

## FEATURES

- High electrical noise immunity
- High switching capacity in a compact package
- High sensitivity: 200 mW (1a), 400 mW (1c)
- High surge voltage: 8,000 V between contacts and coil
- UL, CSA, VDE, TÜV, SEMKO approved
- Class B coil insulation type available

## About Cd-free contacts

We have introduced cadmium-free type products to reduce environmentally hazardous substances. Please replace parts that contain cadmium with Cd-free products. Evaluate them with your actual application before use because the life of a relay depends on the contact material and load.

## SPECIFICATIONS

### Contact

|                                                                  |                                       |    |      | Standard type                           | High capacity type                       |
|------------------------------------------------------------------|---------------------------------------|----|------|-----------------------------------------|------------------------------------------|
| Arrangement                                                      |                                       |    |      | 1 Form A, 1 Form C                      |                                          |
| Initial contact resistance, max.<br>(By voltage drop 6 V DC 1 A) |                                       |    |      | 100 mΩ                                  |                                          |
| Contact material                                                 |                                       |    |      | AgSnO <sub>2</sub> type                 |                                          |
| Rating<br>(resistive)                                            | Nominal switching capacity            | 1a |      | 5 A 125 V AC, 2 A 250 V AC, 5 A 30 V DC | 10 A 125 V AC, 5 A 250 V AC, 5 A 30 V DC |
|                                                                  |                                       | 1c | N.O. | 5 A 125 V AC, 2 A 250 V AC, 3 A 30 V AC | 10 A 125 V AC, 5 A 250 V AC, 5 A 30 V DC |
|                                                                  |                                       |    | N.C. | 2 A 125 V AC, 1 A 250 V AC, 1 A 30 V DC | 3 A 125 V AC, 2 A 250 V AC, 1 A 30 V DC  |
|                                                                  | Max. switching power                  | 1a |      | 625 VA, 150 W                           | 1,250 VA, 150 W                          |
|                                                                  |                                       | 1c | N.O. | 625 VA, 90 W                            | 1,250 V AC, 150 W                        |
|                                                                  |                                       |    | N.C. | 250 VA, 30 W                            | 500 V AC, 30 W                           |
|                                                                  | Max. switching voltage                |    |      | 250 V AC, 110 V DC (0.3A)               |                                          |
|                                                                  | Max. switching current                |    |      | N.O.: 5 A N.C.: 2 A                     | N.O.: 10 A N.C.: 3 A                     |
|                                                                  | Min. switching capacity <sup>#1</sup> |    |      | 100 mA, 5 V DC                          |                                          |
| Expected mechanical life (at 180 cpm)(min. operations)           |                                       |    |      | 10 <sup>7</sup>                         |                                          |

### Expected electrical life (min. operations)

| Type               |    |      | Switching capacity                                          | No. of operations                                                              |
|--------------------|----|------|-------------------------------------------------------------|--------------------------------------------------------------------------------|
| Standard type      | 1a |      | 5 A 125 V AC<br>3 A 125 V AC<br>2 A 250 V AC<br>5 A 30 V DC | 5×10 <sup>4</sup><br>2×10 <sup>5</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup> |
|                    |    |      | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC                | 5×10 <sup>4</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup>                      |
|                    | 1c | N.O. | 5 A 125 V AC<br>2 A 250 V AC<br>3 A 30 V DC                 | 5×10 <sup>4</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup>                      |
|                    |    | N.C. | 2 A 125 V AC<br>1 A 250 V AC<br>1 A 30 V DC                 | 2×10 <sup>5</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup>                      |
| High capacity type | 1a |      | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC                | 5×10 <sup>4</sup><br>5×10 <sup>4</sup><br>10 <sup>5</sup>                      |
|                    |    |      | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC                | 5×10 <sup>4</sup><br>5×10 <sup>4</sup><br>10 <sup>5</sup>                      |
|                    | 1c | N.O. | 10 A 125 V AC<br>5 A 250 V AC<br>5 A 30 V DC                | 5×10 <sup>4</sup><br>5×10 <sup>4</sup><br>10 <sup>5</sup>                      |
|                    |    | N.C. | 3 A 125 V AC<br>2 A 250 V AC<br>1 A 30 V DC                 | 2×10 <sup>5</sup><br>2×10 <sup>5</sup><br>10 <sup>5</sup>                      |

### Coil (at 20°C 68°F)

|                         |            |            |
|-------------------------|------------|------------|
| Nominal operating power | 1a: 200 mW | 1c: 400 mW |
|-------------------------|------------|------------|

<sup>#1</sup> 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.

Characteristics

|                                                                                                       |                           |                                                              |
|-------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------|
| Max. operating speed                                                                                  |                           | 20 cpm                                                       |
| Initial insulation resistance*1                                                                       |                           | Min. 1,000 MΩ at 500 V DC                                    |
| Initial breakdown voltage*2                                                                           | Between open contacts     | 1a: 1,000 Vrms for 1 min.<br>1c: 750 Vrms for 1 min.         |
|                                                                                                       | Between contacts and coil | 4,000 Vrms for 1 min.                                        |
| Surge voltage between contact and coil*3                                                              |                           | 8,000 V                                                      |
| Operate time*4 (at nominal voltage)                                                                   |                           | Max. 20 ms                                                   |
| Release time*4 (at nominal voltage)(without diode)                                                    |                           | Max. 10 ms                                                   |
| Temperature rise*5                                                                                    |                           | Max. 45°C                                                    |
| Shock resistance                                                                                      | Functional*6              | Min. 294 m/s² {30 G}                                         |
|                                                                                                       | Destructive*7             | Min. 980 m/s² {100 G}                                        |
| Vibration resistance                                                                                  | Functional*8              | 98 m/s² {10 G}, 10 to 55 Hz at double amplitude of 1.6 mm    |
|                                                                                                       | Destructive               | 117.6 m/s² {12 G}, 10 to 55 Hz at double amplitude of 2.0 mm |
| Conditions for operation, transport and storage*9<br>(Not freezing and condensing at low temperature) |                           | Ambient temp.*10<br>−40°C to +85°C −40°F to +185°F           |
|                                                                                                       |                           | Humidity<br>5 to 85% R.H.                                    |
| Unit weight                                                                                           |                           | Approx. 7 g .25 oz                                           |

|                                                                            |                                                                                               |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Remarks</b>                                                             |                                                                                               |
| * Specifications will vary with foreign standards certification ratings.   |                                                                                               |
| *1 Measurement at same location as "Initial breakdown voltage" section     |                                                                                               |
| *2 Detection current: 10 mA                                                |                                                                                               |
| *3 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981 |                                                                                               |
| *4 Excluding contact bounce time                                           |                                                                                               |
| *5 Measured conditions                                                     |                                                                                               |
| Standard type                                                              | Resistive, nominal voltage applied to the coil. Contact carrying current: 5 A, at 70°C 158°F  |
| High capacity type                                                         | Resistive, nominal voltage applied to the coil. Contact carrying current: 10 A, at 70°C 158°F |

\*6 Half-wave pulse of sine wave: 11ms; detection time: 10μs  
\*7 Half-wave pulse of sine wave: 6ms  
\*8 Detection time: 10μs  
\*9 Refer to "6. Usage, Storage and Transport Conditions" in [AMBIENT ENVIRONMENT](#) section in [Relay Technical Information](#).  
\*10When using relays in a high ambient temperature, consider the pick-up voltage rise due to the high temperature (a rise of approx. 0.4% V for each 1°C 33.8°F with 20°C 68°F as a reference) and use a coil impressed voltage that is within the maximum allowable voltage range.

TYPICAL APPLICATIONS

- Air conditioners
- Refrigerators
- Microwave ovens
- Heaters

ORDERING INFORMATION

Ex. JQ 1a P — B — 12 V — F

| Contact arrangement         | Contact capacity                  | Coil insulation class                                      | Coil voltage (DC)          | Contact material           |
|-----------------------------|-----------------------------------|------------------------------------------------------------|----------------------------|----------------------------|
| 1a: 1 Form A<br>1: 1 Form C | Nil: Standard<br>P: High capacity | Nil: Class E coil insulation<br>B: Class B coil insulation | 5, 6, 9, 12, 18, 24, 48* V | F: AgSnO <sub>2</sub> type |

UL/CSA, VDE, SEMKO approved type is standard.  
\* Available only for 1 Form C type

# TYPES AND COIL DATA at 20°C 68°F

|          | Part No.           | Nominal voltage, V DC | Pick-up voltage, V DC (min.) | Drop-out voltage, V DC (min.) | Nominal operating current, mA | Nominal operating power, mW | Coil resistance, $\Omega$ ( $\pm 10\%$ ) | Max. allowable voltage, V DC |
|----------|--------------------|-----------------------|------------------------------|-------------------------------|-------------------------------|-----------------------------|------------------------------------------|------------------------------|
| 1 Form A | Standard type      | JQ1a-5V-F             | 5                            | 3.75                          | 0.25                          | 40                          | 200                                      | 125                          |
|          |                    | JQ1a-6V-F             | 6                            | 4.5                           | 0.3                           | 33.3                        |                                          | 180                          |
|          |                    | JQ1a-9V-F             | 9                            | 6.75                          | 0.45                          | 22.2                        |                                          | 405                          |
|          |                    | JQ1a-12V-F            | 12                           | 9                             | 0.6                           | 16.7                        |                                          | 720                          |
|          |                    | JQ1a-18V-F            | 18                           | 13.5                          | 0.9                           | 11.1                        |                                          | 1,620                        |
|          |                    | JQ1a-24V-F            | 24                           | 18                            | 1.2                           | 8.3                         |                                          | 2,880                        |
|          | High capacity type | JQ1aP-5V-F            | 5                            | 4                             | 0.25                          | 40                          | 200                                      | 125                          |
|          |                    | JQ1aP-6V-F            | 6                            | 4.8                           | 0.3                           | 33.3                        |                                          | 180                          |
|          |                    | JQ1aP-9V-F            | 9                            | 7.2                           | 0.45                          | 22.2                        |                                          | 405                          |
|          |                    | JQ1aP-12V-F           | 12                           | 9.6                           | 0.6                           | 16.7                        |                                          | 720                          |
|          |                    | JQ1aP-18V-F           | 18                           | 14.4                          | 0.9                           | 11.1                        |                                          | 1,620                        |
|          |                    | JQ1aP-24V-F           | 24                           | 19.2                          | 1.2                           | 8.3                         |                                          | 2,880                        |
| 1 Form C | Standard type      | JQ1-5V-F              | 5                            | 3.75                          | 0.25                          | 80                          | 400                                      | 62.5                         |
|          |                    | JQ1-6V-F              | 6                            | 4.5                           | 0.3                           | 66.7                        |                                          | 90                           |
|          |                    | JQ1-9V-F              | 9                            | 6.75                          | 0.45                          | 44.4                        |                                          | 202.5                        |
|          |                    | JQ1-12V-F             | 12                           | 9                             | 0.6                           | 33.3                        |                                          | 360                          |
|          |                    | JQ1-18V-F             | 18                           | 13.5                          | 0.9                           | 22.2                        |                                          | 810                          |
|          |                    | JQ1-24V-F             | 24                           | 18                            | 1.2                           | 16.7                        |                                          | 1,440                        |
|          | High capacity type | JQ1P-5V-F             | 5                            | 4                             | 0.25                          | 80                          | 400                                      | 62.5                         |
|          |                    | JQ1P-6V-F             | 6                            | 4.8                           | 0.3                           | 66.7                        |                                          | 90                           |
|          |                    | JQ1P-9V-F             | 9                            | 7.2                           | 0.45                          | 44.4                        |                                          | 202.5                        |
|          |                    | JQ1P-12V-F            | 12                           | 9.6                           | 0.6                           | 33.3                        |                                          | 360                          |
|          |                    | JQ1P-18V-F            | 18                           | 14.4                          | 0.9                           | 22.2                        |                                          | 810                          |
|          |                    | JQ1P-24V-F            | 24                           | 19.2                          | 1.2                           | 16.7                        |                                          | 1,440                        |
|          |                    | JQ1P-48V-F            | 48                           | 38.4                          | 2.4                           | 8.3                         |                                          | 5,760                        |

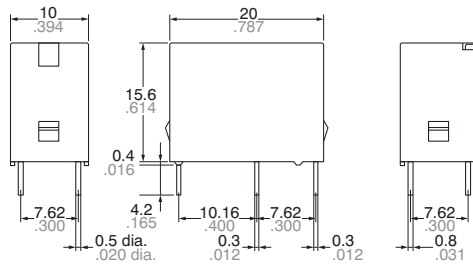
## DIMENSIONS (mm inch)

Download [CAD Data](#) from our Web site.

[CAD Data](#)

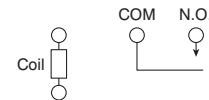


1 Form A

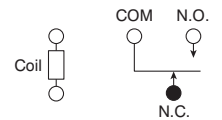


Schematic (Bottom view)

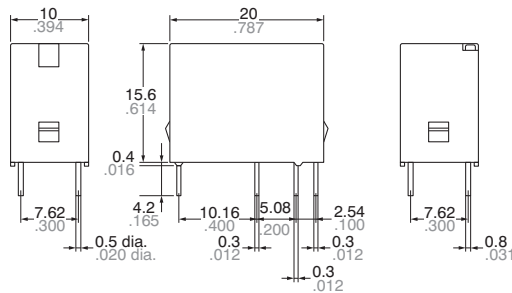
1 Form A



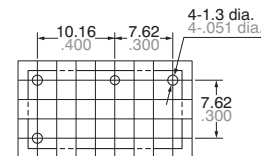
1 Form C



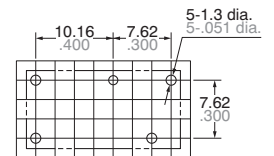
1 Form C



1 Form A



1FormC



Tolerance:  $\pm 0.1 \pm .004$

### Dimension :

Max. 1mm .039 inch  $\pm 0.2 \pm .008$

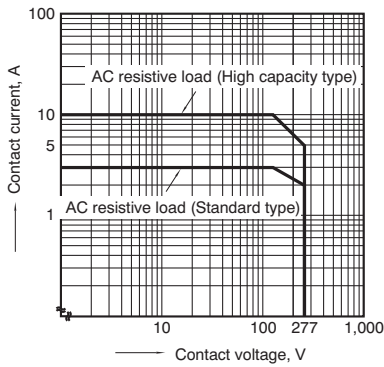
1 to 5mm .039 to .118 inch  $\pm 0.3 \pm .012$

Min. 5mm .118 inch  $\pm 0.4 \pm .016$

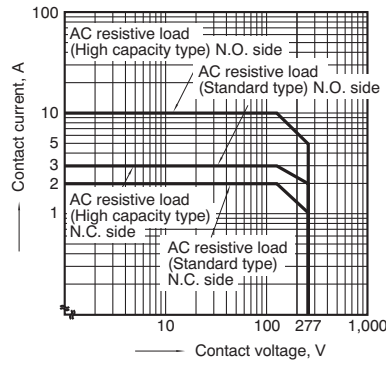
### General tolerance

## REFERENCE DATA

Max. switching capacity (1 Form A type)



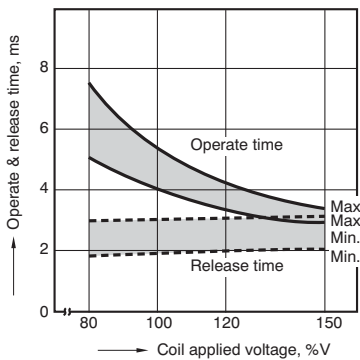
Max. switching capacity (1 Form C type)



### Standard type

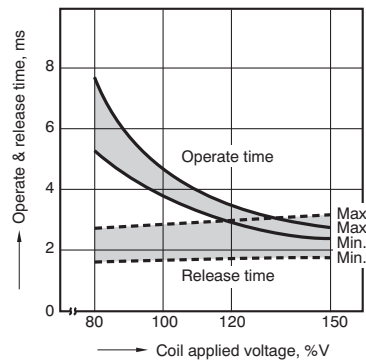
1-(1). Operate & release time (1 Form A type)

Tested sample: JQ1a-12V-F, 25 pcs.



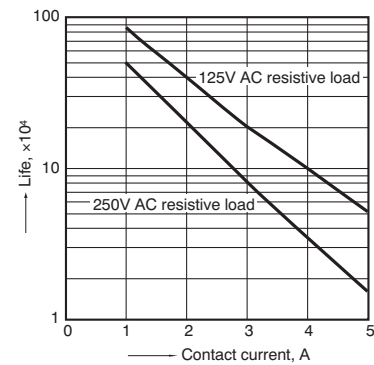
1-(2). Operate & release time (1 Form C type)

Tested sample: JQ1-24V-F, 25 pcs.



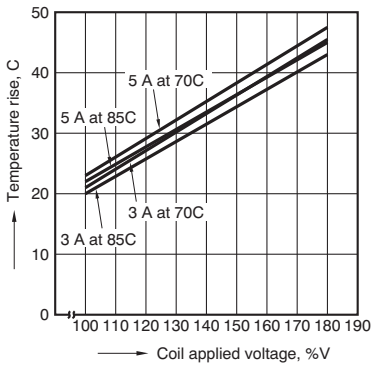
2. Life curve

Ambient temperature: room temperature



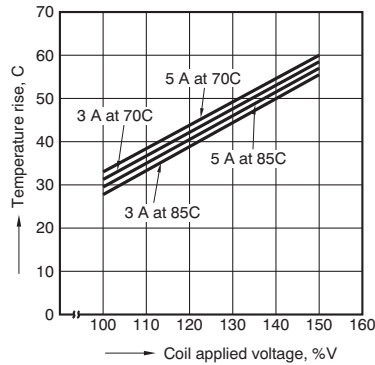
3-(1). Coil temperature rise (1 Form A type)

Contact carrying current: 3 A, 5 A  
Measured portion: Inside the coil



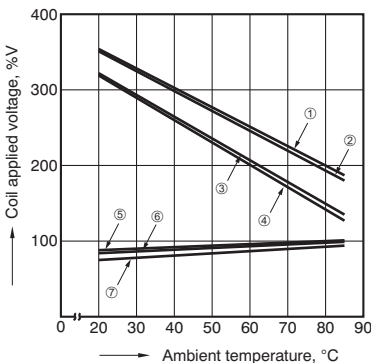
3-(2). Coil temperature rise (1 Form C type)

Contact carrying current: 3 A, 5 A  
Measured portion: Inside the coil



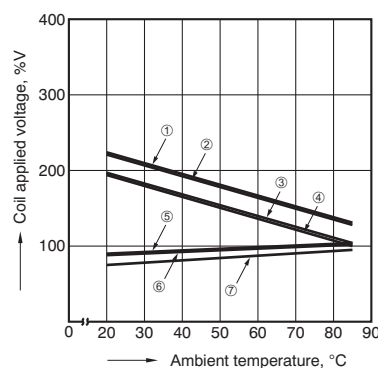
4-(1). Ambient temperature characteristics (1 Form A type)

Tested sample: JQ1a-24V-F  
Contact carrying current: 3 A, 5 A



4-(2). Ambient temperature characteristics (1 Form C type)

Tested sample: JQ1-24V-F  
Contact carrying current: 3 A, 5 A

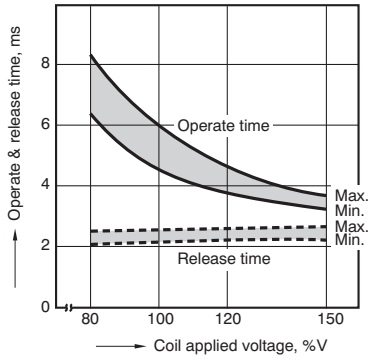


- ① Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 130°C 266°F) (Carrying current: 3 A)
- ② Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 130°C 266°F) (Carrying current: 5 A)
- ③ Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 115°C 239°F) (Carrying current: 3 A)
- ④ Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 115°C 239°F) (Carrying current: 5 A)
- ⑤ Pick-up voltage with a hot-start condition of 100%V on the coil (Carrying current: 5 A)
- ⑥ Pick-up voltage with a hot-start condition of 100%V on the coil (Carrying current: 3 A)
- ⑦ Pick-up voltage

## High capacity type

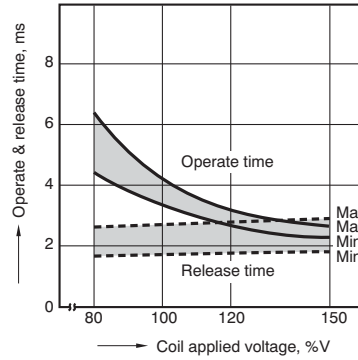
### 1-(1). Operate & release time (1 Form A type)

Tested sample: JQ1aP-12V-F, 25 pcs.



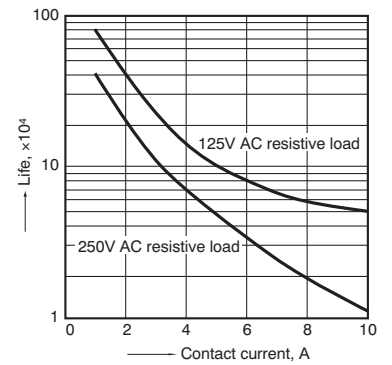
### 1-(2). Operate & release time (1 Form C type)

Tested sample: JQ1P-12V-F, 25 pcs.



### 2. Life curve

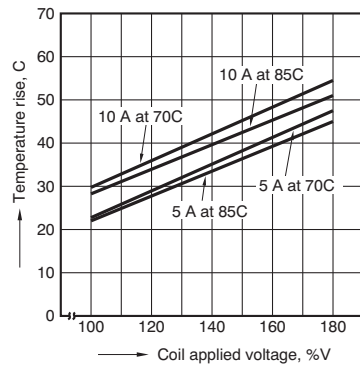
Ambient temperature: room temperature



### 3-(1). Coil temperature rise (1 Form A type)

Contact carrying current: 5 A, 10 A

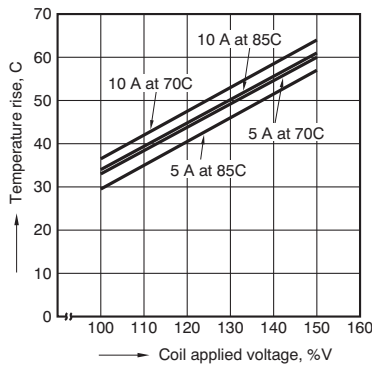
Measured portion: Inside the coil



### 3-(2). Coil temperature rise (1 Form C type)

Contact carrying current: 5 A, 10 A

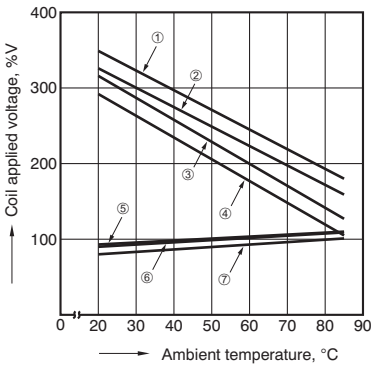
Measured portion: Inside the coil



### 4-(1). Ambient temperature characteristics (1 Form A type)

Tested sample: JQ1aP-24V-F

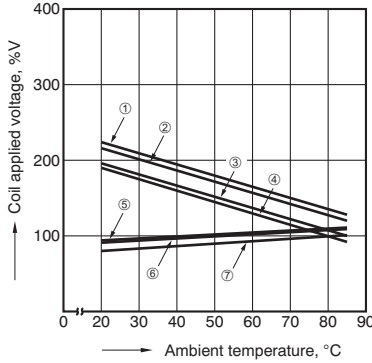
Contact carrying current: 5 A, 10 A



### 4-(2). Ambient temperature characteristics (1 Form C type)

Tested sample: JQ1P-24V-F

Contact carrying current: 5 A, 10 A



- ① Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 130°C 266°F) (Carrying current: 5 A)
- ② Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 130°C 266°F) (Carrying current: 10 A)
- ③ Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 115°C 239°F) (Carrying current: 5 A)
- ④ Allowable ambient temperature against % coil voltage (max. inside the coil temperature set as 115°C 239°F) (Carrying current: 10 A)
- ⑤ Pick-up voltage with a hot-start condition of 100%V on the coil (Carrying current: 10 A)
- ⑥ Pick-up voltage with a hot-start condition of 100%V on the coil (Carrying current: 5 A)
- ⑦ Pick-up voltage

## SAFETY STANDARDS

| Item                                    | UL/C-UL (Recognized) |                                                                                                                 | CSA (Certified) |                                                                                                                 | VDE (Certified) |                                                                                           | TÜV (Certified)         |                                                      | SEMKO (Certified) |                                             |
|-----------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------|-------------------|---------------------------------------------|
|                                         | File No.             | Contact rating                                                                                                  | File No.        | Contact rating                                                                                                  | File No.        | Contact rating                                                                            | File No.                | Rating                                               | File No.          | Contact rating                              |
| Standard type<br>(5A) 1 Form A          | E43028               | 5A 125V AC<br>5A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC  | LR26550         | 5A 125V AC<br>5A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC  | 40011435        | 5A 250V AC<br>( $\cos\phi=0.4$ )                                                          | B 08 09<br>13461<br>252 | 5A 250V AC<br>( $\cos\phi=0.4$ )<br>5A 30V DC (0ms)  | 817138            | 3(2)A 125V AC<br>2(1)A 250V AC<br>5A 30V DC |
| Standard type<br>(5A) 1 Form C          | E43028               | 5A 125V AC<br>5A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC  | LR26550         | 5A 125V AC<br>5A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC  | 40011435        | 5A 250V AC<br>( $\cos\phi=0.4$ )<br>(N.O.)<br>3A 250V AC<br>( $\cos\phi=0.4$ )<br>(N.C.)  | B 08 09<br>13461<br>252 | 5A 250V AC<br>( $\cos\phi=0.4$ )<br>5A 30V DC (0ms)  | 817138            | 3(2)A 125V AC<br>2(1)A 250V AC<br>5A 30V DC |
| High capacity<br>type<br>(10A) 1 Form A | E43028               | 10A 125V AC<br>8A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC | LR26550         | 10A 125V AC<br>8A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC | 40011435        | 10A 250V AC<br>( $\cos\phi=0.4$ )                                                         | B 08 09<br>13461<br>252 | 10A 250V AC<br>( $\cos\phi=0.4$ )<br>5A 30V DC (0ms) | 817138            | 5(3)A 250V AC<br>5A 30V DC                  |
| High capacity<br>type<br>(10A) 1 Form C | E43028               | 10A 125V AC<br>8A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC | LR26550         | 10A 125V AC<br>8A 277V AC<br>5A 30V DC<br>0.3A 110V DC<br>$\frac{1}{10}$ HP 125V AC<br>$\frac{1}{6}$ HP 277V AC | 40011435        | (N.O.)<br>10A 250V AC<br>( $\cos\phi=0.4$ )<br>(N.C.)<br>3A 250V AC<br>( $\cos\phi=0.4$ ) | B 08 09<br>13461<br>252 | 10A 250V AC<br>( $\cos\phi=0.4$ )<br>5A 30V DC (0ms) | 817138            | 5(3)A 250V AC<br>5A 30V DC                  |

For Cautions for Use, see [Relay Technical Information](#).