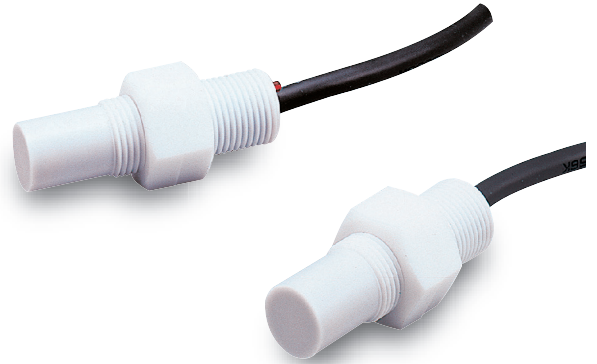



## Fluororesin-coated Capacitive Sensor with Sensitivity Adjuster

- Excellent resistance against chemicals and oil with fluororesin-coated case.
- Distance adjustment according to the sensing object using the sensitivity adjuster.





 Be sure to read *Safety Precautions* on page 3.

Note: The cable is made of vinyl chloride and requires separate protection.

## Ordering Information

**Sensors** [Refer to *Dimensions* on page 4.]

| Appearance  |     | Sensing distance (Adjustable range)   |                       |  | Output Model     | Operation mode | Model          |
|---|-----|---|-----------------------|--|------------------|----------------|----------------|
| Unshielded<br> | M18 |  | 10 mm<br>(6 to 10 mm) |  | DC 3-wire<br>NPN | NO             | E2KQ-X10ME1 2M |
|   |     |   |                       |  |                  | NC             | E2KQ-X10ME2 2M |

## Ratings and Specifications

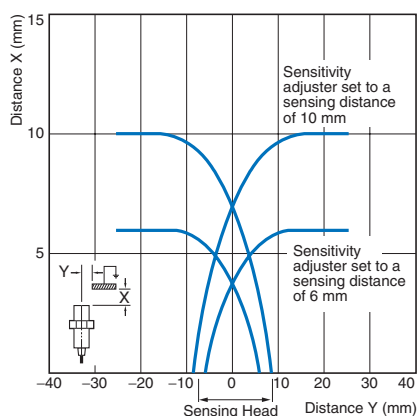
| Item  | Model                 | E2KQ-X10ME1  | E2KQ-X10ME2 |
|---|-----------------------|--|-------------|
| Sensing distance *1                                 |                       | 10 mm  |             |
| Sensing distance adjustable range                   |                       | 6 to 10 mm   |             |
| Differential travel                                 |                       | 4% to 20% of sensing distance  |             |
| Detectable object                                   |                       | Conductors and dielectrics   |             |
| Standard sensing object                             |                       | Grounded metal plate: 50 × 50 × 1 mm   |             |
| Response frequency                                  |                       | 35 Hz  |             |
| Power supply voltage (operating voltage range)      |                       | 12 to 24 VDC (10 to 30 VDC), ripple (p-p): 10% max.  |             |
| Current consumption                                 |                       | 15 mA max.   |             |
| Control output                                      | Load current          | 100 mA   |             |
|   | Residual voltage      | 1.5 V max. (Load current: 100 mA, Cable length: 2 m)   |             |
| Indicators  |                       | Detection indicator (red)  |             |
| Operation mode (with sensing object approaching) *2 |                       | NO   | NC          |
| Protection circuits                                 |                       | Reverse polarity protection, Surge suppressor  |             |
| Ambient temperature range                           |                       | Operating: -10 to 55°C, Storage: -25 to 55°C (with no icing or condensation)                 |             |
| Ambient humidity range                              |                       | Operating/storage: 35% to 85% (with no condensation)   |             |
| Temperature influence                               |                       | ±15% max. of sensing distance at 23°C in the temperature range of -10 to 55°C                |             |
| Voltage influence                                   |                       | ±2% max. of sensing distance at rated voltage at rated voltage ±20%                          |             |
| Insulation resistance                               |                       | 50 MΩ min. (at 500 VDC) between current-carrying parts and case                              |             |
| Dielectric strength                                 |                       | 500 VAC, 50/60 Hz for 1 min between current-carrying parts and case                          |             |
| Vibration resistance                                |                       | Destruction: 10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions |             |
| Shock resistance                                    |                       | Destruction: 500 m/s <sup>2</sup> 3 times each in X, Y, and Z directions                     |             |
| Degree of protection                                |                       | IP66 (IEC), in-house standards: oil-resistant  |             |
| Connection method                                   |                       | Pre-wired Models (Standard cable length: 2 m)  |             |
| Weight (packed state)                               |                       | Approx. 150 g  |             |
| Materials   | Case, sensing surface | Fluorine resin   |             |
|   | Clamping nuts         |  |             |
|   | Cable                 | Vinyl chloride   |             |
| Accessories   |                       | Adjustment screwdriver, Instruction manual   |             |

\*1. The above values are sensing distances for the standard sensing object. Refer to *Engineering Data* on the next page for other materials.

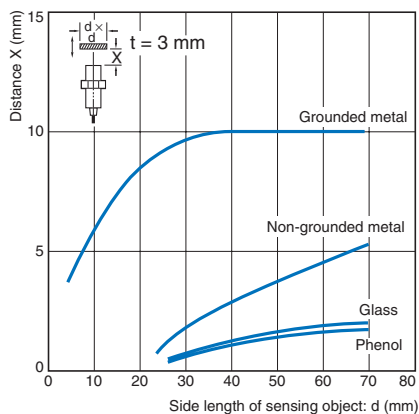
\*2. Refer to the timing charts under *I/O Circuit Diagrams* on page 3 for details.

## Engineering Data (Reference Value)

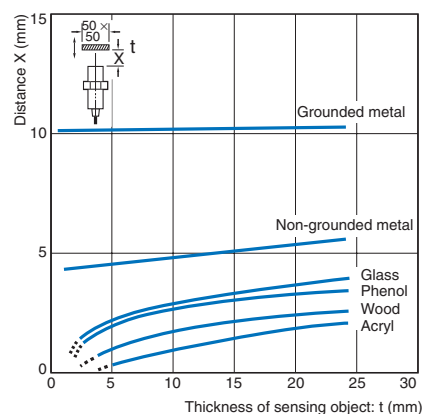
### Sensing Area (Grounded Metal Plate)



### Influence of Sensing Object Size and Material



### Influence of Sensing Object Thickness and Material



## I/O Circuit Diagrams

### DC 3-Wire Models

| Operation mode | Model       | Timing chart  | Output circuit   |
|----------------|-------------|---|--|
| NO             | E2KQ-X10ME1 | <p>Sensing object: Present (High), Not present (Low)</p> <p>Load (between brown and black leads): Operate (High), Reset (Low)</p> <p>Output voltage (between black and blue leads): High, Low</p> <p>Detection indicator (red): ON, OFF</p> | <p>*1. Load current: 100 mA max.<br/>*2. When a transistor is connected.</p> |
| NC             | E2KQ-X10ME2 | <p>Sensing object: Present (High), Not present (Low)</p> <p>Load (between brown and black leads): Operate (High), Reset (Low)</p> <p>Output voltage (between black and blue leads): High, Low</p> <p>Detection indicator (red): ON, OFF</p> |  |

## Safety Precautions

Refer to *Warranty and Limitations of Liability*.

### ⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.



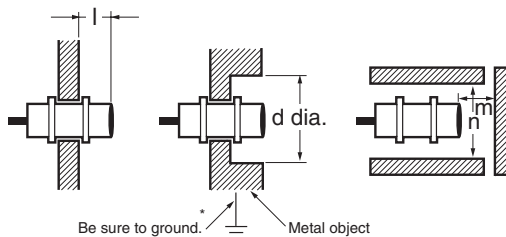
### Precautions for Correct Use

Do not use this product under ambient conditions that exceed the ratings.

#### ● Design

##### Influence of Surrounding Metal

If the E2KQ-X is embedded in metal, maintain at least the following distances between the E2KQ-X and the metal.



\* Be sure to ground the metal object, otherwise E2KQ-X operation will not be stable.

##### Influence of Surrounding Metal (Unit: mm)

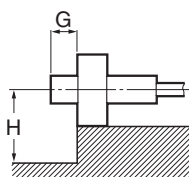
| Model       | Dimension | l  | d  | m  | n  |
|-------------|-----------|----|----|----|----|
| E2KQ-X10ME□ |           | 30 | 75 | 18 | 90 |

If a mounting bracket is used, be sure that at least the following distances are maintained.

##### Influence of Surrounding Metal

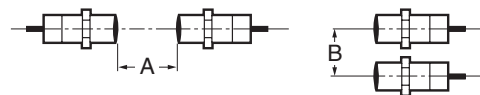
(Unit: mm)

| Model       | Dimension | G  | H  |
|-------------|-----------|----|----|
| E2KQ-X10ME□ |           | 30 | 35 |



#### Mutual Interference

When installing Sensors face-to-face or side-by-side, ensure that the minimum distances given in the following table are maintained.



#### Mutual Interference (Unit: mm)

| Model       | Dimension | A   | B  |
|-------------|-----------|-----|----|
| E2KQ-X10ME□ |           | 200 | 32 |

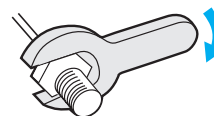
#### Effects of a High-frequency Electromagnetic Field

The Sensor may malfunction if there is an ultrasonic washer, high-frequency generator, or transceiver nearby.

For major measures, refer to *Noise of Warranty and Limitations of Liability* for Photoelectric Sensors.

#### ● Mounting

Be sure to tighten each nut with torque not exceeding the following value.



| Model       | Torque  |
|-------------|---------|
| E2KQ-X10ME□ | 0.6 N·m |

#### ● Adjustment

##### Sensing Object

The maximum sensing distance will decrease if the sensing object is a non-grounded metal object or dielectric object.

##### ● Sensing Object Material

The E2KQ-X can detect almost any type of object. The sensing distance of the E2KQ-X, however, will vary with the electrical characteristics of the object, such as the conductance and inductance of the object, and the water content and capacity of the object. The maximum sensing distance of the E2KQ-X will be obtained if the object is made of grounded metal.

● There are objects that cannot be detected indirectly. Therefore, be sure to test the E2KQ-X in a trial operation with the objects before using the E2KQ-X in actual applications.

● Miscellaneous

**Ambient Environment**

The Sensor may malfunction if subjected to water, oil, chemicals, or condensation by falsely detecting these as sensing objects.

**Environment**

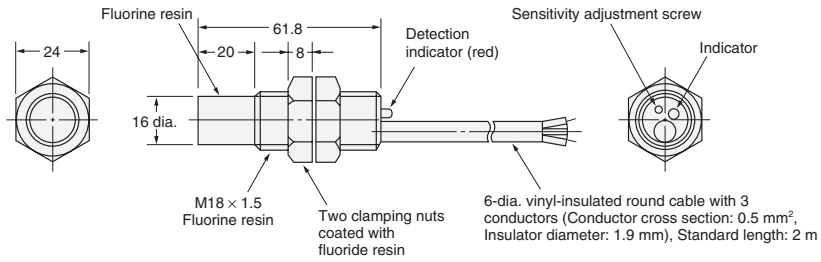
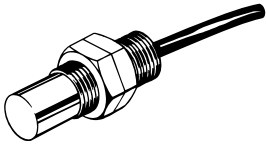
The E2KQ-X is of water-resistant construction. To increase the reliability of the E2KQ-X in operation, however, it is recommended that the E2KQ-X be protected with an appropriate cover so that the E2KQ-X will be free from sprayed water or machining oil.  
The cable is not coated with Fluororesin, which must be taken into consideration when installing the E2KQ-X.

**Dimensions**

(Unit: mm)

Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

**E2KQ-X10ME□**



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