

Digital Amplifier Ultrasonic Sensor

E4C-UDA

CSM_E4C-UDA_DS_E_12_2

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.


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)

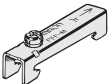
Mounting Bracket (Refer to E39-L, E39-S, and E39-R.)

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/s², 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

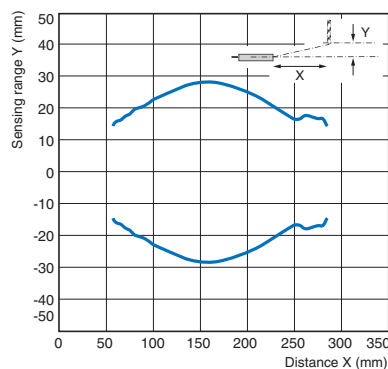
| Model | | E4C-UDA11 | E4C-UDA41 | E4C-UDA11AN | E4C-UDA41AN |
|---------------------------|-----------------------------|---|------------|-----------------------------|-------------|
| Item | Type | Twin Output Models | | Analog Output Models | |
| Output configuration | | NPN output | PNP output | 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/s², 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.

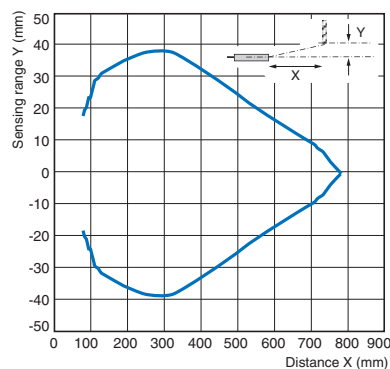
Engineering Data (Reference Values)

Operating Range

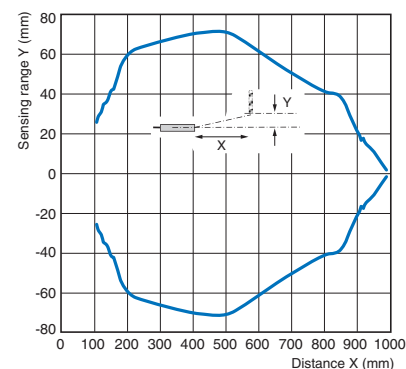
E4C-DS30(L)



E4C-DS80(L)

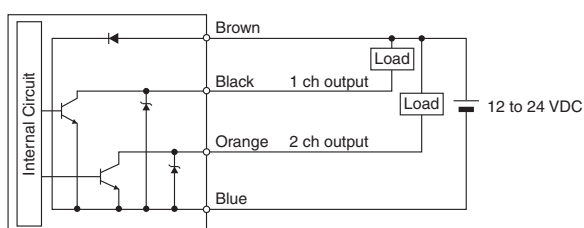


E4C-DS100

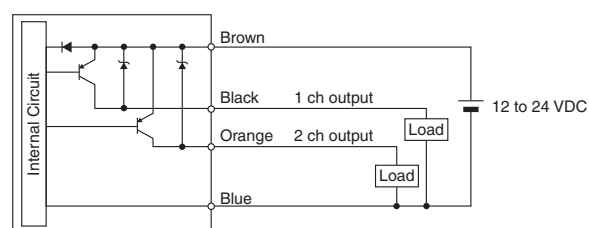


I/O Circuit Diagrams

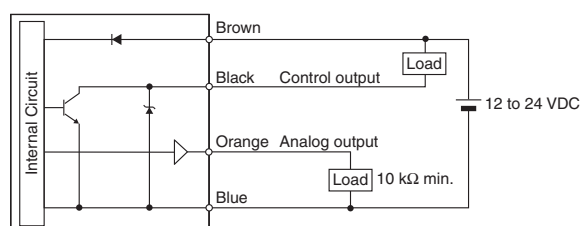
E4C-UDA11 (NPN)



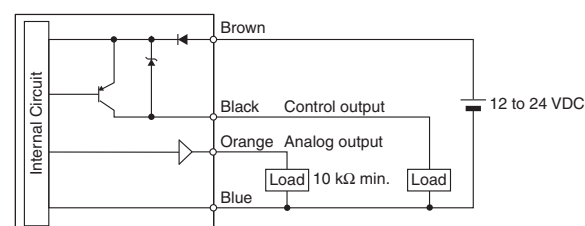
E4C-UDA41 (PNP)



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.



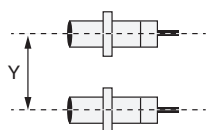
Precautions for Correct Use

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. |

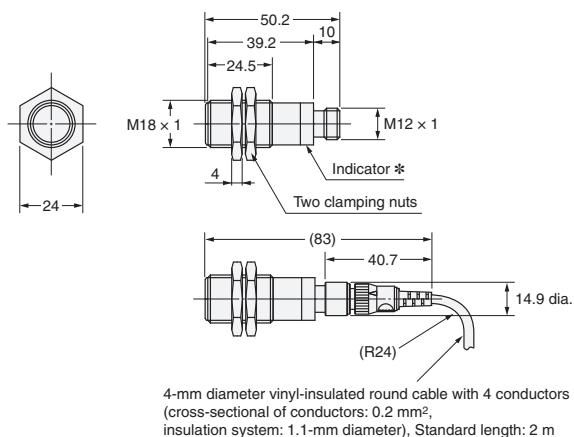
* These distances are the separations at the maximum measurement distances. The degree of effect depends on the equipment and surrounding conditions. Check the degree of effect after you install the Sensor Heads in your operating environment.

Dimensions

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

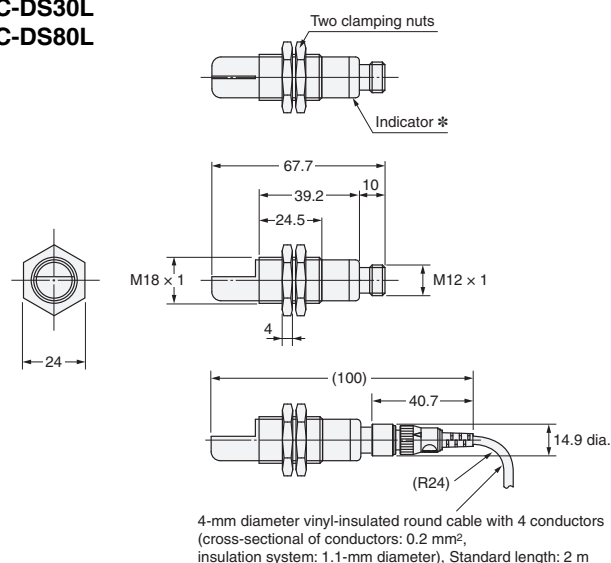
Sensor Heads

E4C-DS30 E4C-DS80



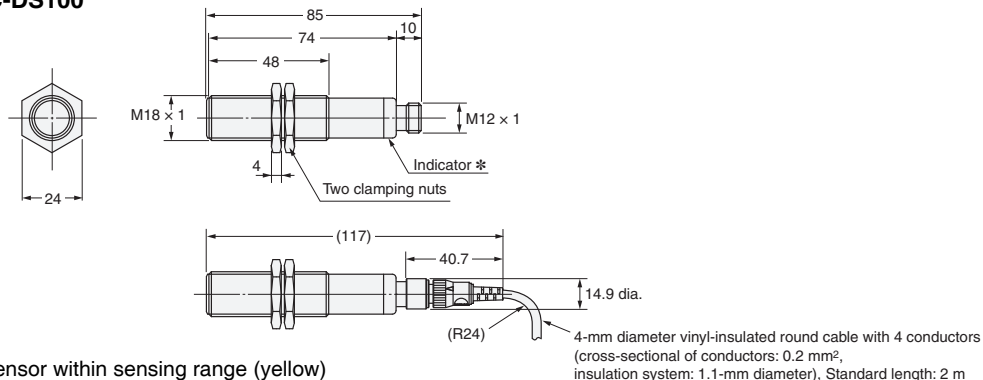
* Sensor within sensing range (yellow), Power indicator (green)

E4C-DS30L E4C-DS80L



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

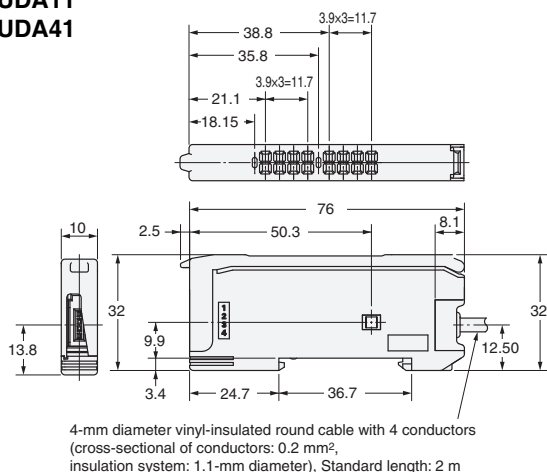
E4C-DS100



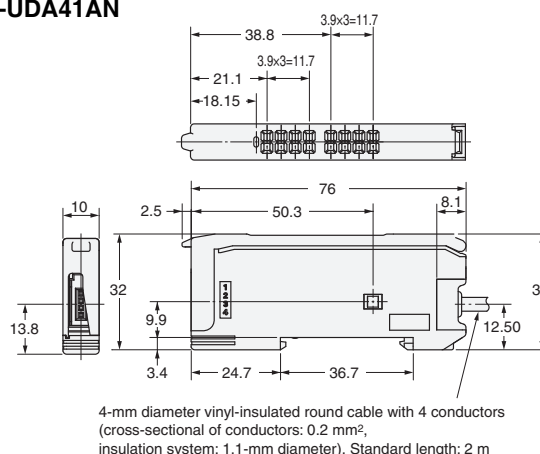
* Sensor within sensing range (yellow)

Amplifiers

E4C-UDA11 E4C-UDA41



E4C-UDA11AN E4C-UDA41AN



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