MELSEC A Series

Programmable Logic Controller

User's Manual

AnS Module type I/O

Art. no. 049765
01 05 2003
IB(NA)66541
Version J

MITSUBISHI ELECTRIC INDUSTRIAL AUTOMATION

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual.

Also pay careful attention to safety and handle the module properly.These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual for a description of the PC system safety precautions.

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

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

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

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

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

[DESIGN PRECAUTIONS]

DANGER

- Install a safety circuit external to the PC that keeps the entire system safe even when there are problems with the external power supply or the PC module. Otherwise, trouble could result from erroneous output or erroneous operation.
  (1) Outside the PC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits positioning upper and lower limits switches and interlocking forward/reverse operations.
  (2) When the PC detects the following problems, it will stop calculation and turn off all output.
    - The power supply module has and over current protection equipment and over voltage protection equipment.
    - The PC CPUs self diagnostic functions, such as the watchdog timer error, detect problems. In addition, all output will be turned on when there are problems that the PC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PC that will make sure the equipment operates safely at such times. Refer to Section 8.1 of this user's manual for example fail safe circuits.

    Refer to this user's manual for example fail safe circuits.
  (3) Output could be left on or off when there is trouble in the output module relay or transistor. So build an external monitoring circuit that will monitor any single output that could cause serious trouble.

- When overcurrent which exceeds the rating or caused by short-circuited load flows in the output module for a long time, it may cause smoke or fire. To prevent this, configure an external safety circuit, such as fuse.

- Build a circuit that turns on the external power supply when the PC main mosule power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.

- When configuring a system, do not leave any slots vacant on the base.
  Should there be any vacant slots, always use a blank cover (A1SG60) or dummy module (A1SG62). When the extension base A1S52B, A1S55B or A1S58B is used, attach the dustproof cover supplied with the product to the module installed in slot 0. If the cover is not attached, the module's internal parts may be dispersed when a short-circuit test is performed or overcurrent/overvoltage is accidentally applied to the external I/O area.

CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100mm (3.94inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.

- When controlling items like lamp load, heater or solenoid valve using an output module, large current (approximately ten times greater than that present in normal circumstances) may flow when the output is turned OFF → ON. Take measures such as replacing the module with one having sufficient rated current.

[INSTALLATION PRECAUTIONSDANGER]

⚠ CAUTION

- Use the PC in an environment that meets to the general specifications contained in this manual. Using the PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes and use the specified torque to tighten the module's fixing screws. Not installing the module correctly could result in erroneous operation, damage, or pieces of the product falling. Tightening the screws too far may cause damages to the screws and/or the module, resulting in fallout, short circuits, or malfunctions.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause erroneous operation or damage of the module.

[WIRING PRECAUTIONS]

⚠ DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning of the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

⚠ CAUTION

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Tighten the terminal screws to with the specified torque. If the terminal screws are loosen, it could result in short circuits, fire or erroneous operation.
  Tightening the terminal screws too far may cause damages to the screws and /or the module, resulting in fallout, short circuits, or malfunctions.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module.Such debris could cause fires, damage, or erroneous operation.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. For information regarding the crimping and pressure welding tools, refer to the I/O module's user's manual. Imperfect connections could result in short circuit, fires, or erroneous operation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminals while the power is ON. Doing so could cause shock or erroneous operation.
- Switch all phases of the external power supply off when cleaning the module or tightening the terminal screws. Not doing so could result in electric shock. If the screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or modules.

CAUTION

- Do not disassemble or modify the modules.
  Doing so could cause trouble, erroneous operation, injury, or fire.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch off the external power supply, it will cause failure or malfunction of the module.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste

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

Print Date	*Manual Number	Revision
May.,2003	IB (NA) 66541-J	Partial correction Section 1.2

CONTENTS

Manuals

The following manuals are also relevant to this product.

Related manuals

- **A1SCPU/A1SCPUC24-R2/A2SCPU User's Manual (IB-66320)**

  This manual describes the specifications and functions of A1S, A1SC24-R2 and A2SCPU (S1), and specifications etc. of the memory cassettes, the power supply module and extension base unit.

  (Sold separately)

- **A2ASCPU(S1/S30) User's Manual(IB-66455)**

  This manual describes the specifications and functions of A2ASCPU(S1/S30) and the specifications of the memory cassettes, the power supply modules and extension base units that can be used with it.

  (Sold separately)

- **A1SJHCPU(S8)/A1SHCPU/A2SHCPU(S1) User's Manual (IB-66779)**

  This manual describes the specifications and functions of A1SJHCPU(S8), A1SH,and A2SHCPU(S1) and the specifications of the memory cassettes, the power supply modules and extension base units that can used with it.

  (Sold separately)

- **Q2AS(H)CPU(S1) User's Manual (SH-3599)**

  This manual describes the performance, functions and handling-related items of the Q2ASCPU, Q2ASCPU-S1, Q2ASHCPU and Q2ASHCPU-S1 and the specifications and handling of the power supplies, memory cards and base units.

  (Sold separately)

MEMO

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

1.1 General Specifications

The followings are specifications common to modules being used.

General Specifications

<table>
<tr><th>Item</th><th colspan="5">Specifications</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="5">0 to 55 °C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="5">-20 to 75 °C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="5">10 to 90 % RH, no condensation</td></tr>
<tr><td>Storage ambient humidity</td><td colspan="5">10 to 90 % RH, no condensation</td></tr>
<tr><td rowspan="8">Vibration resistance</td><td rowspan="8">Conforms to JIS B 3502 and IEC 61131-2</td><td colspan="4">Intermittent vibrations</td></tr>
<tr><td>Frequency</td><td>Acceleration</td><td>Amplitude</td><td>Sweep count</td></tr>
<tr><td>10 to 57 Hz</td><td>—</td><td>0.075 mm</td><td rowspan="5">10 times each for X, Y, Z directions (80 minutes)</td></tr>
<tr><td>57 to 150 Hz</td><td>9.8 m/s^2</td><td>—</td></tr>
<tr><td colspan="3">Continuous vibrations</td></tr>
<tr><td>Frequency</td><td>Acceleration</td><td>Amplitude</td></tr>
<tr><td>10 to 57 Hz</td><td>—</td><td>0.035 mm</td></tr>
<tr><td>57 to 150 Hz</td><td>4.9 m/s^2</td><td>—</td></tr>
<tr><td>Shock resistance</td><td colspan="5">Conforms to JIS B 3502 and IEC 61131-2
(147 m/s^2, three times each for three orthogonal directions)</td></tr>
<tr><td>Operating ambiance</td><td colspan="5">No corrosive gas should be present</td></tr>
<tr><td>Operating altitude *3</td><td colspan="5">2000 m (6562ft.) or less</td></tr>
<tr><td>Installation position</td><td colspan="5">In the control panel</td></tr>
<tr><td>Overvoltage category *1</td><td colspan="5">II or less</td></tr>
<tr><td>Pollution level *2</td><td colspan="5">2 or less</td></tr>
</table>

*1 Indicating a particular distribution board which this machine is to be connected among many boards, situated between public power supply lines and interior machine equipment. Category II is for machines receiving power supply from stationary facilities. For power rating of 300 V or less, its surge tolerance voltage is 2500 V.

*2 Index indicating level of conductive material generation in the operating ambiance. Pollution level 2 is an ambiance which generates only non-conductive pollution, except for temporary conduction due to occasional condensation.

*3 Do not use or store the PC in the environment where the pressure is higher than the atmospheric pressure at sea level. Otherwise, malfunction may result. To use the PC in high-pressure environment, contact your nearest Mitsubishi representative.

1.2 Selecting Instructions

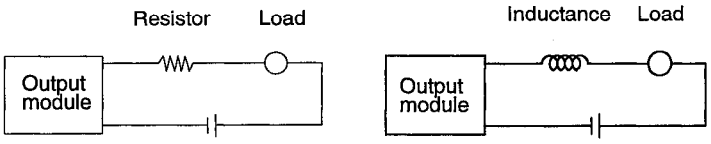
(1) It is recommended that a triac output module be used with a load that is frequently opened and closed or with a coil load (e.g. an electromagnet) that has a large capacity or a low power factor.

(If a contact output module is used, its service life will be shorter than specified.)

(2) If an inductive L load is driven by an output module, it must be switched ON for 1 second or longer and switched OFF for 1 second or longer.

(3) If a counter or timer which has a DC-DC converter as a load is used with an A1SY40, A1SY41, or A1SY42 output module, a fault may be caused in the output module due to periodic rush currents when it is turned ON or during operation.

To prevent failure due to rush current, connect a resistor or an inductance to the load in series or use an A1SY50 whose maximum load current is larger.



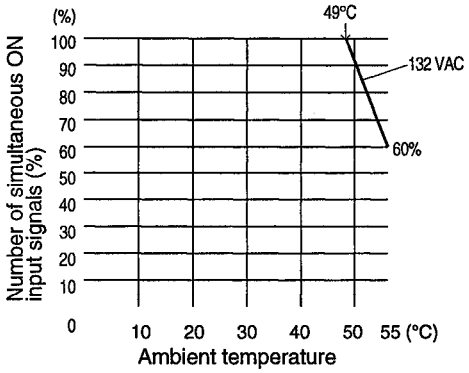
(4) Fuses installed in output modules cannot be replaced. They are principally designed to protect external wiring if the module outputs are shorted.

Therefore, output modules may not be protected from a short circuit.

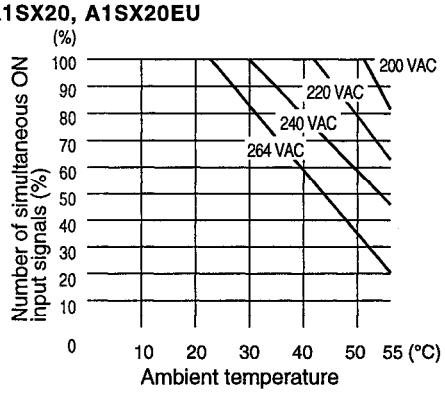
If an output module becomes faulty due to any cause other than a short circuit, its fuse may not function.

(5) The number of signals which can be turned ON simultaneously in an input module varies according to the input voltage and ambient temperature. Select the number of the simultaneous ON signals by referring to the charts on the next page.

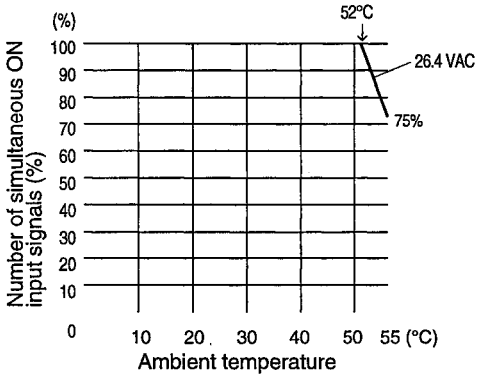
A1SX10, A1SX10EU



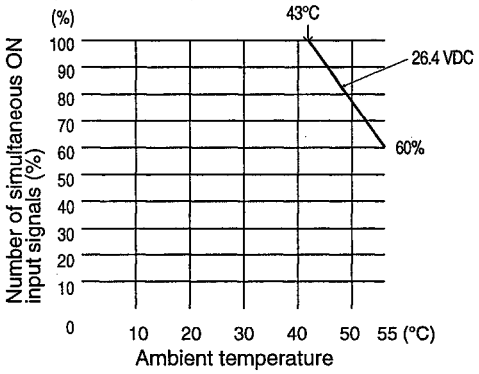
A1SX20, A1SX20EU



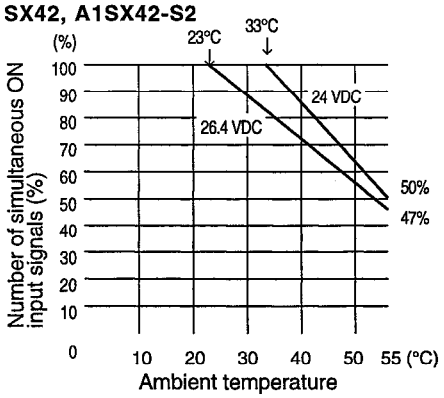
A1SX30



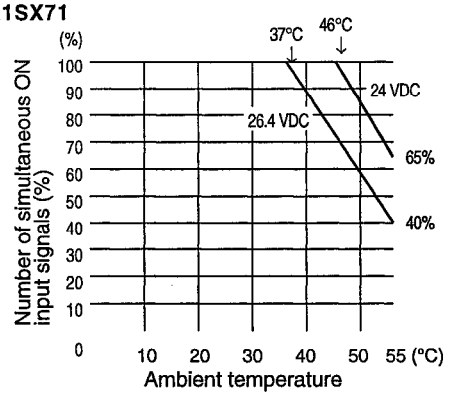
A1SX41, A1SX41-S2, A1SX81, A1SX81-S2



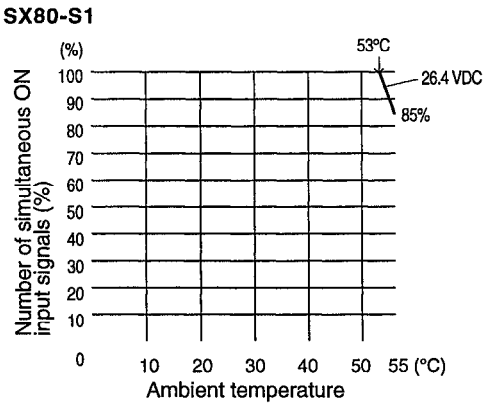
A1SX42, A1SX42-S2



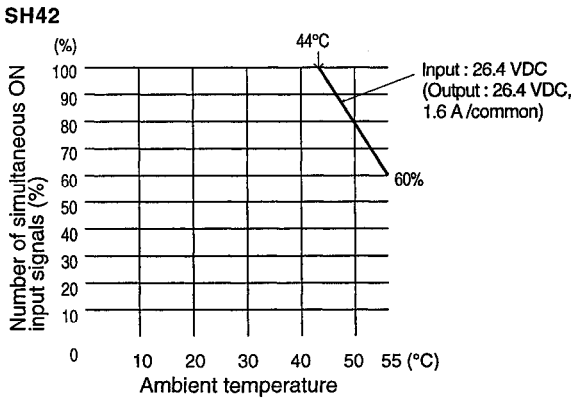
A1SX71



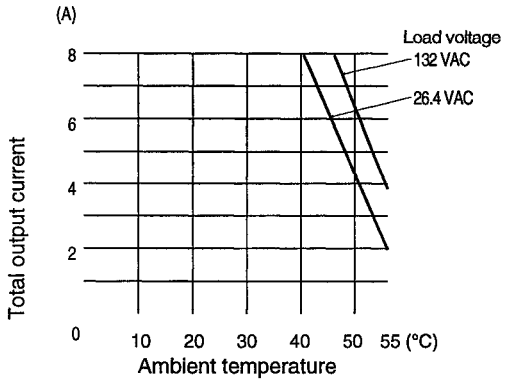
A1SX80-S1



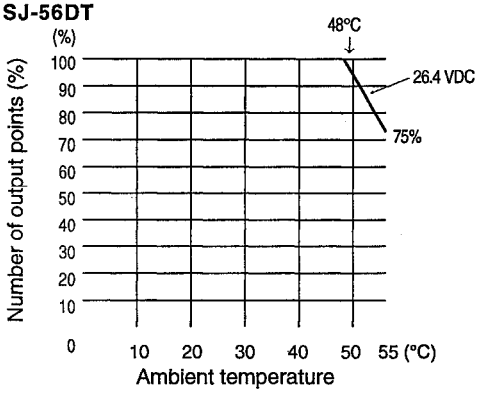
A1SH42



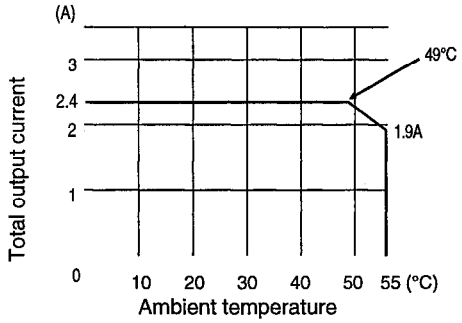
A1SY28A



A1SJ-56DT

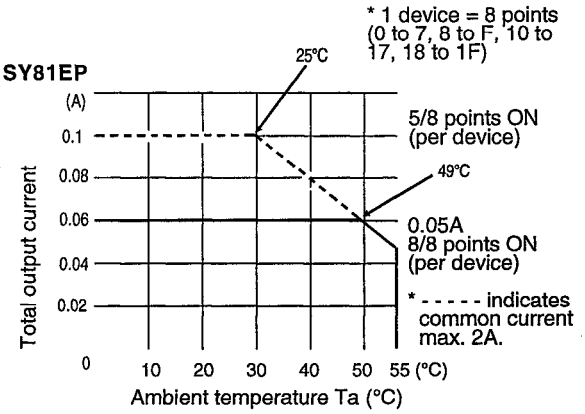


A1SY28EU



Output current per common vs. ambient temperature

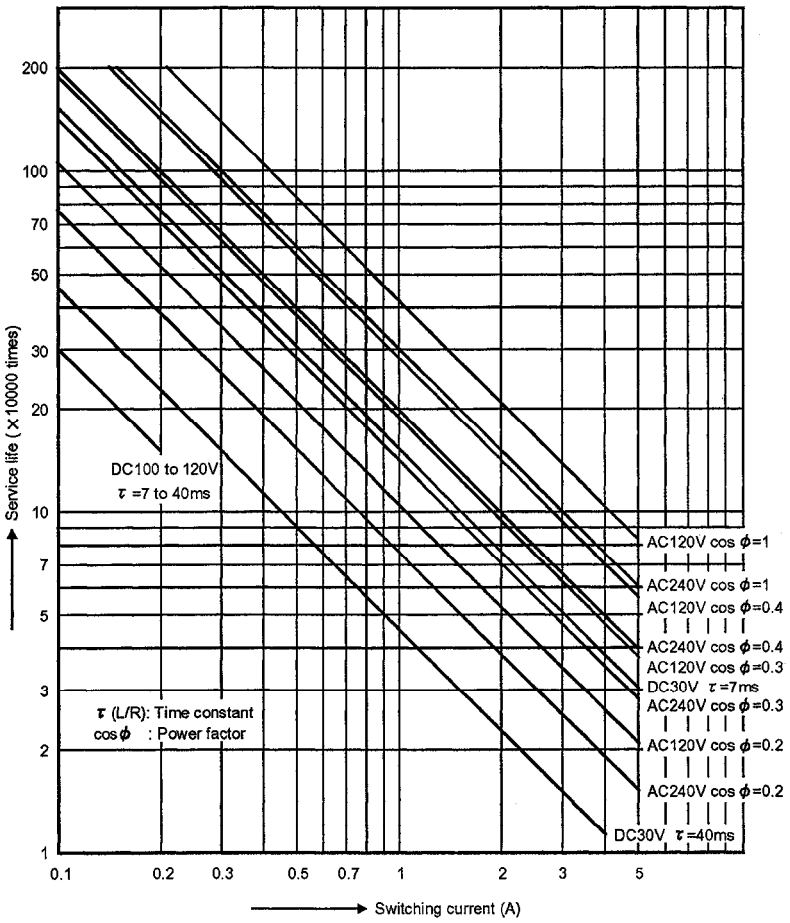
A1SY81EP



(6) The chart below shows the service life of relay output modules.

Select the appropriate modules, considering the direction given in (1).

(a) Applicable module: A1SY10, A1SJ-56DR, A1SX48Y18



Point

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

(2) The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin of error. The relay life span differs according to the specifications as follows:

Rated switching voltage, current load	100 thousand operations
200VAC 1.5A, 240VAC 1A (COS ϕ=0.7)	100 thousand operations
200VAC 1A, 240VAC 0.5A (COS ϕ=0.35)	100 thousand operations
24VDC 1A, 100VDC 0.1A (L/R=7ms)	100 thousand operations

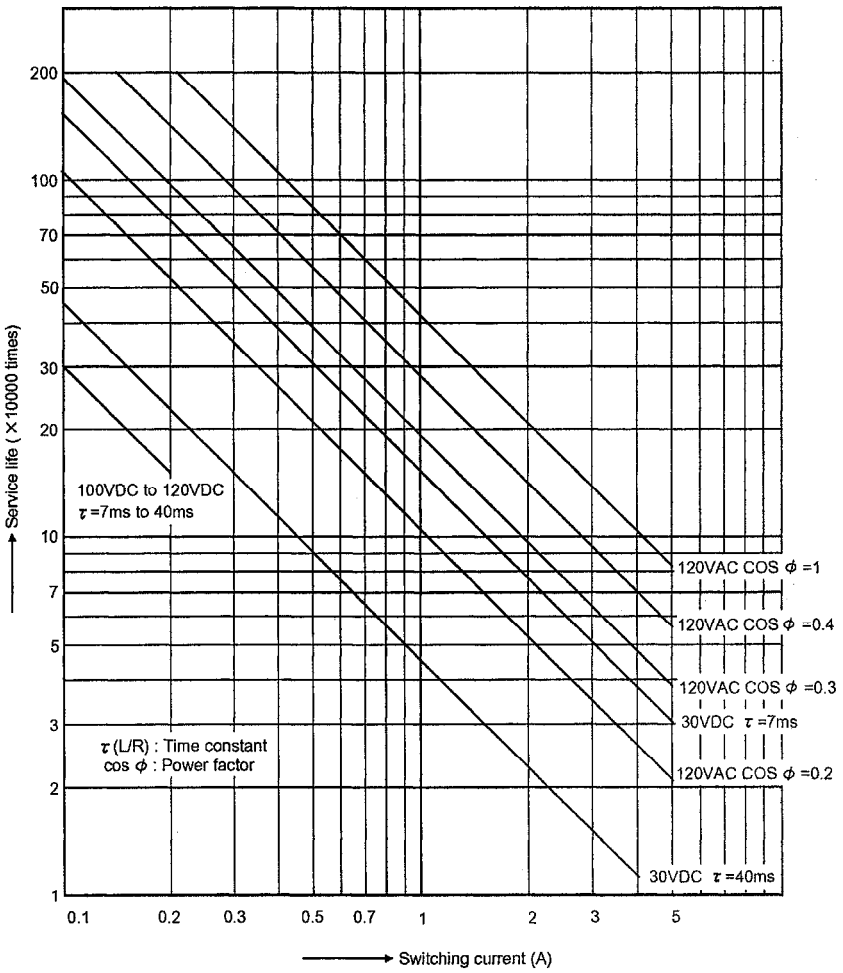
(3) Relay life is substantially affected by the load type and inrush current characteristics. The inrush current may cause the contact welding. Therefore, consideration should be given to it as well as constant current.

(a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is shut off, high counter-electromotive force is generated between the contacting materials to produce an arc discharge. Consideration should be made especially when the power factor is low, as it may decrease the life period. In addition, make sure to consider the contact melting, as the inrush current equivalent to 5 to 15 times of constant current flows when the module is powered on.

(b) Lamp load
Make sure to consider the contact melting, as the inrush current equivalent to 10 to 15 times of constant current flows in the lamp circuit.

(c) Capacitive load
Make sure to consider the contact melting when a device such as condenser is used in a load circuit, as the inrush current equivalent to 20 to 40 times of constant current may flow in the circuit. Also, pay full attention to the wire capacity if long length of wire is routed.

(b) Applicable module: A1SY10EU



Point

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

(2) The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin of error.
The relay life span differs according to the specifications as follows:

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

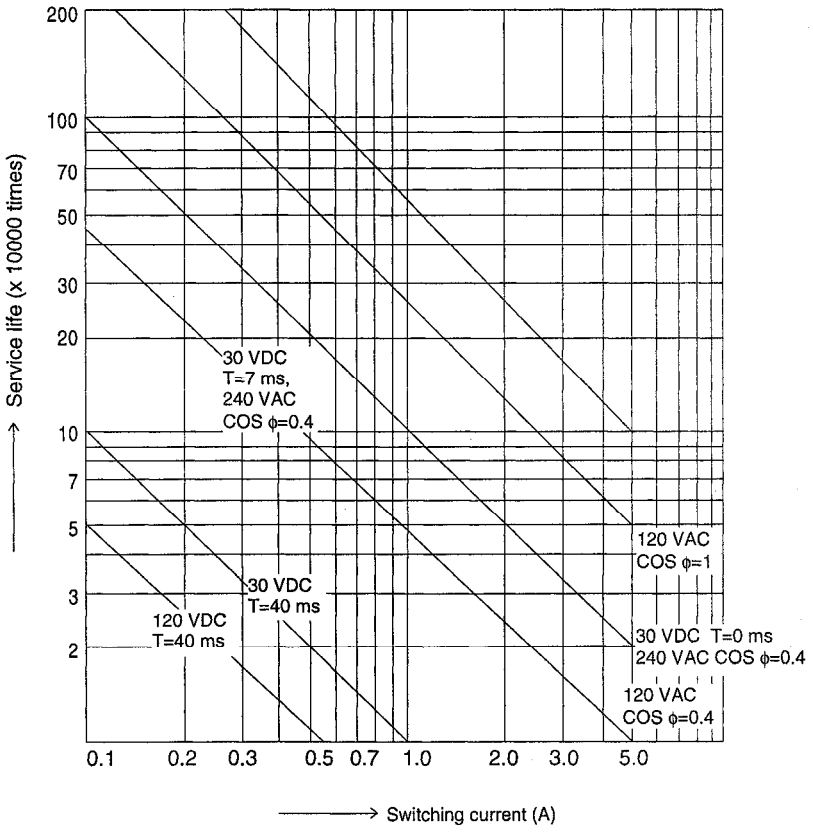
(3) Relay life is substantially affected by the load type and inrush current characteristics. The inrush current may cause the contact welding. Therefore, consideration should be given to it as well as constant current.

(a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is shut off, high counter-electromotive force is generated between the contacting materials to produce an arc discharge. Consideration should be made especially when the power factor is low, as it may decrease the life period. In addition, make sure to consider the contact melting, as the inrush current equivalent to 5 to 15 times of constant current flows when the module is powered on.

(b) Lamp load
Make sure to consider the contact melting, as the inrush current equivalent to 10 to 15 times of constant current flows in the lamp circuit.

(c) Capacitive load
Make sure to consider the contact melting when a device such as condenser is used in a load circuit, as the inrush current equivalent to 20 to 40 times of constant current may flow in the circuit. Also, pay full attention to the wire capacity if long length of wire is routed.

(c) Applicable module: A1SY14AEU



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(2) The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin of error.
The relay life span differs according to the specifications as follows:

Rated switching voltage, current load	200 thousand operations
200VAC 2A, 240VAC 1.8A (COS ϕ=0.7)	200 thousand operations
200VAC 1.1A, 240VAC 0.9A (COS ϕ=0.35)	200 thousand operations
24VDC 1.1A, 100VDC 0.1A (L/R=7ms)	200 thousand operations

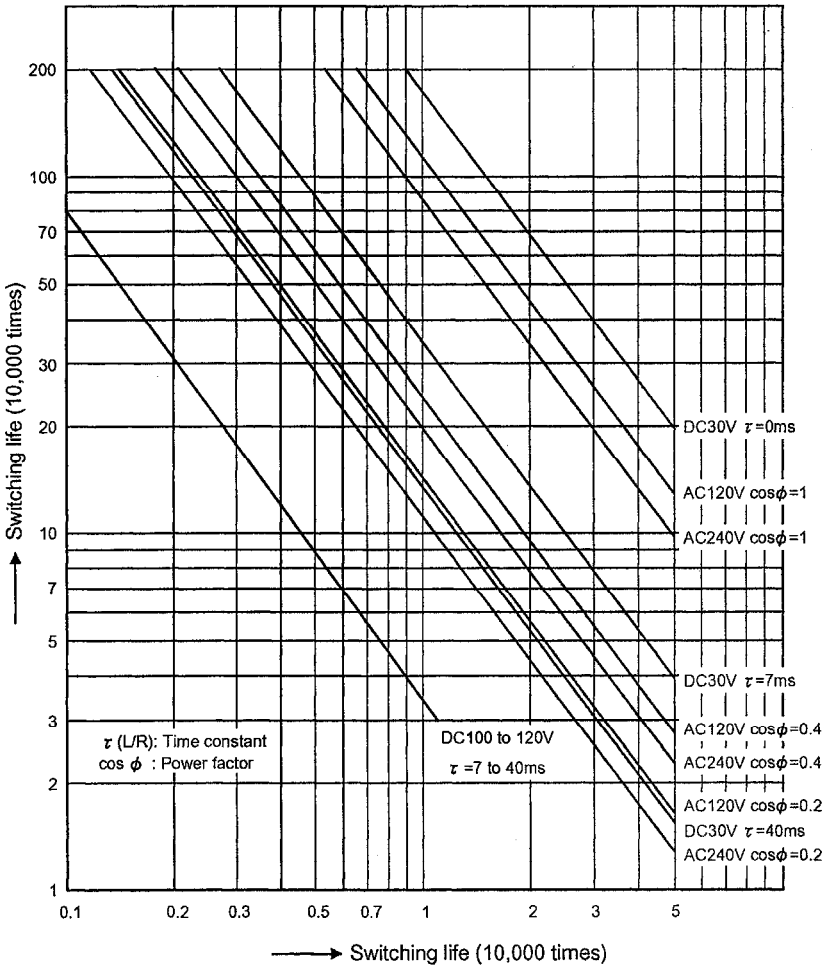
(3) Relay life is substantially affected by the load type and inrush current characteristics. The inrush current may cause the contact welding. Therefore, consideration should be given to it as well as constant current.

(a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is shut off, high counter-electromotive force is generated between the contacting materials to produce an arc discharge. Consideration should be made especially when the power factor is low, as it may decrease the life period. In addition, make sure to consider the contact melting, as the inrush current equivalent to 5 to 15 times of constant current flows when the module is powered on.

(b) Lamp load
Make sure to consider the contact melting, as the inrush current equivalent to 10 to 15 times of constant current flows in the lamp circuit.

(c) Capacitive load
Make sure to consider the contact melting when a device such as condenser is used in a load circuit, as the inrush current equivalent to 20 to 40 times of constant current may flow in the circuit. Also, pay full attention to the wire capacity if long length of wire is routed.

(d) Aplicable module: A1SY18A, A1SY18AEU



Point

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

(2) The relay life curve shows the value based on actual use, which is not guaranteed. Therefore, make sure to allow for a margin of error. The relay life span differs according to the specifications as follows:

Rated switching voltage, current load	200 thousand operations
200VAC 1.5A, 240VAC 1A (COSϕ =0.7)	200 thousand operations
200VAC 075A, 240VAC 0.5A (COSϕ =0.35)	200 thousand operations
24VDC 1A, 100VDC 0.1A (L/R=7ms)	200 thousand operations

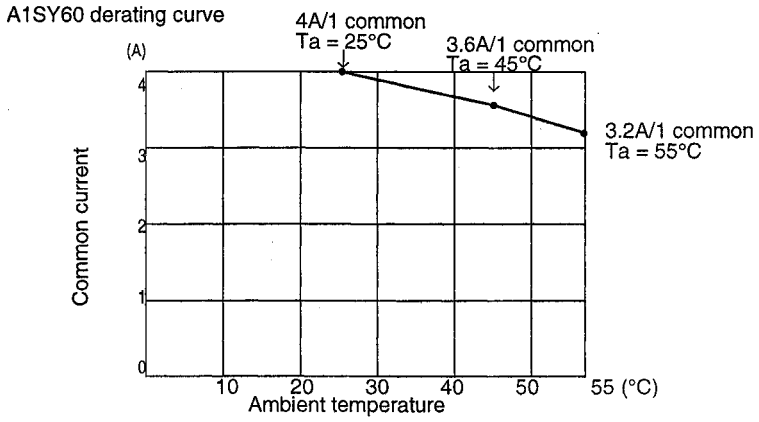
(3) Relay life is substantially affected by the load type and inrush current characteristics. The inrush current may cause the contact welding. Therefore, consideration should be given to it as well as constant current.

(a) Inductive load
When the inductive load such as electromagnetic contactor or solenoid is shut off, high counter-electromotive force is generated between the contacting materials to produce an arc discharge. Consideration should be made especially when the power factor is low, as it may decrease the life period. In addition, make sure to consider the contact melting, as the inrush current equivalent to 5 to 15 times of constant current flows when the module is powered on.

(b) Lamp load
Make sure to consider the contact melting, as the inrush current equivalent to 10 to 15 times of constant current flows in the lamp circuit.

(c) Capacitive load
Make sure to consider the contact melting when a device such as condenser is used in a load circuit, as the inrush current equivalent to 20 to 40 times of constant current may flow in the circuit. Also, pay full attention to the wire capacity if long length of wire is routed.

(7) The common current of A1SY60 output module varies according to ambient temperature. Select a common current referring to the chart shown below.



(8) The A1SX41 and A1SX42 input modules and the A1SY41 and A1SY42 output modules are 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) Soldering-type 40-pin connector

Model name : A6CON1 (straight out type),
A6CON4 (straight/diagonal out type)

(b) Crimp-contact-type 40-pin connector

Model name : A6CON2 (straight out type)

Tool : Fujitsu FCN-363T-T005/H

Applicable wire size : AWG #24 to 28

(c) Pressure-displacement-type 40-pin connector

Model name : A6CON3 (flat cable type)

Tool : Fujitsu
FCN-367T-T012/H (locator plate)
FCN-707T-T001/H (cable cutter)
FCN-707T-T101/H (hand press)

Applicable wire size : AWG #28 (twisted)
AWG #30 (single wire)

(d) Supplier's offices:

Fujitsu Limited

North and South America:

Fujitsu Component of America, Inc.
3545 North First Street, San Jose, CA 95134-1804 U.S.A.
Phone: (408) 922-9000
Telex: (910) 338-0190
Fax: (408) 428-0640

Europe:

Fujitsu Microelectronik GmbH

Am Siebestein 6-10 6072, Dreieich-Buchschtag, F.R. Germany
Phone: (061) 03-690-0
Telex: 411963
Fax: (061) 03-690-122

Asia:

Fujitsu Microelectronics Asia PTE, Limited
#06-04 to #06-07 Plaza, By The Park, No.51 Bras Basah Road, Singapore 0719
Phone: 336-1600
Telex: 55573
Fax: 336-1609

(9) The 37-pin D sub-connector for the A1SX81 input module and A1SY81 output module 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 and pressure-displacement connectors must be procured by the user.

(a) Soldering-type 37-pin D sub-connector

Model name	: A6CON1E (straight out type)

(b) Crimp-contact-type 37-pin D sub-connector

Model name	: A6CON2E (straight out type)
Tool	: Tyco Electronics AMP 91503-1
Applicable wire size	: AWG #20 to 24

(c) Pressure-displacement-type 37-pin D sub-connector

Model name	: A6CON3E (flat cable type)
Tool	: Tyco Electronics AMP 91257-1 (die set) 91220-1 (cable cutter) 91085-2 (hand press)
Applicable wire size	: AWG #28 (twisted) AWG #30 (single wire)

(d) Contact for enquiries about tools for crimp-contact and pressure-displacemet-type cables
(The tools cited above are only examples: for more details, enquire at the contact given below Home Page.)

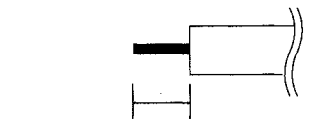
http://www.tycoelectronics.com/

(10) The fixing screw tightening torque should be within the following range.
Module fixing screw (M4 screw) ..... 78.4 to 117.6N•cm

(11) When using A1SX10EU, A1SX20EU, A1SY10EU, A1SY14EU, A1SY28EU, etc., if the wires are connected to the terminal block without using solderless terminals, observe the following points.

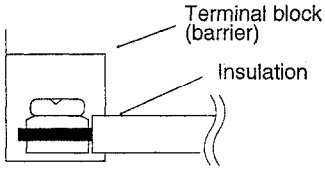
(a) Bare the end of insulated wires to expose about 6 to 8 mm of naked wire.

When making connections, ensure that bared wire does 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.

(12) 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, A1SY50, A1SY60(E), A1SY68A, A1SY80, A1SY81EP
Input/output composite module	A1SX48Y18, A1SX48Y58
Special function module	A1SI61, A1S64AD, A1S62DA, A1S63ADA, A1S62RD3/4, A1SD61, A1SP60

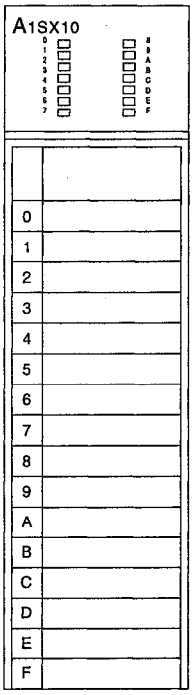
(13) Precaution when Connecting the Uninterruptive Power Supply (UPS)
Use a UPS which employs the constant inverter power supply method with 5 % or less voltage fluctuation.
Do not use a UPS with the constant commercial power supply method.

2. INPUT MODULE SPECIFICATIONS

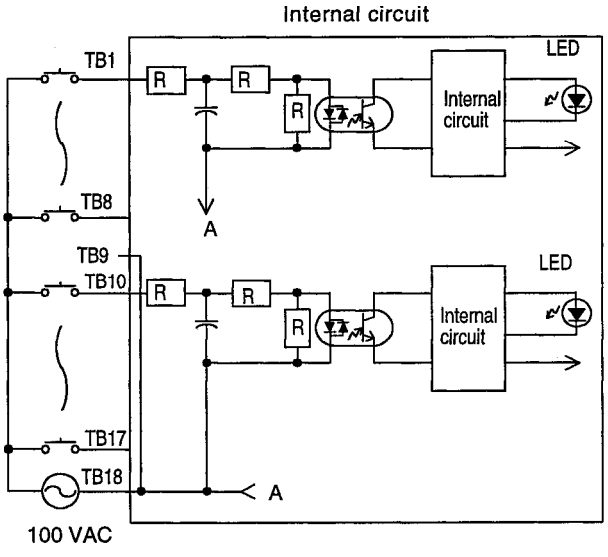
2.1 A1SX10 AC Input Module

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 (13))
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 1.2 mm^2 (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		0.21

Appearance



External Connections

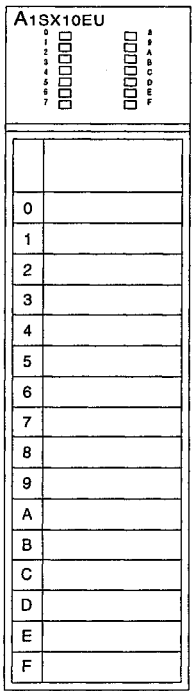


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

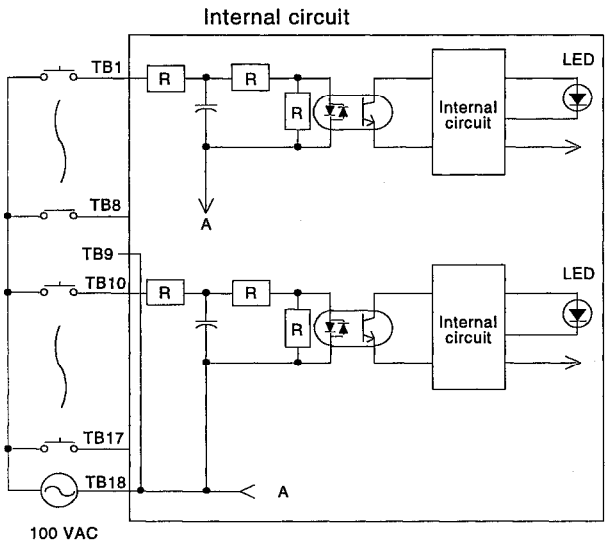
2.2 A1SX10EU AC Input Module

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 (13))
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

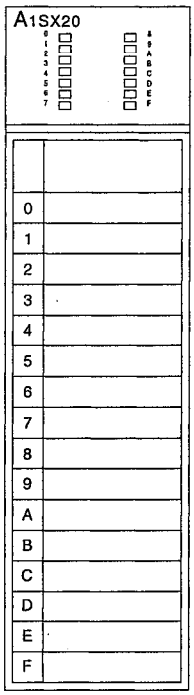


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

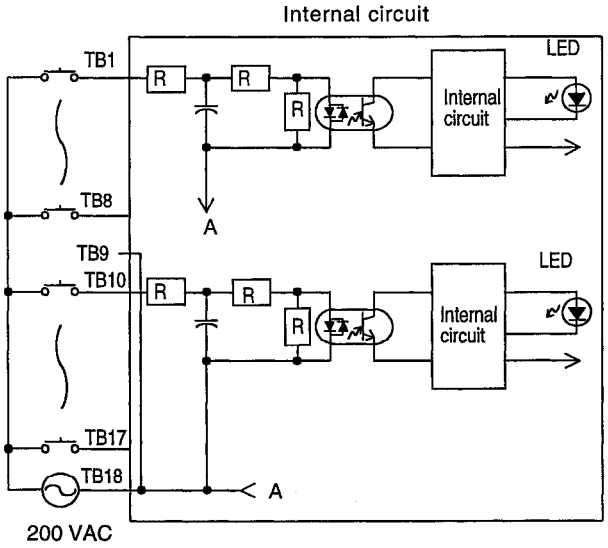
2.3 A1SX20 AC Input Module

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 (13))
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 (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

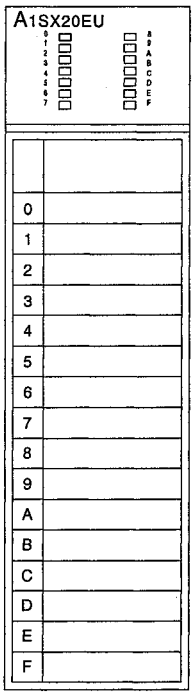


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

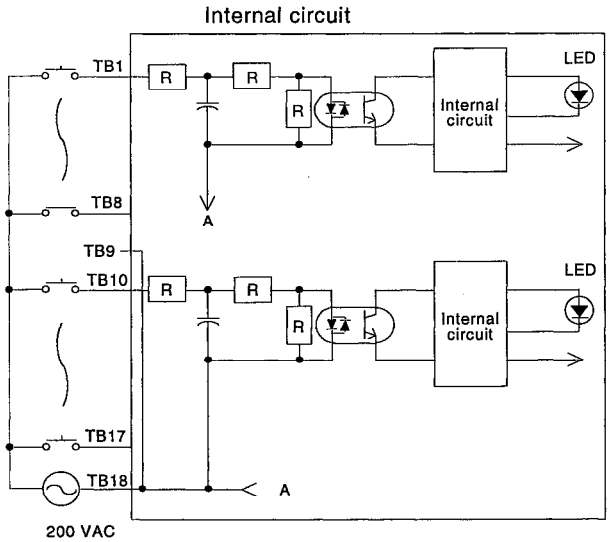
2.4 A1SX20EU AC Input Module

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 (13))
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

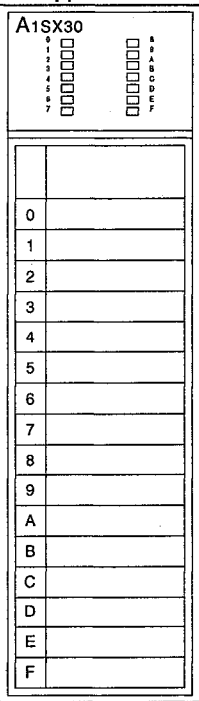


Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

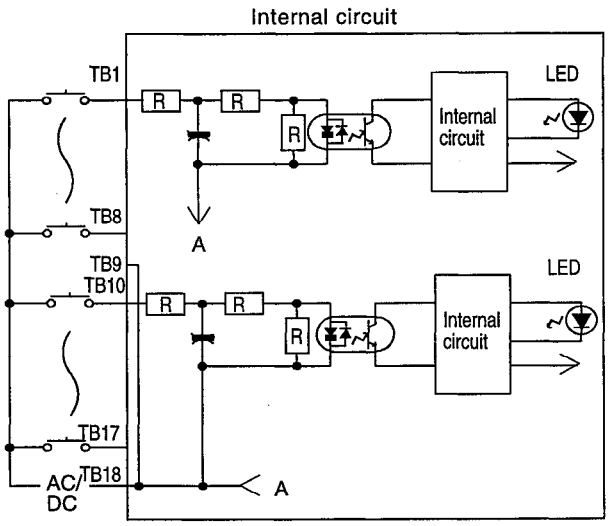
2.5 A1SX30 DC/AC Input Module

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		4.2 mA (12 VDC/VAC), 8.6 mA (24 VDC/VAC)	
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 (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



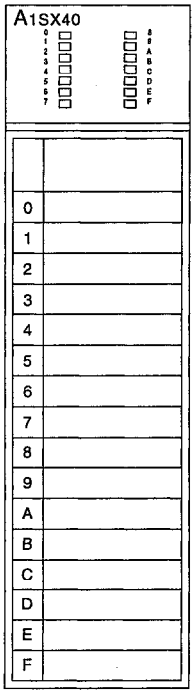
External Connections



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

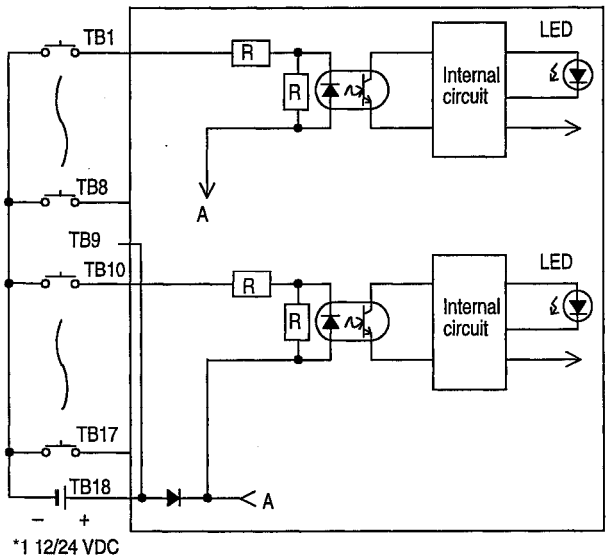
2.6 A1SX40(S1/S2) DC Input Module (Sink Type)

Specifications \ Model		DC Input Module (Sink Type)			
		A1SX40	A1SX40-S1	A1SX40-S2	Appearance
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)	
	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 (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			



External Connections

Internal circuit

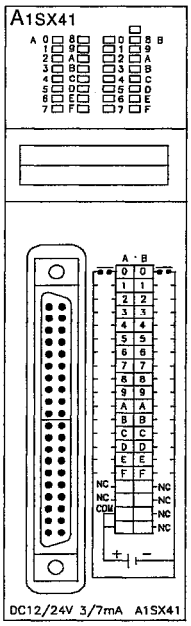


*1: A1SX40-S1/S2 is 24 VDC only.

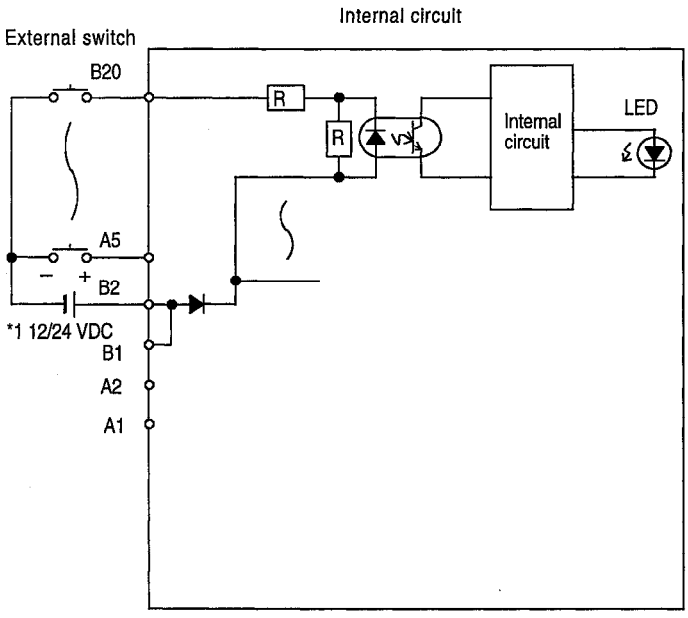
Terminal No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM
TB10	X08
TB11	X09
TB12	X0A
TB13	X0B
TB14	X0C
TB15	X0D
TB16	X0E
TB17	X0F
TB18	COM
TB19	Vacant
TB20	Vacant

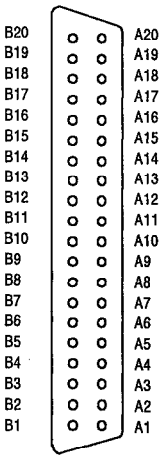
2.7 A1SX41(S1/S2) DC Input Module (Sink Type)

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/ 3.5 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/ 1.8 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		0.3 mm^2			
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



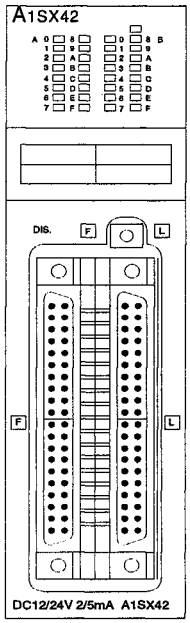


Pin Arrangement	Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)
	B20	X00	A20	X10
	B19	X01	A19	X11
	B18	X02	A18	X12
	B17	X03	A17	X13
	B16	X04	A16	X14
	B15	X05	A15	X15
	B14	X06	A14	X16
	B13	X07	A13	X17
	B12	X08	A12	X18
	B11	X09	A11	X19
	B10	X0A	A10	X1A
	B9	X0B	A9	X1B
	B8	X0C	A8	X1C
	B7	X0D	A7	X1D
	B6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

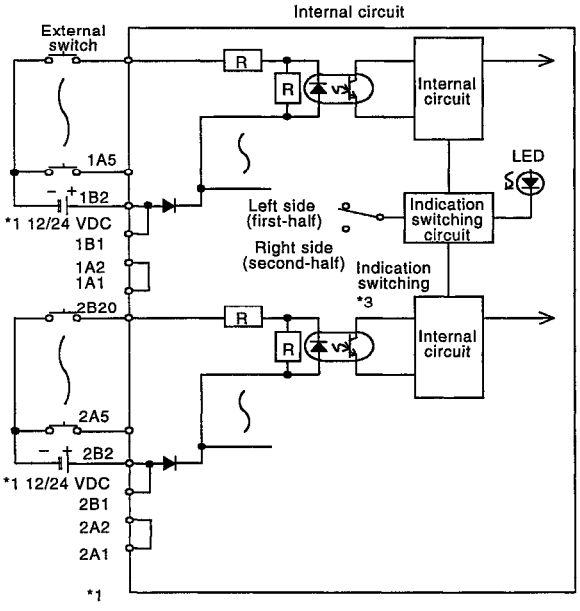
*1: A1SX42-S2 is 24 VDC only.
*2: The arrangement of pins A and B shown above is the opposite of the arrangement of pins of the connector on the module.

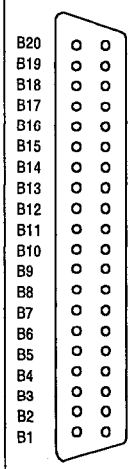
2.8 A1SX42(S1/S2) DC Input Module (Sink Type)

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		0.3 mm^2			
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





Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (SH)	Pin No.	Signal Name (SH)
1B20	X00	1A20	X10	2B20	X20	2A20	X30
1B19	X01	1A19	X11	2B19	X21	2A19	X31
1B18	X02	1A18	X12	2B18	X22	2A18	X32
1B17	X03	1A17	X13	2B17	X23	2A17	X33
1B16	X04	1A16	X14	2B16	X24	2A16	X34
1B15	X05	1A15	X15	2B15	X25	2A15	X35
1B14	X06	1A14	X16	2B14	X26	2A14	X36
1B13	X07	1A13	X17	2B13	X27	2A13	X37
1B12	X08	1A12	X18	2B12	X28	2A12	X38
1B11	X09	1A11	X19	2B11	X29	2A11	X39
1B10	X0A	1A10	X1A	2B10	X2A	2A10	X3A
1B9	X0B	1A9	X1B	2B9	X2B	2A9	X3B
1B8	X0C	1A8	X1C	2B8	X2C	2A8	X3C
1B7	X0D	1A7	X1D	2B7	X2D	2A7	X3D
1B6	X0E	1A6	X1E	2B6	X2E	2A6	X3E
1B5	X0F	1A5	X1F	2B5	X2F	2A5	X3F
1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
1B2	COM1	1A2	Vacant	2B2	COM2	2A2	Vacant
1B1	COM1	1A1	Vacant	2B1	COM2	2A1	Vacant

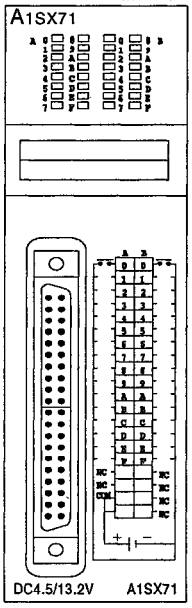
*1: A1SX42-S1/S2 is 24 VDC only.

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

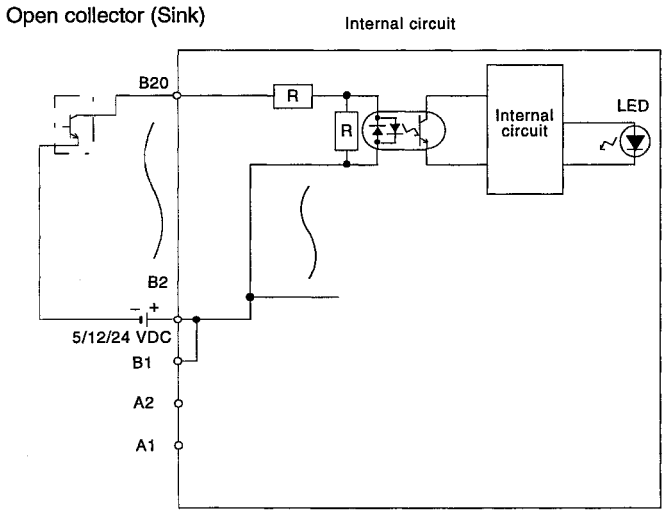
*3: When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (X20 to X3F) is displayed by the LEDs.

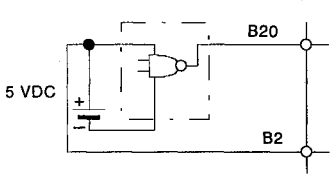
2.9 A1SX71 DC Input Module (Sink/Source Common Type)

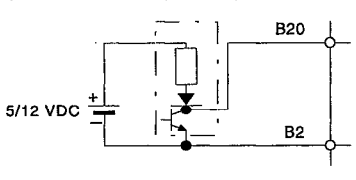
Specifications \ Model		DC Input Module (Sink/Source Common Type)		
		A1SX71		Appearance
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		5 VDC	12 VDC	24 VDC *1
Rated input current		1.2 mA	3.3 mA	7 mA
Operating voltage range		4.5 to 26.4 VDC (ripple: less than 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		0.3 mm^2		
Accessories		Connector (1 pce.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		75 mA (TYP, all points ON)		
Weight kg		0.19		

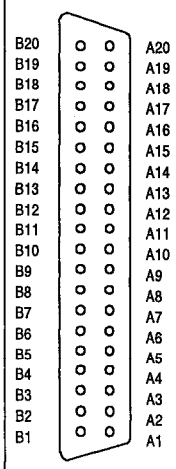


External Connections









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
	B3	Vacant	A3	Vacant
	B2	COM	A2	Vacant
	B1	COM	A1	Vacant

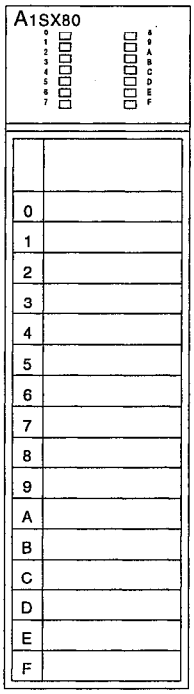
*1: 24 VDC can be used with hardware version B and later versions.

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

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

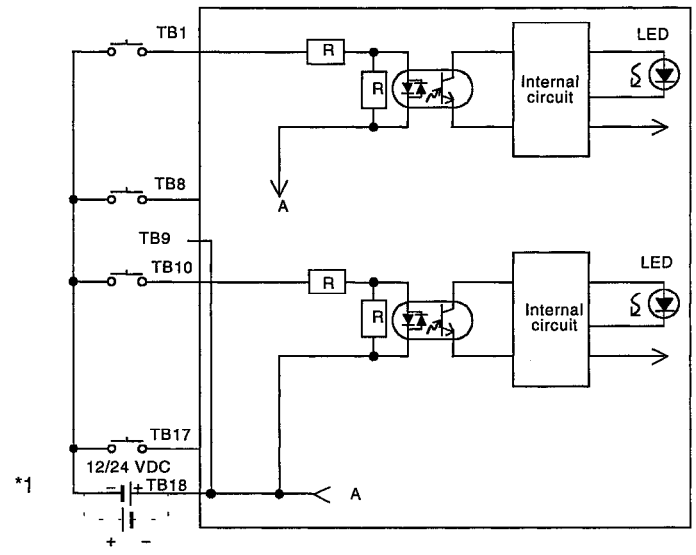
Specifications \ Model		DC Input Module (Sink/Source Common Type)			
		A1SX80		A1SX80-S1	A1SX80-S2
Number of input points		16 points			
Isolation method		Photocoupler			
Rated input voltage		12 VDC	24 VDC	24 VDC	
Rated input current		Approx. 3 mA	Approx. 7 mA	Approx. 7 mA	
Operating voltage range		10.2 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)			
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 (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

Internal circuit



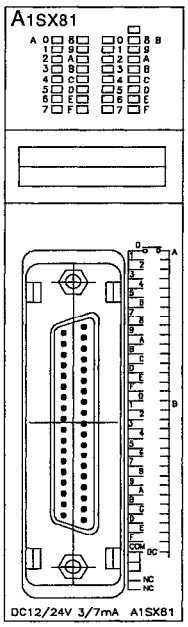
*1: A1SX80-S1/S2 is 24 VDC only.

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

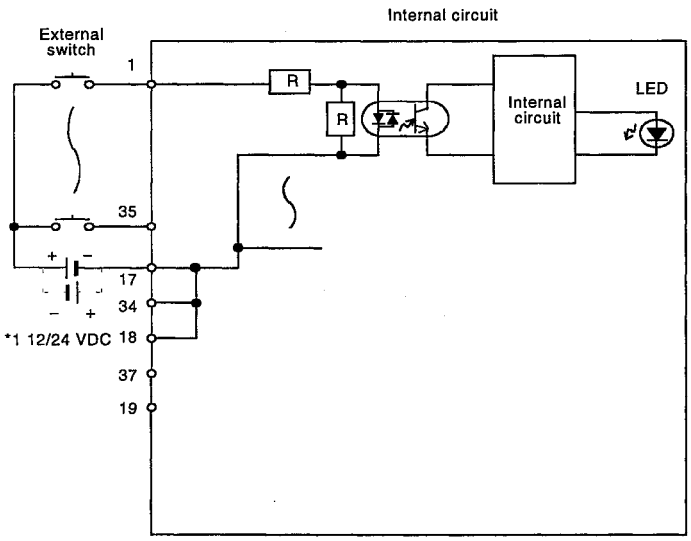
2.11 A1SX81(S2) DC Input Module (Sink/Source Common Type)

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		0.3 mm^2		
Accessories		Connector (1 pce.) for external wiring (soldering type)		
Internal current consumption (5 VDC)		80 mA (TYP, all points ON)		
Weight kg		0.24		

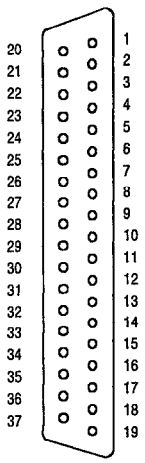
Appearance



External Connections



*1: A1SX81-S2 is 24 VDC only.



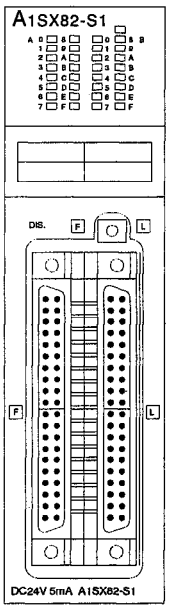
Front view

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		

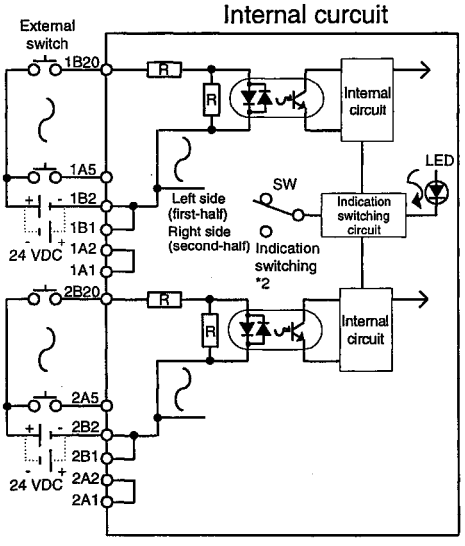
2.12 A1SX82-S1 DC Input Module (Sink/Source Common Type)

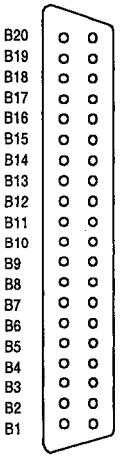
Specifications \ Model		DC Input Module (Sink/Source Common Type) A1SX82-S1
Number of input points		64 points
Isolation method		Photocoupler
Rated input voltage		24 VDC
Rated input current		Approx. 5 mA
Operating voltage range		19.2 to 26.4 VDC (ripple: less than 5%)
Max. simultaneous input points		50% (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		0.3 mm^2
Accessories		Connectors (2 pces.) for external wiring (soldering type)
Internal current consumption (5 VDC)		160 mA (TYP, all points ON)
Weight kg		0.28

Appearance



External Connections





Front view

Pin No.	Signal Name (FH)	Pin No.	Signal Name (FH)	Pin No.	Signal Name (SH)	Pin No.	Signal Name (SH)
1B20	X00	1A20	X10	2B20	X20	2A20	X30
1B19	X01	1A19	X11	2B19	X21	2A19	X31
1B18	X02	1A18	X12	2B18	X22	2A18	X32
1B17	X03	1A17	X13	2B17	X23	2A17	X33
1B16	X04	1A16	X14	2B16	X24	2A16	X34
1B15	X05	1A15	X15	2B15	X25	2A15	X35
1B14	X06	1A14	X16	2B14	X26	2A14	X36
1B13	X07	1A13	X17	2B13	X27	2A13	X37
1B12	X08	1A12	X18	2B12	X28	2A12	X38
1B11	X09	1A11	X19	2B11	X29	2A11	X39
1B10	X0A	1A10	X1A	2B10	X2A	2A10	X3A
1B9	X0B	1A9	X1B	2B9	X2B	2A9	X3B
1B8	X0C	1A8	X1C	2B8	X2C	2A8	X3C
1B7	X0D	1A7	X1D	2B7	X2D	2A7	X3D
1B6	X0E	1A6	X1E	2B6	X2E	2A6	X3E
1B5	X0F	1A5	X1F	2B5	X2F	2A5	X3F
1B4	Vacant	1A4	Vacant	2B4	Vacant	2A4	Vacant
1B3	Vacant	1A3	Vacant	2B3	Vacant	2A3	Vacant
1B2	COM1	1A2	Vacant	2B2	COM2	2A2	Vacant
1B1	COM1	1A1	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.

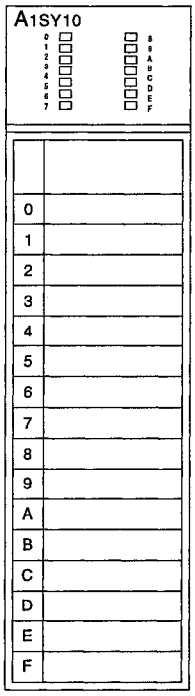
*2: When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs. When it is set to the right side, the status of the second-half devices (X20 to X3F) is displayed by the LEDs.

3. OUTPUT MODULE SPECIFICATIONS

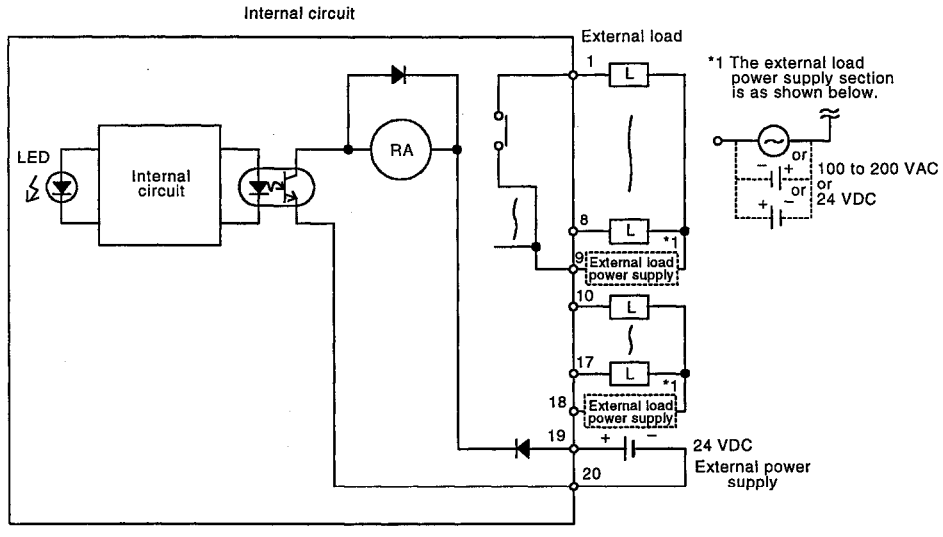
3.1 A1SY10 Contact Output Module

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
	Electrical	Switching rated voltage/current More than 100000 times
		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
		24 VDC 1 A, 100 VDC 0.1 A (L/R = 7 ms) More than 100000 times
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
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

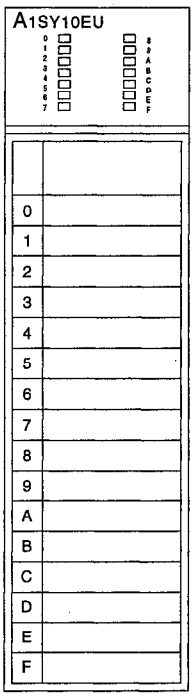


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0V

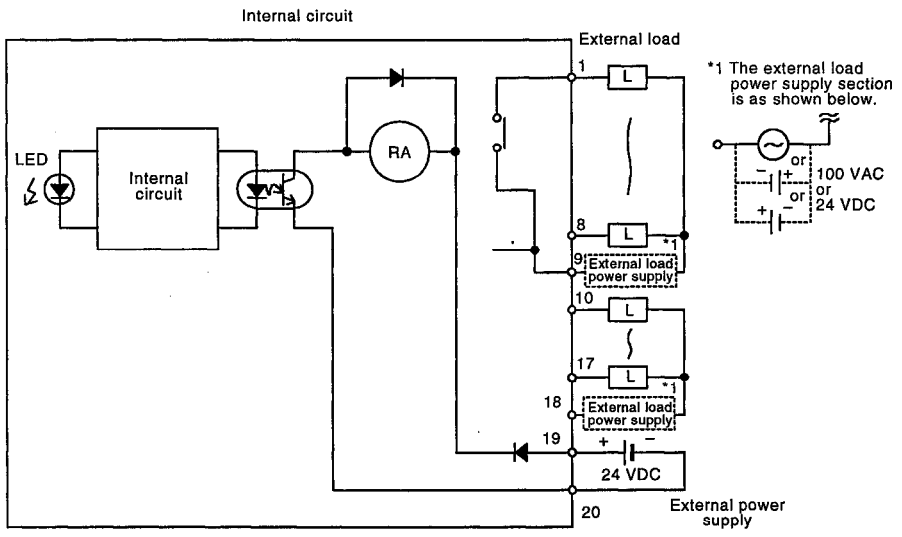
3.2 A1SY10EU Contact Output Module

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

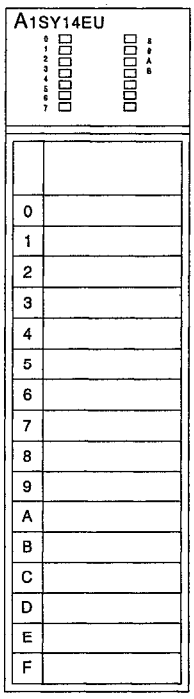


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0V

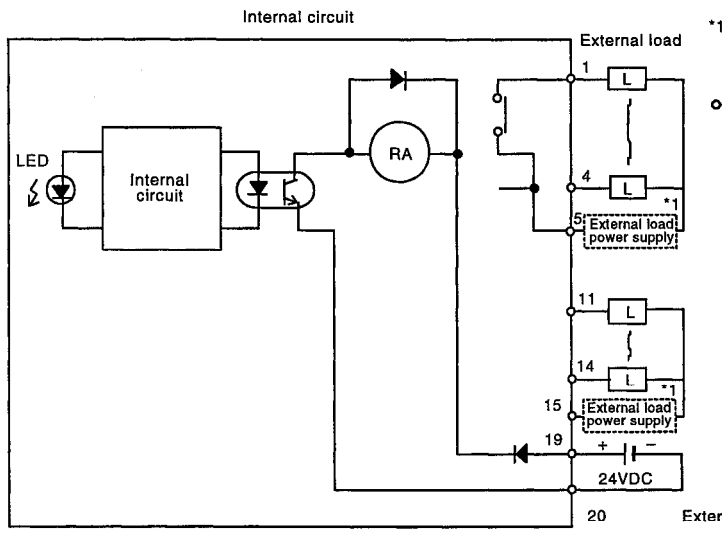
3.3 A1SY14EU Contact Output Module

Specifications \ Model		Contact Output Module A1SY14EU	
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	

Appearance



External Connections

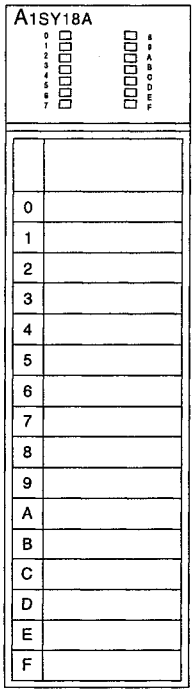


Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	COM1
TB6	Y04
TB7	Y05
TB8	Y06
TB9	Y07
TB10	COM2
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	COM3
TB16	Vacant
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0V

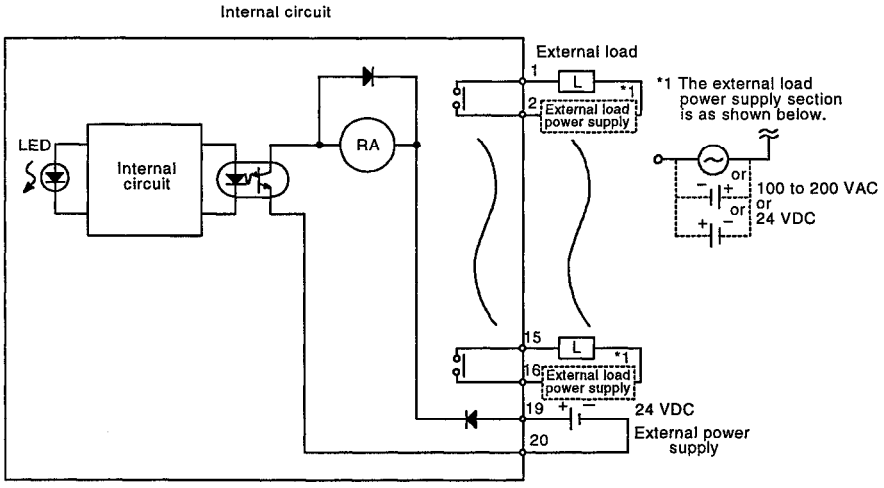
3.4 A1SY18A Contact Output Module (All Points Independent)

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
	Electrical	Switching rated voltage/current More than 200000 times
		200 VAC 1.5 A, 240 VAC 1 A (COSϕ = 0.7) More than 200000 times
		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
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 (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



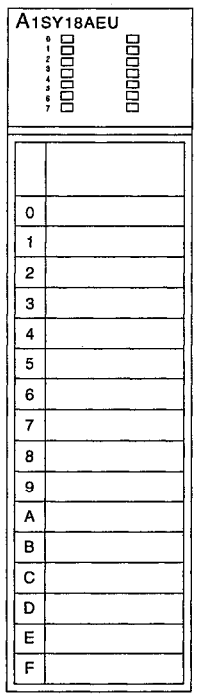
External Connections



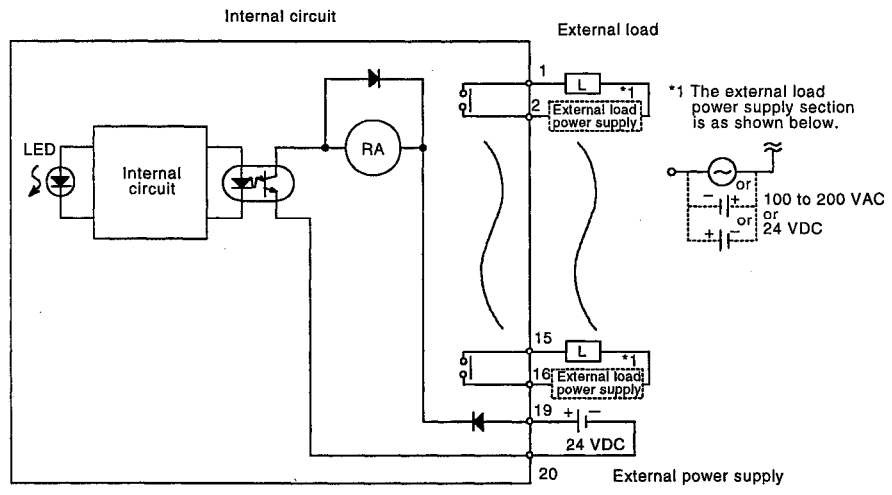
Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0 V

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 1 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

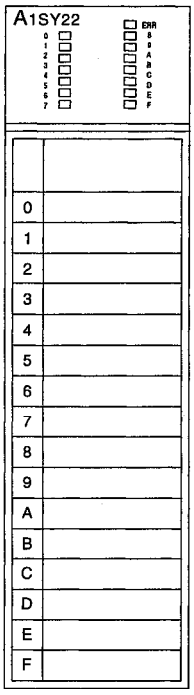


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	24 VDC
TB20	0V

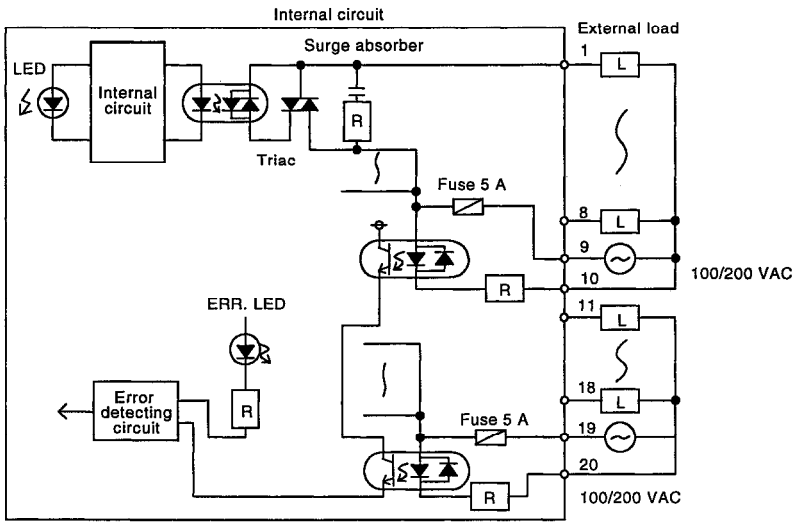
3.6 A1SY22 Triac Output Module

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	0.5 CYCLE + 1 ms 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

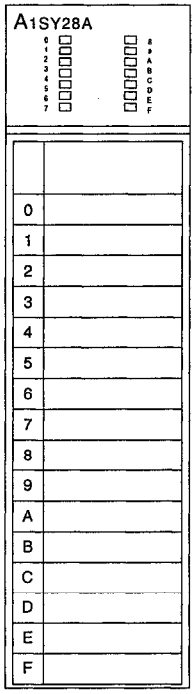
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

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

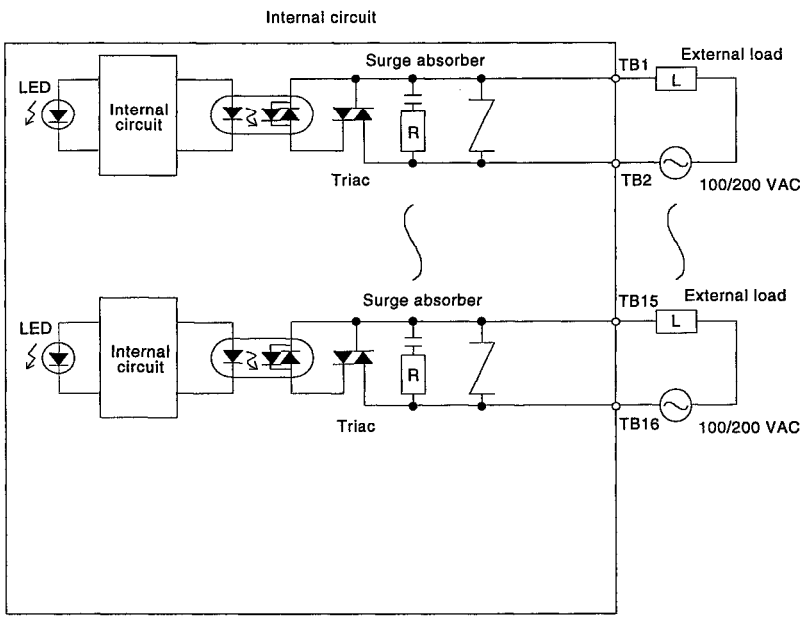
3.7 A1SY28A Triac Output Module (All Points Independent)

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		1 A/point, 4 A/module(132 VAC), 2 A/module(264 VAC)
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	0.5 CYCLE + 1 ms 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

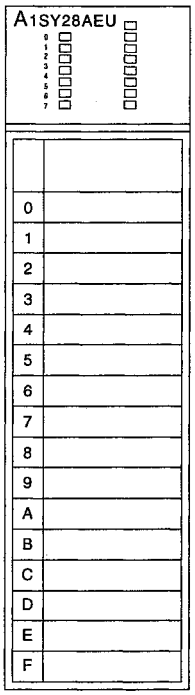


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

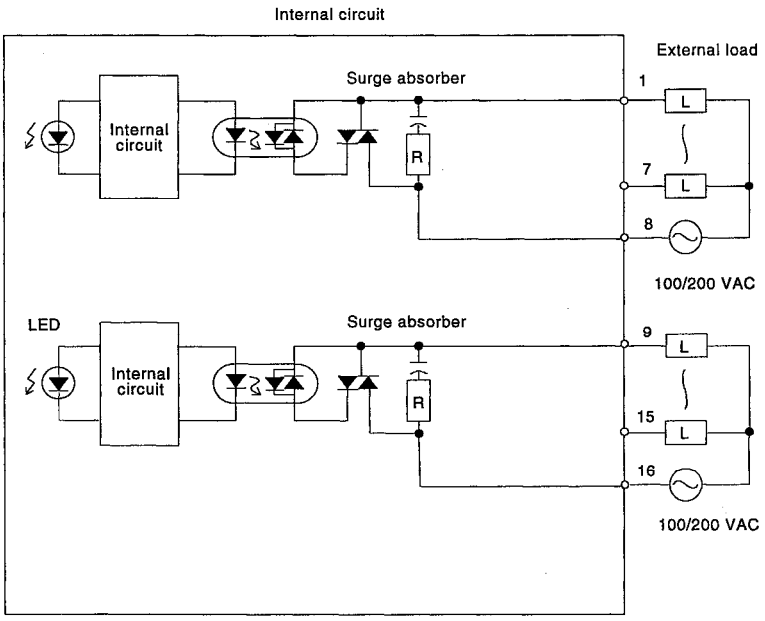
3.8 A1SY28AEU Triac Output Module

Specifications \ Model		Triac Output Module: A1SY28AEU
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		0.6 A/point, 1.9 A/common
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	0.5 CYCLE + 1 ms or less
Surge absorber		Built-in CR absorber (0.01 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

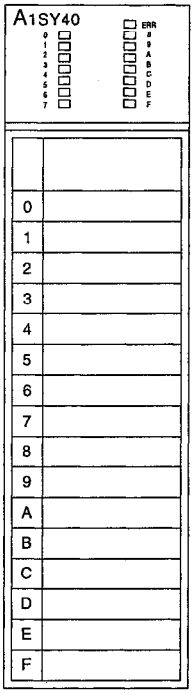


Terminal No.	Signal Name
TB1	Y00
TB2	Vacant
TB3	Y01
TB4	Vacant
TB5	Y02
TB6	Vacant
TB7	Y03
TB8	COM1
TB9	Y04
TB10	Vacant
TB11	Y05
TB12	Vacant
TB13	Y06
TB14	Vacant
TB15	Y07
TB16	COM2
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

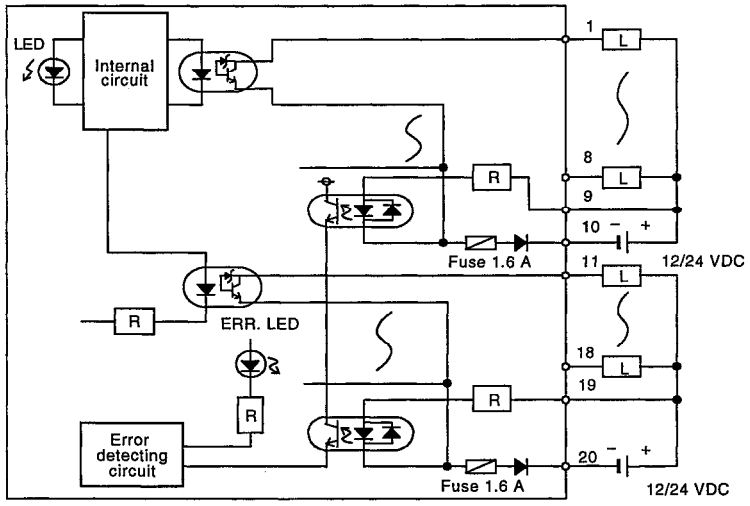
3.9 A1SY40 Transistor Output Module (Sink Type)

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

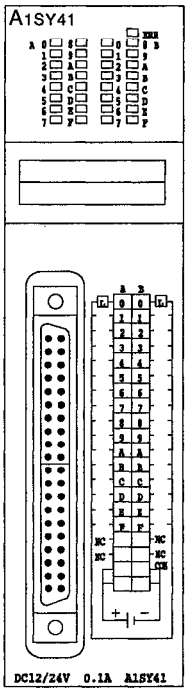
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

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

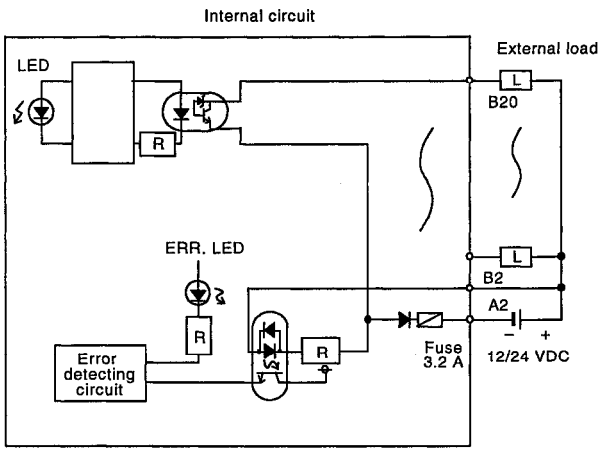
3.10 A1SY41 Transistor Output Module (Sink Type)

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 *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		0.3 mm^2
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

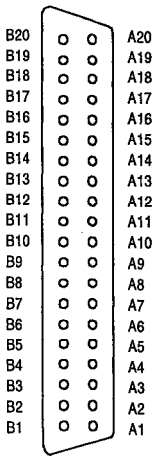


*1 : The arrangement of pins A and B shown right is the opposite of the arrangement of pins of the connector on the module.

*2 : 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.

Pin Arrangement



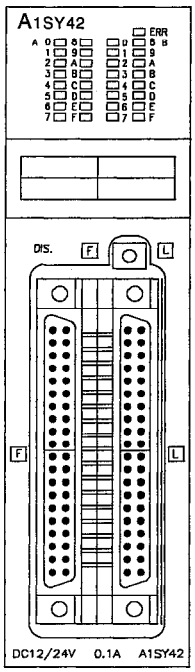
Front view

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

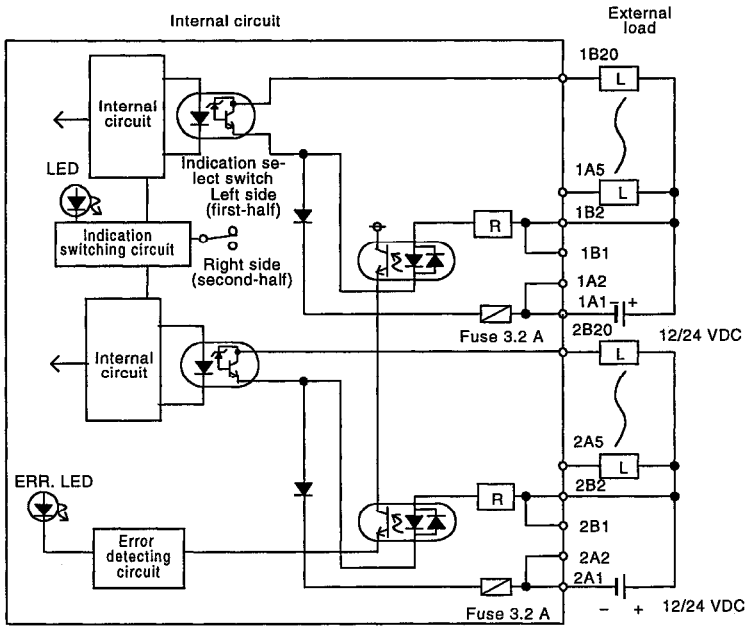
3.11 A1SY42 Transistor Output Module (Sink Type)

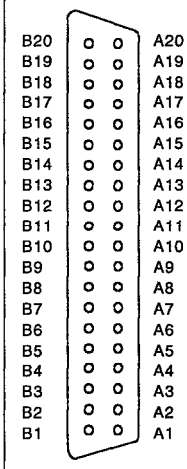
Specifications \ Model		Transistor Output Module (Sink Type) A1SY42
Number of output points		64 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 1.6 A/common
Max. allowed rush current		0.4 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		0.3 mm^2
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.

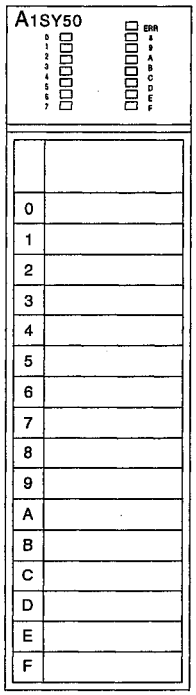
*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

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

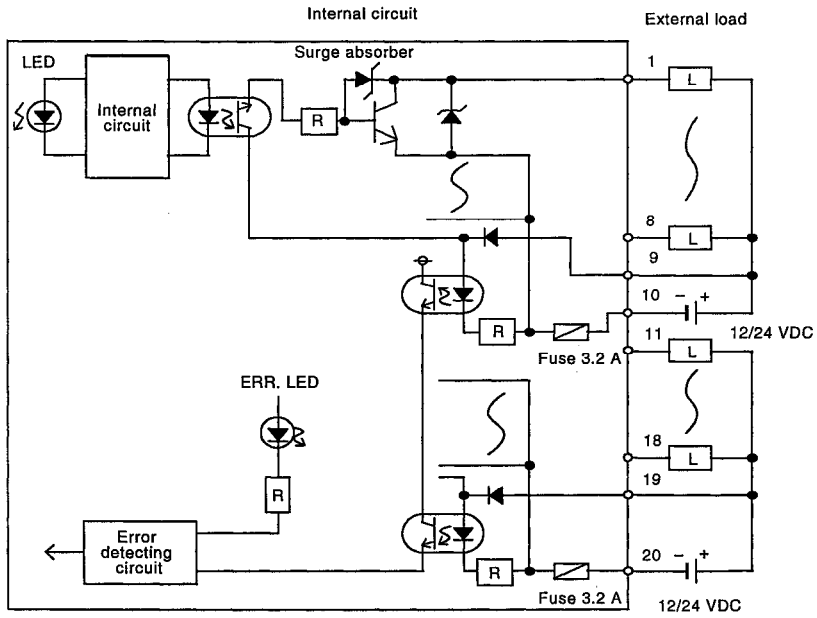
3.12 A1SY50 Transistor Output Module (Sink Type)

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

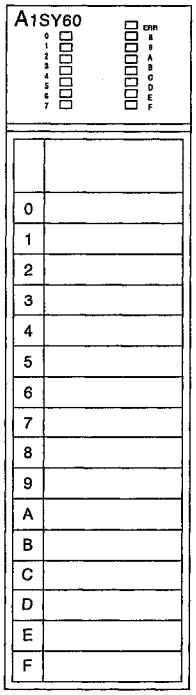
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

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

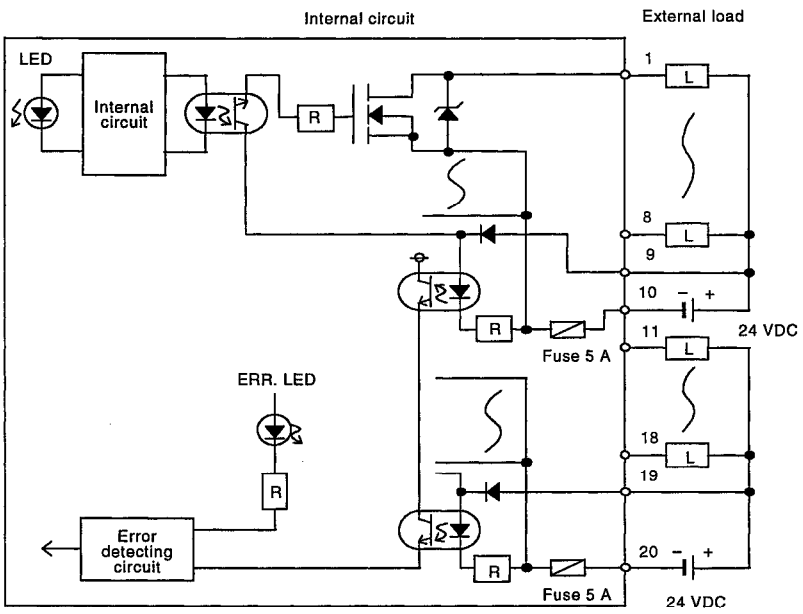
3.13 A1SY60 Transistor Output Module (Sink Type)

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

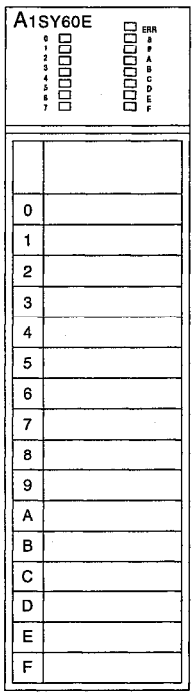
*1 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

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

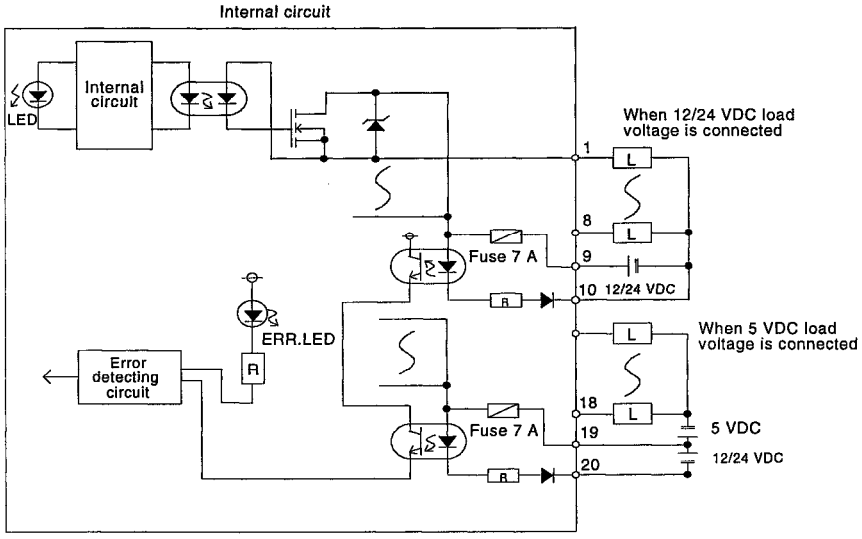
3.14 A1SY60E Transistor Output Module (Source Type)

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



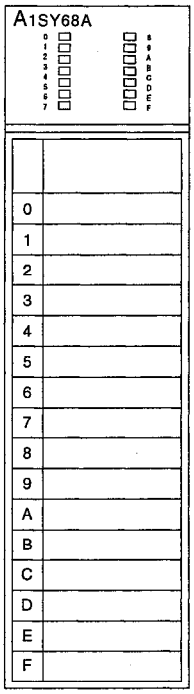
Terminal No.	Signal Name
TB1	Y00
TB2	Y01
TB3	Y02
TB4	Y03
TB5	Y04
TB6	Y05
TB7	Y06
TB8	Y07
TB9	COM1
TB10	0V
TB11	Y08
TB12	Y09
TB13	Y0A
TB14	Y0B
TB15	Y0C
TB16	Y0D
TB17	Y0E
TB18	Y0F
TB19	COM2
TB20	0V

*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.

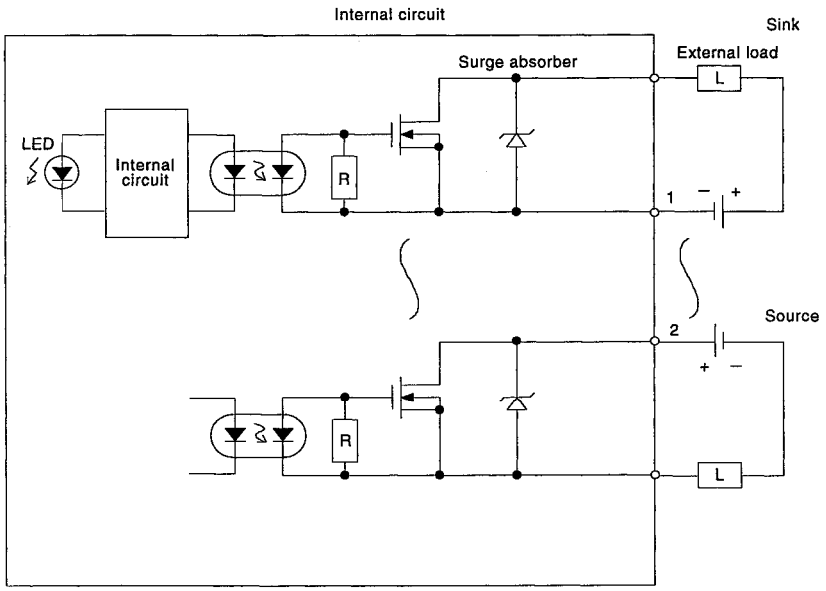
*3 When 5 VDC operating load voltage is used, another 12/24 VDC power supply is required for external power supply.

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

Specifications \ Model		Transistor Output Module A1SY68A	Appearance
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	

0
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F

External Connections

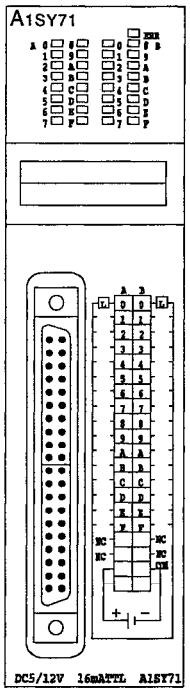


Terminal No.	Signal Name
TB1	Y00
TB2	
TB3	Y01
TB4	
TB5	Y02
TB6	
TB7	Y03
TB8	
TB9	Y04
TB10	
TB11	Y05
TB12	
TB13	Y06
TB14	
TB15	Y07
TB16	
TB17	Vacant
TB18	Vacant
TB19	Vacant
TB20	Vacant

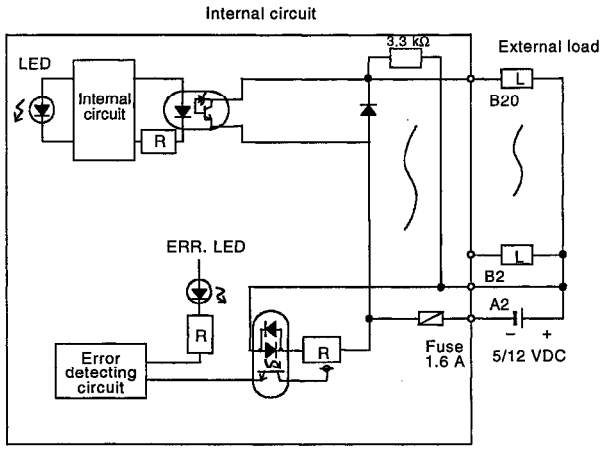
3.16 A1SY71 Transistor Output Module (Sink Type)

Specifications \ Model		Transistor Output Module (for TTL, CMOS : Sink Type) A1SY71
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		VOH : 3.5 VDC (VCC = 5 VDC, IOH = 0.4 mA)
Max. voltage drop at ON circuit		VOL : 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		0.3 mm^2
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

Appearance



External Connections

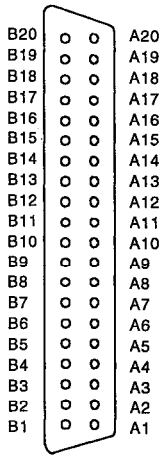


*1 : The arrangement of pins A and B shown right is the opposite of the arrangement of pins of the connector on the module.

*2 : 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.

Pin Arrangement



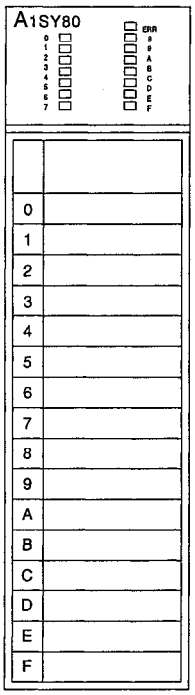
Front view

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

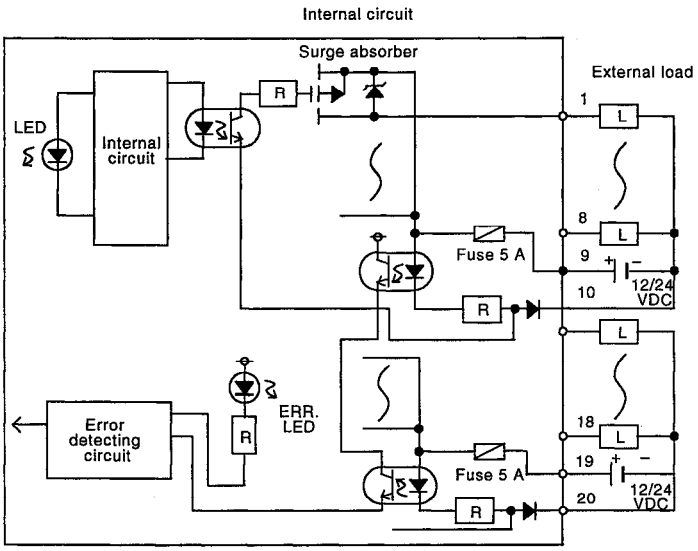
3.17 A1SY80 Transistor Output Module (Source Type)

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



*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.

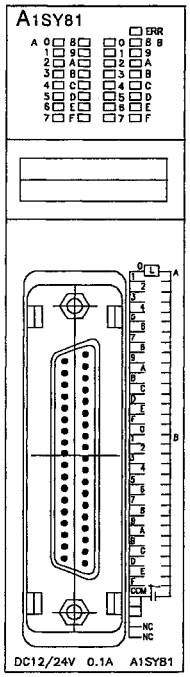
*2 : The ERR. indicating LED will also light when the external power supply is shut OFF.

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

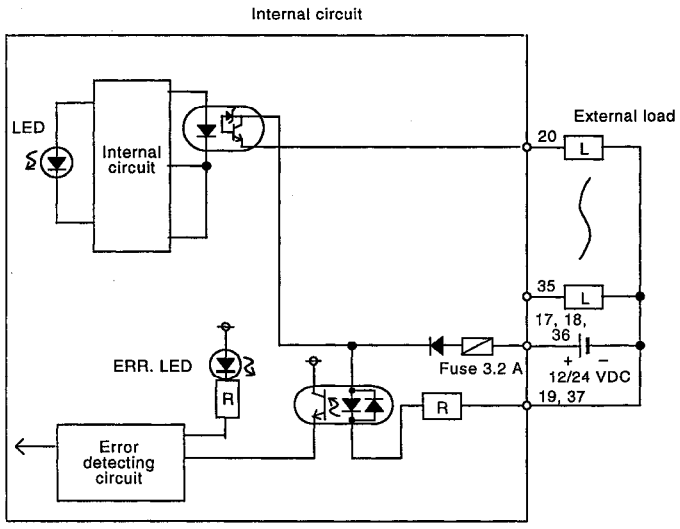
3.18 A1SY81 Transistor Output Module (Source Type)

Specifications \ Model		Transistor Output Module (Source Type) A1SY81
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		0.3 mm^2
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

Appearance

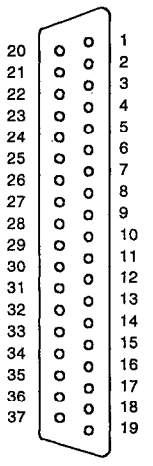


External Connections



*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.



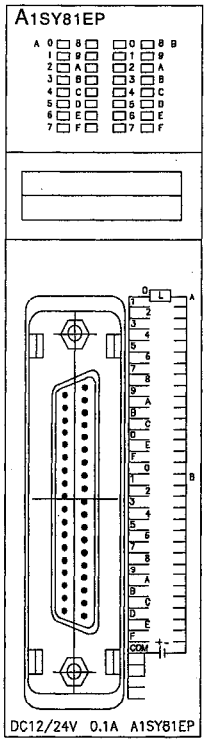
Front view

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
	36	COM	19	0V
	18	COM		

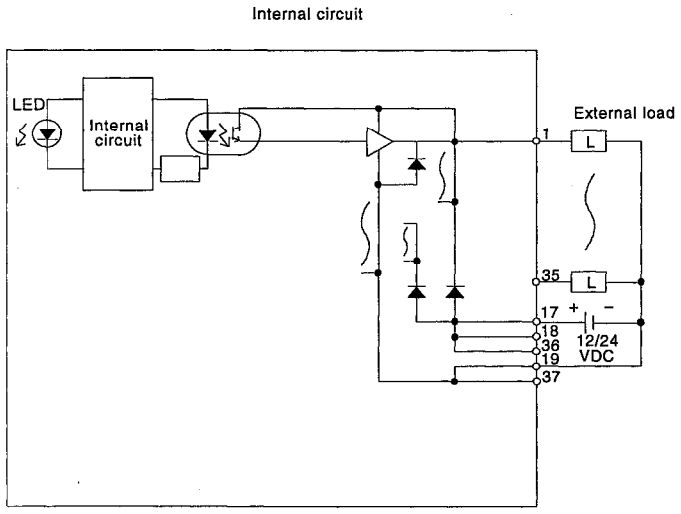
3.19 A1SY81EP Circuit Protection Provided Transistor Output Module (Source Type)

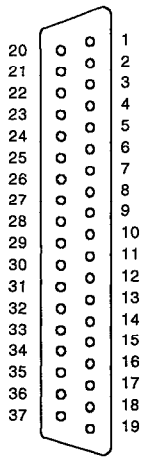
Specifications \ Model		Transistor Output Module (Source Type) A1SY81EP
Number of output points		32 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating load voltage range		10.2 to 26.4 VDC
Max. load current		0.1 A/point, 2 A/common (Ta = 25 °C), 0.05 A/point, 1.6 A/common (Ta = 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 (thermal and short-circuit protect) Thermal protect is detected in 8 points module (Y0 to 7, 8, to F, 10 to 17, 18 to 1F). When thermal protect 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 PC 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		0.3 mm^2
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
	36	COM	19	0V
	18	COM		

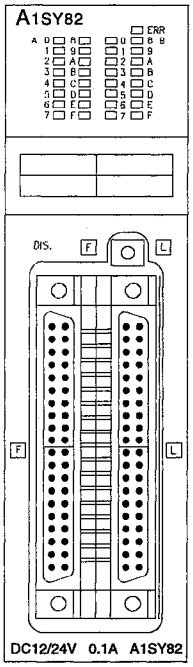
Front view

* 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.

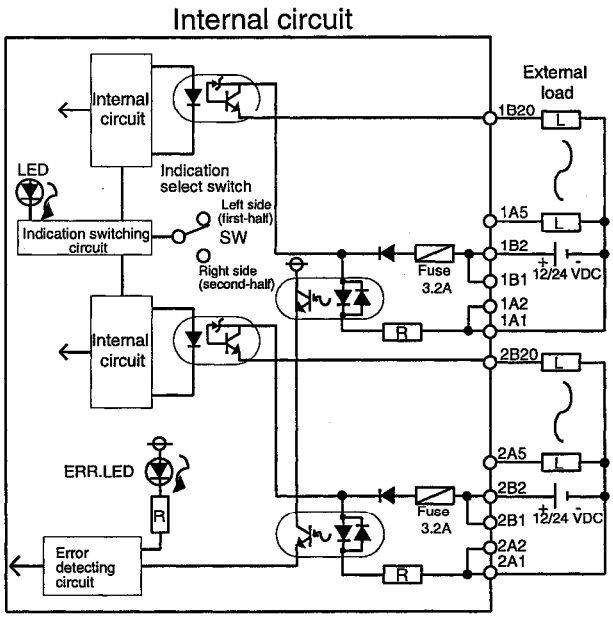
3.20 A1SY82 Transistor Output Module (Source Type)

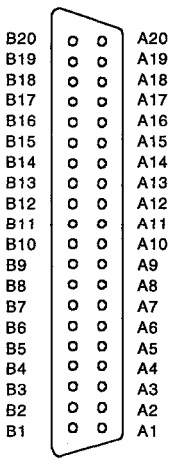
Specifications \ Model		Transistor Output Module (Source Type) A1SY82
Number of output points		64 points
Isolation method		Photocoupler
Rated load voltage		12/24 VDC
Operating voltage range		10.2 to 30 VDC (peak voltage 30 VDC)
Max. load current		0.1 A/point, 1.6 A/common
Max. allowed rush current		0.4 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		0.3 mm^2
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.

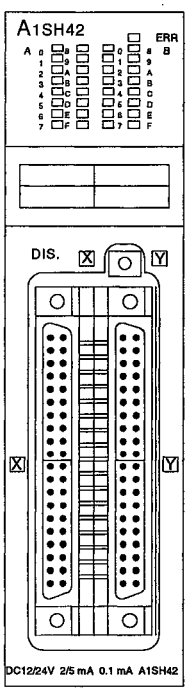
*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

4. INPUT/OUTPUT COMPOSITE MODULE SPECIFICATIONS

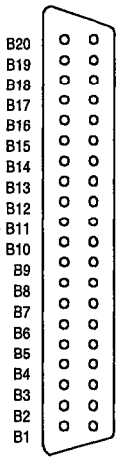
4.1 Input/Output Composite Module Specifications

4.1.1 A1SH42 input/output module

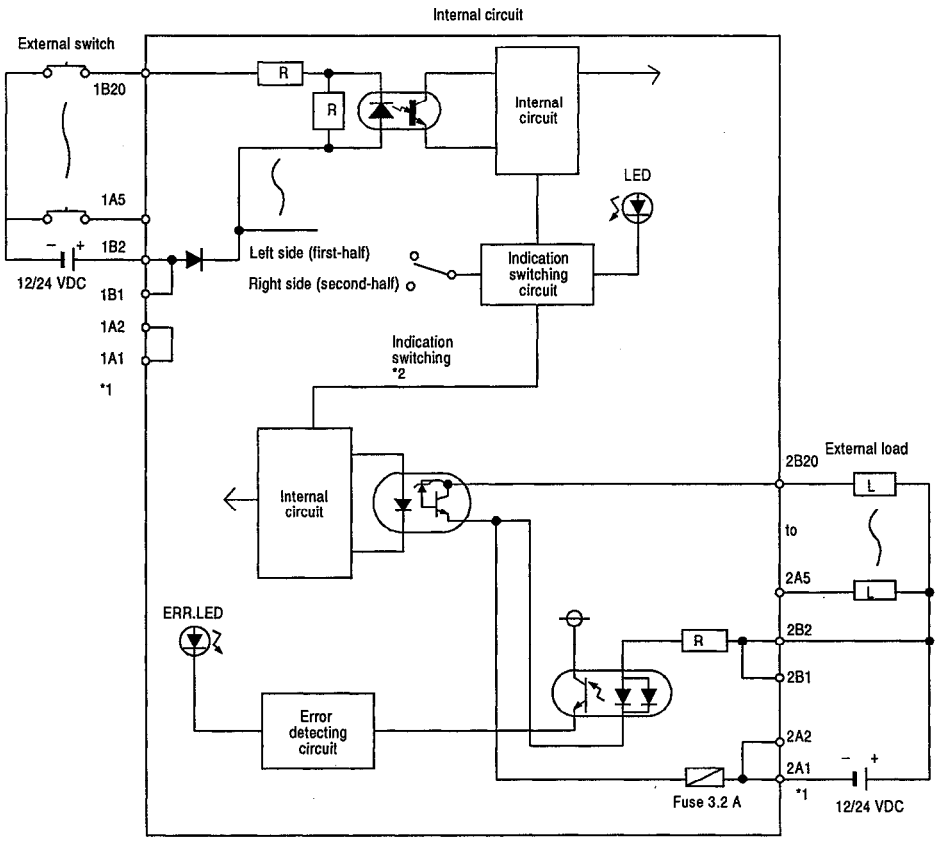
Specifications \ Model		Input/Output Composite Module		Appearance
		Input Specifications		
Number of input points		32 points		
Isolation method		Photocoupler		
Rated input voltage		12 VDC	24 VDC	
Rated input current		Approx. 2 mA	Approx. 5 mA	
Operating voltage range		10.2 to 26.4 VDC (ripple: less than 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)		
Insulatoin withstand voltage		500 VAC		
Noise immunity		500 VAC		
		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)		
Insulatoin withstand voltage		500 VAC		
Noise immunity		500 VAC		
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		0.3 mm^2		
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



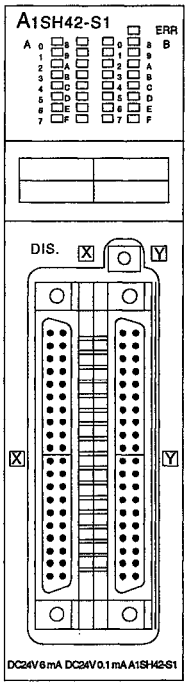
*1 : In the pin number column, the pins beginning with "1[ ][ ]" are left connector pins and those beginning with "2[ ][ ]" are right connector pins.

*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.

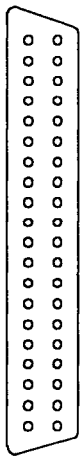
*3 : The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices.
If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

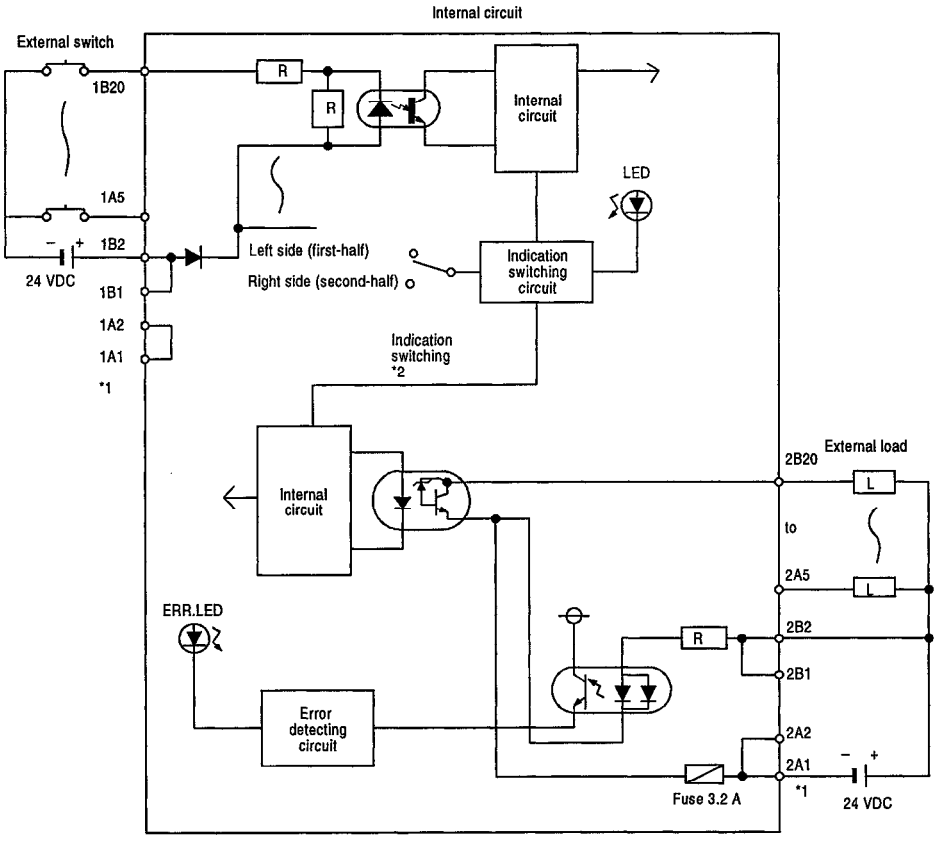
*4 : The ERR. indicating LED will also light when the external power supply is shut OFF.

4.1.2 A1SH42-S1 input/output module

Specifications \ Model		Input/Output Composite Module	Appearance
		Input Specifications	
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)	
Insulatoin withstand voltage		500 VAC	
Noise immunity		500 VAC	
		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)	
Insulatoin withstand voltage		500 VAC	
Noise immunity		500 VAC	
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		0.3 mm^2	
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	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.

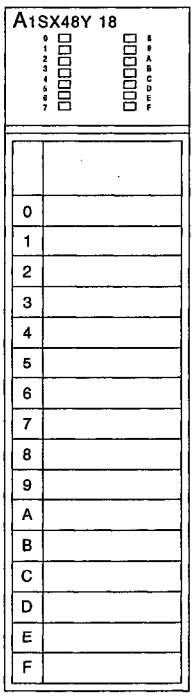
*2 : When the switch is set to the left side position, the status of the first-half devices (X00 to X1F) is displayed by the LEDs.
When it is set to the right side, the status of the second-half devices (Y00 to Y1F) is displayed by the LEDs.

*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.

4.1.3 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 (method by which the input current flows out)	
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)	
Weight kg		0.225	
Number of I/O points		16 points (Make I/O allocation as a 16-point output module.)	



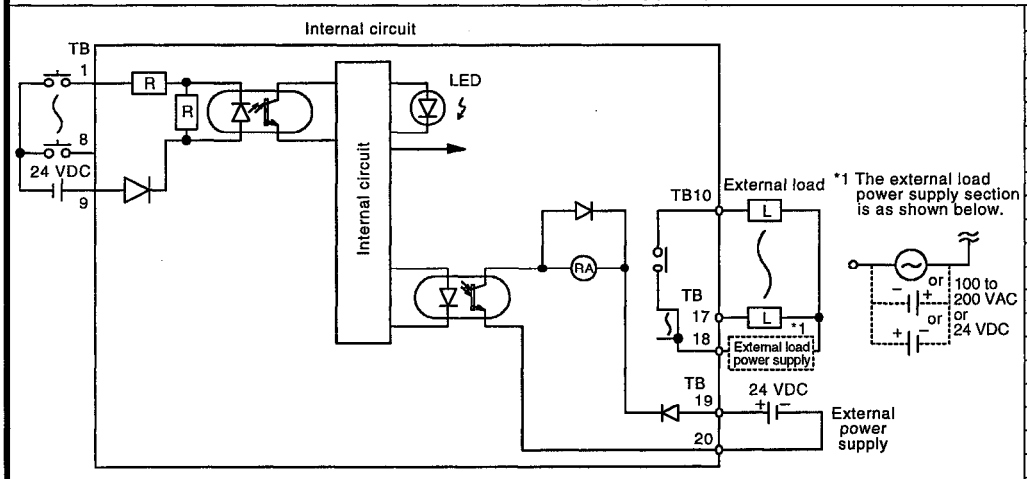
POINT

If using an A1SX48Y18, observe the following points.

(1) Set the I/O control mode of the PC CPU to the direct mode.

(2) If the I/O control mode of the PC CPU is set to the refresh mode, install input modules or special function modules at the both sides of the A1SX48Y18.

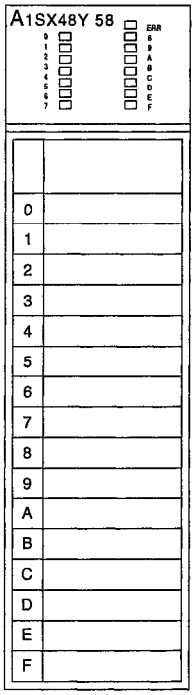
External Connections



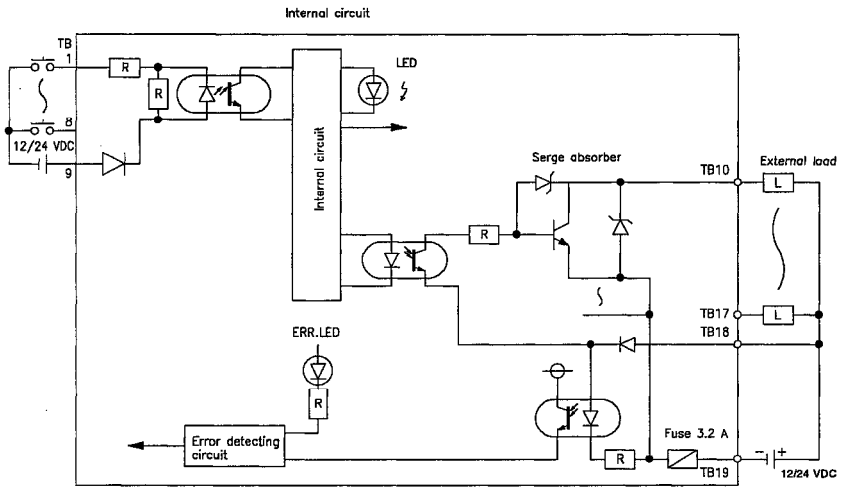
Pin No.	Signal Name
TB1	X00
TB2	X01
TB3	X02
TB4	X03
TB5	X04
TB6	X05
TB7	X06
TB8	X07
TB9	COM1
TB10	Y08
TB11	Y09
TB12	Y0A
TB13	Y0B
TB14	Y0C
TB15	Y0D
TB16	Y0E
TB17	Y0F
TB18	COM2
TB19	24 VDC
TB20	0 V

4.1.4 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.

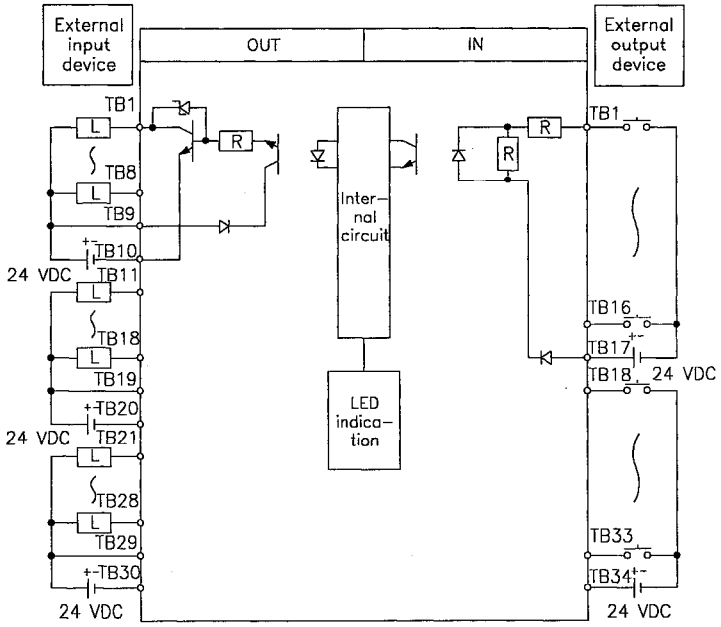
4.1.5 A1SJ-56DT I/O module

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

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



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

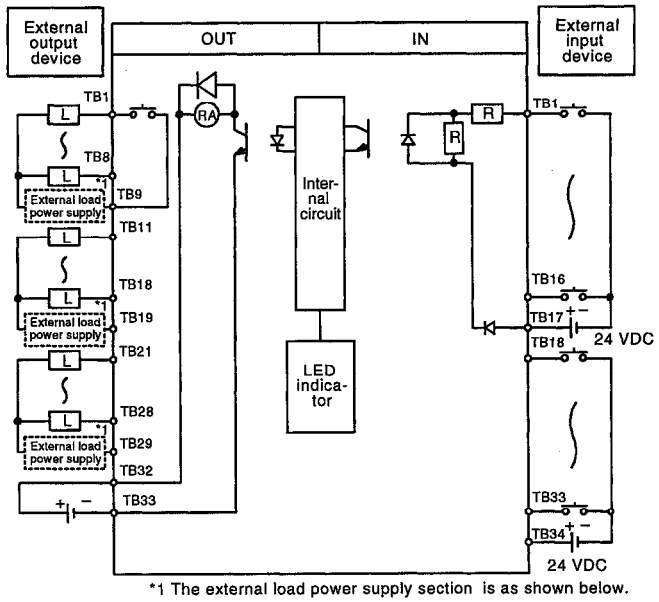
4.1.6 A1SJ-56DR I/O module

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).

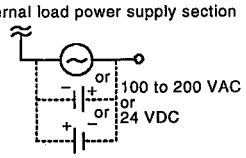
Output Specifications			Input Specifications		
Number of output points		24 points	Number of input points		32 points
Isolation method		Photocoupler	Isolation method		Photocoupler
Rated switching voltage and current		24 VDC 2 A (resistive load) 240 VAC 2A (COSϕ=1)/point, 5 A/common	Rated input voltage		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

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



*1 The external load power supply section is as shown below.



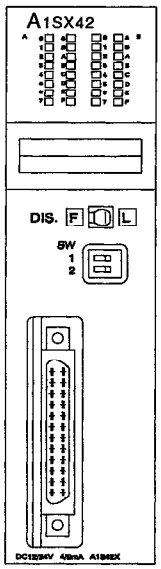
IN	
Signal Name	Pin No.
X00	TB1
X01	TB2
X02	TB3
X03	TB4
X04	TB5
X05	TB6
X06	TB7
X07	TB8
X08	TB9
X09	TB10
X0A	TB11
X0B	TB12
X0C	TB13
X0D	TB14
X0E	TB15
X0F	TB16
COM1	TB17
X10	TB18
X11	TB19
X12	TB20
X13	TB21
X14	TB22
X15	TB23
X16	TB24
X17	TB25
X18	TB26
X19	TB27
X1A	TB28
X1B	TB29
X1C	TB30
X1D	TB31
X1E	TB32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

4.2 Dynamic Input/Output Module Specifications

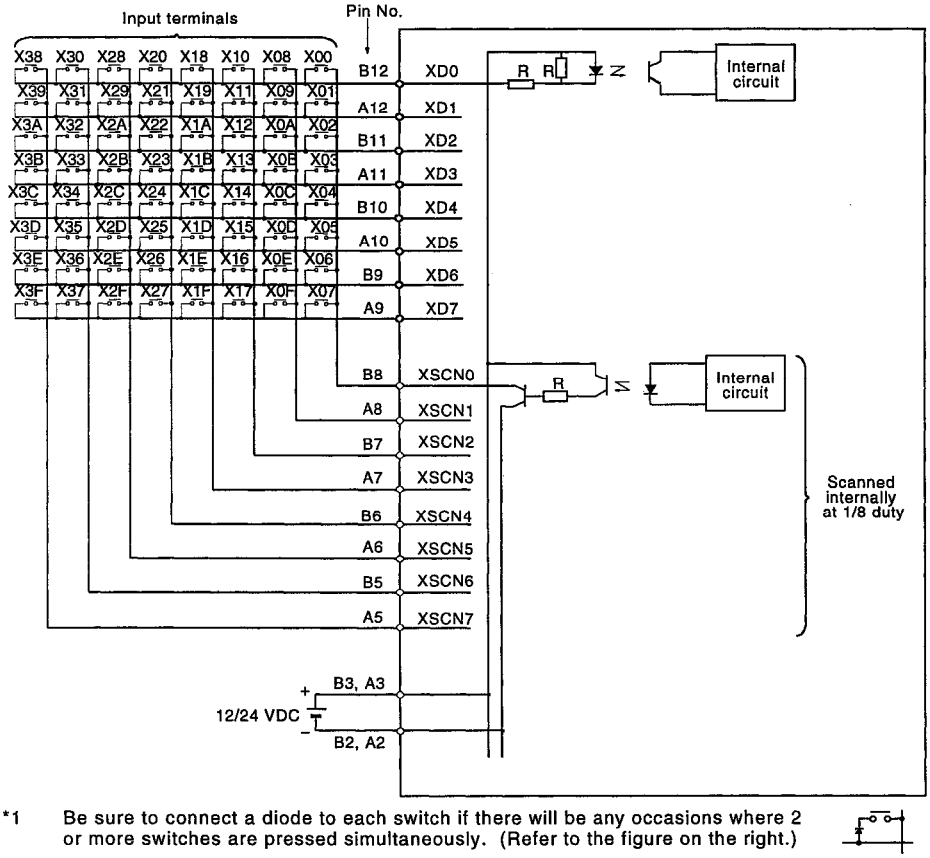
4.2.1 A1S42X dynamic input module

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

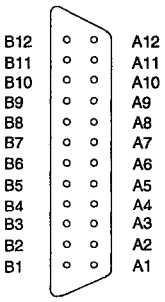


External Connections



*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

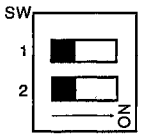
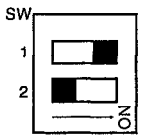
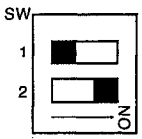
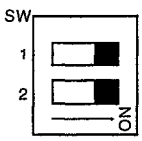


Front view

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

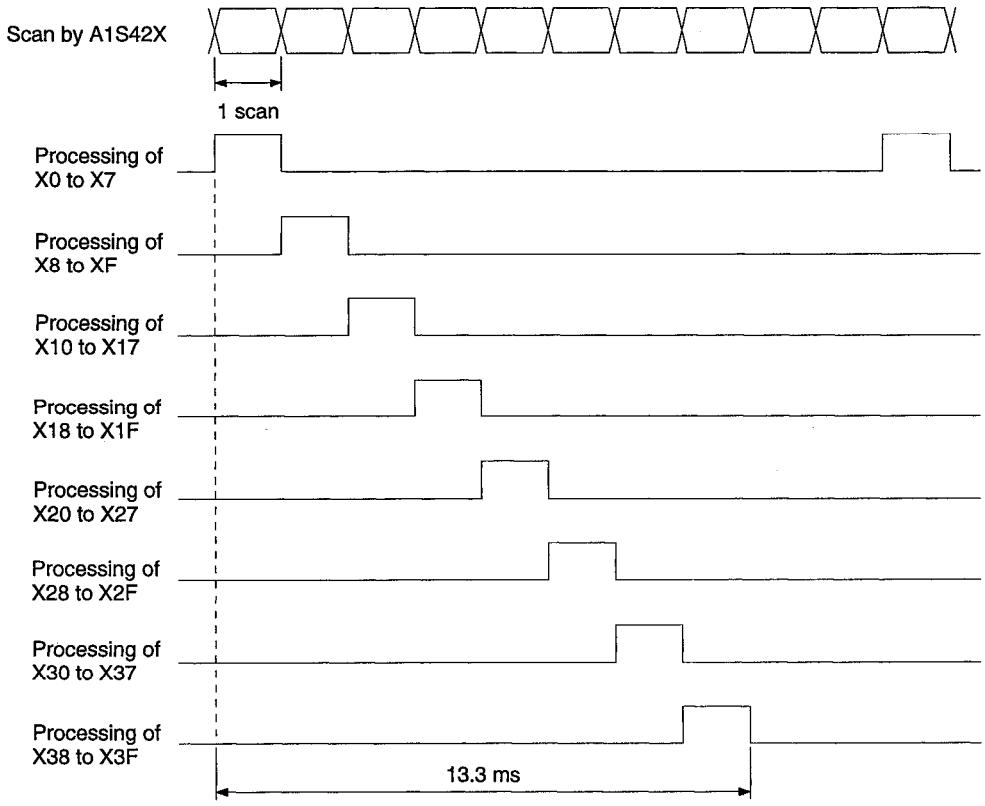
(1) Number of occupied I/O points setting

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

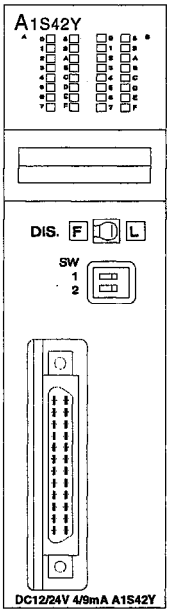
In the dynamic scan method, the whole number of occupied I/O points is divided into several groups of a specified number of points, and processed in several scans. 64 input points are divided into 8 groups of 8 points, and processed group by group as shown in the figure below. Regardless of whether the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



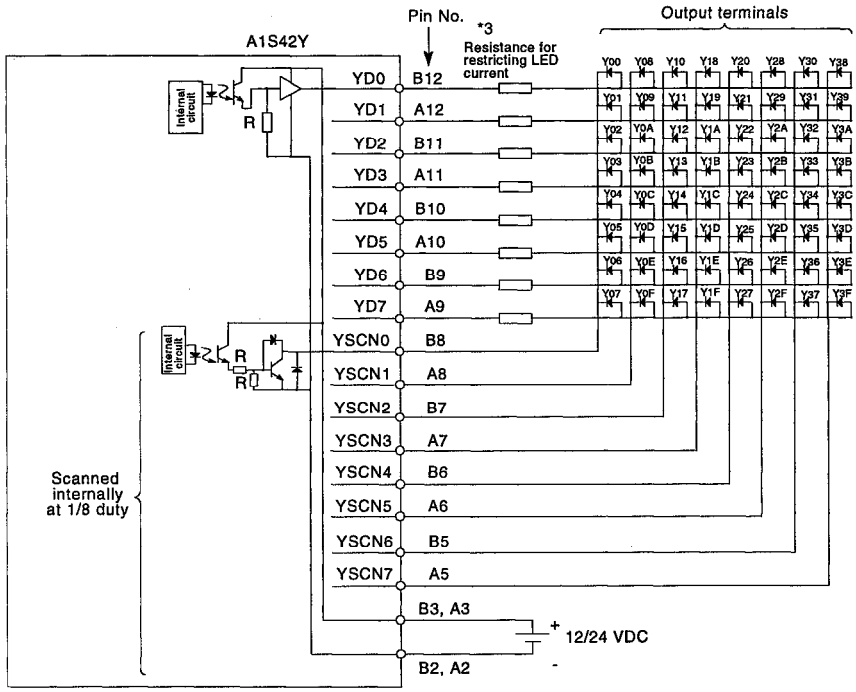
4.2.2 A1S42Y dynamic output module

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
Leakage current at OFF circuit		0.1 mA or less
Max. voltage drop at ON circuit		Source : 1.1 VDC, Sink : 1.5 VDC
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	8 mA (TYP, 24 VDC/common)
Internal current consumption (5 VDC)		100 mA (TYP, all points ON)
Weight kg		0.19

Appearance



External Connections



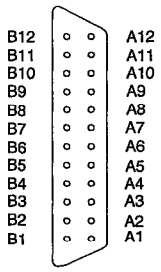
*1 The fuse in the output module is provided to prevent the external wiring from burning in the event of a short in the module's output. Therefore, it may not be able to protect output devices. If an output device is damaged in a failure mode other than a short circuit, the fuse might not blow.

*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

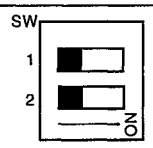
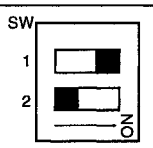
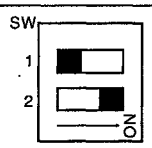
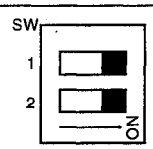


Front view

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

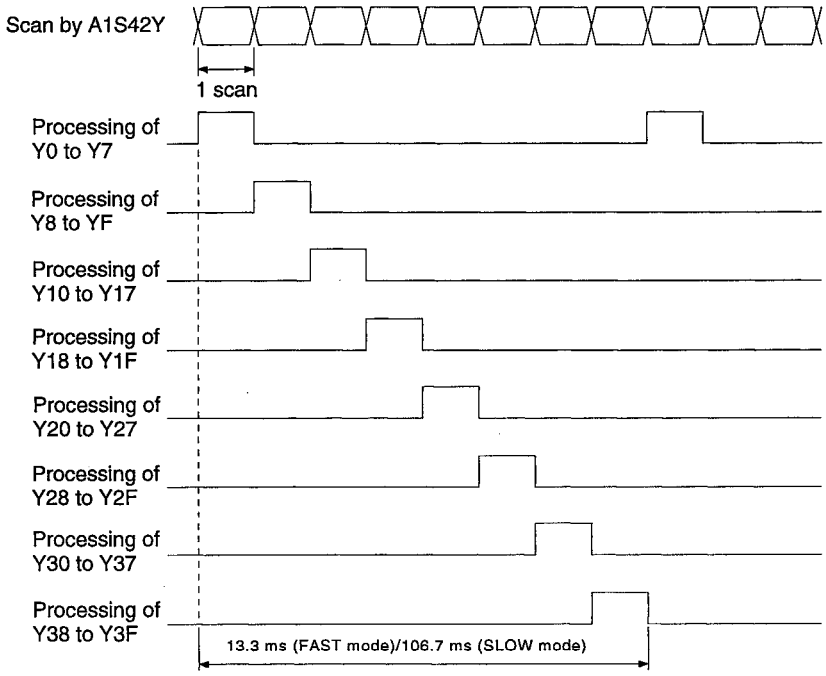
The number of occupied I/O points is set using the DIP switches on the front face of the module. It is factory-set to 64 points.

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

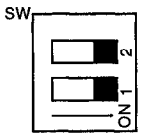
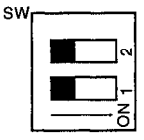
(a) Dynamic scan method

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
 Module top	 Module top

5. SPECIFICATIONS OF CONNECTOR/TERMINAL BLOCK CONVERTOR MODULES

5.1 Specifications of Connector/Terminal Block Convertor Modules

1) Connector/Terminal Block Convertor Module

Type	Details	Weight	Applicable Models
A6TBXY36	For positive common type input modules and sink type output modules (standard type)	0.4kg	Q series: QX41, QX42, QY41P, QY42P, QH42P AnS series: A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX42, A1SX82-S1 A1SY41, A1SY42, A1SY82, A1SH42, A1SH42-S1 A series: AX42, AX42-S1, AY42, AY42-S1, AY42-S3, AY42-S4, AH42 CC-Link: AJ65SBTCF1-32D, AJ65SBTCF1-32T, AJ65SBTC1-32D AJ65SBTC1-32T 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, QX42, QH42P AnS series: A1SX41, A1SX41-S1, A1SX41-S2, A1SX42, A1SX42-S1, A1SX42-S2, A1SX42, A1SX82-S1, A1SH42, A1SH42-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-S1, 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	

INPORTANT

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

(2) Though the A1SX81(S1/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 is a source type output module, use theA6TBXY36 or A6TBXY54. The A6TBXY36-E or A6TBXY54-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

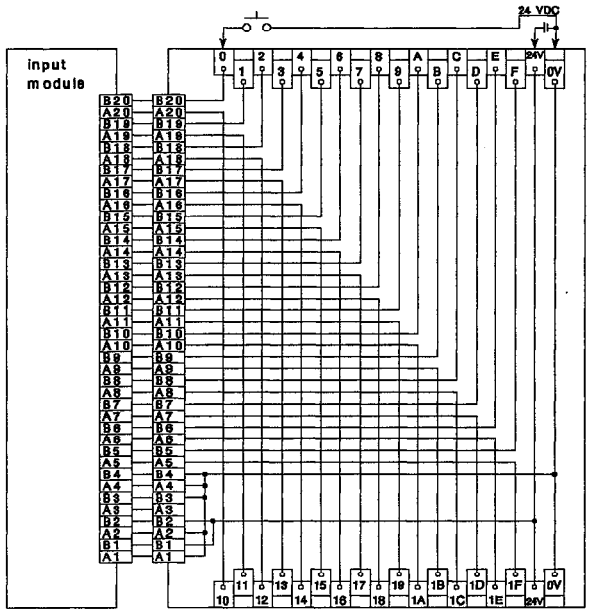
2) Cable

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	

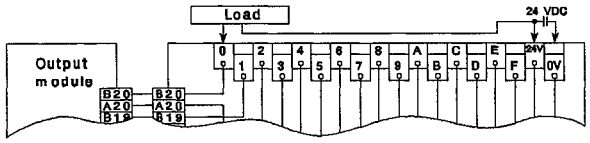
5.2 Connector/Terminal Block Convertor Module Connection Diagrams

5.2.1 A6TBXY36

(a) When connecting an input module

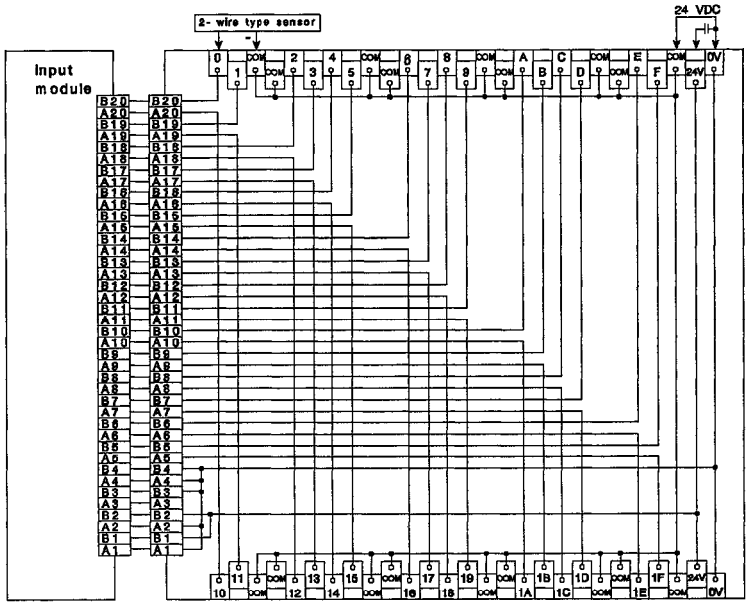


(b) When connecting an output module

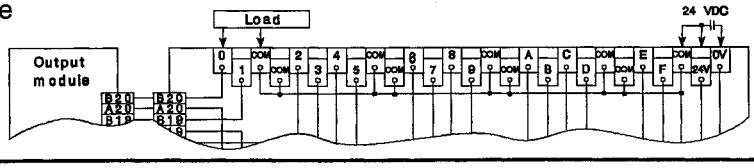


5.2.2 A6TBXY54

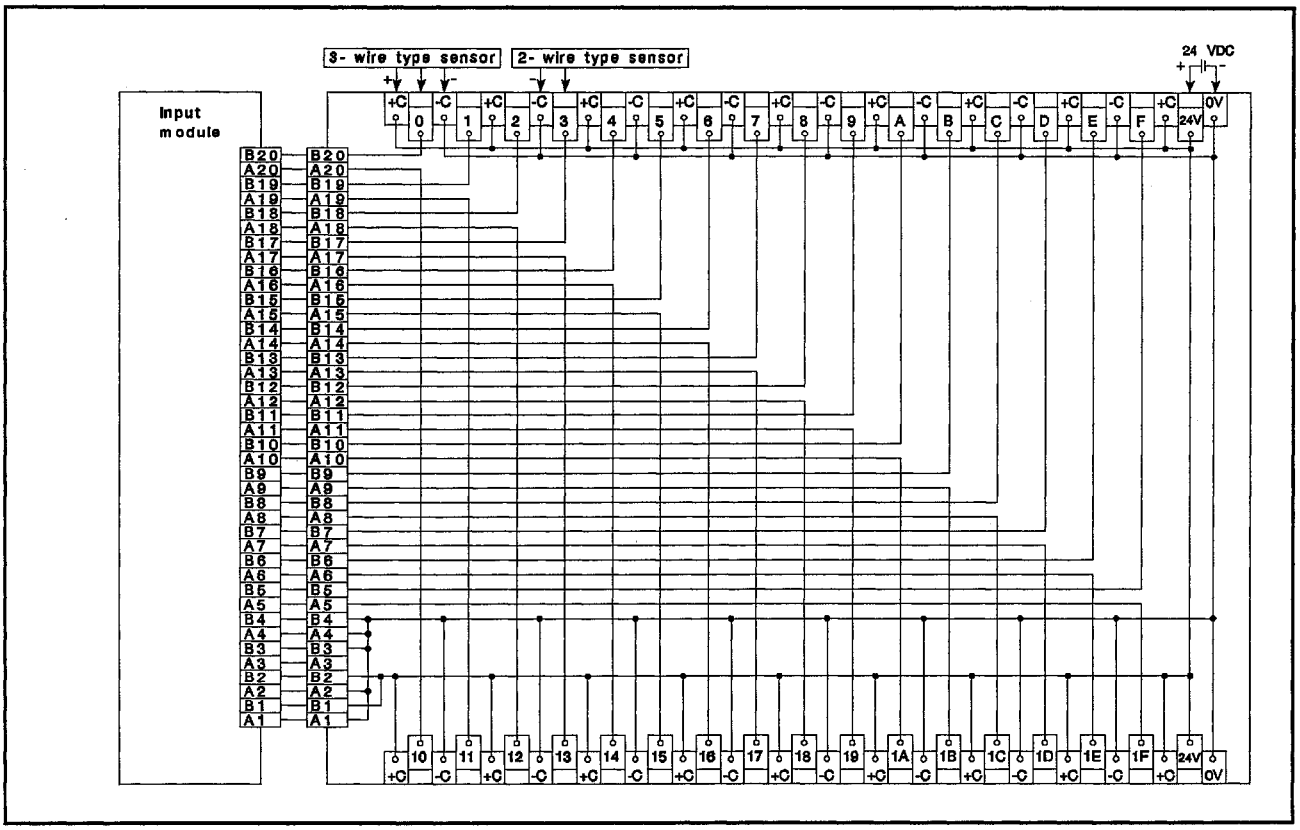
(a) When connecting an input module



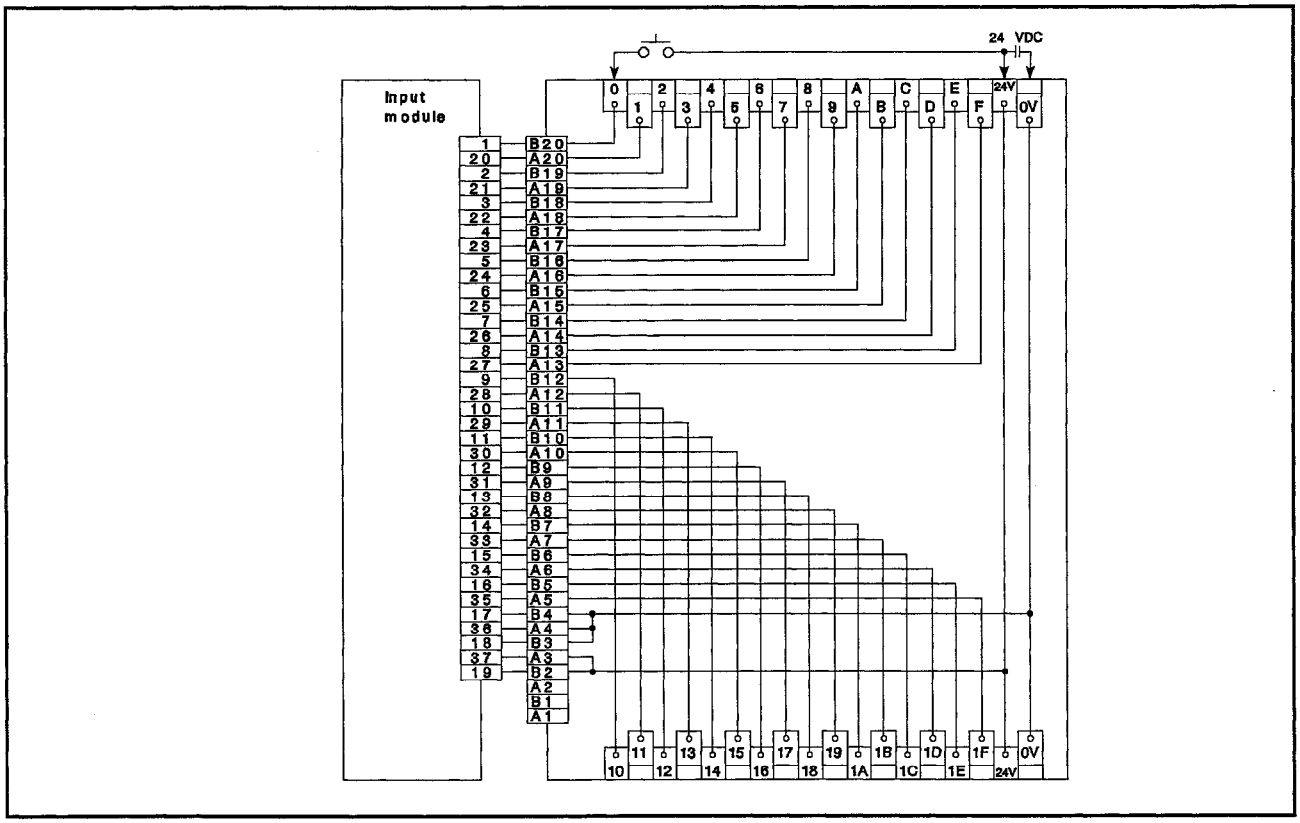
(b) When connecting an output module



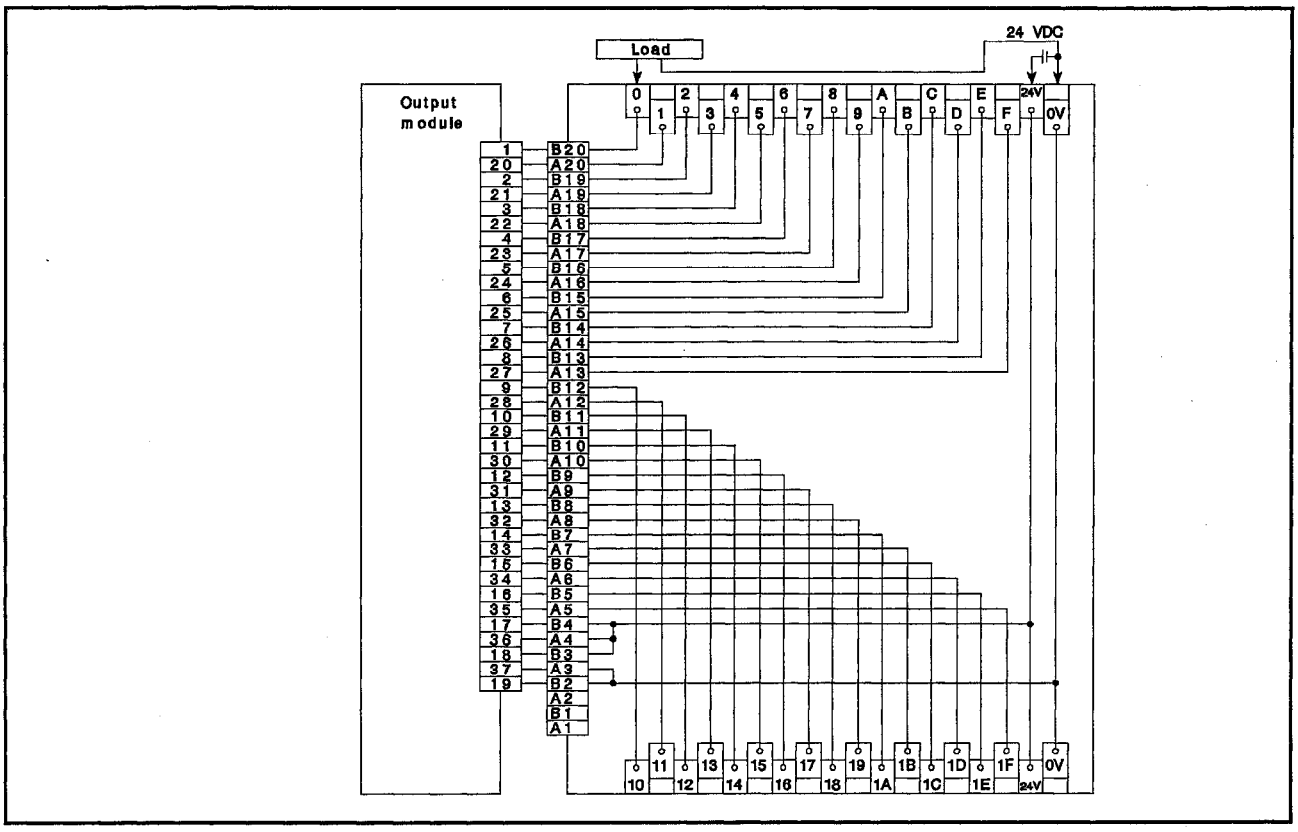
5.2.3 A6TBX70



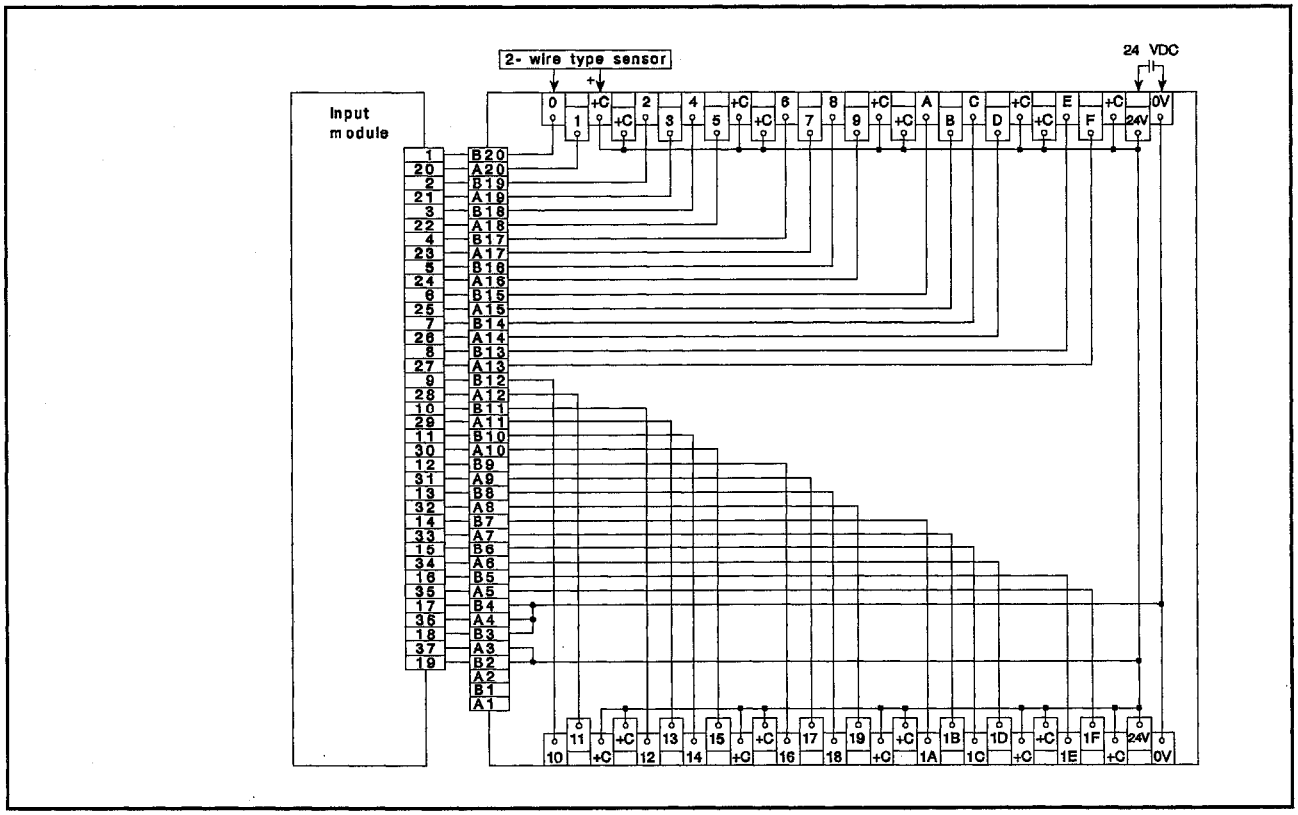
5.2.4 A6TBX36-E



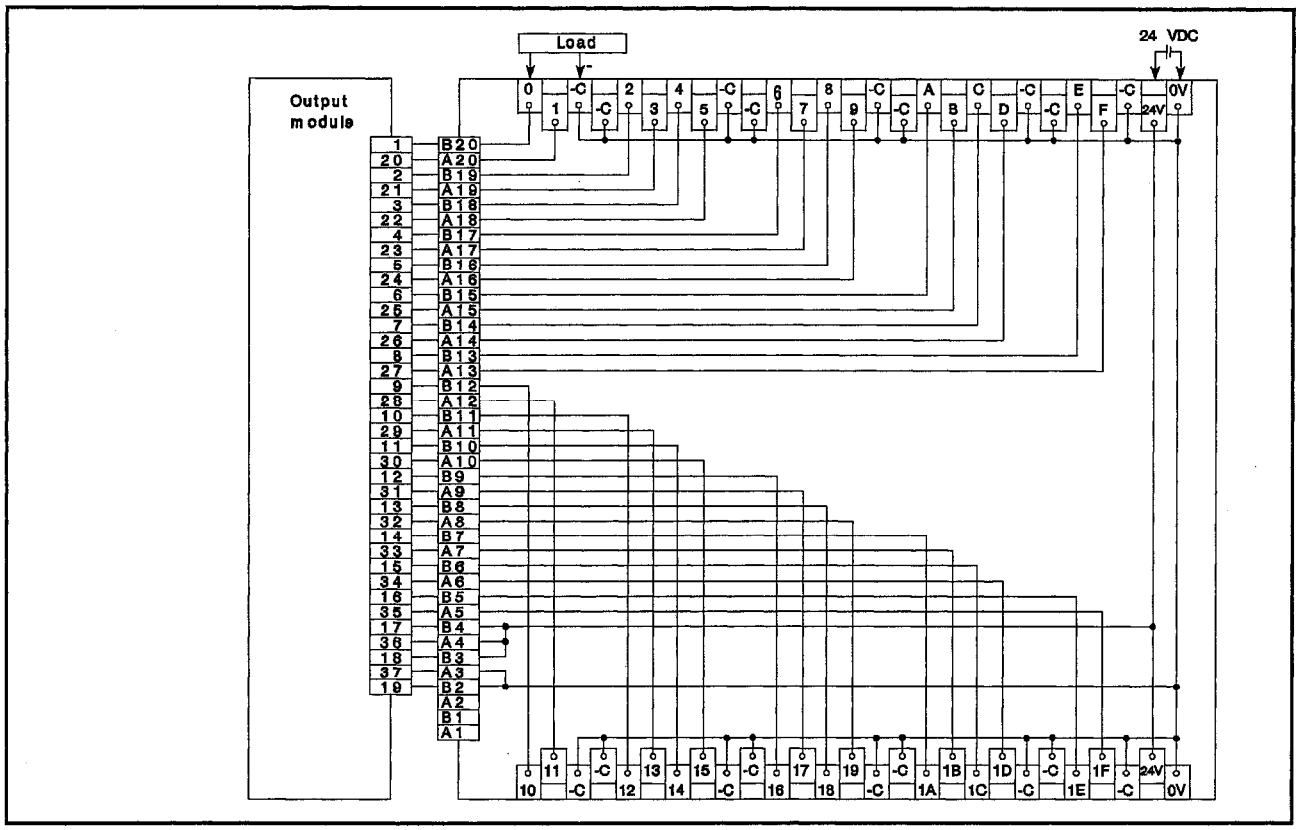
5.2.5 A6TBY36-E



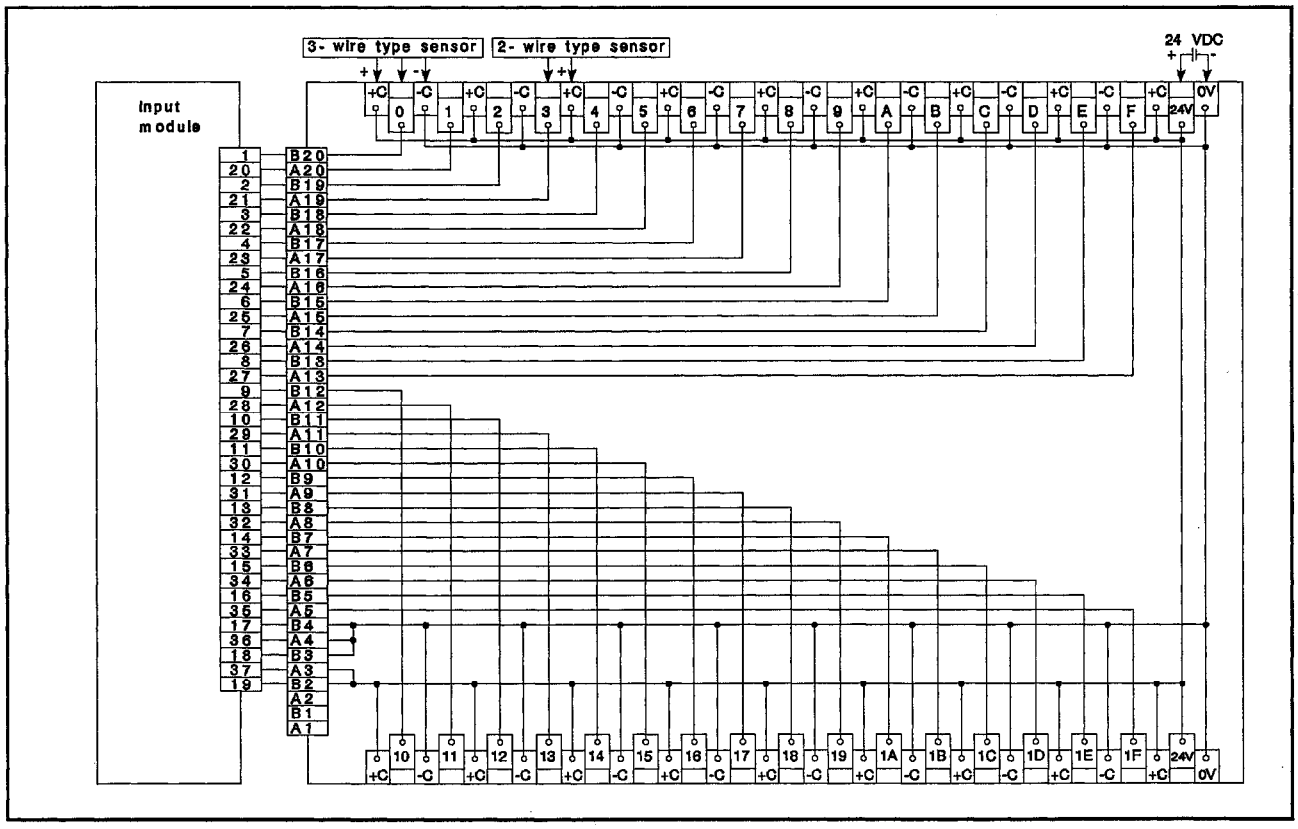
5.2.6 A6TBX54-E



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.

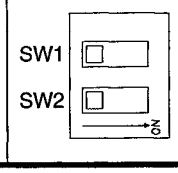
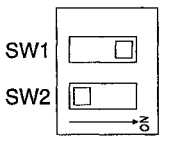
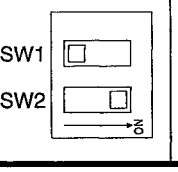
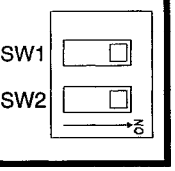
The A1SG62 dummy module is used to reserve a specified number of I/O points at any base unit slot.

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	16 vacant points	□ 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

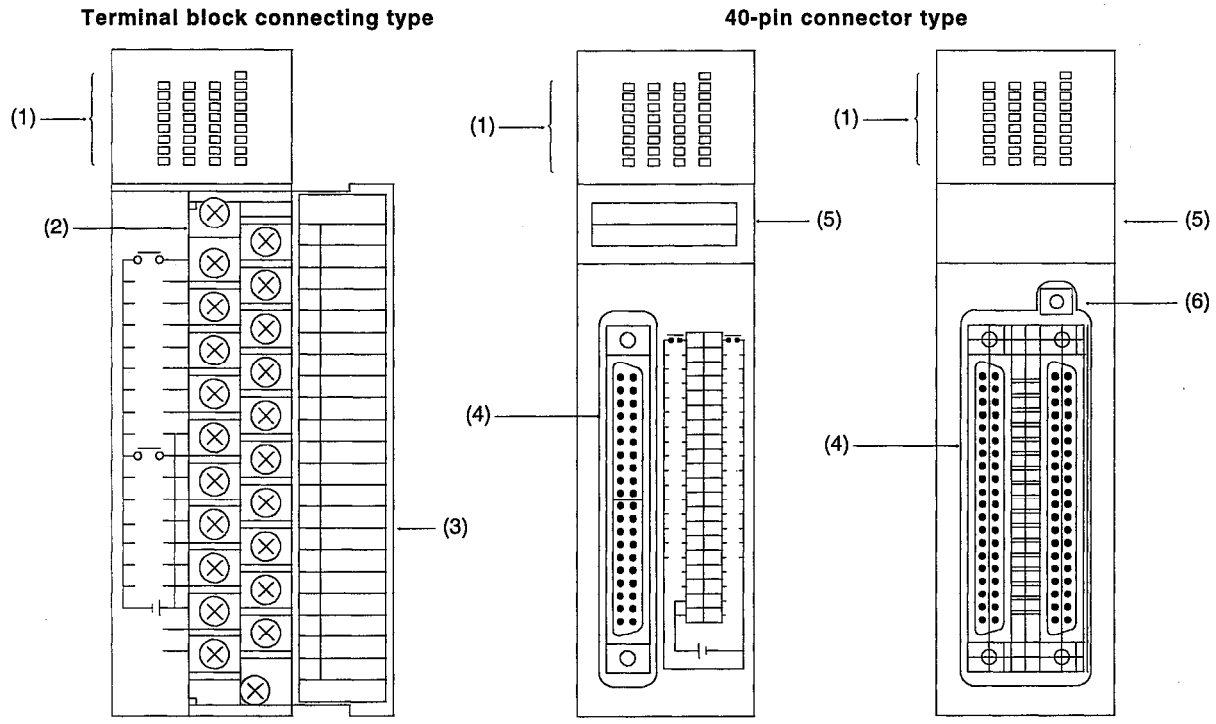
6.2 Setting the Occupying Number of Inputs/Outputs for A1SG62

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

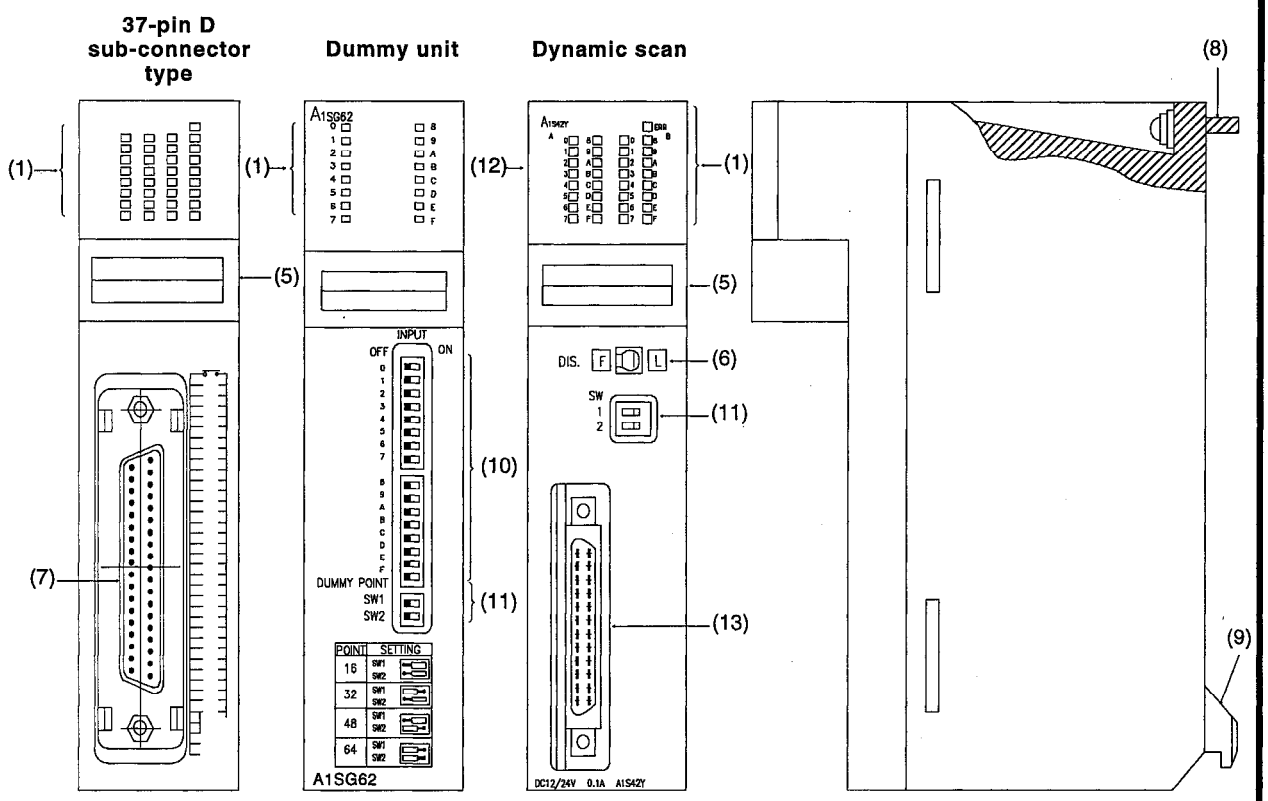
The figures and table below show the names of the parts of I/O modules.



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.

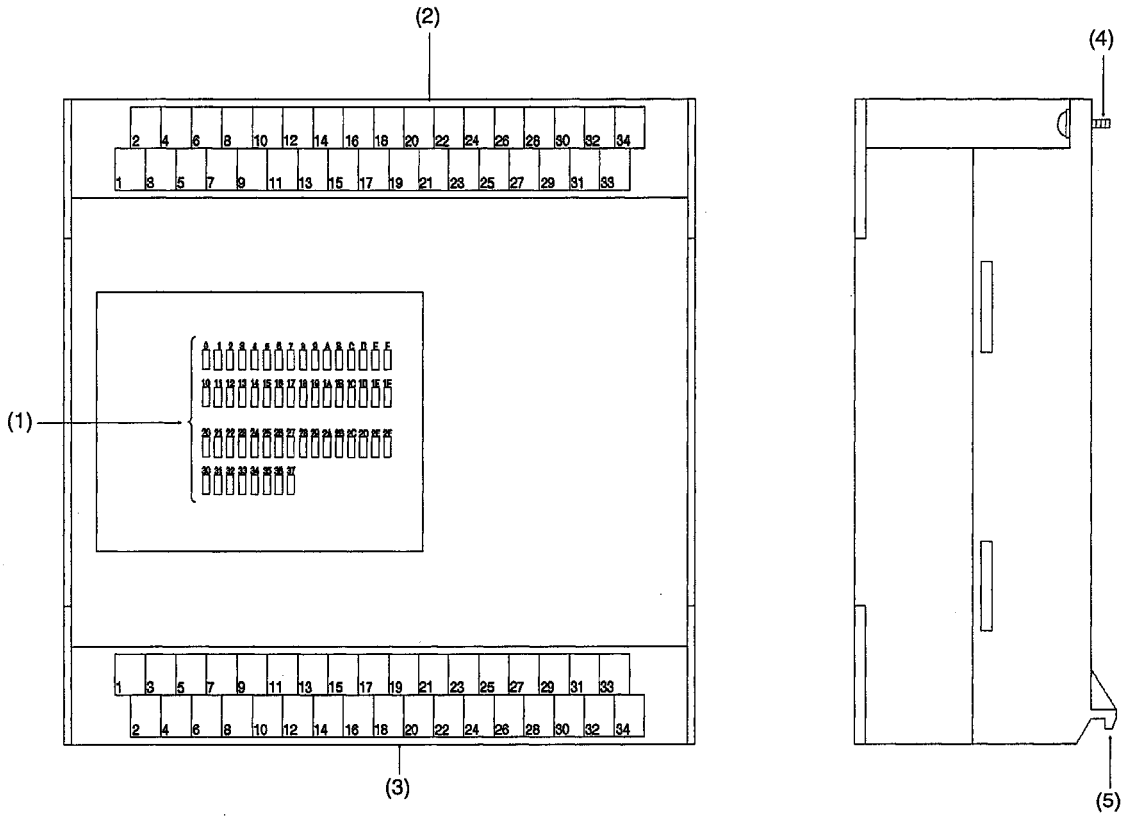
REMARK

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



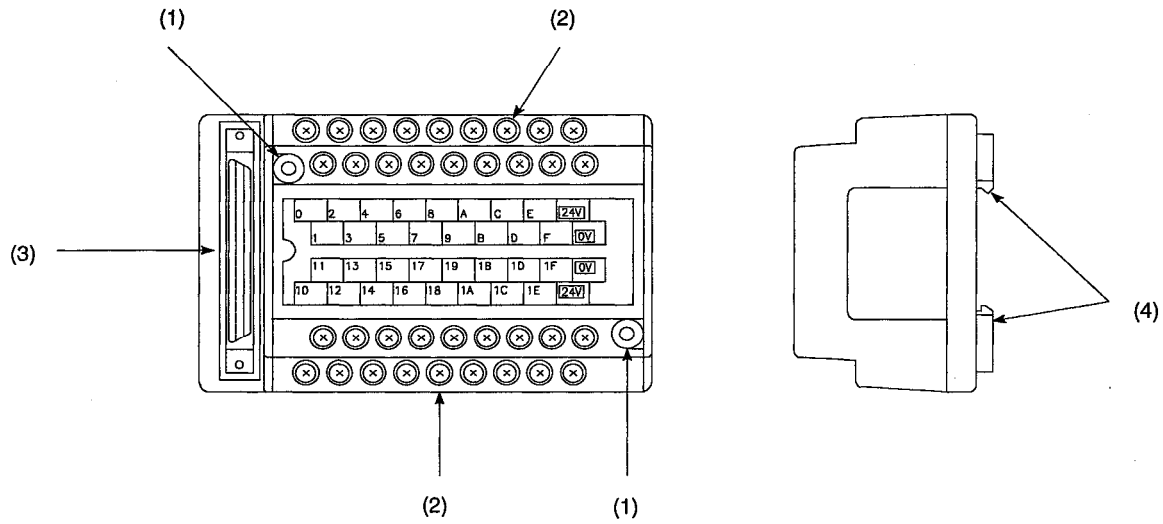
No.	Name	Description
(10)	Simulation switches	Used for input simulation. 16 points beginning with the head I/O number of the dummy module are allocated.
(11)	Occupied I/O points	16, 32, 48, or 64 points can be selected for the occupied I/O points.
(12)	Dynamic scan cycle	Used to set the dynamic scan 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□



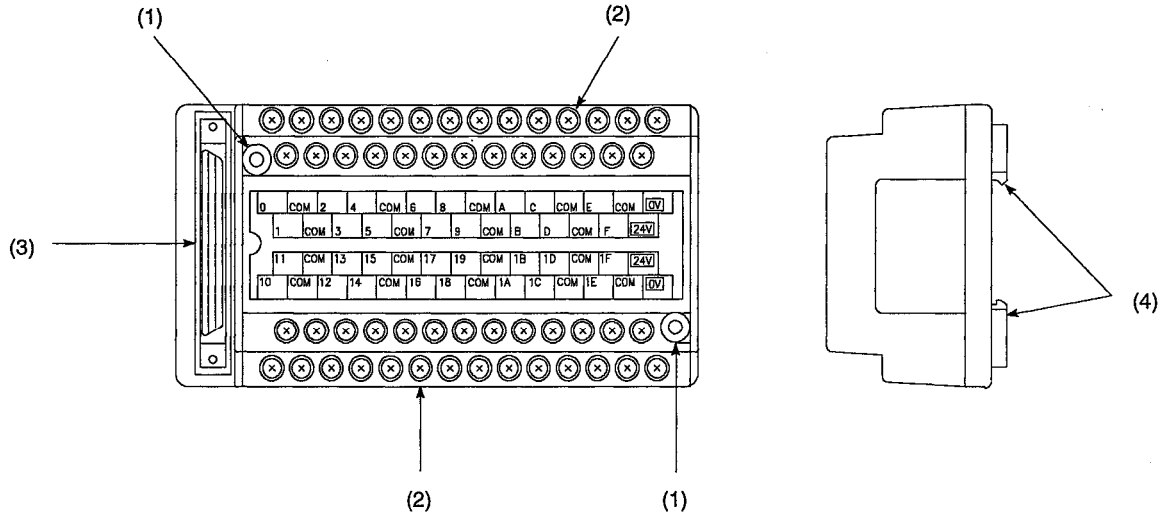
No.	Name	Description
(1)	I/O indicator LED	Indicates the ON/OFF state of input and output. Indicates the ON state when it is lit. 0 to 1F: input X0 to 1F, 20 to 37: Y20 to 37
(2)	Terminal block	Used to connect a power cable and input cables.
(3)	Terminal block	Used to connect a power cable and output 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[ ]



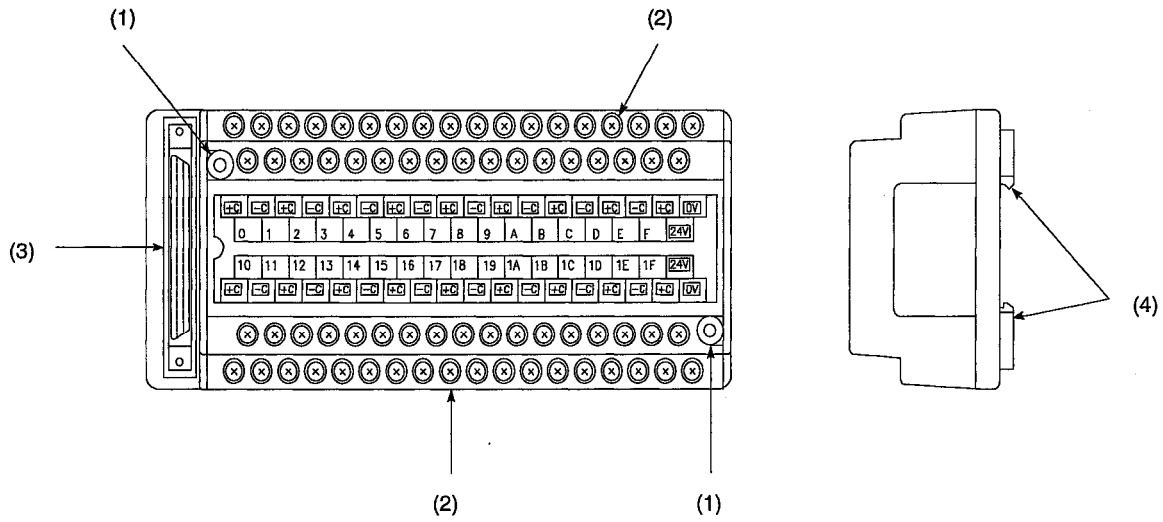
No.	Name	Description
(1)	Panel mounting hole	Panel mounting hole (for M4 screws)
(2)	Terminal block	Terminal block that connects power supply and signal wires
(3)	40-pin connector	40-pin connector for a 32-point module; connects power supply and input signal wires
(4)	Module fixing hooks	Hooks for mounting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

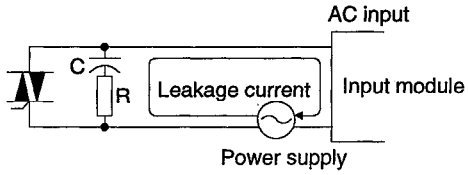
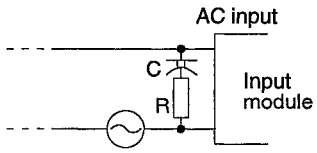
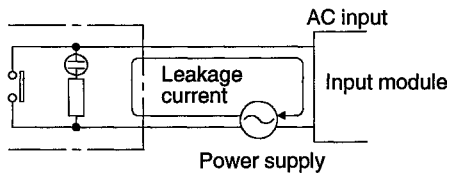
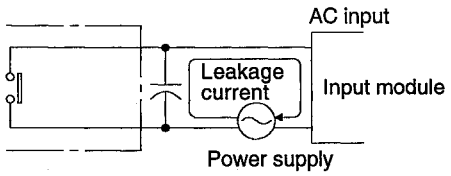
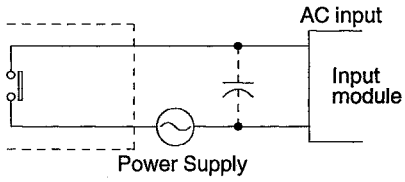
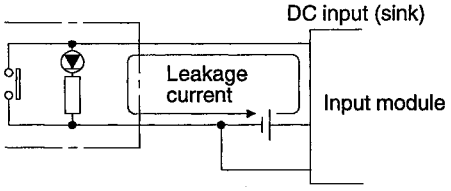
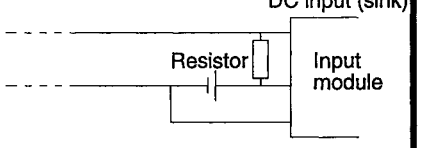
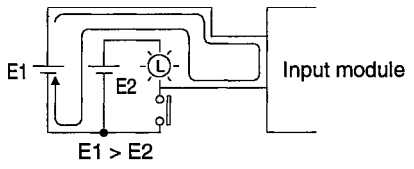
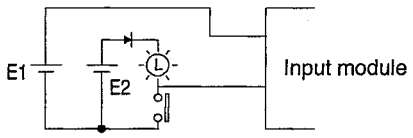
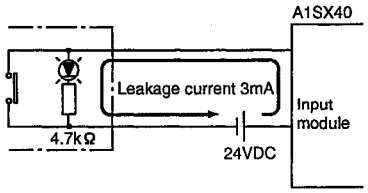
	Condition	Cause	Corrective Action
Example 1	Input signal does not turn OFF.	• Leakage current of input switch (e.g. drive by non-contact switch). 	• Connect an appropriate resistor which will make the voltage across the terminals of the input module lower than the OFF voltage value.  It is recommended 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 a register which will make the voltage between the input module terminal and common higher than the OFF voltage, as shown below.  * 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)

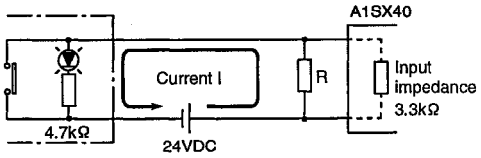
	Condition	Cause	Corrective Action
Example 5	Input signal does not turn OFF.	• Sneak path due to the use of two power supplies. 	• Use only one power supply. • Connect a sneak path prevention diode. (Figure below) 

<Example 4s Calculation Example>



If a switch with an LED display is connected to A1SX40 and a leak current of 3 mA is observed

- Voltage V_{TB} across the terminal and common base is:
  V_{TB} = 3 [mA] × 3.3 [kΩ] = 9.9 [V] (Ignore the voltage drop caused by the LED.)
  Because the condition for the OFF voltage (≤ 4 [V]) is not satisfied, the input does not turn off. To correct this, connect a resistor as shown below.

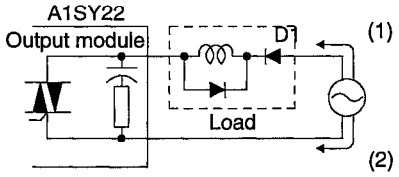
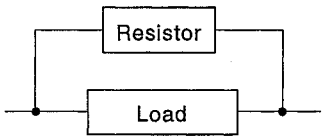
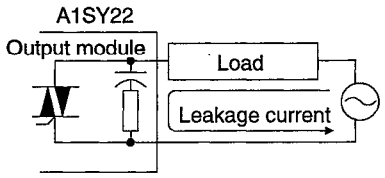
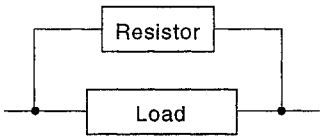
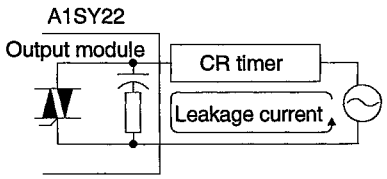
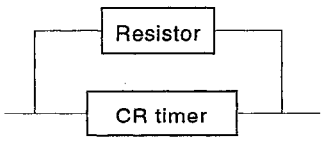


- Calculation of resistance of connected resistor R
  The voltage of A1SX40 across the terminals must be reduced to within 4 [V]. The current for reducing the voltage across the terminals to within 4 [V] is:
  (24 – 4 [V] ÷ 4.7 [kΩ] = 4.26 mA)
  Therefore resistor R for flowing current I of 4.26 [mA] must be connected.
- Resistance of the connected resistor R is obtained in the following equations.
  4 [V] ÷ R > 4.26 – 1.21 [mA] ← 4 [V] ÷ Input impedance 3.3 [kΩ]
  4 [V] ÷ 3.05 [mA] > R
  1.31 [kΩ] > R
  Suppose that the resistance R is 1.2 [kΩ].
  The power capacity W of the resistor during activation of the switch is:
  $W = (\text{Applied voltage})^2/R$
  $W = (26.4\ [V])^2/\ 1.2\ [k\Omega] = 0.58\ [W]$
- Because the resistance is selected so that the power capacity is three to five times the actual power consumption, 2 to 3 [W] should be selected. From the above, the resistor to be connected across the terminal in question and COM is 1.2 [kΩ] 2 to 3 [W].

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

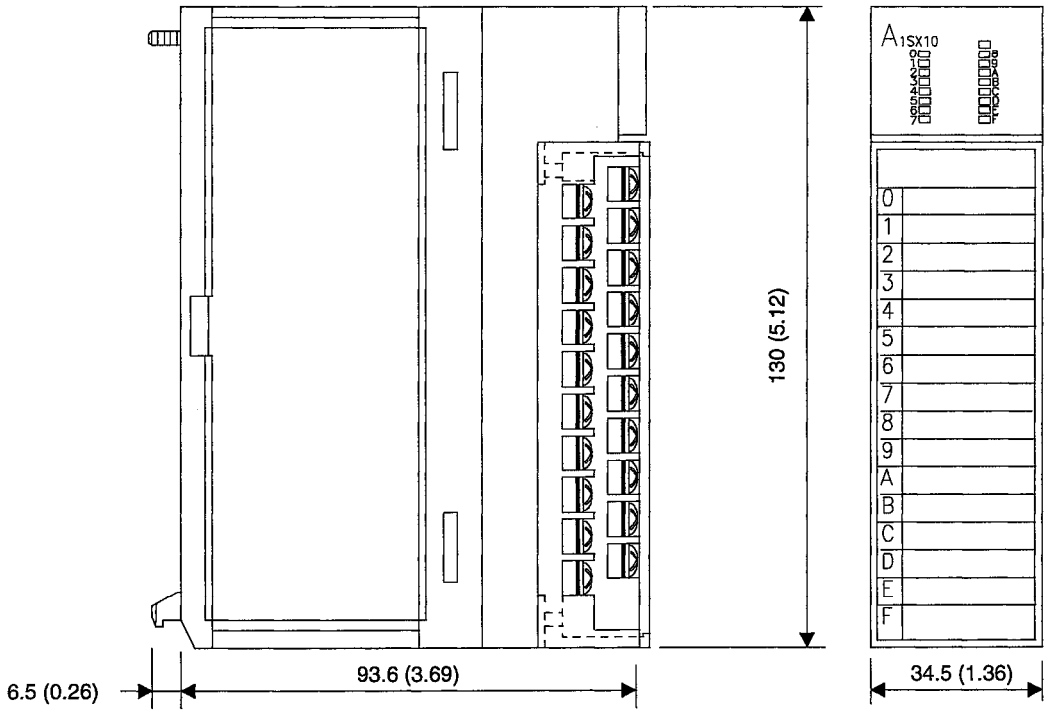
	Condition	Cause	Corrective Action
Example 1	When the output is OFF, excessive voltage is applied to the load.	• Load is half-wave rectified inside (in some cases, this is true of a solenoid).  • When the polarity of the power supply is as shown in (1), C is charged. When the polarity is as shown in (2), 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.

APPENDICES

APPENDIX 1 OUTSIDE DIMENSIONS

1.1 Input/Output Modules

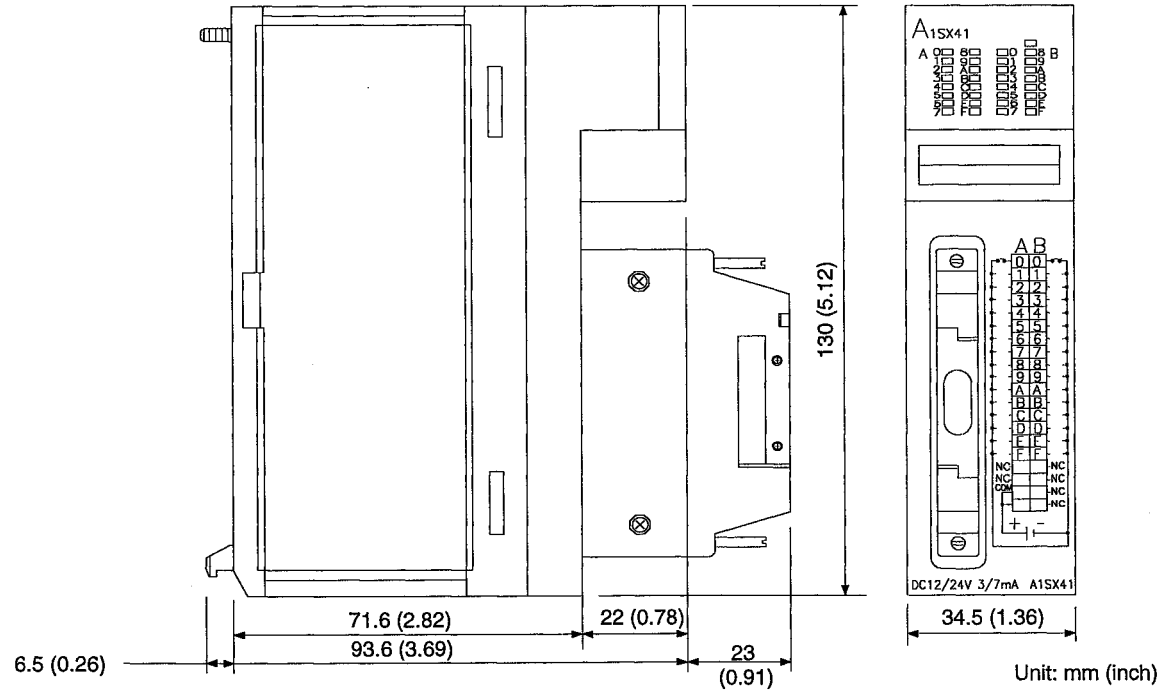
1.1.1 Terminal base connecting type



Unit: mm (inch)

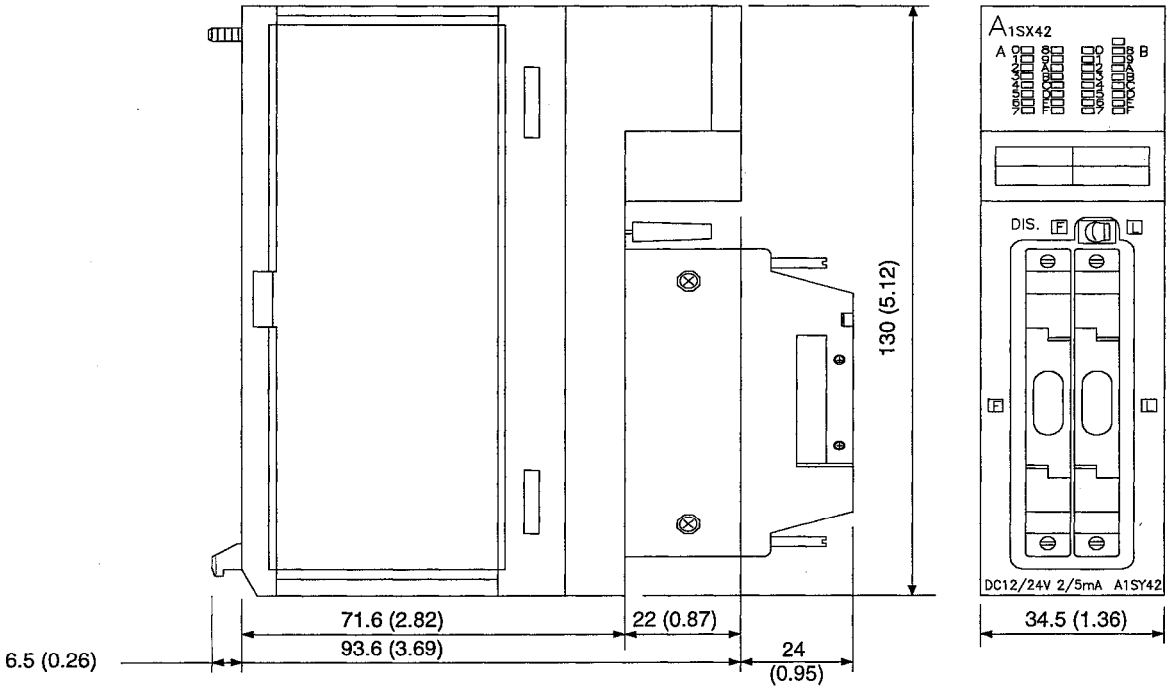
1.1.2 40-pin connector type

(1) 32-input/output module



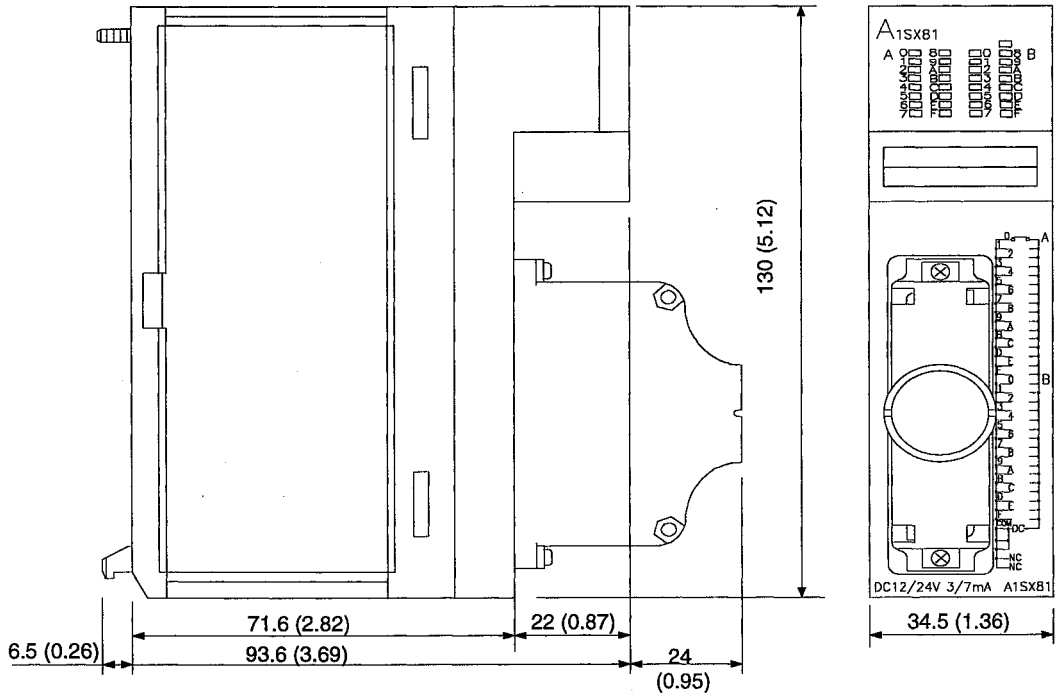
Unit: mm (inch)

(2) 64-input/output module



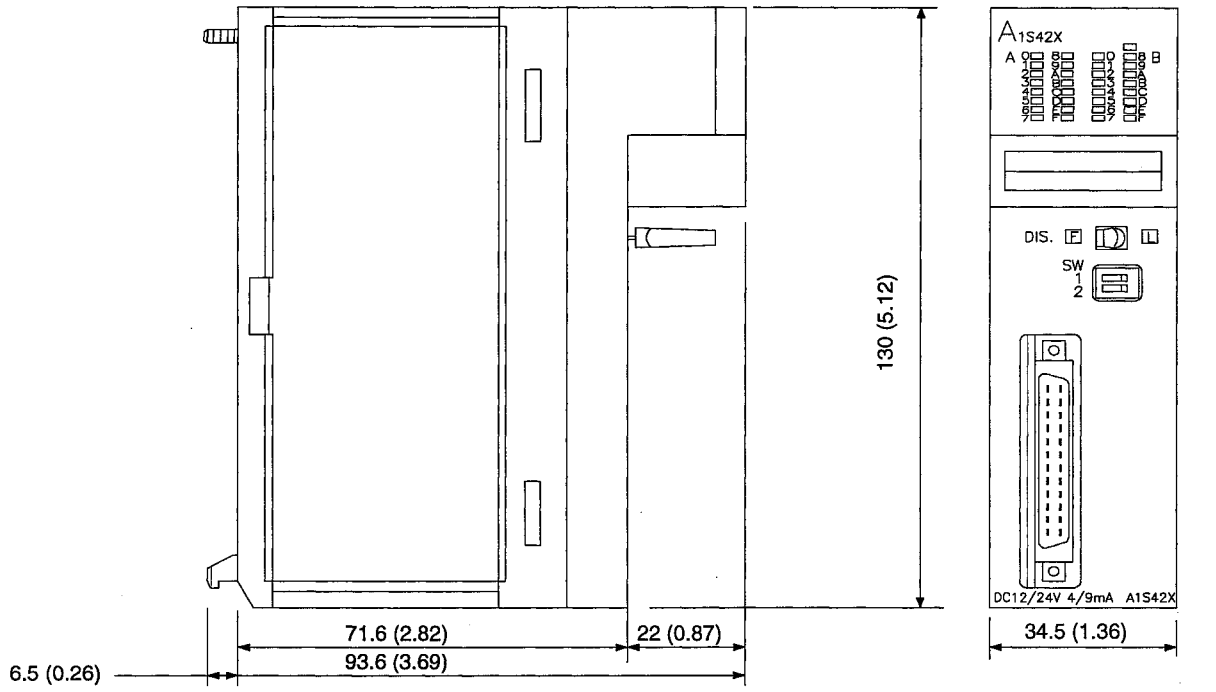
Unit: mm (inch)

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



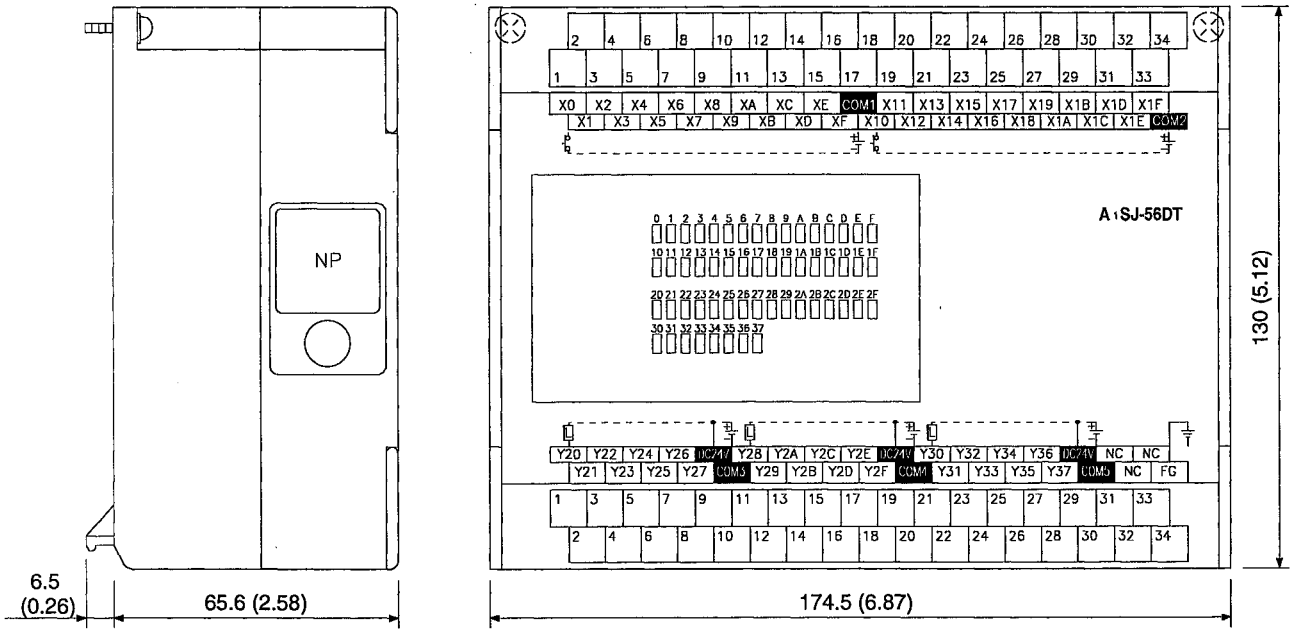
Unit: mm (inch)

1.2 Dynamic I/O Module



Unit: mm (inch)

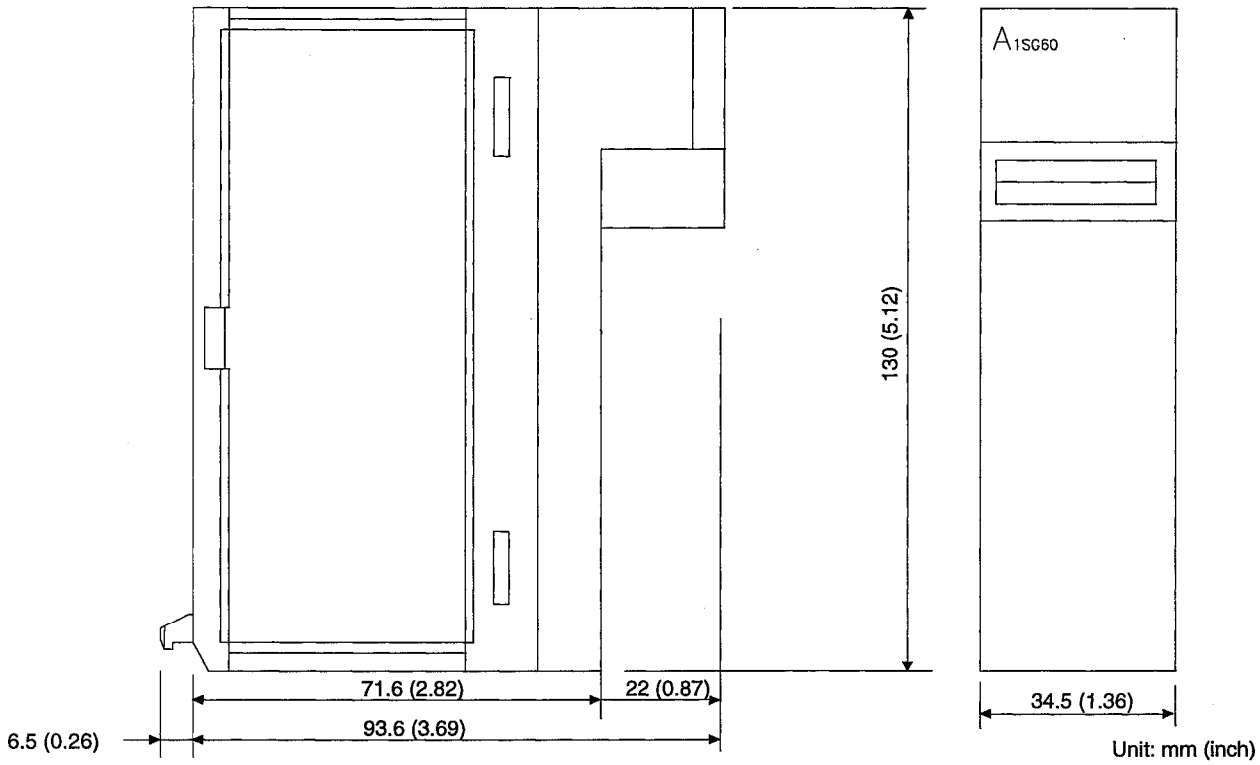
1.3 A1SJ-56□ Input/Output Combination Module



Unit: mm (inch)

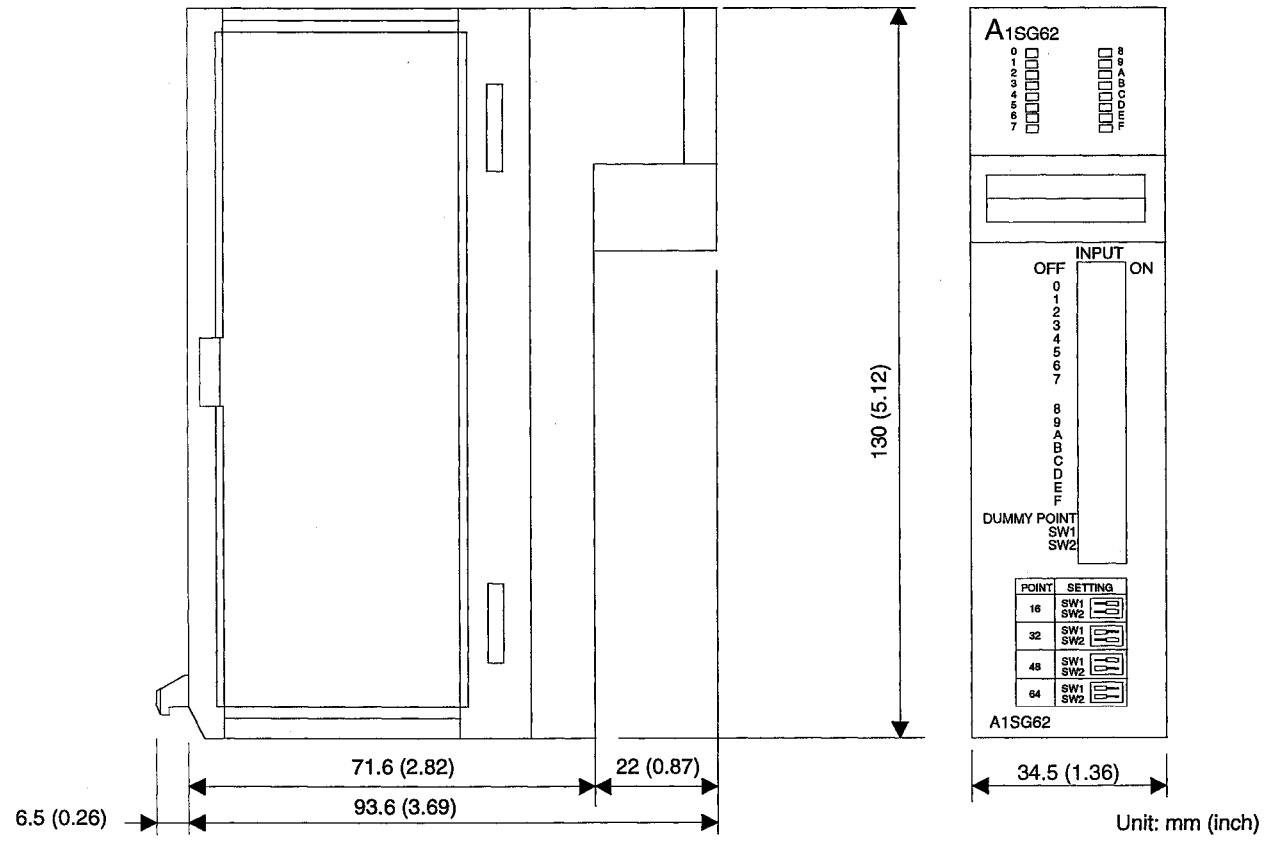
1.4 Dummy Module, Blank Cover

1.4.1 A1SG60 blank cover



Unit: mm (inch)

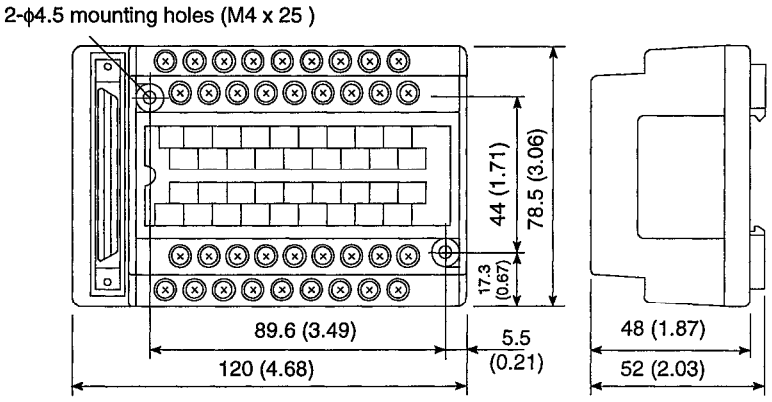
1.4.2 A1SG62 dummy module



Unit: mm (inch)

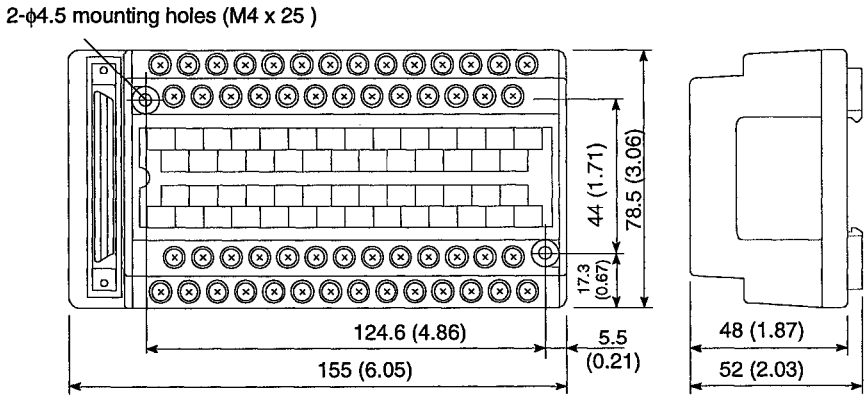
1.5 Connector/Terminal Block Convertor Modules

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



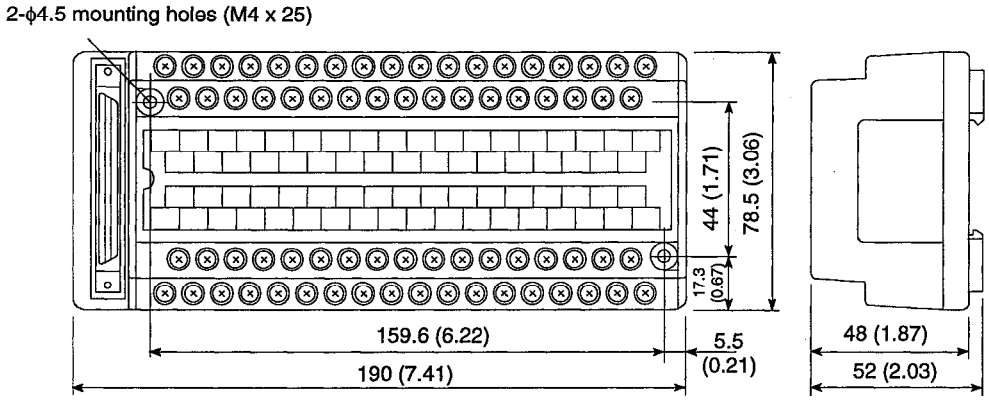
Unit: mm (inch)

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



Unit: mm (inch)

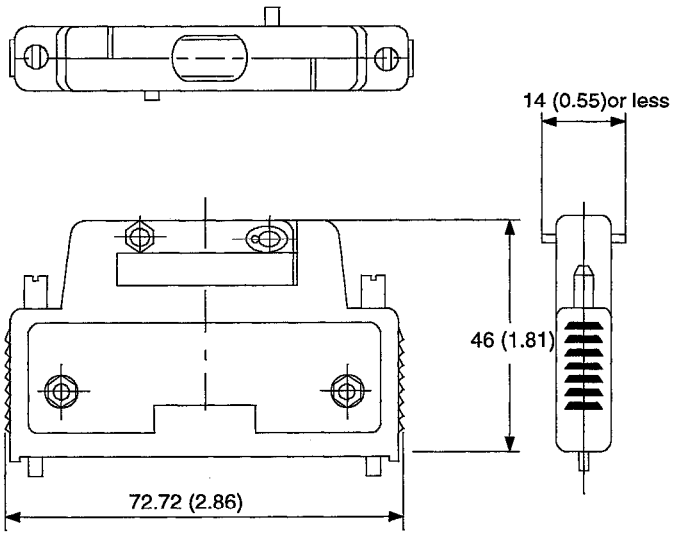
1.5.3 A6TBX70□ type connector/terminal block convertor module



Unit: mm (inch)

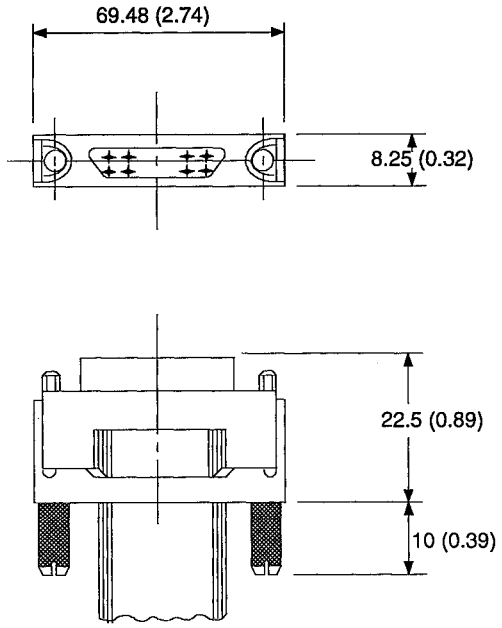
1.6 40-Pin Connectors

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



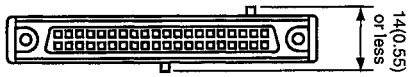
Unit: mm (inch)

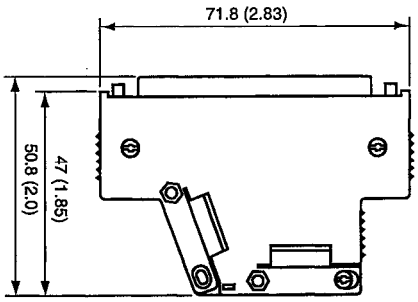
1.6.2 A6CON3 pressure-displacement-type 40-pin connector (flat cable type)



Unit: mm (inch)

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



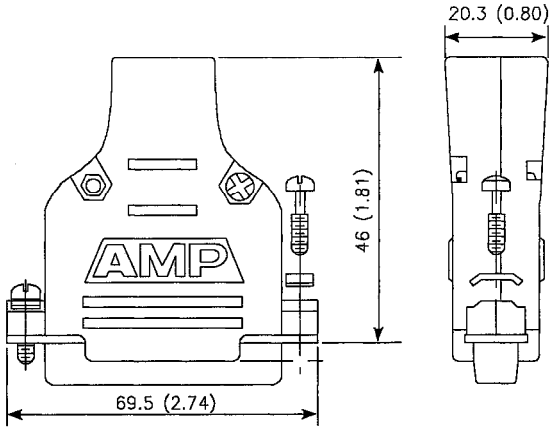


Unit: mm (inch)

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.

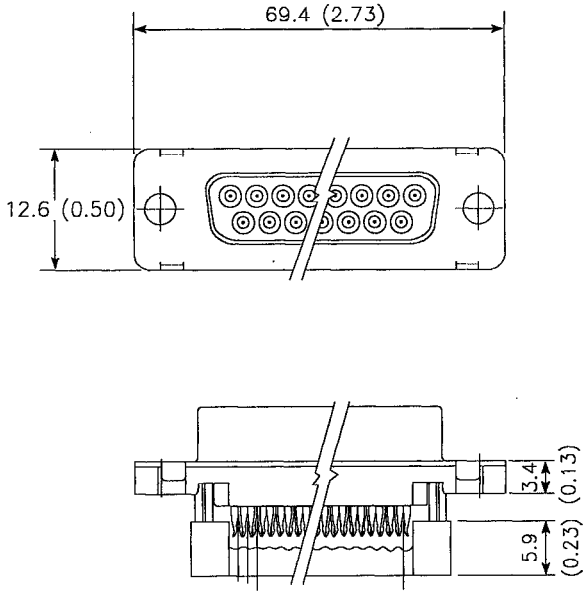
1.7 Pin D Sub-Connectors

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 starting use.

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 dealer or Mitsubishi Service Company. Note that if repairs are required at a site overseas, on a detached island or remote place, expenses to dispatch an engineer shall be charged for.

[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 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 possible 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 chance loss and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation to damages caused by any cause found not to be the responsibility of Mitsubishi, chance losses, lost profits incurred to the user by Failures of Mitsubishi products, damages and secondary damages caused from special reasons regardless of Mitsubishi's expectations, compensation for accidents, and compensation for damages to products other than Mitsubishi products and other duties.

5. Changes in product specifications

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

6. Product application

(1) In using the Mitsubishi MELSEC programmable logic controller, the usage conditions shall be that the application will not lead to a major accident even if any problem or fault should occur in the programmable logic controller device, and that backup and fail-safe functions are systematically provided outside of the device for any problem or fault.

(2) The Mitsubishi general-purpose programmable logic controller has been designed and manufactured for applications in general industries, etc. Thus, applications in which the public could be affected such as in nuclear power plants and other power plants operated by respective power companies, and applications in which a special quality assurance system is required, such as for Railway companies or National Defense purposes shall be excluded from the programmable logic controller applications.

Note that even with these applications, if the user approves that the application is to be limited and a special quality is not required, application shall be possible.

When considering use in aircraft, medical applications, railways, incineration and fuel devices, manned transport devices, equipment for recreation and amusement, and safety devices, in which human life or assets could be greatly affected and for which a particularly high reliability is required in terms of safety and control system, please consult with Mitsubishi and discuss the required specifications.

AnS Module type I/O

User's Manual

MODEL	ANS-TYPE-I/O-U-E
MODEL CODE	13JE81
IB(NA)-66541-J(0305)MEE	

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