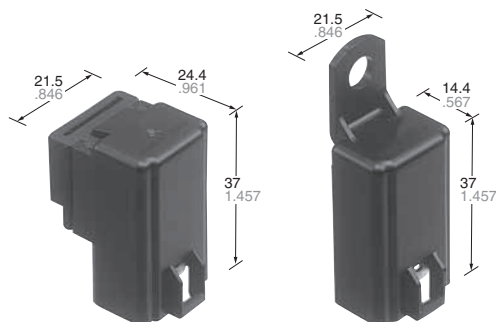


Small Size, Light Weight Automotive Power Relays

CA RELAYS

<Protective construction>
Sealed/Dust cover



(Unit: mm inch)

RoHS compliant

FEATURES

- Small size and light weight
- Since the terminal arrangement complies with JIS
- Low operating power (1.4W) type is available (1 Form A, 1 Form B)

TYPICAL APPLICATIONS

- **Motorcycles and automobiles**
Motorcycle cell motors, car air conditioners, halogen lamps, etc.
- **Agricultural equipment**
- **Battery equipped devices such as conveyance vehicles**

ORDERING INFORMATION

CA □ □ □ □ - □ □ - □ □ - □ □

Contact arrangement

- 1a: 1 Form A
- 1b: 1 Form B
- 1: 1 Form C

Protective construction

- Nil: Sealed
- F: Dust cover

Rated operating power

- Nil: Standard type (1.8 W)
- S: Low operating power type (1.4 W) (1 Form A, 1 Form B)

Protective element

- Nil: None
- R: With resistor inside

Rated coil voltage (DC)

- DC12V : 1 Form C only
- DC24V : 1 Form C only
- 12V : 1 Form A or 1 Form B

Mounting method

- A: Rubber bracket A type (1 Form A, 1 Form B)
- N: Screw mounting type
- C: Direct coupling type

Classification by type

- Nil: 1 Form C
- 5: 1 Form A or 1 Form B

TYPES

Contact arrangement	Mounting type	Rated coil voltage	Standard type (1.8W)		Low operating power type (1.4W)		Packing		
			Sealed	Dust cover	Sealed	Dust cover	Carton	Case	
			Type No.	Type No.	Type No.	Type No.			
1 Form A	Rubber bracket A	12 V DC	CA1a-12V-A-5	CA1aF-12V-A-5	CA1aS-12V-A-5	CA1aFS-12V-A-5	20 pcs.	200 pcs.	
	Screw-mounting		CA1a-12V-N-5	CA1aF-12V-N-5	CA1aS-12V-N-5	CA1aFS-12V-N-5			
	Direct coupling		CA1a-12V-C-5	CA1aF-12V-C-5	CA1aS-12V-C-5	CA1aFS-12V-C-5			
1 Form B	Rubber bracket A		CA1b-12V-A-5	CA1bF-12V-A-5	CA1bS-12V-A-5	CA1bFS-12V-A-5			
	Screw-mounting		CA1b-12V-N-5	CA1bF-12V-N-5	CA1bS-12V-N-5	CA1bFS-12V-N-5			
	Direct coupling		CA1b-12V-C-5	CA1bF-12V-C-5	CA1bS-12V-C-5	CA1bFS-12V-C-5			
1 Form C	Screw-mounting		12 V DC	CA1-12V-N	—	—			—
	Direct coupling			CA1-12V-C	—	—			—
	Screw-mounting		24 V DC	CA1-24V-N	—	—			—
	Direct coupling	CA1-24V-C		—	—	—			

Note: Please use "CA**R-***" or CA**SR-***" with resistor inside type. (Asterisks "*" should be filled in from ORDERING INFORMATION.)

RATING

1. Coil data

Contact arrangement	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	Usable voltage range
1 Form A and 1 Form B (Standard)	12 V DC	Max. 8 V DC	0.6 to 6 V DC	150 mA	80Ω	1.8 W	10 to 16V DC
1 Form A and 1 Form B (Low operating power)				120 mA	100Ω	1.4 W	10 to 16V DC
1 Form C	12 V DC	Max. 8 V DC	Min. 0.6 V DC	150 mA	80Ω	1.8 W	10 to 15V DC
	24 V DC	Max. 16 V DC	Min. 1.2 V DC	75 mA	320Ω		20 to 30V DC

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

2. Specifications

1) 12 V DC type

Item	Specifications		
	1 Form A type	1 Form B type	1 Form C type
Contact arrangement	1 Form A	1 Form B	1 Form C
Contact resistance (initial)	Max. 50mΩ (Typ. 3mΩ) (By voltage drop 1A 6V DC)		
Contact material	Ag alloy		
Rated switching capacity (resistive)	20 A 12V DC (1.4 W type) 30 A 12V DC (1.8 W type)	20 A 12 V DC	
Max. carrying current (at coil applied voltage 14 V DC, at 80°C 176°F)	20 A continuous (1.4 W type) 30 A for 1 min. (1.8 W type)	20 A continuous	20 A continuous
Min. switching load (resistive)*1	1 A 14V DC (at 20°C 68°F)		
Contact voltage drop (after electrical life test)	Max. 0.3 V [By carrying 20 A 12 V DC (1.4 W type), 30 A 12 V DC (1.8 W type)]	Max. 0.3 V (By carrying 20 A 12 V DC)	Max. 0.4 V (By carrying 20 A 12 V DC)
Insulated resistance (initial)	Min. 10 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)	
	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 contact bounce time)	
	Release (Reset) time (at rated voltage)	Max. 10ms (at 20°C 68°F, without contact bounce time) (Without diode)	
Shock resistance	Functional	Min. 200 m/s ² {approx. 20G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs)	Min. 100 m/s ² {approx. 10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs)
	Destructive	Min. 1,000 m/s ² {approx. 100G} (Half-wave pulse of sine wave: 6ms)	
Vibration resistance	Functional	Rubber bracket A type: 50 to 500 Hz, Min. 100 m/s ² {approx. 10G} Screw-mounting and direct coupling type: 33 Hz, Min. 44.1 m/s ² {approx. 4.5G} (Detection time: 10μs)	
	Destructive	Rubber bracket A type: 50 to 500 Hz, Min. 100 m/s ² {approx. 10G} Screw-mounting and direct coupling type: 33 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 ⁶ (at 120 cpm)	
	Electrical (at rated switching capacity)	Min. 10 ⁵ (operating frequency: 2s ON, 2s OFF) (1.4 W and 1.8 W type at 20 A) Min. 2 × 10 ⁴ (operating frequency: 3s ON, 15s OFF) (1.8 W type at 30 A)	Min. 10 ⁵ (operating frequency: 2s ON, 2s OFF)
Conditions	Conditions for usage, transport and storage*2	Ambient temperature: -30 to +80°C -22 to +176°F, Humidity: 5 to 85% R.H. (Please avoid icing or condensation)	
Water-proof standard	Sealed: JIS D 0203 S2, Dust cover: JIS D 0203 R2		
Weight	Rubber bracket A type: approx. 23 g .81 oz, Screw-mounting and direct coupling type: approx. 19 g .67 oz		approx. 31 g 1.09 oz

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

*2. 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)

CA (ACA)

2) 24 V DC type

Item		Specifications
		1 Form C type
Contact data	Contact arrangement	1 Form C
	Contact resistance (initial)	Max. 50mΩ (Typ. 3mΩ) (By voltage drop 1A 6V DC)
	Contact material	Ag alloy
	Rated switching capacity (resistive)	10 A 24V DC
	Max. carrying current	10 A continuous (At coil applied voltage 28 V DC, 80°C 176°F)
	Min. switching load (resistive)*1	1 A 14V DC (at 20°C 68°F)
	Contact voltage drop (after electrical life test)	Max. 0.4 V (by voltage drop 24 V DC 10 A)
Insulated resistance (initial)		Min. 10 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)
	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 contact bounce time)
	Release (Reset) time (at rated voltage)	Max. 10ms (at 20°C 68°F, without contact bounce time)
Shock resistance	Functional	Min. 100 m/s ² {approx. 10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs)
	Destructive	Min. 1,000 m/s ² {approx. 100G} (Half-wave pulse of sine wave: 6ms)
Vibration resistance	Functional	JIS D1601 Group 1, B type, Stage 4 (33 Hz, Min. 44.1 m/s ² {approx. 4.5G}) (Detection time: 10μs)
	Destructive	JIS D1601 Group 1, B type, Stage 4 (33 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	Electrical (at rated switching capacity)	Min. 10 ⁵ (operating frequency: 2s ON, 2s OFF)
	Mechanical	Min. 5 × 10 ⁵ (at 120 cpm)
Conditions	Conditions for usage, transport and storage*2	Ambient temperature: -30 to +80°C -22 to +176°F, Humidity: 5 to 85% R.H. (Please avoid icing or condensation)
Water-proof standard		JIS D 0203 S2
Weight		approx. 31 g 1.09 oz

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

*2. 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)

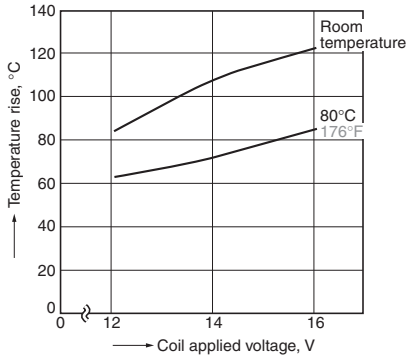
Electrical life

Contact arrangement	Rated coil voltage	Motor load	Halogen lamp load
1 Form A	12 V DC	Operating frequency: 3s ON, 15s OFF 12V DC 30A, Min. 2 × 10 ⁴	—
1 Form B		Operating frequency: 3s ON, 15s OFF 12V DC 20A, Min. 10 ⁵	Operating frequency: 1s ON, 14s OFF 12V DC 20A, Min. 10 ⁵
1 Form C	12 V DC	Operating frequency: 2s ON, 1s OFF 12V DC 20A, Min. 10 ⁵	Operating frequency: 1s ON, 14s OFF 12V DC 20A, Min. 10 ⁵
	24 V DC	Operating frequency: 2s ON, 1s OFF 24V DC 10A, Min. 10 ⁵	Operating frequency: 1s ON, 14s OFF 24V DC 6A, Min. 10 ⁵

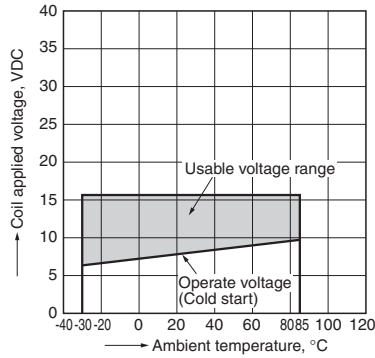
REFERENCE DATA

1. Coil temperature rise

Samples: CA1aS-12V-N-5, 5pcs.
 Measured portion: Inside the coil
 Carrying current: 20A
 Ambient temperature: Room temperature, 80°C
 176°F

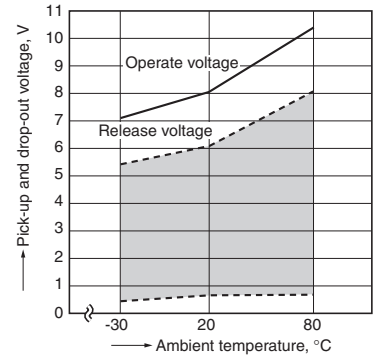


2. Ambient temperature and usable voltage range



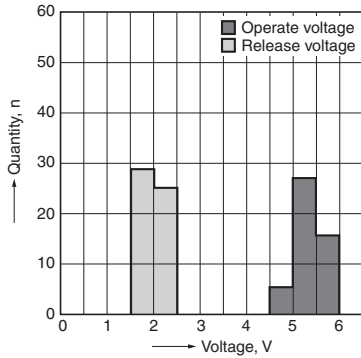
3. Ambient temperature characteristics (Cold start)

Samples: CA1bS-12V-N-5



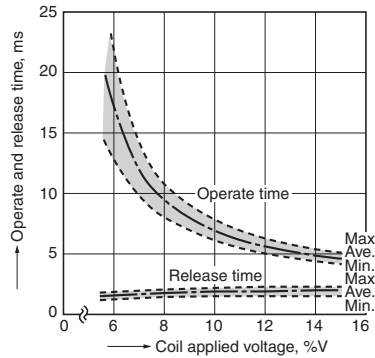
4. Distribution of operate (set) and release (reset) voltage

Quantity: 50pcs.



5. Distribution of operate (set) and release (reset) time

Sample: CA1a-12V-N-5, 10pcs.

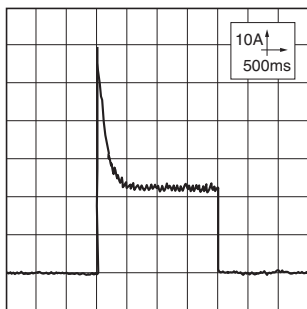


6.-(1) Electrical life test (Motor load)

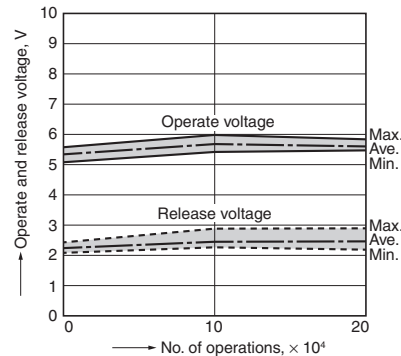
Sample: CA1a-12V-C, 3pcs.
 Load: Inrush current: 63A, steady current: 23A
 Blower fan motor actual load (motor free)
 Operating frequency: ON 2s, OFF 2s
 Ambient temperature: Room temperature

Load current waveform

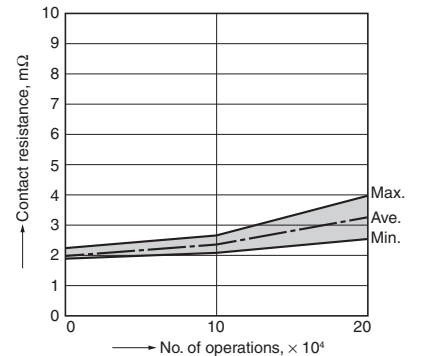
Load: Inrush current: 63A, steady current: 23A,



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



Change of contact resistance



CA (ACA)

DIMENSIONS (mm inch)

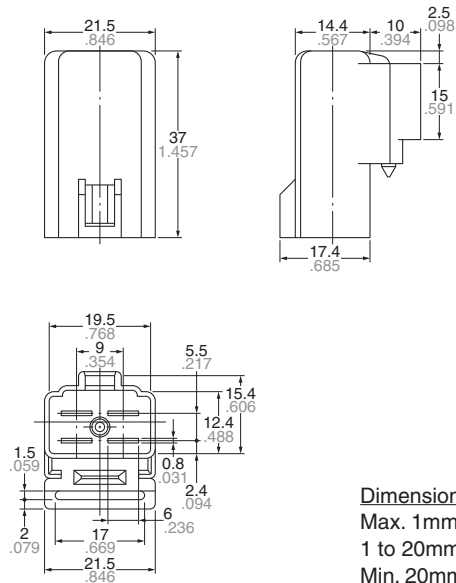
The CAD data of the products with a **CAD** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

1. 1 Form A / 1 Form B Rubber bracket A type

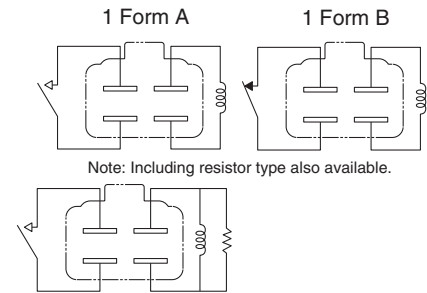
CAD



External dimensions



Schematic (Bottom View)



Including resistor
(1 Form A)

Dimension:

Max. 1mm .039inch:

1 to 20mm .039 to .787inch: $\pm 0.3 \pm 0.12$

Min. 20mm .787inch:

Tolerance

$\pm 0.1 \pm 0.04$

$\pm 0.3 \pm 0.12$

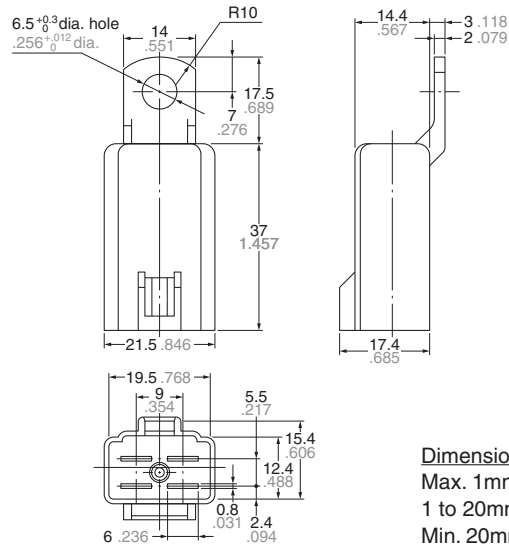
$\pm 0.5 \pm 0.20$

2. 1 Form A / 1 Form B Screw-mounting type

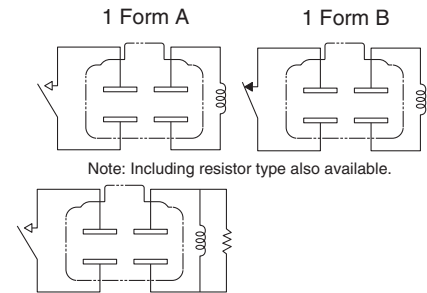
CAD



External dimensions



Schematic (Bottom View)



Including resistor
(1 Form A)

Dimension:

Max. 1mm .039inch:

1 to 20mm .039 to .787inch: $\pm 0.3 \pm 0.12$

Min. 20mm .787inch:

Tolerance

$\pm 0.1 \pm 0.04$

$\pm 0.3 \pm 0.12$

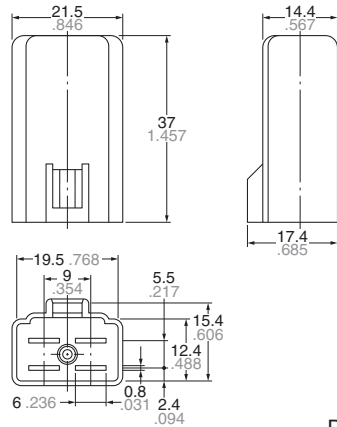
$\pm 0.5 \pm 0.20$

3. 1 Form A / 1 Form B
Direct coupling type

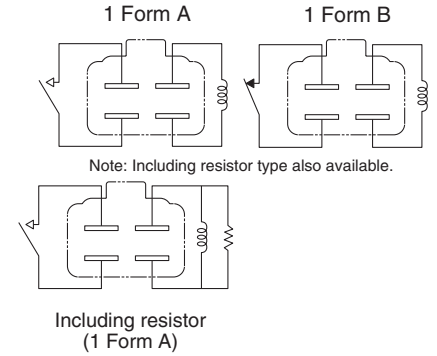
CAD



External dimensions



Schematic (Bottom View)



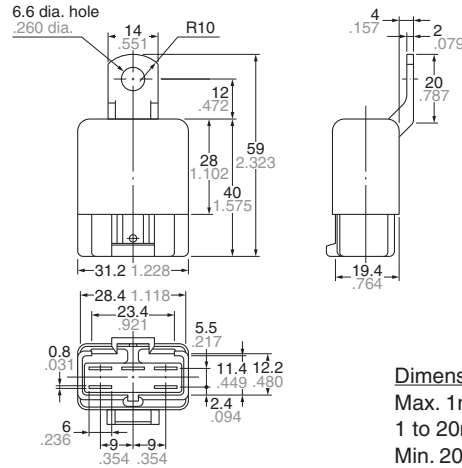
Dimension:	Tolerance
Max. 1mm .039inch:	±0.1 ±.004
1 to 20mm .039 to .787inch:	±0.3 ±.012
Min. 20mm .787inch:	±0.5 ±.020

4. 1 Form C
Screw-mounting type

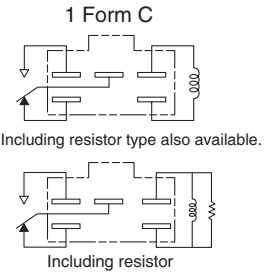
CAD



External dimensions



Schematic (Bottom View)



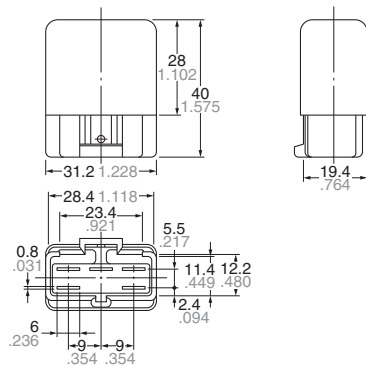
Dimension:	Tolerance
Max. 1mm .039inch:	±0.1 ±.004
1 to 20mm .039 to .787inch:	±0.2 ±.008
Min. 20mm .787inch:	±0.5 ±.020

5. 1 Form C
Direct coupling type

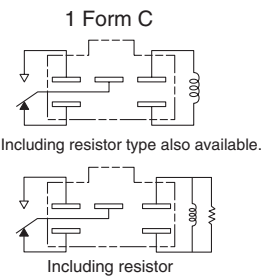
CAD



External dimensions



Schematic (Bottom View)



Dimension:	Tolerance
Max. 1mm .039inch:	±0.1 ±.004
1 to 20mm .039 to .787inch:	±0.2 ±.008
Min. 20mm .787inch:	±0.5 ±.020

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/

Panasonic[®]

©Panasonic Corporation 2019