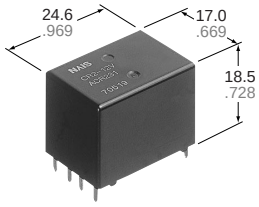
NAiS

DUAL POWER QUIET AUTOMOTIVE RELAY

CR-RELAYS



mm inch

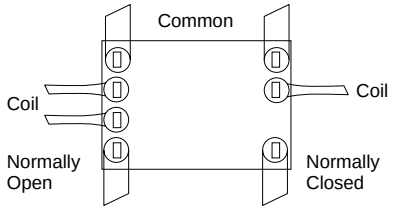
FEATURES

• Quiet
Noise has been reduced by approximately 20 dB, using our own silencing design.

• Twin (1 Form C × 2)
Forward/reverse motor control is possible with a single relay.

• Sealed construction

• Simple footprint enable ease of PC board layout



SPECIFICATIONS

Contact

Arrangement			1 Form C × 2 (H bridge)
Contact material			Silver alloy
Initial contact resistance, max. (By voltage drop 6 V DC 1A)			100 mΩ
Contact voltage drop, max.			0.2V (at 10 A switching)
Rating	Nominal switching capacity		N.O.: 20 A 14 V DC N.C.: 10 A 14 V DC
	Max. carrying current		35 A for 2 minutes, 25 A for 1 hour (12 V, at 20°C68°F) 30 A for 2 minutes, 20 A for 1 hour (12 V, at 85°C185°F)
Expected life (min. operations)	Mechanical (at 120 cpm)		Min. 10^7
	Electrical	Resistive load	Min. 10^5*1
		Motor load	Min. 2×10^5*2
			Min. 10^5*3

Coil

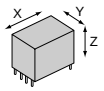
Nominal operating power	640 mW

Remarks
* Specifications will vary with foreigh standards certification ratings.
*1 At nominal switching capacity, operating frequency: 1s ON, 9s OFF
*2 N.O.: at 5 A (steady), 25 A (inrush)/N.C.: at 20 A (brake) 14 V DC, operating frequency: 0.5s ON, 9.5s OFF
*3 At 20A 14 V DC (Motor lock), operating frequency: 0.5s ON, 9.5s OFF
*4 Measurement at same location as "Initial breakdown voltage " section
*5 Detection current: 10mA
*6 Excluding contact bounce time
*7 Half-wave pulse of sine wave: 11ms; detection: 10μs
*8 Half-wave pulse of sine wave: 6ms
*9 Detection time: 10μs

Characteristics

Max. operating speed (at nominal switching capacity)		6 cpm
Initial insulation resistance*4		Min. 100 MΩ (at 500 V DC)
Initial breakdown voltage*5	Between open contacts	500 Vrms for 1 min.
	Between contacts and coil	500 Vrms for 1 min.
Operate time*6 (at nominal voltage)(at 20°C68°F)		Max. 10 ms (initial)
Release time (without diode)*6 (at nominal voltage)(at 20°C68°F)		Max. 10 ms (initial)
Shock resistance	Functional*7	Min. 100 m/s² {10G}
	Destructive*8	Min. 1,000 m/s² {100G}
Vibration resistance	Functional*9	10 to 100 Hz, Min. 44.1 m/s² {4.5G}
	Destructive*10	10 to 500 Hz, Min. 44.1 m/s² {4.5G}
Conditions for operation, transport and storage*11 (Not freezing and condensing at low temperature)	Ambient temperature	–40 to +85°C –40 to +185°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 12.5g.44 oz

*10 Time of vibration for each direction;
X, Y direction: 2 hours
Z direction: 4 hours



*11 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 61)

TYPICAL APPLICATIONS

• Power windows
• Auto door lock
• Power sunroof
• Electrically powered mirror

ORDERING INFORMATION

Ex. CR [2] – [12 V]

Contact arrangement	Coil voltage(DC)
1 Form C × 2	12 V

Standard packing: Carton(tube package) 32pcs. Case: 800pcs.

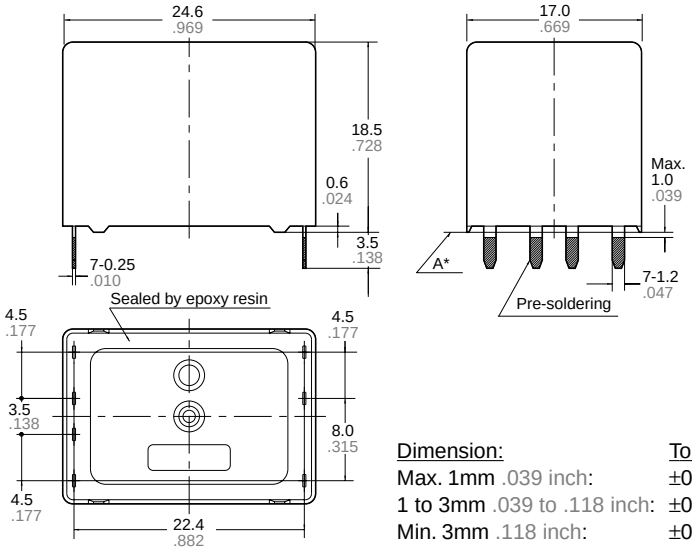
CR

TYPES AND COIL DATA (at 20°C 68°F)

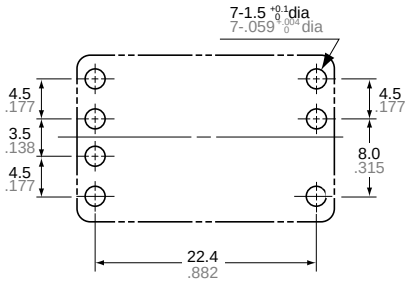
Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Usable voltage range, V DC
CR2-12V	12	(Initial) 7.2	(Initial) 1.0	225	53.3	640	10 to 16

DIMENSIONS

mm inch

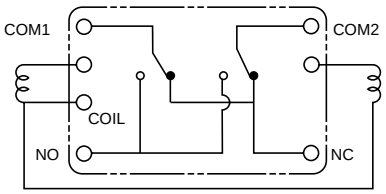


PC board pattern (Bottom view)



Tolerance: ±0.1±.004

Schematic (Bottom view)

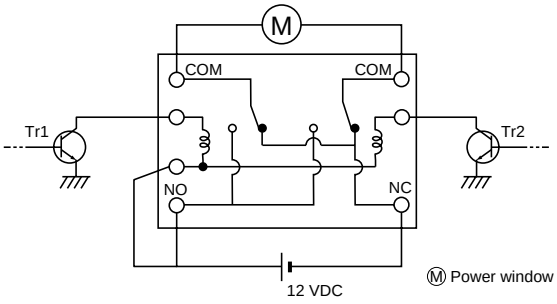


Dimension:	Tolerance
Max. 1mm .039 inch:	±0.1 ± .004
1 to 3mm .039 to .118 inch:	±0.2 ± .008
Min. 3mm .118 inch:	±0.3 ± .012

* Dimensions (thickness and width) of terminal specified in this catalog is measured before pre-soldering.
Intervals between terminals is measured at A surface level.

EXAMPLE OF CIRCUIT

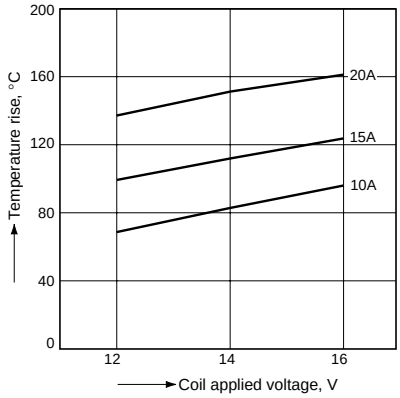
Forward/reverse control circuits of DC motor for power window



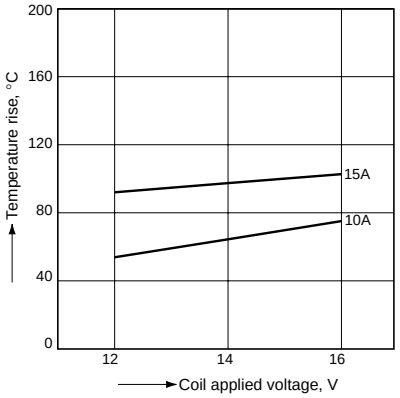
Tr1	Tr2	Motor
OFF	OFF	Stop
ON	OFF	Forward
OFF	ON	Reverse

REFERENCE DATA

1-(1). Coil temperature rise (at 20°C 68°F)
Sample: CR2-12V, 5pcs
Contact carrying current: 10A, 15A, 20A

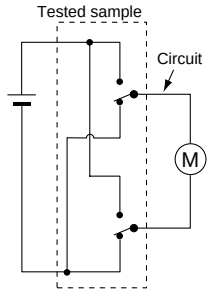


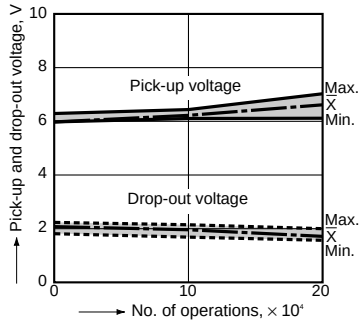
1-(2). Coil temperature rise (at 85°C 185°F)
Sample: CR2-12V, 5pcs
Contact carrying current: 10A, 15A



2. Electrical life test (Motor load)

Tested sample: CR2-12 V, 3pcs.
Load: 5A steady, Inrush 25A, 14V DC
Operating frequency: ON 0.5s, OFF 9.5s

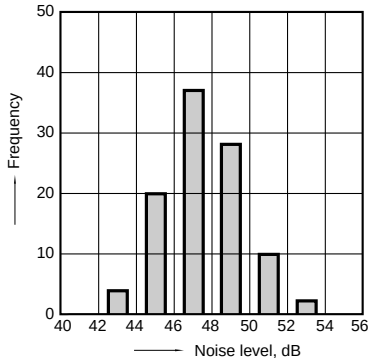




Contact welding: 0 time
Miscontact: 0 time

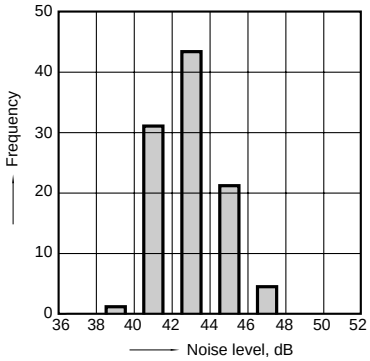
5-(1). Operation noise distribution

When operate



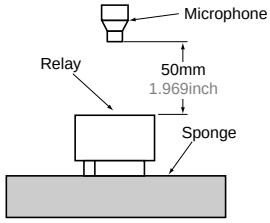
5-(2). Operation noise distribution

When release



Measuring conditions

Tested sample: CR2-12 V, 50 pcs.(No. of data: 100)
Equipment setting: " A " weighted, Fast, Max. hold
Coil voltage: 12V DC
Coil connection device: Diode
Background noise: Approx. 20dB



For Cautions for use, see Relay Technical Information (Page 48 to 76).