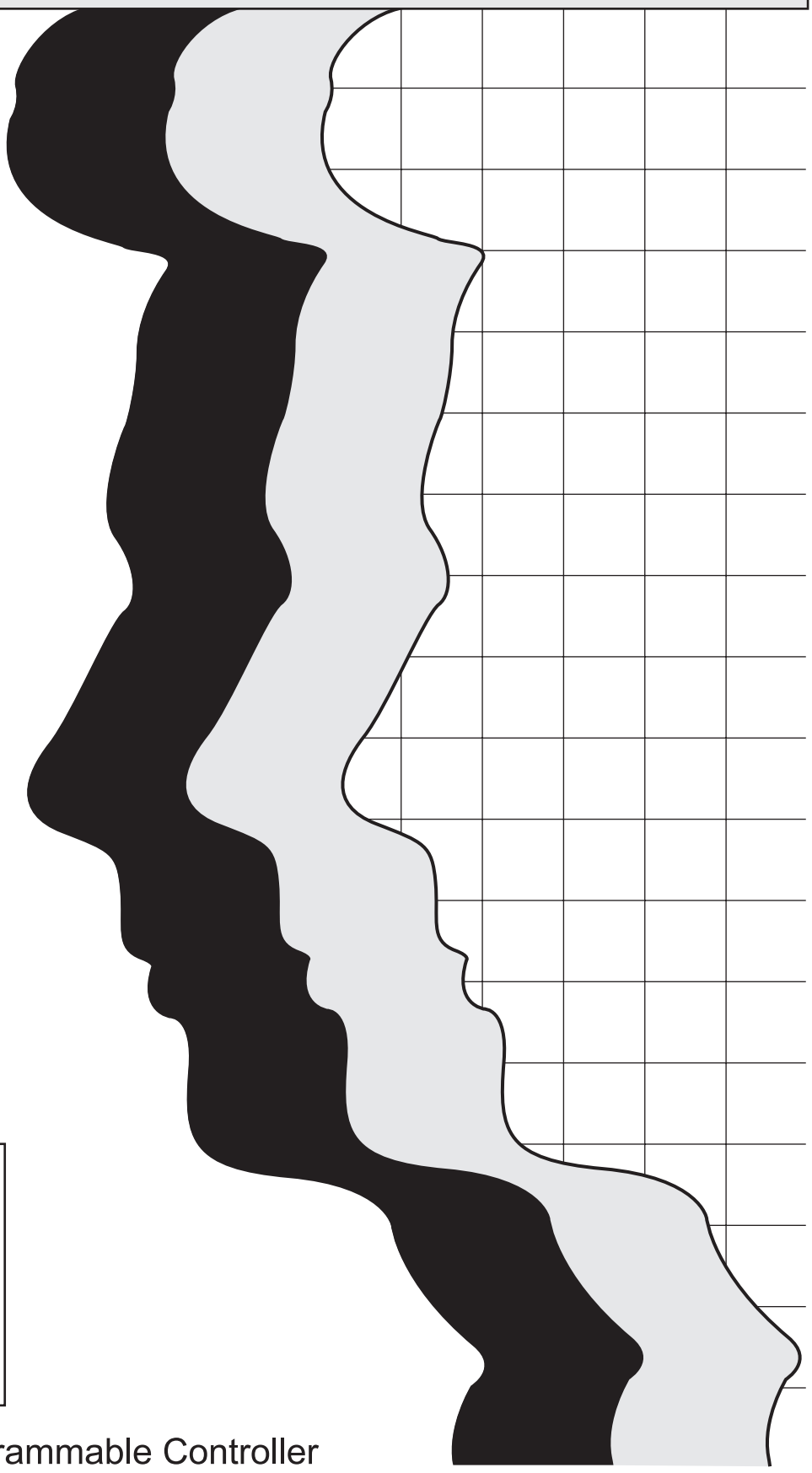
MITSUBISHI

AnS Module Type I/O

User's Manual



MELSEC

Mitsubishi Programmable Controller

• SAFETY PRECAUTIONS •

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.
The precautions given in this manual are concerned with this product only. For the safety precautions of the programmable controller system, refer to the user's manual for the CPU module used.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠ WARNING

• Create a safety circuit outside the programmable controller to ensure the whole system will operate safely even if an external power failure or a programmable controller failure occurs. Otherwise, incorrect output or malfunction may cause an accident.

(1) When creating an emergency stop circuit, a protection circuit or an interlock circuit for incompatible actions such as forward/reverse rotation or for damage prevention such as the upper/lower limit setting in positioning, create it outside the programmable controller. Install the emergency stop switch outsid the controlpanel so that workers can operate it easily.

(2) When the programmable controller detects the following error conditions, it stops the operation and turn off all the outputs.
- The overcurrent or overvoltage protector of the power supply module is activated.
- The programmable controller CPU detects an error such as a watchdog timer error by the self-diagnostics function.

In the case of an error undetectable by the programmable controller CPU, such as an I/O control part error, all the outputs may turn on. In order to make all machines operate safely in such a case, set up a fail-safe circuit or a specific mechanism outside the programmable controller. For a failsafe circuit example, refer to the user's manual for the CPU module used.

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

[Design Precautions]

⚠ WARNING

- If load current more than the rating or overcurrent due to a short circuit in the load has flowed in the output module for a long time, it may cause a fire and smoke. Provide an external safety device such as a fuse.
- Design a circuit so that the external power will be supplied after power-up of the programmable controller.
  Activating the external power supply prior to the programmable controller may result in an accident due to incorrect output or malfunction.
- For the operation status of each station at a communication error in data link, refer to the respective data link manual.
  Otherwise, incorrect output or malfunction may cause an accident.
- When controlling a running programmable controller (data modification) by connecting a peripheral device to the CPU module or a PC to a special function module, create an interlock circuit on sequence programs so that the whole system functions safely all the time.
  Also, before performing any other controls (e.g. program modification, operating status change (status control)), read the manual carefully and ensure the safety.
  In these controls, especially the one from an external device to a programmable controller in a remote location, some programmable controller side problem may not be resolved immediately due to failure of data communications.
  To prevent this, create an interlock circuit on sequence programs and establish corrective procedures for communication failure between the external device and the programmable controller CPU.
- When setting up the system, do not allow any empty slot on the base unit.
  If any slot is left empty, be sure to use a blank cover (A1SG60) or a dummy module (A1SG62) for it.
  When using the extension base unit, A1S52B(S1), A1S55B(S1) or A1S58B(S1), attach the included dustproof cover to the module in slot 0.
  Otherwise, internal parts of the module may be flied in the short circuit test or when an overcurrent or overvoltage is accidentally applied to the external I/O section.

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit or power lines, or bring them close to each other.
  Keep a distance of 100mm (3.94inch) or more between them.
  Failure to do so may cause malfunctions due to noise.
- When an output module is used to control the lamp load, heater, solenoid valve, etc., a large current (ten times larger than the normal one) may flow at the time that the output status changes from OFF to ON. Take some preventive measures such as replacing the output module with the one of a suitable current rating.

[Installation Precautions]

⚠ CAUTION

- Use the programmable controller under the environment specified in the user's manual for the CPU module used.
  Otherwise, it may cause electric shocks, fires, malfunctions, product deterioration or damage.
- Install the module after inserting the pegs on the bottom of the module securely into the base unit peg holes.
  Not doing so could cause a malfunction, failure or fall.
  Tightening the screw excessively may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.
- Be sure to shut off all the phases of the external power supply used by the system before mounting or removing the module.
  Failure to do so may damage the module.
- Do not directly touch the conductive part or electronic components of the module.
  Doing so may cause malfunctions or a failure of the module.

[Wiring Precautions]

⚠ WARNING

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

[Wiring Precautions]

⚠ CAUTION

- Always ground the FG and LG terminals to the protective ground conductor.
  Failure to do so may cause an electric shock or malfunctions.
- Wire the module correctly after confirming the rated voltage and terminal layout.
  Connecting a power supply of a different voltage rating or incorrect wiring may cause a fire or failure.
- Press, crimp or properly solder the connector for external connection with the specified tool.
  Incomplete connection may cause a short circuit, fire or malfunctions.
- Tighten terminal screws within the specified torque range.
  If the screw is too loose, it may cause a short circuit, fire or malfunctions.
  If too tight, it may damage the screw and/or the module, resulting in a short circuit or malfunctions.
- Carefully prevent foreign matter such as dust or wire chips from entering the module.
  Failure to do so may cause a fire, failure or malfunctions.
- Install our programmable controller in a control panel for use.
  Wire the main power supply to the power supply module installed in a control panel through a distribution terminal block.
  Furthermore, the wiring and replacement of a power supply module have to be performed by a maintenance worker who acquainted with shock protection.
  (For the wiring methods, refer to user's manual for the CPU module used.)

[Startup and Maintenance Precautions]

⚠ WARNING

- Do not touch any terminal during power distribution.
  Doing so may cause an electric shock.
- Be sure to shut off all phases of the external power supply used by the system before cleaning or retightening the terminal screws or module mounting screws.
  Failure to do so may result in an electric shock.
  If they are too loose, it may cause a short circuit or malfunctions.
  Tightening the screw excessively may damage the screw and/or the module, resulting in a drop of the module, a short circuit or malfunctions.

[Startup and Maintenance Precautions]

⚠ CAUTION
• When performing online operations (especially, program modification, forced output or operating status change) by connecting a peripheral device to the running CPU module, read the manual carefully and ensure the safety. Incorrect operation will cause mechanical damage or accidents. • Do not disassemble or modify each of modules. Doing so may cause failure, malfunctions, personal injuries and/or a fire. • When using a wireless communication device such as a mobile phone, keep a distance of 25cm (9.84inch) or more from the programmable controller in all directions. Failure to do so may cause malfunctions. • Be sure to shut off all the phases of the external power supply used by the system before mounting or removing the module. Failure to do so may result in failure or malfunctions of the module. • Do not install/remove the terminal block more than 50 times after the first use of the product. (IEC 61131-2 compliant) • Before handling modules, touch a grounded metal object to discharge the static electricity from the human body. Failure to do so may cause failure or malfunctions of the module.

[Disposal Precautions]

⚠ CAUTION
• When disposing of the product, treat it as an industrial waste.

• CONDITIONS OF USE FOR THE PRODUCT •

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

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

Print Date	*Manual Number	Revision
Feb.,1995	IB (NA) 66541-A	First edition
Nov.,1995	IB (NA) 66541-B	Addition of models A1SX10EU, A1SX20EU, A1SY10EU, A1SY14EU, A1SY18AEU, A1SY28EU Correction INTRODUCTION, CONTENTS, Manuals, Page 1-2, 1-3, 1-4, 4-7, 4-8
Jul.,1996	IB (NA) 66541-C	Correction Section 4.2
Sep.,1996	IB (NA) 66541-D	Correction Section 3.2, 4.1.1, 4.1.2, 4.1.3
Mar.,1997	IB (NA) 66541-E	Addition A6TB[ ]36[ ], A6TB[ ]54[ ],A6TBX70[ ], Chapter 5 Correction Section 4.2.1, 4.2.2
Sep.,1997	IB (NA) 66541-F	Addition SAFETY PRECAUTIONS, Section 1.1, 1.2 Correction CONTENTS, Section 1.2, 2.1 to 2.4, 2.8, 3.1 to 3.5, 3.8 to 3.11, 3.13, 4.1.2 to 4.1.5, 4.2.2, 5.1, 6.1, 6.2, Chapter 7, APPENDICES
Dec.,1997	IB (NA) 66541-G	Addition Section 1.2, 3.15 (A1SY81EP) Correction SAFETY PRECAUTIONS, CONTENTS, APPENDICES
May.,1999	IB (NA) 66541-H	Addition of models A1SX82-S1, A1SY82, A1SH42-S1
Oct., 2002	IB (NA) 66541-I	Equivalent to Japanese version I Partial correction CONTENTS, Manuals, Section 1.2, 2.1 to 2.4, 2.6, 2.8, 3.1 to 3.5, 3.8 to 3.11, 3.13, 4.1.3 to 4.1.6, 5.1, 8.1, 8.2, APPENDICES Partial addition Section 2.1 to 2.2.1, APPENDICES Addition Section 1.1, WARRANTY

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

Print Date	*Manual Number	Revision
May., 2003	IB (NA) 66541-J	Partial correction Section 1.2
Dec., 2003	IB (NA) 66541-K	Addition of models A1SY42P Partial correction SAFETY PRECAUTIONS, Section 1.2, 5.1 Addition Section 3.11.1
Nov., 2004	IB (NA) 66541-L	Partial correction SAFETY PRECAUTIONS, Section 1.2, 3.7.1, 3.8, 3.15, 5.2.1, 5.2.2
Sep., 2005	IB (NA) 66541-M	Partial correction Chapter 1, Section 1.1, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.10, 2.11, 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.10, 3.11, 3.11.1, 3.19, 4.1.1, 4.1.2, 4.1.3, 4.1.6, 5.1, Chapter 7, Appendix 1.2, 1.5.1, 1.5.2, 1.5.3, 1.6.2 Chapter 2 through 4 have been changed for the external connection diagrams. Addition Appendix 1.5.4
Jul., 2006	IB (NA) 66541-N	Addition of models A1SY40P, A1SY41P Partial correction SAFETY PRECAUTIONS, Section 1.2, 3.7, 3.7.1, 5.1, 6.1 Addition Section 3.9.1, 3.10.1
Apr., 2008	IB (NA) 66541-O	Addition of models A1SH42P, A1SH42P-S1 Partial correction Section 1.2, 3.6, 3.7, 3.8, 3.9.1, 3.10.1, 3.11.1, 3.19, 4.1.1, 4.1.3, 5.1, 5.2.1, 5.2.2, 8.1, Appendix 1.6.1, 1.6.3, 1.7.1 Chapter 2 through 4 have been changed for the external connection diagrams. Addition Section 4.1.2, 4.1.4

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

Print Date	*Manual Number	Revision
Jan., 2009	IB (NA) 66541-P	Partial correction Section 1.1, 1.2, 8.2 Addition Section 1.2.1, 1.2.2, 1.2.3, 1.2.4
Sep., 2010	IB (NA) 66541-Q	External connections are reviewed according to IEC 60617. Partial correction SAFETY PRECAUTIONS, Section 1.2.1, 1.2.2, Chapter 2 to 4, Chapter 5, Section 8.1 Addition CONDITIONS OF USE FOR THE PRODUCT
Dec., 2013	IB (NA)-66541-R	Partial correction Section 1.2.2, 1.2.4, 2.7, 2.8, 2.9, 2.11, 2.12, 3.11, 3.12, 3.13, 3.14, 3.19, 3.21, 3.22, 3.23, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 8.1, Appendix 1.7.1
Oct., 2014	IB (NA)-66541-S	Partial correction Section 3.14, 4.1.2, 4.1.4 Addition COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

Japanese Manual Version SH-3497-U

INTRODUCTION

Thank you for purchasing the MELSEC-A series programmable controller.
Before using the equipment, please read this manual carefully to develop full familiarity with the functions and performance of the A-series programmable controller you have purchased, so as to ensure correct use. Please forward a copy of this manual to the end user.

CONTENTS

MANUALS

The following manuals are also relevant to this product.

Related Manuals

Manual name	Manual number (model code)
Type A1S/A1SC24-R2/A2SCPU(S1) User's Manual Specifications, functions, and handling of the A1SCPU, A1SC24-R2CPU, and A2SCPU(S1), and specifications and handling of memory cassettes	IB-66320 (13J672)
Type A2USCPU(S1) User's Manual Specifications, functions, and handling of the A2USCPU(S1), and specifications and handling of memory cassettes	IB-66536 (13JE78)
Type A2USHCPU-S1/A2USCPU(S1)/A2ASCPU(S1/S30) User's Manual Specifications, functions, and handling of the A2USHCPU-S1, and specifications and handling of memory cassettes	IB-66789 (13JL30)
Type A1SJH(S8)/A1SH/A2SHCPU(S1) User's Manual Specifications, functions, and handling of the A1SJH(S8)CPU, A1SHCPU, and A2SHCPU(S1)CPU, and specifications and handling of memory cassettes	IB-66779 (13JL22)
Model Q2AS(H)CPU(S1) User's Manual Specifications, functions, and handling of the Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU, and Q2ASHCPU-S1CPU, and specifications and handling of power supply modules, memory cards, and base units	SH-3599 (13J858)

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance

To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.

- User's manual for the CPU module used
- User's manual (hardware) for the CPU module or base unit used

(2) Additional measures

No additional measures are necessary for the compliance of this product with EMC and Low Voltage Directives.

1. GENERAL SPECIFICATIONS OF INPUT AND OUTPUT MODULES AND INSRUCTIONS FOR SELECTING THEM

This chapter describes the general specifications of I/O modules and instructions for selecting them.

1.1 General Specifications

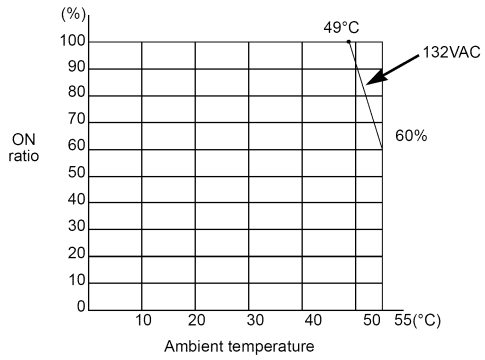
Refer to the CPU module user's manual for the general specifications of the I/O modules.

1.2 Precaution for Use

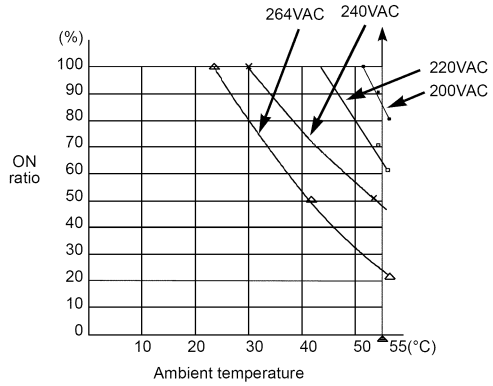
1.2.1 Input module

(1) Simultaneous ON points
The number of simultaneous on points of input module depends on the input voltage and ambient temperature.
Refer to the derating chart of the input module specifications.

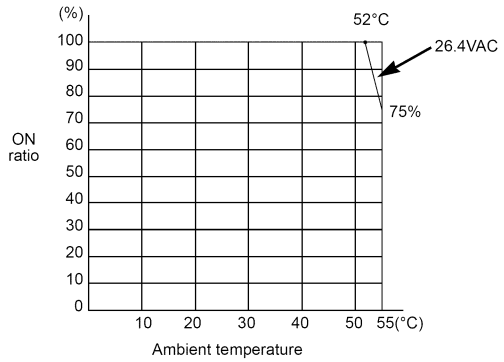
A1SX10



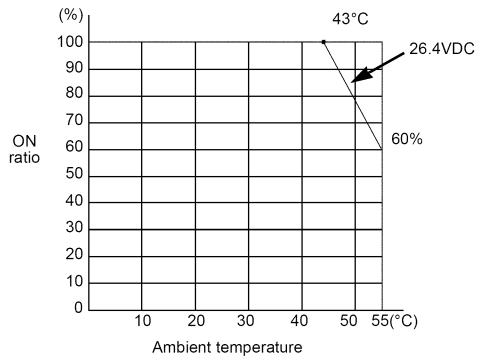
A1SX20, A1SX20EU



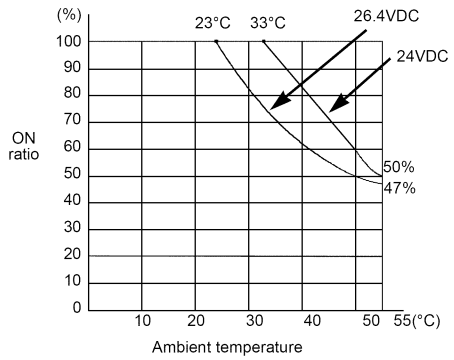
A1SX30



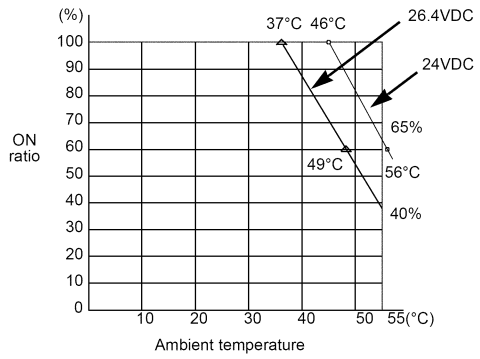
A1SX41(S1/S2), A1SX81(S2)



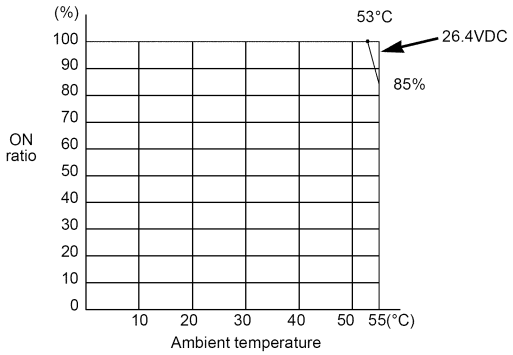
A1SX42(S1/S2)



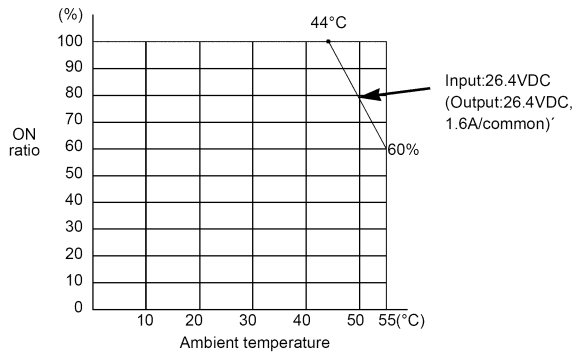
A1SX71



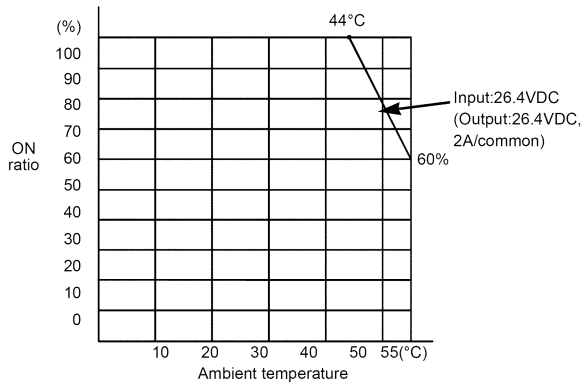
A1SX80-S1



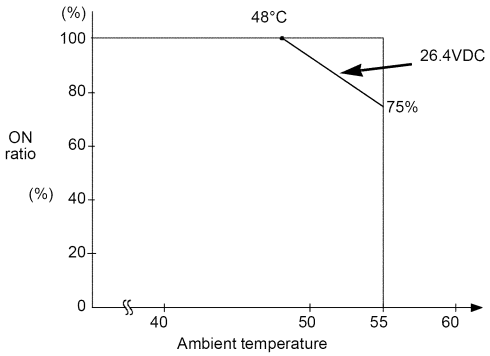
A1SH42, A1SH42-S1



A1SH42P, A1SH42P-S1



A1SJ-56DT

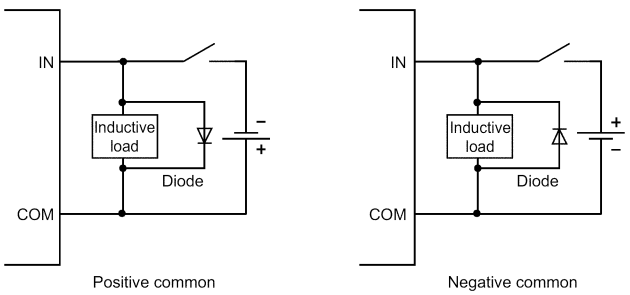


(2) Precautions for using the DC input module

(a) Measures against back EMF

When an inductive load is connected, connect a diode to the load in parallel.
Use a diode that meets the following conditions.

- Reverse breakdown voltage is equal to or more than 10 times as large as the circuit voltage.
- Forward current is equal to or more than 2 times as large as the load current.



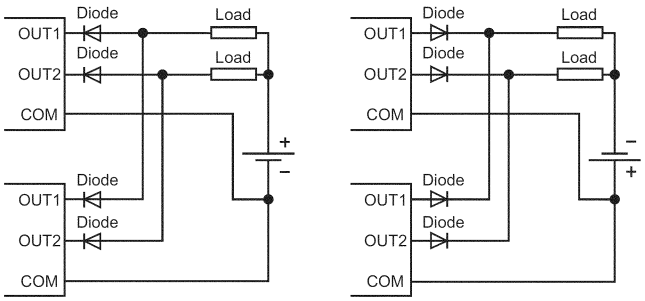
1.2.2 Output module

(1) Load and connectable output module
When the relays of the connected load is frequently switched or a coil load (e.g. electromagnet) of large capacity and low power factor is connected, use a triac output module.

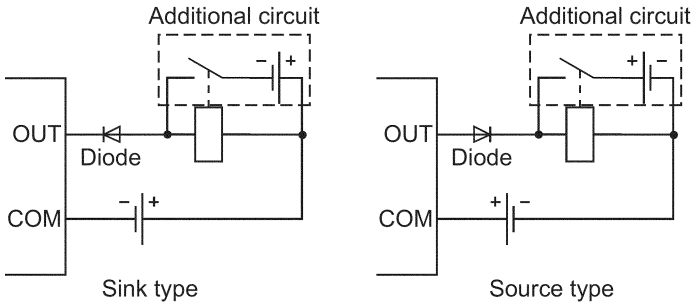
(2) Maximum switching frequency when the module drives inductive load
The output must be on for one second or longer and off for one second or longer.

(3) Load for connection
For the A1SY40, A1SY40P, A1SY41, A1SY41P, A1SY42, and A1SY42P, when employing a counter or timer using a DC/DC converter as a load, select an output module whose maximum load current is greater than the inrush current of the connected load.
Depending on the connected load, inrush current may flow at constant period while the output module is on or operating.
Therefore, when an output module is selected according to the average current of the connected load, the module may fail.
When selecting an output module in the manner, take either of the following actions to reduce the effect of inrush current or use the A1SY50, whose maximum load current is great.

(4) Precautions for using the transistor output module
(a) Action against reverse current
If a transistor output module is wired as shown below, reverse current flows in an output element, causing a failure of the element.
When wiring a transistor output module, connect a diode as shown below.
• When connecting transistor output modules in parallel



- When incorporating an additional circuit parallel to a transistor output module



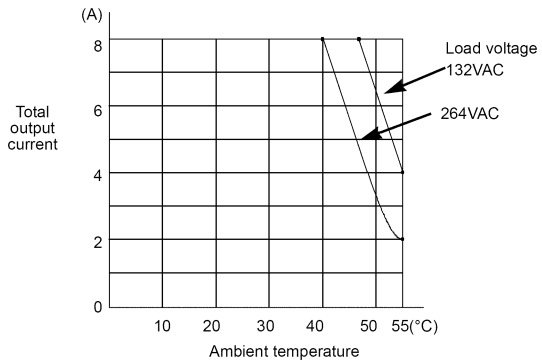
(5) Built-in fuses

Built-in fuses works to prevent the external cables from being burned when a short circuit occurs in the internal output circuit.
For this reason, the output module may not be protected if the fuses blow any other reasons except for a short circuit.

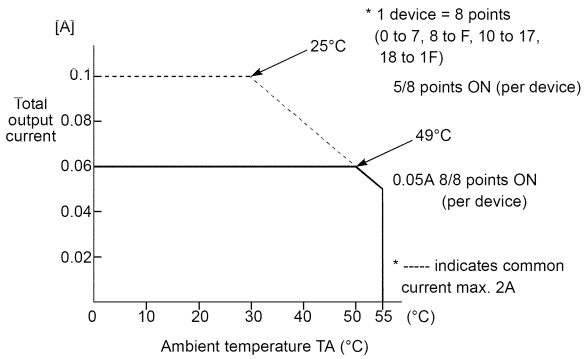
(6) Simultaneous ON points

The simultaneous on points depends on the input voltage and ambient temperature.
Select simultaneous on points with referring to the following.

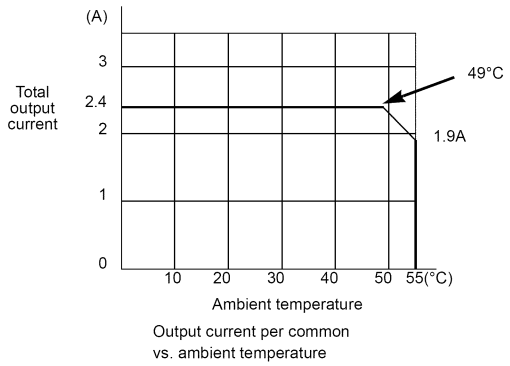
A1SY28A



A1SY81EP

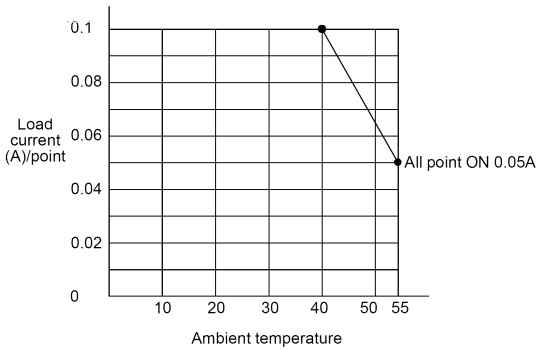


A1SY28EU



Output current per common vs. ambient temperature

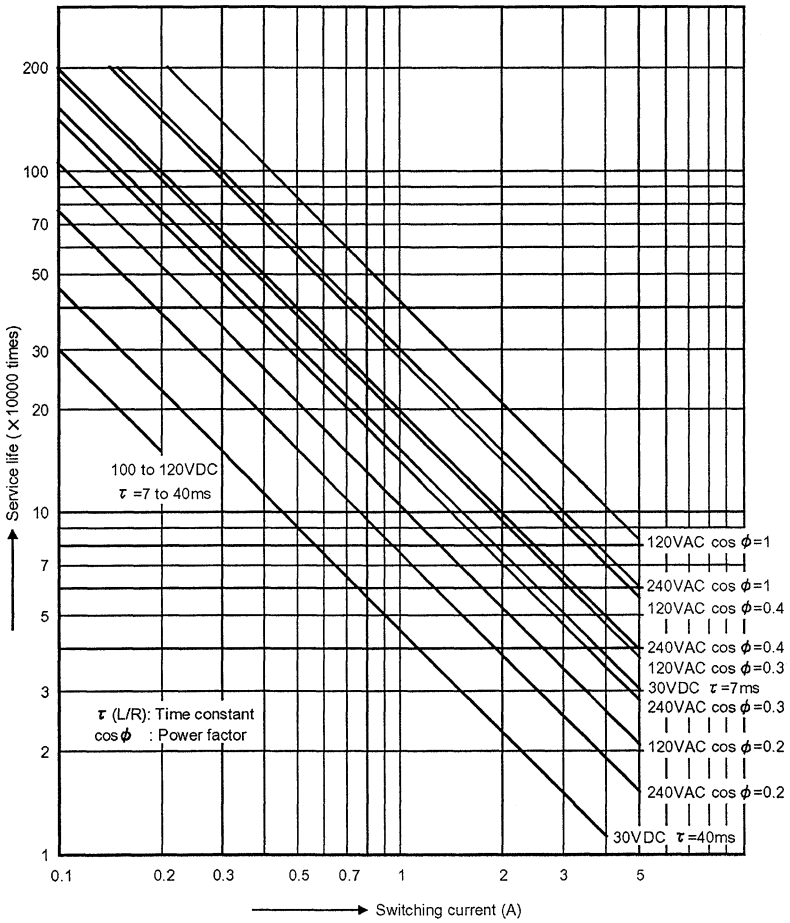
A1S42Y



(7) Precautions for using the contact output module
When using the contact output module, consider the following.
- Relay life (contact switching life)
- Effects to relay life due to connected load
- Measures against back EMF

(a) Relay life
The relay life depends on the operating environment.
Select a module according to the operating environment.
The relay lives shown below are the actual service values, not the guaranteed values. Replace the module well in advance since the actual switching life may be shorter than the one shown below.

Applicable module.....A1SY10, A1SJ-56DR, A1SX48Y18

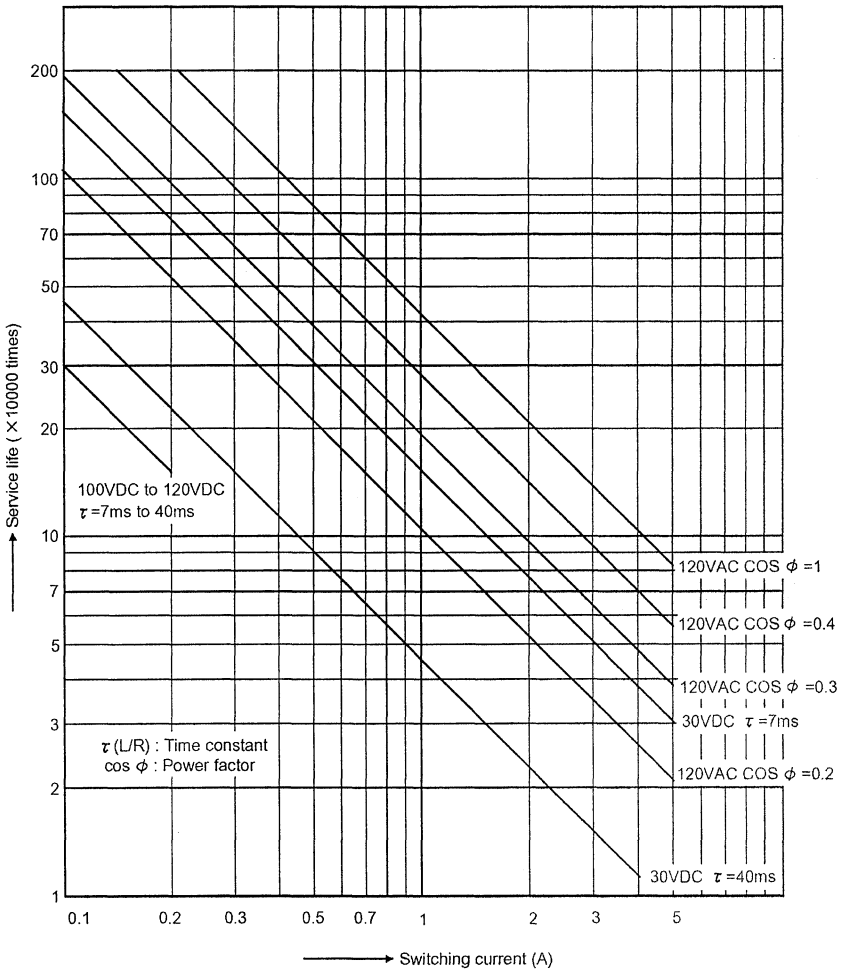


Operating environment	Switching life
Rated switching voltage/current load	100 thousand times
200VAC 1.5A, 240VAC 1A (COSϕ=0.7)	100 thousand times
200VAC 1A, 240VAC 0.5A (COSϕ=0.35)	100 thousand times
24VDC 1A, 100VDC 0.1A (L/R=7ms)	100 thousand times

Point

When using the module for the application in which the relay contact is frequently switched, the relay life span should be considered. It is recommended to use a triac output module.

Applicable module: A1SY10EU

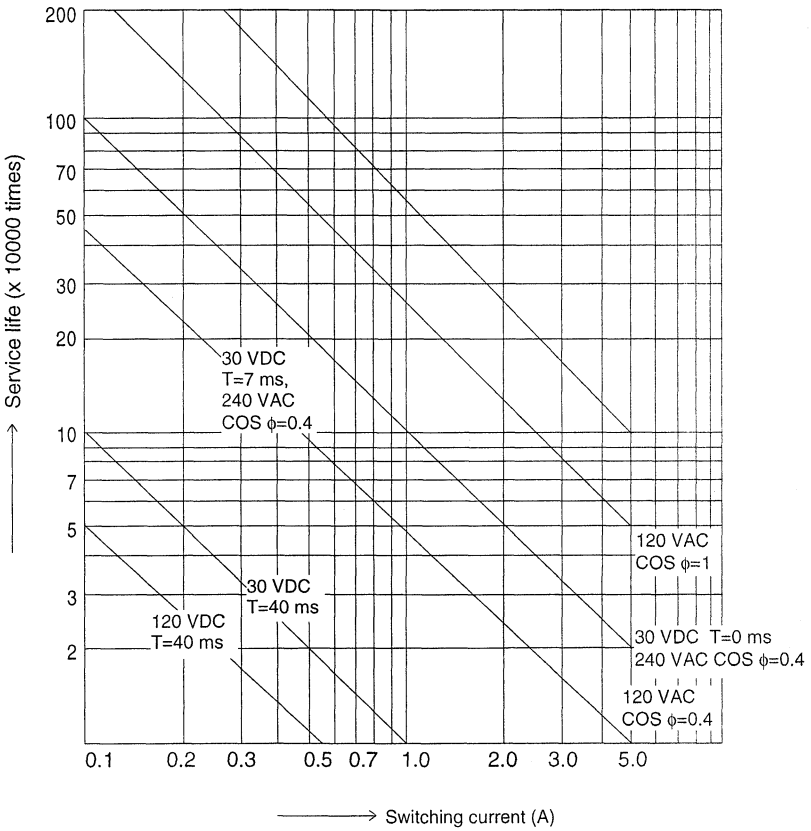


Operating environment	Switching life
Rated switching voltage/current load	200 thousand times
100VAC 2A, 120VAC 2A (COS ϕ =0.7)	200 thousand times
100VAC 2A, 120VAC 2A (COS ϕ =0.35)	100 thousand times
24VDC 1.5A, 100VDC 0.1A (L/R=7ms)	100 thousand times

Point

When using the module for the application in which the relay contact is frequently switched, the relay life span should be considered. It is recommended to use a triac output module.

Applicable module: A1SY14AEU

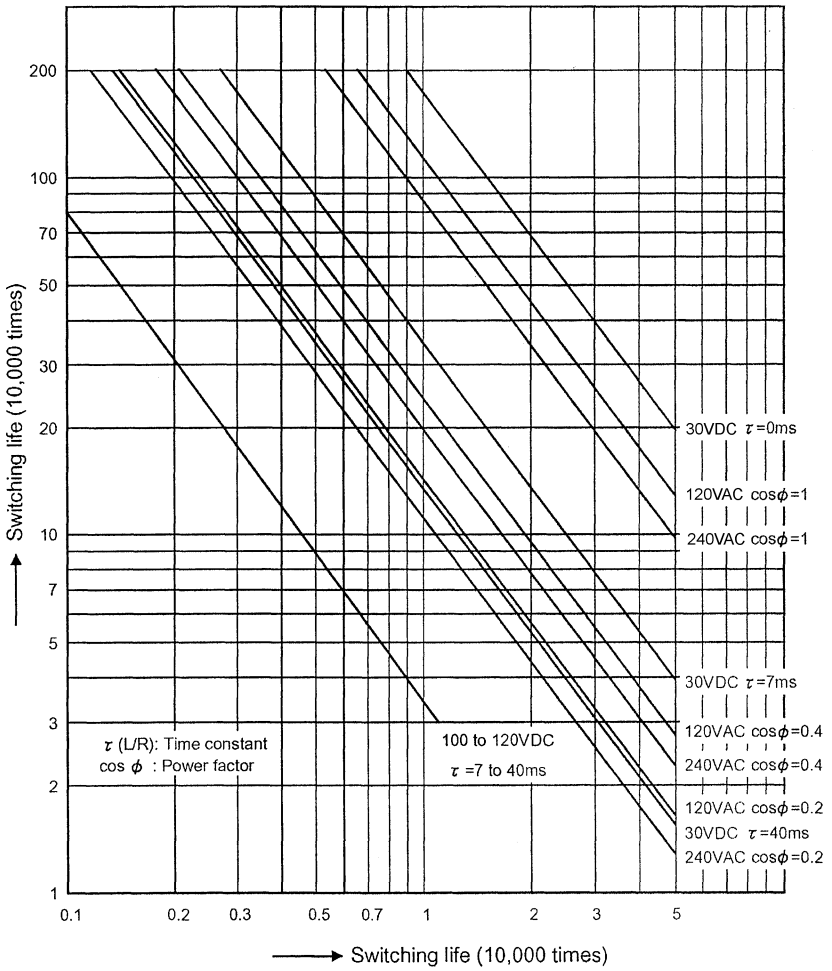


Operating environment	Switching life
Rated switching voltage/current load	200 thousand times
200VAC 2A, 240VAC 1.8A (COSϕ=0.7)	200 thousand times
200VAC 1.1A, 240VAC 0.9A (COSϕ=0.35)	200 thousand times
24VDC 1.1A, 100VDC 0.1A (L/R=7ms)	200 thousand times

Point

When using the module for the application in which the relay contact is frequently switched, the relay life span should be considered. It is recommended to use a triac output module.

Aplicable module: A1SY18A, A1SY18AEU



Operating environment	Switching life
Rated switching voltage/current load	200 thousand times
200VAC 1.5A, 240VAC 1A (COSφ=0.7)	200 thousand times
200VAC 0.75A, 240VAC 0.5A (COSφ=0.35)	200 thousand times
24VDC 1A, 100VDC 0.1A (L/R=7ms)	200 thousand times

Point

When using the module for the application in which the relay contact is frequently switched, the relay life span should be considered. It is recommended to use a triac output module.

(b) Effects to relay life due to connected load

The actual relay life may be significantly shortened compared to the one shown in (7)(a), depending on the type of a load connected and the characteristics of inrush current.

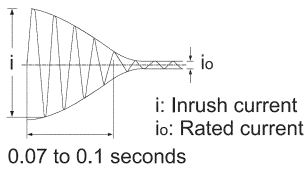
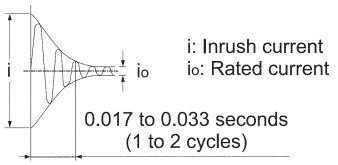
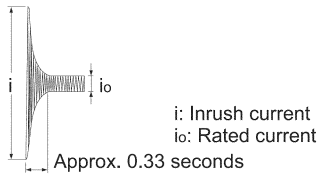
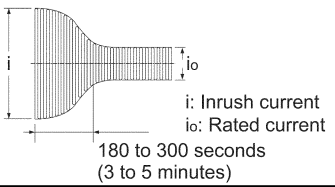
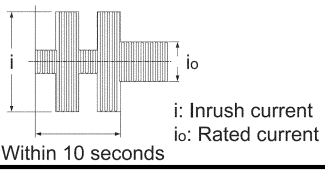
Also, the inrush current may cause contact welding.

Take the following measures to prevent shortening of the relay life and the contact welding.

- Select a load so that the inrush current will be within the rated current of the module.
- Connect an external relay that can withstand the inrush current.

The following table shows the relation between the road and the inrush current. Select a load so that the inrush current (i) and the rated current (io) will be within the rated switching current specified for the output module used.

The inrush current may flow for a longer time depending on the load.

Load type	Signal waveform diagram	Inrush current(i)/rated current (io)	Signal waveform diagram	Inrush current(i)/rated current (io)
Inductive load	Load of a solenoid 	Approx. 10 to 20 times	Load of an electromagnetic contactor 	Approx. 3 to 10 times
Lamp load	Load of an incandescent bulb 	Approx. 3 to 10 times	Load of a mercury lamp 	Approx. 3 times*1
	Load of a fluorescent 	Approx. 5 to 10 times	—	—

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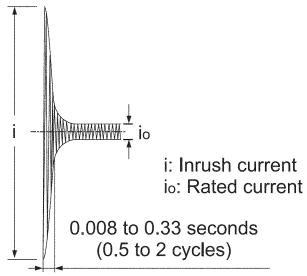
*1: Typical electric-discharge lamp circuit includes discharge tubes, transformers, choke coils, and capacitors. Therefore, note that the inrush current may flow 20 to 40 times as large as the rated current in the case of high power factor and low power impedance.

Load type	Signal waveform diagram	Inrush current(i)/rated current (io)	Signal waveform diagram	Inrush current(i)/rated current (io)
Capacitive load	Capacitive load*2 	Approx. 20 to 40 times	—	—

*2: When the wiring of the circuit is long, take care of the wire capacity.

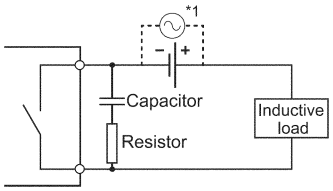
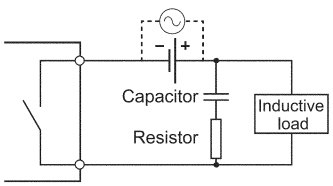
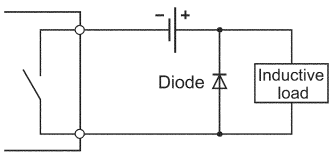
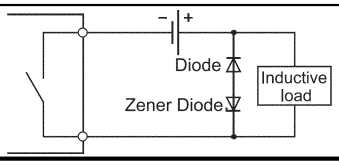
(c) Measures against back EMF

Configure a contact protection circuit for extending the contact life, preventing noise when the contact is cut off, and suppressing the generation of carbide and nitric acid due to arc discharge.

An Incorrect contact protection circuit may cause contact welding.

Also, when using the contact protection circuit, the recovery time may be long.

The following table shows the representative examples of the contact protection circuit.

Circuit example		Method for selecting elements	Remarks
Capacitor + Resistor method (CR method)		Refer to the following for constants of the capacitor and resistor. Note that the following values may differ depending on a nature of the load and a variation of characteristics of it. • Capacitor 0.5 to 1 (μF) against contact current of 1A • Resistor 0.5 to 1 (Ω)against contact voltage of 1V Use a capacitor whose withstand voltage is 200 to 300V. In AC circuit, use a capacitor having no polarity.	If a load is from a relay or solenoid, the recovery time delays. A capacitor suppresses electric discharge while a contact is off, and a resistor restricts a flow of current while a contact is on.
			
Diode method		Use a diode that meets both conditions shown below. • Reverse breakdown voltage is equal to or more than 10 times as large as the circuit voltage. • The forward current is equal to or more than 2 times as large as the load current.	The recovery time is later than the CR method.
Diode + Zener diode method		Use zener voltage for the zener diode equal to or more than the power supply voltage.	The diode method is effective when the recovery time is too late.

*1: When using AC power, impedance of CR must be larger enough than that of the load. (prevention of a malfunction due to leak current from the CR)

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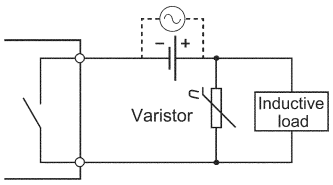
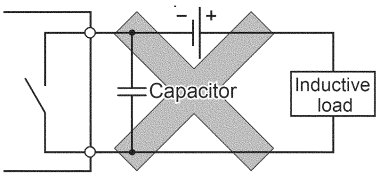
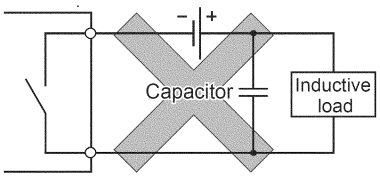
Circuit example		Method for selecting elements	Remarks
Varistor method		Select a cut voltage (Vc) for the varistor to meet the following condition. • Vc > power voltage×1.5(V) • Vc > power voltage×1.5(V) ×√2 (When using AC power) This method is not effective when the Vc is too high.	The recovery time delays slightly.

POINT

(1) Avoid providing contact protection circuits shown below.
These circuits are effective for preventing an arc at shut-off. However, the contact welding may occur because the charge current flows to capacitor when the contact turns on or off.
A DC inductive load is usually harder for switching than a resistor load, but if a proper protection circuit is configured, the performance will be similar to the resistor load.

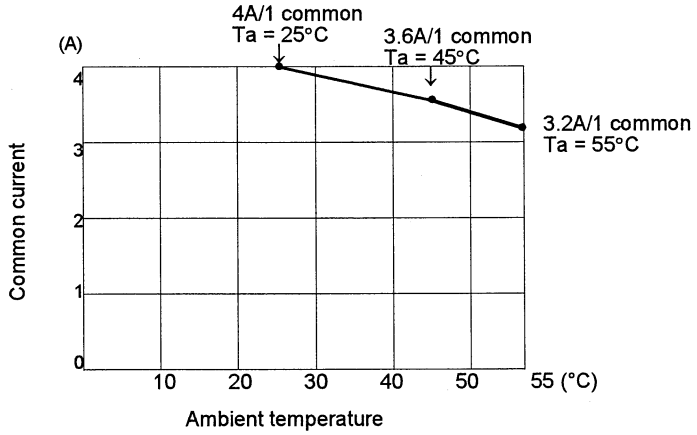




(2) A protection circuit must be provided closely to a load or contact (module). If their distance is far, the protection circuit may not be effective. Appropriate distance is within 50cm.

(8) Precautions for using the A1SY60
The common current of the A1SY60 varies according to ambient temperature. Select a common current referring to the chart shown below.

A1SY60 derating curve



1.2.3 Module with protection function

The overload protection function and overheat protection function of the following modules will be explained below.

(1) A1SY40P, A1SY41P, A1SY42P, A1SH42P, A1SH42P-S1

Function	Description
Common (Overload and overheat protection functions)	• If an overcurrent keeps flowing due to overload, heat is generated to activate the overheat protective function. • Each protection function is designed to protect the internal elements of the module, not the external equipment.
Overload protection function	• The overload protection function is activated in 1 point increments in terms of 1A to 3A/point. • The overload protection function returns operation to normal when the load becomes a rated load.
Overheat protection function	• The overheat protection function is activated in 1 point increments. • The overheat protection function automatically returns operation to normal when heat reduces.

1.2.4 Installation and woring

(1) 40-pin connector

The A1SX41, A1SX42, A1SY41, A1SY41P, A1SY42 and A1SY42P supplied with soldering-type 40-pin connectors. 40-pin connectors of the pressure-displacement type and crimp contact type are also available.

Tools for the pressure displacement and crimp contact type connectors must be procured from the following suppliers:

(a) 40-pin connectors

Type	Model name	Applicable wire size
Soldering connector (straight out type)	A6CON1 *1	0.088 to 0.3mm^2 (28 to 22 AWG) (stranded wire)
Crimp connector (straight out type)	A6CON2	28 to 24 AWG (stranded wire)
Pressure-displacement connector (straight out type)	A6CON3	28 AWG (stranded wire) 30 AWG (single wire) Flat cable of 1.27mm pitch
Soldering connector (both for straight out and 45-degree types)	A6CON4 *1	0.088 to 0.3mm^2 (28 to 22 AWG) (stranded wire)

*1 Use cables with outside diameter of 1.3mm or shorter to connect 40 cables to the connector. In addition, consider the amount of current to be used and select appropriate cables.

(b) 40-pin connector crimp-contact and pressure-displacement tools

Type	Model name	Contact
Crimp-contact tool	FCN-363T-T005/H	FUJITSU COMPONENT LIMITED
Pressure-displacement tool	FCN-367T-T012/H (locator plate)	
	FCN-707T-T001/H (cable cutter)	
	FCN-707T-T101/H (hand press)	

(2) 37-pin D sub-connector

The 37-pin D sub-connector for the A1SX81 and A1SY81 is a soldering-type connector. Crimp-contact-type and pressure-displacement type 37-pin D sub-connectors are also available.

Tools for the crimp-contact-type connectors must be procured by the user.

(a) 37-pin D-sub connectors

Type	Model name	Applicable wire size
Soldering connector (straight out type)	A6CON1E*1	0.088 to 0.3mm^2 (28 to 22 AWG) (stranded wire)
Crimp connector (straight out type)	A6CON2E	24 to 20 AWG (stranded wire)
Pressure-displacement connector (straight out type)	A6CON3E	28 AWG (stranded wire) 30 AWG (single wire)

*1 Use cables with outside diameter of 1.3mm or shorter to connect 37 cables to the connector. In addition, consider the amount of current to be used and select appropriate cables.

(b) 37-pin D-sub connector crimp-contact and pressure-displacement tools

Type	Model name	Contact
Crimp-contact tool	91503-1	Tyco Electronics AMP K.K.
Pressure-displacement tool	768349-1 (die set) 768338-1	
	91220-1 (cable cutter)	
	91085-2 (hand mini-press)	

(3) Tightening torque

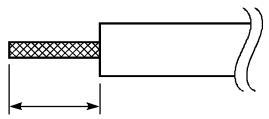
The fixing screw tightening torque should be within the following range.

Module fixing screw (M4 screw) ..... 78.4 to 117.6N • cm

(4) Precautions for handling the I/O modules compatible with A1SX □□ EU, A1SY □□ EU type marked CE.
When connecting electric cable to the terminal block without using solderless terminals.

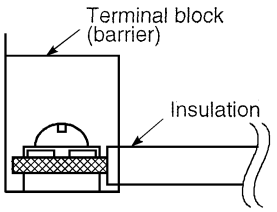
(a) Bare the end of insulated wires to expose about 6 to 8 mm of naked wire.

When making connections, ensure that bared wire does not project from the terminal block. If it does, it may close the gap to a distance shorter than that required for insulation between the terminals



Bared length: 6 to 8 mm (0.24 to 0.31 in.)

Treatment of end of wire



Connection to the terminal block
(viewed from side)

(b) If twisted wire is used, make sure that is does not unravel.

(5) Terminal block protective cover
When the terminal block cover cannot be closed due to wire gauge treatment, etc., replace the terminal block cover with the following product. This protects the charging section.

Type: A1STEC-S

Applicable module

	Type
Input module	A1SX10, A1SX20, A1SX30, A1SX40(S1/S2), A1SX80(S1/S2)
Output module	A1SY10, A1SY18A, A1SY22, A1SY28A, A1SY40, A1SY41P, A1SY50, A1SY60(E), A1SY68A, A1SY80, A1SY81EP
Input/output composite module	A1SX48Y18, A1SX48Y58
Special function module	A1SI61, A1S64AD, A1S62DA, A1S63ADA, A1S62RD3/4, A1SD61, A1SP60

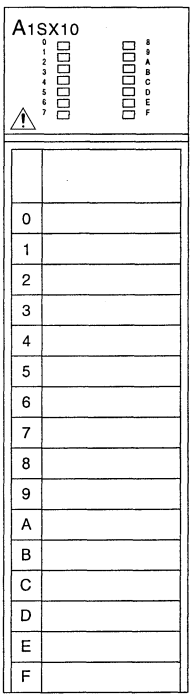
(6) Precaution when Connecting the Uninterruptive Power Supply (UPS)
Use a UPS which employs the constant inverter power supply method with 5 % or less voltage fluctuation.
Do not use a UPS with the constant commercial power supply method.

2. INPUT MODULE SPECIFICATIONS

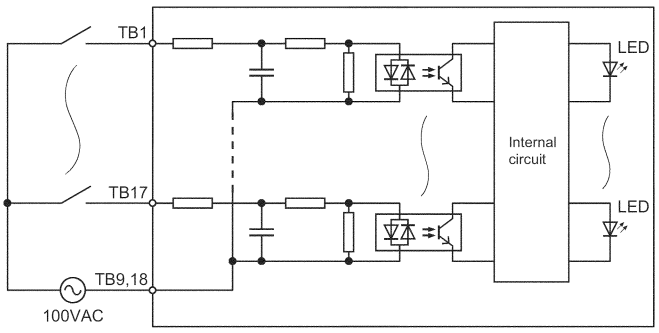
2.1 A1SX10 AC Input Module

Specifications \ Model		AC Input Module A1SX10
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		100 to 120 VAC 50/60 Hz
Input voltage distortion factor		5% or less (See section 1.2.4(6))
Rated input current		Approx. 6 mA (100 VAC 60 Hz)
Operating voltage range		85 to 132 VAC (50/60 Hz ±5%)
Max. simultaneous input points		100% simultaneously ON (at 110 VAC) 60% simultaneously ON (at 132 VAC)
Inrush current		Max. 200 mA, within 1 ms (132 VAC)
ON voltage/ON current		80 VAC or higher/5 mA or higher
OFF voltage/OFF current		30 VAC or lower/1.4 mA or lower
Input impedance		Approx. 18 kΩ (60 Hz), Approx. 21 kΩ (50 Hz)
Response time	OFF → ON	20 ms or less (100 VAC 60 Hz)
	ON → OFF	35 ms or less (100 VAC 60 Hz)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25mm^2(AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3 RAV1.25-3.5, RAV2-3.5
Accessories		None
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)
Weight kg		0.21

Appearance



External Connections

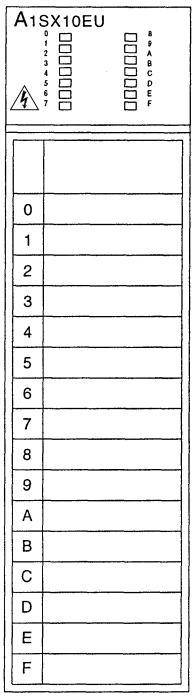


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

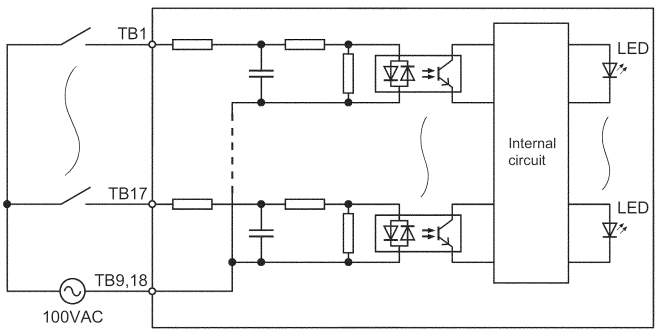
2.2 A1SX10EU AC Input Module

Specifications \ Model		AC Input Module A1SX10EU
Number of input points		16 points
Insulation method		Photocoupler
Rated input voltage		100 to 120 VAC 50/60 Hz
Input voltage distortion factor		5% or less (See section 1.2.4(6))
Rated input current		Approx. 7 mA (120 VAC 60 Hz)
Operating voltage range		85 to 132 VAC (50/60 Hz ±5%)
Max. simultaneous input points		100% simultaneously ON
Inrudh current		Max. 200 mA, within 1 ms (132 VAC)
ON voltage/ON current		80 VAC or higher/5 mA or higher
OFF voltage/OFF current		30 VAC or lower/1.4 mA or lower
Input impedance		Approx. 18 kΩ (60 Hz), Approx. 21 kΩ (50 Hz)
Response time	OFF → ON	20 ms or less (100 VAC 60 Hz)
	ON → OFF	35 ms or less (100 VAC 60 Hz)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable crimp terminals		RAV1.25-3.5
Accessories		None
Insulation withstand voltage		1780 VAC rms/3 cycle (altitude 2,000 m)
Insulation resistor		10 MΩ or higher at insulation resistance tester
Noise immunity		IEC801-4:1 kV
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)
Weight kg		0.21

Appearance



External Connections

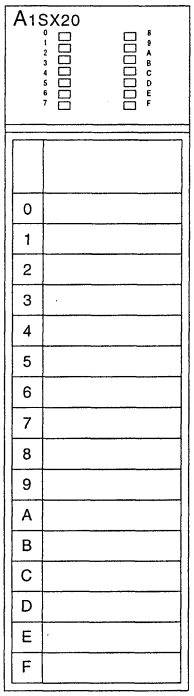


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

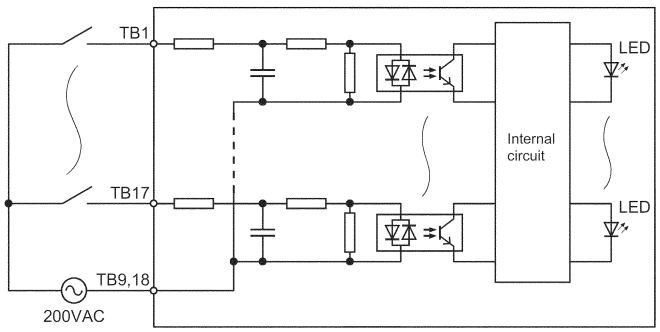
2.3 A1SX20 AC Input Module

Specifications \ Model		AC Input Module
		A1SX20
Number of input points		16 points
Isolation method		Photocoupler
Rated input voltage		200 to 240 VAC 50/60 Hz
Input voltage distortion factor		5% or less (See section 1.2.4(6))
Rated input current		Approx. 9 mA (200 VAC 60 Hz)
Operating voltage range		170 to 264 VAC (50/60 Hz ±5%)
Max. simultaneous input points		60% simultaneously ON (at 220 VAC)
Inrush current		Max. 500 mA, within 1 ms (264 VAC)
ON voltage/ON current		80 VAC or higher/4 mA or higher
OFF voltage/OFF current		30 VAC or lower/1 mA or lower
Input impedance		Approx. 22 kΩ (60 Hz), Approx. 27 kΩ (50 Hz)
Response time	OFF → ON	30 ms or less (200 VAC 60 Hz)
	ON → OFF	55 ms or less (200 VAC 60 Hz)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5
Accessories		None
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)
Weight kg		0.23

Appearance



External Connections

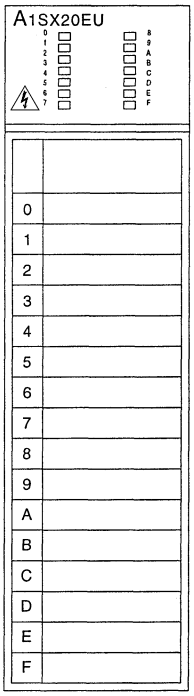


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

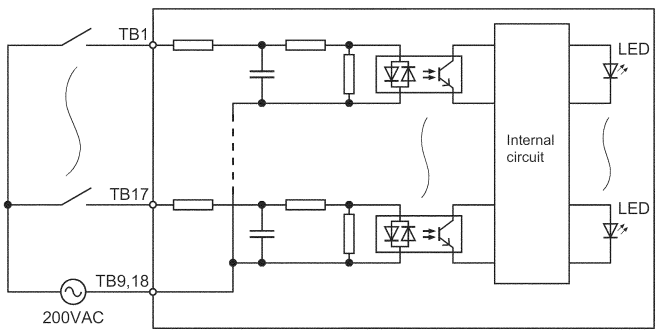
2.4 A1SX20EU AC Input Module

Specifications \ Model		AC Input Module
		A1SX20EU
Number of input points		16 points
Insulation method		Photocoupler
Rated input voltage		200 to 240 VAC 50/60 Hz
Input voltage distortion factor		5% or less (See section 1.2.4(6))
Rated input current		Approx. 11 mA (240 VAC 60 Hz)
Operating voltage range		170 to 264 VAC (50/60 Hz ±5%)
Max. simultaneous input points		60% simultaneously ON (at 220 VAC)
Inrush current		Max. 500 mA, within 1 ms (264 VAC)
ON voltage/ON current		80 VAC or higher/4 mA or higher
OFF voltage/OFF current		30 VAC or lower/1 mA or lower
Input impedance		Approx. 22 kΩ (60 Hz), Approx. 27 kΩ (50 Hz)
Response time	OFF → ON	30 ms or less (200 VAC 60 Hz)
	ON → OFF	55 ms or less (200 VAC 60 Hz)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable crimp terminals		RAV1.25-3.5
Accessories		None
Insulation withstand voltage		2830 VAC rms/3 cycle (altitude 2,000 m)
Insulation resistor		10 MΩ or higher at insulation resistance tester
Noise immunity		IEC801-4:1 kV
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)
Weight kg		0.23

Appearance



External Connections

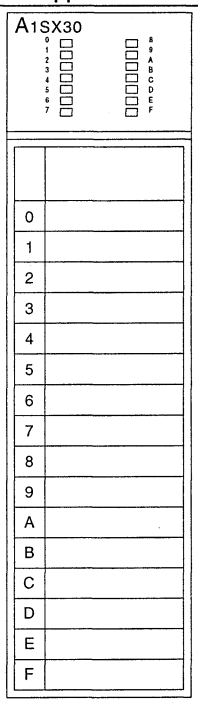


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

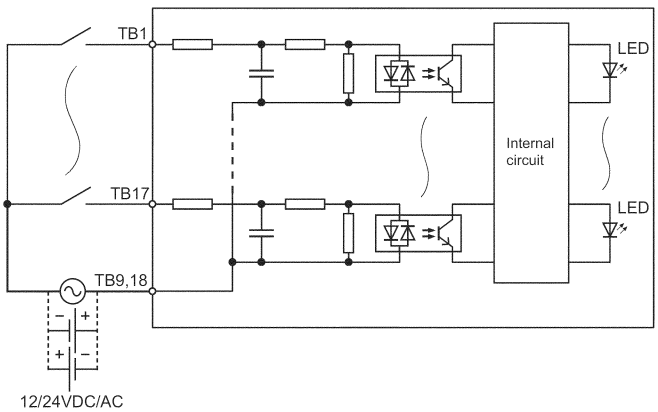
2.5 A1SX30 DC/AC Input Module

Specifications \ Model		DC/AC Input Module	
		A1SX30	
Number of input points		16 points	
Isolation method		Photocoupler	
Rated input voltage		12/24 VDC	12/24 VAC 50/60 Hz
Rated input current		4 mA (12 VDC/AC), 8.5 mA (24 VDC/AC)	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)	10.2 to 26.4 VAC (50/60 Hz ±5%)
Max. simultaneous input points		75% simultaneously ON (at 26.4 VDC)	
ON voltage/ON current		7 VDC/AC or higher/2 mA or higher	
OFF voltage/OFF current		2.7 VDC/AC or lower/0.7 mA or lower	
Input impedance		Approx. 2.7 kΩ	
Response time	OFF → ON	20 ms or less (12/24 VDC)	25 ms or less (12/24 VAC 60Hz)
	ON → OFF	20 ms or less (12/24 VDC)	20 ms or less (12/24 VAC 60Hz)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)	
Operating indicator		ON state is indicated (LEDs)	
External connections		20-point terminal block connector (M3.5 x 7 screws)	
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)	
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5	
Accessories		None	
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)	
Weight kg		0.2	

Appearance



External Connections

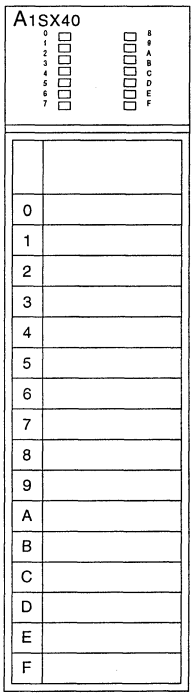


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

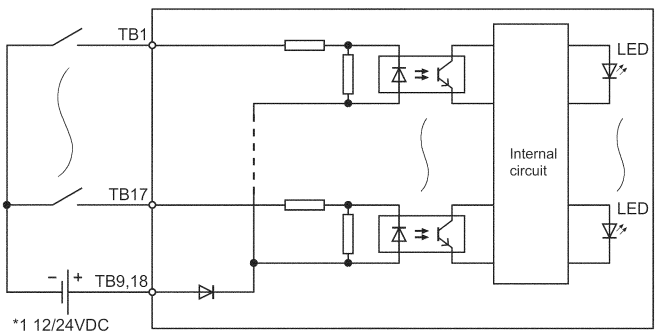
2.6 A1SX40(S1/S2) DC Input Module (Sink Type)

Specifications \ Model	DC Input Module (Sink Type)			
	A1SX40		A1SX40-S1	A1SX40-S2
Number of input points	16 points			
Isolation method	Photocoupler			
Rated input voltage	12 VDC	24 VDC	24 VDC	
Rated input current	Approx. 3 mA	Approx. 7 mA	Approx. 7 mA	
Operating voltage range	10.2 to 26.4 VDC (ripple: less than 5%)		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points	100% simultaneously ON (at 26.4 VDC)			
ON voltage/ON current	8 VDC or higher/2 mA or higher		14 VDC or higher/4 mA or higher	14 VDC or higher/3.5 mA or higher
OFF voltage/OFF current	4 VDC or lower/1 mA or lower		6.5 VDC or lower/1.7 mA or lower	
Input resistance	Approx. 3.3 kΩ			
Response time: OFF → ON	10 ms or less (24 VDC)		0.1 ms or less (24 VDC)	10 ms or less (24 VDC)
Response time: ON → OFF	10 ms or less (24 VDC)		0.2 ms or less (24 VDC)	10 ms or less (24 VDC)
Common terminal arrangement	16 points/common (common terminals: TB9, TB18)			
Operating indicator	ON state is indicated (LEDs)			
External connections	20-point terminal block connector (M3.5 x 7 screws)			
Applicable wire size	0.75 to 1.25 mm^2 (AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)			
Applicable solderless terminals	R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5			
Accessories	None			
Internal current consumption (5 VDC)	50 mA (TYP, all points ON)			
Weight kg	0.2			

Appearance



External Connections

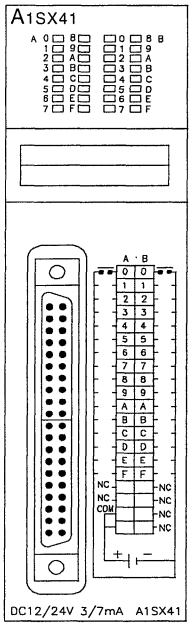


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

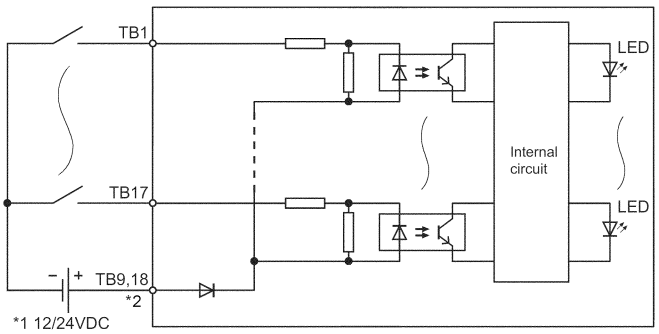
*1: A1SX40-S1/S2 is 24 VDC only.

2.7 A1SX41(S1/S2) DC Input Module (Sink Type)

Specifications \ Model		DC Input Module (Sink Type)			
		A1SX41	A1SX41-S1	A1SX41-S2	Appearance
Number of input points		32 points			
Isolation method		Photocoupler			
Rated input voltage		12 VDC / 24 VDC	24 VDC		
Rated input current		Approx. 3 mA / Approx. 7 mA	Approx. 7 mA		
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)	19.2 to 26.4 VDC (ripple: less than 5%		
Max. simultaneous input points		60% (20 points/common) simultaneously ON (at 26.4 VDC)			
ON voltage/ON current		8 VDC or higher/ 2 mA or higher	17 VDC or higher/ 4.5 mA or higher	14 VDC or higher/ 3.5 mA or higher	
OFF voltage/OFF current		4 VDC or lower/ 1 mA or lower	3.5 VDC or lower/ 0.8 mA or lower	6.5 VDC or lower/ 1.7 mA or lower	
Input resistance		Approx. 3.3 kΩ			
Response time	OFF → ON	10 ms or less (24 VDC)	0.3 ms or less (24 VDC)	10 ms or less (24 VDC)	
	ON → OFF	10 ms or less (24 VDC)	0.3 ms or less (24 VDC)	10 ms or less (24 VDC)	
Common terminal arrangement		32 points/common (common terminals: B1, B2)			
Operating indicator		ON state is indicated (LEDs)			
External connections		40-pin connector			
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3			
Accessories		Connector (1 pce.) for external wiring (soldering type)			
Internal current consumption (5 VDC)		80 mA (TYP, all points ON)	120 mA (TYP, all points ON)	80 mA (TYP, all points ON)	
Weight kg		0.21			



External Connections



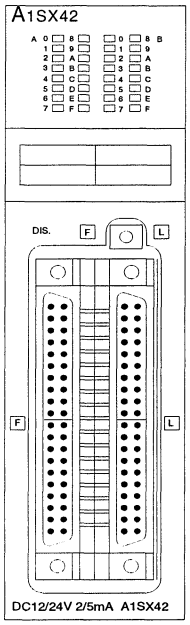
Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
	B20	X00	A20	X10
	B19	X01	A19	X11
	B18	X02	A18	X12
	B17	X03	A17	X13
	B16	X04	A16	X14
	B15	X05	A15	X15
	B14	X06	A14	X16
	B13	X07	A13	X17
	B12	X08	A12	X18
	B11	X09	A11	X19
	B10	X0A	A10	X1A
	B9	X0B	A9	X1B
	B8	X0C	A8	X1C
	B7	X0D	A7	X1D
	B6	X0E	A6	X1E
	B5	X0F	A5	X1F
	B4	Vacant	A4	Vacant
	B3	Vacant	A3	Vacant
Front view	B2	COM	A2	Vacant
	B1	COM	A1	Vacant

*1: A1SX41-S1/S2 is 24 VDC only.

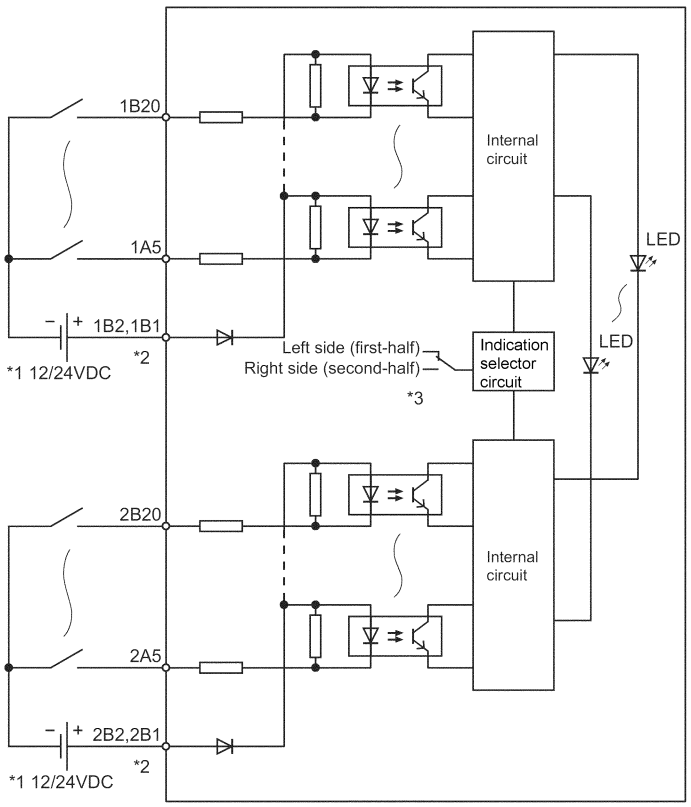
*2: The arrangement of pins A and B shown above is the opposite of the arrangement of pins of the connector on the module.

*3: When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

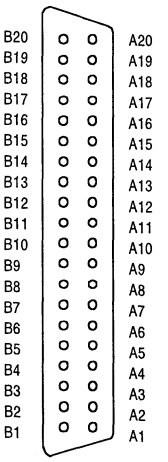
2.8 A1SX42(S1/S2) DC Input Module (Sink Type)

Specifications \ Model		DC Input Module (Sink Type)			
		A1SX42	A1SX42-S1	A1SX42-S2	Appearance
Number of input points		64 points			
Isolation method		Photocoupler			
Rated input voltage		12 VDC / 24 VDC	24 VDC		
Rated input current		Approx. 2 mA / Approx. 5 mA	Approx. 5 mA		
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)	19.2 to 26.4 VDC (ripple: less than 5%)		
Max. simultaneous input points		50% (16 points/common) simultaneously ON (at 24 VDC)			
ON voltage/ON current		8 VDC or higher/ 2 mA or higher	18.5 VDC or higher/ 3.5 mA or higher	17.5 VDC or higher/ 3.5 mA or higher	
OFF voltage/OFF current		4 VDC or lower/ 0.6 mA or lower	3 VDC or lower/ 0.45 mA or lower	7 VDC or lower/ 1.7 mA or lower	
Input resistance		Approx. 5 kΩ	Approx. 4.7 kΩ		
Response time	OFF → ON	10 ms or less (24 VDC)	0.3 mA or less (24 VDC)	10 ms or less (24 VDC)	
	ON → OFF	10 ms or less (24 VDC)	0.3 mA or less (24 VDC)	10 ms or less (24 VDC)	
Common terminal arrangement		32 points/common (common terminals: 1B1, 1B2, 2B1, 2B2)			
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch			
External connections		40-pin connector			
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*4			
Accessories		Connectors (2 pces.) for external wiring (soldering type)			
Internal current consumption (5 VDC)		90 mA (TYP, all points ON)	160 mA (TYP, all points ON)	90 mA (TYP, all points ON)	
Weight kg		0.28			

External Connections



Pin Arrangement



Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
1B20	X00	1A20	X10
1B19	X01	1A19	X11
1B18	X02	1A18	X12
1B17	X03	1A17	X13
1B16	X04	1A16	X14
1B15	X05	1A15	X15
1B14	X06	1A14	X16
1B13	X07	1A13	X17
1B12	X08	1A12	X18
1B11	X09	1A11	X19
1B10	X0A	1A10	X1A
1B9	X0B	1A9	X1B
1B8	X0C	1A8	X1C
1B7	X0D	1A7	X1D
1B6	X0E	1A6	X1E
1B5	X0F	1A5	X1F
1B4	Vacant	1A4	Vacant
1B3	Vacant	1A3	Vacant
1B2	COM1	1A2	Vacant
1B1	COM1	1A1	Vacant

Pin No.	Signal Name (SH)	Pin No.	Signal Name (SH)
2B20	X20	2A20	X30
2B19	X21	2A19	X31
2B18	X22	2A18	X32
2B17	X23	2A17	X33
2B16	X24	2A16	X34
2B15	X25	2A15	X35
2B14	X26	2A14	X36
2B13	X27	2A13	X37
2B12	X28	2A12	X38
2B11	X29	2A11	X39
2B10	X2A	2A10	X3A
2B9	X2B	2A9	X3B
2B8	X2C	2A8	X3C
2B7	X2D	2A7	X3D
2B6	X2E	2A6	X3E
2B5	X2F	2A5	X3F
2B4	Vacant	2A4	Vacant
2B3	Vacant	2A3	Vacant
2B2	COM2	2A2	Vacant
2B1	COM2	2A1	Vacant

*1: A1SX42-S1/S2 is 24 VDC only.

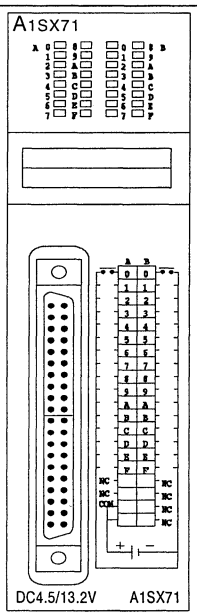
*2: In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*3: When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (X20 to X3F) is displayed by the LEDs.

*4: When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

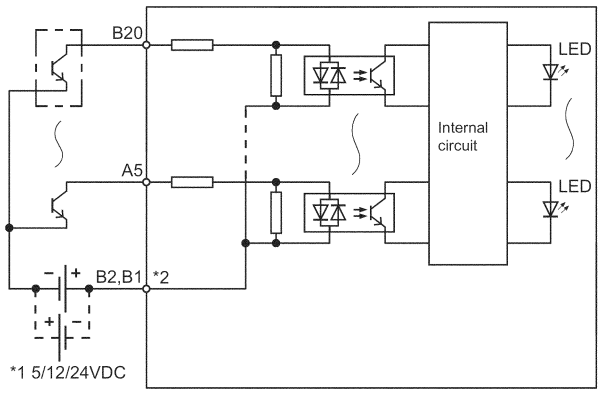
2.9 A1SX71 DC Input Module (Sink/Source Common Type)

Specifications \ Model		DC Input Module (Sink/Source Common Type)		
		A1SX71		Appearance
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		5 VDC	12 VDC	24 VDC *1
Rated input current		1.2 mA	3.3 mA	7 mA
Operating voltage range		4.5 to 26.4 VDC (ripple: less than 5%)		
Max. simultaneous input points		65% (20 points/common) simultaneously ON (at 24 VDC)		
ON voltage/ON current		3.5 VDC or higher/1 mA or higher		
OFF voltage/OFF current		1.0 VDC or lower/0.1 mA or lower		
Input resistance		Approx. 3.5 kΩ		
Response time	OFF → ON	1.5 ms or less		
	ON → OFF	3 ms or less		
Common terminal arrangement		32 points/common (common terminals: B1, B2)		
Operating indicator		ON state is indicated (LEDs)		
External connections		40-pin connector		
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3		
Accessories		Connector (1 pce.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		75 mA (TYP, all points ON) (0.08A is shown on the rating plate of the module.)		
Weight kg		0.19		

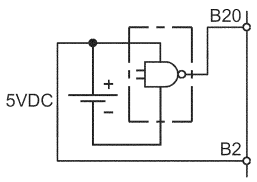


External Connections

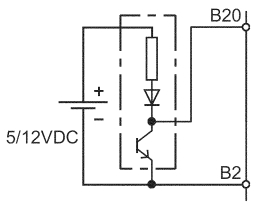
Open collector (Sink)



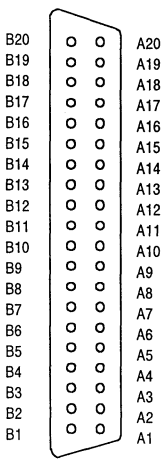
TTL, LS-TTL, CMOS buffer (Sink)



Sensor (Source)



Pin Arrangement	Pin No.	Signal Name	Pin No.	Signal Name
	B20	X00	A20	X10
	B19	X01	A19	X11
	B18	X02	A18	X12
	B17	X03	A17	X13
	B16	X04	A16	X14
	B15	X05	A15	X15
	B14	X06	A14	X16
	B13	X07	A13	X17
	B12	X08	A12	X18
	B11	X09	A11	X19
	B10	X0A	A10	X1A
	B9	X0B	A9	X1B
	B8	X0C	A8	X1C
	B7	X0D	A7	X1D
	B6	X0E	A6	X1E
	B5	X0F	A5	X1F
	B4	Vacant	A4	Vacant
Front view	B3	Vacant	A3	Vacant
	B2	COM	A2	Vacant
	B1	COM	A1	Vacant



*1: 24 VDC can be used with hardware version B and later versions.

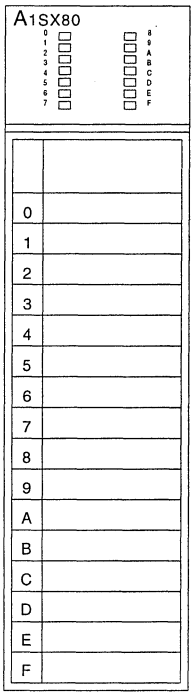
*2: The arrangement of pins A and B shown above is the opposite of the arrangement of pins of the connector on the module.

*3: When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

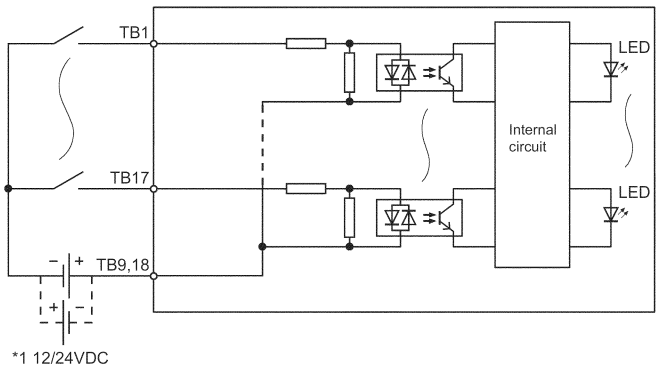
2.10 A1SX80(S1/S2) DC Input Module (Sink/Source Common Type)

Specifications \ Model		DC Input Module (Sink/Source Common Type)			
		A1SX80		A1SX80-S1	A1SX80-S2
Number of input points		16 points			
Isolation method		Photocoupler			
Rated input voltage		12 VDC	24 VDC	24 VDC	
Rated input current		Approx. 3 mA	Approx. 7 mA	Approx. 7 mA	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		100% simultaneously ON (at 26.4 VDC)		85% simultaneously ON (at 26.4 VDC)	100% simultaneously ON (at 26.4 VDC)
ON voltage/ON current		8 VDC or higher/2 mA or higher		17 VDC or higher/5 mA or higher	13 VDC or higher/3.5 mA or higher
OFF voltage/OFF current		4 VDC or lower/1 mA or lower		5 VDC or lower/1.7 mA or lower	6 VDC or lower/1.7 mA or lower
Input resistance		Approx. 3.3 kΩ			
Response time	OFF → ON	10 ms or less (24 VDC)		0.4 ms or less (24 VDC)	10 ms or less (24 VDC)
	ON → OFF	10 ms or less (24 VDC)		0.5 ms or less (24 VDC)	10 ms or less (24 VDC)
Common terminal arrangement		16 points/common (common terminals: TB9, TB18)			
Operating indicator		ON state is indicated (LEDs)			
External connections		20-point terminal block connector (M3.5 x 7 screws)			
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)			
Applicable solderless termials		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5			
Accessories		None			
Internal current consumption (5 VDC)		50 mA (TYP, all points ON)			
Weight kg		0.2			

Appearance



External Connections



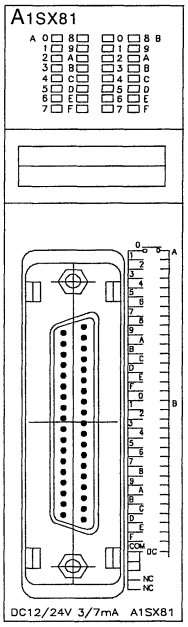
*1: A1SX80-S1/S2 is 24 VDC only.

Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

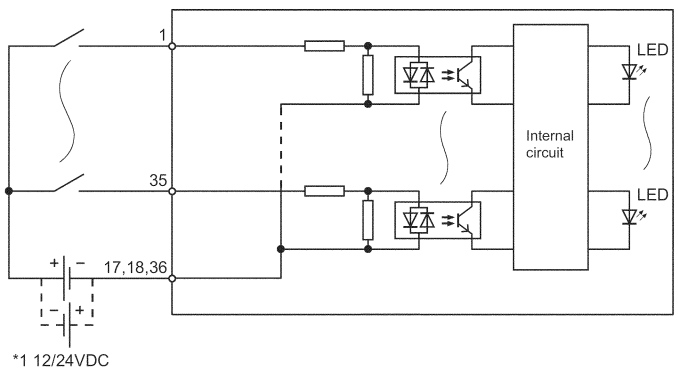
2.11 A1SX81(S2) DC Input Module (Sink/Source Common Type)

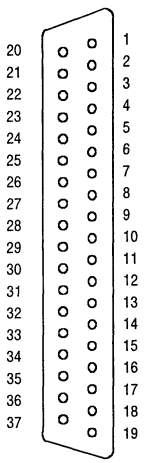
Specifications \ Model		DC Input Module (Sink/Source Common Type)		
		A1SX81		A1SX81-S2
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12 VDC	24 VDC	24 VDC
Rated input current		Approx. 3 mA	Approx. 7 mA	Approx. 7 mA
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)		19.2 to 26.4 VDC (ripple: less than 5%)
Max. simultaneous input points		60% simultaneously ON (at 26.4 VDC)		
ON voltage/ON current		8 VDC or higher/2 mA or higher		13 VDC or higher/3.5 mA or higher
OFF voltage/OFF current		4 VDC or lower/1 mA or lower		6 VDC or lower/1.7 mA or lower
Input resistance		Approx. 3.3 kΩ		
Response time	OFF → ON	10 ms or less (24 VDC)		
	ON → OFF	10 ms or less (24 VDC)		
Common terminal arrangement		32 points/common (common terminals: 17, 18, 36)		
Operating indicator		ON state is indicated (LEDs)		
External connections		37-pin D sub-connector		
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1E)*2		
Accessories		Connector (1 pce.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		80 mA (TYP, all points ON)		
Weight kg		0.24		

Appearance



External Connections

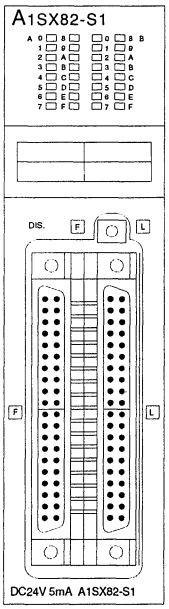


Pin Arrangement	Pin No.	Signal Name	Pin No.	Signal Name
	1	X00	9	X10
	20	X01	28	X11
	2	X02	10	X12
	21	X03	29	X13
	3	X04	11	X14
	22	X05	30	X15
	4	X06	12	X16
	23	X07	31	X17
	5	X08	13	X18
	24	X09	32	X19
	6	X0A	14	X1A
	25	X0B	33	X1B
	7	X0C	15	X1C
	26	X0D	34	X1D
	8	X0E	16	X1E
	27	X0F	35	X1F
	17	COM	37	Vacant
	36	COM	19	Vacant
	18	COM		

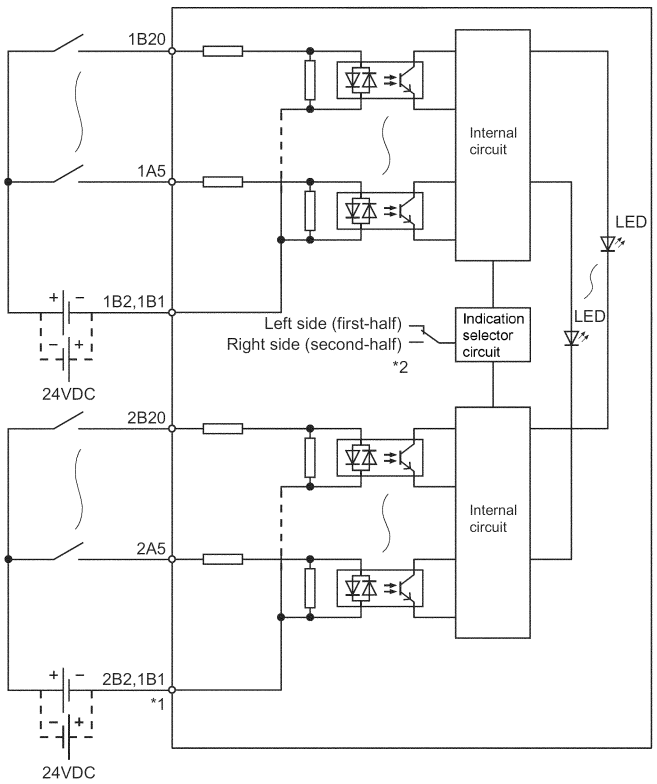
Front view

*1: A1SX81-S2 is 24 VDC only.
*2: When the A6CON2E or A6CON3E is used, refer to Section 1.2.4.

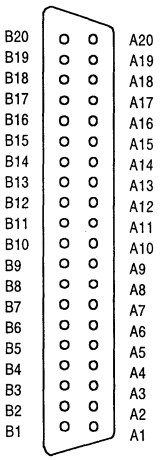
2.12 A1SX82-S1 DC Input Module (Sink/Source Common Type)

Specifications \ Model		DC Input Module (Sink/Source Common Type)	
		A1SX82-S1	Appearance
Number of input points		64 points	
Isolation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 5 mA	
Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		50% (16 points/common) simultaneously ON (at 24 VDC)	
ON voltage/ON current		18.5 VDC or higher/3.5 mA or higher	
OFF voltage/OFF current		3 VDC or lower/0.45 mA or lower	
Input resistance		Approx. 4.7 kΩ	
Response time	OFF → ON	0.3 ms or less (24 VDC)	
	ON → OFF	0.3 ms or less (24 VDC)	
Common terminal arrangement		32 points/common (common terminals: 1B1, 1B2, 2B1, 2B2)	
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)[*3]	
Accessories		Connectors (2 pces.) for external wiring (soldering type)	
Internal current consumption (5 VDC)		160 mA (TYP, all points ON)	
Weight kg		0.28	

External Connections



Pin Arrangement



Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
1B20	X00	1A20	X10
1B19	X01	1A19	X11
1B18	X02	1A18	X12
1B17	X03	1A17	X13
1B16	X04	1A16	X14
1B15	X05	1A15	X15
1B14	X06	1A14	X16
1B13	X07	1A13	X17
1B12	X08	1A12	X18
1B11	X09	1A11	X19
1B10	X0A	1A10	X1A
1B9	X0B	1A9	X1B
1B8	X0C	1A8	X1C
1B7	X0D	1A7	X1D
1B6	X0E	1A6	X1E
1B5	X0F	1A5	X1F
1B4	Vacant	1A4	Vacant
1B3	Vacant	1A3	Vacant
1B2	COM1	1A2	Vacant
1B1	COM1	1A1	Vacant

Pin No.	Signal Name (SH)	Pin No.	Signal Name (SH)
2B20	X20	2A20	X30
2B19	X21	2A19	X31
2B18	X22	2A18	X32
2B17	X23	2A17	X33
2B16	X24	2A16	X34
2B15	X25	2A15	X35
2B14	X26	2A14	X36
2B13	X27	2A13	X37
2B12	X28	2A12	X38
2B11	X29	2A11	X39
2B10	X2A	2A10	X3A
2B9	X2B	2A9	X3B
2B8	X2C	2A8	X3C
2B7	X2D	2A7	X3D
2B6	X2E	2A6	X3E
2B5	X2F	2A5	X3F
2B4	Vacant	2A4	Vacant
2B3	Vacant	2A3	Vacant
2B2	COM2	2A2	Vacant
2B1	COM2	2A1	Vacant

*1: In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*2: When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (X20 to X3F) is displayed by the LEDs.

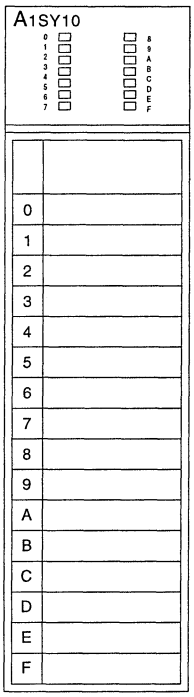
*3: When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

3. OUTPUT MODULE SPECIFICATIONS

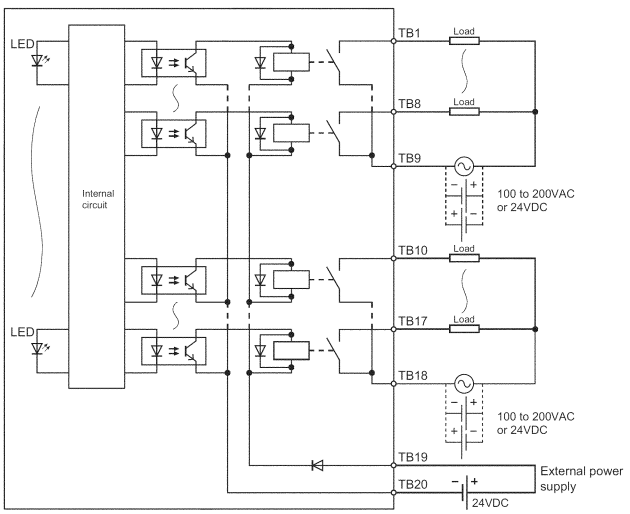
3.1 A1SY10 Contact Output Module

Specifications \ Model		Contact Output Module: A1SY10
Number of output points		16 points
Isolation method		Photocoupler
Switching rated voltage/current		24 VDC 2 A (load resistance) 240 VAC 2 A (COSϕ = 1) /1 point, 8 A/common
Min. switching load		5 VDC 1 mA
Max. switching voltage		264 VAC 125 VDC
Response time	OFF → ON	10 ms or less
	ON → OFF	12 ms or less
Service life	Mechanical	More than 20 million times or more
	Electrical	Switching rated voltage/current More than 100000 times or more
		200 VAC 1.5 A, 240 VAC 1 A (COSϕ = 0.7) More than 100000 times or more
		200 VAC 1 A, 240 VAC 0.5 A (COSϕ = 0.35) More than 100000 times or more
		24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) More than 100000 times or more
Max. switching frequency		3600 times per hour
Surge absorber		None
Fuse		None
Common terminal arrangement		8 points/common (common terminals: TB9, TB18)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	24 VDC ±10%, Ripple voltage: 4VP-P or less
	Current	90 mA (TYP 24 VDC all points ON)
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)
Weight kg		0.25

Appearance



External Connections

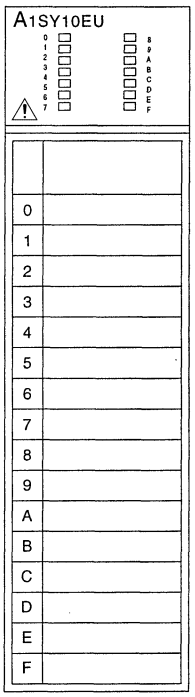


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0V

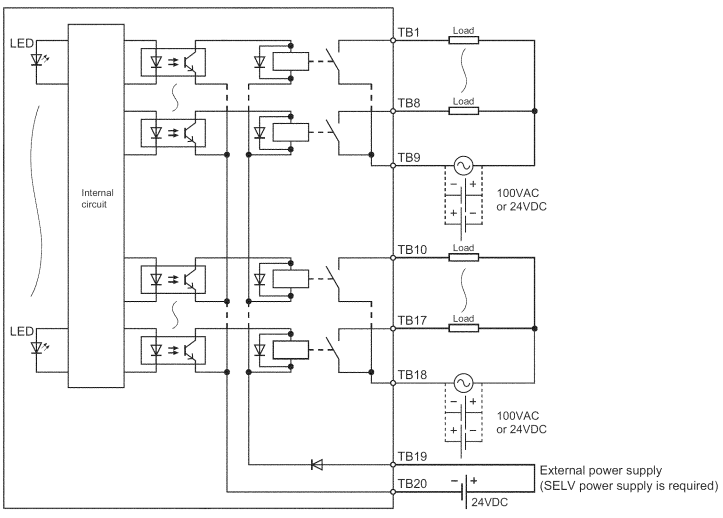
3.2 A1SY10EU Contact Output Module

Specifications \ Model		Contact Output Module A1SY10EU	
Number of output points		16 points	
Insulation method		Photocoupler	
Switching rated voltage/current		24 VDC 2 A (load resistance) 120 VAC 2 A (COSϕ = 1) /1 point, 8 A/common	
Min. switching load		5 VDC 1 mA	
Max. switching voltage		132 VAC 125 VDC	
Response time	OFF → ON	10 ms or less	
	ON → OFF	12 ms or less	
Service life	Mechanical	More than 20 million times or more	
	Electrical	Switching rated voltage/current More than 200000 times or more	
		100 VAC 2A, 120 VAC 2 A (COSϕ = 0.7) More than 200000 times or more	
		100 VAC 2A, 120 VAC 2 A (COSϕ = 0.35) More than 100000 times or more	
		24 VDC 1 .5A, 100 VDC 0.1 A (L/R = 7 ms) More than 100000 times or more	
Max. switching frequency		3600 times per hour	
Surge absorber		None	
Fuse		None	
Common terminal arrangement		8 points/common (common terminals: TB9, TB18)	
Operating indicator		ON state is indicated (LEDs)	
External connections		20-point terminal block connector (M3.5 x 7 screws)	
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)	
Applicable crimp terminals		RAV1.25-3.5	
Accessories		None	
Insulation withstand voltage		AC terminals-Relay coil, 5 VAC	1780 VAC rms/3 cycle (altitude 2,000 m)
		Relay coil, 5 VAC	500 VAC rms/3 cycle (altitude 2,000 m)
Insulation resistor		10 MΩ or higher at insulation resistance tester	
Noise immunity		IEC801-4:1 kV	
External power supply	Voltage	24 VDC ±10%, Ripple voltage: 4VP-P or less	Must be a SELV power supply
	Current	90 mA (TYP 24 VDC all points ON)	
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)	
Weight kg		0.25	

Appearance



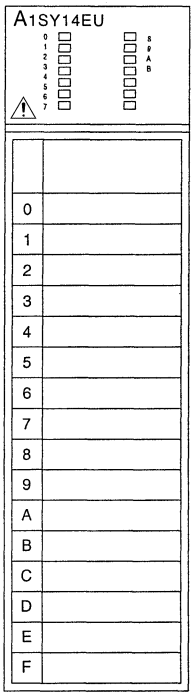
External Connections



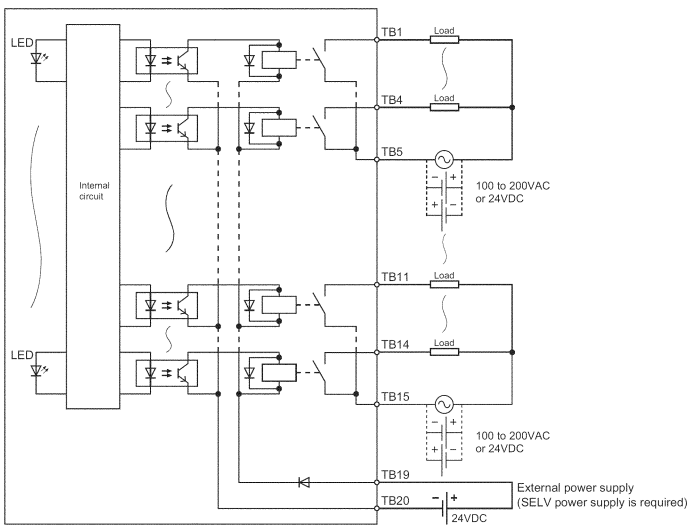
Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0V

3.3 A1SY14EU Contact Output Module

Specifications \ Model		Contact Output Module A1SY14EU		Appearance
Number of output points		12 points (number of occupied I/O points : 16 points)		
Insulation method		Photocoupler		
Switching rated voltage/current		24 VDC 2 A (load resistance) 240 VAC 2 A (COSϕ = 1) /1 point, 8 A/common		
Min. switching load		5 VDC 10 mA		
Max. switching voltage		264VAC 125 VDC		
Response time	OFF → ON	10 ms or less		
	ON → OFF	12 ms or less		
Service life	Mechanical	More than 20 million times or more		
	Electrical	Switching rated voltage/current More than 200000 times or more		
		200 VAC 2A, 240VAC 1.8 A (COSϕ = 0.7) More than 200000 times or more		
		200 VAC 1.1A, 240VAC 0.9 A (COSϕ = 0.35) More than 200000 times or more		
		24 VDC 1.1A, 100 VDC 0.1 A (L/R = 7 ms) More than 200000 times or more		
Max. switching frequency		3600 times per hour		
Surge absorber		None		
Fuse		None		
Common terminal arrangement		4 points/common (common terminals: TB5, TB10, TB15)		
Operating indicator		ON state is indicated (LEDs)		
External connections		20-point terminal block connector (M3.5 x 7 screws)		
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)		
Applicable crimp terminals		RAV1.25-3.5		
Accessories		None		
Insulation withstand voltage		AC terminals-Relay coil, 5VAC	2830VAC rms/3 cycle (altitude 2,000 m)	
		Relay coil, 5VAC	500VAC rms/3 cycle (altitude 2,000 m)	
Insulation resistor		10 MΩ or higher at insulation resistance tester		
Noise immunity		IEC801-4:1 kV		
External power supply	Voltage	24 VDC ±10%, Ripple voltage: 4VP-P or less	Must be a SELV power supply	
	Current	100 mA (TYP 24 VDC all points ON)		
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)		
Weight kg		0.25		



External Connections

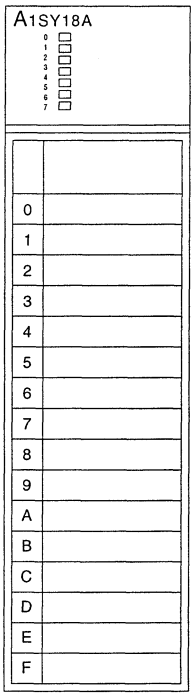


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	COM1
TB6	Y04
TB7	Y05
TB8	Y06
TB9	Y07
TB10	COM2
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	COM3
TB16	Vacant
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0V

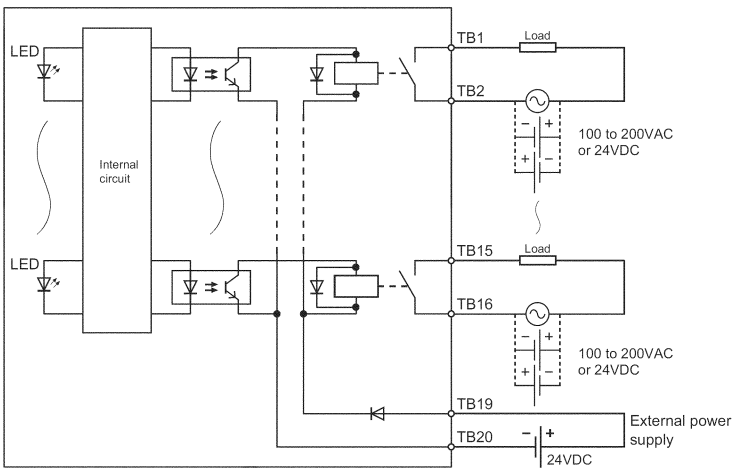
3.4 A1SY18A Contact Output Module (All Points Independent)

Specifications \ Model		Contact Output Module A1SY18A
Number of output points		8 points (number of occupied I/O points : 16 points)
Isolation method		Photocoupler
Switching rated voltage/current		24 VDC 2 A/point (load resistance) 24 VDC 8A/module 240 VAC 2 A/point (COSϕ = 1) 240 VAC 8A/module
Min. switching load		5 VDC 1 mA
Max. switching voltage		264 VAC 125 VDC
Response time	OFF → ON	10 ms or less
	ON → OFF	12 ms or less
Service life	Mechanical	More than 20 million times or more
	Electrical	Switching rated voltage/current More than 200000 times or more
		200 VAC 1.5 A, 240 VAC 1 A (COSϕ = 0.7) More than 200000 times or more
		200 VAC 0.75 A, 240 VAC 0.5 A (COSϕ = 0.35) More than 200000 times or more
		24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) More than 200000 times or more
Max. switching frequency		3600 times per hour
Surge absorber		None
Fuse		None
Common terminal arrangement		None (all points independent)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 × 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19)(Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	24 VDC ±10%, Ripple voltage: 4VP-P or less
	Current	75 mA (TYP, 24 VDC all points ON)
Internal current consumption (5 VDC)		240 mA (TYP, all points ON)
Weight kg		0.25

Appearance



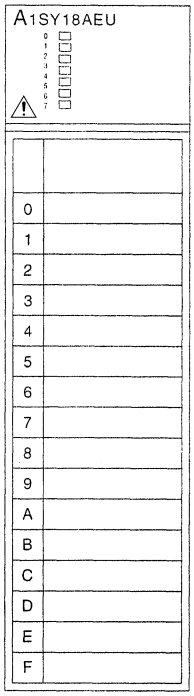
External Connections



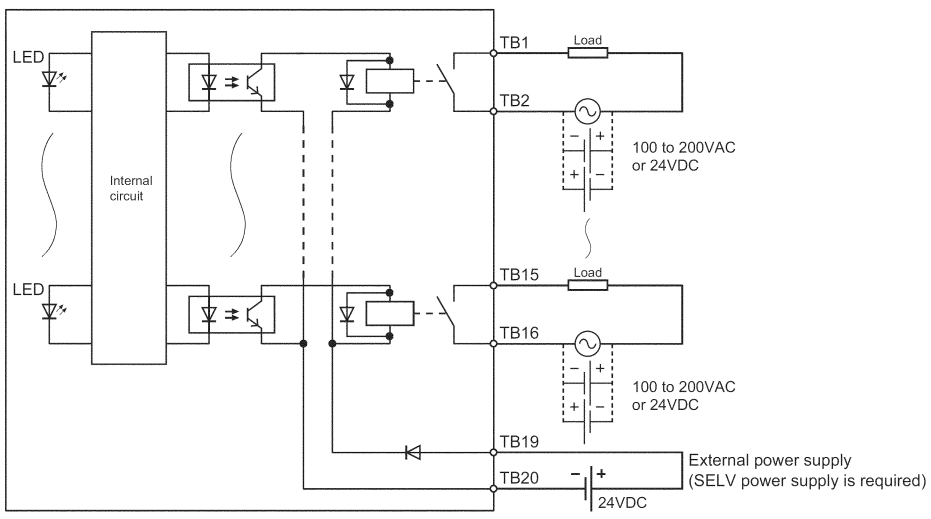
Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0 V

3.5 A1SY18AEU Contact Output Modules (All Points Independent)

Specifications \ Model		Contact Output Module A1SY18AEU		Appearance
Number of output points		8 points (number of occupied I/O points : 16 points)		
Insulation method		Photocoupler		
Switching rated voltage/current		24 VDC 2 A (load resistance) 240 VAC 2 A (COSϕ = 1) /1 point		
Min. switching load		5 VDC 1 mA		
Max. switching voltage		264VAC 125 VDC		
Response time	OFF → ON	10 ms or less		
	ON → OFF	12 ms or less		
Service life	Mechanical	More than 20 million times or more		
	Electrical	Switching rated voltage/current More than 200000 times or more		
		200 VAC 1.5 A, 240VAC 1 A (COSϕ = 0.7) More than 200000 times or more		
		200 VAC 0.75 A, 240VAC 0.5 A (COSϕ = 0.35) More than 200000 times or more		
		24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) More than 200000 times or more		
Max. switching frequency		3600 times per hour		
Surge absorber		None		
Fuse		None		
Common terminal arrangement		None (all points independent)		
Operating indicator		ON state is indicated (LEDs)		
External connections		20-point terminal block connector (M3.5 x 7 screws)		
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)		
Applicable crimp terminals		RAV1.25-3.5		
Accessories		None		
Insulation withstand voltage		AC terminals-Relay coil, 5VAC	2830VAC rms/3 cycle (altitude 2,000 m)	
		Relay coil, 5VAC	500VAC rms/3 cycle (altitude 2,000 m)	
Insulation resistor		10 MΩ or higher at insulation resistance tester		
Noise immunity		IEC801-4:1 kV		
External power supply	Voltage	24 VDC ±10%, Ripple voltage: 4VP-P or less	Must be a SELV power supply	
	Current	75 mA (TYP 24 VDC all points ON)		
Internal current consumption (5 VDC)		240 mA (TYP, all points ON)		
Weight kg		0.25		



External Connections

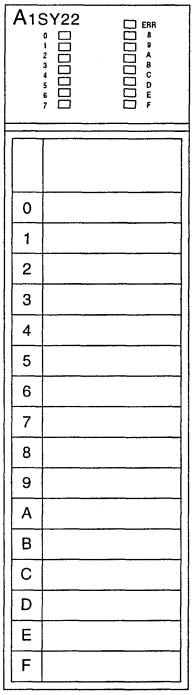


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0V

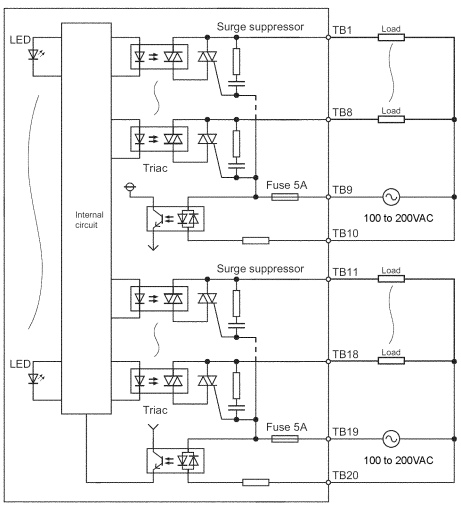
3.6 A1SY22 Triac Output Module

Specifications \ Model		Triac Output Module A1SY22
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		100 to 240 VAC 50/60 Hz ±3 Hz
Max. load voltage		264 VAC
Max. load current		0.6 A/point, 2.4 A/common
Min. load voltage/current		24 VAC 100 mA, 100 VAC 10 mA, 240 VAC 20 mA
Max. allowed rush current		20 A 10 ms or less, 8 A 100 ms or less
Leakage current at OFF circuit		1.5 mA (120 VAC 60 Hz), 3mA (240 VAC 60 Hz)
Max. voltage drop at ON circuit		1.5 VAC or less (0.1 to 0.6 A), 1.8 VAC or less (50 to 100 mA), 2 VAC or less (10 to 50 mA)
Response time	OFF → ON	1 ms or less
	ON → OFF	1 ms + 0.5 cycles or less
Surge absorber		CR absorber (0.01 µF + 47 Ω)
Fuse rating		5 A (1 piece/common), not replaceable *1
Fuse capacity		70 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB9, TB19)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5
Accessories		None
External power supply	Voltage	100 to 240 VAC (85 to 264 VAC)
	Current	2 mA (TYP 200 VAC/common)
Internal current consumption (5 VDC)		270 mA (TYP, all points ON)
Weight kg		0.24

Appearance



External Connections



Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	100/200 VAC
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	COM2
TB20	100/200 VAC

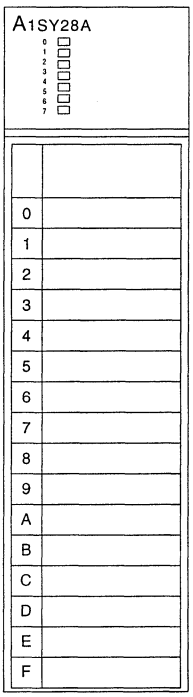
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

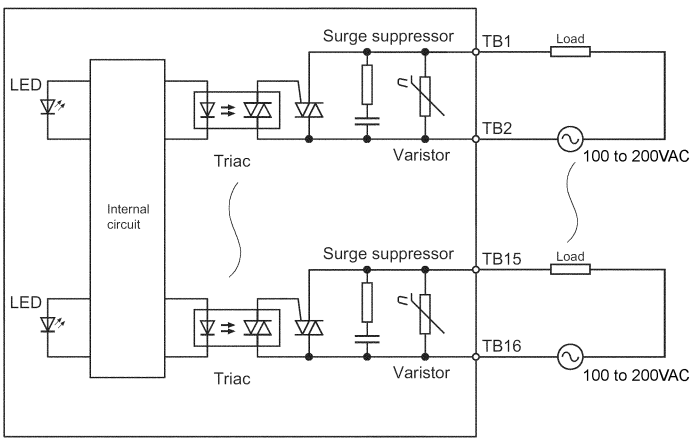
3.7 A1SY28A Triac Output Module (All Points Independent)

Specifications \ Model		Triac Output Module A1SY28A
Number of output points		8 points (number of occupied I/O points : 16 points)
Isolation method		Photocoupler
Rated load voltage		100 to 240 VAC 50/60 Hz ±3 Hz
Max. load voltage		264 VAC
Max. load current		1A/point, 8A/module (132VAC, 46℃), 8A/module (264VAC, 40℃), 4A/module (132VAC, 55℃), 2A/module (264VAC, 55℃)
Min. load voltage/current		24 VAC 100 mA, 100 VAC 55 mA, 240 VAC 55 mA
Max. allowed rush current		25 A 10 ms or less, 10 A 100 ms or less
Leakage current at OFF circuit		1.5 mA (120 VAC 60 Hz), 3mA (240 VAC 60 Hz)
Max. voltage drop at ON circuit		1.5 VAC or less (0.2 to 1 A), 1.8 VAC or less (0.1 to 0.2 A), 3 VAC or less (55 to 100 mA)
Response time	OFF → ON	1 ms or less
	ON → OFF	1 ms + 0.5 cycles or less
Surge absorber		CR absorber (0.01 μF + 47 Ω), Varistor (387 to 473 V)
Fuse rating		None
Common terminal arrangement		None (all points independent)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 × 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5
Accessories		None
External power supply		None
Internal current consumption (5 VDC)		130 mA (TYP, all points ON)
Weight kg		0.25

Appearance



External Connections

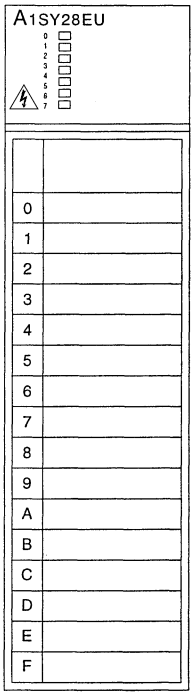


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

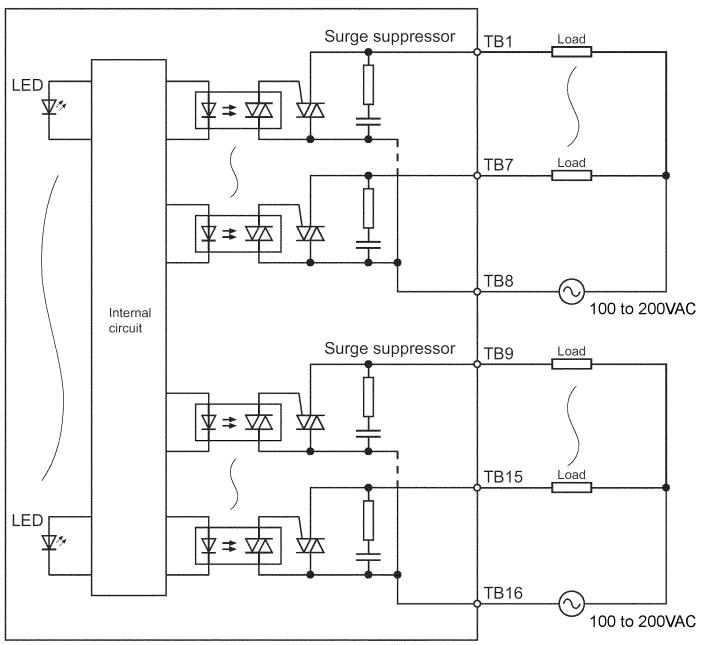
3.8 A1SY28EU Triac Output Module

Specifications \ Model		Triac Output Module A1SY28EU
Number of output points		8 points (number of occupied I/O points : 16 points)
Insulation method		Photocoupler
Rated load voltage		100 to 240 VAC 50/60 Hz ±3 Hz
Max. load voltage		264 VAC
Max. load current		0.6A/point, 2.4A/common (49℃), 1.9A/common (55℃)
Min. load voltage/current		24 VAC 15 mA, 120 VAC 15 mA, 240 VAC 15 mA
Max. input current		30 A 10 ms or less, 15 A 100 ms or less
Leakage current at OFF circuit		1.5 mA (240 VAC 60 Hz)
Max. voltage drop at ON circuit		1.5 VAC or less (15mA to 1 A)
Response time	OFF → ON	1 ms or less
	ON → OFF	1 ms + 0.5 cycles or less
Surge absorber		Built-in CR absorber (0.1 μF + 47 Ω)
Fuse rating		None
Common terminal arrangement		4 points/common (common terminals: TB8, TB16)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 × 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable crimp terminals		RAV1.25-3.5
Accessories		None
Insulation withstand voltage		2830VAC rms/3 cycle (altitude 2,000 m)
Insulation resistor		10 MΩ or higher at insulation resistance tester
Noise immunity		IEC801-4:1 kV
Internal current consumption (5 VDC)		270 mA (TYP, all points ON)
Weight kg		0.24

Appearance



External Connections

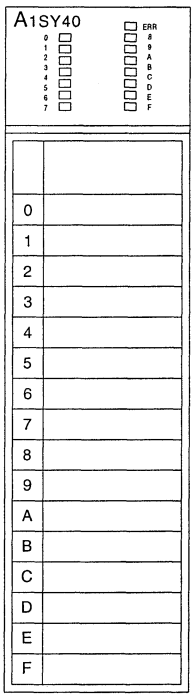


Terminal No.	Signal Name
TB1	Y00
TB2	Vacant
TB3	Y01
TB4	Vacant
TB5	Y02
TB6	Vacant
TB7	Y03
TB8	COM1
TB9	Y04
TB10	Vacant
TB11	Y05
TB12	Vacant
TB13	Y06
TB14	Vacant
TB15	Y07
TB16	COM2
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

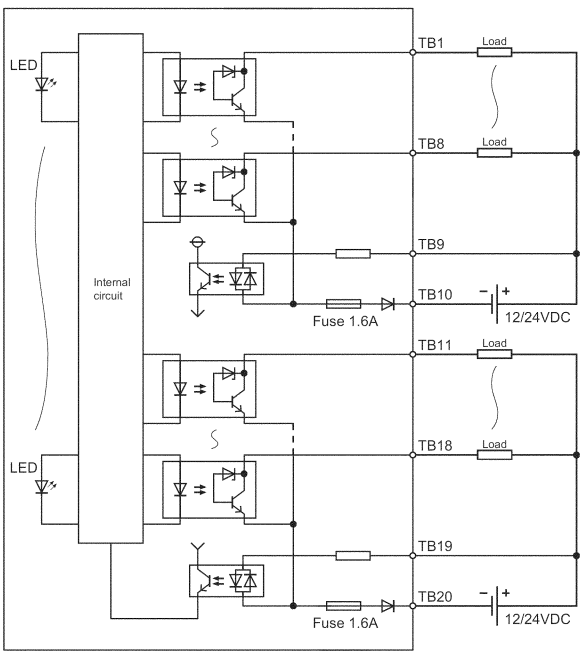
3.9 A1SY40 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink Type) A1SY40
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 0.8 A/common
Max. allowed rush current		0.4 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 1.6 A (1 piece/common), not replaceable *1
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB10, TB20)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5
Accessories		None
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	8 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		270 mA (TYP, all points ON)
Weight kg		0.19

Appearance



External Connections



Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	12/24 VDC
TB10	COM1
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	12/24 VDC
TB20	COM2

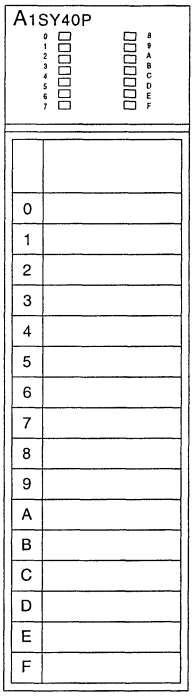
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

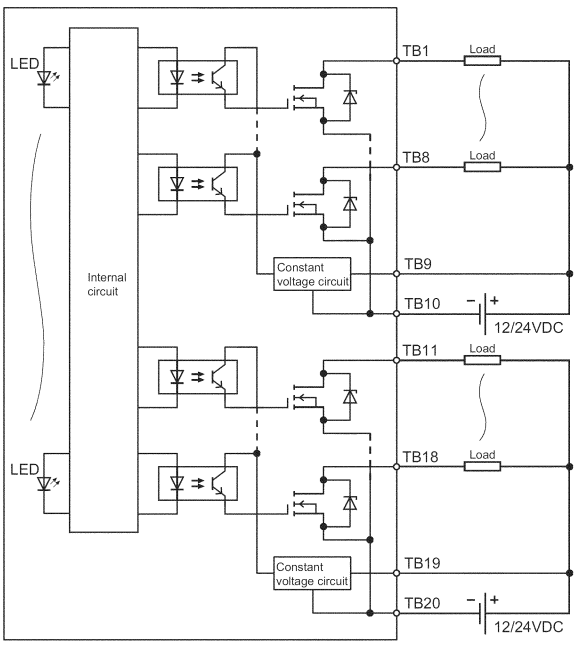
3.9.1 A1SY40P Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink Type) A1SY40P
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 0.8 A/common
Max. allowed rush current		0.7 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.1 VDC (TYP) 0.1 A, 0.2 VDC (MAX) 0.1 A
Response time	OFF → ON	1 ms or less
	ON → OFF	1 ms or less (resistive load)
Surge absorber		Zener diode
Fuse		None
Protection function		Yes (overload protection function, overheat protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.
Common terminal arrangement		8 points/common (common terminals: TB10, TB20)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5
Accessories		None
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	11 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		79 mA (TYP, all points ON) (0.08A is shown on the rating plate of the module.)
Weight kg		0.13

Appearance



External Connections

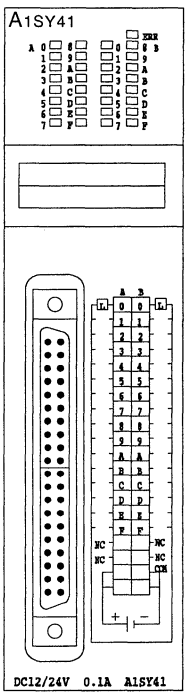


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	12/24 VDC
TB10	COM1
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	12/24 VDC
TB20	COM2

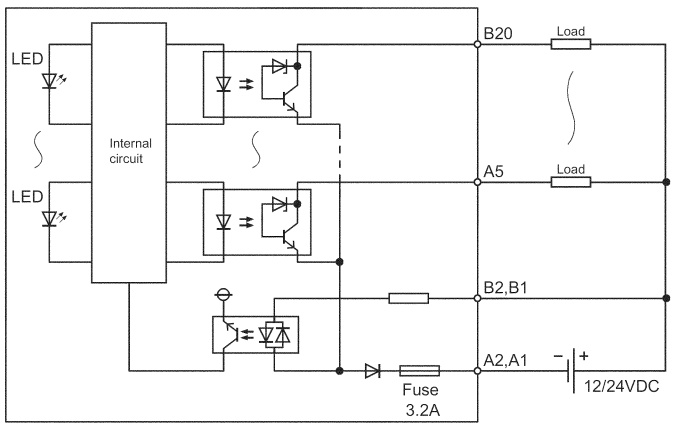
3.10 A1SY41 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink type) A1SY41
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 2 A/common
Max. allowed rush current		0.4 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *3
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *4
Common terminal arrangement		32 points/common (common terminals: A1, A2)
Operating indicator		ON state is indicated (LEDs)
External connections		40-pin connector
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*5
Accessories		Connector (1 pce.) for external wiring (soldering type)
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	8 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		500 mA (TYP, all points ON)
Weight kg		0.21

Appearance

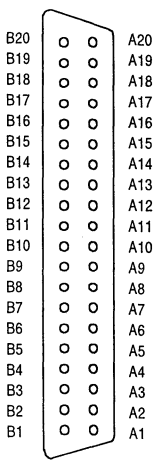


External Connections



*1 : The arrangement of pins A and B shown right is the opposite of the arrangement of pins of the connector on the module.
*2 : A1SY41 has one connector jack soldering type (A6CON1) included.
*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.
*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.
*5 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

Pin Arrangement



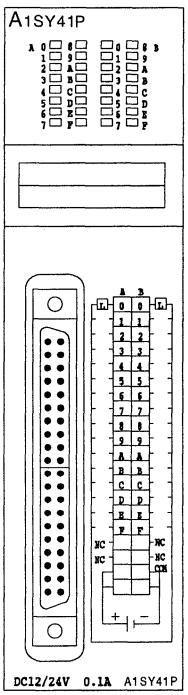
Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
B20	Y00	A20	Y10
B19	Y01	A19	Y11
B18	Y02	A18	Y12
B17	Y03	A17	Y13
B16	Y04	A16	Y14
B15	Y05	A15	Y15
B14	Y06	A14	Y16
B13	Y07	A13	Y17
B12	Y08	A12	Y18
B11	Y09	A11	Y19
B10	Y0A	A10	Y1A
B9	Y0B	A9	Y1B
B8	Y0C	A8	Y1C
B7	Y0D	A7	Y1D
B6	Y0E	A6	Y1E
B5	Y0F	A5	Y1F
B4	Vacant	A4	Vacant
B3	Vacant	A3	Vacant
B2	12/24 VDC	A2	COM
B1	12/24 VDC	A1	COM

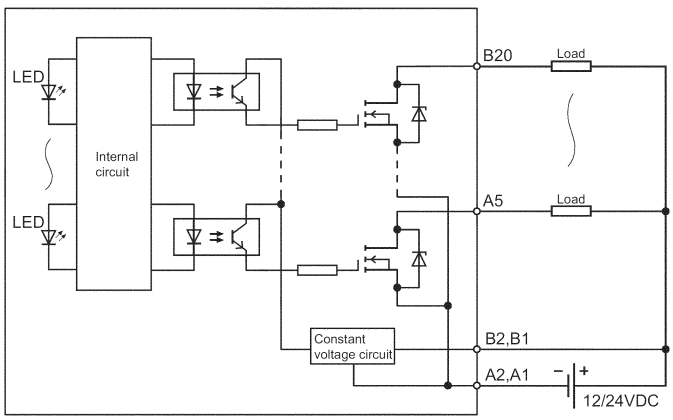
3.10.1 A1SY41P Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink type) A1SY41P
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 2 A/common
Max. allowed rush current		0.7 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.1 VDC (TYP) 0.1 A, 0.2 VDC (MAX) 0.1 A
Response time	OFF → ON	1 ms or less
	ON → OFF	1 ms or less (resistive load)
Surge absorber		Zener diode
Fuse		None
Protection function		Yes (overload protection function, overheat protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.
Common terminal arrangement		32 points/common (common terminals: A1, A2)
Operating indicator		ON state is indicated (LEDs)
External connections		40-pin connector
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3
Accessories		Connector (1 pce.) for external wiring (soldering type)
Applicable connector/terminal block converter unit		A6TBXY36, A6TBXY54
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	12 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		141 mA (TYP, all points ON) (0.15A is shown on the rating plate of the module.)
Weight kg		0.15

Appearance



External Connections

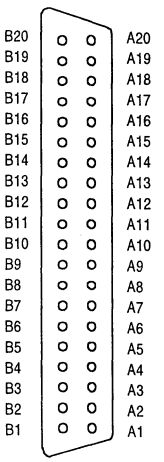


*1 : The arrangement of pins A and B shown right is the opposite of the arrangement of pins of the connector on the module.

*2 : A1SY41 has one connector jack soldering type (A6CON1) included.

*3 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

Pin Arrangement



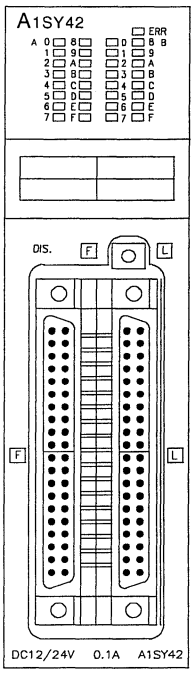
Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
B20	Y00	A20	Y10
B19	Y01	A19	Y11
B18	Y02	A18	Y12
B17	Y03	A17	Y13
B16	Y04	A16	Y14
B15	Y05	A15	Y15
B14	Y06	A14	Y16
B13	Y07	A13	Y17
B12	Y08	A12	Y18
B11	Y09	A11	Y19
B10	Y0A	A10	Y1A
B9	Y0B	A9	Y1B
B8	Y0C	A8	Y1C
B7	Y0D	A7	Y1D
B6	Y0E	A6	Y1E
B5	Y0F	A5	Y1F
B4	Vacant	A4	Vacant
B3	Vacant	A3	Vacant
B2	12/24 VDC	A2	COM
B1	12/24 VDC	A1	COM

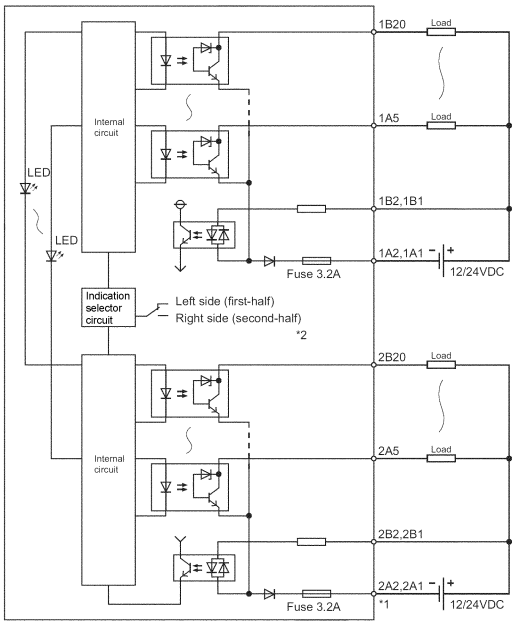
3.11 A1SY42 Transistor Output Module (Sink Type)

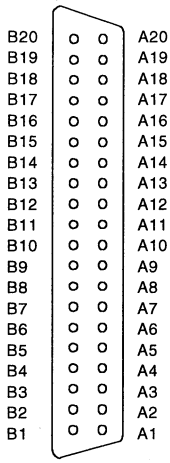
Specifications \ Model		Transistor Output Module (Sink Type) A1SY42
Number of output points		64 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 1.6 A/common
Max. allowed rush current		0.4 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *3
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *4
Common terminal arrangement		32 points/common (common terminals: 1A1, 1A2, 2A1, 2A2)
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch
External connections		40-pin connector
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4) *5
Accessories		Connectors (2 pces.) for external wiring (soldering type)
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	8 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		930 mA (TYP, all points ON)
Weight kg		0.27

Appearance



External Connections



Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
	1B20	Y00	1A20	Y10	2B20	Y20	2A20	Y30
	1B19	Y01	1A19	Y11	2B19	Y21	2A19	Y31
	1B18	Y02	1A18	Y12	2B18	Y22	2A18	Y32
	1B17	Y03	1A17	Y13	2B17	Y23	2A17	Y33
	1B16	Y04	1A16	Y14	2B16	Y24	2A16	Y34
	1B15	Y05	1A15	Y15	2B15	Y25	2A15	Y35
	1B14	Y06	1A14	Y16	2B14	Y26	2A14	Y36
	1B13	Y07	1A13	Y17	2B13	Y27	2A13	Y37
	1B12	Y08	1A12	Y18	2B12	Y28	2A12	Y38
	1B11	Y09	1A11	Y19	2B11	Y29	2A11	Y39
	1B10	Y0A	1A10	Y1A	2B10	Y2A	2A10	Y3A
	1B9	Y0B	1A9	Y1B	2B9	Y2B	2A9	Y3B
	1B8	Y0C	1A8	Y1C	2B8	Y2C	2A8	Y3C
	1B7	Y0D	1A7	Y1D	2B7	Y2D	2A7	Y3D
	1B6	Y0E	1A6	Y1E	2B6	Y2E	2A6	Y3E
	1B5	Y0F	1A5	Y1F	2B5	Y2F	2A5	Y3F
	1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
	1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
	1B2	12/24 VDC	1A2	COM1	2B2	12/24 VDC	2A2	COM2
	1B1	12/24 VDC	1A1	COM1	2B1	12/24 VDC	2A1	COM2

Front view

*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

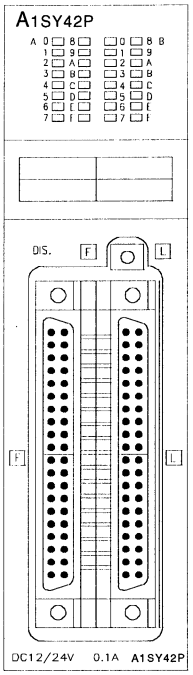
*2 : When the switch is set to the left side position, the status of the first-half devices (Y00 to Y1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (Y20 to Y3F) is displayed by the LEDs.

*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

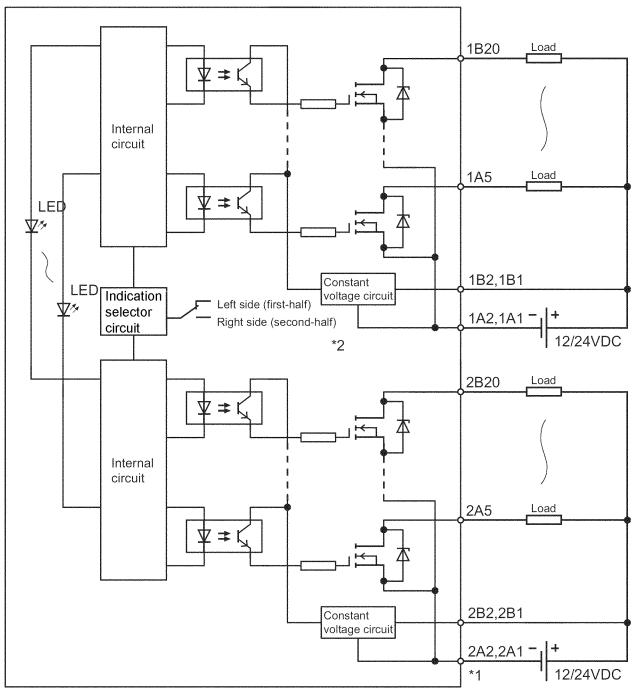
*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

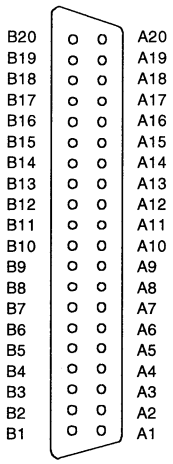
*5 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

3.11.1 A1SY42P Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink Type)	
		A1SY42P	Appearance
Number of output points		64 points	
Isolation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Max. load current		0.1 A/point, 2 A/common	
Max. allowed rush current		0.7 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA or less	
Max. voltage drop at ON circuit		0.1 VDC (TYP) 0.1 A, 0.2 VDC (MAX) 0.1 A	
Response time	OFF → ON	1 ms or less	
	ON → OFF	1 ms or less (rated load, resistance load)	
Surge absorber		Zener diode	
Fuse		No	
Common terminal arrangement		32 points/common (common terminals: 1A1, 1A2, 2A1, 2A2)	
Protection function		Yes (overload protection function, overheat protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3	
Accessories		Connectors (2 pces.) for external wiring (soldering type)	
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)	
	Current	14 mA (TYP 24 VDC/common)	
Internal current consumption (5 VDC)		170 mA (TYP, all points ON)	
Weight kg		0.17	

External Connections



Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
	1B20	Y00	1A20	Y10	2B20	Y20	2A20	Y30
	1B19	Y01	1A19	Y11	2B19	Y21	2A19	Y31
	1B18	Y02	1A18	Y12	2B18	Y22	2A18	Y32
	1B17	Y03	1A17	Y13	2B17	Y23	2A17	Y33
	1B16	Y04	1A16	Y14	2B16	Y24	2A16	Y34
	1B15	Y05	1A15	Y15	2B15	Y25	2A15	Y35
	1B14	Y06	1A14	Y16	2B14	Y26	2A14	Y36
	1B13	Y07	1A13	Y17	2B13	Y27	2A13	Y37
	1B12	Y08	1A12	Y18	2B12	Y28	2A12	Y38
	1B11	Y09	1A11	Y19	2B11	Y29	2A11	Y39
	1B10	Y0A	1A10	Y1A	2B10	Y2A	2A10	Y3A
	1B9	Y0B	1A9	Y1B	2B9	Y2B	2A9	Y3B
	1B8	Y0C	1A8	Y1C	2B8	Y2C	2A8	Y3C
	1B7	Y0D	1A7	Y1D	2B7	Y2D	2A7	Y3D
	1B6	Y0E	1A6	Y1E	2B6	Y2E	2A6	Y3E
	1B5	Y0F	1A5	Y1F	2B5	Y2F	2A5	Y3F
	1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
	1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
	1B2	12/24 VDC	1A2	COM1	2B2	12/24 VDC	2A2	COM2
	1B1	12/24 VDC	1A1	COM1	2B1	12/24 VDC	2A1	COM2

Front view

*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

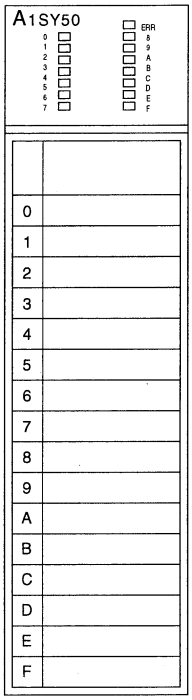
*2 : When the switch is set to the left side position, the status of the first-half devices (Y00 to Y1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (Y20 to Y3F) is displayed by the LEDs.

*3 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

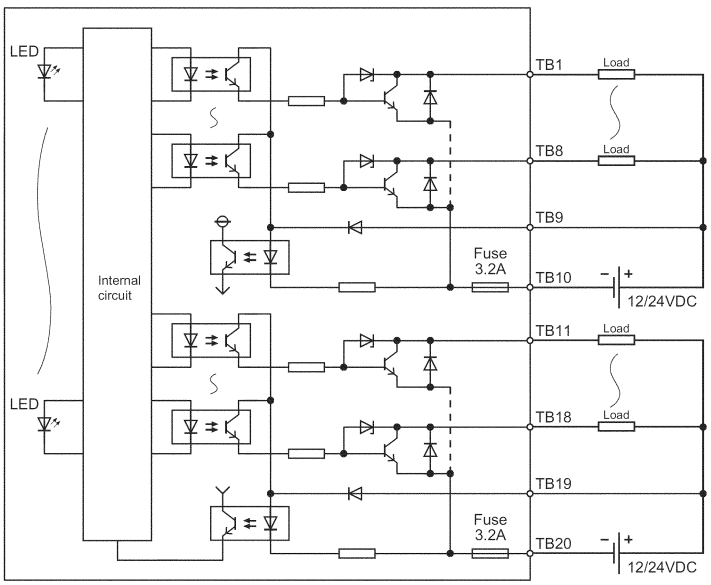
3.12 A1SY50 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink Type) A1SY50
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.5 A/point, 2 A/common
Max. allowed rush current		4 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.9 VDC (TYP) 0.5 A, 1.5 VDC (MAX) 0.5 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *1
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB10, TB20)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	60 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)
Weight kg		0.2

Appearance



External Connections



Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	12/24 VDC
TB10	COM1
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	12/24 VDC
TB20	COM2

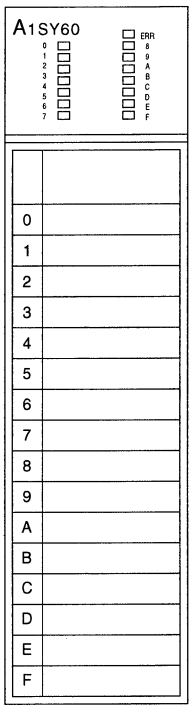
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

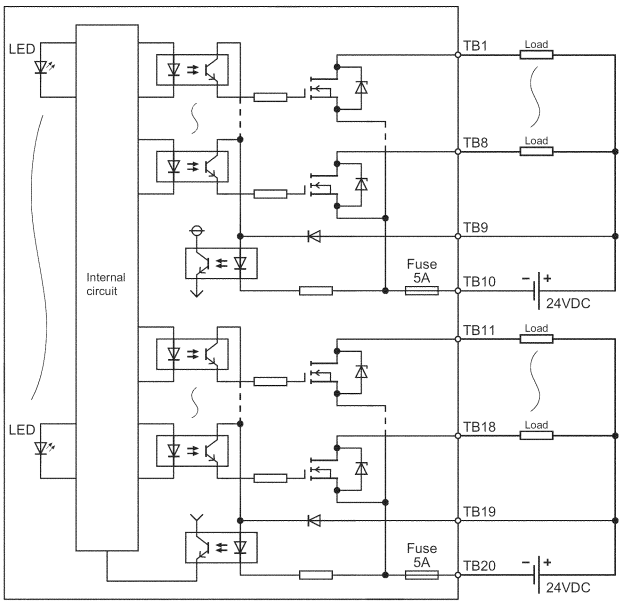
3.13 A1SY60 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (Sink Type) A1SY60
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		24 VDC
Operating voltage range		21.6 to 26.4 VDC (peak voltage 26.4 VDC)
Max. load current		2 A/point, 4 A/common (Ta=25°C), 1.8 A/point, 3.6 A/common (Ta=45°C), 1.6 A/point, 3.2 A/common (Ta=55°C)
Max. allowed rush current		8 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.9 VDC (TYP) 2 A, 1.5 VDC (MAX) 0.5 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 5 A (1 piece/common), not replaceable *1
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB10, TB20)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	24 VDC (21.6 to 26.4 VDC)
	Current	15 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)
Weight kg		0.25

Appearance



External Connections



Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	24 VDC
TB10	COM1
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	24 VDC
TB20	COM2

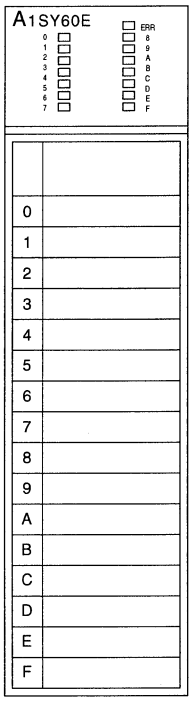
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

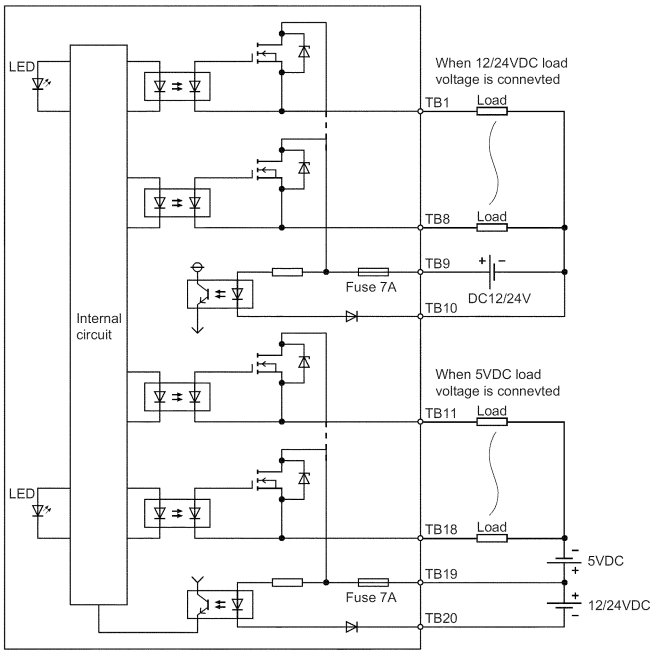
3.14 A1SY60E Transistor Output Module (Source Type)

Specifications \ Model		Transistor Output Module (Source Type) A1SY60E
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		5/12/24 VDC
Operating voltage range		4.5 to 26.4 VDC (peak voltage 26.4 VDC)
Max. load current		2 A/point (condition:τ = L/R ≤ 2.5 ms), 4 A/common
Max. allowed rush current		8 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.2 VDC (MAX) 1 A, 0.4 VDC (MAX) 2 A
Response time	OFF → ON	3 ms or less
	ON → OFF	10 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 7 A (1 piece/common), not replaceable *1
Fuse capacity		300 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB9, TB19)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	12/24 VDC (10.2 to 26.4 VDC)*3
	Current	10 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		200 mA (TYP, all points ON)
Weight kg		0.2

Appearance



External Connections



Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	0V
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	COM2
TB20	0V

*1 The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

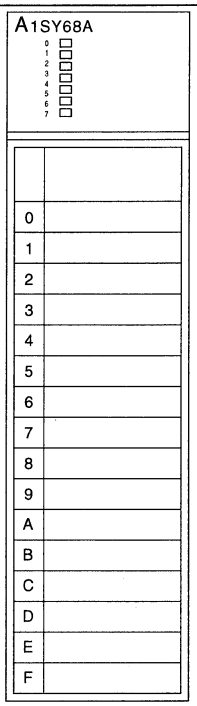
*2 The ERR. indicating LED will also light when the external power supply is shut OFF.

*3 When 5 VDC operating load voltage is used, another 12/24 VDC power supply is required for external power supply.

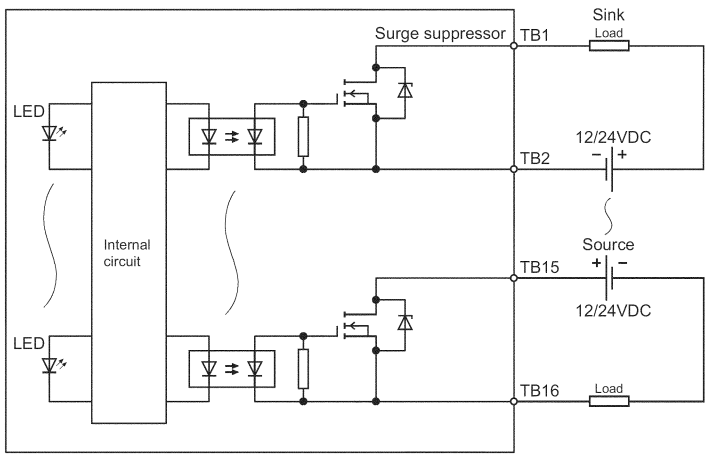
3.15 A1SY68A Transistor Output Module (Sink/Source Common Type (All Points Independent))

Specifications \ Model		Transistor Output Module: A1SY68A
Number of output points		8 points (number of occupied I/O points : 16 points)
Isolation method		Photocoupler
Rated load voltage		5/12/24/48 VDC
Operating voltage range		4.5 to 52.8 VDC
Max. load current		2 A/point
Max. allowed rush current		8 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		0.4 VDC (MAX) 2 A
Response time	OFF → ON	3 ms or less
	ON → OFF	10 ms or less (resistive load)
Surge absorber		Zener diode
Common terminal arrangement		None (all points independent)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
External power supply		None
Internal current consumption (5 VDC)		110 mA
Weight kg		0.2

Appearance

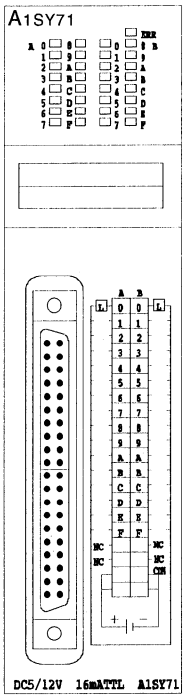


External Connections

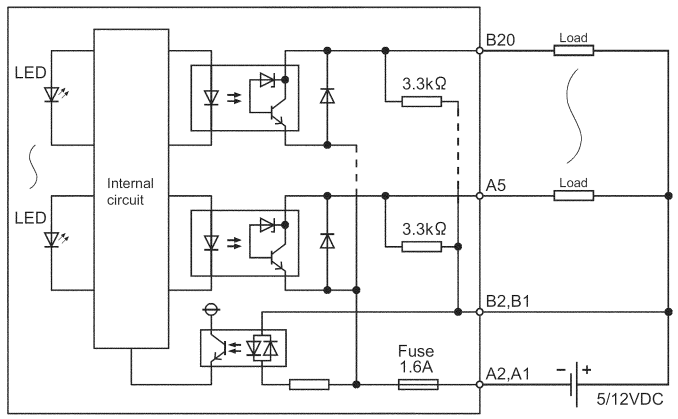


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

3.16 A1SY71 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (for TTL, CMOS : Sink Type)	
		A1SY71	Appearance
Number of output points		32 points	
Isolation method		Photocoupler	
Rated load voltage		5/12 VDC	
Operating voltage range		4.5 to 15 VDC	
Max. load current		16 mA/point, 256 mA/common	
Max. allowed rush current		40 mA 10 ms or less	
Leakage current at OFF circuit		V_{OH} : 3.5 VDC (V_{CC} = 5 VDC, I_{OH} = 0.4 mA)	
Max. voltage drop at ON circuit		V_{OL} : 0.3 VDC	
Response time	OFF → ON	1 ms or less	
	ON → OFF	1 ms or less (resistive load)	
Surge absorber		None	
Fuse rating		Fuse 1.6 A (1 piece/common), not replaceable *2	
Fuse capacity		50 A	
Error display		LED goes ON when fuse blows: signal output to PC CPU *3	
Common terminal arrangement		32 points/common (common terminals: A1, A2)	
Operating indicator		ON state is indicated (LEDs)	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*4	
Accessories		Connector (1 pcs.) for external wiring (soldering type)	
External power supply	Voltage	5/12 VDC (4.5 to 15 VDC)	
	Current	150 mA (TYP 12 VDC/common)	
Internal current consumption (5 VDC)		400 mA (TYP, all points ON)	
Weight kg		0.19	

External Connections



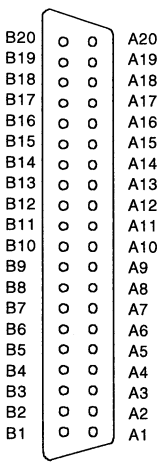
*1 : The arrangement of pins A and B shown right is the opposite of the arrangement of pins of the connector on the module.

*2 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*3 : The ERR. indicating LED will also light when the external power supply is shut OFF.

*4 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

Pin Arrangement



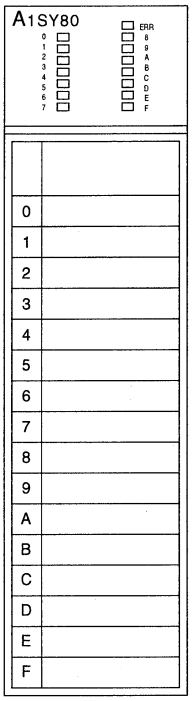
Front view

Pin No.	Signal Name	Pin No.	Signal Name
B20	Y00	A20	Y10
B19	Y01	A19	Y11
B18	Y02	A18	Y12
B17	Y03	A17	Y13
B16	Y04	A16	Y14
B15	Y05	A15	Y15
B14	Y06	A14	Y16
B13	Y07	A13	Y17
B12	Y08	A12	Y18
B11	Y09	A11	Y19
B10	Y0A	A10	Y1A
B9	Y0B	A9	Y1B
B8	Y0C	A8	Y1C
B7	Y0D	A7	Y1D
B6	Y0E	A6	Y1E
B5	Y0F	A5	Y1F
B4	Vacant	A4	Vacant
B3	Vacant	A3	Vacant
B2	5/12 VDC	A2	COM
B1	5/12 VDC	A1	COM

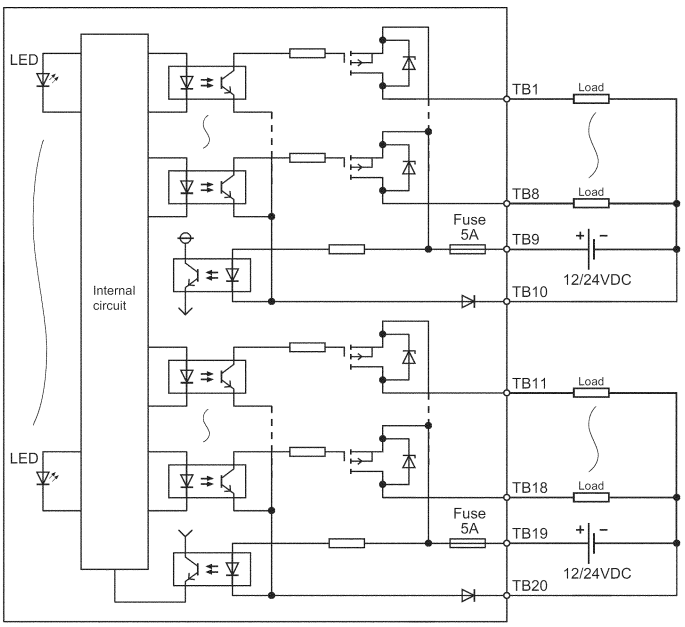
3.17 A1SY80 Transistor Output Module (Source Type)

Specifications \ Model		Transistor Output Module (Source Type) A1SY80
Number of output points		16 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.8 A/point, 3.2 A/common
Max. allowed rush current		8 A 10 ms or less
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		1.5 VDC (MAX) 0.8 A
Response time	OFF → ON	2 ms or less
	ON → OFF	2 ms or less (resistive load)
Surge absorber		Zener diode
Fuse rating		Fuse 5 A (1 piece/common), not replaceable *1
Fuse capacity		50 A
Error display		LED goes ON when fuse blows: signal output to PC CPU *2
Common terminal arrangement		8 points/common (common terminals: TB9, TB19)
Operating indicator		ON state is indicated (LEDs)
External connections		20-point terminal block connector (M3.5 x 7 screws)
Applicable wire size		0.75 to 1.25 mm^2(AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)
Applicable solderless terminals		R1.25-3.5 R2-3.5 RAV1.25-3.5 RAV2-3.5
Accessories		None
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)
	Current	20 mA (TYP 24 VDC/common)
Internal current consumption (5 VDC)		120 mA (TYP, all points ON)
Weight kg		0.2

Appearance



External Connections

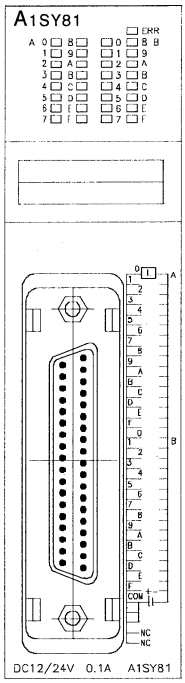


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	0V
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	COM2
TB20	0V
TB18	Y0F
TB19	COM2
TB20	0V

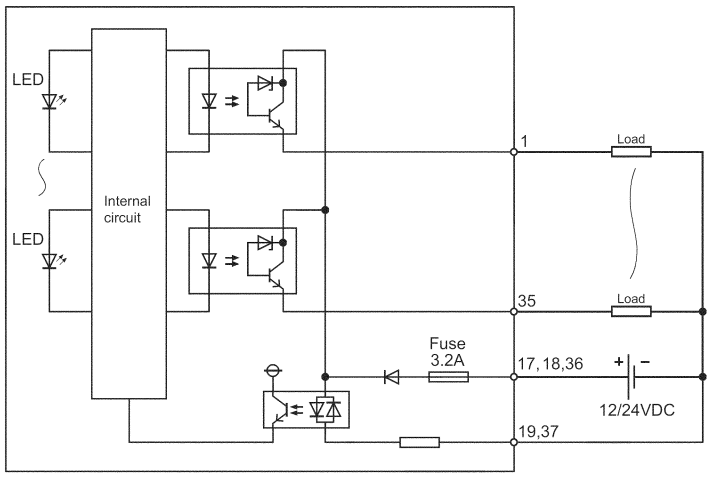
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

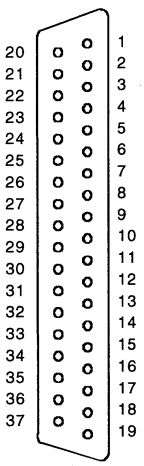
*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

3.18 A1SY81 Transistor Output Module (Source Type)

Specifications \ Model		Transistor Output Module (Source Type) A1SY81	Appearance
Number of output points		32 points	
Isolation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Max. load current		0.1 A/point, 2 A/common	
Max. allowed rush current		0.4 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA or less	
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A	
Response time	OFF → ON	2 ms or less	
	ON → OFF	2 ms or less (resistive load)	
Surge absorber		Zener diode	
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *1	
Fuse breaking capacity		50 A	
Error display		LED goes ON when fuse blows: signal output to PC CPU *2	
Common terminal arrangement		32 points/common (common terminals: 17, 18, 36)	
Operating indicator		ON state is indicated (LEDs)	
External connections		37-pin D sub-connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1E)*3	
Accessories		Connector (1 pce.) for external wiring (soldering type)	
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)	
	Current	8 mA (TYP 24 VDC/common)	
Internal current consumption (5 VDC)		500 mA (TYP, all points ON)	
Weight kg		0.23	

External Connections



Pin Arrangement	Pin No.	Signal Name	Pin No.	Signal Name
	1	Y00	9	Y10
	20	Y01	28	Y11
	2	Y02	10	Y12
	21	Y03	29	Y13
	3	Y04	11	Y14
	22	Y05	30	Y15
	4	Y06	12	Y16
	23	Y07	31	Y17
	5	Y08	13	Y18
	24	Y09	32	Y19
	6	Y0A	14	Y1A
	25	Y0B	33	Y1B
	7	Y0C	15	Y1C
	26	Y0D	34	Y1D
	8	Y0E	16	Y1E
	27	Y0F	35	Y1F
	17	COM	37	0V
Front view	36	COM	19	0V
	18	COM		

*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

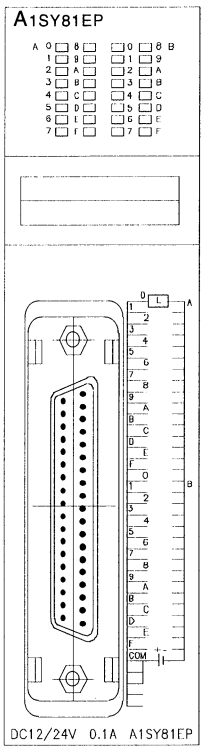
*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

*3 : When the A6CON2E or A6CON3E is used, refer to Section 1.2.4.

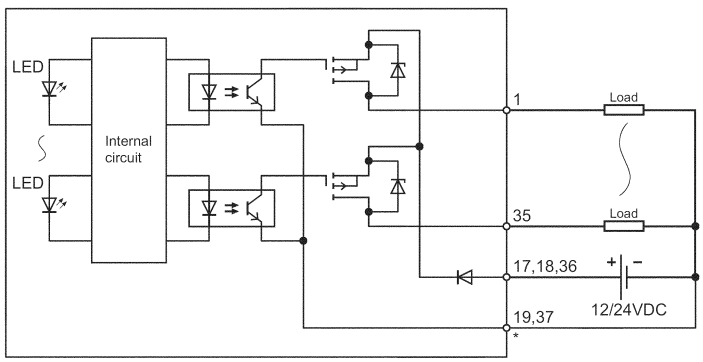
3.19 A1SY81EP Circuit Protection Provided Transistor Output Module (Source Type)

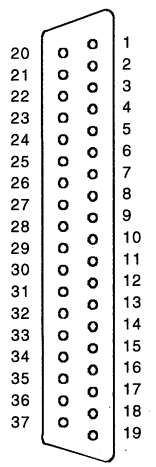
Specifications \ Model		Transistor Output Module (Source Type) A1SY81EP
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating load voltage range		10.2 to 26.4 VDC
Max. load current		0.1 A/point, 2 A/common (25 °C), 0.05 A/point, 1.6 A/common (55 °C)
Max. inrush current		No limit (short protect)
Leakage current at OFF circuit		0.1 mA or lower
Max. voltage drop at ON circuit		3.5 VDC (0.1 A Max.), 2.5 VDC (0.1 A Min.)
Response time	OFF → ON	0.5 ms or less
	ON → OFF	1.5 ms or less (resistive load)
Surge absorber		Clamping diode
Protect		Provided (overload protection function, overheat protection function) Overheat protection function is detected in 8 points module (Y0 to 7, 8, to F, 10 to 17, 18 to 1F). When overheat protection function occurs at an 8 points of 1 common, output of all points for corresponded common terminal is turned OFF.
Protect detection indication		None (signal not output to a PLC CPU.)
Protect reset		Automatic reset (reset by canceling thermal protect)
Common method		32 points/common (common terminals: 17, 18, 36)
Operating indicator		ON state is indicated (LEDs)
External connections		37-pin D sub-connector
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1E)*1
Accessories		Connector (1 pcs.) for external wiring (soldering type)
External power supply	Voltage	12/24 VDC (10.2 to 26.4 VDC)
	Current	80 mA (TYP. 24 VDC/common)
Internal current consumption (5 VDC)		500 mA (TYP. all points ON)
Weight kg		0.25

Appearance



External Connections



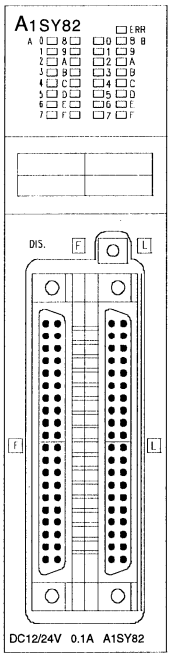
Pin Arrangement	Pin No.	Signal Name	Pin No.	Signal Name
	1	Y00	9	Y10
	20	Y01	28	Y11
	2	Y02	10	Y12
	21	Y03	29	Y13
	3	Y04	11	Y14
	22	Y05	30	Y15
	4	Y06	12	Y16
	23	Y07	31	Y17
	5	Y08	13	Y18
	24	Y09	32	Y19
	6	Y0A	14	Y1A
	25	Y0B	33	Y1B
	7	Y0C	15	Y1C
	26	Y0D	34	Y1D
	8	Y0E	16	Y1E
	27	Y0F	35	Y1F
	17	COM	37	0V
Front view	36	COM	19	0V
	18	COM		

* Make sure that output short-circuits do not occur at more than three outputs simultaneously.
If output short-circuits occur in three or outputs at the same time, the output element may be deteriorated or corrupted.

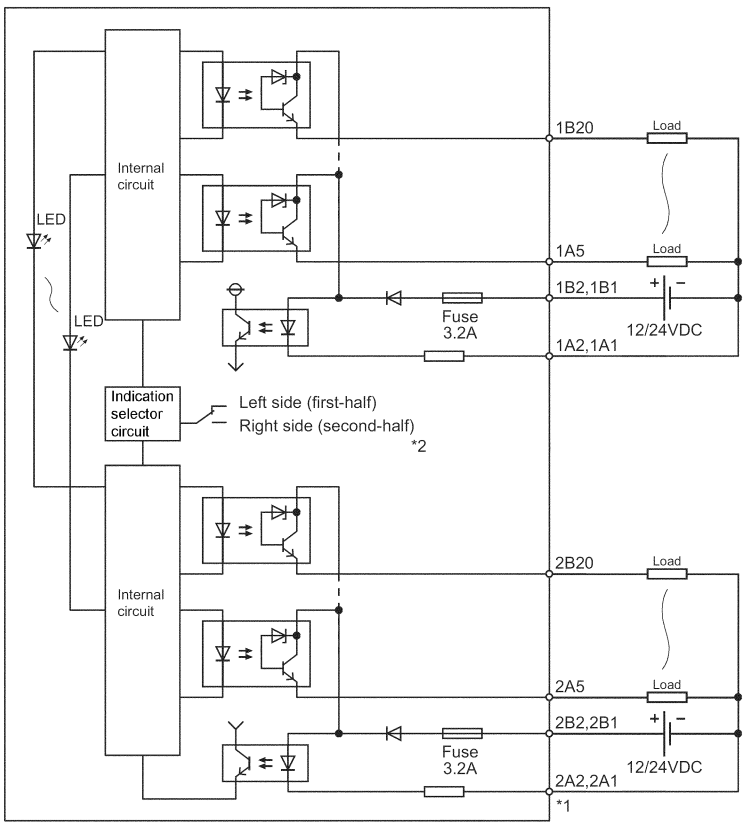
*1 When the A6CON2E or A6CON3E is used, refer to Section 1.2.4.

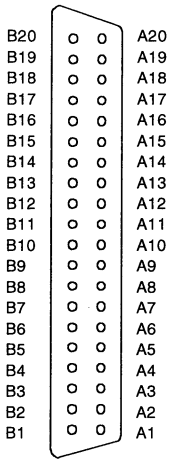
3.20 A1SY82 Transistor Output Module (Source Type)

Specifications \ Model		Transistor Output Module (Source Type) A1SY82	Appearance
Number of output points		64 points	
Isolation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Max. load current		0.1 A/point, 1.6 A/common	
Max. allowed rush current		0.4 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA or less	
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A	
Response time	OFF → ON	2 ms or less	
	ON → OFF	2 ms or less (resistive load)	
Surge absorber		Zener diode	
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *3	
Fuse capacity		50 A	
Error display		LED goes ON when fuse blows: signal output to PC CPU *4	
Common terminal arrangement		32 points/common (common terminals: 1A1, 1A2, 2A1, 2A2)	
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*5	
Accessories		Connectors (2 pces.) for external wiring (soldering type)	
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)	
	Current	8 mA (TYP 24 VDC/common)	
Internal current consumption (5 VDC)		930 mA (TYP, all points ON)	
Weight kg		0.27	



External Connections



Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
	1B20	Y00	1A20	Y10	2B20	Y20	2A20	Y30
	1B19	Y01	1A19	Y11	2B19	Y21	2A19	Y31
	1B18	Y02	1A18	Y12	2B18	Y22	2A18	Y32
	1B17	Y03	1A17	Y13	2B17	Y23	2A17	Y33
	1B16	Y04	1A16	Y14	2B16	Y24	2A16	Y34
	1B15	Y05	1A15	Y15	2B15	Y25	2A15	Y35
	1B14	Y06	1A14	Y16	2B14	Y26	2A14	Y36
	1B13	Y07	1A13	Y17	2B13	Y27	2A13	Y37
	1B12	Y08	1A12	Y18	2B12	Y28	2A12	Y38
	1B11	Y09	1A11	Y19	2B11	Y29	2A11	Y39
	1B10	Y0A	1A10	Y1A	2B10	Y2A	2A10	Y3A
	1B9	Y0B	1A9	Y1B	2B9	Y2B	2A9	Y3B
	1B8	Y0C	1A8	Y1C	2B8	Y2C	2A8	Y3C
	1B7	Y0D	1A7	Y1D	2B7	Y2D	2A7	Y3D
	1B6	Y0E	1A6	Y1E	2B6	Y2E	2A6	Y3E
	1B5	Y0F	1A5	Y1F	2B5	Y2F	2A5	Y3F
	1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
	1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
	1B2	12/24 VDC	1A2	COM1	2B2	12/24 VDC	2A2	COM2
	1B1	12/24 VDC	1A1	COM1	2B1	12/24 VDC	2A1	COM2

Front view

*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*2 : When the switch is set to the left side position, the status of the first-half devices (Y00 to Y1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (Y20 to Y3F) is displayed by the LEDs.

*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

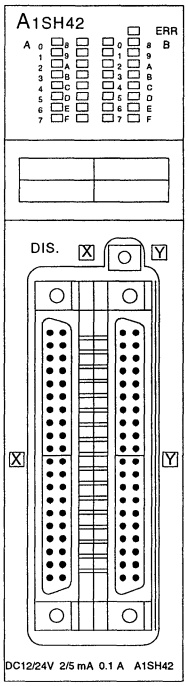
*5 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

4. INPUT/OUTPUT COMPOSITE MODULE SPECIFICATIONS

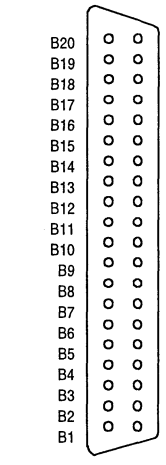
4.1 Input/Output Composite Module Specifications

4.1.1 A1SH42 input/output module

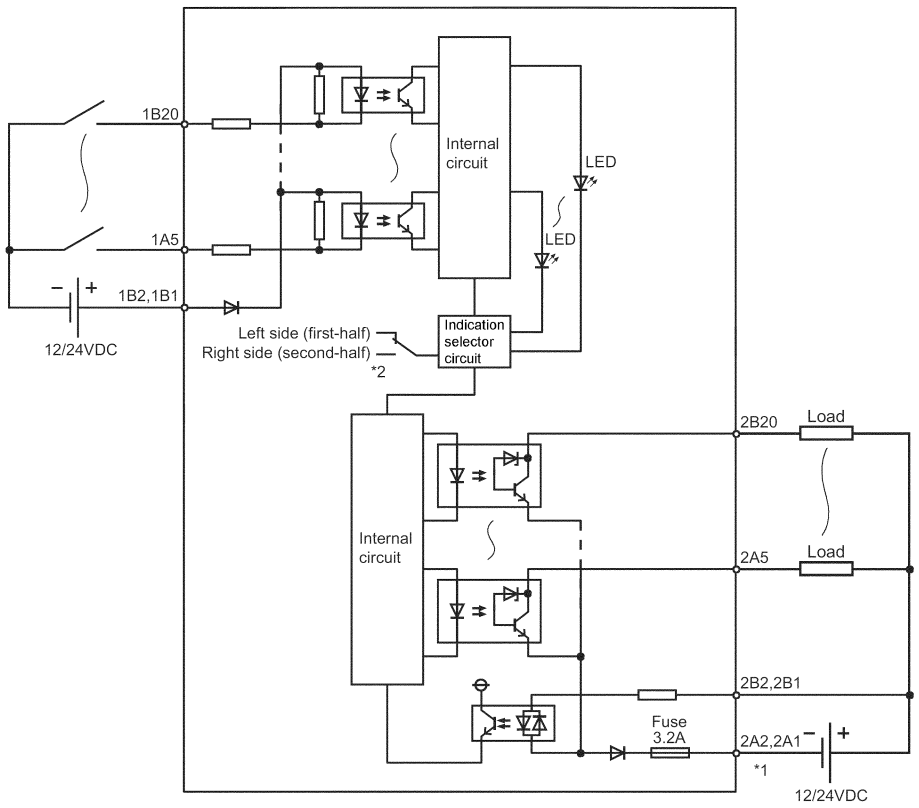
Specifications \ Model		Input/Output Composite Module		Appearance
		Input Specifications		
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12 VDC	24 VDC	
Rated input current		Approx. 2 mA	Approx. 5 mA	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)		
Max. simultaneous input points		60% (20 points/common) simultaneously ON (at 24 VDC)		
ON voltage/ON current		8 VDC or higher/2 mA or higher		
OFF voltage/OFF current		4 VDC or lower/0.6 mA or lower		
Input resistance		Approx. 5 kΩ		
Response time	OFF → ON	10 ms or less (24 VDC)		
	ON → OFF	10 ms or less (24 VDC)		
Common method		32 points/common (common terminals: 1B1, 1B2)		
		Output Specifications		
Number of output points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12/24 VDC		
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)		
Max. load current		0.1 A/point, 1.6 A/common		
Max. allowed rush current		0.4 A 10 ms or less		
Leakage current at OFF circuit		0.1 mA or less		
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A		
Response time	OFF → ON	2 ms or less		
	ON → OFF	2 ms or less (resistive load)		
Surge absorber		Zener diode		
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *3		
Fuse capacity		50 A		
Error display		LED goes ON when fuse blows: signal output to PC CPU *4		
Common method		32 points/common (common terminals: 2A1, 2A2)		
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)		
	Current	8 mA (TYP 24 VDC/common)		
		Common Specifications		
Number of I/O points		32 (I/O allocation is set as a 32-point output module)		
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch		
External connections		40-pin connector		
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*5		
Accessories		Connector (2 cps.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		500 mA (TYP, all points ON)		
Weight kg		0.27		



External Connections



Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
1B20	X00	1A20	X10	2B20	Y00	2A20	Y10
1B19	X01	1A19	X11	2B19	Y01	2A19	Y11
1B18	X02	1A18	X12	2B18	Y02	2A18	Y12
1B17	X03	1A17	X13	2B17	Y03	2A17	Y13
1B16	X04	1A16	X14	2B16	Y04	2A16	Y14
1B15	X05	1A15	X15	2B15	Y05	2A15	Y15
1B14	X06	1A14	X16	2B14	Y06	2A14	Y16
1B13	X07	1A13	X17	2B13	Y07	2A13	Y17
1B12	X08	1A12	X18	2B12	Y08	2A12	Y18
1B11	X09	1A11	X19	2B11	Y09	2A11	Y19
1B10	X0A	1A10	X1A	2B10	Y0A	2A10	Y1A
1B9	X0B	1A9	X1B	2B9	Y0B	2A9	Y1B
1B8	X0C	1A8	X1C	2B8	Y0C	2A8	Y1C
1B7	X0D	1A7	X1D	2B7	Y0D	2A7	Y1D
1B6	X0E	1A6	X1E	2B6	Y0E	2A6	Y1E
1B5	X0F	1A5	X1F	2B5	Y0F	2A5	Y1F
1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
1B2	12/24 VDC	1A2	Vacant	2B2	12/24 VDC	2A2	COM2
1B1	12/24 VDC	1A1	Vacant	2B1	12/24 VDC	2A1	COM2



*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*2 : When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs.
When it is set to the right side, the status of the second-half devices (Y00 to Y1F) is displayed by the LEDs.

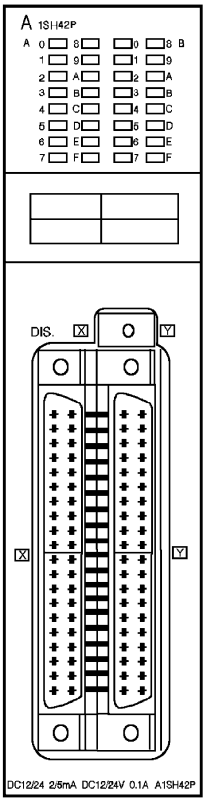
*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

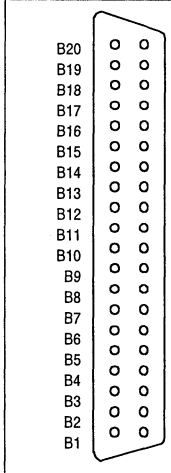
*5 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

4.1.2 A1SH42P input / output module

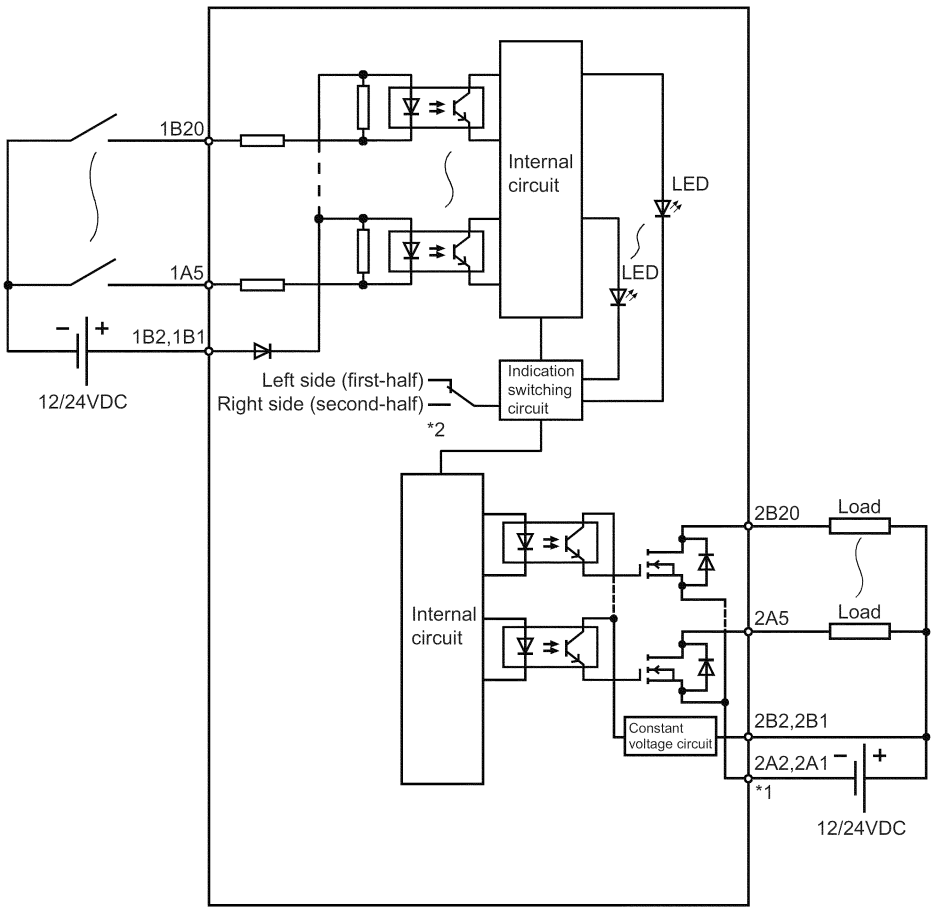
Model / Specifications		Input / Output Composite Module		Appearance
		Input Specifications		
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12VDC	24VDC	
Rated input current		Approx. 2 mA	Approx. 5 mA	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)		
Max. simultaneous input points		60% (20 points / common) simultaneously ON (at 24 VDC)		
ON voltage/ON current		8 VDC or higher/2mA or higher		
OFF voltage/OFF current		4 V or lower / 0.6 mA or lower		
Input resistance		Approx. 5kΩ		
Response time	OFF→ON	10 ms or less (24 VDC)		
	ON→OFF	10 ms or less (24 VDC)		
Common method		32 points / common (common terminal: 1B1, 1B2)		
		Output Specifications		
Number of Output points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12 / 24 VDC		
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)		
Max. load current		0.1 A / points, 2 A / common		
Max. allowed rush current		0.7 A 10 ms or less		
Leakage current at OFF circuit		0.1 mA of less		
Max. voltage drop at ON circuit		0.1 VDC (TYP) 0.1 A, 0.2 VDC (MAX) 0.1 A		
Response time	OFF→ON	1 ms or less		
	ON→OFF	1 ms or less (resistive load)		
Surge absorber		Zener diode		
Fuse rating		None		
Common method		32 points / common (common terminals: 2A1, 2A2)		
External power supply	Voltage	12 / 24 VDC (10.2 to 30 VDC)		
	Current	12 mA (TYP 24 VDC / common)		
Protection function		Yes (overload protection function, overheat protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.		
		Common Specifications		
Number of I/O points		32 (I/O allocation is set as a 32-point output module)		
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch		
External connections		40-pin connector		
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3		
Accessories		Connector (2 cps.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		130 mA (TYP, all points ON)		
Weight Kg		0.17		



External Connections



Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
1B20	X00	1A20	X10	2B20	Y00	2A20	Y10
1B19	X01	1A19	X11	2B19	Y01	2A19	Y11
1B18	X02	1A18	X12	2B18	Y02	2A18	Y12
1B17	X03	1A17	X13	2B17	Y03	2A17	Y13
1B16	X04	1A16	X14	2B16	Y04	2A16	Y14
1B15	X05	1A15	X15	2B15	Y05	2A15	Y15
1B14	X06	1A14	X16	2B14	Y06	2A14	Y16
1B13	X07	1A13	X17	2B13	Y07	2A13	Y17
1B12	X08	1A12	X18	2B12	Y08	2A12	Y18
1B11	X09	1A11	X19	2B11	Y09	2A11	Y19
1B10	X0A	1A10	X1A	2B10	Y0A	2A10	Y1A
1B9	X0B	1A9	X1B	2B9	Y0B	2A9	Y1B
1B8	X0C	1A8	X1C	2B8	Y0C	2A8	Y1C
1B7	X0D	1A7	X1D	2B7	Y0D	2A7	Y1D
1B6	X0E	1A6	X1E	2B6	Y0E	2A6	Y1E
1B5	X0F	1A5	X1F	2B5	Y0F	2A5	Y1F
1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
1B2	12/24 VDC	1A2	Vacant	2B2	12/24 VDC	2A2	COM2
1B1	12/24 VDC	1A1	Vacant	2B1	12/24 VDC	2A1	COM2

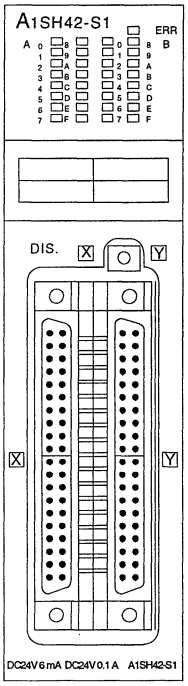


*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

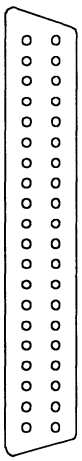
*2 : When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs.
When it is set to the right side, the status of the second-half devices (Y00 to Y1F) is displayed by the LEDs.

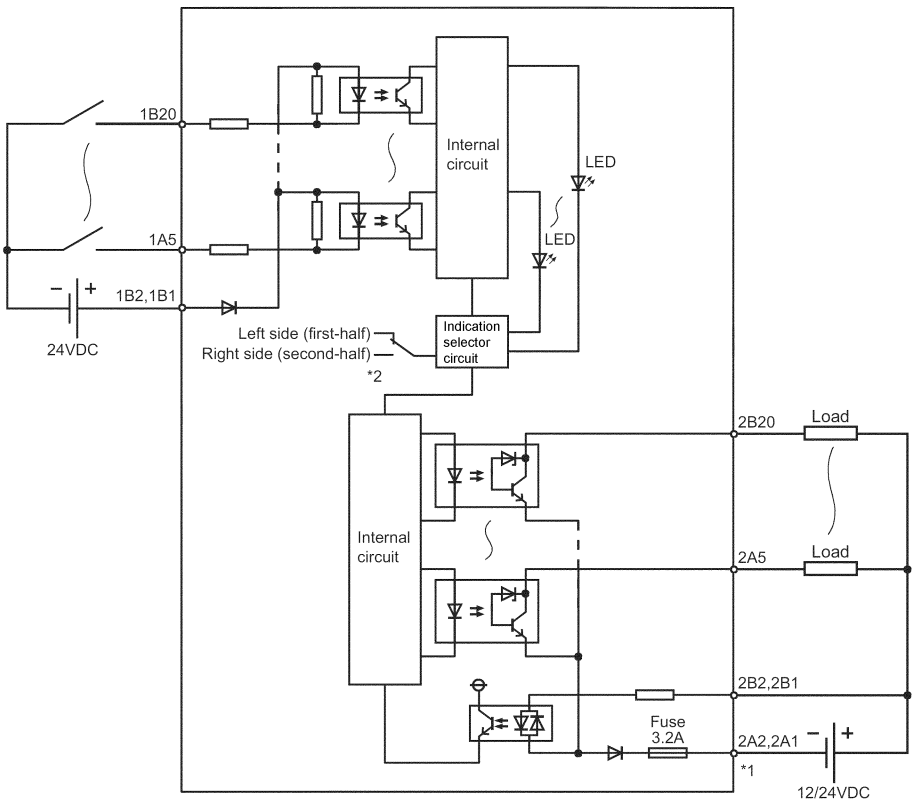
*3 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

4.1.3 A1SH42-S1 input/output module

Specifications \ Model		Input/Output Composite Module	
		Input Specifications	**Appearance**
Number of input points		32 points	
Isolation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 5 mA	
Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		60% (20 points/common) simultaneously ON (at 24 VDC)	
ON voltage/ON current		15 VDC or higher/3 mA or higher	
OFF voltage/OFF current		3 VDC or lower/0.5 mA or lower	
Input resistance		Approx. 5 kΩ	
Response time	OFF → ON	0.3 ms or less (24 VDC)	
	ON → OFF	0.3 ms or less (24 VDC)	
Common method		32 points/common (common terminals: 1B1, 1B2)	
		Output Specifications	
Number of output points		32 points	
Isolation method		Photocoupler	
Rated input voltage		12/24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Max. load current		0.1 A/point, 1.6 A/common	
Max. allowed rush current		0.4 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA or less	
Max. voltage drop at ON circuit		1.0 VDC (TYP) 0.1 A, 2.5 VDC (MAX) 0.1 A	
Response time	OFF → ON	2 ms or less	
	ON → OFF	2 ms or less (resistive load)	
Surge absorber		Zener diode	
Fuse rating		Fuse 3.2 A (1 piece/common), not replaceable *3	
Fuse capacity		50 A	
Error display		LED goes ON when fuse blows: signal output to PC CPU *4	
Common method		32 points/common (common terminals: 2A1, 2A2)	
External power supply	Voltage	12/24 VDC (10.2 to 30 VDC)	
	Current	8 mA (TYP 24 VDC/common)	
		Common Specifications	
Number of I/O points		32 (I/O allocation is set as a 32-point output module)	
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*5	
Accessories		Connector (2 cps.) for external wiring (soldering type)	
Internal current consumption (5 VDC)		500 mA (TYP, all points ON)	
Weight kg		0.27	

External Connections

Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
 Front view	1B20	X00	1A20	X10	2B20	Y00	2A20	Y10
	1B19	X01	1A19	X11	2B19	Y01	2A19	Y11
	1B18	X02	1A18	X12	2B18	Y02	2A18	Y12
	1B17	X03	1A17	X13	2B17	Y03	2A17	Y13
	1B16	X04	1A16	X14	2B16	Y04	2A16	Y14
	1B15	X05	1A15	X15	2B15	Y05	2A15	Y15
	1B14	X06	1A14	X16	2B14	Y06	2A14	Y16
	1B13	X07	1A13	X17	2B13	Y07	2A13	Y17
	1B12	X08	1A12	X18	2B12	Y08	2A12	Y18
	1B11	X09	1A11	X19	2B11	Y09	2A11	Y19
	1B10	X0A	1A10	X1A	2B10	Y0A	2A10	Y1A
	1B9	X0B	1A9	X1B	2B9	Y0B	2A9	Y1B
	1B8	X0C	1A8	X1C	2B8	Y0C	2A8	Y1C
	1B7	X0D	1A7	X1D	2B7	Y0D	2A7	Y1D
	1B6	X0E	1A6	X1E	2B6	Y0E	2A6	Y1E
	1B5	X0F	1A5	X1F	2B5	Y0F	2A5	Y1F
	1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
	1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
	1B2	24 VDC	1A2	Vacant	2B2	12/24 VDC	2A2	COM2
	1B1	24 VDC	1A1	Vacant	2B1	12/24 VDC	2A1	COM2



*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*2 : When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs.
When it is set to the right side, the status of the second-half devices (Y00 to Y1F) is displayed by the LEDs.

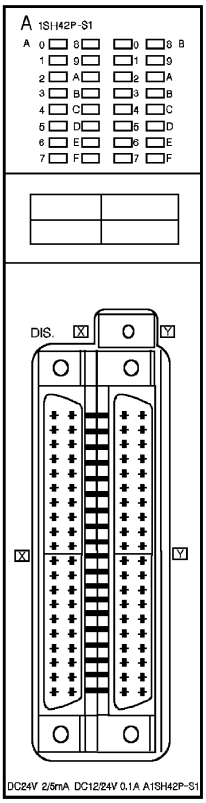
*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

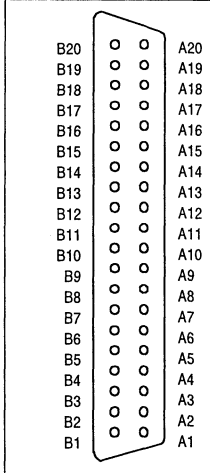
*5 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

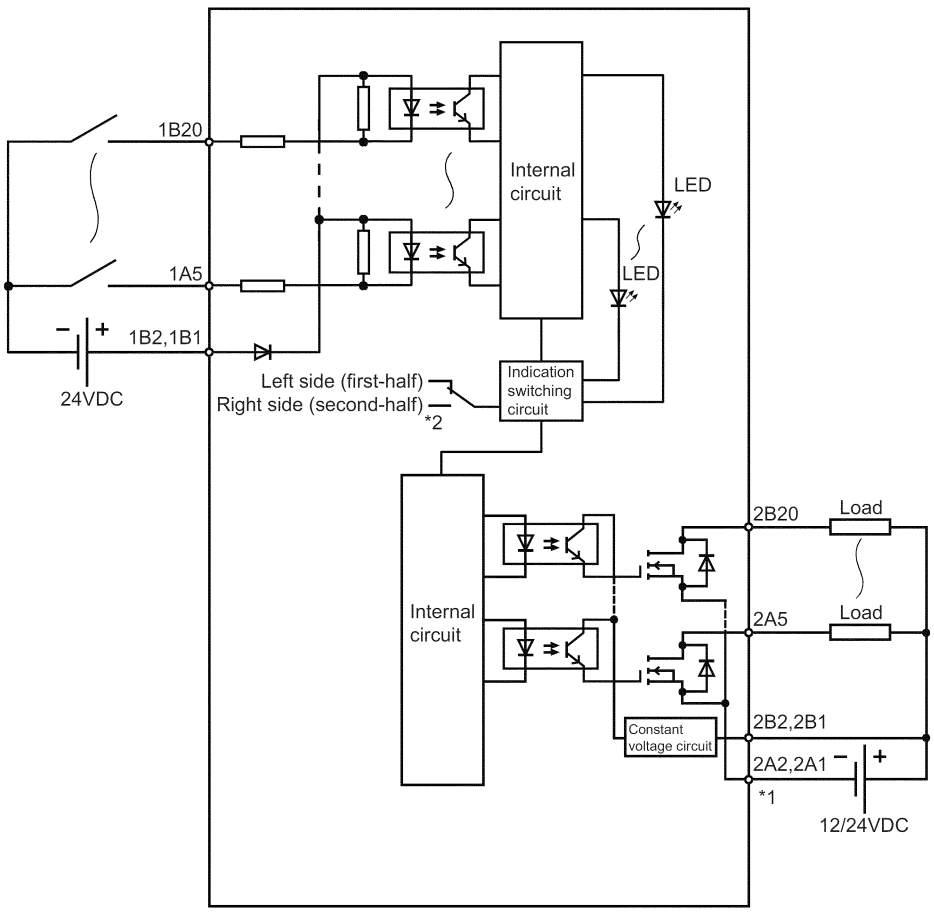
4.1.4 A1SH42P-S1 input / output module

Specifications \ Model		Input / Output Composite Module	
		Input Specifications	Appearance
Number of input points		32 points	
Isolation method		Photocoupler	
Rated input voltage		24VDC	
Rated input current		Approx. 5 mA	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		60% (20 points / common) simultaneously ON (at 24 VDC)	
ON voltage/ON current		15 VDC or higher / 3 mA or higher	
OFF voltage/OFF current		3 V or lower / 0.5 mA or lower	
Input resistance		Approx. 5kΩ	
Response time	OFF→ON	0.3 ms or less (24 VDC)	
	ON→OFF	0.3 ms or less (24 VDC)	
Common method		32 points / common (common terminal: 1B1, 1B2)	
		Output Specifications	
Number of Output points		32 points	
Isolation method		Photocoupler	
Rated input voltage		12 / 24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Max. load current		0.1 A / points, 2 A / common	
Max. allowed rush current		0.7 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA of less	
Max. voltage drop at ON circuit		0.1 VDC (TYP) 0.1 A, 0.2 VDC (MAX) 0.1 A	
Response time	OFF→ON	1 ms or less	
	ON→OFF	1 ms or less (resistive load)	
Surge absorber		Zener diode	
Fuse rating		None	
Common method		32 points / common (common terminals: 2A1, 2A2)	
External power supply	Voltage	12 / 24 VDC (10.2 to 30 VDC)	
	Current	12 mA (TYP 24 VDC / common)	
Protection function		Yes (overload protection function, overheat protection function) • Overheat protection function is activated in increments of 1 point. • Overload protection function is activated in increments of 1 point.	
		Common Specifications	
Number of I/O points		32 (I/O allocation is set as a 32-point output module)	
Operating indicator		ON state is indicated (LEDs), 32-bit indication by switch	
External connections		40-pin connector	
Applicable wire size		0.088 to 0.3mm^2 (for the A6CON1 and A6CON4)*3	
Accessories		Connector (2 cps.) for external wiring (soldering type)	
Internal current consumption (5 VDC)		130 mA (TYP, all points ON)	
Weight Kg		0.17	



External Connections

Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (LH)	Pin No.	Signal Name (LH)
	1B20	X00	1A20	X10	2B20	Y00	2A20	Y10
	1B19	X01	1A19	X11	2B19	Y01	2A19	Y11
	1B18	X02	1A18	X12	2B18	Y02	2A18	Y12
	1B17	X03	1A17	X13	2B17	Y03	2A17	Y13
	1B16	X04	1A16	X14	2B16	Y04	2A16	Y14
	1B15	X05	1A15	X15	2B15	Y05	2A15	Y15
	1B14	X06	1A14	X16	2B14	Y06	2A14	Y16
	1B13	X07	1A13	X17	2B13	Y07	2A13	Y17
	1B12	X08	1A12	X18	2B12	Y08	2A12	Y18
	1B11	X09	1A11	X19	2B11	Y09	2A11	Y19
	1B10	X0A	1A10	X1A	2B10	Y0A	2A10	Y1A
	1B9	X0B	1A9	X1B	2B9	Y0B	2A9	Y1B
	1B8	X0C	1A8	X1C	2B8	Y0C	2A8	Y1C
	1B7	X0D	1A7	X1D	2B7	Y0D	2A7	Y1D
	1B6	X0E	1A6	X1E	2B6	Y0E	2A6	Y1E
	1B5	X0F	1A5	X1F	2B5	Y0F	2A5	Y1F
	1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
	1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
	1B2	24 VDC	1A2	Vacant	2B2	12/24 VDC	2A2	COM2
	1B1	24 VDC	1A1	Vacant	2B1	12/24 VDC	2A1	COM2



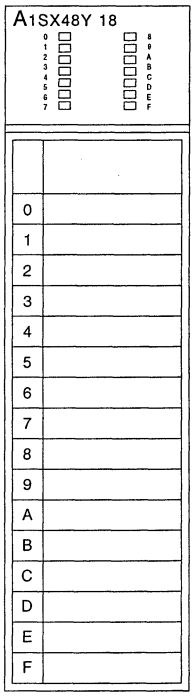
*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*2 : When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs.
When it is set to the right side, the status of the second-half devices (Y00 to Y1F) is displayed by the LEDs.

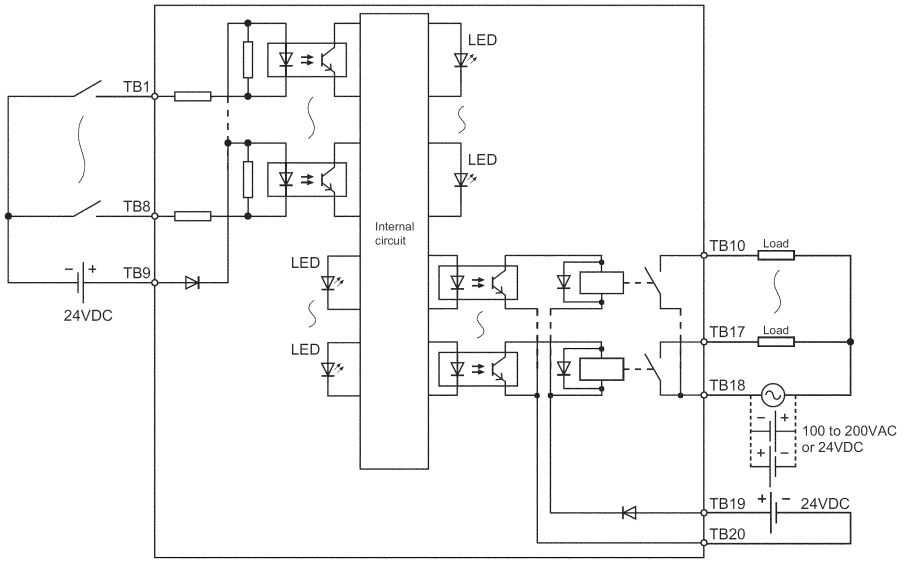
*3 : When the A6CON2 or A6CON3 is used, refer to Section 1.2.4.

4.1.5 A1SX48Y18 I/O module (24 VDC input (sink type), relay contact output)

Specifications \ Model		Input/Output Composite Module	Appearance
		Input Specifications	
Number of input points		8 points	
Isolation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 7 mA	
Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		100% simultaneously ON (at 26.4 VDC)	
ON voltage/ON current		14 VDC or higher/3.5 mA or higher	
OFF voltage/OFF current		6.5 VDC or lower/1.7 mA or lower	
Input resistance		Approx. 3.3 kΩ	
Response time	OFF → ON	10 ms or less (24 VDC)	
	ON → OFF	10 ms or less (24 VDC)	
Input method		Sink input	
Common method		8 points/common (common terminals: TB9)	
		Output Specifications	
Number of output points		8 points	
Isolation method		Photocoupler	
Rated switching voltage and current		24 VDC 2 A (resistive load) 240 VAC 2A (COSϕ=1)/point, 8 A/common	
Minimum switching load		5 VDC 1mA	
Maximum switching voltage		264 VAC 125 VDC	
Response time	OFF → ON	10 ms or less	
	ON → OFF	12 ms or less (resistive load)	
Service life	Mechanical	20,000,000 times of switching or over	
	Electrical	At rated switching voltage and current loads 100,000 times of switching or over	
		At 200 VAC 1.5 A, 240 VAC 1 A (COSϕ=0.7) 100,000 times of switching or over	
		At 200 VAC 1 A, 240 VAC 0.5 A (COSϕ=0.35) 100,000 times of switching or over	
		At 24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) 100,000 times of switching or over	
Maximum switching frequency		3600 times/hour	
Surge absorber		Not provided	
Fuse		None	
External power supply (relay coil drive)	Voltage	24 VDC ±10%, ripple voltage: 4 V_{P-P} or less	
	Current	45 mA (TYP. 24 VDC all points ON)	
Common method		8 points/common (common terminal: TB18)	
		Common Specifications	
Operation indicator		Provided (The LED lights when the input/output is ON.)	
External wiring connection method		20-point terminal block connector (M3.5 x 7 screw)	
Applicable cable size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)	
Applicable solderless terminal		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5	
Accessories		None	
Internal current consumption (5 VDC)		85 mA (TYP. all points ON) (0.09A is shown on the rating plate of the module.)	
Weight kg		0.225	
Number of I/O points		16 points (Make I/O allocation as a 16-point output module.)	



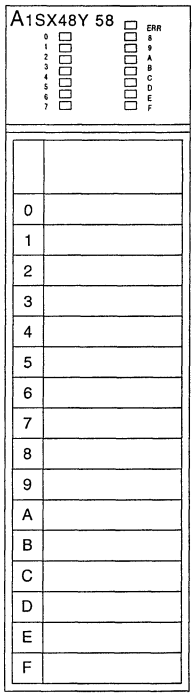
External Connections



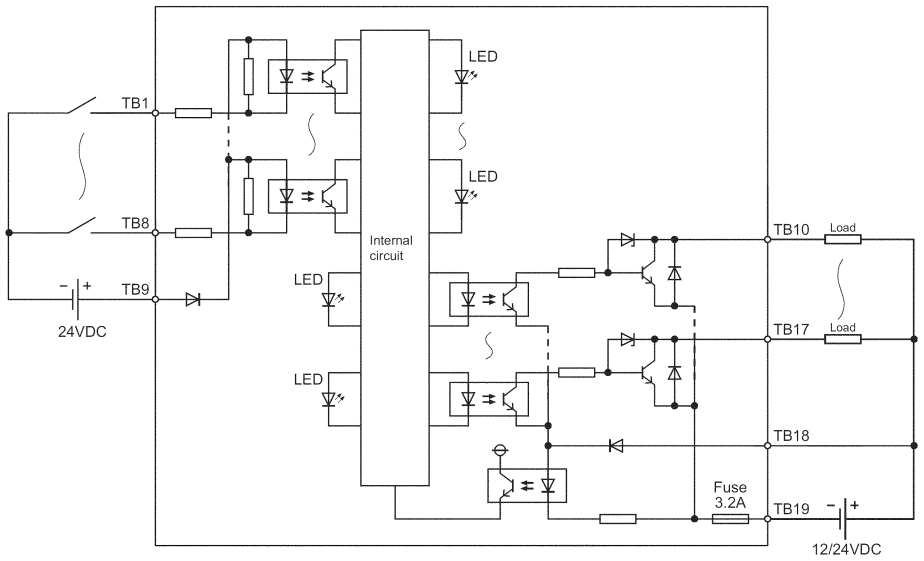
Pin No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0 V

4.1.6 A1SX48Y58 I/O module (24 VDC input (sink type), 12/24 VDC transistor output)

Specifications \ Model		Input/Output Composite Module	
		Input Specifications	Appearance
Number of input points		8 points	
Isolation method		Photocoupler	
Rated input voltage		24 VDC	
Rated input current		Approx. 7 mA	
Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)	
Max. simultaneous input points		100% simultaneously ON (at 26.4 VDC)	
ON voltage/ON current		14 VDC or higher/3.5 mA or higher	
OFF voltage/OFF current		6.5 VDC or lower/1.7 mA or lower	
Input resistance		Approx. 3.3 kΩ	
Response time	OFF → ON	10 ms or less (24 VDC)	
	ON → OFF	10 ms or less (24 VDC)	
Input method		Sink input	
Common method		8 points/common (common terminals: TB9)	
		Output Specifications	
Number of output points		8 points	
Isolation method		Photocoupler	
Rated load voltage		12/24 VDC	
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)	
Maximum load current		0.5 A/point, 2 A/common	
Maximum inrush current		4 A 10 ms or less	
Leakage current at OFF circuit		0.1 mA or less	
Maximum voltage drop at ON circuit		0.9 VDC (TYP.) 0.5 A 1.5 VDC (MAX.) 0.5 A	
Response time	OFF → ON	2 ms or less	
	ON → OFF	2 ms or less (resistive load)	
Surge absorber		Zener diode	
Fuse rating		Fuse 3.2 A (1 per common) Not replaceable *1	
Fuse breaking capacity		5.0 A	
Error display		LED goes ON when fuse blows: signal output to PC CPU *2	
External power supply (relay coil drive)	Voltage	12/24 VDC (10.2 to 30 VDC)	
	Current	60 mA (TYP. 24 VDC per common)	
Common method		8 points/common (common terminal: TB19)	
		Common Specifications	
Operation indicator		Provided (The LED lights when the input/output is ON.)	
External wiring connection method		20-point terminal block connector (M3.5 x 7 screw)	
Applicable cable size		0.75 to 1.25 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)	
Applicable solderless terminal		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5	
Accessories		None	
Internal current consumption (5 VDC)		60 mA (TYP. all points ON)	
Weight kg		0.2	
Number of I/O points		16 points (Make I/O allocation as a 16-point output module.)	



External Connections



Pin No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	12/24 VDC
TB19	COM2
TB20	Vacant

*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

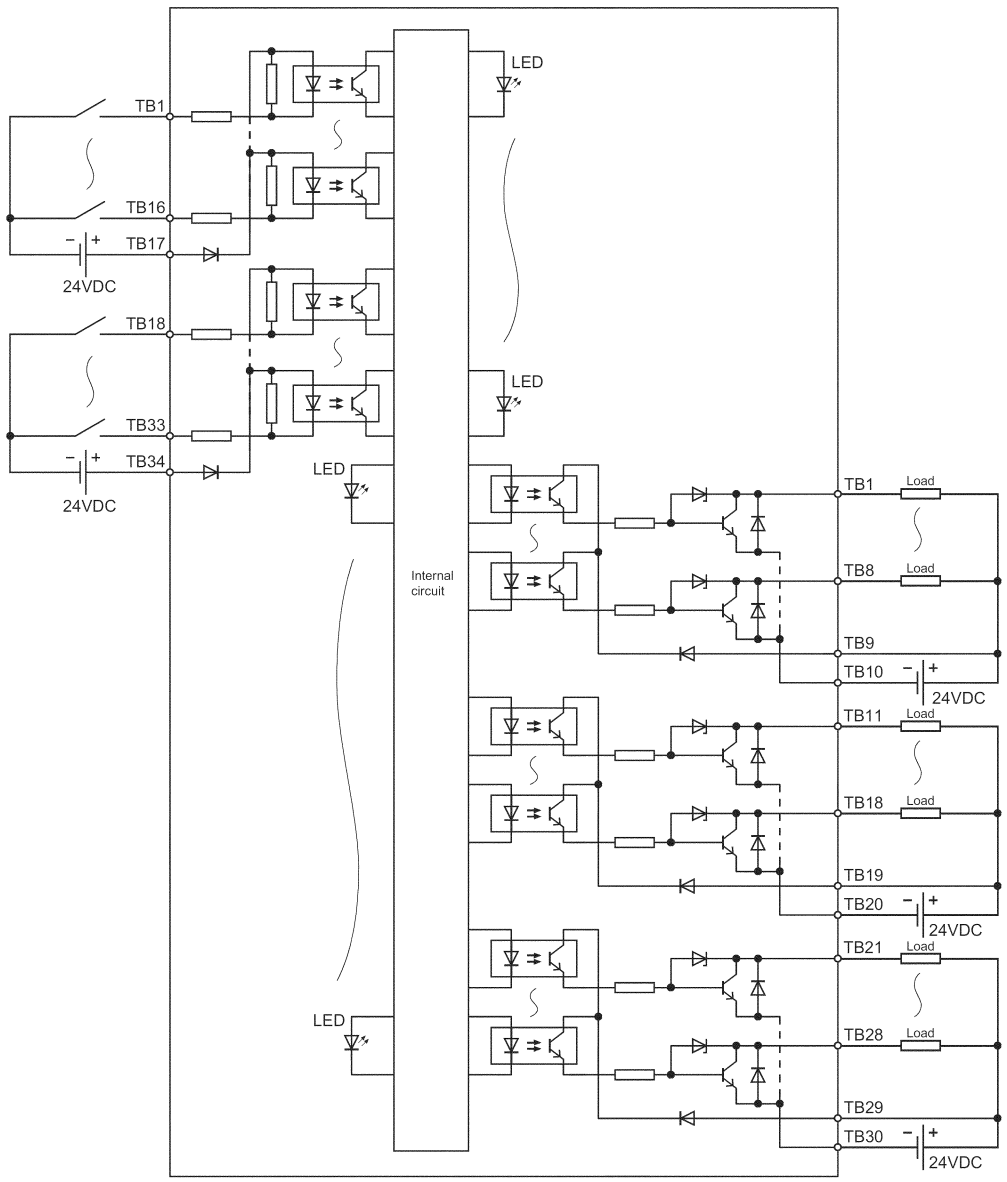
4.1.7 A1SJ-56DT I/O module

Can only be installed on an A1SJ(H)CPU. Cannot be installed on an A1S3□B (S1) (main base unit), or an A1S6□B (S1) (extension base unit).

Output Specifications			Input Specifications		
Number of output points		24 points	Number of input points		32 points
Isolation method		Photocoupler	Isolation method		Photocoupler
Rated load voltage		24 VDC	Rated input voltage		24 VDC
Operating load voltage range		19.2 to 30 VDC (peak voltage: 30 VDC)	Rated input current		Approx. 7 mA
			Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)
Maximum load current		0.5 A/point, 4 A/common	ON voltage/ON current		14 VDC or higher/3.5 mA or higher
Maximum inrush current		4 A 10 ms or less	OFF voltage/OFF current		6.5 VDC or lower/1.7 mA or lower
Leakage current at OFF circuit		0.1mA or less	Input resistance		Approx. 3.3 KΩ
Maximum voltage drop at OFF circuit		0.9 V (TYP.) 0.5 A 1.5 V (MAX.) 0.5 A	Input method		Sink input (method by which the input current flows out)
Response time	OFF → ON	2 ms or less	Response time	OFF → ON	10 ms or less (24 VDC)
	ON → OFF	2 ms or less (resistive load)		ON → OFF	10 ms or less (24 VDC)
External power supply	Voltage	24 VDC (19.2 to 30 VDC)	Common method		16 points/common (common terminal: TB17, TB34)
	Current	60 mA (TYP. 24 VDC/common)			
Surge absorber		Zener diode	Operating indicator		Provided (the LED lights when the input is ON.)
Common method		8 points/common (common terminal: TB10, TB20, TB30)	Maximum simultaneous input points		60 % (10 points/common)simultaneously ON
Operating indicator		Provided (the LED lights when the output is ON.)			
Number of I/O points		128 points (slot 0: output, 64 points; slots 1 to 4: vacant, 16 points)			
Internal current consumption (5 VDC)		220 mA (TYP. all points ON)			
External wiring connection method		34-point terminal block connector (M3.5 x 6 screw), 2 connectors			
Applicable cable size		0.75 to 2 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)			
Applicable solderless terminal		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5			
Weight kg		0.7			

External Connections

IN	
Signal Name	Pin No.
X00	TB1
X01	TB2
X02	TB3
X03	TB4
X04	TB5
X05	TB6
X06	TB7
X07	TB8
X08	TB9
X09	TB10
X0A	TB11
X0B	TB12
X0C	TB13
X0D	TB14
X0E	TB15
X0F	TB16
COM1	TB17
X10	TB18
X11	TB19
X12	TB20
X13	TB21
X14	TB22
X15	TB23
X16	TB24
X17	TB25
X18	TB26
X19	TB27
X1A	TB28
X1B	TB29
X1C	TB30
X1D	TB31
X1E	TB32
X1F	TB33
COM2	TB34



OUT	
Pin No.	Signal Name
TB1	Y20
TB2	Y21
TB3	Y22
TB4	Y23
TB5	Y24
TB6	Y25
TB7	Y26
TB8	Y27
TB9	24 VDC
TB10	COM3
TB11	Y28
TB12	Y29
TB13	Y2A
TB14	Y2B
TB15	Y2C
TB16	Y2D
TB17	Y2E
TB18	Y2F
TB19	24 VDC
TB20	COM4
TB21	Y30
TB22	Y31
TB23	Y32
TB24	Y33
TB25	Y34
TB26	Y35
TB27	Y36
TB28	Y37
TB29	24 VDC
TB30	COM5
TB31	NC
TB32	NC
TB33	NC
TB34	FG

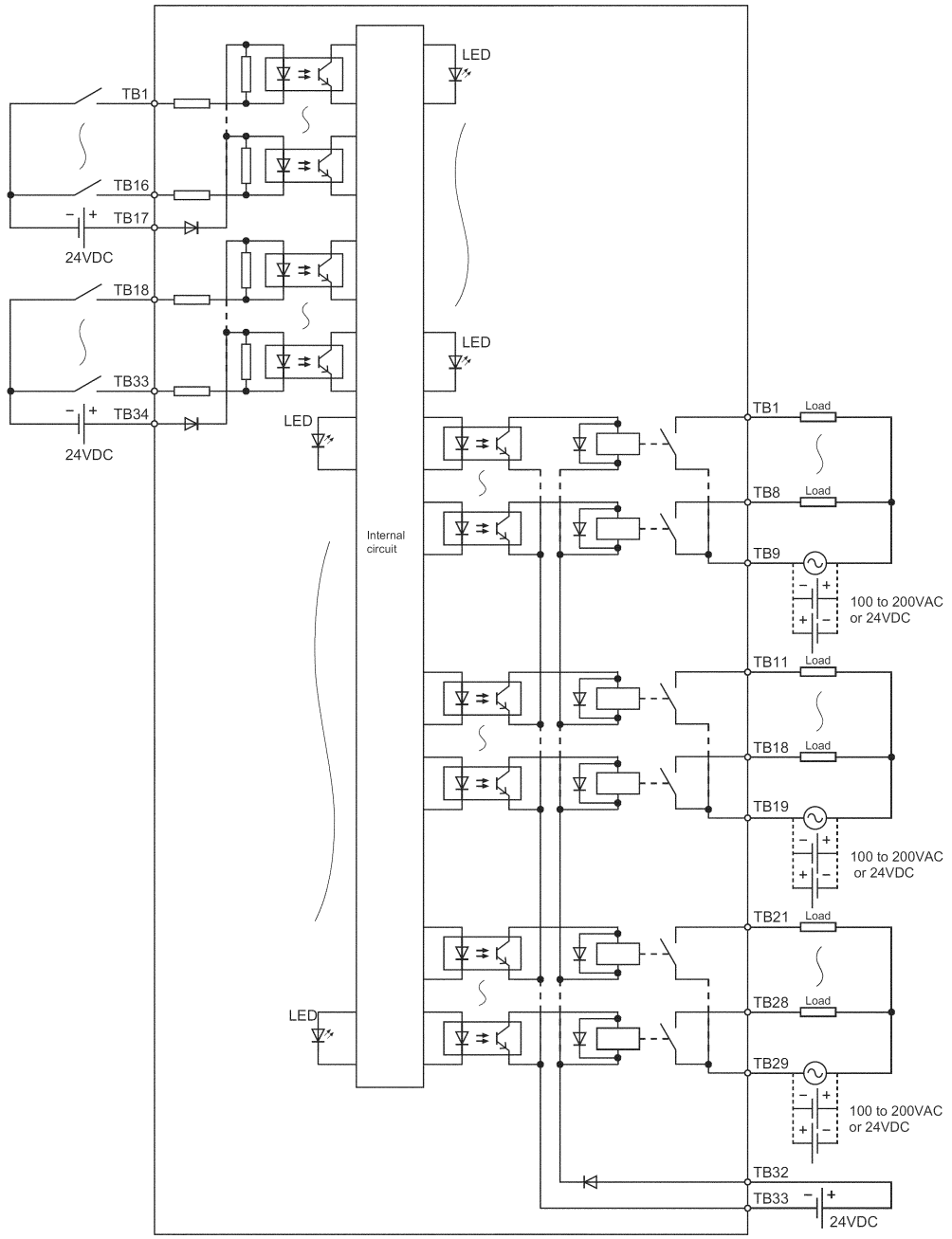
4.1.8 A1SJ-56DR I/O module

Can only be installed on an A1SJ(H)CPU. Cannot be installed on an A1S3□B (S1) (main base unit), or an A1S6□B (S1) (extension base unit).

Output Specifications			Input Specifications		
Number of output points		24 points	Number of input points		32 points
Isolation method		Photocoupler	Isolation method		Photocoupler
Rated switching voltage and current		24 VDC 2 A (resistive load) 240 VAC 2A (COSϕ=1)/point, 5 A/common	Rated input voltage		24 VDC
			Rated input current		Approx. 7 mA
Minimum swithcing load		5 VDC 1 mA	Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)
Max. switching voltage		264 VAC 125 VDC	ON voltage/ON current		14 VDC or higher/3.5 mA or higher
Max. switching frequency		3600 times/hour	OFF voltage/OFF current		6.5 VDC or lower/1.7 mA or lower
Service life	Mechanical	20,000,000 times of switching or over	Input resistance		Approx. 3.3 KΩ
	Electrical	At rated switching voltage and current loads 100,000 times of switching or over	Input method		Sink input (method by which the input current flows out)
		At 200 VAC 1.5 A, 240 VAC 1 A (COSϕ=0.7) 100,000 times of switching or over	Response time	OFF → ON	10 ms or less (24 VDC)
				ON → OFF	10 ms or less (24 VDC)
		At 200 VAC 1 A, 240 VAC 0.5 A (COSϕ=0.35) 100,000 times of switching or over	Common method		16 points/common (common terminal: TB17, TB34)
		At 24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) 100,000 times of switching or over	Operating indicator		Provided (the LED lights when the input is ON.)
Response time	OFF → ON	10 ms or less	Maximum simultaneous input points		60 % (10 points/common)simultaneously ON
	ON → OFF	12 ms or less			
External power supply (relay coil drive)	Voltage	24 VDC ±10%, ripple voltage: 4 V_{P-P} or less			
	Current	140 mA (TYP. 24 VDC all points ON)			
Surge absorber		None			
Common method		8 points/common (common terminal: TB9, TB18, TB27)			
Operating indicator		Provided (the LED lights when the output is ON.)			
Number of I/O points		128 points (slot 0: output, 64 points; slots 1 to 4: vacant, 16 points)			
Internal current consumption (5 VDC)		220 mA (TYP. all points ON)			
External wiring connection method		34-point terminal block connector (M3.5 x 6 screw), 2 connectors			
Applicable cable size		0.75 to 2 mm^2 (AWG16 to AWG19) (Applicable tightening torque 78.4 N•cm)			
Applicable solderless terminal		R1.25-3.5, R2-3.5 RAV1.25-3.5, RAV2-3.5			
Weight kg		0.8			

External Connections

IN	
Signal Name	Pin No.
X00	TB1
X01	TB2
X02	TB3
X03	TB4
X04	TB5
X05	TB6
X06	TB7
X07	TB8
X08	TB9
X09	TB10
X0A	TB11
X0B	TB12
X0C	TB13
X0D	TB14
X0E	TB15
X0F	TB16
COM1	TB17
X10	TB18
X11	TB19
X12	TB20
X13	TB21
X14	TB22
X15	TB23
X16	TB24
X17	TB25
X18	TB26
X19	TB27
X1A	TB28
X1B	TB29
X1C	TB30
X1D	TB31
X1E	TB32
X1F	TB33
COM2	TB34



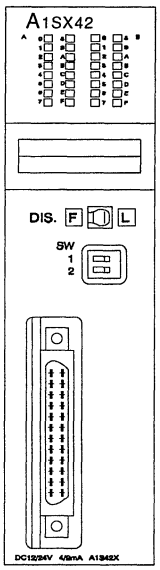
OUT	
Pin No.	Signal Name
TB1	Y20
TB2	Y21
TB3	Y22
TB4	Y23
TB5	Y24
TB6	Y25
TB7	Y26
TB8	Y27
TB9	COM3
TB10	NC
TB11	Y28
TB12	Y29
TB13	Y2A
TB14	Y2B
TB15	Y2C
TB16	Y2D
TB17	Y2E
TB18	Y2F
TB19	COM4
TB20	NC
TB21	Y30
TB22	Y31
TB23	Y32
TB24	Y33
TB25	Y34
TB26	Y35
TB27	Y36
TB28	Y37
TB29	COM5
TB30	NC
TB31	NC
TB32	24 VDC
TB33	24 GDC
TB34	FG

4.2 Dynamic Input/Output Module Specifications

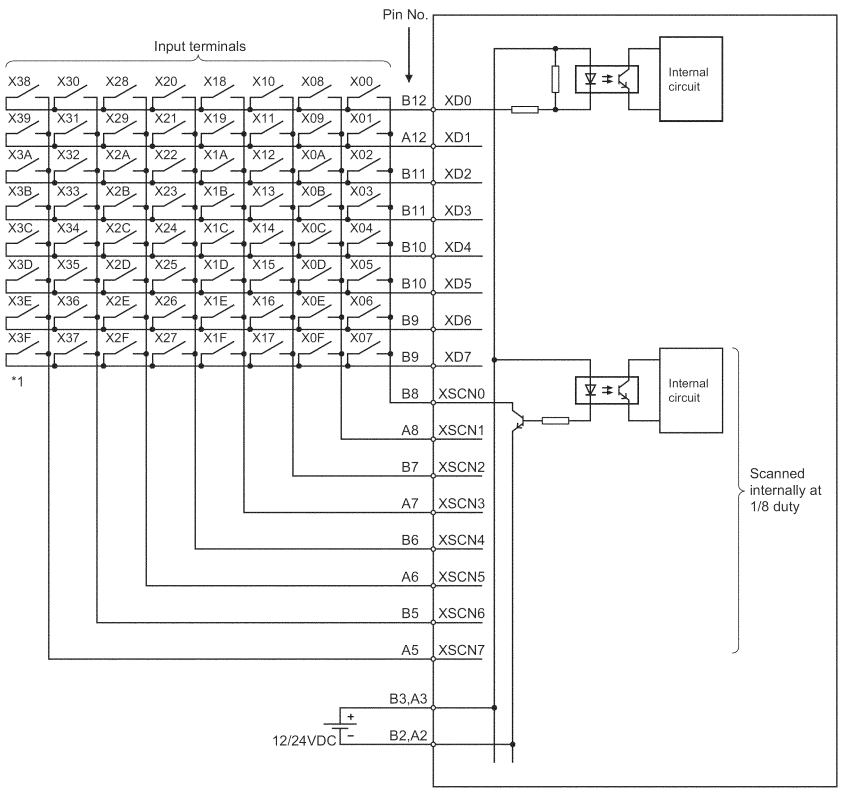
4.2.1 A1S42X dynamic input module

Specifications \ Model		Dynamic Input Module A1S42X	
Number of input points *1		16/32/48/64 points (switch setting)	
Isolation method		Photocoupler	
Rated input voltage		12 VDC	24 VDC
Rated input current		Approx. 4 mA	Approx. 9 mA
Operating voltage range		10.2 to 26.4 VDC (ripple : less than 5 %)	
Max. simultaneous input points		100 % simultaneously ON (at 26.4 VDC)	
ON voltage/ON current		8 VDC or higher/2 mA or higher	
OFF voltage/OFF current		4 VDC or lower/1 mA or lower	
Input resistance		Approx. 2.4 kΩ	
Response time	OFF → ON	0.4 ms or less (24 VDC)	
	ON → OFF	0.4 ms or less (24 VDC)	
Dynamic scan cycle		13.3 ms	
Operating indicator		On state is indicated (LEDs), 32-bit indication by switch	
External connections		24-pin connector	
Applicable wire size		0.3 mm^2	
Accessories		Connector (1 pce.) for external wiring (soldering type)	
Internal current consumption (5 VDC)		80 mA (TYP, all points ON)	
Weight kg		0.18	

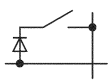
Appearance



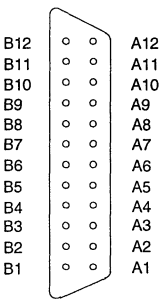
External Connections



*1 Be sure to connect a diode to each switch if there will be any occasions where 2 or more switches are pressed simultaneously. (Refer to the figure on the right.)



PIn Arrangement

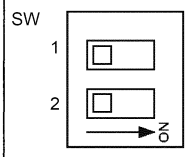
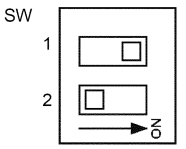
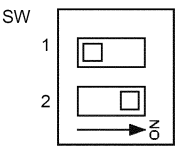
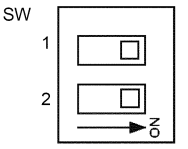


Front view

Pin No.	Signal Name	Pin No.	Signal Name
B12	XD0	A12	XD1
B11	XD2	A11	XD3
B10	XD4	A10	XD5
B9	XD6	A9	XD7
B8	XSCN0	A8	XSCN1
B7	XSCN2	A7	XSCN3
B6	XSCN4	A6	XSCN5
B5	XSCN6	A5	XSCN7
B4	Vacant	A4	Vacant
B3	12/24 VDC	A3	12/24 VDC
B2	0V	A2	0V
B1	FG	A1	FG

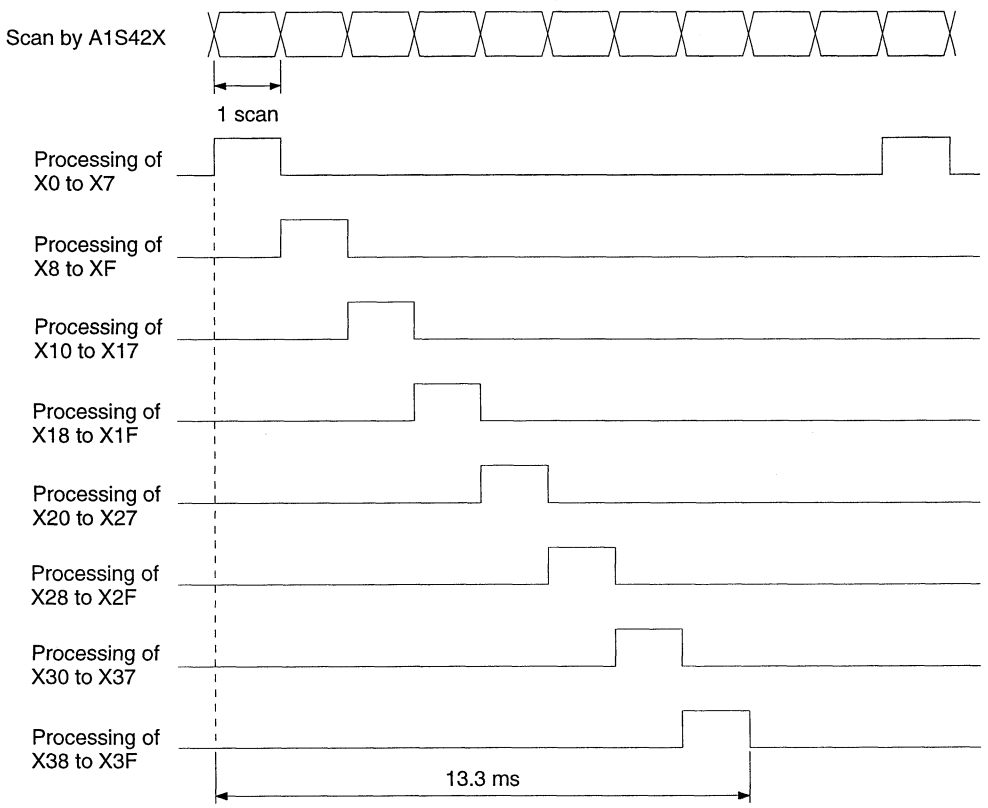
(1) Number of occupied I/O points setting

The Number of occupied I/O points is set by the DIP switches on the front face of the module. It is factory-set to 64 points.

Number of occupied I/O points	16 points	32 points	48 points	64 points
Switch setting				

(2) Dynamic scan method

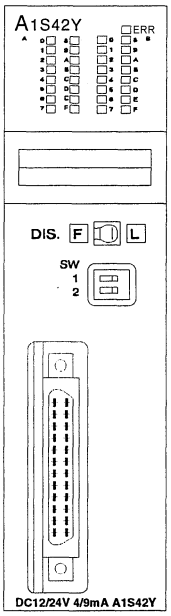
In the dynamic scan method, the whole number of occupied I/O points is divided into several groups of a specified number of points, and processed in several scans. 64 input points are divided into 8 groups of 8 points, and processed group by group as shown in the figure below. Regardless of whether the number of occupied I/O points is set at 16, 32, or 48 points, the dynamic scan cycle is fixed at 13.3 ms.



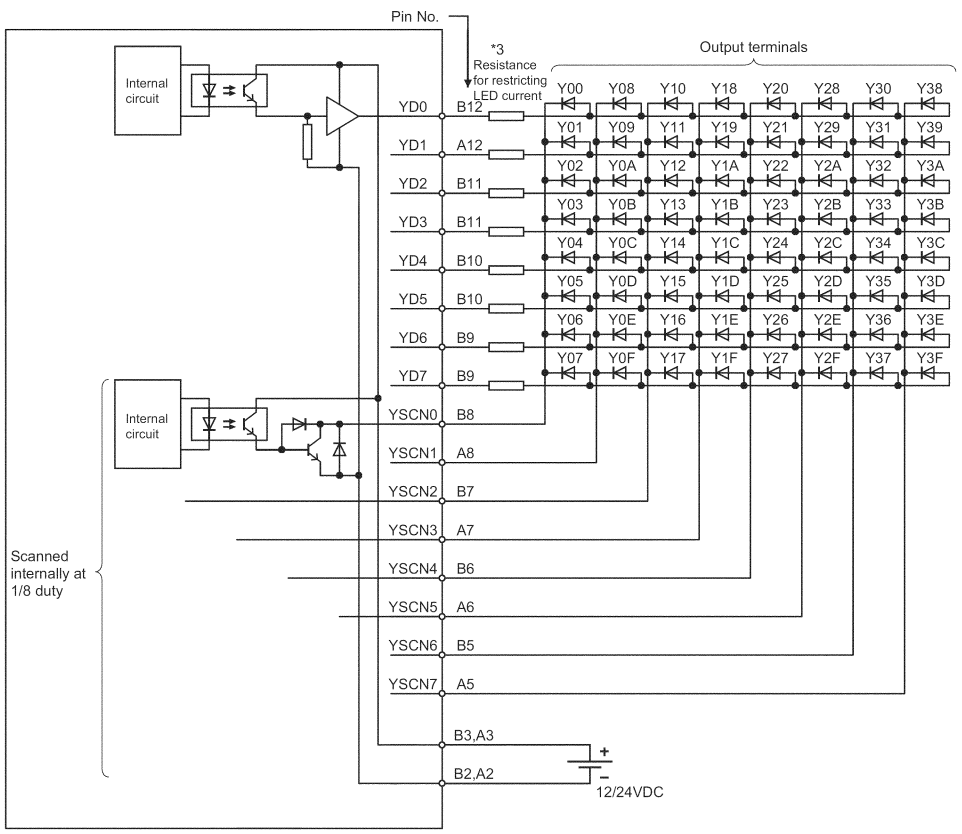
4.2.2 A1S42Y dynamic output module

Specifications \ Model		Dynamic Output Module A1S42Y
Number of output points		16/32/48/64 points (switch setting)
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 26.4 VDC (ripple : less than 5 %)
Max. load current		0.1 A/point (40 °C), 0.05A/point (55 °C)
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		Source 2.0 VDC (MAX) 0.1 A Sink 2.0 VDC (MAX) 0.1 A
Response time	OFF → ON	2 ms or less (resistive load)
	ON → OFF	2 ms or less (resistive load)
Fuse rating		Fuse 1.6 A, not replaceable *1
Fuse capacity		50 A
Error display		LED goes ON when fuse blows : signal output to PC CPU *2
Operating indicator		On state is indicated (LEDs), 32-bit indication by switch
External connections		24-pin connector
Applicable wire size		0.3 mm^2
Accessories		Connector (1 pce.) for external wiring (soldering type)
External power supply	Voltage	12/24 VDC (10.2 to 26.4 VDC)
	Current	55 mA (TYP, 24 VDC/common)
Internal current consumption (5 VDC)		180 mA (TYP, all points ON)
Weight kg		0.19

Appearance



External Connections



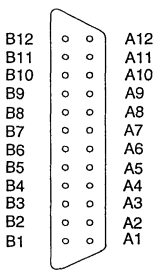
*1 The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*2 The ERR. indicating LED will also light when the external power supply is shut OFF.

*3 Install the resistance for restricting LED current outside the A1S42Y module.

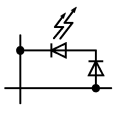
*4 The power supply voltage(24/12 VDC) is applied to the reverse direction of the LED. If the opposite voltage resistance is not sufficient, connect a diode for serial protection to each LED.

PIn Arrangement



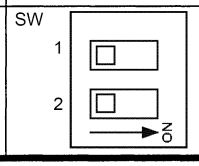
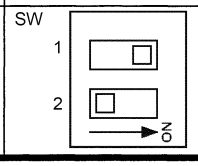
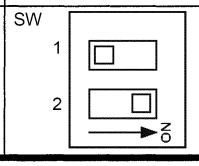
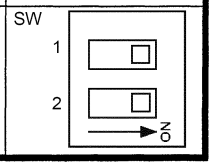
Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Nane (FH)
B12	YD0	A12	YD1
B11	YD2	A11	YD3
B10	YD4	A10	YD5
B9	YD6	A9	YD7
B8	YSCN0	A8	YSCN1
B7	YSCN2	A7	YSCN3
B6	YSCN4	A6	YSCN5
B5	YSCN6	A5	YSCN7
B4	Vacant	A4	Vacant
B3	12/24 VDC	A3	12/24 VDC
B2	0V	A2	0V
B1	Vacant	A1	Vacant



(1) Number of occupied I/O points setting

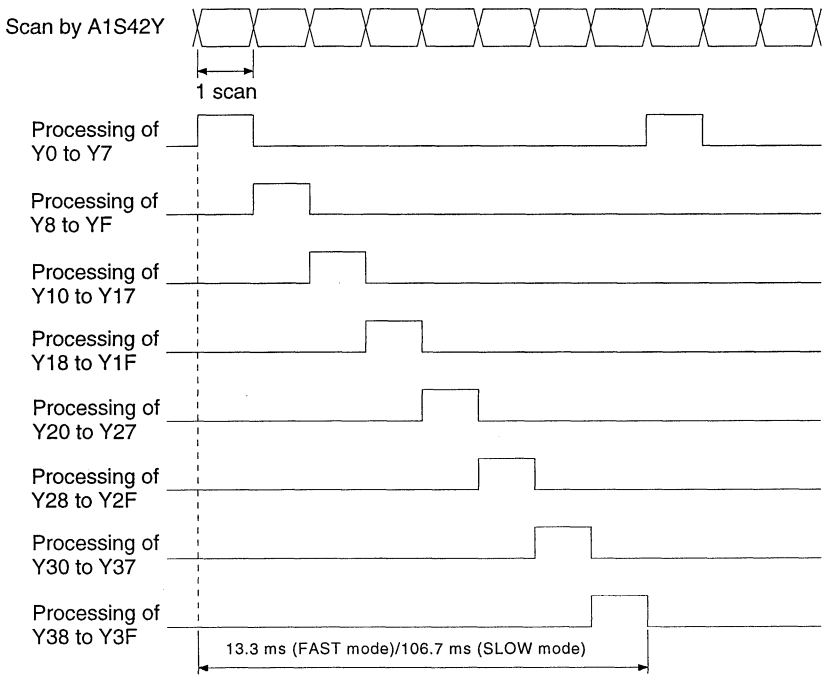
The number of occupied I/O points is set using the DIP switches on the front face of the module. It is factory-set to 64 points.

Number of occupied I/O points	16 points	32 points	48 points	64 points
Switch setting				

(2) Dynamic scan method and dynamic scan cycle setting

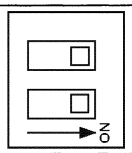
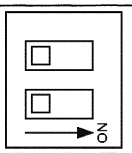
(a) Dynamic scan method

In the dynamic scan method, the whole number of occupied I/O points is divided into several groups of a specified number of points, and processed in several scans. 64 input points are divided into 8 groups of 8 points, and processed group by group as shown in the figure below. Regardless of whether the number of occupied I/O points is set at 16, 32, or 48 points, the dynamic scan cycle is fixed at 13.3/106.7 ms.



(b) Dynamic scan cycle setting

The dynamic scan cycle is set using the DIP switches on the rear face of the module. It is factory-set to FAST mode.

FAST mode	SLOW mode
	

5. SPECIFICATIONS OF CONNECTOR/TERMINAL BLOCK CONVERTER MODULES

5.1 Specifications of Connector/Terminal Block Converter Modules

1) Connector/terminal block converter module specifications

Type	Details	Weight	Applicable Wire Size	Applicable Crimping Terminal	Applicable Models
A6TBXY36	For positive common type input modules and sink type output modules (standard type)	0.4kg	0.75 to 2mm²	1.25-3.5 (JIS) 1.25-YS3A (J.S.T.) Spade tongue V1.25-M3 (J.S.T.) Insulated V1.25-YS3A (J.S.T.) Spade tongue 2-3.5 (JIS) 2-YS3A (J.S.T.) Spade tongue V2-S3 (J.S.T.) Insulated V2-YS3A (J.S.T.) Spade tongue	Q series: QX41, QX41-S1, QX42, QX42-S1, QY41P, QY42P, QY82P, QH42P, QX41Y41P AnS series: A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX82-S1, A1SY41, A1SY41P, A1SY42, A1SY42P, A1SY82, A1SH42, A1SH42P, A1SH42-S1, A1SH42P-S1 A series: AX42, AX42-S1, AY42, AY42-S1, AY42-S3, AY42-S4, AH42 CC-Link: AJ65SBTCF1-32D, AJ65SBTCF1-32T, AJ65BTC1-32D, AJ65BTC1-32T MELSECNET-MINI: AJ35TC1-32D, AJ35TC1-32T
A6TBXY54	For positive common type input modules and sink type output modules (2-wire type)	0.5kg			
A6TBX70	For positive common type input modules (3-wire type)	0.6kg			Q series: QX41, QX41-S1, QX42, QX42-S1, QH42P, QX41Y41P AnS series: A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX82-S1, A1SH42, A1SH42P, A1SH42-S1, A1SH42P-S1 A series: AX42, AX42-S1, AH42 CC-Link: AJ65SBTCF1-32D, AJ65BTC1-32D MELSECNET-MINI: AJ35TC1-32D
A6TBX36-E	For negative common type input modules (standard type)	0.4kg			Q series: QX81 AnS series: A1SX81, A1SX81-S2 A series: AX82
A6TBX54-E	For negative common type input modules (2-wire type)	0.5kg			
A6TBX70-E	For negative common type input modules (3-wire type)	0.6kg			
A6TBY36-E	For source type output modules (standard type)	0.4kg			Q series: QY81P AnS series: A1SY81 A series: AY82EP
A6TBY54-E	For source type output modules (2-wire type)	0.5kg			

POINT

(1) The number of connectable I/O points is 32 for all connector/terminal block converter modules.
Two connector/terminal block converter modules and two cables for connector/terminal block converter modules are required for 64-point I/O modules.

(2) Though the A1SX81(S2) is used either as a sink or source type, use the A6TBX36-E, A6TBX54-E or A6TBX70-E.
The A6TBXY36, A6TBXY54 or A6TBX70 cannot be used.

(3) Though the A1SX82-S1 is used either as a sink or source type, the A6TBXY36/XY54/X70 may be used only when the A1SX82-S1 is used as a sink type.
When it is used as a source type, the A6TBXY36/XY54/X70 cannot be used.

(4) Though the A1SY82 and QY82P are source type output modules, use the A6TBXY36 or A6TBXY54. The A6TBY36-E, A6TBY54-E cannot be used.

(5) In the A series, the plus common input module is separately labeled as a sink type input module, and the minus common input module is separately labeled as a source type input module.

(6) When using the A6TBXY70 as a mixed input/output module, use at the input side.

(7) Tighten the module terminal screws to the following torque.
Supply line connecting terminal screw (M3.5 screw): Tightening torque 78.4N•cm

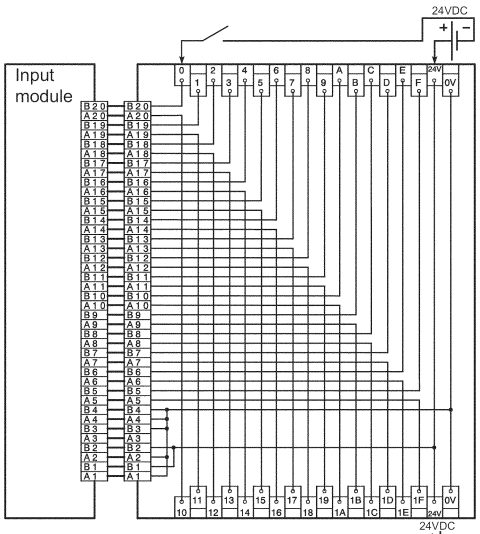
2) Cable

Type	Details	Weight	Applicable Models
AC05TB	0.5 m (19.69 in.), for sink modules	0.17kg	A6TBXY36 A6TBXY54 A6TBX70
AC10TB	1 m (39.37 in.), for sink modules	0.23kg	
AC20TB	2 m (78.74 in.), for sink modules	0.37kg	
AC30TB	3 m (118.11 in.), for sink modules	0.51kg	
AC50TB	5 m (196.85 in.), for sink modules	0.76kg	
AC80TB	8 m (314.96 in.), for sink modules (common current not exceeding 0.5 A)	1.2kg	
AC100TB	10 m (393.7 in.), for sink modules (common current not exceeding 0.5 A)	1.5kg	
AC05TB-E	0.5 m (19.69 in.), for source modules	0.17kg	A6TBX36-E A6TBY36-E A6TBX54-E A6TBY54-E A6TBX70-E
AC10TB-E	1 m (39.37 in.), for source modules	0.23kg	
AC20TB-E	2 m (78.74 in.), for source modules	0.37kg	
AC30TB-E	3 m (118.11 in.), for source modules	0.51kg	
AC50TB-E	5 m (196.85 in.), for source modules	0.76kg	

5.2 Connector/Terminal Block Converter Module Connection Diagrams

5.2.1 A6TBXY36

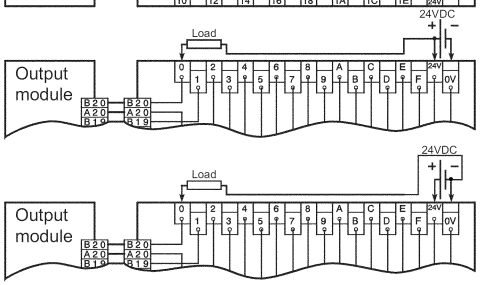
(1) When connecting an input module



(2) When connecting an output module

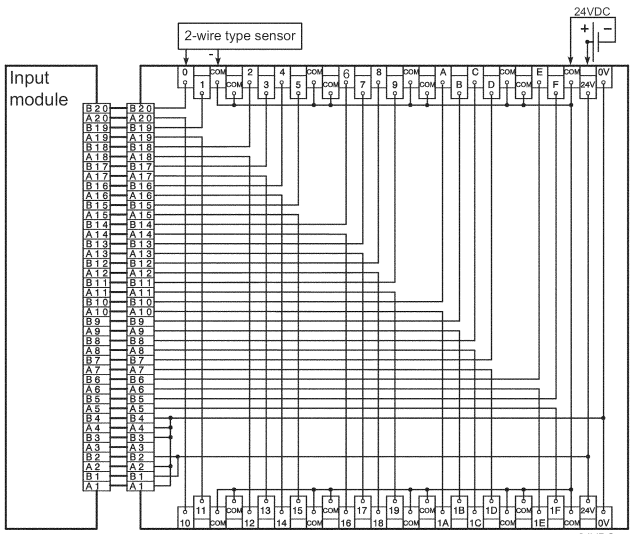
(a) Sink Type

(b) Source Type



5.2.2 A6TBXY54

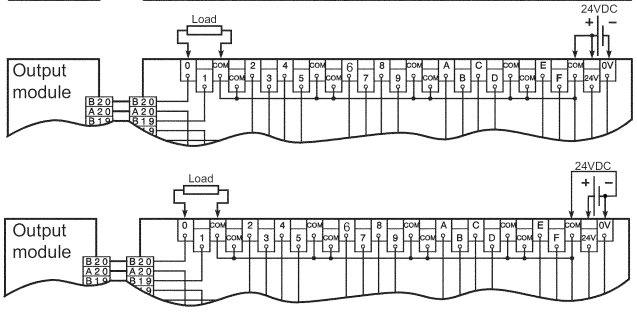
(1) When connecting an input module



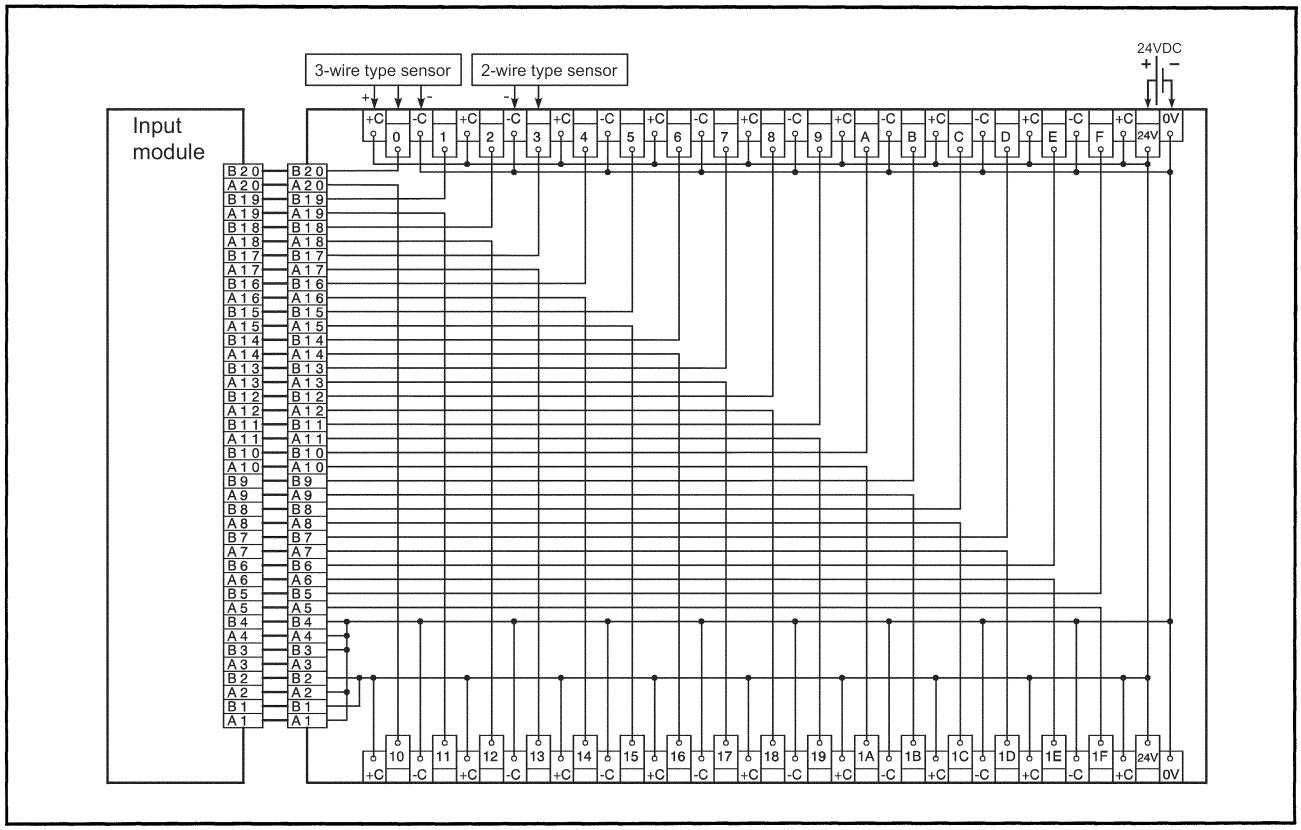
(2) When connecting an output module

(a) Sink Type

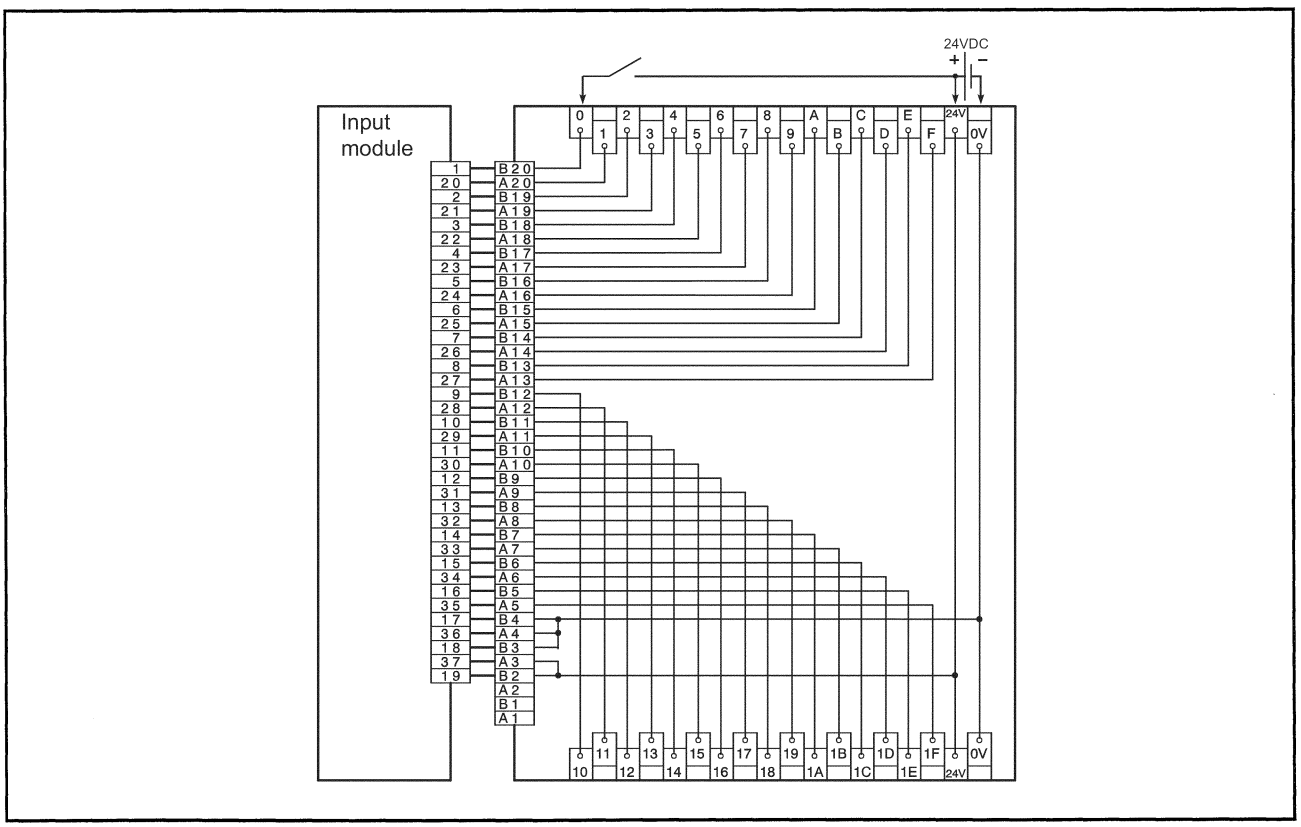
(b) Source Type



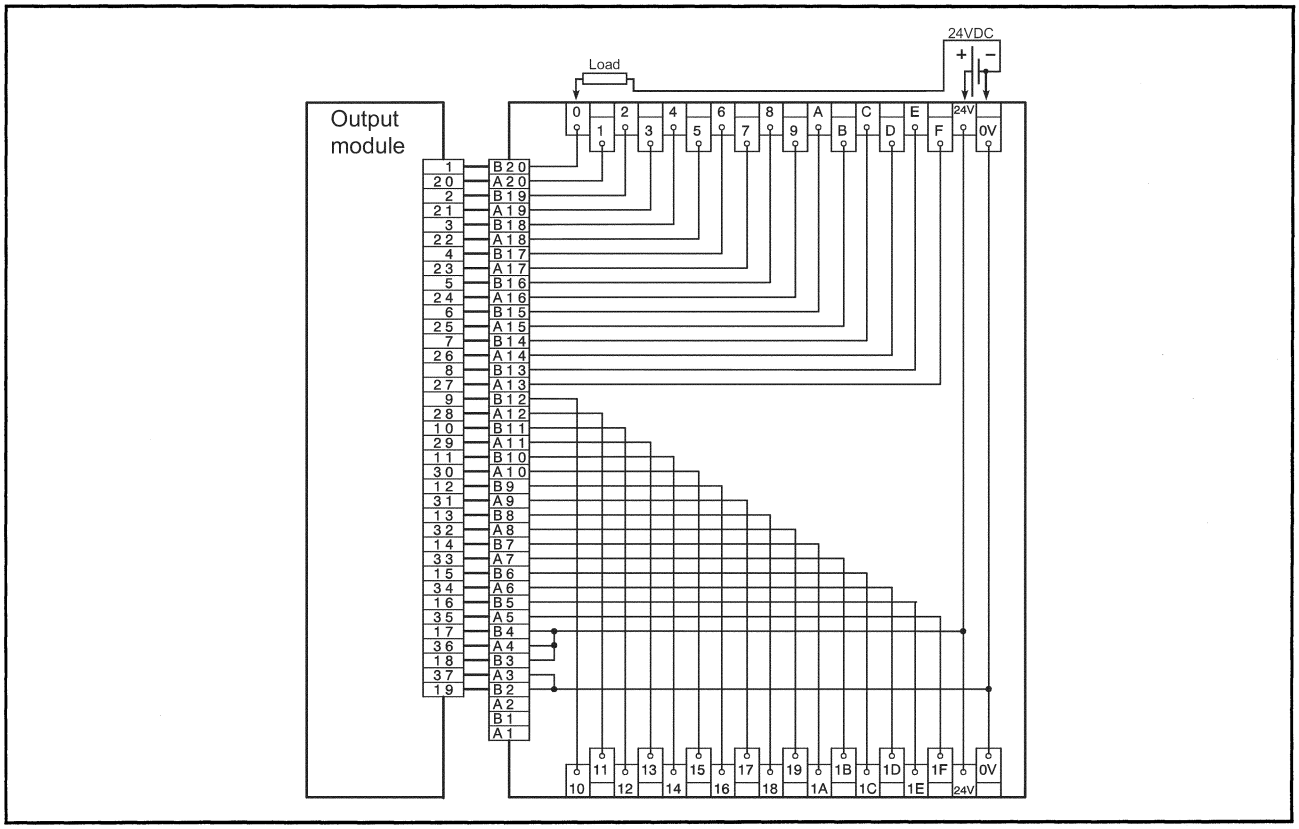
5.2.3 A6TBX70



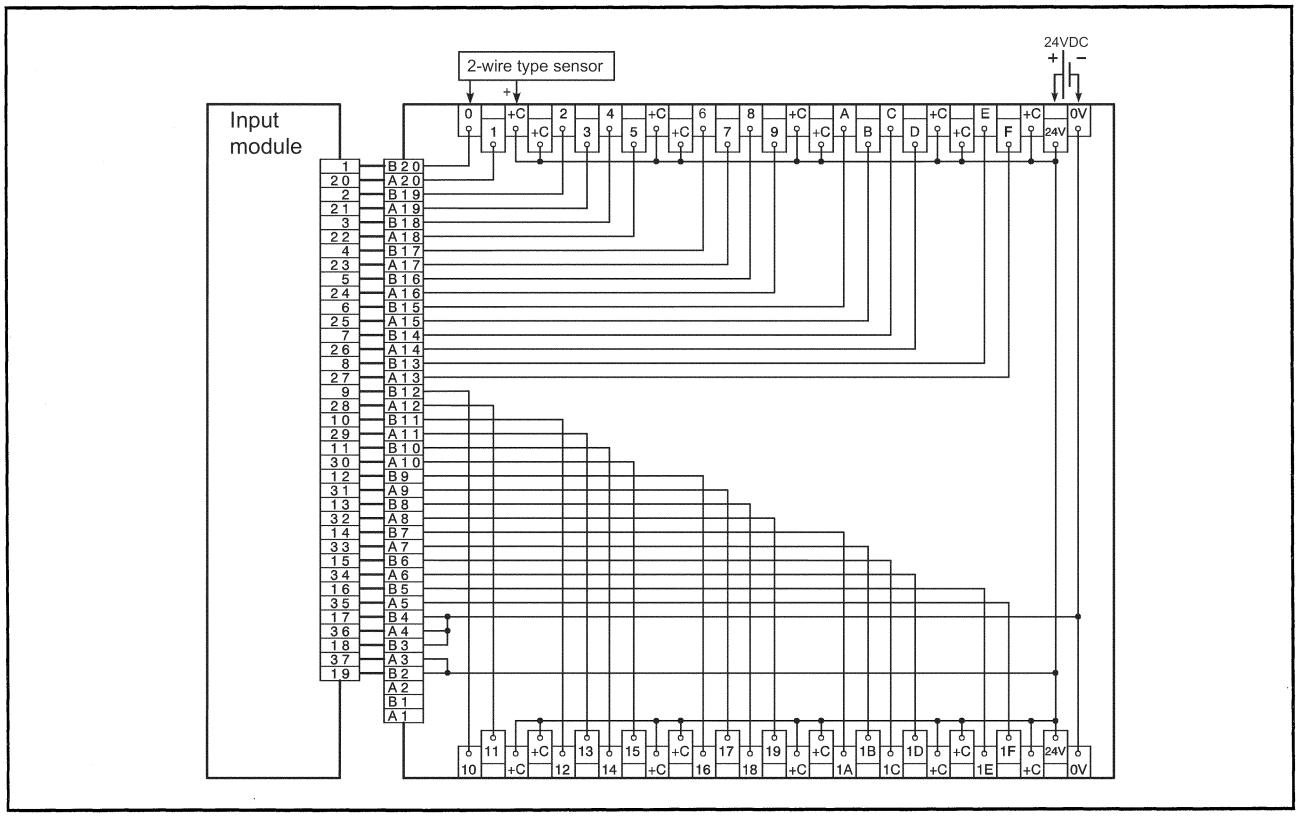
5.2.4 A6TBX36-E



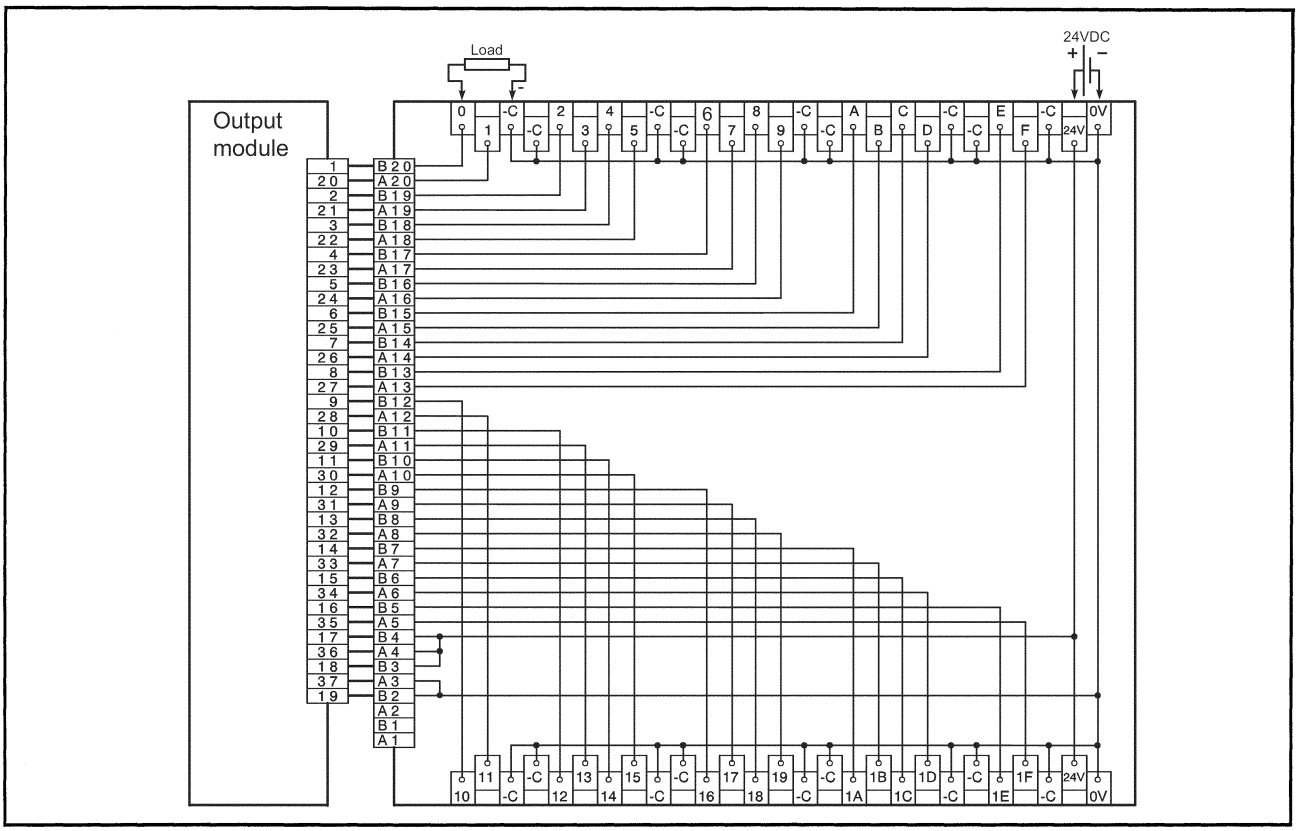
5.2.5 A6TBY36-E



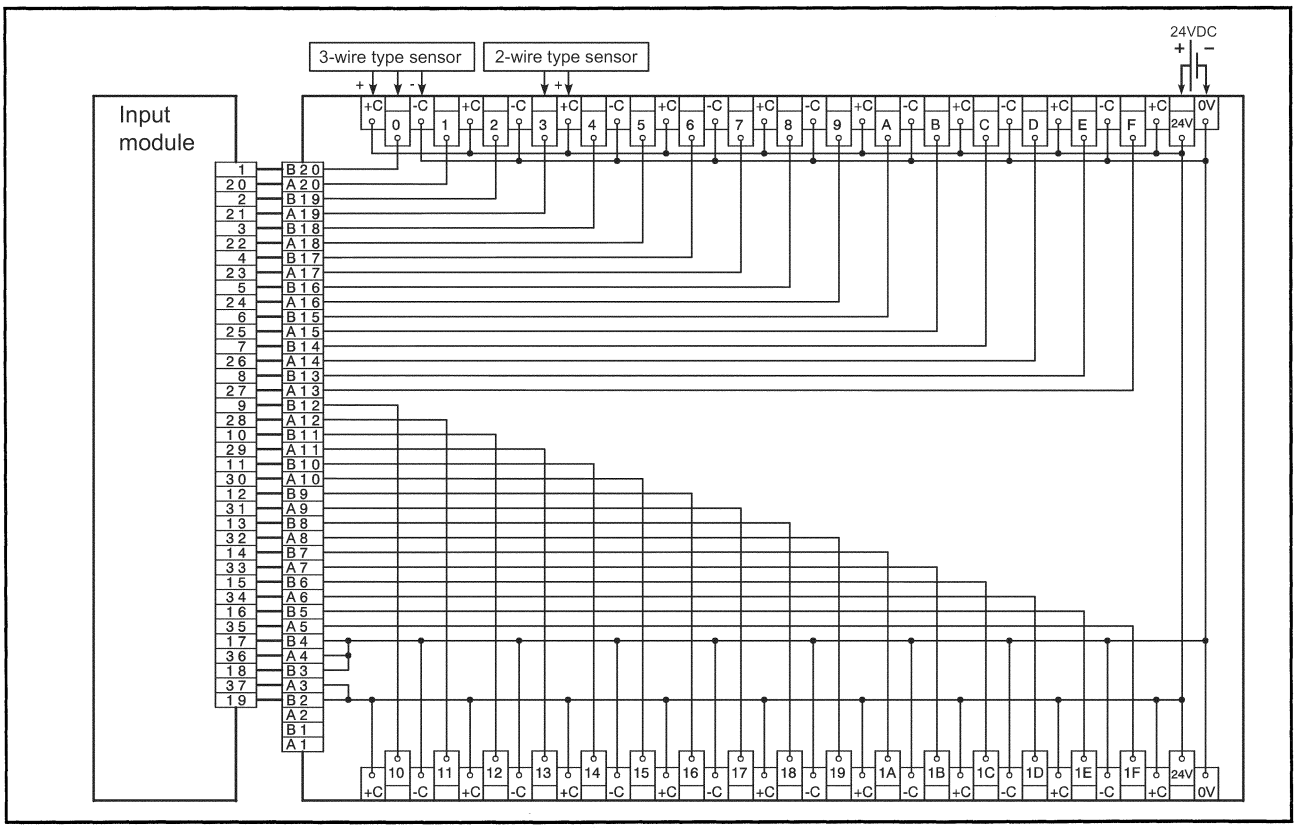
5.2.6 A6TBX54-E



5.2.7 A6TBY54-E



5.2.8 A6TBX70-E



6. BLANK COVER, DUMMY MODULE SPECIFICATIONS

6.1 Blank Cover (A1SG60), Dummy Module (A1SG62) Specifications

The A1SG60 blank cover is used to protect base unit vacant slots against dust etc.

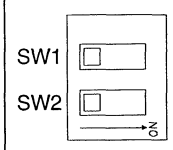
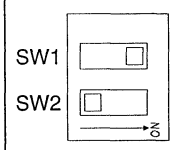
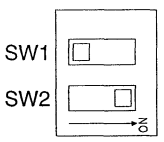
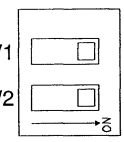
The A1SG62 dummy module is used to reserve a specified number of I/O points at any base unit slot.

Table 6.1 Dummy Module, Blank Cover Specifications

Item \ Model	A1SG60	A1SG62
Occupied I/O points	16 points	Max. 64 (16, 32, 48, or 64 points can be selected by using a select switch on the front of the module.)
I/O allocation specification	Empety □ points 0, 16, 32, 48, or 64 points can be specified to □.	□ input (X) points Designate the number of points set with the select switch in the □.
Purpose	Used as a dust preventive cover for an unused slot where no input/output module is installed (e. g., a vacant slot between modules).	A module used to reserve 16, 32, 48, or 64 points for an I/O module to be installed in the future.
Other functions	—	Equipped with simulation switches for 16 points beginning with the head I/O number: inputs can be turned ON/OFF without using any external switch.
Internal current consumption (5 VDC)	—	60 mA
Outside dimensions (mm)(in)	130(H) x 34.5(W) x 93.6 (D) (5.12 x 1.36 x 3.69)	130(H) x 34.5(W) x 93.6 (D) (5.12 x 1.36 x 3.69)
Weight (kg)	0.08	0.13

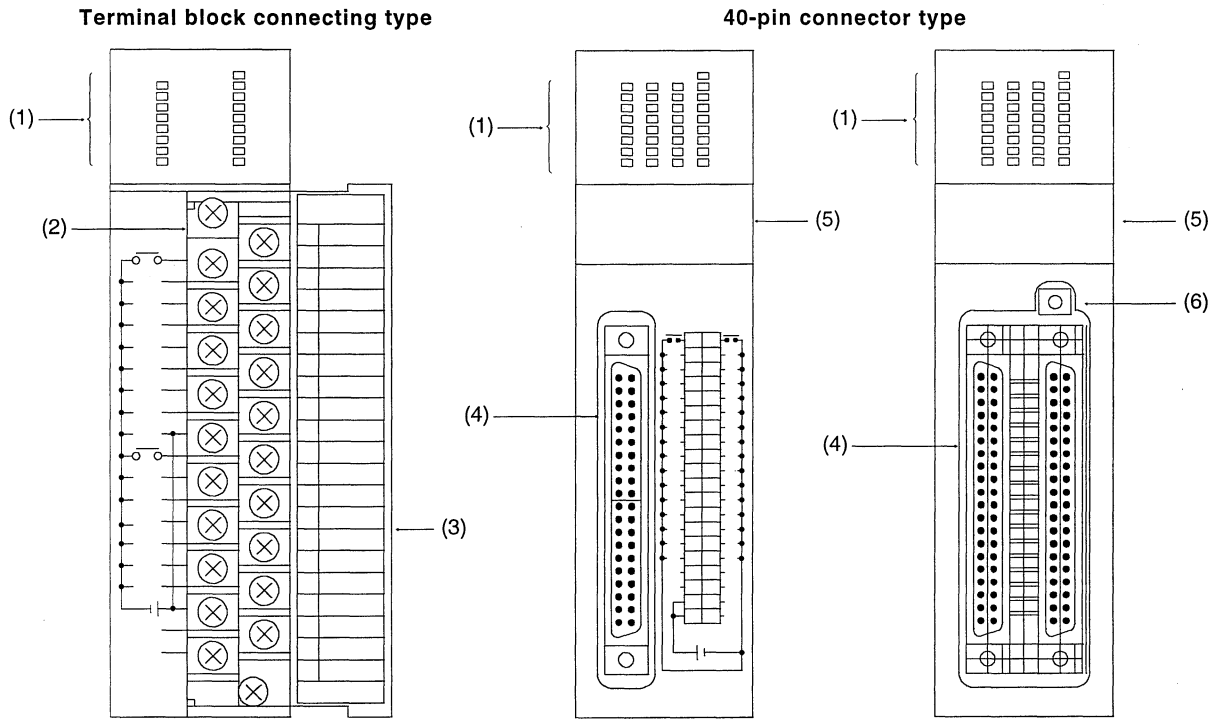
6.2 Setting the Occupying Number of Inputs/Outputs for A1SG62

Set the switches for setting the occupying number inputs/outputs (DIP switches) on the front of the module. The factory setting is 16 points.

Occupying number of inputs/outputs	16 points	32 points	48 points	64 points
Switch settings				

7. NAMES OF PARTS AND SETTINGS

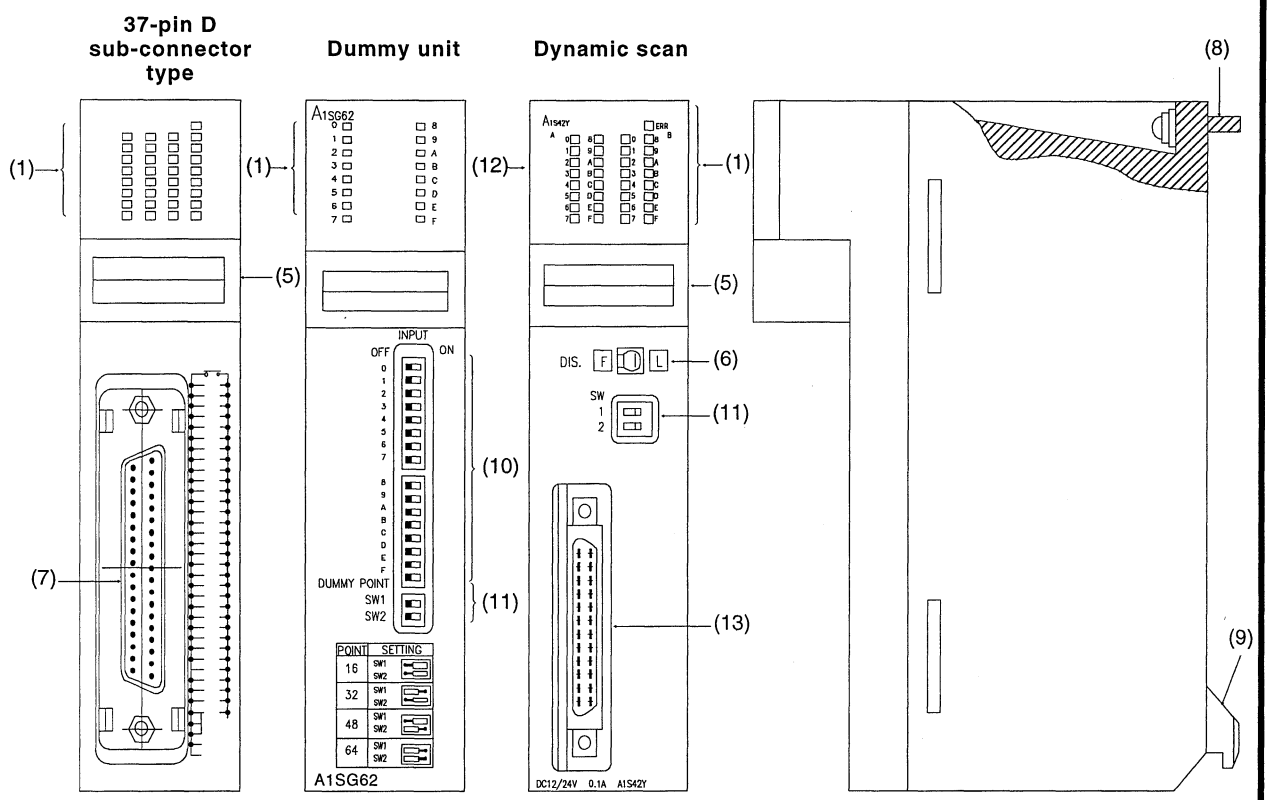
The figures and table below show the names of the parts of I/O modules.



No.	Name	Description
(1)	I/O indicator LED	Indicates the ON/OFF state of input and output. Indicates the ON state when it is lit.
(2)	Terminal block	Used to connect a power cable and I/O cables. (M3.5 screw)
(3)	Terminal cover	Covers the terminals. Terminal symbols can be written on the card attached to the inside of the cover.
(4)	40-pin connector	For 32-I/O and 64-I/O modules. Used to connect a power cable and I/O cables.
(5)	Symbol card cover	Symbol card cover
(6)	Indicator select switch	Used to switch the LED indication for the first-half 32 I/Os or for the second-half 32 I/Os of a 64-I/O module.
(7)	37-pin D sub connector	For 32-I/O and 64-I/O modules. Used to connect a power cable and I/O signal cables.
(8)	Module mounting screw	Used to fix the module to the base unit.
(9)	Module mounting hook	Engages with the mounting hole in the base unit to secure the module.

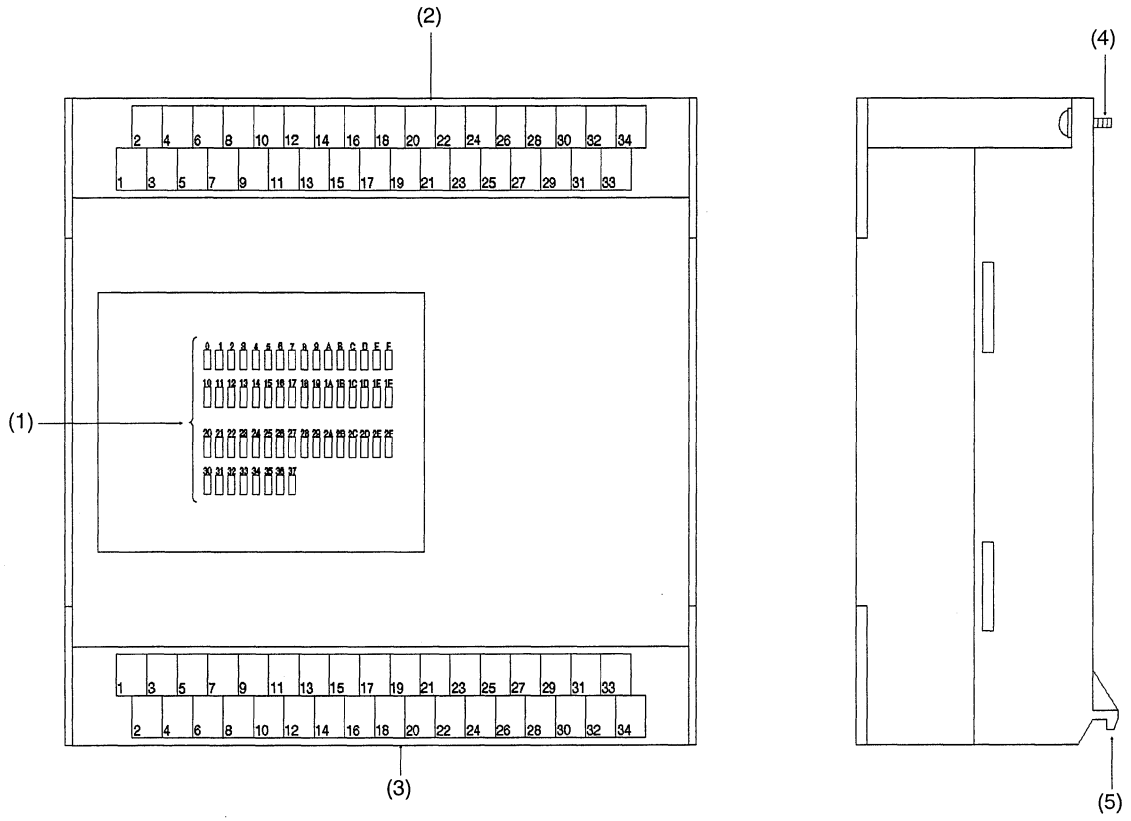
REMARK

When removing the terminal symbol card, lift up the edge of the card a little to pull it out of the terminal cover smoothly.



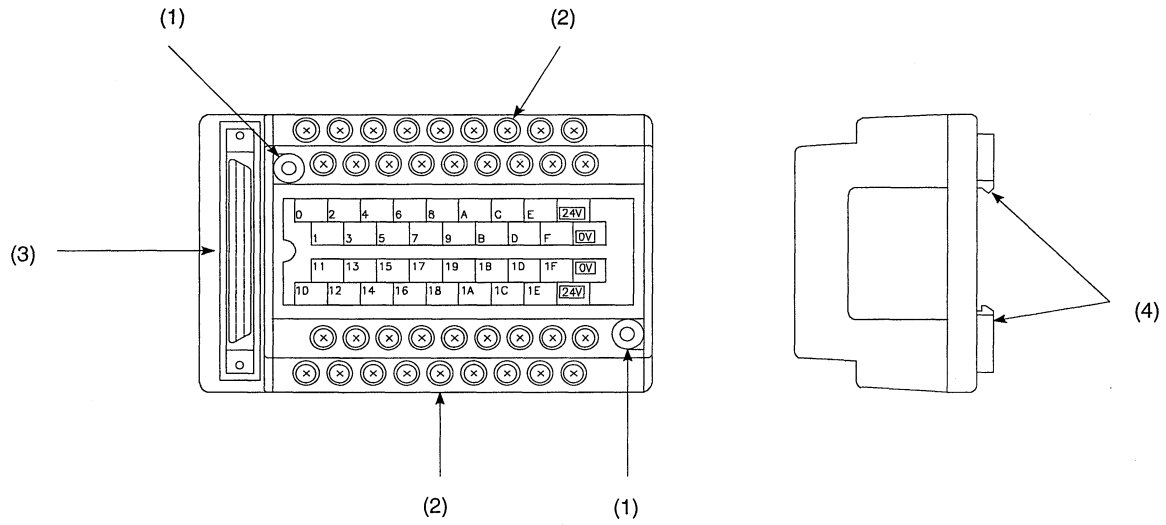
No.	Name	Description
(10)	Simulation switches	Used for input simulation. 16 points beginning with the head I/O number of the dummy module are allocated.
(11)	Occupied I/O points	16, 32, 48, or 64 points can be selected for the occupied I/O points.
(12)	Dynamic scan cycle	Used to set the dynamic scan cycle at 13.3 msec (FAST mode) or 106.7 msec (SLOW mode). (This switch is located on the rear face of the module.)
(13)	24-pin connector	Used for the dynamic scan I/O module to connect a power supply cable and I/O signal wires.

A1SJ-56[ ]



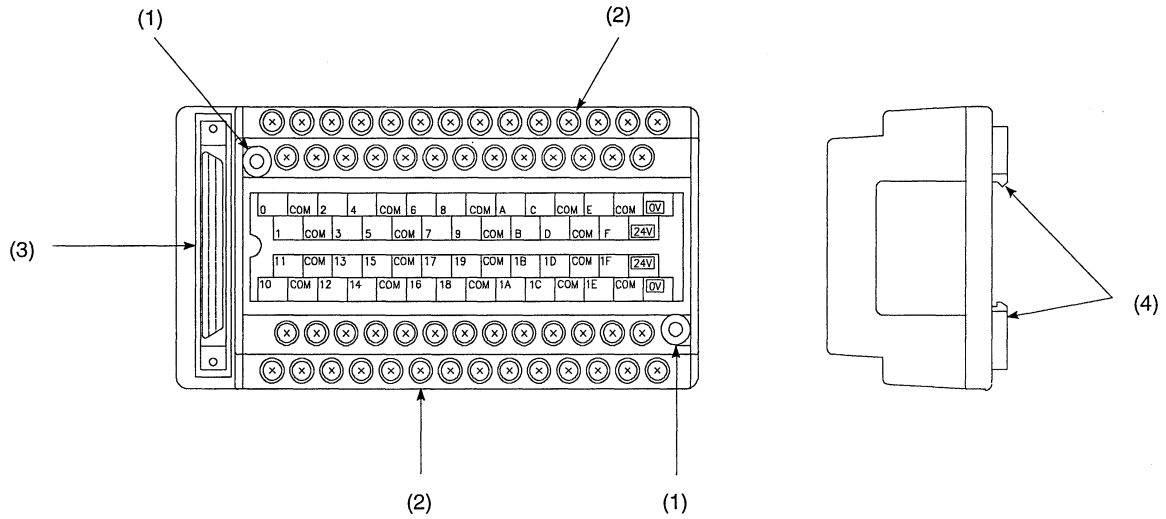
No.	Name	Description
(1)	I/O indicator LED	Indicates the ON/OFF state of input and output. Indicates the ON state when it is lit. 0 to 1F: input X0 to 1F, 20 to 37: Y20 to 37
(2)	Terminal block	Used to connect a power cable and input cables.
(3)	Terminal block	Used to connect a power cable and output cables.
(4)	Module mounting screw	Used to fix the module to the base unit.
(5)	Module mounting hook	Engages with the mounting hole in the base unit to secure the module.

A6TB[ ]36[ ]



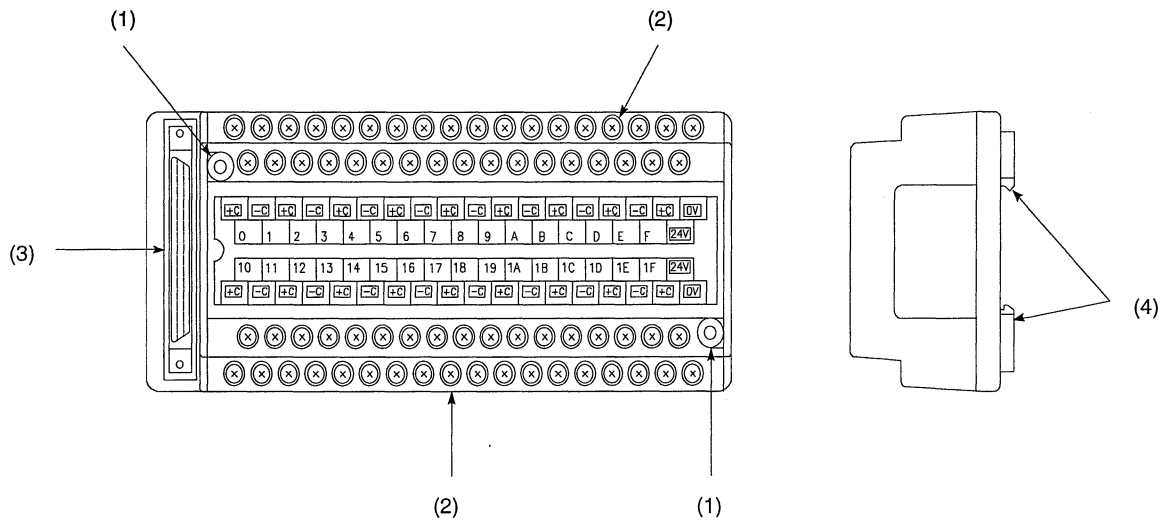
No.	Name	Description
(1)	Panel mounting hole	Panel mounting hole (for M4 screws)
(2)	Terminal block	Terminal block that connects power supply and signal wires
(3)	40-pin connector	40-pin connector for a 32-point module; connects power supply and input signal wires
(4)	Module fixing hooks	Hooks for mounting on a DIN rail

A6TB□54□



No.	Name	Description
(1)	Panel mounting hole	Panel mounting hole (for M4 screws)
(2)	Terminal block	Terminal block that connects power supply and signal wires
(3)	40-pin connector	40-pin connector for a 32-point module; connects power supply and input signal wires
(4)	Module fixing hooks	Hooks for mounting on a DIN rail

A6TBX70□



No.	Name	Description
(1)	Panel mounting hole	Panel mounting hole (for M4 screws)
(2)	Terminal block	Terminal block that connects power supply and signal wires
(3)	40-pin connector	40-pin connector for a 32-point module; connects power supply and input signal wires
(4)	Module fixing hooks	Hooks for mounting on a DIN rail

8. I/O CONNECTION TROUBLESHOOTING

This section explains possible problems with I/O circuits.

8.1 Input Circuit Troubleshooting

This section describes possible problems with input circuits, and corrective action.

Table 8.1 Input Circuit Problems and Corrective Action

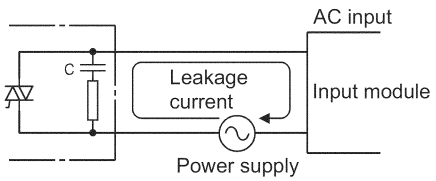
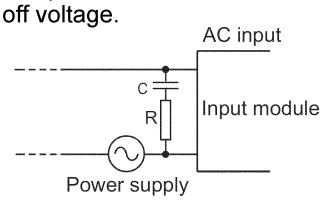
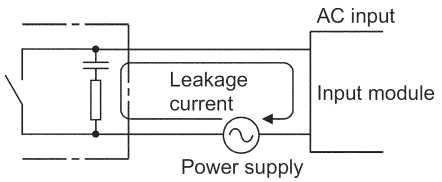
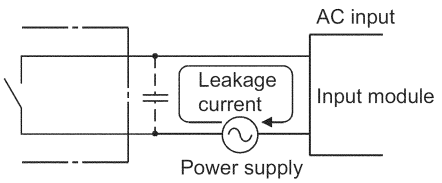
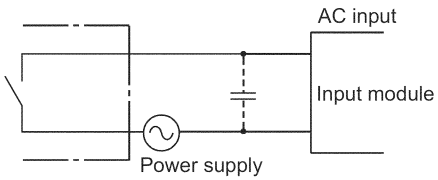
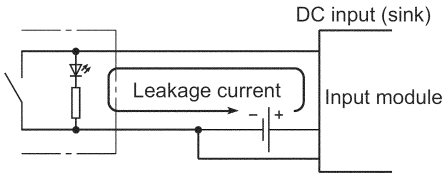
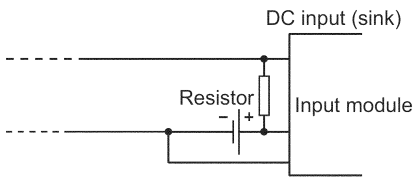
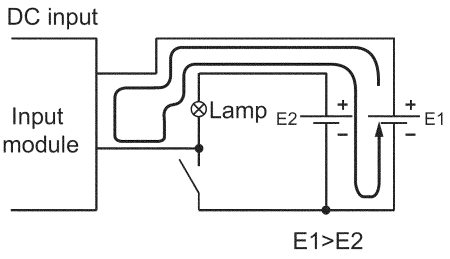
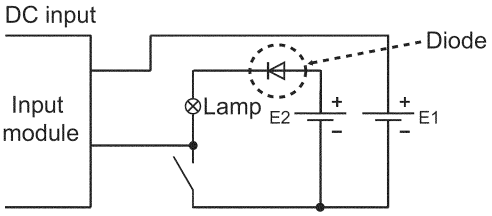
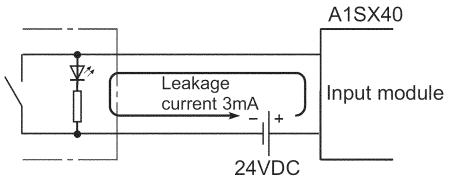
	Condition	Cause	Corrective Action
Example 1	Input signal does not turn OFF.	• Leakage current of input switch (e.g. drive by non-contact switch). 	• Connect an appropriate resistor so that the voltage across the terminals of the input module will be less than the off voltage.  It is recommended to use 0.1 to 0.47 μF + 47 to 120 Ω (1/2 W) for the CR constant.
Example 2	Input signal does not turn OFF.	• Drive by a limit switch with neon lamp. 	• Same as Example 1. • Or make up another independent display circuit.
Example 3	Input signal does not turn OFF.	• Leakage current due to line capacity of wiring cable. (Line capacity C of twisted pair wire is approx. 100 PF/m). 	• Same as Example 1. • However, leakage current is not generated when the power supply is located in the input equipment side as shown below. 
Example 4	Input signal does not turn OFF.	• Drive by switch with LED indicator. 	• Connect an appropriate resistor so that the current flowing through the input module will be less than the off current.  * An example calculation of a value for a connected resistor is given on the following page.

Table 8.1 Input Circuit Problems and Corrective Action (Continued)

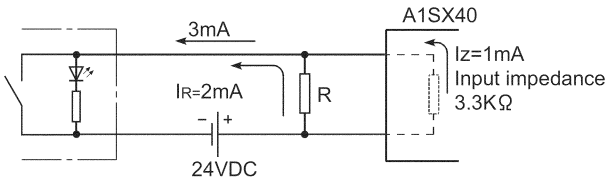
	Condition	Cause	Corrective Action
Example 5	Input signal does not turn OFF.	• Sneak path due to the use of two power supplies. 	• Use only one power supply. • To prevent sneak current, connect diodes as shown below. 

<Sample calculation for Example 4>

When a switch with LED indicator, giving leakage current of 3mA at maximum when 24VDC power is supplied to the A1SX40



(1) 1 mA or less OFF current of the A1SX40 is not satisfied. Hence, connect a resistor as shown below.



(2) Calculate the resistance value R as shown below.
To satisfy 1 mA or less OFF current of the A1SX40, connect a resistor which flows 2 mA or more.

I_R: I_Z=Z (Input impedance): R

$$R \leqq \frac{I_Z}{I_R} \times Z \text{ (Input impedance)} = \frac{1.0}{2.0} \times 3.3 = 1.65[k\Omega]$$

Supposing that the resistance R is 1.5kΩ, the power capacity W of resistor R is:
W = (Input voltage) ^{2} ÷ R = 26.4^2 ÷ 1500 = 0.465 (W)

(3) Connect a resistor of 1.5 (kΩ) and 2 to 3 (W) to a terminal which may cause an error, since the power capacity of a resistor is selected so that it will be 3 to 5 times greater than the actual power consumption.

(4) Also, OFF voltage when resistor R is connected will be as follows.

$$\frac{1}{\frac{1}{1.5[k\Omega]} + \frac{1}{3.3[k\Omega]}} \times 3[mA] = 3.09[V]$$

This satisfies 4V or less OFF voltage of A1SX40.

8.2 Output Circuit Failures and Corrective Action

This section describes possible problems with output circuits, and corrective action.

Table 8.2 Output Circuit Failures and Corrective Action

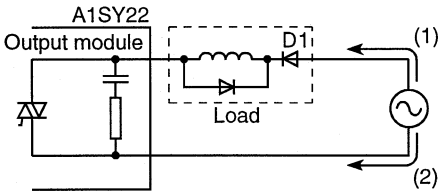
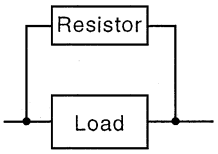
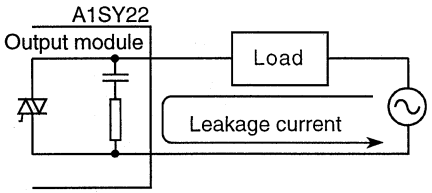
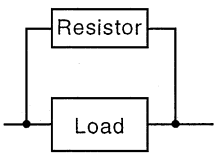
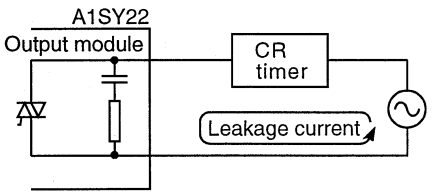
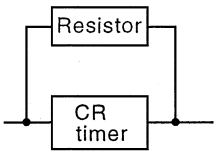
	Condition	Cause	Corrective Action
Example 1	When the output is OFF, excessive voltage is applied to the load.	• Load is half-wave rectified inside (in some cases, this is true of a solenoid).  • When the polarity of the power supply is as shown in (1), C is charged. When the polarity is as shown in (2), the voltage charged in C plus the line voltage are applied across D1. Max. voltage is approx. 2.2E.	• Connect a resistor several tens to hundreds of kΩ across the load. (If a resistor is used in this way, it does not pose a problem to the output element. But it may cause the diode, which is built into the load, to deteriorate, resulting in a fire, etc.) 
Example 2	The load does not turn OFF (triac output).	• Leakage current due to built-in noise suppression 	• Connect the resistors to both ends of the load. (When the wiring distance from the output module to the load is long, there may be a leakage current due to the line capacity.) 
Example 3	When the load is a CR type timer, time constant fluctuates (triac output).		• Connect the resistors to both ends of the CR timer. (When the wiring distance from the output module to the load is long, there may be a leakage current due to the line capacity.)  Calculate the CR constant depending on the load.

Table 8.2 Output Circuit Failures and Corrective Action (Continued)

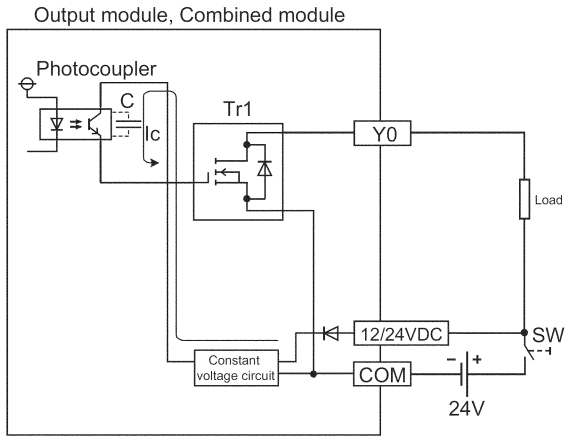
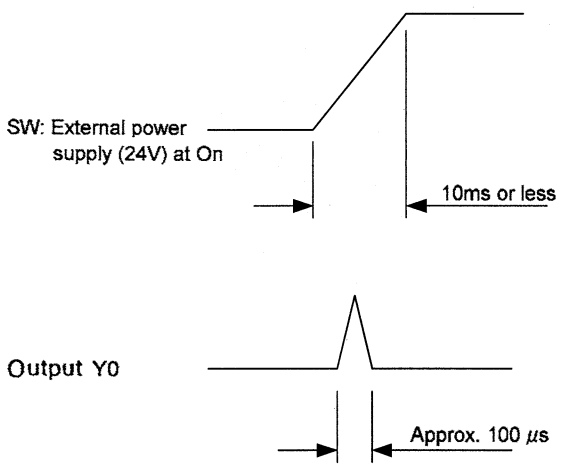
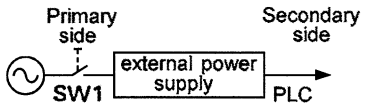
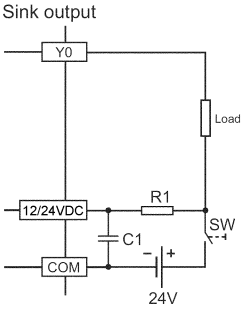
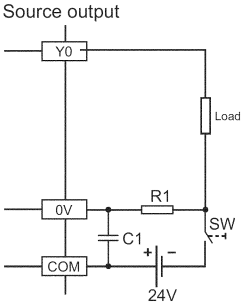
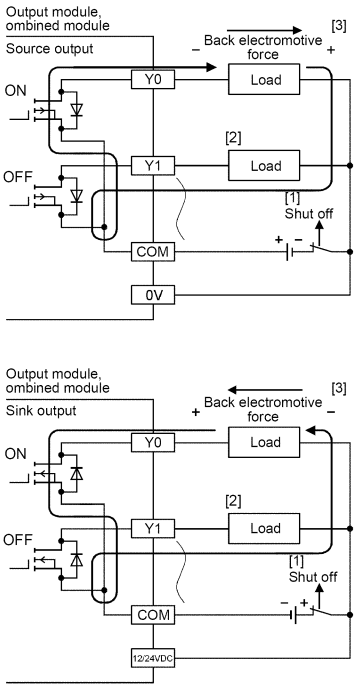
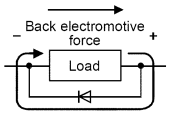
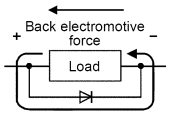
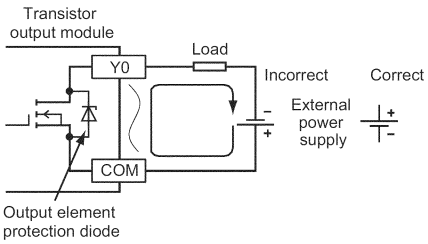
	Condition	Cause	Corrective Action
Example 4	When the external power supply turns on, the load turns on for a moment.	Erroneous output due to the stray capacitance (C) between collector and emitter of hotocoupler. { There is no erroneous output at normal road. An erroneous output may occur at high sensitivity load (such as solid state relay). }  If the external power supply is turned on precipitously, Ic current flows due to the stray capacitance (C) between collector and emitter of hotocoupler Ic current flows to the next stage of transistor Tr1 gate and Y0 output turns on by 100 μs. 	When the external power supply turns ON/OFF, check that the external power supply rising edge must be 10ms or more, and switch the SW1 to the primary side of external power supply.  When switching to the secondary side of the external power supply is required, the external power supply rising edge connected a condenser must be slow, and measured 10ms or more. Sink output  Source output  R1: Several tens of ohms Power capacity ≧ (external power supply current*1)^2 × resistance value × (3 to 5)*2 C1:several hundreds of microfarads 50V *1 Refer to consumption current of the external power supply for modules used in this manual. *2 Select the power capacity of resistance to be 3 to 5 times lager than the actual power consumption. (Example) R1=40 Ω, C1=300 μF Use the below expression to calculated a time constant $C1 \times R1 = 300 \times 10^{-6} \times 40$ $= 12 \times 10^{-3}$s =12ms

Table 8.2 Output Circuit Failures and Corrective Action (Continued)

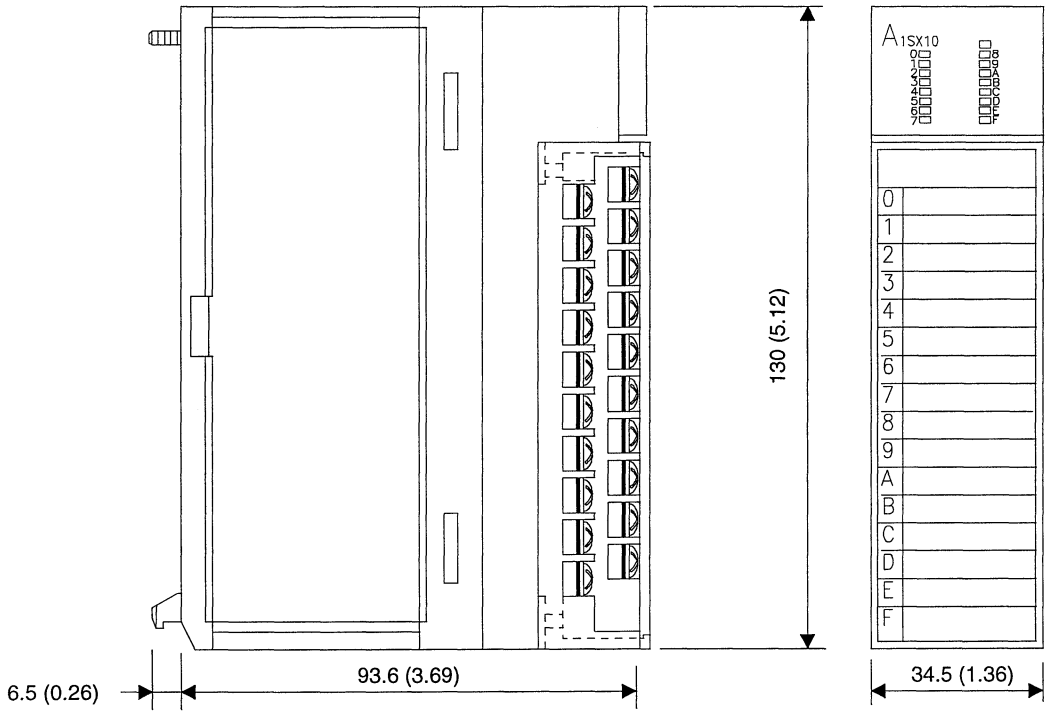
	Condition	Cause	Corrective Action
Example 5	The load which was turned OFF is turned ON for a moment at power-off. (Transistor output)	The load [2] which was turned OFF may be turned ON due to back electromotive force at the time of power-off [1] if an inductive load is used. 	Take action in the following (1) or (2). (1) To prevent the generation of the back electromotive force, connect diode in parallel with load where the back electromotive force has been generated. Source output [3]  Sink output [3] 
Example 6	The load operates due to powering on the external power supply. (transistor output)	The polarity of the external power supply is connected in reverse.  When the polarity is connected in reverse, current may flow across an output element protection diode.	Connect the polarity correctly.

APPENDICES

APPENDIX 1 OUTSIDE DIMENSIONS

1.1 Input/Output Modules

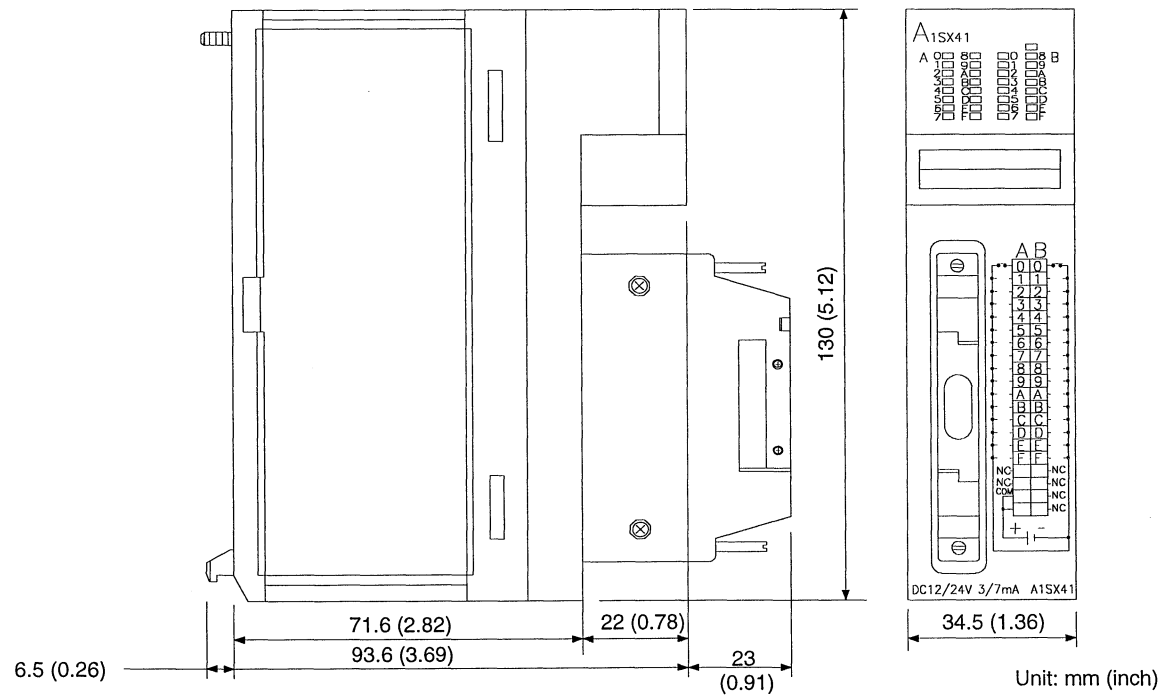
1.1.1 Terminal base connecting type



Unit: mm (inch)

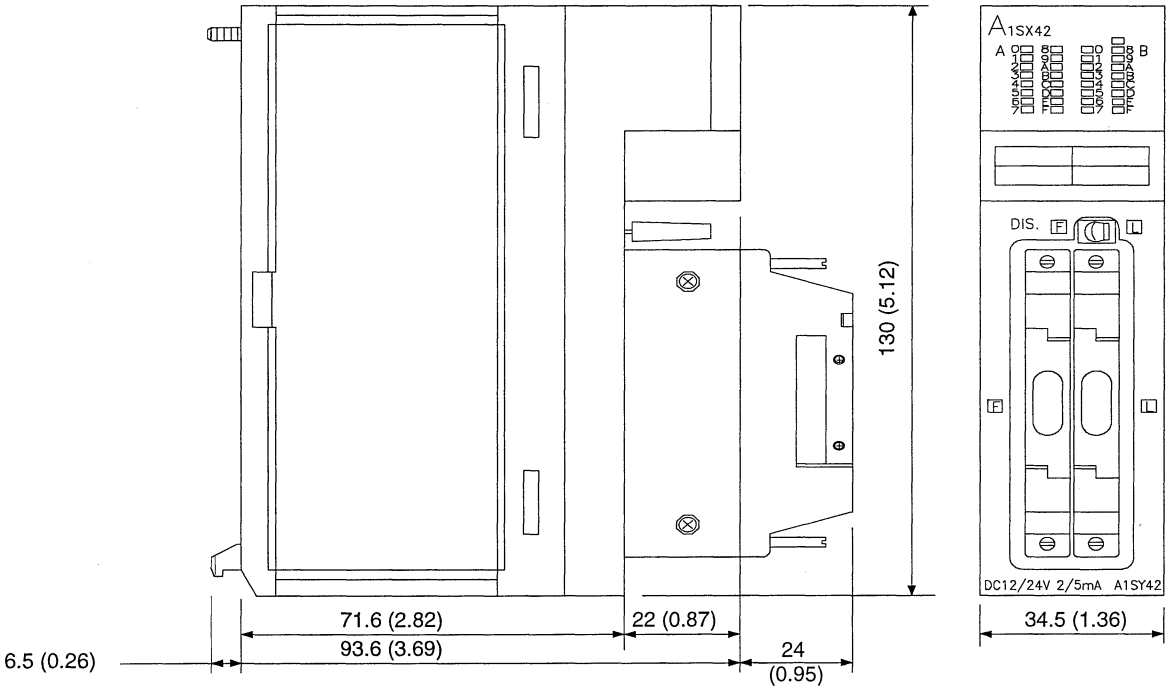
1.1.2 40-pin connector type

(1) 32-input/output module



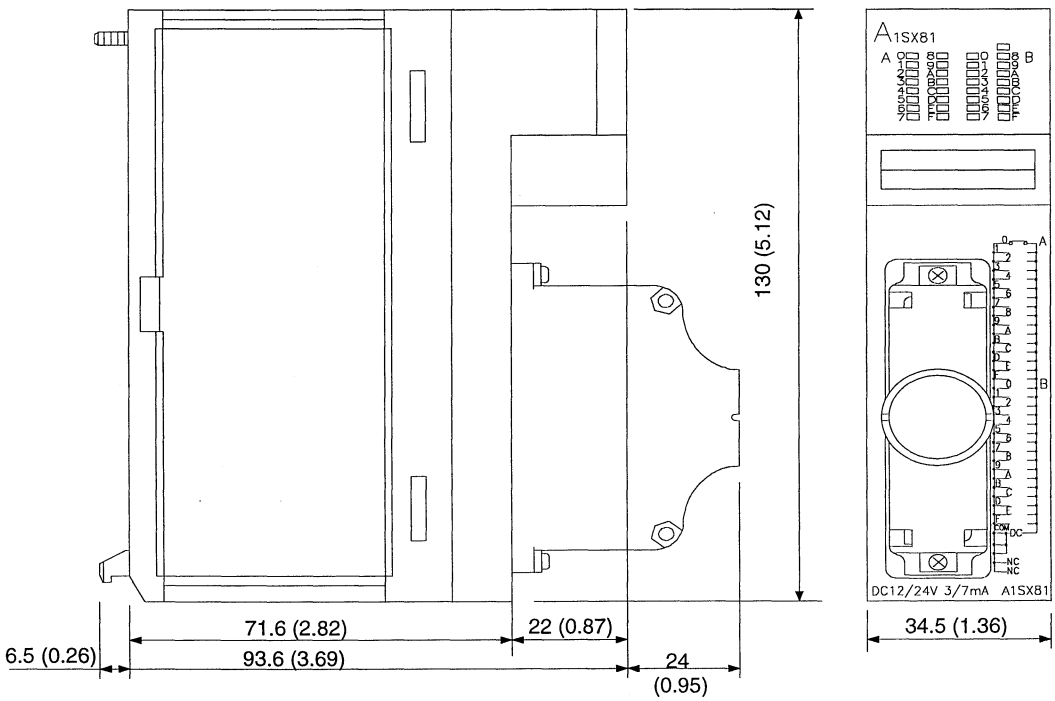
Unit: mm (inch)

(2) 64-input/output module



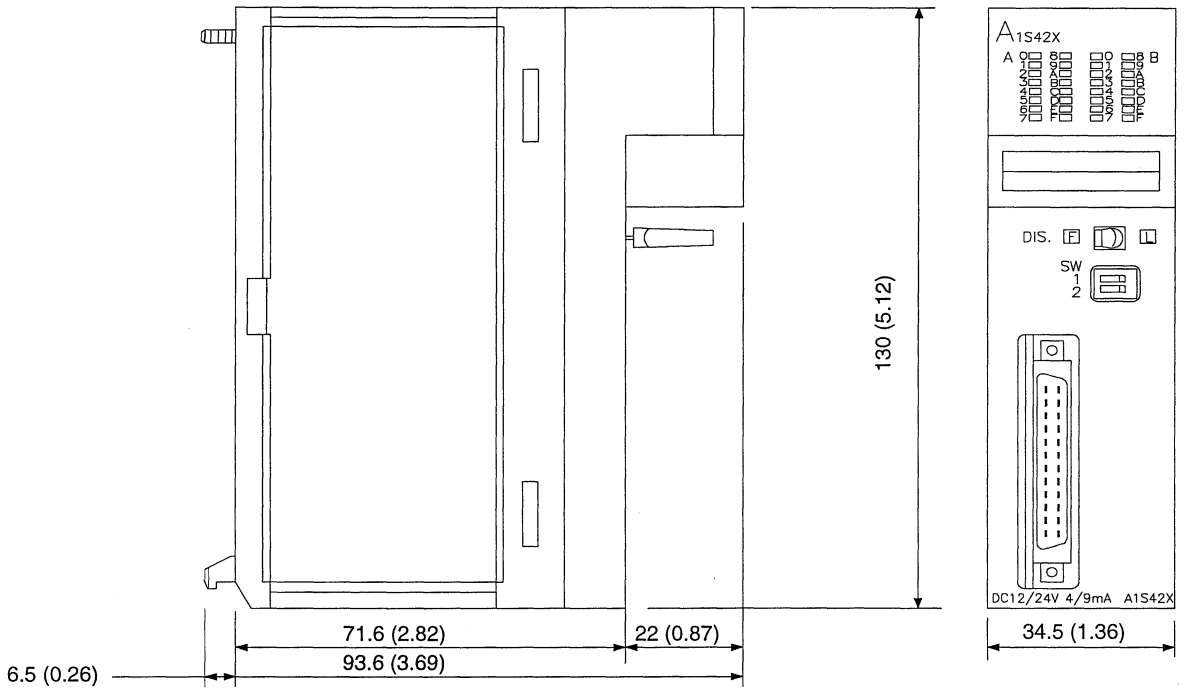
Unit: mm (inch)

1.1.3 37-pin D sub-connector type 32-input/output module



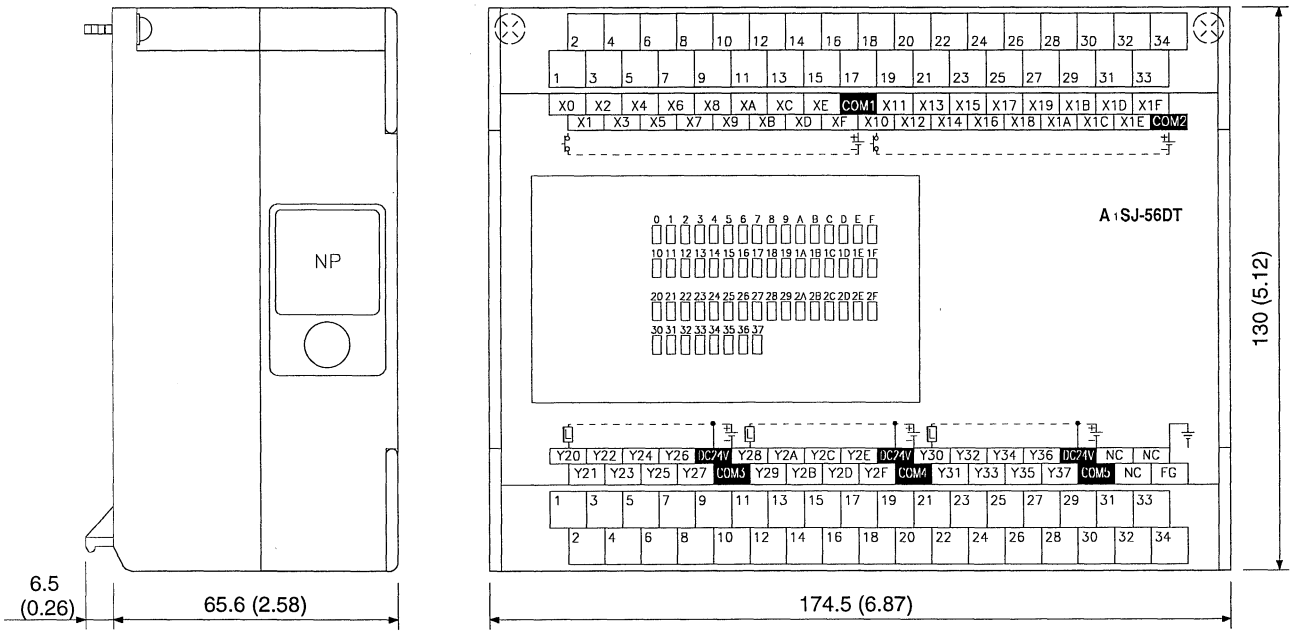
Unit: mm (inch)

1.2 Dynamic I/O Module



Unit: mm (inch)

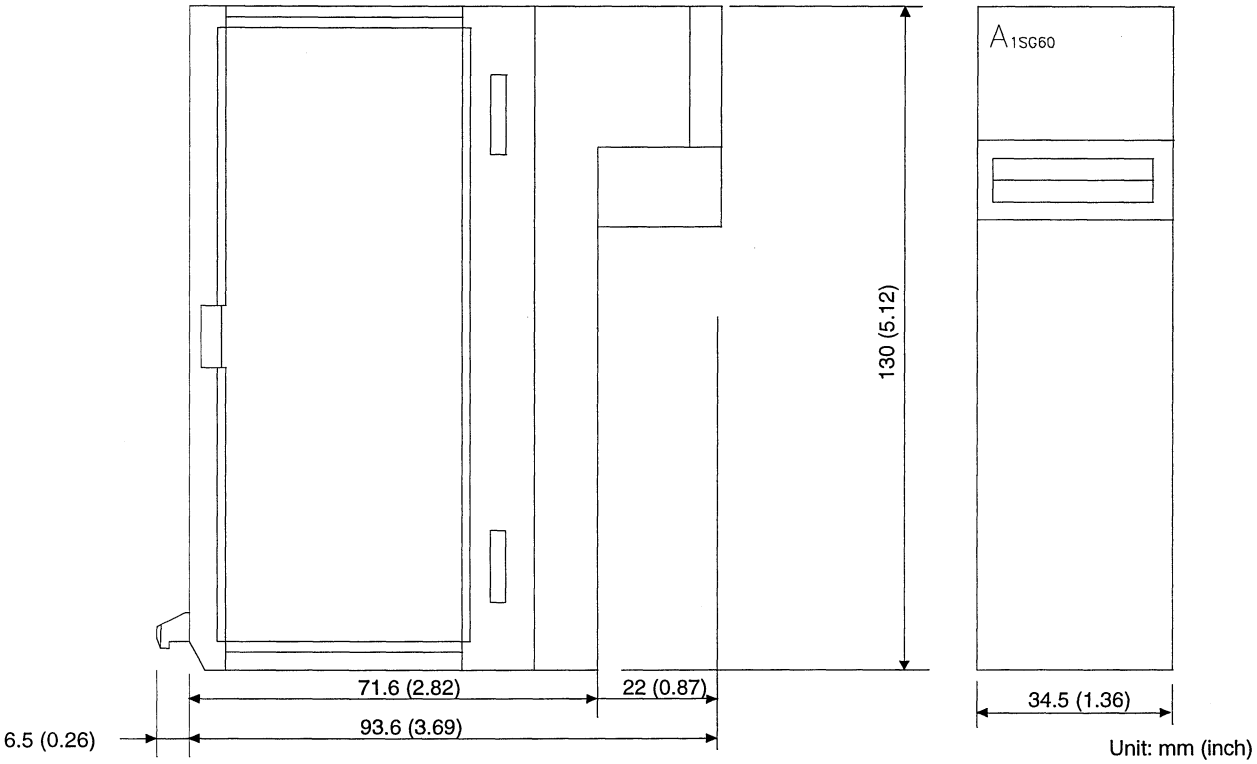
1.3 A1SJ-56□ Input/Output Combination Module



Unit: mm (inch)

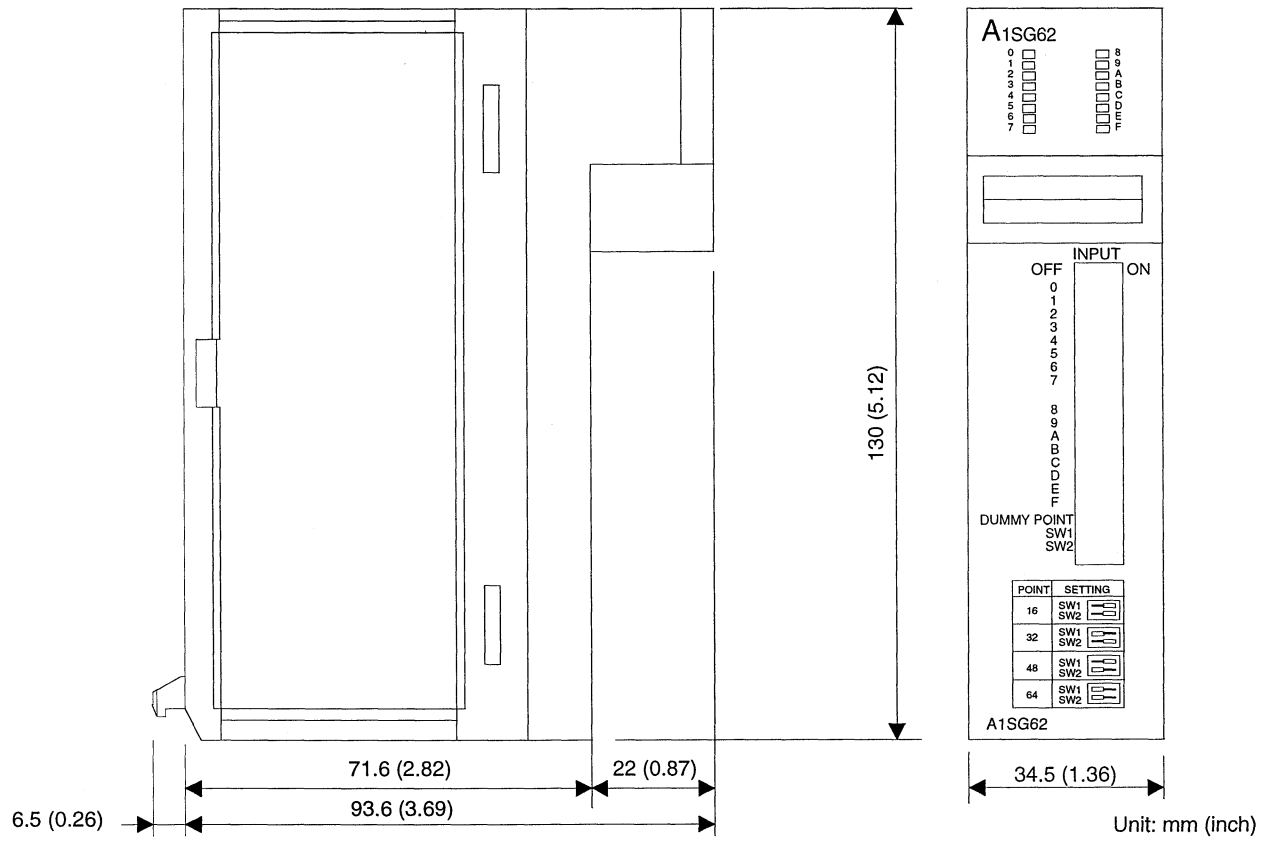
1.4 Dummy Module, Blank Cover

1.4.1 A1SG60 blank cover



Unit: mm (inch)

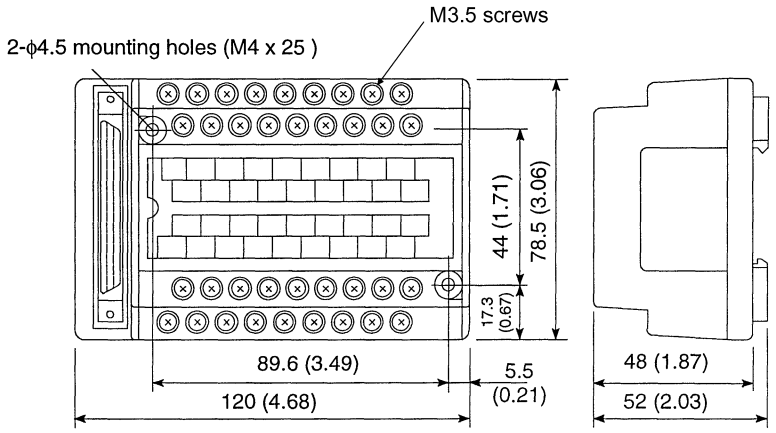
1.4.2 A1SG62 dummy module



Unit: mm (inch)

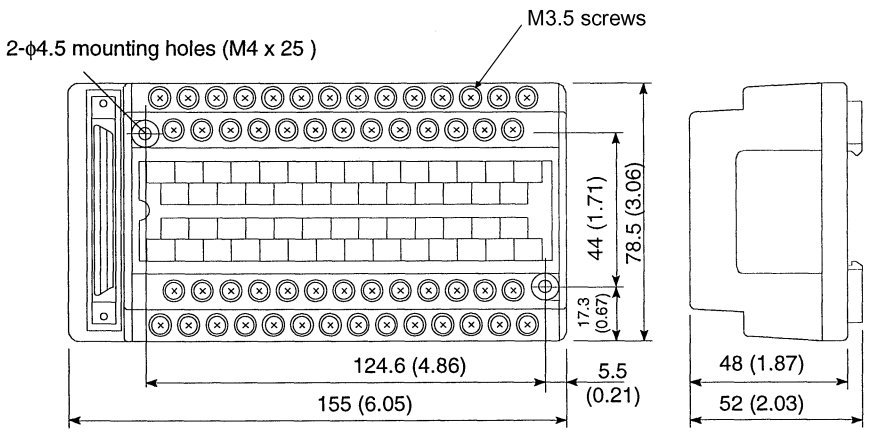
1.5 Connector/Terminal Block Convertor Modules

1.5.1 A6TB□36□ type connector/terminal block convertor module



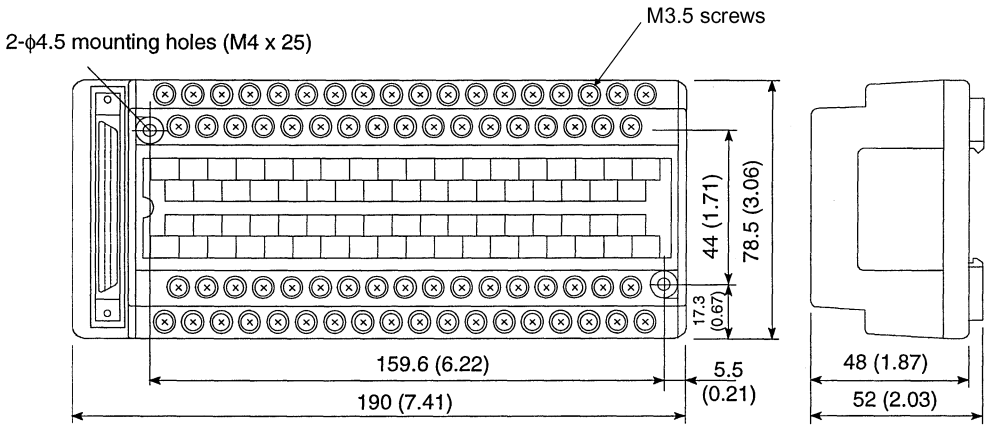
Unit: mm (inch)

1.5.2 A6TB□54□ type connector/terminal block convertor module



Unit: mm (inch)

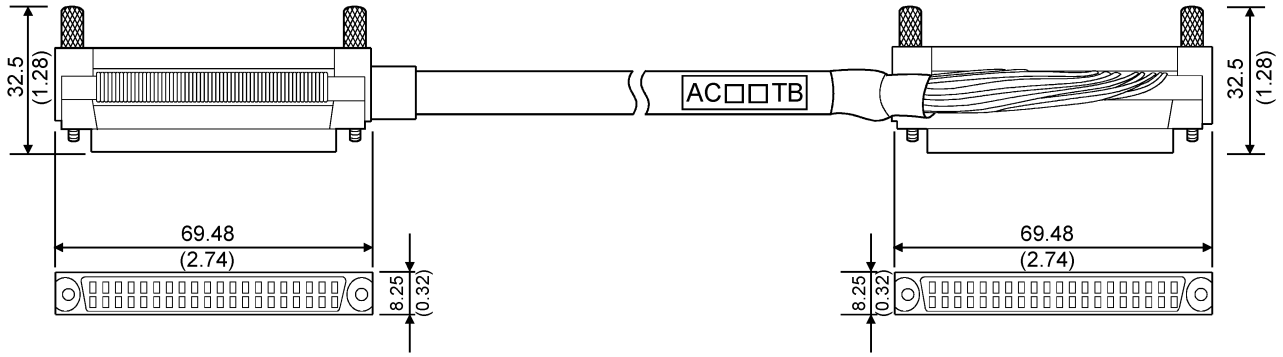
1.5.3 A6TBX70☐ type connector/terminal block convertor module



Unit: mm (inch)

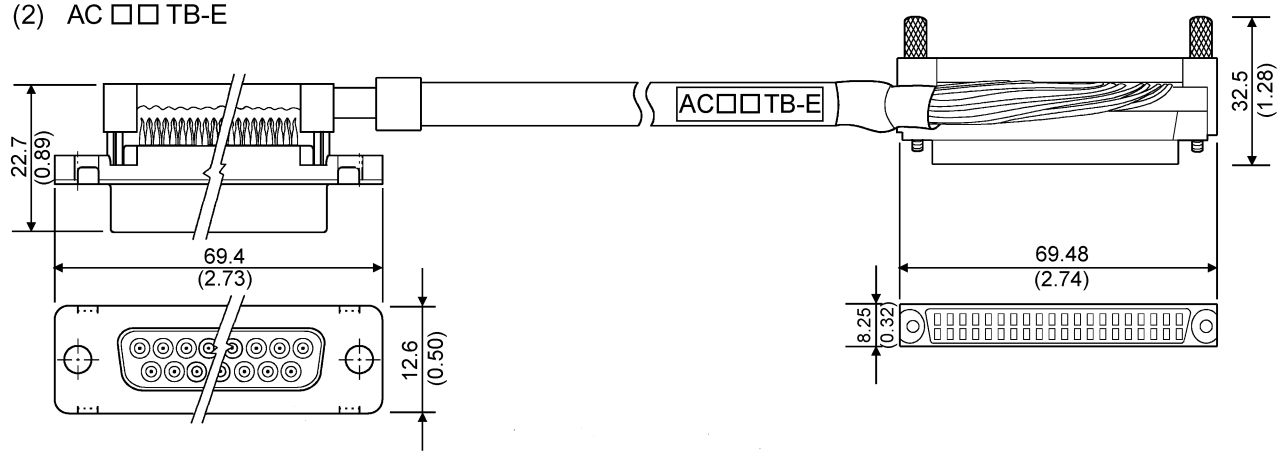
1.5.4 Connector/terminal block converter module cable

(1) AC □□ TB



Unit: mm (inch)

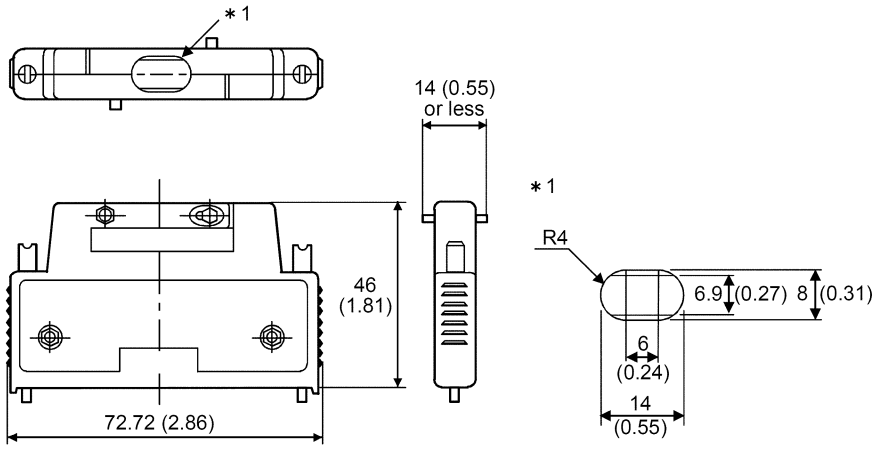
(2) AC □□ TB-E



Unit: mm (inch)

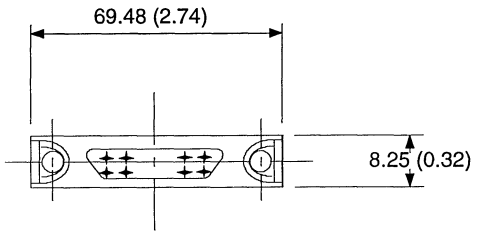
1.6 40-Pin Connectors

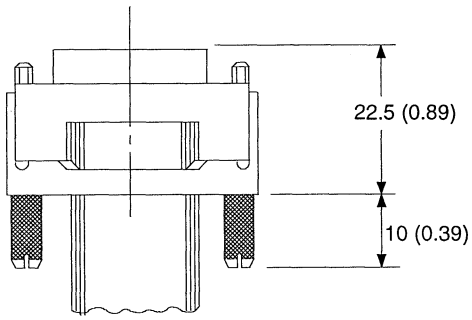
1.6.1 A6CON1 soldering-type 40-pin connector (straight out type), A6CON2 crimp-contact-type 40-pin connector (straight out type)



Unit: mm (inch)

1.6.2 A6CON3 pressure-displacement-type 40-pin connector (flat cable type)

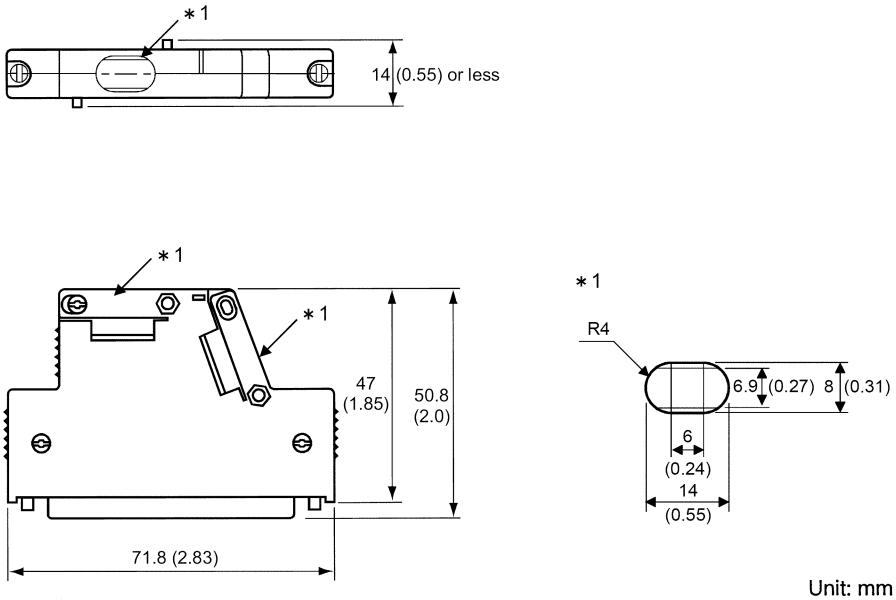




* Sequence of the flat cable is in order of A1→B1→A2 ·····

Unit: mm (inch)

1.6.3 A6CON4 soldering type 40-pin connector (straight/diagonal out type)

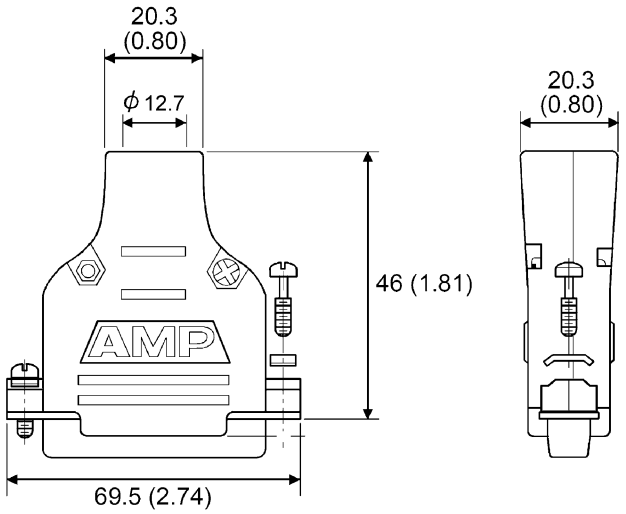


Unit: mm (inch)

If the cable diameter is thinner than the clamp portion, wind tape, etc. to secure the cable so that it will not come off the cable clamp portion.
If the cable is made of slippery material, it is recommended to take anti-slip measures by winding rubber-based tape, etc.

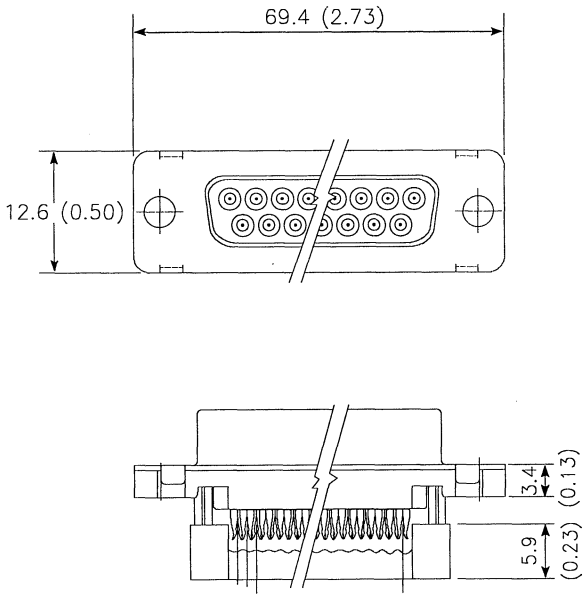
1.7 Pin D Sub-Connectors

1.7.1 A6CON1E soldering type 37-pin D sub-connector (straight out type)
A6CON2E crimp-contact-type 37-pin D sub-connector (straight out type)



Unit: mm (inch)

1.7.2 A6CON3E pressure-displacement-type 37-pin D sub-connector (flat cable type)



Unit: mm (inch)

WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.

However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.

[Gratis Warranty Term]

The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place. Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.

[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.

(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.

1. Failure occurring from inappropriate storage or handling, carelessness or negligence by the user. Failure caused by the user's hardware or software design.
2. Failure caused by unapproved modifications, etc., to the product by the user.
3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued. Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.

(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

5. Changes in product specifications

The specifications given in the catalogs, manuals or technical documents are subject to change without prior notice.

IB(NA)-66541-S

AnS Module Type I/O

User's Manual

MODEL	ANS-TYPE-I/O-U-E
MODEL CODE	13JE81
IB(NA)-66541-S(1410)MEE	

MITSUBISHI ELECTRIC CORPORATION

HEAD OFFICE : TOKYO BUILDING, 2-7-3 MARUNOUCHI, CHIYODA-KU, TOKYO 100-8310, JAPAN
NAGOYA WORKS : 1-14 , YADA-MINAMI 5-CHOME , HIGASHI-KU, NAGOYA , JAPAN