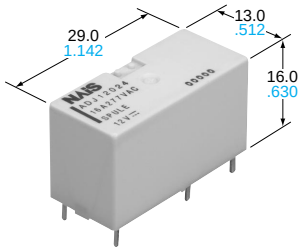
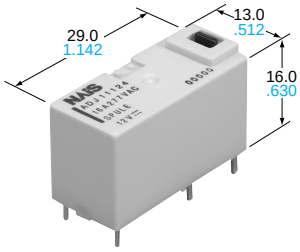
c UL us pending VDE pending

16A, COMPACT AND HIGH INSULATION POWER LATCHING RELAY

DJ-RELAYS



Without test button



With test button

FEATURES

1. Latching operation
Latching via a polarized magnetic circuit structure allows remote operation and lower energy consumption

2. Compact with high capacity
16A contact rating in a compact 29 x 13 x 16.5 mm (L x W x H) size.

3. Low power consumption
1 coil latching: 150mW
2 coil latching: 250mW

4. High insulation
Both clearance and creepage distance between coil and contact are at 8 mm min.

5. With operation verification function
A test button (manual lever) type to facilitate circuit checks is also available.

TYPICAL APPLICATIONS

- Network for household appliances (Motor control, Light control)
- Time switches

SPECIFICATIONS

Contact

Arrangement		1 Form A, 1 Form C
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		100 mΩ
Contact material		Silver alloy
Rating (resistive load)	Nominal switching capacity	16 A 250V AC
	Max. switching power	4,000 V A
	Max. switching voltage	250V AC
	Max. switching current	16 A
Expected life (min. operations)	Mechanical (at 180 cpm)	5×10^6
	Electrical (Resistive load)*1 (at 20 cpm)	10^5 (at 16A 250V AC)

Coil

Nominal operating power	1 coil latching	150mW
	2 coil latching	250mW

Characteristics

Initial insulation resistance*2		Min. 1,000 MΩ (at 500 V DC)
Initial breakdown voltage*3	Between open contacts	1,000 Vrms for 1 min.
	Between contacts and coil	4,000 Vrms for 1 min.
Surge voltage between contact and coil*4		Min. 10,000 V (initial)
Set time*5 (at nominal voltage)		Approx. 10ms
Reset time*5 (at nominal voltage)		Approx. 10ms
Temperature rise (at 70°C)*6		Max. 55°C
Shock resistance	Functional*7	Min. 200 m/s² {20 G}
	Destructive*8	Min. 1,000 m/s² {100 G}
Vibration resistance	Functional*9	10 to 55Hz at double amplitude of 2.0mm
	Destructive	10 to 55Hz at double amplitude of 3.0mm
Conditions for operation, transport and storage*10 (Not freezing and condensing at low temperature)	Ambient temperature	–40°C to +70°C –40°F to +158°F
	Humidity	5 to 85% R.H.
Unit weight		Approx. 14 g .49 oz

Remarks

* Specifications will vary with foreign standards certification ratings.
*1 With breathing holes open
*2 Measurement at same location as "Initial breakdown voltage" section.
*3 Detection current: 10mA
*4 Wave is standard shock voltage of ±1.2 × 50μs according to JEC-212-1981
*5 Excluding contact bounce time.
*6 By resistive method, max. switching current
*7 Half-wave pulse of sine wave: 11 ms; detection time: 10 μs
*8 Half-wave pulse of sine wave: 6 ms
*9 Detection time: 10 μs
*10 Refer to 5. Usage, transport and storage conditions mentioned in NOTES

ORDERING INFORMATION

Ex. ADJ □ □ □ □□

Contact arrangement	Operating function and protective construction	Auxiliary function	Coil voltage (DC)
1: 1 Form C 2: 1 Form A	1: 1 coil latching, Flux-resistant type 2: 1 coil latching, Sealed type 3: 2 coil latching, Flux-resistant type 4: 2 coil latching, Sealed type	0: Without test button 1: With test button	05: 5 V 12: 12 V 06: 6 V 24: 24 V 48: 48 V

Note: Standard packing: Carton: 100 pcs, Case: 500 pcs

TYPES

1. Without test button

1) Flux-resistant type

Contact arrangement	Coil voltage, V DC	1 coil latching type	2 coil latching type
		Part No.	Part No.
1 Form A	5	ADJ21005	ADJ23005
	6	ADJ21006	ADJ23006
	12	ADJ21012	ADJ23012
	24	ADJ21024	ADJ23024
	48	ADJ21048	ADJ23048
1 Form C	5	ADJ11005	ADJ13005
	6	ADJ11006	ADJ13006
	12	ADJ11012	ADJ13012
	24	ADJ11024	ADJ13024
	48	ADJ11048	ADJ13048

2) Sealed type

Contact arrangement	Coil voltage, V DC	1 coil latching type	2 coil latching type
		Part No.	Part No.
1 Form A	5	ADJ22005	ADJ24005
	6	ADJ22006	ADJ24006
	12	ADJ22012	ADJ24012
	24	ADJ22024	ADJ24024
	48	ADJ22048	ADJ24048
1 Form C	5	ADJ12005	ADJ14005
	6	ADJ12006	ADJ14006
	12	ADJ12012	ADJ14012
	24	ADJ12024	ADJ14024
	48	ADJ12048	ADJ14048

2. With test button

Flux-resistant type

Contact arrangement	Coil voltage, V DC	1 coil latching type	2 coil latching type
		Part No.	Part No.
1 Form A	5	ADJ21105	ADJ23105
	6	ADJ21106	ADJ23106
	12	ADJ21112	ADJ23112
	24	ADJ21124	ADJ23124
	48	ADJ21148	ADJ23148
1 Form C	5	ADJ11105	ADJ13105
	6	ADJ11106	ADJ13106
	12	ADJ11112	ADJ13112
	24	ADJ11124	ADJ13124
	48	ADJ11148	ADJ13148

COIL DATA (at 20°C 68°F)

• 1 coil latching type

Nominal voltage, V DC	Set voltage, max. V DC (initial)	Reset voltage, max. V DC (initial)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
5	3.5	3.5	167	150	6.5
6	4.2	4.2	240		7.8
12	8.4	8.4	960		15.6
24	16.8	16.8	3,840		31.2
48	33.6	33.6	15,360		62.4

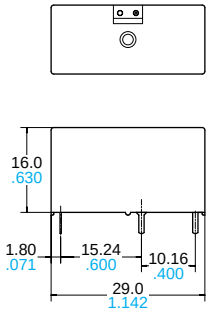
• 2 coil latching type

Nominal voltage, V DC	Set voltage, max. V DC (initial)	Reset voltage, max. V DC (initial)	Coil resistance, Ω (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
5	3.5	3.5	100	250	6.5
6	4.2	4.2	144		7.8
12	8.4	8.4	576		15.6
24	16.8	16.8	2,304		31.2
48	33.6	33.6	9,216		62.4

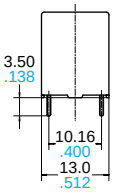
DIMENSIONS

mm inch

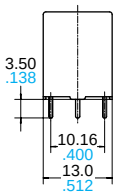
1. 1 Form A, without test button



1 coil latching type

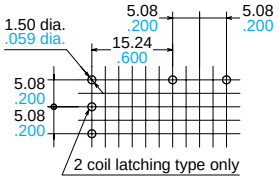


2 coil latching type



General tolerance: ±0.3 ±.012

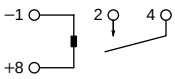
PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

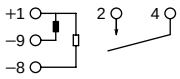
Schematic (Bottom view)

1 coil latching type



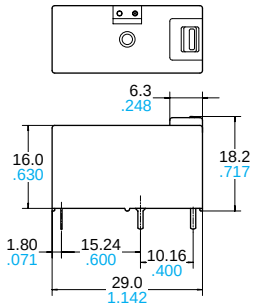
(Reset condition)

2 coil latching type

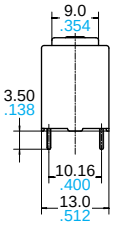


(Reset condition)

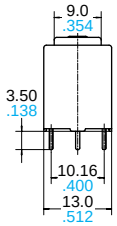
2. 1 Form A, with test button



1 coil latching type

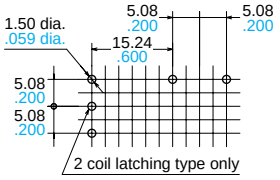


2 coil latching type



General tolerance: ±0.3 ±.012

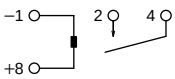
PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

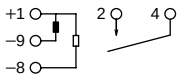
Schematic (Bottom view)

1 coil latching type



(Reset condition)

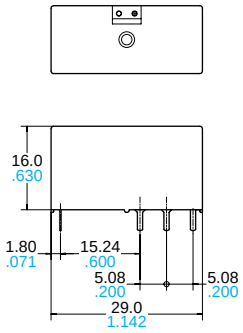
2 coil latching type



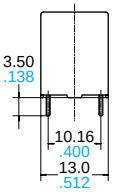
(Reset condition)

3. 1 Form C, without test button

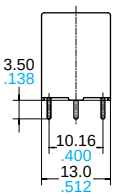
mm inch



1 coil latching type

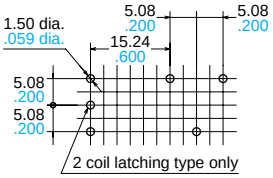


2 coil latching type



General tolerance: ±0.3 ±.012

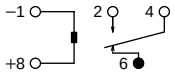
PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

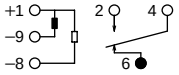
Schematic (Bottom view)

1 coil latching type



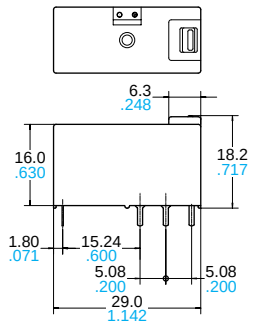
(Reset condition)

2 coil latching type

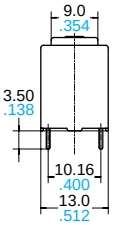


(Reset condition)

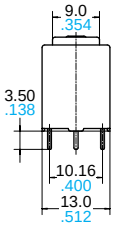
4. 1 Form C, with test button



1 coil latching type

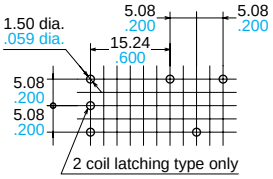


2 coil latching type



General tolerance: ±0.3 ±.012

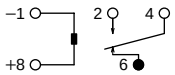
PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

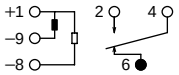
Schematic (Bottom view)

1 coil latching type



(Reset condition)

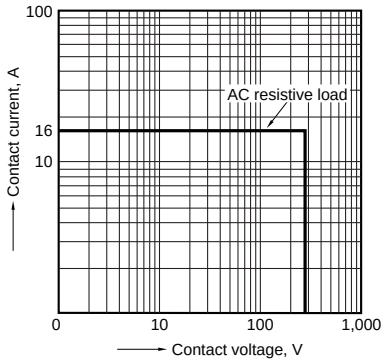
2 coil latching type



(Reset condition)

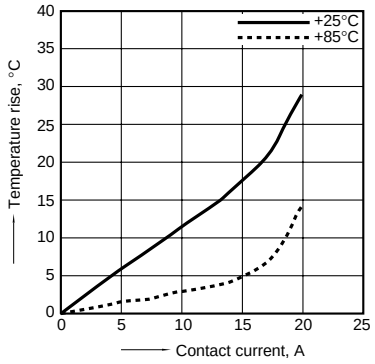
REFERENCE DATA

1. Max. switching capacity



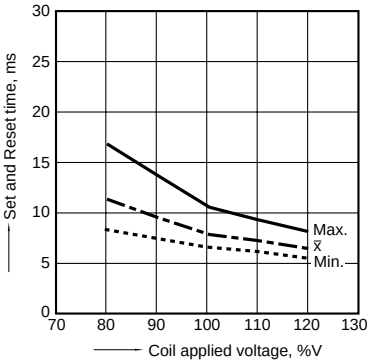
2. Temperature rise

Sample: ADJ12024, 6 pcs.
Coil applied voltage: 0 %V, Contact current: 16 A, 20 A
Measured portion: Contact, Ambient temperature:
25°C 77°F, 85°C 185°F



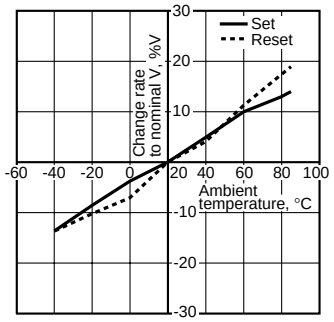
3. Set and Reset time

Sample: ADJ12024, 10 pcs



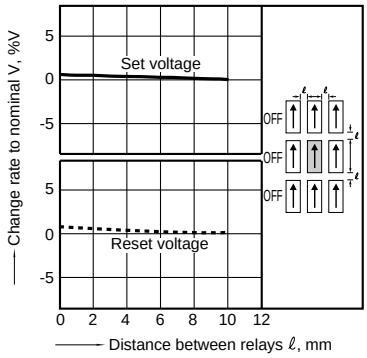
4. Ambient temperature characteristics

Sample: ADJ12024, 6pcs
Ambient temperature: –40 to +85°C –40 to 185°F



5. Influence of adjacent mounting

Sample: ADJ12024, 6pcs
Ambient temperature: Room temperature



NOTES

1. Coil operating power

Pure DC current should be applied to the coil. The wave form should be rectangular. If it includes ripple, the ripple factor should be less than 5%. However, check it with the actual circuit since the characteristics may be slightly different.

2. Coil connection

When connecting coils, refer to the wiring diagram to prevent mis-operation or malfunction.

3. Soldering

We recommend the following soldering conditions
Soldering: 200°C 392° F, max. 5 s

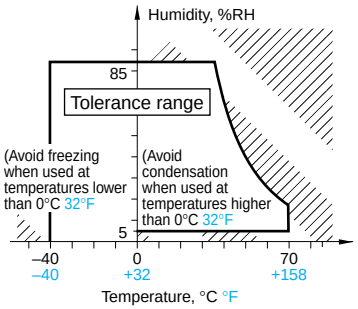
4. Others

1) If the relay has been dropped, the appearance and characteristics should always be checked before use.
2) The cycle lifetime is defined under the standard test condition specified in the JIS* C 5442-1996 standard (temperature 15 to 35°C 59 to 95°F, humidity 25 to 85%). Check this with the real device as it is affected by coil driving circuit, load type, activation frequency, activation phase,ambient conditions and other factors.
Also, be especially careful of loads such as those listed below.
• When used for AC load-operating and the operating phase is synchronous. Rocking and fusing can easily occur due to contact shifting.
• High-frequency load-operating
When high-frequency opening and closing of the relay is performed with a load that causes arcs at the contacts, nitrogen and oxygen in the air is fused by the arc energy and HNO_3 is formed. This can corrode metal materials.
Three countermeasures for these are listed here.
• Incorporate an arc-extinguishing circuit.
• Lower the operating frequency
• Lower the ambient humidity
3) For secure operations, the voltage applied to the coil should be nominal voltage. In addition, please note that pick-up and drop-out voltage will vary according to the ambient temperature and operation conditions.
4) Heat, smoke, and even a fire may occur if the relay is used in conditions outside of the allowable ranges for the coil ratings, contact ratings, operating cycle lifetime, and other specifications. Therefore, do not use the relay if these ratings are exceeded. Also, make sure that the relay is wired correctly.
5) Incorrect wiring may cause unexpected events or the generation of heat or flames.
6) Check the ambient conditions when storing or transporting the relays and devices containing the relays. Freezing or condensation may occur in the relay, causing functional damage. Avoid subjecting the relays to heavy loads, or strong vibration and shocks.

5. Usage, transport and storage conditions

1) Ambient temperature, humidity, and atmospheric pressure during usage, transport, and storage of the relay:

- Temperature:
  –40 to +70°C –40 to +158°F
- Humidity: 5 to 85% RH
  (Avoid freezing and condensation.)
  The humidity range varies with the temperature. Use within the range indicated in the graph below.



- Atmospheric pressure: 86 to 106 kPa
  Temperature and humidity range for usage, transport, and storage

2) Condensation

Condensation forms when there is a sudden change in temperature under high temperature and high humidity conditions. Condensation will cause deterioration of the relay insulation.

3) Freezing

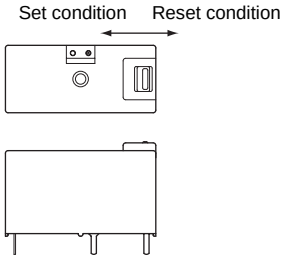
Condensation or other moisture may freeze on the relay when the temperatures is lower than 0°C 32° F. This causes problems such as sticking of movable parts or operational time lags.

4) Low temperature, low humidity environments

The plastic becomes brittle if the relay is exposed to a low temperature, low humidity environment for long periods of time.

6. Test button (manual lever) operation

The relay contacts switch over as follows:



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