18256-RL

Panasonic
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AUTOMOTIVE RELAY WITH ISO TERMINAL ARRANGEMENT

CB RELAYS

RoHS Directive compatibility information
http://www.mew.co.jp/ac/e/environment/

FEATURES

1. This relay has an ISO (International Organization for Standardization) terminal arrangement.
Terminals are all solder plated.
*35 A type: Terminal is the plug-in type (no plating).

2. Relay is compact and high capacity (40 A).
Compact form factor realized with space saving 22 × 26 mm .866 × 1.024 inch small base area thanks to integrated bobbin and base construction. Features high switching capacity of 40 A

3. Features high thermal resistance of 125°C 257°F (heat resistant type).
Heat resistant type is available that can withstand use near engines. (40 A switching capacity)

4. Sealed type available for resisting adverse environments.

5. Surge absorbing built-in diode type that works when the relay coil is off and an internal resistor type are available. (Please inquire.)

6. Protective element type is also available.

7. For only plug-in types, types with nominal switching capacities of 35 A (12 V) and 15 A (24 V) are available.

TYPICAL APPLICATIONS

1. Automobiles
Headlights, Cell motors, Air conditioners, ABS, EPS, etc.

2. Construction equipment

3. Agricultural equipment, Conveyor, etc.

ORDERING INFORMATION

CB ☐ ☐ ☐ ☐ - ☐ ☐ - ☐ ☐ - ☐

Contact arrangement
1a: 1 Form A
1: 1 Form C

Contact rating
Nil: Standard type
H: High contact capacity type
V: 35 A type

Protective construction
Nil: Sealed type
F: Flux-resistant type

Heat resistant of types
Nil: Standard type
T: Heat resistant type

Protective element
Nil: None
D: with diode inside
R: with resistor inside

Mounting classification
Nil: Plug-in type
P: PC board type
M: Bracket type

Coil voltage (DC)
12V, 24 V

TYPES

1. Standard type

Contact arrangement	Mounting classification	Nominal coil voltage	Sealed type Part No.	Flux-resistant type Part No.
1 Form C	Bracket type	12V DC	CB1-M-12V	CB1F-M-12V
		24V DC	CB1-M-24V	CB1F-M-24V

Packing quantity; Carton: 50 pcs. Case: 200 pcs.

RATING

1. Coil data

1) 1. No protective element and with diode inside

Contact arrangement	Nominal coil voltage	Pick-up voltage (Initial, at 20°C 68°F)	Drop-out voltage (Initial, at 20°C 68°F)	Nominal operating current (at 20°C 68°F)	Coil resistance (±10%) (at 20°C 68°F)	Nominal operating power (at 20°C 68°F)	Usable voltage range
1 Form A, 1 Form C	12V DC	3 to 7V DC	1.2 to 4.2V DC	117mA	103Ω	1.4W	10 to 16V DC
	24V DC	6 to 14V DC	2.4 to 8.4V DC	75mA	320Ω	1.8W	20 to 32V DC
High contact capacity (1 Form A)	12V DC	3 to 7V DC	1.2 to 4.2V DC	117mA	103Ω	1.4W (PC board type)	10 to 16V DC
				150mA	80Ω	1.8W	
	24V DC	6 to 14V DC	2.4 to 8.4V DC	58mA	411Ω	1.4W (PC board type)	20 to 32V DC
				75mA	320Ω	1.8W	

Note: Other pick-up voltage types are also available. Please contact us for details.

2) With resistor inside

Contact arrangement	Nominal coil voltage	Pick-up voltage (Initial, at 20°C 68°F)	Drop-out voltage (Initial, at 20°C 68°F)	Nominal operating current (at 20°C 68°F)	Combined resistance (±10%) (at 20°C 68°F)	Nominal operating power (at 20°C 68°F)	Usable voltage range
1 Form A, 1 Form C	12V DC	3 to 7V DC	1.2 to 4.2V DC	134mA	89.5Ω	1.6W	10 to 16V DC
	24V DC	6 to 14V DC	2.4 to 8.4V DC	84mA	287.2Ω	2.0W	20 to 32V DC

2. Specifications

1) Standard type (12 V coil voltage)

Characteristics	Item		Specifications		
Contact	Arrangement		1 Form A	1 Form C	High contact capacity (1 Form A)
	Contact resistance (Initial)		Typ2mΩ (By voltage drop 6 V DC 1 A)		
	Contact material		Ag alloy (Cadmium free)		
Rating	Nominal switching capacity (Initial)		40A 14V DC	N.O.: 40A 14V DC N.C.: 30A 14V DC	70A 14V DC (at 20°C 68°F) 50A 14V DC (at 85°C 185°F)
	Max. carrying current (Initial) (14V DC, at 85°C 185°F, continuous)		N.O.: 40A	N.O.: 40A, N.C.: 30A	N.O.: 40A
	Nominal operating power		1.4W	1.4W	1.8W (1.4W: PC board type)
	Min. switching capacity*1		1A 12V DC (12V DC), 1A 24V DC (24V DC)		
Electrical characteristics	Initial insulation resistance		Min. 20 MΩ (at 500 V DC)		
	Initial breakdown voltage	Between open contacts	500 Vrms for 1 min. (Detection current: 10mA)		
		Between contacts and coil	500 Vrms for 1 min. (Detection current: 10mA)		
	Operate time (at nominal voltage) (at 20°C 68°F)		Max. 15ms (at 20°C 68°F, excluding contact bounce time) (Initial)		
	Release time (at nominal voltage) (at 20°C 68°F)		Max. 15ms (at 20°C 68°F, excluding contact bounce time, without diode) (Initial)		
Mechanical characteristics	Shock resistance	Functional	Min. 200 m/s² {20G}		
		Destructive	Min. 1,000 m/s² {100G}		
	Vibration resistance	Functional	10 Hz to 500 Hz, Min. 44.1m/s² {4.5G}		
		Destructive	10 Hz to 2,000 Hz, Min. 44.1m/s² {4.5G} Time of vibration for each direction; X. Y. Z direction: 4 hours		
Expected life	Electrical (at nominal switching capacity)		Flux-resistant type: Min. 10^5, Sealed type: Min. 5×10^4 (Operating frequency: 2s ON, 2s OFF)		
	Mechanical		Min. 10^6 (at 120 cpm)		
Conditions	Conditions for operation, transport and storage*2		Standard type; Ambient temp: –40 to +85°C –40 to +185°F, Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)		
			Heat resistant type; Ambient temp: –40 to +125°C –40 to +257°F, Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)		
	Max. operating speed		15 cpm (At nominal switching capacity)		
Unit weight			Approx. 33 g 1.16 oz		

Notes: *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.

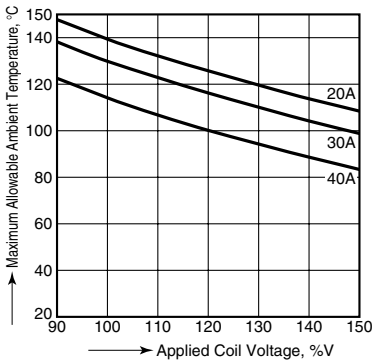
*2. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Refer to Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

Note: All other specifications are the same as those of standard type (12 V coil voltage)

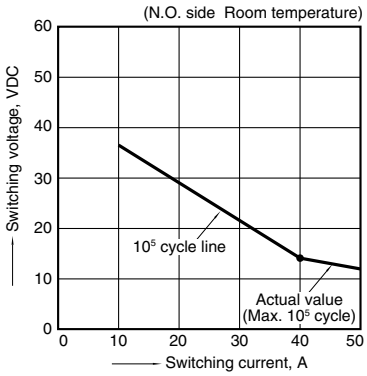
REFERENCE DATA

CB RELAYS (Standard type)

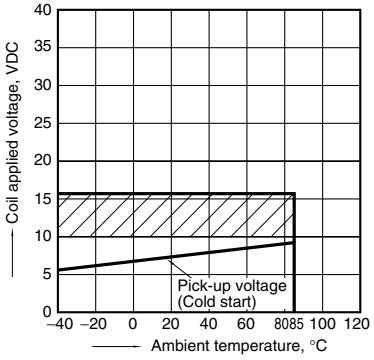
1. Allowable ambient temperature



2. Max. switching capability (Resistive load)
(Standard type)

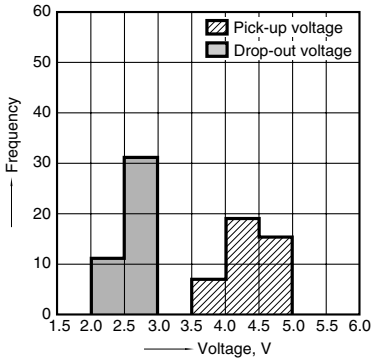


3. Ambient temperature and operating voltage range
(Standard type)

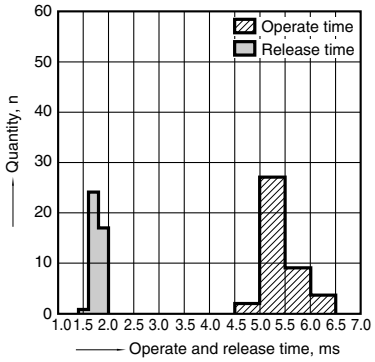


Asssumption:
- Maximum mean coil temperature: 180°C
- Curves are based on 1.4W (Nominal power consumption of the unsupprressed coil at nominal voltage)

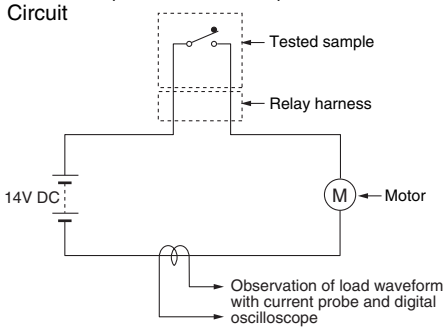
4. Distribution of pick-up and drop-out voltage
Sample: CB1-P-12V, 42pcs.



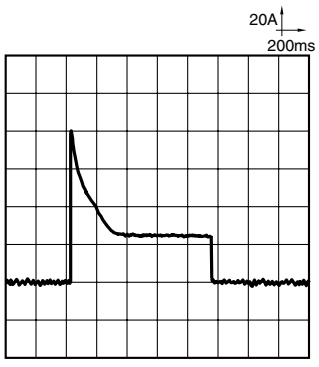
5. Distribution of operate and release time
Sample: CB1-P-24V, 42pcs.
* Without diode



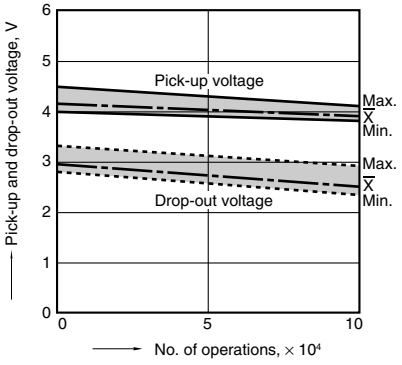
6-(1). Electrical life test (Motor free)
Sample: CB1F-12V, 5pcs.
Load: 25A 14V DC, motor free actual load
Switching frequency: (ON:OFF = 1s:9s)
Ambient temperature: Room temperature
Circuit



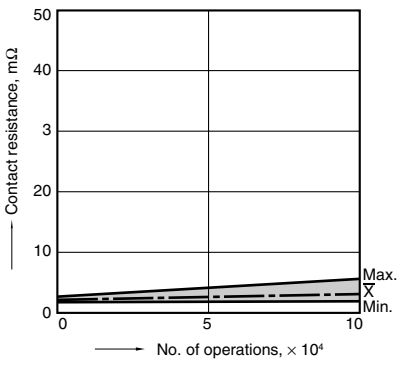
Load current waveform
Inrush current: 80A, Steady current: 25A



Change of pick-up and drop-out voltage



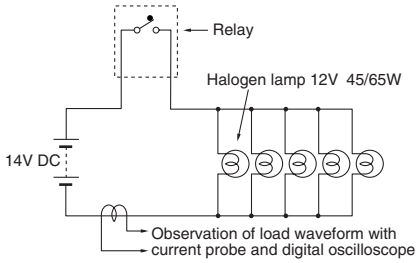
Change of contact resistance



6-(2). Electrical life test (Lamp load)

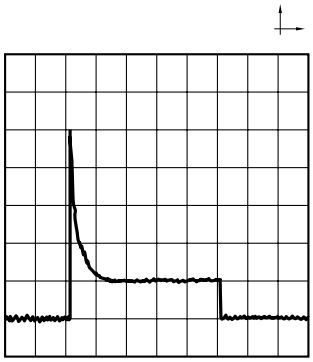
Sample: CB1F-12V, 5pcs.
Load: 45/65Wx5 parallel, 14V DC, halogen lamp actual load
Switching frequency: (ON:OFF = 1s:8s)
Ambient temperature: Room temperature

Circuit

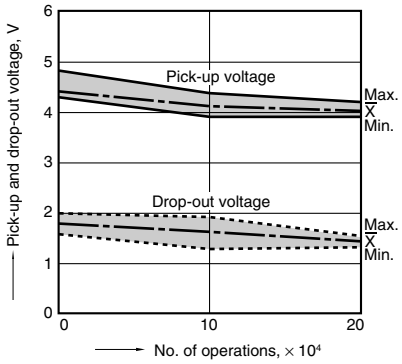


Load current waveform

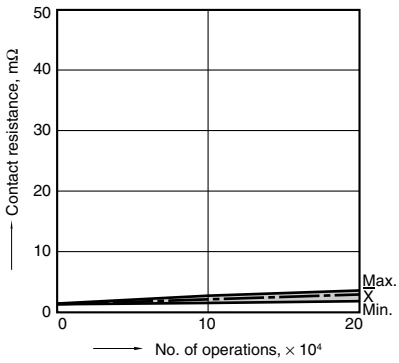
Inrush current: 100A, Steady current: 20A



Change of pick-up and drop-out voltage

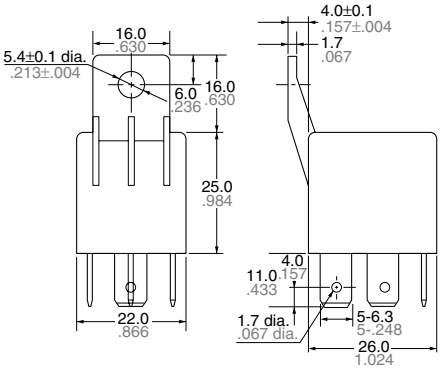


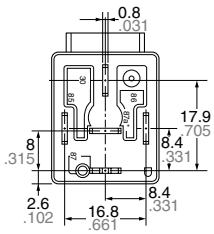
Change of contact resistance



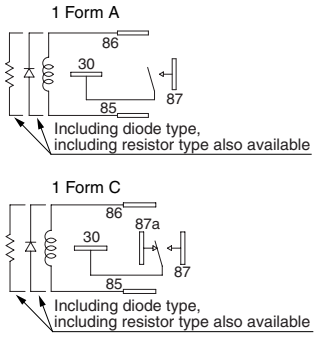
3. Bracket type

External dimensions





Schematic (Bottom view)



Dimension:	General 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

Cautions regarding the protection element

1. Part numbers without protection elements

1) 12 V models

When connecting a coil surge protection circuit to these relays, we recommend a zener diode with a zener voltage of 24 V or higher, or a resistor (680Ω to 1,000Ω). When a diode is connected to the coil in parallel, the release time will slow down and working life may shorten. Before use, please check the circuit and verify that the diode is not connected in parallel to the coil drive circuit.

2) 24 V models

When connecting a coil surge protection circuit to these relays, we recommend a zener diode with a zener voltage of 48 V or higher, or a resistor (2,800Ω to 4,700Ω).

When a diode is connected to the coil in parallel, the release time will slow down and working life may shorten. Before use, please check the circuit and verify that the diode is not connected in parallel to the coil drive circuit.

2. Part numbers with diodes

These relays use a diode in the coil surge protection element. Therefore, the release time is slower and the working life might be shorter compared to part numbers without protection elements and part numbers with resistors.

Be sure to use only after evaluating under actual load conditions.

3. Part numbers with resistors

This part number employs a resistor in the coil surge protection circuit; therefore, an external surge protection element is not required. In particular, when a diode is connected in parallel with a coil, the release time becomes slower which could adversely affect working life.

Please check the circuit and make sure that a diode is not connected in parallel with the coil drive circuit.

For Cautions for Use, see Relay Technical Information.