

OMRON

Model **E4C-DS** □ □

Ultrasonic sensor with Separate Digital Amplifiers Sensor Heads for the E4C-UDA □ □

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:
 Representative in EU: OMRON EUROPE B.V. Wegalaan 67-69 2132 JD Hooftdorp, The Netherlands
 Manufacturer: OMRON CORPORATION, Shiokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN
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The following notice applies only to products that carry the CE mark:
 Notice: This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.
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Precautions for Safe Use

Observe the following precautions to ensure safety.

- Do not use the Sensor Head in locations subject to explosive or flammable gases.
- Do not use the Sensor Head in environments subject to exposure to water, oil, chemicals, etc.
- Do not attempt to disassemble, repair, or modify the Sensor Head.
- Connect in the specified wiring order when connecting the sensor terminals.
- To ensure safety in operation and maintenance, do not install the Sensor Head near High-voltage equipment or power devices.
- Do not use the Sensor Head in locations subject to direct vibration or impact
- Do not connect or disconnect connector or attempt wiring work while power is supplied. The product may be damaged and electric shock may result.
- When disposing of the Amplifier Unit, treat it as industrial waste.

Precautions for Correct Use

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effects on product performance.

- Wire the Amplifier Unit separately from power supply or high-voltage lines. If the Amplifier Unit wiring is wired together with or placed in the same duct as high-power lines, inductive noise may cause operating errors or damage the Amplifier Unit.
- Do not extend the cable to more than 100 m, and use a wire size of 0.3 mm² or larger for the extension cable.
- The appropriate tightening torque of thickness 5mm is 24N · m or less. (recommendation : 15 to 22N · m.) The allowable tightening torque varies depending on material and surface condition of the mounting part. Check the torque of the actual combination before starting the operation. Insufficient tightening torque sometimes prevents the integrity of the protective structure from being maintained or causes screws to become loose due to vibration.
- The sensing distance is impaired if the sensing surface of the sensor is splashed with water droplets.
- The sensor senses solids, liquids and powder. However, the sensor capabilities of the sensor fluctuate depending on the status of the sensing object surface.
- Ambient temperature and humidity of the sensor
 - Generally, acoustic velocity fluctuates roughly 0.17% with respect to a temperature change of 1°C.
 - Also, a fluctuations of roughly 2% occurs due to dry air or humidity in a saturated state. These fluctuations affect the measurement distance of the sensor. Take these points into consideration when using object exceeds 100 °C.
- Ambient atmosphere
 - Ultrasonic sensors use the air as their transmission medium. For this reason, if local temperature differences are present, reflection or diffraction occurs at the boundary surface, or the sensing area will change in windy locations, resulting in malfunction. Accordingly, avoid using ultrasonic sensors near air curtains or blowers.
- Mutual Interference
 - When installing two or more Sensor Heads side by side, ensure that the minimum distances given in the following table are maintained.

| Type | Y |
|-----------------|----------------|
| E4C-DS30/-DS30L | 300mm or more |
| E4C-DS80/-DS80L | 800mm or more |
| E4C-DS100 | 1000mm or more |

* Value at maximum sensing distance.

- Do not use paint thinner, benzene, acetone, or kerosene for cleaning.
- Before connecting or disconnecting connectors to the Sensor Head, be sure to turn the product off.
- Do not use Amplifier Units other than the E4C-UDA. Use of a different model of Amplifier Unit may damage the product.

Shortening the Connection Cable

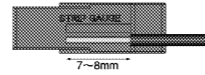
Removing the Connector

Using a flat-blade screwdriver, press the lever in the opening next to the cable and then pull out the cable to adjust its length. The tip of the screwdriver must be 2mm or less in width, and must be of a consistent width to the back of the blade.

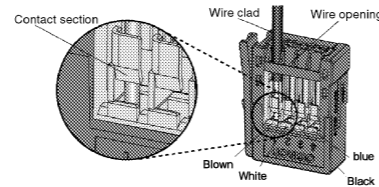


Connecting the Connector

- Using the strip gauge on the side of the product, remove 20 mm (max.) of the cladding from the shield wire, strip 7 to 8 mm of the cladding from the conductor, and twist the mesh together several times.

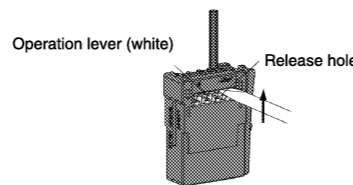


- Insert the wire to the back of the opening. Confirm that the cladding has also entered the opening and that the end of the conductor has passed through the contact section. Connect as follows: Please refer to the table below for the relation between the terminal number and the wiring color.

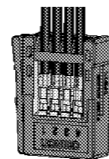


| Terminal No. | Wiring color |
|--------------|--------------|
| 1 | Brown |
| 2 | White |
| 3 | Black |
| 4 | Blue |

- Insert a flat-blade screwdriver into the release hole and move it up and down gently. When you feel it catch, lift it toward the wire opening. You should be able to hear the operation lever reset.



- Confirm that the operation lever has reset and that the cladding is in the insertion opening. (Pull lightly on the line. If you feel resistance, then the connection is okay.)



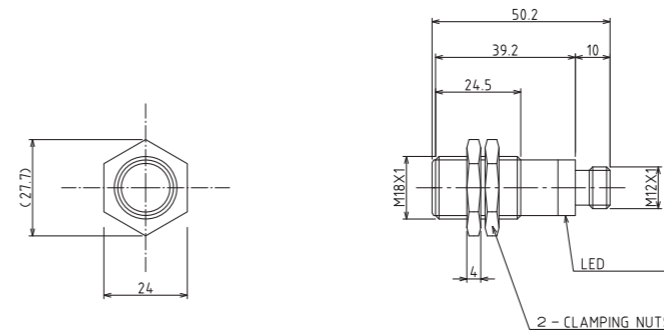
Ratings

| Model | E4C-DS30 | E4C-DS30L | E4C-DS80 | E4C-DS80L | E4C-DS100 |
|-----------------------|--|----------------|----------------|-----------------|----------------|
| Sensing range | 60 to 275mm | 60 to 275mm | 85 to 735mm | 85 to 735mm | 110 to 910mm |
| Standard target plate | 100 × 100mm SUS flat plate | | | | |
| Unusable area | 0 to 50mm | 0 to 50mm | 0 to 70mm | 0 to 70mm | 0 to 90mm |
| Transducer Frequency | Approx. 390kHz | Approx. 390kHz | Approx. 255kHz | Approx. 255kHz | Approx. 255kHz |
| Response delay * | 30ms | 30ms | 100ms | 100ms | 125ms |
| Operating temperature | - 25 to 70°C (With no icing or condensation) | | | | |
| Storage temperature | - 40 to 85°C (With no icing or condensation) | | | | |
| Ambient humidity | Operating/storage: 35% to 85%RH (with no condensation) | | | | |
| Insulation resistance | 50MΩ min. (at 500VDC) | | | | |
| Dielectric strength | 1000V AC 50/60Hz for 1min. | | | | |
| Vibration resistance | 10 to 55Hz, 1.5mm double amplitude 2hrs each in X, Y, and Z directions | | | | |
| Shock resistance | 500m/s ² 3times each in X, Y, and Z directions | | | | |
| Degree of protection | IEC60529 : IP65 | | | | |
| LED | yellow :object in the evaluation range | | | green :power on | |
| Weight(packed state) | Approx.150g | | | Approx.170g | |
| Case | Brass , nickel -plated | | | | |
| Transducer | Epoxy resin/hollow glass sphere mixture ;polyurethane form | | | | |
| Accessories | Connecting cable, Mounting Brackets, Instruction sheet | | | | |

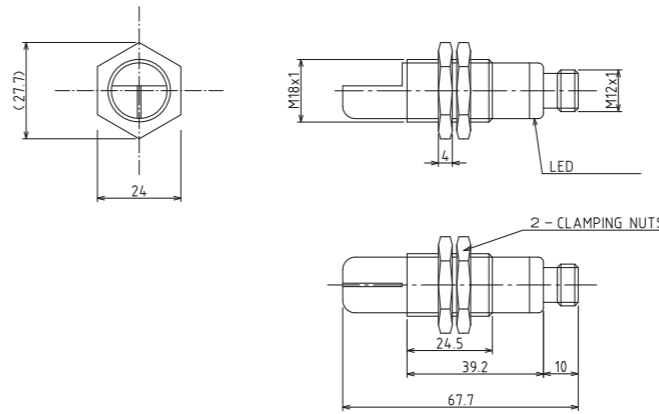
*This value is the average number of operations set to 256.

Dimensions (mm)

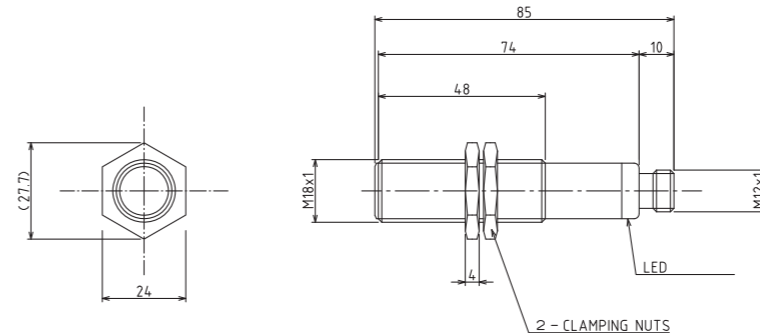
- E4C-DS30/-DS80



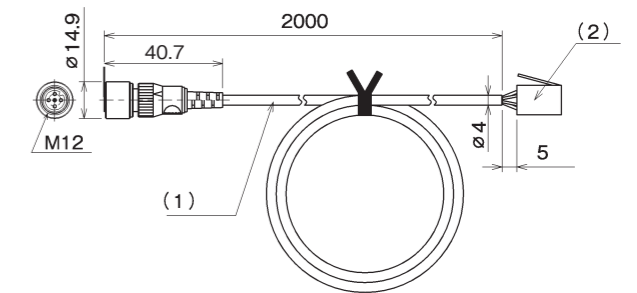
- E4C-DS30L/-DS80L



- E4C-DS100



- Connecting Wire



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

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY 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. See also Product catalog for Warranty and Limitation of Liability.

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