

Long Range Ultrasonic Sensor

E4R

Sensing Distance Adjustable
to 2.5 m

- Mutual interference protection
- Wide beam angle ideal for detecting granular or high-viscosity materials
- Compact sensing head with separate controller



Ordering Information

■ SENSOR SYSTEM

Description	Part number
Ultrasonic sensing head	E4R-A
Controller for sensing head	E4R-2
Reference pulse unit to synchronize multiple sensors	E4R-SP
Switching power supply to power controller E4R-2	S82K-00312

■ REPLACEMENT PARTS

Description	Part number
Socket for E4R-2 controller; mounts to panel or on DIN-rail track	14PFA
Socket for E4R-SP reference pulse unit	8PFA

Specifications

■ SENSING HEAD

Part number	E4R-A
Sensing method	Reflective
Sensing distance	0.7 to 2.5 m (2.30 to 8.20 ft), adjustable
Standard sensing object	200 x 200 mm flat plate
Ultrasonic oscillation frequency	40 ±2 kHz
Directional angle	±20°
Indicator	—
Ambient operating temperature	-25°C to 55°C (-13°F to 131°F) with no icing
Relative humidity	45% to 85% with no condensation
Vibration resistance	10 to 25 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z axes
Shock resistance	100 m/s ² (approx. 10 G) 10 times each in X, Y, and Z axes

(This table continues on the next page.)

Specifications Table - continued from previous page

Part number	E4R-A
Cable length	Use shielded cable, 20 m (65.62 ft) max. between sensor and controller
Weight	Approx. 400 g
Material	Plastic
Temperature influence	±5% max. of sensing distance within the temperature range of -10°C to 40°C (14°F to 104°F)
Voltage influence	±5% max. of sensing distance within the permissible power supply voltage

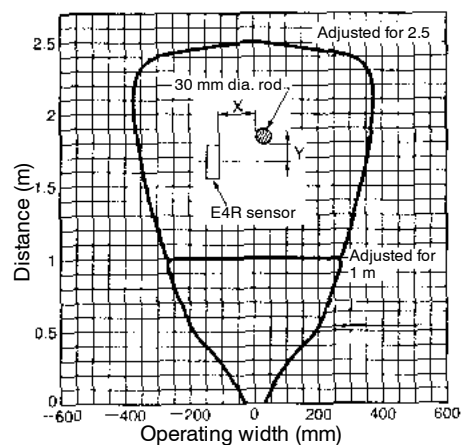
■ CONTROLLER

Part number	E4R-2
Supply voltage	12 VDC ±15%
Current consumption	Approx. 1.5 W (120 mA DC)
Response time	ON: 150 ms; OFF time: 500 ms
Control output	SPDT contact, 4 A at 220 VAC/24 VDC
Operation mode	NO and NC switch selectable
indicator	POWER and DETECT indicators
Ambient operating temperature	-10°C to 40°C (14°F to 104°F)
Relative humidity	45% to 85% with no condensation
Insulation resistance	20 MΩ min. at 500 VDC between current carrying parts and case
Dielectric strength	1500 VAC 50/60 Hz for 1 min between current carry parts and case
Vibration resistance	10 to 25 Hz, 1.5-mm double amplitude for 2 hours each in X,Y and Z axes
Shock resistance	100 m/s ² (approx. 10 G) 10 times each in X, Y, and Z axes
Enclosure rating	IP10
Weight	400 g

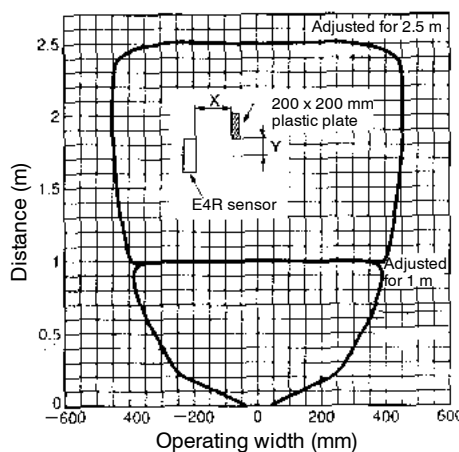
Engineering Data

■ OPERATING RANGE DIAGRAMS (TYPICAL)

30-mm dia. Rod



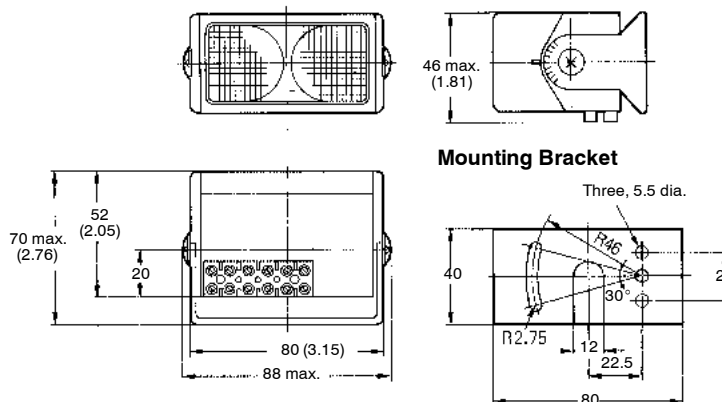
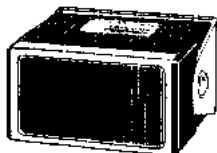
200 x 200 mm Plastic Plate



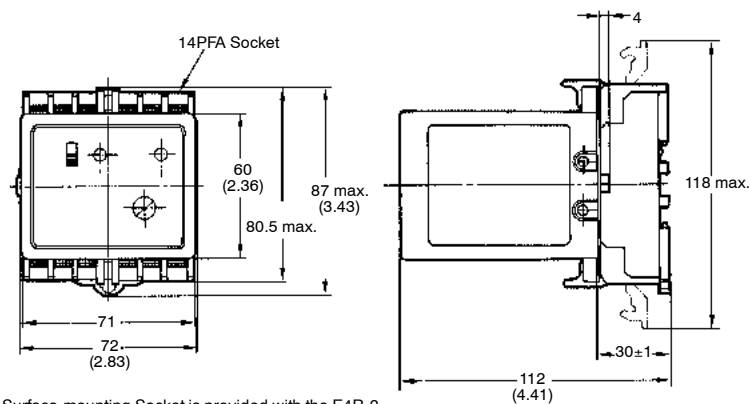
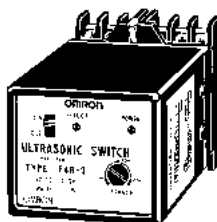
Dimensions

Unit: mm (inch)

■ E4R-A SENSOR



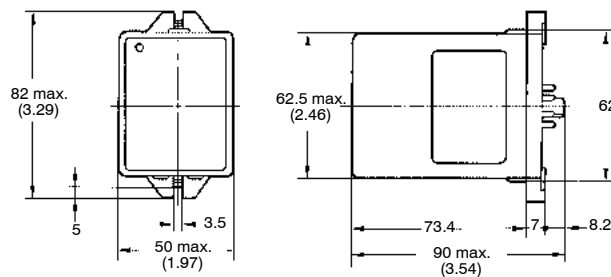
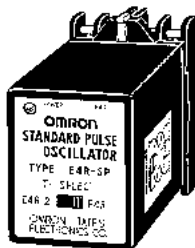
■ E4R-2 CONTROLLER



Note: The dimensions are external dimensions that include the 14PFA Surface-mounting Socket.

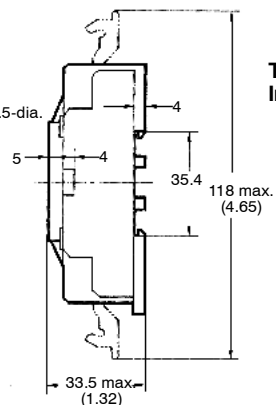
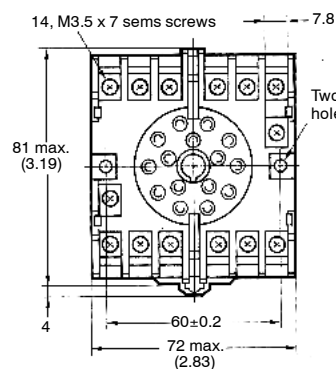
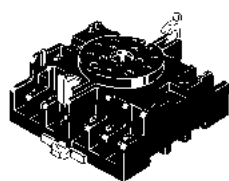
The 14PFA Surface-mounting Socket is provided with the E4R-2.

■ E4R-SP REFERENCE PULSE UNIT

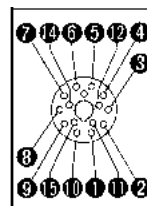


Note: The 8PFA Surface-mounting Socket is provided with the E4R-SP.

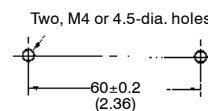
■ 14PFA PANEL AND DIN TRACK MOUNTING SOCKET (ORDER SEPARATELY)



Terminal Arrangement and Internal Connections (Top View)



Mounting Holes

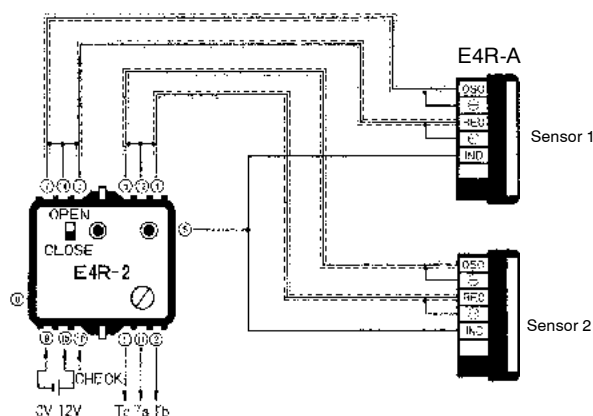


Note: DIN track mounting is possible.

Installation

■ CONNECTIONS

E4R-A/E4R-2



Use shielded cables for the oscillator's transmission line (connected to the OSC terminals) and the reception line (connected to the REC terminals). Each cable must be a maximum of 20 m in length.

The shielded cables connecting the Sensor and terminals 7, 14, and 6 (or 5, 12, and 4) must be all parallel conductors with 11 strands of 0.16-mm dia. each with all conductors shielded independently. The cable connected to terminal 3 must be a single-conductor cable that is 0.2 to 0.3 mm² in size.

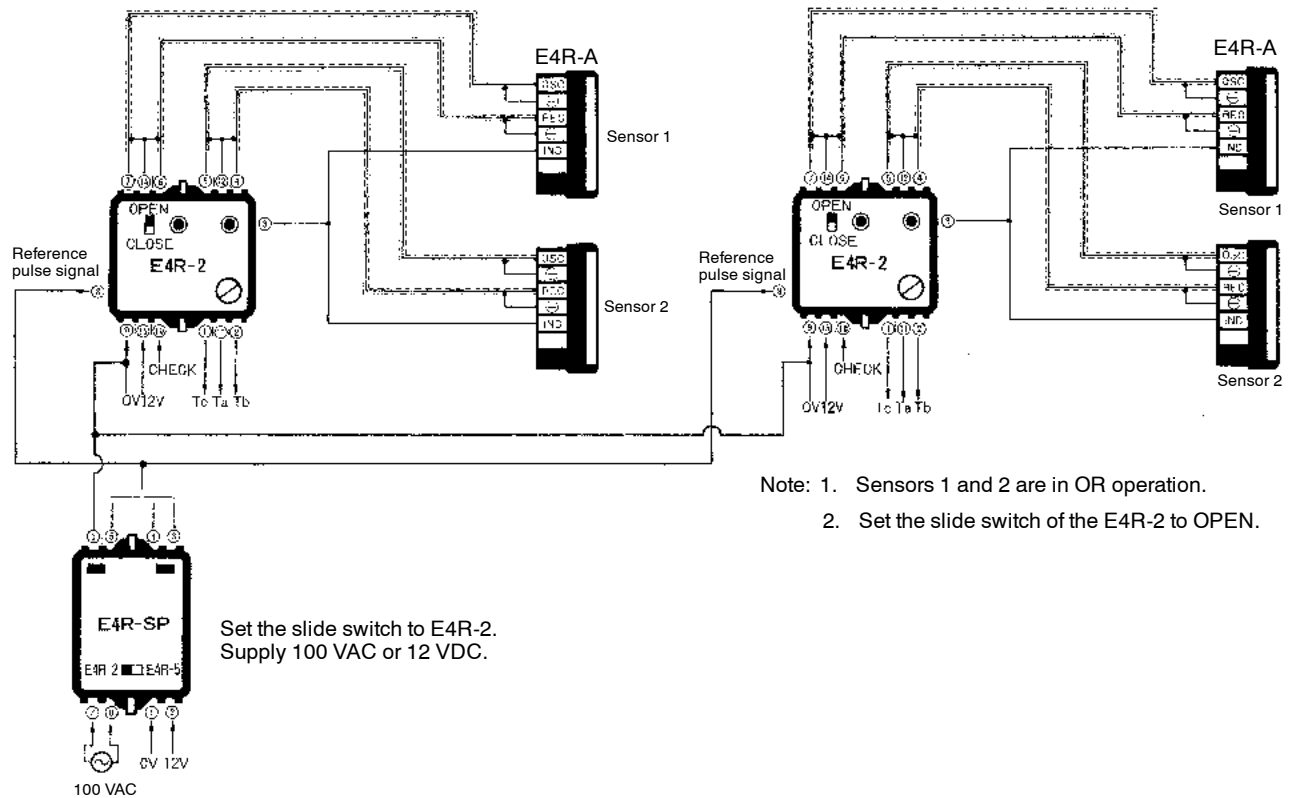
- Note:
1. Sensors 1 and 2 are in OR operation.
 2. If only a single Sensor is connected, leave the terminals for the other Sensor open.
 3. Set the slide switch to CLOSE.



Note: CHECK terminal allows connection of oscilloscope for trouble shooting ultrasonic signal.

REFERENCE PULSE UNIT

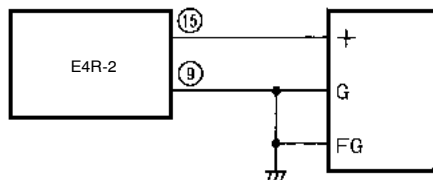
Use the E4R-SP Reference Pulse Unit when more than one E4R-2 Power Supply Unit is applied to a single application. The E4R-SP generates reference pulses that synchronize a maximum of ten E4R-2 Power Supply Units in operation without mutual interference.



Precautions

POWER SUPPLY

If a switching power supply is to be used, the FG and G terminals must be grounded.



NOTE: DIMENSIONS SHOWN ARE IN MILLIMETERS. To convert millimeters to inches divide by 25.4.

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