

Digital Amplifier Ultrasonic Sensor


E4C-UDA

CSM_E4C-UDA_DS_E_12_4

Compact, Cylindrical Reflective Ultrasonic Sensor with Easy Setting

- Stable operation for a variety of objects regardless of color, transparency, or material (metallic or non-metallic).
- Compact M18-sized cylindrical Head.
Product lineup includes Side-view Heads.
- Check the sensing object distance and sensing position (i.e., threshold) on the digital display.
- Easily make settings for workpiece presence/absence and elimination of background influence by using teaching.
- Amplifiers include models with analog outputs.



 Be sure to read *Safety precautions* on page 4.

Note: Orders for E4C-DS Series and E4C-UDA Series will be accepted until the end of March 2023.


Ordering Information

Sensor

Sensor Heads (Refer to Dimensions on page 5.)

Shape	Model	Measurement range	Model
M18	Straight	60 to 275 mm	E4C-DS30
	Side view		E4C-DS30L
	Straight	85 to 735 mm	E4C-DS80
	Side view		E4C-DS80L
	Straight	110 to 910 mm	E4C-DS100


Amplifiers (Refer to Dimensions on page 5.)

Shape	Power supply	Output specifications	Model
	DC	NPN output	E4C-UDA11
			E4C-UDA11AN
		PNP output	E4C-UDA41
			E4C-UDA41AN

Accessories (Order Separately)

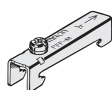
Mounting Bracket (Refer to E39-L, E39-S, and E39-R.)

A Mounting Bracket is not provided with the Amplifier Unit. Order a Mounting Bracket separately if required.

Appearance	Model	Quantity
	E39-L143	1

End Plate (Refer to PFP-□.)

An End Plate is not provided with the Amplifier Unit. Order an End Plate separately if required.

Appearance	Model	Quantity
	PFP-M	1

Ratings and Specifications

Sensor Heads

Item	Model	E4C-DS30	E4C-DS30L	E4C-DS80	E4C-DS80L	E4C-DS100
Measurement range		60 to 275 mm		85 to 735 mm		110 to 910 mm
Standard sensing object		100 × 100 mm SUS flat plate				
Near distance dead band		0 to 50 mm		0 to 70 mm		0 to 90 mm
Ultrasonic oscillation frequency		Approx. 390 kHz		Approx. 255 kHz		
Response speed *		30 ms		100 ms		125 ms
Ambient temperature range		Operating: -25 to +70°C, Storage: -40 to +85°C (with no icing or condensation)				
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)				
Insulation resistance		50 MΩ min. (at 500 VDC)				
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min				
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude, 2 hours each in X, Y, and Z directions				
Shock resistance		500 m/s ² , 3 times each in X, Y and Z directions				
Enclosure rating		IP65				
Indicator		(Yellow) Lit: Sensor within sensing range (Green) Lit: Power indicator				(Yellow) Lit: Sensor within sensing range
Weight		Approx. 150 g				Approx. 170 g
Materials		Case: Nickel-plated brass, Oscillator surface: Glass epoxy resin and polyurethane				
Accessories		Instruction Manual, XS2F-D523-D80-A (Cable length: 2 m), XN2A-1430				

* This value is the average number of operations set to 256.

Amplifiers

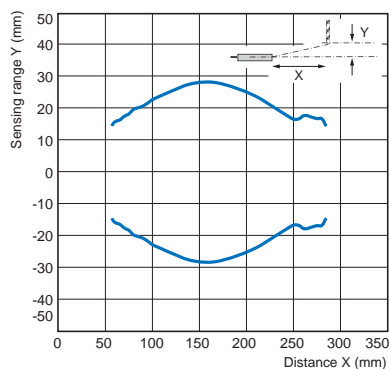
Item	Model Type	E4C-UDA11	E4C-UDA41	E4C-UDA11AN	E4C-UDA41AN
		Twin Output Models		Analog Output Models	
Output configuration		NPN output	PNP output	NPN output	PNP output
Connection method		Pre-wired			
Supply voltage		12 to 24 VDC ±10%, ripple 10% max.			
Current consumption		80 mA max.			
Control output		NPN open collector (26.4 VDC max.), Load current: 50 mA max., Residual voltage: 1 V max.			
Timer		OFF/OFF-delay/ON-delay/one-shot			
Timer time		1 ms to 5 s			
Analog output	Connected load	---		Voltage output (1 to 5 VDC)	
	Output form	---		10 kΩ min.	
	Resolution	---		1.0% F.S.	
	Temperature characteristics	---		0.3% F.S./°C	
	Repeat accuracy	---		2.0% F.S. *	
	Linearity	---		Within ±2% F.S.	
Protective circuit		Power supply reverse polarity protection, output short-circuit protection			
Ambient temperature range		Operating: -25 to +55°C, Storage: -30 to +70°C (with no icing or condensation)			
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)			
Insulation resistance		20 MΩ min. (at 500 VDC)			
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude, 2 hours each in X, Y, and Z directions			
Shock resistance		500 m/s ² , 3 times each in X, Y and Z directions			
Enclosure rating		IP 50			
Materials		Case: PBT (polybutylene terephthalate), Cover: Polycarbonate			
Weight (packed state)		Approx. 100 g			
Accessories		Instruction Manual			

* Value one hour after the product is turned ON. External disturbances, however, sometimes cause minute outputs.

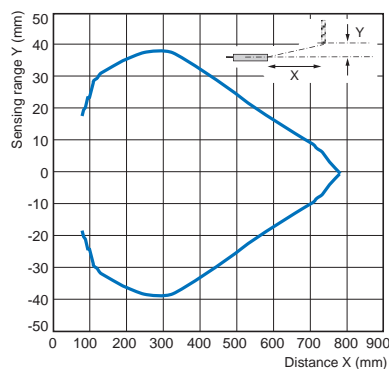
Engineering Data (Reference Values)

Operating Range

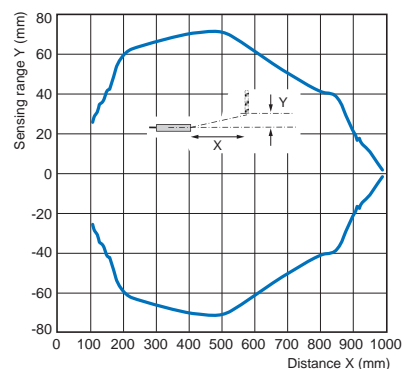
E4C-DS30(L)



E4C-DS80(L)

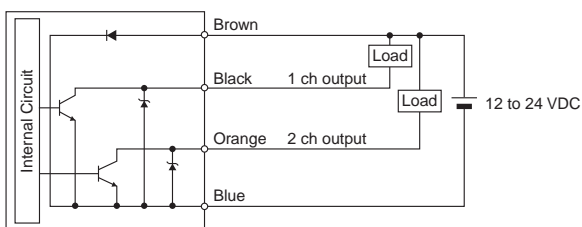


E4C-DS100

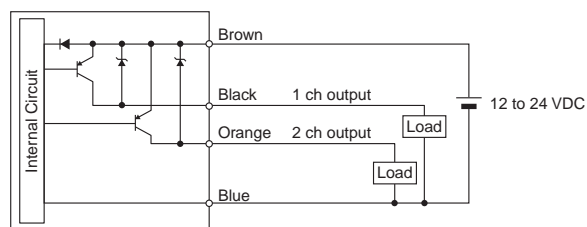


I/O Circuit Diagrams

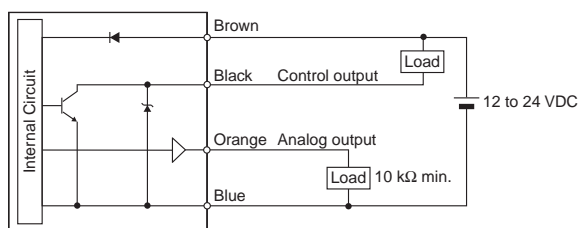
E4C-UDA11 (NPN)



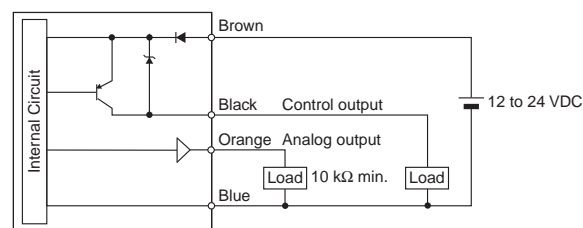
E4C-UDA41 (PNP)



E4C-UDA11AN (NPN)



E4C-UDA41AN (PNP)



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.



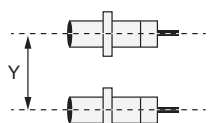
Precautions for Correct Use

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

- Separate the Sensor wiring from power supply and high-voltage lines. If Sensor wiring is placed together with or in the same duct as power supply or high-voltage lines, inductance may cause malfunction or damage to the Sensor.
- The extended cable length must be no more than 10 m. To extend the cable length, use 0.3 mm² cable.
- Detection will be possible 200 ms or longer after the power supply is turned ON. If separate power supplies are used for the load and the Sensor, turn ON the power supply to the Sensor first.
- Make sure that the cover to the Amplifier is in place before using the Sensor.
- If a writing error occurs (ERR/EEP will flash on the display) due to noise resulting from turning OFF the power supply, static electricity, or other cause, initialize the settings using the SET switch on the Amplifier.
- Depending on the application environment, some time may be required for the displayed distance to stabilize after turning ON the power supply.
- Output pulses may be generated when the power supply to the Amplifier is turned OFF. Turn OFF the load or the power supply to the load before turning OFF the Sensor.
- Do not use thinners, benzine, acetone, kerosene, or any other petroleum solvents to clean the Sensor or Amplifier.
- Turn OFF the power supply before connecting or disconnecting the Sensor Head.
Use only an E4C Sensor Head. The product may be damaged if any other Sensor Head is connected.
- The distance displayed on the Amplifier may be different from values obtained with tape measures or other devices.
To adjust the displayed distance, use the scaling function.

Mutual Interference

When installing two or more Sensor Heads side by side, ensure that the minimum distances given in the following table are maintained.



Model	Y
E4C-DS30/-DS30L	300 mm min.
E4C-DS80/-DS80L	800 mm min.
E4C-DS100	1,000 mm min.

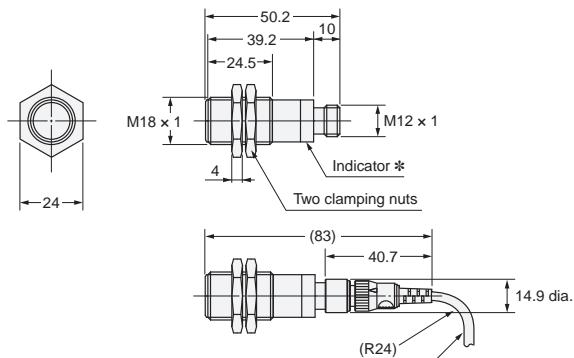
* These distances are the separations at the maximum measurement distances. The degree of effect depends on the equipment and surrounding conditions. Check the degree of effect after you install the Sensor Heads in your operating environment.

Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Heads

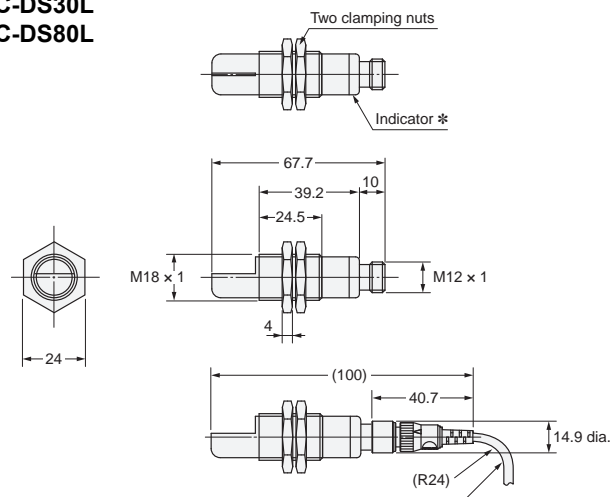
E4C-DS30
E4C-DS80



4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

* Sensor within sensing range (yellow), Power indicator (green)

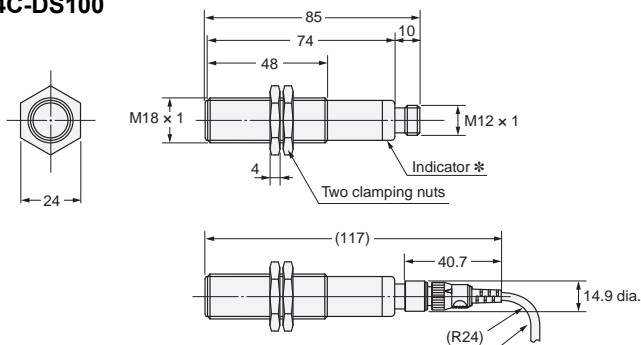
E4C-DS30L
E4C-DS80L



4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

* Sensor within sensing range (yellow), Power indicator (green)

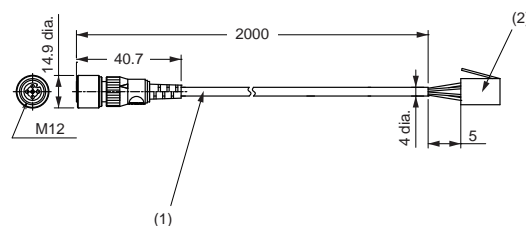
E4C-DS100



4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

* Sensor within sensing range (yellow)

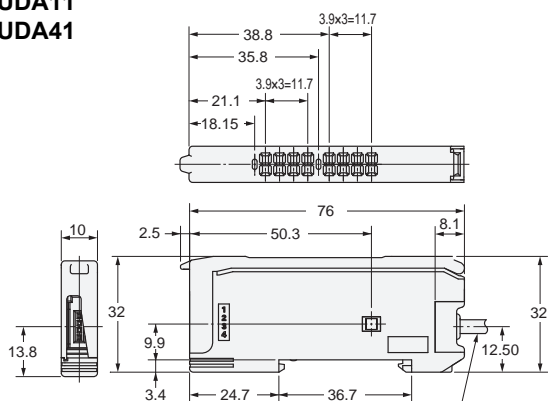
Sensor-Amplifier connection cable
(included with Sensor)



	Products Name	Model
(1)	Standard Cable (2m)	XS2F-D523-D80-A
(2)	Connector	XN2A-1430

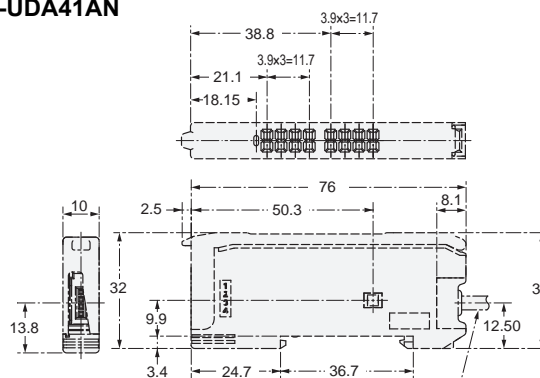
Amplifiers

E4C-UDA11
E4C-UDA41



4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

E4C-UDA11AN
E4C-UDA41AN



4-mm diameter vinyl-insulated round cable with 4 conductors (cross-sectional of conductors: 0.2 mm², insulation system: 1.1-mm diameter), Standard length: 2 m

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Read and understand this catalog.

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NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY OR IN LARGE QUANTITIES WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

Compact Ultrasonic Sensor E4E2


CSM_E4E2_DS_E_2_3

Compact, Through-beam, Ultrasonic Sensor



- 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

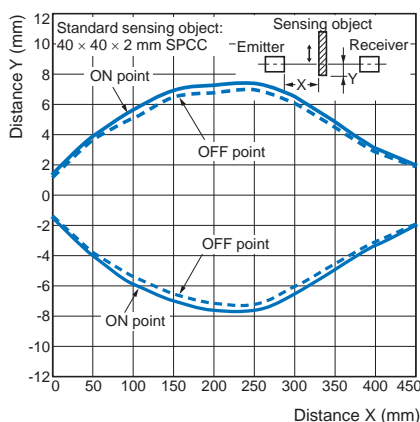
Sensing method	Sensing distance	Output configuration	Model
Through-beam	500 mm	NPN open collector NO (normally open)	E4E2-TS50C1 2M
		NPN open collector NC (normally closed)	E4E2-TS50C2 2M

Ratings and Specifications

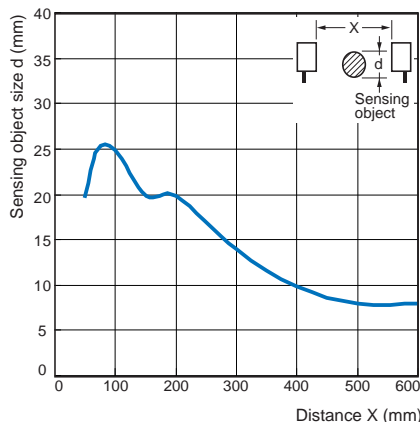
Item	Model	E4E2-TS50C□
Sensing distance		500 mm
Standard sensing object		40 × 40 × 2 mm SPCC plate
Response frequency		20 Hz max.
Power supply voltage (operating voltage range)		24 VDC (21.6 to 26.4 V) with a max. ripple (p-p) 10%
Current consumption		E4E2-TS50TC1 Emitter: 25 mA max. at 24 VDC E4E2-TS50RC1 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) 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 ² 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)

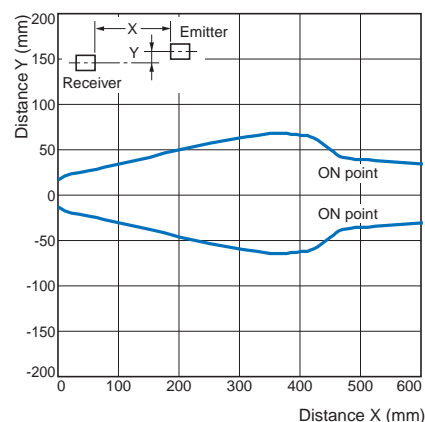
Sensing Range Diagram



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 No incident sound: OFF Control output (NPN open collector): OFF Operation indicator (red): ON	
	E4E2-TS50C2	Incident ON	Incident sound: ON No incident sound: OFF Control output (NPN open collector): ON Operation indicator (red): OFF	

Safety Precautions

Refer to the *Technical Guide*.



WARNING

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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

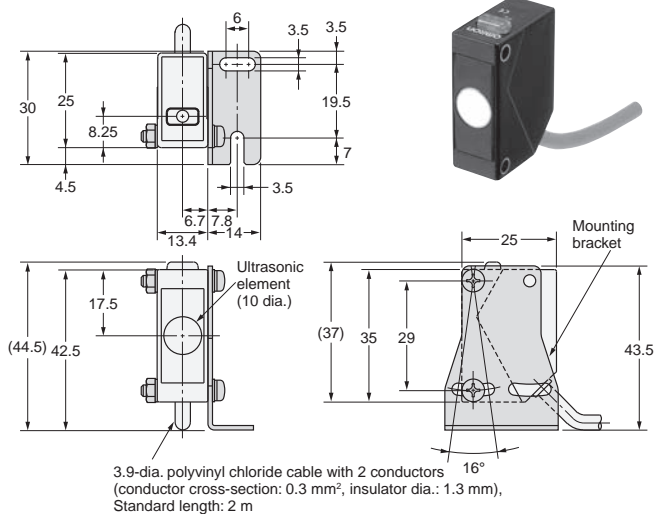
- The green indicator on the Receiver shows stability during sound input. Adjust the mounting shaft so that this indicator light brightly when there is no sensing object present.
- While passing a sensing object through the path, adjust the operation indicator (red) on the Receiver so that it light and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

Dimensions

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

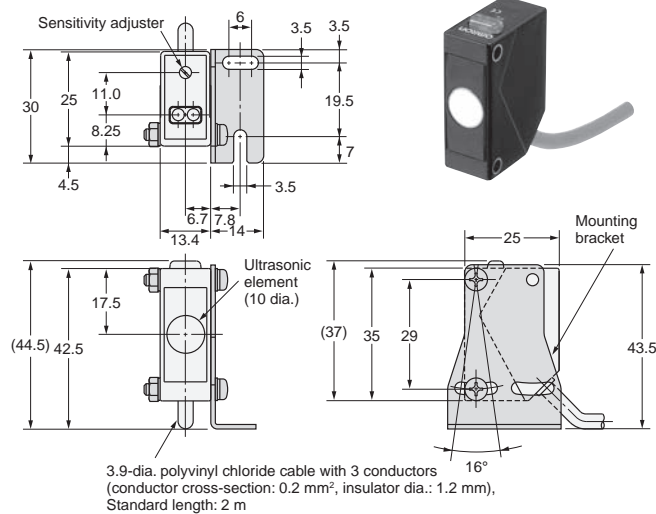
Emitter

E4E2-TS50TC1



Receiver

E4E2-TS50RC1



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