

### 1 Form A 60A power latching relays

### DQ-M RELAYS (ADQM)



**RoHS compliant**

Protective construction: Flux-resistant type

## FEATURES

### 1. Miniature and high capacity

Miniature relay capable of high 60 A capacity control.

Size: 29.0(L)×38.0(W)×17.3(H) mm  
1.142(L)×1.496(W)×.681(H) inch

Nominal switching capacity:  
60A 250V AC

### 2. Latching type

Latching type contributes to device energy efficiency.

Nominal operating power

- 500mW (1 coil latching)
- 1W (2 coil latching)

### 3. High insulation

Between contact and coil

Breakdown voltage: 4,000 V AC

Surge breakdown voltage: 10,000 V

### 4. Cd-free, Pb-free

### 5. Flux-Resistant type

## TYPICAL APPLICATIONS

### 1. Remote control of electric power meters

### 2. Time switches

## ORDERING INFORMATION

ADQM  **6**  **0**

DQ-M relays

Operating function

1: 1 coil latching (1 Form A)  
2: 2 coil latching (1 Form A)

Contact capacity  
6: 60 A

Terminal shape  
Nil: M4 securing screw

Contact material  
0: AgNi type

Nominal coil voltage (DC)  
4H: 4.5 V, 06: 6 V, 09: 9 V, 12: 12 V, 24: 24 V

## TYPES

| Contact arrangement | Nominal coil voltage | Part No.        |                 |
|---------------------|----------------------|-----------------|-----------------|
|                     |                      | 1 coil latching | 2 coil latching |
| 1 Form A            | 4.5V DC              | ADQM1604H       | ADQM2604H       |
|                     | 6V DC                | ADQM16006       | ADQM26006       |
|                     | 9V DC                | ADQM16009       | ADQM26009       |
|                     | 12V DC               | ADQM16012       | ADQM26012       |
|                     | 24V DC               | ADQM16024       | ADQM26024       |

Standard packing: Carton: 20 pcs.; Case: 200 pcs.

**RATING****1. Coil data****1) 1 coil latching**

| Nominal coil voltage | Set voltage (at 20°C 68°F)                | Reset 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 | Max. applied voltage (at 20°C 68°F) |
|----------------------|---|---|---|---------------------------------------|-------------------------|-------------------------------------|
| 4.5V DC              | 80%V or less of nominal voltage (Initial) | 80%V or less of nominal voltage (Initial) | 111.1mA   | 40.5Ω                                 | 500mW                   | 130%V of nominal voltage            |
| 6V DC                |   |   | 83.3mA  | 72Ω                                   |                         |                                     |
| 9V DC                |   |   | 55.6mA  | 162Ω                                  |                         |                                     |
| 12V DC               |   |   | 41.7mA  | 288Ω                                  |                         |                                     |
| 24V DC               |   |   | 20.8mA  | 1,152Ω                                |                         |                                     |

**2) 2 coil latching**

| Nominal coil voltage | Set voltage (at 20°C 68°F)                | Reset 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 | Max. applied voltage (at 20°C 68°F) |
|----------------------|---|---|---|---------------------------------------|-------------------------|-------------------------------------|
| 4.5V DC              | 80%V or less of nominal voltage (Initial) | 80%V or less of nominal voltage (Initial) | 221.7mA   | 20.3Ω                                 | 1,000mW                 | 130%V of nominal voltage            |
| 6V DC                |   |   | 166.7mA   | 36Ω                                   |                         |                                     |
| 9V DC                |   |   | 111.1mA   | 81Ω                                   |                         |                                     |
| 12V DC               |   |   | 83.3mA  | 144Ω                                  |                         |                                     |
| 24V DC               |   |   | 41.7mA  | 576Ω                                  |                         |                                     |

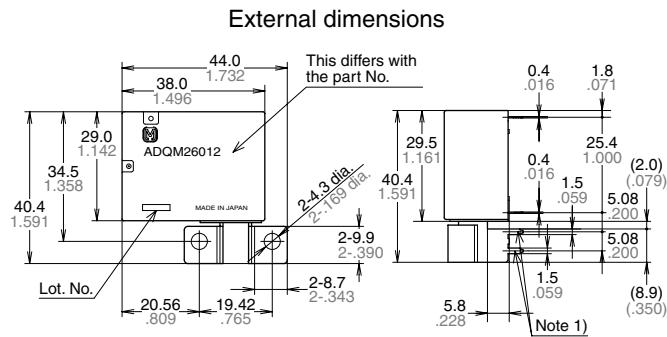
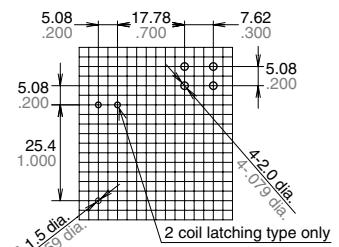
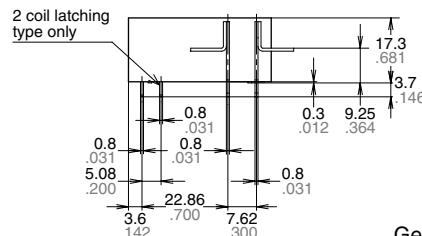
**2. Specifications**

| Characteristics            | Item  |                          | Specifications  |
|----------------------------|---|--------------------------|---|
| Contact                    | Arrangement                                       |                          | 1 Form A  |
|                            | Contact resistance (Initial)                      |                          | Max. 30 mΩ (By voltage drop 6 V DC 1A)  |
|                            | Contact material                                  |                          | Ag alloy (Cadmium free)   |
| Rating                     | Nominal switching capacity (resistive load)       |                          | 60 A 250V AC  |
|                            | Max. switching power (resistive load)             |                          | 15,000 V A  |
|                            | Max. switching voltage                            |                          | 250V AC   |
|                            | Max. switching current                            |                          | 60 A  |
|                            | Nominal operating power                           |                          | 500mW (1 coil latching), 1,000mW (2 coil latching)  |
|                            | Min. switching capacity (Reference value)*1       |                          | 100mA 5 V DC  |
| Electrical characteristics | Insulation resistance (Initial)                   |                          | Min. 1,000MΩ (at 500V DC) Measurement at same location as "Breakdown voltage" section.  |
|                            | Breakdown voltage (Initial)                       | Between open contacts    | 1,500 Vrms for 1min. (Detection current: 10mA.)   |
|                            |   | Between contact and coil | 4,000 Vrms for 1min. (Detection current: 10mA.)   |
|                            | Surge breakdown voltage*2 (Initial)               | Between contact and coil | Min. 10,000 V   |
|                            | Temperature rise (coil) (at 20°C 68°F)            |                          | Max. 50°C (By resistive method, max. switching current) (Coil; de-energized)  |
|                            | Set time (at 20°C 68°F)                           |                          | Max. 20 ms (Nominal voltage applied to the coil, excluding contact bounce time.)  |
| Mechanical characteristics | Reset time (at 20°C 68°F)                         |                          | Max. 20 ms (Nominal voltage applied to the coil, excluding contact bounce time.)  |
|                            | Shock resistance                                  | Functional               | Min. 200 m/s² (Half-wave pulse of sine wave: 11 ms; detection time: 10μs.)  |
|                            |   | Destructive              | Min. 1,000 m/s² (Half-wave pulse of sine wave: 6 ms.)   |
|                            | Vibration resistance                              | Functional               | 10 to 55 Hz at double amplitude of 1.5 mm (Detection time: 10μs.)   |
|                            |   | Destructive              | 10 to 55 Hz at double amplitude of 2.0 mm   |
| Expected life              | Mechanical  |                          | Min. 10⁶ (at 180 times/min.)  |
|                            | Electrical  |                          | 60A 250V AC Min. 10³ (resistive load, operating frequency: 15s ON, 45s OFF)   |
|                            |   |                          | 50A 250V AC Min. 10⁴ (resistive load, operating frequency: 15s ON, 45s OFF)   |
| Conditions                 | Conditions for operation, transport and storage*3 |                          | Ambient temperature: -40°C to +70°C -40°F to +158°F<br>Humidity: 5 to 75% R.H. (Not freezing and condensing at low temperature) |
|                            | Max. operating speed                              |                          | 1 times/min. (at rated load)  |
| Unit weight                | Approx. 35 g 1.23 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. Wave is standard shock voltage of  $\pm 1.2 \times 50\mu\text{s}$  according to JEC-212-1981

\*3. The upper limit of the ambient temperature is the maximum temperature that can satisfy the coil temperature rise value. Refer to Usage, transport and storage conditions in NOTES.

**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****PC board pattern (Bottom view)**Tolerance:  $\pm 0.1$   $\pm 0.004$ General tolerance:  $\pm 0.3$   $\pm 0.012$ 

Notes: 1. These are dummy terminals for the strength reinforcement for the M4 screw terminal connection.

Fix or solder these to the PC board in case setting M4 screw.

However, do not use the dummy terminals as wiring to the PC board. In case wiring of the dummy terminals, the conductor destruction may occur due to the high current.

2. No 3rd terminal on 1 coil latching type.

**NOTES****1. For cautions for use, please read****"GENERAL APPLICATION****GUIDELINES" on page B-1.****2. 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. Also, the power waveform should be square and we recommend it be at least 0.1 seconds. Please keep continuous power to the coil to within 10 seconds.

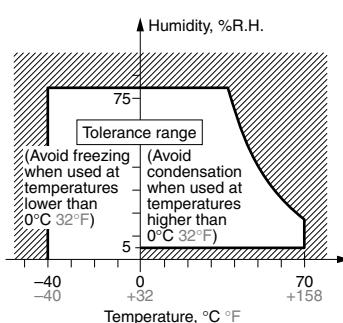
**3. Usage, transport and storage conditions****1) Temperature:**

-40 to +70°C -40 to +158°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**4. Others****Installation of M4 securing screw**

Do not apply excessive pressure on the terminals. This could adversely affect relay performance. Secure to the PC board a dummy terminal designed for reinforcement of the terminal and use a washer in order to prevent deformation. Keep the installation torque to within 1.2 and 1.4 N·m (12 to 14 kgf·cm). Also, use a spring washer to prevent it from loosening. Do not use the dummy terminals as wiring to the PC board. In case wiring of the dummy terminals, the conductor destruction may occur due to the high current.