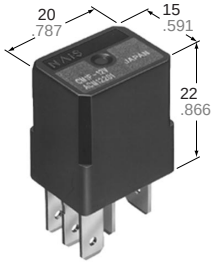
NAiS

AUTOMOTIVE MICRO-ISO RELAY

CM-RELAYS



mm inch

FEATURES

- **Small size: 20 mm(L)×15 mm(W)×22 mm(H)**
  .787 inch(L)×.591 inch(L)×.866 inch(H)
- **Wide line-up**
  PC board and Plug-in type, Resistor and diode inside type
- **35 Amp contact Rating, 100,000 Operations (12V type)**
- **Micro-ISO type terminals**

SPECIFICATIONS

Contact

Type		12 V coil voltage	24 V coil voltage
Arrngement		1 Form A, 1 Form C	
Contact material		Silver alloy	
Initial contact resistance, max.		15mΩ	
Contact voltage drop, max.		N.O.: 0.5 V (at 35 A 14 V DC) N.C.: 0.3 V (at 20 A 14 V DC)	N.O.: 0.3 V (at 15 A 28 V DC) N.C.: 0.2 V (at 8 A 28 V DC)
Rating (resistive load)	Nominal switching capacity	N.O.: 35 A 14 V DC N.C.: 20 A 14 V DC	N.O.: 15 A 28 V DC N.C.: 8 A 28 V DC
	Max. switching current	N.O.: 20 A (14 V DC, at 85°C 185°F) N.C.: 10 A (14 V DC, at 85°C 185°F)	N.O.: 15 A (28 V DC, at 85°C 185°F) N.C.: 8 A (14 V DC, at 85°C 185°F)
Expected life	Mechanical (at 120 cpm)	Min. 10^6	
	Electrical (at rated load)	Flux-resistant type: Min. 10^5*1 Sealed type: Min. 5×10^4	

Coil

Nominal operating power	1.5 W 1.7 W (Internal resistor type)	1.8 W 2.0 W (Internal resistor type)

Characteristics

Type		24V coil type	12V coil type
Max. operating speed (at nominal switching capacity)		15 cpm	
Initial insulation resistance*2		Min. 20 MΩ (at 500 V DC)	
Initial breakdown voltage*3	Between open contacts	500 Vrms for 1 min.	
	Between contacts and coil	500 Vrms for 1 min.	
Operate time*4 (at nominal voltage) (at 20°C 85°F)		Max. 10 ms	
Release time*4 (at nominal voltage) (at 20°C 85°F)		Max. 10 ms Max. 15 ms (with diode)	
Shock resistance	Functional*5	Min. 200 m/s² {20G}	
	Destructive*6	Min. 1,000m/s² {100G}	
Vibration resistance	Functional*7	10 to 500 Hz, Min. 44.1 m/s² {4.5 G}	
	Destructive*8	10 to 2,000 Hz, Min. 44.1 m/s² {4.5 G}	
Conditions for operation, transport and storage*9 (Not freezing and condensing at low temperature)	Ambient temp.	–40°C to + 85°C –40°F to + 185°F	
	Humidity	25 to 85% R.H.	
Unit weight		Approx. 20g .71oz	

Remarks

* Specifications will vary with foreigh standards certification ratings.
*1 At nominal switching capacity, operating frequency: 2s ON, 2s OFF
*2 Measurement at same location as "Initial breakdown voltage" section.
*3 Detection current: 10mA
*4 Excluding contact bounce time.
*5 Half-wave pulse of sine wave: 11 ms; detection time: 10 μs
*6 Half-wave pulse of sine wave: 6 ms
*7 Detection time: 10 μs

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

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

TYPICAL APPLICATIONS

Automotive system
Fan motor, Heater, Tail lump, Air Compressor

ORDERING INFORMATION

CM | 1 | F | R | P | 12V

Contact arrangement	Protective construction	Classification of types	Mounting classification	Coil voltage (DC)
1a: 1 Form A 1: 1 Form C	Nil: Sealed type F: Flux-resistant type	Nil: Standard type D: with diode inside R: with resistor iside	Nil: Quick connect type P: PC board type	12 V 24 V

Note: Bulk package: 50 pcs.; Case: 200 pcs.

TYPES

Packing quantity: Inner 50pcs, Outer 200pcs.

Contact arrangement	Part No.	Coil voltage	Mounting classification	Protective construction
1 Form A	CM1a-12V	12 V DC	Quick connect type	Sealed type
	CM1aF-12V			Flux-resistant type
	CM1a-P-12V		PC board type	Sealed type
	CM1aF-P-12V			Flux-resistant type
1 Form C	CM1-12V		Quick connect type	Sealed type
	CM1F-12V			Flux-resistant type
	CM1-P-12V		PC board type	Sealed type
	CM1F-P-12V			Flux-resistant type

Contact arrangement	Part No.	Coil voltage	Mounting classification	Protective construction
1 Form A	CM1a-24V	24 V DC	Quick connect type	Sealed type
	CM1aF-24V			Flux-resistant type
	CM1a-P-24V		PC board type	Sealed type
	CM1aF-P-24V			Flux-resistant type
1 Form C	CM1-24V		Quick connect type	Sealed type
	CM1F-24V			Flux-resistant type
	CM1-P-24V		PC board type	Sealed type
	CM1F-P-24V			Flux-resistant type

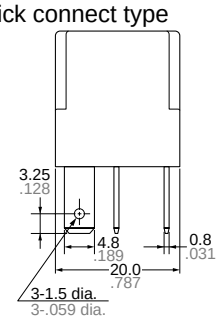
COIL DATA (at 20°C 68°F)

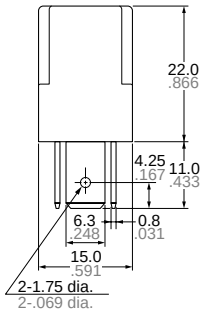
Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltege, V DC (min.)	Nominal current, mA (±10%)	Coil resistance, ohm (±10%)	Nominal operating power, W	Usable voltage range, V DC
12	3 to 7	1.2 to 4.2	125	96	1.5	10 to 16
24	6 to 14	2.4 to 8.4	75	320	1.8	20 to 32

DIMENSIONS

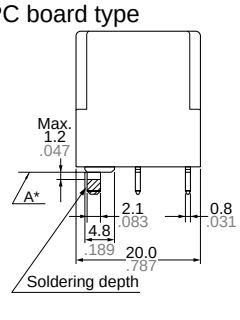
mm inch

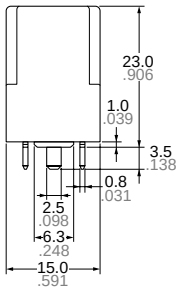
Quick connect type



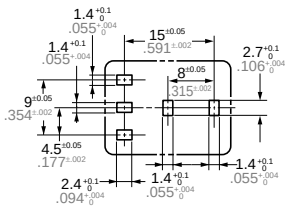


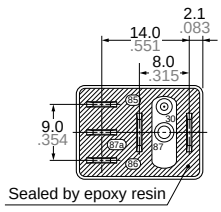
PC board type



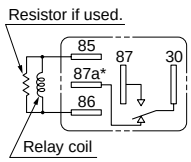


PC board pattern (Bottom view)

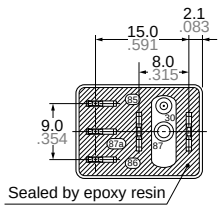




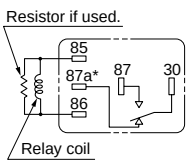
Schematic (Bottom view)



*Not used on 1 Form A type



Schematic (Bottom view)



*Not used on 1 Form A type

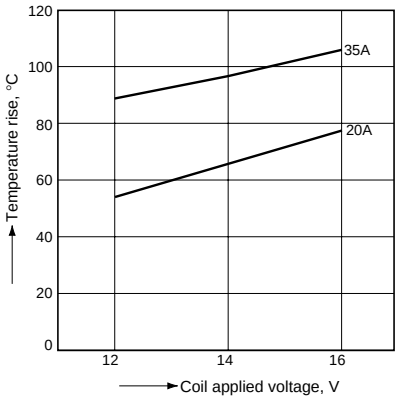
Dimension:	General tolerance
Max. 1mm .039 inch:	±0.1 ±.004
1 to 3mm .039 to .118 inch:	±0.2 ±.008
Min. 3mm .118 inch:	±0.3 ±.012

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

REFERENCE DATA

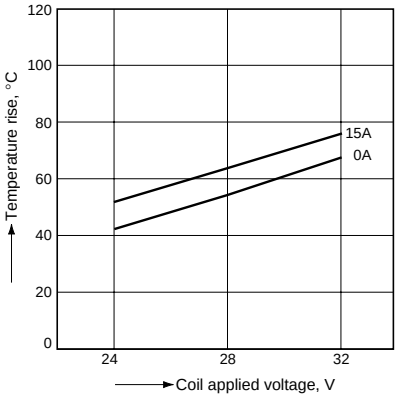
1-(1). Coil temperature rise (12V type)

Tested sample: CM1F-12V, 3 pcs.
Ambient temperature: 85°C 185°F
Contact carrying current: 20 A, 35 A



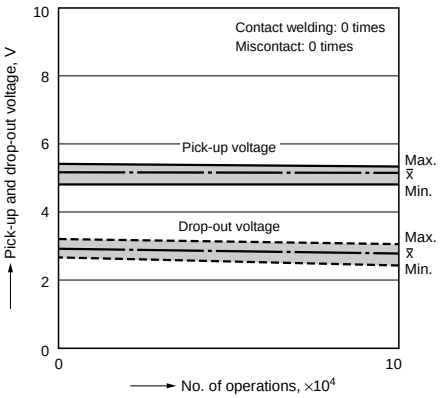
1-(2). Coil temperature rise (24V type)

Tested sample: CM1F-24V, 4 pcs.
Ambient temperature: 85°C 185°F
Contact carrying current: 0 A, 15 A



2-(1). Electrical life test (resistive load)

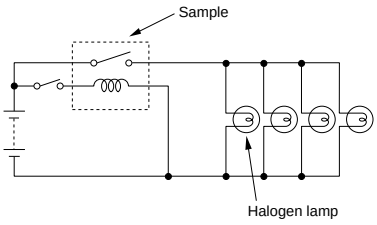
Tested sample: CM1F-12V, 6 pcs.
Load: N.C.: 20A 14V DC
N.O.: 35A 14V DC
Operate frequency: ON 2s, OFF 2s

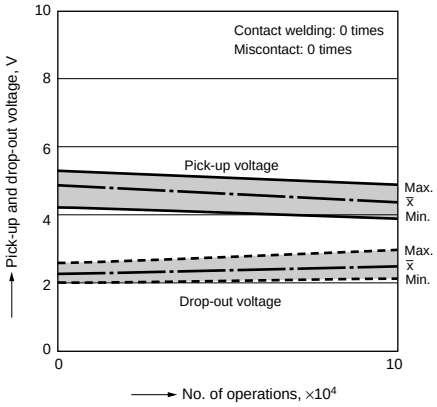


2-(2). Electrical life test (Lamp load)

Tested sample: CM1aF-R-12V, 6 pcs.
Load: 20A 13.5V DC
Operate frequency: ON 1s, OFF 14s

Circuit:





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

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