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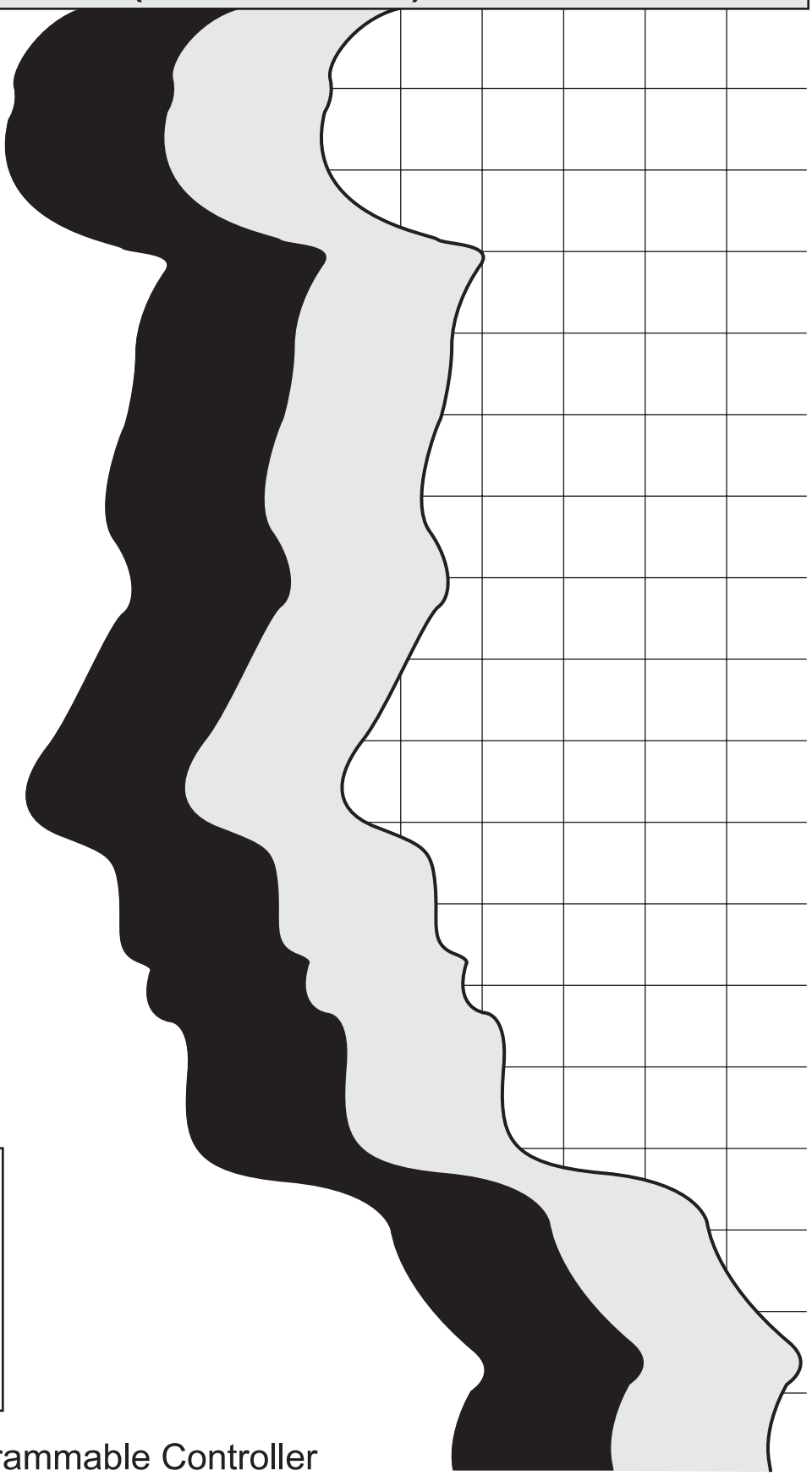
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MITSUBISHI

type A2CCPU(P21/R21), A2CCPU-DC24V,
A2CCPUC24(-PRF), A2CJCPU(S3)

User's Manual (Hardware)



A
MELSEC

Mitsubishi Programmable Controller

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● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual. Also pay careful attention to safety and handle the module properly.

These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a descriprion of the PC system safty precautions.

These ● **SAFETY PRECAUTIONS** ● classifiy the safety precautions into two categories: "DANGER" and "CAUTION".

DANGER	Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.
CAUTION	Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumestances, procedures indicated by **CAUTION** may also be linked to serious results.

In many case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can take it out and read it whenever necessary. Always forward it to the end user.

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[System Design Precautions]

DANGER

- Safety circuits should be installed external to the programmable controller to ensure that the system as a whole will continue to operate safely in the event of an external power supply malfunction or a programmable controller failure. Erroneous outputs and operation could result in an accident.
  1) The following circuitry should be installed outside the programmable controller:
     Interlock circuitry for the emergency stop circuit protective circuit, and for reciprocal operations such as forward/reverse, etc., and interlock circuitry for upper/lower positioning limits, etc., to prevent machine damage.
  2) When the programmable controller detects an abnormal condition, processing is stopped and all outputs are switched OFF. This happens in the following cases:
     - When the power supply module's over-current or over-voltage protection device is activated.
     - When an error (watchdog timer error, etc.) is detected at the PC CPU by the self-diagnosis function.

     Some errors, such as input/output control errors, cannot be detected by the PC CPU, and there may be cases when all outputs are turned ON when such errors occur. In order to ensure that the machine operates safely in such cases, a failsafe circuit or mechanism should be provided outside the programmable controller. Refer to the CPU module user's manual for an example of such a failsafe circuit.
  3) Outputs may become stuck at ON or OFF due to an output module relay or transistor failure. An external circuit should therefore be provided to monitor output signals whose incorrect operation could cause serious accidents.

- A circuit should be installed which permits the external power supply to be switched ON only after the programmable controller power has been switched ON. Accidents caused by erroneous outputs and motion could result if the external power supply is switched ON first.

- When a data link communication error occurs, the status shown below will be established at the faulty station. In order to ensure that the system operates safely at such times, an interlock circuit should be provided in the sequence program (using the communication status information).
  Erroneous outputs and operation could result in an accident.
  1) The data link data which existed prior to the error will be held.
  2) All outputs will be switched OFF at MELSECNET (II, /B, /10) remote I/O stations.
  3) At the MELSECNET/MINI-S3 remote I/O stations, all outputs will be switched OFF or output statuses will be held, depending on the E.C. mode setting.

  For details on procedures for checking faulty stations, and for operation statuses when such errors occur, refer to the appropriate data link manual.

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[System Design Precautions]

⚠ CAUTION

- Do not bundle control lines or communication wires together with main circuit or power lines, or lay them close to these lines.
  As a guide, separate the lines by a distance of at least 100 mm, otherwise malfunctions may occur due to noise.

[Cautions on Mounting]

⚠ CAUTION

- Use the PC in an environment that conforms to the general specifications in the manual.
  Using the PC in environments outside the ranges stated in the general specifications will cause electric shock, fire, malfunction, or damage to/deterioration of the product.
- Plug the memory firmly into the memory socket. Check for loose connection after installation.
  A poor connection could result in erroneous operation.

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DANGER

- Switch off the external power supply before staring installation and wiring work.
  Failure to do so could result in electrical shocks and equipment damage.
- After installation and wiring is completed, be sure to attach the terminal cover before switching the power ON and starting operation.
  Failure to do so could result in electrical shocks.

CAUTION

- Be sure to ground the FG and LG terminals, carrying out at least class 3 grounding work with a ground exclusive to the PC.
  Otherwise there will be a danger of electric shock and malfunctions.
- Carry out wiring to the PC correctly, checking the rated voltage and terminal arrangement of the product.
  Using a power supply that does not conform to the rated voltage, or carrying out wiring incorrectly, will cause fire or failure.
- Outputs from multiple power supply modules should not be connected in parallel. Failure to do so could cause the power supply module to overheat, resulting in a fire or module failure.
- Tighten the terminal screws to the stipulated torque.
  Loose screws will cause short circuits, fire, or malfunctions.
- Make sure that no foreign matter such as chips or wiring offcuts gets inside the module.
  It will cause fire, failure or malfunction.
- Connectors for external connections should be crimped, pressure welded, or soldered in the correct manner using the correct tools.
  For details regarding crimping and pressure welding tools, refer to the input/output module user's manual.
  A poor connection could cause shorts, fire, and erroneous operation.

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[Cautions on Startup and Maintenance]

DANGER

- Do not touch terminals while the power is ON.
  This will cause malfunctions.
- Make sure that the battery is connected properly. Do not attempt to charge or disassemble the battery, do not heat the battery or place it in a flame, and do not short or solder the battery.
  Incorrect handling of the battery can cause battery heat generation and ruptures which could result in fire or injury.
- Switch the power off before cleaning or re-tightening terminal screws.
  Carrying out this work while the power is ON will cause failure or malfunction of the module.

CAUTION

- Read the manuals carefully and thoroughly confirm safety before performing online operations with a peripheral device connected to the CPU module in the RUN state (especially program changes, forced output, and changes in operation status).
  Incorrect operation could result in machine failure and injury.
- Do not disassemble or modify any module.
  This will cause failure, malfunction, injuries, or fire.

[Disposal Precautions]

CAUTION

- When disposing of the 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 Type A2CCPU (P21/R21), A2CCPU-DC24V, A2CCPUC24(-PRF), A2CJCPU User's Manual.)

[Transportation Precautions]

CAUTION

- When transporting lithium batteries, make sure to treat them based on the transportation regulations. For details, refer to the Type A2CCPU(P21/R21), A2CCPU-DC24V, A2CCPUC24(-PRF), A2CJCPU User's Manual.)

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MEMO

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REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision
Apr., 1994	IB (NA) 66475-A	First edition
Mar.,1996	IB (NA) 66475-B	Overall revision
Jan.,1997	IB (NA) 66475-C	Addition SAFETY CAUTIONS Correction Detailed manuals, Sections 1, 2.1, 3.2, 3.4, 7.1
Oct., 2008	IB (NA) 66475-D	Correction SAFETY CAUTIONS

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INTRODUCTION

Thank you for choosing the Mitsubishi MELSEC-A Series of General Purpose Programmable Controllers. Please read this manual carefully so that the equipment is used to its optimum. A copy of this manual should be forwarded to the end User.

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This manual describes precautions for handling of the A2CCPU(P21/R21), A2CCPU-DC24V, A2CCPUC24(-PRF), and A2CJCPU(S3) (hereinafter referred to as the "A2C" unless otherwise required to identify), wiring of the A2C I/O modules, and error codes.

Refer to the following manuals as required:

[Detailed manuals]

- A2CCPU(P21/R21), A2CCPU-DC24V, A2CCPUC24(-PRF), A2CJCPU User's Manual (IB-66545)
- A2CJCPU User's(S3) Manual (IB-66462)

  These manuals describe system configurations, specifications and handling for the A2C.

[Related manuals]

- MELSECNET and MELSECNET/B Data Link System Reference Manual (IB-66350)

  This manual describes performance, functions, and programming methods of the MELSECNET (II) using an A2CCPUP21/R21.

- Computer Link/Multidrop Link Module User's Manual (Computer Link Function/Printer Function) (SH-3511)

  This manual describes specifications, handling, and transmission protocols of the A2CCPUC24(-PRF) computer link.
  Refer to the A2CCPUC24(-PRF) User's Manual for the use of the A2CCPUC24(-PRF).

- ACPU Programming Manual (Fundamentals) (IB-66249)

  This manual describes programming methods, device names, parameters, program types, and memory area configuration required to create programs.

- ACPU Programming Manual (Common Instructions) (IB-66250)

  This manual describes sequence, basic, and application instructions, and the use of microcomputer programs.

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1. ENVIRONMENTAL SPECIFICATIONS

This product has been designed to be installed in the following environmental conditions.
Please place the product at places of where environmental conditions satisfies the specifications.

<table>
<tr><th>Item</th><th colspan="5">Specification</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55 °C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-20 to 75 °C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5">10 to 90%RH, no dewing</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="5">10 to 90%RH, no dewing</td></tr>
<tr><td rowspan="8">Vibration resistance</td><td rowspan="8">Conforms to *JIS B 3501, IEC 1131-2</td><td colspan="4">For intermittent vibration</td></tr>
<tr><td>Frequency</td><td>Acceleration</td><td>Amplitude</td><td>Sweep count</td></tr>
<tr><td>10 to 57Hz</td><td>——</td><td>0.075 mm (0.003 in.)</td><td rowspan="5">10 times each in X, Y and Z directions (80 minutes)</td></tr>
<tr><td>57 to150Hz</td><td>9.8 m/s^2{1G}</td><td>——</td></tr>
<tr><td colspan="3">For continuous vibration</td></tr>
<tr><td>Frequency</td><td>Acceleration</td><td>Amplitude</td></tr>
<tr><td>10 to 57Hz</td><td>——</td><td>0.035 mm (0.0014 in.)</td></tr>
<tr><td>57 to150Hz</td><td>4.9 m/s^2{0.5G}</td><td>——</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Conforms to JIS B 3501, IEC 1131-2
(147 m/s^2 (15G) x 3 times in 3 directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="5">To be free of corrosive gases</td></tr>
<tr><td>Altitude</td><td colspan="5">Up to 2,000 m (6561.68 ft.)</td></tr>
<tr><td>Installation site</td><td colspan="5">Inside a control cabinet</td></tr>
<tr><td>Overvoltage category</td><td colspan="5">II or lower</td></tr>
<tr><td>Degree of contamination</td><td colspan="5">No greater than 2</td></tr>
</table>

REMARK

* JIS: Japanese Industrial Standard

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2. MODULE SPECIFICATIONS

2.1 Power Supply Modules

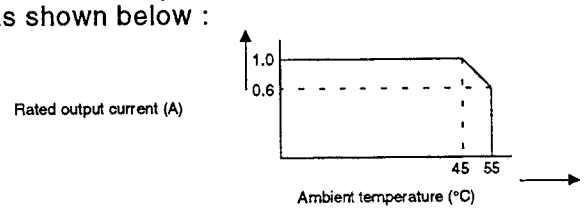
This section describes the power supply units for the A2CJCPU (S3), A2C I/O units, remote terminal block I/O units, and remote connector I/O units. Specifications of power supply modules are shown in the following table.

Item		Specifications	
		A66PC	A2CJ66P
Rated input voltage		100 to 120 / 200 to 240 VAC +10 % / -15 %	
Rated input frequency		50 / 60 Hz ±3 %	
Max. input apparent power		110 VA or lower	
Inrush current		20 AP / 20 AP max. 8 ms	
*1 Rated output current	24 VDC ± 5 %	0.6 A	
*2 Overcurrent protection	24 VDC	1.25 A ± 20 % (Inverted L-type drooping characteristic)	2 A ± 30 % (Invertde L-type drooping characteristic)
*3 Overvoltage protection	24 VDC	35 VDC ±10 %	————
Efficiency		65% or higher	
Insulation withstand voltage	Between primary and 24 VDC	1500 VAC	
Noise immunity		IFC 801-4, 2 KV	
Power indication		Power LED indication	
Terminal screw size		M3.5 x 7	
Applicable wire size		AWG16 to 22	
Applicable tightenig torque		83 to 113 N·cm (8.5 to 11.5 kg·cm)	
External dimension mm (inch)		170 x 64 x 80 (6.7 x 2.5 x 3.2)	166 x 50 x 55 (6.5 x 2.0 x 2.2)
Weight kg (lb)		0.66 (1.45)	0.3 (0.66)
Allowable momentary power failure time		Within 20 ms	

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POINTS

*1 The rated output current varies according to the ambient temperature, as shown below :



*2 If a current larger than that stated in the specifications flows in the 24 VDC circuit, the overcurrent protection function breaks the circuit and stops the system. The LED indicators of the power supply unit go OFF due to the voltage drop.
When the overcurrent protection function has been actuated, first eliminate the cause - for example: insufficient current capacity or short circuit - and then start up the system again. When the current value is normal, the system will execute an initial start.

*3 When an A66PC is being used and an overcurrent of 31.5 to 38.5 V is applied to the 24 VDC circuit, the overcurrent protection device shuts down the circuit and stops the system.
The power supply module's LED indicators go OFF. To restart the system, switch the power ON after it has been OFF for about three minutes; the system will start up by executing an initial start.
If the system fails to start up and the LED indicators remain OFF, the power supply unit has to be replaced.

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2.2 Digital I/O Modules

2.2.1 Input modules

Specifications of input modules are shown in the following table.

Model	Type	No. of Points	Rated Input Voltage	Input Current	Insulation Withstand Voltage	Operating Voltage		Maximum Simultaneous Input Points (Percentage Simultaneously ON)
						ON Voltage	OFF Voltage	
AX11C	AC input	32	100 to 120 VAC, 50/60 Hz	6 mA	1.5 KV	80 VAC or higher	30 VAC or lower	75% (110 VAC)
AX21C	AC input	32	200 to 240 VAC, 50/60 Hz	5 mA	1.5 KV	80 VAC or higher	30 VAC or lower	80% (200 VAC and 60 HZ)
AJ35TB1-16A *2	AC input	16	100 to 120 VAC, 50/60 Hz	6 mA	1.5 KV	80 VAC or higher	30 VAC or lower	100% (110 VAC)
AX31C	AC/DC input	32	12/24 VAC, 50/60 Hz 12/24 VDC	4/8.5 mA	500 V	7 VAC/VDC or higher	2.5 VAC/VDC or lower	75% (26.4 VAC)
AX41C	DC input (sink type)	32	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	100% (26.4 VDC)
AJ35TB3-8D *2	DC input (sink type)	8	24 VDC	7 mA	500 V	14 VDC or higher	6 VDC or lower	100% (26.4 VDC)
AX81C	DC input (sink/source)	32	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	100% (26.4 VDC)
AJ35TB1-16D	DC input (sink/source)	16	24 VDC	7 mA	500 V	14 VDC or higher	6 VDC or lower	70% (26.4 VDC)
AJ35TB2-16D	DC input (sink/source)	16	24 VDC	7 mA	500 V	14 VDC or higher	6 VDC or lower	100% (26.4 VDC)
AJ35TC1-32D *1	DC input (sink/source)	32	24 VDC	5 mA	500 V	17.5 VDC or higher	6 VDC or lower	85% (26.4 VDC)

For all models - Isolation: photocoupler isolation, Input display: LED display

*1: A 40-pin connector is used for external connection.

*2: Only usable with A2CJCPU-S3

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Specifications of input modules are shown in the following table.

Max. Response Time		Field Wiring	Applicable Wire Size	Points/ Common	Noise Immunity	Internal Current Consumption (24 VDC)	No. of Stations Occupied	Power Supply Requirement
OFF to ON	ON to OFF							
15 ms	30 ms	rminal	0.75 to 2 mm^2 AWG 14	16	± 1.5 KV	0.056 A	4	
30 ms	55 ms	Terminal		16	± 1.5 KV	0.058 A	4	
15 ms	30 ms	Terminal		16	± 1.5 KV	0.050 A	2	
35 ms 30 ms	30 ms 30 ms	Terminal		16	± 500 V	0.056 A	4	SELV power supply is required
10 ms	10 ms	Terminal		16	± 500 V	0.055 A	4	
10 ms	10 ms	Terminal		8	± 500 V	0.069 A	1	
10 ms	10 ms	Terminal		16	± 500 V	0.055 A	4	
10 ms	10 ms	Terminal		16	± 500 V	0.045 A	2	
10 ms	10 ms	Terminal		16	± 500 V	0.045 A	2	
10 ms	10 ms	40-pin connector, Terminal		32	± 500 V	0.055 A	4	

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2.2.2 Output modules

Specifications of output modules are shown in the following table.

Model	Type	No. of Points	Rated Load Voltage	Max. Load Current	Insulation Withstand Voltage	Max. Output Response Time	
						OFF to ON	ON to OFF
AY13C	Relay output	32	240 VAC, 24 VDC	2 A/pt, 4 A/com	1.5 KV	10 ms	12 ms
AJ35TB1A-8R *2		8	240 VAC, 24 VDC	2A/pt	1.5 KV	10 ms	12 ms
AJ35TB2-8R *2		8	240 VAC, 24 VDC	2A/pt, 5A/com	1.5 KV	10 ms	12 ms
AJ35TB1-16R *2		16	240 VAC, 24 VDC	2A/pt, 5A/com	1.5 KV	10 ms	12 ms
AY23C	Triac output	32	240 VAC	0.3 A/pt, 1.4A/com	1.5 KV	1 ms	0.5 cycle + 1 ms
AY51C	Transister output	32	12/24 VDC	0.3 A/pt, 7.2A/com	1.5 KV	2 ms	2 ms
AY61CE		32	5/12/24 VDC	1 A/pt, 4 A/com	1.5 KV	2 ms	10 ms
AY81C		32	24 VDC	0.5 A/pt, 9.6 A/com	500 V	2 ms	2 ms
AJ35TB1A-8T *2		8	24 VDC	0.3 A/pt	500 V	2 ms	2 ms
AJ35TB2-8T *2		8	5/12/24 VDC	0.5 A/pt	500 V	2 ms	2 ms
AJ35TB1-16T		16	24 VDC	0.1 A/pt, 1.6 A/com	500 V	2 ms	2 ms
AJ35TB2-16T		16	24 VDC	0.1 A/pt, 1.6 A/com	500 V	2 ms	2 ms
AJ35TC1-32T *1		32	24 VDC	0.1 A/pt, 2 A/com	500 V	2 ms	2 ms

For all models - Isolation: photocoupler isolation, Output display: LED display

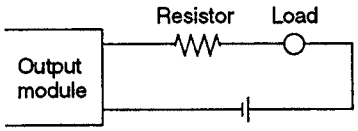
*1: A 40-pin connector is used for external connection.

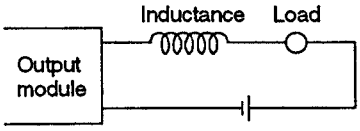
*2: Only usable with A2CJCPU-S3

(1) It is recommended to use a triac output module for a load with high frequency of switching, a large inductive load or a low power factor load. (Durability of relay output units is shortened by using with such types of load.)

(2) Minimum ON time and OFF time of output units for inductive loads is one second.

(3) When a counter or timer device including a DC/DC converter is used as a load for a transistor output unit of which the maximum load current is 0.1 A or 0.3 A, periodic rush current when or while the unit is turned ON may cause its malfunction if the unit is selected based on average load current. If such a load should be used, connect a resistor or inductance to it in series, or used an output module with higher maximum load current to reduce the effect of the rush current.





(4) Excess loads cannot be protected. Each load must be protected with an external fuse separately mounted.

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Field Wiring	Applicable Wire Size	Points/ Common	Surge Suppression	Noise Immunity	External Power Supply		Internal Current Consumption (24 VDC)	No of Stations Occupied
					Current	Requirement		
Trminal	0.75 to 2 mm² AWG14	8	None	± 1.5 KV	0.184 A	SELV power supply is required	0.09 A	4
Terminal		1	None	± 1.5 KV	0.045 A		0.07 A	1
Terminal		8	None	± 1.5 KV	0.045 A		0.07 A	1
Terminal		8	None	± 1.5 KV	0.09 A		0.075 A	2
Terminal		8	CR	± 1.5 KV	—		0.18 A	4
Terminal		32	Zener diode	± 1.5 KV	0.064 A	SELV power supply is required	0.09 A	4
Terminal		8	Zener diode	± 1.5 KV	—		0.15 A	4
Trminal		32	Zener diode	± 500 V	0.017 A		0.10 A	4
Terminal		1	Zener diode	± 500 V	—		0.085 A	1
Terminal		8	Zener diode	± 500 V	—		0.07 A	1
Terminal		16	Zener diode	± 500 V	—		0.13 A	2
Terminal		16	Zener diode	± 500 V	—		0.13 A	2
40-pin connector, Terminal		32	Zener diode	± 500 V	—		0.06 A	4

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2.2.3 Input/output combined modules

Specifications of input/output combined modules are shown in the following table.

(1) Input specifications

Model	Type	No. of Points	Rated Input Voltage	Input Current	Insulation Withstand Voltage	Operating Voltage		Maximum Simultaneous Input Points (Percentage Simultaneously ON)
						ON Voltage	OFF Voltage	
AX10Y10C	AC input	16	100 to 120 VAC	6 mA	1.5 KV	80 VAC or higher	30 VAC or lower	100% (110 VAC)
AX10Y22C	AC input	16	100 to 120 VAC	6 mA	1.5 KV	80 VAC or higher	30 VAC or lower	60% (110 VAC)
AJ35TB1-16AR *2	AC input	8	100 to 120 VAC	6 mA	1.5 KV	80 VAC or higher	30 VAC or lower	100% (110 VAC)
AX40Y10C	DC input	16	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	100% (26.4 VDC)
AJ35TB1-16DR *2	DC input	8	24 VDC	7 mA	500 V	14 VDC or higher	6 VDC or lower	100% (26.4 VDC)
AJ35TB1-16DT *2	DC input	8	24 VDC	7 mA	500 V	14 VDC or higher	6 VDC or lower	100% (26.4 VCD)
AX40Y50C	DC input (sink type)	16	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	60% (26.4 VDC)
AX80Y10C	DC input (sink/source)	16	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	100% (26.4 VDC)
AX80Y80C	DC input (sink/source)	16	12/24 VDC	3/7 mA	500 V	8 VDC or higher	4 VDC or lower	60% (26.4 VDC)
AJ35TC1-32DT *1	DC input (sink/source)	16	24 VDC	5 mA	500 V	17.5 VDC or higher	6 VDC or lower	100% (26.4 VDC)

(2) Output specifications

Model	Type	No. of Points	Rated Load Voltage	Max. Load Current	Insulation Withstand Voltage	Max. Output Response Time	
						OFF to ON	ON to OFF
AX10Y10C	Relay output	16	24 VDC 240 VAC	2 A/pt, 4 A/com	1.5 KV	10 ms	12 ms
AX10Y22C	Triac output	16	240 VAC	0.3 A/pt, 1.8 A/com	1.5 KV	1 ms	0.5 cycle + 1 ms
AJ35TB1-16AR *2	Relay output	8	24 VDC 240 VAC	2 A/pt, 5 A/com	1.5 KV	10 ms	12 ms
AX40Y10C	Relay output	16	24 VDC 240 VAC	2 A/pt, 5 A/com	1.5 KV	10 ms	12 ms
AJ35TB1-16DR *2	Relay output	8	24 VDC 240 VAC	2 A/pt, 5 A/com	1.5 KV	10 ms	12 ms
AJ35TB1-16DT *2	Transistor output	8	24 VDC	0.3 A/pt, 2.4 A/com	500 V	2 ms	2 ms
AX40Y50C	Transistor output	16	12/24 VDC	0.3 A/pt, 3.6 A/com	500 V	2 ms	2 ms
AX80Y10C	Relay output	16	24 VDC 240 VAC	2 A/pt, 4 A/com	1.5 KV	10 ms	12 ms
AX80Y80C	Transistor output	16	24 VDC	0.5 A/pt, 4.8 A/com	500 V	2 ms	2 ms
AJ35TC1-32DT *1	Transistor output	16	24 VDC	0.1 A/pt, 1.6 A/com	500 V	2 ms	2 ms

For all models - Isolation type: photocoupler isolation, Input display: LED display

*1: A 40-pin connector is used for external connection.

*2: Only usable with A2CJCPU-S3

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Max. Response Time		Field Wiring	Applicable Wire Size	Points/ Common	Noise immunity	Internal Current Consumption (24 VDC)	No. of Stations Occupied	Power Supply Requirement
OFF to ON	ON to OFF							
15 ms	30 ms	Terminal	0.75 to 2 mm^2 AWG14	16	± 1.5 KV	0.074 A	4	
15 ms	30 ms	rminal		16	± 1.5 KV	0.116 A	4	
15 ms	30 ms	Terminal		8	± 1.5 KV	0.062 A	2	
10 ms	10 ms	Terminal		16	± 500 V	0.072 A	4	SELV power supply is required
10 ms	10 ms	Terminal		8	± 500 V	0.062 A	2	
10 ms	10 ms	Terminal		8	± 500 V	0.061 A	2	
10 ms	10 ms	Terminal		16	± 500 V	0.074 A	4	
10 ms	10 ms	Terminal		16	± 500 V	0.072 A	4	
10 ms	10 ms	Terminal		16	± 500 V	0.082 A	4	
10 ms	10 ms	40-pin connector,Terminal		16	± 500 V	0.137 A	4	

Field Wiring	Applicable Wire Size	Points/ Common	Surge Suppression	Fuse Rating	Noise immunity	External Power Supply	
						Current	Requirement
Terminal	0.75 to 2 mm^2 AWG 14	8	None	——	± 1.5 KV	0.092 A	SELV power supply is required
Terminal		8	CR	——	± 1.5 KV	——	
Terminal		8	None	——	± 1.5 KV	0.045 A	SELV power supply is required
Terminal		8	None	——	± 1.5 KV	0.092 A	
Terminal		8	None	——	± 1.5 KV	0.045A	
Terminal		8	Zener diode	——	± 500 V	——	
Terminal		16	Zener diode	——	± 500 V	0.064 A	SELV power supply is required
Terminal		8	None	——	± 1.5 KV	0.092 A	
Terminal		16	Zener diode	——	± 500 V	0.010 A	
40-pin connector,Terminal		16	Zener diode	——	± 500 V	——	

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3. INSTALLATION

3.1 General Safety Requirements



CAUTION

This product is an open type equipment and itself doesn't comply with IP2X protection. The product must be installed in a suitable enclosure which should be selected and installed in accordance to the local and national standards.

An enclosure which contains the product can be opened only under any of the following conditions (a) to (c) in order to protect operators from electrical shock in normal operations. As the measure,

(a) The use of a key or tool is necessary. This method is only allowed for access by skilled or instructed persons.

(b) Disconnection of supplied power before the enclosure is opend.

(c) Barriers should be provided for all live parts except those supplied by Extra-Low Voltage.

This products must be installed and used in environment specified as the environmental specifications. Otherwise, using in different environment could cause electrical shock, fire, malfunction, damage of the products and/or decrease of product capability.

Unsecured mounting of modules could cause malfunction, failure and/or fall-off of the modules.

Extension base cables must be securely connected. And make sure that no unsecured connection was made. Unsecured connection could cause PC to read and/or write wrong status from/to input or output modules.

A memory cassette module or memory chips must be securely loaded on a connector or socket. And make sure that no unsecured loading was made. Otherwise, unsecured loading could cause malfunction of the product.

3.2 Module Handling

(1) Module enclosure, terminal block connectors and pin connectors are made of resin; do not drop them or subject them to strong impact.

(2) Do not remove modules' printed circuit boards from the enclosure in order to avoid giving any changes.

(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 and fixing screws as specified below.

Screw	Tightenig Torque N·cm (kg·cm) [lb·inch]
Module mounting screws (M4)	78.4 to 117.6 (8 to 12) [6.93 to 10.39]
I/O module terminal screw (M3.5)	58.8 to 88.2 (6 to 9) [5.2 to 7.79]
Power spply module terminal screws (M3.5)	83 to 113 (8.5 to 11.5) [7.37 to 9.95]

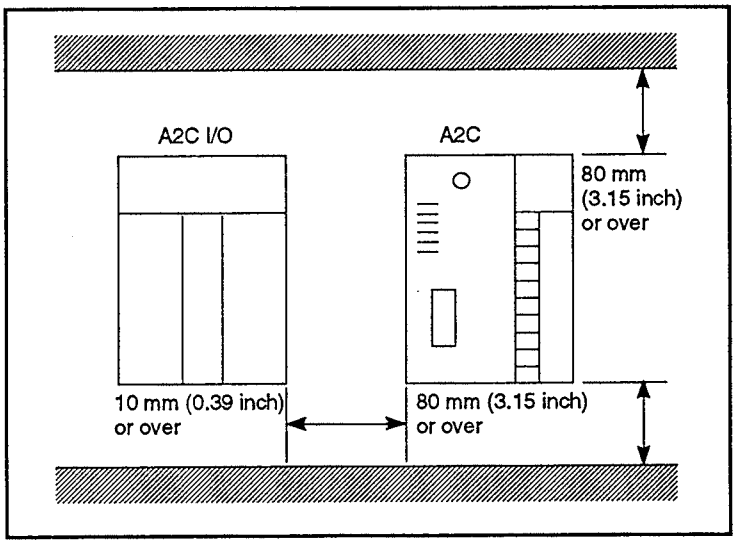
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3.3 Unit Mounting

(1) Unit mounting position

(a) To provide good ventilation and to make unit replacement easy, allow a clearance of 80 mm (3.15 inch) or over between the top side of the module and surrounding structures or parts.

(b) If the A2C I/O unit, A66PC or other unit is to be installed on the left side of the A2C, provide a clearance of 10 mm (0.39 inch) or over between them to allow Cover 1 to be opened and closed.



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(2) Unit mounting orientation

Never install A2C units in the following environmental conditions.

(a) Locations where ambient temperature is outside the range 0 to 55°C.

(b) Locations where ambient humidity is outside the range of 10 and 90 % RH.

(c) Locations where dew condensation takes place due to sudden temperature changes.

(d) Locations where there are corrosive gasses and combustible gasses.

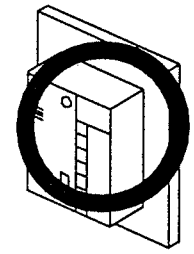
(e) Locations where there is a high level of conductive powder such as dust and iron filings, oil mist, salt, and organic solvent.

(f) Locations exposed to the direct rays of the sun.

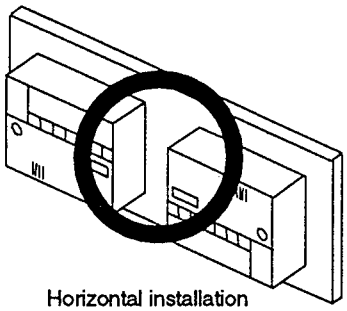
(g) Locations where strong power and magnetic fields are generated.

(h) Locations where vibration and shock are directly transmitted to the main unit.

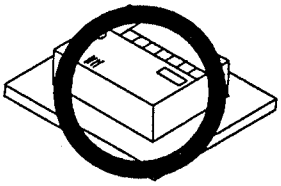
(i) Installing A2C units
A2C and A2C I/O units can be installed vertically, horizontally or levelly.



Vertical installation

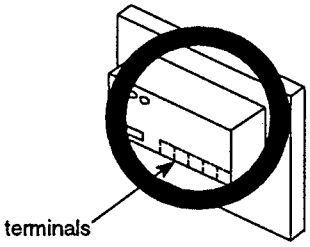


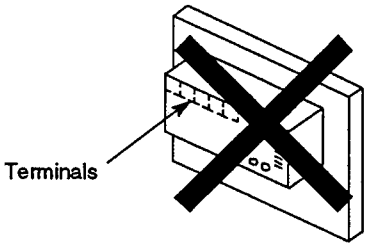
Horizontal installation



Level installation

AN A2CJCPU (S3), however, should not be installed horzontally with the terminals facing up.





A2CJCPU (S3) installation horizontally

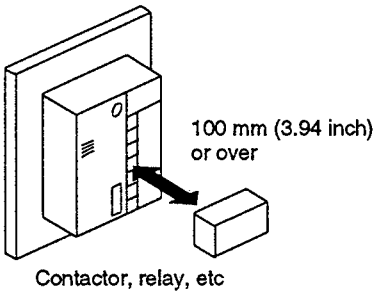
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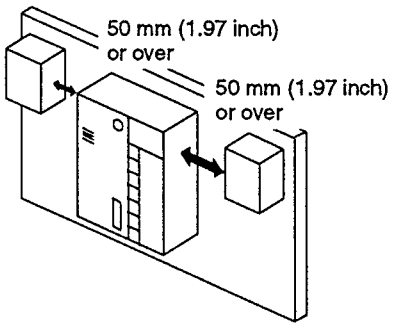
(j) Install each unit on a flat surface.
If the surface is uneven, an excess force may apply to printed circuit boards, causing malfunctioning.

(k) Do not install the units together with or near such vibration sources as large-sized electromagnetic contactors and no-fuse breakers. Install them on a separate panel, or keep them away from the vibrating devices.

(l) To avoid the effect of radiation noise or heat, keep the following distances between the units and devices (contactor, relay, etc.) which may generate radiation noise or heat:

- Clearance in front of the units ..... 100 mm (3.94 inch) or over
- Clearance on the right or left side of .... 50 mm (1.97 inch) or over the units



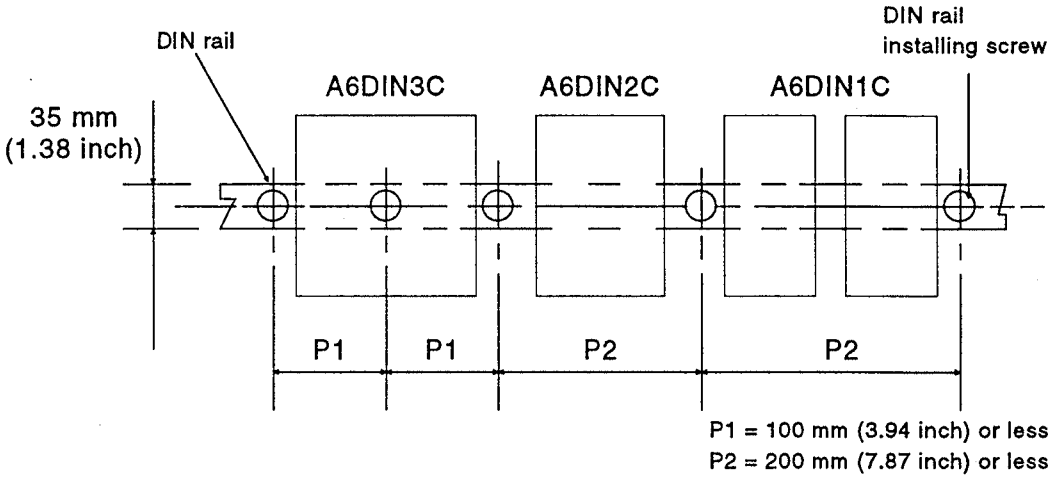


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(3) When using a DIN rail adapter, install a DIN rail in accordance with the following instructions.

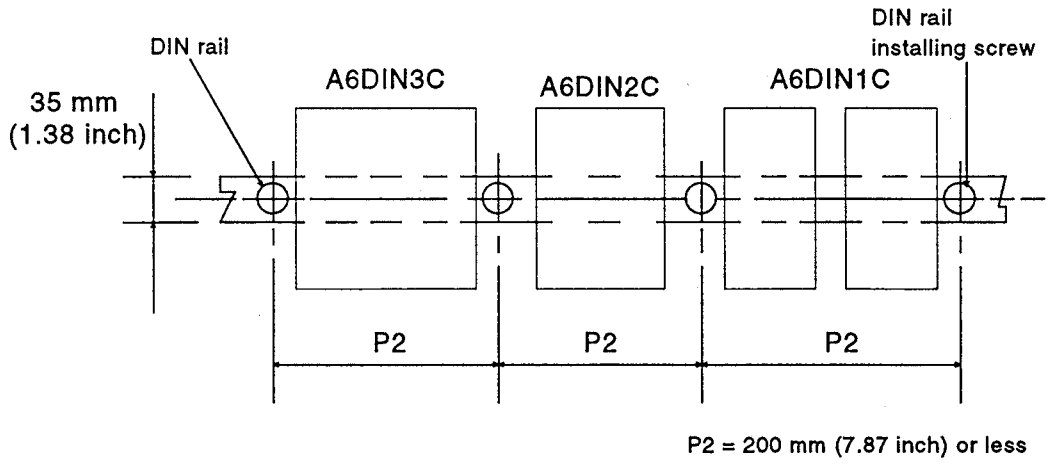
(a) When installing a DIN rail TH35-7.5Fe or TH35-7.5Al

When installing DIN rails TH35-7.5Fe and TH35-7.5Al, fix the rails by screws every 200 mm (7.87 inch) or less.
Fix the rails by screws every 100 mm (3.94 inch) or less to mount an A6DIN3C or to mount units side by side.



(b) When installing a DIN rail TH35-15Fe

When installing a DIN rail TH35-15Fe, fix the rails by screws every 200 mm (7.87 inch) or less.
Also, use the same intervals to mount an A6DIN3C or to mount units side by side.



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3.4 Constructions to Reduce EMI Noise

The following measures are effective to reduce EMI noise generated by equipment which contains the A2C products.

(1) Grounding of a control cabinet

Material of the control cabinet should be steel or equivalent conductor so that radiation of noise is protected. However, if grounding of the cabinet is not good enough, the cabinet body to which noise is inducted becomes an antenna to radiate noise. Therefore, impedance of a grounding cable of the cabinet should be as low as possible. Use of a flat braided wire at shortest distance to the earth is recommended to minimize high frequency impedance.

Door of the cabinet should be also connected to the body by low impedance wires.

(2) Grounding of A2C

Please be aware of the following points for grounding of A2C.

(a) Connect both LG and FG terminal on power supply modules to the control cabinet at shortest distance. Approx. 20 cm (7.87 in.).

(b) Use thick wire for the earth connections. 2 mm^2 or thicker.

(3) Process signal cables

Please be aware of the following points for process signal cable installations.

(a) Do not install process signal cables with primary voltage lines.

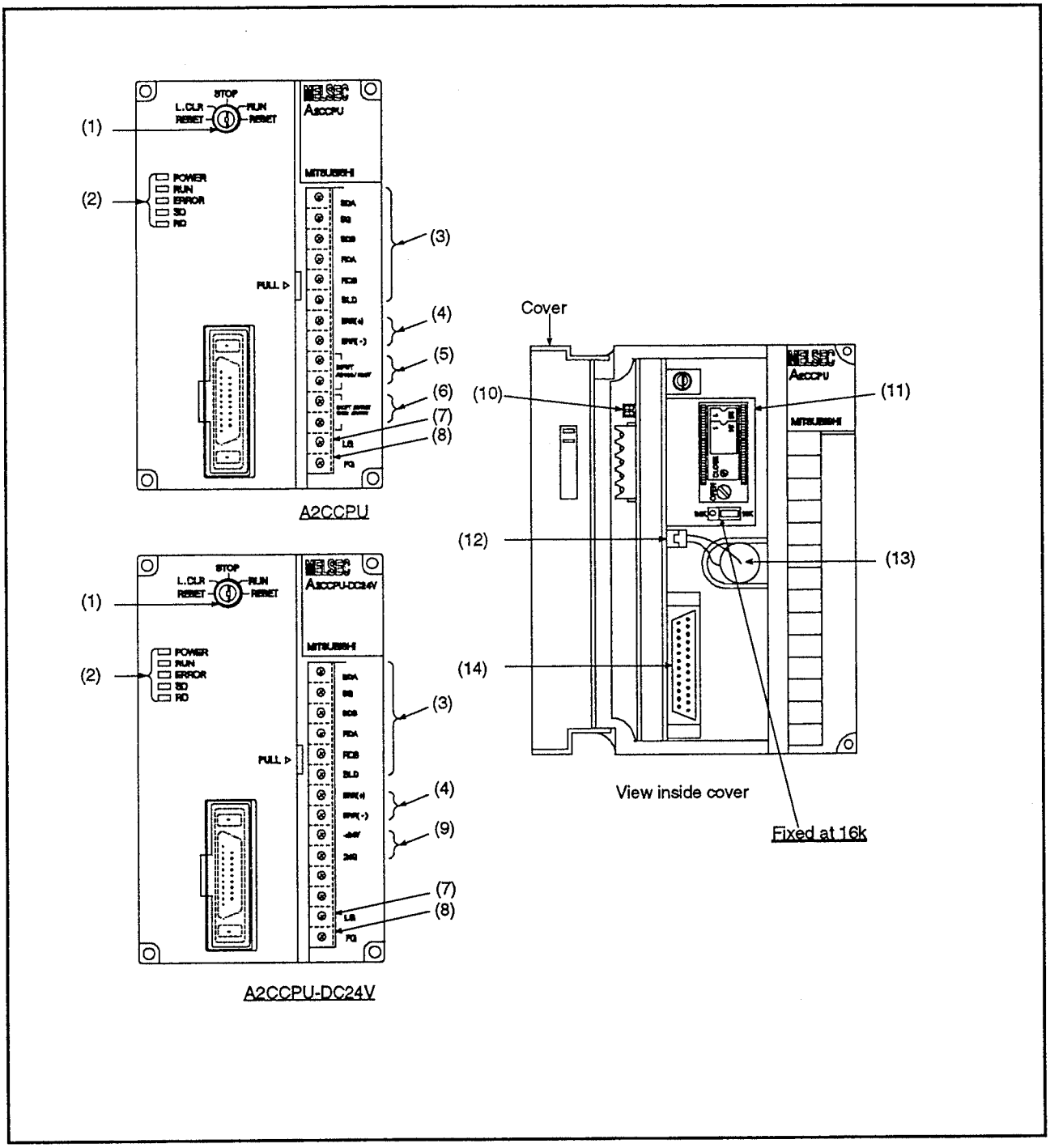
(b) If process signal cables are installed outside of the cabinet ,use of screen cables is effective for EMI noise reduction

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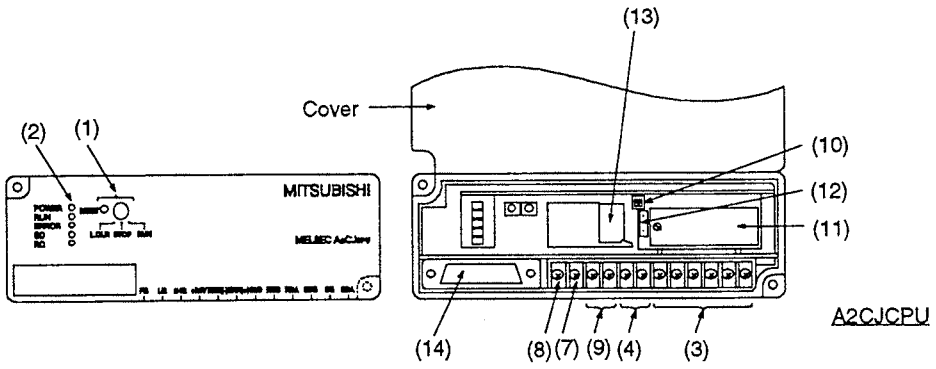
3.5 Part Identification of the CPU

This section gives the names of each part of the CPU.

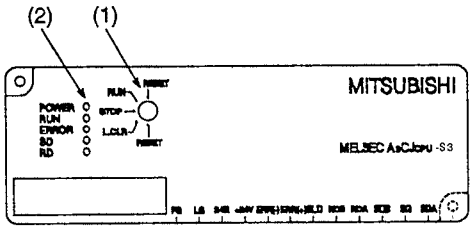
3.5.1 Names and settings of parts of the A2CCPU, A2CCPU-DC24V and A2CJCPU(S3)



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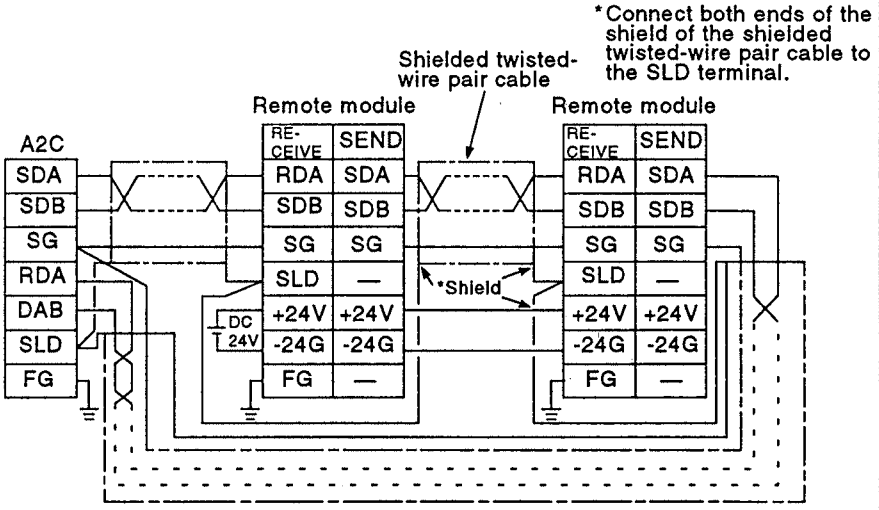
A2CJCPU



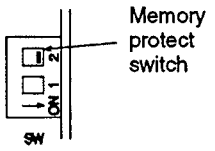
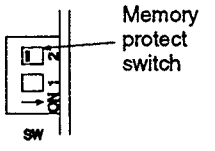
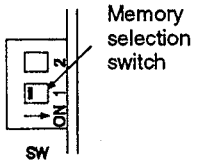
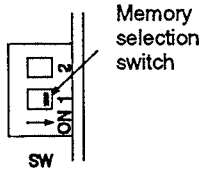
A2CJCPU-S3

No.	Name		Function
(1)	RUN key switch		• RUN/STOP : Used to start/stop running a sequence program. • RESET : Used to reset the hardware. It resets an error which occurred during operation, and initializes the operation. • L.CLR : Used to clear (turns OFF or sets to 0) the device in the latch and non-latch ranges which are set by parameters. Clear latching according to the following procedure: (1) Turn the RUN key switch from STOP to L.CLR several times to let the "RUN" LED flash. (2) Turn the RUN key switch from STOP to L.CLR again. (3) The "RUN" LED goes OFF, and latching is cleared.
(2)	Indicator LEDs	"POWER" LED	5 VDC power supply status indicator LED • ON : The 100/200 VAC or 24 VDC is supplied to the A2C, and converted into 5 VDC correctly. • OFF : The 100/200 VAC or 24 VDC is not supplied to the A2C. Or, the supplied 100/200 VAC or 24 VDC is not converted into 5 VDC correctly.
		"RUN" LED	A2C run status indicator LED • ON : A sequence program operation is being executed with the RUN key switch set in the "RUN" position. (This LED remains ON if an error occurs, which permits the sequence program operation to continue.) • OFF : This LED goes OFF if any of the following conditions exists: •The 100/200 VAC or 24 VDC is not supplied to the A2C. •The RUN key switch is in the "STOP" position. •A remote stop or remote pause signal exists. • Flash : This LED flashes if either of the following conditions exists: •An error, which stopped the sequence program operation, has been detected by self-diagnosis. •Latching is being cleared.
		"ERROR" LED	Self-diagnosis error detection status indicator LED • ON : An error has been detected by self-diagnosis. (This LED remains OFF when an error for which the indicator LED setting is OFF in the LED indication priority setting is detected.) Or, the MINI-S3 link is faulty. • OFF : Normal • Flash : The annunciator (F) is set ON by the sequence program.

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<table>
<tr><th>No.</th><th colspan="2">Name</th><th>Function</th></tr>
<tr><td rowspan="2">(2)</td><td rowspan="2">Indicator LEDs</td><td>"SD" LED</td><td>Data transmission status indicator LED (transmission to I/O modules and remote terminal modules)
• ON : The A2C is transmitting data to an I/O module or remote terminal module properly.
• OFF : This LED goes OFF if any of the following conditions exists:
•The A2C does not transmit data to an I/O module or remote terminal module.
•Initial data or initial program error.
•A2C hardware fault</td></tr>
<tr><td>"RD" LED</td><td>Data receiving status indicator LED (receiving from I/O modules and remote terminal modules)
• ON : The A2C is receiving data from an I/O module or remote terminal module.
• OFF : This LED goes OFF if any of the following conditions exists:
•The A2C does not receive data from an I/O module or remote terminal module.
•Disconnected cable to RDA or RDB or improper connection.
•Hardware trouble of the A2C, I/O module and/or remote terminal module.</td></tr>
<tr><td>(3)</td><td colspan="2">Terminals for connection to remote modules</td><td>• The terminals used to connect cables for communications with remote modules.
SDA : Connected to the RDA of the next station.
SDB : Connected to the RDB of the next station.
SG : Connected to the SG of the preceding and next stations.
RDA : Connected to the SDA of the preceding station.
RDB : Connected to the SDB of the preceding station.
SLD : The shield of the shielded twisted-wire pair cable is connected.
The following diagram shows the connections of the cables to the remote modules.

</td></tr>
<tr><td>(4)</td><td colspan="2">ERR terminal</td><td>• The output terminal to tell MINI-S3 link line troubles and self-diagnosis errors to the operator.</td></tr>
<tr><td>(5)</td><td colspan="2">Power input terminal</td><td>• The power input terminal used to connect the 100 VAC or 200 VAC power supply.</td></tr>
<tr><td>(6)</td><td colspan="2">Operating voltage switching terminal</td><td>• Used to set the voltage to the power input terminal.
When 100 VAC is applied: This terminal short-circuits the circuit between it and the input terminal with the attached jumper.
When 200 VAC is applied: This terminal opens the circuit between it and the input terminal.</td></tr>
<tr><td>(7)</td><td colspan="2">LG terminal</td><td>• Used to ground the power filter.
• Has an electric potential half the input voltage.</td></tr>
</table>

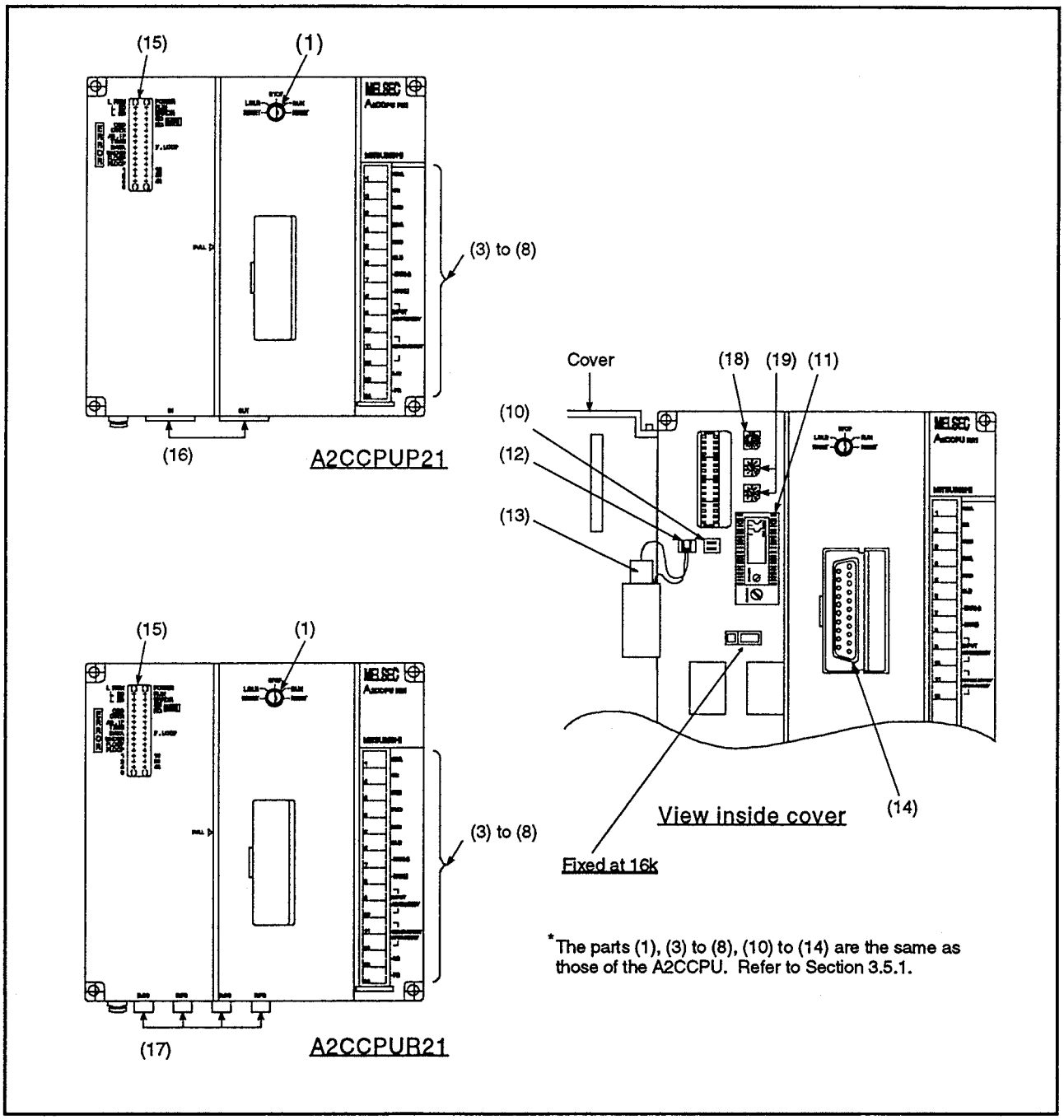
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<table>
<tr><th>No.</th><th>Name</th><th>Function</th></tr>
<tr><td>(8)</td><td>FG terminal</td><td>• The grounding terminal connected to the shielding pattern on the PC board.</td></tr>
<tr><td>(9)</td><td>Power input terminal</td><td>• The power input terminal used to connect the 24 VDC power supply.</td></tr>
<tr><td rowspan="2">(10)</td><td>Memory protect switch</td><td>• The switch used to protect the data in the user memory area from being rewritten (memory protect) due to wrong operation of peripheral devices.
• Data of 20k bytes from the head of the memory area can be protected by this function.
<table><tr><th>To set memory protect</th><th>To cancel memory protect</th></tr><tr><td>
</td><td>
</td></tr></table></td></tr>
<tr><td>Memory selection switch</td><td>• The switch used to set the type of memory (A2C's internal RAM memory or EP-ROM) in which programs will be stored.
• Set the switch in the OFF position to use internal RAM memory.
• Set the switch in the ON position to use EP-ROM.
<table><tr><th colspan="2">Memory selection switch setting</th></tr><tr><th>To use internal RAM memory</th><th>To use EP-ROM</th></tr><tr><td>
</td><td>
</td></tr></table></td></tr>
<tr><td>(11)</td><td>Memory connection socket</td><td>• The socket used to install EP-ROM.</td></tr>
<tr><td>(12)</td><td>Battery connector</td><td>• The connector used to connect the battery connector.</td></tr>
<tr><td>(13)</td><td>Battery</td><td>• The battery used to retain data, such as programs, devices in the latch range, and file register data.</td></tr>
<tr><td>(14)</td><td>RS-422 connector</td><td>• The connector for peripheral device connection.
• Used to write/read, monitor, or test a program using a peripheral device.</td></tr>
</table>

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3.5.2 Names and settings of parts of the A2CCPUP21/R21

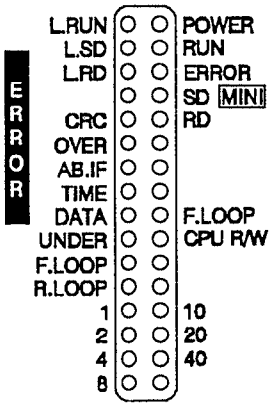
This section describes names and settings of parts of the A2CCPUP21/R21 MELSECNET data link system.
The module has the same terminals, battery, RS-422 connector, and memory protect switch as the A2CCPU.
For details of these parts, refer to Section 3.5.1.



*The parts (1), (3) to (8), (10) to (14) are the same as those of the A2CCPU. Refer to Section 3.5.1.

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(15) Indicator LEDs

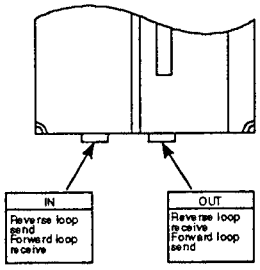


LEDs for indicating A2CCPUP21/R21 operation status and errors

LED Name	Description	LED Name	Description
L. RUN	Comes ON when the data link is normal.	*1 POWER	Comes ON when the power is turned ON.
L. SD	Remains ON while data is sent.	*2 RUN	Comes ON when the RUN key switch is in the RUN position.
L. RD	Remains ON while data is received.	*3 ERROR	Comes ON when a PC CPU error occurs.
	Not used (always OFF)	*4 SD	Remains ON while data is sent in the MININET.
CRC	Comes ON when a code check error occurs.	*5 RD	Remains ON while data is received in the MININET.
OVER	Comes ON when a data entry delay error occurs.		
AB. IF	Comes ON when data is all *1*.		
TIME	Comes ON when a time-out occurs.		
DATA	Comes ON when a receive data error occurs.	F.LOOP	Comes ON when the forward loop serves as the data receiving line, or goes OFF when the reverse loop is used for it.
UNDER	Comes ON when a send data error occurs.	CPU R/W	Comes ON during communications with the PC CPU.
F. LOOP	Comes ON when a forward loop receive data error occurs.		
R. LOOP	Comes ON when a reverse loop receive data error occurs.		
1	Indicate the figures at the one's digit of the station numbers in BCD.	10	Indicate the figures at the ten's digit of the station numbers in BCD codes.
2		20	
4		40	
8			

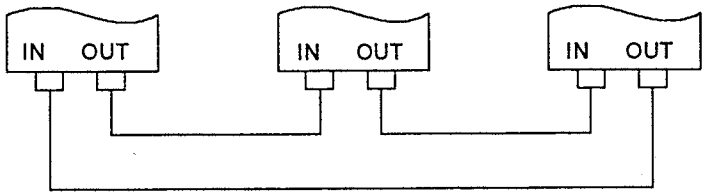
- Refer to Section 2.4.1 for LEDs from *1 to *5.
- The LEDs other than *1 to *5 indicate the operation status of the MELSECNET data link. For details, refer to the MELSECNET (II) Data Link System Reference Manual.

(16) Connectors

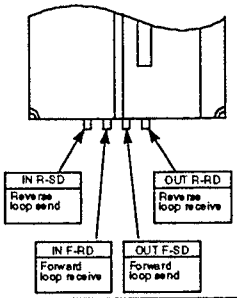


Connectors for connecting optical fiber cables

- Connect the cables as illustrated below:

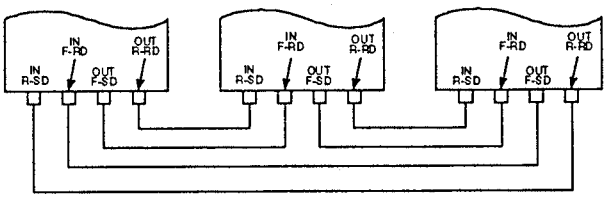


(17) Connectors



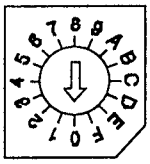
Connectors for connecting coaxial cables

- Connect the cables as illustrated below:



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<table>
<tr><th>No.</th><th>Name</th><th>Description</th></tr>
<tr><td>(18)</td><td>Mode select switch

MODE
</td><td>• By switching mode, the following functions are available:
<table>
<tr><th>Setting Number</th><th>Name</th><th>Description</th></tr>
<tr><td>0</td><td>Online</td><td>Automatic return is set during normal operation.</td></tr>
<tr><td>1</td><td>Online</td><td>Automatic return is not set during normal operation.</td></tr>
<tr><td>2</td><td>Offline</td><td>The host station is disconnected.</td></tr>
<tr><td>3</td><td>Test mode 1</td><td>A test is performed on the forward loop lines of the whole data link system.</td></tr>
<tr><td>4</td><td>Test mode 2</td><td>A test is performed on the reverse loop lines of the whole data link system.</td></tr>
<tr><td>5</td><td>Test mode 3</td><td rowspan="2">A test is performed on the line between two connected stations.</td></tr>
<tr><td>6</td><td>Test mode 4</td></tr>
<tr><td>7</td><td>Test mode 5</td><td>A test is performed by the A2CCPUP21/R21 alone on the hardware including the send/receive lines of the sending system.</td></tr>
<tr><td>8</td><td>——</td><td>Not used</td></tr>
<tr><td>9</td><td>——</td><td>Not used</td></tr>
<tr><td>A to C</td><td>——</td><td>Not used</td></tr>
<tr><td>D to F</td><td>——</td><td>Not used</td></tr>
</table>
For details of operations in the test modes, refer to the MELSECNET and MELSECNET/B Data Link System Reference Manual.</td></tr>
<tr><td>(19)</td><td>Station number setting switches

STATION No.
X10

X1
</td><td>Station number setting switches
• Station numbers from 00 to 64 can be set.
• The "X10" switch is to set the ten's digit of a station number.
• The "X1" switch is to set the one's digit of a station number.
• To use a station as the master station, set "00".
• To use a station as a local station, set between "01" and "64".</td></tr>
</table>

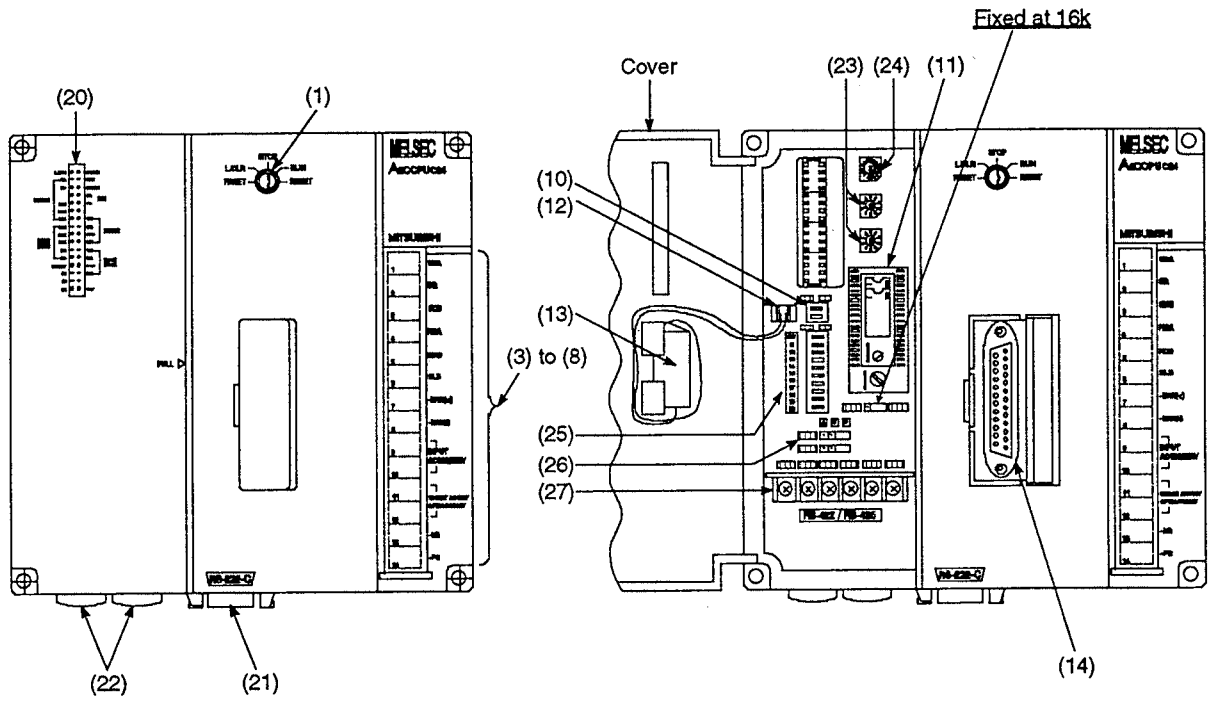
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3.5.3 Names and settings of parts of the A2CCPUC24(-PRF)

This section describes names of parts of the A2CCPUC24(-PRF) computer link and switch settings.

The A2CCPUC24(-PRF) has the same terminals, battery, RS-422 connector, and memory protect switch as the A2CCPU.

Refer to Section 3.5.1.



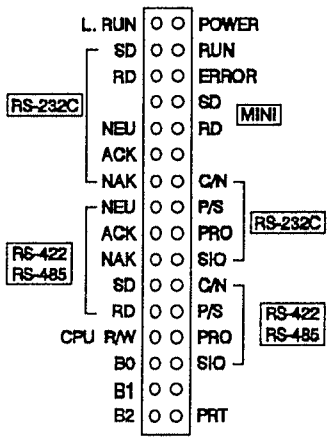
View inside cover

* The parts (1), (3) to (8), (10) to (14) are the same as those of the A2CCPU. Refer to Section 3.5.1.

No.	Name	Functions and Settings				
		LED Name		LED Indication	When LED Is ON	When LED Is OFF	Initial state of LED
(20)	Indicator LEDs LRUN, SD, RD, NEU, ACK, NAK, CN, PS, PRO, SIO, POWER, RUN, ERROR, MINI, RS-232C, RS-422/485, CPU R/W, B0, B1, B2, PRT	L-RUN		Computer link normal operation	The computer link is normal.	Error	ON
		RS232C	SD	RS-232C send state	Flashes while data is sent.		OFF
			RD	RS-232C receive state	Flashes while data is received.		OFF
			NEU	RS-232C neutral	Transmission sequence initial state (waiting for ENQ)	ENQ has been received.	*
			ACK	RS-232C ACK	After sending ACK	After sending NAK	OFF
			NAK	RS-232C NAK	After sending NAK	After sending ACK	OFF
		RS422/485	NEU	RS-422/485 neutral	Transmission sequence initial state (waiting for ENQ)	ENQ has been received.	*
			ACK	RS-422/485 ACK	After sending ACK	After sending NAK	OFF
			NAK	RS-422/485 NAK	After sending NAK	After sending ACK	OFF
			SD	RS-422/485 send state	Flashes while data is sent.		OFF
			RD	RS-422/485 receive state	Flashes while data is received.		OFF

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No.	Name	Functions and Settings
(20)	Indicator LEDs	



LED Name		LED Indication	When LED Is ON	When LED Is OFF	Initial State of LED
CPU R/W		Communications with CPU	Flashes during communications with CPU. (Comes ON when not in communication.)		ON
		Baud rate (BPS)	300 / 600 / 1200 / 2400 / 4800 / 9600 / 19200		The LED for the set baud rate is ON.
B0		Baud rate setting	OFF / ON / OFF / ON / OFF / ON / OFF		
B1			OFF / OFF / ON / ON / OFF / OFF / ON		
B2			OFF / OFF / OFF / OFF / ON / ON / ON		
RS-232C	C/N	Result of communications between RS-232C and CPU	• Access that was prohibited was made by the computer link while the CPU was running. • Accessing the CPU is not normal.	Normal	OFF
	P/S	RS-232C parity/sum check error	Parity/sum check error	Normal	OFF
	PRO	RS-232C protocol error	Communication protocol error	Normal	OFF
	SIO	RS-232C SIO error	Overrun/framing error	Normal	OFF
RS-422/485	C/N	Result of communications between RS-422/485 and CPU	• Access that was prohibited was made by the computer link while the CPU was running. • Accessing the CPU is not normal.	Normal	OFF
	P/S	RS-422/485 parity/sum check error	Parity/sum check error	Normal	OFF
	PRO	RS-422/485 protocol error	Communication protocol error	Normal	OFF
	SIO	RS-422/485 SIO error	Overrun/framing error	Normal	OFF
PRT *1		Printer message output	Remains ON during printer message output.	Normal	OFF

The indication and function indicated by *1 in the above table is peculiar to the A2CCPUC24-PRF.

(1) The right side LEDs from RS-232C C/N to RS-422/485 S10 come ON when an error occurs.
Since the ON/OFF states of the C/N to the S10 are stored at buffer memory address 101H, the states can be confirmed by the sequence program by reading them with a FROM instruction from the CPU.

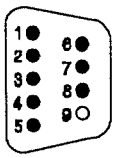
(2) Once the LEDs from RS-232C C/N to RS-422/485 S10 come ON, they remain ON even after the normal state has been restored.
To turn them OFF, a request to turn them OFF must be sent to buffer memory address 102H through a TO instruction from the CPU.

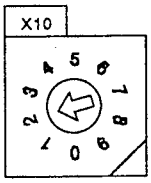
(3) The initial state of LED means the state when turning ON the power or resetting the module.

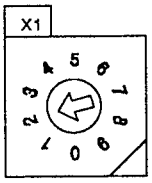
(4) The right side LEDs from "POWER" to "RD" are the same as those of the A2CCPU. Refer to Section 3.5.1.
The states indicated by * vary according to the switch setting.
Refer to the following table.

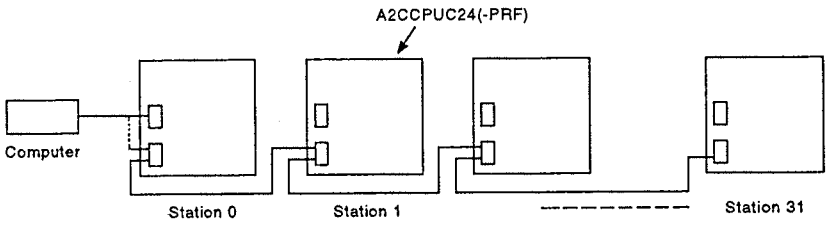
Mode Setting	1 to 4	5 to 8	9	A to D		F
Main Channel Setting / Name	RS-232C RS-422/485	RS-232C RS-422/485	RS-232C RS-422/485	RS-232C	RS-422 RS-485	RS-232C RS-422/485
RS-232C-NEU	ON	OFF	OFF	ON	OFF	OFF
RS-422/485-NEU	OFF	ON	OFF	OFF	ON	ON

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<table>
<tr><th>No.</th><th>Name</th><th>Functions and Settings</th></tr>
<tr><td>(21)</td><td>RS-232C connector</td><td>• The RS-232C connector for connection to computer or printer


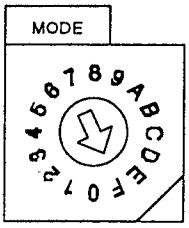
<table>
<tr><th>Pin No.</th><th>Abbre-viation of Signal</th><th>Signal Name</th><th>Signal Direction Computer Link ↕ External Device</th></tr>
<tr><td>1</td><td>CD</td><td>Receive carrier detection</td><td>←</td></tr>
<tr><td>2</td><td>RD(RXD)</td><td>Receive data</td><td>←</td></tr>
<tr><td>3</td><td>SD(TXD)</td><td>Send data</td><td>→</td></tr>
<tr><td>4</td><td>DTR(ER)</td><td>Data terminal ready</td><td>→</td></tr>
<tr><td>5</td><td>SG</td><td>Signal ground</td><td>↔</td></tr>
<tr><td>6</td><td>DSR(DR)</td><td>Data set ready</td><td>←</td></tr>
<tr><td>7</td><td>RS(RTS)</td><td>Request to send</td><td>→</td></tr>
<tr><td>8</td><td>CS(CTS)</td><td>Clear to send</td><td>←</td></tr>
</table>
RS-232C connector specifications
For details of signals, refer to the Computer Link/Multidrop Link Module User's Manual (Computer Link Function/Printer Function).</td></tr>
<tr><td>(22)</td><td>Rubber cap</td><td>• The cap used to pull the cables from the RS-422/485 terminal block in the module.
• Make a cut in the cap before using it.</td></tr>
<tr><td>(23)</td><td>Station number setting switches




The switches are factory-set to 0.</td><td>(1) Set station numbers between 0 and 31. (Do not use numbers 32 and up.)
(2) The "X10" switch is to set the ten's digit of a station number.
(3) The "X1" switch is to set the one's digit of a station number.
(4) Set station numbers between 0 and 31. Each number must not be used more than once. Stations need not be numbered sequentially from the first to the last connected to the computer. Some numbers can be skipped.
(5) Example of station number setting:


POINT
Do not assign a same number to one or more stations. If such a setting is made, communications data will be destroyed when data link operation is executed.</td></tr>
</table>

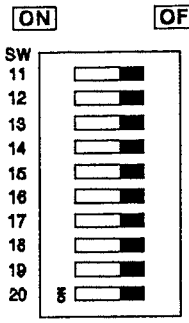
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<table>
<tr><th>No.</th><th>Name</th><th colspan="4">Functions and Settings</th></tr>
<tr><td rowspan="16">(24)</td><td rowspan="16">Mode setting switch


These switches are factory-set to "0".</td><td>Setting Position Number</td><td colspan="2">Setting</td><td>Remarks</td></tr>
<tr><td></td><td>RS-232C</td><td>RS-422/485</td><td></td></tr>
<tr><td>0</td><td colspan="2">Unusable</td><td>————————</td></tr>
<tr><td>1</td><td>Protocol 1 mode</td><td>No-protocol mode</td><td rowspan="8">These positions are used to print out the data in the no-protocol area of buffer memory by connecting two separate computers to the RS-232C and RS-422/485 interfaces or a printer to the no-protocol mode interface.
The RS-232C and RS-422/485 interfaces operate independently, but the transmission format is the same.</td></tr>
<tr><td>2</td><td>Protocol 2 mode</td><td>No-protocol mode</td></tr>
<tr><td>3</td><td>Protocol 3 mode</td><td>No-protocol mode</td></tr>
<tr><td>4</td><td>Protocol 4 mode</td><td>No-protocol mode</td></tr>
<tr><td>5 *1</td><td>No-protocol mode</td><td>Protocol 1 mode</td></tr>
<tr><td>6 *1</td><td>No-protocol mode</td><td>Protocol 2 mode</td></tr>
<tr><td>7 *1</td><td>No-protocol mode</td><td>Protocol 3 mode</td></tr>
<tr><td>8 *1</td><td>No-protocol mode</td><td>Protocol 4 mode</td></tr>
<tr><td>9</td><td>No-protocol mode</td><td>No-protocol mode</td><td>This setting position is used to write data sent from a computer to all stations, or data from a station to a computer.</td></tr>
<tr><td>A</td><td>Protocol 1 mode</td><td>Protocol 1 mode</td><td rowspan="4">These positions are used when a 1 : n-station computer link configuration is adopted. The RS-232C and the RS-422/485 interfaces function as a pair.</td></tr>
<tr><td>B</td><td>Protocol 2 mode</td><td>Protocol 2 mode</td></tr>
<tr><td>C</td><td>Protocol 3 mode</td><td>Protocol 3 mode</td></tr>
<tr><td>D</td><td>Protocol 4 mode</td><td>Protocol 4 mode</td></tr>
<tr><td>E</td><td colspan="2">Unusable</td><td>————————</td></tr>
<tr><td>F</td><td colspan="2">For self-loopback test</td><td>This position is used to check the A2CCPUC24(-PRF) to see if it functions properly without connecting a computer.</td></tr>
<tr><td colspan="4">Regarding the A2CCPUC24-PRF, pay attention to the following point:
The modes indicated by *1 (5 to 8) must be set when using the printer function.
The RS-422/485 interface functions as an independent computer link.</td></tr>
</table>

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No.	Name	Functions and Settings
(25)	Transmission specification setting switches	See below
(26)	Terminal resistance setting pins	The terminal resistance must be set with the two terminal stations when connecting link cables.



These switches are factory-set to "OFF".

Switch No.	Setting Item	Position and Setting: ON	Position and Setting: OFF	C	P
SW11	Transmission speed (baud rate) — Baud rate (BPS): 300	OFF	ON	O	O
SW12	Transmission speed (baud rate) — Baud rate (BPS): 600	OFF	ON	O	O
SW13	Transmission speed (baud rate) — Baud rate (BPS): 1200	OFF	ON	O	O
	Transmission speed (baud rate) — Baud rate (BPS): 2400	OFF	ON	O	O
	Transmission speed (baud rate) — Baud rate (BPS): 4800	ON	OFF	O	O
	Transmission speed (baud rate) — Baud rate (BPS): 9600	OFF	ON	O	O
	Transmission speed (baud rate) — Baud rate (BPS): 19200	ON	OFF	O	O
	Transmission speed (baud rate) — Baud rate (BPS): Unusable	ON	ON	O	O
SW14	Data bit	8 bits	7 bits	O	O
SW15	Parity	Checked	Not checked	O	O
SW16	Even/odd parity	Even	Odd	O	O
SW17	Stop bit	2 bits	1 bit	O	O
SW18	Sum check code	Added	Not added	O	X
SW19	Main channel	RS-422/RS-485	RS-232C	O	X
SW20	Write during RUN	Enabled	Disabled	O	X

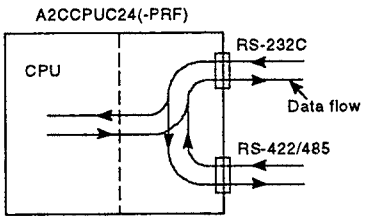
C: Computer mode P: Printer mode

(1) Transmission specification setting (SW11 to SW17)
The same specifications must be set for both the RS-232C interface and the RS-422/485 interface. The interfaces cannot be set with different transmission specifications.
When setting the baud rate, do not use the "unusable" combination (SW11, SW12, and SW13 are all ON). If used, the RUN LED will go OFF, and all operations will be disabled.

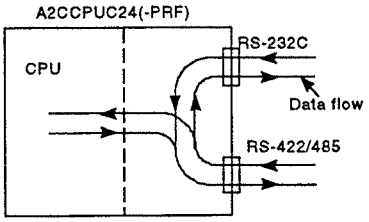
(2) Sum check setting (SW18)
When a computer link uses a dedicated protocol, this switch is used to set whether a sum check code should be added to the end of a text.
Refer to the Computer Link Module User's Manual for text formats and sum check codes when this switch is set to ON.

(3) Main channel setting (SW19) The main channel means the connector (interface) to which a computer link is connected. The main channel setting is valid only when the mode setting switch is set to a position between "9" and "D". In any mode other than the above, this switch may be in ON or OFF position.

When the main channel setting is valid, data flows as described below:
The data received by the main channel is sent automatically by the sub channel, and the data received by the sub channel is sent automatically to the main channel.
When the mode setting switch is set to a position between "9" and "D", the commands to request processing from other stations to the self-station are valid only when they are received by the main channel.
The A2CCPUC24(-PRF) executes the requested processing and sends processing result to the main channel.



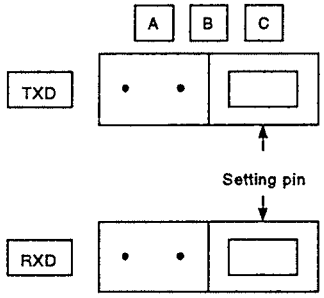
When the main channel is RS-232C

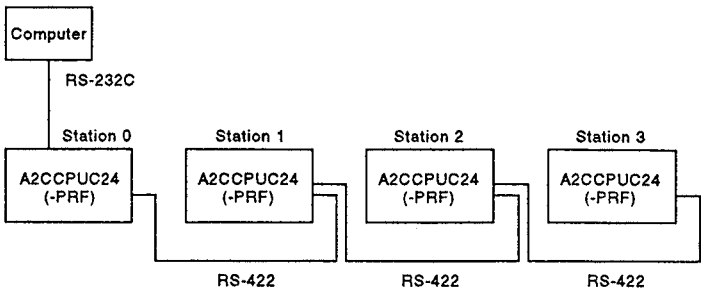


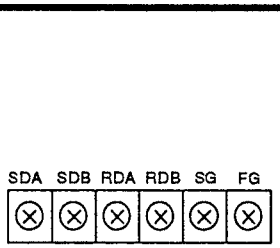
When the main channel is RS-422/485

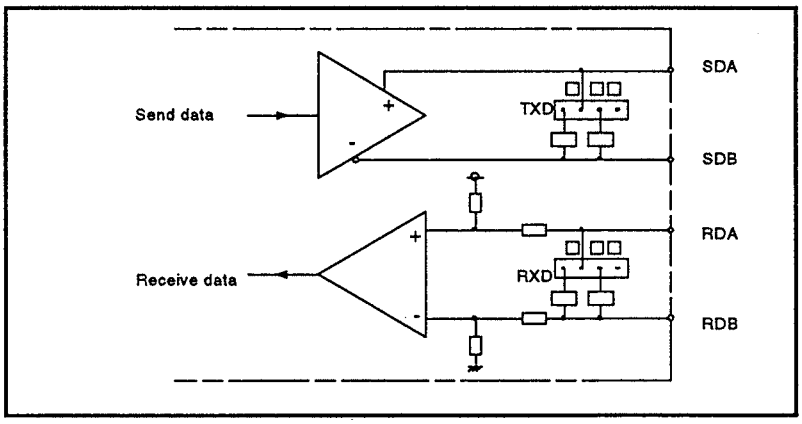
(4) Write during RUN enabled/disabled setting (SW20)
When a computer link uses a dedicated protocol, this setting enables/disables the CPU to execute the processing requested by an external device when the CPU is in the RUN state.

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<table>
<tr><th>No.</th><th>Name</th><th>Functions and Settings</th></tr>
<tr><td></td><td>


These pins are factory-set to "C".
</td><td>
TXD: Send side
RXD: Receive side
A: RS-422
B: RS-485
C: Open (no terminal resistance) ..... Factory setting
Example of terminal resistance setting pins


<table>
<tr><th></th><th colspan="2">Setting Pin</th></tr>
<tr><th>Station No.</th><th>TXD</th><th>RXD</th></tr>
<tr><td>0</td><td>A</td><td>C</td></tr>
<tr><td>1</td><td>C</td><td>C</td></tr>
<tr><td>2</td><td>C</td><td>C</td></tr>
<tr><td>3</td><td>C</td><td>A</td></tr>
</table>
</td></tr>
<tr><td>(27)</td><td>RS-422/485 terminal block</td><td>
• The RS-422/485 terminal block to connect a computer or another A2CCPUC24(-PRF).
• M3.5 screws are used to fasten cables.


<table>
<tr><th>Signal Abbre-viation</th><th>Signal Direction A2CCPUC24(-PRF) ↕ Computer</th><th>Note</th></tr>
<tr><td>SDA</td><td>→</td><td>Send data</td></tr>
<tr><td>SDB</td><td>→</td><td>Send data</td></tr>
<tr><td>RDA</td><td>←</td><td>Receive data</td></tr>
<tr><td>RDB</td><td>←</td><td>Receive data</td></tr>
<tr><td>SG</td><td>→</td><td>Signal ground</td></tr>
<tr><td>FG</td><td>→</td><td>Frame ground</td></tr>
</table>
RS-422/485 terminal block specifications


RS-422/485 function block diagram
</td></tr>
</table>

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4. WIRING

4.1 General Safety Requirements

DANGER

All external power supply must be turned off during installation and wiring. Unless all phases are cut off from the products, it could cause electrical shock or damage on the products.

Before connecting the power to the products, put terminal covers back onto the terminals.
Otherwise, it could cause electrical shock.

A protective earth terminal which is marked with "⏚(LG)" must be connected to the earth.
Otherwise, it could cause electrical shock.

All electrical connections should be carried out by trained and competent personnel, and must comply with the requirements of all relevant local and national wiring regulations for installation wiring.

Particular attention is required when preparing the installation wiring for connection to terminal to ensure that hazardous live wiring are adequately separated from the Safety Extra Low Voltage wiring.

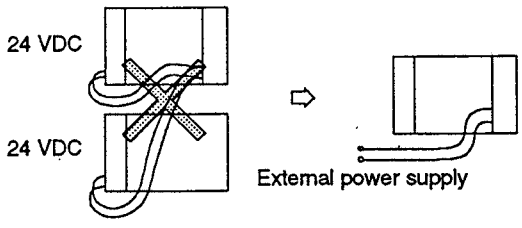
All external power supplies and signals connected to other devices or equipment, of which rated voltage is 24 V or lower, should not compromise the Safety Extra Low Voltage requirements.

A readily accessible switch or circuit breaker should be included in the equipment which contains the product so that the power supply for the product can be disconnected at any trouble.

CAUTION

Rated voltage and terminal assignment of each module should be confirmed before wiring is carried out. Connection of different voltage or wrong connection could cause fire and/or malfunction of the products.

Do not supply 24 VDC power supply from more than one power supply modules in parallel to one I/O moudle. If they are connected so, the power supply modules will be heated up and could be caused fire and/or malfunction.



Terminal screws should be tighten by the specified torque. Loose connection could cause short-circuit, fire and/or malfunction of the products.

During wiring, be sure that no off-cut of wires or other conductive dusts go into modules. It could cause fire, malfunction and/or failure of the products.

Wiring for modules which provide connector for external wiring should be securely carried out with the specified tools or by soldering. Unsecured connection could cause circuit-short, fire, and/or malfunction of the products.

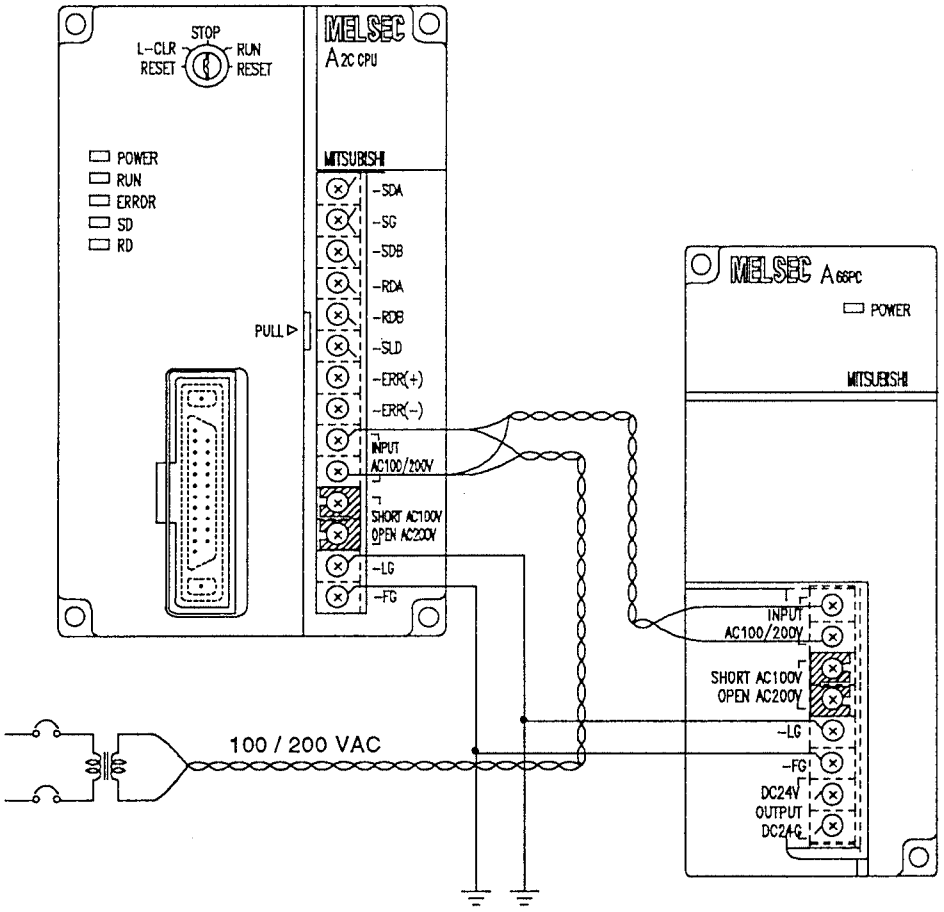
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Do not place process control signal cables and/or communication cables nearby main power calbes or actuation power cables so that risk of noise trouble can be minimized. It is recommended to keep a distance of 100 mm or more between those cables.

4.2 Power Supply Modules

(1) Terminal assignment

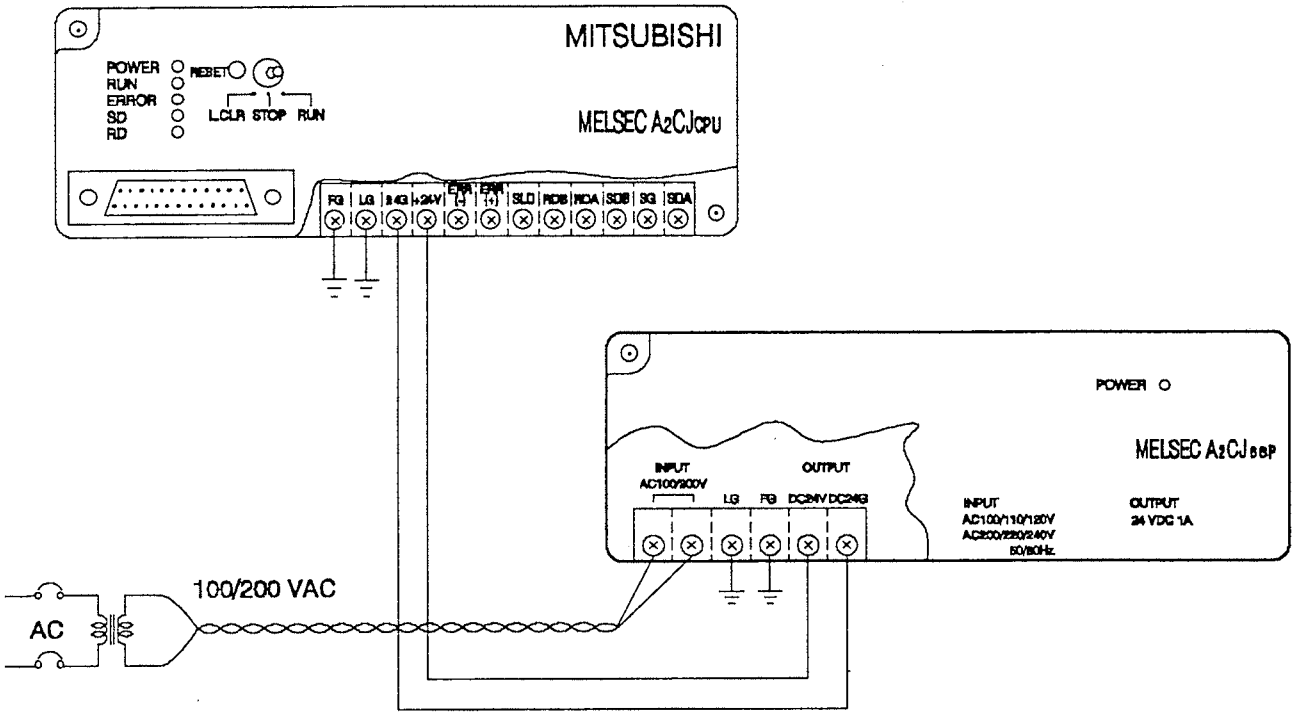
(a) A66PC



Terminal Name	Wiring Instructions
INPUT AC100/200V	Connect 100 to 120/200 to 240 VAC power supply wires to these terminals. Both of the terminal can be connected to either of hot or neutral line.
Short AC100 Open AC200	These are voltage selection terminal. Short the terminals for 100 to 120 VAC input, and open them for 200 to 240 VAC input.
LG	This is a functional earth terminal to be connected to the noise free earth. **WARNING: If this terminal is not connected to the earth, the terminal holds half of the supplied voltage.**
FG	This is a functional earth terminal to be connected to the noise free earth.
24V 24G	These are output terminals of 24 VDC service power which can be used as I/O load power and/or other purposes.

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(b) A2CJ66P

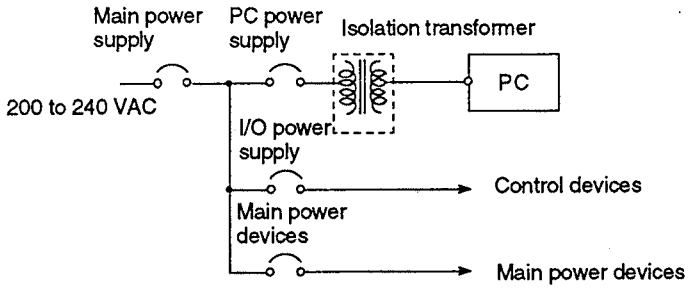


Terminal Name	Wiring Instructions
INPUT AC100/200V	Connect 100 to 120/200 to 240 VAC power supply wires to these terminals. Both of the terminal can be connected to either of hot or neutral line.
LG	This is a functional earth terminal to be connected to the noise free earth. **WARNING: If this terminal is not connected to the earth, the terminal holds half of the supplied voltage.**
FG	This is a functional earth terminal to be connected to the noise free earth.
24V 24G	These are output terminals of 24 VDC service power which can be used as I/O load power and/or other purposes.

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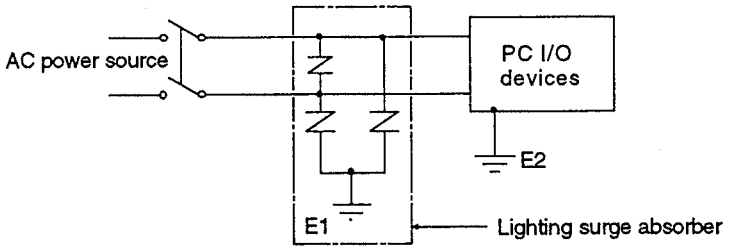
(2) Take following measures as much as possible so that risk of electrical noise problem is minimized.

(a) Provide separate wiring system for the PC power, I/O devices, and other operating devices as shown below. Further more, insert an isolated transformer if intensive noise is expected.



(b) Power supply wires should be twisted as tightly as possible, and connect to power supply modules at the shortest distance. To minimize voltage drop, use wires as thick as possible.

(c) As a measure against lighting surges, insert surge absorbers as shown below.



POINTS

(1) Provide separator grounding for the lighting surge absorber (E1) and for the PC (E2).

(2) Select a lighting surge absorber of which maximum allowable line voltage is higher than input voltage of the power supply module.

4.3 Digital I/O Modules

The following instructions should be observed for I/O module wiring.

(1) I/O signal wires must be installed at least 100 mm (3.94 inch) away from high-voltage and large-current main power wires so that noise induction from such high power circuit is minimized.

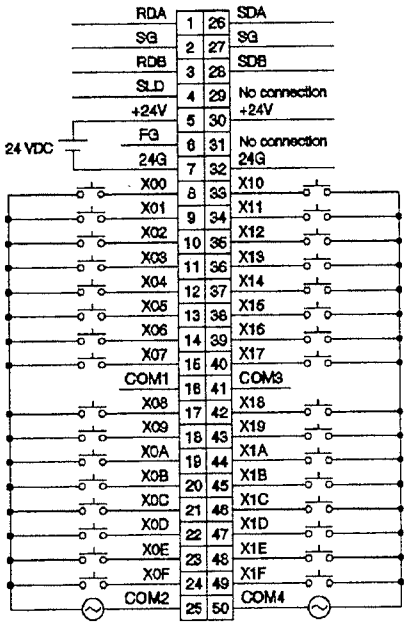
(2) If the I/O signal wires cannot be separately installed from the high power wires, use shielded cables for I/O signal and connect their shield to the earth.

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4.3.1 Input module connections

(1)

Model	Rated Input Voltage
AX11C	100 to 120 VAC
AX21C	200 to 240 VAC

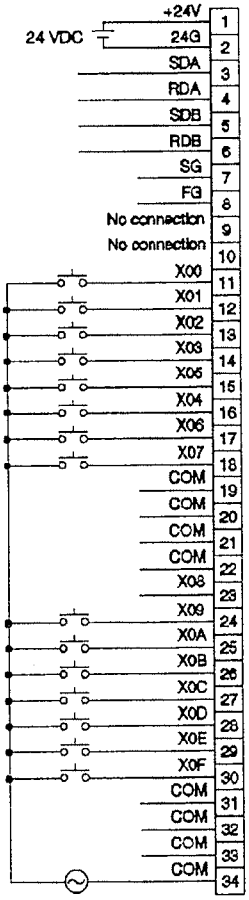


* [16] and [25], and [41] and [50] are connected internally.
[5] and [30], and [7] and [32] are connected internally.

DANGER
Do not touch termminals while the power is supplied.

(2)

Model	Rated Input Voltage
AJ35TB1-16A	100 to 120 VAC

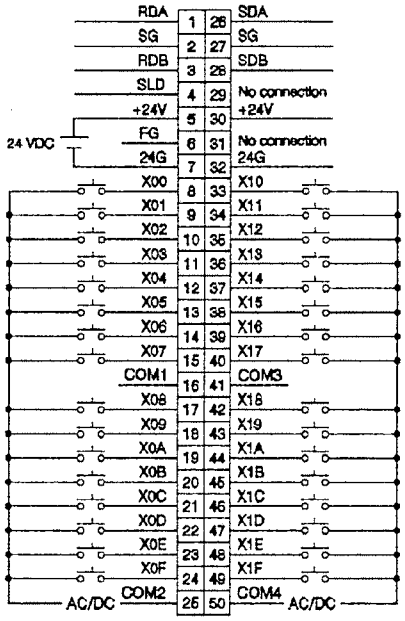


* [19], [20], [21], [22], [31], [32], [33], [34], are connected internally.

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(3)

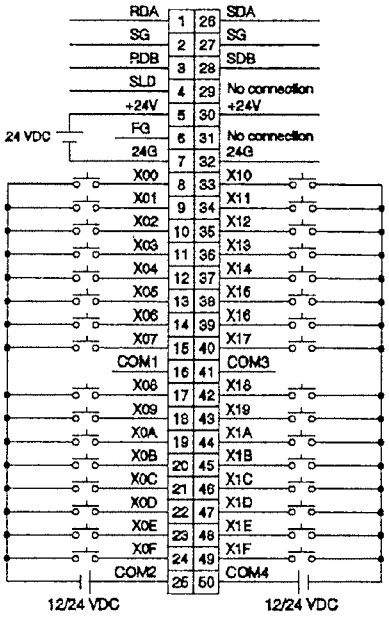
Model	Rated Input Voltage
AX31C	12/24 VAC 12/24 VDC



* [16] and [25], and [41] and [50] are connected internally.
[5] and [30], and [7] and [32] are connected internally.

(4)

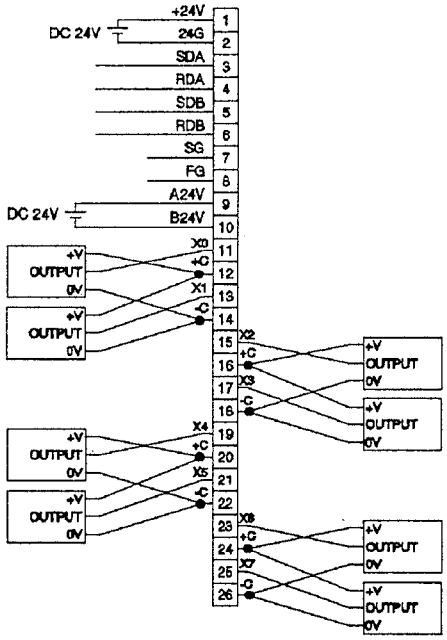
Model	Rated Input Voltage
AX41C	12/24 VDC



* [16] and [25], and [41] and [50] are connected internally.
[5] and [30], and [7] and [32] are connected internally.

(5)

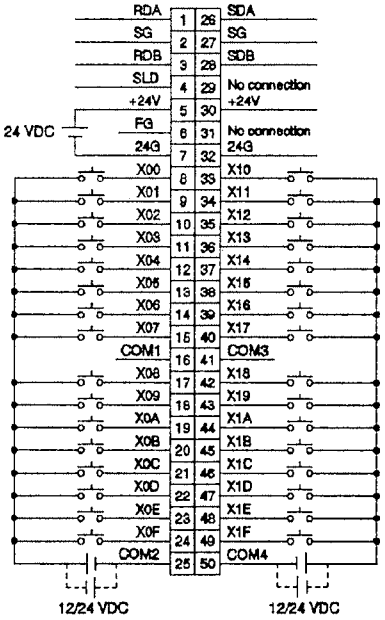
Model	Rated Input Voltage
AJ35TB3-8D	24 VDC



* [9], [12], [16], [20], [24] are connected internally.
[10], [14], [18], [22], [26] are connected internally.

(6)

Model	Rated Input Voltage
AX81C	12/24 VDC

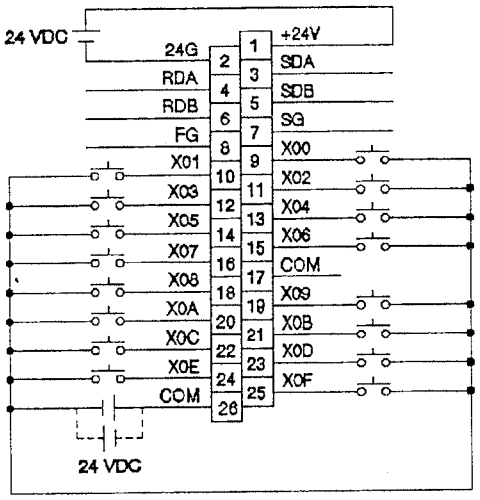


* [16] and [25], and [41] and [50] are connected internally.
[5] and [30], and [7] and [32] are connected internally.

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(7)

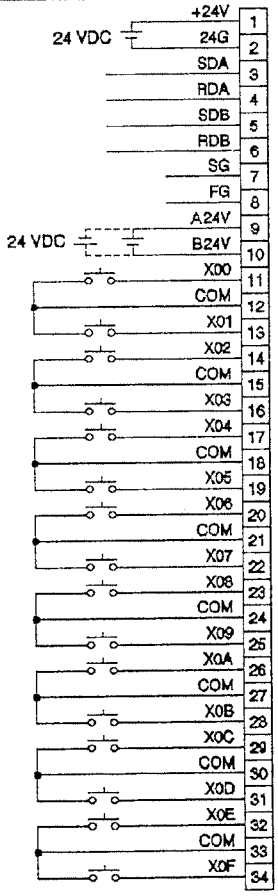
Model	Rated Input Voltage
AJ35TB1-16D	12/24 VDC



* [17] and [26] are connected internally.

(8)

Model	Rated Input Voltage
AJ35TB2-16D	24 VDC



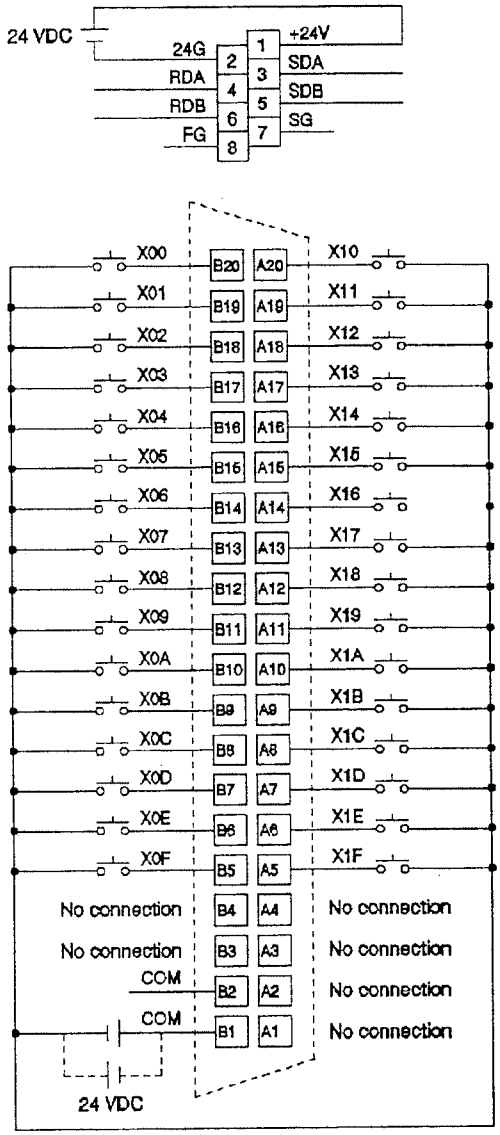
*I/O power supply connection

Input Terminal	Sink	Source
A 24 V	+ 24 V	0 V
B 24 V	0 V	+ 24 V

* [10], [12], [15], [18], [21], [24], [27], [30], and [33] are connected internally.

(9)

Model	Rated Input Voltage
AJ35TC1-32D	24 VDC



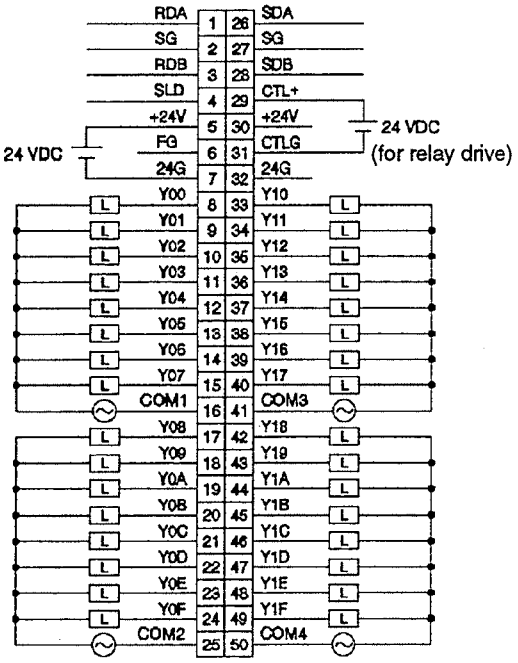
* [B1] and [B2] are connected internally.

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4.3.2 Output module connections

(1)

Model	Rated Input Voltage
AY13C	24 VDC/100 to 240 VAC

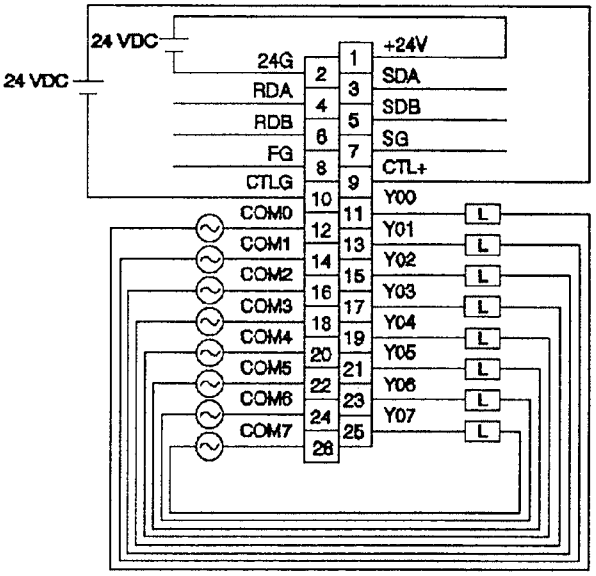


* [5] and [30], and [7] and [32] are connected internally.

DANGER
Do not touch termminals while the power is supplied.

(2)

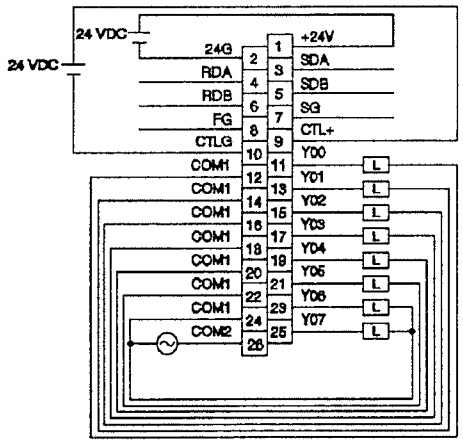
Model	Rated Input Voltage
AJ35TB1A-8R	24 VDC/100 to 240 VAC



DANGER
Do not touch termminals while the power is supplied.

(3)

Model	Rated Input Voltage
AJ35TB2-8R	24 VDC/100 to 240 VAC



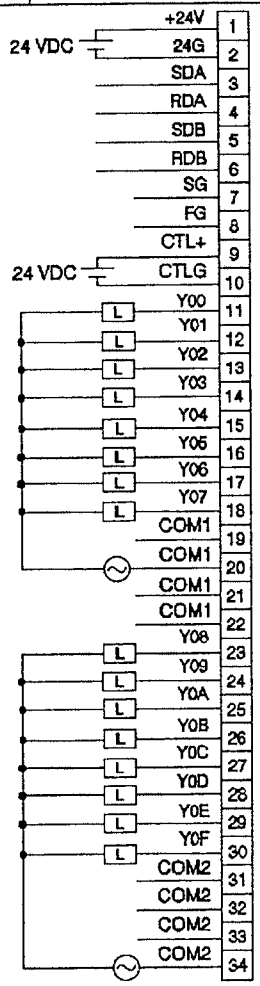
* [12], [14], [16], [18], [20], [22], [24], are connected internally.

DANGER
Do not touch termminals while the power is supplied.

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(4)

Model	Rated Input Voltage
AJ35TB1-16R	24 VDC/100 to 240 VDC

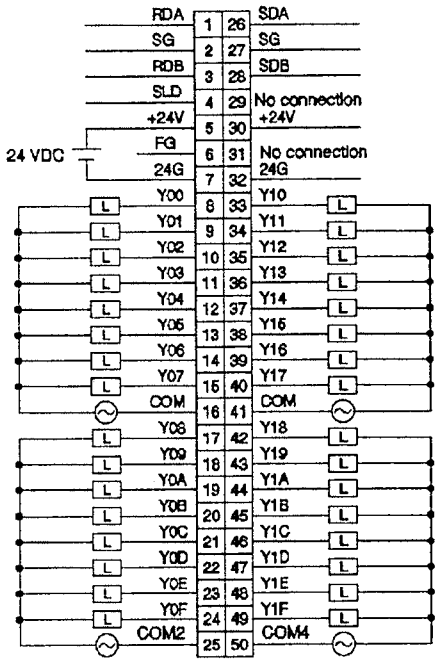


DANGER

Do not touch termminals while the power is supplied.

(5)

Model	Rated Input Voltage
AY23C	100 to 240 VAC



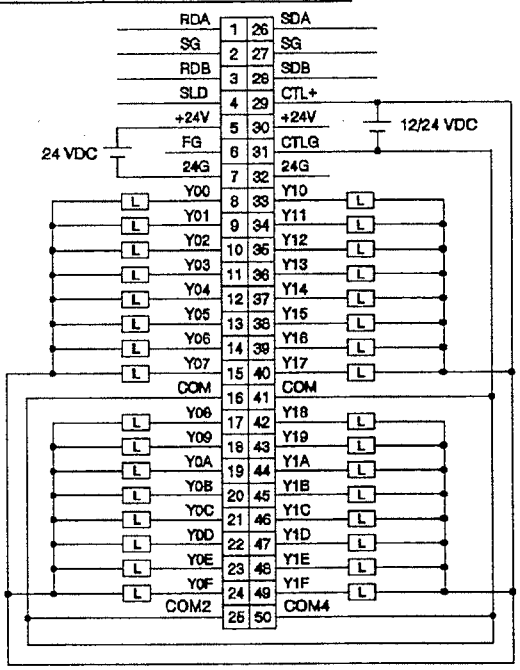
* [5] and [30], and [7] and [32] are connected internally.

DANGER

Do not touch termminals while the power is supplied.

(6)

Model	Rated Input Voltage
AY51C	12/24 VDC

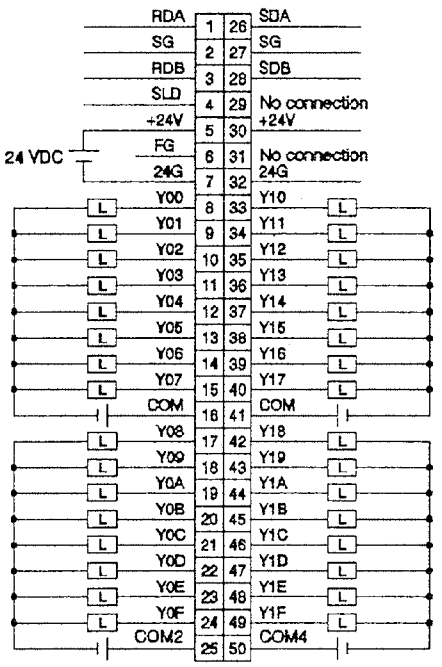


* [5] and [30], and [7] and [32] are connected internally.

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(7)

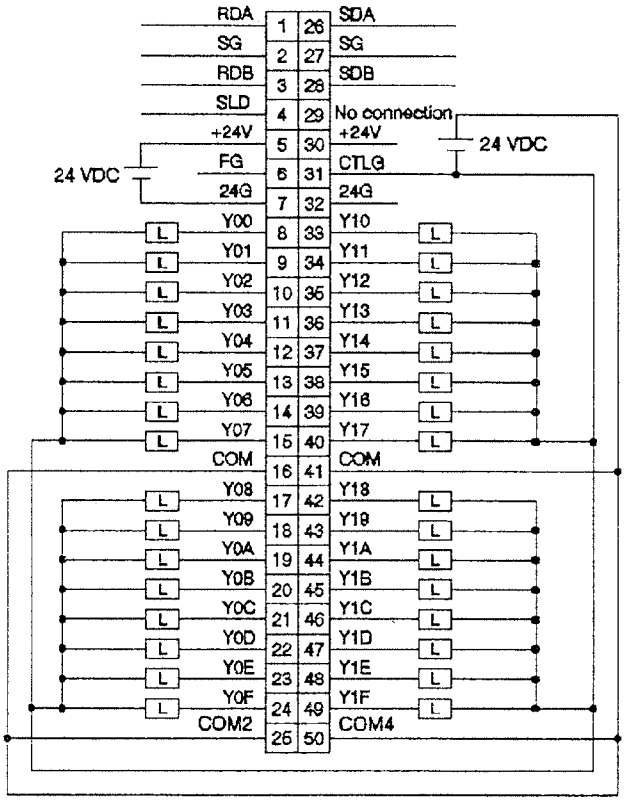
Model	Rated Input Voltage
AY61CE	5/12/24 VDC



* [5] and [30], and [7] and [32] are connected internally.

(8)

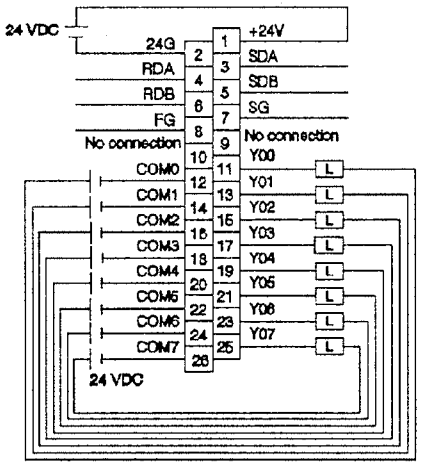
Model	Rated Input Voltage
AY81C	24 VDC



* [5] and [30], and [7] and [32] are connected internally.

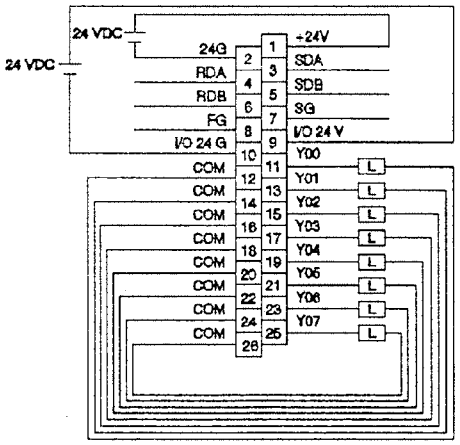
(9)

Model	Rated Input Voltage
AJ35TB1A-8T	24 VDC



(10)

Model	Rated Input Voltage
AJ35TB2-8T	5/12/24 VDC

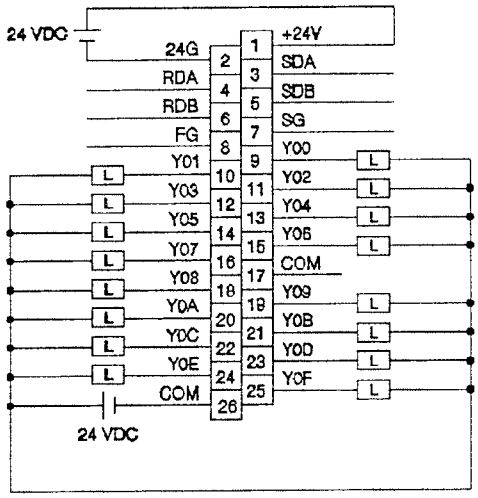


* [9], [12], [14], [16], [18], [20], [22], [24], and [26] are connected internally.

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(11)

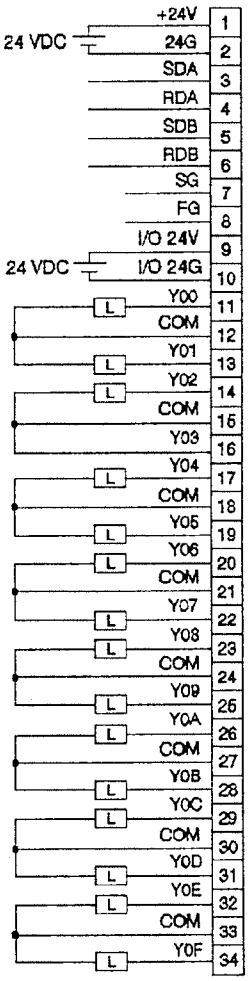
Model	Rated Input Voltage
AJ35TB1-16T	24 VDC



* [17] and [26] are connected internally.

(12)

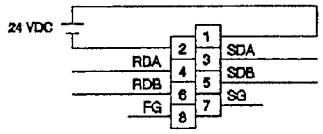
Model	Rated Input Voltage
AJ35TB2-16T	24 VAC

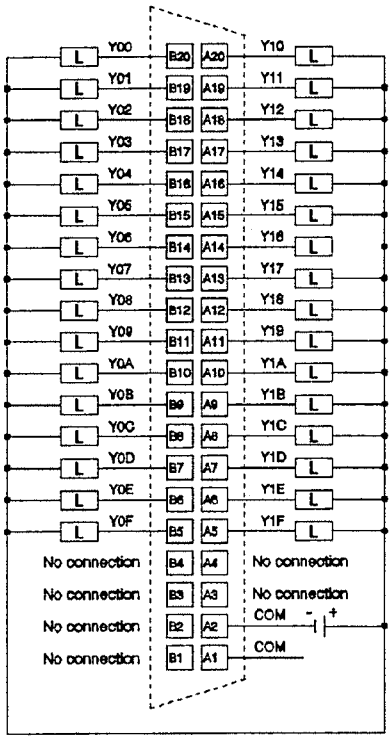


* [9], [12], [15], [18], [21], [24], [27], [30], and [33] are connected internally.

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(13)	Model	Rated Input Voltage
	AJ35TC1-32T	24 VDC





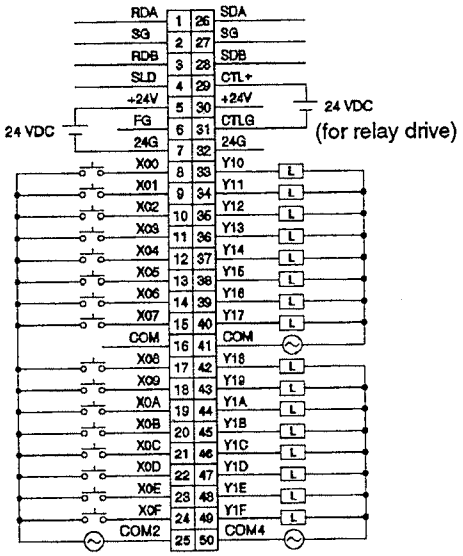
[A1] and [A2] are connected internally.

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4.3.3 Input/output composite module connections

(1)

Model	Rated Input Voltage	Rated Load Voltage
AX10Y10C	100 to 120 VAC	24 VDC/240 VAC

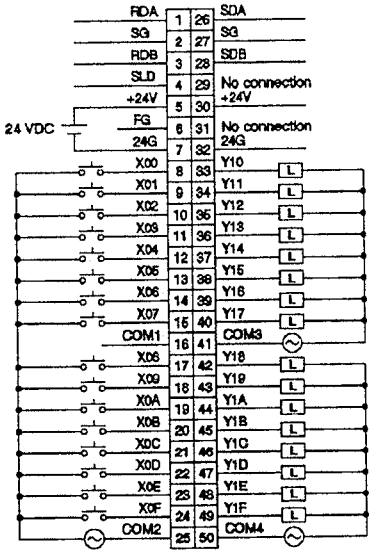


[5] and [30], [7] and [32], and [16] and [25] are connected internally.

DANGER
Do not touch termminals while the power is supplied.

(2)

Model	Rated Input Voltage	Rated Load Voltage
AX10Y22C	100 to 120 VAC	100 to 240 VAC

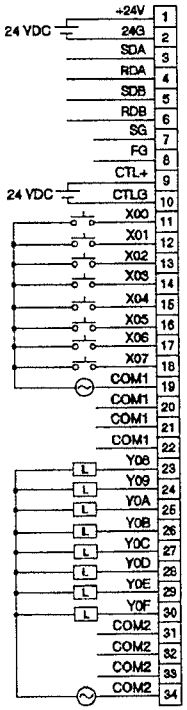


[5] and [30], [7] and [32], and [16] and [25] are connected internally.

DANGER
Do not touch termminals while the power is supplied.

(3)

Model	Rated Input Voltage	Rated Load Voltage
AJ35TB1-16AR	100 to 120 VAC	24 VDC/240 VAC

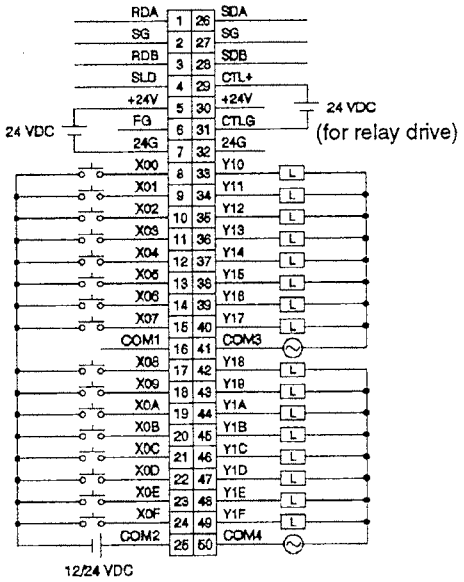


DANGER
Do not touch termminals while the power is supplied.

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(4)

Model	Rated Input Voltage	Rated Load Voltage
AX40Y10C	12/24 VDC	24 VDC/240 VAC

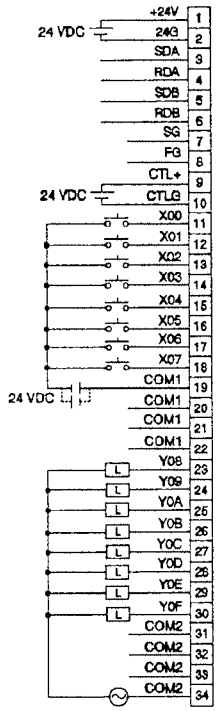


[5] and [30], [7] and [32], and [16] and [25] are connected internally.

DANGER
Do not touch termminals while the power is supplied.

(5)

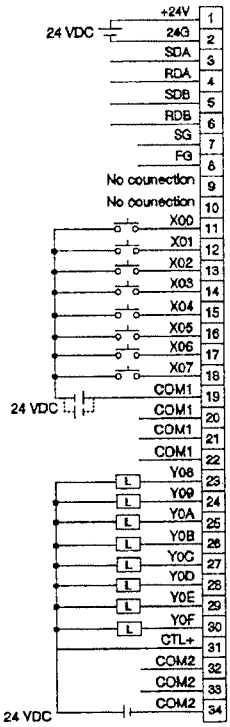
Model	Rated Input Voltage	Rated Load Voltage
AJ35TB1-16DR	24 VDC	24 VDC/240 VAC



DANGER
Do not touch termminals while the power is supplied.

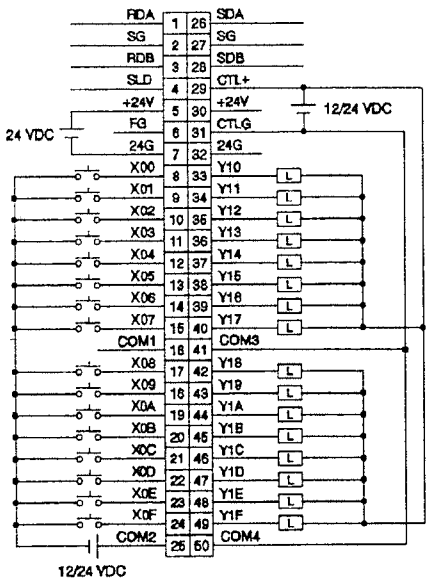
(6)

Model	Rated Input Voltage	Rated Load Voltage
AJ35TB1-16DT	24 VDC	24 VDC



(7)

Model	Rated Input Voltage	Rated Load Voltage
AX40Y50C	12/24 VDC	12/24 VDC

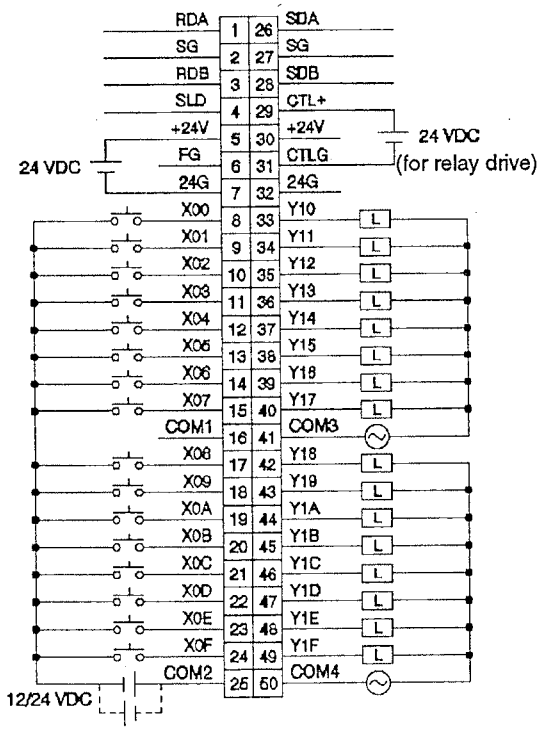


[5] and [30], [7] and [32], and [16] and [25] are connected internally.

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(8)

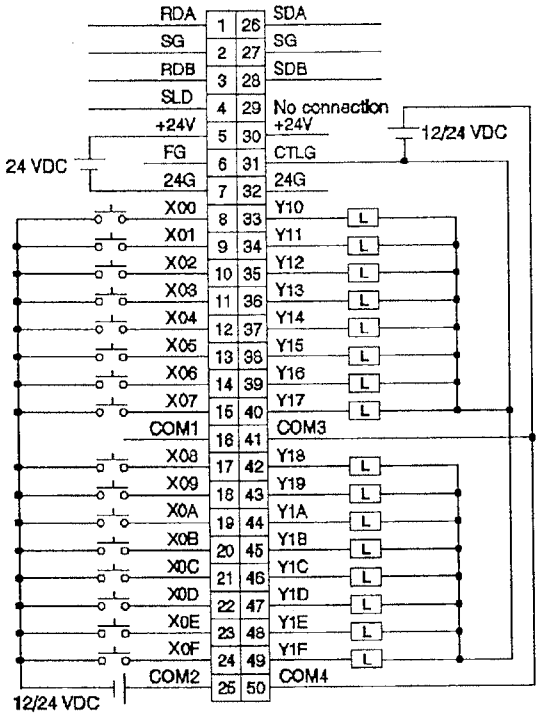
Model	Rated Input Voltage	Rated Load Voltage
AX80Y10C	12/24 VDC	24 VDC/240 VAC



[5] and [30], [7] and [32], and [16] and [25] are connected internally.

(9)

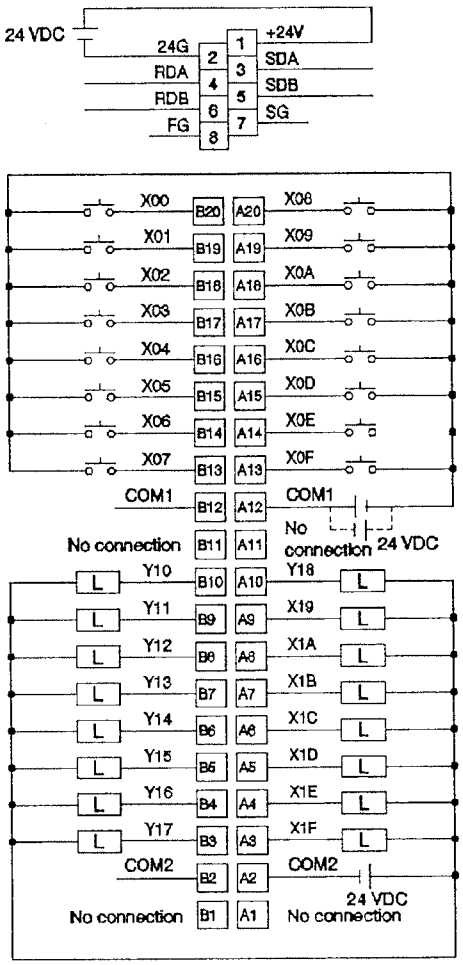
Model	Rated Input Voltage	Rated Load Voltage
AX80Y80C	12/24 VDC	24 VDC



[5] and [30], [7] and [32], and [16] and [25] are connected internally.

(10)

Model	Rated Input Voltage	Rated Load Voltage
AJ35TC1-32DT	24 VDC	24 VDC



[A12] and [B12], and [A2] and [B2] are connected internally.

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5. FAIL-SAFE CONSTRUCTIONS

5.1 General Safety Requirements



DANGER

Safety circuitry must be so designed and constructed externally that an entire system stays in safe in case of a external power supply failure and/or PC failure. In particular, the following safety circuitry are required to constructed outside of the PC.

(1) Emergency stop circuit, protection circuit, interlocking circuit for contrary operations such as forward and reverse movement, and hardware stroke limit circuit for positioning controls must be constructed externally.

(2) In case that hardware failure which PC CPU cannot detect occurs, all or some output signals could be turned on without program instructions. An external safety circuitry must be so constructed that safety of equipment or machine can be protected from such case.
Please refer to Sub-clause 5.2 for details.

(3) In some cases, relays or transistors used in output modules stay always ON or OFF as failure symptoms. If such failure could cause serious damage on persons or properties, those safety critical output signals must be externally monitored.

If the power to the PC is turned ON after turning ON the external power supply used for the process control with the DC output module, the DC output module may make an erroneous output for an instant. Take the following procedures for power up of the equipment, in order to prevent such erroneous input and output to/from the PC.

(1) Turn ON the power to the PC.

(2) Turn ON the external power supply used for the process control.

(3) Turn ON the START switch.

(4) Turn ON the power to the output devices by using a program.

(5) Confirm that all external power supplies are turned ON, and then, an I/O control program should be executed.

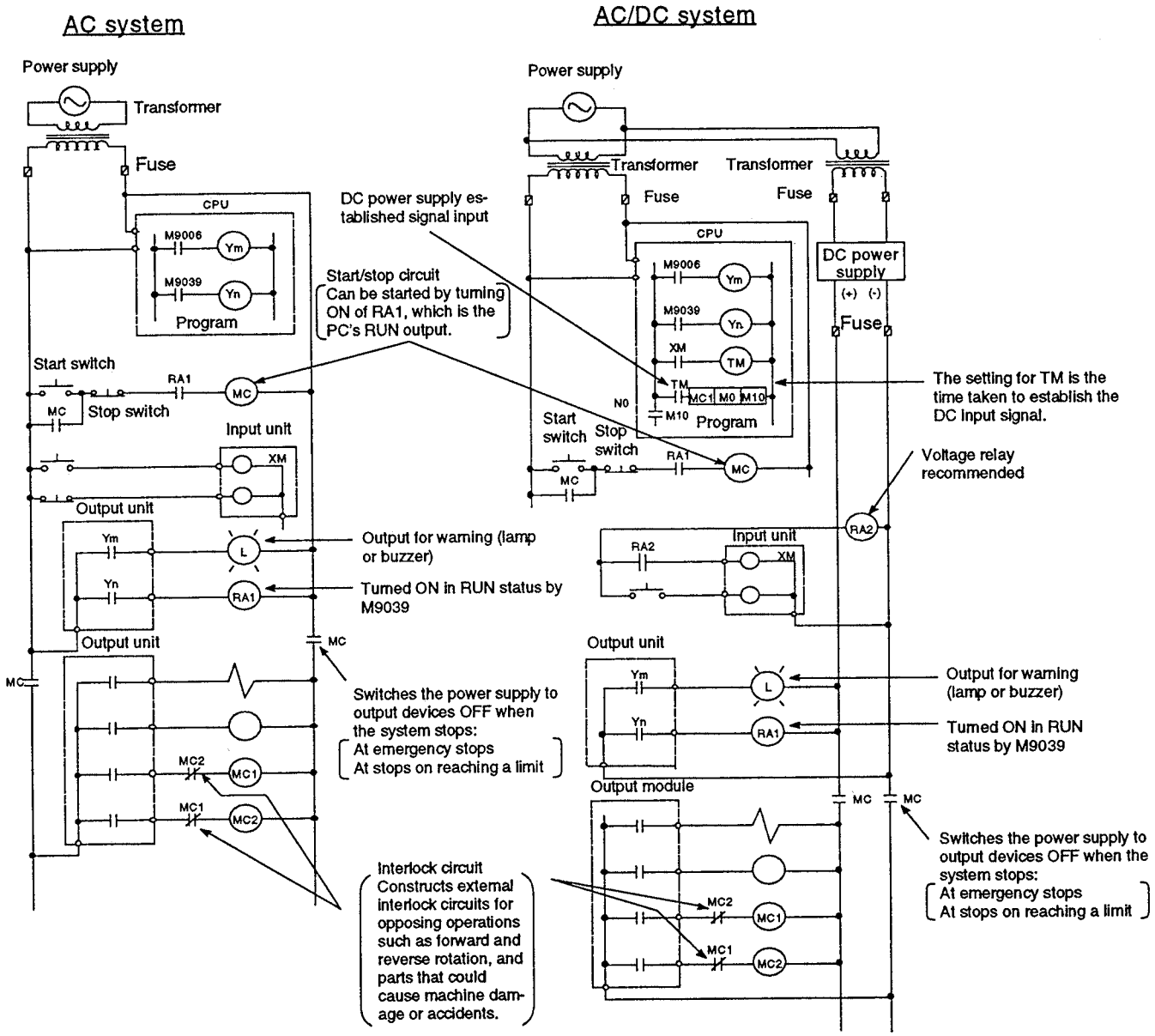
5.2 Fail-Safe Circuitry Against to Failure of the PC

Though Mitsubishi PCs are manufactured under strict quality control, they may cause failure or abnormal operations due to unspecific reasons. To prevent the abnormal operation of the whole system, machine breakdown, and accidents, fail-safe circuitry against to failure of the PC must be constructed outside the PC.

The following page gives an example of system designing that conforms to the explanation mentioned above and an example of fail-safe measures when the PC causes a failure.

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(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 to RUN.
[3] Switch the start switch ON.
[4] The output devices are driven in accordance with the program when the magnetic contactor (MC) comes ON.

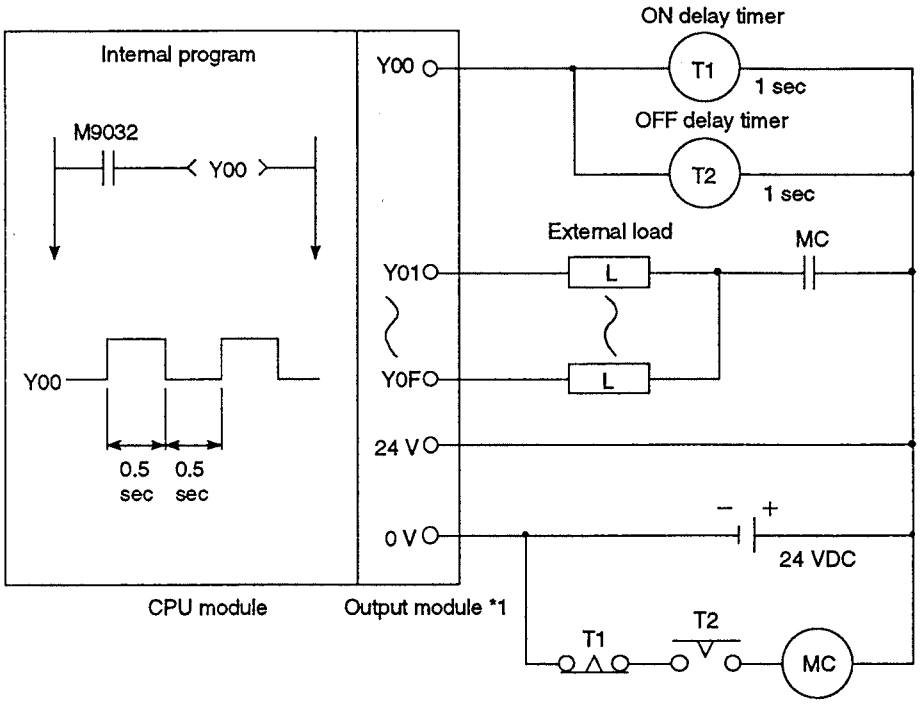
AC/DC system

[1] Switch the power supply ON.
[2] Set the CPU to RUN.
[3] Switch RA2 ON when establishment of the DC power supply starts.
[4] Switch the timer (TM) ON when the DC power supply is 100% established.
(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.)

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Failure of a CPU or memory can be detected by the self diagnosis function. However, Failure of I/O control area may not be detected by the CPU. In such cases, all I/O points turn ON or OFF depending on a condition of problem, and normal operating conditions and operating safety cannot sometimes be maintained. Examples of fail-safe circuitry are described as follows:

(a) Using on-delay and off-delay timers



*1: Y00 repeats turning ON and then OFF at 0.5 second intervals. Use a no-contact output module (transistor in the example shown above).

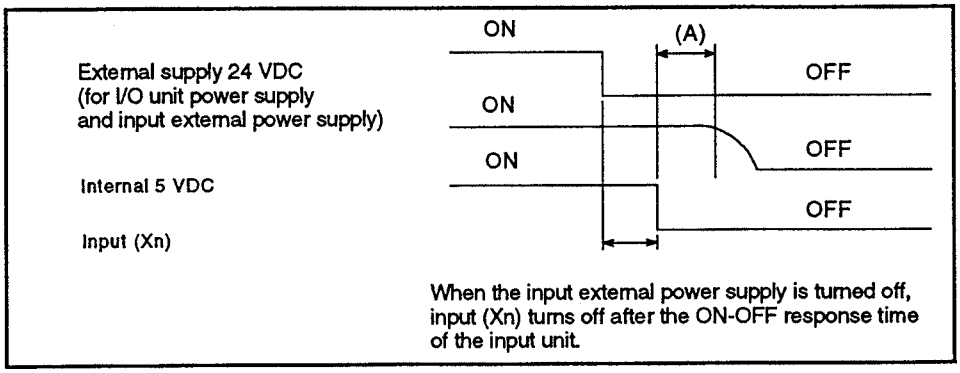
(2) Countermeasure for momentary power failure to I/O units

Momentary power failure of the power supply to I/O units may cause incorrect input.

(a) Cause of incorrect input

I/O units have a DC-DC converter circuit to generate 5 VDC power from 24 VDC power supplied from the external.

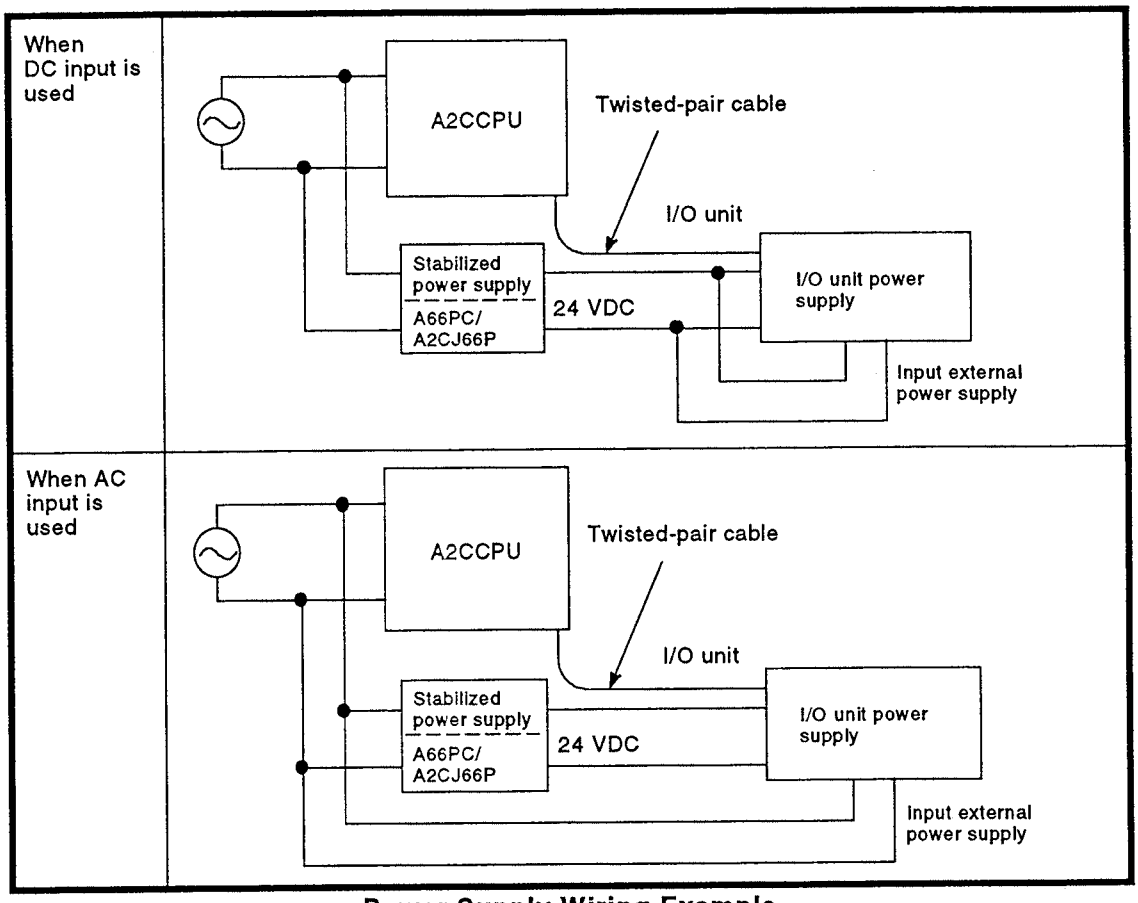
Since internal 5 VDC holding time is longer than ON to OFF input response time, the A2C may be given incorrect input during the time signified by (A).



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(b) Prevention of incorrect input

Connect A66PC, A2CJ66P to a stabilized power supply and connect AC input to one same power supply.



Power Supply Wiring Example

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6. MAINTENANCE

6.1 General Safety Requirement



DANGER

Maintenance activeties for the product should be carried out by trained and competent personnel.

Do not touch terminals while the power is supplied.

Cleaning or screw tightenig must be carried out while the power is off.



CAUTION

Do not change program, move switch of RUN, STOP of PAUSE, nor proceed force output during CPU RUN without confirmation of safety.

Do not disassemble nor modify the products.

Do not mount not dismount a module while the power is supplied.

Connect a battery properly. Do not recharge, disassemble, heat, burn, short, nor solder a battery.

Do not replace a battery other than A6BAT.

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6.2 Daily Inspection

It is recommended to inspect items listed in the follwing table to keep the equipment running without troubles.

No.	Check Item		Check Point	Judgment	Corrective Action
1	Connecting condition		Check for loose terminal screws.	Screws should not be loose.	Retigten terminal screws.
			Check distance between solderless terminals.	Proper clearance should be provided between solderless terminals.	Correct.
			Check connectors of extension cable.	Connections should not be loose.	Retighten connector mounting screws.
2	CPU module indicator lamps	"POWER" LED	Check that the LED is ON.	ON (OFF indicates an error.)	Refer to User's Manual
		"RUN" LED	Check that the LED is ON during RUN.	ON (OFF or flash indicates an error.)	Refer to User's Manual
		"ERROR" LED	Check that the LED is ON when an error occurred.	OFF (ON when an error occurred.)	Refer to User's Manual
		Input LED	Check that the LED turns ON and OFF.	ON when input is ON. OFF when input is OFF. (Display, which is not as mentioned above, indicates an error.)	Refer to User's Manual
		Output LED	Check that the LED turns ON and OFF.	ON when output is ON. OFF when output is OFF. (Display, which is not as mentioned above, indicates an error)	Refer to User's Manual

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6.3 Periodic Inspection

This section explains the inspection items which are to be checked every six months to one year. This inspection should also be performed when the equipment is moved or modified or the wiring is chaged.

No.	Check Item		Checking Method	Judgment	Corrective Action
1	Ambient environment	Ambient temperature	Measure with thermometer and hygrometer. Measure corrosive gas.	0 to 55 °C	When PC is used inside a panel, the temperature in the panel is ambient temperature.
		Ambient humidity		10 to 90 %RH	
		Ambience		There should be no corrosive gases.	
2	Line voltage check.		Measure voltage across power supply input terminal of power supply unit.	85 to 132 VAC	Change supply power . Change transformer tap.
				170 to 264 VAC	
				15.6 to 31.2 VDC	
3	condition of each unit	Ingress of dust or foreign material	Visual check.	There should be no dust or foreign material, in the vicinity of the PC.	Remove and clean.
4	Connecting conditions	Loose terminal screws	Retighten.	Connectors should not be loose.	Retighten.
		Distances between solderless terminals.	Visual check.	Proper clearance should be provided between solderless terminals.	Correct.
		Loose connector	Visual check.	Connectors should not be loose.	Retighten connector mounting screws.
5	Battery		Check battery status by mounting special auxiliary relays M9006 and M9007. Retighten battery if necessary.	Preventive maintenance	If battery capacity reduction is not indicated, change the battery when specified service life is exceeded.

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6.4 Battery Replacement

A lithium battery is used in a CPU module to keep program and data during power failure time. When the voltage of battery comes low, M9006 and/or M9007 internal diagnostic signal come on. Please replace a battery as soon as possible once the signal is activated.

6.5 Fuse

Some of output modules have fuses on their output circuit. Aim of the fuses is not for protection of output modules themselves, but for protection of external wiring.

If a fuse is blown, it is expected that output devices on the module are damaged. And it is recommended to return the module to Mitsubishi representative for repair.

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7. ERROR CODE

If an error occurs in the RUN mode, an error display or error code (including a step number) is stored in the special register by the self-diagnostic function.
The error code reading procedure and the causes of and corrective actions for errors are shown in Table 7.1.

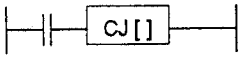
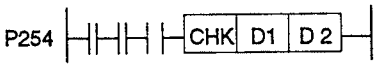
7.1 Error Code List

Table 7.1 Error Code List

Error Message	Content of Special Register D9008 (BIN value)	CPU States	Error and Cause	Corrective Action
"INSTRCT. CODE ERR" (Checked during instruction execution)	10	Stop	Instruction code, which cannot be decoded by CPU, is included in the program. (1) ROM including invalid instruction code, has been loaded. (2) Memory contents have been corrected. (3) The PR and IRET instructions are used.	(1) Read the error step by use of peripheral device and correct the program at that step. (2) In the case of ROM, rewrite the contents of the ROM or change the ROM.
"PARAMETER ERROR" (Checked at power on, reset, STOP to RUN, PAUSE to RUN)	11	Stop	The parameter contents of CPU memory are changed due to noise or incorrect loading of memory.	(1) Check the loading of CPU memory and load it correctly. (2) Read the parameter contents of CPU memory, check and correct the contents, and write them to the memory again.
"MISSING END INS." (Checked at STOP to RUN, PAUSE to RUN)	12	Stop	There is no END (FEND) instruction in the program.	Write END at the end of the program/subprogram.
CAN'T EXECUTE (P)" (Checked at [CJ], [SCJ], [JMP], [CALL(P)], [FOR to NEXT] execution,STOP to RUN, PAUSE to RUN)	13	Stop	(1) There is no jump destination or plural destinations specified by the [CJ], [SCJ], [CALL], [CALLP], or [JMP] instruction. (2) Although there is no [CALL] instruction, the [RET] instruction exists in the program and has been executed. (3) The [CJ], [SCJ], [CALL], [CALLP], or [JMP] instruction has been executed with its jump destination located below the END instruction. (4) The number of [FOR] instructions does not match that of [NEXT] instruction. (5) The [JMP] instruction specified between [FOR to NEXT] has caused execution to deviate from between [FOR to NEXT].	Read the error by use of peripheral device and correct the program at that step. (Make correction such as the insertion of jump destination or the changing of jump destinations to one.)

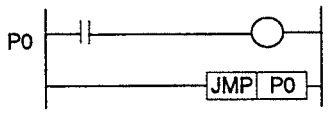
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Table 7.1 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN value)	CPU States	Error and Cause	Corrective Action
"CAN'T EXECUTE (P)" (Checked at [CJ], [SCJ], [JUMP], [CALL (P)], [FOR to NEXT] execution, STOP to RUN, PAUSE to RUN)	13	Stop	(6) The [JMP] instruction has caused execution to deviate from the subroutine before the [RET] instruction is executed. (7) The [JMP] instruction has caused execution to jump to a step or subroutine between [FOR to NEXT].	Read the error by use of peripheral device and correct the program at that step. (Make correction such as the insertion of jump destination or the changing of jump destinations to one.)
"CHK FORMAT ERR" (Checked at STOP to RUN and PAUSE to RUN)	14	Stop	(1) There are instructions (including [NOP]) other than LDX, LDIX ANDX and ANIX in the [CHK] instruction circuit block. (2) There is more than one [CHK] instruction. (3) The number of contact points in the [CHK] instruction circuit block exceeds 150. (4) The X device number in the [CHK] instruction circuit block exceeds X1FE. (5) There is not  circuit block above the [CHK] instruction circuit block. (6) D1 device (number) of the [CHK|D1|D2] instruction is different from the contact device (number) above the CJ[ ] instruction. (7) Pointer P254 is not attached to the start of the [CHK] instruction circuit block. 	Check the program of the [CHK] instruction circuit block for (1) to (6) in the left column. Correct errors using a peripheral device and start operation again.
"ROM ERROR" (Checked at power on and reset)	17	Stop	(1) Parameters and sequence programs are not correctly written to installed EP-ROM. (2) EP-ROM is destroyed.	Replace EP-ROM with another EP-ROM to which parameters and sequence programs are correctly written.
"MEMORY PROTECT ERROR" (Checked at power on and reset)	18	Stop	The MEMORY PROTECT switch is set in the ON position while operating the A2C system using ROM stored programs.	Set the MEMORY PROTECT switch in the OFF position.

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Table 7.1 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN value)	CPU States	Error and Cause	Corrective Action
"RAM ERROR" (Checked at power on, reset, M9084 ON during STOP)	20	Stop	The CPU has checked if write and read operations can be performed properly to the data memory area of CPU, and as a result, either or both has not been performed.	Since this is CPU hardware error, consult Mitsubishi representative.
"OPE. CIRCUIT ERR." (Checked at power on and reset)	21	Stop	The operation circuit, which performs the sequence processing in the CPU, does not operate properly.	
"WDT ERROR" (Checked at the execution of END instruction)	22	Stop	Scan time exceeds watch dog error monitor time. (1) Scan time of user program has become excessive. (2) Scan time has lengthened due to Momentary power failure which occurred during scan.	(1) Calculate and check the scan time of user program and reduce the scan time by use of [CJ] instruction, etc. (2) Monitor the content of special register D9005 by use of peripheral device. When the content is other than 0, line voltage is insufficient. Therefore, check the power and eliminate the voltage fluctuation.
"END NOT EXECUTE" (Checked at the excution of END instruction)	24	Stop	(1) When the [END] instruction is executed, another instruction code has been read due to noise, etc. (2) The [END] instruction has changed to another instruction code for some reason.	Perform reset and run. If the same error is displayed again, it is the CPU hardware error. Therefore, consult Mitsubishi representative.
"WDT ERROR" (Checked continuously)	25	Stop	The CPU is executing an endless loop. example: 	Switch the CPU to STOP and reset it with the RUN key switch. Check the position of JMP, CJ and SCJ in the program and the pointer (P).
"CONTROL BUS ERR" (for A2CCPUC24 (REF))	40	Stop	FROM/TO instructions cannot be executed. (1) An error occurred in the control bus to the computer link.	There is a hardware fault in the A2CCPUC24(-PRF). Replace the module and check the faulty module. Consult your nearest Mitsubishi representative.
"SP. UNIT DOWN" (for A2CCPUC24 (REF))	41	Stop	When a FROM/TO instruction is executed no response comes back from the computer link. (1) The accessed computer link is faulty.	There is a hardware fault in the A2CCPUC24(-PRF). Consult your nearest Mitsubishi representative.
"I/O INT EROR" (for A2CCPUC24 (REF))	43	Stop	Although the computer link did not make a request, a request was generated in the CPU.	There is a hardware fault in the A2CCPUC24(-PRF). Consult your nearest Mitsubishi representative.

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Table 7.1 Error Code List (Continued)

Error Message	Content of Special Register D9008 (BIN value)	CPU States	Error and Cause	Corrective Action
"SP. UNIT LAY ERR." (for A2CCPUC24 (PRF))	44	Stop	Initial communications could not be made with the computer link.	There is a hardware fault in the A2CCPUC24(-PRF). Consult your nearest Mitsubishi representative.
"SP. UNIT ERROR" (Checked at the execution of FROM and TO instructions)	46	Stop	The [FROM/TO] instructions were executed for the station (1 to 61) which was not designated by the initial setting.	(1) Perform initial setting of the stations which is designated by the [FROM/TO] instructions. (2) Change the station number designated by the [FROM/TO] instructions.
"LINK PARA. ERROR" (Checked at power on, reset, STOP to RUN, and PAUSE to RUN) (for A2CCPUP21/R21)	47	Run	(1) Data written to a link parameter area specified by parameter setting of a peripheral device is different from data read by the CPU for some reason. (2) Number of total slave stations is set at 0.	(1) Perform parameter setting and operate again. (2) If the same error is displayed again, it is a hardware error. Consult Mitsubishi representative.
"OPERATION ERROR" (Checked at instruction execution)	50	Run (Stop)	(1) The result of BCD conversion has exceeded the specified range (9999 or 99999999). (2) Setting has been performed exceeding the specified device range and operation cannot be performed. (3) File registers are used in the program without performing the capacity setting of file registers. (4) Station designation of the [FROM/TO] instructions is 0 or over 62.	Read the error step by use of peripheral device, and check and correct the program at that step. • Device setting range • BCD conversion value • Parameter setting for file registers • Station number designated by the [FROM/TO] instructions
"BATTERY ERROR" (Checked continuously (Not checked when M9084 is on)	70	Run	(1) The battery voltage has reduced to less than the specified value. (2) The battery lead is disconnected.	(1) Change the battery. (2) When RAM or power failure compensation is used, connect the battery.

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IMPORTANT

(1) Design the configuration of a system to provide an external protective or safety inter locking circuit for the PCs.

(2) The components on the printed circuit boards will be damaged by static electricity, so avoid handling them directly. If it is necessary to handle them take the following precautions.

(a) Ground your body and the work bench.

(b) Do not touch the conductive areas of the printed circuit board and its electrical parts with non-grounded tools, etc.

Under no circumstances will Mitsubishi Electric be liable or responsible for any consequential damage that may arise as a result of the installation or use of this equipment.

All examples and diagrams shown in this manual are intended only as an aid to understanding the text, not to guarantee operation. Mitsubishi Electric will accept no responsibility for actual use of the product based on these illustrative examples.

Owing to the very great variety in possible applications of this equipment, you must satisfy yourself as to its suitability for your specific application.

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type A2CCPU(P21/R21), A2CCPU-DC24V,
A2CCPUC24(-PRF), A2CJCPU(S3)

User's Manual (Hardware)

MODEL	A2CPU(H/W)-U-E
MODEL CODE	13JE62
IB(NA)66475-D(0810)MEE	

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
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