

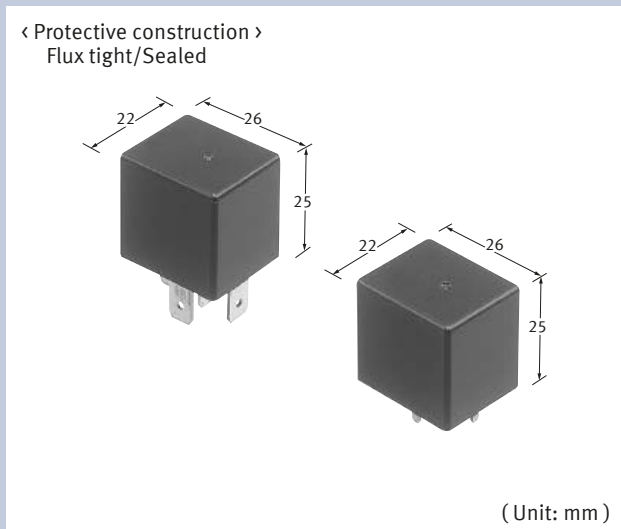
Automotive Relays  
**CB RELAYS**

Product Catalog

**IN Your  
Future**

# CB RELAYS

## Mini-ISO Automotive Relay



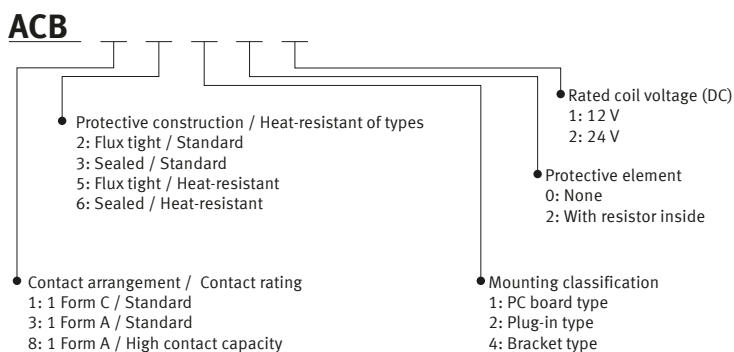
### FEATURES

- This relay has an Mini-ISO ( International Organization for Standardization ) terminal arrangement.
- Compact and high capacity
- Features heat-resistant type
- Built-in resistor type is also available.

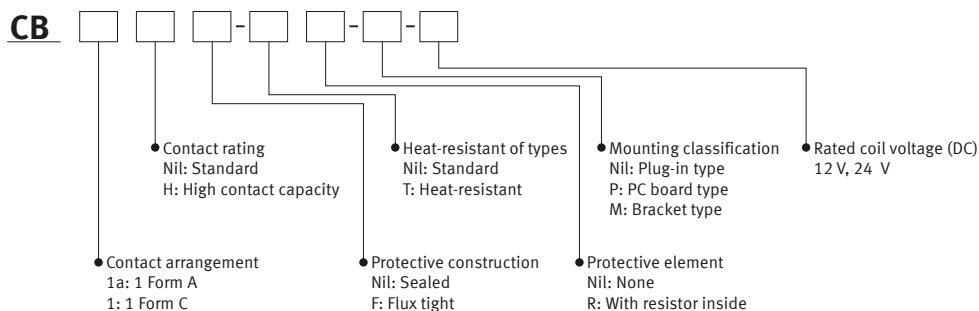
### TYPICAL APPLICATIONS

- Automobiles  
Cell motors, Air compressor, ABS, EPS, etc.
- Construction equipment
- Agricultural equipment, Conveyor, etc.

### ORDERING INFORMATION ( PART NO. : Ordering part number for Japanese market )



### ORDERING INFORMATION ( TYPE NO. : Ordering part number for non Japanese market )



# Automotive Relays CB RELAYS

## TYPES

" Type No. " is ordering part number for non Japanese market. " Part No. " is ordering part number for Japanese market.

Contact arrangement	Mounting classification	Rated coil voltage	Standard type				High heat-resistant type				Packing	
			Sealed		Flux tight		Sealed		Flux tight		Carton	Case
			Type No.	Part No.	Type No.	Part No.	Type No.	Part No.	Type No.	Part No.		
1 Form A	PC board type	12 V DC	CB1a-P-12V	ACB33101	CB1aF-P-12V	ACB32101	CB1a-T-P-12V	ACB36101	CB1aF-T-P-12V	ACB35101	50 pcs.	200 pcs.
		24 V DC	CB1a-P-24V	ACB33102	CB1aF-P-24V	ACB32102	CB1a-T-P-24V	ACB36102	CB1aF-T-P-24V	ACB35102		
	Plug-in type	12 V DC	CB1a-12V	ACB33201	CB1aF-12V	ACB32201	CB1a-T-12V	ACB36201	CB1aF-T-12V	ACB35201		
		24 V DC	CB1a-24V	ACB33202	CB1aF-24V	ACB32202	CB1a-T-24V	ACB36202	CB1aF-T-24V	ACB35202		
	Bracket type	12 V DC	CB1a-M-12V	ACB33401	CB1aF-M-12V	ACB32401	CB1a-T-M-12V	ACB36401	CB1aF-T-M-12V	ACB35401		
		24 V DC	CB1a-M-24V	ACB33402	CB1aF-M-24V	ACB32402	CB1a-T-M-24V	ACB36402	CB1aF-T-M-24V	ACB35402		
1 Form C	PC board type	12 V DC	CB1P-12V	ACB13101	CB1F-P-12V	ACB12101	CB1-T-P-12V	ACB16101	CB1F-T-P-12V	ACB15101		
		24 V DC	CB1P-24V	ACB13102	CB1F-P-24V	ACB12102	CB1-T-P-24V	ACB16102	CB1F-T-P-24V	ACB15102		
	Plug-in type	12 V DC	CB1-12V	ACB13201	CB1F-12V	ACB12201	CB1-T-12V	ACB16201	CB1F-T-12V	ACB15201		
		24 V DC	CB1-24V	ACB13202	CB1F-24V	ACB12202	CB1-T-24V	ACB16202	CB1F-T-24V	ACB15202		
	Bracket type	12 V DC	CB1-M-12V	ACB13401	CB1F-M-12V	ACB12401	CB1-T-M-12V	ACB16401	CB1F-T-M-12V	ACB15401		
		24 V DC	CB1-M-24V	ACB13402	CB1F-M-24V	ACB12402	CB1-T-M-24V	ACB16402	CB1F-T-M-24V	ACB15402		
1 Form A High contact capacity	PC board type	12 V DC	CB1aH-P-12V	ACB83101	CB1aHF-P-12V	ACB82101	CB1aH-T-P-12V	ACB86101	CB1aHF-T-P-12V	ACB85101		
		24 V DC	CB1aH-P-24V	ACB83102	CB1aHF-P-24V	ACB82102	CB1aH-T-P-24V	ACB86102	CB1aHF-T-P-24V	ACB85102		
	Plug-in type	12 V DC	CB1aH-12V	ACB83201	CB1aHF-12V	ACB82201	CB1aH-T-12V	ACB86201	CB1aHF-T-12V	ACB85201		
		24 V DC	CB1aH-24V	ACB83202	CB1aHF-24V	ACB82202	CB1aH-T-24V	ACB86202	CB1aHF-T-24V	ACB85202		
	Bracket type	12 V DC	CB1aH-M-12V	ACB83401	CB1aHF-M-12V	ACB82401	CB1aH-T-M-12V	ACB86401	CB1aHF-T-M-12V	ACB85401		
		24 V DC	CB1aH-M-24V	ACB83402	CB1aHF-M-24V	ACB82402	CB1aH-T-M-24V	ACB86402	CB1aHF-T-M-24V	ACB85402		

Note) Please use " CB\*\*\*R\*\* " to order with resistor inside type. ( Asterisks " \* " should be filled in from ORDERING INFORMATION. )

## RATING

### ■ Coil data

#### 1) No protective element

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

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

#### 2) With resistor inside

Contact arrangement Contact rating	Rated coil voltage	Operate voltage ( at 20 °C ) ( Initial )	Release voltage ( at 20 °C ) ( Initial )	Rated operating current [ ±10 % ] ( at 20 °C )	Equivalent coil resistance [ ±10 % ] ( at 20 °C )	Rated operating power ( at 20 °C )	Usable voltage range
1 Form A, 1 Form C	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	134 mA	89.5 Ω	1.6 W	10 to 16 V DC
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	84 mA	287.2 Ω	2.0 W	20 to 32 V DC
1 Form A High contact capacity	12 V DC	3 to 7 V DC	1.2 to 4.2 V DC	134 mA	89.5 Ω	1.6 W ( PC board type )	10 to 16 V DC
				168 mA	71.6 Ω	2.0 W	
	24 V DC	6 to 14 V DC	2.4 to 8.4 V DC	67 mA	358 Ω	1.6 W ( PC board type )	20 to 32 V DC
				84 mA	287.2 Ω	2.0 W	

# Automotive Relays CB RELAYS

## ■ Specifications

### 1) Standard type ( 12 V coil voltage )

Item		Specifications		
Contact data	Contact arrangement	1 Form A	1 Form C	1 Form A High contact capacity
	Contact resistance ( initial )	Max. 15 mΩ ( Typ. 2 mΩ ) ( by voltage drop 1 A 6 V DC )		
	Contact material	Ag alloy		
	Rated switching capacity ( resistive )	40 A 14 V DC	N.O. side: 40 A 14 V DC N.C. side: 30 A 14 V DC	70 A 14 V DC ( at 20 °C ) 50 A 14 V DC ( at 85 °C )
	Max. carrying current*1 ( coil applied voltage 14 V DC, at 85 °C, continuous )	N.O. side: 40 A	N.O. side: 40 A N.C. side: 30 A	N.O. side: 40 A
	Min. switching load ( resistive ) *2	1 A 14 V DC ( at 20 °C )		
Insulated resistance ( initial )		Min. 20 MΩ ( at 500 V DC, Measurement at same location as " Dielectric strength " section. )		
Dielectric strength ( initial )	Between open contacts	500 Vrms for 1 min ( Detection current: 10 mA )		
	Between contacts and coil	500 Vrms for 1 min ( Detection current: 10 mA )		
Time characteristics ( initial )	Operate time ( at rated voltage )	Max. 15 ms ( at 20 °C, without contact bounce time )	Max. 15 ms ( at 20 °C, without contact bounce time )	Max. 15 ms ( at 20 °C, without contact bounce time )
	Release time ( at rated voltage )	Max. 15 ms ( at 20 °C ) ( without diode )	Max. 15 ms ( at 20 °C, without contact bounce time ) ( without diode )	Max. 15 ms ( at 20 °C ) ( without diode )
Shock resistance	Functional	Min. 200 m/s <sup>2</sup> ( Half-wave pulse of sine wave: 11 ms, detection time: 10 μs )		
	Destructive	Min. 1,000 m/s <sup>2</sup> ( Half-wave pulse of sine wave: 6 ms )		
Vibration resistance	Functional	10 to 500 Hz, Min. 44.1 m/s <sup>2</sup> ( Detection time: 10 μs )		
	Destructive	10 to 2,000 Hz, Min. 44.1 m/s <sup>2</sup> ( Time of vibration for each direction; X, Y, Z direction: 4 hours )		
Expected life	Mechanical	Min. 10 <sup>6</sup> ( at 120 times/min )		
	Electrical ( at rated switching capacity )	Flux tight: Min. 10 <sup>5</sup> , Sealed: Min. 5 × 10 <sup>4</sup> ( operating frequency: 2 s ON, 2 s OFF )		
Conditions	Conditions for usage, transport and storage*3	Standard: Ambient temperature : -40 to +85 °C, Humidity: 5 to 85% RH ( Avoid icing and condensation ) Heat-resistant: Ambient temperature: -40 to +125 °C, Humidity: 2 to 85% RH ( Avoid icing and condensation )		
Weight		Approx. 33 g		

\*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 ).

### 2) Standard type ( 24 V coil voltage )

Item		Specifications		
Contact data	Contact arrangement	1 Form A	1 Form C	1 Form A High contact capacity
	Contact resistance ( initial )	Max. 15 mΩ ( by voltage drop 1 A 6 V DC )		
	Contact material	Ag alloy		
	Rated switching capacity ( resistive )	20 A 28 V DC	N.O. side: 20 A 28 V DC N.C. side: 10 A 28 V DC	20 A 28 V DC
	Max. carrying current ( coil applied voltage 28 V DC, at 85 °C, continuous )	20 A	N.O. side: 20 A N.C. side: 10 A	20 A

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

# Automotive Relays CB RELAYS

## 3) Heat-resistant type ( 12 V and 24 v coil voltage )

Item	Specifications					
	12 V			24 V		
Contact arrangement	1 Form A	1 Form C	1 Form A High contact capacity	1 Form A	1 Form C	1 Form A High contact capacity
Contact resistance ( initial )	Max. 15 mΩ ( by voltage drop 1 A 6 V DC )					
Contact material	Ag alloy					
Rated switching capacity ( resistive )	40 A 14 V DC	N.O. side: 40 A 14 V DC N.C. side: 30 A 14 V DC	70 A 14 V DC	20 A 28 V DC	N.O. side: 20 A 28 V DC N.C. side: 10 A 28 V DC	20 A 28 V DC
Max. carrying current ( at coil applied voltage, at 125 °C, continuous )	50 A 14 V DC	N.O. side: 50 A 14 V DC N.C. side: 30 A 14 V DC	45 A 14 V DC* 50 A 14 V DC*	25 A 28 V DC	N.O. side: 25 A 28 V DC N.C. side: 10 A 28 V DC	25 A 28 V DC*

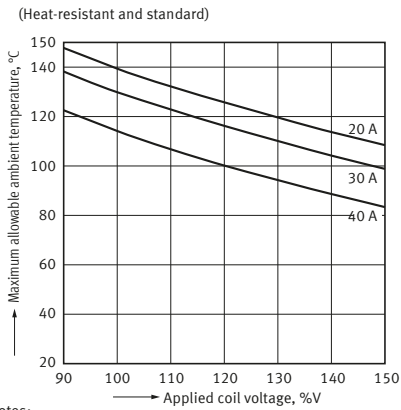
Notes) All other specifications are the same as those of standard ( 12 V coil voltage ).

\*Conditions: at coil applied voltage, at 85 °C, continuous

## REFERENCE DATA

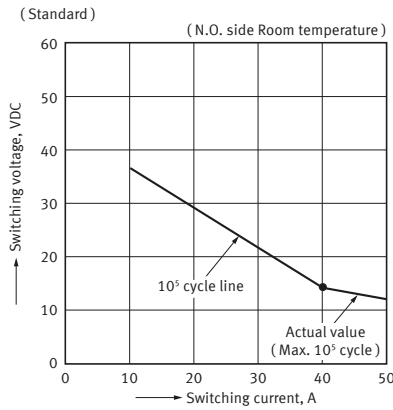
### CB Relays ( Standard )

#### 1. Allowable ambient temperature

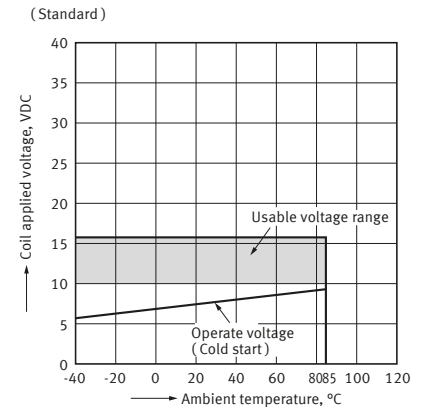


Notes:  
 • Maximum mean coil temperature: 180°C  
 • Curves are based on 1.4 W (Nominal power consumption of the unsuppressed coil at nominal voltage)

#### 2. Max. switching capability ( Resistive )

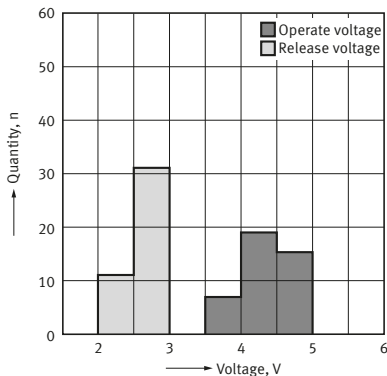


#### 3. Ambient temperature and usable voltage range



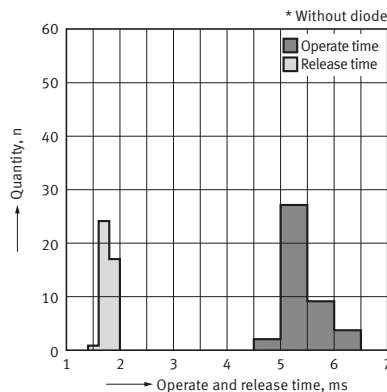
#### 4. Distribution of operate and release voltage

Sample: CB1-P-12V, 42 pcs.



#### 5. Distribution of operate and release time

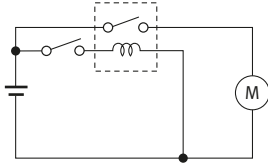
Sample: CB1-P-12V, 42 pcs.



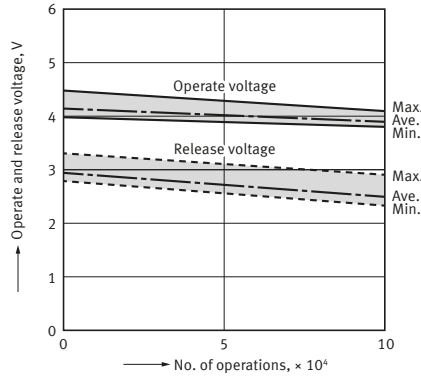
# Automotive Relays CB RELAYS

## 6. Electrical life test ( Motor free )

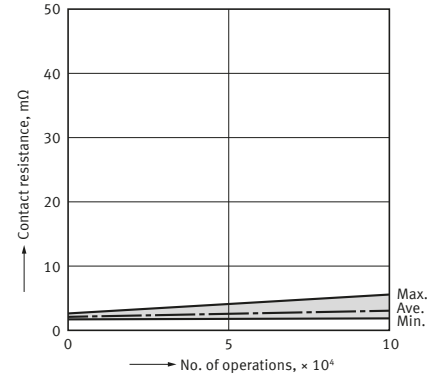
Sample: CB1F-12V, 5 pcs.  
 Load: 25 A 14 V DC, motor free actual load  
 Operating frequency: ON 1 s, OFF 9 s  
 Ambient temperature: Room temperature  
 Circuit:



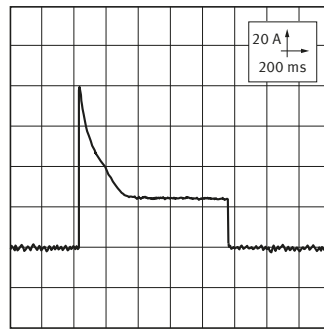
Change of operate and release voltage



Change of contact resistance

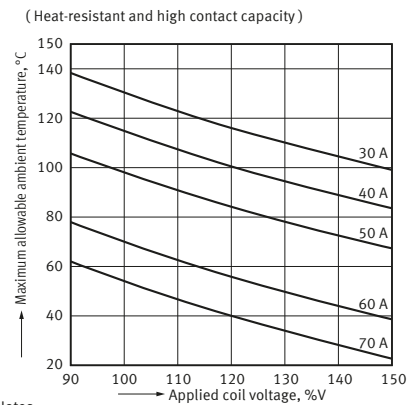


Load current waveform  
 Load; Inrush current: 80 A, Steady current: 25 A



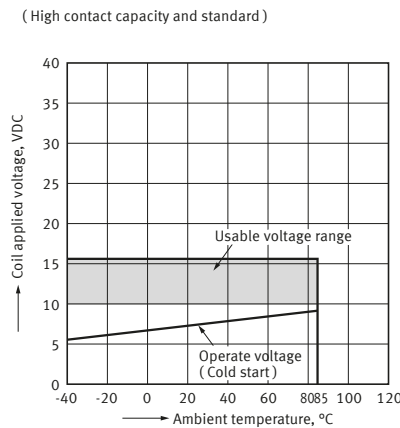
## CB Relays ( High contact capacity )

### 1. Allowable ambient temperature



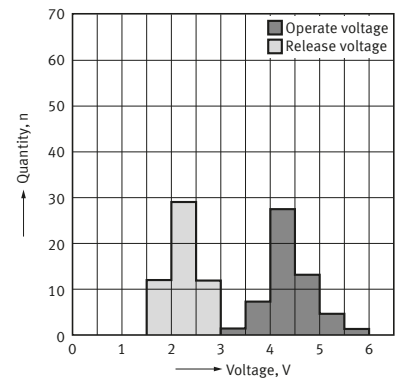
Notes:  
 • Maximum mean coil temperature: 180°C  
 • Curves are based on 1.4 W (Nominal power consumption of the unsuppressed coil at nominal voltage)

### 2. Ambient temperature and usable voltage range



### 3. Distribution of operate and release voltage

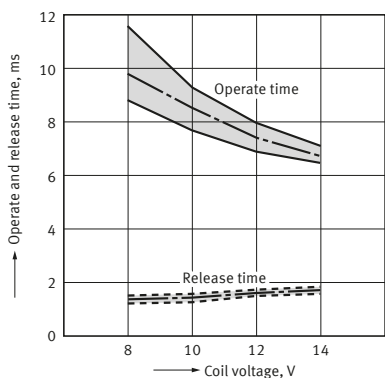
Sample: CB1aHF-12V, 53 pcs.



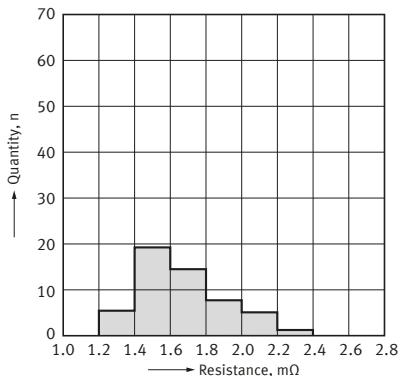
# Automotive Relays CB RELAYS

## 4. Distribution of operate and release time 5. Contact resistance

Sample: CB1aHF-12V, 53 pcs.

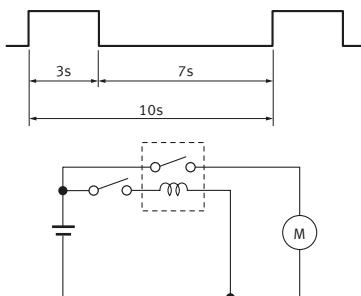


Sample: CB1aHF-12 V, 53 pcs.  
(By voltage drop 1 A 6 V DC)

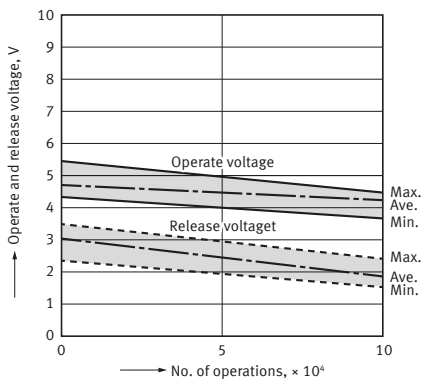


## 6. Electrical life test ( Motor free )

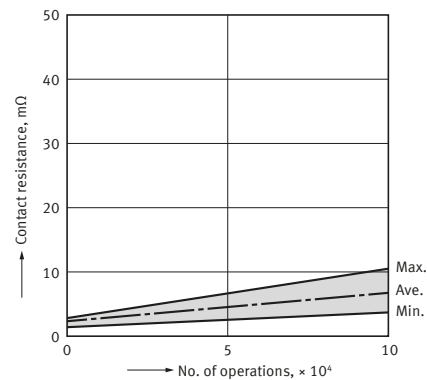
Sample: CB1aH-12V, 3 pcs.  
Load: Inrush current: 64 A, Steady current: 35 A  
Fan motor actual load ( motor free ) 12 V DC  
Operating frequency: ON 3 s, OFF 7 s  
Ambient temperature: Room temperature  
Circuit:



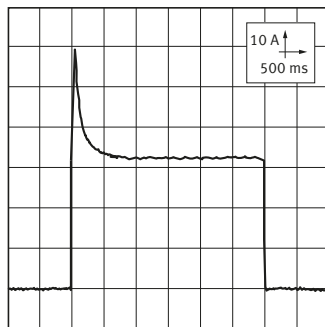
Change of operate and release voltage



Change of contact resistance



Load current waveform  
Load; Inrush current: 64 A, Steady current: 35 A



# Automotive Relays CB RELAYS

## DIMENSIONS ( Unit: mm )

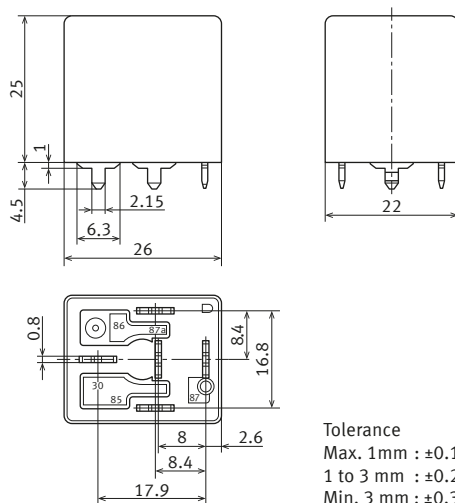
**CAD** The CAD data of the products with a " CAD " mark can be downloaded from our Website.

### ■ PC board type

**CAD**

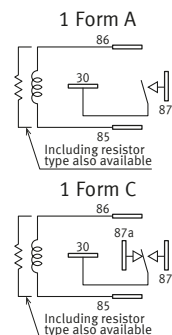


External dimensions

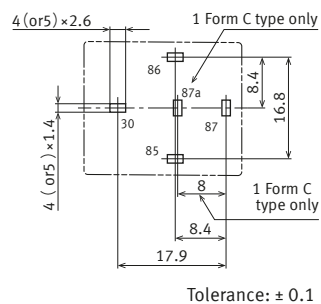


Tolerance  
 Max. 1mm : ±0.1  
 1 to 3 mm : ±0.2  
 Min. 3 mm : ±0.3

Schematic  
 ( BOTTOM VIEW )



PC board pattern  
 ( BOTTOM VIEW )



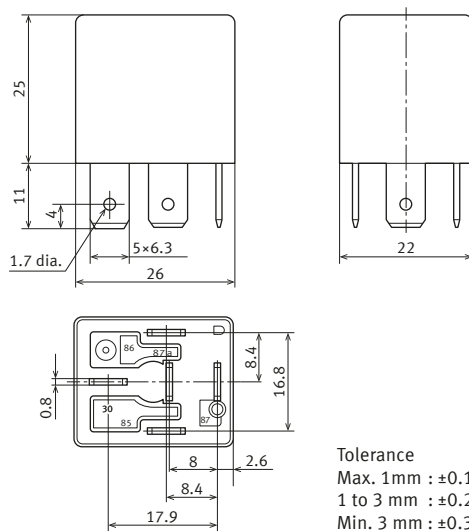
Tolerance: ± 0.1

### ■ Plug-in type

**CAD**

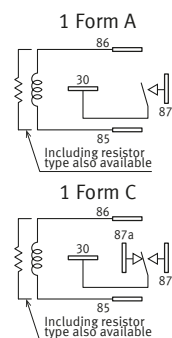


External dimensions



Tolerance  
 Max. 1mm : ±0.1  
 1 to 3 mm : ±0.2  
 Min. 3 mm : ±0.3

Schematic  
 ( BOTTOM VIEW )





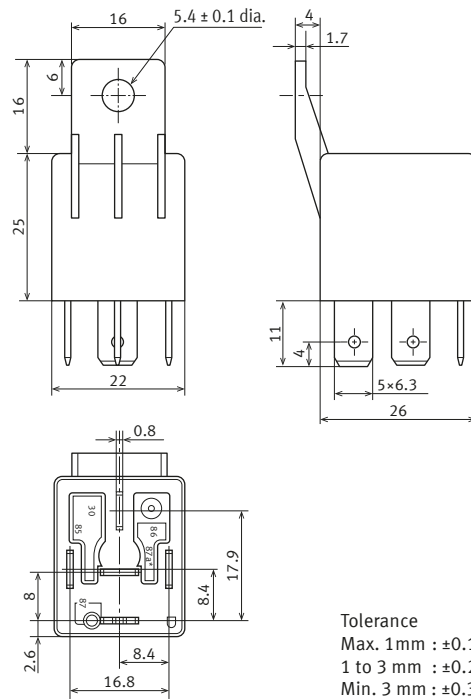
# Automotive Relays CB RELAYS

## Bracket type

CAD

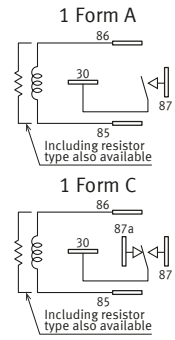


External dimensions



Tolerance  
 Max. 1mm : ±0.1  
 1 to 3 mm : ±0.2  
 Min. 3 mm : ±0.3

Schematic (BOTTOM VIEW)

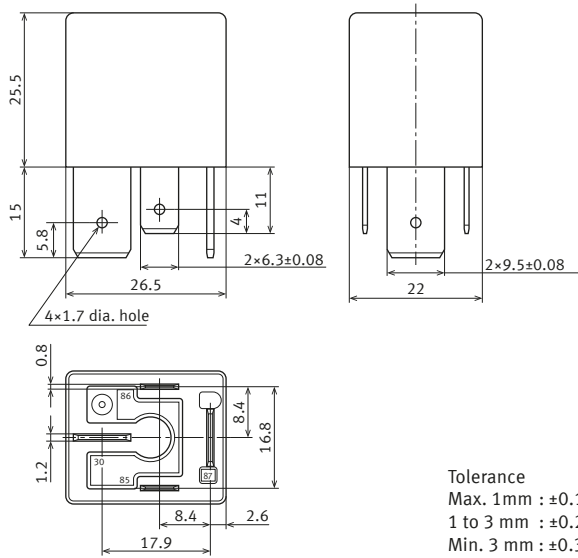


## 1 Form A high contact capacity ( Plug-in type )

CAD

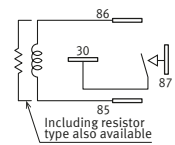


External dimensions



Tolerance  
 Max. 1mm : ±0.1  
 1 to 3 mm : ±0.2  
 Min. 3 mm : ±0.3

Schematic (BOTTOM VIEW)



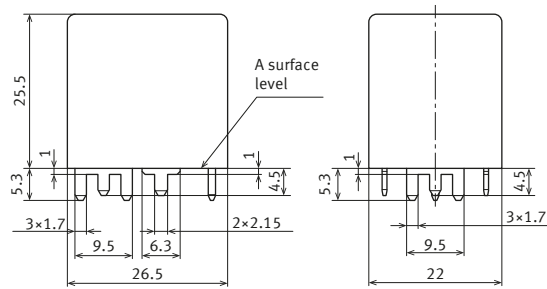
# Automotive Relays CB RELAYS

## ■ 1 Form A high contact capacity ( PC board type )

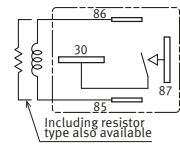
CAD



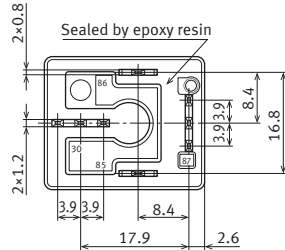
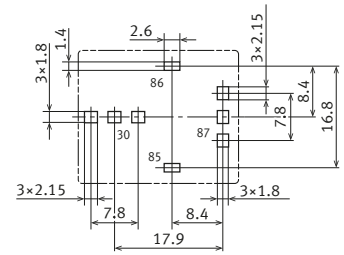
External dimensions



Schematic  
( BOTTOM VIEW )



PC board pattern  
( BOTTOM VIEW )



Tolerance  
Max. 1mm : ±0.1  
1 to 3 mm : ±0.2  
Min. 3 mm : ±0.3

Tolerance: ± 0.1

\* Intervals between terminals is measured at A surface level.

## GUIDELINES FOR USAGE

■ For general cautions for use, please refer to the " Automotive Relay Users Guide " .

### ■ Precautions when using CB relays

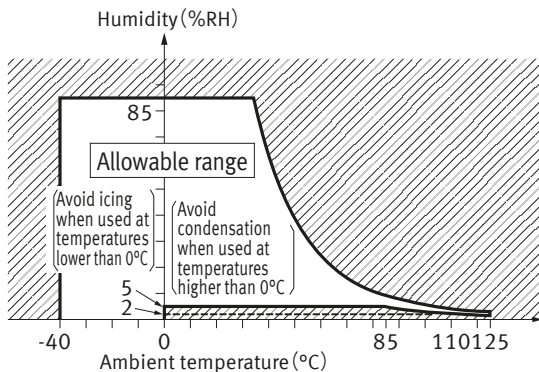
#### ● Soldering

Solder temperature: 350 °C, within 3 s ( in a solder bath )  
The effect on the relay depends on the actual PC board used. Please verify the PC board to be used.

#### ● Usage, transport and storage conditions

- 1) Ambient temperature, humidity, and air pressure during usage, transport of the relay
  - (1) Temperature: -40 to +85 °C ( Standard type )  
-40 to +125 °C ( High heat-resistant type )
  - (2) Humidity: 2 to 85 % RH ( Avoid icing and condensation )
  - (3) Air pressure: 86 to 106 kPa  
The humidity range varies with the temperature. Use within the range indicated in the graph.

[ Temperature and humidity range for usage, transport, and storage ]



Please refer to " the latest product specifications " when designing your product.  
• Requests to customers:  
<https://industry.panasonic.com/global/en/salespolicies>

■ Global Sales Network Information: [industry.panasonic.com/global/en/salesnetwork/globalnetwork](https://industry.panasonic.com/global/en/salesnetwork/globalnetwork)

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**Panasonic**  
INDUSTRY

**Panasonic Industry Co., Ltd.**

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