

# Compact Ultrasonic Sensor

## E4E2

CSM\_E4E2\_DS\_E\_2\_1

### Compact, Through-beam, Ultrasonic Sensor

CE

- Provides stable detection of transparent films, transparent bottles, PET bottles, and other similar workpieces.
- Compact design with built-in amplifier allows easy mounting on small conveyor lines.
- Detects as far as 500 mm away.
- Equipped with stability indicator.



 Refer to *Safety Precautions* on page 3.

For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

### Ordering Information

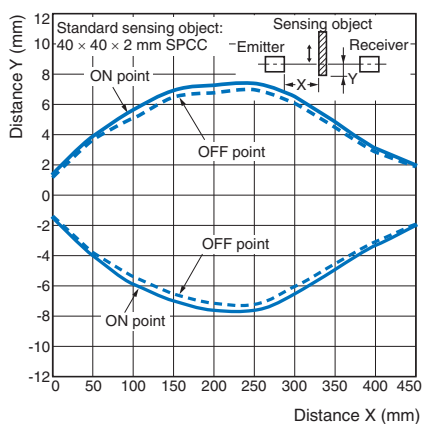
| Sensing method | Sensing distance |  |  |        | Output configuration                       | Model                 |
|----------------|------------------|--|--|--------|--------------------------------------------|-----------------------|
| Through-beam   |                  |  |  |        | NPN open collector<br>NO (normally open)   | <b>E4E2-TS50C1 2M</b> |
|                |                  |  |  | 500 mm | NPN open collector<br>NC (normally closed) | <b>E4E2-TS50C2 2M</b> |

## Ratings and Specifications

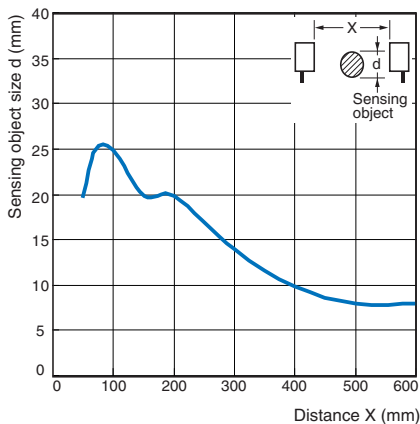
| Item                                           | Model | E4E2-TS50C□                                                                                             |
|------------------------------------------------|-------|---------------------------------------------------------------------------------------------------------|
| Sensing distance                               |       | 500 mm                                                                                                  |
| Standard sensing object                        |       | 40 × 40 × 2 mm SPCC plate                                                                               |
| Response frequency                             |       | 20 Hz max.                                                                                              |
| Power supply voltage (operating voltage range) |       | 24 VDC (21.6 to 26.4 V) with a max. ripple (p-p) 10%                                                    |
| Current consumption                            |       | E4E2-TS50TC1 Emitter: 25 mA max. at 24 VDC<br>E4E2-TS50RC1 Receiver: 15 mA max. at 24 VDC               |
| Control output                                 |       | NPN open collector, Load voltage: 26.4 VDC max., Load current: 100 mA max. (Residual voltage: 1 V max.) |
| Indicators                                     |       | Emitter: Power indicator (red)<br>Receiver: Operation indicator (red), Stability indicator (green)      |
| Ambient temperature                            |       | Operating: 0 to 50°C, Storage: -10 to 55°C (with no icing or condensation)                              |
| Ambient humidity                               |       | Operating and storage: 35% to 85% (with no condensation)                                                |
| Insulation resistance                          |       | 100 MΩ min. (at 500 VDC) between current-carrying parts and case                                        |
| Dielectric strength                            |       | 1,500 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> three times each in X, Y, and Z directions                            |
| Degree of protection                           |       | IP64 (IEC)                                                                                              |
| Connection method                              |       | Pre-wired (Standard cable length: 2 m)                                                                  |
| Weight (packed state)                          |       | Approx. 160 g (Emitter and Receiver)                                                                    |
| Materials                                      |       | Case: ABS resin, Oscillator surface: Epoxy resin                                                        |
| Accessories                                    |       | Mounting Bracket (with screws), adjustment screwdriver, instruction sheet                               |

## Engineering Data (Reference Value)

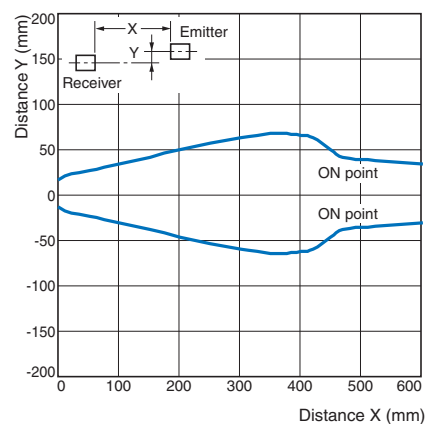
### Sensing Range Diagram



### Sensing Distance and Sensing Object Size



### Parallel Movement



## I/O Circuit Diagram

| Output configuration | Model       | Operating mode | Timing chart                                                                                                              | Output circuit |
|----------------------|-------------|----------------|---------------------------------------------------------------------------------------------------------------------------|----------------|
| NPN output           | E4E2-TS50C1 | No-incident ON | Incident sound: ON<br>No incident sound: OFF<br>Control output (NPN open collector): ON<br>Operation indicator (red): ON  |                |
|                      | E4E2-TS50C2 | Incident ON    | Incident sound: ON<br>No incident sound: OFF<br>Control output (NPN open collector): ON<br>Operation indicator (red): OFF |                |

## Safety Precautions

Refer to the *Technical Guide*.



### WARNING

This product is not designed or rated for ensuring safety of persons. Do not use it for such purpose.



### Precautions for Correct Use

Do not use the product in atmospheres or environments that exceed product ratings.

#### • Designing the System

##### Power ON

The E4E2 needs a maximum of 100 ms to be ready to operate after the E4E2 is turned ON. If power is supplied to the E4E2 and the load independently, be sure to turn ON the E4E2 first.

#### • Installation

##### Mounting

Mount the Emitter and Receiver so that they face each other in a straight line, and so that they are within the specified sensing distance.

##### Mutual Interference

If more than one Sensor is closely mounted together or used in a narrow space, mutual interference of the Sensors will result.

#### • Adjustment

##### Sensitivity Adjuster

- Check the power indicator (red) of the Emitter, then turn the sensitivity adjuster (ADJ) clockwise as far as it will go.
- Be sure not to turn the sensitivity adjuster excessively. If the sensitivity adjuster is turned beyond the permissible range, no sensitivity adjustment will be possible.

##### Indicators

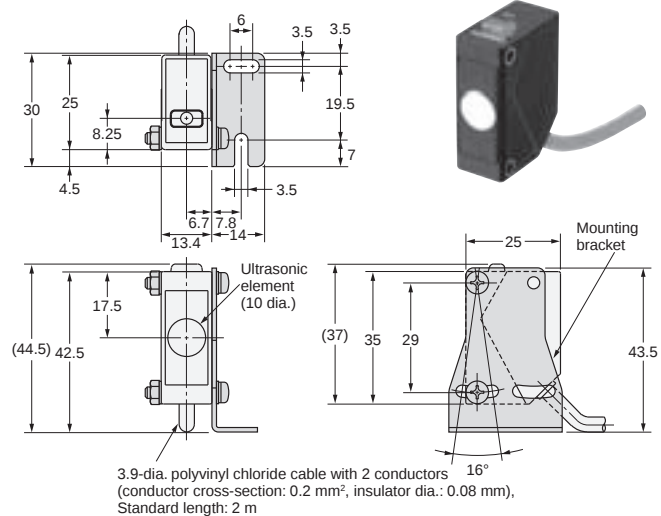
- The green indicator on the Receiver shows stability during sound input. Adjust the mounting shaft so that this indicator light brightly when there is no sensing object present.
- While passing a sensing object through the path, adjust the operation indicator (red) on the Receiver so that it light and goes out correctly.

# Dimensions

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

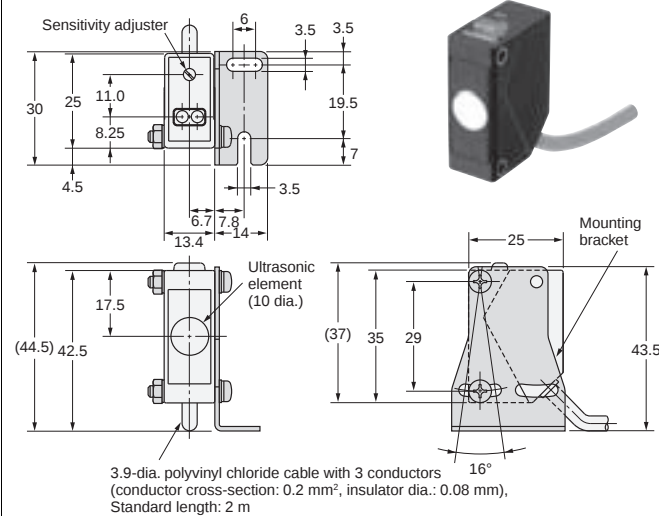
## Emitter

### E4E2-TS50TC1



## Receiver

### E4E2-TS50RC1



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