



RoHS compliant

FEATURES

- Sound pressure reduced by approx. 20 dB from that of the company's non-silent relays
- Space saving
- Adopting standard terminal pitch (for compact relays)
- Plastic sealed type
- Wiper load models are listed

TYPICAL APPLICATIONS

For intermittent wipers and applications requiring quiet operation

ORDERING INFORMATION

| | | | | |
|-----------------------------|-----|--|---|--|
| | ACQ | | 3 | |
| Contact arrangement | | | | |
| 1: 1 Form C | | | | |
| W1: 1 Form C for wiper load | | | | |
| Protective construction | | | | |
| 3: Sealed type | | | | |
| Coil voltage (DC) | | | | |
| 1: 12 V | | | | |

TYPES

| Contact arrangement | Coil voltage | Part No. |
|-------------------------|--------------|----------|
| 1 Form C | 12V DC | ACQ131 |
| 1 Form C for wiper load | | ACQW131 |

Standard packing; Carton (tube): 40 pcs.; Case: 800 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 [±10%] (at 20°C 68°F) | Coil resistance [±10%] (at 20°C 68°F) | Nominal operating power | Usable voltage range |
|----------------------|-----------------------------------|------------------------------------|--|--|-------------------------|----------------------|
| 12V DC | Max. 7.2V DC (Initial) | Min. 1.0V DC (Initial) | 53.3 mA | 225Ω | 640 mW | 10 to 16V DC |

Note: Other pick-up voltage types are also available. Please contact us for details.

CQ (ACQ)

2. Specifications

1) Standard CQ relay

| Characteristics | Item | | Specifications |
|----------------------------|---|---------------------------|---|
| Contact | Arrangement | | 1 Form C |
| | Contact resistance (Initial) | | N.O.: Typ7mΩ, N.C.: Typ8mΩ (By voltage drop 6V DC 1A) |
| | Contact voltage drop | | Max. 0.2V (at 10 A) |
| | Contact material | | Ag alloy (Cadmium free) |
| Rating | Nominal switching capacity (resistive load) | | N.O.: 20A 14V DC, N.C.: 10A 14V DC |
| | Max. carrying current (12V DC initial)*3 | | N.O.: 35A for 2 minutes, 25A for 1 hour (at 20°C 68°F) 30A for 2 minutes, 20A for 1 hour (at 85°C 185°F) |
| | Nominal operating power | | 640 mW |
| | Min. switching capacity (resistive load)*1 | | 1A 14V DC |
| Electrical characteristics | Insulation resistance (Initial) | | Min. 100 MΩ (at 500V DC, Measurement at same location as "Breakdown voltage" section.) |
| | Breakdown voltage (Initial) | Between open contacts | 500 Vrms for 1 min. (Detection current: 10mA) |
| | | Between contacts and coil | 500 Vrms for 1 min. (Detection current: 10mA) |
| | Operate time (at nominal voltage) | | Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial) |
| Mechanical characteristics | Release time (at nominal voltage) | | Max. 10ms (at 20°C 68°F, excluding contact bounce time) (Initial) |
| | Shock resistance | Functional | Min. 100 m/s ² {10G} (Half-wave pulse of sine wave: 11ms; detection time: 10μs) |
| | | Destructive | Min. 1,000 m/s ² {100G} (Half-wave pulse of sine wave: 6ms) |
| | Vibration resistance | Functional | 10 Hz to 100 Hz, Min. 44.1 m/s ² {4.5G} (Detection time: 10μs) |
| | | Destructive | 10 Hz to 500 Hz, Min. 44.1 m/s ² {4.5G} |
| | Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours | | |
| Expected life | Mechanical | | Min. 10 ⁷ (at 120 cpm) |
| | Electrical*4 | | <Resistive load> Min. 10 ⁵ (at nominal switching capacity, operating frequency: 1s ON, 9s OFF) <Motor load> Min. 3×10 ⁵ (Inrush 30A, steady 5A, 20A 14V DC at brake current) (Operating frequency: 1s ON, 2s OFF) |
| Conditions | Conditions for operation, transport and storage*2 | | Ambient temperature: -40°C to +85°C -40°F to +185°F Humidity: 5% R.H. to 85% R.H. (Not freezing and condensing at low temperature) |
| | Max. operating speed | | 6 cpm (at nominal switching capacity) |
| Mass | | | Approx. 6.5g .23 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. The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. Please refer to "Usage ambient condition" in CAUTIONS FOR USE OF AUTOMOTIVE RELAYS.

*3. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

*4. Motor load does not apply to wiper load applications.

2) For wiper load (ACQW131)

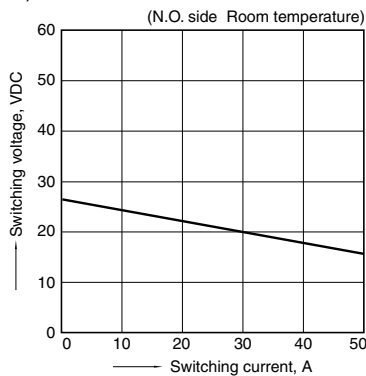
Anything outside of that given below complies with standard CQ relays.

| Characteristics | Item | | Specifications |
|-----------------|--|--|--|
| Rating | Max. carrying current (12V DC initial)*1 | | N.O.: 25A for 1 minutes, 15A for 1 hour (at 20°C 68°F) |
| Expected life | Electrical | | <Wiper motor load (L = Approx. 1mH)> N.O. side: Min. 5×10 ⁵ (Inrush 25A, steady 6A 14V DC) |
| | | | N.C. side: Min. 5×10 ⁵ (12A 14V DC at brake current) (Operating frequency: 1s ON, 9s OFF) |

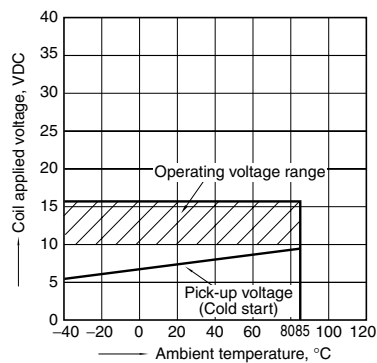
Note: *1. Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

REFERENCE DATA

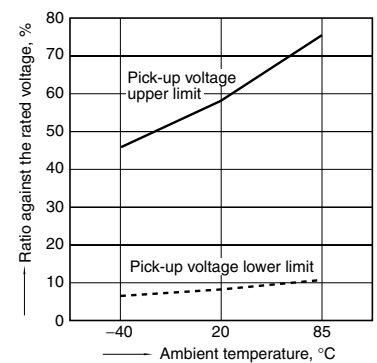
1. Max. switching capability (Resistive load, initial)



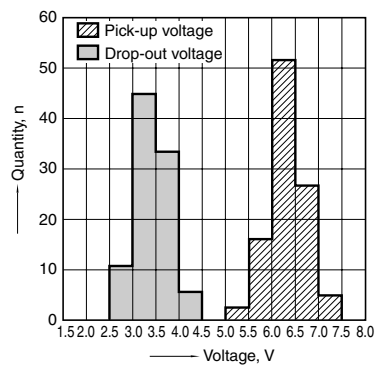
2. Ambient temperature and operating voltage range



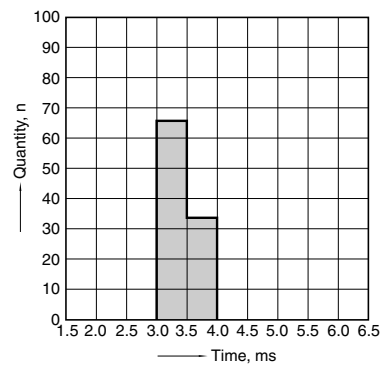
3. Ambient temperature characteristics



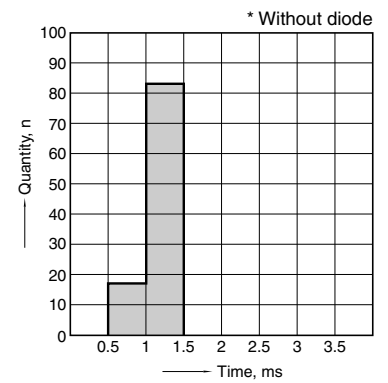
4. Distribution of pick-up and drop-out voltage
Sample: ACQ131, 100pcs



5. Distribution of operate time
Sample: ACQ131, 100pcs



6. Distribution of release time
Sample: ACQ131, 100pcs



7. Electrical life test for wiper load (motor free)

Sample: ACQW131

Quantity: n = 3

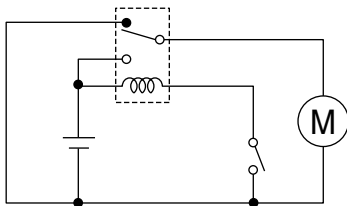
Load: N.O. side: Inrush 25A, steady 6A 14V DC

N.C. side: Brake current 12A 14V DC

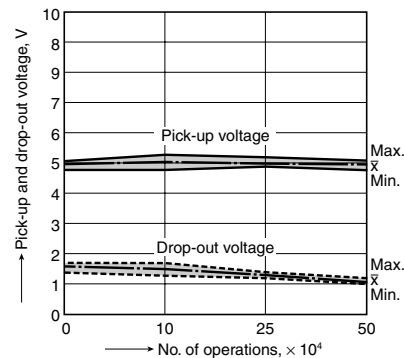
Operating frequency: ON 1s, OFF 9s

Ambient temperature: Room temperature

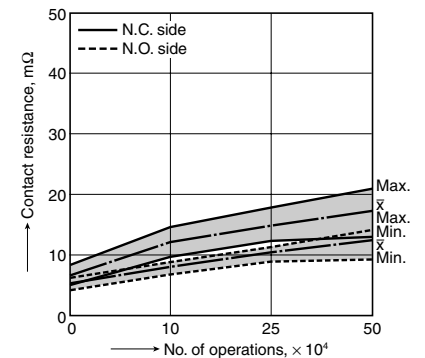
Circuit



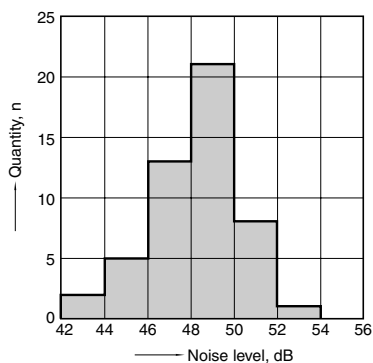
Change of pick-up and drop-out voltage



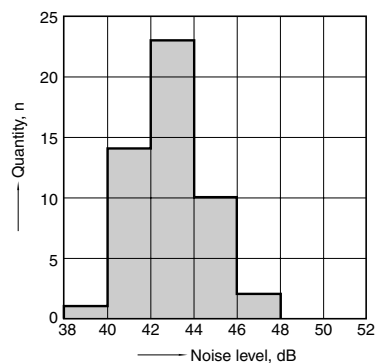
Change of contact resistance



8.-(1) Operation noise distribution
When operate



8.-(2) Operation noise distribution
When release



Measuring conditions

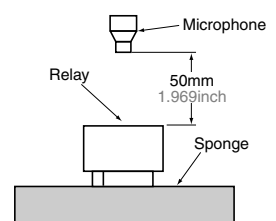
Sample: ACQ131, 50 pcs.

Equipment setting: "A" weighted, Fast, Max. hold

Coil voltage: 12V DC

Coil connection device: Diode

Background noise: Approx. 20dB

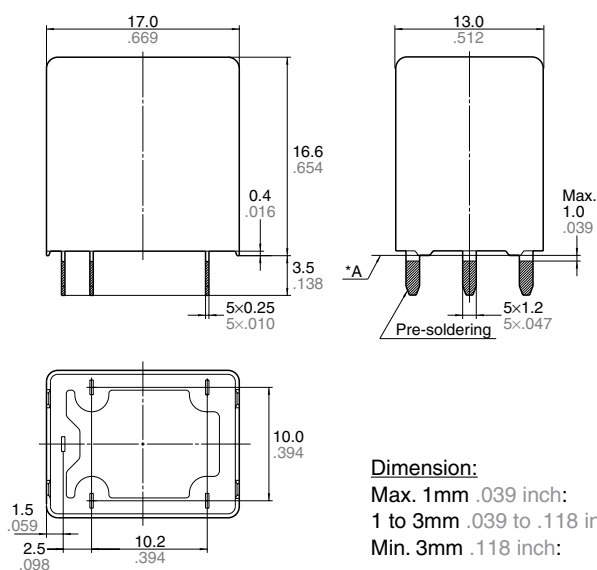


DIMENSIONS (mm inch)

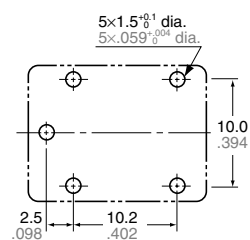
The CAD data of the products with a **CAD Data** mark can be downloaded from: <http://industrial.panasonic.com/ac/e/>

CAD Data

External dimensions

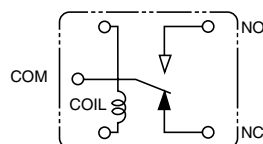


PC board pattern (Bottom view)



Tolerance: $\pm 0.1 \pm .004$

Schematic (Bottom view)



* Dimensions (thickness and width) of terminal is measured before pre-soldering. Intervals between terminals is measured at A surface level.

For general cautions for use, please refer to the “CAUTIONS FOR USE OF AUTOMOTIVE RELAYS”