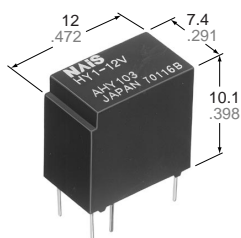


NAIS

High Sensitivity 1 Form C Relay in Ultra Small Size

HY-RELAYS



mm inch

UL File No.: E43149
CSA File No.: LR26550

- High sensitivity: 150 mW/200 mW
- A wide range of ambient temperature: -40°C to $+70^{\circ}\text{C}$ -40°F to $+158^{\circ}\text{F}$
- Sealed construction
- Rating: 1 A 30 V DC

SPECIFICATIONS

Contact

Arrangement	1 Form C	
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	100 m Ω	
Contact material	Gold-clad silver	
Rating (resistive)	Nominal switching capacity	1 A 30 V DC
	Max. switching power	30 W
	Max. switching voltage	60 V DC
	Max. switching current	1 A
	Max. carrying current	2 A
UL/CSA rating	1 A 30 V DC	
Expected life (min. operations)	Mechanical (at 180 cpm)	10^7
	Electrical (at 20 cpm) 1 A 30 V DC	10^5

Coil

Nominal operating power	Standard type	200 mW
	High sensitivity type	150 mW

Remarks

- *1 Measurement at same location as "Initial breakdown voltage" section
 *2 Detection current: 10mA
 *3 Excluding contact bounce time
 *4 Half-wave pulse of sine wave: 11ms; detection time: 10 μ s
 *5 Half-wave pulse of sine wave: 6ms
 *6 Detection time: 10 μ s
 *7 Refer to 5. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT (Page 49)

Characteristics (at 25°C 77°F, 50% Relative humidity)

Max. operating speed		20 cpm (at nominal voltage)
Initial insulation resistance*1	Between contacts	Min. 100 M Ω at 500 V DC
	Between contact and coil	Min. 100 M Ω at 500 V DC
Initial breakdown voltage*2	Between open contacts	500 Vrms
	Between contacts and coil	1,000 Vrms
Operate time*3 (at nominal voltage)		Max. 5 ms (approx. 2 ms)
Release time (without diode)*3 (at nominal voltage)		Max. 4 ms (approx. 1 ms)
Temperature rise at nominal voltage Contact switching current 1A at 20°C		Max. 50°C
Shock resistance	Functional*4	Min. 98 m/s ² {10 G}
	Destructive*5	Min. 980 m/s ² {100 G}
Vibration resistance	Function*6	58.8 m/s ² {6 G}, 10 to 55 Hz at double amplitude of 1 mm
	Destructive	117.6 m/s ² {12 G}, 10 to 55 Hz at double amplitude of 2 mm
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)	Ambient temp.	-40°C to $+70^{\circ}\text{C}$ -40°F to $+158^{\circ}\text{F}$
	Humidity	5 to 85% R.H.
Unit weight		1.8 g .063 oz

TYPICAL APPLICATION

- Automotive: Switching to small motor
 - 1) Automirror controller
 - 2) Retractable head light controller
- Push button device: Dial pulsing

- Low-voltage signal switching and motor control of small home appliances such as portable video tape recorders and audio devices
- Operating of dish-control motors for PCs and word processors

ORDERING INFORMATION

Ex. HY	1	Z	3V
Contact arrangement	Sensitivity		Coil voltage (DC)
1: 1 Form C	Nil: High sensitivity 150 mW Z: Standard 200 mW		1.5, 3, 4.5, 5, 6, 9, 12, 24 V

Standard packing: Carton: 100 pcs. Case 500 pcs.

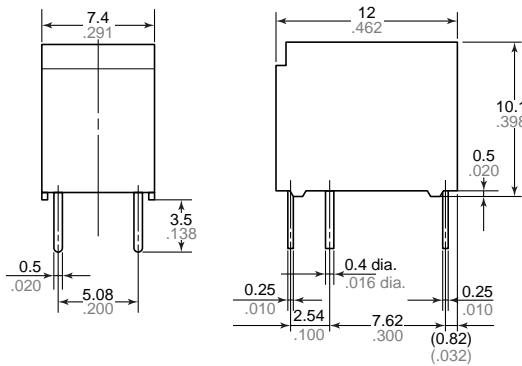
HY

TYPES AND COIL DATA at 20°C 68°F

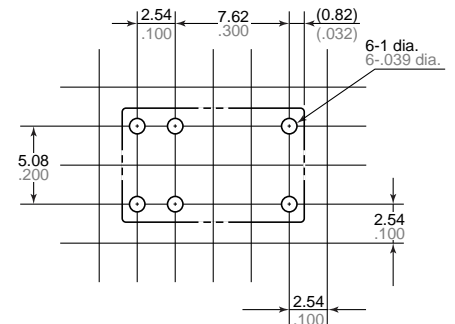
	Part No.	Nominal voltage, V DC	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Coil resistance, Ω ($\pm 10\%$)	Nominal operating current, mA	Nominal operating power, mW	Max. allowable voltage, V DC (at 70°C 158°F)
200 mW Standard type	HY1Z-1.5V	1.5	1.125	0.15	11.25	133.3	200 mW	1.8
	HY1Z-3V	3	2.25	0.3	45	66.7		3.6
	HY1Z-4.5V	4.5	3.375	0.45	101.2	44.5		5.4
	HY1Z-5V	5	3.75	0.5	125	40		6
	HY1Z-6V	6	4.5	0.6	180	33.3		7.2
	HY1Z-9V	9	6.75	0.9	405	22.2		10.8
	HY1Z-12V	12	9	1.2	720	16.7		14.4
	HY1Z-24V	24	18	2.4	2,880	8.3		28.8
150 mW High sensitivity type	HY1-1.5V	1.5	1.125	0.15	15	100	150 mW	2.1
	HY1-3V	3	2.25	0.3	60	50		4.2
	HY1-4.5V	4.5	3.375	0.45	135	33.3		6.3
	HY1-5V	5	3.75	0.5	166	30.1		7
	HY1-6V	6	4.5	0.6	240	25		8.4
	HY1-9V	9	6.75	0.9	540	16.7		12.6
	HY1-12V	12	9	1.2	960	12.5		16.8
	HY1-24V	24	18	2.4	3,840	6.25		33.6

DIMENSIONS

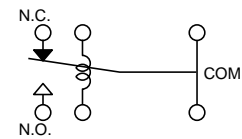
mm inch



PC board pattern (Copper-side view)



Schematic (Bottom view)

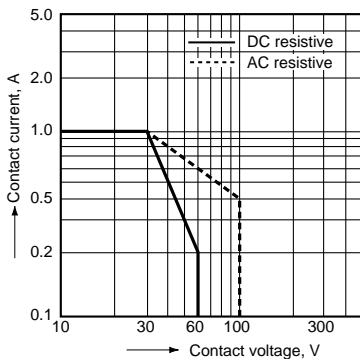


General tolerance: $\pm 0.3 \pm 0.012$

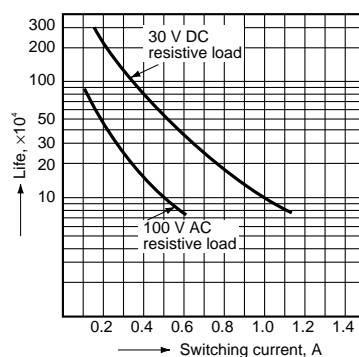
Tolerance: $\pm 0.1 \pm 0.004$

REFERENCE DATA

1. Maximum switching power

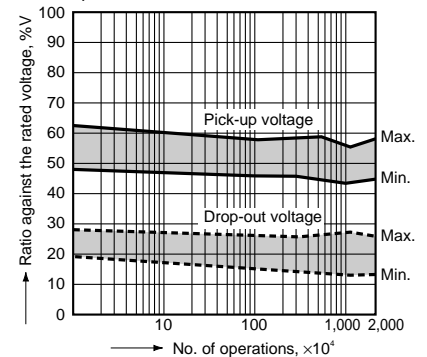


2. Life curve



3. Mechanical life

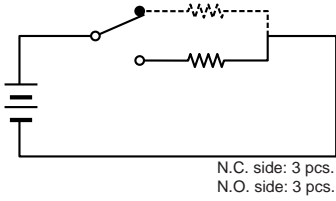
Tested sample: HY1Z-12V, 10 pcs.
Ambient temperature: 20°C to 25°C 68°F to 77°F



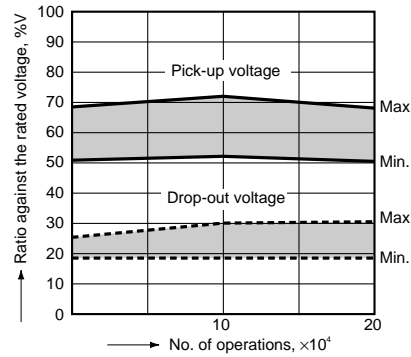
4. Electrical life

Tested sample: HY1-12V, 6 pcs.

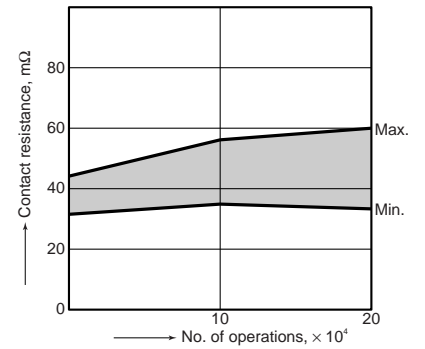
Condition: 1 A 30 V DC resistive load, 30 cpm
Circuit:



Change of pick-up and drop-out voltage

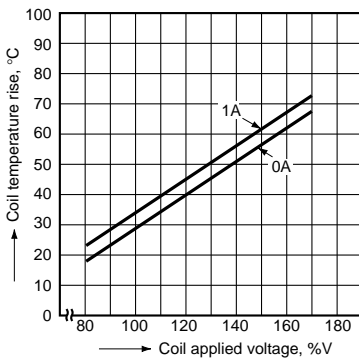


Change of contact resistance



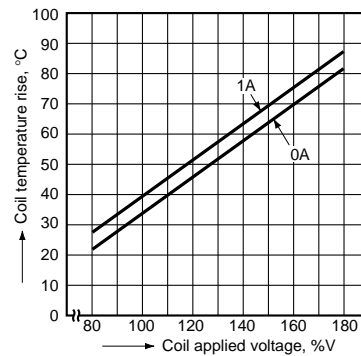
5-(1). Coil temperature rise (150 mW high sensitivity type)

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



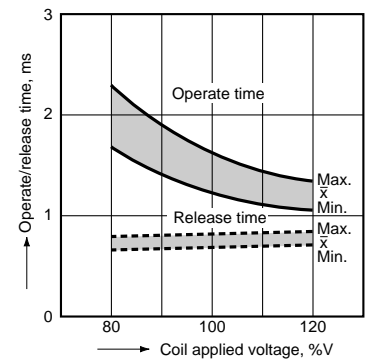
5-(2). Coil temperature rise (200 mW standard type)

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



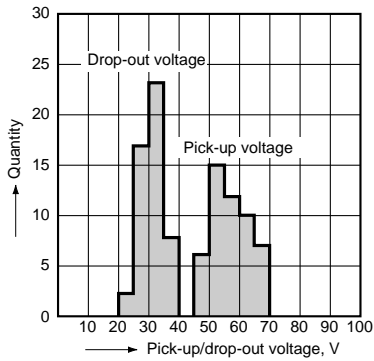
6. Operate/release time characteristics

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



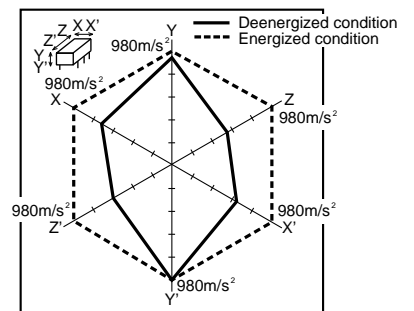
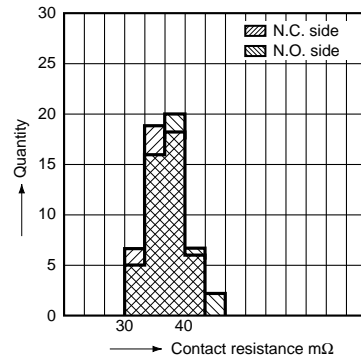
7. Distribution of pick-up and drop-out voltages

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



8. Distribution of contact resistance

Tested sample: HY1-12V, 50 pcs.



NOTE

Soldering and cleaning

HY relay have the sealed construction.

It is possible to do automatic soldering and automatic cleaning. but avoid the ultrasonic cleaning.

For cleaning, it is recommended that a fluorinated hydrocarbon or other alcoholic solvent be used.