

**HIGH ELECTRICAL &
MECHANICAL NOISE
IMMUNITY RELAY**

PQ RELAYS



FEATURES

- 1. Compact and slim**
20 mm (L) × 10 mm (W) × 16 mm (H)
.787 inch (L) × .394 inch (W) × .630 inch (H) slim type
- 2. Twin contact structure**
Gold-clad twin (bifurcated) contacts provide high reliability.
- 3. High capacity and small size**
This small package can provide high 5 A capacity.
- 4. High sensitivity with 200 mW nominal operating power**
- 5. 8,000 V surge breakdown voltage**
Despite the compact size, between contact and coil surge resistance of 8,000 V has been achieved. The relay has low susceptibility to noise.
- 6. Outstanding shock resistance.**
Functional shock resistance: 294 m/s²
- 7. Most suitable for PLC output and internal device output relays.**
- 8. Sealed type**

TYPICAL APPLICATIONS

- 1. Programmable controllers**
- 2. Interface relays for Factory Automation and Communication equipment**
- 3. Output relays for measuring equipment, timers, counters and temperature controllers**

RoHS Directive compatibility information
<http://www.mew.co.jp/ac/e/environment/>

ORDERING INFORMATION

PQ **1a** -

Contact arrangement
1a: 1 Form A (Bifurcated)

Coil voltage (DC)
3, 5, 6, 9, 12, 18, 24 V

Notes: 1. UL/CSA, VDE, SEMKO approved type is standard.
2. TÜV approved type is available.

TYPES

Contact arrangement	Nominal coil voltage	Part No.
1 Form A (Bifurcated)	3V DC	PQ1a-3V
	5V DC	PQ1a-5V
	6V DC	PQ1a-6V
	9V DC	PQ1a-9V
	12V DC	PQ1a-12V
	18V DC	PQ1a-18V
	24V DC	PQ1a-24V

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

RATING

1. Coil data

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. allowable voltage
3V DC	75%V or less of nominal voltage (Initial)	5%V or more of nominal voltage (Initial)	66.7mA	45 Ω	200mW	180%V of nominal voltage (at 20°C 68°F) 130%V of nominal voltage (at 70°C 158°F)
5V DC			40mA	125 Ω		
6V DC			33.3mA	180 Ω		
9V DC			22.2mA	405 Ω		
12V DC			16.7mA	720 Ω		
18V DC			11.1mA	1,620 Ω		
24V DC			8.3mA	2,880 Ω		

2. Specifications

Characteristics	Item	Specifications	
Contact	Arrangement	1 Form A (Bifurcated)	
	Initial contact resistance, max.	Max. 50 m Ω (By voltage drop 6 V DC 1A)	
	Contact material	Au-clad AgNi type	
Rating	Nominal switching capacity (resistive load)	5 A 250 V AC, 5 A 30 V DC	
	Max. switching power (resistive load)	1,250 VA, 150 W	
	Max. switching voltage	250 V AC, 110 V DC (0.3 A)	
	Max. switching current	5 A	
	Nominal operating power	200 mW	
	Min. switching capacity (Reference value)*1	100 μ A 100mV DC	
Electrical characteristics	Insulation resistance (Initial)	Min. 1,000M Ω (at 500V DC) Measurement at same location as "Initial breakdown voltage" section.	
	Breakdown voltage (Initial)	Between open contacts	1,000 Vrms for 1min. (Detection current: 10mA.)
		Between contact and coil	4,000 Vrms for 1min. (Detection current: 10mA.)
	Surge breakdown voltage (Initial)*2	Between contacts and coil	8,000 V
	Temperature rise		Max. 45°C (By resistive method, nominal voltage applied to the coil, contact carrying current: 5 A, at 70°C)
	Operate time (at 20°C 68°F)		Max. 20 ms (Nominal voltage applied to the coil, excluding contact bounce time.)
Release time (at 20°C 68°F)		Max. 10 ms (Nominal voltage applied to the coil, excluding contact bounce time.) (without diode)	
Mechanical characteristics	Shock resistance	Functional	Min. 294 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 2.0 mm (Detection time: 10 μ s.)
		Destructive	10 to 55 Hz at double amplitude of 3.5 mm
Expected life	Mechanical	Min. 2 $\times 10^7$ (at 180 cpm)	
	Electrical (at 20 cpm)	Min. 2 $\times 10^5$ (5 A 125 V AC), Min. 10 ⁵ (5 A 250 V AC), Min. 10 ⁵ (5 A 30 V DC)	
Conditions	Conditions for operation, transport and storage*3	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 cpm	
Unit weight		Approx. 7 g .25 oz	

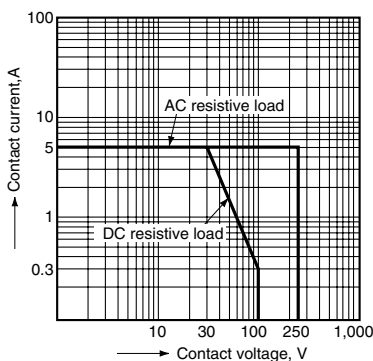
Notes: *1 This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.

*2 Wave is standard shock voltage of $\pm 1.2 \times 50\mu$ s according to JEC-212-1981

*3 Refer to 6. Conditions for operation, transport and storage mentioned in AMBIENT ENVIRONMENT.

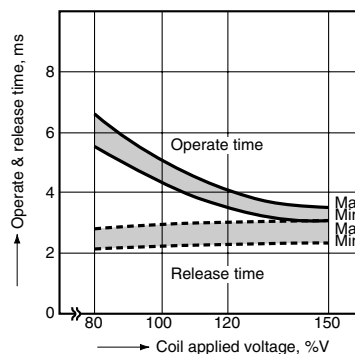
REFERENCE DATA

1. Max. switching capacity



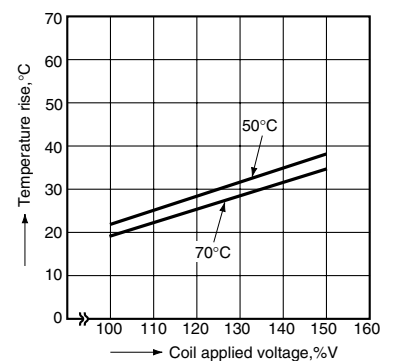
2. Operate & release time

Tested sample: PQ1a-24V, 25 pcs.



3. Coil temperature rise

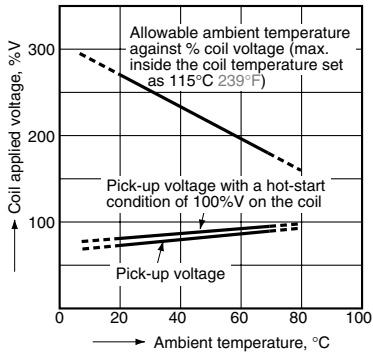
Measured portion: Inside the coil
Contact carrying current: 5 A



4. Ambient temperature characteristics

Tested sample: PQ1a-24V

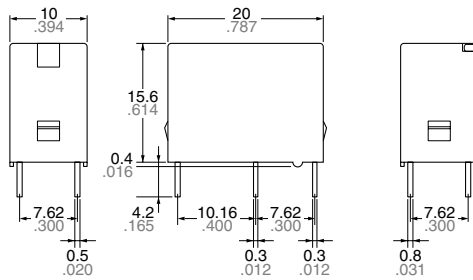
Contact carrying current: 5 A



DIMENSIONS (Unit: mm inch)

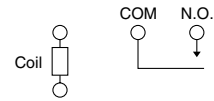


External dimensions

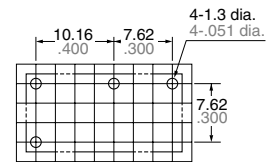


Dimension :	General tolerance
Max. 1mm .039 inch	$\pm 0.2 \pm .008$
1 to 5mm .039 to .118 inch	$\pm 0.3 \pm .012$
Min. 5mm .118 inch	$\pm 0.4 \pm .016$

Schematic (Bottom view)



PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm .004$

For Cautions for Use, see Relay Technical Information.