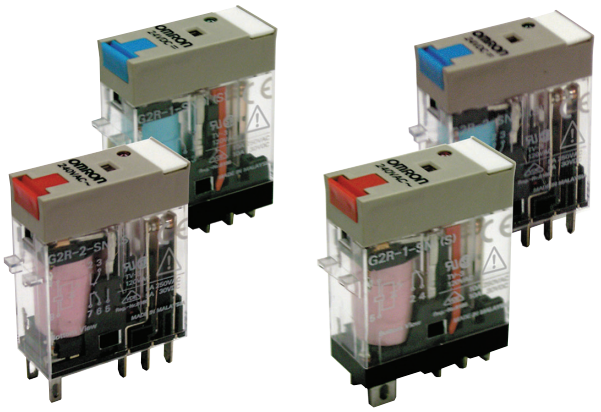
General-Purpose Relay

# G2R-□-S (S)

J140I-E-02

## Slim and Space-saving Power Plug-in Relay

- Reduces wiring work by 60% when combined with the P2RF-□-PU Push-In Plus Socket (according to actual OMRON measurements).
- Lockable test button models available.
- Built-in mechanical operation indicator.
- Provided with nameplate.
- AC type is equipped with a coil-disconnection self-diagnostic function (LED type).
- High switching power (1-pole: 10 A).



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

## Model Number Structure

### Model Number Legend

G2R - □ - S □ □ (S)
1 2 3 4 5

1. **Number of Poles**
   1: 1 pole
   2: 2 poles
2. **Terminals**
   S: Plug-in
3. **Classification**
   Blank: General-purpose
   N: LED indicator
   D: Diode
   ND: LED indicator and diode
   NI: LED indicator with test button
   NDI: LED indicator and diode with test button
4. **Rated Coil Voltage**
5. **Mechanical operation indicator and Nameplate**
   (S): Models with mechanical operation indicator and Nameplate

**Note:** Contact your OMRON representative for Relays with gold-plated contacts.

## Ordering Information

When your order, specify the rated voltage.

### List of Models

| Classification | Coil ratings | Contact form | |
|---|---|---|---|
| | | SPDT | DPDT |
| General-purpose | AC 24, 110, 120, 230, 240<br>DC 6, 12, 24, 48 | **G2R-1-S (S)** | **G2R-2-S (S)** |
| LED indicator | | **G2R-1-SN (S)** | **G2R-2-SN (S)** |
| LED indicator with test button | | **G2R-1-SNI (S)** | **G2R-2-SNI (S)** |
| Diode | DC 6, 12, 24, 48 | **G2R-1-SD (S)** | **G2R-2-SD (S)** |
| LED indicator and diode | | **G2R-1-SND (S)** | **G2R-2-SND (S)** |
| LED indicator and diode with test button | | **G2R-1-SNDI (S)** | **G2R-2-SNDI (S)** |

**Note: 1.** The standard models are compliant with UL/CSA and VDE standards. Also, an EC compliance declaration has been made for combinations with the P2RF-□-E, P2RF-□-S and P2RF-□-PU. The Relays bear the CE Marking.

**2.** Refer to *Connecting Sockets*, below, for applicable Socket models.

**3.** When ordering, add the rated coil voltage and "(S)" to the model number. Rated coil voltages are given in the coil ratings table.
Example: G2R-1-S 12 VDC (S)
└ Rated coil voltage

# Accessories (Order Separately)

## Connecting Sockets

| Applicable Relay model | | Track/surface-mounting Socket | | Back-mounting Socket | |
|---|---|---|---|---|---|
| | | Push-In Plus Terminal Blocks | Screw terminals * | PCB terminals | Solder terminals |
| No. of poles | | Model | Models | Models | Model |
| 1 pole | G2R-1-S (S) | P2RF-05-PU | P2RF-05<br>P2RF-05-E | P2R-05P<br>P2R-057P | P2R-05A |
| 2 poles | G2R-2-S (S) | P2RF-08-PU | P2RF-08<br>P2RF-08-E | P2R-08P<br>P2R-087P | P2R-08A |

* The structure of P2RF-□-E models provides finger protection. Round terminals cannot be used. Use forked crimp terminals.

## Accessories for Push-In Plus Terminal Block Sockets (P2RF-□-PU)

### Short Bars

| Pitch | No. of poles | Colors | Model ✱ | Minimum order (quantity) |
|---|---|---|---|---|
| 7.75 mm | 2 | Red (R)<br>Blue (S)<br>Yellow (Y) | PYDN-7.75-020□ | 10 |
| | 3 | | PYDN-7.75-030□ | |
| | 4 | | PYDN-7.75-040□ | |
| | 20 | | PYDN-7.75-200□ | |
| 15.5 mm | 8 | | PYDN-15.5-080□ | |

**Note:** Use the Short Bars for crossover wiring within one Socket or between Sockets.
* Replace the box (□) in the model number with the code for the covering color.

### Labels

| Model | Minimum order (sheet) (quantity per sheet) |
|---|---|
| XW5Z-P4.0LB1 | 5<br>1 sheet (60 pieces) |

## Mounting Tracks

| Applicable Socket | Description | | Model | Minimum order (quantity) |
|---|---|---|---|---|
| Track-connecting Socket | Mounting track | 50 cm (ℓ) × 7.3 mm (t): | PFP-50N | --- |
| | | 1 m (ℓ) × 7.3 mm (t): | PFP-100N | |
| | | 1 m (ℓ) × 16 mm (t): | PFP-100N2 | |
| | End plate *1 | | PFP-M | 10 |
| | Spacer | | PFP-S | |
| Back-connecting Socket | Mounting plate *2 | | P2R-P | 1 |

*1. When mounting DIN rail, please use End Plate (PFP-M).
*2. Used to mount several P2R-05A and P2R-08A Connecting Sockets side by side.

# Specifications

## Coil Ratings

| Rated voltage | | Rated current* | | Coil resistance | Coil inductance (H) (ref. value) | | Must operate voltage | Must release voltage | Max. voltage | Power consumption (approx.) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 50 Hz | 60 Hz | | Armature OFF | Armature ON | % of rated voltage | | | |
| AC | 24 V | 43.5 mA | 37.4 mA | 253 Ω | 0.81 | 1.55 | 80% max. | 30% max. | 110% | 0.9 VA at 60 Hz |
| | 110 V | 9.5 mA | 8.2 mA | 5,566 Ω | 13.33 | 26.83 | | | | |
| | 120 V | 8.6 mA | 7.5 mA | 7,286 Ω | 16.13 | 32.46 | | | | |
| | 230 V | 4.4 mA | 3.8 mA | 27,172 Ω | 72.68 | 143.90 | | | | |
| | 240 V | 3.7 mA | 3.2 mA | 30,360 Ω | 90.58 | 182.34 | | | | |

| Rated voltage | | Rated current* | Coil resistance | Coil inductance (H) (ref. value) | | Must operate voltage | Must release voltage | Max. voltage | Power consumption (approx.) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Armature OFF | Armature ON | % of rated voltage | | | |
| DC | 6 V | 87.0 mA | 69 Ω | 0.25 | 0.48 | 70% max. | 15% min. | 110% | 0.53 W |
| | 12 V | 43.2 mA | 278 Ω | 0.98 | 2.35 | | | | |
| | 24 V | 21.6 mA | 1,113 Ω | 3.60 | 8.25 | | | | |
| | 48 V | 11.4 mA | 4,220 Ω | 15.2 | 29.82 | | | | |

**Note: 1.** The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/-20% for the AC rated current and ±10% for the DC coil resistance.
**2.** The AC coil resistance and inductance values are reference values only (at 60 Hz).
**3.** Operating characteristics were measured at a coil temperature of 23°C.
**4.** The maximum voltage is the maximum possible value of the voltage that can be applied to the relay coil. It is not the maximum voltage that can be applied continuously.

## Contact Ratings

| Number of poles | 1 pole | | 2 poles | |
|---|---|---|---|---|
| Load | 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) |
| Rated load | 10 A at 250 VAC; 10 A at 30 VDC | 7.5 A at 250 VAC; 5 A at 30 VDC | 5 A at 250 VAC; 5 A at 30 VDC | 2 A at 250 VAC; 3 A at 30 VDC |
| Rated carry current | 10 A | | 5 A | |
| Max. switching voltage | 440 VAC, 125 VDC | | 380 VAC, 125 VDC | |
| Max. switching current | 10 A | | 5 A | |
| Max. switching power | 2,500 VA, 300 W | 1,875 VA, 150 W | 1,250 VA, 150 W | 500 VA, 90 W |
| Failure rate (reference value) * | 100 mA at 5 VDC | | 10 mA at 5 VDC | |

**Note:** P level: $\lambda_{60}$ = 0.1 x $10^{-6}$/operation
*This value was measured at a switching frequency of 120 operations per minute.

## Characteristics

| Item | 1 pole | 2 poles |
|---|---|---|
| **Contact configration** | SPDT | |
| **Contact structure** | Single | |
| **Contact resistance** | 100 mΩ max. | |
| **Operate (set) time** | 15 ms max. | |
| **Release (reset) time** | AC: 10 ms max.; DC: 5 ms max.<br>(w/built-in diode: 20 ms max.) | AC: 15 ms max.; DC: 10 ms max.<br>(w/built-in diode: 20 ms max.) |
| **Max. operating frequency** | Mechanical: 18,000 operations/hr<br>Electrical: 1,800 operations/hr (under rated load) | |
| **Insulation resistance** | 1,000 MΩ min. (at 500 VDC) | |
| **Dielectric strength *** | 5,000 VAC, 50/60 Hz for 1 min between coil and contacts;<br>1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity | 5,000 VAC, 50/60 Hz for 1 min between coil and contacts;<br>3,000 VAC, 50/60 Hz for 1 min between contacts of different polarity<br>1,000 VAC, 50/60 Hz for 1 min between contacts of same polarity |
| **Vibration resistance** | Destruction: 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude)<br>Malfunction: 10 to 55 to 10 Hz, 0.75 mm single amplitude (1.5 mm double amplitude) | |
| **Shock resistance** | Destruction: 1,000 $m/s^2$<br>Malfunction: 200 $m/s^2$ when energized; 100 $m/s^2$ when not energized | |
| **Endurance** | Mechanical: AC coil: 10,000,000 operations min.;<br>DC coil: 20,000,000 operations min. (at 18,000 operations/hr)<br>Electrical: 100,000 operations min. (at 1,800 operations/hr under rated load) | |
| **Ambient temperature** | Operating: –40°C to 70°C (with no icing or condensation) | |
| **Ambient humidity** | Operating: 5% to 85% | |
| **Weight** | Approx. 20 g | |

**Note:** Values in the above table are the initial values.
* These values are relay only. Prease refer to the “Products Related to Common Sockets and DIN Tracks Data Sheet” for connecting sockets.

## Approved Standards

### UL 508 (File No. E41643)

| Model | Contact form | Coil ratings | Contact ratings | Operations |
|---|---|---|---|---|
| G2R-1-S (S) | SPDT | 5 to 110 VDC<br>6 to 240 VAC | 10 A, 30 VDC (resistive)<br>10 A, 250 VAC (general use) | $100 \times 10^3$ |
| | | | TV-3 (NO contact only) | $25 \times 10^3$ |
| G2R-2-S (S) | DPDT | | 5 A, 30 VDC (resistive)<br>5 A, 250 VAC (general use) | $100 \times 10^3$ |
| | | | TV-3 (NO contact only) | $25 \times 10^3$ |

### CSA 22.2 No.0, No.14 (File No. LR31928)

| Model | Contact form | Coil ratings | Contact ratings | Operations |
|---|---|---|---|---|
| G2R-1-S (S) | SPDT | 5 to 110 VDC<br>6 to 240 VAC | 10 A, 30 VDC (resistive)<br>10 A, 250 VAC (general use) | $100 \times 10^3$ |
| | | | TV-3 (NO contact only) | $25 \times 10^3$ |
| G2R-2-S (S) | DPDT | | 5 A, 30 VDC (resistive)<br>5 A, 250 VAC (general use) | $100 \times 10^3$ |
| | | | TV-3 (NO contact only) | $25 \times 10^3$ |

### IEC/VDE (Certificate No. 40015012 EN 61810-1)

| Contact form | Coil ratings | Contact ratings | Operations |
|---|---|---|---|
| 1 pole | 6, 12, 24, 48 VDC<br>24, 110, 120, 230, 240 VAC | 5 A, 440 VAC ($\cos\phi$ = 1.0)<br>10 A, 250 VAC ($\cos\phi$ = 1.0)<br>10 A, 30 VDC (0 ms) | $100 \times 10^3$ |
| 2 poles | 6, 12, 24, 48 VDC<br>24, 110, 120, 230, 240 VAC | 5 A, 250 VAC ($\cos\phi$ =1.0)<br>5 A, 30 VDC (0 ms) | $100 \times 10^3$ |

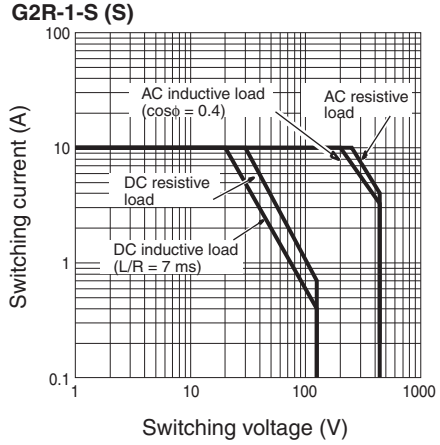
### LR

| Number of poles | Coil ratings | Contact ratings | Operations |
|---|---|---|---|
| 1 pole | 5 to 110 VDC<br>6 to 240 VDC | 10 A, 250 VAC (general use)<br>7.5 A, 250 VAC (PF0.4)<br>10 A, 30 VDC (resistive)<br>5A, 30VDC (L/R=7ms) | $100 \times 10^3$ |
| 2 poles | 5 to 110 VDC<br>6 to 240 VDC | 5 A, 250 VAC (general use)<br>2 A, 250 VAC (PF0.4)<br>5 A, 30 VDC (resistive)<br>3A, 30VDC (L/R=7ms) | $100 \times 10^3$ |

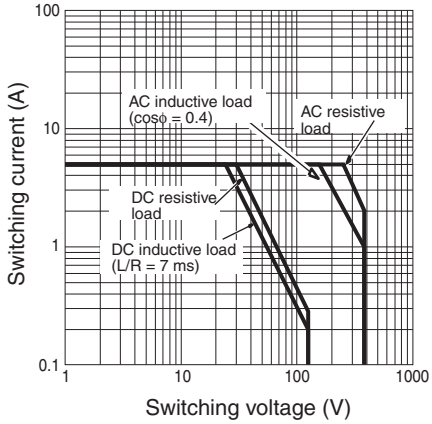
# Engineering Data

## Maximum Switching Power

G2R-1-S (S)

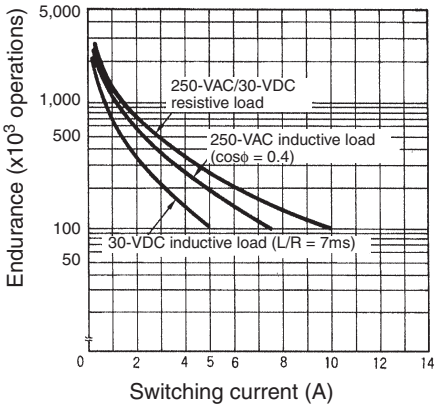



G2R-2-S (S)

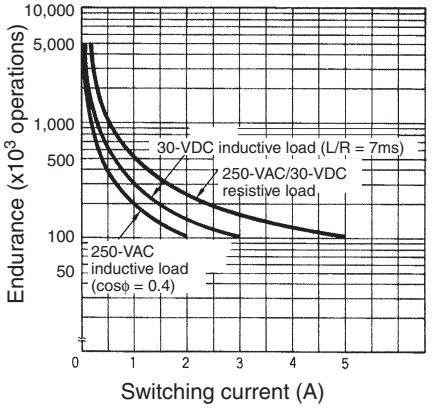



## Endurance

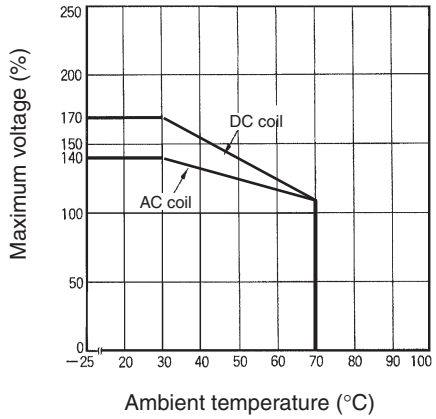
G2R-1-S (S)




G2R-2-S (S)




## Ambient Temperature vs Maximum Coil Voltage



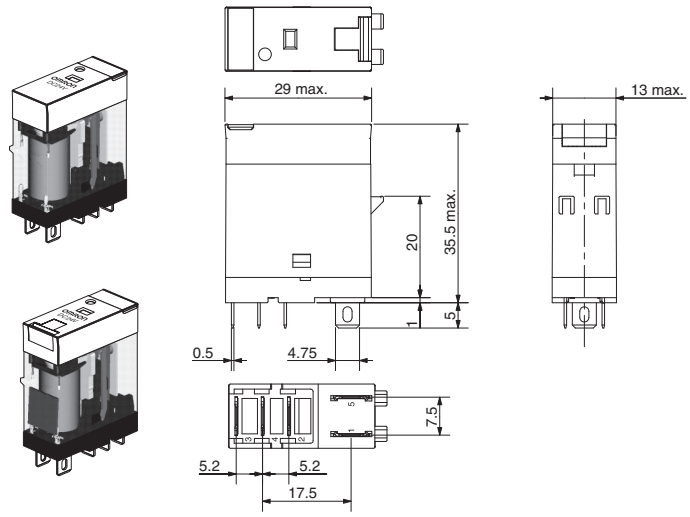
# Dimensions

(Unit: mm)

**Note:** All units are in millimeters unless otherwise indicated.

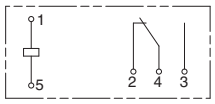
## SPDT Relays

**G2R-1-S (S), G2R-1-SN (S), G2R-1-SNI (S)**
**G2R-1-SD (S), G2R-1-SND (S), G2R-1-SNDI (S)**

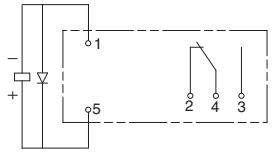



**Terminal Arrangement/Internal Connections (Bottom View)**

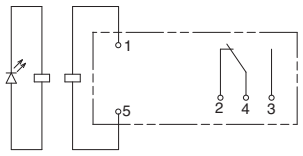
**G2R-1-S (S)**



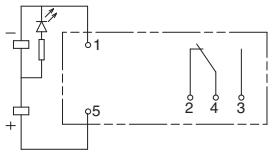

**G2R-1-SD (S) (DC)**



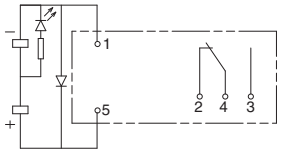

**G2R-1-SN (S), G2R-1-SNI (S) (AC)**




**G2R-1-SN (S), G2R-1-SNI (S) (DC)**

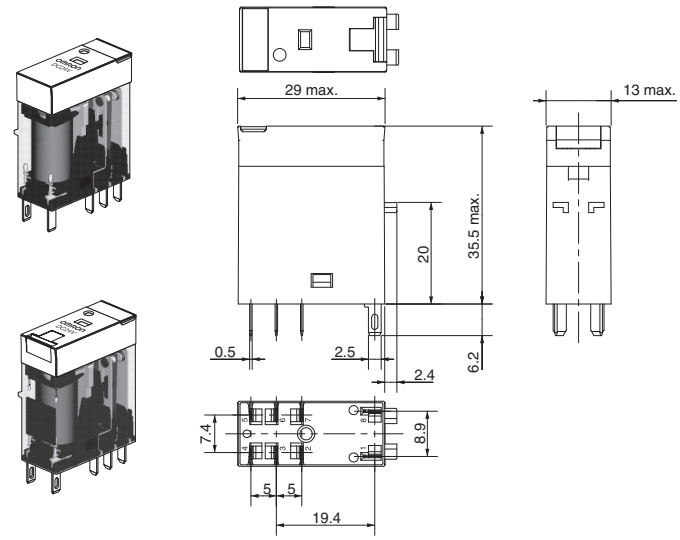



**G2R-1-SND (S), G2R-1-SNDI (S) (DC)**



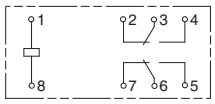

## DPDT Relays

**G2R-2-S (S), G2R-2-SN (S), G2R-2-SNI (S)**
**G2R-2-SD (S), G2R-2-SND (S), G2R-2-SNDI (S)**

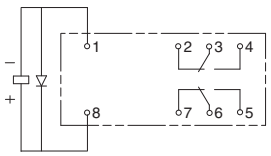



**Terminal Arrangement/Internal Connections (Bottom View)**

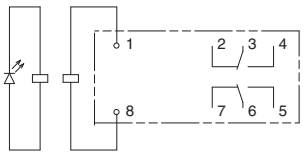
**G2R-2-S (S)**



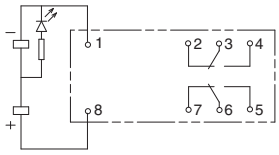

**G2R-2-SD (S) (DC)**



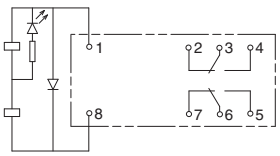

**G2R-2-SN (S), G2R-2-SNI (S) (AC)**




**G2R-2-SN (S), G2R-2-SNI (S) (DC)**

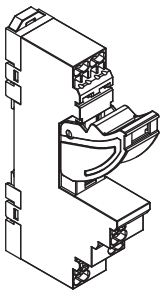


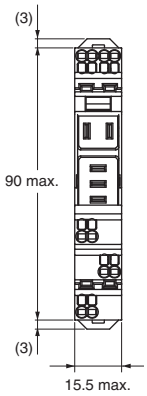

**G2R-2-SND (S), G2R-2-SNDI (S) (DC)**

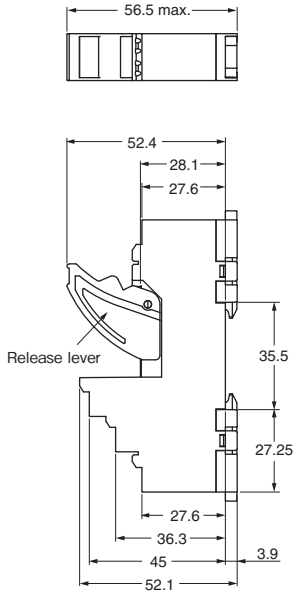


## Track/Surface Mounting Sockets

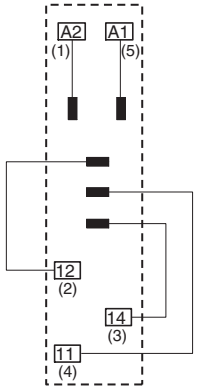
### P2RF-05-PU





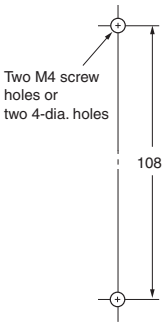




**Terminal Arrangement/ Internal Connection Diagram (Top View)**



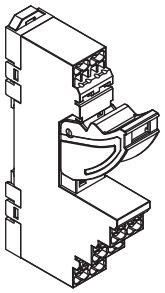

**Note:** The numbers in parentheses are traditionally used terminal numbers.

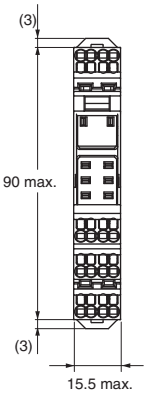
**Mounting Hole Dimensions**

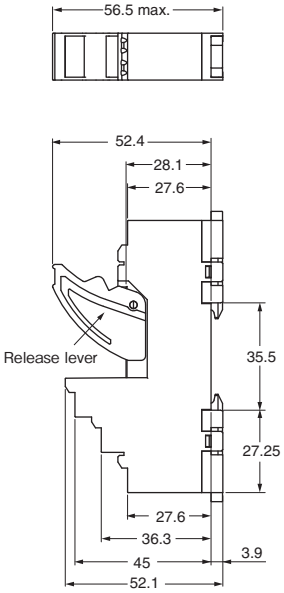



**Note:** Pull out the hooks to mount the Relay with screws.

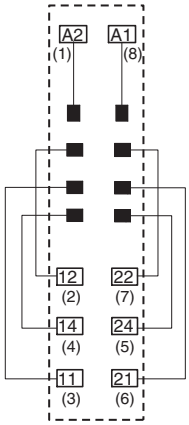
### P2RF-08-PU





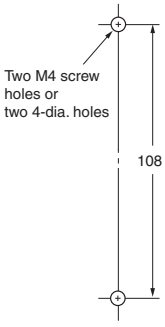




**Terminal Arrangement/ Internal Connection Diagram (Top View)**




**Note:** The numbers in parentheses are traditionally used terminal numbers.

**Mounting Hole Dimensions**

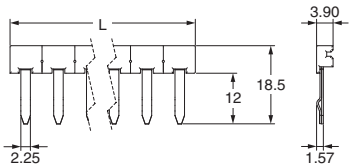



**Note:** Pull out the hooks to mount the Relay with screws.

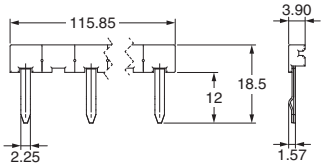
## Accessories for P2RF-□-PU

### Short Bars

#### PYDN-7.75-□□ (7.75 mm)




#### PYDN-15.5-080□ (15.5 mm)




| Application | Pitch | No. of poles | L (Length) | Colors | Model * | Maximum carry current |
|---|---|---|---|---|---|---|
| For Contact terminals (common) | 7.75 mm | 2 | 15.1 | Red (R) Blue (S) Yellow (Y) | PYDN-7.75-020□ | 20 A |
| | | 3 | 22.85 | | PYDN-7.75-030□ | |
| | | 4 | 30.6 | | PYDN-7.75-040□ | |
| | | 20 | 154.6 | | PYDN-7.75-200□ | |
| For Coil terminals | 15.5 mm | 8 | 115.85 | | PYDN-15.5-080□ | |

* Replace the box (□) in the model number with the code for the covering color.

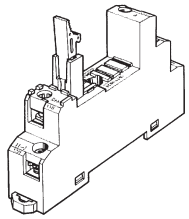
**Note: 1.** Use the Short Bars for crossover wiring within one Socket or between Sockets.

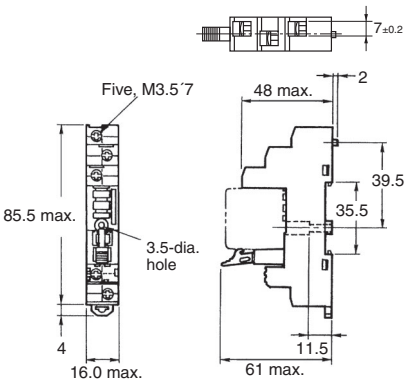
**2.** When using short bar to coil terminals of P2RF-□□-PU, A1 terminal cannot be used. In case crossover wiring of A1 terminal side is needed, crossover wiring using A1 terminals by wire is possible.

**Short bar correspondence table**

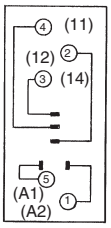
| | Contact terminal (Common) | Coil terminal | |
|---|---|---|---|
| | | A1 | A2 |
| P2RF-□□-PU | Available | --- | ❍ |

## P2RF-05-E

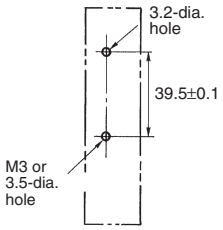





**Terminal Arrangement (Top View)**

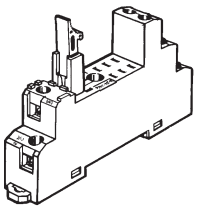


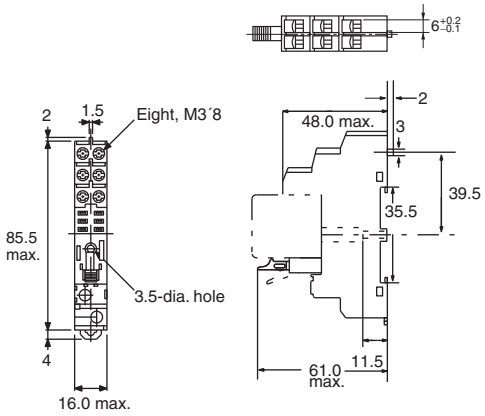

**Mounting Holes (for Surface Mounting)**



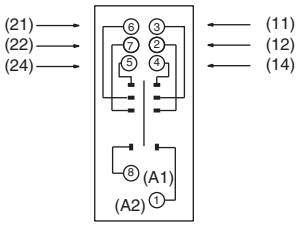

**Note:** Pin numbers in parentheses apply to DIN standard.

## P2RF-08-E

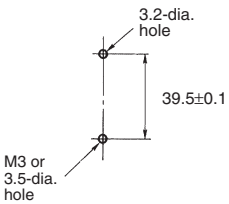




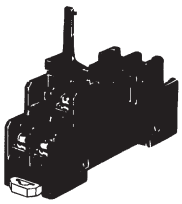

**Terminal Arrangement (Top View)**

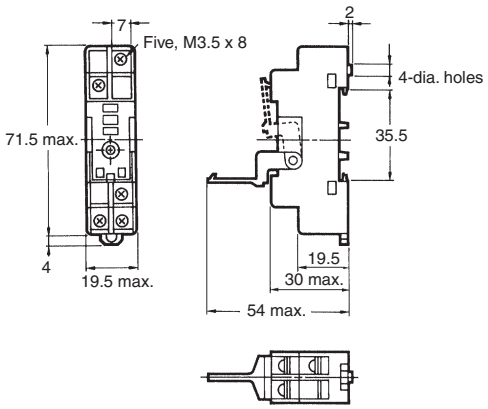



**Mounting Holes (for Surface Mounting)**

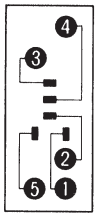



## P2RF-05

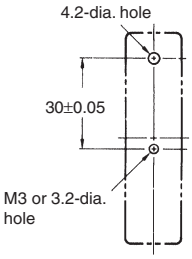




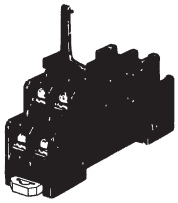

**Terminal Arrangement (Top View)**

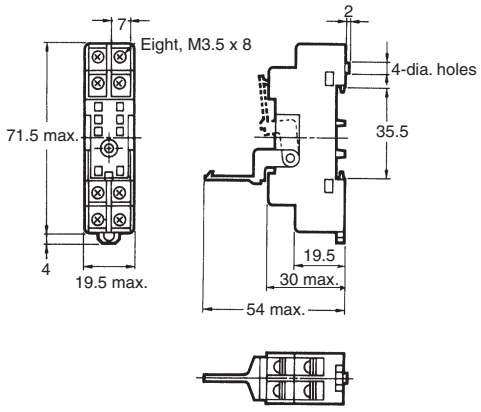



**Mounting Holes (for Surface Mounting)**

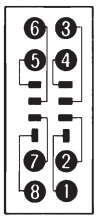



## P2RF-08

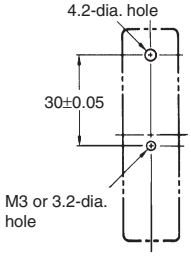





**Terminal Arrangement (Top View)**

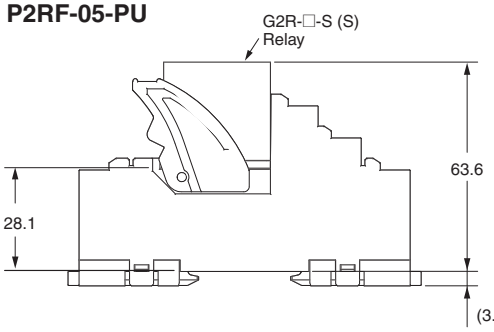



**Mounting Holes (for Surface Mounting)**

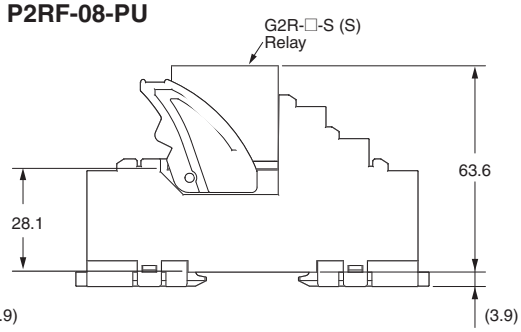


## Mounting Height of Relay with Track/Surface Mounting Sockets

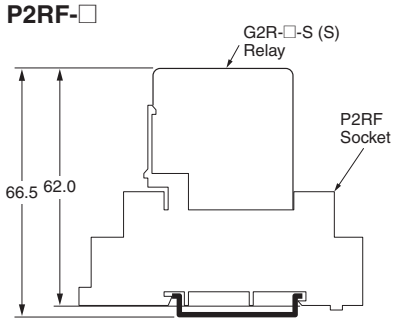
**P2RF-05-PU**



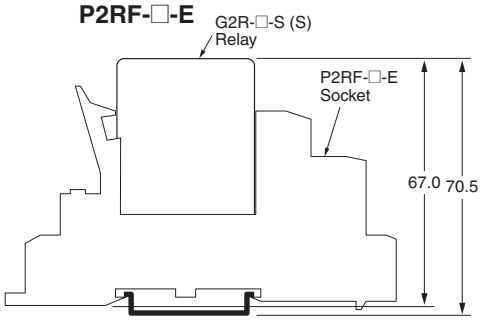

**P2RF-08-PU**




**P2RF-□**

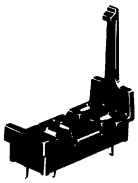


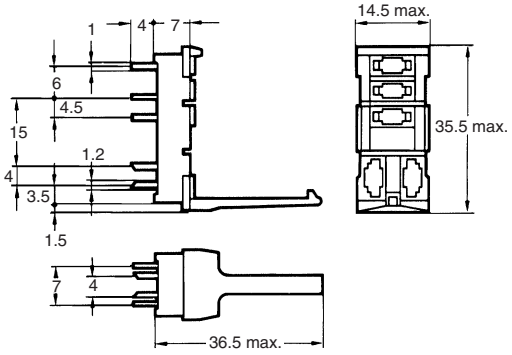

**P2RF-□-E**



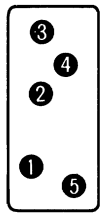

## Back-connecting Sockets

**P2R-05P (1-pole)**



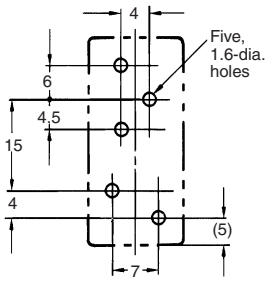



**Terminal Arrangement (Bottom View)**

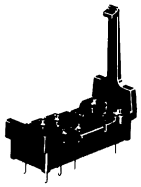


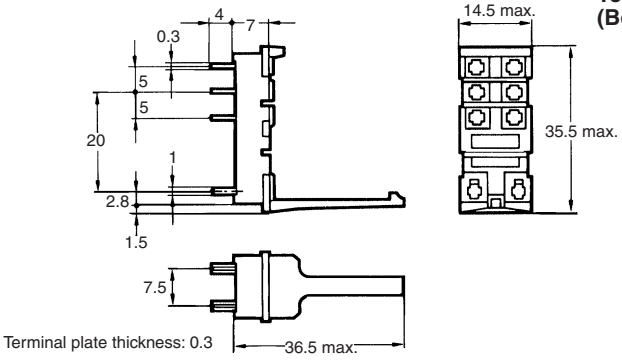

**Mounting Holes**

Tolerance: ±0.1

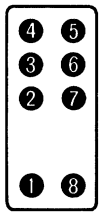



**P2R-08P (2-pole)**

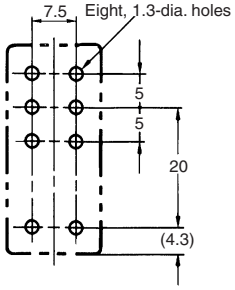




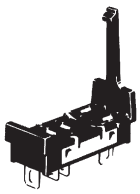

**Terminal Arrangement (Bottom View)**

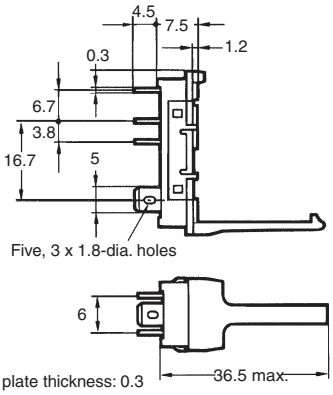


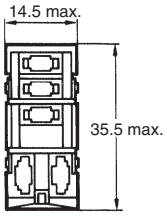

**Mounting Holes**



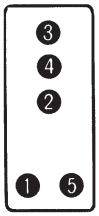
### P2R-05A (1-pole)



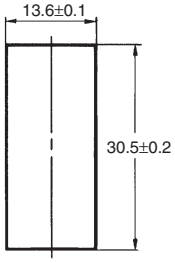



**Terminal Arrangement (Bottom View)**

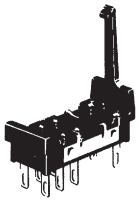


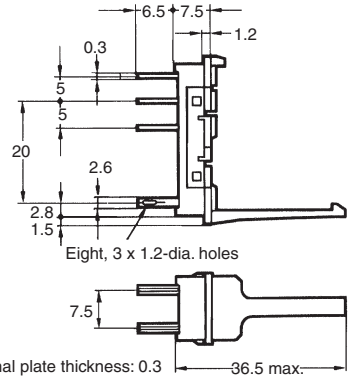

**Panel Cutout**

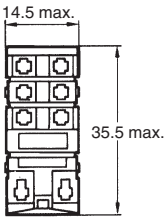



Recommended thickness of the panel is 1.6 to 2.0 mm

### P2R-08A (2-pole)

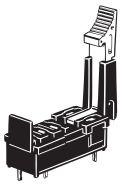


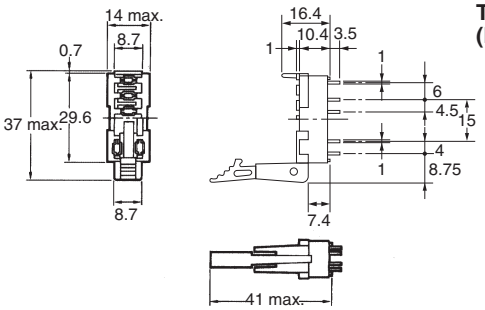


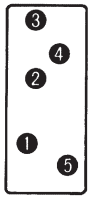
Recommended thickness of the panel is 1.6 to 2.0 mm

### P2R-057P (1-pole)

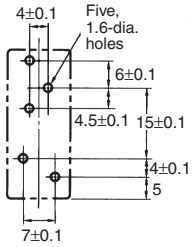




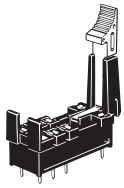

**Terminal Arrangement (Bottom View)**

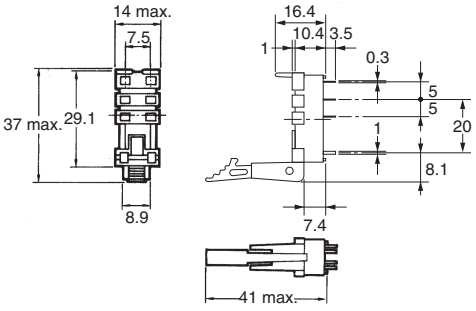



**Mounting Holes**



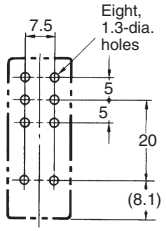

### P2R-087P (2-pole)





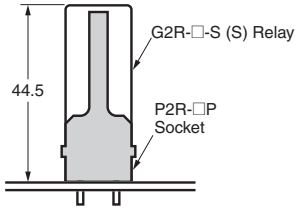

**Terminal Arrangement (Bottom View)**

**Mounting Holes**

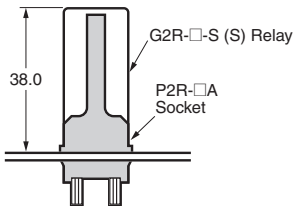



## Mounting Height of Relay with Back-connecting Sockets

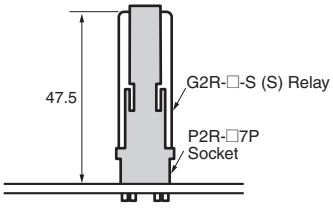
**P2R-□P**




**P2R-□A**

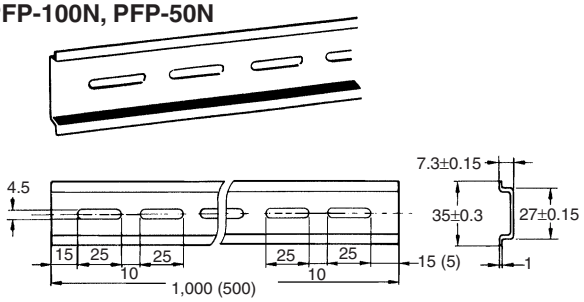



**P2R-□7P**

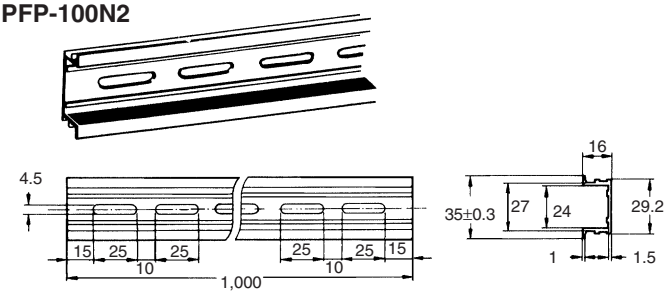


## Mounting Tracks

### PFP-100N, PFP-50N



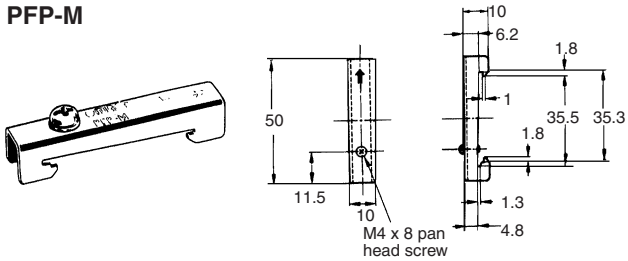

### PFP-100N2




It is recommended to use a panel 1.6 to 2.0 mm thick.

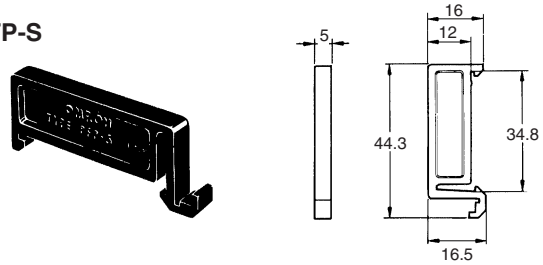
## End Plate

### PFP-M



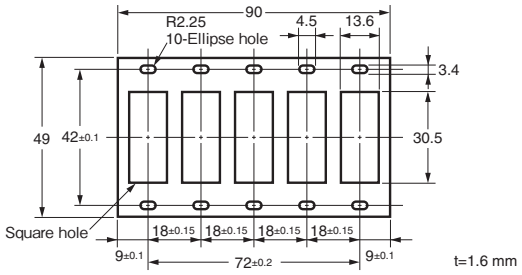

## Spacer

### PFP-S




## Mounting Plate

### P2R-P




# Safety Precautions

**Be sure to read the *Common Precautions for All Relay* in the website at the following URL: http://www.ia.omron.com/.**
**Refer to *Products Related to Common Sockets and DIN Tracks* for precautions on the applicable Sockets.**
**Refer to *PYF-□□-PU/P2RF-□□-PU* for precautions on Push-In Plus Terminal Block Sockets.**

## Warning Indications

| | |
|---|---|
| ⚠ CAUTION | **Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.** |

**⚠ Cation**

- Do not use the test button for any purpose other than testing. Be sure not to touch the test button accidentally as this will turn the contacts ON. Before using the test button, confirm that circuits, the load, and any other connected item will operate safely.
- Check that the test button is released before turning ON relay circuits.
- If the test button is pulled out too forcefully, it may bypass the momentary testing position and go straight into the locked position.
- Use an insulated tool when you operate the test button.

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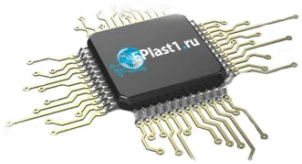
- Защита от снятия компонента с производства.

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