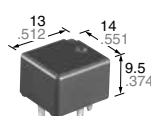


High Carrying Current Type Miniature Low Profile Automotive Relay

CP RELAYS POWER TYPE

<Protective construction>
Sealed



(Unit: mm inch)

RoHS compliant

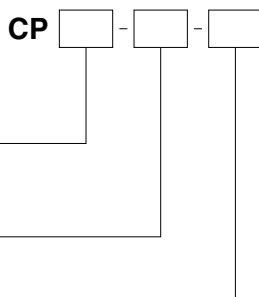
FEATURES

- Maximum carrying current of 35 A (450 mW type, 16 V applied) made possible through using the same size as CP relays
- Supports capacitor loads required for power supply applications

TYPICAL APPLICATIONS

- Defoggers, Ignitions, Heaters, Accessories, Powered windows, etc.

ORDERING INFORMATION



Contact arrangement
1H: 1 Form C Power type
1aH: 1 Form A Power type

Operate (Set) voltage
Nil: Max. 7.2 V DC
N: Max. 6.5 V DC

Rated coil voltage (DC)
12 V

TYPES

Contact arrangement	Rated coil voltage	Operate (Set) voltage (at 20°C 68°F) (Initial)	Type No.	Packing	
				Carton (tube)	Case
1 Form C	12 V DC	Max. 7.2 V DC	CP1H-12V	40 pcs.	1,000 pcs.
		Max. 6.5 V DC	CP1H-N-12V		
		Max. 7.2 V DC	CP1aH-12V		
		Max. 6.5 V DC	CP1aH-N-12V		
1 Form A					

Note: Other operate (set) voltage types are also available. Please inquire our sales representative for details.

RATING

1. Coil data

Rated coil voltage	Operate (Set) voltage (at 20°C 68°F) (Initial)	Release (Reset) voltage (at 20°C 68°F) (Initial)	Rated operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Rated operating power (at 20°C 68°F)	Usable voltage range (at 85°C 185°F)
12V DC	Max. 7.2 V DC	Min. 1.0 V DC	37.5 mA	320Ω	450 mW	10 to 16V DC
	Max. 6.5 V DC		53.3 mA	225Ω	640 mW	10 to 16V DC

2. Specifications

Item	Specifications
Contact data	Contact arrangement
	1 Form A, 1 Form C
	Contact resistance (initial)
	Max. 100mΩ (N.O.: Typ. 6mΩ, N.C.: Typ. 8mΩ) (By voltage drop 1A 6V DC)
	Contact material
Contact data	Ag alloy
	Rated switching capacity (resistive)
	N.O. side: 20 A 14V DC, N.C. side: 10 A 14V DC
Contact data	Max. carrying current*1
	N.O. side: <For 450 mW> 45 A for 2 minutes, 35 A for 1 hour (Coil applied voltage 16V DC, at 20°C 68°F) 40 A for 2 minutes, 30 A for 1 hour (Coil applied voltage 16V DC, at 85°C 185°F) <For 640 mW> 40 A for 2 minutes, 30 A for 1 hour (Coil applied voltage 16V DC, at 20°C 68°F) 35 A for 2 minutes, 25 A for 1 hour (Coil applied voltage 16V DC, at 85°C 185°F)
Contact data	Min. switching load (resistive)*2
	1 A 14V DC (at 20°C 68°F)
Insulated resistance (initial)	
Min. 100 MΩ (at 500V DC, Measurement at same location as "Dielectric strength" section.)	
Dielectric strength (initial)	Between open contacts
	500 Vrms for 1 min. (Detection current: 10mA)
Dielectric strength (initial)	Between contacts and coil
	500 Vrms for 1 min. (Detection current: 10mA)
Time characteristics (initial)	Operate (Set) time (at Rated voltage)
	Max. 10ms (at 20°C 68°F, without bounce time)
Time characteristics (initial)	Release (Reset) time (at Rated voltage)
	Max. 10ms (at 20°C 68°F, without bounce time) (without diode)
Shock resistance	Functional
	Min. 100 m/s ² {approx. 10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs)
Shock resistance	Destructive
	Min. 1,000 m/s ² {approx. 100G} (Half-wave pulse of sine wave: 6ms)
Vibration resistance	Functional
	10 to 100 Hz, Min. 44.1 m/s ² {approx. 4.5G} (Detection time: 10μs)
Vibration resistance	Destructive
	10 to 500 Hz, Min. 44.1 m/s ² {approx. 4.5G}, Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours
Expected life	Mechanical
	Min. 10 ⁷ (at 120 cpm)
Expected life	Electrical
	<Resistive load> Min. 10 ⁵ (at rated switching capacity, operating frequency: 1s ON, 9s OFF) <Capacitor load> Min. 10 ⁵ (at Inrush 60A, Steady 1A 14 V DC, operating frequency: 1s ON, 9s OFF)
Conditions	Conditions for usage, transport and storage*3
Ambient temperature: -40 to +85°C -40 to +185°F, Humidity: 5 to 85% R.H. (Please avoid icing or condensation)	
Weight	Approx. 4.5 g .16 oz

Notes: *1. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

*2. 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.

*3. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. For details, please refer to the "Automotive Relay Users Guide".

Please inquire our sales representative if you will be using the relay in a high temperature atmosphere (110°C 230°F).

REFERENCE DATA

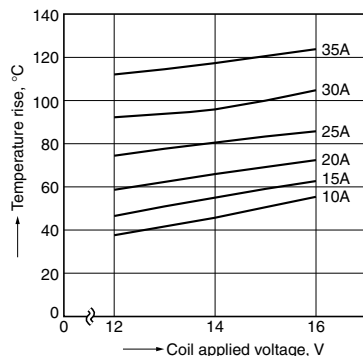
1-(1). Coil temperature rise (at room temperature)

Sample : CP1H-12V, 3pcs

Point measured : Inside the coil

Carrying current: 10A, 15A, 20A, 25A, 30A, 35A

Ambient temperature: 27°C 81°F



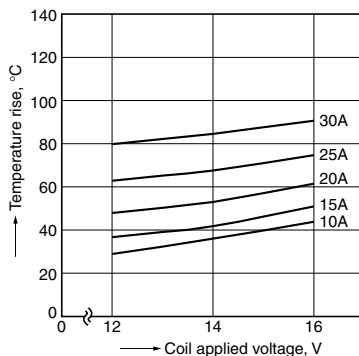
1-(2). Coil temperature rise (at 85°C 185°F)

Sample : CP1H-12V, 3pcs

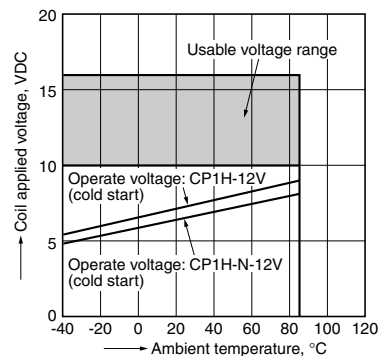
Point measured : Inside the coil

Carrying current: 10A, 15A, 25A, 30A

Ambient temperature: 85°C 185°F

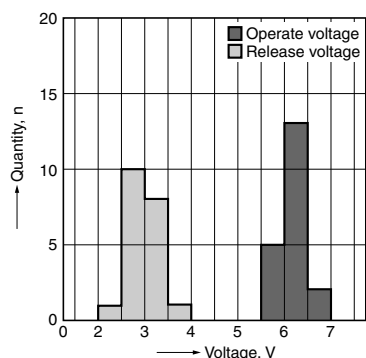


2. Ambient temperature and usable voltage range



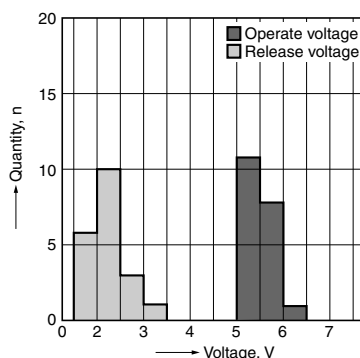
3-(1). Distribution of operate (set) and release (reset) voltage

Sample : CP1H-12V, 20pcs.



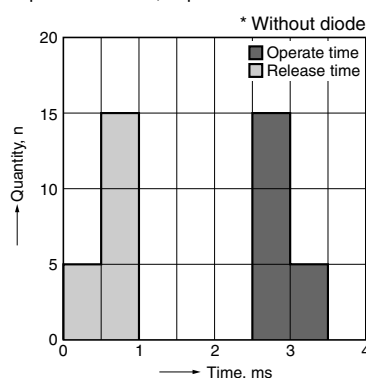
3-(2). Distribution of operate (set) and release (reset) voltage

Sample : CP1H-N-12V, 20pcs.



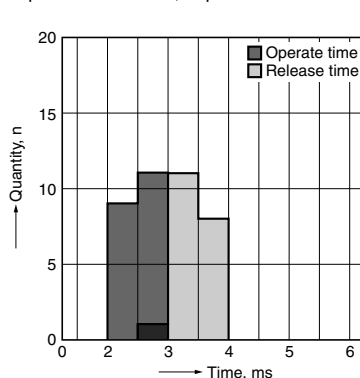
4-(1). Distribution of operate (set) and release (reset) time

Sample : CP1H-12V, 20pcs.



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

Sample : CP1H-N-12V, 20pcs.



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

Sample : CP1H-12V

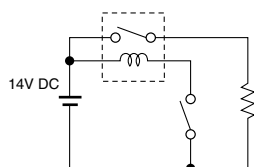
Quantity : n = 6

Load : Resistive load (N.O. side : 20 A 14 V DC)

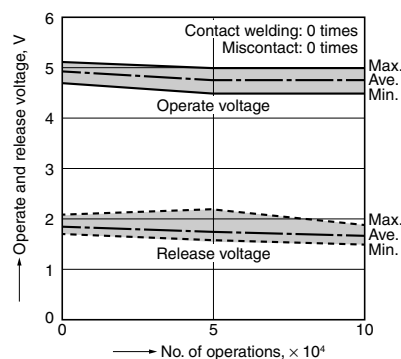
Operating frequency : ON 1s, OFF 9s

Ambient temperature : Room temperature

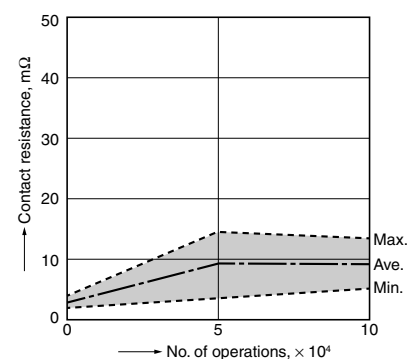
Circuit:



Change of operate (set) and release (reset) voltage



Change of contact resistance



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

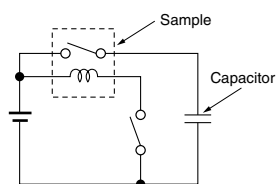
Sample : CP1H-12V, 6pcs.

Load : Inrush current 60A, steady current 1A

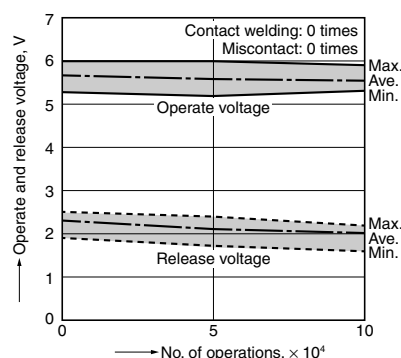
Operating frequency : ON 1s, OFF 9s

Ambient temperature : Room temperature

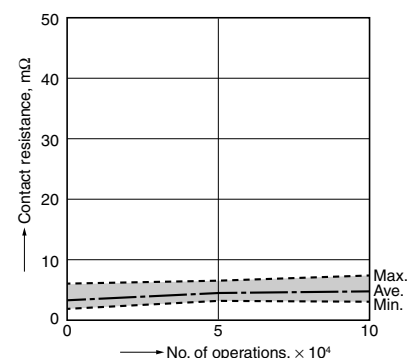
Circuit:



Change of operate (set) and release (reset) voltage



Change of contact resistance



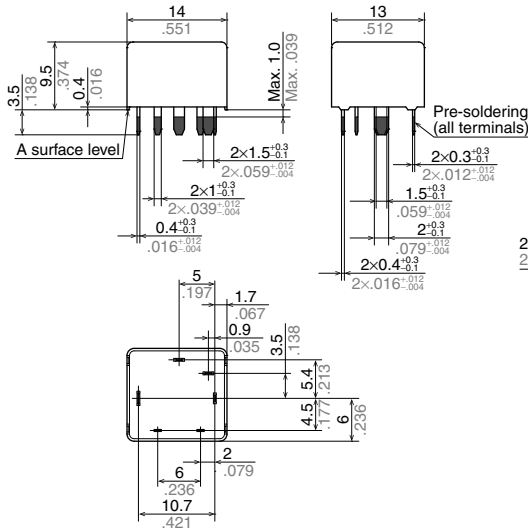
DIMENSIONS (mm inch)

The CAD data of the products with a **CAD** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

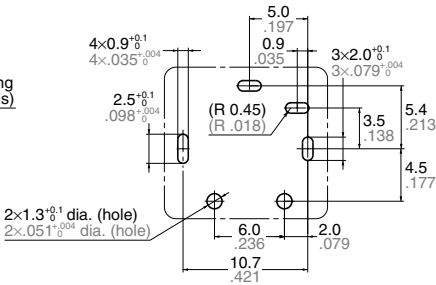
CAD



External dimensions

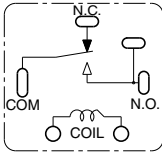


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.004$

Schematic (Bottom view)



Dimension:	Tolerance
Max. 1mm .039 inch:	$\pm 0.1 \pm 0.004$
1 to 3mm .039 to .118 inch:	$\pm 0.2 \pm 0.008$
Min. 3mm .118 inch:	$\pm 0.3 \pm 0.012$

* Dimensions (thickness and width) of terminal is measured after pre-soldering.
Intervals between terminals is measured at A surface level.

For general cautions for use, please refer to the “Automotive Relay Users Guide”.

Please contact

Panasonic Corporation

Electromechanical Control Business Division

■ 1006, Oaza Kadoma, Kadoma-shi, Osaka 571-8506, Japan
industrial.panasonic.com/ac/e/

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