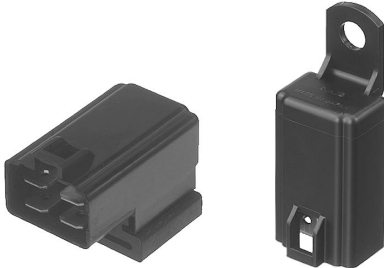


### FEATURES



#### 1. Small size and light weight

For space saving, the outside dimensions of the main body are reduced to be 21.5 mm (length) × 14.4 mm (width) × 37 mm (height) (.846 × .567 × 1.457 inch). and the weight is also reduced to be approx. 19 g .67 oz (Direct coupling 1 Form A, 1 Form B type)

#### 2. Water tightness

Since the relays comply with the water tightness standards, JIS D 0203, water and dust will not enter the relay even if it is mounted in the engine area.

**3. Low operating power (1.4W) type is available (1 Form A, 1 Form B)**

**4. Since the terminal arrangement complies with JIS D5011 B4-M1, commercial connectors are available for these types of relays.**

### SPECIFICATIONS

#### Contact

| Type  |  | 12 V DC  |   |   | 24 V DC   |
|---|--|--|---|---|---|
| Arrangement   |  | 1 Form A   | 1 Form B  | 1 Form C  | 1 Form C  |
| Initial contact resistance, max.<br>(By voltage drop 6 V DC 1A) |  | 50 m ohm   |   |   |   |
| Contact material  |  | silver alloy   |   |   |   |
| Contact voltage drop, max.                                      |  | 0.3 V<br>After electrical life test,<br>by voltage drop<br>12 V DC 20 A<br>(1.4 W type),<br>12 V DC 30 A<br>(1.8 W type) | 0.3 V<br>After electrical life test,<br>by voltage drop<br>12 V DC 20 A | 0.4 V<br>After electrical life test,<br>by voltage drop<br>12 V DC 20 A | 0.4 V<br>After electrical life test,<br>by voltage drop<br>24 V DC 10 A |
| Rating  | Nominal switching capacity<br>(resistive load) | 20 A 12 V DC<br>(1.4 W type)<br>30 A 12 V DC<br>(1.8 W type)   | 20 A 12 V DC  |   | 10 A 24 V DC<br>(ON: 2s, OFF: 2s)                                       |
|   | Max. switching voltage                         | 16 V   |   | 15 V  | 30 V  |
|   | Max. switching current                         | 120 A (1.4 W type)<br>150 A (1.8 W type)   | 120 A   | 100 A   | 50 A (Inrush current)   |
|   | Max. carrying current                          | 20 A continuous<br>(1.4 W type)<br>30 A for 1 min<br>(1.8 W type)  | 20 A continuous   | 20 A continuous   | 10 A continuous   |
| Nominal operating power   |  | 1.4 W / 1.8 W  |   |   | 1.8 W   |
| Expected life (min. operations)                                 | Mechanical (at 120 cpm)                        | 10 <sup>6</sup>  |   |   | 5×10 <sup>5</sup>   |
|   | Electrical                                     | 20 A<br>(1.4 W, 1.8 W type)  | 10 <sup>5</sup><br>(ON: 2s, OFF: 2s)                                    | 10 <sup>5</sup> (ON 2s, OFF 2s)   |   |
|   |  | 30 A<br>(1.8 W type)   | 2×10 <sup>4</sup><br>(ON: 3s, OFF: 15s)                                 |   |   |

# CA

## Characteristics (at 20°C 68°F)

|   |  |   |  |
|---|--|---|--|
| Type  | 12 V DC  |   | 24 V DC  |
| Max. operating speed  | 15 cpm (1.4 W type: at nominal load)<br>1.8 W type: at 20 A    |   | 15 cpm (at nominal load)                           |
| Initial insulation resistance   | Min. 10 Ω at 500 V DC  |   |  |
| Initial breakdown voltage*1   | Between open contacts  | 500 V rms for 1 min.  |  |
|   | Between contacts and coil                                      | 500 V rms for 1 min.  |  |
| Operate time*2 (at nominal voltage)   | Max. 10 ms at 20°C   |   | Max. 10 ms   |
| Release time (without diode)*2 (at nominal voltage)   | Max. 10 ms at 20°C   |   | Max. 10 ms   |
| Shock resistance  | Functional   | Min. 200 m/s <sup>2</sup> {20 G}  | Min. 100 m/s <sup>2</sup> {10 G}                   |
|   | Destructive*4  | Min. 1,000 m/s <sup>2</sup> {100 G}   |  |
| Vibration resistance  | Functional*5   | Rubber bracket A type: Min. 100 m/s <sup>2</sup> {10 G}, 50 to 500Hz<br>Direct coupling type or Screw-mounting type: Min. 44.1 m/s <sup>2</sup> {4.5 G}, 10 to 100 Hz | Min. 44.1 m/s <sup>2</sup> {4.5 G},<br>10 to 100Hz |
|   | Destructive  | Rubber bracket A type: Min. 100m/s <sup>2</sup> {10 G},50 to 500Hz<br>Direct coupling type or Screw-mounting type: Min. 44.1 m/s <sup>2</sup> {4.5 G}, 10 to 100 Hz   | Min. 44.1 m/s <sup>2</sup> {4.5 G},<br>10 to 500Hz |
| Conditions for operation, transport and storage*6 (Not freezing and condensing low temperature) | Ambient temp.  | -30°C to +80°C -22°F to +176°F  |  |
|   | Humidity   | 5 to 85% R.H.   |  |
| Water-proof standard  | Plastic sealed type: JIS DO203S2, Dust cover type: JIS DO203R2 |   | JIS DO203S2  |
| Unit weight   | Rubber bracket A type : 23 g .81 oz                            |   | 31 g 1.09 oz                                       |
|   | Direct coupling type or Screw-mounting type: 19 g .67 oz       |   |  |

## Electrical life (min. operation)

|                    | Nominal coil voltage, V DC | Motor load (operating frequency ON: 2 s, OFF: 2 s) | Halogen lamp load (operating frequency ON: 1 s, OFF: 14 s) |
|--------------------|----------------------------|--|--|
| 1 Form A, 1 Form B | 12                         | 10 <sup>5</sup> , 20 A 12 V DC                     | 10 <sup>5</sup> , 20 A 12 V DC                             |
| 1 Form C           | 12                         | 10 <sup>5</sup> , 20 A 12 V DC                     | 10 <sup>5</sup> , 20 A 12 V DC                             |
|                    | 24                         | 10 <sup>5</sup> , 10 A 24 V DC                     | 10 <sup>5</sup> , 6 A 24 V DC                              |

## Remarks

\* Specifications will vary with foreign standards certification ratings.

\*1 Detection current: 10 mA

\*2 Excluding contact bounce time

\*3 Half-wave pulse of sine wave: 11ms; detection time: 10μs

\*4 Half-wave pulse of sine wave: 6ms

\*5 Detection time: 10μs

\*6 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

## ORDERING INFORMATION

CA 1a F S — 12 V — A — 5

| Contact arrangement                          | Protective construction                        | Nominal operating power   | Coil voltage (DC)            | Mounting method   | Classification by type                      |
|--|--|---|------------------------------|---|---|
| 1a: 1 Form A<br>1b: 1 Form B<br>1 : 1 Form C | Nil: Plastic sealed type<br>F: Dust cover type | Nil: Standard type (1.8 W)<br>S: Low operating power type (1.4 W)<br>(1 Form A, 1 Form B) | 12 V<br>24 V (1 Form C only) | A: Rubber bracket A type<br>(1 Form A, 1 Form B)<br>N: Screw mounting type<br>C: Direct coupling type | Nil: 1 Form C<br>5: 1 Form A or<br>1 Form B |

Notes: 1. Type with resistor/diode inside are available as options. Please consult our sales office.

2. Standard packing: Carton: 20 pcs. Case: 200 pcs.

## COIL DATA

### 1) Standard type

| Contact arrangement | Mounting type    | Plastic sealed type | Dust cover type | Nominal voltage, V DC | Pick-up voltage, V DC (max.) (at 20°C 68°F) | Drop-out voltage, V DC (min.) (at 20°C 68°F) | Nominal operating current, mA (±10%) (at 20°C 68°F) | Coil resistance, Ω (±10%) (at 20°C 68°F) | Nominal operating power, mW (at 20°C 68°F) | Usable voltage range, V DC |
|---------------------|------------------|---------------------|-----------------|-----------------------|---|--|---|--|--|----------------------------|
| 1 Form A            | Rubber bracket A | CA1a-12V-A-5        | CA1aF-12V-A-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
|                     | Screw-mounting   | CA1a-12V-N-5        | CA1aF-12V-N-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
|                     | Direct coupling  | CA1a-12V-C-5        | CA1aF-12V-C-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
| 1 Form B            | Rubber bracket A | CA1b-12V-A-5        | CA1bF-12V-A-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
|                     | Screw-mounting   | CA1b-12V-N-5        | CA1bF-12V-N-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
|                     | Direct coupling  | CA1b-12V-C-5        | CA1bF-12V-C-5   | 12                    | 8   | 0.6 to 6                                     | 150   | 80                                       | 1.8  | 10 to 16                   |
| 1 Form C            | Screw-mounting   | CA1-DC12V-N         | -               | 12                    | 8   | 0.6  | 150   | 80                                       | 1.8  | 10 to 15                   |
|                     | Direct coupling  | CA1-DC12V-C         | -               | 12                    | 8   | 0.6  | 150   | 80                                       | 1.8  | 10 to 15                   |
|                     | Screw-mounting   | CA1-DC24V-N         | -               | 24                    | 16  | 1.2  | 75  | 320                                      | 1.8  | 20 to 30                   |
|                     | Direct coupling  | CA1-DC24V-C         | -               | 24                    | 16  | 1.2  | 75  | 320                                      | 1.8  | 20 to 30                   |

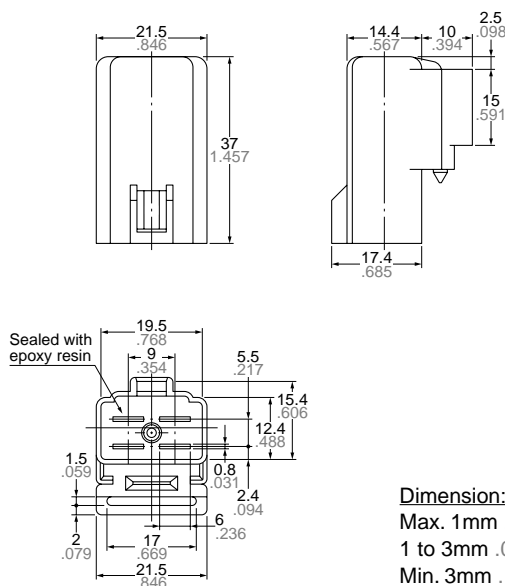
2) Low operating power type

| Contact arrangement | Mounting type    | Plastic sealed type | Dust cover type | Nominal voltage, V DC | Pick-up voltage, V DC (max.) (at 20°C 68°F) | Drop-out voltage, V DC (min.) (at 20°C 68°F) | Nominal operating current, mA (±10%) (at 20°C 68°F) | Coil resistance, Ω (±10%) (at 20°C 68°F) | Nominal operating power, mW (at 20°C 68°F) | Usable voltage range, V DC |
|---------------------|------------------|---------------------|-----------------|-----------------------|---|--|---|--|--|----------------------------|
| 1 Form A            | Rubber bracket A | CA1aS-12V-A-5       | CA1aFS-12V-A-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |
|                     | Screw-mounting   | CA1aS-12V-N-5       | CA1aFS-12V-N-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |
|                     | Direct coupling  | CA1aS-12V-C-5       | CA1aFS-12V-C-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |
| 1 Form B            | Rubber bracket A | CA1bS-12V-A-5       | CA1bFS-12V-A-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |
|                     | Screw-mounting   | CA1bS-12V-N-5       | CA1bFS-12V-N-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |
|                     | Direct coupling  | CA1bS-12V-C-5       | CA1bFS-12V-C-5  | 12                    | 8   | 0.6 to 6                                     | 120   | 100                                      | 1.4  | 10 to 16                   |

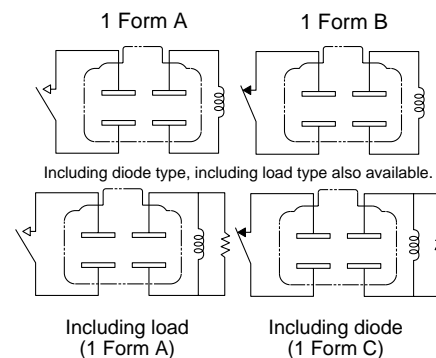
**DIMENSIONS**

mm inch

1. 1 Form A/1 Form B  
Rubber bracket A type



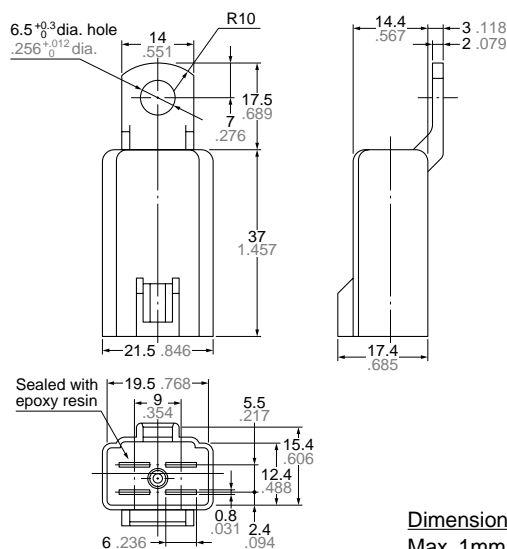
SCHMATIC (Bottom View)



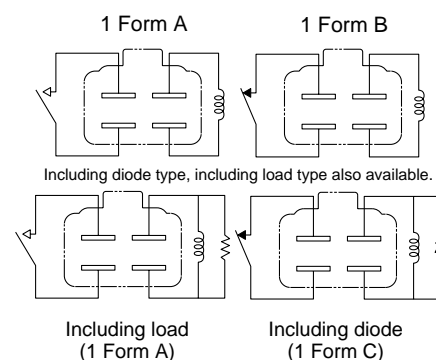
**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

**General tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

2. 1 Form A/1 Form B  
Screw-mounting type



SCHMATIC (Bottom View)



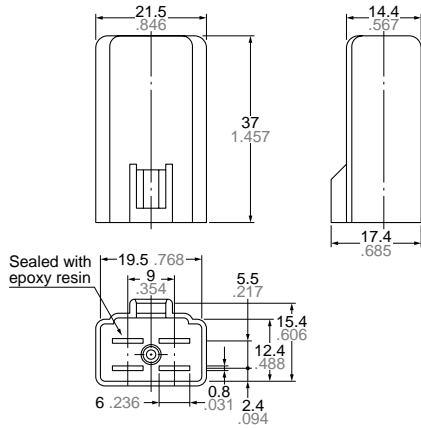
**Dimension:**  
 Max. 1mm .039 inch:  
 1 to 3mm .039 to .118 inch:  
 Min. 3mm .118 inch:

**General tolerance**  
 ±0.1 ±.004  
 ±0.2 ±.008  
 ±0.3 ±.012

# CA

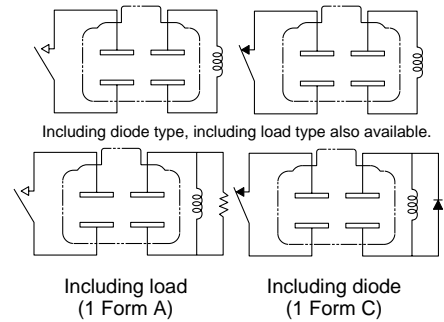
## 3. 1 Form A/1 Form B Direct coupling type

mm inch



### SCHMATIC (Bottom View)

#### 1 Form A      1 Form B



### Dimension:

Max. 1mm .039 inch:

1 to 3mm .039 to .118 inch:

Min. 3mm .118 inch:

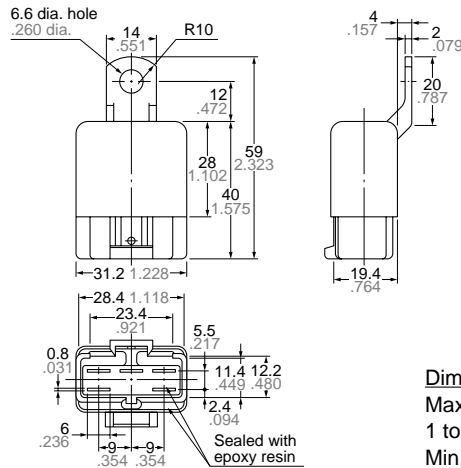
### General tolerance

$\pm 0.1 \pm .004$

$\pm 0.2 \pm .008$

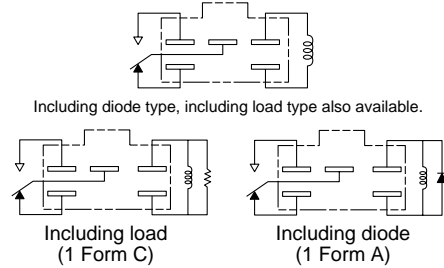
$\pm 0.3 \pm .012$

## 4. 1 Form C Screw-mounting type



### SCHMATIC (Bottom View)

#### 1 Form C



### Dimension:

Max. 1mm .039 inch:

1 to 3mm .039 to .118 inch:

Min. 3mm .118 inch:

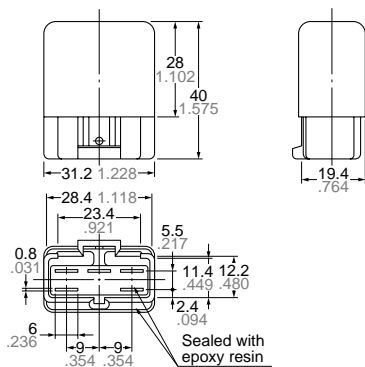
### General tolerance

$\pm 0.1 \pm .004$

$\pm 0.2 \pm .008$

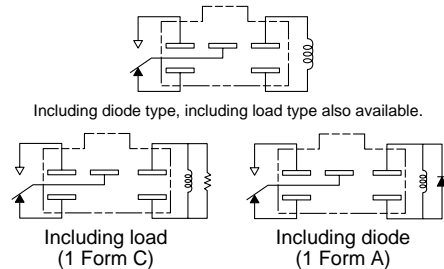
$\pm 0.3 \pm .012$

## 5. 1 Form C Direct coupling type



### SCHMATIC (Bottom View)

#### 1 Form C



### Dimension:

Max. 1mm .039 inch:

1 to 3mm .039 to .118 inch:

Min. 3mm .118 inch:

### General tolerance

$\pm 0.1 \pm .004$

$\pm 0.2 \pm .008$

$\pm 0.3 \pm .012$

## REFERENCE DATA

### 1. Coil temperature rise

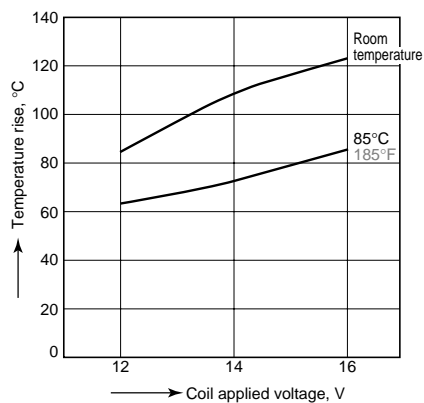
Tested sample: CA1aS-12V-N-5, 5 pcs.

Point measured: Inside the coil

Contact carrying current: 20A

Ambient temperature: Room temperature,

85°C 185°F



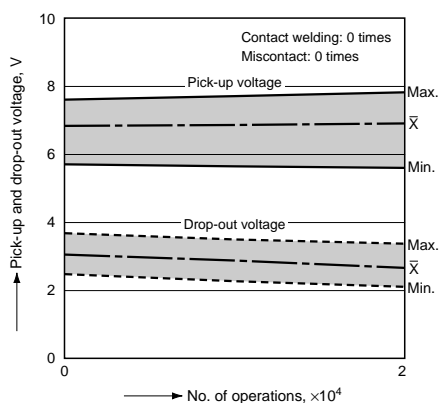
### 2. Electrical life test (Motor load)

Tested sample: CA1a-12V-N-5, 5 pcs.

Load: Steady 30A, Inrush 150A, 12V DC

Operate frequency: ON 3s, OFF 15s

Ambient temperature: Room temperature



**For Cautions for use, see Relay Technical Information (Page 48 to 76).**