

Power Relays ( Over 2 A )  
**HE RELAYS**

Product Catalog

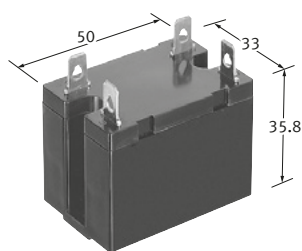
**IN Your  
Future**

# HE RELAYS

## TV-10/TV-15 rated, 1 Form A 30 A, 2 Form A 25 A, Power relays

### Protective construction

- Dust cover type : Plug-in, TM and Screw terminal types
- Flux-resistant type : PC board type



1 Form A Plug-in type

(Unit : mm)

### FEATURES

- High capacity: 30 A ( 1 Form A ) , 25 A ( 2 Form A )
- TV standard approved: TV-15 ( 1 Form A ) , TV-10 ( 2 Form A )
- Surge withstand voltage: 10,000 V ( between contact and coil )
- Terminal sockets are available

### TYPICAL APPLICATIONS

- Office equipment
- Industrial equipment
- Home appliances

### ORDERING INFORMATION ( PART NO. : Ordering part number for Japanese market )

#### AHE

- Contact arrangement  
1 : 1 Form A (Single side stable)  
2 : 2 Form A (Single side stable)

- Operate voltage  
2 : 70% of Rated voltage

- Terminal shape  
1 : Plug-in type (DC)  
2 : TM type (DC)  
3 : Screw terminal type (DC)  
5 : Plug-in type (AC)  
6 : TM type (AC)  
7 : Screw terminal type (AC)  
9 : PC board type (DC)

| Rated coil voltage | Part Number | 0 | 1  | 2  | 3  | 4       | 5       | 6   |
|--------------------|-------------|---|----|----|----|---------|---------|-----|
| VDC                |             | 6 | 12 | 24 | 48 | 100     | —       | 110 |
| VAC                |             | — | 12 | 24 | 48 | 100/120 | 200/240 | —   |

### ORDERING INFORMATION ( TYPE NO. : Ordering part number for non Japanese market )

#### HE

- Contact arrangement  
1a : 1 Form A (Single side stable)  
2a : 2 Form A (Single side stable)

- Operate voltage  
N : 70% of Rated voltage

- Terminal shape  
Nil : Plug-in type  
S : Screw terminal type  
Q : TM type  
P : PC board type

- Rated coil voltage  
DC : 6, 12, 24, 48, 100, 110V  
AC : 12, 24, 48, 100(100/120), 200(200/240)V

### CLASSIFICATION

| Item  | PC board terminal        | Plug-in terminal      | TM type  | Screw terminal |
|---|--------------------------|-----------------------|----------|----------------|
| Operational function                          | Single side stable       |                       |          |                |
| Contact arrangement                           | 1 Form A                 | 1 Form A              | 2 Form A | 1 Form A       |
| Insulation gap                                | Min. 8 mm                |                       |          |                |
| Distance between contacts ( Reference value ) | Min. 2.5 mm              | Min. 3 mm             |          |                |
| Dielectric strength ( initial )               | Between open contacts    | 2,000 V rms for 1 min |          |                |
|   | Between contact and coil | 5,000 V rms for 1 min |          |                |

# Power Relays ( Over 2 A ) HE RELAYS

## TYPES

" Type No. " is ordering part number for non Japanese market. " Part No. " is ordering part number for Japanese market.

### ■ DC PC board terminal

| Rated coil voltage | 1 Form A       |          | Standard packing |              |
|--------------------|----------------|----------|------------------|--------------|
|                    | Type No.       | Part No. | Inner carton     | Outer carton |
| 6 V DC             | HE1aN-P-DC6V   | AHE1290  | 25 pcs.          | 100 pcs.     |
| 12 V DC            | HE1aN-P-DC12V  | AHE1291  |                  |              |
| 24 V DC            | HE1aN-P-DC24V  | AHE1292  |                  |              |
| 48 V DC            | HE1aN-P-DC48V  | AHE1293  |                  |              |
| 100 V DC           | HE1aN-P-DC100V | AHE1294  |                  |              |
| 110 V DC           | HE1aN-P-DC110V | AHE1296  |                  |              |

### ■ Plug-in terminal

| Type    | Rated coil voltage | 1 Form A     |          | 2 Form A     |          | Standard packing |              |
|---------|--------------------|--------------|----------|--------------|----------|------------------|--------------|
|         |                    | Type No.     | Part No. | Type No.     | Part No. | Inner carton     | Outer carton |
| DC type | 6 V DC             | HE1aN-DC6V   | AHE1210  | HE2aN-DC6V   | AHE2210  | 20 pcs.          | 100 pcs.     |
|         | 12 V DC            | HE1aN-DC12V  | AHE1211  | HE2aN-DC12V  | AHE2211  |                  |              |
|         | 24 V DC            | HE1aN-DC24V  | AHE1212  | HE2aN-DC24V  | AHE2212  |                  |              |
|         | 48 V DC            | HE1aN-DC48V  | AHE1213  | HE2aN-DC48V  | AHE2213  |                  |              |
|         | 100 V DC           | HE1aN-DC100V | AHE1214  | HE2aN-DC100V | AHE2214  |                  |              |
|         | 110 V DC           | HE1aN-DC110V | AHE1216  | HE2aN-DC110V | AHE2216  |                  |              |
| AC type | 12 V AC            | HE1aN-AC12V  | AHE1251  | HE2aN-AC12V  | AHE2251  |                  |              |
|         | 24 V AC            | HE1aN-AC24V  | AHE1252  | HE2aN-AC24V  | AHE2252  |                  |              |
|         | 48 V AC            | HE1aN-AC48V  | AHE1253  | HE2aN-AC48V  | AHE2253  |                  |              |
|         | 100/120 V AC       | HE1aN-AC100V | AHE1254  | HE2aN-AC100V | AHE2254  |                  |              |
|         | 200/240 V AC       | HE1aN-AC200V | AHE1255  | HE2aN-AC200V | AHE2255  |                  |              |

### ■ TM type

| Type    | Rated coil voltage | 1 Form A       |          | 2 Form A       |          | Standard packing |              |
|---------|--------------------|----------------|----------|----------------|----------|------------------|--------------|
|         |                    | Type No.       | Part No. | Type No.       | Part No. | Inner carton     | Outer carton |
| DC type | 6 V DC             | HE1aN-Q-DC6V   | AHE1220  | HE2aN-Q-DC6V   | AHE2220  | 20 pcs.          | 100 pcs.     |
|         | 12 V DC            | HE1aN-Q-DC12V  | AHE1221  | HE2aN-Q-DC12V  | AHE2221  |                  |              |
|         | 24 V DC            | HE1aN-Q-DC24V  | AHE1222  | HE2aN-Q-DC24V  | AHE2222  |                  |              |
|         | 48 V DC            | HE1aN-Q-DC48V  | AHE1223  | HE2aN-Q-DC48V  | AHE2223  |                  |              |
|         | 100 V DC           | HE1aN-Q-DC100V | AHE1224  | HE2aN-Q-DC100V | AHE2224  |                  |              |
|         | 110 V DC           | HE1aN-Q-DC110V | AHE1226  | HE2aN-Q-DC110V | AHE2226  |                  |              |
| AC type | 12 V AC            | HE1aN-Q-AC12V  | AHE1261  | HE2aN-Q-AC12V  | AHE2261  |                  |              |
|         | 24 V AC            | HE1aN-Q-AC24V  | AHE1262  | HE2aN-Q-AC24V  | AHE2262  |                  |              |
|         | 48 V AC            | HE1aN-Q-AC48V  | AHE1263  | HE2aN-Q-AC48V  | AHE2263  |                  |              |
|         | 100/120 V AC       | HE1aN-Q-AC100V | AHE1264  | HE2aN-Q-AC100V | AHE2264  |                  |              |
|         | 200/240 V AC       | HE1aN-Q-AC200V | AHE1265  | HE2aN-Q-AC200V | AHE2265  |                  |              |

### ■ Screw terminal

| Type    | Rated coil voltage | 1 Form A       |          | 2 Form A       |          | Standard packing |              |
|---------|--------------------|----------------|----------|----------------|----------|------------------|--------------|
|         |                    | Type No.       | Part No. | Type No.       | Part No. | Inner carton     | Outer carton |
| DC type | 6 V DC             | HE1aN-S-DC6V   | AHE1230  | HE2aN-S-DC6V   | AHE2230  | 10 pcs.          | 50 pcs.      |
|         | 12 V DC            | HE1aN-S-DC12V  | AHE1231  | HE2aN-S-DC12V  | AHE2231  |                  |              |
|         | 24 V DC            | HE1aN-S-DC24V  | AHE1232  | HE2aN-S-DC24V  | AHE2232  |                  |              |
|         | 48 V DC            | HE1aN-S-DC48V  | AHE1233  | HE2aN-S-DC48V  | AHE2233  |                  |              |
|         | 100 V DC           | HE1aN-S-DC100V | AHE1234  | HE2aN-S-DC100V | AHE2234  |                  |              |
|         | 110 V DC           | HE1aN-S-DC110V | AHE1236  | HE2aN-S-DC110V | AHE2236  |                  |              |
| AC type | 12 V AC            | HE1aN-S-AC12V  | AHE1271  | HE2aN-S-AC12V  | AHE2271  |                  |              |
|         | 24 V AC            | HE1aN-S-AC24V  | AHE1272  | HE2aN-S-AC24V  | AHE2272  |                  |              |
|         | 48 V AC            | HE1aN-S-AC48V  | AHE1273  | HE2aN-S-AC48V  | AHE2273  |                  |              |
|         | 100/120 V AC       | HE1aN-S-AC100V | AHE1274  | HE2aN-S-AC100V | AHE2274  |                  |              |
|         | 200/240 V AC       | HE1aN-S-AC200V | AHE1275  | HE2aN-S-AC200V | AHE2275  |                  |              |

For the terminal sockets, please refer to the " HE RELAYS Terminal sockets ".

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## RATING

### ■ Coil data

- Operating characteristics such as " Operate voltage " and " Release voltage " are influenced by mounting conditions or ambient temperature, etc.  
Therefore, please use the relay within  $\pm 5\%$  of rated coil voltage.
- " Initial " means the condition of products at the time of delivery.

### ● AC type

| Rated coil voltage | Operate voltage*<br>( at 20 °C )                    | Release voltage*<br>( at 20 °C )                    | Rated operating current<br>( $\pm 10\%$ , at 20 °C ) | Rated operating power | Max. allowable voltage<br>( at 20 °C ) |
|--------------------|---|---|--|-----------------------|--|
| 12 V AC            | Max. 70 % V of<br>rated coil voltage<br>( Initial ) | Min. 15 % V of<br>rated coil voltage<br>( Initial ) | 138 mA   | 1.7 VA                | 110 % V of<br>rated coil<br>voltage    |
| 24 V AC            |   |   | 74 mA  | 1.8 VA                |  |
| 48 V AC            |   |   | 39 mA  | 1.9 VA                |  |
| 100/120 V AC       | Max. 70 V AC<br>( Initial )                         | Min. 18 V AC<br>( Initial )                         | 18.7 to 22.1 mA                                      | 1.9 to 2.7 VA         |  |
| 200/240 V AC       | Max. 140 V AC<br>( Initial )                        | Min. 36 V AC<br>( Initial )                         | 9.1 to 10.8 mA                                       | 1.8 to 2.6 VA         |  |

\* Square, pulse drive

### ● DC type

| Rated coil voltage | Operate voltage*<br>( at 20 °C )                    | Release voltage*<br>( at 20 °C )                    | Rated operating current<br>( $\pm 10\%$ , at 20 °C ) | Coil resistance<br>( $\pm 10\%$ , at 20 °C ) | Rated operating power | Max. allowable voltage<br>( at 55 °C ) |
|--------------------|---|---|--|--|-----------------------|--|
| 6 V DC             | Max. 70 % V of<br>rated coil voltage<br>( Initial ) | Min. 10 % V of<br>rated coil voltage<br>( Initial ) | 320 mA   | 18.8 $\Omega$                                | 1,920 mW              | 110 % V of<br>rated coil<br>voltage    |
| 12 V DC            |   |   | 160 mA   | 75 $\Omega$                                  |                       |  |
| 24 V DC            |   |   | 80 mA  | 300 $\Omega$                                 |                       |  |
| 48 V DC            |   |   | 40 mA  | 1,200 $\Omega$                               |                       |  |
| 100 V DC           |   |   | 19 mA  | 5,200 $\Omega$                               |                       |  |
| 110 V DC           |   |   | 18 mA  | 6,300 $\Omega$                               |                       |  |

\* Square, pulse drive

# Power Relays ( Over 2 A ) HE RELAYS

## ■ Specifications

| Item   |   | Specifications  |  |
|--|---|---|--|
| Contact data                                       | Contact arrangement                                       | 1 Form A  | 2 Form A   |
|  | Contact resistance ( initial )                            | Max. 100 mΩ ( by voltage drop 6 V DC 1 A )  |  |
|  | Contact material  | AgSnO <sub>2</sub> type   |  |
|  | Contact rating ( resistive )                              | 30 A 277 V AC   | 25 A 277 V AC                                      |
|  | Max. switching power ( resistive )                        | 8,310 VA  | 6,925 VA   |
|  | Max. switching voltage                                    | 277 V AC, 30 V DC   |  |
|  | Max. switching current                                    | 30 A ( AC )   | 25 A ( AC )  |
|  | Min. switching load ( reference value ) * <sup>1</sup>    | 100 mA 5 V DC   |  |
| Insulation resistance ( initial )                  |   | Min. 1,000 MΩ ( at 500 V DC, Measured portion is the same as the case of dielectric strength. )   |  |
| Dielectric strength ( initial )                    | Between open contacts                                     | 2,000 V rms for 1 min ( detection current: 10 mA )  |  |
|  | Between contact sets                                      | —   | 4,000 V rms for 1 min ( detection current: 10 mA ) |
|  | Between contact and coil                                  | 5,000 V rms for 1 min ( detection current: 10 mA )  |  |
| Surge withstand voltage ( initial ) * <sup>2</sup> | Between contact and coil                                  | 10,000 V  |  |
| Time characteristics ( initial )                   | Operate time  | Max. 30 ms at rated coil voltage ( at 20 °C, without bounce )   |  |
|  | Release time  | DC: Max. 10 ms at rated coil voltage ( at 20 °C, without bounce, without diode )<br>AC: Max. 30 ms at rated coil voltage ( at 20 °C, without bounce )       |  |
| Shock resistance                                   | Functional  | 98 m/s <sup>2</sup> ( half-sine shock pulse: 11 ms, detection time: 10 μs )   |  |
|  | Destructive   | 980 m/s <sup>2</sup> ( half-sine shock pulse: 6 ms )  |  |
| Vibration resistance                               | Functional  | 10 to 55 Hz ( at double amplitude of 1 mm, detection time: 10 μs )  |  |
|  | Destructive   | 10 to 55 Hz ( at double amplitude of 1.5 mm )   |  |
| Expected life                                      | Mechanical life   | DC: Min. 10 × 10 <sup>6</sup> ope. ( switching frequency: at 180 times/min )<br>AC: Min. 5 × 10 <sup>6</sup> ope. ( switching frequency: at 180 times/min ) |  |
| Conditions   | Conditions for usage, transport and storage* <sup>3</sup> | Temperature: -50 to +55 °C, Humidity: 5 to 85 % RH ( Avoid icing and condensation )   |  |
| Unit weight  |   | PC board terminal: Approx. 80 g, Plug-in terminal and TM type: Approx. 90 g, Screw terminal: Approx. 120 g  |  |

\*1: This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

\*2: Wave is standard shock voltage of  $\pm 1.2 \times 50 \mu\text{s}$  according to JEC-212-1981

\*3: For ambient temperature, please read " GUIDELINES FOR RELAY USAGE ".

## ■ Expected electrical life

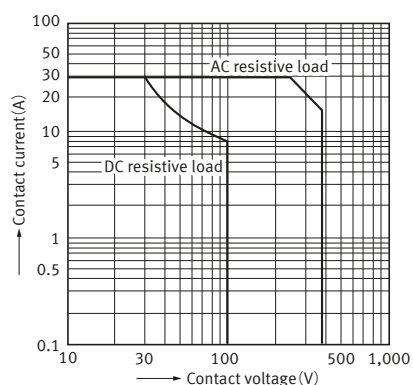
Conditions: Resistive load, switching frequency at 20 times/min

| Type     | Switching capacity | Number of operations            |
|----------|--------------------|---------------------------------|
| 1 Form A | 30 A 250 V AC      | Min. 200 × 10 <sup>3</sup> ope. |
| 2 Form A | 20 A 250 V AC      | Min. 200 × 10 <sup>3</sup> ope. |
|          | 25 A 277 V AC      | Min. 100 × 10 <sup>3</sup> ope. |

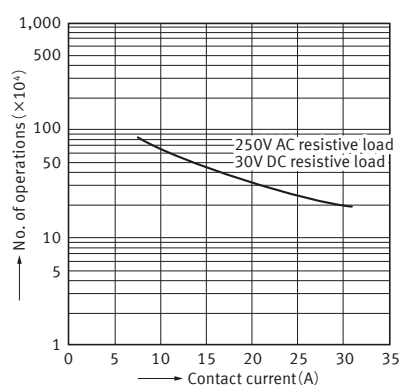
## REFERENCE DATA

### ■ 1 Form A

#### 1. Max. switching capacity

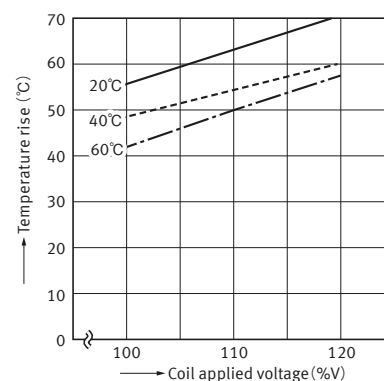


#### 2. Switching life curve



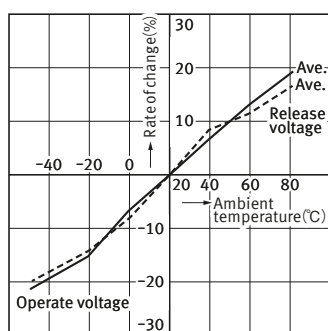
#### 3. Coil temperature characteristics ( DC type )

Measured portion : Coil inside  
Contact current : 30A



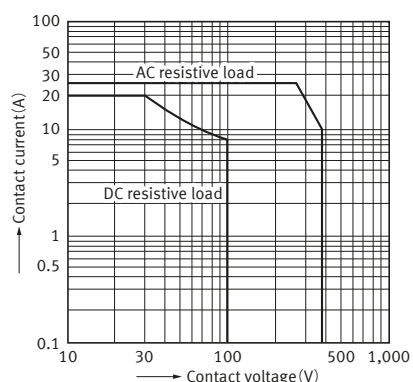
#### 4. Ambient temperature characteristics ( Average )

Tested sample : HE1aN-120V AC, 6pcs.

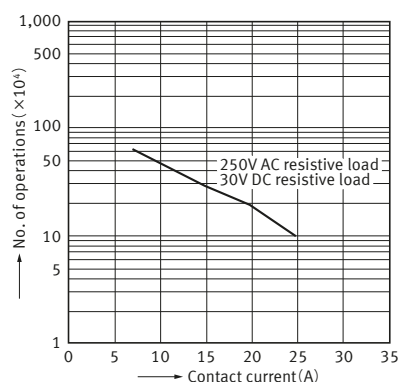


### ■ 2 Form A

#### 1. Max. switching capacity

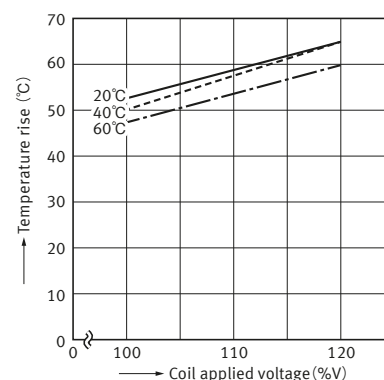


#### 2. Switching life curve



#### 3. Coil temperature characteristics ( DC type )

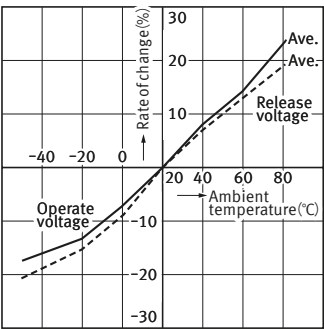
Measured portion : Coil inside  
Contact current : 25A



# Power Relays ( Over 2 A ) HE RELAYS

## 4. Ambient temperature characteristics ( Average )

Tested sample : HE2aN-120V AC, 6 pcs.



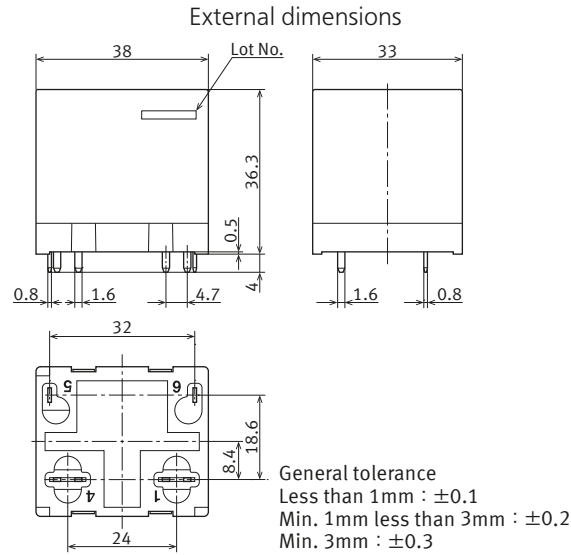
## DIMENSIONS ( Unit: mm )

**CAD** The CAD data of the products with a " CAD " mark can be downloaded from our Website.

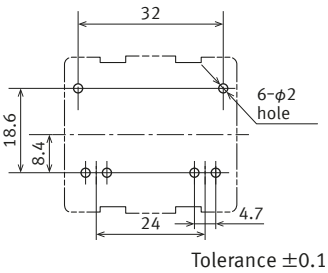
### ■ PC board terminal

#### ● 1 Form A

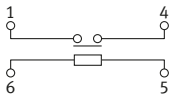
**CAD**



### Recommended PC board pattern ( BOTTOM VIEW )



### Schematic ( BOTTOM VIEW )



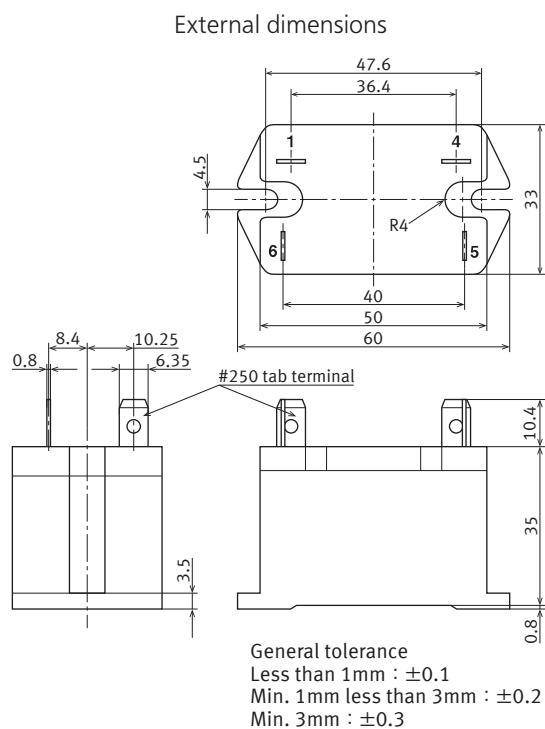


# Power Relays ( Over 2 A ) HE RELAYS

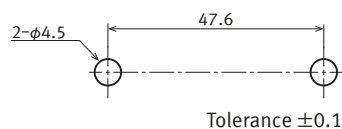
## ■ TM type

### ● 1 Form A

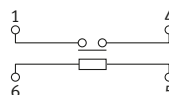
CAD



### Mounting hole pattern

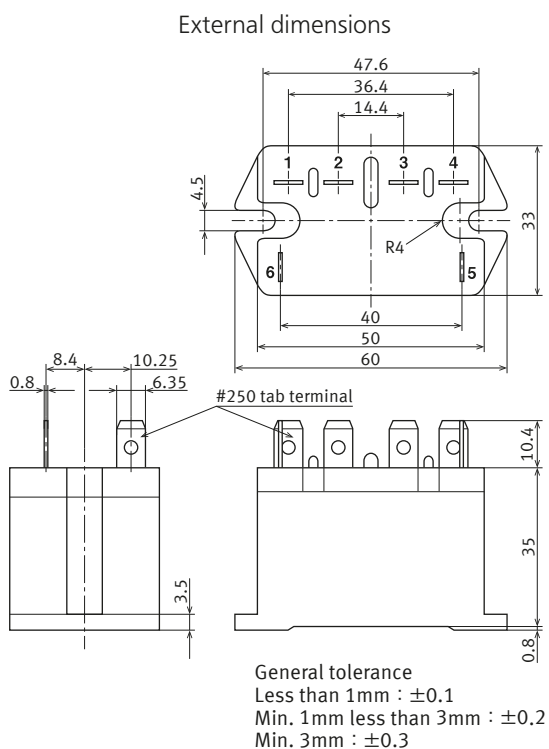


### Schematic ( BOTTOM VIEW )

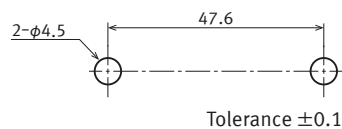


### ● 2 Form A

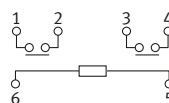
CAD



### Mounting hole pattern



### Schematic ( BOTTOM VIEW )

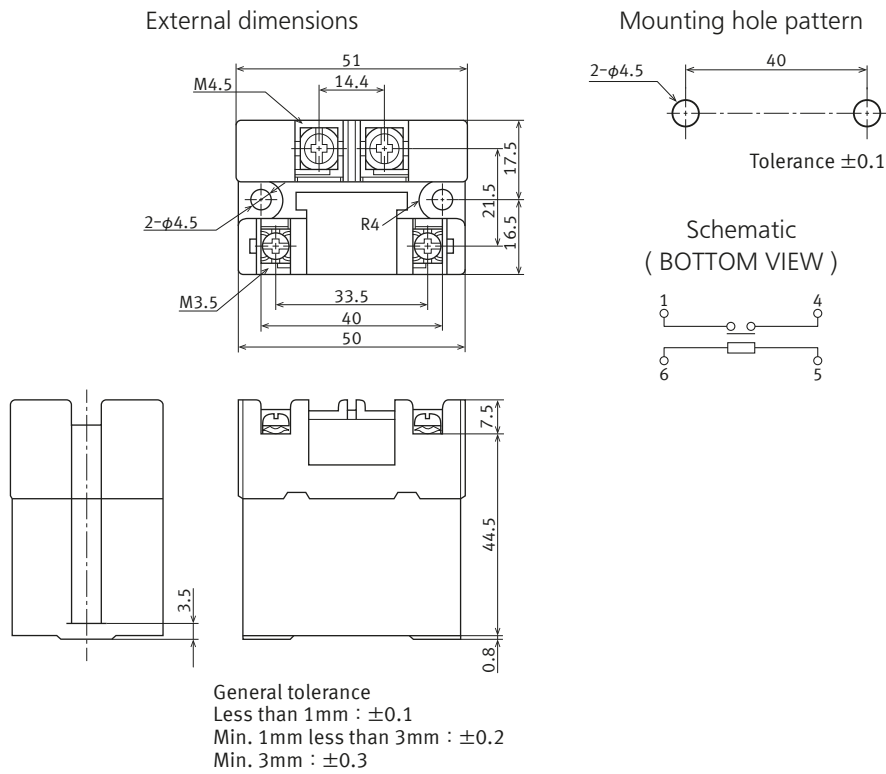


# Power Relays ( Over 2 A ) HE RELAYS

## ■ Screw terminal

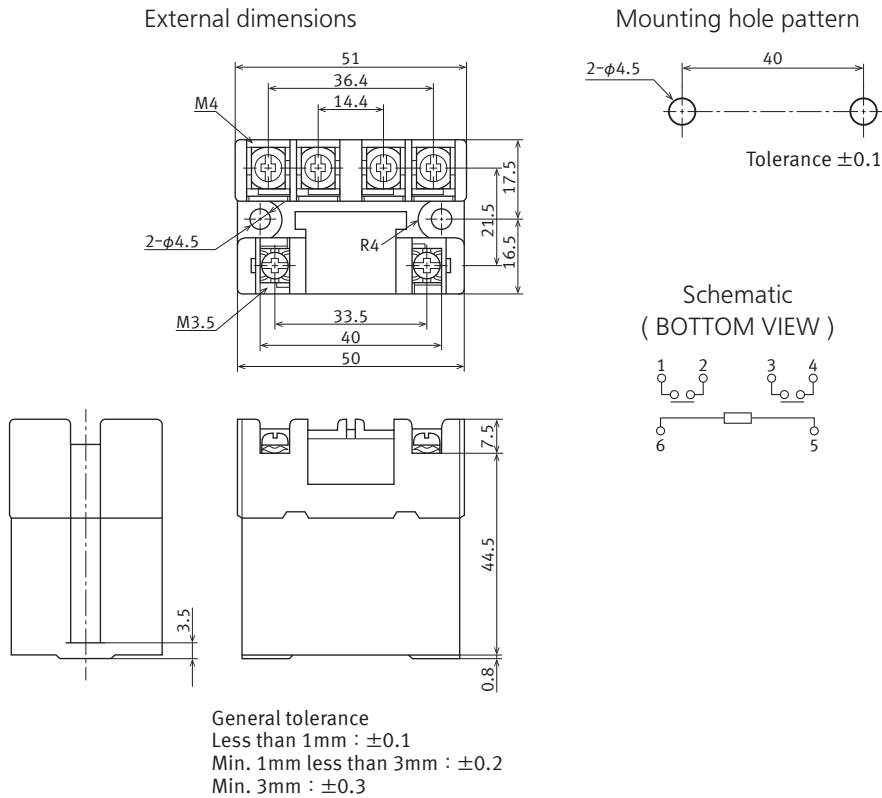
### ● 1 Form A

CAD



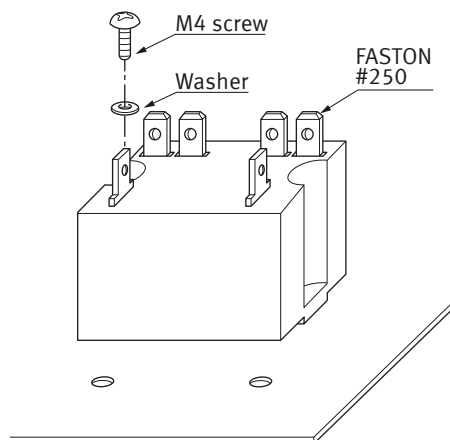
### ● 2 Form A

CAD

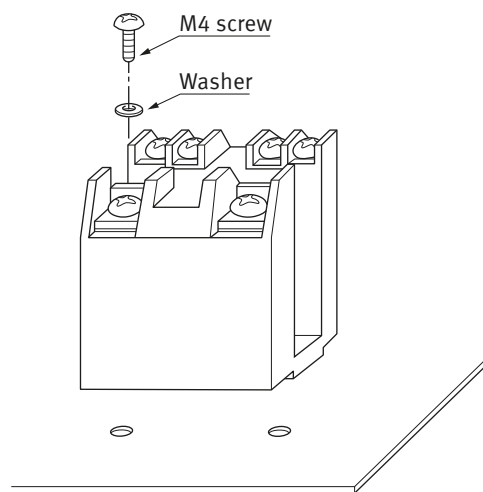


## MOUNTING METHOD

### ■ Plug-in terminal



### ■ Screw terminal



Due to the UP terminals, it is possible to either directly connect the wires or use crimped terminal.

## SAFETY STANDARDS

Each standard may be updated at any time, so please check our Website for the latest information.

### ■ UL ( Approved )

1 Form A

| File No. | Contact rating  | Operations        |
|----------|-----------------|-------------------|
| E43028   | 30 A 277 V AC   | $100 \times 10^3$ |
|          | 30 A 30 V DC    | $100 \times 10^3$ |
|          | 3 HP 250 V AC   | $100 \times 10^3$ |
|          | 1.5 HP 125 V AC | $100 \times 10^3$ |

2 Form A

| File No. | Contact rating  | Operations        |
|----------|-----------------|-------------------|
| E43028   | 25 A 277 V AC   | $100 \times 10^3$ |
|          | 25 A 30 V DC    | $100 \times 10^3$ |
|          | 3 HP 277 V AC   | $30 \times 10^3$  |
|          | 2 HP 250 V AC   | $100 \times 10^3$ |
|          | 1.5 HP 120 V AC | $30 \times 10^3$  |
|          | 1 HP 125 V AC   | $100 \times 10^3$ |

### ■ VDE ( Approved )

1 Form A

| File No. | Contact rating                      |
|----------|-------------------------------------|
| 40006681 | 30 A 250 V AC ( $\cos \phi = 1.0$ ) |
|          | 30 A 250 V AC ( $\cos \phi = 0.4$ ) |
|          | 8 A 110 V DC ( 0 ms )               |

2 Form A

| File No. | Contact rating                      |
|----------|-------------------------------------|
| 40006681 | 25 A 250 V AC ( $\cos \phi = 1.0$ ) |
|          | 25 A 250 V AC ( $\cos \phi = 0.4$ ) |
|          | 8 A 110 V DC ( 0 ms )               |

### ■ TV rating

1 Form A

| File No.   | Contact rating |
|------------|----------------|
| UL: E43028 | TV-15          |

2 Form A

| File No.   | Contact rating |
|------------|----------------|
| UL: E43028 | TV-10          |

### ■ CSA ( Approved )

1 Form A

| File No. | Contact rating  | Operations        |
|----------|-----------------|-------------------|
| 1011904  | 30 A 277 V AC   | $100 \times 10^3$ |
|          | 30 A 30 V DC    | $100 \times 10^3$ |
|          | 3 HP 250 V AC   | $100 \times 10^3$ |
|          | 1.5 HP 125 V AC | $100 \times 10^3$ |

2 Form A

| File No. | Contact rating | Operations        |
|----------|----------------|-------------------|
| 1011904  | 25 A 277 V AC  | $100 \times 10^3$ |
|          | 25 A 30 V DC   | $100 \times 10^3$ |
|          | 2 HP 250 V AC  | $100 \times 10^3$ |
|          | 1 HP 125 V AC  | $100 \times 10^3$ |

### ■ CQC ( Approved )

1 Form A

| File No.       | Contact rating | Operations       | Temp. |
|----------------|----------------|------------------|-------|
| CQC13002100110 | 30 A 250 V AC  | $10 \times 10^3$ | 55 °C |

2 Form A

| File No.       | Contact rating | Operations       | Temp. |
|----------------|----------------|------------------|-------|
| CQC13002100110 | 20 A 250 V AC  | $10 \times 10^3$ | 55 °C |

# Power Relays ( Over 2 A ) HE RELAYS

## INSULATION CHARACTERISTICS ( IEC61810-1 )

| Item  | Characteristics       |
|---|-----------------------|
| Clearance/Creepage distance ( IEC61810-1 )      | Min. 5.5/8.0 mm       |
| Category of protection ( IEC61810-1 )           | RT II                 |
| Tracking resistance ( IEC60112 )                | PTI 175               |
| Insulation material group                       | III a                 |
| Over voltage category                           | III                   |
| Rated voltage                                   | 250 V                 |
| Pollution degree                                | 3                     |
| Type of insulation ( Between contact and coil ) | Reinforced insulation |
| Type of insulation ( Between open contact )     | Full disconnection    |

\* Actual value

## GUIDELINES FOR USAGE

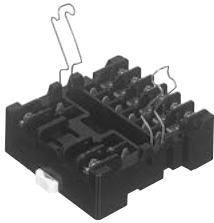
■ For cautions for use, please read " GUIDELINES FOR RELAY USAGE ".  
[https://industrial.panasonic.com/ac/e/control/relay/cautions\\_use/index.jsp](https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp)

### ■ Cautions for usage of HE relays

- The dust cover should not be removed since doing so may alter the characteristics. ( A cover doesn't remove by usual handling. )
- Avoid use under severe environmental conditions, such as high humidity, organic gas or in dust, oily locations and locations subjected to extremely frequent shock or vibrations.
- When mounting, use spring washers. Optimum fastening torque ranges from 49 to 68.6 N·m ( 5 to 7 kgf·cm ) .
- Firmly insert the receptacles so that there is no slack or looseness. To remove a receptacle, 19.6 to 39.2 N ( 2 to 4 kg ) of pulling strength is required. Do not remove more than one receptacle at one time. Always remove one receptacle at a time and pull it straight outwards.
- When using the AC type, the operate time and release time due to the in-rush phase is 20 ms or more. Therefore, it is necessary for you to verify the characteristics for your actual circuit.
- When using the push-on blocks for the screw terminal type, use crimped terminals and tighten the screw-down terminals to the torque below.

|            |                                       |
|------------|---------------------------------------|
| M4.5 screw | 147 to 166.6 N·cm ( 15 to 17 kgf·cm ) |
| M4 screw   | 117.6 to 137 N·cm ( 12 to 14 kgf·cm ) |
| M3.5 screw | 78.4 to 98 N·cm ( 8 to 10 kgf·cm )    |

HE RELAYS Terminal sockets



TYPES

| Product name | Type No. | Part No. | Standard packing |              |
|--------------|----------|----------|------------------|--------------|
|              |          |          | Inner carton     | Outer carton |
| 1 Form A     | JH1-SF   | AR58102  | 10 pcs.          | 50 pcs.      |
| 2 Form A     | JH2-SF   | AR58202  |                  |              |

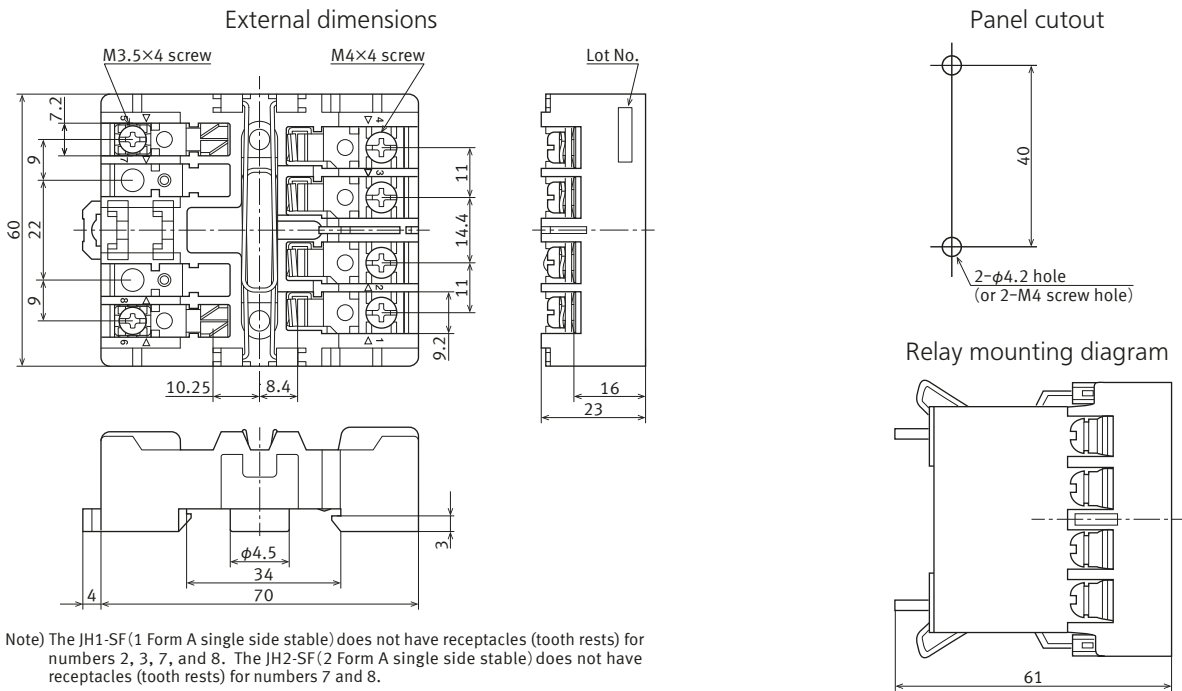
RATING

| Item  | Specifications   |               |
|---|--|---------------|
| Contact arrangement                         | 1 Form A   | 2 Form A      |
| Dielectric strength ( initial )             | Each between terminals: 2,000 V rms for 1 min ( detection current: 10 mA )<br>Between contacts – coil side: 5,000 V rms for 1 min ( detection current: 10 mA ) |               |
| Insulation resistance ( initial )           | Each between terminals: Min. 100 MΩ ( at 500 V DC, Measured portion is the same as the case of dielectric strength. )  |               |
| Maximum carrying current                    | 30 A 250 V AC  | 20 A 250 V AC |
| Conditions for usage, transport and storage | Ambient temperature: −50 to +55 °C<br>Humidity: 5 to 85 % RH ( Avoid icing and condensation )  |               |

DIMENSIONS ( Unit: mm )

CAD The CAD data of the products with a " CAD " mark can be downloaded from our Website.

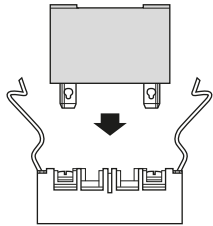
CAD



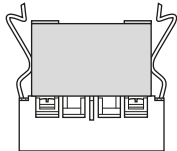
HANDLING

■ Mounting method of relay

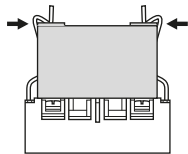
1) Match the direction of relay and terminal socket.



2) Insert both ends of the relay firmly, all the way in.

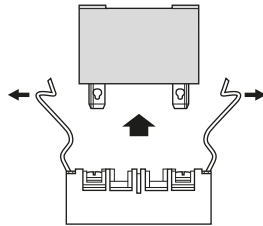


3) Press the hooks in the direction of the arrows to attach the relay securely.



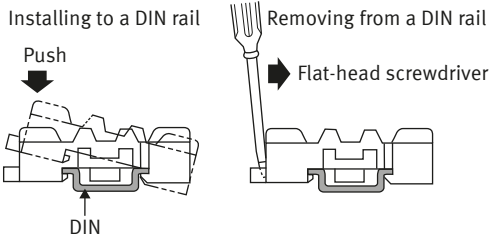
■ Removing method of relay

Pull out the relay after fully releasing both hooks



■ Mounting to a DIN rail and Removing from a DIN rail

- Please use a DIN Standard rail of the 35 mm width ( DIN46277 and IEC60715 ) .
- Mounting and removing methods will be as follows.



GUIDELINES FOR USAGE

- Be sure to tighten the screw-down terminals firmly. Loose terminals may lead to the generation of heat.
- When the 1 Form A is used in situations covered by the Japanese Electrical Appliance and Material Control Law, the use of 5.5 mm<sup>2</sup> cabling and 30 A current is not allowed. Consequently, the circuit should be less than 20 A.

- When fixing the terminal socket with screws, to avoid torque damage and distortion, apply torque within the ranges shown below.

|            |                                       |
|------------|---------------------------------------|
| M3.5 screw | 0.784 to 0.98 N·m ( 8 to 10 kgf·cm )  |
| M4 screw   | 1.176 to 1.37 N·m ( 12 to 14 kgf·cm ) |

- For cautions for use, please read " GUIDELINES FOR RELAY USAGE ".  
[https://industrial.panasonic.com/ac/e/control/relay/cautions\\_use/index.jsp](https://industrial.panasonic.com/ac/e/control/relay/cautions_use/index.jsp)

## Precautions for Coil Input

### ■ Long term current carrying

A circuit that will be carrying a current continuously for long periods without relay switching operation. ( circuits for emergency lamps, alarm devices and error inspection that, for example, revert only during malfunction and output warnings with form B contacts ) Continuous, long-term current to the coil will facilitate deterioration of coil insulation and characteristics due to heating of the coil itself. For circuits such as these, please use a magnetic-hold type latching relay. If you need to use a single stable relay, use a sealed type relay that is not easily affected by ambient conditions and make a failsafe circuit design that considers the possibility of contact failure or disconnection.

### ■ DC Coil operating power

Steady state DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5 %. However, please check with the actual circuit since the electrical characteristics may vary. The rated coil voltage should be applied to the coil and the set/reset pulse time of latching type relay differs for each relays, please refer to the relay's individual specifications.

### ■ Coil connection

When connecting coils of polarized relays, please check coil polarity ( +, - ) at the internal connection diagram ( Schematic ). If any wrong connection is made, it may cause unexpected malfunction, like abnormal heat, fire and so on, and circuit do not work. Avoid impressing voltages to the set coil and reset coil at the same time.

### ■ Maximum allowable voltage and temperature rise

Proper usage requires that the rated coil voltage be impressed on the coil. Note, however, that if a voltage greater than or equal to the maximum continuous voltage is impressed on the coil, the coil may burn or its layers short due to the temperature rise. Furthermore, do not exceed the usable ambient temperature range listed in the catalog.

#### ● Operate voltage change due to coil temperature rise

In DC relays, after continuous passage of current in the coil, if the current is turned OFF, then immediately turned ON again, due to the temperature rise in the coil, the operate voltage will become somewhat higher. Also, it will be the same as using it in a higher temperature atmosphere. The resistance/temperature relationship for copper wire is about 0.4 % for 1 °C, and with this ratio the coil resistance increases. That is, in order to operate of the relay, it is necessary that the voltage be higher than the operate voltage and the operate voltage rises in accordance with the increase in the resistance value. However, for some polarized relays, this rate of change is considerably smaller.

## Ambient Environment

### ■ Usage, Transport, and Storage Conditions

During usage, storage, or transportation, avoid locations subjected to direct sunlight and maintain normal temperature, humidity and pressure conditions.

#### ●Temperature/Humidity/Pressure

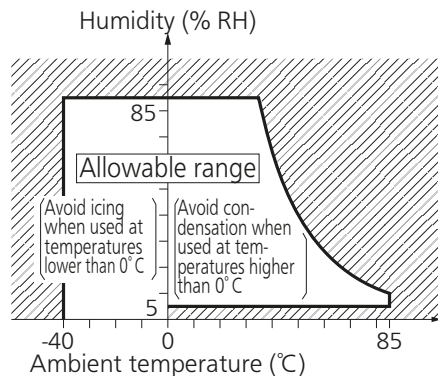
When transporting or storing relays while they are tube packaged, there are cases the temperature may differ from the allowable range. In this case be sure to check the individual specifications.

Also allowable humidity level is influenced by temperature, please check charts shown below and use relays within mentioned conditions. ( Allowable temperature values differ for each relays, please refer to the relay's individual specifications. )

##### 1) Temperature:

The tolerance temperature range differs for each relays, please refer to the relay's individual specifications

##### 2) Humidity: 5 to 85 % RH



##### 3) Pressure: 86 to 106 kPa

#### ●Dew condensation

Condensation occurs when the ambient temperature drops suddenly from a high temperature and humidity, or the relay is suddenly transferred from a low ambient temperature to a high temperature and humidity.

Condensation causes the failures like insulation deterioration, wire disconnection and rust etc.

Panasonic Industry Co., Ltd. does not guarantee the failures caused by condensation.

The heat conduction by the equipment may accelerate the cooling of device itself, and the condensation may occur.

Please conduct product evaluations in the worst condition of the actual usage. ( Special attention should be paid when high temperature heating parts are close to the device. Also please consider the condensation may occur inside of the device. )

#### ●Icing

Condensation or other moisture may freeze on relays when the temperature become lower than 0 °C. This icing causes the sticking of movable portion, the operation delay and the contact conduction failure etc. Panasonic Industry Co., Ltd. does not guarantee the failures caused by the icing.

The heat conduction by the equipment may accelerate the cooling of relay itself and the icing may occur.

Please conduct product evaluations in the worst condition of the actual usage.

#### ●Low temperature and low humidity

The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

#### ●High temperature and high humidity

Storage for extended periods of time ( including transportation periods ) at high temperature or high humidity levels or in atmospheres with organic gases or sulfide gases may cause a sulfide film or oxide film to form on the surfaces of the contacts and/or it may interfere with the functions. Check out the atmosphere in which the units are to be stored and transported.

#### ●Package

In terms of the packing format used, make every effort to keep the effects of moisture, organic gases and sulfide gases to the absolute minimum.

#### ●Silicon

When a source of silicone substances ( silicone rubber, silicone oil, silicone coating materials and silicone filling materials etc. ) is used around the relay, the silicone gas ( low molecular siloxane etc. ) may be produced.

This silicone gas may penetrate into the inside of the relay. When the relay is kept and used in this condition, silicone compound may adhere to the relay contacts which may cause the contact failure. Do not use any sources of silicone gas around the relay ( Including plastic sealed types ).

#### ●NOx Generation

When relay is used in an atmosphere high in humidity to switch a load which easily produces an arc, the NOx created by the arc and the water absorbed from outside the relay combine to produce nitric acid.

This corrodes the internal metal parts and adversely affects operation.

Avoid use at an ambient humidity of 85 % RH or higher ( at 20 °C ). If use at high humidity is unavoidable, please contact our sales representative.

## Others

### ■ Cleaning

- Although the environmentally sealed type relay ( plastic sealed type, etc. ) can be cleaned, avoid immersing the relay into cold liquid ( such as cleaning solvent ) immediately after soldering. Doing so may deteriorate the sealing performance.
- Cleaning with the boiling method is recommended ( The temperature of cleaning liquid should be 40 °C or lower ). Avoid ultrasonic cleaning on relays. Use of ultrasonic cleaning may cause breaks in the coil or slight sticking of the contacts due to ultrasonic energy.

Please refer to **"the latest product specifications"** when designing your product.

- Requests to customers:

<https://industrial.panasonic.com/ac/e/salespolicies/>

■ Global Sales Network Information: [industrial.panasonic.com/ac/e/salesnetwork](https://industrial.panasonic.com/ac/e/salesnetwork)

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**Panasonic**  
INDUSTRY

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