CSM_LY_DS_E_5_18

Power-switching Compact General-purpose Relays

- Wiring work can be shortened by as much as 60%*
 compared to conventional screw terminal sockets by
 combining with push-in plus terminal sockets
 (PTF-PU) that feature light insertion force and
 strong pull-out strength to achieve less wiring work.
- The standard models include models that are compliant with the UL and CSA safety standards and with the Electrical Appliances and Material Safety Act.
- Equipped with an arc barrier for arc interruption.
- Withstand voltages up to 2,000 V.
- New built-in diode and built-in CR circuit models have joined the series.
- The lineup also includes models that are compliant with the LR and VDE safety standards.
- *When both push-in plus terminals and screw terminal sockets are combined with plug-in terminal types (according to actual OMRON measurements as of November 2015)



Refer to the Common Relay Precautions.

9N° @ △ C€ LR







Refer to the standards certifications and compliance section of your OMRON website for the latest information on certified models.

Model Number Structure

| | s | tructure | Relays with Plu | ug-in Terminals | Relays with PCB Terminals | Case-surface mounting |
|--|---|-----------------|-----------------|---------------------------|---------------------------|-----------------------|
| Classification | | ımber poles | | With operation indicators | | |
| | 1 | | LY1 | LY1N | LY1-0 | LY1F |
| Standard models | | | LY2 | LY2N | LY2-0 | LY2F |
| Compliance with Electrical Appliances | 2 | Bifur- cated | LY2Z | LY2ZN | LY2Z-0 | LY2ZF |
| and Material Safety Act | 3 | | LY3 | LY3N | LY3-0 | LY3F |
| | 4 | | LY4 | LY4N | LY4-0 | LY4F |
| | 1 | | LY1-D | LY1N-D2 | | |
| Models with diode for coil surge absorption | | | LY2-D | LY2N-D2 | | |
| (DC coil specification only) | 2 | Bifur- cated | LY2Z-D | LY2ZN-D2 | | |
| → | 3 | | LY3-D | LY3N-D2 | | |
| | 4 | | LY4-D | LY4N-D2 | | |
| Models with CR circuits | 1 | | | | | |
| for coil surge absorption | | | LY2-CR | LY2N-CR | | |
| (AC coil specification only) | 2 | Bifur- cated | LY2Z-CR | LY2ZN-CR | | |

- **Note: 1.** Cells with a diagonal line cannot be manufactured. Ask your OMRON representative for details on manufacturing products for cells containing "---" in the above table.
 - 2. Refer to page 3 to 4 for information on plug-in terminal and socket combinations.
 - 3. The models in this table are compliant with the UL, CSA, and IEC (TÜV-approved) standards. These products display the relevant certification marking.
 - **4.** The models with plug-in terminals (single-pole, double-pole, and 4-pole) were combined with the PTF-E series or the PTF-PU series for the EC Declaration of Conformity. These products display the CE Marking.

Ordering Information When your order, specify the rated voltage.

Relays

Models with Plug-in Terminals

| | Number of poles | | 1 pole | | 2 poles | | 3 poles | | 4 poles |
|---------------------|---|--|--|--------------|---|-------------|---------------------------------|-------------|---------------------------------|
| Classification | n | Model | Rated voltage (V) | Model | Rated voltage (V) | Model | Rated voltage (V) | Model | Rated voltage (V) |
| | Standard models | 12, 24, 100/110, 110/120, or 200/220 VAC | | LY2 | 12, 24, 100/110,110/ 120, 200/220, or220/240 VAC | LY3 | 12, 24, 100/110, or 200/220 VAC | LY4 | 12, 24, 100/110, or 200/220 VAC |
| | | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC |
| | Models with built-in operation indicators | LY1N | 12, 24, 100/110, 110/120, or 200/220 VAC | LY2N | 12, 24, 100/110,110/ 120, 200/220, or 220/240 VAC | LY3N | 12, 24, 100/110, or 200/220 VAC | LY4N | 12, 24, 100/110, or 200/220 VAC |
| Models with | operation mulcators | | 12, 24, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC |
| single contacts | Models with built-in diodes | LY1-D | 12, 24, 48, or 100/110 VDC | LY2-D | 12, 24, 48, or 100/110 VDC | LY3-D | 12, 24, 48, or 100/110 VDC | LY4-D | 12, 24, 48, or 100/110 VDC |
| | Models with built-in diodes and operation indicators | LY1N- D2 | 12, 24, or 48 VDC | LY2N-D2 | 12, 24, 48, or 100/110 VDC | LY3N- D2 | 12, 24, or 100/110 VDC | LY4N- D2 | 12, 24, 48, or 100/110 VDC |
| | Models with built-in CR circuits | _ | - | LY2-CR | 100/110, 110/120, 200/220, or 220/240 VAC | | - | | |
| | Models with built-in CR circuits and operation indicators | _ | - | LY2N-CR | 100/110, 110/120, 200/220, or 220/240 VAC | | - | | - |
| | Standard models | | | LY2Z | 100/110 or200/220 VAC | | - | | |
| | Standard models | _ | _ | LIZZ | 12, 24, 48, or 100/ 110 VDC | | - | | |
| | Models with built-in operation indicators | _ | _ | LY2ZN | 100/110, 110/120, 200/220, or 220/240 VAC | | _ | _ | - |
| | | _ | _ | | 12 or 24 VDC | | _ | _ | |
| Bifurcated contacts | Models with built-in diodes | | _ | LY2Z-D | 12, 24, or 48 VDC | | _ | | |
| | Models with built-in diodes and operation indicators | _ | _ | LY2ZN- D2 | 12, 24, or 100/110 VDC | _ | _ | _ | _ |
| | Models with built-in CR circuits | - | - | LY2Z-CR | 100/110 VAC | | _ | | |
| | Models with built-in CR circuits and operation indicators | _ | _ | LY2ZN- CR | 100, 110, 110/1 20, or 200/220 VAC | | _ | _ | |

Relays with PCB Terminals

| Number of poles | 1 pole | | | 2 poles | | 3 poles | 4 poles | |
|-----------------------------|--------|---|-------|--|-------|--------------------------------|---------|---------------------------------|
| Classification | Model | Rated voltage (V) | Model | Rated voltage (V) | Model | Rated voltage (V) | Model | Rated voltage (V) |
| Models with single contacts | LY1-0 | 24,100/110, 110/120, or 200/220 VAC | LY2-0 | 12, 24, 100/110, 110/120, 200/ 220, or 220/240 VAC | LY3-0 | 24, 100/110, or 200/220 VAC | LY4-0 | 24, 100/110, or 200/ 220 VAC |
| Contacts | | 12 or 24 VDC | | 12, 24, 48 or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC |
| | | | | 100/110 VAC | | | | |
| Bifurcated contacts | | | | 24, 48, or 100/110 VDC | | _ | | |

Case-surface Mounting

| Number of poles | 1 pole | | | 2 poles | | 3 poles | 4 poles | |
|-----------------------------|---|---|-------|--|-------|------------------------------------|---------|------------------------------------|
| Classification | Model Rated voltage (V) Model Rated voltage (V) | | Model | Rated voltage (V) | Model | Rated voltage (V) | | |
| Models with single contacts | LY1F | 24, 100/110, 110/120, 200/220, or 220/240 VAC | LY2F | 12, 24, 100/110, 110/ 120, 200/220, or 220/240 VAC | LY3F | 12, 24, 100/110, or 200/220 VAC | LY4F | 12, 24, 100/110, or 200/220 VAC |
| Contacts | | 6, 12, 24, or 100/110 VDC | | 12, 24, 48, or 100/110 VDC | | 12, 24, or 100/110 VDC | | 12, 24, or 100/110 VDC |
| Bifurcated contacts | | | LY2ZF | 24, 100/110, or 200/220 VAC | | | | |
| | | | | 12 or 24 VDC | | | | |

Accessories (Order Separately)

Front-mounting Sockets

| Applicable relay model | Mounting Method | Conductive part protection | Terminal Type | Applicable crimp terminal/ Electric wire | Appearance | Model | Hold-down Clips/ Release Levers (Order Separately) | |
|-------------------------|--------------------|----------------------------|-------------------------------------|--|---|-------------------------------------|--|--|
| | | | Push-In Plus | Ferrules Solid wire | | PTF-08-PU * LY2⊡-CR cannot be used | With release lever * Hold by release lever | |
| LY1□ LY2□ LY2□-CR | | Available | Terminal | Stranded wire | | PTF-08-PU-L | | |
| | | | Screw terminal (M3.5 screw size) | Forked terminals Solid wire Stranded wire | | PTFZ-08-E * | LY2□-CR: Y92H-3 Other than those above: PYC-A1 | |
| | Mounted on a | None | (MIS.S SCIEW SIZE) | Round terminals Forked terminals Solid wire Stranded wire | | PTF08A | | |
| LY3□ | with screws | None | Screw terminal (M3.5 screw size) | Round terminals Forked terminals Solid wire Stranded wire | | PTF11A | PYC-A1 | |
| | | | Available | Push-In Plus Terminal | Ferrules Solid wire Stranded wire | | PTF-14-PU-L | |
| LY4□ | | Available | Screw terminal | Forked terminals Solid wire Stranded wire | | PTFZ-14-E * | PYC-A1 | |
| | | None | · (M3.5 screw size) | Round terminals Forked terminals Solid wire Stranded wire | | PTF14A | | |

The PTFZ-□-E Relays have finger protection. Round terminals cannot be used. Use forked terminals.

Back-mounting Sockets

| Applicable relay model | Terminal Type | Appearance | Mode | Hold-down Clips (Order Separately) |
|-------------------------|--------------------|------------|--------|--|
| | Solder terminals | 0000 | PT08* | |
| LY1□ LY2□ LY2□-CR | Wrapping terminals | | PT08QN | LY2□-CR: PYC-1 Other than those above: PYC-P |
| | PCB terminals | | PT08-0 | |
| | Solder terminals | | PT11* | |
| LY3□ | Wrapping terminals | | PT11QN | PYC-P |
| | PCB terminals | | PT11-0 | |
| | Solder terminals | | PT14* | |
| LY4□ | Wrapping terminals | | PT14QN | PYC-P |
| 1.14 | PCB terminals | | PT14-0 | |

^{*}When ordering PT08, PT11, or PT14 sockets, please note that the minimum order quantity is 10 and orders are accepted in multiples of the minimum order.

Relay Hold-down Clips

| Application Item | Used wit | h Socket | Used with Socket mounting plate | For models with built-in CR circuits | | |
|---------------------------|----------|-----------|---------------------------------|--------------------------------------|-------|--|
| Appearance | | Approx. 3 | Approx. 2.5 | | | |
| Model | PYC-A1 | PYC-P | PYC-S | Y92H-3 | PYC-1 | |
| Minimum order (quantity)* | 100 | 100 | 10 | 10 | 10 | |

^{*} Orders are accepted in multiples of the minimum order.

Socket Mounting Plates

| Applicable sockets | Number of sockets | Model |
|--------------------|-------------------|-----------|
| | 1 | PYP-1 *1 |
| PT08 PT08QN | 18 | PYP-18 *2 |
| | 36 | PYP-36 *2 |
| PT11 | 1 | PTP-1-3 |
| PT11QN | 12 | PTP-12 |
| PT14 | 1 | PTP-1 |
| PT14QN | 10 | PTP-10 |

^{*1.} When ordering PYP-1, please note that the minimum order quantity is 10 and orders are accepted in multiples of the minimum order. *2. PYP-18 and PYP-36 can be cut to any required length.

DIN Track Mounting Parts

| Type | | Appearance | Model |
|------------|-----------------------------------|--|-----------|
| | Shallow type, total length: 1 m | | PFP-100N |
| DIN Tracks | Shallow type, total length: 0.5 m | | PFP-50N |
| | Deep type, total length: 1 m | 0000 | PFP-100N2 |
| End Plate | | Control of the contro | PFP-M |
| Spacer | | | PFP-S |

Ratings and Specifications

Ratings

Standard Models with Built-in Operation Indicators

Operating Coil, Single-pole and Double-pole Models

| | Item | Rated cur | rent (mA) | Coil | Coil indu | ctance (H) | Must spends | Must-release | Maximum | Power |
|--------------|-----------|-----------|-----------|-------------------|-----------------|-------------|--------------------------|--------------|---------------|-------------------------------------|
| Rated (V) | d voltage | 50 Hz | 60Hz | resistance (Ω) | Armature OFF | Armature ON | Must-operate voltage (V) | voltage (V) | voltage (V) | consumption (VA, W) |
| | 12 | 106.5 | 91 | 46 | 0.17 | 0.33 | | | | Approx. 1.0 to 1.2 |
| | 24 | 53.8 | 46 | 180 | 0.69 | 1.3 | | | 110% of rated | (at 60 Hz) |
| AC | 100/110 | 11.7/12.9 | 10/11 | 3,750 | 14.54 | 24.6 | | 30% min.*2 | | |
| ,,, | 110/120 | 9.9/10.8 | 8.4/9.2 | 4,430 | 19.2 | 32.1 | | | | Approx. 0.9 to 1.1 (at 60 Hz) |
| | 200/220 | 6.2/6.8 | 5.3/5.8 | 12,950 | 54.75 | 94.07 | | | | |
| | 220/240 | 4.8/5.3 | 4.2/4.6 | 18,790 | 83.5 | 136.4 | 80% max.*1 | | | |
| | 6 | 15 | 50 | 40 | 0.16 | 0.33 | | | voltage | |
| | 12 | 7: | 5 | 160 | 0.73 | 1.37 | | | | |
| DC | 24 | 36 | .9 | 650 | 3.2 | 5.72 | | 10% min.*2 | | Approx. 0.9 |
| | 48 | 18 | .5 | 2,600 | 10.6 | 21.0 | | | | |
| | 100/110 | 9.1/ | /10 | 11,000 | 45.6 | 86.2 | | | | |

3 poles

| | Item | Rated cur | rent (mA) | Coil | Coil indu | ctance (H) | Must-operate | Must-release | Maximum | Power |
|-------------------|---------|-----------|-----------|-------------------|-----------------|-------------|--------------|---------------|-------------|-------------------------------------|
| Rated voltage (V) | | 50 Hz | 60Hz | resistance (Ω) | Armature OFF | Armature ON | voltage (V) | voltage (V) | voltage (V) | consumption (VA, W) |
| | 12 | 159 | 134 | 24 | 0.12 | 0.21 | | | | |
| AC | 24 | 80 67 | 67 | 100 | 0.44 | 0.79 | | 30% min.*2 | 110% of | Approx. 1.6 to 2.0 (at 60 Hz) |
| AC | 100/110 | 14.1/16 | 12.4/13.7 | 2,300 | 10.5 | 18.5 | | | | |
| | 200/220 | 9.0/10.0 | 7.7/8.5 | 8,650 | 34.8 | 59.5 | 80% max.*1 | | | |
| | 12 | 1 | 12 | 107 | 0.45 | 0.98 | 00% IIIax. | | voltage | |
| DC | 24 | 58.6 | | 410 | 1.89 | 3.87 | | 10% min.*2 | | A 4 4 |
| ЪС | 48 | 28 | 3.2 | 1,700 | 8.53 | 13.9 | | 10 /6 111111. | | Approx. 1.4 |
| | 100/110 | 12.7 | 7/13 | 8,500 | 29.6 | 54.3 | | | | ļ |

4 poles

| | Item | Rated cur | rent (mA) | Coil | Coil indu | ctance (H) | Must-operate | Must-release | Maximum | Power |
|--------------|-----------|-----------------|-----------|-------------------|-----------------|-------------|------------------------|---------------|---------------|------------------------|
| Rated (V) | d voltage | 50 Hz | 60Hz | resistance (Ω) | Armature OFF | Armature ON | voltage (V) | voltage (V) | voltage (V) | consumption (VA, W) |
| | 12 | 199 | 170 | 20 | 0.1 | 0.17 | | | | |
| AC | 24 | 93.6 80 78 0.38 | 0.67 | | 30% min.*2 | | Approx. 1.95 to 2.5 | | | |
| AC | 100/110 | 22.5/25.5 | 19/21.8 | 1,800 | 10.5 | 17.3 | | 30 /6 111111. | 110% of rated | (at 60 Hz) |
| | 200/220 | 11.5/13.1 | 9.8/11.2 | 6,700 | 33.1 | 57.9 | 80% max.*1 | | | |
| | 12 | 12 | 20 | 100 | 0.39 | 0.84 | 00% IIIax. | | voltage | |
| DC | 24 | 6 | 9 | 350 | 1.41 | 2.91 | | 10% min.*2 | | Approx 1 F |
| DC | 48 | 3 | 0 | 1,600 | 6.39 | 13.6 | | | | Approx. 1.5 |
| | 100/110 | 15/1 | 15.9 | 6,900 | 32.0 | 63.7 | | | | |

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 ±15% 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 capacity was measured at an ambient temperature of 23°C.

*1. There is variation between products, but actual values are 80% max.

To ensure operation, apply at least 80% of the rated value (at a coil temperature of +23°C).

*2. The actual values are 30% min. for AC and 10% min. for DC. To ensure release, use a value that is lower than the specified value.

Refer to List of Certified Models for a list of models that are certified for safety standards and the Electrical Appliances and Material Safety Act.

| Classification | 1 pole | | | Double-, 3-, and 4-pole models | | | Bifurcated contacts | |
|-------------------------|---|-----------------|---|---|------------------------|--|---------------------------------|--|
| Item Load | Resistive load $(\cos \phi = 0)$ | | Inductive load ($\cos \varphi = 0.4$, L/R = 7 ms) | Resistive load | | Inductive load (cos φ = 0.4, L/R = 7 ms) | Resistive load | Inductive load (cos φ = 0.4, L/R = 7 ms) |
| Contact type | | | | Single | | • | Bifure | cated |
| Contact materials | | Ag alloy | | | | A | g | |
| Rated load | 15 A at 110 VAC 15 A at 24 VDC | 10 A at 250 VAC | 10 A at 110 VAC 7 A at 24 VDC | 10 A at 110 VAC 10 A at 24 VDC | 10 A at 250 VAC | 7.5 A at 110 VAC 5 A at 24 VDC | 5 A at 110 VAC 5 A at 24 VDC | 4 A at 110 VAC 4 A at 24 VDC |
| Electrical endurance*1 | 200,000 200,000 200,000 operations min. operations min. operations min. | | | 3-, 4-pole: 200,000 operations min. 2-pole: 500,000 operations min. | 50,000 operations min. | 3-, 4-pole: 200,000 operations min. 2-pole: 500,000 operations min. | 2-pole: 500,000 | operations min. |
| Rated carry current | 15 A | | | 10 A | | | 7 | A |
| Maximum contact voltage | 250 VAC 250 VAC 125 VDC 250 VAC 125 VDC 125 VDC 125 VDC | | | | | | | |
| Maximum contact current | | 15 A | | | 10 A | | 7 A | |

| Type | Single-pole and double-pole models (standard models and bifurcated contact models) | Single-pole, double-pole models (models with built-in operation indicators, models with built-in diodes, and models with built-in CR circuits), 3-pole and 4-pole models | |
|-------------------------------|--|--|--|
| Ambient operating temperature | −25 to 55°C (with no icing or condensation)*2 | −25 to +40°C (with no icing or condensation)*3 | |
| Ambient operating humidity | 5% to 85% | | |

Note: 1.

- Some models in the LY1 and LY2 Series have an upper temperature limit of +40°C. This limitation is due to the diode junction temperature and the elements used. Refer to Ambient Temperature vs. Coil Temperature Rise in Engineering Data on page 8 to 9 for information on operation in temperature conditions that are not described here.

 When you apply a minimum of 10 A of current to an LY1 when it is used in combination with the PTF-08-PU or PTF-08-PU-L, connect each of the following terminal pairs: terminal No.12 (1) to 42 (4), 14 (5) to 44 (8), and 11 (9) to 41 (12).

When you apply a minimum of 10 A of current to an LY1 when it is used in combination with the PTF08A, PTFZ-08-E, or PT08, connect each of the following terminal pairs: (1) to (2), (3) to (4), and (5) to (6).

*1. Ambient temperature condition: 23° C Rated load, operating frequency: 1,800 operations/h

*2. If the carry current is 4 A or less, the usable ambient temperature range is -25 to 70° C.

*3. If the flowing current is 4 A or less, the usable ambient temperature range is -25 to 55° C.

Characteristics

| Item | Туре | Standard models, models with built-in operation indicators, models with built-in CR circuits, and models with built-in diodes | Bifurcated contacts | | | |
|------------------------|--|---|--|--|--|--|
| Contact resis | tance ^{#1} | 50 mΩ max. | | | | |
| Operating tim | le*2 | 25 ms max. | | | | |
| Release time | 12 | 25 ms max. | | | | |
| Maximum | Mechanical | 18,000 operations/h | | | | |
| operating frequency | Rated load | 1,800 operations/h | | | | |
| Insulation res | istance ^{#3} | 100 MΩ min. | | | | |
| | Between coil and contacts | | | | | |
| Dielectric strength | Between contacts of different polarity | 2,000 VAC at 50/60 Hz for 1 min. | | | | |
| Strength | Between contacts of the same polarity | 1,000 VAC at 50/60 Hz for 1 min. | | | | |
| Vibration | Destruction | 10 to 55 to 10 Hz, 0.5-mm single amplitude (1.0-mm double amplitude) | | | | |
| resistance | Malfunction | 10 to 55 to 10 Hz, 0.5-mm single amplitude (1.0-mm double amplitude) | | | | |
| Shock | Destruction | 1,000 m/s ² | | | | |
| resistance | Malfunction | 200 m/s ² | | | | |
| Endurance | Mechanical | AC: 50,000,000 operations min. DC: 100,000,000 operations min. | (switching frequency: 18,000 operations/h) | | | |
| Failure rate P va | lue (reference value)*4 | 100 mA at 5 VDC | 10mA at 5 VDC | | | |
| Weight | | 1-pole and 2-pole: 40 g, 3-pole: Approx. 50 g, 4-pole: Approx. 70 g | | | | |

- Note: The values at the left are initial values.

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

 *2. Measurement conditions: With rated operating power applied, not including contact bounce. Ambient temperature condition: 23° C

 *3. Measurement conditions: For 500 VDC applied to the same location as for dielectric strength measurement.

 *4. This value was measured at a switching frequency of 120 operations per minute.

Endurance Under Real Loads (Reference Only)

| | , | | | | | | | | | | |
|--------------|--|---------------------|---|--|-----------------------------|---|--|-----------------------------|---|--------------|---|
| Item | LY | /1, 100 VAC | | LY2, 100 VAC | | | LY | 74, 100 VAC | | | |
| Load type | Conditions | Operating frequency | Electrical life (×10,000 operations min.) | Conditions | Operating frequency | Electrical life (×10,000 operations min.) | Conditions | Operating frequency | Electrical life (×10,000 operations min.) | | |
| AC motor | 400 W, 100 VAC single- phase with 35-A inrush | ON for 10 s, | 5 | 200 W, 100 VAC single- phase with 25-A inrush | ON for 10 s, | 20 | 200 W, 200 VAC three- phase with 5-A inrush current, 1-A current flow | ON for 10 s, | 50 | | |
| 7.c moto. | current, 7-A current flow | OFF for 50 s | | current, 5-A current flow | t, 5-A current OFF for 50 s | | 750 W, 200 VAC three- phase with 18-A inrush current, 3.5-A current flow | OFF for 50 s | 7 | | |
| AC lamp | 300 W, 100 VAC with 51-A inrush current, 3- A current flow | ON for 5 s, | 10 | 300 W, 100 VAC with 51-A inrush current, 3- | ON for 5 s, | 8 | 300 W, 100 VAC with 51-A inrush current, 3- | ON for 5 s, | 5 | | |
| AC lamp | 500 W, 100 VAC with 78-A inrush current, 5- A current flow | OFF for 55 s | 2.5 | A current flow | | | OFF for 55 s | 0 | A current flow | OFF for 55 s | 3 |
| Capacitor | 24 VDC with 50-A inrush current, 1-A | ON for 1 s, | 10 | 24 VDC with 50-A inrush current, 1-A current flow | ON for 1 s, | 1 | 24 VDC with 50-A inrush current, 1-A current flow | ON for 1 s, OFF for 15 s | 0.5 | | |
| (2,000 µF) | current flow | OFF for 6 s | 10 | 24 VDC with 20-A inrush current, 1-A current flow | OFF for 15 s | 15 | 24 VDC with 20-A inrush current, 1-A current flow | ON for 1 s, OFF for 2 s | 20 | | |
| AC solenoid | 50 VA with 2.5-A inrush current, 0.25-A current flow | ON for 1 s, | 150 | 50 VA with 2.5-A inrush current, 0.25-A current flow | ON for 1 s, | 100 | 50 VA with 2.5-A inrush current, 0.25-A current flow | ON for 1 s, | 100 | | |
| AC Solenoid | 100 VA with 5-A inrush current, 0.5-A current flow | OFF for 2 s | 80 | 100 VA with 5-A inrush current, 0.5-A current flow | OFF for 2 s | 50 | 100 VA with 5-A inrush current, 0.5-A current flow | OFF for 2 s | 50 | | |

Details on Safety-standard-certified Models, LY□

- Standard models are certified for the UL and CSA safety standards.
- Refer to Model Number Structure on page 1 for a list of applicable models
- The rated values for safety standard certification are not the same as individually defined performance values. Always check the specifications before use.

UL-certified Models (File No. E41643)

| Model | Coil ratings | Number of poles | Contact ratings | Certified number of operations | |
|----------------------------|----------------------------|-----------------------|--|--------------------------------------|--|
| | | | 15A, 120VAC (General use) | 100,000 operations | |
| | 6 to 240VAC 6 to 125VDC | | 15A, 240VAC (General use) | 6 000 operations | |
| | | | 15A, 30VDC (Resistive) | 6,000 operations | |
| | | 1 | 1/2HP, 120VAC | 100,000 operations | |
| | | | 8.5FLA, 30LRA, 120VAC | 100,000 operations | |
| | | | TV-5, 120VAC | 25,000 operations | |
| | | | 470VA, Pilot duty, 120VAC | 6,000 operations | |
| | | | 15A, 120VAC (General use) | 100,000 operations | |
| | | | 12A, 240VAC (General use) | | |
| | | | 7A, 250VAC (General use) | 6,000 operations | |
| | | | 15A, 30VDC (Resistive) | 6,000 operations | |
| | | 5A, 38VDC (Resistive) | 1 | | |
| | 6 to 240VAC | 2 | 1/2HP, 120VAC | 100,000 operations | |
| LY | 6 to 125VDC | | 1/3HP, 240VAC | 1,000 operations | |
| | | | 8.5FLA, 30LRA, 120VAC | 100,000 operations 25,000 operations | |
| | | | 5FLA, 50LRA, 50VDC | | |
| | | | TV-3, 120VAC | | |
| | | | 345VA, Pilot duty, 120-240VAC | C 000 anarations | |
| | | | B300/R300 | 6,000 operations | |
| | | | 10A, 240VAC (General use) (Same polarity) | | |
| 6 to 240VAC 6 to 125VDC | | | 10A, 30VDC (General use) (Same polarity) | 6,000 operations | |
| | | 3 4 | 2A, 40VDC (Resistive) (Same polarity) | | |
| | | | 1/2HP, 240VAC | 1,000 operations | |
| | | | 0.6A, 100VDC (Resistive) (Same polarity) | 6,000 operations | |

TÜV-certified Models (File No. R50030064, EN 61810-1) △

| Model | Coil ratings | Number of poles | Contact ratings | Certified number of operations | |
|-------|--|-----------------|------------------------------|--------------------------------|--|
| | | | 15 A, 110 VAC resistive load | | |
| | | | 10 A, 110 VAC inductive load | 1 | |
| | 6 to 240 VAC | 1 | 10 A, 250 VAC resistive load | 200,000 | |
| | 6 to 110 VDC | ļ | 7A, 250 VAC inductive load | operations | |
| | | | 10 A, 30 VDC resistive load | 1 | |
| | | | 7 A, 30 VDC inductive load | 1 | |
| | | | 10 A, 250 VAC resistive load | 50,000 operations | |
| | 6 to 240 VAC 6 to 125 VDC | | 10 A, 110 VAC resistive load | | |
| | | 2 | 7.5A, 110 VAC inductive load | | |
| LY□ | | | 7A, 250 VAC resistive load | 200,000 | |
| | | | 4 A, 250 VAC inductive load | operations | |
| | | | 7 A, 30 VDC resistive load | 1 | |
| | | | 4 A, 30 VDC inductive load | 7 | |
| | | | 10 A, 250 VAC resistive load | 50,000 operations | |
| | 6 to 240 VAC 6 to 110 VDC 6 to 240 VAC 6 to 125 VDC | 3 | 10 A, 110 VAC resistive load | 100,000 | |
| | | | 7.5A, 110 VAC inductive load | operations | |
| | | | 10 A, 250 VAC resistive load | 50,000 operations | |
| | | 4 | 10 A, 110 VAC resistive load | 100,000 | |
| | | | 7.5A, 110 VAC inductive load | operations | |

CSA-certified Models (File No. LR31928)

| (| P |
|---|---|
| 9 | 5 |

| Model | Coil ratings | Number of poles | Contact ratings | Certified number of operations | |
|-------|----------------------------|-----------------|--|--------------------------------|--|
| | | | 15A, 120VAC (General use) | 100,000 operations | |
| | | | 15A, 240VAC (General use) | 6,000 operations | |
| | | | 15A, 30VDC (Resistive) | 0,000 operations | |
| | 6 to 240VAC 6 to 125VDC | 1 | 1/2HP, 120VAC | 100 000 aparations | |
| | | | 8.5FLA, 30LRA, 120VAC | 100,000 operations | |
| | | | TV-5, 120VAC | 25,000 operations | |
| | | | 470VA, Pilot duty, 120VAC | 6,000 operations | |
| | | | 15A, 120VAC (General use) | | |
| | | | 12A, 240VAC (General use) | | |
| | | | 7A, 250VAC (General use) | 6,000 operations | |
| | | 2 | 15A, 30VDC (Resistive) | | |
| | | | 5A, 38VDC (Resistive) | | |
| | 6 to 240VAC | | 1/2HP, 120VAC | 100,000 operations | |
| LY | Y 6 to 125VDC | | 1/3HP, 240VAC | 1,000 operations | |
| | | | 8.5FLA, 30LRA, 120VAC | 100 000 energtions | |
| | | | 5FLA, 50LRA, 50VDC | 100,000 operations | |
| | | | TV-3, 120VAC | 25,000 operations | |
| | | | 345VA, Pilot duty, 120-240VAC | 6,000 operations | |
| | | | B300/R300 Pilot duty | 0,000 operations | |
| | | | 10A, 240VAC (General use) (Same polarity) | C 000 enerations | |
| | | | 10A, 30VDC (Resistive) (Same polarity) | - 6,000 operations | |
| | 6 to 240VAC | 3 | 1/8HP, 240VAC (Same polarity) | | |
| | 6 to 125VDC | 4 | 1/2HP, 240VAC (Same polarity) | 1,000 operations | |
| | | | 1/3HP, 240VAC (Same polarity) | | |
| | | | 2A, 40VDC (Resistive) | 0.000 | |
| | | | 0.6A, 100VDC (Resistive) | 6,000 operations | |

• When ordering a model that is certified for VDE or Lloyd's Register (LR) standards, always specify "VDE-certified Model" or "LR Standard-certified Model" with your order.

VDE Certification (Certificate No. 6359, EN 61810-1)

| Model | Coil ratings | Number of poles | Contact ratings | Certified number of operations |
|------------|-----------------------------------|-----------------|------------------------------|--------------------------------|
| | | | 10 A, 220 VAC resistive load | |
| | | 1 | 7 A, 220 VAC inductive load | |
| | | | 10 A, 28 VDC resistive load | 200,000 operations |
| LY□-VD | 6, 12, 24, 50, 110, or 220 VAC | | 7 A, 28 VDC inductive load | |
| LTL-VD | 6, 12, 24, 48, or 110 VDC | | 7 A, 220 VAC resistive load | |
| UI 110 VDC | OI 110 VDC | 2 | 4 A, 220 VAC inductive load | |
| | | | 7 A, 28 VDC resistive load | |
| | | | 4 A, 28 VDC inductive load | • |

LR-certified Models (File No. 00/10047)

| Model | Coil ratings | Number of poles | Contact ratings |
|-------|--------------|-----------------|-------------------------------|
| LY□ | 6 to 240 VAC | 2 | 7.5 A, 230 VAC inductive load |
| -10 | 6 to 110 VDC | | 5 A, 24 VDC inductive load |

Details on Safety-standard-certified Models, Sockets

UL-certified Models (File No. E87929)

| | • | |
|----------------------------------|--------------------------|-------------------|
| Model | Ratings | Listed/Recognized |
| PTF-08-PU | 10A 250V | |
| PTF-14-PU | 10A 250V (Same polarity) | |
| PTFZ-08-E | 15A 250V (at 50 deg) | |
| PTFZ-14-E | 12A 250V (at 70 deg) | |
| PTF08A PT08 | 15A 250V | Recognized |
| PTF11A PTF14A PT11 PT14 | 10A 250V | |

CSA-certified Models (File No. LR31928)

| | • | , – |
|------------------|--------------------------|--------------|
| Model | Ratings | Class number |
| PTF-08-PU | 10A 250V | |
| PTF-14-PU | 10A 250V (Same polarity) | |
| PTFZ-08-E | 15A 250V (at 50 deg) | |
| PTFZ-14-E | 12A 250V (at 70 deg) | 3211 07 |
| PTF08A | 15A 240V AC | |
| PTF11A PTF14A | 10A 240V AC | |

CE Marking Compliance

| Model | EMC Directive | Low Voltage Directive | Machinery Directive | Safety Category |
|---------------|----------------|-----------------------|---------------------|-----------------|
| PTFZ-08-E | | | | |
| PTFZ-14-E | Not oppliedble | 0 | Net englischle | 4 |
| PTF-08-PU(-L) | Not applicable | | Not applicable | 1 |
| PTF-14-PU(-L) | | | | |

CE compliance is achieved when used with a relay (LY).
 The Safety Category refers to the maximum applicable category selected when constructing control system safety components. The category does not apply to individual components.

TÜV Rheinland certification

| Model | Ratings | Standard number | Certification number | |
|-----------|----------------------|-----------------|----------------------|--|
| PTF-08-PU | 10A 250V *1 | | R50327595 | |
| PTF-14-PU | 10A 250V *2 | EN 61984 | | |
| PTFZ-08-E | 15A 250V (at 50 deg) | | R50438680 | |
| PTFZ-14-E | 12A 250V (at 70 deg) | | 130430000 | |

*1. Ratings are for an ambient temperature of 55°C. At an ambient temperature of 70°C, the value is 7A.
*2. Ratings are for an ambient temperature of 40°C. At an ambient temperature of 70°C, the value is 7A.

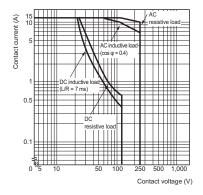
Compliance with Electrical Appliances and Material Safety Act, LY□

All standard models comply with the Electrical Appliances and Material Safety Act.

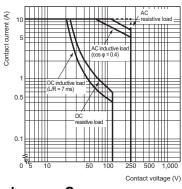
| Model | Coil ratings | Number of poles | Contact ratings |
|-------|------------------------------|-----------------|-----------------|
| LY□ | 6 to 240 VAC 6 to 120 VDC | 1 | 15 A at 200 VAC |
| | | 2 3 4 | 10A at 200 VAC |

Engineering Data

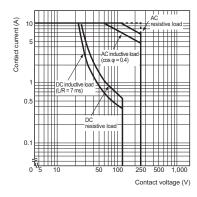
Engineering Data Maximum Switching Capacity



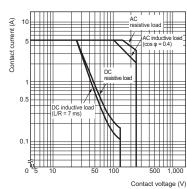
LY2



LY3 and LY4

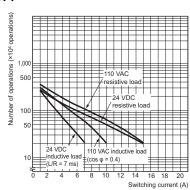


LY2Z

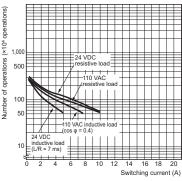


Endurance Curve

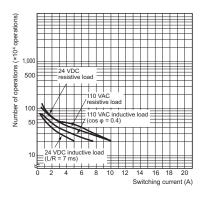




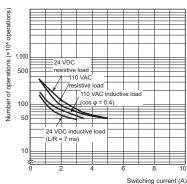
LY2



LY3 and LY4

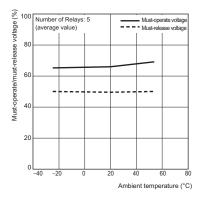


LY2Z

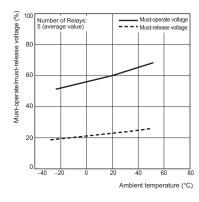


Ambient Temperature vs. Mustoperate and Must-release Voltage

LY2 100/110 VAC at 50Hz

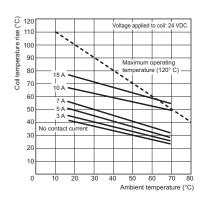


LY2 24 VDC

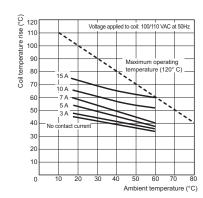


Ambient Temperature vs. Coil Temperature Rise

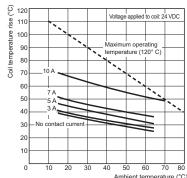
LY1 24 VDC



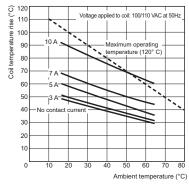
LY1 100/110 VAC



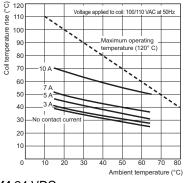
LY2 24 VDC



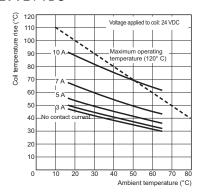
LY3 100/110 VAC



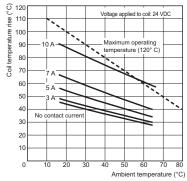
LY2 100/110 VAC



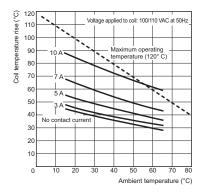
LY4 24 VDC



LY3 24 VDC

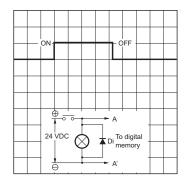


LY4 100/110 VAC

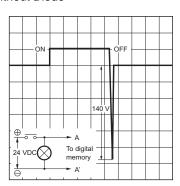


Models with built-in diodes

The diode absorbs surge from the coil. With Diode



Without Diode



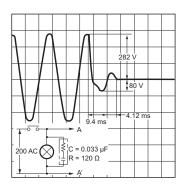
Note: 1. Make sure that the polarity is correct.
2. The release time will increase, but the

- I ne release time will increase, but the 25-ms specification for standard models is satisfied.
- is satisfied.

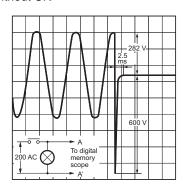
 3. Diode characteristics:
 Reversed dielectric strength: 1,000 V
 Forward current: 1 A

Models with Built-in CR Circuits

With CR

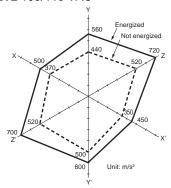


Without CR



Malfunctioning Shock

LY2 100/110 VAC



N = 20

Measurement: Shock was applied 2 times each in 6 directions along 3 axes with the Relay energized and not energized to check the shock values that cause the Relay to malfunction. Criteria: Non-energized: 200 m/s 2 , Energized: 200 m/s 2





Dimensions

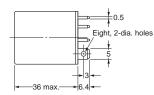
(Unit: mm)

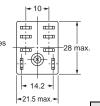
Relays

Plug-in Terminals

LY1 LY1N LY1-D LY1N-D2



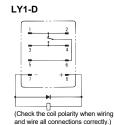




Terminal Arrangement/Internal Connections (Bottom View)

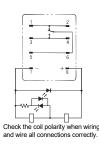
LY1





| LY1N | | | |
|-----------|---|--|--|
| DC Models | AC Models | | |
| | 1 2 3 4 5 6 7 8 7 7 8 8 7 7 8 8 7 7 8 8 7 7 8 8 7 7 8 8 7 7 8 8 7 7 8 8 7 7 8 8 7 | | |

LY1N-D2



Note: 1. For the DC models, check the coil polarity

- when wiring and wire all connections correctly.
- The indicator is red for AC and green for DC.
- The operation indicator indicates the energization of the coil and does not represent contact operation.

LY2 LY2-D LY2Z LY2Z-D LY2N LY2N-D2 LY2ZN LY2ZN-D2

Terminal Arrangement/Internal Connections (Bottom View)

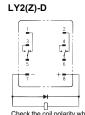
(The coil has no polarity.)

LY2(Z)

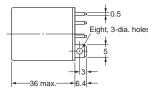
(The coil has no polarity.)

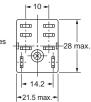


(The coil has no polarity.)

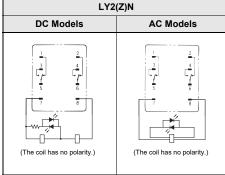


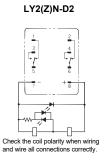
Check the coil polarity when wiring and wire all connections correctly.





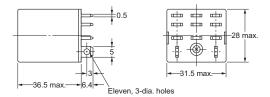
- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
 - The indicator is red for AC and green for DC.
 - The operation indicator indicates the energization of the coil and does not represent contact operation.





LY3 LY3N LY3-D LY3N-D2

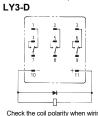




| LY3N | | | |
|-----------------------------|-----------------------------|--|--|
| DC Models | AC Models | | |
| (The coil has no polarity.) | (The coil has no polarity.) | | |

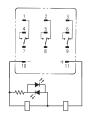
Terminal Arrangement/Internal Connections (Bottom View)

LY3 7 10 (The coil has no polarity.)



Check the coil polarity when wiring and wire all connections correctly.

LY3N-D2



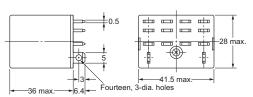
Check the coil polarity when wiring and wire all connections correctly.

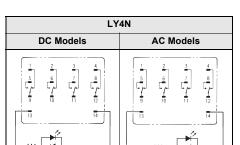
- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
 2. The indicator is red for AC and green for DC.

 - 3. The operation indicator indicates the energization of the coil and does not represent contact operation.

LY4 LY4N LY4-D LY4N-D2



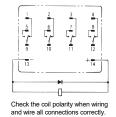




(The coil has no polarity.)

Terminal Arrangement/Internal Connections (Bottom View)





LY4N-D2

Check the coil polarity when wiring and wire all connections correctly.

- Note: 1. For the DC models, check the coil polarity when wiring and wire all connections correctly.
 - The indicator is red for AC and green for DC.

(The coil has no polarity.)

3. The operation indicator indicates the energization of the coil and does not represent contact operation.

LY2(Z)-CR

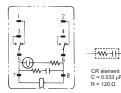
LY2-CR LY2Z-CR LY2N-CR LY2ZN-CR

0.5 ш ф ш - ----

*These dimensions are for the LY2N-CR.

Terminal Arrangement/Internal Connections (Bottom View)





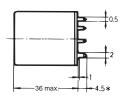
LY2(Z)N-CR

(The coil has no polarity.)

Relays with PCB Terminals

LY1-0, LY3-0, LY2-0, and LY4-0







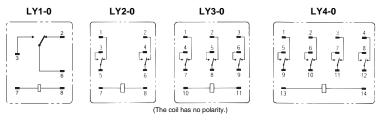
PCB Processing Dimensions (Bottom View) 1 pole 3 poles 4 poles 3.4 Five, 2.5-dia. holes Eight, 2.5-dia. holes Eleven, 2.5-dia. holes

Note: The figures and dimensions depicted here are for the LY2-0. The dimension with an asterisk (*) is 6.4 for the LY1-0.

The dimensional tolerance is 0.1 mm. Note: 1.

When using the LY1-0, please note that in addition to terminals 2, 3, and 6, exposed conductive parts are also present at the positions of terminals 1, 4, and 5. Please take this into consideration during your design.

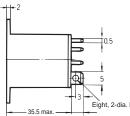
Terminal Arrangement/Internal Connections (Bottom View)

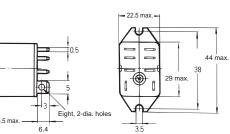


Case-surface mounting









Dimensions two M3 screw holes

Mounting Hole

Connections (Bottom View) LY1F LY2F (The coil has no polarity.)

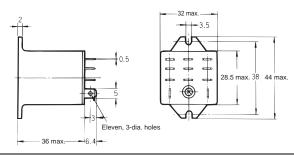
Terminal Arrangement/Internal

Note: The figures and dimensions depicted here are for the LY1F. The LY2F and LY2ZF also conform to these measurements.

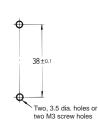
Note: The dimensional tolerance is ±0.1 mm.

LY3F

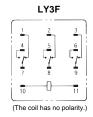




Mounting Hole Dimensions

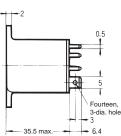


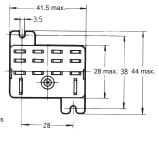
Terminal Arrangement/Internal Connections (Bottom View)



LY4F

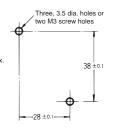




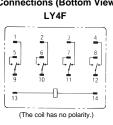


Dimensions Three, 3.5 dia. holes or two M3 screw holes

Mounting Hole



Terminal Arrangement/Internal Connections (Bottom View)



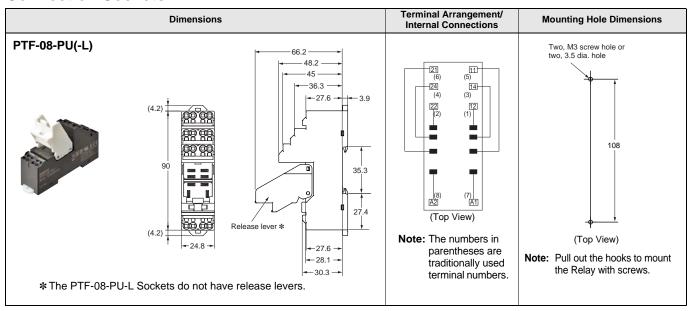
Accessories (Order Separately)

Socket Characteristics

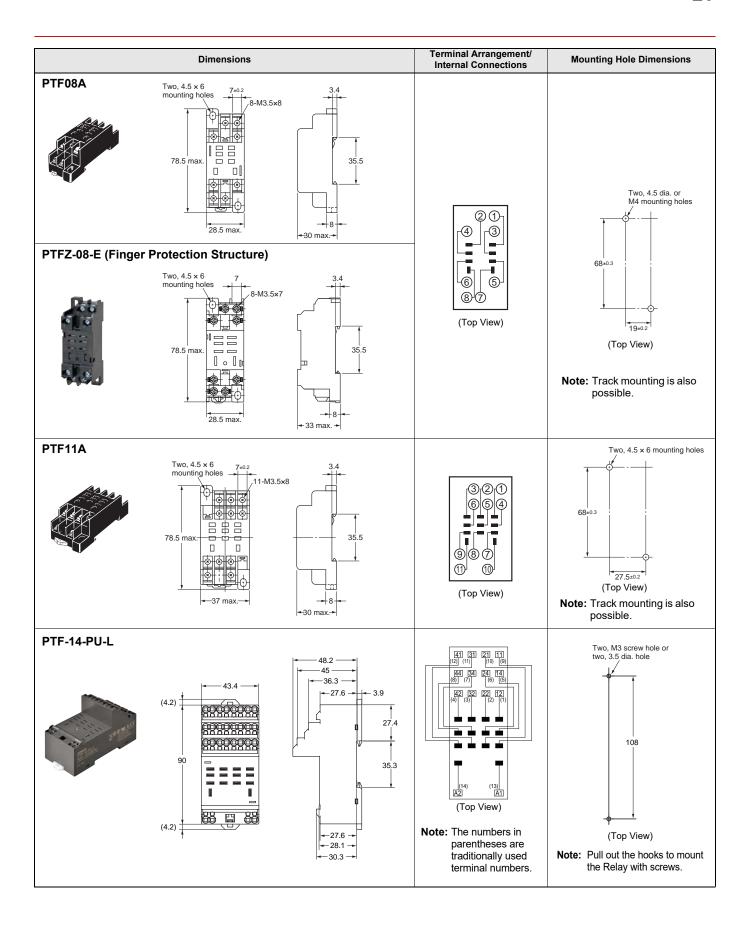
| Model | Rated carry current | Dielectric strength | Insulation resistance *1 | Remarks |
|-------------|---------------------------------|---|--------------------------|---------|
| PTF-□-PU(L) | 10 A | Between contact terminals of same polarity: 2,000 VAC, 1 min | 1,000 MΩ min. | |
| | | Between contact terminals of different polarity: 2,000 VAC, 1 min | | |
| | | Between coil and contact terminals: 2,000 VAC, 1 min | | |
| PTFZ-□□-E | 12 A (@70°C) 15 A (@50°C) *2 | Between contact terminals of different polarity: 2,500 VAC, 1 min | - 1,000 MΩ min. | |
| | | Between contact terminals of same polarity: 2,500 VAC, 1 min | | |
| | | Between ground terminals: 2,500 VAC, 1 min | | |
| | | Between coil and contact terminals: 2,500 VAC, 1 min | | |
| PTF□□A | 10 A | Between terminals: 2,000 VAC for 1 min | 100 MΩ min. | |
| PT-□□ | 10 A | Between terminals: 2,000 VAC for 1 min | 100 MΩ min. | |
| PT□□-0 | 10 A | Between terminals: 2,000 VAC for 1 min | 100 MΩ min. | |
| PT□□QN | 10 A | Between terminals: 2,000 VAC for 1 min | 100 MΩ min. | |

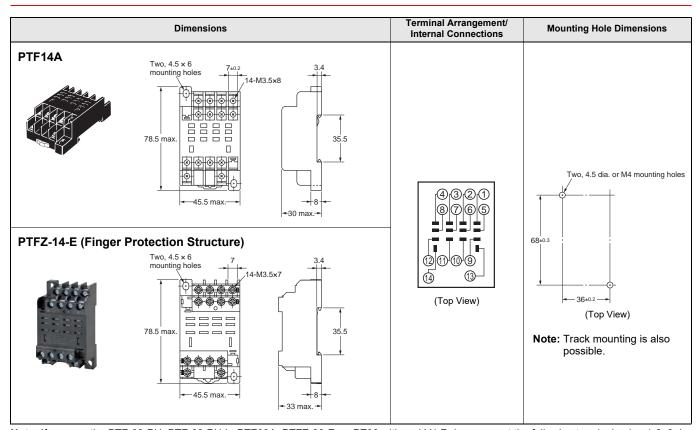
^{*1.} The insulation resistance was measured with a 500-VDC insulation resistance meter at the same places as those used for measuring the dielectric strength.

Connection Sockets

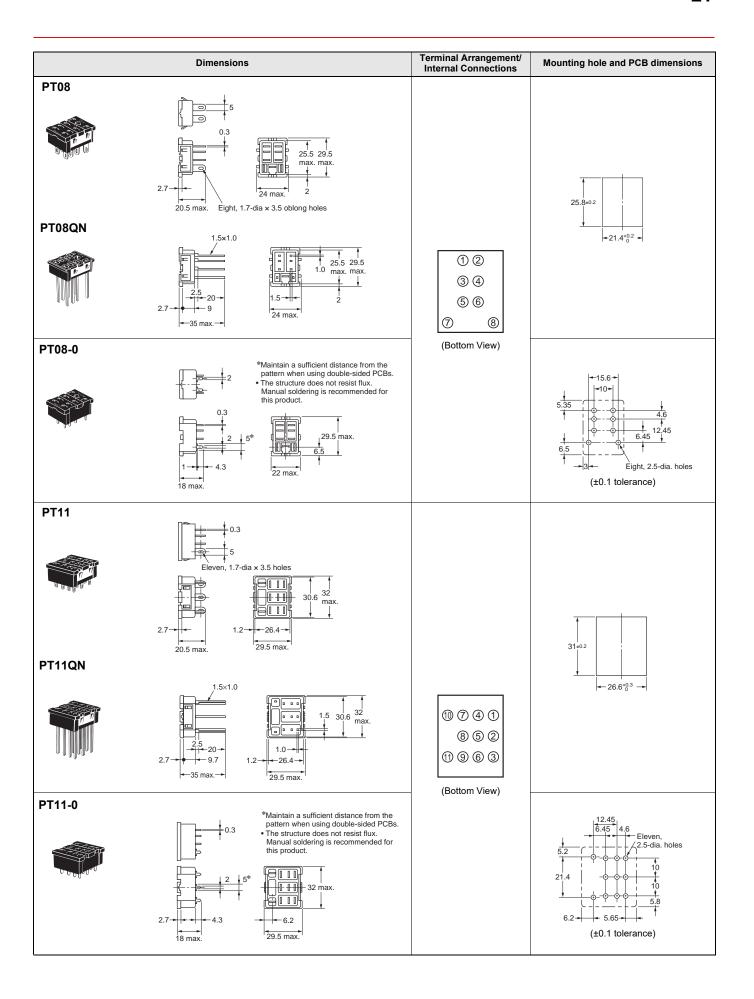


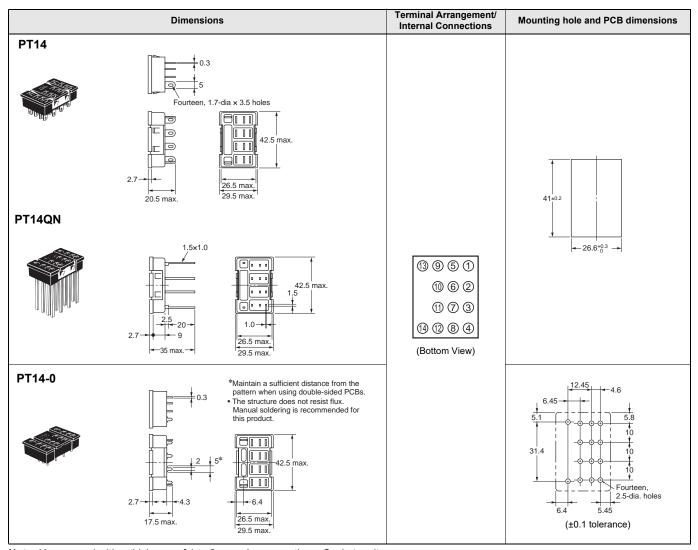
^{*2.} However, do not exceed the continuous carry current of the socket to be mounted.





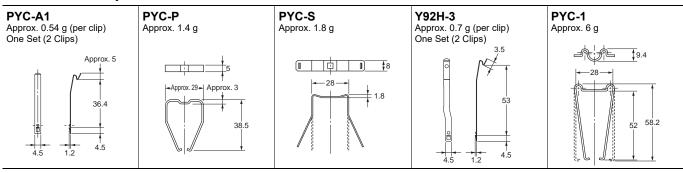
Note: If you use the PTF-08-PU, PTF-08-PU-L, PTF08A, PTFZ-08-E, or PT08 with an LY1 Relay, connect the following terminal pairs: 1-2, 3-4, and 5-6 (for usage at 10 A or higher).





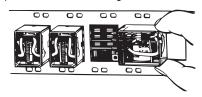
Note: Use a panel with a thickness of 1 to 2 mm when mounting a Socket on it.

Hold-down Clips

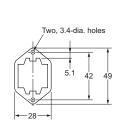


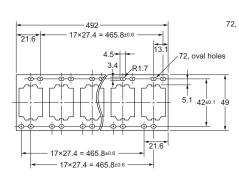
Socket Mounting Plates (t = 1.6)

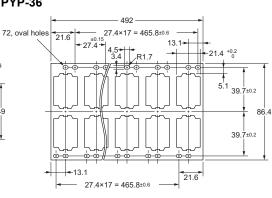
OMRON can provide Socket Mounting Plate for convenient Socket installation. Please use these Plates as required.



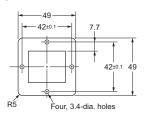
PYP-1 PYP-18 PYP-36



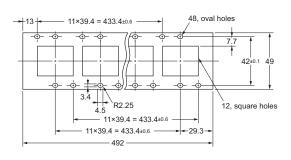




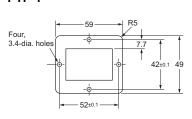
PTP-1-3



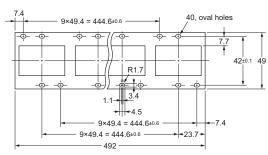
PTP-12



PTP-1



PTP-10

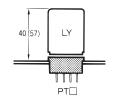


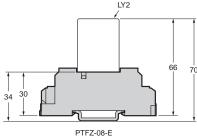
Mounting Height with Sockets

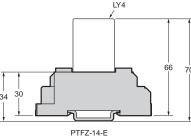
Front-mounting Sockets

LY 71 (88) 28.1 PTF_A PTF-□-PU LY2 LY4

Back-mounting Sockets







Note: 1. 2.

The PTF□A can be mounted on a track or with screws.

The measurements in parentheses are for the LY□-CR (built-in CR circuit).

Safety Precautions

Refer to the Common Relay Precautions for precautions that apply to all Relays.

Precautions for Correct Use

- · Use two M3 screws to attach case-surface-mounted models (LY1F, LY2F, LY3F, and LY4F) and tighten the screws securely. (Normal tightening torque: 0.98 N·m)
- For Relays with Tab Terminals, select a wire diameter for the lead wires that connect to the faston receptacle terminals that is within the allowed range for the load current.
- Do not impose excessive external force on the Relay when inserting the Relay to the faston receptacle or pulling the Relay out from the faston receptacle. Do not attempt to insert a terminal diagonally or insert or pull out more than one terminal at the same time
- · LY Single-contact Relays are for power switching applications. Do not use the LY Series for switching minute loads of 100 mA or less, such as signals.

About the Built-in Diode and CR Elements

The diode and CR elements built into the Relay are designed to absorb the reverse voltage from the Relay coil.

- (1) These components do not absorb external surges such as those from other devices in the circuit or from lightning.
 - The diode and CR element will be destroyed if a large external surge voltage is applied.
 - If there is the possibility of large voltage surges that could be applied to the diode or element from an external source, take any necessary surge absorption measures.
- (2) Relays with a built-in diode have coil polarity. If the relay is connected with reverse polarity, the diode may be damaged when voltage is applied to the coil. Make sure that the polarity is correct.

Applying 10 A or More When Using an LY1 with the Following Sockets

When you apply a minimum of 10 A of current to an LY1 when it is used in combination with the PTF-08-PU or PTF-08-PU-L, connect each of the following terminal pairs: terminal No.12 (1) to 42 (4), 14 (5) to 44 (8), and 11 (9) to 41 (12).

When you apply a minimum of 10 A of current to an LY1 when it is used in combination with the PTF08A, PTFZ-08-E, or PT08, connect each of the following terminal pairs: (1) to (2), (3) to (4), and (5) to (6).

Relay Replacement

To replace the Relay, turn OFF the power supply to the load and Relay coil sides to prevent unintended operation and possible electrical shock.

Attaching and Removing Relay Hold-down Clips

When you attach a Hold-down Clip to or remove it from a Socket, wear gloves or take other measures to prevent injuring your fingers on the Hold-down Clip.

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