000 V

4. LOADING AND INSTALLATION

4.1 Installing modules

4.1.1 Precautions for handling of modules

This section describes the precautions that must be taken when handling the CPU, I/O modules, special function modules, power supply module, base units, etc.

- (1) Module enclosure, memory cassette, terminal block connectors and pin connectors are made of resin; do not drop them or subject them to strong impact.
- (2) Do not remove module's printed circuit boards from the plastic casing.
- (3) During wiring, take care to ensure that wiring off cuts, etc. do not get inside the case.
If anything does get inside the case, remove it.
- (4) Tighten the module mounting (unnecessary in normal operating condition) and terminal block screws as indicated below.

Screw	Tightening Torque N · cm
Module mounting screws (M4 screw) (optional)	78 to 118
Terminal block screws	98 to 137

- (5) To install a module, push it firmly into the base unit so that the latch engages properly. To remove a module, press the latch to disengage it from the base unit, then pull the module out (for details, refer to the relevant PLC CPU User's Manual).

4.1.2 Installation environment

The CPU system should not be installed under the following environmental conditions:

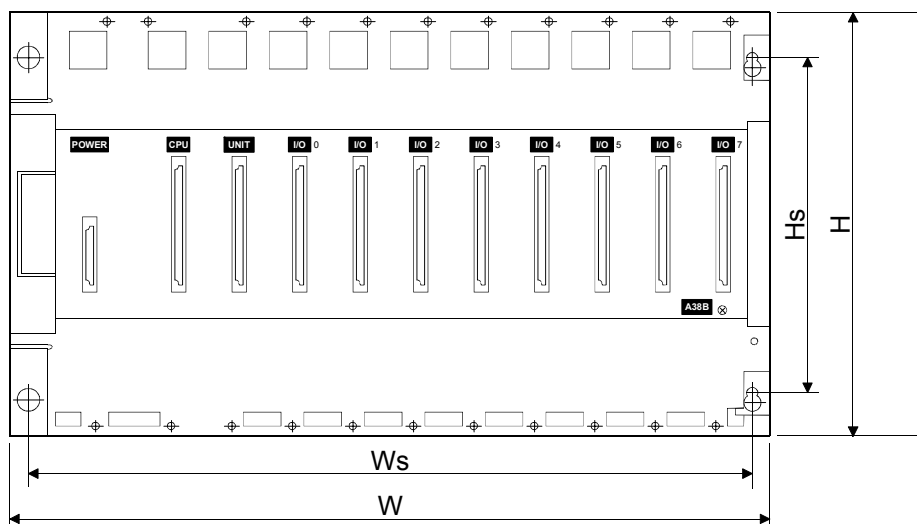
- (1) Places where ambient temperature is outside of 0 to 55°C range.
- (2) Places where ambient humidity is outside of 10 to 90%RH range.
- (3) Places where dewing (condensation) occurs due to sudden temperature changes.
- (4) Places where corrosive or inflammable gas exists.
- (5) Places where a large amount of dust, iron powder and other conductive powder, oil mist, salt or organic solvent exists.
- (6) places exposed to direct sunlight.
- (7) Places where a strong electric or magnetic field exists.
- (8) Places where mechanical vibrations or impacts are transmitted directly to the module body.

4.1.3 Precautions relating to the installation of the unit

The following precautions must be observed when installing a PLC to an operation panel or other bases considering fully the operability, maintainability, and resistance to the environment.

(1) Mounting dimension

Mounting dimensions of each base unit are as follows.

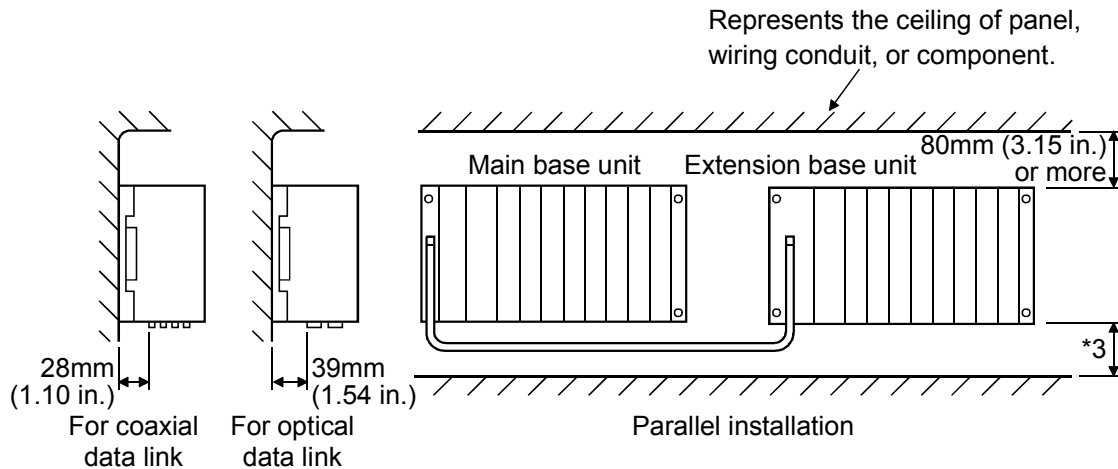


	A32B	A32B-S1	A35B	A38B A38HB A38HBEU	A62B	A65B	A68B	A52B	A55B	A58B
W	247 (9.72)	268 (10.55)	382 (15.03)	480 (18.9)	238 (9.37)	352 (13.86)	466 (18.35)	183 (7.2)	297 (11.69)	411 (16.18)
Ws	227 (8.93)	248 (9.76)	362 (14.25)	460 (18.11)	218 (8.58)	332 (13.07)	446 (17.6)	163 (6.42)	277 (10.9)	391 (15.4)
H	250 (9.84)									
Hs	200 (7.87)									

Dimensions: mm (inch)

(2) Unit mounting position

To ensure proper ventilation and make module replacement easy, provide a clearance of 80 mm (3.15 in.) or more between the top of the unit and any surrounding structure or equipment.



(3) A wiring conduit should be provided if required.

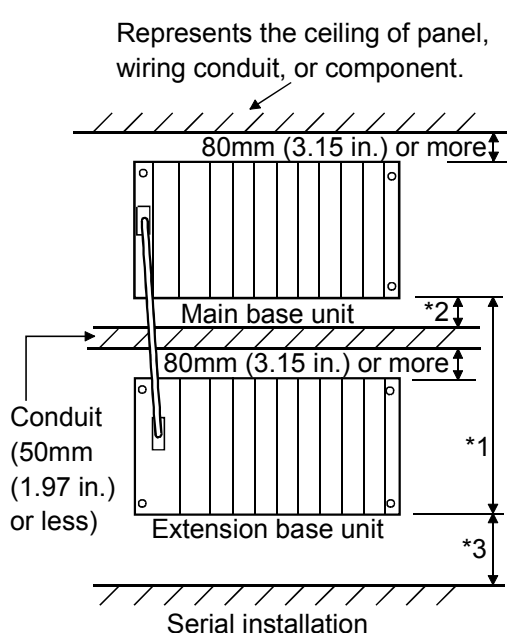
If its clearance above or below the programmable controller is less than indicated in the figure above, observe the following points:

- (a) If the wiring conduit is installed above the programmable controller, its height must be no greater than 50 mm (1.97 in.) to ensure good ventilation.

In addition, there should be adequate space between the programmable controller and the wiring conduit to allow module latches to be pressed.

It will not be possible to replace modules if their latches cannot be pressed.

- (b) If the wiring conduit is installed below the programmable controller, it should be installed so as to allow connection of the optical fiber cable or coaxial cable, taking the minimum bending radius of the cable into consideration.



*1: These dimensions vary depending on the length of the extension cable as follows:

AC06B cable..... 450mm (17.71 in.) or less
 AC12B cable..... 1050mm (41.34 in.) or less
 AC30B cable..... 2850mm (112.20 in.) or less

*2: When a link module is

not used 50mm (1.97 in.) or more

When using $\phi 4.5\text{mm}$

optical fiber cable,

or coaxial cable 100mm (3.94 in.) or more

When using $\phi 8.5\text{mm}$

optical fiber cable 130mm (5.12 in.) or more

*3: When a link module is

not used 50mm (1.97 in.) or more

When using $\phi 4.5\text{mm}$

optical fiber cable,

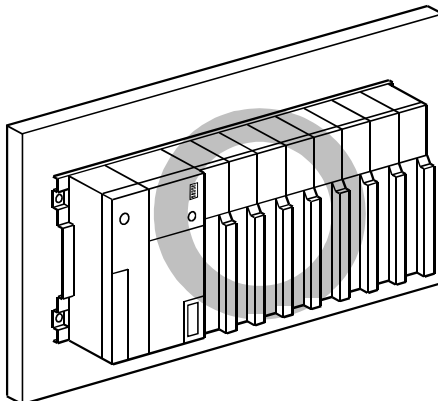
or coaxial cable 100mm (3.94 in.) or more

When using $\phi 8.5\text{mm}$

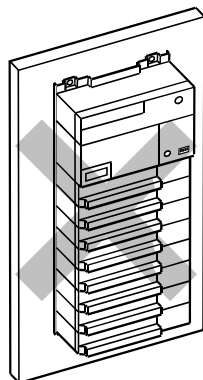
optical fiber cable 130mm (5.12 in.) or more

(4) Unit mounting orientation

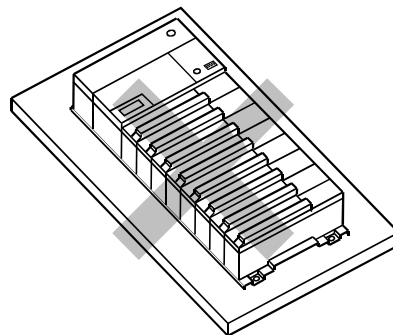
- (a) Since the PLC generates heat, mount it in a well-ventilated location and in the orientation shown below.



- (b) Do not mount it in either of the orientations shown below.



Vertical

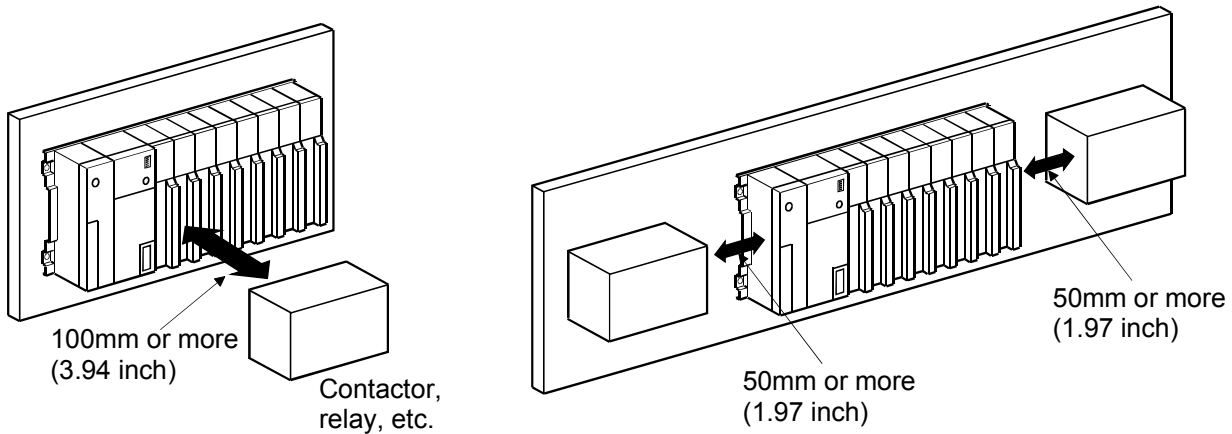


Flat

(5) Mount base unit on a flat surface.

If the mounting surface is uneven, this may strain the printed circuit boards and cause malfunctions.

- (6) Avoid mounting the base unit in proximity to vibration sources such as large magnetic contractors and no-fuse circuit breakers; mount these on a separate panel or at a distance.
- (7) In order to avoid the effects of radiated noise and heat, provide the clearances indicated below between the PLC and devices that generate noise or heat (contactors and relays).
- Required clearance in front of 100mm or more (3.94inch)
 - Required clearance on the right and left of..... 50mm or more (1.97inch)



4.2 Fail-Safe Circuit Concept

When the PLC is powered ON and then OFF, improper outputs may be generated temporarily depending on the delay time and start-up time differences between the PLC power supply and the external power supply for the control target (especially, DC).

For example, if the external power supply for the control target is powered ON and then the PLC is powered ON, the DC output module may generate incorrect outputs temporarily upon the PLC power-ON. Therefore, it is required to build the circuit that energizes the PLC by priority.

The external power failure or PLC failure may lead to the system error.

In order to eliminate the possibility of the system error and ensure fail-safe operation, build the following circuit outside the PLC: emergency circuit, protection circuit and interlock circuit, as they could cause machine damages and accidents due to the abovementioned failures.

An example of system design, which is based on fail-safe concept, is provided on the next page.

**DANGER**

● Create a safety circuit outside the PLC to ensure the whole system will operate safely even if an external power failure or a PLC failure occurs.

Otherwise, incorrect output or malfunction may cause an accident.

(1) For an emergency stop circuit, protection circuit and interlock circuit that is designed for incompatible actions such as forward/reverse rotation or for damage prevention such as the upper/lower limit setting in positioning, any of them must be created outside the PLC.

(2) When the PLC detects the following error conditions, it stops the operation and turn off all the outputs.

- The overcurrent protection device or overvoltage protection device of the power supply module is activated.
- The PLC CPU detects an error such as a watchdog timer error by the self-diagnostics function.

In the case of an error of a part such as an I/O control part that cannot be detected by the PLC CPU, all the outputs may turn on. In order to make all machines operate safely in such a case, set up a fail-safe circuit or a specific mechanism outside the PLC.


Refer to "LOADING AND INSTALLATION" in this manual for example fail safe circuits.


(3) Depending on the failure of the output module's relay or transistor, the output status may remain ON or OFF incorrectly. For output signals that may lead to a serious accident, create an external monitoring circuit.

- If load current more than the rating or overcurrent due to a short circuit in the load has flowed in the output module for a long time, it may cause a fire and smoke. Provide an external safety device such as a fuse.
- Design a circuit so that the external power will be supplied after power-up of the PLC.

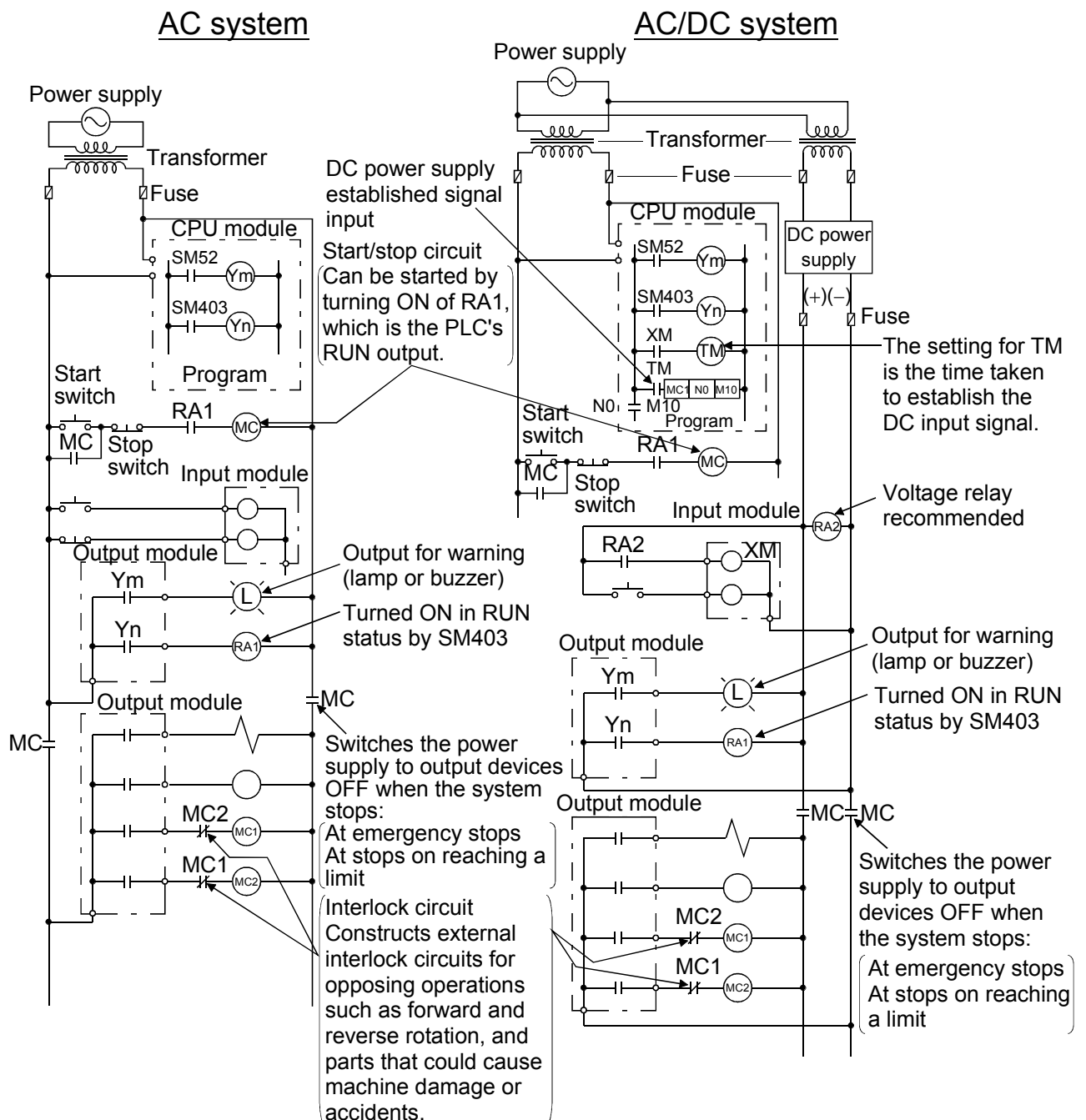
Activating the external power supply prior to the PLC may result in an accident due to incorrect output or malfunction.

- For the operation status of each station at a communication error in data link, refer to the respective data link manual. The communication error may result in an accident due to incorrect output or malfunction.

-  **DANGER** ● When controlling a running PLC (data modification) by connecting a peripheral device to the CPU module or a PC to a special function module, create an interlock circuit on sequence programs so that the whole system functions safely all the time.
- Also, before performing any other controls (e.g. program modification, operating status change (status control)), read the manual carefully and ensure the safety.
- In these controls, especially the one from an external device to a PLC in a remote location, some PLC side problem may not be resolved immediately due to failure of data communications.
- To prevent this, create an interlock circuit on sequence programs and establish corrective procedures for communication failure between the external device and the PLC CPU.
- When setting up the system, do not allow any empty slot on the base unit.
If any slot is left empty, be sure to use a blank cover (AG60) or a dummy module (AG62) for it.
When using the extension base unit, A52B, A55B or A58B, attach the included dustproof cover to the module in slot 0. Otherwise, internal parts of the module may be fried in the short circuit test or when an overcurrent or overvoltage is accidentally applied to external I/O section.

-  **CAUTION** ● Do not install the control lines or communication cables together with the main circuit or power lines, or bring them close to each other.
Keep a distance of 100mm (3.94inch) or more between them.
Failure to do so may cause malfunctions due to noise.
- If having read register R outside the allowable range with the MOV instruction, the file register data will be FFFFH. Using this as it is may cause malfunctions. Pay attention not to use any out-of-range file register when designing sequence programs. For instruction details, refer to the programming manual.
 - When an output module is used to control the lamp load, heater, solenoid valve, etc., a large current (ten times larger than the normal one) may flow at the time that the output status changes from OFF to ON. Take some preventive measures such as replacing the output module with the one of a suitable current rating.

(1) System design circuit example



The procedures used to switch on the power supply are indicated below.

- AC system**
- [1] Switch the power supply ON.
 - [2] Set the CPU module to RUN.
 - [3] Switch the start switch ON.
 - [4] The output devices are driven in accordance with program when the magnetic contactor (MC) turns ON.

- AC/DC system**
- [1] Switch the power supply ON.
 - [2] Set the CPU module to RUN.
 - [3] Switch RA2 ON when the DC power supply starts.
 - [4] Switch the timer (TM) ON when the DC power supply reaches working voltage. (The set value for TM must be the time it takes for 100% establishment of the DC power after RA2 is switched ON. Make this set value 0.5 seconds.)
 - [5] Switch the start switch ON.
 - [6] The output devices are driven in accordance with the program when the magnetic contactor (MC) comes ON. (If a voltage relay is used at RA2, no timer (TM) is necessary in the program.)

(2) Fail-safe measures to cover the possibility of PLC failure

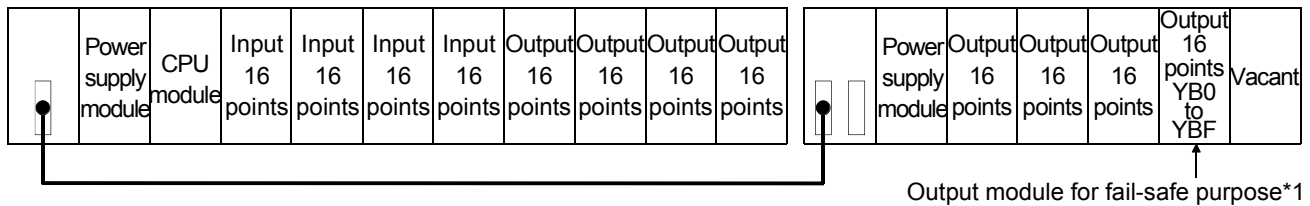
Problems with a CPU module and memory can be detected by the self diagnostics function. However, problems with I/O control area may not be detected by the CPU module.

In such cases, all I/O points turn ON or OFF depending on the problem, and normal operation and safety cannot be maintained.

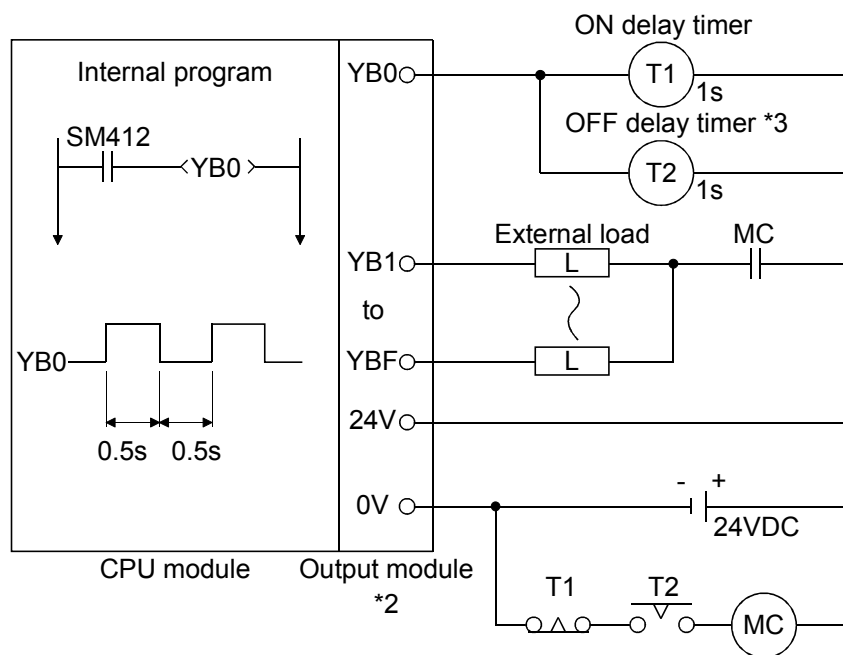
Though Mitsubishi PLCs are manufactured under strict quality control, they may fail or malfunction due to unspecified reasons. To prevent the whole system failure, machine breakdown, and accidents, build a fail-safe circuit outside the PLC.

Examples of a system and its fail-safe circuitry are described below:

<System example>



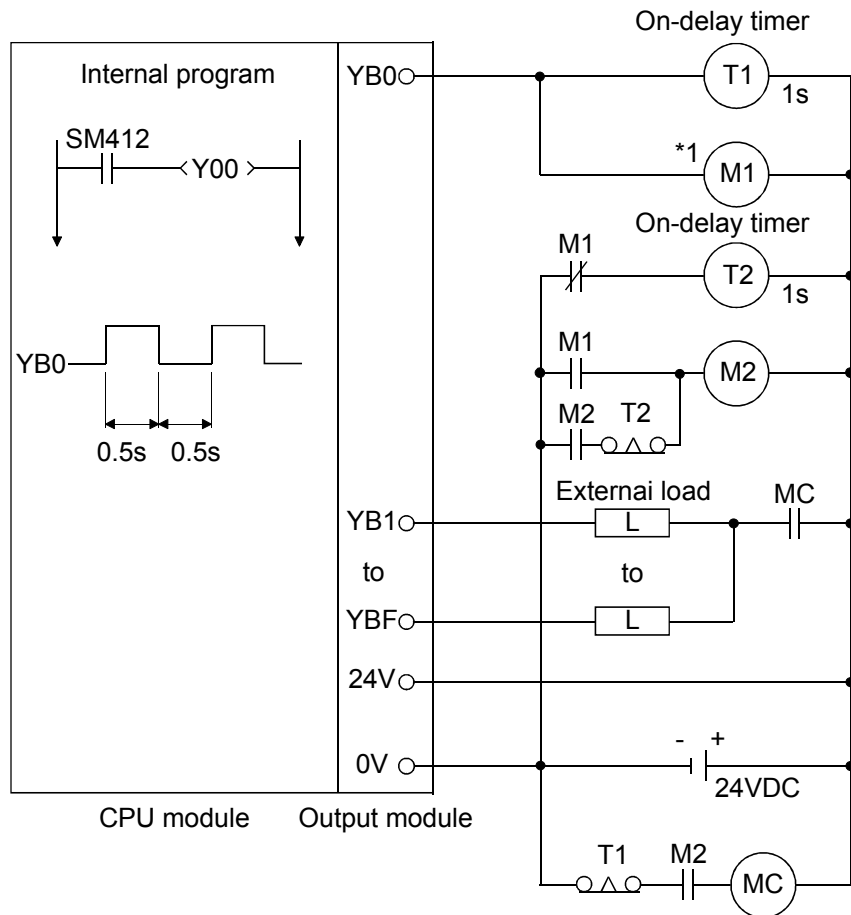
*1: The output module for fail-safe purpose should be mounted on the last slot of the system. (YB0 to YBF in the above system.)



*2: Since YB0 turns ON and OFF alternatively at 0.5 second intervals, use a contactless output module (a transistor is used in the above example).

*3: If an offdelay timer (especially miniature timer) is not available, construct the failsafe circuit using an ondelay timer shown on the next page.

When constructing a failsafe circuit using ondelay timers only



*1: Use a solid state relay for the M1 relay.

4.3 Power supply connection

4.3.1 Performance Specifications for Power Supply Modules

(1) Standard power supply module

Table 4.1 Power Supply Module Specifications

Item		Specifications						
		A61P	A61PN	A62P	A63P	A65P	A66P	A67P
Base unit position		Power supply module slot					I/O module slot	Power supply module slot
Input voltage		100 to 120 VAC ^{+10%} -15% (85 to 132 VAC)		24VDC ^{+30%} -35% (15.6 to 31.2 VDC)	100 to 120 VAC ^{+10%} -15% (85 to132 VAC)		110 VDC (85 to 140 VDC)	
		200 to 240 VAC ^{+10 %} -15 % (170 to 264 VAC)			200 to 240 VAC ^{+10 %} -15 % (170 to 264 VAC)			
Input frequency		50/60 Hz ±5 %		—	50/60 Hz ±5 %		—	
Input voltage distortion factor.		Within 5% (Refer to Section 4.4)		—	Within 5% (Refer to Section 4.4)		—	
Max. input apparent power		160 VA		155 VA	65 W	110 VA	95 VA	65 W
Inrush current		20 A, within 8 ms *4		100 A, within 1 ms	20 A, within 8 ms *4		20 A, within 8 ms	
Rated output current	5 VDC	8 A		5 A	8 A	2 A	—	8 A
	24 VDC	—		0.8 A	—	1.5 A	1.2 A	—
*1 Overcurrent protection	5 VDC	8.8 A or higher		5.5 A or higher	8.5 A or higher	2.2 A or higher	—	8.5 A or higher
	24 VDC	—		1.2 A or higher	—	2.3 A or higher	1.7 A or higher	—
*2 Overvoltage protection	5 VDC	5.5 to 6.5 V		5.5 to 6.5 V	5.5 to 6.5 V	5.5 to 6.5 V	—	5.5 to 6.5 V
	24 VDC	—						
Efficiency		65 % or higher						
Withstanding voltage		1500 VAC for 1 minute between all AC external terminals together and ground 500 VAC for 1 minute between all DC external terminals together and ground						
Noise durability		Noise voltage 1500 V _{P-P} Noise width 1 μs, Noise frequency 25 to 60 Hz (noise simulator condition)			Noise voltage 500 V _{P-P} Noise width 1 μs, Noise frequency 25 to 60 Hz (noise simulator condition)	Noise voltage 1500 V _{P-P} Noise width 1 μs, Noise frequency 25 to 60 Hz (noise simulator condition)		
Insulation resistance		10 MΩ or higher, measured with a 500 VDC insulation resistance tester						
Power indicator		Power LED display						
Terminal screw size		M4 × 0.7 × 6					M3 × 0.5 × 6	M4 × 0.7 × 6

Table 4.1 Power Supply Module Specifications

Item	Specifications						
	A61P	A61PN	A62P	A63P	A65P	A66P	A67P
Applicable wire size	0.75 to 2 mm ²						
Applicable solderless terminal	R1.25-4, R2-4, RAV1.25, RAV2-4					R1.25-3, R2-3 RAV1.25-3, RAV2-3	R1.25-4, R2-4 RAV1.25-4, RAV2-4
Applicable tightening torque	78 to 118 N · cm					39 to 59 N · cm	78 to 118 N · cm
External dimensions	250 (H) × 55 (W) × 121 (D) (9.8 × 2.1 × 4.7) mm (inch)					250 (H) × 37.5 (W) × 121 (D) (9.8 × 1.5 × 4.7)	250 (H) × 55 (W) × 121 (D) (9.8 × 2.1 × 4.7)
Weight	0.98 kg	0.75 kg	0.94 kg	0.8 kg	0.94 kg	0.75 kg	0.8 kg
Allowable momentary power interruption time *3	Less than 20ms			Less than 1ms	Less than 20ms	—	Less than 20ms (at 100 VDC)

REMARK

The A66P module occupies 1 slot

(2) CE marked power supply module

Table 4.2 Power Supply Module Specifications

Item		Specifications	
		A61PEU	A62PEU
Base unit loading position		Power supply module slot	
Input voltage		100 to 120 / 200 to 240 VAC $\begin{matrix} +10\% \\ -15\% \end{matrix}$	
Input frequency		50/60 Hz $\pm 5\%$	
Input voltage distortion factor		Within 5% (Refer to Section 4.4)	
Max. input apparent power		130 VA	155 VA
Inrush current		20 A, within 8 ms *4	
Rated output current	5 VDC	8 A	5 A
	24 VDC	—	0.8 A
Overcurrent protection *1	5 VDC	8.8 A or higher	5.5 A or higher
	24 VDC	—	1.2 A or higher
Overvoltage protection *2	5 VDC	5.5 to 6.5 V	—
	24 VDC	—	—
Efficiency		65 % or higher	
Dielectric withstand voltage	Acrosis primary circuit and FG	2830VAC rms/3 cycles (2000m (6562 ft.))	
Noise durability		Noise voltage IEC801-4; 2kV, 1500 V _{P-P} Noise width 1 μ s, Noise frequency 25 to 60 Hz (noise simulator condition)	
Insulation resistance		10 M Ω or higher, measured with a 500 VDC insulation resistance tester	
Power indicator		Power LED display	
Terminal screw size		M4 \times 0.7 \times 6	
Applicable wire size		0.75 to 2 mm ²	
Applicable solderless terminal		RAV1.25-4, RAV2-4	
Applicable tightening torque		98 to 137 N \cdot cm	
External dimensions		250 (H) \times 55 (W) \times 121 (D) (9.8 \times 2.1 \times 4.7) mm (inch)	
Weight		0.8 kg	0.9 kg
Allowable momentary power interruption time *3		Less than 20ms	

POINT
<p>*1: Overcurrent protection</p> <p>(a) The overcurrent protection device shuts off the 5VDC and/or 24VDC circuit(s) and stops the system if the current exceeding the specified value flows in the circuit(s). As this results in voltage drop, the power supply module LED turns OFF or is dimly lit.</p> <p>(b) After that, eliminate the causes of overcurrent, e.g., insufficient current capacity and short circuit, and then start the system. When the current has reached the normal value, the initial start up of the system will be performed.</p> <p>*2: Overvoltage protection</p> <p>The overvoltage protection shuts off the 5VDC circuit and stops the system if the overvoltage of 5.5 to 6.5V is applied to the circuit. This results in the power supply module LED turning OFF. When restarting the system, power OFF and ON the input power supply, and the initial start up of the system will be performed. If the system is not booted and the LED remains off, this means that the power supply module has to be replaced.</p> <p>*3: Allowable momentary power failure period</p> <p>The PLC CPU allowable momentary power failure period varies with the power supply module used. In case of the A63P power supply module, the allowable momentary power failure period is defined as the time from when the primary side of the stabilized power supply for supplying 24VDC to the A63P is turned OFF until when the voltage (secondary side) has dropped from 24VDC to the specified value (15.6VDC) or less.</p> <p>*4: Inrush current</p> <p>If the power supply module is re-powered ON right after powered OFF (within 5seconds), the inrush current exceeding the specified value (2ms or less) may be generated. Therefore, make sure to re-power ON the module 5seconds after power off. When selecting a fuse or breaker for external circuit, consider the above point as well as meltdown and detection characteristics.</p>

4.3.2 Part names and settings of Power Supply Module

The parts of the power supply modules are explained belows.

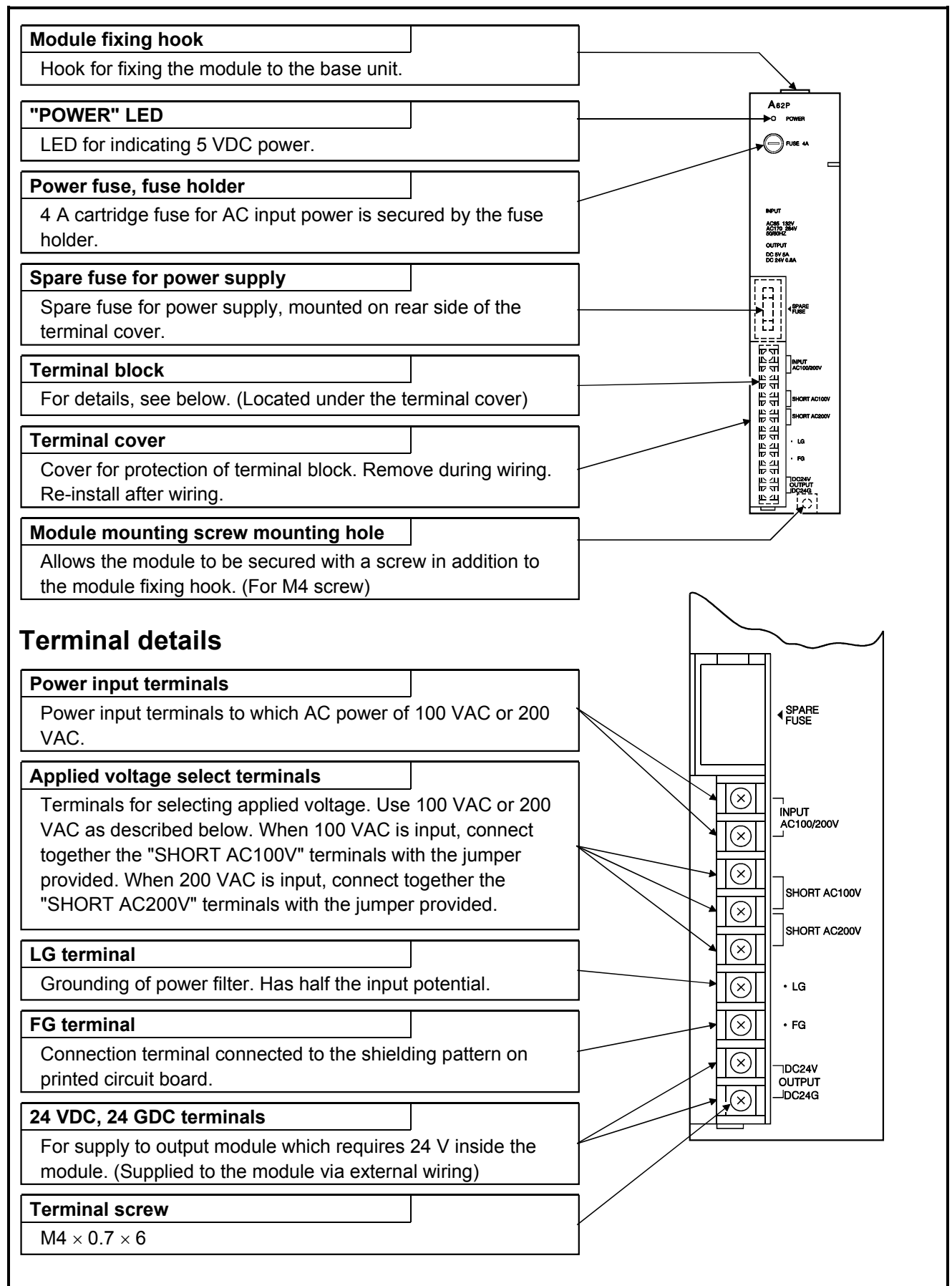
(1) Parts of the A61P, A61PN, A61PEU modules

Module fixing hook	
Hook for fixing the module to the base unit.	
"POWER" LED	
LED for indicating 5 VDC power.	
Power fuse, fuse holder	
4 A cartridge fuse for AC input power is secured by the fuse holder.	
Spare fuse for power supply	
Spare fuse for power supply, mounted on rear side of the terminal cover.	
Terminal block	
For details, see below. (Located under the terminal cover)	
Terminal cover	
Cover for protection of terminal block. Remove during wiring. Re-install after wiring.	
Module mounting screw mounting hole	
Allows the module to be secured with a screw in addition to the module fixing hook. (For M4 screw)	

Terminal details

Power input terminals	
Power input terminals to which AC power of 100 VAC or 200 VAC.	
Applied voltage select terminals	
Terminals for selecting applied voltage. Use 100 VAC or 200 VAC as described below. When 100 VAC is input, connect together the "SHORT AC100V" terminals with the jumper provided. When 200 VAC is input, connect together the "SHORT AC200V" terminals with the jumper provided.	
LG terminal	
Grounding of power filter. Has half the input potential.	
FG terminal	
Connection terminal connected to the shielding pattern on printed circuit board.	
Terminal screw	
M4 × 0.7 × 6	

(2) Parts of the A62P, A62PEU and A65P modules



(3) Parts of the A63P and A67P modules

Module fixing hook

Hook for fixing the module to the base unit.

"POWER" LED

LED for indicating 5 VDC power.

Power fuse, fuse holder

Cartridge fuse for DC input power is fixed by the fuse holder.
The rating for the fuses are as follows.

A63P: 6.3 A (SM6.3 A or FGTA 250V 6A)

A67P: 4 A (GTH4, FGTA250V 4A or SM250V 4A)

Spare fuse for power supply

Spare fuse for power supply, mounted on rear side of the terminal cover.

Terminal block

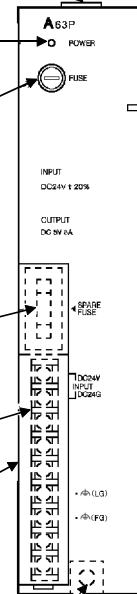
For details, see below. (Located under the terminal cover)

Terminal cover

Cover for protection of terminal block. Remove during wiring.
Re-install after wiring.

Module mounting screw mounting hole

Allows the module to be secured with a screw in addition to the module fixing hook. (For M4 screw)



Terminal details

Power input terminals

Power input terminals for A63P: 24 VDC, A67P: 100 VDC.
The power fuse will be blown if the 24 VDC connection is made with the wrong polarity.

LG terminal

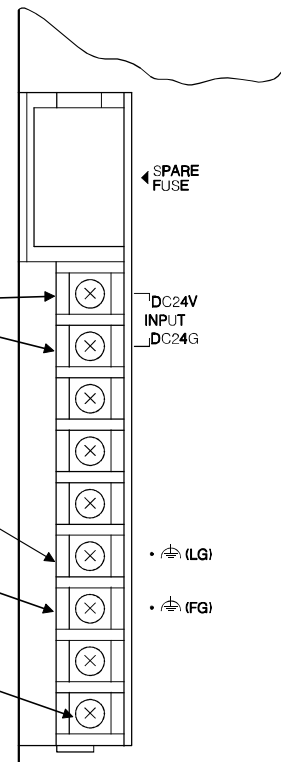
Grounding of power filter.

FG terminal

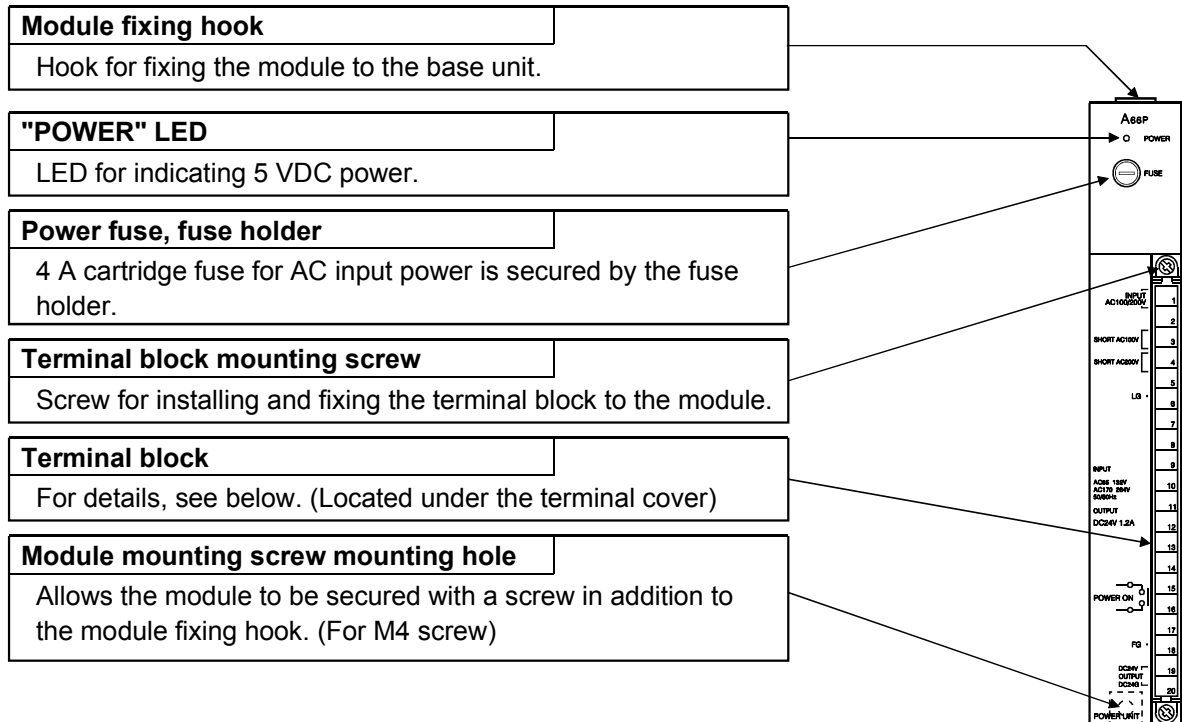
Connection terminal connected to the shielding pattern on printed circuit board.

Terminal screw

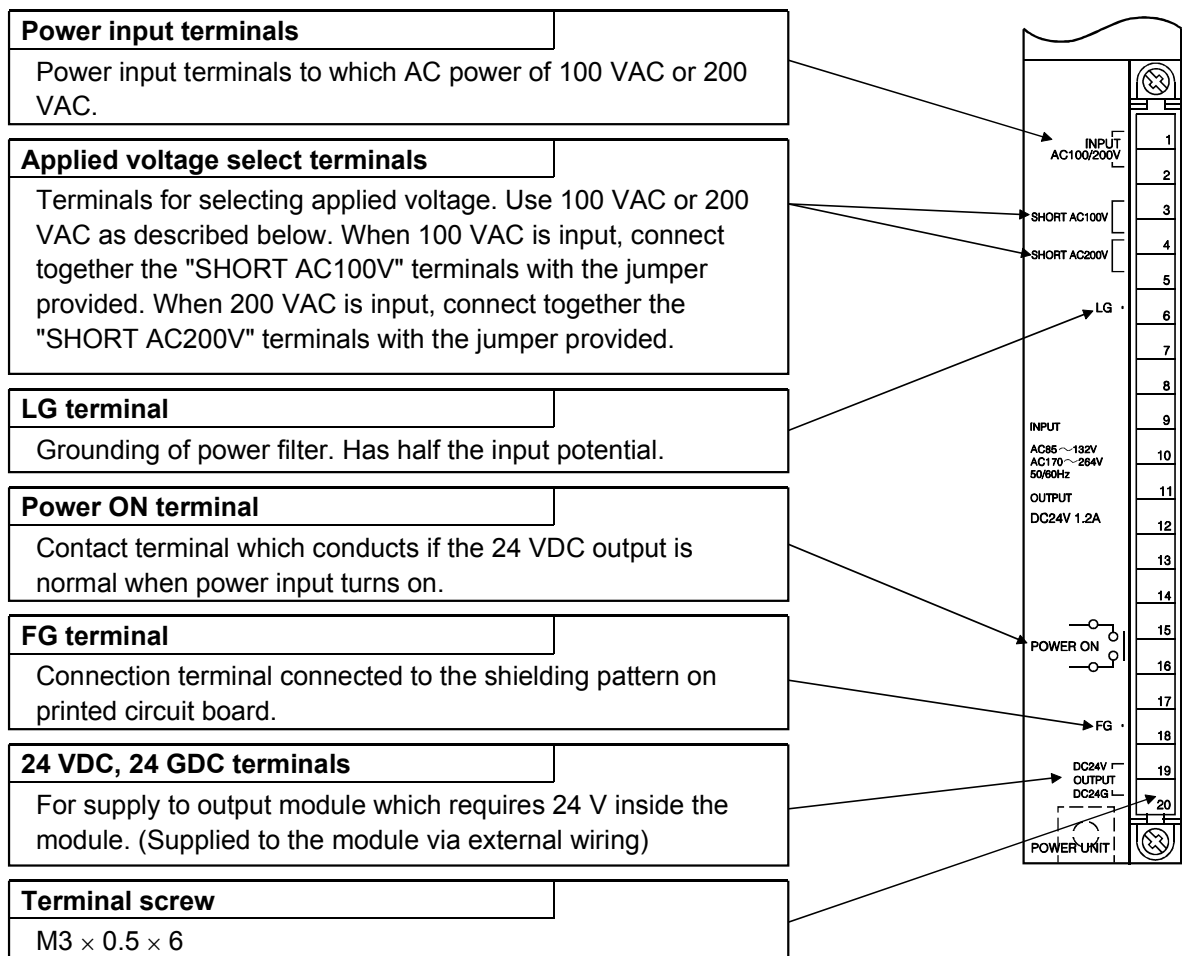
M4 × 0.7 × 6



(4) Parts of the A66P module

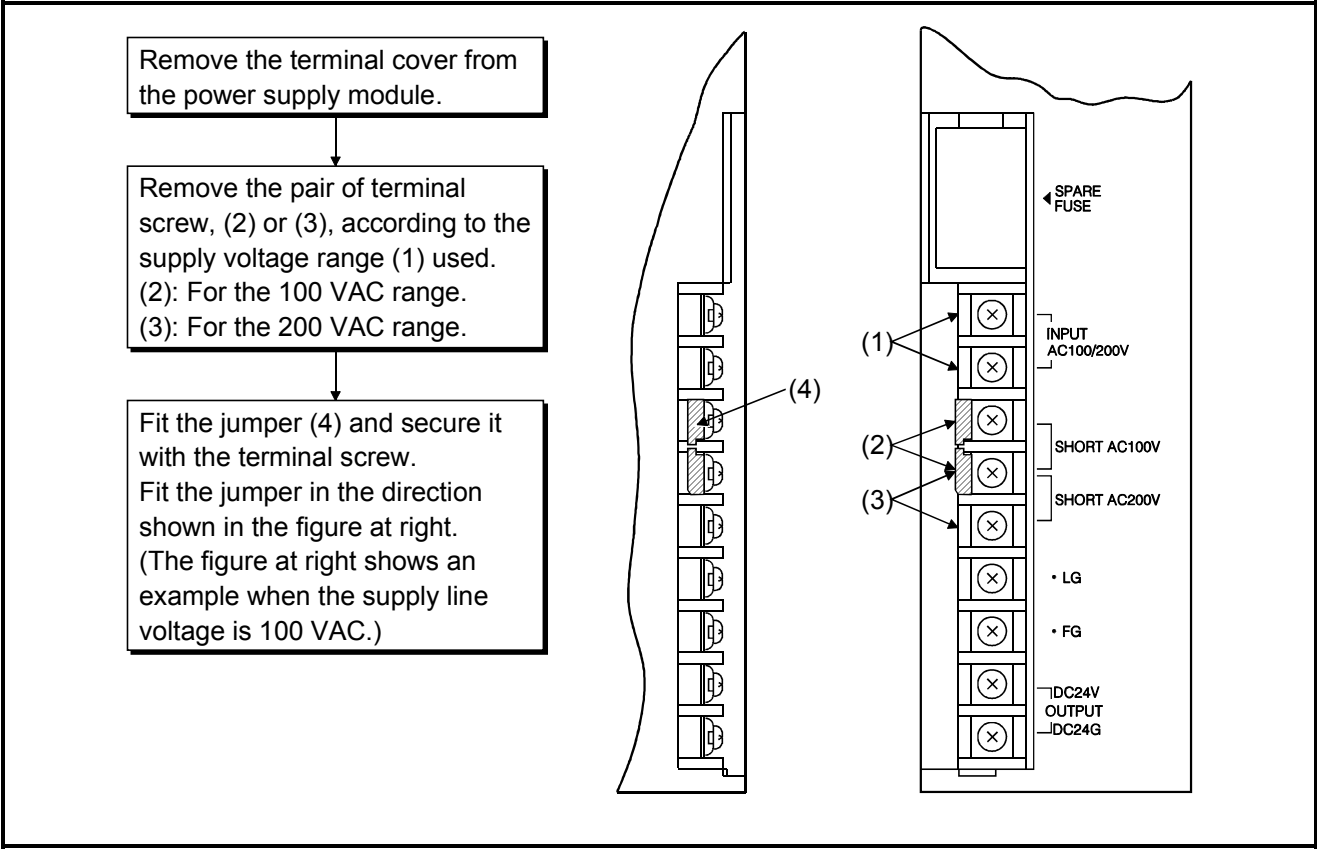


Terminal details



(5) Settings

For A61P(EU), A61PN, A62P(EU), A65P or A66P, the input voltage range, 100V or 200V, must be specified by placing a jumper (supplied) across two terminals as described below:



POINT

If the setting differs from the supply line voltage, the following occurs: do not mis-set.

	Supply Line Voltage	
	100VAC	200VAC
Setting to 100VAC (jumper fitted as indicated at (2))	—	The power supply module is damaged. (The CPU module is not damaged.)
Setting to 200VAC (jumper fitted as indicated at (3))	No error occurs in the module. However, the CPU module does not operate.	—
No setting (jumper not fitted)	No error occurs in the module. However, the CPU module does not operate.	

4.3.3 Wiring instructions

Instructions for wiring the power supply cable and I/O cable.



DANGER

- Be sure to shut off all phases of the external power supply used by the system before wiring.
Failure to do so may result in an electric shock or damage of the product.
- Before energizing and operating the system after wiring, be sure to attach the terminal cover supplied with the product.
Failure to do so may cause an electric shock.

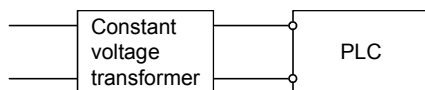


CAUTION

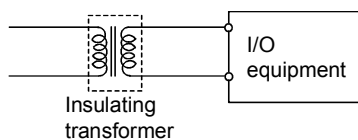
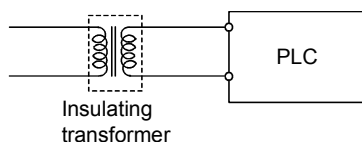
- Always ground the FG and LG terminals to the protective ground conductor.
Failure to do so may cause an electric shock or malfunctions.
- Wire the module correctly after confirming the rated voltage and terminal layout.
Connecting a power supply of a different voltage rating or incorrect wiring may cause a fire or failure.
- Do not connect multiple power supply modules to one module in parallel. The power supply modules may be heated, resulting in a fire or failure.
- Press, crimp or properly solder the connector for external connection with the specified tool.
Incomplete connection may cause a short circuit, fire or malfunctions.
- Tighten terminal screws within the specified torque range. If the screw is too loose, it may cause a short circuit, fire or malfunctions.
If too tight, it may damage the screw and/or the module, resulting in a short circuit or malfunctions.
- Carefully prevent foreign matter such as dust or wire chips from entering the module.
Failure to do so may cause a fire, failure or malfunctions.
- Install our PLC in a control panel for use.
Wire the main power supply to the power supply module installed in a control panel through a distribution terminal block.
Furthermore, the wiring and replacement of a power supply module have to be performed by a maintenance worker who acquainted with shock protection.
(For the wiring methods, refer to Q2ACPU(S1)/ Q3ACPU /Q4ACPU User's Manual)

(1) Power Supply Connection

- (a) When voltage fluctuations are larger than the specified value, connect a constant-voltage transformer.



- (b) Use a power supply which generates minimal noise between wires and between the PLC and ground. If excessive noise is generated, connect an insulating transformer.



- (c) When a power transformer or insulating transformer is employed to reduce the voltage from 200 VAC to 100 VAC, use one with a capacity greater than those indicated in the following table.

Power Supply Module	Transformer Capacity
A61P, A61PN	$160\text{VA} \times n$
A62P	$155\text{VA} \times n$
A65P	$110\text{VA} \times n$
A66P	$95\text{VA} \times n$

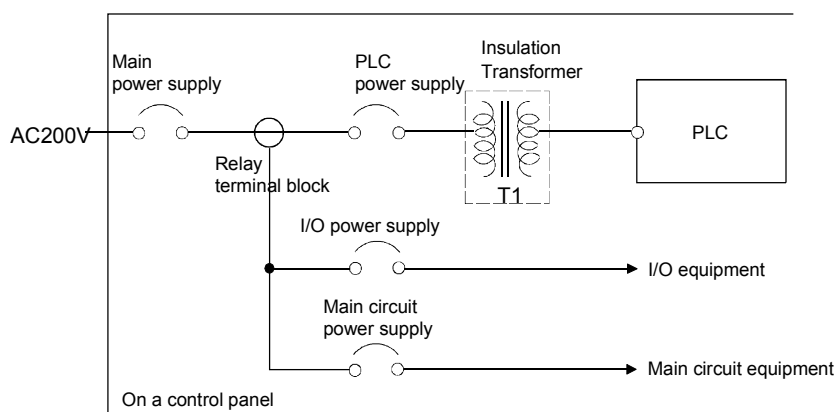
n: Stands for the number of power supply modules.

- (d) Provide separate wiring systems for the PLC power, I/O devices, and operating devices as shown below.

If the wiring is influenced by excessive noise, connect an isolation transformer.

- (e) Taking rated current or inrush current into consideration when wiring the power supply, be sure to connect a breaker or an external fuse that have proper blown and detection.

When using a single PLC, a 10A breaker or an external fuse are recommended for wiring protection.



REMARK

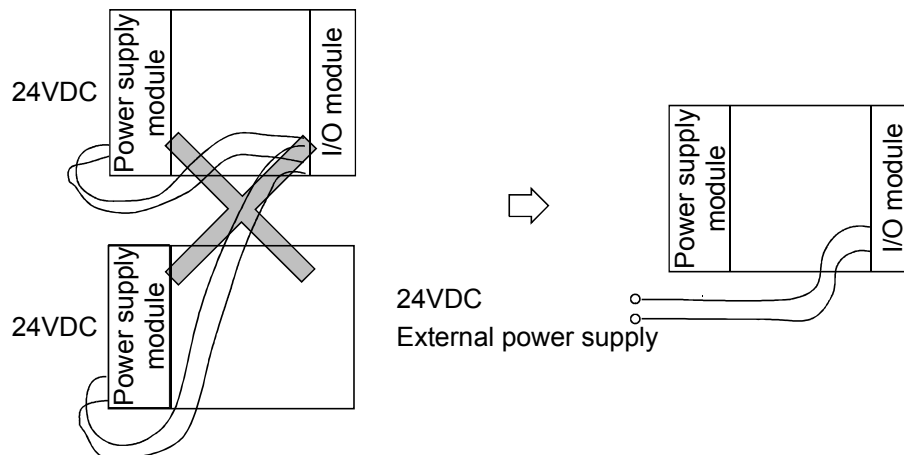
As safety measures, install a switch for use with "online I/O module change" only to each of the corresponding modules and equipment.

- (f) Note on using the 24 VDC output of the A62P, A65P and A66P power supply module.

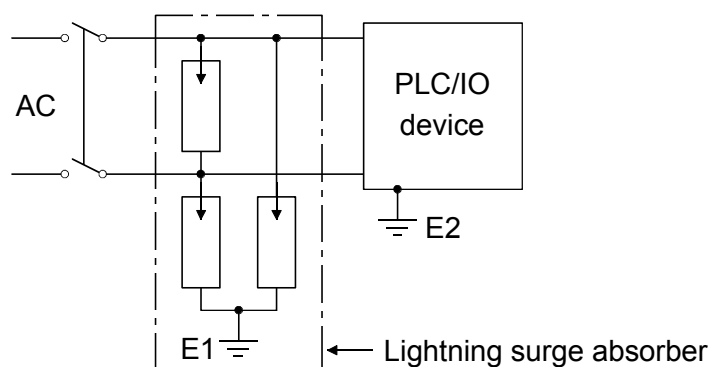


CAUTION • Do not connect multiple power supply modules to one module in parallel. The power supply modules may be heated, resulting in a fire or failure.

If the 24 VDC output capacity is insufficient for one power supply module, supply 24 VDC from the external 24 VDC power supply as shown below:



- (g) 100VAC, 200VAC, and 24VDC wires should be twisted as tightly as possible, and connect the modules at the shortest distance between them.
- To minimize voltage drop, use thick wires (MAX. 2mm²) where possible.
- (h) Do not bind 100VAC and 24VDC wires together with main circuit (high tension and large current) wires or I/O signal lines (including common line) nor place them near each other. Provide 100mm (3.94 inch) clearance between the wires if possible.
- (i) As a measure against surges caused by lightning, insert a lightning surge absorber as shown below.



POINT

- (1) Provide separate grounding for the lightning surge absorber (E1) and the PLC (E2).
- (2) Select a lightning surge absorber whose maximum allowable circuit voltage is higher than the circuit voltage at the maximum power supply voltage.

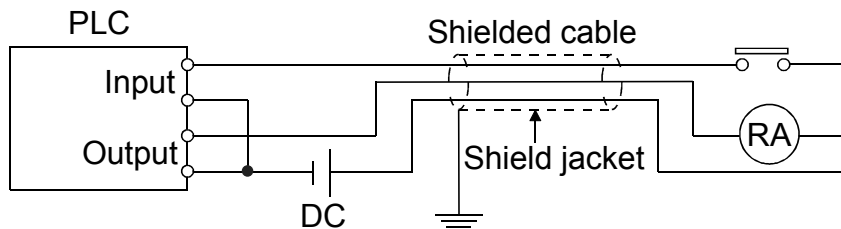
(2) Wiring to I/O device

- (a) The solderless terminal with insulation sleeve is inapplicable to a terminal block.

It is advisable to cover the wire connection part of a terminal with a mark tube or insulation tube.

- (b) Install wiring to a terminal block using the cable of core diameter 0.3 to 0.75mm², and outside diameter 2.8mm or less.
- (c) Run the I/O line and output line away from each other.
- (d) When the main circuit line and power line cannot be separated, use a shielding cable and ground it on the PLC side.

However, ground it on the opposite side in some cases.



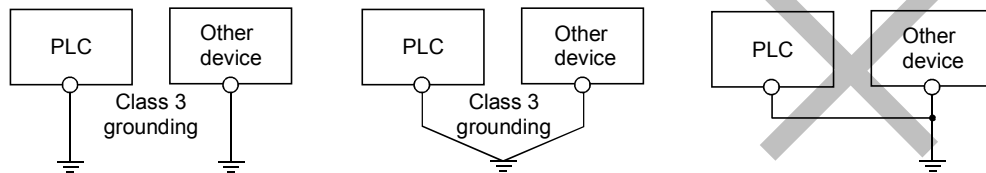
- (e) When cables are run through pipes, securely ground the pipes.
- (f) Run the 24VDC input line away from the 100VAC and 200 VAC lines.
- (g) The cabling of 200m (656.2ft.) or longer distance may produce leakage current depending on the capacity between lines and result in an accident.
- (h) As a countermeasure against the power surge due to lightning, separate the AC wiring and DC wiring and connect a surge absorber for lightning as shown in (i) of item (1). Failure to do so increases the risk of I/O device failure due to lightning.

(3) Grounding



CAUTION • Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.

- (a) Carry out the independent grounding if possible. (Grounding resistance 100Ω or less.)
- (b) If the independent grounding is impossible, carry out the shared grounding (2) as shown below.

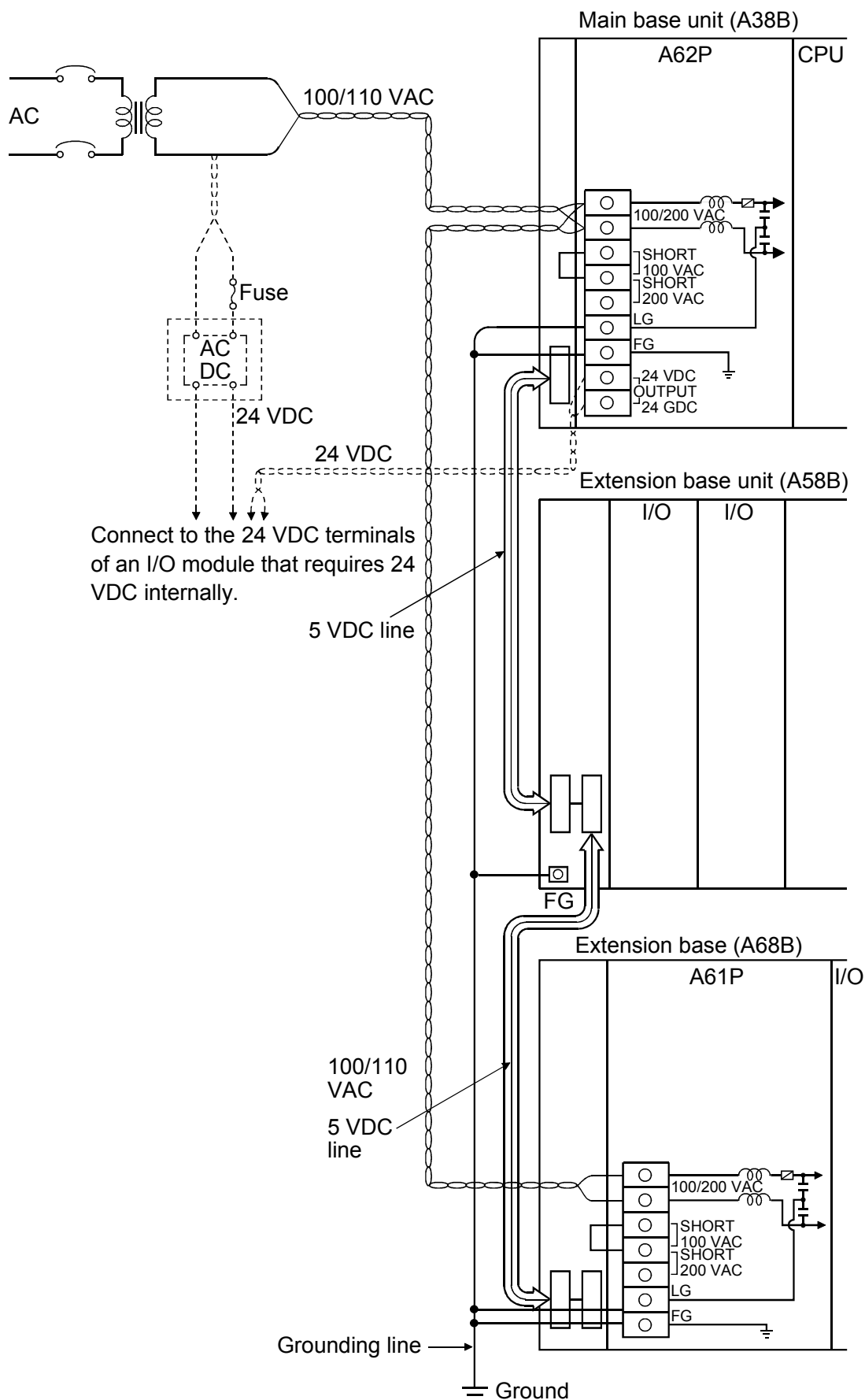


(1) Independent grounding.....Best (2) Shared grounding.....Good (3) Common grounding.....Not allowed

- (c) Use the cable of 2mm^2 or more for grounding.
Set the grounding point closer to the PLC to make the grounding cable short as possible.
- (d) If a malfunction occurs due to earthing, separate either LG or FG of the base module, the device combination, or all the connection from the earthing.

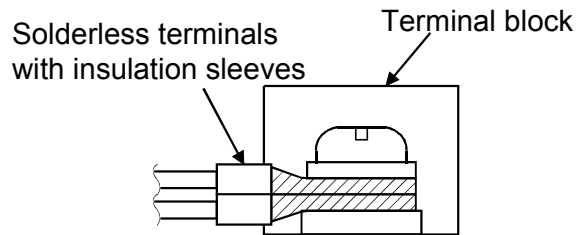
4.3.4 Wiring to module terminals

The following is an example of wiring of power supply and grounding wires to main base unit and extension base units.



POINT

- (1) Use the thickest possible (max. 2 mm² (14 AWG)) wires for the 100/200 VAC and 24 VDC power cables. Be sure to twist these wires starting at the connection terminals. For wiring a terminal block, be sure to use a solderless terminal. To prevent short-circuit due to loosening screws, use the solderless terminals with insulation sleeves of 0.8 mm (0.03 inch) or less thick. The number of the solderless terminals to be connected for one terminal block are limited to 2.



- (2) Be sure to ground the LG and FG terminals. Failure to do so may cause the PLC to be susceptible to noise. Note that LG terminals include the potential as half as that of input voltage; you might get an electric shock when you touch them.

4.4 Precaution when Connecting the Uninterruptive Power Supply (UPS)

Be sure of the following items when connecting the PLC system to the uninterruptive power supply (abbreviated as UPS hereafter):

As for UPS, use the online power system or online interactive system with a voltage distortion rate of 5% or less.

For the UPS of the commercial online power system, use Mitsubishi Electric's F Series UPS (serial number P or later) (Ex.: FW-F10-0.3K/0.5K).

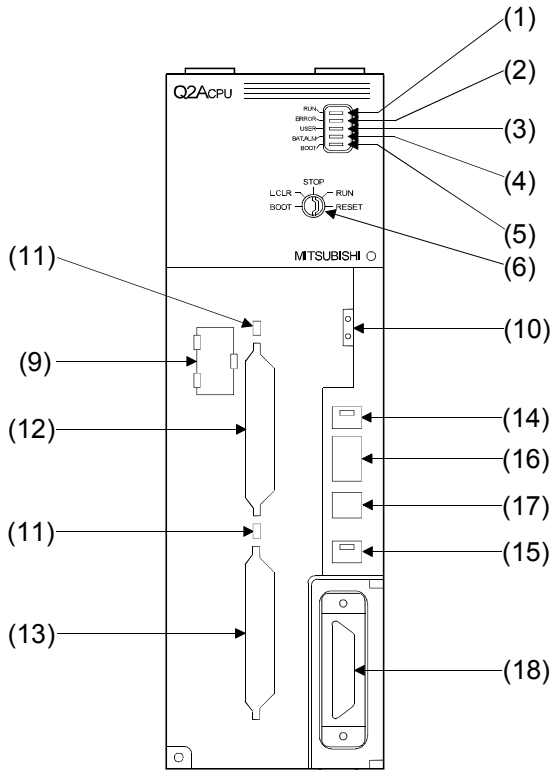
Do not use any UPS of the commercial online power system other than the F series mentioned above.

4.5 Part Names and Settings

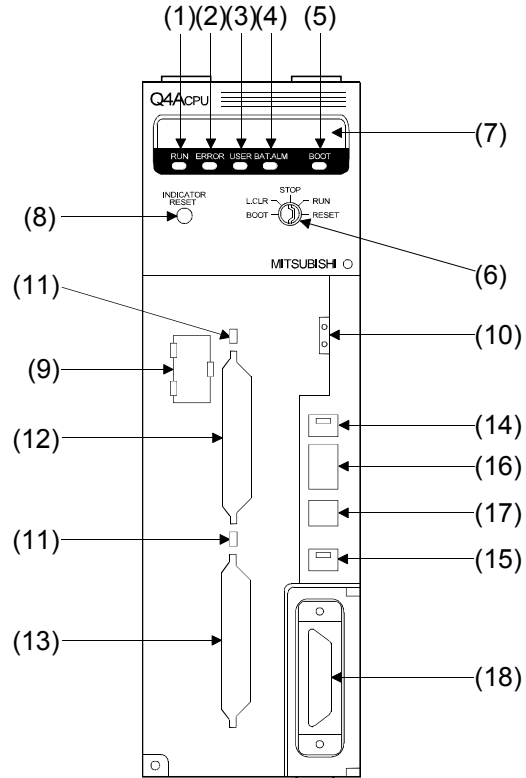
4.5.1 Part names and settings

The programmable controller nomenclature and settings are explained in this section.

(1) Q2ACPU, Q2ACPU-S1

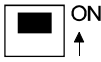



(2) Q3ACPU, Q4ACPU



Appearance with front cover open

No.	Name	Function
(1)	RUN LED	<p>Indicates the CPU module operating Status.</p> <p>Lamp ON :When RUN/STOP key switch is set to RUN or STEP-RUN, and operation is in progress.</p> <p>Lamp OFF :When RUN/STOP key switch is set to STOP, PAUSE or STEP-RUN and operation is stopped. Or, when an error that stops operation has been detected.</p> <p>Lamp flashing :When a program is written during STOP and the RUN/STOP key switch is moved from "STOP" to "RUN". The CPU module is not in the RUN status. To put the CPU module in the RUN status, move the RUN/STOP key switch from "RUN" to "STOP" to "RUN" again. Alternatively, perform reset operation with the RUN/STOP key switch. (The Q3ACPU or Q4ACPU shows the "PRG. CHECK!!" message on the display.)</p>
(2)	ERROR LED	<p>Lamp ON :When a self diagnostics error (excluding battery error) which does not stop operation has been detected. (When a "continue operation at error detection" parameter setting has been designated.)</p> <p>Lamp OFF :Normal</p> <p>Lamp flashing :When an error that stops operation has been detected.</p>

No.	Name	Function
(3)	USER LED	Lamp ON :An error has been detected by the CHK instruction, or an annunciator F has come ON. (With Q3ACPU or Q4ACPU, a message or the comment for the annunciator is displayed on the LED indicator.) Lamp OFF :Normal Lamp flashing :Flashing when latch clear is performed. (With Q3ACPU or Q4ACPU, the message "L. CLR RDY" is displayed on the LED indicator.)
(4)	BAT.ALARM LED	Lamp ON :When a battery error is activated by a low voltage condition at the CPU module and memory card battery. Lamp OFF :Normal
(5)	BOOT LED	Lamp ON :When boot operation is completed. Lamp OFF :When boot operation is not being executed.
(6)	RUN/STOP key switch	RUN/STOP :Sequence program operation EXECUTE/STOP. L.CLR :Sets all data in the latch area (designated by parameter) to "OFF" or "0". Also clears sampling trace and status latch registrations. RESET :Executes a hardware reset for operation error, and to initialize operation, etc.
(7)	LED display (Q3A and Q4ACPU only)	16-character display Display content includes comments for self diagnostics errors, comments for LED display instructions, clock data for SET SM212, and annunciator F-No. comments for SET F, etc.
(8)	Display RESET switch (Q3A and Q4ACPU only)	Clears the LED display content, displays the next data (when next data exists).
(9)	Battery (A6BAT)	Battery for internal memory and power failure backup.
(10)	Battery connector pin	For battery's lead wire connection. (To prevent wasted battery power consumption, the lead wire is disconnected from the connector when shipped from the factory.)
(11)	Memory card EJECT button	Ejects the memory card from the CPU module.
(12)	Memory card "A" installation connector	Connectors for installing memory cards in the CPU module.
(13)	Memory card "B" installation connector	
(14)	Memory card "A" in/out (with built in LED) 	This switch setting determines whether or not the memory card can be inserted and ejected while power is ON. Factory set to OFF. ON :Insertion/ejection prohibited (LED is ON) OFF :Insertion/ejection permitted (LED is OFF)
(15)	Memory card "B" in/out switch (with built in LED) 	

No.	Name	Function						
(16)	Ejects the memory card from the CPU <div><div>→ ON</div><div><div><div></div></div>1</div><div><div><div></div></div>2</div><div><div><div></div></div>3</div><div><div><div></div></div>4</div><div><div><div></div></div>5</div></div>	Designates settings required for CPU module operation. All switches are factory set to OFF.						
		SW1 :Boot setting. Designates the memory used for operation. ON :Boot operation OFF :Boot operation is not performed.						
		SW2 to SW4 : Parameter area. These switches designate the memory where parameters are stored.						
			Internal RAM	Memory card A		Memory card B		*SW2 to 4 are valid if SW1 is OFF.
				RAM	ROM	RAM	ROM	
		SW2	OFF	ON	OFF	ON	OFF	
		SW3	OFF	OFF	ON	ON	OFF	
		SW4	OFF	OFF	OFF	OFF	ON	
		SW5 :System protect. Prevents all CPU module writing and control operations. ON :System protect ON OFF :System protect OFF						
(17)	System setting switch 2 <div><div>→ ON</div><div><div><div></div></div>1</div><div><div><div></div></div>2</div></div>	Designates settings required for CPU module operation. All switches are factory set to OFF.						
		SW1: For future expansion. Not used at present						
		SW2 : Peripheral protocol. Designates the types of peripheral devices connected to the CPU module peripheral interface. (Set to ON if another ACPU station is to be accessed from a peripheral device. The ON or OFF setting becomes valid immediately upon switching.) ON : ACPU peripheral device 1: For future expansion. Not used at present OFF : QnACPU peripheral device						
(18)	RS-422 connector	Connector for connection with peripheral devices.						

4.5.2 Switch settings and corresponding LED displays

(1) Program writing when CPU module is stopped.

To execute program writing when the CPU module is stopped, follow the key switch setting procedure shown below.

- (a) RUN/STOP key switch :STOP
RUN LED :OFF
Q3ACPU, Q4ACPU display :OFF
.....CPU module STOP status → program write
- (b) RUN/STOP key switch :RESET
RUN LED :OFF
Q3ACPU, Q4ACPU display : "PRG.CHECK!" message is displayed
.....CPU module STOP status
- (c) RUN/STOP key switch :STOP → RUN
RUN LED :ON
Q3ACPU, Q4ACPU display :OFF
.....CPU module STOP status

POINT	
	<ul style="list-style-type: none">• After writing a program (except for online program write), perform reset operation, and then place the CPU module in the RUN status.• When remote STOP is switched to RUN, the CPU module is not put in the "PROG CHECK" status but is placed in the RUN status.

(2) Latch CLEAR operation

To execute a "Latch CLEAR", follow the key switch setting procedure shown below.

- 1) Turn the RUN/STOP key switch of the CPU module from the "STOP" position to the "L. CLR" position several times to flicker the "USER LED" on the CPU module front.
Normally, the LED flickers when the switch is turned several times (three or four times).
When the "USER LED" flickers, it indicates that latch clear is ready.
- 2) After the "USER LED" has flickered, turning the RUN/STOP key switch from the "STOP" position to the "L. CLR" position again executes latch clear and lights up the "USER LED".
If the "USER LED" comes on for two seconds and then goes off, it indicates that latch clear is completed normally.
- 3) To cancel latch clear midway, turn the RUN/STOP key switch to the "RUN" position to place the CPU module in the RUN state, or turn it to the "RESET" position to make a reset.

POINT	
	<ul style="list-style-type: none"> • The devices where the "Latch CLEAR" occurs can be designated by the "Latch CLEAR" enabled/disabled settings for each device made in device setting in the parameter mode. • In addition to the RUN/STOP key switch method, a remote "Latch CLEAR" can also be executed from a peripheral device. (Refer to the Q2A (S1)/Q3A/Q4ACPU User's Manual).

- (3) Removing a memory card while PLC power is ON
- To remove the memory card while the PLC power is ON, set the "memory card in/out" switch as shown below. Removing a memory card while power is ON:
- (a) Switch ON (build-in LED ON)
.....Memory card insertion/ejection prohibited
- (b) Switch OFF (build-in LED OFF)
.....Memory card insertion/ejection enabled →
remove the memory card

POINT	
	<ul style="list-style-type: none"> • The built-in LED at the "memory card in/out" switch may not go OFF if a CPU module system function (sampling trace, status latch, etc.) is in progress, or if the memory card is being used by the program. In such cases, stop the system function or the program, then remove the memory card after checking that the switch's built-in LED has turned OFF. • Do not turn the "memory card in/out" switch ON after removing the memory card. An error will occur if the switch is turned ON at this time. • When there are parameter-set file registers, local devices or failure history, the memory card cannot be the removed. If the "memory card in/out" switch is turned OFF, the in/out switch built-in LED does not go off. For the file registers, the memory card can be removed when they are set to be unused with the QDRSET(P) instruction.

- (4) Inserting a memory card while PLC power is ON
- To insert the memory card while the PLC power is ON, set the "memory card in/out" switch as shown below.
- (a) Insert the memory card.
- (b) Turn the "memory card in/out" switch ON (built-in LED ON)
.....Memory card insertion/ejection prohibited

POINT	
	<ul style="list-style-type: none">• After inserting the memory card, turn the "memory card in/out" switch ON. The memory card cannot be used until the switch is turned ON.• Since mount processing is performed again after the memory card is inserted, note that the scan time of one scan when mount processing is performed increases by a maximum of 10ms.

5. I/O MODULE SPECIFICATIONS AND CONNECTIONS

This section presents the specifications and wiring drawings for each of the A series I/O modules.

5.1 Input Modules

5.1.1 Input module specifications

Model	Input Type	Number of Points/ Module	Rated Input Voltage	Input Current	Operating Voltage		Maximum Simultaneous ON Input Point (Percentage Simultaneous ON)	
					ON Voltage	OFF Voltage		
AX10	AC input	16 points	100V to 120VAC	10mA	80VAC or higher	40VAC or lower	100%	
AX11		32 points		12mA	79VAC or higher		60%	
AX11EU								
AX20		16 points	200V to 240VAC	10mA	160VAC or higher	70VAC or lower	100%	
AX21		32 points		12mA			60%	
AX21EU								
AX40	DC input (sink type)	16 points	12/24 VDC	4/10mA	9.5VDC or higher	6VDC or lower	100%	
AX41		32 points					60%	
AX41-S1								
AX42 *1		64 points		60% *3				
AX42-S1 *1	DC input							
AX50	DC input (sink type)	16 points	48VDC	4mA	34VDC or higher	10VDC or lower	100%	
AX50-S1	DC input (sink/source type)		100/110/ 125VDC	2mA	80VDC or higher	20VDC or lower		
AX60	DC input (sink type)							
AX60-S1	DC input (sink/source type)							
AX70	Sensor input (sink/source type)	5VDC (SW ON)	3.5mA (TYP) 5.5mA (MAX)	3.5VDC or higher	1.1VDC or lower			
		12VDC (SW OFF)	2mA (TYP) 3mA (MAX)	5VDC or higher	2VDC or lower			
		24VDC (SW OFF)	4.5mA (TYP) 6mA (MAX)					

	Input Response Time		External Connections	Common Terminal Arrangement	Internal Current Consumption	Number of Occupied I/O Points
	OFF to ON	ON to OFF				
	15ms or less	25ms or less	20 terminal block connector	16 points/ common	0.055A	16 points
			38 terminal block connector	32 points/ common	0.11A	32 points
					0.15A	
			20 terminal block connector	16 points/ common	0.055A	16 points
			38 terminal block connector	32 points/ common	0.11A	32 points
					0.15A	
	10ms or less	10ms or less	20 terminal block connector	8 points/ common	0.055A	16 points
	0.1ms or less	0.2ms or less	38 terminal block connector		0.11A	32 points
				32 points/ common		
	10ms or less	10ms or less	40-pin connector × 2	32 points/ common	0.12A	64 point
	0.5ms or less	0.5ms or less				32 points
	10ms or less	10ms or less	20 terminal block connector	8 points/ common	0.055A	16 points
	10ms or less	20ms or less				
	1.5ms or less	3ms or less				

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Model	Input Type	Number of Points/ Module	Rated Input Voltage	Input Current	Operating Voltage		Maximum Simultaneous ON Input Point (Percentage Simultaneous ON)		
					ON Voltage	OFF Voltage			
AX71	Sensor input (sink/source type)	32 points	5VDC (SW ON)	3.5mA (TYP) 5.5mA (MAX)	3.5VDC or higher	1.1VDC or lower	100%		
			12VDC (SW OFF)	2mA (TYP) 3mA (MAX)	5VDC or higher	2VDC or lower			
			24VDC (SW OFF)	4.5mA (TYP) 6mA (MAX)					
AX80	DC input (source type)	16 points	12/24 VDC	4/10mA	9.5VDC or higher	6VDC or lower	60%		
AX80E									
AX81		32 points							48/60 VDC
AX81-S1	DC input		2.5/5mA	5.6VDC or higher	2.4VDC or lower				
AX81-S2	DC input (source type)		12/24 VDC	4/10mA	9.5VDC or higher	6VDC or lower			
AX81-S3	DC input								
AX81B	DC input (sink/source type)	32 points	24VDC	7mA	At normal input		60%		
					21VDC or higher	6VDC or lower			
					When disconnection detected				
					1VDC or higher	6VDC or lower			
AX82 *1	DC Input (source type)	64 points	12/24 VDC	3/7mA	9.5VDC or higher	6VDC or lower			
AX31	AC/DC input	32 points	12/24 VAC	8.5/4mA	7VAC/ VDC or higher	2.5VAC /VDC or lower	100%		
			12/24 VDC						

	Input Response Time		External Connections	Common Terminal Arrangement	Internal Current Consumption	Number of Occupied I/O Points
	OFF to ON	ON to OFF				
	1.5ms or less	3ms or less	38 terminal block connector	8points/ common	0.11A	32 points
	10ms or less	10ms or less	20 terminal block connector		0.055A	16 points
	[TYP] 5.5ms 6.0ms [High-speed mode] 0.5ms or less 1.0ms or less					
	10ms or less	10ms or less	38 terminal block connector	8 points/ common	0.11A	32 points
	20ms or less	20ms or less			0.105A	
	0.1ms or less	0.2ms or less			0.11A	
	10ms or less	10ms or less	38 terminal block connector		0.125A	64 points
	10ms or less	10ms or less	37-pin D subconnector × 2	32 points/ common	0.12A	64 points
	25ms or less	20ms or less	38 terminal block connector		0.11A	32 points
20ms or less						

The following specifications apply to all modules:

Isolation method : Photocoupler

Input indication : LEDs

*1 : The ON/OFF status of the first or latter half is indicated by the LEDs in accordance with the setting of the selector switch on the front panel of the module:

FH setting: First half (X00 to X1F), LH setting: Latter half (X20 to X3F)

*2 : It is possible to select high speed or low speed for the upper eight points only using the DIP switch:

HIGH setting: high-speed, LOW setting: low-speed

*3: The number of simultaneous input points is 40% (13 inputs/common) simultaneously ON when the unit is used adjacent to the power supply module.

5.1.2 Input module connections

	Model	Rated Input Voltage
(1)	AX10	100-120 VAC
	AX20	200-240 VAC

* 9 and 18 are connected internally.

	Model	Rated Input Voltage
(2)	AX11	100-120 VAC
	AX11EU	
	AX21	200-240 VAC
	AX21EU	

* 9 and 18 , and 27 and 36 are connected internally.

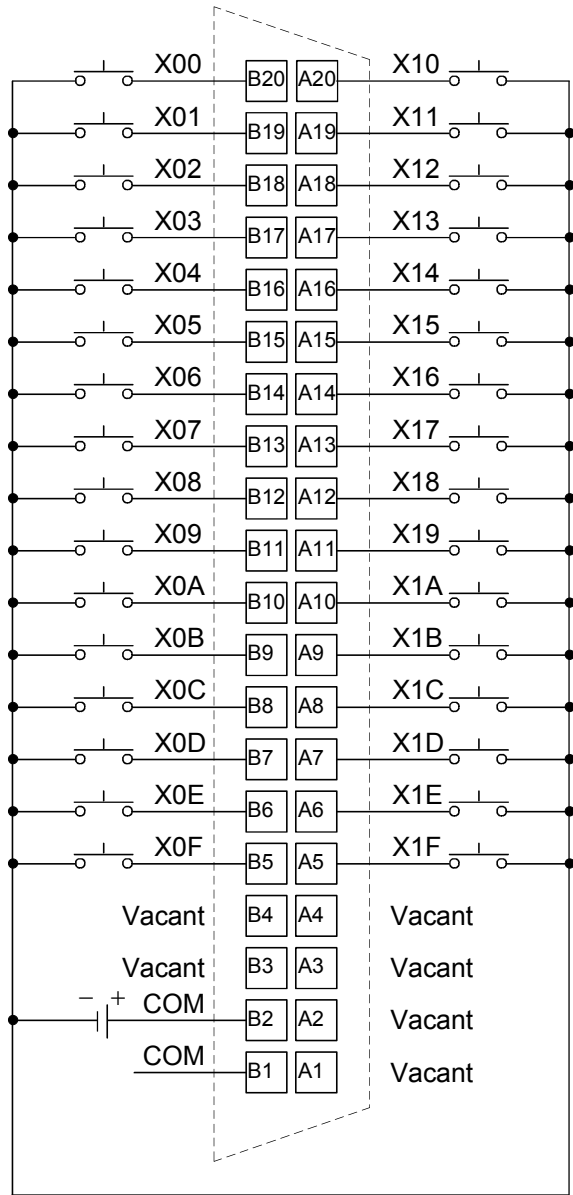
	Model	Rated Input Voltage
(3)	AX40	12/24 VDC
	AX50	48 VDC

* 9 and 18 are connected internally.

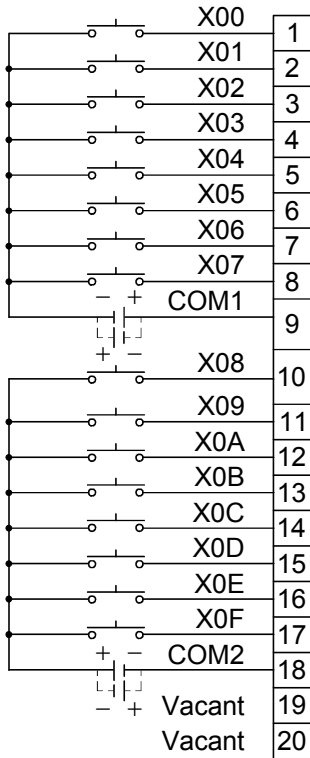
	Model	Rated Input Voltage
(4)	AX41	12/24 VDC
	AX41-S1	

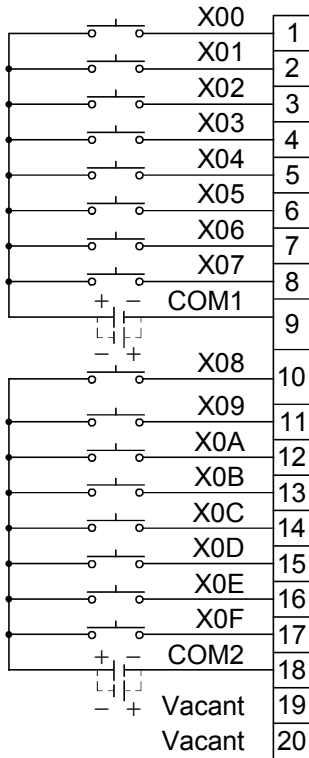
* 9 and 18 , and 27 and 36 are connected internally.

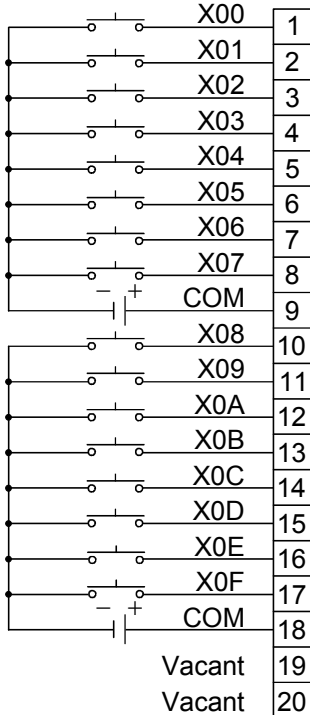
(5)	Model	Rated Input Voltage
	AX42	12/24 VDC
	AX42-S1	

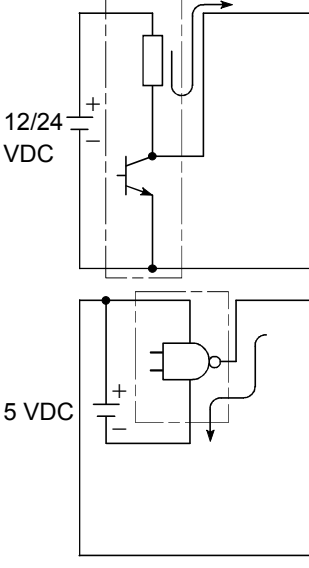
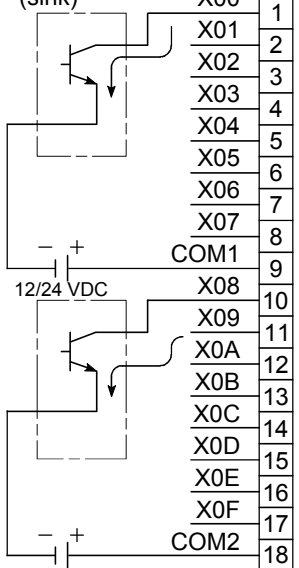
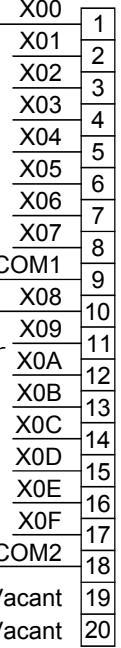


* The figure above indicates **F** (the first half 32 points).
 The connections for **L** (the latter half 32 points) are the same
 as for **F** (regard X00 to X1F as X20 to X3F).
B1 and **B2** are connected internally.

(6)	Model	Rated Input Voltage
	AX50-S1	48 VDC
		

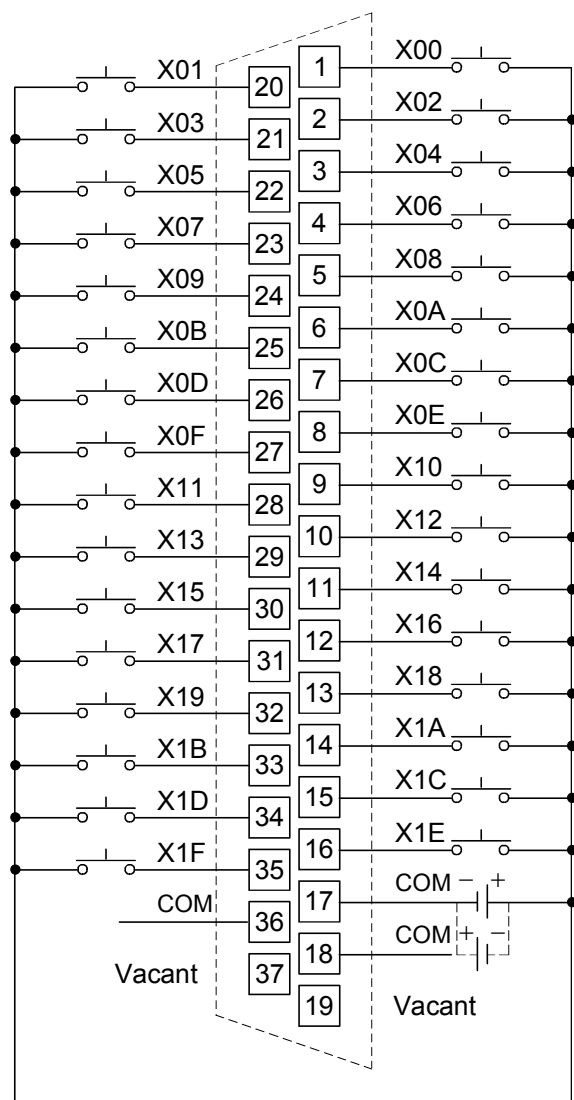
(8)	Model	Rated Input Voltage
	AX60-S1	100/110/125 VAC
		

(7)	Model	Rated Input Voltage
	AX60	100/110/125 VDC
		

(9)	Model	Rated Input Voltage
	AX70	5/12/24 VDC
<div><div><ul style="list-style-type: none">• Sensor (source)</div><div><ul style="list-style-type: none">• Open collector (sink)</div></div> <div><ul style="list-style-type: none">• TTL LS-TTL C-MOS buffer (sink)• 5 VDC open collector (sink)</div> 		

- Can be used in any combination in units of 8 points per common.
- When using the COMS source type, only CMOSs with a 5 VDC rating as shown above can be used (e.g. HCMOS).

(14)	Model	Rated Input Voltage
	AX82	12/24 VDC



* The figure above indicates **F** (the first half 35 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard X00 to X1F as X20 to X3F).

17 , **18** , and **36** are connected internally.

(15)	Model	Rated Input Voltage
	AX31	12/24 VAC 12/24 VDC

* [9] and [18] , and [27] and [36] are connected internally.

5.2 Output Modules

5.2.1 Output module specifications

Model	Output Type	No. of Points/ Module	Rated Load Voltage	Max. Load Current		Output Response Time			
				Per Point	Per Common	OFF to ON	ON to OFF		
AY10	Contact output	16 points	240VAC 24VDC	2A	8A	10ms or less	12ms or less		
AY10A	Contact output (All points independent)				16A/all points				
AY11	Contact output				8A				
AY11A	Contact output (All points independent)				16A/all points				
AY11AEU									
AY11E	Contact output		240VAC 24VAC		8A				
AY11EEU			24VDC 24VAC						
AY13			32 points		240VAC 24VAC				5A
AY13EEU					24VDC 24VAC				
AY13E					240VAC 24VAC				
AY15EU	24 points	24VDC 240VAC	8A						
AY20EU	Triac output	16 points	100 to 200 VAC	0.6A	1.9A	1ms or less	0.5Hz + 1ms or less		
AY22				2A	3.3A				
AY23		32 points		0.6A	2.4A *4 (1.05A)				
AY40	Transistor output (sink type)	16 points	12/24VDC	0.1A	0.8A	2ms or less	2ms or less (resistive load)		
AY40A	Transistor output (all points independent sink type)			0.3A	—				
AY40P	Transistor output (sink type)			0.1A	0.8A				

	External Connections	Common Terminal Arrangement	Surge Suppression	Fuse Rating	Error Display	External Power Supply (TYP 24VDC)	Internal Current Consumption	Number of Occupied I/O Points
						Current		
	20 terminal block connector	8 points/ common	None	None	None	0.15A	0.115A	16 points
	38 terminal block connector	No common (all points independent)						
	20 terminal block connector	8 points/ common	Varistor					
	38 terminal block connector	No common (all points independent)						
	20 terminal block connector			8A				
	38 terminal block connector		None	None		0.29A	0.23A	32 points
				8A				
		None		0.22A				
			4 points/ common	CR absorber	3.2A	Display *10	—	0.40A
20 terminal block connector		8 points/ common	CR absorber varistor	7A *6	0.305A			
38 terminal block connector			Absorber	3.2A *6	None	0.59A		32 points
	20 terminal block connector	No common (all points independent)	Clamp diode	None		None	0.008A	0.115A
	38 terminal block connector		Surge absorbing diode		—		0.19A	
	20 terminal block connector	8 points/ common	Cramp diode		0.015A		0.115A	

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Model	Output Type	No. of Points/ Module	Rated Load Voltage	Max. Load Current		Output Response Time			
				Per Point	Per Common	OFF to ON	ON to OFF		
AY41	Transistor output (sink type)	32 points	12/24VDC	0.1A	1.6A	2ms or less	2ms or less (resistive load)		
AY41P					1A				
AY42 *1		64 points			2A *4 (1.6A)	0.1ms or less	0.3ms or less (resistive load)		
AY42-S1									
AY42-S2		5/12/24 VDC	0.1A *5	2A	2ms or less	2ms or less (resistive load)			
AY42-S3 *1				0.1A			1.92A		
AY42-S4 *1			0.5A	2A			2A *4 (3.3A)		
AY50		16 points	12/24VDC	0.3A			2A		0.5ms or less
AY51		32 points			2A				
AY51-S1				2A	6.4A	1ms or less	3ms or less (resistive load)		
AY60		Transistor output (source type)	16 points	24VDC (12/48V) *2	2A	5A	1ms or less		1ms or less
AY60E					12/24 VDC 2A 48VDC 0.8A	3A			
AY60EP	12/24VDC			12VDC 2A	9.6A	0.5ms or less	1.5ms or less		
				24VDC 0.8A	3.8A				
AY60S	Transistor output (sink type)		24/48VDC (12V) *3	2A	6.4A	1ms or less	3ms or less (resistive load)		
AY70	Transistor output (for TTL. COMOS) (sink type)	16 points	5/12VDC	0.016A	0.128A	1ms or less	1ms or less		
AY71		32 points		0.016A	0.256A				

	External Connections	Common Terminal Arrangement	Surge Suppression	Fuse Rating	Error Display	External Power Supply (TYP 24VDC)	Internal Current Consumption	Number of Occupied I/O Points
						Current		
	38 terminal block connector	16 points/ common	Cramp diode	None	None	0.02A	0.23A	32 points
		0.03A						
	40-pin connector × 2	32 points/ common				0.04A	0.29A	64 points
							0.34A	
							0.29A	
			0.29A					
			1.6A *7	Display *11		0.29A		
			Photo coupler Built-in Zener diode	None	None	—	0.5A	
	20 terminal block connector	8 points/ common	Varistor	2A *6	Display *10	0.065A	0.115A	16 points
		None		None	0.05A	0.023A	32 points	
	38 terminal block connector	16 points/ common	Transistor Built-in Zener diode	1A *8	Display *10	0.1A		0.31A
	20 terminal block connector	8 points/ common	Varistor	3.2A *9	Display	0.065A	0.115A	16 points
			Surge absorbing diode	5A *9		0.065A		
				None		0.11A		
			Varistor	5A *9	None	0.003A	0.075A	
				*12 0.055A		0.1A	16 points	
38 terminal block connector			16 points/ common	None	None		*12 0.1A	

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Model	Output Type	No. of Points/ Module	Rated Load Voltage	Max. Load Current		Output Response Time		
				Per Point	Per Common	OFF to ON	ON to OFF	
AY72 *1	Transistor output (for TTL. COMOS) (sink type)	64 points	5/12VDC	0.016A	0.512A	1ms or less	1ms or less	
AY80	Transistor output (source type)	16 points	12/24VDC	0.5A	2A	2mc of less	2ms of less (resistive load)	
AY80EP				0.8A	3.84A	0.5ms or less	1.5ms or less	
AY81		32 points		0.5A	4A	2ms of less	2ms of less (resistive load)	
AY81EP				12VDC 0.8A	7.68A	0.5ms or less	1.5ms or less	
		24VDC 0.4A		3.84A				
*1 AY82EP		64 points		12VDC 0.1A	1.92A			
				24VDC 0.04A	0.758A			

	External Connections	Common Terminal Arrangement	Surge Suppression	Fuse Rating	Error Display	External Power Supply (TYP 24VDC)	Internal Current Consumption	Number of Occupied I/O Points
						Current		
	40-pin connector × 2	32 points/ common	None	None	None	*12 0.3A	0.3A	64 points
	20 terminal block connector	8 points/ common	Varistor	2A *6	Display *10	0.06A	0.115A	16 points
			Surge absorbing diode			0.11A		
	38 terminal block connector	16 points/ common	Varistor	None	None	0.05A	0.23A	32 points
			Surge absorbing diode			0.22A		
	40-pin connector × 2	32 points/ common				0.05A	0.29A	64 points

The following specifications apply to all modules:

Isolation method : Photocoupler

Input indication : LEDs

*1 : The ON/OFF status of the first or latter half is indicated by the LEDs in accordance with the setting of the selector switch on the front panel of the module:

FH setting: First half (Y00 to Y1F), LH setting: Latter half (Y20 to Y3F)

*2 : When 12/48 VDC is used as the load power supply, a separate 24 VDC power supply must be used as an external power supply.

*3 : When 12 VDC is used as the load power supply, a separate 24/48 VDC power supply must be used as an external power supply.

*4 : When the module is installed adjacent to the power supply module, the value indicated in parentheses applies.

*5 : The maximum load current differs depending on the number of simultaneously ON points.

*6 : Fast-melting fuse (one per common)

*7 : Normal fuse (two per common)

*8 : Fast-melting fuse (two per 8-per-common unit)

*9 : Fast-melting fuse (two per common)

*10 : LED comes on when a fuse blows or the external power supply is turned off.

*11 : Since this is a built-in fuse directly fixed to the module, replace the entire module if it blows.

*12 : TYP. 12 VDC

(1)

Model	Rated Input Voltage
AY10	24 VDC/240 VAC
AY11	
AY11E	
AY11EEU	

(2)

Model	Rated Input Voltage
AY10A	24 VDC/240 VAC
AY11A	
AY11AEU	

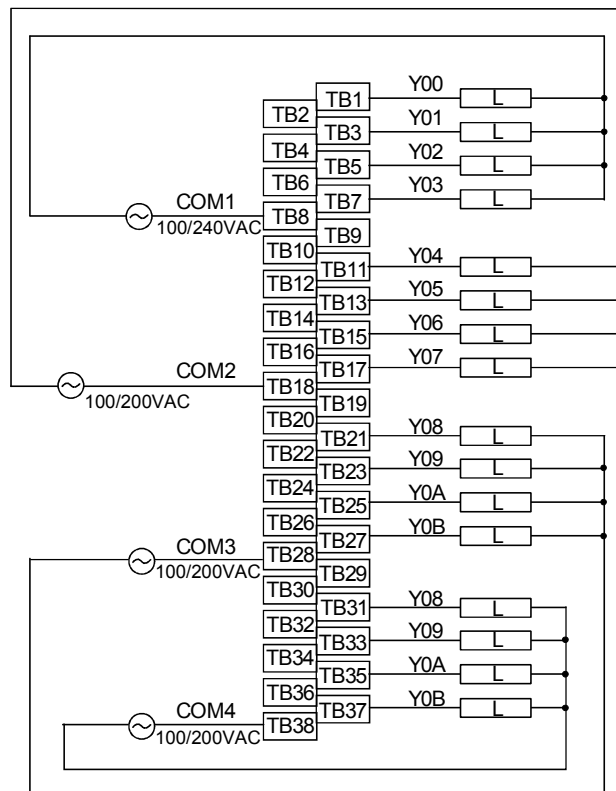
(3)

Model	Rated Input Voltage
AY13	12 VDC/240 VAC
AY13E	
AY13EU	

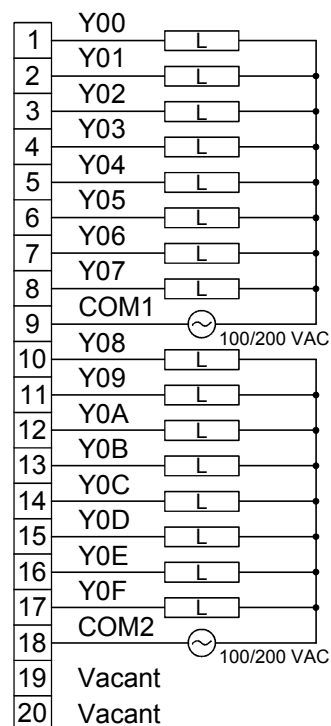
(4)

Model	Rated Input Voltage
AY15EU	24VDC/240 VAC

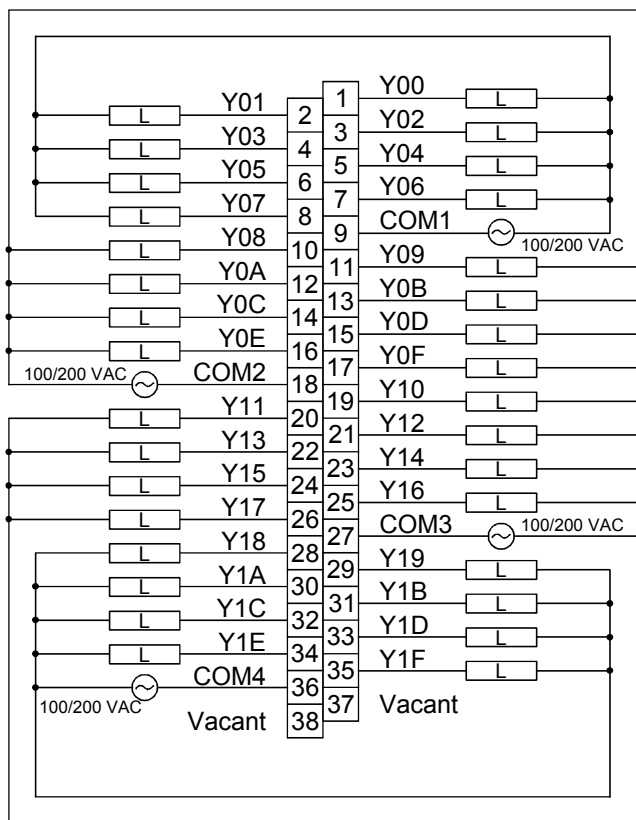
(5)	Model	Rated Input Voltage
	AY20EU	100/200 VAC



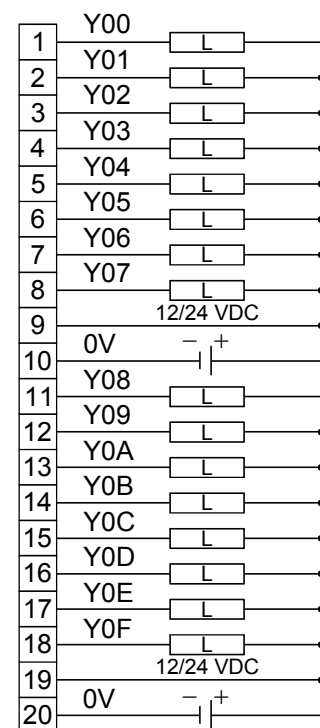
(6)	Model	Rated Input Voltage
	AY22	24 VDC/240 VAC



(7)	Model	Rated Input Voltage
	AY23	100/240 VAC



(8)	Model	Rated Input Voltage
	AY40	12/240 VDC
	AY40P	
	AY50	



(9)	Model	Rated Input Voltage
	AY40A	12/24 VDC
(10)	Model	Rated Input Voltage
	AY41 AY41P	12/24 VDC
(11)	Model	Rated Input Voltage
	AY42 AY42-S3	12/24 VDC
(12)	Model	Rated Input Voltage
	AY42-S2	5/12/24 VDC

* The figure above indicates **F** (the first half 32 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).

B1 and **B2** , and **A1** and **A2** are connected internally.

(17)	Model	Rated Input Voltage	(18)	Model	Rated Input Voltage
	AY60EP	12/24 VDC		AY60S	24/48 (12) VDC
			<ul style="list-style-type: none"> When 12 VDC is used as the load power supply, a separate 24/48 VDC power supply must be used as an external power supply. 		
(19)	Model	Rated Input Voltage	(20)	Model	Rated Input Voltage
	AY70	5/12 VDC		AY71	5/12 VDC

	<table><tr><th>Model</th><th>Rated Input Voltage</th></tr><tr><td>AY80</td><td rowspan="2">12/24 VDC</td></tr><tr><td>AY80EP</td></tr></table>	Model	Rated Input Voltage	AY80	12/24 VDC	AY80EP																																																																												
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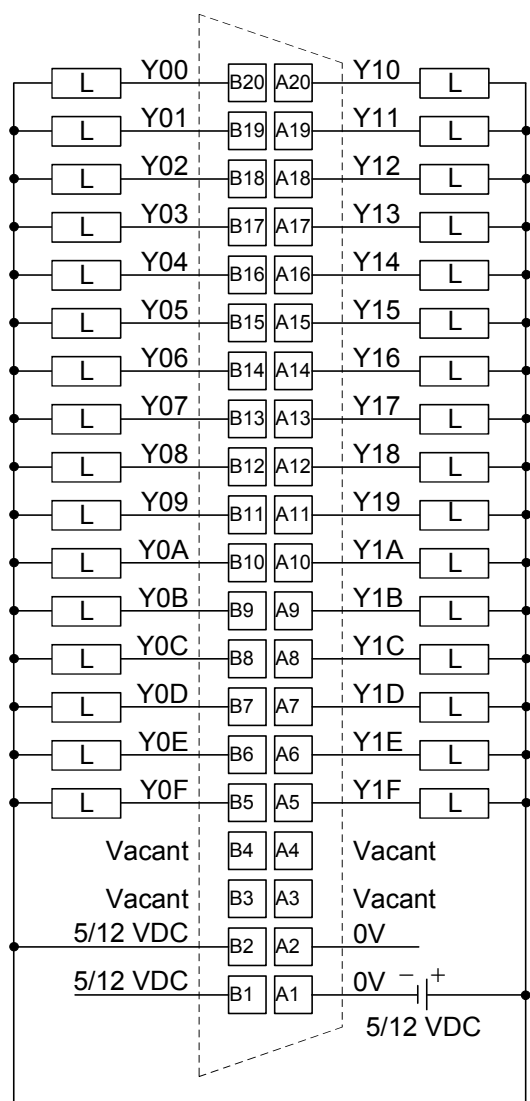
* The figure above indicates **F** (the first half 32 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).

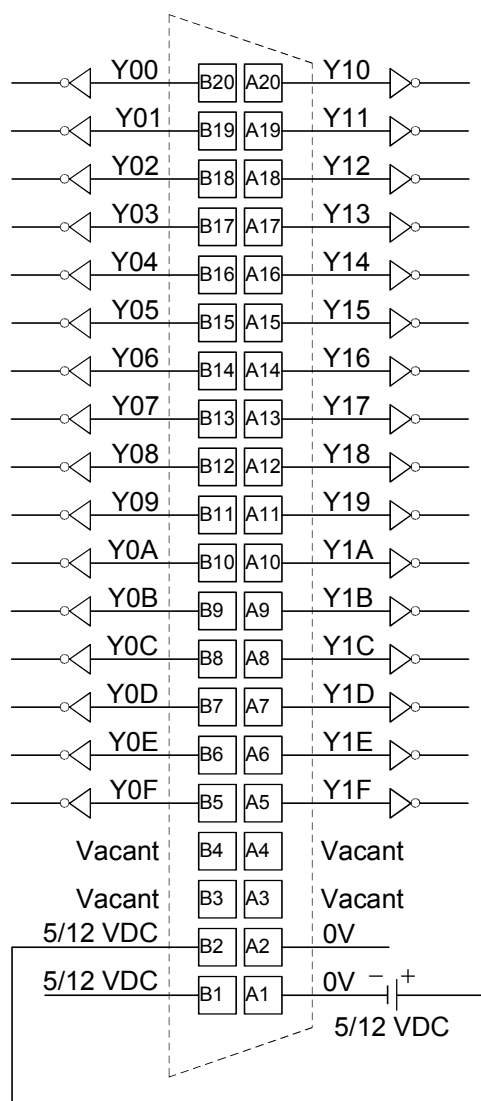
17 and **18** and **36** , and **19** and **37** are connected internally.

(24)	Model	Rated Input Voltage
	AY72	5/12 VDC

Load connection



TTL, CMOS logic



MEMO

[illegible]

5.3 Input/Output Combined Modules

5.3.1 Input/output combined module specifications

Model	Input Type	Number of Points/Module	Isolation Method	Rated Input Voltage	Input Current	Operating Voltage		
						ON Voltage	OFF Voltage	
A42XY	Dynamic scan	64 points *1	Photocoupler insulation	12/24VDC		7VDC or higher	3VDC or lower	
AH42	DC input (sink type)	32 points			3/7mA	9.5VDC or higher	6VDC or lower	

Model	Output Type	Number of Points/Module	Rated Load Voltage	Max. Load Current		Input Response Time		
				Per Point	Per Common	OFF to ON	ON to OFF	
A42XY	Dynamic scan	64 points	12/24VDC	50mA	—	16ms or less	16ms or less	
AH42	Transistor output (sink type)	32 points		0.1A	1A	2ms or less	2ms or less	

	Maximum Simultaneous ON Input Point (Percentage Simultaneous ON)	Input Response Time		Input Display	External Connections	Common Terminal Arrangement
		OFF to ON	ON to OFF			
60%		16ms or less	16ms or less	LED display	16-pin connector	—
		10ms or less	10ms or less		40-pin connector × 2	30 points/ common

	External Connections	Common Terminal Arrangement	Surge Suppression	Fuse Rating	Error Display	External Power Supply (TYP 24VDC)	Internal Current Consumption	Number of Occupied I/O Points
						Current		
	32-pin connector	—	None	None	None	0.18A	0.11A	64 points *1
	40-pin connector × 2	32 points/ common	Clamp diode			0.04A	0.245A	64 points *2

*1 : The same numbers are allocated to both input and output points. The number of occupied I/O points is 64.

*2 : The first half 32 points are allocated to input and the latter half 32 points are allocated to output. Thus, the number of occupied I/O points is 64. When I/O allocation is carried out at a peripheral device, both modules should be set as 64-point output modules.

5.3.2 Input/output combined module connections

(1)

Model	Rated Input Voltage	Rated Load Voltage
A42XY	12/24 VDC	12/24 VDC

Input side

Input terminals

Pin No.

1A XD0
1B XD1
2A XD2
2B XD3
3A XD4
3B XD5
4A XD6
4B XD7
5A XSCN0
5B XSCN1
6A XSCN2
6B XSCN3
7A XSCN4
7B XSCN5
8A XSCN6
8B XSCN7

Internal control circuit

Internal scan at 1/8th duty

12/24 VDC
12/24 VDC
12/24 GDC

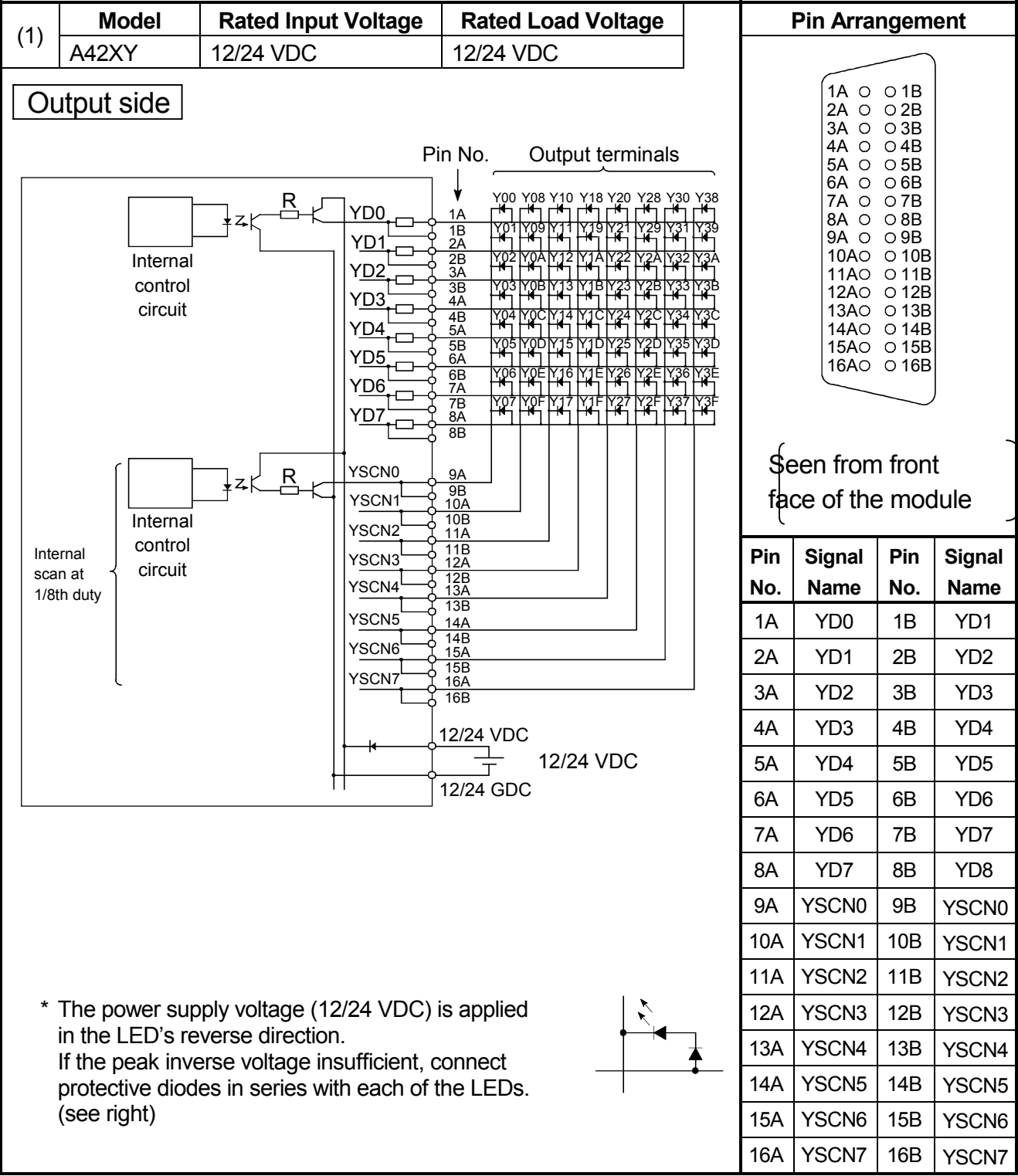
Pin Arrangement

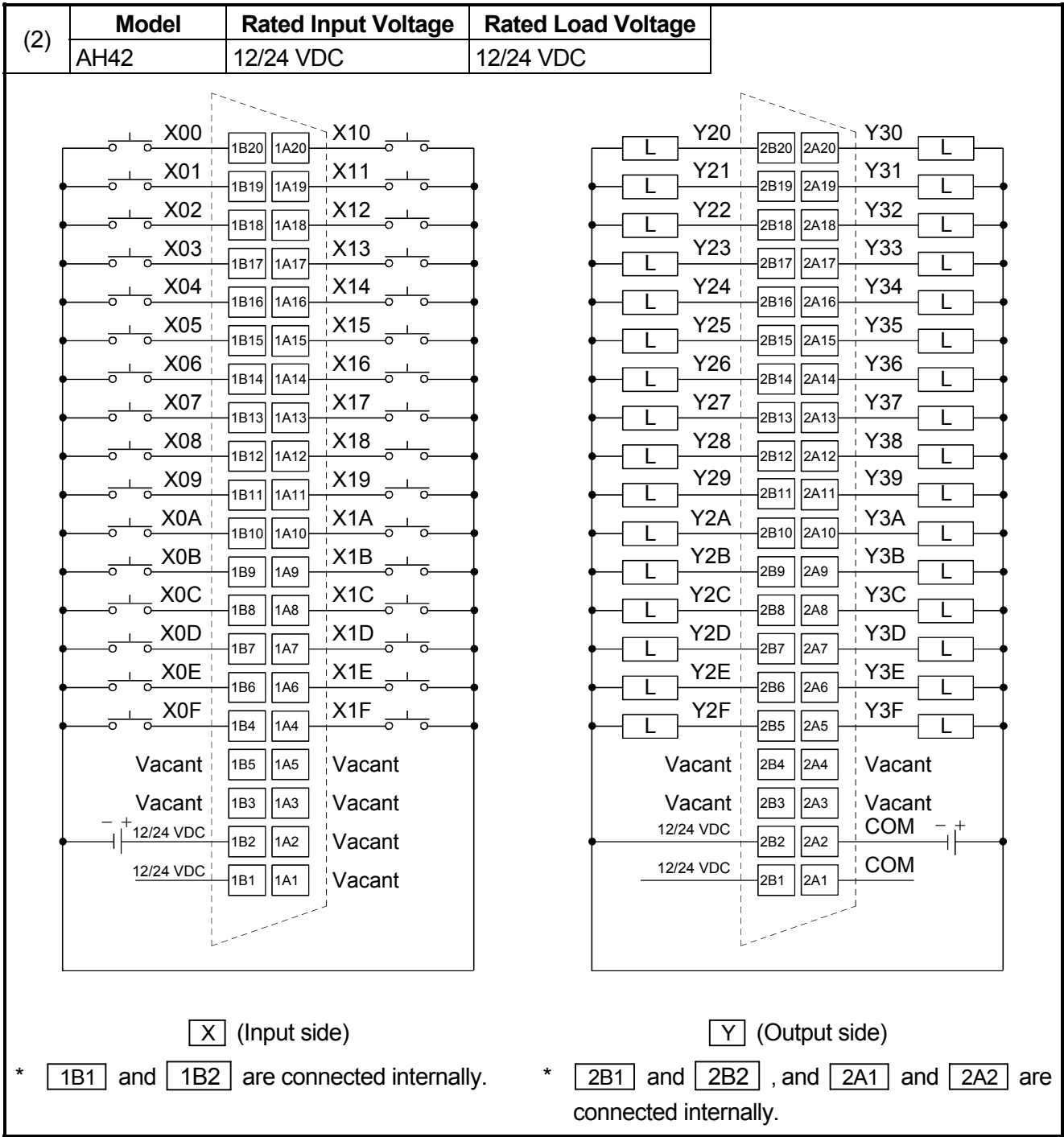
1A ○ ○ 1B
2A ○ ○ 2B
3A ○ ○ 3B
4A ○ ○ 4B
5A ○ ○ 5B
6A ○ ○ 6B
7A ○ ○ 7B
8A ○ ○ 8B

Seen from front face of the module

Pin No.	Signal Name	Pin No.	Signal Name
1A	XD0	1B	XD1
2A	XD2	2B	XD3
3A	XD4	3B	XD5
4A	XD6	4B	XD7
5A	XSCN0	5B	XSCN1
6A	XSCN2	6B	XSCN3
7A	XSCN4	7B	XSCN5
8A	XSCN6	8B	XSCN7

* If there will be cases when two or more switches are pressed simultaneously, install a diode at each switch (see right)





❖ 6. ERROR CODE ❖

If an error occurs when the PLC is powered ON, switched to RUN status or running, the QnACPU module executes the self diagnostics function to display the error (LED display, message display) and store the error information into the special relay SM and special register SD.

Also, if an error occurs when a communication request is issued from a peripheral device, special function module or network system, the QnACPU returns the error code (4000H to 4FFFH) to the request source.

The following explains the QnACPU errors and the corresponding corrective actions.

REMARK

The error code of the error that occurred when a general data processing request is made from the peripheral device, special function module or network system is not stored into SD0 of the Q2ACPU.

The error code is returned to the source of the general data processing request.

6.1 Error Code Type

Errors are detected by the self diagnostics function of CPU module or during communication with CPU module.

The following table classifies the errors according to the detection pattern, detection location and error code.

Error detection pattern	Error detection location	Error code	Reference
Detection by the self diagnostics function of CPU module	CPU module	1000 to 10000*1	Section 6.3
Detection at communication with CPU module	CPU module	4000H to 4FFFH	Q2A(S1)/Q3A/Q4ACPU User's Manual
	Serial communication module, etc.	7000H to 7FFFH	Serial Communication User's Manual, etc.
	CC-Link module	B000H to BFFFH	CC-Link System Master/Local Module User's Manual
	Ethernet module	C000H to CFFFH	Ethernet Interface Module User's Manual
	MELSECNET/H network module	F000H to FFFFH	For QnA/Q4AR MELSECNET/10 Network System Reference Manual

*1 : CPU module error codes are classified into minor, moderate, major errors as shown below.

- Minor error: Errors that may allow the CPU module to continue the operation, e.g., battery error.
(Error code: 1300 to 10000)
- Moderate error: Errors that may cause the CPU module to stop the operation, e.g., WDT error.
(Error code: 1300 to 10000)
- Major error: Errors that may cause the CPU module to stop the operation, e.g., RAM error.
(Error code: 1000 to 1299)

Determine the error level, i.e. whether the operation can be continued or stopped, by referring to “Operating Statuses of CPU” described in Section 6.3 “Error Code List”

6.2 Reading Error Code

When an error occurs, the corresponding error code and error message can be read out using a peripheral device.

For details on peripheral device operation, refer to GX Developer Operating Manual or SW□IVD-GPPQ/SW□NX-GPPQ Operating Manual (Online).

6.3 Error Code List

The following information deals with error codes and the meanings, causes, and corrective measures of error messages.

<Relevant CPU>

- : Indicates all the QnACPU and QCPU.
- QCPU : Indicates all the Q series CPU modules.
- Q00J/Q00/Q01 : Indicates the Basic model QCPU.
- Qn(H) : Indicates the High Performance model QCPU.
- QnPH : Indicates the Process CPU.
- QnPRH : Indicates the Redundant CPU.
- QnA : Indicates the QnA series and Q2ASCPU series.
- Rem : Indicates the MELSECNET/H remote I/O modules.

Each CPU module model name: Indicates the relevant specific CPU module.

(Example: Q4AR, Q2AS)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1000	[MAIN CPU DOWN] Runaway or failure of CPU module or failure of main CPU <ul style="list-style-type: none"> Malfunctioning due to noise or other reason Hardware fault ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	<ul style="list-style-type: none"> Take noise reduction measures. Reset the CPU module and RUN it again.If the same error is displayed again, this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.) 	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
1010	[END NOT EXECUTE] Entire program was executed without the execution of an END instruction. <ul style="list-style-type: none"> When the END instruction is executed it is read as another instruction code, e.g. due to noise. The END instruction has been changed to another instruction code somehow. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When an END instruction executed 	<ul style="list-style-type: none"> Take noise reduction measures. Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.) 		
1101	[RAM ERROR] The sequence program storing built-in RAM/ program memory in the CPU module is faulty. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/ At reset/ When an END instruction executed 	<ul style="list-style-type: none"> Take noise reduction measures. Reset the CPU module and RUN it again. If the same error is displayed again,this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.) 		
1102	[RAM ERROR] <ul style="list-style-type: none"> The work area RAM in the CPU module is faulty. The standard RAM and extended RAM in the CPU module are faulty. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/ At reset/ When an END instruction executed 	<ul style="list-style-type: none"> Take noise reduction measures. Reset the CPU module and RUN it again. If the same error is displayed again,this suggests a CPU module hardware fault.(Contact your local Mitsubishi representative.) 		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1103	[RAM ERROR] The device memory in the CPU module is faulty. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset	<ul style="list-style-type: none">• Take noise reduction measures.• When indexing is performed, check the value of index register to see if it is within the device range.• Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
1104	[RAM ERROR] The address RAM in the CPU module is faulty. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset	<ul style="list-style-type: none">• Take noise reduction measures.• Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		
1105	[RAM ERROR] The system RAM in the CPU module is faulty. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset	<ul style="list-style-type: none">• Take noise reduction measures.• Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		Q4AR
1200	[OPE. CIRCUIT ERR.] The operation circuit for index modification in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset	This suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)		QnA
1201	[OPE. CIRCUIT ERR.] The hardware (logic) in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset			
1202	[OPE. CIRCUIT ERR.] The operation circuit for sequence processing in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset			
1203	[OPE. CIRCUIT ERR.] The operation circuit for index modification in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When an END instruction executed			Q4AR
1204	[OPE. CIRCUIT ERR.] The hardware (logic) in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When an END instruction executed			

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1205	[OPE. CIRCUIT ERR.] The operation circuit for sequence processing in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:– • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • When an END instruction executed 	This suggests a CPU module hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker	QnA
1206	[OPE. CIRCUIT ERR.] The DSP operation circuit in the CPU module does not operate normally. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:– • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • When instruction executed 		CPU Status: Stop	Q4AR
1300	[FUSE BREAK OFF] There is an output module with a blown fuse. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Module No.(Slot No.) [For Remote I/O network] Network No./Station No. • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • Always 	<ul style="list-style-type: none"> • Check ERR. LED of the output modules and replace the fuse of the module whose LED is lit. • Read the common information of the error using the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1". • When a GOT is bus-connected to the main base unit or extension base unit, check the connection status of the extension cable and the grounding status of the GOT. 	RUN: Off/On ERR.: Flicker/On	QnA Q4AR
	[FUSE BREAK OFF] <ul style="list-style-type: none"> • There is an output module with a blown fuse. • External power supply for output load is turned off or disconnected. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Module No.(Slot No.) [For Remote I/O network] Network No./Station No. • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • Always 	<ul style="list-style-type: none"> • Check ERR. LED of the output modules and replace the module whose LED is lit. • Read the common information of the error using the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1". • Check whether the external power supply for output load is ON or OFF. • When a GOT is bus-connected to the main base unit or extension base unit, check the connection status of the extension cable and the earth status of the GOT. 	CPU Status: Stop/ Continue*1	Q2AS
1310	[I/O INT. ERROR] An interruption has occurred although there is no interrupt module. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:– • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • During interrupt 	Any of the mounted modules is experiencing a hardware fault. Therefore, check the mounted modules and change the faulty module. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
1401	[SP. UNIT DOWN] When PLC parameter I/O allocation was being made, there was no return signal from the special function module during initial processing stage.(When error is generated, the head I/O number of the special function module that corresponds to the common information is stored.) ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Module No.(Slot No.) • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • At power ON/At reset 	The CPU module, base unit and/or the special function module that was accessed is experiencing a hardware fault. (Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop*2	

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

*2 The BAT. ALM LED turns on at BATTERY ERROR.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1402	[SP. UNIT DOWN] The special function module was accessed during the execution of a FROM/TO instruction set, but there was no response. (When an error is generated, the program error location corresponding to the individual information is stored.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Module No.(Slot No.)• Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none">• During execution of FROM/TO instruction set	The CPU module, base unit and/or the special function module that was accessed is experiencing a hardware fault.(Contact your local Mitsubishi representative.)	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
1411	[CONTROL-BUS. ERR.] When performing a parameter I/O allocation the intelligent function module/special function module could not be accessed during initial communications. (On error occurring, the head I/O number of the corresponding intelligent function module/special function module is stored in the common information.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Module No.(Slot No.)• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON / At reset	Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module/special function module, CPU module or base unit is faulty. (Contact your local Mitsubishi representative.)		
1412	[CONTROL-BUS. ERR.] The FROM/TO instruction is not executable, due to a control bus error with the intelligent function module/special function module. (On error occurring, the program error location is stored in the individual information.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Module No.(Slot No.)• Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none">• During execution of FROM/TO instruction set			
1421	[SYS. UNIT DOWN] Hardware fault at the system management module AS92R. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• Always	This suggests a system management module AS92R hardware fault. (Contact your local Mitsubishi representative.)		Q4AR
1500	[AC/DC DOWN] <ul style="list-style-type: none">• A momentary power supply interruption has occurred.• The power supply went off. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• Always	Check the power supply.	RUN: On ERR.: Off CPU Status: Continue	QnA

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
1510	[DUAL DC DOWN 5V] The power supply voltage (100 to 240VAC) of either of the two power supply modules on the power supply duplexing extension base unit dropped to or below 85% of the rated voltage. (This can be detected from the control system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Check the supply voltage of the power supply module. If the voltage is abnormal then replace the power supply module.	RUN: On ERR.: On CPU Status: Continue	Q4AR
1520	[DC DOWN 5V] The voltage(100 to 240VAC) of the power supply module on the extension base unit dropped to or below 85% of the rated voltage. (This can be detected from the control system of the stand-alone system or redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Check the supply voltage of the power supply module. If the voltage is abnormal then replace the power supply module.	RUN: Off ERR.: Flicker CPU Status: Stop	
1530	[DC DOWN 24V] The 24 VDC power supplied to the system management module AS92R has dropped below 90% of the rated voltage. (This can be detected from the control system or standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Check the 24VDC power supplied to the system management module AS92R.	RUN: On ERR.: On CPU Status: Continue	
1600	[BATTERY ERROR*2] <ul style="list-style-type: none"> The battery voltage in the CPU module has dropped below stipulated level. The lead connector of the CPU module battery is not connected. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Drive Name Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	<ul style="list-style-type: none"> Change the battery. If the battery is for program memory, standard RAM or for the back-up power function, install a lead connector. 	RUN: On ERR.: Off	QnA
1601	[BATTERY ERROR*2] Voltage of the battery on memory card 1 has dropped below stipulated level. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Drive Name Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Change the battery.	CPU Status: Continue	
1602	[BATTERY ERROR*2] Voltage of the battery on memory card 2 has dropped below stipulated level. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Drive Name Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Change the battery.	RUN: On ERR.: On CPU Status: Continue	

*2 The BAT.ALM LED turns on at BATTERY ERROR.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2104	[SP. UNIT LAY ERR.] At the MELSECNET/MINI auto refresh network parameter settings, the module allocation that was set is different from the actual module models at the station numbers in the link system. ■Collateral informationmmmon • Common Information:Module No.(Slot No.) • Individual Information:– ■Diagnostic Timing • At power ON/At reset	Reset the network parameter MELSECNET/MINI auto refresh unit module allocation setting so that it conforms to the station number of the module that is actually linked.		
2105	[SP. UNIT LAY ERR.] There are too many special function modules that can use dedicated instructions allocated (number of modules installed). (The total of the figures indicated below is above 1344.) <div>(AD59 modules installed × 5) (AD57(S1)/AD58 modules installed × 8) (AJ71C24(S3/S6/S8) modules installed × 10) (AJ71UC24 modules installed × 10) (AJ71C21(S1) modules installed × 29) (AJ71PT32-S3/AJ71T32-S3 modules installed × 125) * (AJ71QC24(R2,R4) modules installed × 29) (AJ71ID1(2)-R4 modules installed × 8) +(AD75 modules installed × 12) total > 1344</div> *: When the expansion mode is used. ■Collateral informationmmmon • Common Information:Module No.(Slot No.) • Individual Information:– ■Diagnostic Timing • At power ON/At reset	Reduce the number of special function modules installed.	RUN: Off ERR.: Flicker	QnA
2106	[SP.UNIT LAY ERR.] • Five or more AJ71QLP21 & AJ71QBR11 modules are installed. • Three or more AJ71AP21/R21 & AJ71AT21B modules are installed. • The total number of installed AJ71QLP21, AJ71QBR11, AJ71AP21/R21, and AJ71AT21B modules exceeds five. • The same network numbers or identical station numbers exist in the MELSECNET/10 network system. • Two or more master or load stations exist simultaneously at the MELSECNET(II) or MELSECNET/B data link system. ■Collateral informationmmmon • Common Information:Module No. (Slot No.) • Individual Information:– ■Diagnostic Timing • At power ON/At reset	 • Reduce the AJ71QLP21 and AJ71QBR11 modules to four or less. • Reduce the AJ71AP21/R21 and AJ71AT21B modules to two or less. • Reduce the AJ71QLP21, AJ71QBR11, AJ71AP21/R21 and AJ71AT21B modules to a total of four or less. • Check the network Nos. and station Nos. • Check the station Nos.	CPU Status: Stop	
2107	[SP. UNIT LAY ERR.] The start X/Y set in the PLC parameter's I/O assignment settings is overlapped with the one for another module. ■Collateral informationmmmon • Common Information:Module No.(Slot No.) • Individual Information:– ■Diagnostic Timing • At power ON/At reset	Make the PLC parameter's I/O assignment setting again so it is consistent with the actual status of the special function modules.		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2108	[SP. UNIT LAY ERR.] A(1S)J71LP21 or A(1S)J71BR11 for use with the AnUCPU network module has been installed. ■Collateral information • Common Information:Module No.(Slot No.) • Individual Information:— ■Diagnostic Timing • At power ON/At reset	Replace the network module to A(1S)J71QLP21 or A(1S)J71QBR11.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
2109	[SP. UNIT LAY ERR.] The control system and standby system module configurations are different when a redundant system is in the backup mode. ■Collateral information • Common Information:Module No.(Slot No.) • Individual Information:— ■Diagnostic Timing • At power ON/At reset	Check the module configuration of the standby system.	RUN: Off ERR.: Flicker CPU Status: Stop/ Continue ^{*2}	Q4AR
2110	[SP. UNIT ERROR] • The location designated by the FROM/TO instruction set is not the special function module. • The module that does not include buffer memory has been specified by the FROM/TO instruction. • The special function module, Network module being accessed is faulty. • Station not loaded was specified using the instruction whose target was the CPU share memory. ■Collateral information • Common Information:Module No.(Slot No.) • Individual Information:Program error location ■Diagnostic Timing • When instruction executed	• Read the individual information of the error using the GX Developer, check the FROM/TO instruction that corresponds to that numerical value (program error location), and correct when necessary. • The special function module that was accessed is experiencing a hardware fault. Therefore, change the faulty module. Alternatively, contact your local Mitsubishi representative.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue ^{*1}	QnA
2111	[SP. UNIT ERROR] • The location designated by a link direct device (J□ \ □) is not a network module. • The I/O module (special function module) was nearly removed, completely removed, or mounted during running. ■Collateral information • Common Information:Module No.(Slot No.) • Individual Information:Program error location ■Diagnostic Timing • When instruction executed			
2112	[SP. UNIT ERROR] • The module other than special function module is specified by the special function module dedicated instruction. Or, it is not the corresponding special function module. • The module model specified by the special function module dedicated instruction and that specified by the parameter I/O assignment is different. ■Collateral information • Common Information:Module No.(Slot No.) • Individual Information:Program error location ■Diagnostic Timing • When instruction executed/STOP → RUN			

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

*2 The BAT.ALM LED turns on at BATTERY ERROR.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2113	[SP. UNIT ERROR] Data of special function module to be simulated is not set in the simulation date. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:FFFFH (fixed)• Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed/STOP → RUN	Read the individual information of the error using a peripheral device, and check the special function module /special function module dedicated instruction (network instruction) that corresponds to the value (program error part) to make modification.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	QnA
2210	[BOOT ERROR] There is no boot file in the drive designated by the parameter enabled drive switch even though the Boot DIP switch is ON. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Drive name• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset	Check and correct the valid parameter drive settings made by the DIP switches. Set the boot file to the drive specified by the parameter drive DIP switches.	RUN: Off ERR.: Flicker CPU Status: Stop	
2300	[ICM. OPE. ERROR] <ul style="list-style-type: none">• A memory card was removed without switching the memory card in/out switch OFF.• The memory card in/out switch is turned ON although a memory card is not actually installed. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Drive name• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When memory card is inserted or removed/When memory card is inserted	<ul style="list-style-type: none">• Remove memory card after placing the memory card in/out switch OFF.• Turn on the card insert switch after inserting a memory card.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	
2301	[ICM. OPE. ERROR] <ul style="list-style-type: none">• The memory card has not been formatted.• Memory card format status is incorrect. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Drive name• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When memory card is inserted or removed/When memory card is inserted	<ul style="list-style-type: none">• Format memory card.• Reformat memory card.		
2302	[ICM. OPE. ERROR] A memory card that cannot be used with the CPU module has been installed. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Drive name• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When memory card is inserted or removed	<ul style="list-style-type: none">• Format memory card.• Reformat memory card.• Check memory card.		
2400	[FILE SET ERROR] The file designated at the PLC file settings in the parameters cannot be found. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:File name/Drive name• Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset/ At writing to progurammable controller	<ul style="list-style-type: none">• Read the individual information of the error using peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct.• Create a file created using parameters, and load it to the CPU module.	RUN: Off ERR.: Flicker CPU Status: Stop	

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2401	[FILE SET ERROR] The file specified by parameters cannot be made. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/ At writing to programmable controller 	<ul style="list-style-type: none"> Read the individual information of the error using the peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct. Check the space remaining in the memory card. 	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
2402	[FILE SET ERROR] Though the file register has been set in the pairing setting/tracking setting, the file register does not exist. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/ At writing to programmable controller 	Confirm the file register and parameter.		Q4AR
2410	[FILE OPE. ERROR] <ul style="list-style-type: none"> The specified program does not exist in the program memory. This error may occur when the ECALL, EFCALL, PSTOP, PSCAN, POFF or PLOW instruction is executed. The specified file does not exist. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	<ul style="list-style-type: none"> Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Create a file created using parameters, and load it to the CPU module. In case a specified file does not exist, write the file to a target memory and/or check the file specified with the instruction again. 	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue ^{*1}	QnA
2411	[FILE OPE. ERROR] <ul style="list-style-type: none"> The file is the one which cannot be specified by the sequence program (such as comment file). The specified program exists in the program memory, but has not been registered in the program setting of the Parameter dialog box. This error may occur when the ECALL, EFCALL, PSTOP, PSCAN or POFF instruction is executed. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.		
2412	[FILE OPE. ERROR] The SFC program file is one that cannot be designated by the sequence program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct.		
2413	[FILE OPE. ERROR] No data has been written to the file designated by the sequence program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Program error location ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Check to ensure that the designated file has not been write protected.		

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
2500	[CAN'T EXE. PRG.] <ul style="list-style-type: none">There is a program file that uses a device that is out of the range set in the PLC parameter device setting.After the PLC parameter setting is changed, only the parameter is written into the PLC. ■Collateral informationmmon <ul style="list-style-type: none">Common Information:File name/Drive nameIndividual Information:– ■Diagnostic Timing <ul style="list-style-type: none">At power ON/At reset	<ul style="list-style-type: none">Read the common information of the error using the peripheral device, check to be sure that the parameter device allocation setting and the program file device allocation correspond to the numerical values there (file name), and correct if necessary.If PLC parameter device setting is changed, batch-write the parameter and program file into the PLC.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
2501	[CAN'T EXE. PRG.] <p>There are multiple program files although "none" has been set at the PLC parameter program settings.</p> ■Collateral informationmmon <ul style="list-style-type: none">Common Information:File name/Drive nameIndividual Information:– ■Diagnostic Timing <ul style="list-style-type: none">At power ON/At reset	Edit the PLC parameter program setting to "yes". Alternatively, delete unneeded programs.		
2502	[CAN'T EXE. PRG.] <p>The program file is incorrect. Alternatively, the file contents are not those of a sequence program.</p> ■Collateral informationmmon <ul style="list-style-type: none">Common Information:File name/Drive nameIndividual Information:– ■Diagnostic Timing <ul style="list-style-type: none">At power ON/At reset	Check whether the program version is * * * .QPG, and check the file contents to be sure they are for a sequence program.		
2503	[CAN'T EXE. PRG.] <p>There are no program files at all.</p> ■Collateral informationmmon <ul style="list-style-type: none">Common Information:File name/Drive nameIndividual Information:– ■Diagnostic Timing <ul style="list-style-type: none">At power ON/At reset	<ul style="list-style-type: none">Check program configuration.Check parameters and program configuration.		
2504	[CAN'T EXE. PRG.] <p>Two or more SFC normal programs or control programs have been designated.</p> ■Collateral informationmmon <ul style="list-style-type: none">Common Information:File name/Drive nameIndividual Information:– ■Diagnostic Timing <ul style="list-style-type: none">At power ON/At reset			

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3000	[PARAMETER ERROR] The PLC parameter settings for timer time limit setting, the RUN-PAUSE contact, the common pointer number, general data processing, number of empty slots, system interrupt settings, baud rate setting, and service processing setting are outside the range that can be used by the CPU module. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:File name/Drive name • Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> • At power ON/At reset/STOP → RUN/ At writing to progurammable controller 	<ul style="list-style-type: none"> • Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Rewrite corrected parameters to the CPU module, reload the CPU power supply and/or reset the module. • If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.) 	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
	[PARAMETER ERROR] The parameter settings in the error individual information (special register SD16) are illegal. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:File name/Drive name • Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> • At power ON/At reset/STOP → RUN/ At writing to progurammable controller 			
3001	[PARAMETER ERROR] The parameter settings are corrupted. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:File name/Drive name • Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> • At power ON/At reset/STOP → RUN/ At writing to progurammable controller 			
3002	[PARAMETER ERROR] When "Use the following file" is selected for the file register in the PLC file setting of the PLC parameter dialog box, the specified file does not exist although the file register capacity has been set. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:File name/Drive name • Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> • At power ON/At reset/STOP → RUN/ At writing to progurammable controller 	<ul style="list-style-type: none"> • Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. • Rewrite corrected parameters to the CPU module, reload the CPU power supply and/or reset the module. • If the same error occurs, it is thought to be a hardware error. (Contact your local Mitsubishi representative.) 		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3003	[PARAMETER ERROR] ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> When an END instruction executed 	<ul style="list-style-type: none"> Read the individual information of the error using the peripheral device, check the parameter item corresponding to the numerical value (parameter No.), and correct it. If the error is still generated following the correction of the parameter settings, the possible cause is the memory error of the CPU module's built-in RAM or program memory or the memory card. (Contact your local Mitsubishi representative.) 	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
	[PARAMETER ERROR] The number of devices set at the PLC parameter device settings exceeds the possible CPU module range. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power-On/At reset/STOP → RUN/ At writing to progurammable controller 			
3004	[PARAMETER ERROR] The parameter file is incorrect. Alternatively, the contents of the file are not parameters. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power-On/At reset/STOP → RUN/ At writing to progurammable controller 	Check whether the parameter file version is * * * .QPA, and check the file contents to be sure they are parameters.		
3100	[LINK PARA. ERROR] Although the QnACPU is a control station or master station, the network parameters have not been written. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 	<ul style="list-style-type: none"> Correct and write the network parameters. If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.) 		
3101	[LINK PARA. ERROR] <ul style="list-style-type: none"> The network No. specified by a network parameter is different from that of the actually mounted network. The head I/O No. specified by a network parameter is different from that of the actually mounted I/O unit. The network class specified by a network parameter is different from that of the actually mounted network. The network refresh parameter of the MELSECNET/H, MELSECNET/10 is out of the specified area. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 	<ul style="list-style-type: none"> Check the network parameters and mounting status, and if they differ, match the network parameters and mounting status. If any network parameter has been corrected, write it to the CPU module. Confirm the setting of the number of extension stages of the extension base units. Check the connection status of the extension base units and extension cables. When the GOT is bus-connected to the main base unit and extension base units, also check their connection status. If the error occurs after the above checks, the cause is a hardware fault. (Contact your local Mitsubishi representative, explaining a detailed description of the problem.)		
3102	[LINK PARA. ERROR] <ul style="list-style-type: none"> The network module detected a network parameter error. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN³ 	<ul style="list-style-type: none"> Correct and write the network parameters. If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.) 		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3103	[LINK PARA. ERROR] <ul style="list-style-type: none"> Although the number of modules has been set to one or greater number in the Ethernet network parameter setting, the number of actually mounted module is zero. The start I/O No. of the Ethernet network parameter differs from the I/O No. of the actually mounted module. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 	<ul style="list-style-type: none"> Correct and write the network parameters. If the error occurs after correction, it suggests a hardware fault. (Contact your local Mitsubishi representative.) 	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
	[LINK PARA. ERROR] <ul style="list-style-type: none"> AJ71QE71 does not exist in the position of I/O number set by the parameter. I/O number designation is overlapping. Numbers of the network parameter and loaded AJ71QE71 are different. Ethernet (parameter + dedicated instruction) is set to more than five. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name/Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 			
3104	[LINK PARA. ERROR] <ul style="list-style-type: none"> The Ethernet and MELSECNET/10 use the same network number. The network number, station number or group number set in the network parameter is out of range. The specified I/O number is outside the range of the used CPU module. The Ethernet-specific parameter setting is not normal. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name / Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 			
3105	[LINK PARA. ERROR] <p>The contents of the Ethernet parameter are incorrect.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name / Drive name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 	Write after correcting parameters.		
3107	[LINK PARA. ERROR] <ul style="list-style-type: none"> The CC-Link parameter setting is incorrect. The set mode is not allowed for the version of the mounted CC-Link module. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:File name Individual Information:Parameter number ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN 	Check the parameter setting.		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
3200	[SFC PARA. ERROR] The parameter setting is illegal. • Though Block 0 was set to "Automatic start" in the SFC setting of the PLC parameter dialog box, Block 0 does not exist. ■Collateral informationmmon • Common Information:File name • Individual Information:Parameter number ■Diagnostic Timing • STOP → RUN	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
3201	[SFC PARA. ERROR] The block parameter setting is illegal. ■Collateral informationmmon • Common Information:File name • Individual Information:Parameter number ■Diagnostic Timing • STOP → RUN			
3202	[SFC PARA. ERROR] The number of step relays specified in the device setting of the PLC parameter dialog box is less than that used in the program. ■Collateral informationmmon • Common Information:File name • Individual Information:Parameter number ■Diagnostic Timing • STOP → RUN			
3203	[SFC PARA. ERROR] The execution type of the SFC program specified in the program setting of the PLC parameter dialog box is other than scan execution. ■Collateral informationmmon • Common Information:File name • Individual Information:Parameter number ■Diagnostic Timing • At power ON/At reset/STOP → RUN			

*3 The diagnostic timing of CPU modules except for Universal QCPU can be performed only when switching the CPU modules to run.

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4000	[INSTRCT. CODE ERR] <ul style="list-style-type: none"> The program contains an instruction code that cannot be decoded. An unusable instruction is included in the program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN When instruction executed 	Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4001	[INSTRCT. CODE ERR] <p>The program contains a dedicated instruction for SFC although it is not an SFC program.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN When instruction executed 			
4002	[INSTRCT. CODE ERR] <ul style="list-style-type: none"> The name of dedicated instruction specified by the program is incorrect. The dedicated instruction specified by the program cannot be executed by the specified module. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN When instruction executed 			
4003	[INSTRCT. CODE ERR] <p>The number of devices for the dedicated instruction specified by the program is incorrect.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN When instruction executed 			
4004	[INSTRCT. CODE ERR] <p>The device which cannot be used by the dedicated instruction specified by the program is specified.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At power ON/At reset/STOP → RUN When instruction executed 			

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4010	[MISSING END INS.] There is no END (FEND) instruction in the program. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • At power ON/At reset/STOP → RUN	Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4020	[CAN'T SET(P)] The total number of internal file pointers used by the program exceeds the number of internal file pointers set in the parameters. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • At power ON/At reset/STOP → RUN			
4021	[CAN'T SET(P)] • The common pointer Nos. assigned to files overlap. • The local pointer Nos. assigned to files overlap. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • At power ON/At reset/STOP → RUN			
4030	[CAN'T SET(I)] The allocation pointer Nos. assigned by files overlap. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • At power ON/At reset/STOP → RUN			
4100	[OPERATION ERROR] The instruction cannot process the contained data. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	
4101	[OPERATION ERROR] • The number of setting data dealt with the instruction exceeds the applicable range. • The storage data and constant of the device specified by the instruction exceeds the applicable range. • When writing to the host CPU shared memory, the write prohibited area is specified for the write destination address. • The range of storage data of the device specified by the instruction is duplicated. • The device specified by the instruction exceeds the range of the number of device points. • The interrupt pointer No. specified by the instruction exceeds the applicable range. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed			

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4102	[OPERATION ERROR] <ul style="list-style-type: none"> The network No. or station No. specified for the dedicated instruction is wrong. The link direct device (J□\□) setting is incorrect. The module No./ network No./number of character strings exceeds the range that can be specified. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On	QnA
4103	[OPERATION ERROR] <p>The configuration of the PID dedicated instruction is incorrect.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			
4104	[OPERATION ERROR] <p>The number of settings is beyond the range.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the common information of the error using peripheral device, and check and correct the program corresponding to that value (program error location).	CPU Status: Stop/ Continue*1	Q4AR
4107	[OPERATION ERROR] <p>Numbers of execution to the CC-Link instruction are beyond 32.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Set the numbers of execution to the CC-Link instruction to 32 or less.		QnA
4108	[OPERATION ERROR] <p>The CC-Link parameter is not set when the CC-Link instruction is executed.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Execute the CC-Link instruction after setting the CC-Link parameter.		
4200	[FOR NEXT ERROR] <p>No NEXT instruction was executed following the execution of a FOR instruction. Alternatively, there are fewer NEXT instructions than FOR instructions.</p> ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4201	[FOR NEXT ERROR] A NEXT instruction was executed although no FOR instruction has been executed. Alternatively, there are more NEXT instructions than FOR instructions. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4202	[FOR NEXT ERROR] More than 16 nesting levels are programmed. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Keep nesting levels at 16 or under.		
4203	[FOR NEXT ERROR] A BREAK instruction was executed although no FOR instruction has been executed prior to that. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		
4210	[CAN'T EXECUTE(P)] The CALL instruction is executed, but there is no subroutine at the specified pointer. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed			
4211	[CAN'T EXECUTE(P)] There was no RET instruction in the executed subroutine program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed			
4212	[CAN'T EXECUTE(P)] The RET instruction exists before the FEND instruction of the main routine program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed			
4213	[CAN'T EXECUTE(P)] More than 16 nesting levels are programmed. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Keep nesting levels at 16 or under.		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4220	[CAN'T EXECUTE(I)] Though an interrupt input occurred, the corresponding interrupt pointer does not exist. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4221	[CAN'T EXECUTE(I)] An IRET instruction does not exist in the executed interrupt program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			
4223	[CAN'T EXECUTE(I)] The IRET instruction exists before the FEND instruction of the main routine program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			
4230	[INST. FORMAT ERR.] The number of CHK and CHKEND instructions is not equal. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			
4231	[INST. FORMAT ERR.] The number of IX and IXEND instructions is not equal. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			
4235	[INST. FORMAT ERR.] The configuration of the check conditions for the CHK instruction is incorrect. Alternatively, a CHK instruction has been used in a low speed execution type program. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	
4300	[EXTEND INST. ERR.] The designation of a MELSECNET/mini-S3 master module control instruction was wrong. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 			

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4301	[EXTEND INST. ERR.] The designation of an AD57/AD58 control instruction was wrong. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	QnA
4400	[SFCP. CODE ERROR] No SFCP or SFCPEND instruction in SFC program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN	Write the program to the CPU module again using GX Developer.		
4410	[CAN'T SET(BL)] The block number designated by the SFC program exceeds the range. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN			
4411	[CAN'T SET(BL)] Block number designations overlap in SFC program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN			
4420	[CAN'T SET(S)] A step number designated in an SFC program exceeds the range. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN			
4421	[CAN'T SET(S)] Total number of steps in all SFC programs exceed the maximum. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN			
4422	[CAN'T SET(S)] Step number designations overlap in SFC program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• STOP → RUN			

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4500	[SFCP. FORMAT ERR.] The numbers of BLOCK and BEND instructions in an SFC program are not equal. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • STOP → RUN 	Write the program to the CPU module again using the peripheral device.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4501	[SFCP. FORMAT ERR.] The configuration of the STEP* to TRAN* to TSET to SEND instructions in the SFC program is incorrect. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • STOP → RUN 			
4502	[SFCP. FORMAT ERR.] The structure of the SFC program is illegal. <ul style="list-style-type: none"> • STEPI* instruction does not exist in the block of the SFC program. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • STOP → RUN 			
4503	[SFCP. FORMAT ERR.] The structure of the SFC program is illegal. <ul style="list-style-type: none"> • The step specified in the TSET instruction does not exist. • In jump transition, the host step number was specified as the destination step number. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • STOP → RUN 	<ul style="list-style-type: none"> • Write the program to the CPU module again using GX Developer. • Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location). 		
4504	[SFCP. FORMAT ERR.] The structure of the SFC program is illegal. <ul style="list-style-type: none"> • The step specified in the TAND instruction does not exist. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • STOP → RUN 	Write the program to the CPU module again using GX Developer.		
4600	[SFCP. OPE. ERROR] The SFC program contains data that cannot be processed. ■Collateral informationmmon <ul style="list-style-type: none"> • Common Information:Program error location • Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> • When instruction executed 	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On CPU Status: Stop/ Continue*1	

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4601	[SFCP. OPE. ERROR] Exceeds device range that can be designated by the SFC program. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off/On ERR.: Flicker/On	QnA
4602	[SFCP. OPE. ERROR] The START instruction in an SFC program is preceded by an END instruction. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed		CPU Status: Stop/ Continue*1	
4610	[SFCP. EXE. ERROR] The active step information at presumptive start of the SFC program is incorrect. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • STOP → RUN	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. The program is automatically subjected to an initial start.	RUN: On ERR.: On	
4611	[SFCP. EXE. ERROR] Key-switch was reset during RUN when presumptive start was designated for SFC program. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • STOP → RUN		CPU Status: Continue	
4620	[BLOCK EXE. ERROR] Startup was executed at a block in the SFC program that was already started up. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. • Read the common information of the error using GX Developer, and check and correct the error step corresponding to that value (program error location). • Turn ON if the special relay SM321 is OFF.	RUN: Off ERR.: Flicker	
4621	[BLOCK EXE. ERROR] Startup was attempted at a block that does not exist in the SFC program. ■Collateral information • Common Information: Program error location • Individual Information:— ■Diagnostic Timing • When instruction executed		CPU Status: Stop	

*1 CPU operation can be set in the parameters at error occurrence. (LED indication varies.)

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
4630	[STEP EXE. ERROR] Startup was executed at a block in the SFC program that was already started up. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
4631	[STEP EXE. ERROR] <ul style="list-style-type: none">• Startup was attempted at the step that does not exist in the SFC program. Or, the step that does not exist in the SFC program was specified for end.• Forced transition was executed based on the transition condition that does not exit in the SFC program. Or, the transition condition for forced transition that does not exit in the SFC program was canceled. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	<ul style="list-style-type: none">• Read the common information of the error using the peripheral device, and check and correct the error step corresponding to that value (program error location).• Turn ON if the special relay SM321 is OFF.		
4632	[STEP EXE. ERROR] There were too many simultaneous active steps in blocks that can be designated by the SFC program. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed	Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem.		
4633	[STEP EXE. ERROR] There were too many simultaneous active steps in all blocks that can be designated. ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Program error location• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When instruction executed			

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
5000	[WDT ERROR] • The scan time of the initial execution type program exceeded the initial execution monitoring time specified in the PLC RAS setting of the PLC parameter. ■Collateral informationmmon • Common Information:Time (value set) • Individual Information:Time (value actually measured) ■Diagnostic Timing • Always	• Read the individual information of the error from the peripheral device, check its value (time), and shorten the scan time. • Change the initial execution monitoring time or the WDT value in the PLC RAS setting of the PLC parameter. • Resolve the endless loop caused by jump transition.	RUN: Off ERR.: Flicker CPU Status: Stop	QnA
5001	[WDT ERROR] • The scan time of the program exceeded the WDT value specified in the PLC RAS setting of the PLC parameter. ■Collateral informationmmon • Common Information:Time (value set) • Individual Information:Time (value actually measured) ■Diagnostic Timing • Always			
5010	[PRG. TIME OVER] The program scan time exceeded the constant scan setting time specified in the PLC RAS setting of the PLC parameter. ■Collateral informationmmon • Common Information:Time (value set) • Individual Information:Time (value actually measured) ■Diagnostic Timing • Always	• Review the constant scan setting time. • Review the constant scan setting time and low speed program execution time in the PLC parameter so that the excess time of constant scan can be fully secured.	RUN: On ERR.: On CPU Status: Continue	
	[PRG. TIME OVER] The low speed program execution time specified in the PLC RAS setting of the PLC parameter exceeded the excess time of the constant scan. ■Collateral informationmmon • Common Information:Time (value set) • Individual Information:Time (value actually measured) ■Diagnostic Timing • Always			
5011	[PRG. TIME OVER] The scan time of the low speed execution type program exceeded the low speed execution watch time specified in the PLC RAS setting of the PLC parameter dialog box. ■Collateral informationmmon • Common Information:Time (value set) • Individual Information:Time (value actually measured) ■Diagnostic Timing • Always	Read the individual information of the error using the peripheral device, check the numerical value (time) there, and shorten scan time if necessary. Change the low speed execution watch time in the PLC RAS setting of the PLC parameter dialog box.		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6000	[PRG. VERIFY ERR.] The control system and standby system in the redundant system do not have the same programs and parameters. (This can be detected from the standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:File name• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• Always	Synchronise the programs and parameters of the control system and standby system.	RUN: Off ERR.: Flicker CPU Status: Stop	Q4AR
6010	[MODE. VERIFY ERR.] The operational status of the control system and standby system in the redundant system is not the same. (This can be detected from the standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• Always	Synchronise the operation statuses of the control system and standby system.		
6100	[TRUCKINERR.] A CPU module tracking memory error was detected during initial. (This can be detected from the control system or standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• At power ON/At reset/STOP → RUN	Hardware fault of the CPU module. (Please contact your local nearest Mitsubishi or sales representative, explaining a detailed description of the problem. Change the CPU modules in order of the standby system CPU module and control system CPU module.)	RUN: On ERR.: On CPU Status: Continue	
6101	[TRUCKIN ERR.] The CPU module detected an error during the handshake for tracking. (This can be detected from the control system or standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:–• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• When an END instruction executed	Check the condition of the other stations.		
6200	[CONTROL EXE.] The standby system in a redundant system is switched to the control system. (This can be detected from the standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none">• Common Information:Reason(s) for system switching• Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none">• Always	Check the control system condition.	RUN: On ERR.: Off CPU Status: Continue	

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
6210	[CONTROL WAIT] The control system in a redundant system is switched to the standby system. (This can be detected from the standby system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Reason(s) for system switching Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Check the control system condition.	RUN: On ERR.: Off CPU Status: Continue	Q4AR
6220	[CAN'T EXE. CHANGE] <ul style="list-style-type: none"> Since the standby system is in an error or similar status in the redundant system, the control system cannot be switched to the standby system. When an attempt was made to execute system switching, the control system could not be switched to the standby system due to a network error of the control system. (This can be detected from the control system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Reason(s) for system switching Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At switching request 	Check the standby system condition.	RUN: On ERR.: On CPU Status: Continue	
6221	[CAN'T EXE. CHANGE] Switching is disabled because of a bus switching module error. (This can be detected from the control system of the redundant system.) ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Reason(s) for system switching Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> At switching request 	This is a bus switching module hardware fault. (Contact your local Mitsubishi representative.)	CPU Status: Continue	
6230	[DUAL SYS. ERROR] The link module mounted on the standby system CPU module is the remote master station. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:– Individual Information:– ■Diagnostic Timing <ul style="list-style-type: none"> Always 	Check the system configuration status.		

Error Code	Error Contents and Cause	Corrective Action	LED Status CPU Status	Corresponding CPU
9000	[F****] Annunciator (F) was set ON ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:Annunciator number ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (annunciator number).	RUN: On ERR.: On/Off *2 CPU Status: Continue	QnA
			RUN: USER LED On ERR.: USER LED On CPU Status: Continue	
9010	[<CHK>ERR ***.***] Error detected by the CHK instruction. ■Collateral informationmmon <ul style="list-style-type: none"> Common Information:Program error location Individual Information:Failure No. ■Diagnostic Timing <ul style="list-style-type: none"> When instruction executed 	Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (error number) there.	RUN: On ERR.: Off CPU Status: Continue	
			RUN: USER LED On ERR.: USER LED On CPU Status: Continue	

*2 For the Basic model QCPU, the special register (SD207 to DS209) for LED indication priority can turn off the indication. (The LED indication is always OFF for the High Performance model QCPU, Process CPU, Redundant CPU, and Universal model QCPU.)

6.4 Canceling of Errors

Q series CPU module can perform the cancel operation for errors only when the errors allow the CPU module to continue its operation.

To cancel the errors, follow the steps shown below.

- 1) Eliminate the cause of the error.
- 2) Store the error code to be canceled in the special register SD50.
- 3) Energize the special relay SM50 (OFF → ON).
- 4) The error to be canceled is canceled.

After the CPU module is reset by the canceling of the error, the special relays, special registers, and LEDs associated with the error are returned to the status under which the error occurred.

If the same error occurs again after the cancellation of the error, it will be registered again in the error history.

When multiple enunciators(F) detected are canceled, the first one with No. F only is canceled.

Refer to the following manual for details of error canceling.

→ QCPU User's Manual (Function Explanation, Program Fundamentals

POINT	
(1)	When the error is canceled with the error code to be canceled stored in the SD50, the lower one digit of the code is neglected. (Example) If error codes 2100 and 2101 occur, and error code 2100 to cancel error code 2101. If error codes 2100 and 2111 occur, error code 2111 is not canceled even if error code 2100 is canceled.
(2)	Errors developed due to trouble in other than the CPU module are not canceled even if the special relay (SM50) and special register (SD50) are used to cancel the error. (Example) Since "SP. UNIT DOWN" is the error that occurred in the base unit (including the extension cable), intelligent function module, etc. the error cause cannot be removed even if the error is canceled by the special relay (SM50) and special register (SD50). Refer to the error code list and remove the error cause.

7. TRANSPORTATION PRECAUTIONS

When transporting lithium batteries, make sure to treat them based on the transportation regulations.

7.1 Relevant Models

The batteries for the QnACPU are classified as shown in the table below.

Product Name	Model	Description	Handled As
QnA series battery	A6BAT	Lithium battery	Non-dangerous goods
QnA series battery memory card	Q1MEM-128S, Q1MEM-128SE, Q1MEM-1MS, Q1MEM-1MSE, Q1MEM-1MSF, Q1MEM-256S, Q1MEM-256SE, Q1MEM-256SF, Q1MEM-2MS, Q1MEM-2MSF, Q1MEM-512S, Q1MEM-512SE, Q1MEM-512F, Q1MEM-64S, Q1MEM-64SE	Packed with lithium coin battery (BR2325)	

7.2 Transportation Guidelines

Products are packed properly in compliance with the transportation regulations prior to shipment. When repacking any of the unpacked products to transport it to another location, make sure to observe the IATA Dangerous Goods Regulations, IMDG Code and other local transportation regulations.

For details, please consult your transportation company.

MEMO

[illegible]

Warranty

Mitsubishi will not be held liable for damage caused by factors found not to be the cause of Mitsubishi; machine damage or lost profits caused by faults in the Mitsubishi products; damage, secondary damage, accident compensation caused by special factors unpredictable by Mitsubishi; damages to products other than Mitsubishi products; and to other duties.

⚠ For safe use

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

Country/Region	Sales office/Tel	Country/Region	Sales office/Tel
U.S.A	Mitsubishi Electric Automation Inc. 500 Corporate Woods Parkway Vernon Hills, IL 60061, U.S.A. Tel : +1-847-478-2100	Hong Kong	Mitsubishi Electric Automation (Hong Kong) Ltd. 10th Floor, Manulife Tower, 169 Electric Road, North Point, Hong Kong Tel : +852-2887-8870
Brazil	MELCO-TEC Rep. Com.e Assessoria Tecnica Ltda. Rua Correia Dias, 184, Edificio Paraíso Trade Center-8 andar Paraíso, Sao Paulo, SP Brazil Tel : +55-11-5908-8331	China	Mitsubishi Electric Automation (Shanghai) Ltd. 4/F Zhi Fu Plazz, No.80 Xin Chang Road, Shanghai 200003, China Tel : +86-21-6120-0808
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