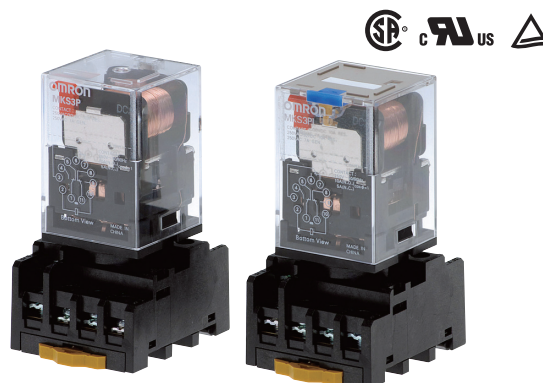


# General Purpose Relays

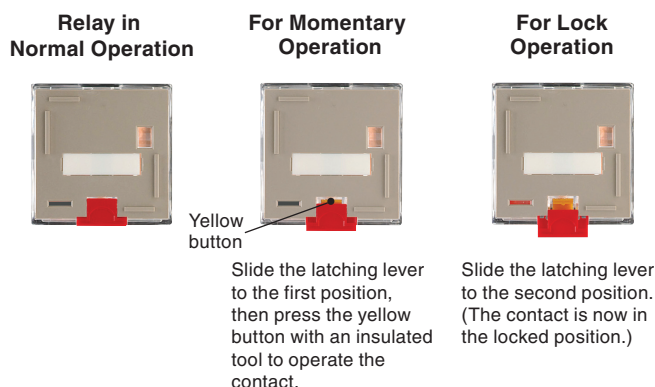
## Exceptionally Reliable General Purpose Relay now available with Lockable Test Button

- IEC Rating of 7A 250 V AC 50/60 Hz, General use 100,000 cycles.
- Mechanical indicator standard for all models.
- Optional features include lockable test button, LED indicator, diode surge suppression, varistor, reverse polarity, and alternate wiring styles.
- UL (RU/CRU), CE and TUV approved.
- RoHS Compliant.



## Features

### Two-way Action Test Button (Models with Lockable Test Button)



**Note:** The latching lever is Red for AC Coil versions and Blue for DC Coil versions.

## Model Number Structure

## ■ Model Number Legend

**MKS**                          -      -       
1 2 3 4 5 6 7

## 1. Contact Form

- ```

2:  DPDT
3:  3PDT

```

## 2. Terminals

- P: Plug-in

### 3. Mechanical Indicator/Test Button

- Blank: Mechanical indicator  
I: Mechanical indicator and lockable test button

#### 4. LED Indicator

- Blank: Standard  
N: LED indicator

## 5. Coil Polarity

- Blank: Standard  
1: Reverse polarity (DC coil only)

## 6. Surge Absorption

- Blank: Standard  
D: Surge absorber diode (DC coil only)  
V: Surge absorber varistor (AC coil only)

## 7. Internal Connections DPDT

- Blank: Standard  
2 or 5: Non-standard connections.(Refer to “*Terminal Arrangement/Internal Connection (Bottom View)*”.)

## 8. Rated Voltage

- (Refer to "Coil Ratings".)

# Ordering Information

## List of Models

| Type                                       | Terminals | Contact form | Internal connections<br>(See note 3.) | With mechanical indicator | With mechanical indicator<br>and lockable test button | Coil ratings |
|--------------------------------------------|-----------|--------------|---------------------------------------|---------------------------|-------------------------------------------------------|--------------|
| Basic Models                               | Plug-in   | DPDT         | Standard                              | MKS2P                     | MKS2PI                                                | AC/DC        |
|                                            |           |              | Non Standard                          | MKS2P-2                   | MKS2PI-2                                              |              |
|                                            |           | 3PDT         | Standard                              | MKS3P                     | MKS3PI                                                |              |
|                                            |           |              | Non Standard                          | MKS3P-2                   | MKS3PI-2                                              |              |
|                                            |           |              |                                       | MKS3P-5                   | MKS3PI-5                                              |              |
|                                            |           |              |                                       |                           |                                                       |              |
| Models with LED Indicator<br>(See note 2.) |           | DPDT         | Standard                              | MKS2PN(1)                 | MKS2PIN(1)                                            | AC/DC        |
|                                            |           |              | Non Standard                          | MKS2PN(1)-2               | MKS2PIN(1)-2                                          |              |
|                                            |           | 3PDT         | Standard                              | MKS3PN(1)                 | MKS3PIN(1)                                            |              |
|                                            |           |              | Non Standard                          | MKS3PN(1)-2               | MKS3PIN(1)-2                                          |              |
|                                            |           |              |                                       | MKS3PN(1)-5               | MKS3PIN(1)-5                                          |              |
|                                            |           |              |                                       |                           |                                                       |              |
| Models with Diode<br>(See note 2.)         |           | DPDT         | Standard                              | MKS2P(1)-D                | MKS2PI(1)-D                                           | DC           |
|                                            |           |              | Non Standard                          | MKS2P(1)-D-2              | MKS2PI(1)-D-2                                         |              |
|                                            |           | 3PDT         | Standard                              | MKS3P(1)-D                | MKS3PI(1)-D                                           |              |
|                                            |           |              | Non Standard                          | MKS3P(1)-D-2              | MKS3PI(1)-D-2                                         |              |
|                                            |           |              |                                       | MKS3P(1)-D-5              | MKS3PI(1)-D-5                                         |              |
|                                            |           |              |                                       |                           |                                                       |              |
| Models with LED Indicator<br>and Diode     |           | DPDT         | Standard                              | MKS2PN-D                  | MKS2PIN-D                                             | DC           |
|                                            |           |              | Non Standard                          | MKS2PN-D-2                | MKS2PIN-D-2                                           |              |
|                                            |           | 3PDT         | Standard                              | MKS3PN-D                  | MKS3PIN-D                                             |              |
|                                            |           |              | Non Standard                          | MKS3PN-D-2                | MKS3PIN-D-2                                           |              |
|                                            |           |              |                                       | MKS3PN-D-5                | MKS3PIN-D-5                                           |              |
|                                            |           |              |                                       |                           |                                                       |              |
| Models with Varistor                       |           | DPDT         | Standard                              | MKS2P-V                   | MKS2PI-V                                              | AC           |
|                                            |           |              | Non Standard                          | MKS2P-V-2                 | MKS2PI-V-2                                            |              |
|                                            |           | 3PDT         | Standard                              | MKS3P-V                   | MKS3PI-V                                              |              |
|                                            |           |              | Non Standard                          | MKS3P-V-2                 | MKS3PI-V-2                                            |              |
|                                            |           |              |                                       | MKS3P-V-5                 | MKS3PI-V-5                                            |              |
|                                            |           |              |                                       |                           |                                                       |              |
| Models with LED Indicator<br>and Varistor  |           | DPDT         | Standard                              | MKS2PN-V                  | MKS2PIN-V                                             | AC           |
|                                            |           |              | Non Standard                          | MKS2PN-V-2                | MKS2PIN-V-2                                           |              |
|                                            |           | 3PDT         | Standard                              | MKS3PN-V                  | MKS3PIN-V                                             |              |
|                                            |           |              | Non Standard                          | MKS3PN-V-2                | MKS3PIN-V-2                                           |              |
|                                            |           |              |                                       | MKS3PN-V-5                | MKS3PIN-V-5                                           |              |
|                                            |           |              |                                       |                           |                                                       |              |

**Note:** 1. When ordering, add the rated voltage to the model number. Rated voltages are given in the coil ratings table in the specifications.

Example: MKS2P DC48

Rated voltage

2. The DC coil comes in two types: standard coil polarity and reverse coil polarity.

Refer to *Terminal Arrangement and Internal Connections*.

Example: MKS3PN1-5 DC24

Reverse coil polarity

3. Refer to *Terminal Arrangement and Internal Connections* for all wiring diagrams.

## 10A Sockets (Order Separately)

| Item                                          | Type   | Model    |
|-----------------------------------------------|--------|----------|
| Track-mounted Socket                          | 8-pin  | PF083A-E |
|                                               | 11-pin | PF113A-E |
|                                               | 8-pin  | PF083A-D |
|                                               | 11-pin | PF113A-D |
| Hold-down Clip<br>(For PF083A-E and PF113A-E) |        | PFC-A1   |

# Specifications

## ■ Ratings

### Coil Ratings

| Rated voltage |       | Rated current |         | Coil resistance | Must operate voltage      | Must release voltage                                                     | Max. voltage          | Power consumption                                  |
|---------------|-------|---------------|---------|-----------------|---------------------------|--------------------------------------------------------------------------|-----------------------|----------------------------------------------------|
|               |       | 50 Hz         | 60 Hz   |                 |                           |                                                                          |                       |                                                    |
| AC            | 6 V   | 443 mA        | 385 mA  | 3.1 $\Omega$    | 80% max. of rated voltage | 30% min. of rated voltage at 60 Hz<br>25% min. of rated voltage at 50 Hz | 110% of rated voltage | Approx. 2.3 VA at 60 Hz<br>Approx. 2.7 VA at 50 Hz |
|               | 12 V  | 221 mA        | 193 mA  | 13.7 $\Omega$   |                           |                                                                          |                       |                                                    |
|               | 24 V  | 110 mA        | 96.3 mA | 48.4 $\Omega$   |                           |                                                                          |                       |                                                    |
|               | 100 V | 26.6 mA       | 23.1 mA | 760 $\Omega$    |                           |                                                                          |                       |                                                    |
|               | 110 V | 24.2 mA       | 21.0 mA | 932 $\Omega$    |                           |                                                                          |                       |                                                    |
|               | 120 V | 22.2 mA       | 19.3 mA | 1,130 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 200 V | 13.3 mA       | 11.6 mA | 3,160 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 220 V | 12.1 mA       | 10.5 mA | 3,550 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 230 V | 11.5 mA       | 10.0 mA | 4,250 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 240 V | 11.0 mA       | 9.6 mA  | 4,480 $\Omega$  |                           |                                                                          |                       |                                                    |
| DC            | 6 V   | 224 mA        |         | 26.7 $\Omega$   | 15% min. of rated voltage |                                                                          |                       | Approx. 1.4 W                                      |
|               | 12 V  | 112 mA        |         | 107 $\Omega$    |                           |                                                                          |                       |                                                    |
|               | 24 V  | 55.8 mA       |         | 430 $\Omega$    |                           |                                                                          |                       |                                                    |
|               | 48 V  | 28.1 mA       |         | 1,710 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 100 V | 13.5 mA       |         | 7,390 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 110 V | 12.3 mA       |         | 8,960 $\Omega$  |                           |                                                                          |                       |                                                    |
|               | 125 V | 10.8 mA       |         | 11,576 $\Omega$ |                           |                                                                          |                       |                                                    |

- Note:** 1. The rated current and coil resistance are measured at a coil temperature of 23°C with tolerances of +15%/–20% for AC rated current and  $\pm 15\%$  for DC coil resistance.  
 2. Performance characteristic data are measured at a coil temperature of 23°C.  
 3. The maximum voltage is one that is applicable instantaneously to the Relay coil at 23°C and not continuously.  
 4. For DC-operated Relays with the LED indicator built-in, add an LED current of approx. 5 mA to the rated current.

### Contact Ratings

|                         |    |                              |                                |
|-------------------------|----|------------------------------|--------------------------------|
| Load                    |    | Resistive load<br>(cosφ = 1) | Inductive load<br>(p.f. = 0.4) |
| Contact mechanism       |    | Single                       |                                |
| Contact material        |    | AgSnIn                       |                                |
| Rated load              | NO | 10 A, 250 VAC<br>10A, 30 VDC | 7 A, 250 VAC                   |
|                         | NC | 5 A, 250 VAC<br>5 A, 30 VDC  |                                |
| Rated carry current     |    | 10 A                         |                                |
| Max. switching voltage  |    | 250 VAC, 250 VDC             |                                |
| Max. switching current  |    | 10 A                         |                                |
| Max. switching capacity | NO | 2,500 VA/300 W               |                                |
|                         | NC | 1,250 VA/150 W               |                                |

## ■ Characteristics

|                           |                                                                                                                                                                                                                                                                                  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact resistance        | 100 mΩ max.                                                                                                                                                                                                                                                                      |
| Operate time              | AC: 20 ms max.<br>DC: 30 ms max.                                                                                                                                                                                                                                                 |
| Release time              | 20 ms max.(40 ms max. for built-in diode models)                                                                                                                                                                                                                                 |
| Max. operating frequency  | Mechanical: 18,000 operations/hr (no load)<br>Electrical:1,800 operations/hr (at rated load)                                                                                                                                                                                     |
| Insulation resistance     | 100 MΩ min. (at 500 VDC)                                                                                                                                                                                                                                                         |
| Dielectric strength       | 2,500 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 and terminals of the same polarity<br>2,500 VAC 50/60 Hz for 1 min. between current-carrying parts, non-current-carrying parts, and opposite polarity |
| Insulation method         | Basic insulation                                                                                                                                                                                                                                                                 |
| Impulse withstand voltage | 4.5 kV between coil and contacts (with 1.2 × 50 μs impulse wave)<br>3.0 kV between contacts of different polarity (with 1.2 × 50 μs impulse wave)                                                                                                                                |
| Pollution degree          | 3                                                                                                                                                                                                                                                                                |
| Rated insulation voltage  | 250 V                                                                                                                                                                                                                                                                            |
| Vibration resistance      | Destruction:10 to 55 Hz, 1.5 mm double amplitude<br>Malfunction:10 to 55 Hz, 1.0 mm double amplitude                                                                                                                                                                             |
| Shock resistance          | Destruction:1,000 m/s <sup>2</sup> (approx. 100 G)<br>Malfunction:100 m/s <sup>2</sup> (approx. 10 G)                                                                                                                                                                            |
| Life expectancy           | Mechanical: 5,000,000 operations min.<br>Electrical:100,000 operations min.                                                                                                                                                                                                      |
| Min. permissible load     | 10 mA at 1 VDC P level: λ <sub>60</sub> =0.1 × 10 <sup>-6</sup> / ops                                                                                                                                                                                                            |
| Ambient temperature       | Operating: -40 to 60°C (with no icing or condensation)                                                                                                                                                                                                                           |
| Ambient humidity          | Operating: 5% to 85%                                                                                                                                                                                                                                                             |
| Weight                    | Approx. 90 g                                                                                                                                                                                                                                                                     |

**Note:** 1. The values given above are initial values.

2. Ambient temperature of models with LED indicator is -25 to 60°C.

## ■ Approved Standards

UL Recognized (File No. E41515) -- Ambient Temp. = 40°C

| Coil ratings                 | Contact ratings |                                                                                                          | Operations |
|------------------------------|-----------------|----------------------------------------------------------------------------------------------------------|------------|
| 6 to 110 VDC<br>6 to 240 VAC | N.O.<br>contact | 10 A, 250 V AC 50/60 Hz (Resistive)<br>10 A, 30 V DC (Resistive)<br>7 A, 250 V AC 50/60 Hz (General Use) | 100,000    |
|                              | N.C.<br>contact | 10 A, 250 V AC 50/60 Hz (Resistive)<br>10 A, 30 V DC (Resistive)<br>7 A, 250 V AC 50/60 Hz (General Use) | 100,000    |

**Note:** 10A UL ratings are with no load on the other contact set.

CSA Certified (File No. LR35535)

| Coil ratings                 | Number of Poles | Contact ratings                                                                                                                           | Operations |
|------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------|
| 6 to 125 VDC<br>6 to 240 VAC | 2               | 10 A, 250 V AC (Resistive)<br>10 A, 30 V DC (Resistive)<br>7 A, 250 V AC (General Use)                                                    | 100,000    |
|                              | 3               | 10 A, 250 V AC (Resistive)<br>Same Polarity<br>10 A, 30 V DC (Resistive)<br>Same Polarity<br>7 A, 250 V AC (General Use)<br>Same Polarity | 100,000    |

IEC Standard/TUV Certification: IEC61810-1  
(Certification No. R50104853)

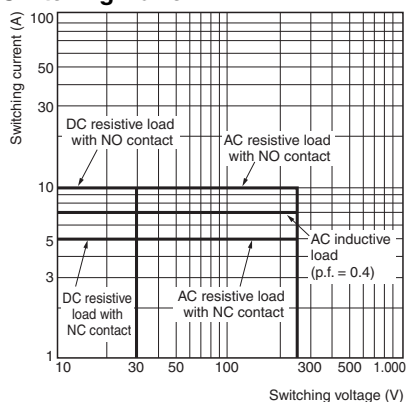
| Coil ratings                                                                   | Contact ratings |                                                                                                          | Operations |
|--------------------------------------------------------------------------------|-----------------|----------------------------------------------------------------------------------------------------------|------------|
| 6, 12, 24, 48,<br>100, 110 VDC<br>6, 12, 24, 100,<br>110, 200, 220,<br>240 VAC | N.O.<br>contact | 10 A, 250 V AC 50/60 Hz (Resistive)<br>10 A, 30 V DC (Resistive)<br>7 A, 250 V AC 50/60 Hz (General Use) | 100,000    |
|                                                                                | N.C.<br>contact | 5 A, 250 V AC 50/60 Hz (Resistive)<br>5 A, 30 V DC (Resistive)<br>7 A, 250 V AC 50/60 Hz (General Use)   | 100,000    |

**Note:** Maximum carrying current per TUV Certification is 9 A when new MK-S relays are mounted in PF083A-E or PF113A-E Sockets.

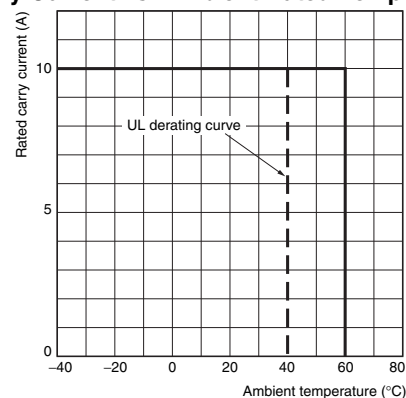
# Engineering Data

## Reference Data

### Maximum Switching Power



### Rated Carry Current vs. Ambient Temperature

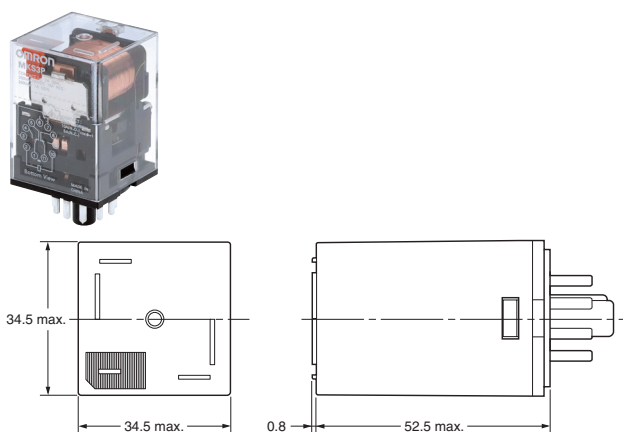


**Note:** The lower limit of the ambient operating temperature for models with built-in operation indicators is -25°C.

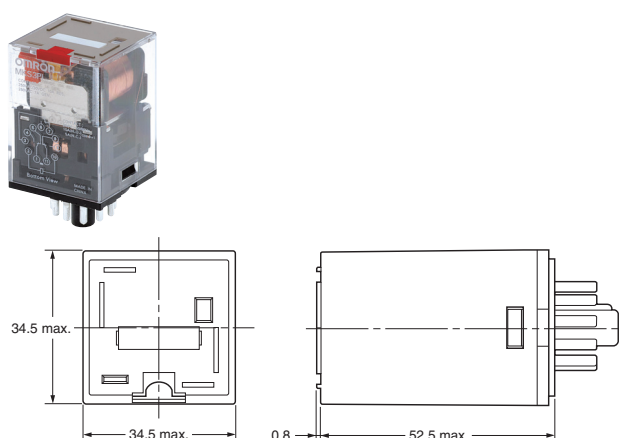
## Dimensions

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

### Models without Test Button

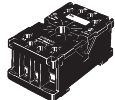
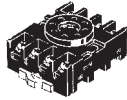
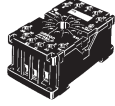


### Models with Lockable Test Button



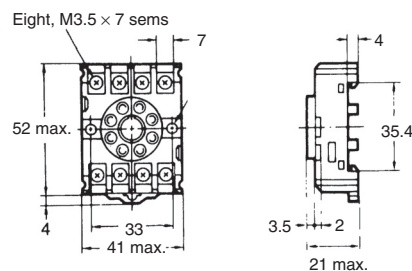
### Track Mounted Sockets

See below for Socket dimensions.

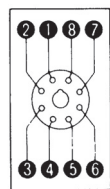
| Poles                 | Finger-protection models                                                                        |                                                                                                 |                                                                                               |
|-----------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Maximum carry current | 10 A                                                                                            |                                                                                                 | 5 A                                                                                           |
| 2 poles               | PF083A-E<br> | PF083A-D<br> | PF083A<br> |
| 3 poles               | PF113A-E<br> | PF113A-D<br> | PF113A<br> |

**Note:** If using the PF083A or PF113A Sockets, be sure the maximum carrying current is 5 A or less. When using finger-protection sockets, make sure the connecting wire terminals are Y-shaped.

**PF083A-E (Conforming to EN 50022)**

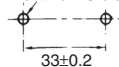


**Terminal Arrangement**

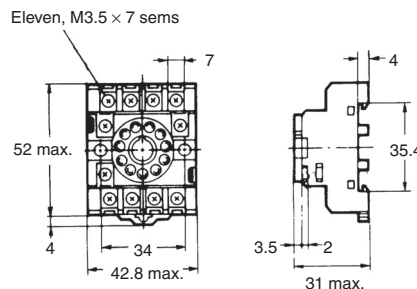


**Mounting Holes**

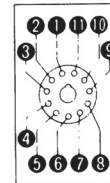
Two, M4 or two 4.5-dia. holes



**PF113A-E (Conforming to EN 50022)**



**Terminal Arrangement**

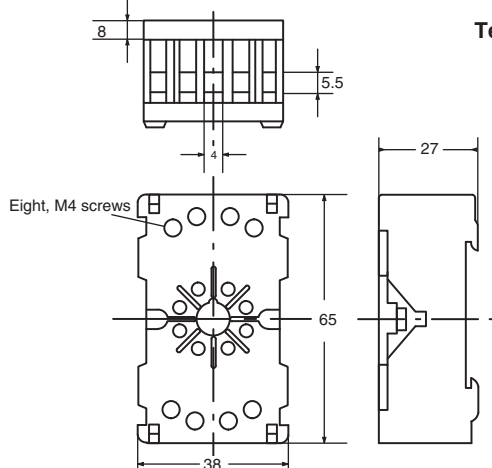


**Mounting Holes**

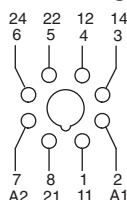
Two, M4 or two 4.5-dia. holes



**PF083A-D**



**Terminal Arrangement**

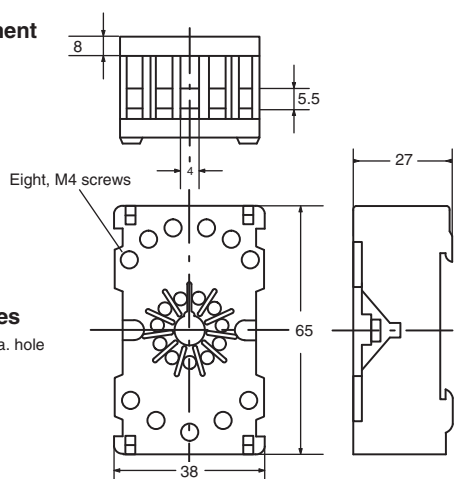


**Mounting Holes**

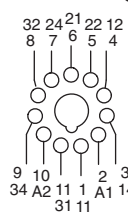
Two, M4 or two 4.5-dia. hole



**PF113A-D**



**Terminal Arrangement**



**Mounting Holes**

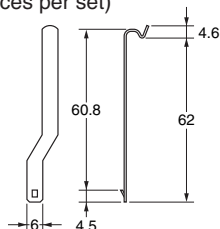
Two, M4 or two 4.5-dia. hole



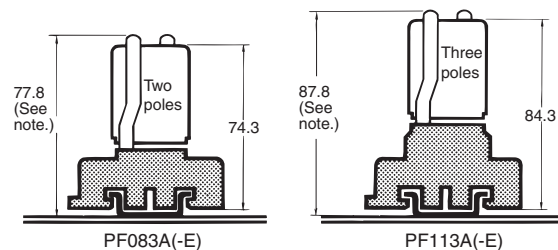
**Hold-down Clips**

**PFC-A1**

(2 pieces per set)



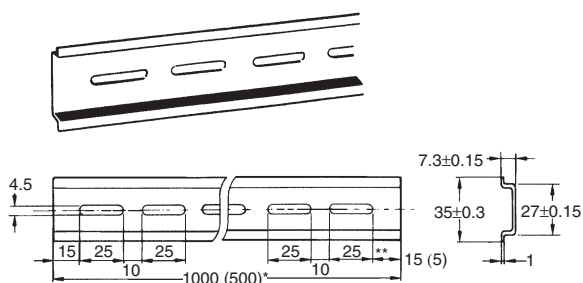
**Mounting Height with Sockets**



**Note:** PF083A(-E) and PF113A(-E) allow either track or screw mounting.

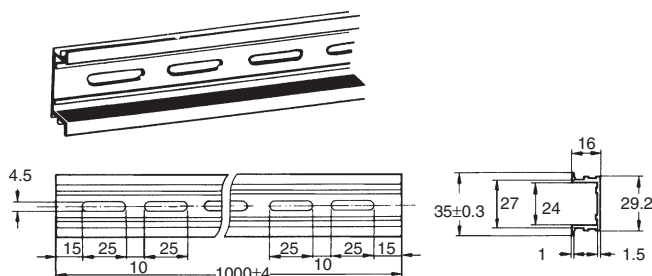
**Mounting Tracks**

**PFP-100N, PFP-50N  
(Conforming to EN 50022)**



\* The figure in parenthesis is for PFP-50N.

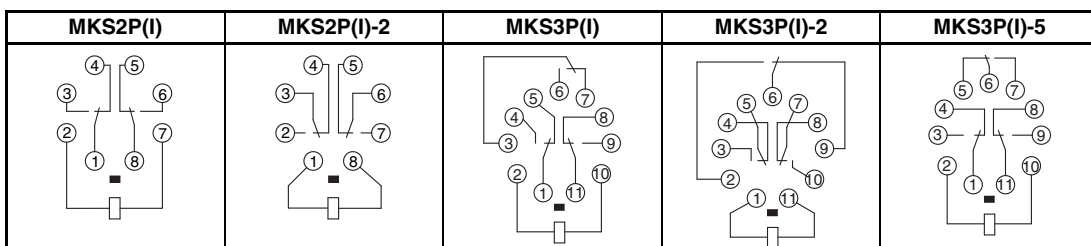
**PFP-100N2  
(Conforming to EN 50022)**



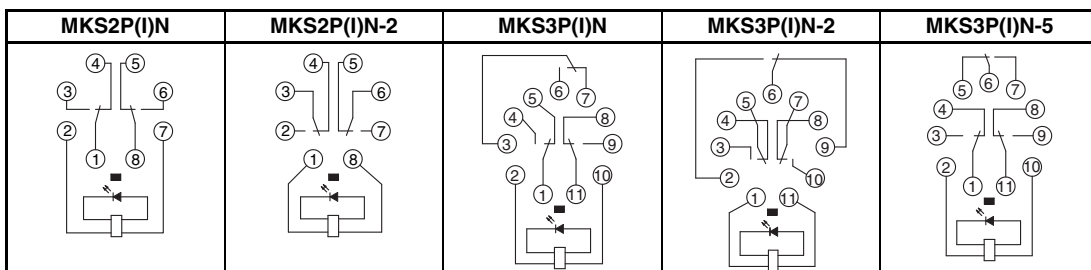
\*\* A total of twelve 25 x 4.5 elliptic holes is provided with six holes cut from each track end at a pitch of 10 mm.

# Terminal Arrangement/Internal Connection (Bottom View)

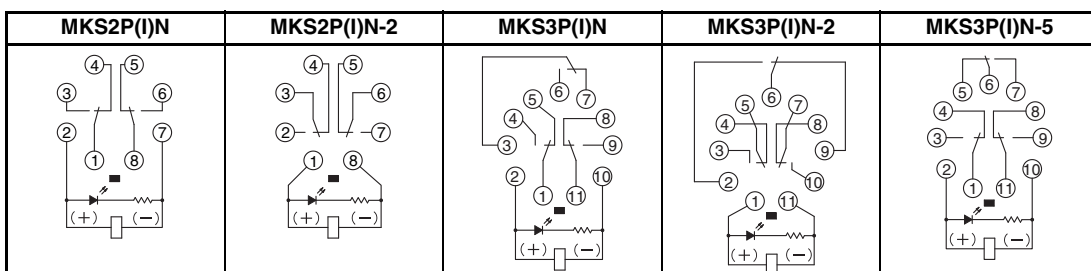
## Basic Models (AC/DC Coil)



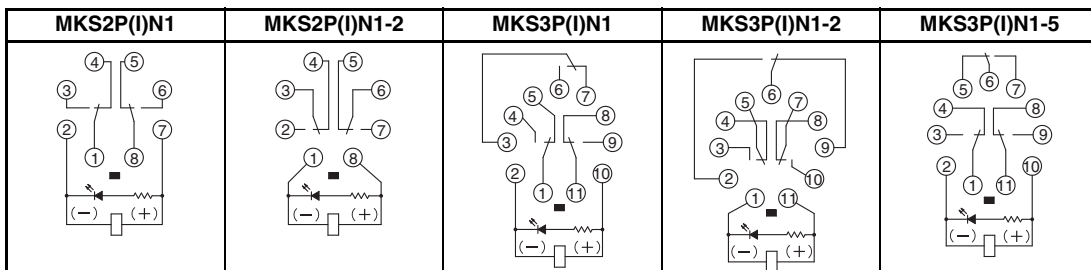
## LED Indicator Type (AC Coil)



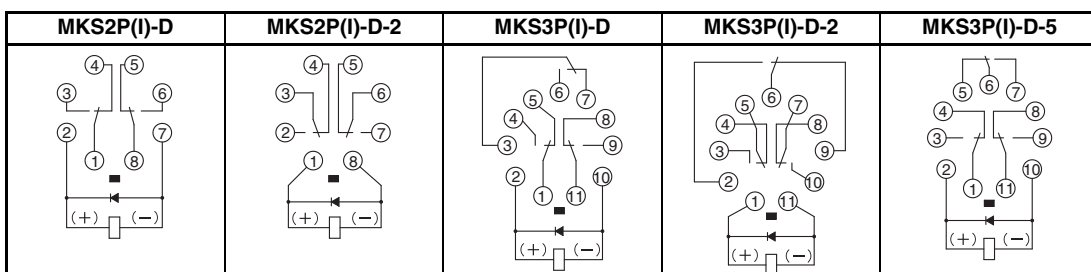
## LED Indicator Type (DC Coil: Standard Polarity)



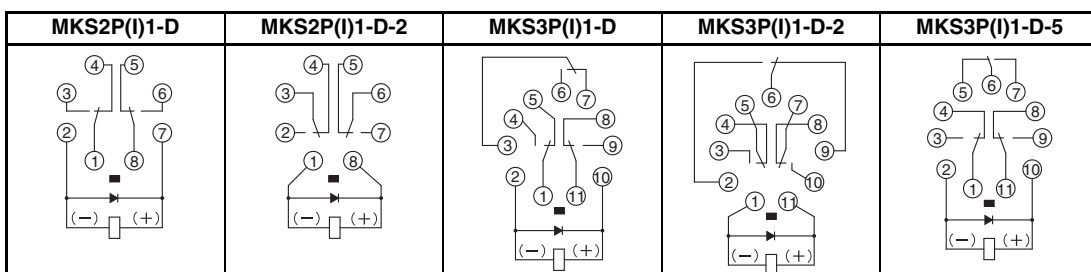
## LED Indicator Type (DC Coil: Reverse Polarity)



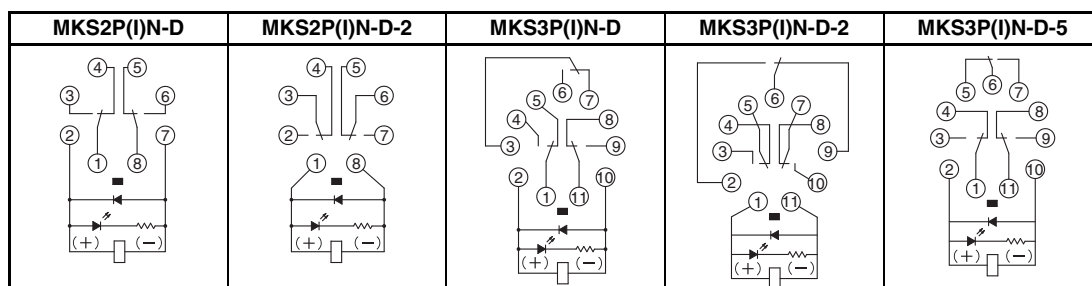
## Diode Type (DC Coil: Standard Polarity)



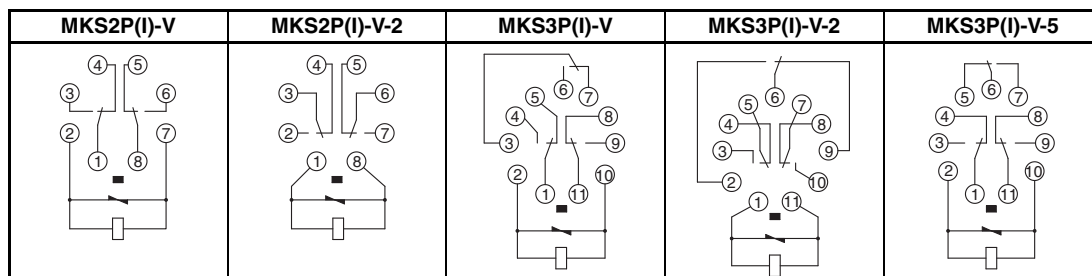
## Diode Type (DC Coil: Reverse Polarity)



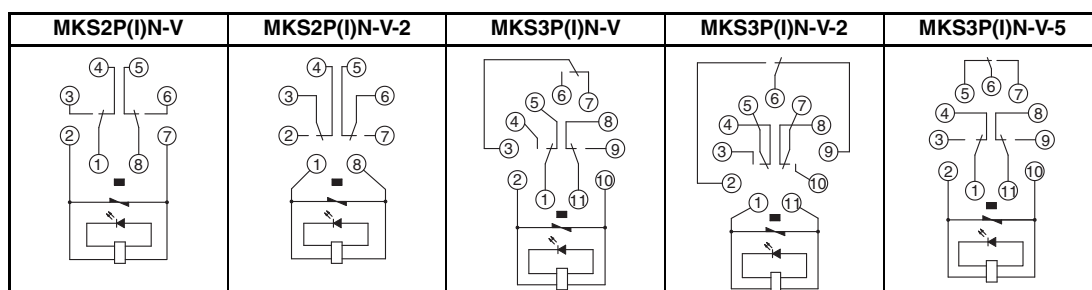
**LED Indicator and Diode Type (DC Coil)**



**Varistor Type (AC Coil)**



**LED Indicator and Varistor Type (AC Coil)**



## Safety Precautions

### ■ Safety Precautions for Correct Use

#### Installation

Recommend mounting MK-S Relay so that side with wiring diagram is facing down.

#### Handling

Check coil polarity when wiring LED Indicator and Diode Models.

#### Test Button

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.

Models with test buttons or LED indicators fulfill the requirements for reinforced insulation between live parts and the front of cover only when the Relay is in a complete condition, i.e. with the nameplate, nameplate frame, test button, and slider in place. If any of these parts are removed, only the requirements for basic insulation are fulfilled.



All sales are subject to Omron Electronic Components LLC standard terms and conditions of sale, which can be found at [http://www.components.omron.com/components/web/webfiles.nsf/sales\\_terms.html](http://www.components.omron.com/components/web/webfiles.nsf/sales_terms.html)

**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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