

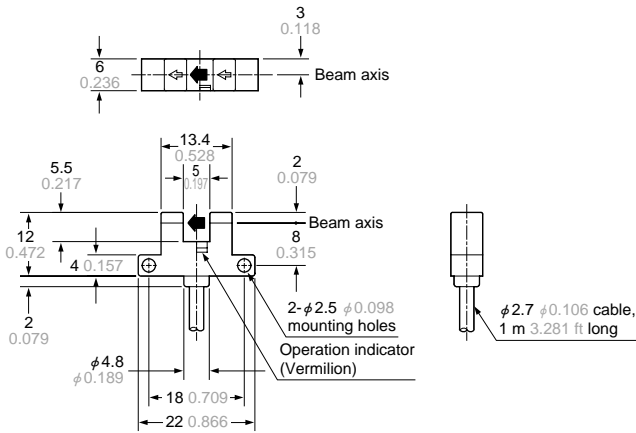
U-shaped Micro Photoelectric Sensor

The ultra-small PM series of u-shaped photoelectric sensors provides a wide range of 29 different models to suit any of your application needs. With the industry's smallest size, the PM series plays a key role in the miniaturization of your equipment. All models are equipped with two outputs, one for **Light-ON** and the other for **Dark-ON** sensing. This increases the versatility of the sensor for use in existing applications. The series is also available in a connector type to maximize ease of installation and allow for wire replacement if the cable is severed. The PM series conforms to the European EMC Directive and carries UL Recognition. Both NPN and PNP transistor output models are available.

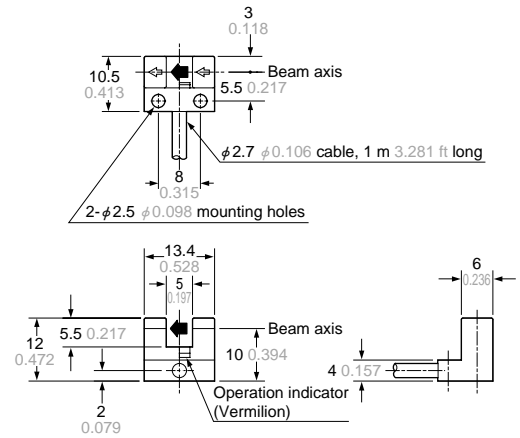
Model Name	Type	Output Operation	Output Configuration	Emitting Element	Max. Range (mm)	Max. Range (in)	Quick Disconnect
Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼	Sort ▲ ▼
PM-F24	Ultra-Small F-Type	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-F44	Small F-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-K24	Ultra-Small K-Type	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-K44	Small K-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-L24	Ultra-Small L-Type	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-L44	Small L-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-R24	Ultra-Small R-Type	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-R44	Small R-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-T44	Small T-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-U24	Ultra-Small U-Type	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable
PM-Y44	Small Y-Type with cable	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Cable

DIMENSIONS (Unit: mm in)

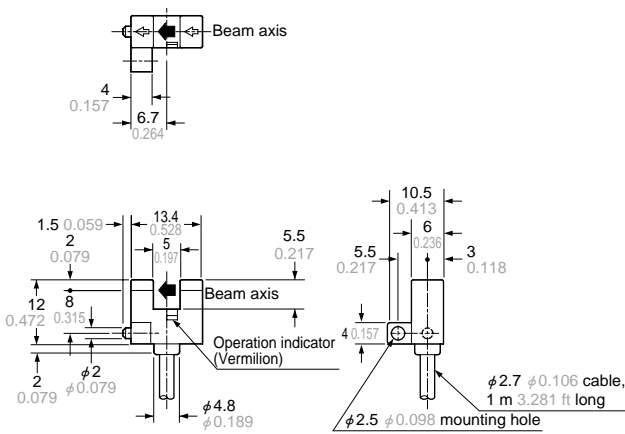
**PM-K24
PM-K24-R** Sensor



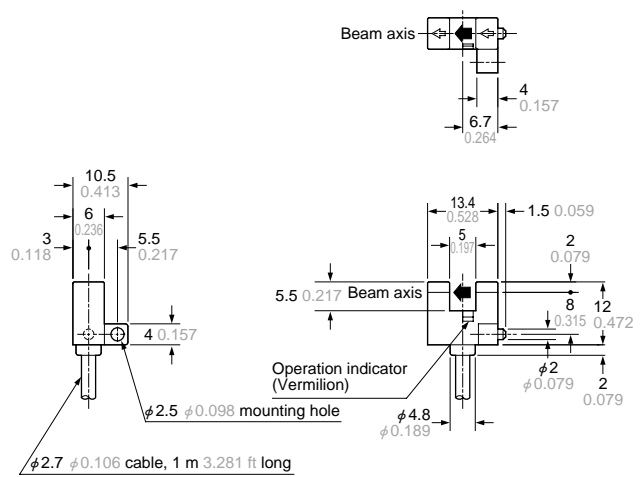
**PM-L24
PM-L24-R** Sensor



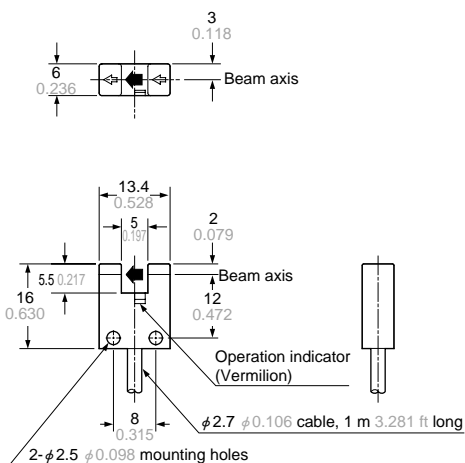
**PM-F24
PM-F24-R** Sensor



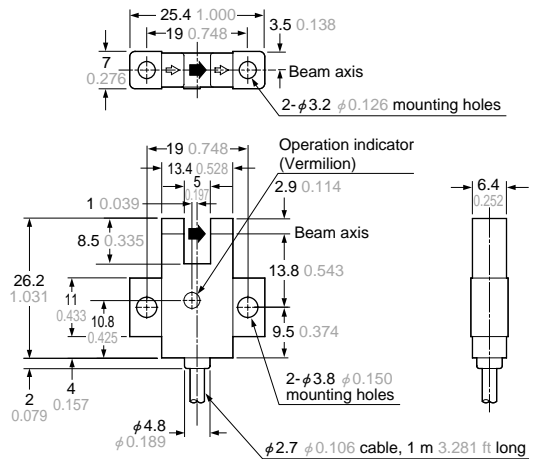
**PM-R24
PM-R24-R** Sensor



**PM-U24
PM-U24-R** Sensor

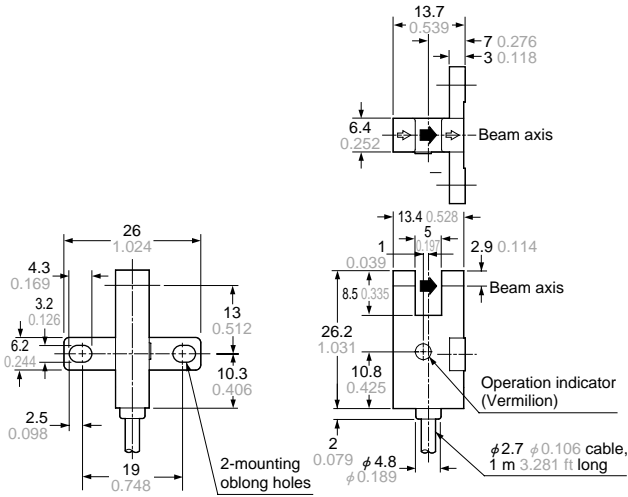


**PM-K44
PM-K44P** Sensor

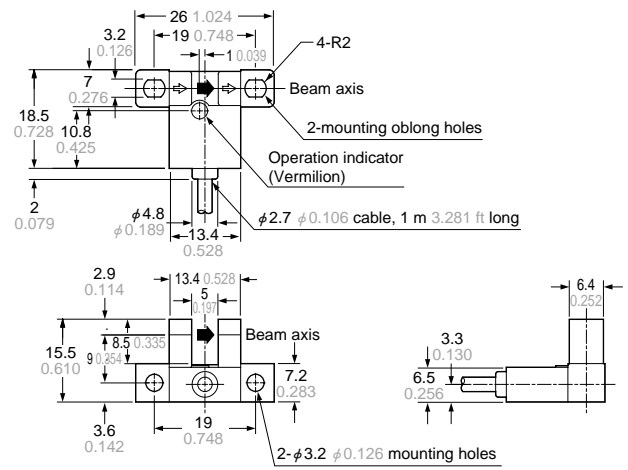


MENSIONS (Unit: mm in)

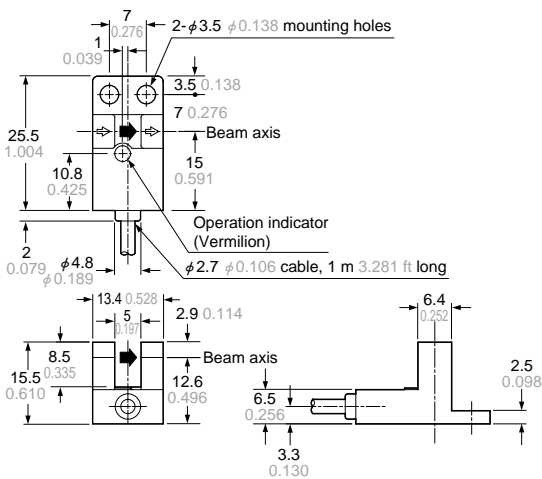
**PM-T44
PM-T44P** Sensor



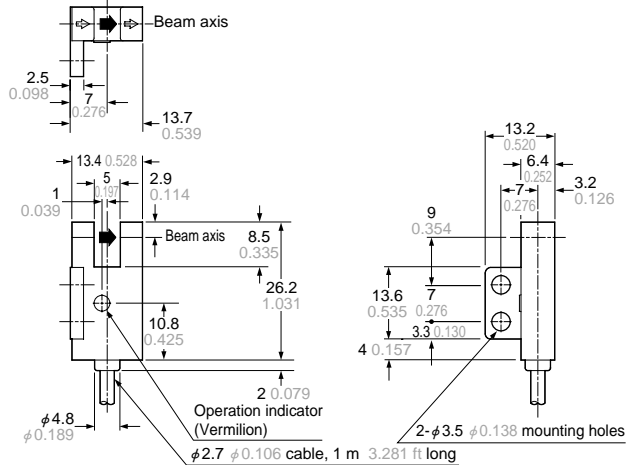
**PM-L44
PM-L44P** Sensor



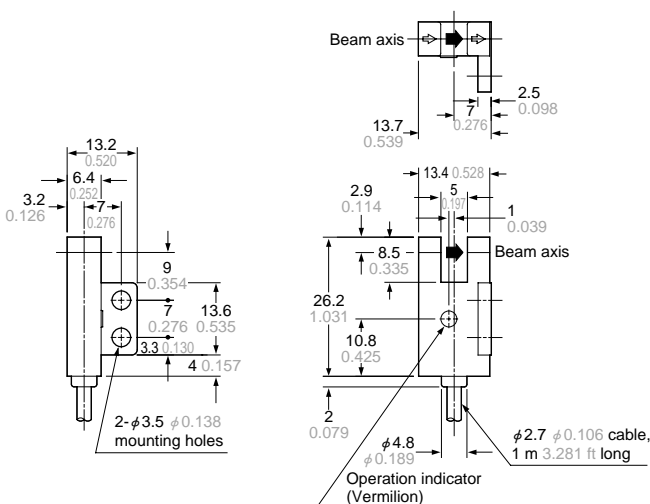
**PM-Y44
PM-Y44P** Sensor



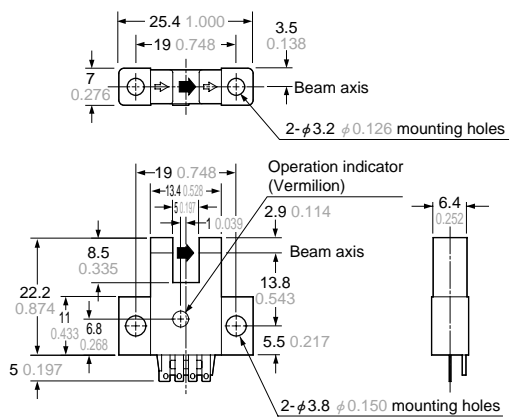
**PM-F44
PM-F44P** Sensor



**PM-R44
PM-R44P** Sensor



**PM-K54
PM-K54P** Sensor



SPECIFICATIONS

Item	Model No.	Type	Ultra-small		Small	
		NPN output type	PM-□24	With flexible cable	With cable	With connector
		PNP output type		PM-□24-R	PM-□44	PM-□54
				PM-□44P	PM-□54P	
Sensing range		5 mm 0.197 in (fixed)				
Minimum sensing object		0.8 × 1.8 mm 0.031 × 0.071 in opaque object				
Hysteresis		0.05 mm 0.002 in or less				
Repeatability		0.03 mm 0.001 in or less				
Supply voltage		5 to 24 V DC ± 10 % Ripple P-P 10 % or less				
Current consumption		15 mA or less				
Output		<NPN output type> NPN open-collector transistor • Maximum sink current: 50 mA • Applied voltage: 30 V DC or less (between output and 0 V) • Residual voltage: 0.7 V or less (at 50 mA sink current) 0.4 V or less (at 16 mA sink current)		<PNP output type> PNP open-collector transistor • Maximum source current: 50 mA • Applied voltage: 30 V DC or less (between output and + V) • Residual voltage: 0.7 V or less (at 50 mA source current) 0.4 V or less (at 16 mA source current)		
Utilization category		DC-12 or DC-13				
Output operation		Incorporated with 2 outputs: Light-ON / Dark-ON				
Response time		Under light received condition: 20 μs or less Under light interrupted condition: 100 μs or less (Response frequency: 1 kHz or more)(Note 1)				
Operation indicator		Vermilion LED (lights up under light received condition)				
Environmental resistance	Pollution degree	3 (Industrial environment)				
	Ambient temperature (Note 2, 3)	- 25 to + 55 °C - 13 to + 131 °F (No dew condensation or icing allowed), Storage: - 30 to + 80 °C - 22 to + 176 °F				
	Ambient humidity	35 to 85 % RH, Storage: 35 to 85 % RH				
	Ambient illuminance	Fluorescent light: 1,000 lx at the light-receiving face				
	EMC	EN 50081-2, EN 50082-2, EN 60947-5-2				
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure				
	Insulation resistance	50 MΩ, or more, with 250 V DC megger between all supply terminals connected together and enclosure				
	Vibration resistance	10 to 2,000 Hz frequency, 1.5 mm 0.059 in amplitude in X, Y and Z directions for two hours each				
Shock resistance	15,000 m/s ² acceleration (1,500 G approx.) in X, Y and Z directions for three times each					
Emitting element		Infrared LED (non-modulated)				
Material		Enclosure: PBT, Slit cover: Polycarbonate, Terminal part [PM-□54(P) only]: Solder plated				
Cable		0.09 mm ² 4-core cabtyre cable [PM-□24-R: 0.1 mm ² flexible, oil and heat resistant cabtyre cable (Note 4)], 1 m 3.281 ft long				
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm ² , or more, cable.				
Weight		10 g approx.		15 g approx.		3 g approx.

Notes: 1) The response frequency is the value when the disc, given in the figure below, is rotated.



2) In case the ultra-small type PM-□24(-R) is used at an ambient temperature of + 50 °C + 122 °F, or more, make sure to mount it on a metal body.

3) Take care that the flexibility of the PM-□24-R cable is lost if the ambient temperature is near - 10 °C + 14 °F.

4) The cable of PM-□24-R is a flexible cable usable on a moving base. When the sensor is mounted on a moving base, fix the sensor cable joint so that stress is not applied to it.