

General-purpose Relay G2RS-(S)

Slim and Space-saving Power Plug-in Relay

- Lockable test button models now 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).
- Environment-friendly (Cd, Pb free).
- Wide range of Sockets also available.
- RoHS Compliant.



Model Number Structure

Model Number Legend

G2R□-□□□□-□□□□(S)
1 2 3 4 5 6 7

1. Relay Function

Blank: General-purpose

2. Number of Poles

- 1: 1 pole
- 2: 2 poles

3. Contact Form

Blank: SPDT

4. Contact Type

Blank: Single

5. Terminals

S: Plug-in

6. 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

7. Rated Coil Voltage

Ordering Information

List of Models

| | Classification | Enclosure rating | Coil ratings | Contact form/Model | |
|------------------|--|------------------|--------------|--------------------|------------|
| | | | | SPDT | DPDT |
| Plug-in terminal | General-purpose | Unsealed | AC/DC | G2R-1-S | G2R-2-S |
| | LED indicator | | | G2R-1-SN | G2R-2-SN |
| | LED indicator with test button | | | G2R-1-SNI | G2R-2-SNI |
| | Diode | | DC | G2R-1-SD | G2R-2-SD |
| | LED indicator and diode | | | G2R-1-SND | G2R-2-SND |
| | LED indicator and diode with test button | | | G2R-1-SNDI | G2R-2-SNDI |

Note: 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 DC12 (S) ——— New model
Rated coil voltage

■ Accessories (Order Separately)

Connecting Sockets

| Applicable Relay model | Track/surface-mounting Socket | | Back-mounting Socket | |
|---------------------------------------|---|--------------------------|----------------------|-------------------|
| | Screwless clamp terminal (See note.) | Screw terminal | Terminals | Model |
| 1 pole G2R-1-S(N)(D)(ND)(NI)(NDI) | P2RF-05-S + P2CM-S | P2RF-05-E P2RF-05 | PCB terminals | P2R-05P, P2R-057P |
| | | | Solder terminals | P2R-05A |
| 2 poles G2R-2-S(N)(D)(ND)(NI)(NDI) | P2RF-08-S + P2CM-S | P2RF-08-E P2RF-08 | PCB terminals | P2R-08P, P2R-087P |
| | | | Solder terminals | P2R-08A |

Note: 1. Use of P2CM Clips are optional. However, use of the P2CM Clip & Release Lever is recommended to ensure stable mounting.

2. “-E” models are of finger-safe product construction. Round terminals cannot be used. Use Y-shaped terminals.

Accessories for Screwless Clamp Terminal Socket (Option)

| Name | Model |
|----------------------|------------------------------------|
| Clip & Release Lever | P2CM-S |
| Nameplate | R99-11 Nameplate for MY |
| Socket Bridge | P2RM-SR (for AC), P2RM-SB (for DC) |

Mounting Tracks

| Applicable Socket | Description | | Model |
|--------------------------------|-------------------------|---|----------------------------------|
| Mounting track and accessories | Mounting track | 50 cm (ℓ) x 7.3 mm (t) 1 m (ℓ) x 7.3 mm (t) 1 m (ℓ) x 16 mm (t) | PFP-50N PFP-100N PFP-100N2 |
| | End plate | | PFP-M |
| | Spacer | | PFP-S |
| Mounting plate* | Back-connecting Sockets | | P2R-P |

*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% min. | 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.) |
|---------------|----------------|---------|------------------|-------------------------------------|-------------|----------------------|----------------------|--------------|-----------------------------|
| | 50 Hz | 60 Hz | | Armature OFF | Armature ON | | | | |
| 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 | | | | |

* The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of ±10%.

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 capacity | 2,500 VA, 300 W | 1,875 VA, 150 W | 1,250 VA, 150 W | 500 VA, 90 W |
| Minimum permissible load | 100 mA at 5 VDC | | 10 mA at 5 VDC | |

Note: P level: $\lambda_{60} = 0.1 \times 10^{-6}$ /operation

Characteristics

| Item | 1 pole | 2 poles |
|--------------------------|---|--|
| Contact resistance | 100 mΩ max. | |
| Operate (set) time | 15 ms max. | |
| Release (reset) time | AC: 10 ms max.; DC: 5 ms max. (w/built-in diode: 20 ms max.) | AC: 15 ms max.; DC: 10 ms max. (w/built-in diode: 20 ms max.) |
| Max. operating frequency | Mechanical: 18,000 operations/hr 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*; 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*; 3,000 VAC, 50/60 Hz for 1 min between contacts of different polarity 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) 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 Malfunction: 200 m/s ² when energized; 100 m/s ² when not energized | |
| Service life | Mechanical: AC coil: 10,000,000 operations min.; DC coil: 20,000,000 operations min. (at 18,000 operations/hr) Electrical: 100,000 operations min. (at 1,800 operations/hr under rated load) (DC coil type) | |
| Ambient temperature | Operating: -40°C to 70°C (with no icing or condensation) | |
| Ambient humidity | Operating: 5% to 85% | |
| Weight | Approx. 21 g | |

Note: Values in the above table are the initial values.

*4,000 VAC, 50/60 Hz for 1 minute when the P2R-05A or P2R-08A Socket is used.

Approved Standards

UL Recognized (File No. E41643) -- Ambient Temp. = 40°C

| Model | Contact form | Coil ratings | Contact ratings | Cycles |
|---------|--------------|------------------------------|---|---------------------|
| G2R-1-S | SPDT | 5 to 110 VDC 5 to 240 VAC | 10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) TV-3 (NO contact only) | 6 x 10 ³ |
| G2R-2-S | DPDT | | 5 A, 30 VDC (resistive) 5 A, 250 VAC (general use) TV-3 (NO contact only) | 6 x 10 ³ |

CSA Certified (File No. LR31928)

| Model | Contact form | Coil ratings | Contact ratings | Cycles |
|---------|--------------|------------------------------|---|---------------------|
| G2R-1-S | SPDT | 5 to 110 VDC 5 to 240 VAC | 10 A, 30 VDC (resistive) 10 A, 250 VAC (general use) TV-3 (NO contact only) | 6 x 10 ³ |
| G2R-2-S | DPDT | | 5 A, 30 VDC (resistive) 5 A, 250 VAC (general use) TV-3 (NO contact only) | 6 x 10 ³ |

IEC/VDE (EN61810)

| Contact form | Coil ratings | Contact ratings | Cycles |
|--------------|--|--|-----------------------|
| 1 pole | 6, 12, 24, 48 VDC 24, 110, 120, 230, 240 VAC | 5 A, 440 VAC (cosφ = 1.0) 10 A, 250 VAC (cosφ = 1.0) 10 A, 30 VDC (0 ms) | 100 x 10 ³ |
| 2 poles | 6, 12, 24, 48 VDC 24, 110, 120, 230, 240 VAC | 5 A, 250 VAC (cosφ = 1.0) 5 A, 30 VDC (0 ms) | 100 x 10 ³ |

LR

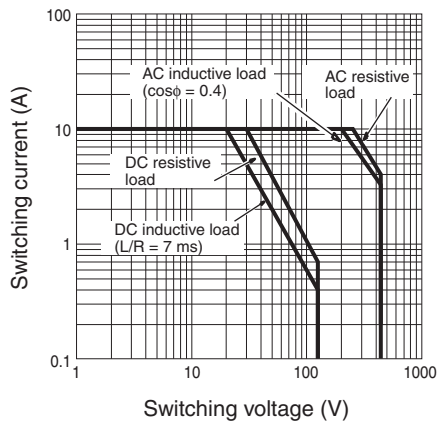
| Number of poles | Coil ratings | Contact ratings | Cycles |
|-----------------|------------------------------|--|-----------------------|
| 1 pole | 5 to 110 VDC 5 to 240 VDC | 10 A, 250 VAC (general use) 7.5 A, 250 VAC (PF0.4) 10 A, 30 VDC (resistive) 5A, 30VDC (L/R=7ms) | 100 x 10 ³ |
| 2 poles | 5 to 110 VDC 5 to 240 VDC | 5 A, 250 VAC (general use) 2 A, 250 VAC (PF0.4) 5 A, 30 VDC (resistive) 3A, 30VDC (L/R=7ms) | 100 x 10 ³ |

Engineering Data

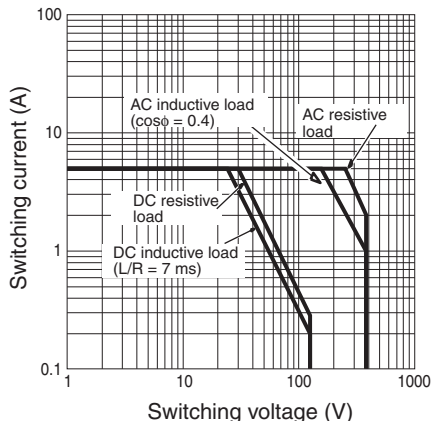
Maximum Switching Capacity

Plug-in Relays

G2R-1-S



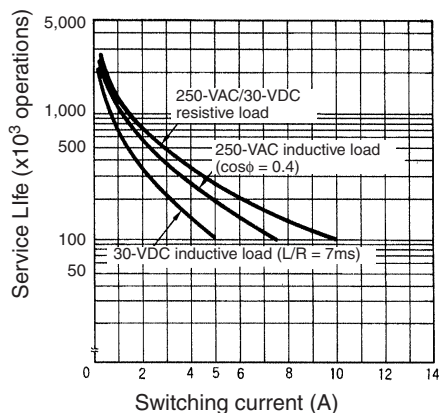
G2R-2-S



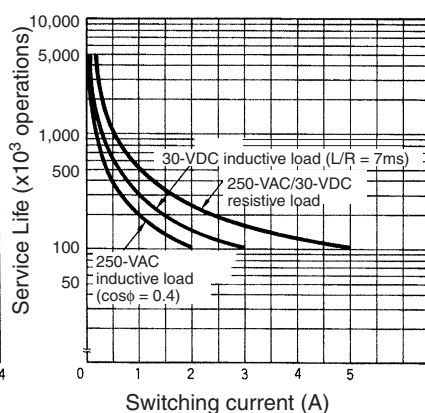
Electrical Service Life

Plug-in Relays

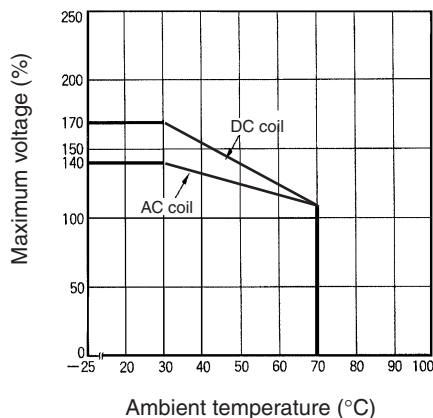
G2R-1-S



G2R-2-S



Ambient Temperature vs. Maximum Coil Voltage



Note: The maximum voltage refers to the maximum value in a varying range of operating power voltage, not a continuous voltage.

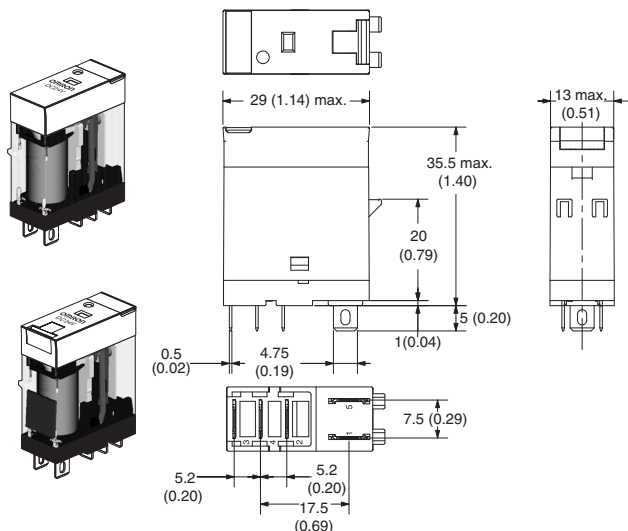
Dimensions

Unit: mm (inch)

Relays with Plug-in Terminals

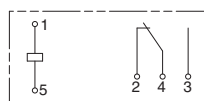
SPDT Relays

G2R-1-S, G2R-1-SN, G2R-1-SNI
G2R-1-SD, G2R-1-SND, G2R-1-SNDI

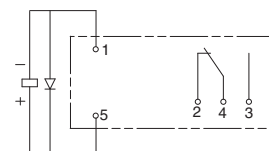


Terminal Arrangement/Internal Connections (Bottom View)

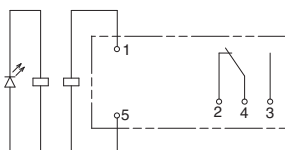
G2R-1-S



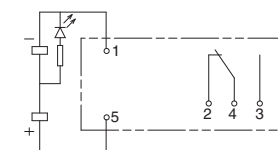
G2R-1-SD (DC)



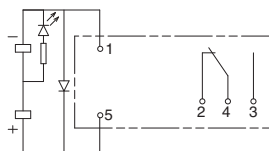
G2R-1-SN, G2R-1-SNI (AC)



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

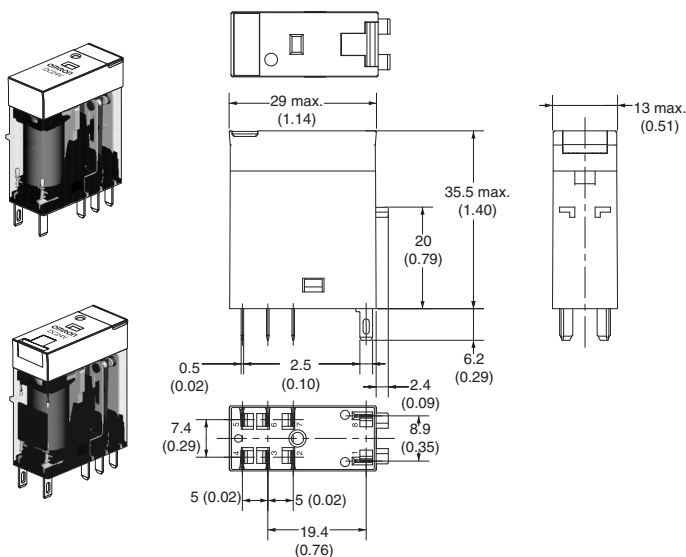


G2R-1-SND, G2R-1-SNDI (DC)



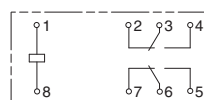
DPDT Relays

G2R-2-S, G2R-2-SN, G2R-2-SNI
G2R-2-SD, G2R-2-SND, G2R-2-SNDI

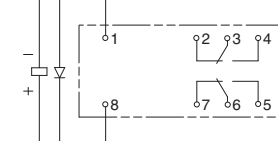


Terminal Arrangement/Internal Connections (Bottom View)

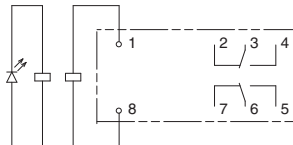
G2R-2-S



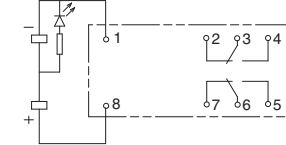
G2R-2-SD (DC)



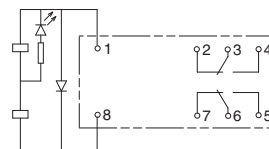
G2R-2-SN, G2R-2-SNI (AC)



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

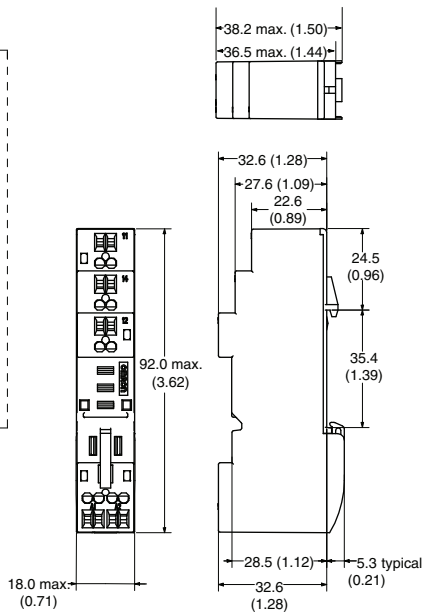
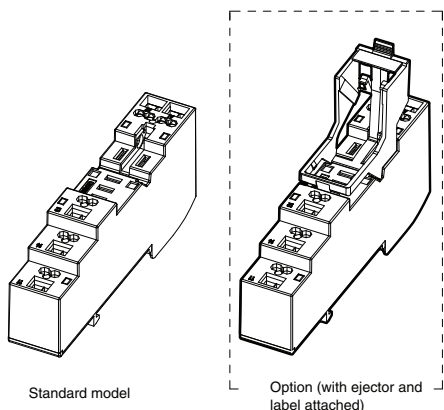


G2R-2-SND, G2R-2-SNDI (DC)



Track/Surface Mounting Sockets

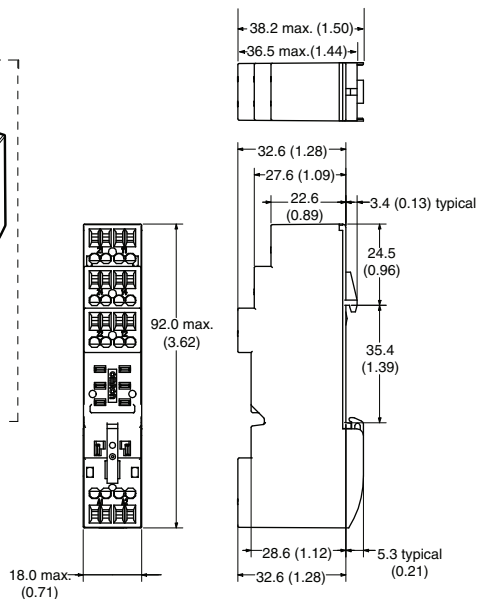
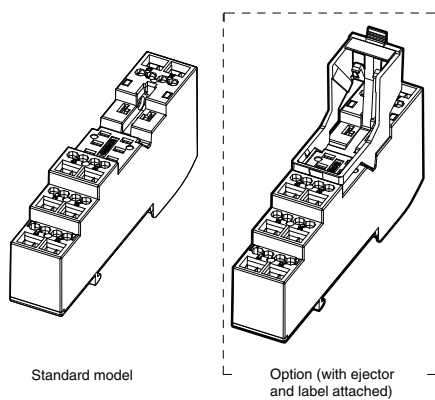
P2RF-05-S



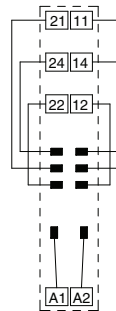
Terminal Arrangement (Top View)



P2RF-08-S

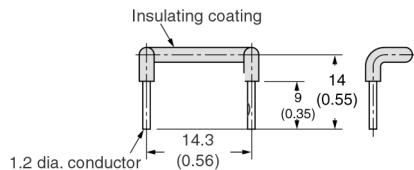


Terminal Arrangement (Top View)



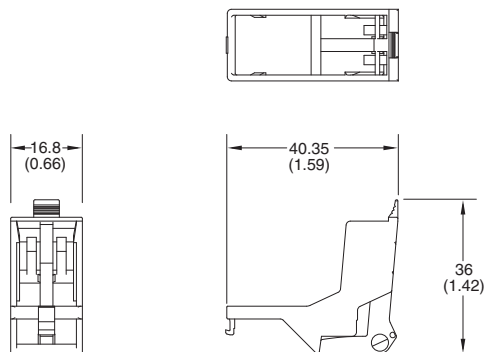
Accessories for P2RF-□-S

Socket Bridge



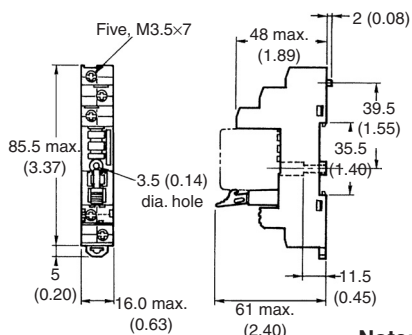
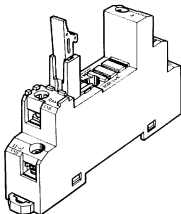
Note: The color of insulating coating indicates power type.

Clip and Release Lever

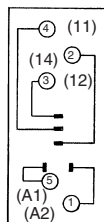


| Model | Power | Color |
|---------|-------|-------|
| P2RM-SR | AC | Red |
| P2RM-SB | DC | Blue |

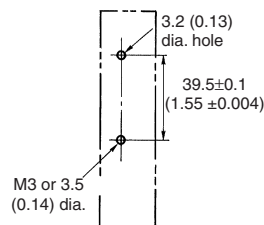
P2RF-05-E



Terminal Arrangement (Top View)

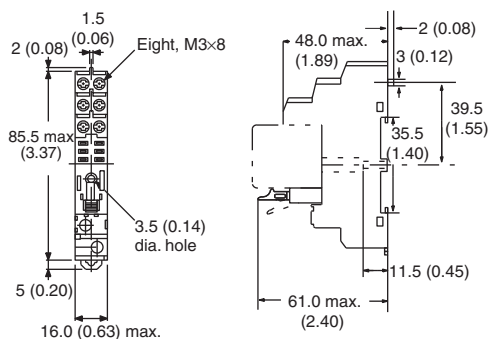
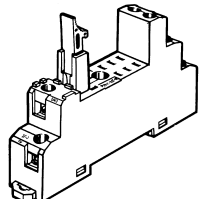


Mounting Holes (for Surface Mounting)

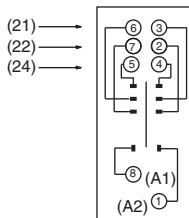


Note: Pin numbers in parentheses apply to DIN standard.

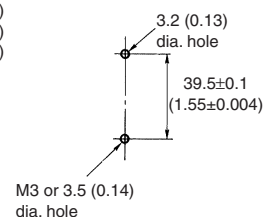
P2RF-08-E



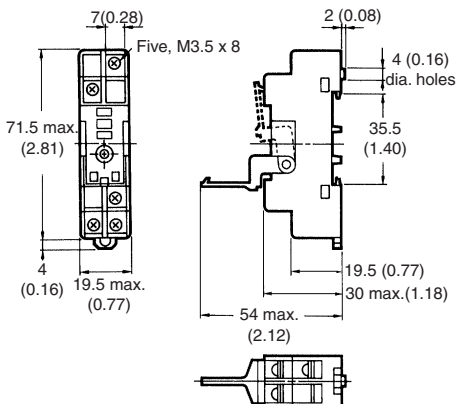
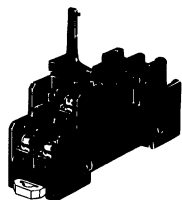
Terminal Arrangement (Top View)



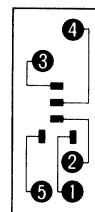
Mounting Holes (for Surface Mounting)



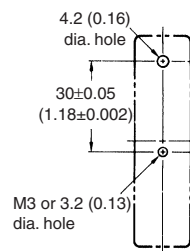
P2RF-05



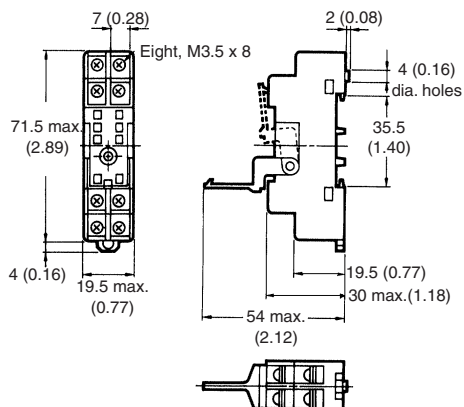
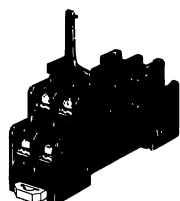
Terminal Arrangement (Top View)



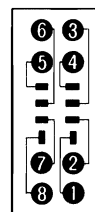
Mounting Holes (for Surface Mounting)



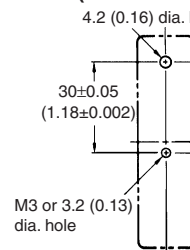
P2RF-08



Terminal Arrangement (Top View)

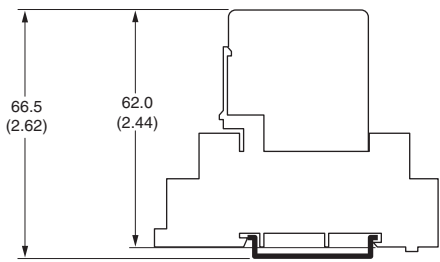


Mounting Holes (for Surface Mounting)

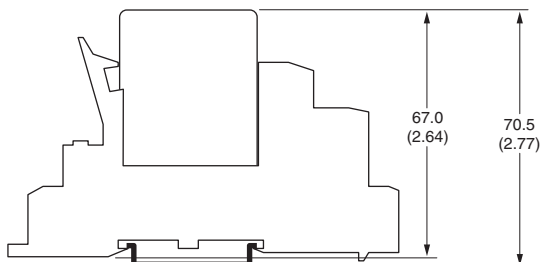


Mounting Height of Relay with Track/Surface Mounting Sockets

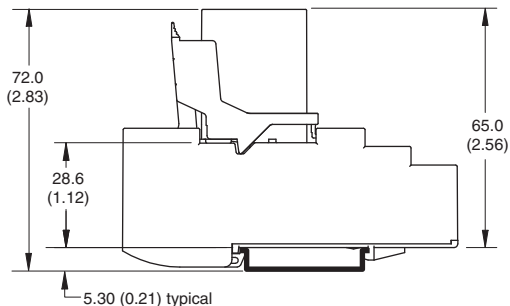
P2RF-□



P2RF-□-E

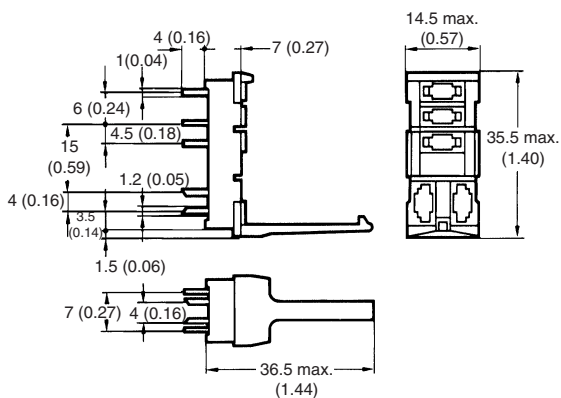
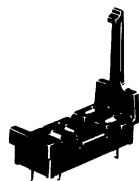


P2RF-□-S

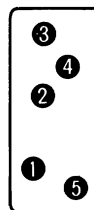


Back-connecting Sockets

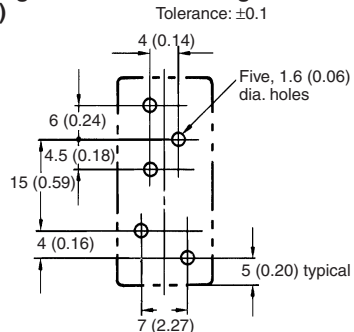
P2R-05P (1-pole)



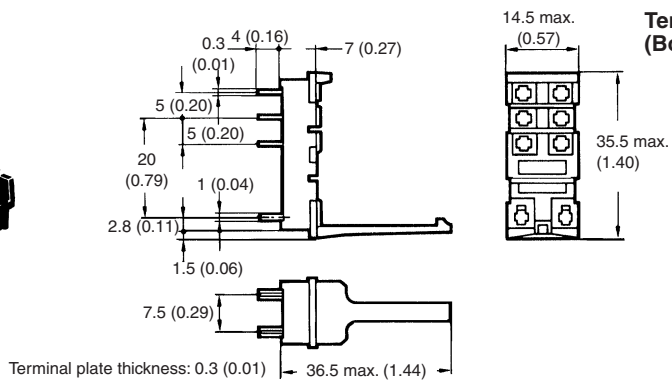
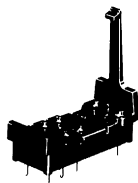
Terminal Arrangement (Bottom View)



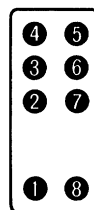
Mounting Holes



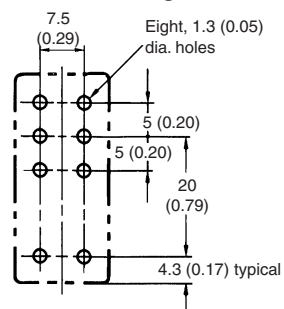
P2R-08P (2-pole)



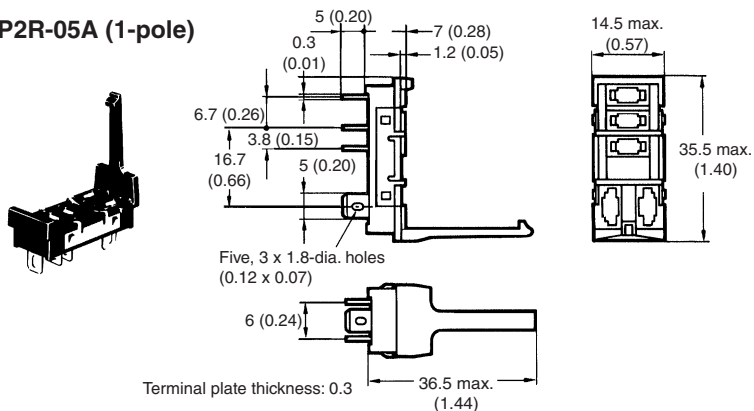
Terminal Arrangement (Bottom View)



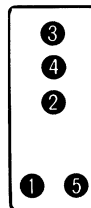
Mounting Holes



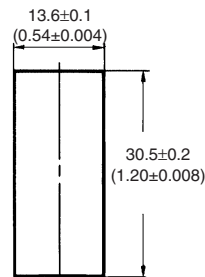
P2R-05A (1-pole)



Terminal Arrangement (Bottom View)

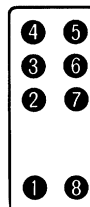
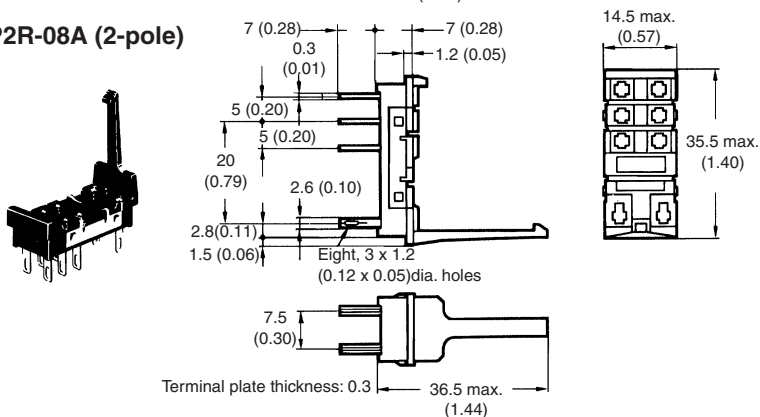


Panel Cutout

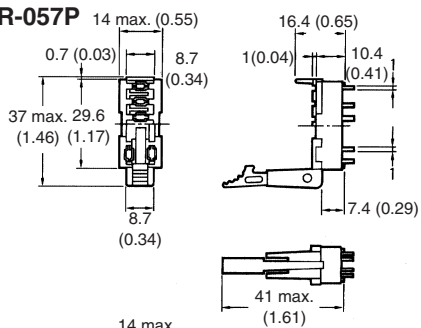


Recommended thickness of the panel is 1.6 to 2.0 mm

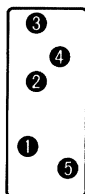
P2R-08A (2-pole)



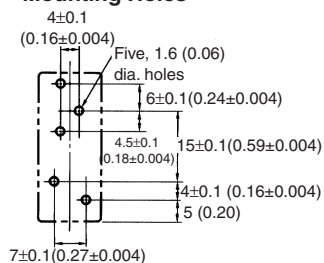
P2R-057P



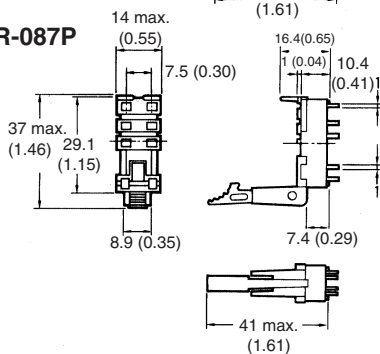
Terminal Arrangement (Bottom View)



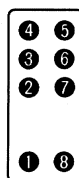
Mounting Holes



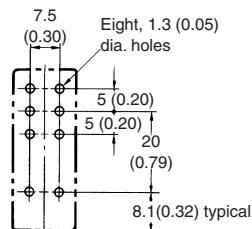
P2R-087P



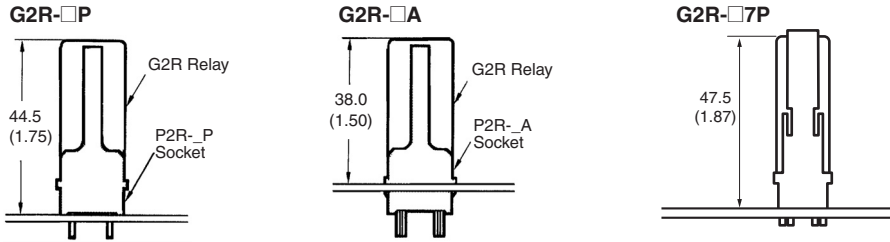
Terminal Arrangement (Bottom View)



Mounting Holes

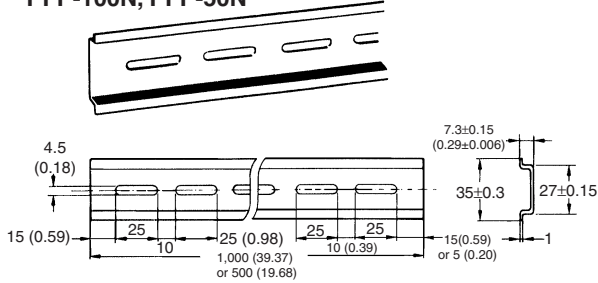


Mounting Height of Relay with Back-connecting Sockets

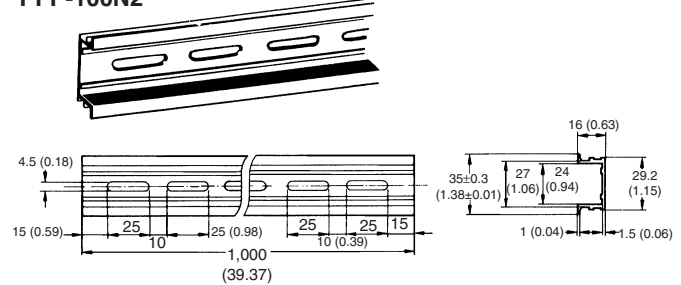


Mounting Tracks

PPF-100N, PPF-50N



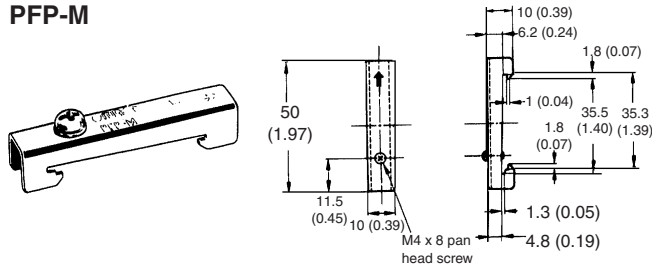
PPF-100N2



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

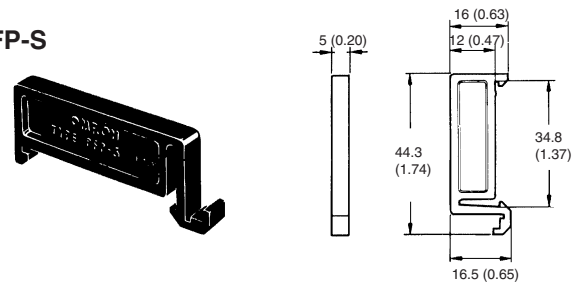
End Plate

PPF-M



Spacer

PPF-S



Precautions

CAUTION
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.

CAUTION
Check that the test button is released before turning ON relay circuits.

CAUTION
If the test button is pulled out too forcefully, it may bypass the momentary testing position and go straight into the locked position.

CAUTION
Use an insulated tool when you operate the test button.

Precautions for P2RF-□-S Connection

- Do not move the screwdriver up, down, or from side to side while it is inserted in the hole. Doing so may cause damage to internal components (e.g., deformation of the clamp spring or cracks in the housing) or cause deterioration of insulation.
- Do not insert the screwdriver at an angle. Doing so may break the side of the socket and result in a short-circuit.

A large grid of 20 columns and 30 rows of small squares, used for technical drawing or notes. The grid is composed of thin lines forming a uniform pattern of squares across the page.

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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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