

Compact Ultrasonic Sensor

E4E

Through-Beam Sensor with Built-in Amplifier

- Compact size
- Fully-potted IP66, resists shock and vibration
- Easy-to-use sensitivity adjustment
- No separate amplifier required



Ordering Information

Supply voltage	Sensing type	Sensing distance	Cable length	Output configuration	Part number
12 to 24 VDC	Through-beam	30 cm	2 m	NPN-NO open collector	E4E-TS30C1
				NPN-NC open collector	E4E-TS30C2

Note: Model E4E-TS30C1-1 with no indicator is available for photo film detection applications.

Specifications

RATINGS/CHARACTERISTICS

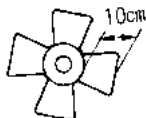
Part number		E4E-TS30C1	E4E-TS30C2
Sensing method		Through-beam	
Supply voltage		12 to 24 VDC - 10%/+15% (10.8 to 27.6 V) with a max. ripple of ±10% (p-p)	
Current consumption	Emitter	20 mA max. at 24 VDC	
	Receiver	30 mA max. at 24 VDC	
Sensing distance		30 cm (11.81 in)	
Standard sensing object		40 x 40 mm	
Ultrasonic oscillation frequency		Approx. 270 kHz	
Response frequency		20 Hz max.	
Response time		25 ms on, 25 ms off	
Control output		NPN-NO, 100 mA max. at 30 VDC	NPN-NC, 100 mA max. at 30 VDC
Residual voltage		1.0 V	
Indicator	Emitter	POWER indicator (green LED)	
	Receiver	OPERATION indicator (with control output ON) and Sensitivity indicator (red LED)	
Ambient operating temperature		0°C to 50°C (32°F to 122°F) with no icing	
Storage temperature		- 10°C to 60°C with no icing	
Relative humidity		35% to 95%	
Temperature influence		±10% max. of sensing distance at 20°C (68°F) in the temperature range of 0°C to 50°C (32°F to 122°F)	
Insulation resistance		100 MΩ min. at 500 VDC between current carrying parts and case	
Dielectric strength		1500 VAC, 50/60 Hz for 1 min between current carrying parts and case	

(This table continues on the next page.)

Specifications Table - continued from previous page

Part number		E4E-TS30C1	E4E-TS30C2
Vibration resistance		10 to 55 Hz, 1.5-mm double amplitude for 2 hours each in X, Y, and Z axes	
Shock resistance		500 m/s ² (approx. 50G) once each in X, Y, and Z axes	
Enclosure rating		IEC60529 IP66	
Approvals	UL, cUL	Recognized, File No. E41515 when used with a Class 2 power supply	
Weight		Approx. 120 g (Emitter and Receiver)	
Material		Heat-resistant ABS resin	

Note: The response frequencies are the values obtained with the E4E used for detecting the rotating propeller-shaped disc as shown to here.

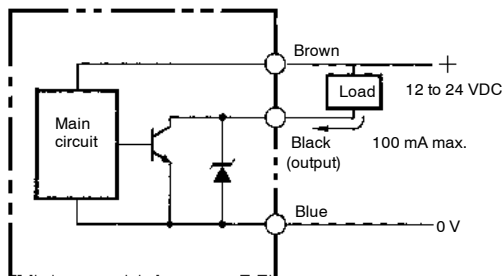


Space:Blade = 1:1

Operation

■ OUTPUT CIRCUITS (RECEIVER)

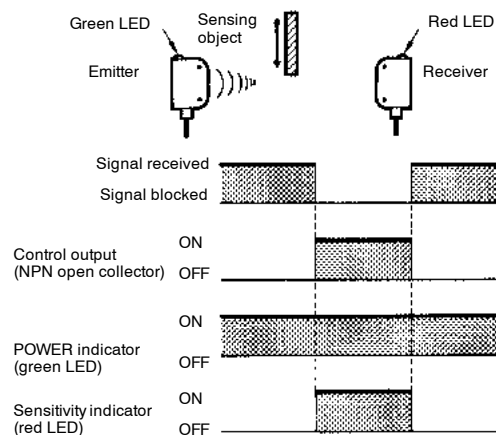
NPN Output



PNP Output

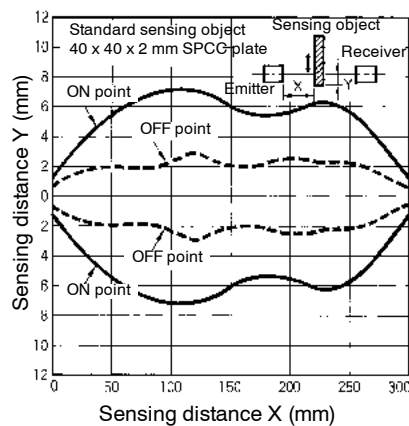
(Not shown)

■ OPERATION CHART (N.O.)

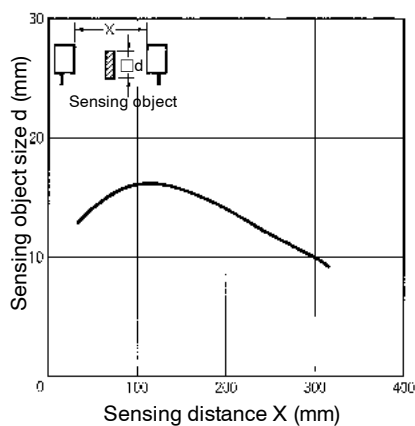


Engineering Data

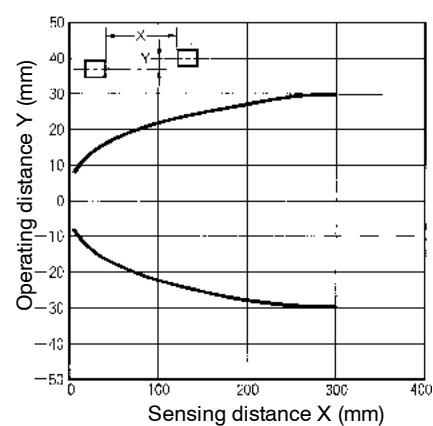
■ SENSING RANGE DIAGRAM (TYPICAL)



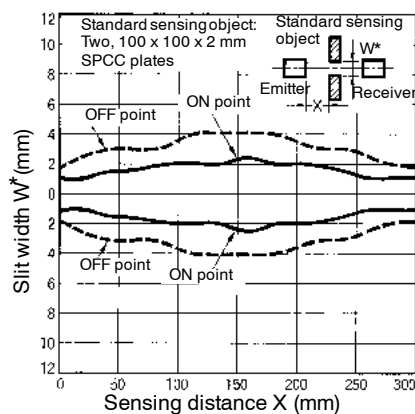
■ OPERATING DISTANCE VS. MINIMUM SENSING OBJECT SIZE (TYPICAL)



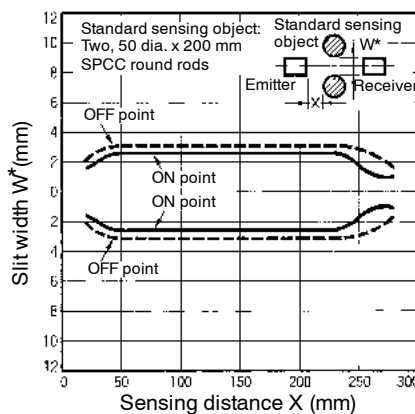
■ PARALLEL MOVEMENT (TYPICAL)



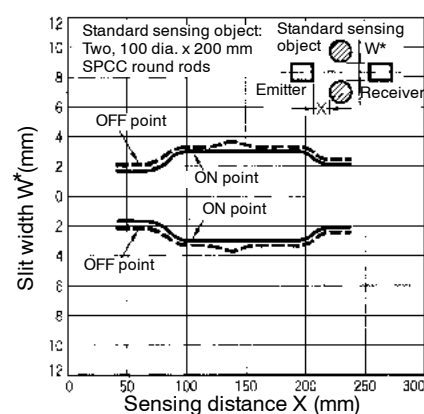
■ SLIT SENSING RANGE (TYPICAL)



*Value W is the limit of jam detection.



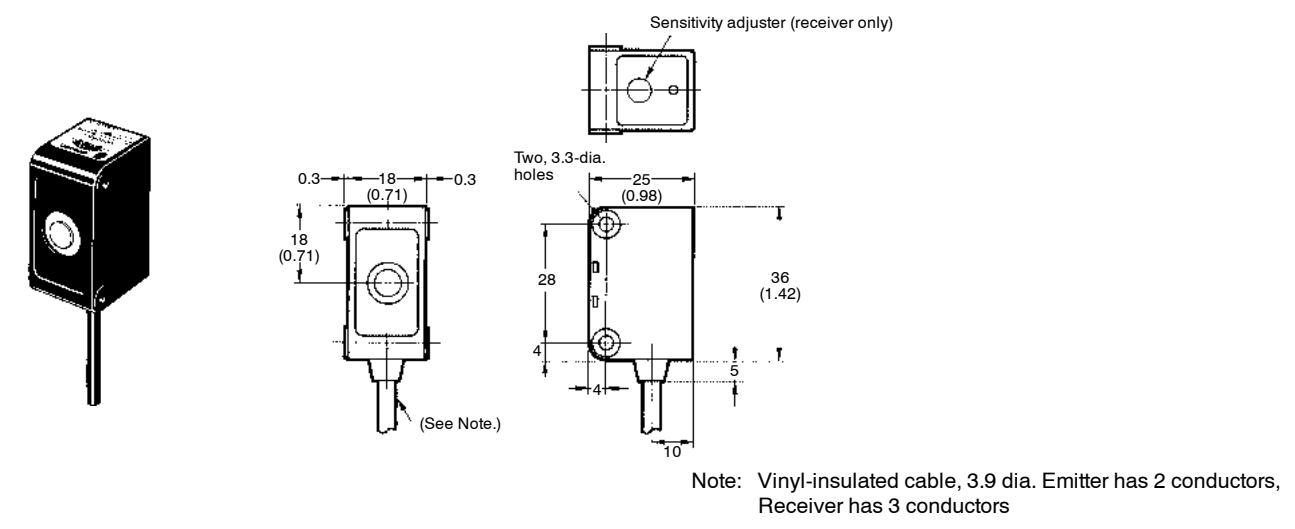
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Dimensions

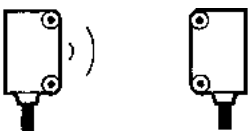

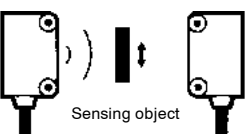



Unit: mm (inch)



Installation

■ BEAM AXIS AND SENSITIVITY ADJUSTMENTS

- Set the sensitivity adjuster of the Receiver to maximum.
 - Move the Emitter and Receiver vertically and horizontally and secure the Emitter and Receiver in the center of the range within which the OPERATION indicator is ON.
- Let the sensing object pass through the sensing range and adjust the sensitivity so that the OPERATION indicator is ON and OFF.

Step	1	2	3
Sensing			
Sensitivity adjuster			
Adjustment procedure	Set the sensitivity adjuster of the receiver to max.	Move the Emitter and Receiver vertically and horizontally and secure the Emitter and Receiver in the center of the range within which the OPERATION indicator is OFF.	Let the sensing object pass through the sensing range and adjust the sensitivity so that the OPERATION indicator is ON and OFF.

Precautions

■ MUTUAL INTERFERENCE

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

■ WIRING

Do not wire the lines of the E4E along with high-tension or power lines in the same conduit or close together, otherwise the E4E may malfunction due to inductive noise.

■ SENSITIVITY ADJUSTMENT

Be sure not to turn the sensitivity adjuster excessively. If the sensitivity adjuster is turned exceeding the permissible range, no sensitivity adjustment will be possible again.

■ POWER SUPPLY

If a standard switching regulator is used, ground the FG and G terminals.

■ POWER ON

The E4E needs a maximum of 100 ms to be ready to operate after the E4E is turned ON. If power is supplied to the E4E and the load independently, be sure to turn ON the E4E first.

■ OUTPUT SHORT-CIRCUIT

The E4E has a built-in circuit protecting the output from short-circuit damage. If the circuit is triggered, the output will not operate. Turn OFF the E4E, check the condition of the load, and then turn ON the E4E again.

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

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