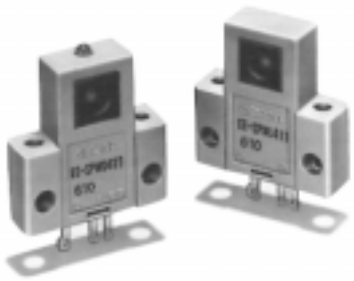
OMRON

EE-SPW311/411

Photomicrosensor with a Sensing Distance as Long as 1 m

- Easy-to-see Light-ON indicator
- Wide operating voltage range: 5 to 24 VDC
- Light modulation effectively reduces external light interference
- Easy-to-wire connector assures ease of maintenance
- Convert to PNP output with EE-2002 conversion connector



Ordering Information

Appearance	Sensing method	Sensing distance	Sensing object	Output configuration	Weight	**Part number**
	Transmissive	1 m	Opaque material, 5 mm dia. min.	Dark-ON	Approximately 8.8 g	**EE-SPW311**
				Light-ON		**EE-SPW411**

Note: Wire Harness/Connector included with EE-SPW311 and EE-SPW411

Specifications

■ RATINGS

Item	Transmissive type	
	EE-SPW311	EE-SPW411
Supply voltage	5 (-5%) to 24 (+10%) VDC, ripple (p-p): 10% max.	
Current consumption	40 mA max. (emitter: 20 mA max.; receiver: 20 mA max.)	
Sensing distance	1 m	
Standard reference object	Opaque: 5 mm dia. min.	
Directional angle	5° to 20°	
Control output	At 5 to 24 VDC: 100 mA load current (I_C) with a residual voltage of 0.8 V max. When driving TTL: 40 mA load current (I_C) with a residual voltage of 0.4 V max.	

(This table continues on the next page.)

Specifications Table – continued from previous page

Item		Transmissive type	
		EE-SPW311	EE-SPW411
Output configuration	Transistor on output stage without detecting object	OFF	ON
	Transistor on output stage with detecting object	ON	OFF
Indicator (See Note.)	Without detecting object	ON	
	With detecting object	OFF	
Response frequency		100 Hz max. (200 Hz typ.)	
Connecting method		Dedicated connectors: EE-1001, EE-1006, EE-1006L and EE-1006D	
Light source		GaAs infrared LED (pulse modulated) with a peak wavelength of 940 nm	
Receiver		Si photo-transistor with a sensing wavelength of 850 nm max.	

Note: The indicator is a GaP red LED (peak emission wavelength: 700 nm).

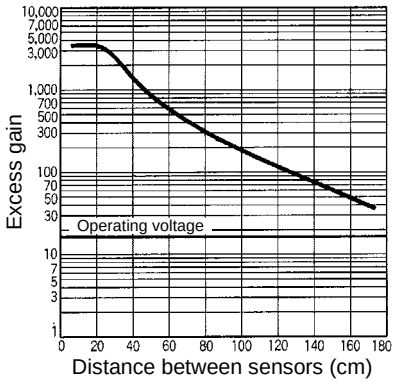
■ CHARACTERISTICS

Ambient illumination*		Sensing face: fluorescent light: 1,000 ℓ x max.; incandescent light: 3,000 ℓ x max.
Enclosure ratings		IP60
Ambient temperature	Operating	-10°C to 55°C (14°F to 131°F)
	Storage	-25°C to 80°C (-13°F to 176°F)
Ambient humidity	Operating	45% to 85%
	Storage	35% to 95%
Vibration resistance		Destruction: 200 to 2,000 Hz (with a peak acceleration of 10G's), 1.5-mm double amplitude for 2 hrs (with 4-minute cycles) each in X, Y, and Z directions
Shock resistance		Destruction: 500 m/s^2 (approx. 50G) for 3 times each in X, Y, and Z directions
Material		Case: PBT; lens: polycarbonate
Cable length		10 m max. with a cross-sectional area of 0.3 mm^2 min. (AWG24 min.)

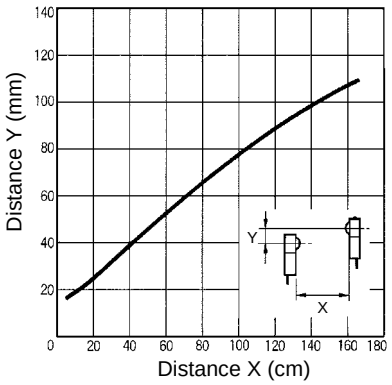
Note: *The ambient illumination is measured on the surface of the receiver.

Engineering Data

■ RECEIVER OUTPUT VS. SENSING DISTANCE (TYPICAL)



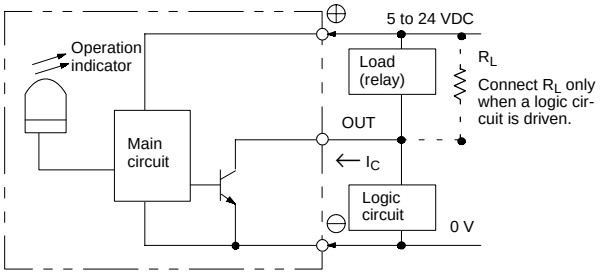
■ PARALLEL MOVEMENT CHARACTERISTICS (TYPICAL)



Operation

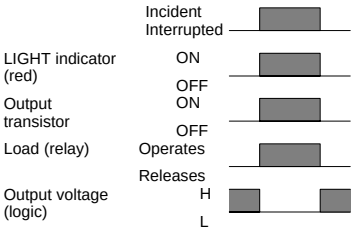
■ INTERNAL/EXTERNAL CIRCUIT DIAGRAM

Light-ON/Dark-ON

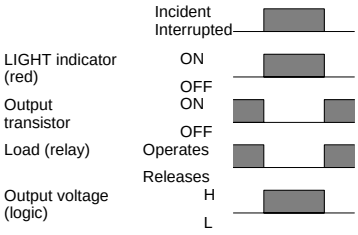


■ TIMING CHART

Light-ON



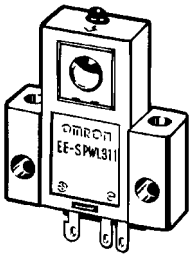
Dark-ON



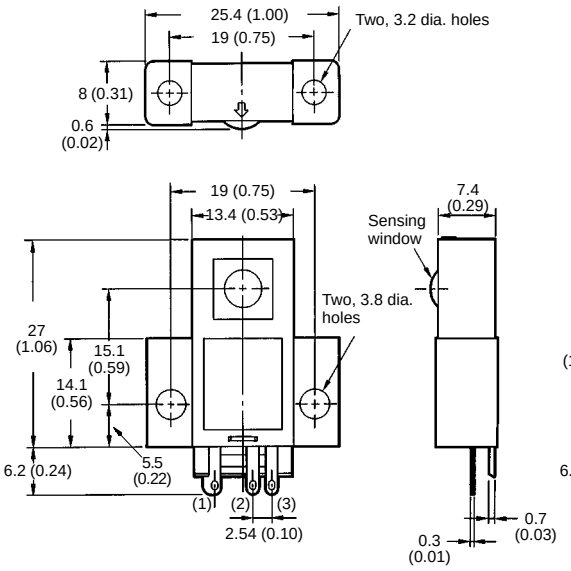
Dimensions

Unit: mm (inch)

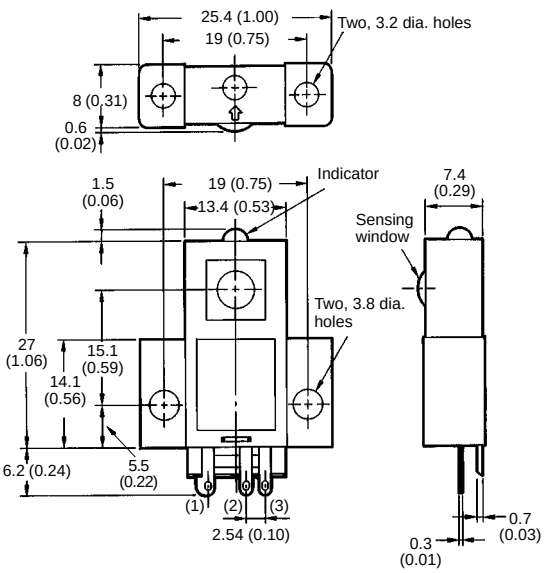
■ EE-SPW311/SPW411



Emitter (EE-SPWL_11)



Receiver (EE-SPWD_11)



Terminal Arrangement

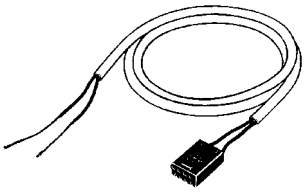
Emitter

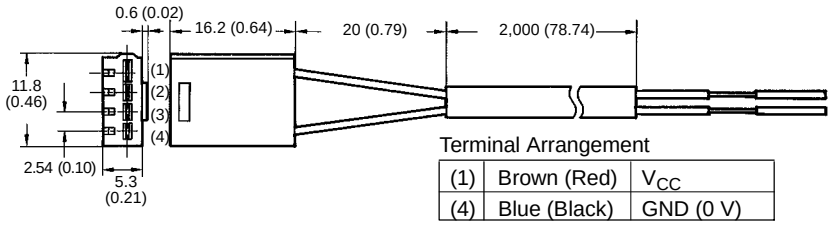
(1)	⊕	V_{CC}
(2)	OUT	—
(3)	⊖	GND (0 V)

Receiver

(1)	⊕	V_{CC}
(2)	OUT	OUTPUT
(3)	⊖	GND (0 V)

EE-1006L CONNECTOR FOR EMITTER (ATTACHMENT)



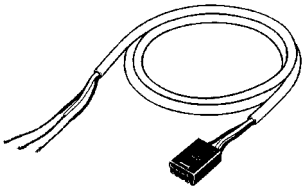


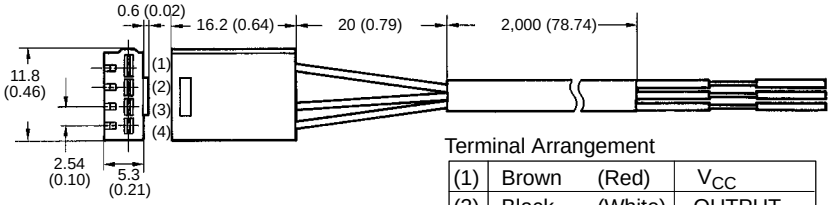
Terminal Arrangement

(1)	Brown (Red)	V_{CC}
(4)	Blue (Black)	GND (0 V)

Note: Older standard colors are shown in parentheses. The connector comes with an 18 strand, 0.12-wire, 2-m attached RED CABLE.

EE-1006D CONNECTOR FOR RECEIVER (ATTACHMENT)





Terminal Arrangement

(1)	Brown	(Red)	V_{CC}
(2)	Black	(White)	OUTPUT
(3)	Blue	(Black)	GND (O V)

Note: Older standard colors are shown in parentheses. The connector comes with an 18 strand, 0.12-wire, 2-m attached GRAY CABLE.

Precautions

Refer to the Technical Information Section for general precautions.

CHEMICAL RESISTANCE

The sensing window is made of a polycarbonate resin which withstands chloride solvents and strong acids but is soluble in strong alkali, aromatic hydrocarbons, and aliphatic hydrocarbonate chloride solvents.

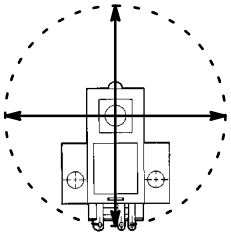
AXIS ADJUSTMENT

1. When mounting the emitter and receiver, ensure that the center line of each lens will be on the same plane (refer to the diagrams).

Side view

Top view

2. Turn on the emitter and receiver after making sure that they have been wired correctly. When power is turned on, the operation indicator on the receiver will light. Make sure the operation indicator is off when an object intercepts the optical axis and the operation indicator lights again when the object is removed.
3. Fix the position of the receiver (or emitter) securely, move the emitter (or receiver) horizontally and vertically to check the range in which the operation indicator is lit. Then locate the emitter (or receiver) in the center of the range, and fix the position securely.



CONNECTION

Extra care must be taken when making connections to the units because they are protected against reverse polarity.

Install the wiring for the photomicrosensor in a separate wiring duct well away from both supply lines and high voltage cables to prevent damage or faulty operation from induced transients.

Any extension must be shorter than 10 meters with wire that has a cross-sectional area greater than 0.3 mm^2.

POWER SUPPLY

When using a commercial switching regulator, the frame ground (FG) and ground (G) pins must be grounded. Failure to do so may result in faulty operation due to switching noise.

LOADS

Operate the sensor with a load. The sensor is not protected against short circuits.

When the photomicrosensor is turned on, a period of approximately 1 to 3 ms is required for the photomicrosensor to operate stably.

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

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