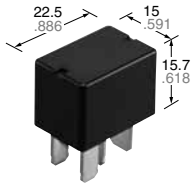
Low Profile Micro-ISO Automotive Relay

CV-N RELAYS

<Protective construction>
Sealed



(Unit: mm inch)

FEATURES

- **Low profile automotive relays for Micro-ISO terminal**
- **Compact and high-capacity load switching**

TYPICAL APPLICATIONS

- **Headlights, Magnetic clutches, Radiator fans, Blowers, Fog lamps, Tail lights, Heaters, Defoggers, Condenser fans, etc.**

RoHS compliant

ORDERING INFORMATION

ACVN □ □ □ □

Contact arrangement
5: 1 Form A

Mounting classification
1: Micro ISO plug-in type

Protective element
0: None
2: With resistor inside

Rated coil voltage, DC
12: 12 V

TYPES

Contact arrangement	Rated coil voltage	Part No.	Packing	
			Carton	Case
1 Form A	12 V DC	ACVN51012	50 pcs.	200 pcs.

Note: Please use "ACVN∗∗2∗∗" to order with resistor inside type. (Asterisks " ∗ " should be filled in from ORDERING INFORMATION.)

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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
12V DC	Max. 7.0 V DC	Min. 0.5 V DC	66.7 mA, 74.7 mA (with resistor inside)	180Ω, 160.7Ω (with resistor inside)	800 mW, 900 mW (with resistor inside)	10 to 16V DC

2. Specifications

Item		Specifications
Contact data	Contact arrangement	1 Form A
	Contact resistance (initial)	Max. 15mΩ (Typ. 3mΩ) (By voltage drop 1A 6V DC)
	Contact material	Ag alloy
	Rated switching capacity (resistive)	N.O. side: 35 A 14V DC
	Max. carrying current*1	N.O. side: 20 A 14V DC (at 85°C 185°F, continuous)
	Min. switching load (resistive)*2	1 A 14V DC (at 20°C 68°F)
	Contact voltage drop (initial)	N.O. side: Max. 0.5 V (By voltage drop 14 V DC 35 A)
Insulated resistance (initial)		Min. 20 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 coil voltage)	Max. 10ms (at 20°C 68°F, without contact bounce time)
	Release (Reset) time (at rated coil voltage)	Max. 10ms (at 20°C 68°F, without contact bounce time) (Without diode)
Shock resistance	Functional	Min. 100 m/s² {approx. 10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs)
	Destructive	Min. 1,000 m/s² {approx. 100G} (Half-wave pulse of sine wave: 6ms)
Vibration resistance	Functional	10 to 100 Hz, Min. 44.1 m/s² {approx. 4.5G} (Detection time: 10μs)
	Destructive	10 to 500 Hz, Min. 44.1 m/s² {approx. 4.5G}, Time of vibration for each direction; X, Y, Z direction: 4 hours
Expected life	Mechanical	Min. 10^6 (at 120 cpm)
	Electrical	<Resistive load> Min. 10^5 at rated switching capacity, operating frequency: 2s ON, 2s OFF <Motor load> Min. 3×10^5 at inrush 84 A, steady 18 A, 14 V DC, Operating frequency: 2s ON, 5s OFF <Lamp load> Min. 2×10^5 at inrush 84 A, steady 12 A, 14 V DC, Operating frequency: 1s ON, 14s OFF
Conditions	Conditions for usage, transport and storage*3	Ambient temperature: –40 to +85°C –40 to +185°F*4, Humidity: 5 to 85% R.H. (Please avoid icing or condensation)
Weight		Approx. 12 g .42 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”.
*4. Please inquire our sales representative if you will be using the relay in a high temperature atmosphere.

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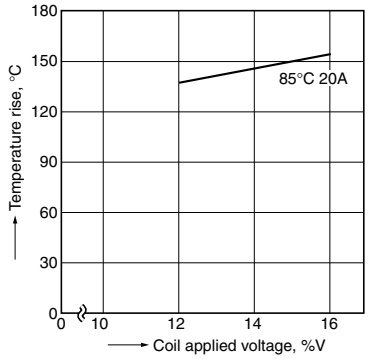
REFERENCE DATA

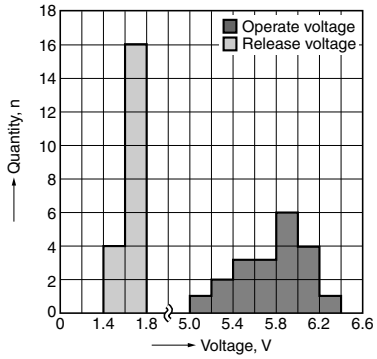
1. Coil temperature rise

Point measured: Inside the coil
Carrying current: 20A
Coil applied voltage: 12V, 14V, 16V
Ambient temperature: 85°C 185°F



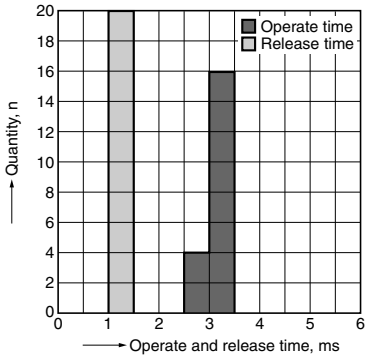
2. Distribution of operate (set) and release (reset) voltage

Sample: ACVN51012, 20pcs

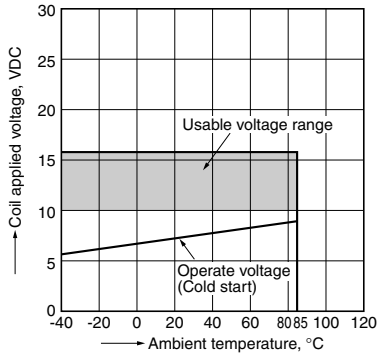


3. Distribution of operate (set) time and release (reset) time

Sample: ACVN51012, 20pcs.

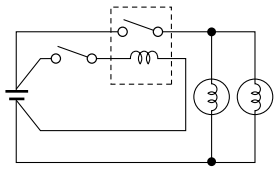


4. Ambient temperature and usable voltage range

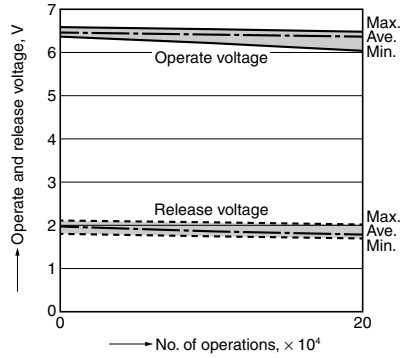


5.-(1) Electrical life test (Lamp load)

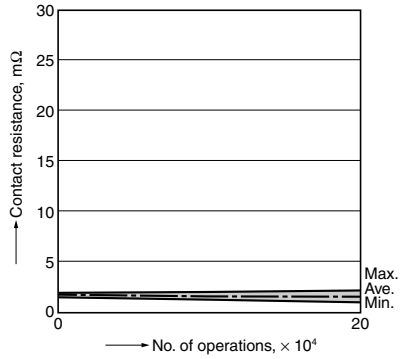
Sample: ACVN51012, 3pcs.
Load: Inrush: 84A, Steady: 12A,
halogen lamp load (60W×2)
Switching frequency: ON 1s, OFF 14s
Ambient temperature: 85°C 185°F
Circuit:



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

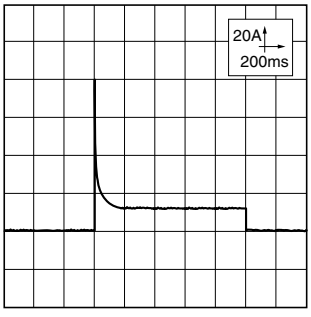


Change of contact resistance



Load current waveform

Load: Inrush current: 84A, steady current: 12A



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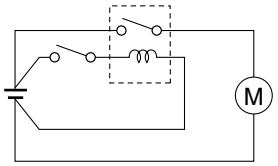
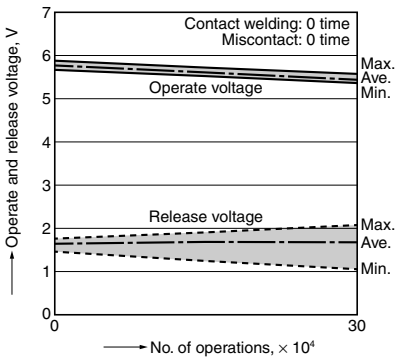
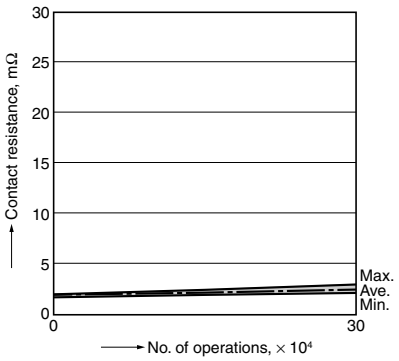
5.-(2) Electrical life test (Motor load)
Sample: ACVN51012, 3pcs.
Load: Inrush: 80A, Steady: 18A,
Radiator fan motor (motor free)
Switching frequency: ON 1s, OFF 4s
Ambient temperature: 85°C 185°F
Circuit:



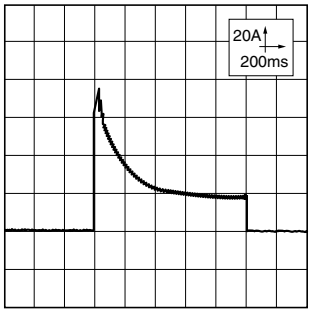
Change of operate (set) and release (reset) voltage



Change of contact resistance



Load current waveform
Load: Inrush current: 80A, Steady current: 18A



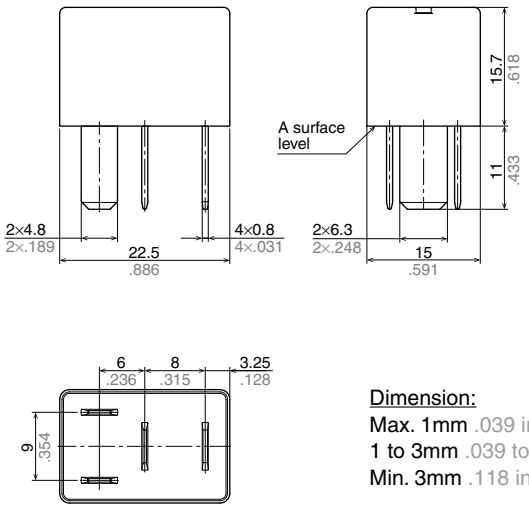
DIMENSIONS (mm inch)

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

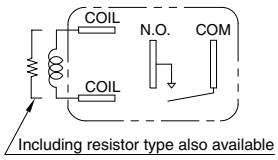
1. Micro ISO plug-in type

CAD

External dimensions



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

Note: Intervals between terminals is measured at A surface level.

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

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Please contact .....

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Specifications are subject to change without notice.