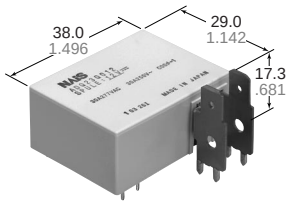
NAiS

30A POWER LATCHING RELAY

DQ-RELAYS



FEATURES

1. Compact with high capacity
Although compact this relay can handle high capacity control of 30A.

2. Latching type
With latching this relay contributes to energy conservation in devices.

3. High insulation
Designed with an insulation distance of at least 8 mm.

4. Cadmium and lead free

5. Complies with safety standards
UL, CSA and VDE approved.

SPECIFICATIONS

Contact

Arrangement		1 Form A
Initial contact resistance, max. (By voltage drop 6 V DC 1 A)		30 mΩ
Contact material		Silver alloy
Rating (resistive load)	Nominal switching capacity	30 A 250V AC
	Max. switching power	7,500 V A
	Max. switching voltage	250V AC
	Max. switching current	30 A
Expected life (min. operations)	Mechanical (at 180 cpm)	10^6
	Electrical (Resistive load)	10^{4}*1

Coil

	Nominal operating power
1 coil latching	800 mW
2 coil latching	1,600 mW

Remarks

* Specifications will vary with foreign standards certification ratings.
*1 At nominal switching capacity, operating frequency: 3s ON, 3s OFF
*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
*11 Under the packing condition, allowable temperature range is from –40 to +65°C –40° to +149°F.

Characteristics

Max. operating speed (at rated load)		180 cpm
Initial insulation resistance*2		Min. 1,000 MΩ (at 500 V DC)
Initial breakdown voltage*3	Between open contacts	1,500 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)
Operate time [Set time]*5 (at 20°C) (at nominal voltage)		Max. 20ms
Release time [Reset time]*5 (at 20°C) (at nominal voltage)		Max. 20ms
Temperature rise (at 65°C)*6		Max. 50°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 1.5mm
	Destructive	10 to 55Hz at double amplitude of 2.0mm
Conditions for operation, transport and storage*10 (Not freezing and condensing at low temperature)	Ambient temperature*11	–40°C to +65°C –40°F to +149°F
	Humidity	5 to 75% R.H.
Unit weight		Approx. 35 g 1.23 oz

TYPICAL APPLICATIONS

- Time switches
- Electric water heaters
- Remote control of electric power meters

ORDERING INFORMATION

ADQ [ ] [3] [Q] [0] [ ]

Operating function	Contact capacity	Terminal shape	Contact characteristics	Coil voltage (DC)
1: 1 coil latching 2: 2 coil latching	3: 30 A	Q: 250 Faston terminal	0: Standard contact	4H: 4.5 V 12: 12 V 06: 6 V 24: 24 V 09: 9 V

TYPES AND COIL DATA (at 20°C 68°F)

• 1 coil latching type

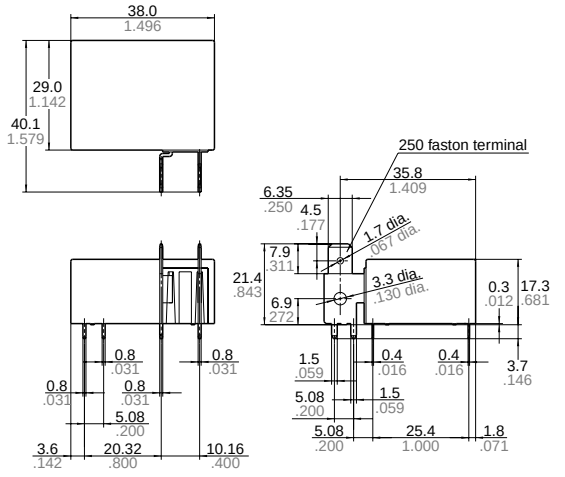
Contact arrangement	Part No.	Nominal voltage, V DC	Set voltage, max. V DC (initial)	Reset voltage, max. V DC (initial)	Coil resistance, Ω (±10%)	Nominal operating current, mA (±10%)	Nominal operating power, mW	Max. allowable voltage, V DC
1 Form A	ADQ13Q04H	4.5	3.15	3.15	40.5	111.1	500	5.85
	ADQ13Q006	6	4.2	4.2	72	83.3	500	7.8
	ADQ13Q009	9	6.3	6.3	162	55.6	500	11.7
	ADQ13Q012	12	8.4	8.4	288	41.7	500	15.6
	ADQ13Q024	24	16.8	16.8	1152	20.8	500	31.2

• 2 coil latching type

Contact arrangement	Part No.	Nominal voltage, V DC	Set voltage, max. V DC (initial)	Reset voltage, max. V DC (initial)	Coil resistance, Ω (±10%)		Nominal operating current, mA (±10%)		Nominal operating power, mW		Max. allowable voltage, V DC
					Set coil	Reset coil	Set coil	Reset coil	Set coil	Reset coil	
1 Form A	ADQ23Q04H	4.5	3.15	3.15	20.3	20.3	221.7	221.7	1,000	1,000	5.85
	ADQ23Q006	6	4.2	4.2	36	36	166.7	166.7	1,000	1,000	7.8
	ADQ23Q009	9	6.3	6.3	81	81	111.1	111.1	1,000	1,000	11.7
	ADQ23Q012	12	8.4	8.4	144	144	83.3	83.3	1,000	1,000	15.6
	ADQ23Q024	24	16.8	16.8	576	576	41.7	41.7	1,000	1,000	31.2

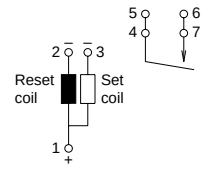
DIMENSIONS

mm inch



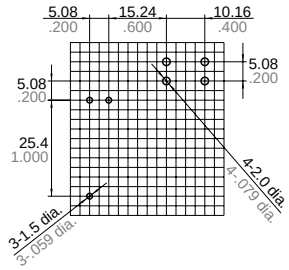
General tolerance: ±0.3 ±.012

Schematic (Bottom view)



Note) Terminal No.3 is only for 2 coil latching type.

PC board pattern (Bottom view)



Tolerance: ±0.1 ±.004

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: 300°C 572° 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 75%). 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.

(1) When used for AC load-operating and the operating phase is synchronous. Rocking and fusing can easily occur due to contact shifting.

(2) 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.

1. Incorporate an arc-extinguishing circuit.
2. Lower the operating frequency
3. 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:

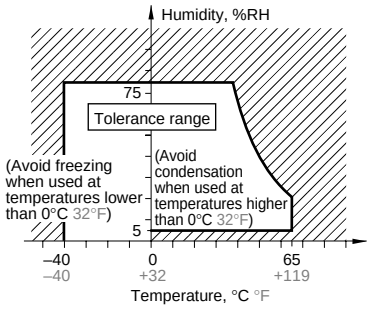
(1) Temperature:

–40 to +65°C – 40 to +149° F

(2) Humidity: 5 to 75% RH

(Avoid freezing and condensation.)

The humidity range varies with the temperature. Use within the range indicated in the graph below.



(3) 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.