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AUTOMOTIVE LOW PROFILE **MICRO-ISO RELAY**

CV RELAYS (ACV)



Micro ISO 1 Form C type



Micro ISO 1 Form A type

FEATURES

• Low profile:

22.5 mm(L)×15 mm(W)×15.7 mm(H)

.886 inch(L)×.591 inch(W)×.618 inch(H) • Low temperature rise

Terminal temperature has been reduced compared with using our conventional product

• Low sound pressure level

Noise level has been reduced approx.10dB compared with using our conventional product.

• Wide line-up

Micro ISO terminal types and resistor inside type.

- Plastic sealed type
- Plastically sealed for automatic cleaning.
- · Compact and high-capacity 20A load switching

N.O.: 20A 14V DC, N.C.: 10A 14V DC (Max. carrying current: at 85°C 185°F)

TYPICAL APPLICATIONS

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

RoHS compliant

ORDERING INFORMATION



TYPES

Contact arrangement	Coil voltage	Protective construction	Mounting classification	Part No.
1 Form A	12 / DC	Socied type	Micro ISO plug-in type	ACV31012
1 Form C	12 V DC	Sealed type	Micro ISO plug-in type	ACV11012

Note: Please use "ACV**212" to order built-in resistor type. (Asterisks " * " should be filled in from ORDERING INFORMATION.) Standard packing; Carton: 50 pcs.; Case: 200 pcs.

RATING

1. Coil data

Nominal coil voltage	Pick-up voltage* (at 20°C 68°F) Drop-out voltage (at 20°C 68°F)		Nominal operating current [±10%] (at 20°C 68°F)	Coil resistance [±10%] (at 20°C 68°F)	Nominal operating power (at 20°C 68°F)	Usable voltage range (at 85°C 185°F)
12V DC	Max. 7.0 V DC (Initial)	Min. 0.6 V DC (Initial)	67 mA, 84 mA (with resistor)	180 $Ω$, 142.3 $Ω$ (with resistor)	0.8 W, 1.0 W (with resistor)	10 to 16V DC

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

2. Specifications

Characteristics		Item	Specifications				
	Arrangement		1 Form A	1 Form C			
Contact	Contact resistance (Initial)		Typ 3mΩ (By voltage drop 6V DC 1A)				
	Contact voltage	drop (after electrical life test)	N.O.: Max. 0.2 V (By voltage drop 14 V DC 20 A)	N.O.: Max. 0.2 V (By voltage drop 14 V DC 20 A) N.C.: Max. 0.5 V (By voltage drop 14 V DC 10 A)			
	Contact material		Ag alloy (Cadmium free)				
	Nominal switchin	g capacity (resistive load)	N.O.: 20 A 14V DC	N.O.: 20 A 14V DC, N.C.: 10 A 14V DC			
Rating	Max. carrying cu (at 85°C 185°F, c	rrent continuous)	N.O.: 20 A 14V DC	N.O.: 20 A 14V DC N.C.: 10 A 14V DC			
	Nominal operatin	g power	0.8 W, 1.0 W (built-in resistor type)				
	Min. switching ca	pacity (resistive load)*1	1 A 12V DC				
	Insulation resista	nce (Initial)	Min. 20 MΩ (at 500V DC)				
	Breakdown voltage (Initial)	Between open contacts	500 Vrms for 1 min. (Detection current: 10mA)				
Electrical		Between contacts and coil	500 Vrms for 1 min. (Detection current: 10mA)				
characteristics	Operate time (at (at 20°C 68°F)	nominal voltage)	Max. 10ms (excluding contact bounce time) (Initial)				
	Release time (at (at 20°C 68°F)	nominal voltage)	Max. 10ms (excluding contact bounce time) (Initial)				
	Shock	Functional	Min. 100 m/s ² {10G} (Half-wave pulse of sine wave: 11ms; detection time: 10µs)				
Mechanical	resistance	Destructive	Min. 1,000 m/s ² {100G} (Half-	wave pulse of sine wave: 6ms)			
characteristics	Vibration	Functional	10 Hz to 100 Hz, Min. 44.1 m/s ² {4.5G} (Detection time: 10µs)				
	resistance	Destructive	10 Hz to 500 Hz, Min. 44.1 m/s ² {4.5G}, Time of vibration for each direction; X, Y, Z direction:				
Exported life	Mechanical		Min. 10 ⁶ (at 120 cpm)				
Expected life	Electrical (at non	ninal switching capacity)	Min. 10 ⁵ (operating frequency: 2s ON, 2s OFF)				
Conditions	Conditions for operation, transport and storage*2		Ambient temperature: -40°C to +85°C -40°F to +185°F*3, Humidity: 5% R.H. to 85% R.H. (Not freezing and condensing at low temperature), air pressure: 86 to 106kPa				
Mass			Approx. 15 g .53 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. Please refer to "Usage ambient condition" in CAUTIONS FOR USE OF AUTOMOTIVE RELAYS.

*3. Please inquire if you will be using the relay in a high temperature atmosphere. * Regarding solder, this product is not MIL (Military Standard) compliant. Please evaluate solder mounting by the actual equipment before using.

REFERENCE DATA

1. Coil temperature rise (20A) Point measured: Inside the coil Contact carrying current: 20A Coil applied voltage: 13.5V



2. Distribution of pick-up and drop-out voltage Sample: ACV11012, 100pcs



3. Distribution of operate and release time Sample: ACV11012, 100pcs.



4. Ambient temperature and operating voltage range



CV (ACV)

5-(1). Electrical life test (Resistive load) Sample: ACV11012, 3pcs. Load: Resistive load (NC switching) 10A Switching frequency: ON 1s, OFF 1s Ambient temperature: Room temperature

Circuit



Load current waveform

Up: (volta wave	Coil ge eforr	10 n	∨ 200r	► ns	Dov curr wav	vn: L ent refor	.oad m	5A 20	00ms

Change of pick-up and drop-out voltage



Change of contact resistance



Change of pick-up and drop-out voltage

Change of contact resistance



5-(2). Electrical life test (Lamp load) Sample: ACV31212, 3pcs. Load: 55Wx4, inrush: 90A/steady: 20A,

lamp actual load

Switching frequency: ON 1s, OFF 14s Ambient temperature: Room temperature



Load current waveform Inrush current: 90A, steady current: 20A







5-(3). Electrical life test (Motor load) Sample: ACV31212, 3pcs. Load: inrush: 80A/steady: 18A, radiator fan actual load (motor free) Switching frequency: ON 2s, OFF 6s Ambient temperature: Room temperature



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

Up: Coil 10V voltage waveform 500ms					Dow curre wav	n: L ent eforr	20A 500ms		
					~~~~				
					-			-	
			Ν						

Change of pick-up and drop-out voltage







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

#### 1. Micro ISO plug-in type

**DIMENSIONS** (mm inch)

CAD Data







Schematic (Bottom view) 1 Form A Including resistor type also available

1 Form C



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

# For Cautions for Use, see Relay Technical Information.