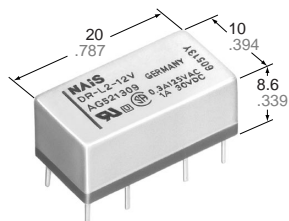


NAIS**HIGHLY RELIABLE MINIATURE
DIP RELAYS****DR-RELAYS**

mm inch

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

- High breakdown voltage — Between open contacts: 750 Vrms
Between contacts and coil: 1500 Vrms
- Surge voltage withstand: 1500 V (Based on part 68, FCC standard)
- 1 coil and 2 coil latching types available
- High sensitivity
- High contact pressure
- Miniature size and low profile — standing only 8.6 mm (.339 inches) including stand-offs on headers
- High speed — Operate time: Approx. 1 ms

SPECIFICATIONS

Contacts

Arrangement	1 Form C		
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)	60 mΩ		
Initial contact pressure	Approx. 9 g .32 oz		
Contact material	Gold cobalt		
Electrostatic capacitance	Contact-Contact	Approx. 3 pF	
	N.O. contact-Coil	Approx. 4 pF	
	N.C. contact-Coil	Approx. 5 pF	
Rating (resistive)	Nominal switching capacity	1 A 20 VDC, 0.3 A 110 VAC	
	Max. switching power	20 W, 33 VA	
	Max. switching voltage	110 V AC, 30 V DC	
	Max. switching current	AC 0.3 A, DC 1 A	
Expected life (min. operations)	Electrical	Mechanical (at 50 cps.)	10 ⁹
		1 A 20 V DC resistive	10 ⁶
		0.3 A 110 V AC resistive	10 ⁶
		0.2 A 24 V DC resistive	10 ⁷

Coil

Nominal operating power	Single side stable	78 to 160 mW
	1 coil latching	59 to 99 mW
	2 coil latching	111 to 150 mW

Remarks

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

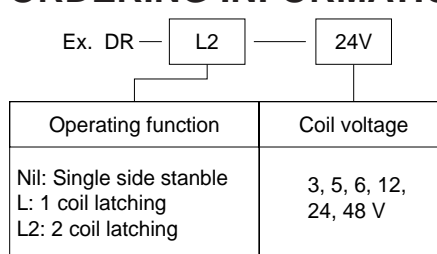
Characteristics

Max. operating speed	60 cpm at nominal load 300 cps. at no load	
Initial insulation resistance*1	Min. 1,000 MΩ at 500 V DC	
Initial breakdown voltage*2	Between open contacts	750 Vrms
	Between live parts and ground	1,000 Vrms
	Between coil and contact	1,500 Vrms
Operate time*3 (at nominal voltage)	Max. 3 ms (Approx. 1 ms)	
Release time(without diode)*3 (at nominal voltage)	(Approx. 0.5 ms)	
Contact bounce	Single side stable	Approx. 0.5 ms
	1 coil latching	Approx. 0.3 ms
	2 coil latching	Approx. 0.3 ms
Temperature rise (at 20°C)	Max. 20°C (at 120 mW application) Max. 47°C (at 500 mW application)	
Shock resistance	Functional*4	Min. 980 m/s ² {100 G}
	Destructive*5	Min. 980 m/s ² {100 G}
Vibration resistance	Functional*6	196 m/s ² {20 G}, 10 to 55 Hz at double amplitude of 3.3 mm
	Destructive	196 m/s ² {20 G}, 10 to 55 Hz at double amplitude of 3.3 mm
Conditions for operation, transport and storage*7 (Not freezing and condensing at low temperature)	Ambient temp.	-50°C to +85°C -58°F to +185°F
	Humidity	5 to 85% R.H.
Unit weight	Approx. 4 g .14 oz	

TYPICAL APPLICATIONS

Telecommunications equipment, alarm devices, machine tools, NC machines, automatic warehouse control, conveyors, air-conditioners, pressing machines, textile machinery, elevators, control panels, pin-board programmers, parking meters, industrial robots, detectors, annunciators, optical instruments, business machine, time recorders, cash registers, copiers, vending machines, medical equipment.

ORDERING INFORMATION



(Note) Standard packing: Carton; 50 pcs.
Case; 500 pcs.

TYPES AND COIL DATA at 20°C 68°F

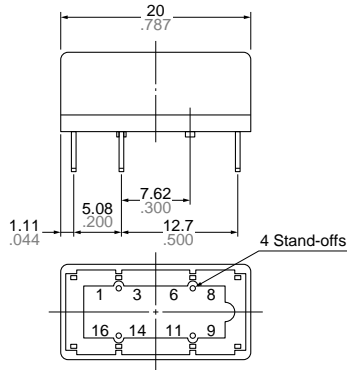
Single side stable	Pick-up voltage, V DC (max.)	Drop-out voltage, V DC (min.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%)	Nominal Operating power, mW
DR-3V	2.4	0.3	6.8	94	96
DR-5V	4.0	0.3	10.9	320	78
DR-6V	4.8	0.6	12.8	330	109
DR-12V	9.6	1.2	26.4	1,400	103
DR-24V	17.0	2.4	42.4	3,600	160
DR-48V	33.6	4.8	74.1	11,000	209

1 coil latching	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%)	Nominal Operating power, mW
DR-L-3V	2.4	8.9	160	56
DR-L-5V	4.0	14.5	420	59
DR-L-6V	4.8	17.4	610	59
DR-L-12V	9.6	33.9	2,300	63
DR-L-24V	17.0	53.8	5,800	99
DR-L-48V	33.6	102.7	21,100	110

2 coil latching	Pick-up voltage, V DC (max.)	Maximum allowable voltage, V DC	Coil resistance, Ω (± 10%) Set coil & Reset coil	Nominal Operating power, mW
DR-L2-3V	2.4	6.3	80	112
DR-L2-5V	4.0	10.6	225	111
DR-L2-6V	4.8	12.0	290	124
DR-L2-12V	9.6	24.6	1,210	119
DR-L2-24V	18.0	43.6	3,840	150
DR-L2-48V	33.6	63.0	7,950	290

DIMENSIONS

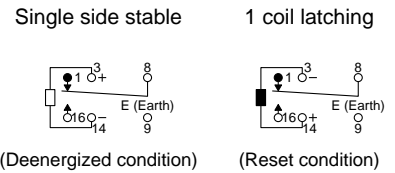
Single side stable
1 coil latching



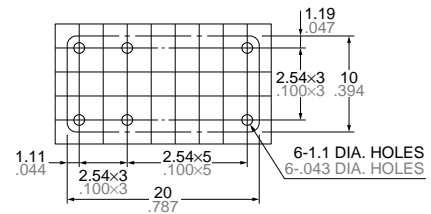
General tolerance: ±0.3 ±0.12

mm inch

Schematic (Bottom view)

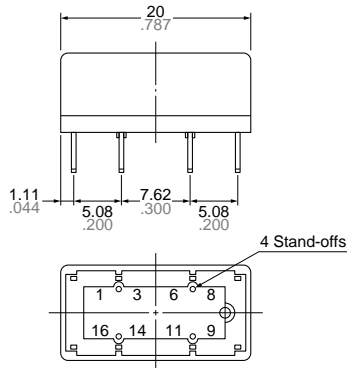


PC board pattern (Bottom view)



Tolerance: ±0.1 ±0.04

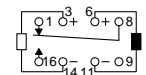
2 coil latching



General tolerance: ±0.3 ±0.12

Schematic (Bottom view)

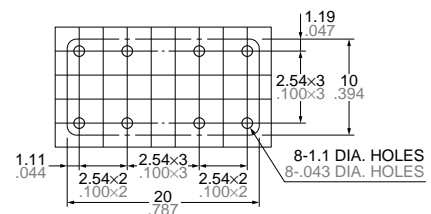
2 coil latching



(Reset condition)

Note: With the 2-coil latching type, use with one of the following combinations: No. 3 (+) and No. 14 (-) as the set coil, and No. 6 (+) and No. 1 (-) as the reset coil, or No. 6 (-) and No. 11 (+) as the set coil, and No. 3 (-) and No. 14 (+) as the reset coil.

PC board pattern (Bottom view)

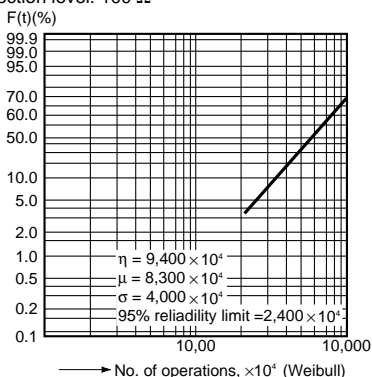


Tolerance: ±0.1 ±0.04

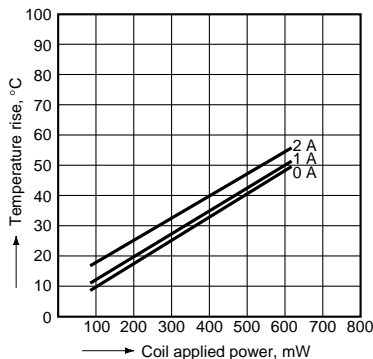
REFERENCE DATA

1. Contact reliability test

Sample: DR-12V, 10 pcs.
 Load: 10 μ A 100 mV DC, 50 cps
 Detection level: 100 Ω

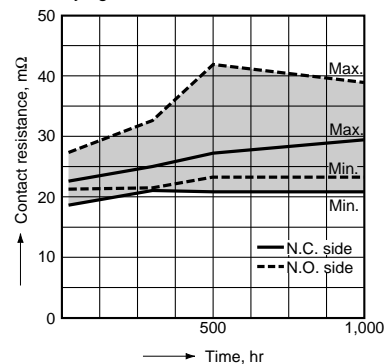


2. Coil temperature rise



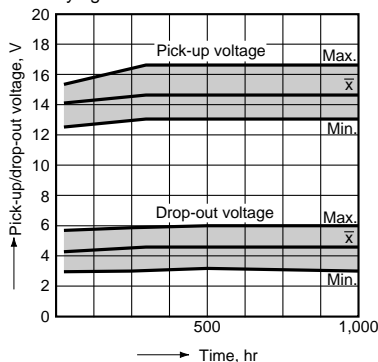
3.-(1) Leaving at high temperature

(Change of contact resistance)
 Tested Sample: DR-24V, 10 pcs
 Ambient temperature: 85°C 185°F
 Coil applied voltage: 24V DC (Nominal voltage)
 Contact carrying current: No current



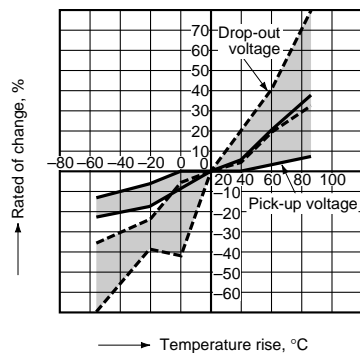
3.-(2) Leaving at high temperature

(Change of pick-up and drop-out voltages)
 Tested Sample: DR-24V, 10 pcs
 Ambient temperature: 85°C 185°F
 Coil applied voltage: 24V DC (Nominal voltage)
 Contact carrying current: No current



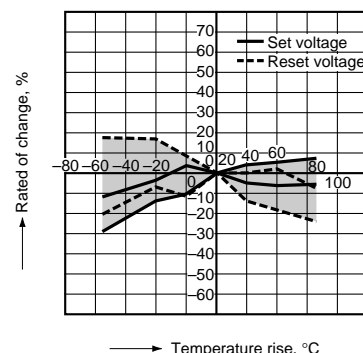
4.-(1) Pick-up/drop-out voltage vs. temperature

(Single side stable)
 Sample: DR-5V, 5 pcs.



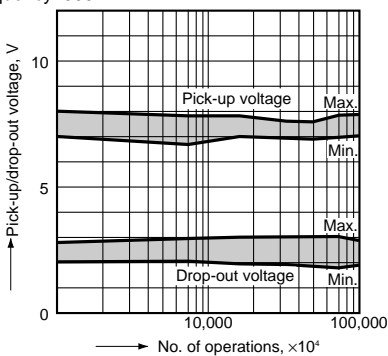
4.-(2) Pick-up/drop-out voltage vs. temperature

(1-coil latching)
 Sample: DR-L-5V, 5 pcs.



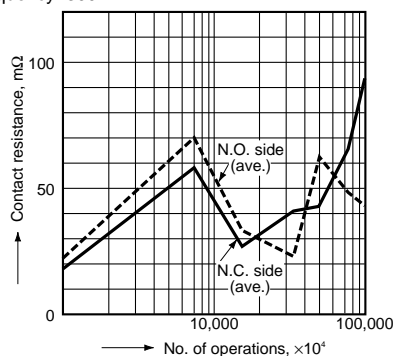
5.-(1) Mechanical life

Change of pick-up and drop-out voltage
 Sample: DR-12V, 5 pcs.
 Frequency: 300 Hz



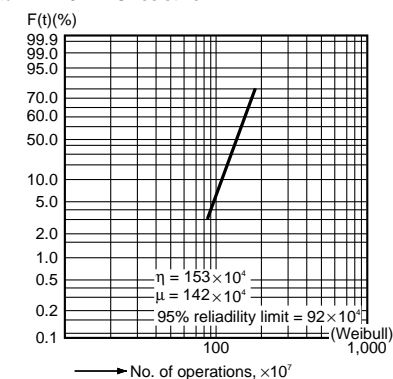
5.-(2) Mechanical life

Change of contact resistance
 Sample: DR-12V, 5 pcs.
 Frequency: 300 Hz



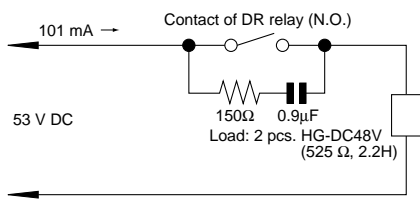
6.-(1) Electrical life

Sample: DR-12V, 10 pcs.
 Load: 1 A 20 V DC resistive

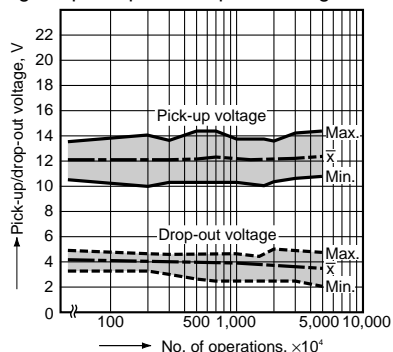


6.-(2) Electrical life test

Sample 10 pcs. DR-12V
 Load: 101 mA 53 V DC relay coil
 2 pcs. HG4-DC48V coils in parallel



Change of pick-up and drop-out voltage



Change of contact resistance

