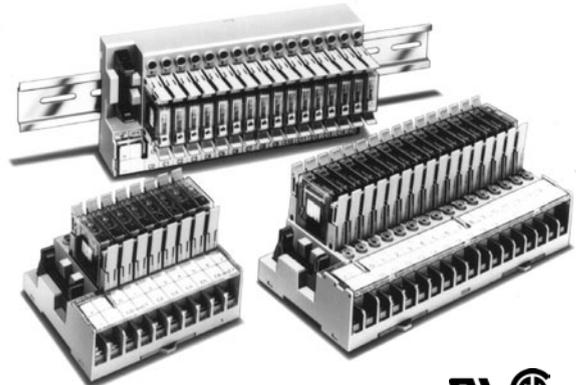


### Single Cable Connection to PLC Means Space is Saved and Less Control Panel Wiring is Required.

- Compact size: 182 (W) × 85 (D) × 68 (H) mm (8-point Output Block width is 102 mm).
- Connects to the PC through the connecting cable (G79 Series) and connector, and requires only a snap-in operation.
- Surge suppressor circuit built-in.
- Immediate recognition of I/O signal status using LED operation indicators.
- G3TA I/O Solid-state relay can be mounted instead of G7T.
- Mounts easily on a DIN track.
- Approved by UL, CSA (except for G7TC-OC16-1).



## Ordering Information

### Model Number Legend

A G7TC I/O Block is a combination of (8 or 16) G7T I/O Relays with SPST-NO specifications and a P7TF I/O Terminal.

G7TC-    - 

1    2    3    4

#### 1. Input/Output Classification

I : For input  
O : For output

#### 2. Type of I/O Signal

A : AC coil type for input relays mounted (Input/Output Classification: I)  
D : DC coil type for input relays mounted (Input/Output Classification: I)  
C : Contact output for output relays mounted (Input/Output Classification: O)

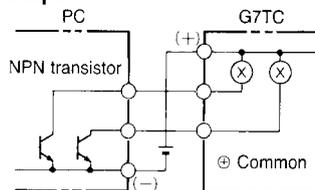
#### 3. Number of I/O Points

16: 16 points  
08: 8 points (for output only)

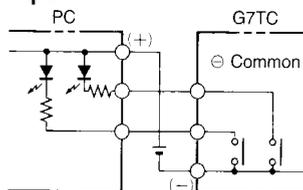
#### 4. Internal I/O Circuit Common

Blank: NPN  
1: PNP

#### Output

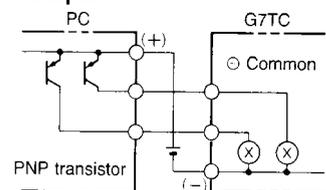


#### Input



1: PNP

#### Output



## I/O Block

I/O classification	I/O points	Internal I/O circuit common	Rated voltage	Model	
Input	16	NPN (– common)	12 VDC	G7TC-ID16	
			24 VDC		
			100 (110) VDC		
			100 (110) VAC		G7TC-IA16
			200 (220) VAC		
Output	16	NPN (+ common)	12 VDC	G7TC-OC16	
			24 VDC		
		PNP (– common)	12 VDC	G7TC-OC16-1 (see note 1)	
			24 VDC		
	8	NPN (+ common)	12 VDC	G7TC-OC08	
			24 VDC		
			24 VDC		

**Note:** 1. Not approved by UL, CSA.

2. When ordering, add the rated coil voltage to the model number.

Example: G7TC-ID16 24 VDC

└─ Rated coil voltage

## Specifications

## ■ Coil Ratings (Common to Input/Output per Relay)

Item	Rated current (mA)	Coil resistance (Ω)	Must operate	Must release	Maximum voltage	Power consumption			
						50 Hz	60 Hz	of rated voltage	per Relay
<b>AC</b>	100/(110) 200/(220)	8.2/– 4.1/–	7/7.7 3.5/3.85	8,700 33,300	80% max.	30% min.	105%	0.7 VA	11 VA
<b>DC</b>	12 24 100/110	42 21 5	290 1,150 20,000	80% max.	10% min.	105%	0.5 W	8 W	

**Note:** 1. The rated current and coil resistance are measured at a coil temperature of +23°C with a tolerance of +15%/–20% for AC rated current and ±15% for coil resistance.

2. The operating characteristics are measured at a coil temperature of +23°C.

3. The value for maximum voltage is the maximum value within the allowable voltage fluctuation range for the relay coil's operating power supply. Continuous operation at this voltage is not within product specifications.

4. Approx. 4 mA flows into each LED indicator. To calculate the power supply capacity, add the current value of each LED indicator.

5. When the G7TC is used with an AC rated voltage, three rated currents can be used. If a coil voltage of 110 or 220 VAC is used, 50 Hz cannot be used.

## ■ Contact Ratings (G7T I/O Relay)

Classification	For input		For output	
	Resistive load (cosφ=1)	Inductive load (cosφ=0.4 L/R=7 ms)	Resistive load (cosφ=1)	Inductive load (cosφ=0.4 L/R=7 ms)
<b>Rated load</b>	1 A at 24 VDC	0.5 A at 24 VDC	5 A at 24 VDC 2 A at 220 VAC	2 A at 24 VDC 1 A at 220 VAC
<b>Rated carry current</b>	1 A		5 A	
<b>Max. switching voltage</b>	250 VAC, 125 VDC			
<b>Max. switching current</b>	1 A	0.5 A	5 A	2 A
<b>Error rate (reference value) (See note.)</b>	100 μA at 1 V		10 mA at 5 V	
<b>Electrical life expectancy</b>	10,000,000 operations (at 10 mA) 50,000 operations (at 1 A)	2,500,000 operations (at 10 mA) 20,000 operations (at 1 A)	1,000,000 operations (under rated load)	
<b>Mechanical life expectancy</b>	50,000,000 operations			

**Note:** The above values are for a switching frequency of 120 operations/min.

## ■ Characteristics

Model		G7TC-IA16 (Input, AC coil)	G7TC-ID16 (Input, DC coil)	G7TC-OC16 (-1) (output, DC coil)	G7TC-OC08 (output, DC coil)
<b>Item</b>					
<b>Contact form</b>		SPST-NO × 16			SPST-NO × 8
<b>Contact mechanism</b>		Bifurcated crossbar contact		Single contact	
<b>Contact material</b>		Au cladding + Ag		AgInSn	
<b>Contact resistance (See note 2.)</b>		50 mΩ max.			
<b>Must Operate time (See note 3.)</b>		15 ms max.			
<b>Release time (See note 3.)</b>		15 ms max.			
<b>Max. switching frequency</b>	<b>Mechanical limit</b>	18,000 operations/hour			
	<b>At rated load</b>	1,800 operations/hour			
<b>Insulation resistance</b>		100 MΩ (at 500 VDC)			
<b>Dielectric strength</b>	<b>Between coil and contact</b>	2,000 VAC, 50/60 Hz for 1 minute			
	<b>Between same polarity contacts</b>	1,000 VAC, 50/60 Hz for 1 minute			
	<b>Between paired connectors</b>	250 VAC, 50/60 Hz for 1 minute			
<b>Vibration resistance</b>		10 to 55 to 10 Hz with 0.5-mm single amplitude (1.0-mm double amplitude)			
<b>Shock resistance</b>		200 m/s <sup>2</sup>			
<b>Noise immunity</b>		Noise level: 1.5 kV; pulse width: 100 ns to 1 μs			
<b>Rated voltage between positive and negative terminal blocks</b>		Rated voltage of controller's (PLC or other) input circuit		12 VDC ± 5% 24 VDC ± 5%	
<b>Rated current between positive and negative terminal blocks</b>		Input circuit current of controller (PLC or other) × number of ON points		12 VDC: 46 mA × number of ON points 24 VDC: 25 mA × number of ON points	
<b>Cable length (See note 4.)</b>	<b>To controller</b>	5 m max. (reference value)			
	<b>To I/O devices</b>	50 m max. (reference value, for 2-mm <sup>2</sup> CVV cable)		Dependent on load	
<b>Ambient operating temperature</b>		0 to 55°C			
<b>Ambient operating humidity</b>		35% to 85% (with no icing or condensation)			
<b>Tightening torque for external connections</b>		0.78 to 1.18 N·m			
<b>Tensile strength</b>		No damage when a tensile force of 49 N is applied in each direction. In the direction of the track, the tensile strength is 9.8 N min.			
<b>I/O terminal tightening torque</b>		Tightening strength: 0.98 N·m; Tensile strength 49 N per minute			
<b>LED color</b>		Red	Green		
<b>Case color</b>		Transparent red	Transparent green	Transparent green	
<b>Coil surge absorber</b>		Varistor	Diode (1 A, 400 V)		
<b>Weight</b>		Approx. 640 g	Approx. 630 g	Approx. 670 g	Approx. 350 g

- Note:**
1. The above values are initial values.
  2. Measurement condition: 1 A at 5 VDC.
  3. Ambient temperature: 23°C.
  4. Connecting cables up to 5 m are available as standard products. For longer cables, enquire separately.

### UL and CSA Standards

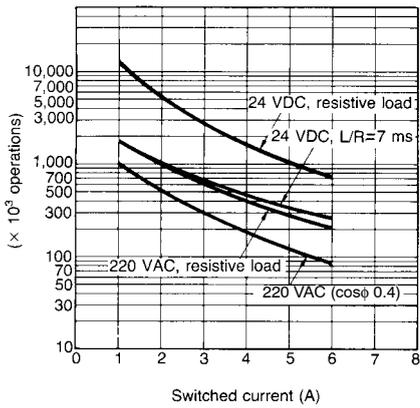
Standard G7TC I/O Blocks, except for the G7TC-OC16-1 and the G7TC-OC08, have met UL and CSA standards (UL file no. E95399; CSA file no. LR35535).

Note that the following UL- and CSA-qualifying ratings differ from the performance characteristics of the individual models:

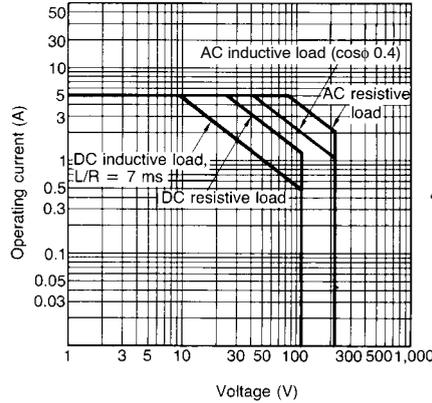
Model	Coil ratings	Contact ratings
G7TC-ID16, G7TC-IA16	10 mA/point, 24 VDC	250 VAC max.
G7TC-OC16	Coil drive current, 24 VDC	Inductive load: 10 A, 250 VAC Resistive load: 10 A, 30 VDC Rated horsepower: 1/2 HP, 240 VAC

# Engineering Data

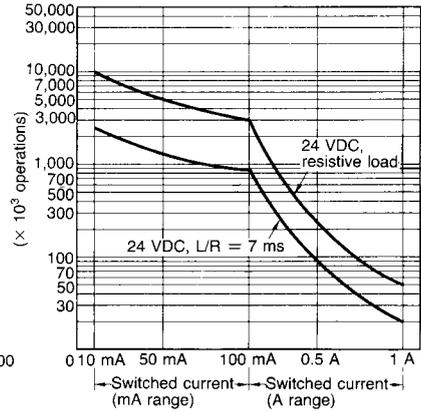
**Life Expectancy of Output**



**Max. Switching Capacity of Output**  
(Life expectancy : 1,000,000 Operations)

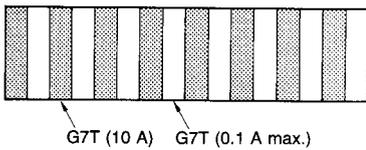


**Life Expectancy of Input**



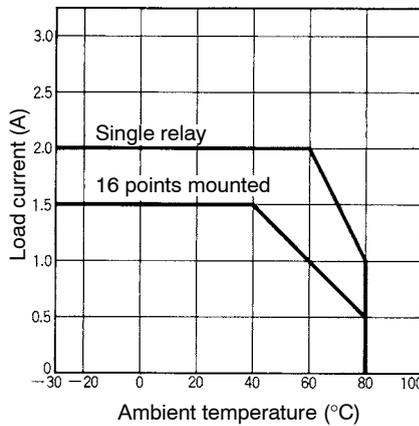
**Example for Output Block (for Reference)**

If a G7T I/O Relay is mounted in every other position on an Output Block (see drawing), a resistive load of 10 A (24 VDC) can be switched. Note that the service life is reduced to 150,000 operations in this case.

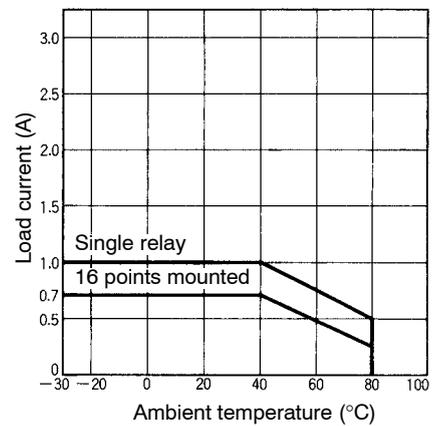


**Load Current vs. Ambient Temperature**

G3TA-OA202SZ  
G3TA-OA202SL  
G3TA-ODX02S



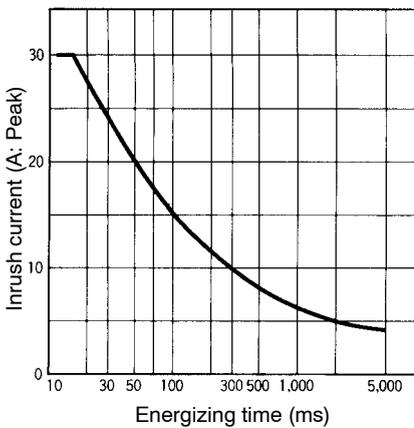
G3TA-OA201S



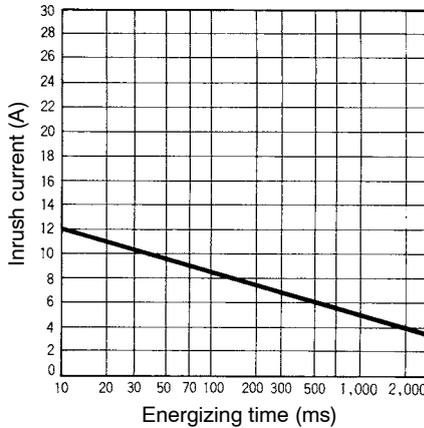
**Inrush Current**

The following graphs show the maximum inrush currents that can be withstood for non-repetitive operation. For repetitive operation, the figures should be reduced by half.

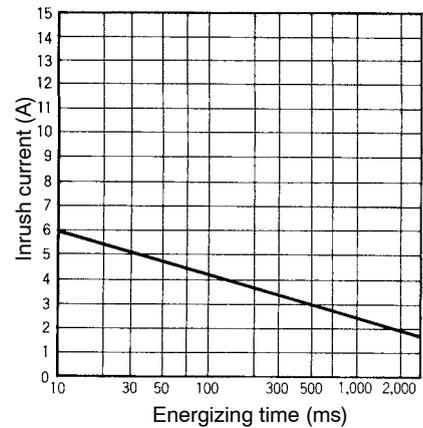
G3TA-OA202SZ  
G3TA-OA202SL



G3TA-ODX02S

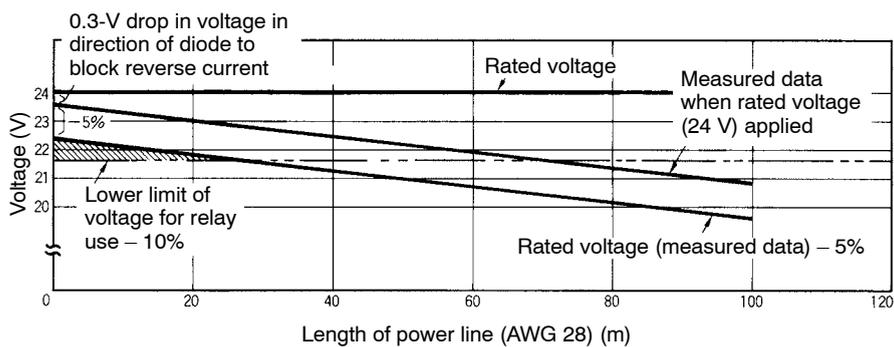


G3TA-OD201S



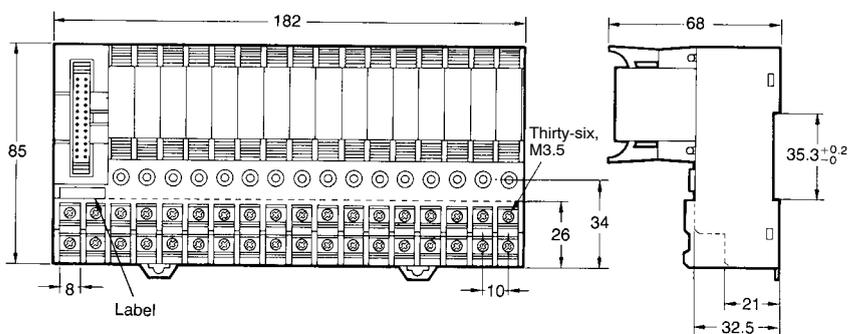
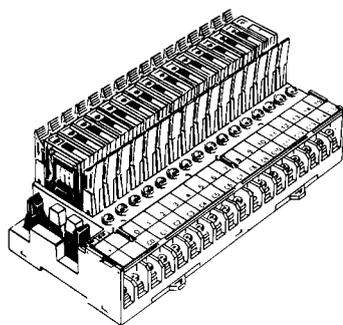
### Cable Length

The following graph gives reference values for the relationship between cable length and voltage in the case where the voltage fluctuation of the power supply is 5%.

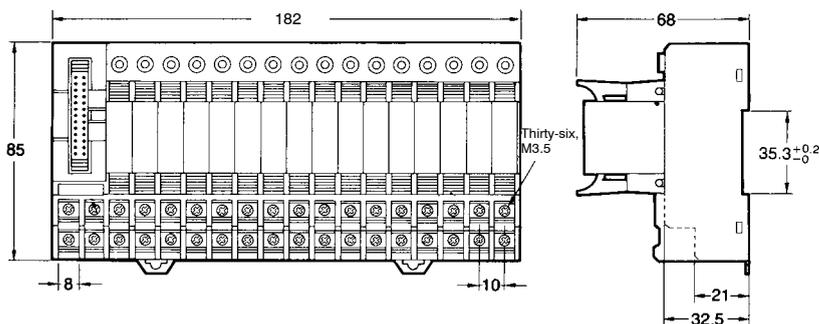
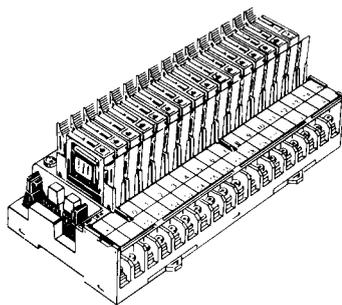


### Dimensions

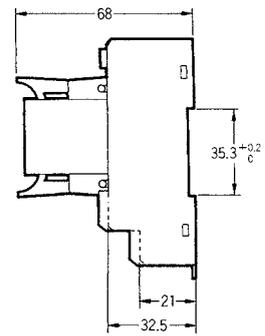
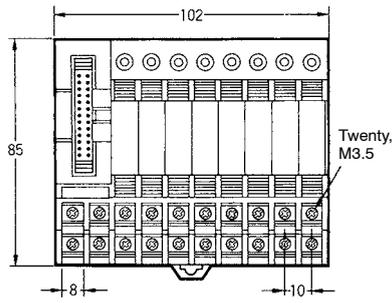
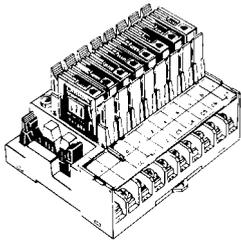
G7TC-ID16  
G7TC-IA16



G7TC-OC16  
G7TC-OC16-1

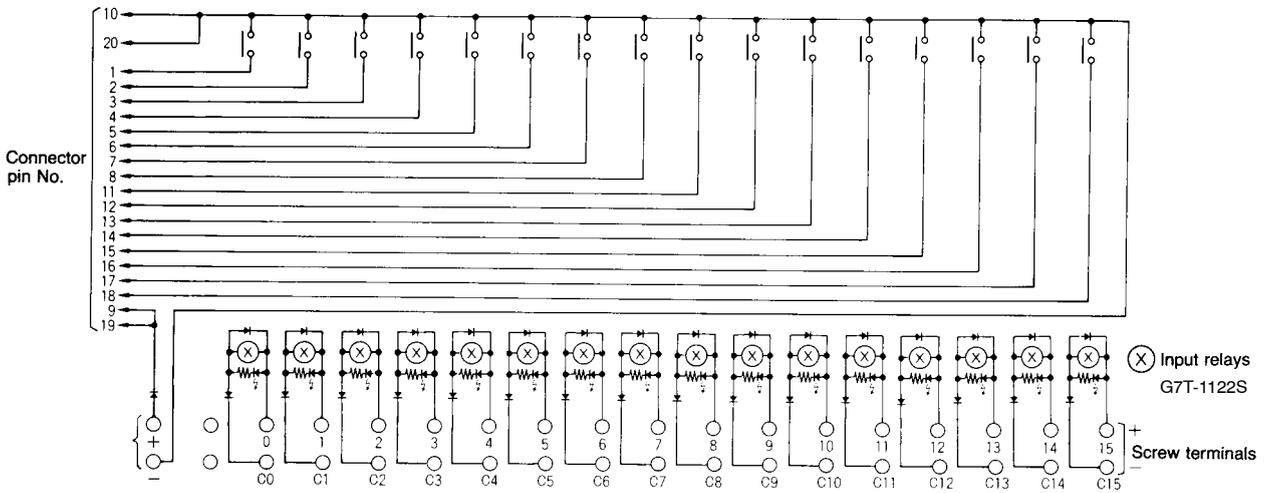


G7TC-OC08

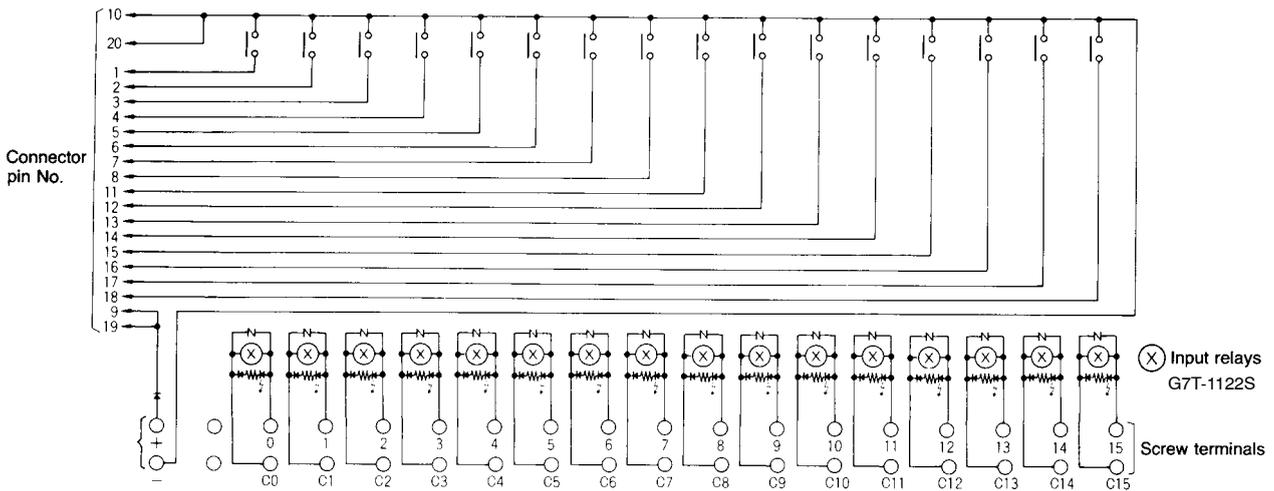


■ Terminal Arrangement/Internal Connection

G7TC-ID16 (NPN input/- common)

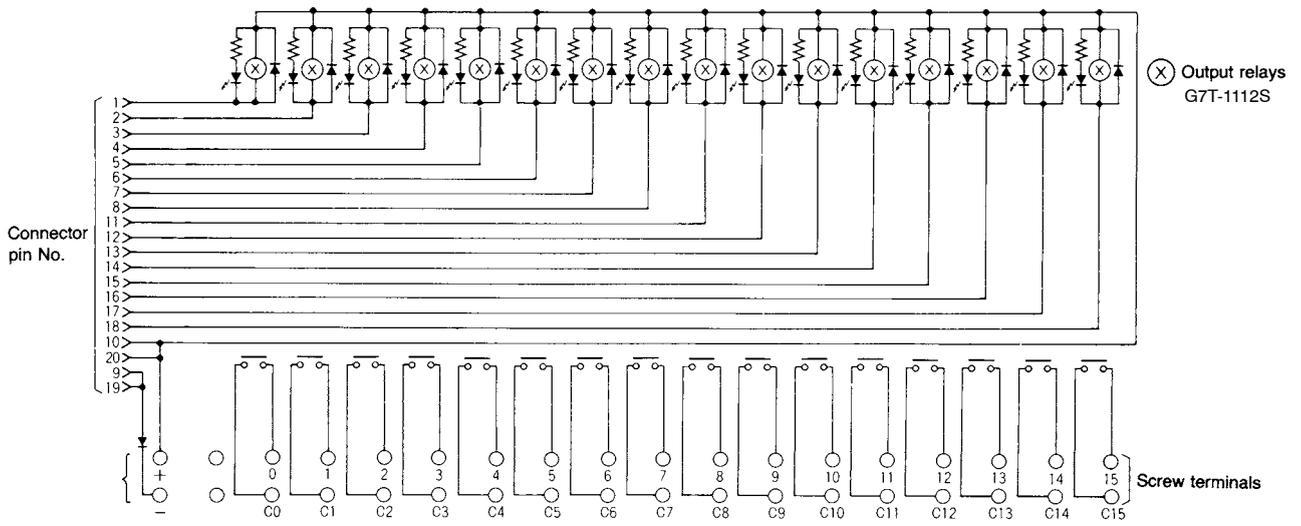


G7TC-IA16 (NPN input/- common)



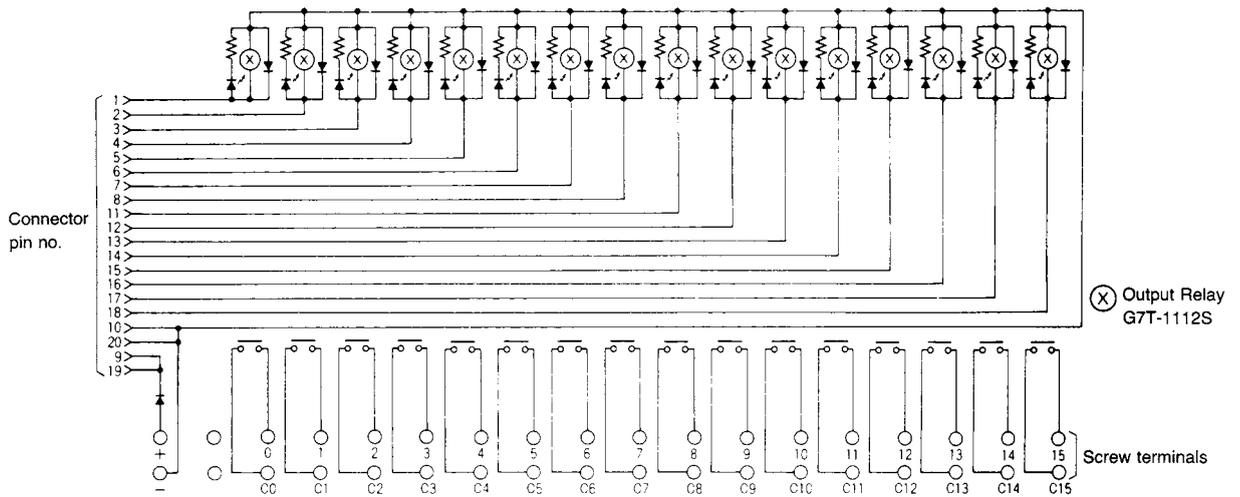
**G7TC-OC16**

**Note:** A controller with an NPN transistor, common output can be connected to the G7TC-OC16.



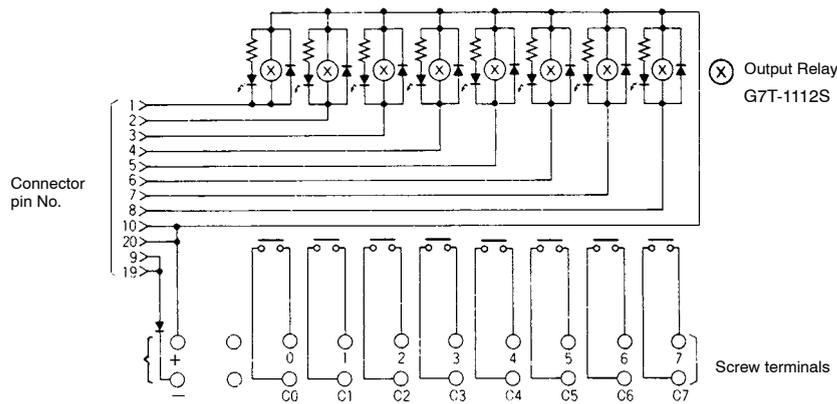
**G7TC-OC16-1**

**Note:** A controller with a PNP transistor, + common output can be connected to the G7TC-OC16-1. Do not connect the G71 Remote Interface to the G7TC-OC16-1. Due to the difference in polarity, the G71 will be damaged if the G7TC-OC16-1 and the G71 are connected to each other. Use the G7TC-OC16 (NPN output/+ common) instead, to connect to the G71.



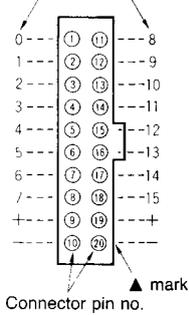
**G7TC-OC08 (NPN output/+ common)**

**Note:** A controller with an NPN transistor, – common output can be connected to the G7TC-OC08.

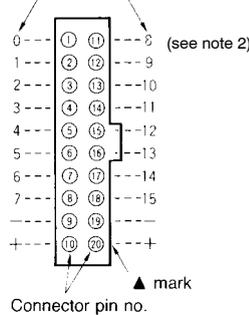


**Connector Pin Configuration  
Top View**

I/O indications on Screw Terminals of G7TC-ID16, G7TC-IA16, G7TC-OC16-1



I/O Numbers Allocated to Screw Terminals of G7TC-OC16 and G7TC-OC08



- Note:**
1. Pin numbers are indicated for convenience. The ▲ mark can be used to determine orientation.
  2. The G7TC-OC08 does not have terminals 8 to 15.

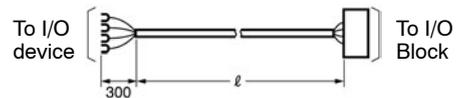
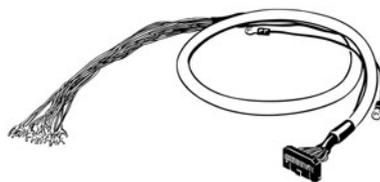
**Accessories (Order Separately)**

**■ G79 Connecting Cables**

**G79-Y□C Connecting Cable with Crimp-type Hooks**

This Cable is convenient for connecting I/O Blocks to devices equipped with screw terminals.

Length (ℓ)	Model
1,000 mm	G79-Y100C
1,500 mm	G79-Y150C
2,000 mm	G79-Y200C
3,000 mm	G79-Y300C
5,000 mm	G79-Y500C

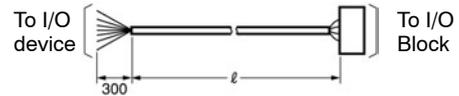


- Note:**
1. Power line capacity must be within 50 mA per I/O point. Always check driver capacity and I/O relay power consumption when using an Output Block.
  2. Hooks are labeled with corresponding connector pin numbers.
  3. Connect terminals 9 and 19 and terminals 10 and 20 together when using the G7TC-OC08.
  4. The separate wires at the device end of the Cable each have a diameter of AWG 28 (10/0.38).

**G79-A□C Connecting Cable**

This Cable has separate wires at the device end.

Length (ℓ)	Model
2,000 mm	G79-A200C
5,000 mm	G79-A500C

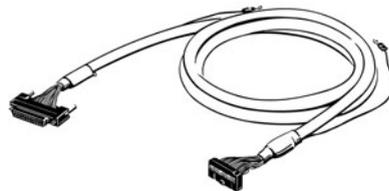


- Note:**
1. The separate wires at the device end of the Cable each have a diameter of AWG 24 (7/0.203).
  2. Connect terminals 9 and 19 and terminals 10 and 20 together when using the G7TC-OC08.

**G79-□C Connecting Cable with One Connector**

This Cable is convenient for connecting an I/O Block to a single device equipped with one connector socket.

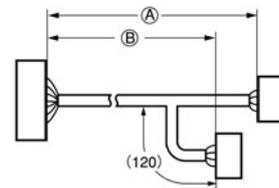
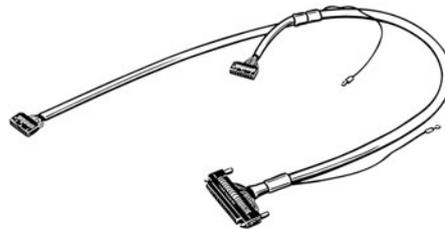
Length (ℓ)	Model
1,000 mm	G79-100C
1,500 mm	G79-150C
2,000 mm	G79-200C
3,000 mm	G79-300C
5,000 mm	G79-500C



**G79-O□C-□ and G79-I□C-□ Connecting Cables with Two Connectors**

Cables for both Output Blocks (for connection to SYSMAC I/O Units; tape color: red) and Input Blocks (for connection to SYSMAC I/O Units; tape color: yellow) are available.

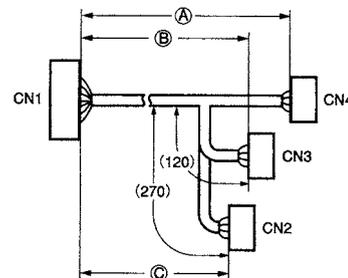
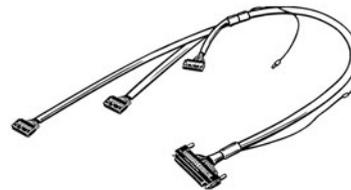
Length		Cables for Input Blocks	Cables for Output Blocks
A	B		
1,000 mm	750 mm	G79-I100C-75	G79-O100C-75
1,500 mm	1,250 mm	G79-I150C-125	G79-O150C-125
2,000 mm	1,750 mm	G79-I200C-175	G79-O200C-175
3,000 mm	2,750 mm	G79-I300C-275	G79-O300C-275
5,000 mm	4,750 mm	G79-I500C-475	G79-O500C-475



**Note:** The 32-point card-type connector for Input Block Cables and that for Output Block Cables have different pin arrangements.

**G79-□C-□-□ Connecting Cable with Three Connectors**

Length			Model
A	B	C	
1,500 mm	1,250 mm	1,000 mm	G79-150C-125-100
2,000 mm	1,750 mm	1,500 mm	G79-200C-175-150
3,000 mm	2,750 mm	2,500 mm	G79-300C-275-250

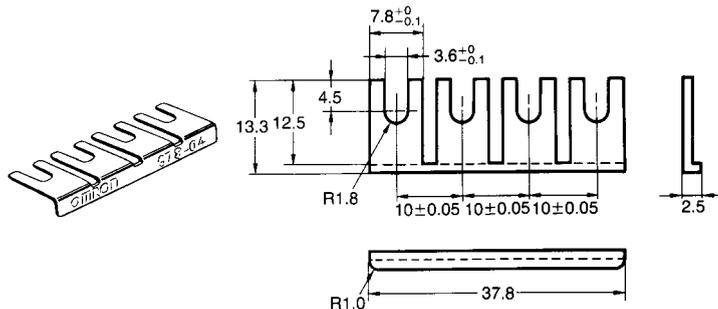


The lengths given are for straight lines and do not take bends into account.

### ■ Shorting Bar

#### G78-04

Use this piece for short-circuiting across terminals.  
Max. current flow: 20 A



# I/O Block Details

## Input Blocks

### G7TC-ID16

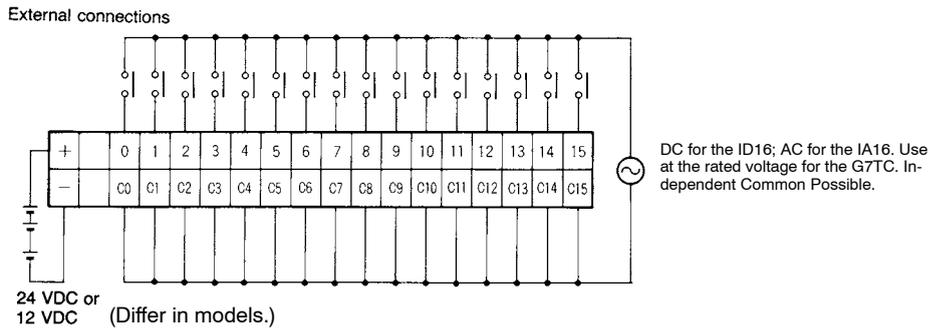
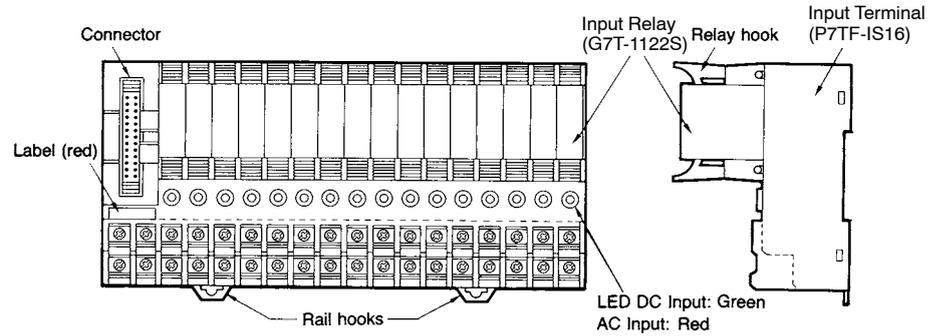
### G7TC-IA16

Supply power to terminals 0 through 15 and C0 through C15 according to the voltage specifications of the I/O Relays and I/O Block. Do not reverse positive and negative terminals on the DC Input Block (0 through 15 are positive; C0 through C15, negative). Shorting bars are available.

Supply to the power terminal (positive and negative) the rated voltage of the controller's input circuits (24 VDC or 12 VDC). Use a low-noise power source.

When using a Connecting Cable with two connectors, be sure to use the Cable for Input Blocks. Using the Cable for Output Blocks may result in malfunction or damage to the product.

Connecting Cable: G79-I□C-□  
Tape Color: Red



## Output Block

### G7TC-OC16(-1)

### G7TC-OC08

There are voltage specifications for the Relays and Terminals. Depending on the controller connected, select either 12 or 24 VDC.

Supply power to contact output terminals 0 through 15 and C0 through C15 according to the requirements of the loads. A 4 terminal Shorting Bar is available.

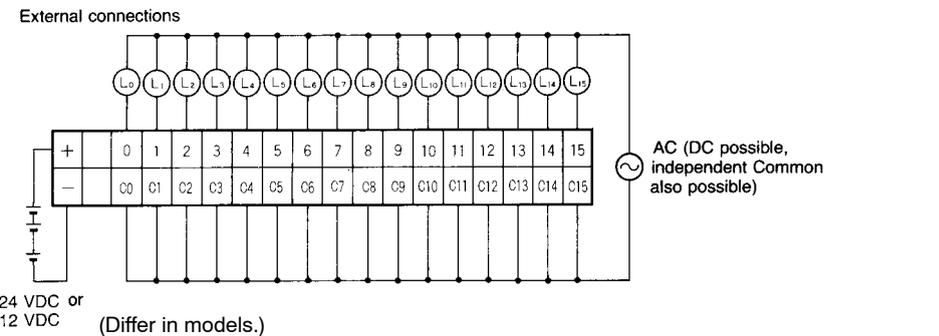
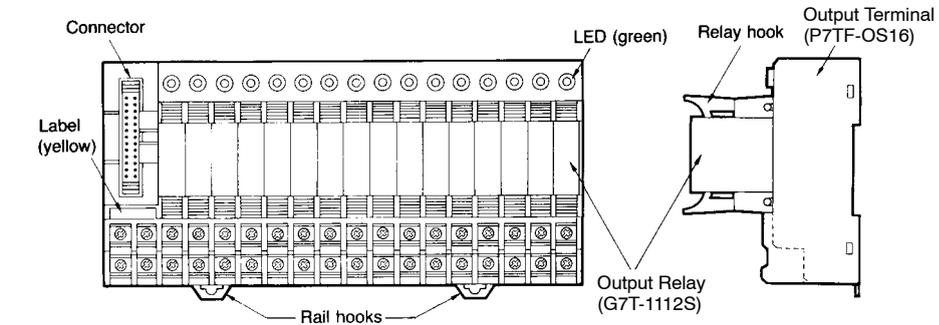
Supply to the power terminals (positive and negative) power both for driving the relays and for controller output transistors. Match the controller and I/O block voltage specifications. Use a low-noise power source.

When using a Connecting Cable with two connectors, be sure to use the Cable for Output Blocks. Using the Cable for Input Blocks may result in malfunction or damage to the product.

Connecting Cable: G79-O□C-□  
Tape Color: Yellow

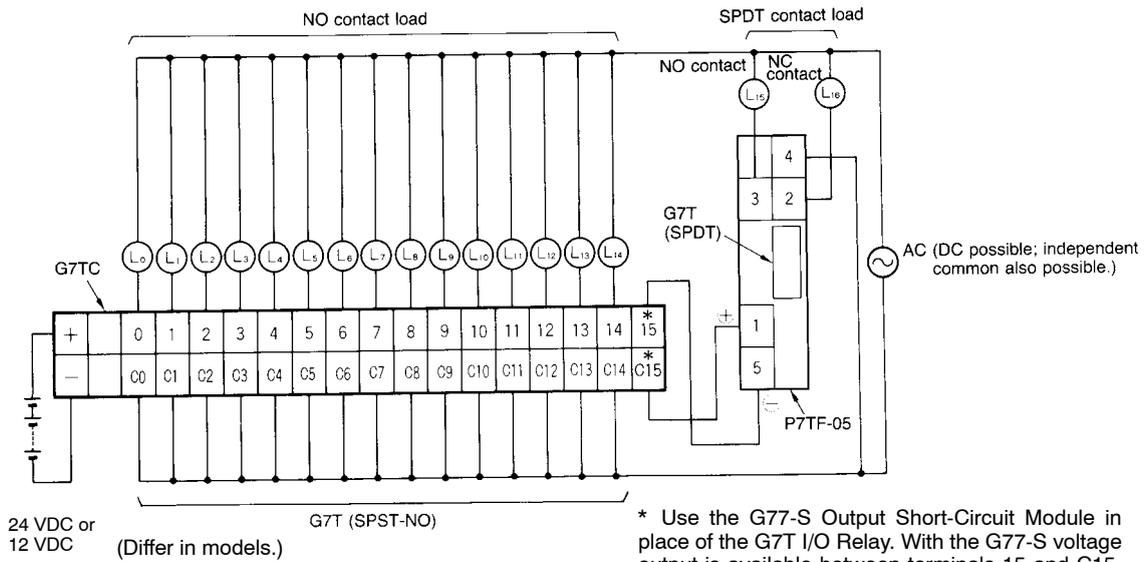
Output Block Unit G7TC-OC08 does not have terminals 8 through 15 and C8 through C15. Although a 20-pin connector is used, pins 11 through 18 are not connected.

When an I/O SSR (G3TA-OD□□) is mounted, terminals 0 to 15 will be positive.



# Connection Example for SPDT Relays

The following is an application example for the P7TF-05 using an SPDT Relay on a terminal of the G7TC-16(-1).

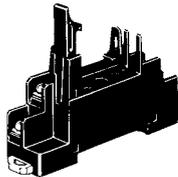


**Note:** If more than one G77-S Output Short-Circuit Module is employed, the voltage output of the terminals on the G7TC is as follows:  
 G7TC-OS16: The positive side (the lower row) connects to the common line internally.  
 G7TC-OS16-1: The negative side (the upper row) connects to the common line internally.

## ■ P7TF-05 Socket

The G7T (SPST-NO, SPST-NC, and SPDT types) and the G3TA I/O Relays can be mounted on the P7TF-05 Socket.

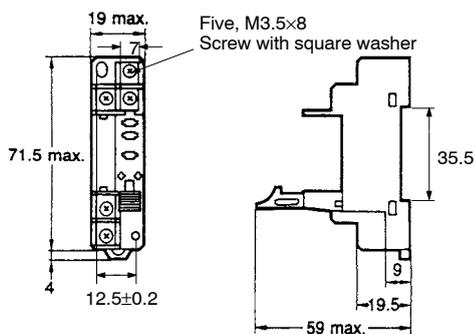
The P7TF-05 can be used for applications involving sequences that require slim relays, or to enable use of SPDT relays with the I/O Block. To use part of the I/O Block with SPDT specifications, insert an Output Short-Circuit Module into the I/O Block, and use the P7TF-05 Socket in combination with an SPDT Relay for the Module's output.



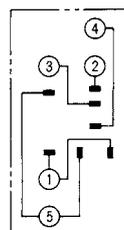
### Specifications

<b>Contact resistance</b>	10 mΩ max.
<b>Dielectric strength</b>	2,000 VAC for 1 minute
<b>Insulation resistance</b>	100 MΩ (at 500 V)
<b>Vibration resistance</b>	10 to 55 Hz, 1.0 mm double amplitude
<b>Shock resistance</b>	200 m/s <sup>2</sup>
<b>Ambient temperature</b>	Operating: 0 to 55°C
<b>Ambient humidity</b>	35% to 85%
<b>Weight</b>	Approx. 28 g

### Dimensions

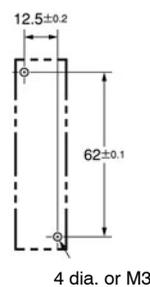


### Internal Connections (Top View)



**Note:** Terminal 1 is positive when the I/O SSR is employed.

### Mounting Hole Dimensions



**Note:** Terminal 1 is positive when the G3TA or Indicator Module is employed.

### ■ P70 Indicator Module (With Surge Suppressing Function)

Remove the transparent style strip of the P7TF-05 socket and mount this module and it will function as an operation indicator with the surge suppression.

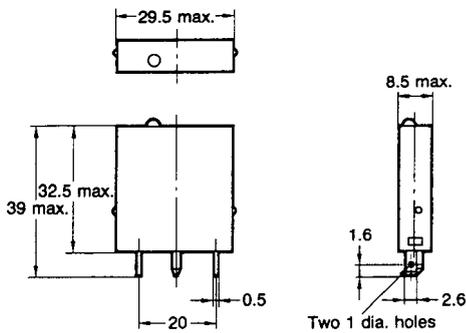


#### Ordering Information

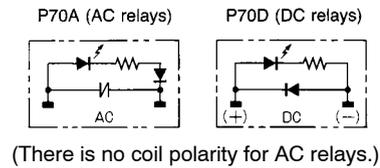
Model	Applicable relay coil voltage	Remarks
For AC relay	P70A	100 (110) VAC
		200 (220) VAC
For DC relay	P70D	12/24 VDC
		Surge suppressing system with diode

- Note:** 1. Order the indicator module suitable for the relay coil voltage.  
 2. The indicator module for DC relays has a multiple power supply common to both 12 and 24 VDC.

#### Dimensions

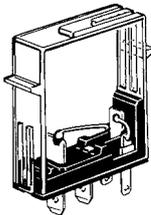


#### Internal Connection

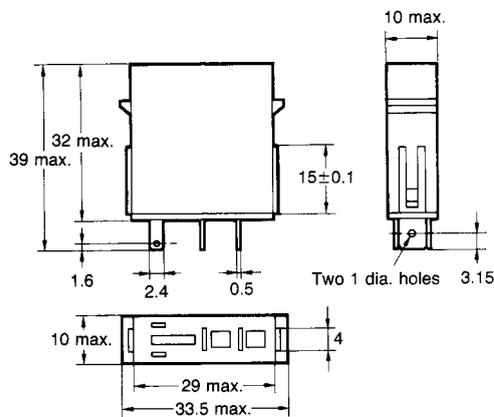


### ■ G77-S Output Short-Circuit Module

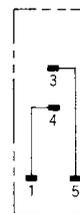
The output of the I/O Block can be obtained without relays through the G77-S Output Short-Circuit Module. Note that the G77-S Output Short-Circuit Module is not available for inputs.



#### Dimensions



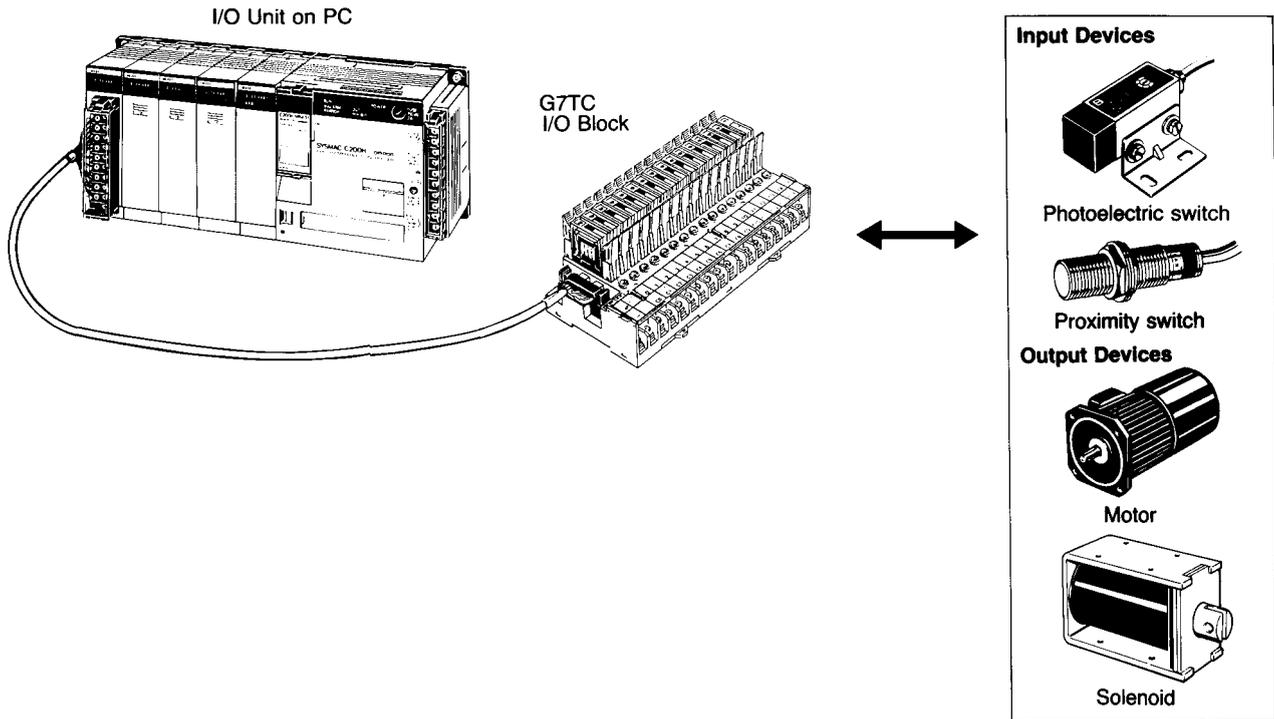
#### Terminal Arrangement/Internal Connections (Bottom View)



(There is no coil polarity.)

### ■ Connecting to Programmable Controller through Crimp-type Hooks

I/O Units without connectors can be easily connected to the I/O Block through the connecting cable equipped with crimp-type hooks.



# Precautions

## ■ General

I/O Relays and I/O Block Bases can be combined as follows to form I/O Blocks:

	I/O Blocks	Block Base*3	I/O Relay	I/O SSR*2	
<b>DC output</b>	G7TC-OC16 G7TC-OC16-1 G7TC-OC08	P7TF-OS16 P7TF-OS16-1 P7TF-OS08	G7T-1112S (SPST-NO type)*1 G7T-1012S (SPST-NC type)	AC	G3TA-OA202SZ G3TA-OA202SL
				DC	G3TA-ODX02S G3TA-OD201S
<b>DC input</b>	G7TC-ID16	P7TF-IS16 (DC type)	G7T-1122S*1	DC	G3TA-IDZ002 (M)
<b>AC input</b>	G7TC-IA16	P7TF-IS16 (AC type)		AC	G3TA-IAZR02S

\*1 These are the I/O Relays mounted on the G7TC I/O Relay Terminal.

\*2 To use I/O SSRs, remove the I/O Relays and mount the I/O SSRs to the slots where the I/O Relays were mounted. Or, order and combine a P7FT I/O Terminal and I/O SSRs.

\*3 The P7TF I/O Terminal provides only sockets. It does not have Relays mounted to it. Mount I/O Relays or I/O SSRs to the sockets. Specify the rated voltage in the same way as when ordering the G7TC I/O Relay Terminal.

- Combinations of AC Input Relays/SSRs and DC Input Relays/SSRs cannot be used with the same Terminal. This is because specifications for coil surge suppression elements are different.

Relays/SSRs with different voltage specifications cannot be used with the same Terminal. (For example, a 100-VAC Input Relay and a 200-VAC Input Relay, or a 12-VDC Output Relay and a 24-VDC Output Relay cannot be used with the same Terminal.) This is because specifications of operation indicator circuits are different.

- Only use I/O Terminals, I/O Relays, and I/O SSRs with the same specifications for rated voltage.

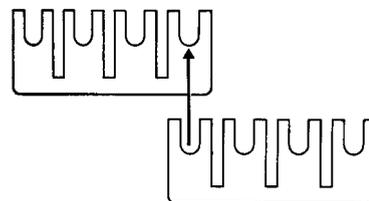
## ■ General

- I/O Blocks are color coded, as shown below, according to input/output and AC/DC specifications.

	I/O Terminal label	I/O Terminal indicators	I/O Relay case
<b>Output Block (DC)</b>	Yellow	Green	Transparent
<b>Input Block</b>	<b>DC</b>	Red	Green
	<b>AC</b>	Red	Red

- Both Input and Output Blocks do not have internal power supplies. For an Output Block, supply the relay drive power to the positive and negative terminals (either 12 or 24 VDC). Loads (terminal contacts 0 through 15) must also be supplied with appropriate power. For an Input Block, supply, to the positive and negative terminals, power for input signals to the controller.
- The same Connecting Cable, G79-Y, is used for the G7TC-OC08 eight-point Output Block as for other I/O Blocks; leave 8 points unconnected.
- Indicators indicate the presence or absence of signals.  
Use the display lever inside each relay for fault diagnosis. (Some relays do not have this lever depending on the specifications.)
- Each relay must be pressed down until its hold-down hooks engage completely. Heating or malfunction can result if relays are not mounted properly.
- Unlabeled terminals are not electrically connected. Use these for repeater terminals.
- Indicator positions and relay orientation differ between Input and Output Blocks. This is to aid in differentiating Input Blocks from Output Blocks and in following signal flow.
- DC Input Blocks and Output Blocks with G3TA-OD□□□□ have positive and negative terminals, with the positive terminals normally being on the top of the I/O Block. Reversing positive and negative terminals will prevent operation.

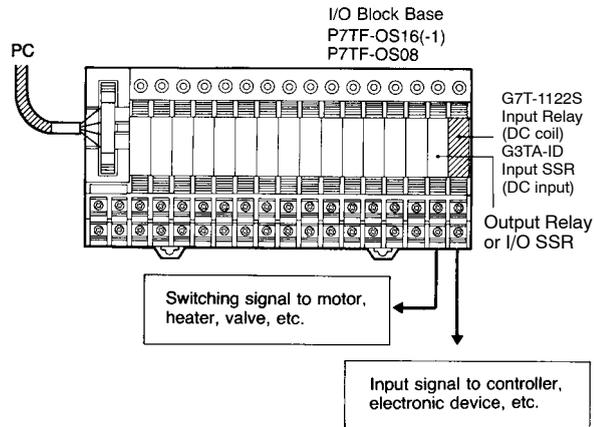
- DIN tracks are generally used to mount I/O Blocks. For screw mounting, a 210-mm DIN track is available that can be used as an adapter in combination with End Plates (PFP-M, two required).
- A Shorting Bar is provided to connect four terminals. The current capacity of the shorting bar is 20 A. As long as this current capacity is not exceeded, the shorting bar can be used in combination as shown at the right to connect more than four terminals.



- Special Connecting Cables are provided for connections to OMRON SYSMAC I/O Units with Connectors. Connecting Cables with two connectors, however, come in two types: Cables for Input Blocks (G79-I) and Cables for Output Blocks (G79-O). Be sure to purchase the correct Cable for the application.

## ■ Microload Switching

Input Relays (DC coil type) and I/O SSRs (DC input type) can be mounted onto an Output Block. Doing so enables using controller programming to simultaneously switch on or off two outputs (DPST-NO operation) to switch a SPST-NO load that in turn switches another SPST-NO load. One configuration for this is shown below.







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