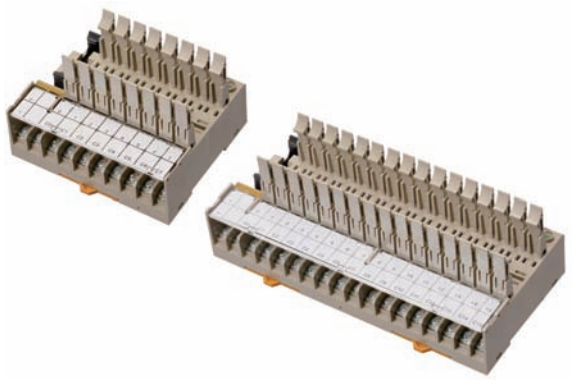
I/O Terminal Socket
P7TF-IS16/OS16/OS08

CSM_P7TF-IS16_OS16_OS08_DS_E_8_1

I/O Terminal Sockets to Flexibly Build Systems

- Mount either G7T I/O Relays or G3TA SSRs.
- Compact size for both Input and Output I/O Terminal Sockets: 182 (102 for 8 I/O points) (W) × 85 (D) × 68 (H) mm.
- Surge absorption circuits provided.
- LED indicators as a standard feature.
- DIN Track mounting.



Ordering Information

I/O Terminal Sockets

When ordering, specify the rated voltage.

I/O classification	I/O points	Internal I/O common	Rated voltage	Model
For inputs	16	NPN (– common)	12 VDC	**P7TF-IS16 DC12**
			24 VDC	**P7TF-IS16 DC24**
			100/110 VDC	**P7TF-IS16 DC100/110**
			100/110 VAC	**P7TF-IS16 AC100/110**
			200/220 VAC	**P7TF-IS16 AC200/220**
For outputs		NPN (+ common)	12 VDC	**P7TF-OS16 DC12**
			24 VDC	**P7TF-OS16 DC24**
		PNP (– common)	12 VDC	**P7TF-OS16-1 DC12**
			24 VDC	**P7TF-OS16-1 DC24**
	8	NPN (+ common)	12 VDC	**P7TF-OS08 DC12**
			24 VDC	**P7TF-OS08 DC24**

Accessories (Order Separately)

Cables for I/O Relay Terminals

- Cables with Loose Wires and Crimp Terminals: XW2Z-RY□C
- Cables with Loose Wires: XW2Z-RA□C
- Cables with Connectors: XW2Z-R□C-□-□
- Cables with Connectors (1:2): XW2Z-RO□C-□ and XW2Z-RI□C-□
- Cables with Connectors (1:1): XW2Z-R□C

Refer to the XW2Z-R Datasheet for details.

Shorting Bar

Model
G78-04

Output Short-Circuit Module

Model
G77-S

Sockets

Model
P7TF-05

Indicator Module (with Surge Suppressing Function)

Type	Applicable relay coil voltage	Model	Remarks
For AC Relays	100 (110) VAC	**P70A AC100/110**	Varistors
	200 (220) VAC	**P70A AC200/220**	
For DC Relays	12/24 VDC	**P70D DC12/24**	Diodes

Note: 1. Order the Indicator Module that is suited to the Relay coil voltage.
2. The Indicator Module for DC Relays has a multiple power supply common to 12 and 24 VDC.
3. The input current is as given below (reference values).
100/110 VAC: 1.14 to 1.38 mA
200/220 VAC: 1.40 to 1.71 mA
12/24 VDC: 4.83 to 5.90 mA
4. Weight: Approx. 6 g

Accessories for DIN Track Mounting

Refer to your OMRON website for details on the PFP-□.

Accessories (Order Separately)

Mountable I/O Relays

I/O classification	Rated coil voltage	Contact structure	Case color	Rated load (resistive load)	Model
For inputs	12 VDC	SPST-NO	Transparent green	1 A at 24 VDC 1 A at 110 VAC	G7T-1122S DC12 ✻
	24 VDC				G7T-1122S DC24 ✻
	100/110 VDC				G7T-1122S DC100/110 ✻
	100/110 VAC		Transparent red		G7T-1122S AC100/110 ✻
	200/220 VAC				G7T-1122S AC200/220 ✻
For outputs	12 VDC		Transparent	5 A at 24 VDC 2 A at 220 VAC	G7T-1112S DC12 ✻
	24 VDC				G7T-1112S DC24 ✻
	12 VDC	SPST-NC			G7T-1012S DC12
	24 VDC				G7T-1012S DC24

Mountable I/O SSRs

I/O classification	Rated input voltage	Isolation	Operation indicator	Zero cross function	Applicable load	Model
For inputs	5 to 24 VDC	Photocoupler	Yes	---	Logic level supply current: 25 mA	G3TA-IDZR02S-US DC5-24
	4 to 24 VDC		No			G3TA-IDZR02SM-US
	100 to 240 VAC		Yes			G3TA-IAZR02S-US AC100-240
For outputs	12 VDC	Phototriac	Yes	Yes	2 A at 100 to 240 VAC	G3TA-OA202SZ-US DC12
	24 VDC					G3TA-OA202SZ-US DC24
	12 VDC			No		G3TA-OA202SL-US DC12
	24 VDC					G3TA-OA202SL-US DC24
	12 VDC	Photocoupler		---	2 A at 5 to 48 VDC	G3TA-ODX02S-US DC12
	24 VDC					G3TA-ODX02S-US DC24
	12 VDC				1 A at 48 to 200 VDC	G3TA-OD201S-US DC12
	24 VDC					G3TA-OD201S-US DC24

Note: "For inputs" and "for outputs" indicate the I/O relationship to a PLC.
Input Relays and SSRs are mainly suitable for input signals to a PLC or other device. Output Relays are mainly suitable to switching loads that receive output signals from a PLC or other device. The Input and Output Relays and SSRs have different switching performances. Select a suitable Relay for the application.

✻ Mounted as standard features to G7TC I/O Relay Terminals.

Specifications

Item	Model	P7TF-IS16 AC	P7TF-IS16 DC	P7TF-OS16 P7TF-OS16-1	P7TF-OS08
Contact resistance*		10 mΩ max.			
Terminal block	Permissible current	100 mA		10 A	
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 minute		2,000 VAC, 50/60 Hz for 1 minute	
	Insulation resistance	100 MΩ min. (at 500 VDC)		1,000 MΩ min. (at 500 VDC)	
Vibration resistance		10 to 55 Hz with 1.0-mm double amplitude			
Shock resistance		200m/s^2			
Noise immunity		Noise level: 1.6 kV; pulse width: 100 ns to 1 μs			
Ambient operating temperature		0 to 55°C (with no icing or condensation)			
Ambient operating humidity		35% to 85%			
Tightening torque for external connections		0.78 to 1.17 N·m			
LED color		Red	Green		
Coil surge absorption element		Varistors	Diodes (1 A, 400 V)		
Protection diode for inverse connection		Diodes (2 A, Reverse withstand voltage: 400 V)			
Weight		Approx. 360 g		Approx. 400 g	Approx. 350 g

Note: The above values are initial values.

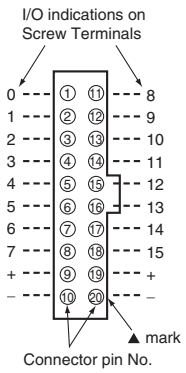
✻ Measurement: 1 A at 5 VDC.

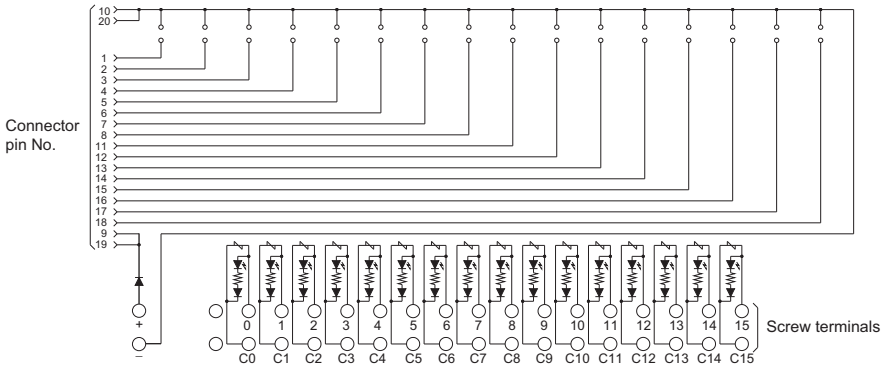
Internal Circuits

P7TF-IS16

For AC
(NPN input/- common)

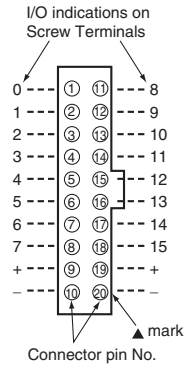
Connector Pin (male) Configuration
View from engaged side

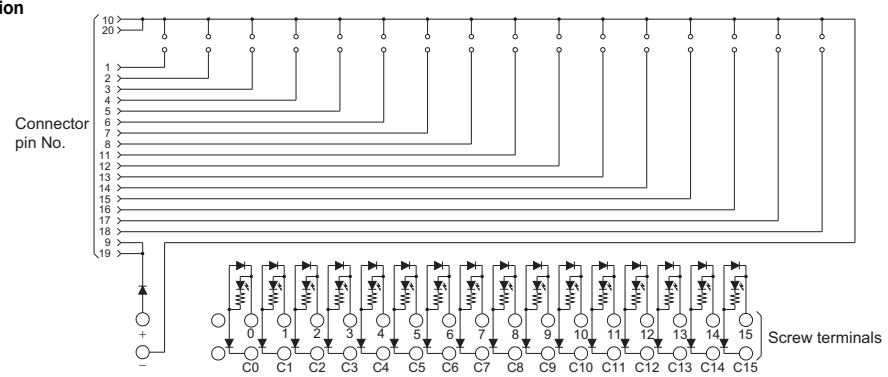




For DC
(NPN input/- common)

Connector Pin (male) Configuration
View from engaged side



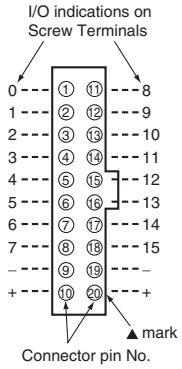


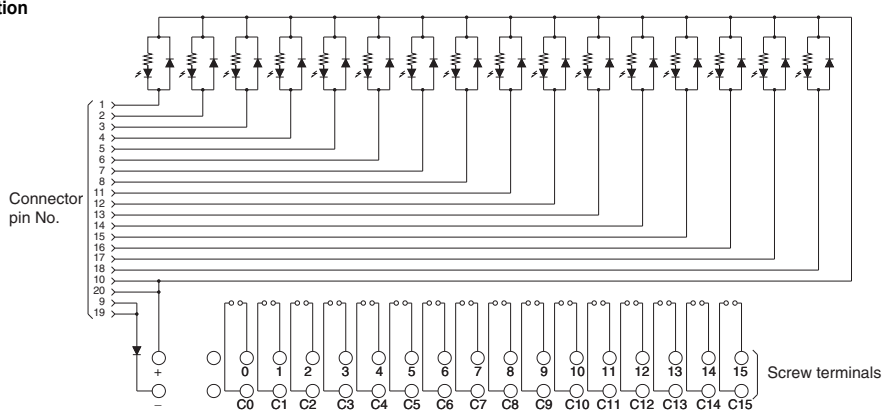
Note: Pin numbers are indicated for convenience. The ▲ mark can be used to determine orientation.

P7TF-OS16

(NPN output/+ common)

Connector Pin (male) Configuration
View from engaged side

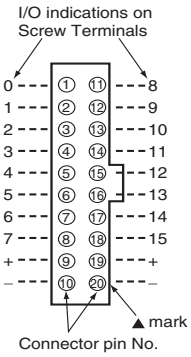


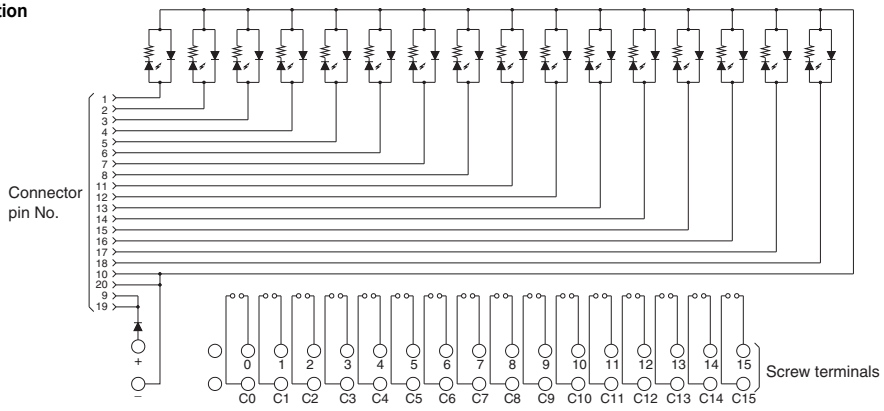


P7TF-OS16-1

(PNP output/- common)

Connector Pin (male) Configuration
View from engaged side

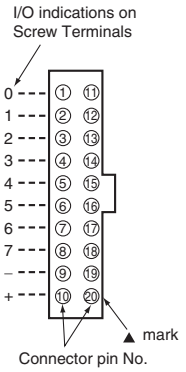


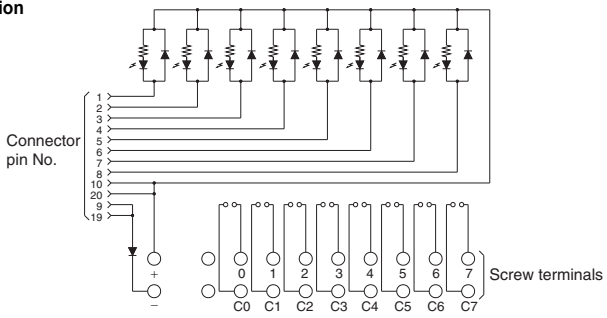


P7TF-OS08

(NPN output/+ common)

Connector Pin (male) Configuration
View from engaged side





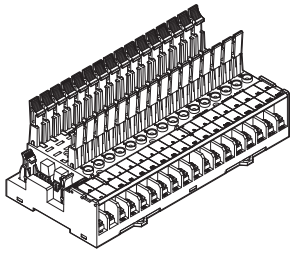
Note: Pin numbers are indicated for convenience. The ▲ mark can be used to determine orientation.

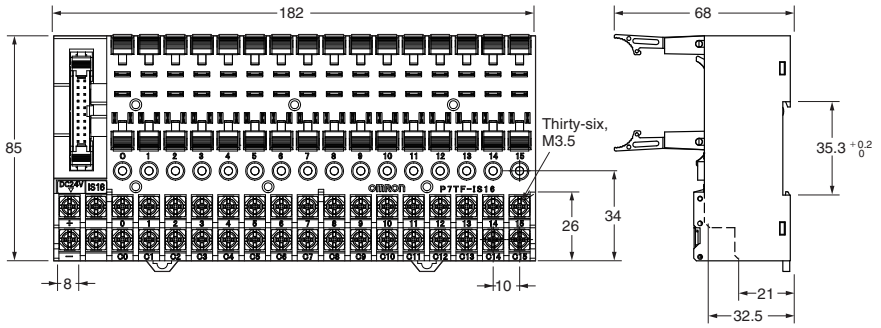
Dimensions

(Unit: mm)

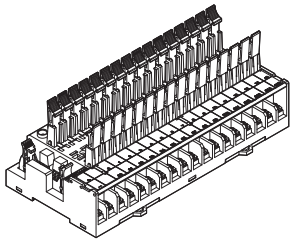
I/O Terminal Sockets

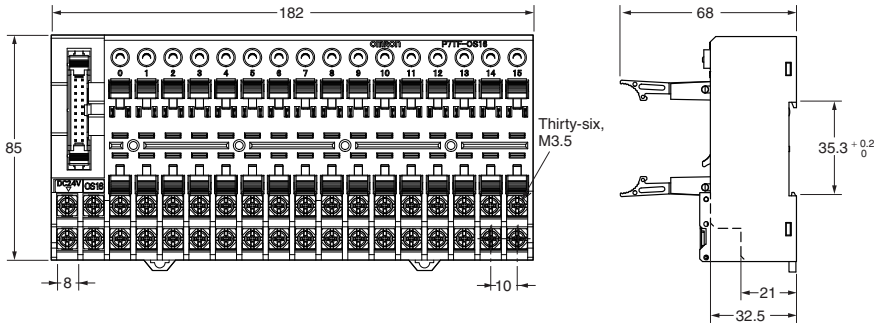
P7TF-IS16



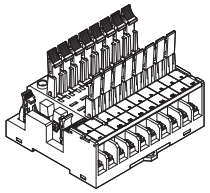


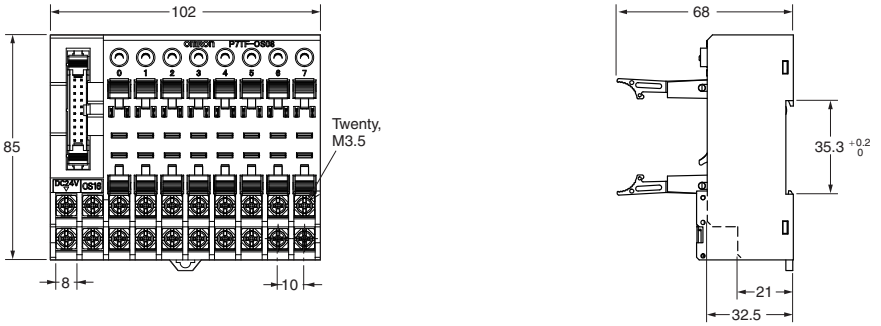
P7TF-OS16
P7TF-OS16-1





P7TF-OS08



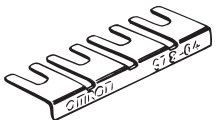


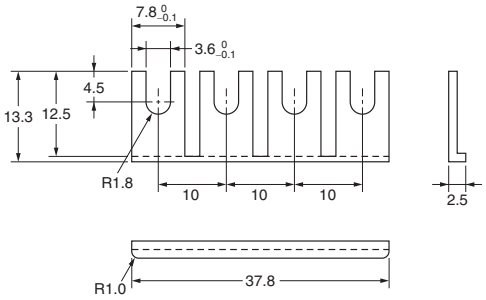
Accessories (Order Separately)

Shorting Bar

G78-04

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

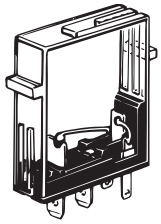


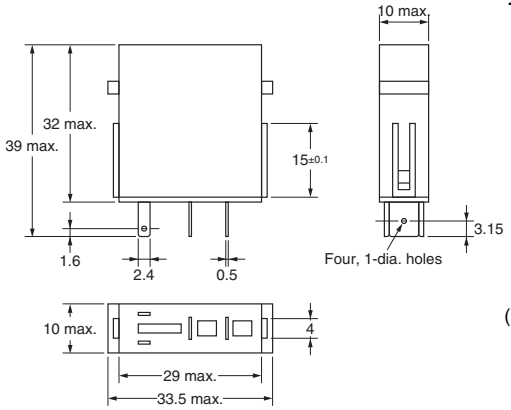


Output Short-Circuit Module

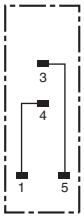
G77-S

The output of the I/O Relay Terminal can be obtained without relays through the G77-S Output Short-Circuit Module.
Refer to *Connection Example for SPDT Relays* on page 7 for details.
Note that the G77-S Output Short-Circuit Module is not available for inputs.





Terminal Arrangement/ Internal Connections (Bottom View)

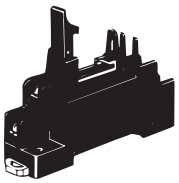


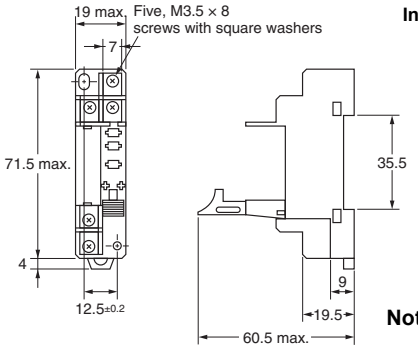
(The coil has no polarity.)

Sockets (Can be used for G7T models with SPST-NO, SPST-NC, or SPDT specifications or G3TA models.)

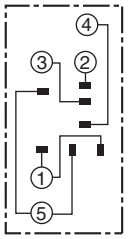
P7TF-05

Can be used for sequences that use Slim Relays and for applications that develop to SPDT contacts on I/O Relay Terminals.
To use SPDT on the P7TF I/O Terminal Socket, insert an Output Short-Circuit Module on the I/O Terminal, and combine the Block Base with an SPDT Relay on the output from the Output Short-Circuit Module.





Internal Connections (Top View)



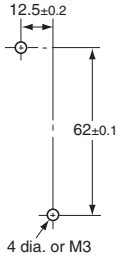
Note: Terminal 1 is positive when the I/O SSR is employed.

Specifications

Contact resistance ✻	10 mΩ max.
Dielectric strength	2,000 VAC for 1 minute
Insulation resistance	1,000 MΩ min. (at 500 VDC)
Vibration resistance	10 to 55 to 10 Hz with 0.5-mm single amplitude (1.0-mm double amplitude)
Shock resistance	1,000m/s^2
Ambient operating temperature	–40 to 70°C (with no icing or condensation)
Ambient operating humidity	5% to 85%
Weight	Approx. 28 g

✻ Measurement conditions: 1 A at 5 VDC using the voltage drop method

Mounting Hole Dimensions

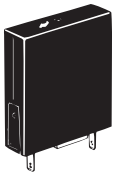


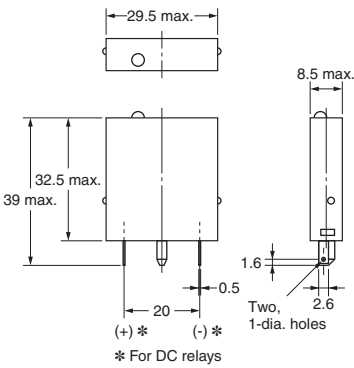
Note: Terminal 1 is positive when the G3TA or Indicator Module is employed.

Indicator Module (with Surge Suppressing Function)

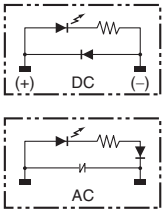
P70☐

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.





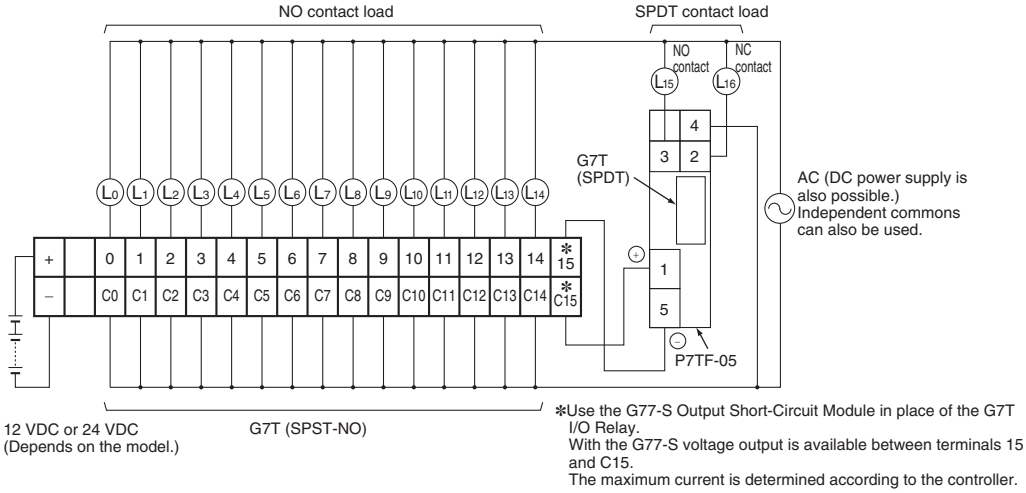
✻ For DC relays



There is no coil polarity for AC Relays.

Connection Example for SPDT Relays

The following is an application example for the P7TF-05 using an SPDT Relay on a terminal of the P7TF-OS16/OS08.



Note: If more than one G77-S Output Short-Circuit Module is employed, the voltage output of the terminals on the P7TF is as follows:
P7TF-OS16: The positive side (the lower row) connects to the common line internally.
P7TF-OS16-1: The negative side (the upper row) connects to the common line internally.

Safety Precautions

Be sure to read the *Common Precautions for I/O Relay Terminal* in the website at the following URL: http://www.ia.omron.com/.

Warning Indications

Precautions for Correct Use	**Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effects on product performance.**

Precautions for Correct Use

General

I/O Relays and I/O Relay Terminal can be combined as follows to from I/O Relay Terminal:

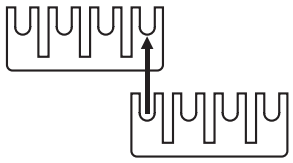
		I/O Terminal Socket ✻	Replaceable Relay		
			I/O Relay	I/O SSR	
For outputs	DC	P7TF-OS16 P7TF-OS16-1 P7TF-OS08	G7T-1112S (SPST-NO type) G7T-1012S (SPST-NC type)	AC	G3TA-OA202SZ-US G3TA-OA202SL-US
				DC	G3TA-ODX02S-US G3TA-OD201S-US
For inputs	DC	P7TF-IS16 (DC)	G7T-1122S	DC	G3TA-IDZR02S(M)-US
	AC	P7TF-IS16 (AC)		AC	G3TA-IAZR02S-US

✻ Relays are not mounted to the P7TF I/O Terminal Socket. Mount I/O Relays or I/O SSRs to the sockets. Specify the rated voltage in the same way as when ordering the P7TF I/O Terminal Socket.

- Combinations of AC Input Relays/SSRs and DC Input Relays/SSRs cannot be used with the same I/O Terminal Socket. This is because specifications for coil surge absorption elements are different.
  Relays/SSRs with different voltage specifications cannot be used with the same I/O Terminal Socket. (For example, a 100-VAC Input Relay/SSR and a 200-VAC Input Relay/SSR, or a 12-VDC Output Relay/SSR and a 24-VDC Output Relay cannot be used with the same I/O Terminal Socket.)
  This is because specifications of operation indicator circuits are different.
- Only use I/O Terminal Sockets, I/O Relays, and I/O SSRs with the same specifications for rated voltage.
- I/O Terminal Socket 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
For outputs	DC	Yellow	Green	Transparent
For inputs	DC	Red	Green	Green
	AC	Red	Red	Red

- 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 I/O Terminal Socket. This is to aid in differentiating Input I/O Terminal Sockets from Output Terminal Sockets and in following signal flow.
- DC Input I/O Terminal Sockets and Output I/O Terminal Sockets with G3TA-OD□□□□ have positive and negative terminals, with the positive terminals normally being on the top of the I/O Relay Terminal Socket. Reversing positive and negative terminals will prevent operation.
- DIN tracks are generally used to mount I/O Relay Terminal. 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 below to connect more than four terminals.

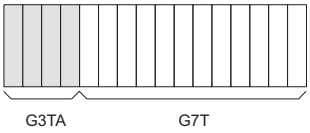


- Special Connecting Cables are provided for connections to OMRON SYSMAC PLC I/O Units with Connectors. Connecting Cables with two connectors, however, come in two types: Cables for Input Blocks (XW2Z-RI) and Cables for Output Blocks (XW2Z-RO).
  Be sure to purchase the correct Cable for the application.

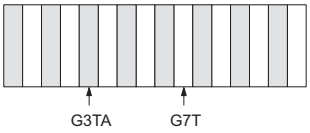
Microload Switching

- Input Relays (DC coil type) and I/O SSRs (DC input type) can be mounted onto an Output I/O Terminal Socket.

With up to four G3TA SSRs mounted before G7T Relays, switching is possible at the rated load current for each Relay.



With G3TA SSRs mounted before every other G7T Relays, switching is possible at the rated load current for each Relay.



Connection

With the SSR for DC switching, the load can be connected to either positive or negative output terminal of the SSR.

Protective Component

Since the SSR does not incorporate an overvoltage absorption component, be sure to connect an overvoltage absorption component when using the SSR under an inductive load.

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