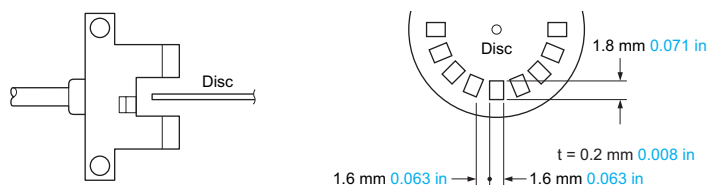


SPECIFICATIONS

Item	Model No.	Type	Ultra-small	
				With flexible cable
		NPN output	PM-□24	PM-□24-R
		PNP output	PM-□24P	—
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		<p><NPN output type></p> <p>NPN open-collector transistor</p> <ul style="list-style-type: none"> • 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) <p><PNP output type></p> <p>PNP open-collector transistor</p> <ul style="list-style-type: none"> • 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 2)		
Operation indicator		Vermilion LED (lights up under light received condition)		
Environmental resistance	Pollution degree		3 (Industrial environment)	
	Ambient temperature (Note 3, 4)		-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 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 (Peak emission wavelength: 940 nm 0.037 mil , non-modulated)		
Material		Enclosure: PBT, Slit cover: Polycarbonate		
Cable		0.09 mm ² 4-core cabtyre cable [PM-□24-R : 0.1 mm ² flexible, oil and heat resistant cabtyre cable (Note 5)], 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		Net weight: 10 g approx.		

Notes: 1) Where measurement conditions have not been specified precisely, the conditions used were an ambient temperature of +23 °C **+73.4 °F**.

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



3) In case the **PM-24** series is used at an ambient temperature of +50 °C **+122 °F**, or more, make sure to mount it on a metal body.

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

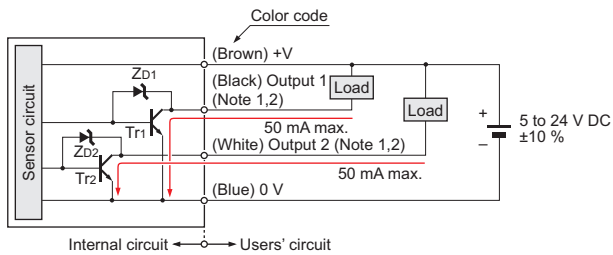
5) The cable of **PM-□24-R** is a flexible cable usable on a moving base. When the sensor is mounted on a moving base, fix the sensor cable joint so that stress is not applied to it. (Models other than the **PM-□24-R** cannot be used on a moving base.)

I/O CIRCUIT AND WIRING DIAGRAMS

PM-□24 PM-□24-R

NPN output type

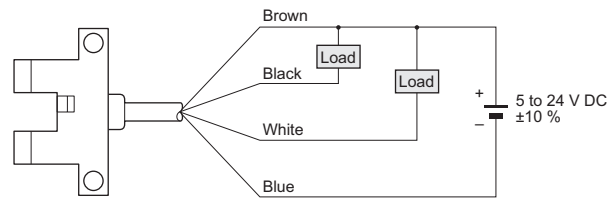
I/O circuit diagram



- Notes: 1) Make sure to connect terminals correctly as the sensor does not incorporate a reverse polarity protection circuit. Further, the output is not incorporated with a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load. Faulty wiring may result in damage.
2) Ensure to insulate the unused output wire.

Symbols ... ZD1, ZD2: Surge absorption zener diode
Tr1, Tr2 : NPN output transistor

Wiring diagram



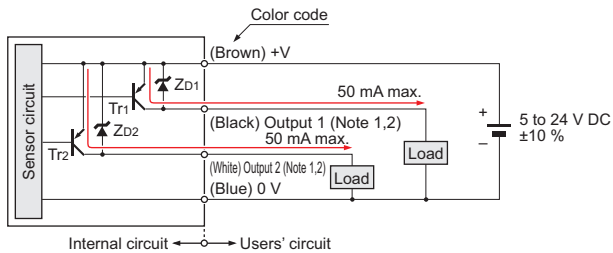
Output operation

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

PM-□24P

PNP output type

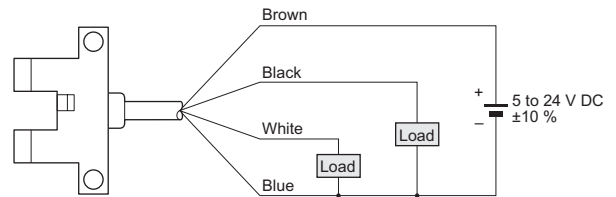
I/O circuit diagram



- Notes: 1) Make sure to connect terminals correctly as the sensor does not incorporate a reverse polarity protection circuit. Further, the output is not incorporated with a short-circuit protection circuit. Do not connect it directly to a power supply or a capacitive load. Faulty wiring may result in damage.
2) Ensure to insulate the unused output wire.

Symbols ... ZD1, ZD2 : Surge absorption zener diode
Tr1, Tr2 : PNP output transistor

Wiring diagram

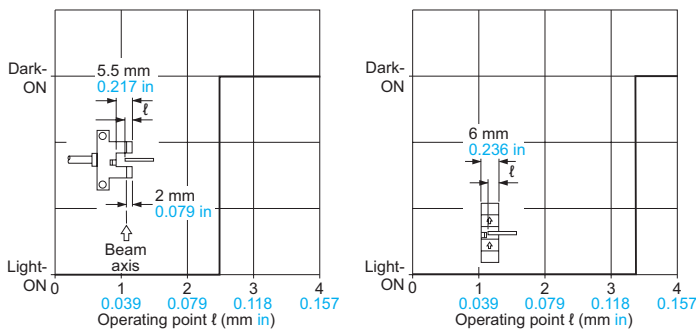


Output operation

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

SENSING CHARACTERISTICS (TYPICAL)

Sensing position



FIBER SENSORS

LASER SENSORS

PHOTO-ELECTRIC SENSORS

MICRO PHOTO-ELECTRIC SENSORS

AREA SENSORS

LIGHT CURTAINS / SAFETY COMPONENTS

PRESSURE / FLOW SENSORS

INDUCTIVE PROXIMITY SENSORS

PARTICULAR USE SENSORS

SENSOR OPTIONS

SIMPLE WIRE-SAVING UNITS

WIRE-SAVING SYSTEMS

MEASUREMENT SENSORS

STATIC ELECTRICITY PREVENTION DEVICES

LASER MARKERS

PLC

HUMAN MACHINE INTERFACES

ENERGY CONSUMPTION VISUALIZATION COMPONENTS

FA COMPONENTS

MACHINE VISION SYSTEMS

UV CURING SYSTEMS

Selection Guide

U-shaped

Convergent Reflective

PM-64

PM-24

PM-44/ PM-54