

Non-polarized 1 Form C relay that realizes nominal operating power of 150 mW

HY RELAYS



FEATURES

- Nominal operating power:**
High sensitivity of 150mW (Single side stable type)
 A nominal operating power of 150 mW (minimum operating power of 84 mW) has been achieved.
- The use of gold-clad twin contacts ensures high contact reliability.**
- Sealed construction**
- Sealed according to RTIII (IP67)**

TYPICAL APPLICATIONS

- Automotive equipment**
 Automirror controller
 Retractable head light controller
- Push button device: Dial pulsing**
- Portable video tape recorders and audio devices**
- Computer peripherals**

ORDERING INFORMATION



Contact arrangement
1: 1 Form C

Sensitivity
Nil: High sensitivity 150 mW
Z: Standard 200 mW

Nominal coil voltage (DC)
1.5, 3, 4.5, 5, 6, 9, 12, 24 V

Note: In case of 5 V drive circuit, it is recommended to use 4.5 V type relay.

TYPES

Contact arrangement	Nominal coil voltage	150mW type	200mW type
		Part No.	Part No.
1 Form C	1.5V DC	HY1-1.5V	HY1Z-1.5V
	3V DC	HY1-3V	HY1Z-3V
	4.5V DC	HY1-4.5V	HY1Z-4.5V
	5V DC	HY1-5V	HY1Z-5V
	6V DC	HY1-6V	HY1Z-6V
	9V DC	HY1-9V	HY1Z-9V
	12V DC	HY1-12V	HY1Z-12V
	24V DC	HY1-24V	HY1Z-24V

Standard packing: Tube: 50 pcs.; Case: 2,000 pcs.

RATING

1. Coil data

Contact arrangement	Nominal coil voltage	Pick-up voltage (at 20°C 68°F)	Drop-out voltage (at 20°C 68°F)	Nominal operating current [$\pm 10\%$] (at 20°C 68°F)	Coil resistance [$\pm 10\%$] (at 20°C 68°F)	Nominal operating power	Max. applied voltage (at 70°C 158°F)
1 Form C	1.5V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	100mA	15 Ω	150mW	140%V of nominal voltage
	3V DC			50mA	60 Ω		
	4.5V DC			33.3mA	135 Ω		
	5V DC			30mA	166 Ω		
	6V DC			25mA	240 Ω		
	9V DC			16.7mA	540 Ω		
	12V DC			12.5mA	960 Ω		
	24V DC			6.25mA	3,840 Ω		
	1.5V DC	75%V or less of nominal voltage (Initial)	10%V or more of nominal voltage (Initial)	133.3mA	11.25 Ω	200mW	120%V of nominal voltage
	3V DC			66.7mA	45 Ω		
	4.5V DC			44.5mA	101.2 Ω		
	5V DC			40mA	125 Ω		
	6V DC			33.3mA	180 Ω		
	9V DC			22.2mA	405 Ω		
	12V DC			16.7mA	720 Ω		
	24V DC			8.3mA	2,880 Ω		

2. Specifications

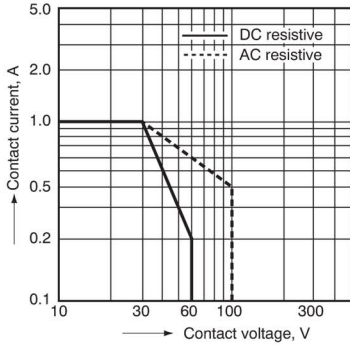
Characteristics	Item	Specifications	
Contact	Arrangement	1 Form C	
	Initial contact resistance, max.	Max. 100 m Ω (By voltage drop 6 V DC 1A)	
	Contact material	Ag+Au clad	
Rating	Nominal switching capacity	1 A 30 V DC (resistive load)	
	Max. switching power	30 W (DC) (resistive load)	
	Max. switching voltage	60 V DC	
	Max. carrying current	2 A	
	Max. switching current	1 A (30 V DC)	
	Min. switching capacity (Reference value) ¹	1mA 1 V DC	
	Nominal operating power	150/200mW	
Electrical characteristics	Insulation resistance (Initial)	Min. 100M Ω (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.	
	Breakdown voltage (Initial)	Between open contacts	500 Vrms for 1min. (Detection current: 10mA)
		Between contact and coil	1,000 Vrms for 1min. (Detection current: 10mA)
	Temperature rise (at 20°C 68°F)	Max. 50°C (By resistive method, nominal coil voltage applied to the coil, nominal switching capacity.)	
	Operate time [Set time] (at 20°C 68°F)	Max. 5 ms (Nominal coil voltage applied to the coil, excluding contact bounce time.)	
Release time [Reset time] (at 20°C 68°F)	Max. 4 ms (Nominal coil voltage applied to the coil, excluding contact bounce time.) (without diode)		
Mechanical characteristics	Shock resistance	Functional	Min. 98 m/s ² (Half-wave pulse of sine wave: 11 ms; detection time: 10 μ s.)
		Destructive	Min. 980 m/s ² (Half-wave pulse of sine wave: 6 ms.)
	Vibration resistance	Functional	10 to 55 Hz at double amplitude of 1 mm (Detection time: 10 μ s.)
		Destructive	10 to 55 Hz at double amplitude of 2 mm
Expected life	Mechanical	Min. 10 ⁷ (at 180 times/min.)	
	Electrical	Min. 10 ⁵ (1 A 30 V DC resistive) (at 20 times/min.)	
Conditions	Conditions for operation, transport and storage ²	Ambient temperature: -40°C to +70°C -40°F to +158°F Humidity: 5 to 85% R.H. (Not freezing and condensing at low temperature)	
	Max. operating speed (at rated load)	20 times/min.	
Unit weight		Approx. 1.8 g 063 oz.	

¹This 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.

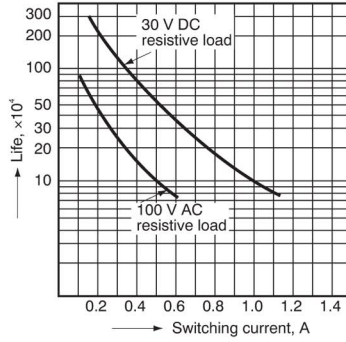
²Refer to "6. Usage, Storage and Transport Conditions" in AMBIENT ENVIRONMENT section in Relay Technical Information.

REFERENCE DATA

1. Maximum switching power

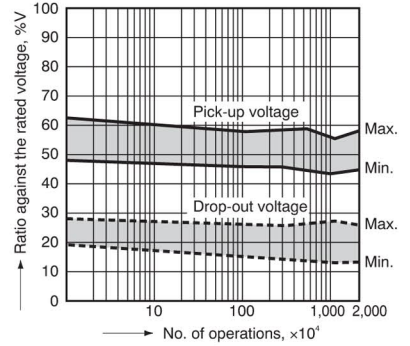


2. Life curve



3. Mechanical life

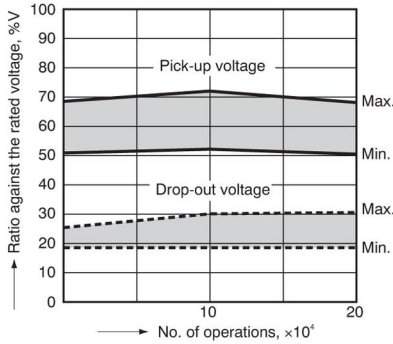
Tested sample: HY1Z-12V, 10 pcs.
Ambient temperature: 20°C to 25°C 68°F to 77°F



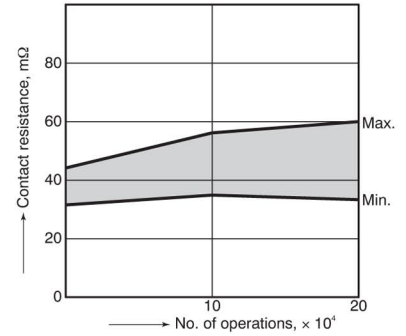
4. Electrical life

Tested sample: HY1-12V, 6 pcs.
Condition: 1 A 30 V DC resistive load, 30 times/min.

Change of pick-up and drop-out voltage

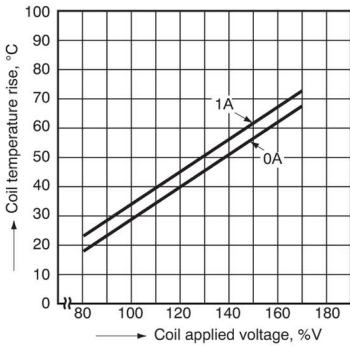


Change of contact resistance



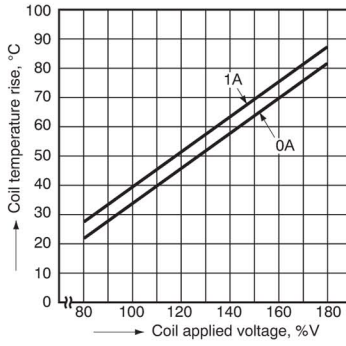
5-(1). Coil temperature rise (150 mW high sensitivity type)

Tested sample: HY1-9V, 5 pcs.
Ambient temperature: 24°C 75°F



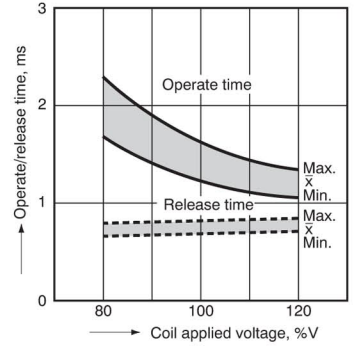
5-(2). Coil temperature rise (200 mW Standard type)

Tested sample: HY1Z-12V, 5 pcs.
Ambient temperature: 23°C 74°F



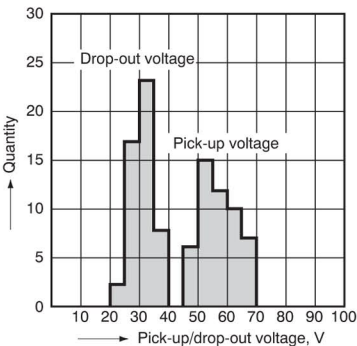
6. Operate/release time characteristics

Tested sample: HY1Z-12V, 5 pcs.
Ambient temperature: 25°C 77°F



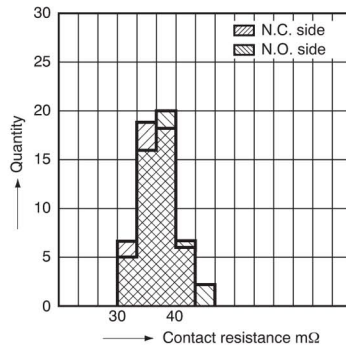
7. Distribution of pick-up and drop-out voltages

Tested sample: HY1-12V, 50 pcs.
Ambient temperature: 23°C 74°F



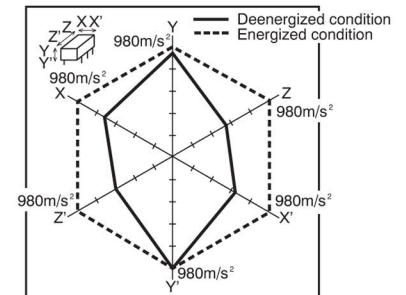
8. Distribution of contact resistance

Tested sample: HY1-12V, 50 pcs.
N.C. side N.O. side

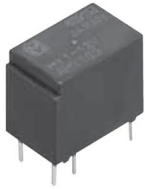


9. Malfunction shock

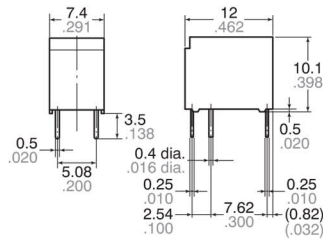
Tested sample: HY1Z-12V, 6 pcs.



CAD Data

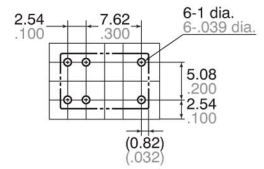


External dimensions



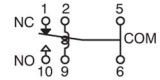
General tolerance: $\pm 0.3 \pm 0.12$

PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm 0.04$

Schematic (Bottom view)

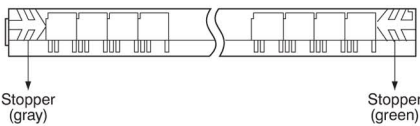


NOTE

1. Packing style

1) As shown in the diagram below, the relays are presented in tube packages with pins 1 and 10 on the left. Be sure to maintain relays in the correct orientation when mounting on PC boards.

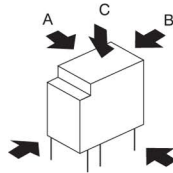
Side with pins 1 and 10.



2. Automatic insertion

To maintain the internal function of the relay, the chucking pressure should not exceed the values below.

- Chucking pressure in the direction A: 4.9 N {500gf} or less
- Chucking pressure in the direction B: 4.9 N {500gf} or less
- Chucking pressure in the direction C: 4.9 N {500gf} or less



Avoid chucking the center of the relay. In addition, excessive chucking pressure to the pinpoint of the relay should be avoided.

For Cautions for Use, see [Relay Technical Information](#).