

## FEATURES

- **Compact flat type**

We successfully developed a power type that is the same size as our CP relay (14 mm (L) x 13 mm (W) x 9.5 mm (H) .551 inch (L) x .512 inch (W) x .374 inch (H)).

- **35A maximum carrying current**

Current carrying of 35 A/1h and 45 A/2 min. at 20°C (450 W type, 16 V applied) is possible due to use of N.O. double pin terminals and COM terminal width expansion.

- **Supports capacitor loads required for power supply applications**

Inrush current: 60A, steady-state current: 1A and 10<sup>5</sup> switching times possible.

- **Plastic sealed type**

This plastic sealed type can be automatically cleaned.

## TYPICAL APPLICATIONS

**For automotive system**

Defoggers, Ignitions, Heaters, Accessories, Power windows, EPS and ABS etc.

## SPECIFICATIONS

### Contact

|  |                                      |   |
|--|--------------------------------------|---|
| Arrangement  | 1 Form A, 1 Form C                   |   |
| Contact material   | Ag alloy (Cadmium free)              |   |
| Initial contact resistance (Initial)<br>(By voltage drop 6V DC 1A) | Typ. 3 mΩ (N.O.)<br>Typ. 4 mΩ (N.C.) |   |
| Rating   | Nominal switching capacity           | 20A 14V DC (N.O.)<br>10A 14V DC (N.C.)  |
|  | Max. carrying current (16V DC)       | N.O.:<br>For 450mW<br>45A/2 minutes, 35A/1 hour at 20°C 68°F<br>40A/2 minutes, 30A/1 hour at 85°C 185°F<br>35A/2 minutes, 25A/1 hour at 110°C 230°F<br>For 640mW<br>40A/2 minutes, 30A/1 hour at 20°C 68°F<br>35A/2 minutes, 25A/1 hour at 85°C 185°F<br>30A/2 minutes, 20A/1 hour at 110°C 230°F |
|  | Min. switching capacity#1            | 1A 12V DC   |
|  | Expected life (min. operations)      | Mechanical (at 120cpm) Min. 10 <sup>7</sup><br>Electrical (at 6cpm) Resistive load Min. 10 <sup>5*1</sup><br>Capacitor load Min. 10 <sup>5*2</sup>  |

### Coil

|                         |  |
|-------------------------|--|
| Nominal operating power | 450 mW for pick-up voltage 7.2V DC<br>640 mW for pick-up voltage 6.5V DC |
|-------------------------|--|

#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.

### Characteristics

|  |                          |   |
|--|--------------------------|---|
| Max. operating speed<br>(at nominal switching capacity)  | 6cpm                     |   |
| Initial insulation resistance  | Min. 100MΩ (at 500 V DC) |   |
| Initial breakdown voltage*3  | Between open contacts    | 500 Vrms for 1min.                                    |
|  | Between contact and coil | 500 Vrms for 1min.                                    |
| Operate time*4<br>(at nominal voltage) (Initial)   | Max. 10ms (at 20°C 68°F) |   |
| Release time*4<br>(at nominal voltage) (Initial)   | Max. 10ms (at 20°C 68°F) |   |
| Shock resistance   | Functional <sup>5</sup>  | Min. 100 m/s <sup>2</sup> {10 G}                      |
|  | Destructive*6            | Min. 1,000 m/s <sup>2</sup> {100 G}                   |
| Vibration resistance   | Functional*7             | 10 Hz to 100 Hz,<br>Min.44.1 m/s <sup>2</sup> {4.5 G} |
|  | Destructive*8            | 10 Hz to 500 Hz,<br>Min.44.1 m/s <sup>2</sup> {4.5 G} |
| Conditions in case of operation, transport and storage*9<br>(Not freezing and condensing at low temperature) | Ambient temp             | -40°C to +85°C<br>-40 to +185°F                       |
|  | Humidity                 | 5% R.H. to 85% R.H.                                   |
| Mass   | Approx. 4.5g .16 oz      |   |

### Remarks

- \*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF
- \*2 At 1A (steady), 60A (inrush), 14V DC, operating frequency: 1s ON, 9s OFF
- \*3 Detection current: 10mA
- \*4 Excluding contact bounce time
- \*5 Half-wave pulse of sine wave: 11ms; detection time: 10μs
- \*6 Half-wave pulse of sine wave: 6ms
- \*7 Detection time: 10μs
- \*8 Time of vibration for each direction;
  - X, Y direction: 2 hours
  - Z direction: 4 hours
- \*9 Refer to "6. Usage, Storage and Transport Conditions" in **AMBIENT ENVIRONMENT** section in **Relay Technical Information**. Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).

# CP POWER

## ORDERING INFORMATION

Ex. CP  -  -

| Contact arrangement                               | Pick-up voltage                        | Coil voltage (DC) |
|---|--|-------------------|
| 1H: 1 Form C Powr type<br>1aH: 1 Form A Powr type | Nil: Max. 7.2 V DC<br>N: Max. 6.5 V DC | 12 V              |

Note: Tube packing: Carton (Tube): 40 pcs.; Case: 1,000 pcs.

## TYPES

| Contact arrangement | Coil voltage | Pick-up voltage, V DC (Initial) (at 20°C 68°F) | Part No.    |
|---------------------|--------------|--|-------------|
| 1 Form C            | 12 V DC      | Max. 7.2                                       | CP1H-12V    |
|                     |              | Max. 6.5                                       | CP1H-N-12V  |
| 1 Form A            |              | Max. 7.2                                       | CP1aH-12V   |
|                     |              | Max. 6.5                                       | CP1aH-N-12V |

Note: THD type only

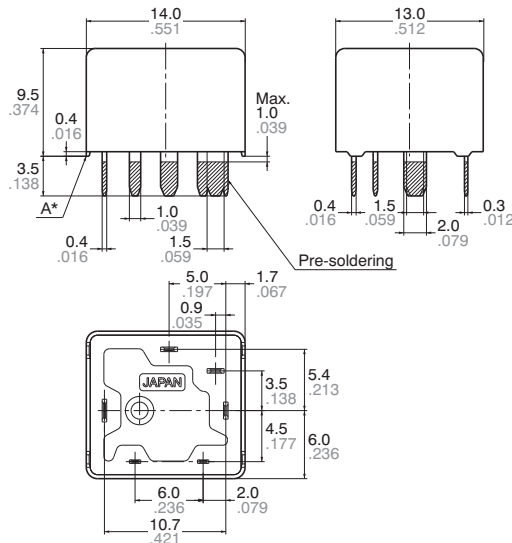
## COIL DATA (at 20°C 68°F)

| Nominal voltage, V DC (at 20°C 68°F) | Pick-up voltage, V DC (Initial) (at 20°C 68°F) | Drop-out voltage, V DC (Initial) (at 20°C 68°F) | Coil resistance $\Omega$ (at 20°C 68°F) | Nominal operating current mA (at 20°C 68°F) | Nominal operating power mW (at 20°C 68°F) | Usable voltage range, V DC (at 85°C 185°F) |
|--------------------------------------|--|---|---|---|---|--|
| 12                                   | Max. 7.2                                       | Min. 1.0  | 320±10%                                 | 37.5±10%                                    | 450                                       | 10 to 16                                   |
|                                      | Max. 6.5                                       |   | 225±10%                                 | 53.3±10%                                    | 640                                       | 9 to 16                                    |

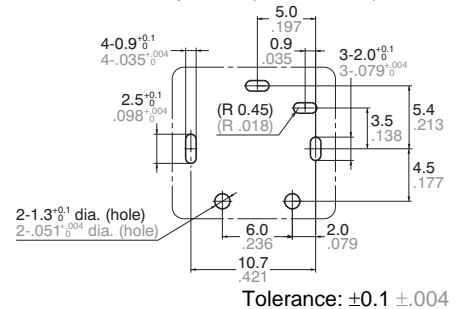
## DIMENSIONS (mm inch)

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

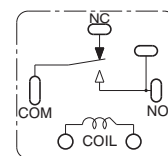
[CAD Data](#)



PC board pattern (Bottom view)



Schematic (Bottom view)



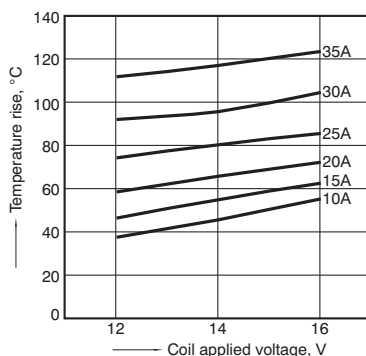
| Dimension:                  | Tolerance  |
|-----------------------------|------------|
| Max. 1mm .039 inch:         | ±0.1 ±.004 |
| 1 to 3mm .039 to .118 inch: | ±0.2 ±.008 |
| Min. 3mm .118 inch:         | ±0.3 ±.012 |

\*Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

## REFERENCE DATA

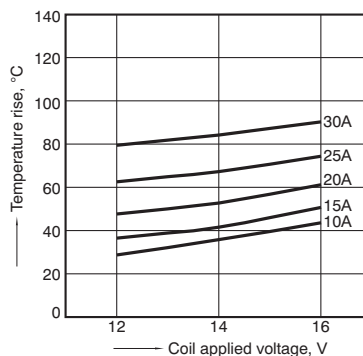
### 1-(1). Coil temperature rise

Sample : CP1H-12V, 3pcs  
 Point measured : Inside the coil  
 Ambient temperature : 27°C 81°F

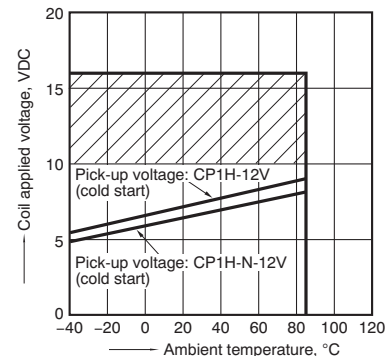


### 1-(2). Coil temperature rise

Sample : CP1H-12V, 3pcs  
 Point measured : Inside the coil  
 Ambient temperature : 85°C 185°F

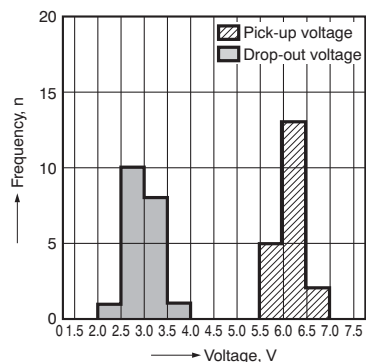


### 2. Ambient temperature and operating voltage range



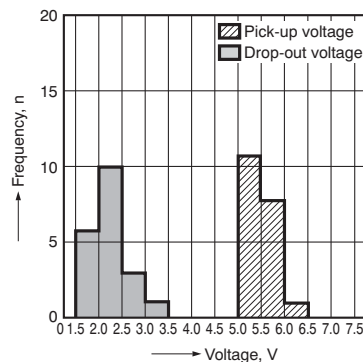
### 3-(1). Distribution of pick-up and drop-out voltage

Sample : CP1H-12V



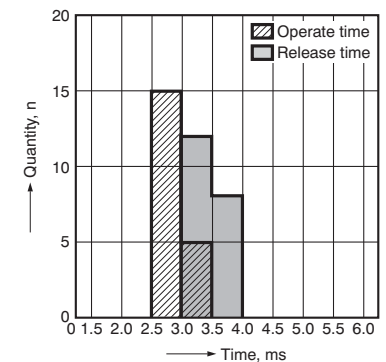
### 3-(2). Distribution of pick-up and drop-out voltage

Sample : CP1H-N-12V



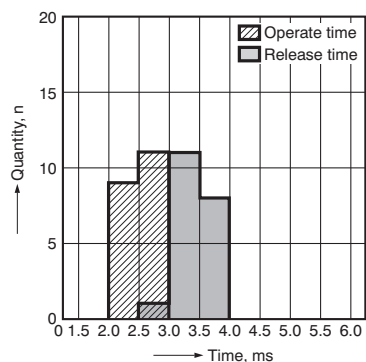
### 4-(1). Distribution of operate and release time

Sample : CP1H-12V



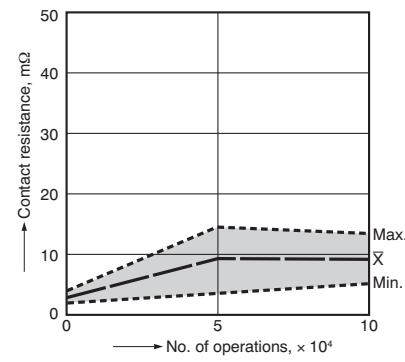
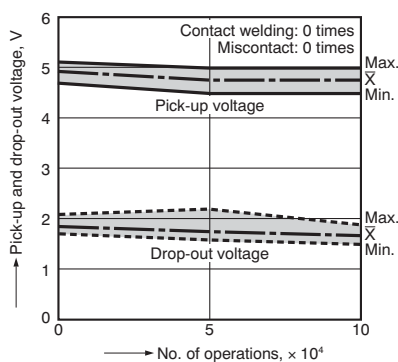
### 4-(2). Distribution of operate and release time

Sample : CP1H-N-12V



### 5-(1). Electrical life test (at rated load)

Sample : CP1H-12V  
 Quantity : n = 6  
 Load : Resistive load (NO side : 20 A 14 V DC)  
 Operating frequency : ON 1s, OFF 9s  
 Ambient temperature : Room temperature



# CP POWER

## 5-(2). Electrical life test (at capacitor load)

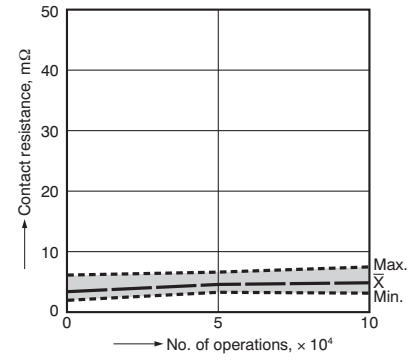
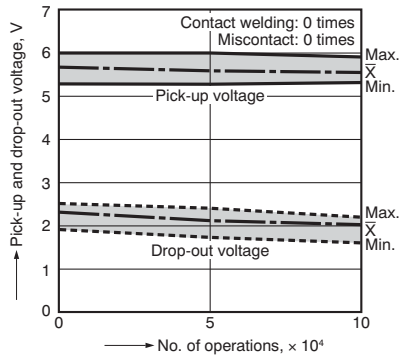
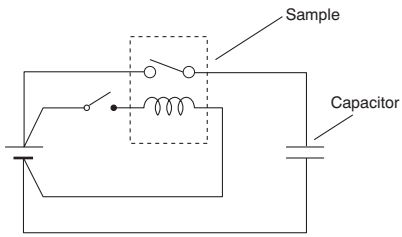
Sample : CP1H-12V, 6pcs.

Load : Inrush 60A/steady 1A

Operating frequency : (ON : OFF = 1s : 9s)

Ambient temperature : Room temperature

Circuit :



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