

### 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.

Compliance with RoHS Directive

## SPECIFICATIONS

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

Coil		450 mW for pick-up voltage 7.2V DC 640 mW for pick-up voltage 6.5V DC	
Nominal operating power		450 mW for pick-up voltage 7.2V DC 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 (at nominal switching capacity)		6cpm
Initial insulation resistance		Min. 100MΩ (at 500 V DC)
Initial breakdown voltage <sup>*3</sup>	Between open contacts	500 Vrms for 1min.
	Between contact and coil	500 Vrms for 1min.
Operate time <sup>*4</sup> (at nominal voltage) (Initial)		Max. 10ms (at 20°C 68°F)
Release time <sup>*4</sup> (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 <sup>*6</sup>	Min. 1,000 m/s <sup>2</sup> {100 G}
Vibration resistance	Functional <sup>*7</sup>	10 Hz to 100 Hz, Min.44.1 m/s <sup>2</sup> {4.5 G}
	Destructive <sup>*8</sup>	10 Hz to 500 Hz, Min.44.1 m/s <sup>2</sup> {4.5 G}
Conditions in case of operation, transport and storage <sup>*9</sup> (Not freezing and condensing at low temperature)	Ambient temp	-40°C to +85°C -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 Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT  
Please inquire if you will be using the relay in a high temperature atmosphere (110°C 230°F).

**ORDERING INFORMATION**

Ex. CP  -  -

Contact arrangement	Pick-up voltage	Coil voltage (DC)
1H: 1 Form C Powr type 1aH: 1 Form A Powr type	Nil: Max. 7.2 V DC 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

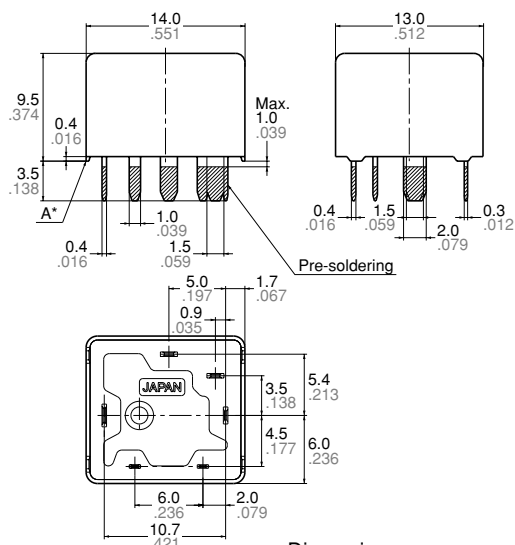
Note: THD type only

**COIL DATA (at 20°C 68°F)**

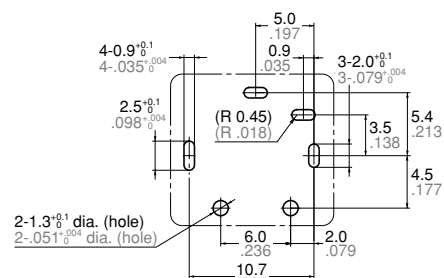
Nominal voltage, V DC (at 20°C 68°F)	Pick-up voltage, V DC (Initial) (at 20°C 68°F)	Drop-out voltage, V DC (Initial) (at 20°C 68°F)	Coil resistance Ω (at 20°C 68°F)	Nominal operating current mA (at 20°C 68°F)	Nominal operating power mW (at 20°C 68°F)	Usable voltage range, V DC (at 85°C 185°F)
12	Max. 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

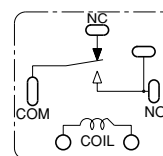


PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

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

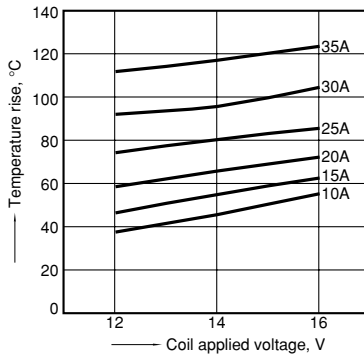
\*Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering. Intervals between terminals is measured at A surface level.

# CP POWER

## REFERENCE DATA

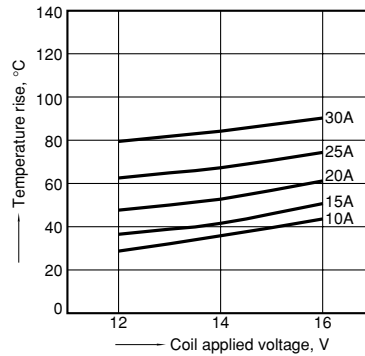
### 1-(1). Coil temperature rise

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

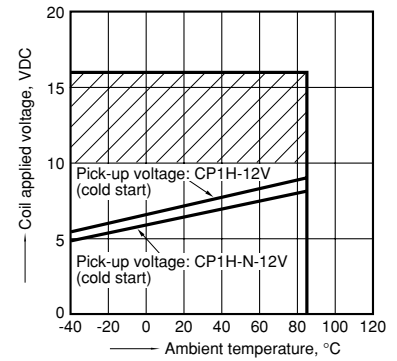


### 1-(2). Coil temperature rise

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

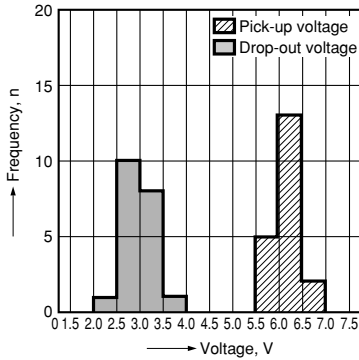


### 2. Ambient temperature and operating voltage range



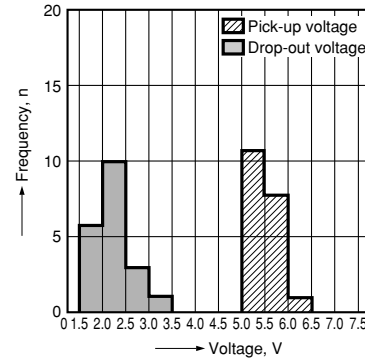
### 3-(1). Distribution of pick-up and drop-out voltage

Sample : CP1H-12V



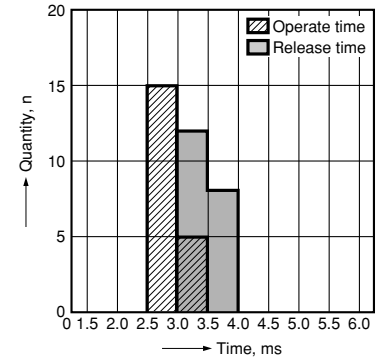
### 3-(2). Distribution of pick-up and drop-out voltage

Sample : CP1H-N-12V



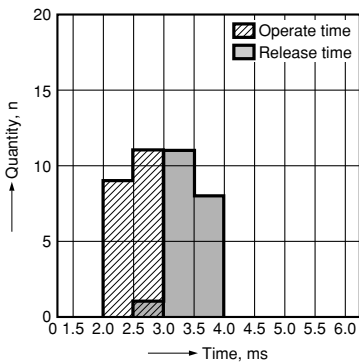
### 4-(1). Distribution of operate and release time

Sample : CP1H-12V



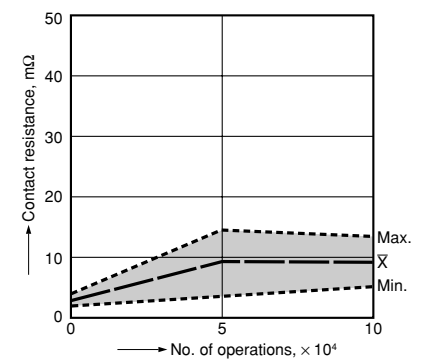
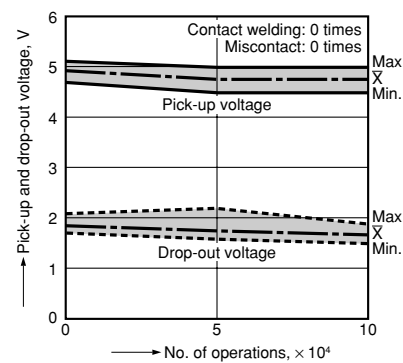
### 4-(2). Distribution of operate and release time

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



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

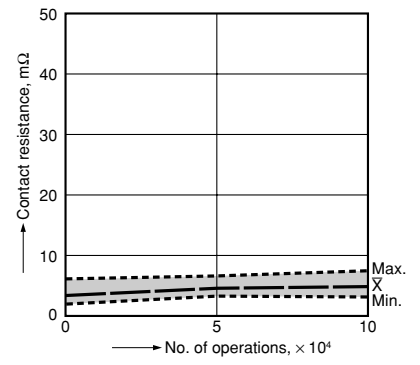
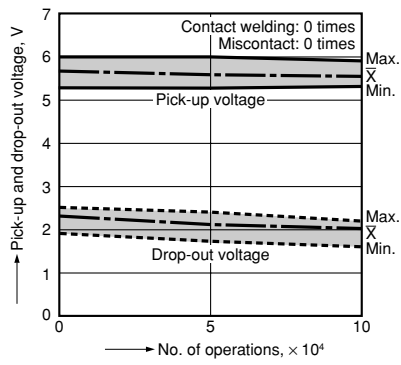
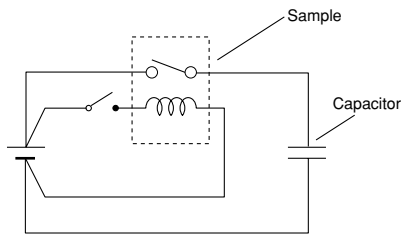
Sample : CP1H-12V, 6pcs.

Load : Inrush 60A/steady 1A

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

Ambient temperature : Room temperature

Circuit :



**For Cautions for Use, see Relay Technical Information.**