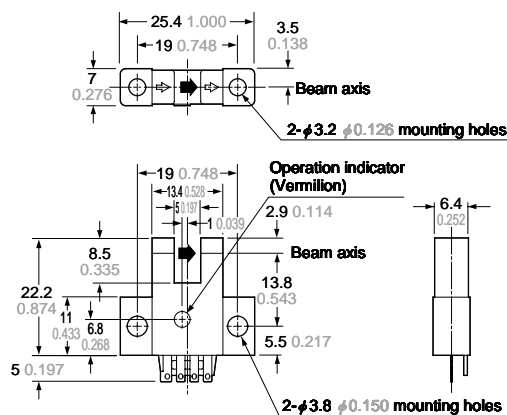


U-shaped Micro Photoelectric Sensor

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-F54	Small F-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-K54	Small K-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-L54	Small L-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-R54	Small R-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-T54	Small T-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector
PM-Y54	Small Y-Type with connector	Light-ON/Dark-ON	NPN	Infrared LED	5	0.2	Connector

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.