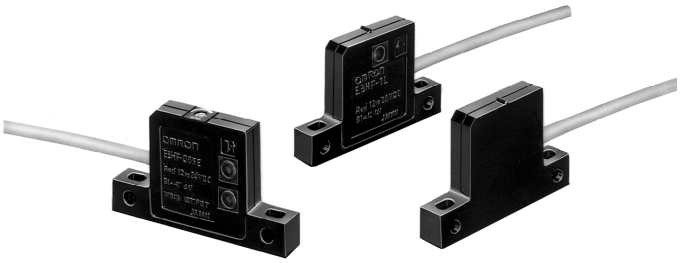
OMRON

Thin-Profile 7-mm Photoelectric Sensor

E3HF

Thin Flat-pack Style

- Just 7 mm (0.276 in) thick
- NPN transistor output switches 80 mA
- Choose Light-ON or Dark-ON operation models
- Top and side through holes make mounting easy
- 3 pairs of focusing slits supplied with separate type sensors



Ordering Information

■ SENSORS

Method of detection		Through-beam	Diffuse reflective
Sensing distance		1 m (3.28 ft)	5 cm (1.97 in)
Part number	**Light-ON operation**	**E3HF-1E1**	**E3HF-DS5E1**
	Dark-ON operation	**E3HF-1E2**	**E3HF-DS5E2**

Specifications

Part number		E3HF-1E□	E3HF-DS5E□□□
Method of detection		Through-beam	Diffuse reflective
Supply voltage		12 to 24 VDC	
Current consumption	Emitter	25 mA max.	30 mA max.
	Receiver	15 mA max.	
Sensing distance		1 m (3.28 ft)	50 mm (1.97 in) with 3 x 3 cm (1.18 x 1.18 in) 90% reflectance white mat paper
Light source		Pulse modulate Infrared LED	
Detectable object type		Opaque materials, 6 mm (0.24 in) minimum dimension	Opaque materials
Operation mode	Light-ON	E3HF-□□□E1	
	Dark-ON	E3HF-□□□E2	
Sensitivity		Fixed	Adjustable

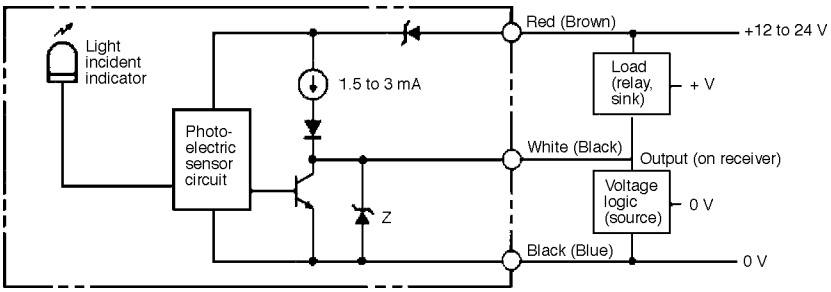
(Table continues on the next page)

Specifications Table - continued from previous page

Part number			E3HF-1E□	E3HF-DS5E□□□
Output	Type		NPN open collector with pull-up resistor	
	Max. load		Load (relay, sink) logic: 80 mA Voltage (source) logic: 1.5 to 3 mA	
	Max. on-state voltage drop		1 VDC at 80 mA	
Response time	On		5 ms max.	3 ms max.
	Off		5 ms max.	3 ms max.
Circuit protection	Output short-circuit		Provided	
	DC power supply reverse polarity		Provided	
Indicators	Emitter		Power On (red LED)	Light incident (red LED)
	Receiver		Light Incident (red LED)	
Materials	Lens		Plastic	
	Case		Plastic	
Mounting			Top and side surface with two through holes	
Connections	Cable	Emitter	2-conductor cable, 2 m (6.56 ft) length	3-conductor cable, 2 m (6.56 ft)
		Receiver	3-conductor cable, 2 m (6.56 ft)	
Weight	Emitter		40 g (1.4 oz)	40 g (1.4 oz)
	Receiver		40 g (1.4 oz)	
Enclosure ratings	NEMA		1, 3, 4X, 12	
	IEC 144		IP64	
Ambient temperature	Operating		-25° to 55°C (-13° to 131°F)	
	Storage		-30° to 70°C (-22° to 158°F)	

Operation

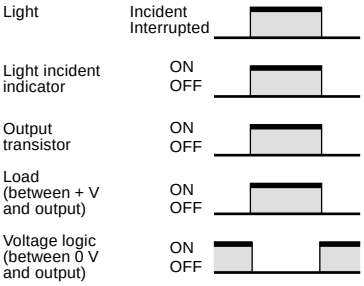
■ OUTPUT CIRCUIT DIAGRAM



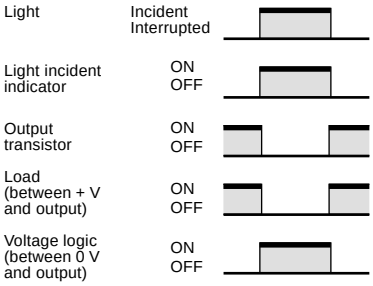
Note: IEC colors are shown in parentheses.

■ TIMING CHARTS

Light-ON operation mode



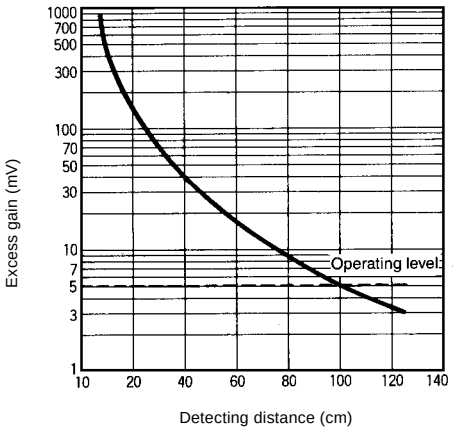
Dark-ON operation mode



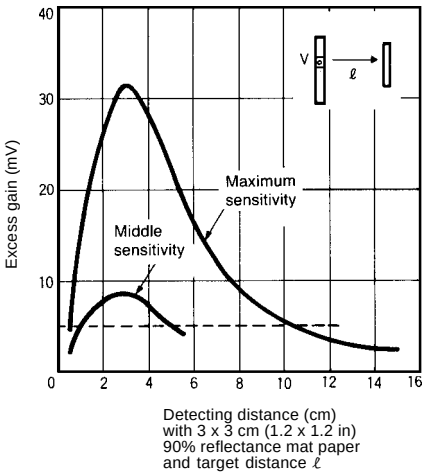
Engineering Data

■ EXCESS GAIN

Through-Beam Type

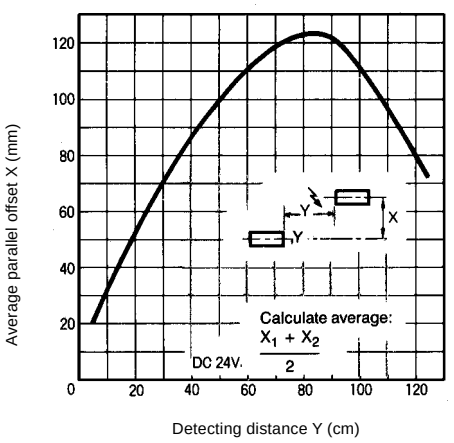


■ DIFFUSE REFLECTIVE TYPE



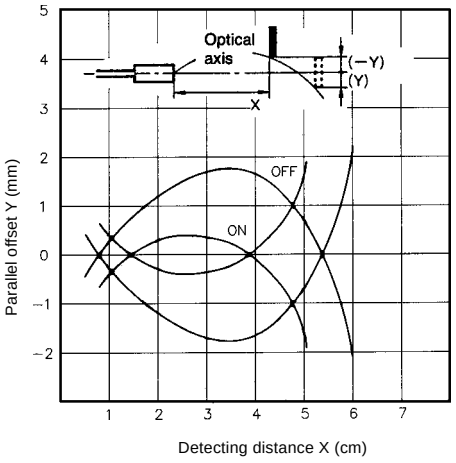
■ LIGHT SOURCE/RECEIVER SETTING RANGE

Through-Beam Type



■ OPERATING RANGE

Diffuse Reflective Type

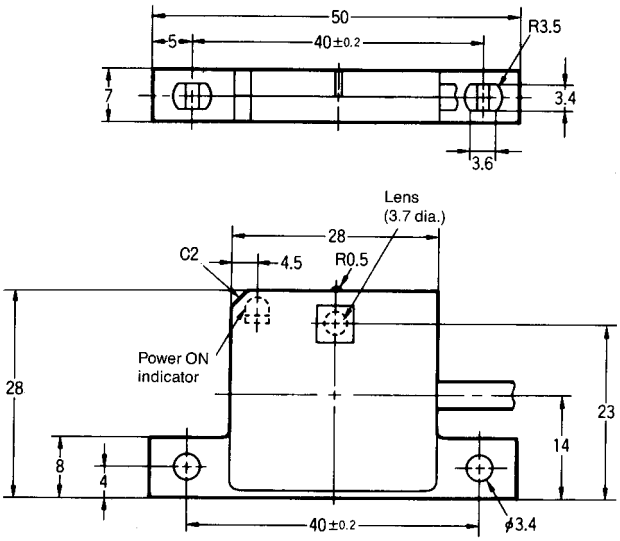


Dimensions

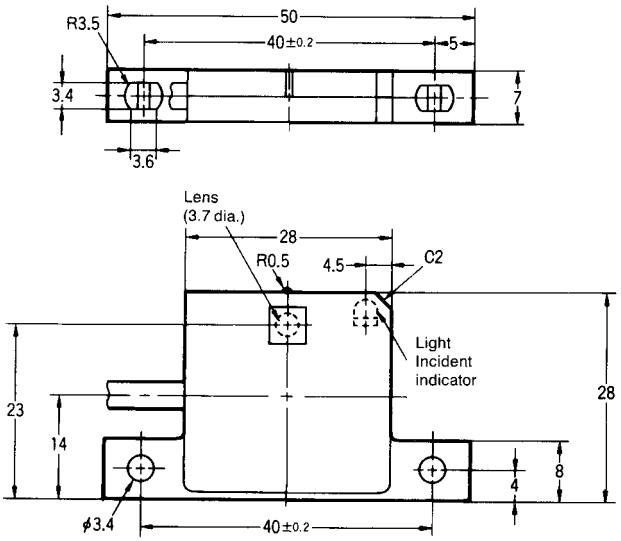
Unit: mm

Through-beam Type

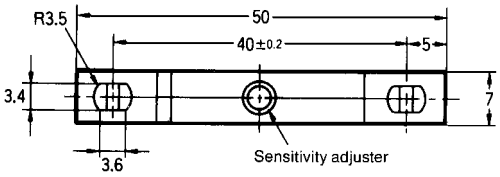
Light Source

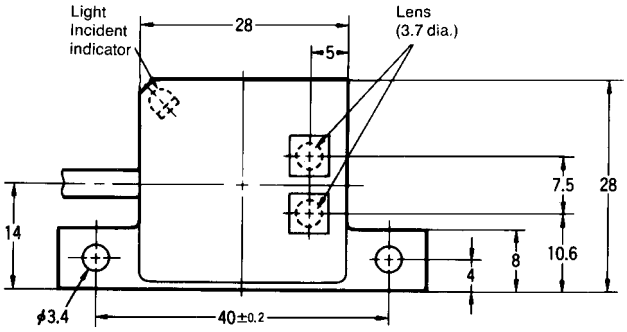


Receiver



Diffuse Reflective Type





■ SLITS FOR THROUGH-BEAM

Using slits reduces the sensing distance and allows smaller objects to be detected.

Three pairs of slits are supplied with E3HF-1E1 and E3HF-1E2 sensors. The slits are decals that can be peeled off the protective backing sheet and applied to the emitter and receiver. See table below for dimensions of slit openings.

Slit width	0.5 mm (0.020 in)	1 mm (0.039 in)	2 mm (0.079 in)
Sensing distance	12 cm (4.74 in)	20 cm (7.87 in)	40 cm (15.75 in)
Minimum detectable object size	0.5 mm (0.020 in)	1 mm (0.039 in)	2 mm (0.079 in)

OMRON

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