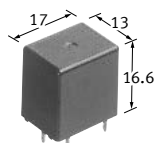


## CQ RELAYS

### 1 Form C Automotive Quiet Relay

[Protective construction] Sealed



(Unit: mm)

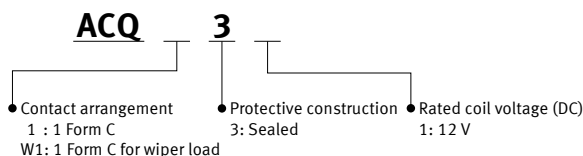
#### FEATURES

- Sound pressure reduced by approx. 20 dB from that of the conventional non-quiet relays.
- Space saving.
- Adopting standard terminal pitch (for compact relays).
- Wiper load models are listed.

#### TYPICAL APPLICATIONS

- For intermittent wipers and applications requiring quiet operation.

#### ORDERING INFORMATION (PART NO.)



#### TYPES

Contact arrangement	Rated coil voltage	Part No.	Packing	
			Carton (1-tube)	Case
1 Form C	12 V DC	ACQ131	40 pcs.	800 pcs.
1 Form C for wiper load		ACQW131		

#### RATING

##### Coil data

Rated coil voltage	Operate voltage (at 20°C) (Initial)	Release voltage (at 20°C) (Initial)	Rated operating current [±10%] (at 20°C)	Coil resistance [±10%] (at 20°C)	Rated operating power (at 20°C)	Usable voltage range
12 V DC	Max. 7.2 V DC	Min. 1.0 V DC	53.3 mA	225 Ω	640 mW	10 to 16 V DC

Note: Other operate voltage types are also available. Please inquire our sales representative for details.

# Automotive Relays CQ RELAYS

## Specifications

### 1) Standard CQ relay

Item		Specifications
Contact data	Contact arrangement	1 Form C
	Contact resistance (initial)	Max. 100 mΩ (N.O. side: typ. 7 mΩ, N.C. side: typ. 8 mΩ) (By voltage drop 1 A 6 V DC)
	Contact voltage drop (initial)	Max. 0.2 V (at 10 A 12 V DC)
	Contact material	Ag alloy
	Rated switching capacity (resistive)	N.O. side: 20 A 14 V DC, N.C. side: 10 A 14 V DC
	Max. carrying current *1 *4	N.O. side: 35 A/2 min, 25 A/1 hour (Coil applied voltage 12 V DC, at 20°C) 30 A/2 min, 20 A/1 hour (Coil applied voltage 12 V DC, at 85°C)
	Min. switching load (resistive)*2	1 A 14 V DC (at 20°C)
Insulated resistance (initial)		Min. 100 MΩ (at 500 V DC, Measurement at same location as "Dielectric strength" section.)
Dielectric strength (initial)	Between open contacts	500 Vrms for 1 min (Detection current: 10 mA)
	Between contacts and coil	500 Vrms for 1 min (Detection current: 10 mA)
Time characteristics (initial)	Operate time (at rated voltage)	Max. 10 ms (at 20°C, without contact bounce time)
	Release time (at rated voltage)	Max. 10 ms (at 20°C, without contact bounce time) (without diode)
Shock resistance	Functional	Min. 100 m/s <sup>2</sup> (Half-wave pulse of sine wave: 11 ms, detection time: 10 μs)
	Destructive	Min. 1,000 m/s <sup>2</sup> (Half-wave pulse of sine wave: 6 ms)
Vibration resistance	Functional	10 to 100 Hz, Min. 44.1 m/s <sup>2</sup> (Detection time: 10 μs)
	Destructive	10 to 500 Hz, Min. 44.1 m/s <sup>2</sup> Time of vibration for each direction; X, Y direction: 2 hours, Z direction: 4 hours
Expected life	Mechanical	Min. 10 x 10 <sup>5</sup> (at 120 times/min)
	Electrical *4	<Resistive load> Min. 10 <sup>5</sup> (at rated switching capacity, operating frequency: 1 s ON, 9 s OFF) <Motor load> N.O. side: Min. 3 x 10 <sup>5</sup> (inrush 30 A, steady 5 A, 20 A 14 V DC at break current) (operating frequency: 1 s ON, 2 s OFF)
Conditions	Conditions for usage, transport and storage *3	Ambient temperature: -40 to +85°C, Humidity: 5 to 85% RH (Avoid icing and condensation)
Weight		Approx. 6.5 g

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

\*2.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.

\*3.The upper operation ambient temperature limit is the maximum temperature that can satisfy the coil temperature rise value. For details, please refer to the "Automotive Relay Users Guide".

\*4.For wiper motor load, please see the wiper load specifications, below.

### 2) For wiper load (ACQW131)

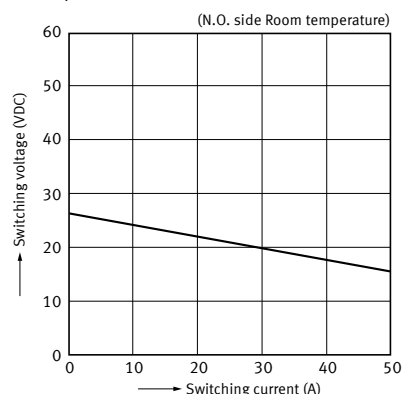
Anything outside of that given below complies with standard CQ relays.

Item		Specifications
Contact data	Max. carrying current (initial)*1	N.O. side: 25 A/1 min, 15 A/1 hour (coil applied voltage 12 V DC, at 20°C)
Expected life	Electrical life	<Wiper motor load (L = approx. 1 mH, without capacitor)> N.O. side: Min. 500 x 10 <sup>3</sup> (inrush 25 A, steady 6 A 14 V DC) N.C. side: Min. 500 x 10 <sup>3</sup> (12 A 14 V DC at brake current) (operating frequency: 1 s ON, 9 s OFF)

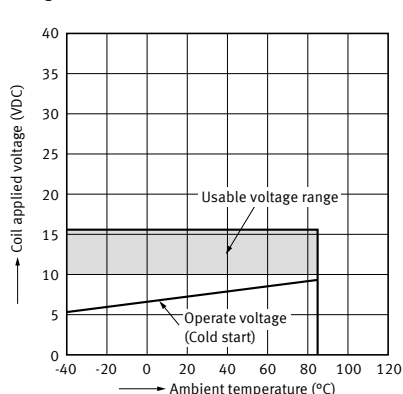
Note: \*1.Depends on connection conditions. Also, this does not guarantee repeated switching. We recommend that you confirm operation under actual conditions.

## REFERENCE DATA

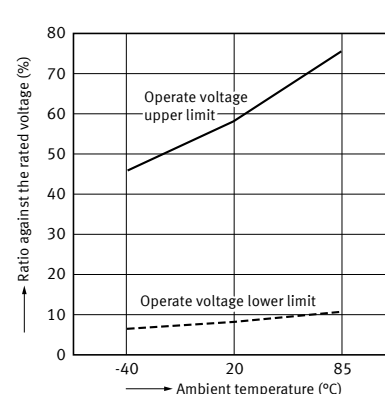
### 1.Max. switching capability (Resistive load, initial)



### 2.Ambient temperature and usable voltage range

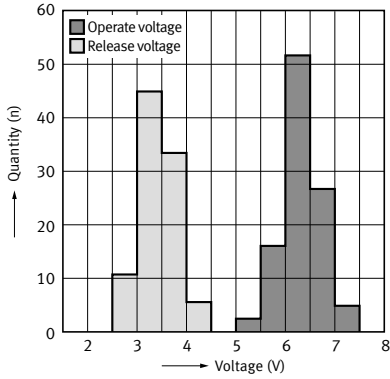


### 3.Ambient temperature characteristics

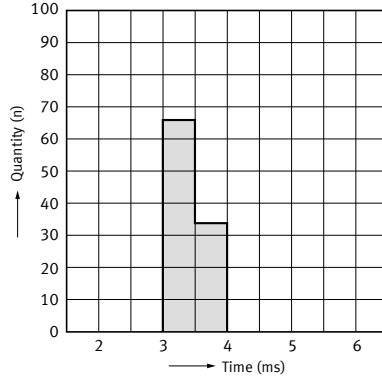


4. Distribution of operate and release voltage 5. Distribution of operate time

Sample: ACQ131, 100 pcs

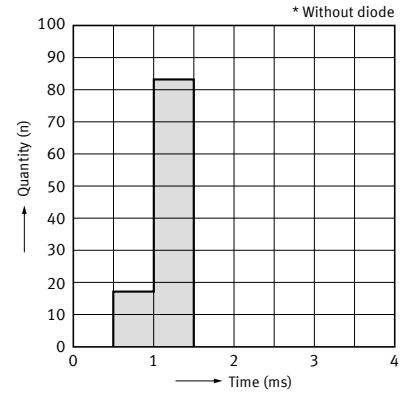


Sample: ACQ131, 100 pcs



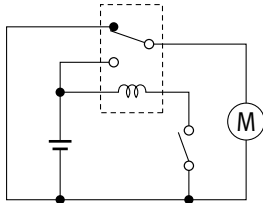
6. Distribution of release time

Sample: ACQ131, 100 pcs

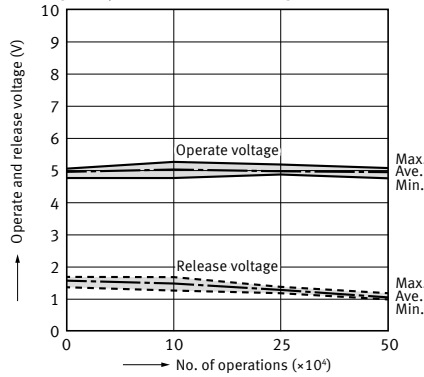


7. Electrical life test for wiper load (Motor free)

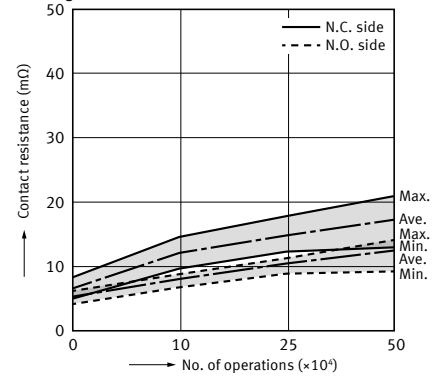
Sample: ACQW131  
 Quantity: n = 3  
 Load: N.O. side: Inrush 25 A, steady 6 A 14 V DC  
 N.C. side: Brake current 12 A 14 V DC  
 Operating frequency: ON 1 s, OFF 9 s  
 Ambient temperature: Room temperature  
 Circuit:



Change of operate and release voltage

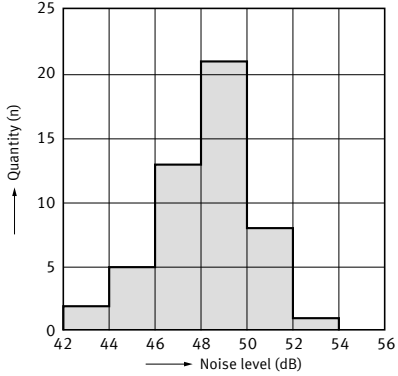


Change of contact resistance



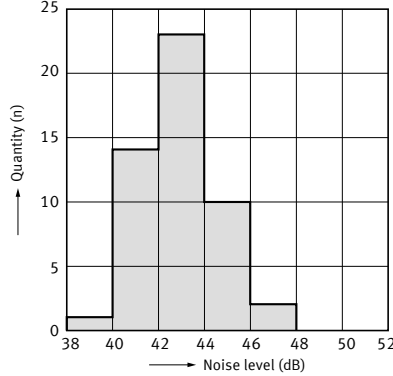
8-1. Operation noise distribution

When operate

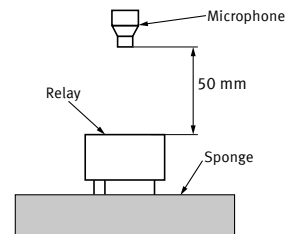


8-2. Operation noise distribution

When release



Measuring conditions  
 Sample: ACQ131, 50 pcs.  
 Equipment setting: "A" weighted, Fast, Max. hold  
 Coil voltage: 12 V DC  
 Coil connection device: Diode  
 Background noise: Approx. 20 dB



## DIMENSIONS

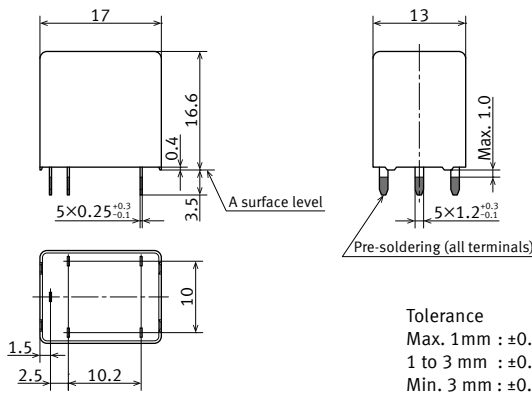
**CAD** The CAD data of the products with a "CAD" mark can be downloaded from our Website.

Unit: mm

### CAD

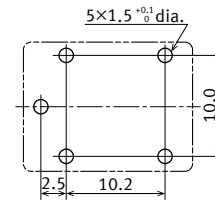


### External dimensions



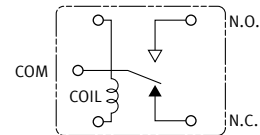
\* Dimensions (thickness and width) of terminal is measured before pre-soldering. Intervals between terminals is measured at A surface level.

### PC board pattern (BOTTOM VIEW)



Tolerance: ±0.1

### Schematic (BOTTOM VIEW)



## GUIDELINES FOR USAGE

■ For general cautions for use, please refer to the "Automotive Relay Users Guide".

Please refer to **"the latest product specifications"** when designing your product.

•Requests to customers:

<https://industrial.panasonic.com/ac/e/salespolicies/>

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Please contact .....

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