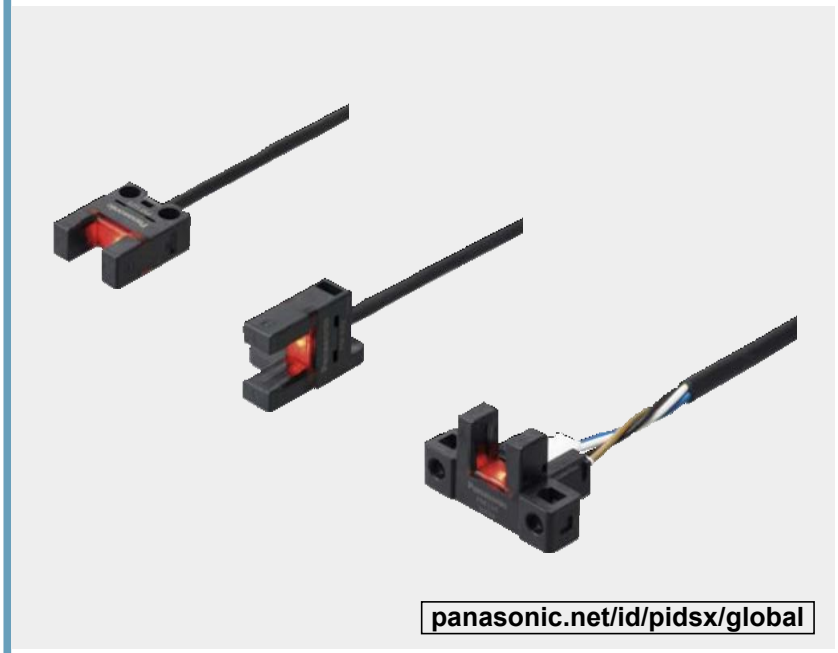
U-shaped Micro Photoelectric Sensor Amplifier Built-in

PM-25 SERIES PM-45 SERIES PM-65 SERIES

Related Information
General terms and conditions ..... F-3 ■Selection guide P.393~
■Glossary of terms / General precautions.....P.1549~ / P.1552~ ■Korea's S-mark..... P.1602



panasonic.net/id/pidsx/global

CE

cULus Recognition

Certified (Some models only)

PNP output type available

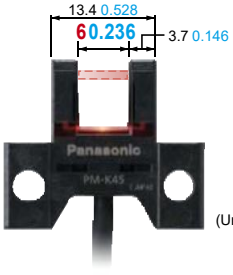
One step ahead in performance and mounting ease

Three protection circuits standard on all models
PM-25/45/65 SERIES

All models are standardly equipped with the following protection circuits in their compact bodies. These protection circuits minimize the possibility of sensor malfunctions caused by erroneous wiring.
① Reverse supply polarity protection circuit
② Reverse output polarity protection circuit
③ Output short-circuit protection circuit

Ample beam emitting / receiving distance of 6 mm 0.236 in
PM-25/45/65 SERIES

The beam emitting and receiving sections are 0.5 mm 0.02 in thinner than those on our conventional models while their external dimensions are the same. As a result, the distance between the beam emitting point and receiving point increased by 1 mm 0.039 in. The wider distance means less possibility of collision between the sensing section and sensing object.

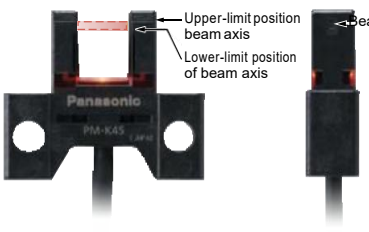


Industry's first*! IP64 rating
*As of April 2017, in-company survey.
PM-25/45 SERIES

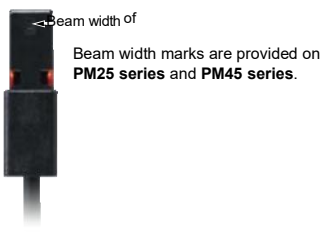
Our original integrated molding method has eliminated grooves and gaps on the sensing surface and main body, thus reducing the possibility of malfunctions caused by splashing water or dust.

Beam marks for easy adjustment
PM-25/45/65 SERIES

The upper-limit and lower-limit positions of beam can be visually confirmed from the front, back, right and left sides of the sensor unit. This allows easy adjustment of the position of sensing object.



< Front / back >

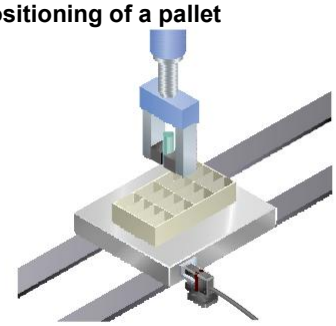


< Right / left >

Beam width marks are provided on **PM25 series** and **PM45 series**.

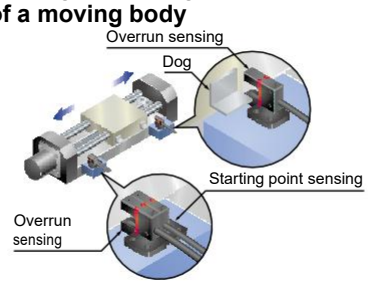
APPLICATIONS

Positioning of a pallet



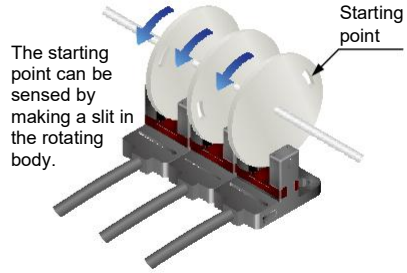
Pallet is stopped by sensing the dog*.

Sensing the starting point and overrun of a moving body



Starting point and overrun is sensed using the dog* on the base.

Sensing the starting point on a rotating body



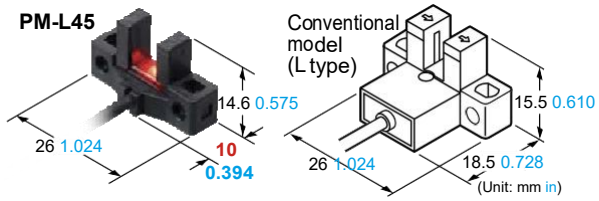
*"Dog" refers to the sensing object for activating the sensor's detecting operation.

Large and easy to see Multi-angle operation indicator PM-25/45/65 SERIES

The large operation indicator (orange) lights up when the beam enters. The indicator is easy to see from above and from the sides.

Compact size PM-45 SERIES

All new models require significantly less mounting space than our conventional models when mounted with the same pitch. What's more, the new models can directly replace our conventional models currently in use.



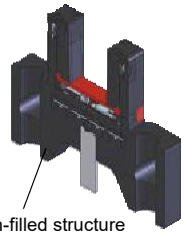
All models easy to mount with M3 screws PM-25/45/65 SERIES

The sensor unit can be installed with one or two M3 screws.
* M3 screws and washers are not included.

- Models requiring one M3 screw for installation
  PM-F25, **PM-R25**, **PM-F65**, **PM-R65**
- Models requiring two M3 screws for installation
  Models other than above

Resistant to vibrations and impacts PM-25/45/65 SERIES

The sections where stress concentrates, such as the connecting section of the cable and internal circuit, are covered with a resin. This helps prevent malfunctions caused by vibrations and impacts.



Resin-filled structure
(cross-sectional view)

VARIATION

Sensors come in various shapes to suit a wide range of mounting conditions

Ultra-small / Cable type PM-25 SERIES

Easy mounting with M2/M3 screws!

NPN output	1 m 3.281 ft cable	3 m 9.843 ft cable	1 m 3.281 ft bending-resistant cable
PNP output	1 m 3.281 ft cable	3 m 9.843 ft cable	1 m 3.281 ft bending-resistant cable

Compact / Cable type PM-45 SERIES

Compact size!

NPN output	1 m 3.281 ft cable	3 m 9.843 ft cable	1 m 3.281 ft bending-resistant cable
PNP output	1 m 3.281 ft cable	3 m 9.843 ft cable	1 m 3.281 ft bending-resistant cable

Compact / Connector built-in type PM-65 SERIES

Easy connection with a single touch using commercially-available connectors

NPN output	Connector attached cable 1 m 3.281 ft, 2 m 6.562 ft, 3 m 9.843 ft, 5 m 16.404 ft	Connector attached bending-resistant cable 1 m 3.281 ft, 2 m 6.562 ft, 3 m 9.843 ft, 5 m 16.404 ft
PNP output	Connector attached cable 1 m 3.281 ft, 2 m 6.562 ft, 3 m 9.843 ft, 5 m 16.404 ft	Connector attached bending-resistant cable 1 m 3.281 ft, 2 m 6.562 ft, 3 m 9.843 ft, 5 m 16.404 ft

Ultra-small / Cable type PM-25 SERIES

Easy mounting with M2/M3 screws!

Cable type
Built-in connector

NPN output: 1 m 3.281 ft cable | 3 m 9.843 ft cable | 1 m 3.281 ft bending-resistant cable
PNP output: 1 m 3.281 ft cable | 3 m 9.843 ft cable | 1 m 3.281 ft bending-resistant cable

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* NPN output / 1 m 3.281 ft cable length type only (Excluding bending-resistant cable type)

PM-K25

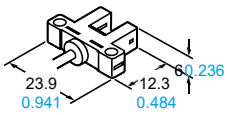
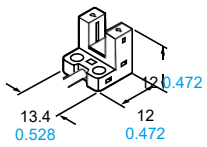
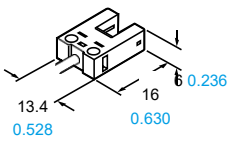
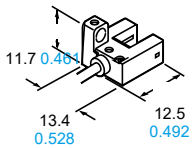
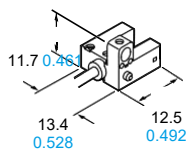
PM-L25

PM-U25

PM-F25

PM-R25

ORDER GUIDE

Type		Appearance (mm in)	Sensing range	Model No.	Cable length	Output	Output operation
Ultra-small / Cable type	K type		6 mm 0.236 in (fixed)	**PM-K25**	1 m 3.281 ft	NPN open-collector transistor	Incorporated with 2 outputs: Light-ON/Dark-ON
				PM-K25-R	1 m 3.281 ft, bending-resistant cable		
				PM-K25-C3	3 m 9.843 ft		
				PM-K25-P	1 m 3.281 ft	PNP open-collector transistor	
	L type			**PM-L25**	1 m 3.281 ft	NPN open-collector transistor	
				PM-L25-R	1 m 3.281 ft, bending-resistant cable		
				PM-L25-C3	3 m 9.843 ft		
				PM-L25-P	1 m 3.281 ft	PNP open-collector transistor	
	U type			**PM-U25**	1 m 3.281 ft	NPN open-collector transistor	
				PM-U25-R	1 m 3.281 ft, bending-resistant cable		
				PM-U25-C3	3 m 9.843 ft		
				PM-U25-P	1 m 3.281 ft	PNP open-collector transistor	
	F type			**PM-F25**	1 m 3.281 ft	NPN open-collector transistor	
				PM-F25-R	1 m 3.281 ft, bending-resistant cable		
				PM-F25-C3	3 m 9.843 ft		
				PM-F25-P	1 m 3.281 ft	PNP open-collector transistor	
	R type			**PM-R25**	1 m 3.281 ft	NPN open-collector transistor	
				PM-R25-R	1 m 3.281 ft, bending-resistant cable		
				PM-R25-C3	3 m 9.843 ft		
				PM-R25-P	1 m 3.281 ft	PNP open-collector transistor	

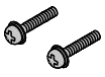
suffix "**-R**" in the model No. indicates a bending-resistant cable type. The suffix "**-C3**" indicates a 3 m 9.843 ft cable length type.

OPTIONS

Designation	Model No.	Description
Mounting screw	**MS-M2**	Mounting screw with washers for the ultra-small type sensor (50 pcs. lot). It can mount securely as it is spring washer attached.

Mounting screw

• **MS-M2**

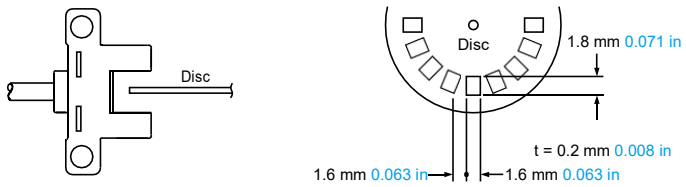


M2 (length 10 mm 0.394 in) screw with a spring washer

SPECIFICATIONS

Item \ Type		Ultra-small / Cable type		
			Bending-resistant cable	3 m 9.843 ft cable
Model No.	NPN output	**PM-□25**	**PM-□25-R**	**PM-□25-C3**
	PNP output	**PM-□25-P**	———	———
CE marking directive compliance		EMC Directive, RoHS Directive		
Sensing range		6 mm 0.236 in (fixed)		
Minimum sensing object		0.8 × 1.2 mm 0.031 × 0.047 in opaque object		
Hysteresis		0.05 mm 0.002 in or less		
Repeatability		0.01 mm 0.0004 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: 2 V or less (at 50 mA sink current) 1 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: 2 V or less (at 50 mA source current) 1 V or less (at 16 mA source current)
	Output operation	Incorporated with 2 outputs: Light-ON/Dark-ON		
	Short-circuit protection	Incorporated		
Response time		Under light received condition: 20 µs or less Under light interrupted condition: 80 µs or less (Maximum response frequency: 3 kHz) (Note 2)		
Operation indicator		Orange LED (lights up under light received condition)		
Pollution degree		3		
Environmental resistance	Protection	IP64 (IEC)		
	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	5 to 85 % RH, Storage: 5 to 95 % RH		
	Ambient illuminance	Fluorescent light: 1,000 ℓx or less at the light-receiving face		
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure		
	Insulation resistance	20 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 double amplitude (maximum acceleration 196 m/s²) in X, Y and Z directions for two hours each		
	Shock resistance	15,000 m/s² acceleration (1,500 G approx.) in X, Y and Z directions three times each		
Emitting element		Infrared LED (Peak emission wavelength: 855 nm 0.034 mil, non-modulated)		
Material		Enclosure: PBT, Display section: Polycarbonate		
Cable		0.09 mm² 4-core cabtyre cable, PVC, 1 m 3.281 ft long	0.1 mm² 4-core bending-resistant cabtyre cable, PVC, 1 m 3.281 ft long (Note 5, 6)	0.09 mm² 4-core cabtyre cable, PVC, 3 m 9.843 ft long
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable. (Note 7)		
Weight		Net weight: 10 g approx., Gross weight: 15g approx.		Net weight: 30 g approx., Gross weight: 35 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-25** series is used at an ambient temperature of +50 °C +122 °F, or more, make sure to mount it on a metal body.
4) Note that the cable of **PM-□25-R** loses its flexibility when the ambient temperature decreases to about -10 °C +14 F°.
5) The cable of **PM-□25-R** is a bending-resistant cable usable on a moving base. When the sensor is mounted on a moving base, secure the sensor cable joint at the unit in place so that stress is not applied to it.
6) When storing **PM-□25-R**, make sure that the cable does not come into contact with the sensing section or operation indicator.
7) If the cable is extended to 20 m 65.617 ft or longer, confirm that the supply voltage at the end of the cable attached to the sensor is 4.5 V or higher.

Compact / Cable type PM-45 SERIES

Compact size!

Cable type | Built-in connector

NPN output: 1 m 3.281 ft cable | 3 m 9.843 ft cable | 1 m 3.281 ft bending-resistant cable

PNP output: 1 m 3.281 ft cable | 3 m 9.843 ft cable | 1 m 3.281 ft bending-resistant cable

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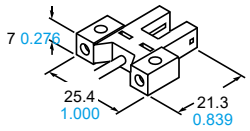
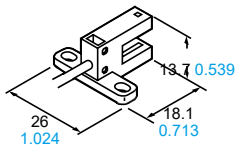
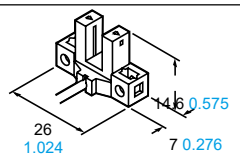
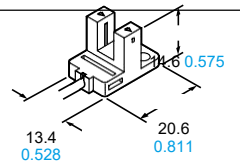
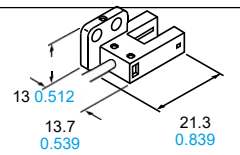
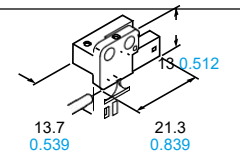
* NPN output / 1 m 3.281 ft cable length type only

PM-K45 PM-T45 PM-L45 PM-Y45 PM-F45 PM-R45

ORDER GUIDE

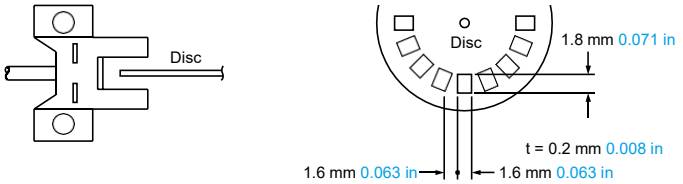
Type		Appearance (mm in)	Sensing range	Model No.	Cable length	Output	Output operation
Compact / Cable type	K type		6 mm 0.236 in (fixed)	PM-K45	1 m 3.281 ft	NPN open-collector transistor	Incorporated with 2 outputs: Light-ON/Dark-ON
				PM-K45-C3	3 m 9.843 ft		
				PM-K45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-K45-P-C3	3 m 9.843 ft		
	T type			PM-T45	1 m 3.281 ft	NPN open-collector transistor	
				PM-T45-C3	3 m 9.843 ft		
				PM-T45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-T45-P-C3	3 m 9.843 ft		
	L type			PM-L45	1 m 3.281 ft	NPN open-collector transistor	
				PM-L45-C3	3 m 9.843 ft		
				PM-L45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-L45-P-C3	3 m 9.843 ft		
	Y type			PM-Y45	1 m 3.281 ft	NPN open-collector transistor	
				PM-Y45-C3	3 m 9.843 ft		
				PM-Y45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-Y45-P-C3	3 m 9.843 ft		
	F type			PM-F45	1 m 3.281 ft	NPN open-collector transistor	
				PM-F45-C3	3 m 9.843 ft		
				PM-F45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-F45-P-C3	3 m 9.843 ft		
	R type			PM-R45	1 m 3.281 ft	NPN open-collector transistor	
				PM-R45-C3	3 m 9.843 ft		
				PM-R45-P	1 m 3.281 ft	PNP open-collector transistor	
				PM-R45-P-C3	3 m 9.843 ft		

e suffix "**-C3**" in the model No. indicates a 3 m 9.843 ft cable length type.

SPECIFICATIONS

Item \ Type		Compact / Cable type	
			3 m 9.843 ft cable
Model No.	NPN output	**PM-□45**	**PM-□45-C3**
	PNP output	**PM-□45-P**	**PM-□45-P-C3**
CE marking directive compliance		EMC Directive, RoHS Directive	
Sensing range		6 mm 0.236 in (fixed)	
Minimum sensing object		0.8 × 1.2 mm 0.031 × 0.047 in opaque object	
Hysteresis		0.05 mm 0.002 in or less	
Repeatability		0.01 mm 0.0004 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: 2 V or less (at 50 mA sink current) 1 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: 2 V or less (at 50 mA source current) 1 V or less (at 16 mA source current)
	Output operation	Incorporated with 2 outputs: Light-ON/Dark-ON	
	Short-circuit protection	Incorporated	
Response time		Under light received condition: 20 µs or less Under light interrupted condition: 80 µs or less (Maximum response frequency: 3 kHz) (Note 2)	
Operation indicator		Orange LED (lights up under light received condition)	
Pollution degree		3	
Environmental resistance	Protection	IP64 (IEC)	
	Ambient temperature	–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	5 to 85 % RH, Storage: 5 to 95 % RH	
	Ambient illuminance	Fluorescent light: 1,000 ℓx or less at the light-receiving face	
	Voltage withstandability	1,000 V AC for one min. between all supply terminals connected together and enclosure	
	Insulation resistance	20 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 double amplitude (maximum acceleration 196 m/s²) in X, Y and Z directions for two hours each	
	Shock resistance	15,000 m/s² acceleration (1,500 G approx.) in X, Y and Z directions three times each	
Emitting element		Infrared LED (Peak emission wavelength: 855 nm 0.034 mil, non-modulated)	
Material		Enclosure: PBT, Display section: Polycarbonate	
Cable		0.09 mm² 4-core cabtyre cable, PVC, 1 m 3.281 ft long	0.09 mm² 4-core cabtyre cable, PVC, 3 m 9.843 ft long
Cable extension		Extension up to total 100 m 328.084 ft is possible with 0.3 mm², or more, cable. (Note 3)	
Weight		Net weight: 10 g approx., Gross weight: 15g approx.	Net weight: 30 g approx., Gross weight: 35 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.

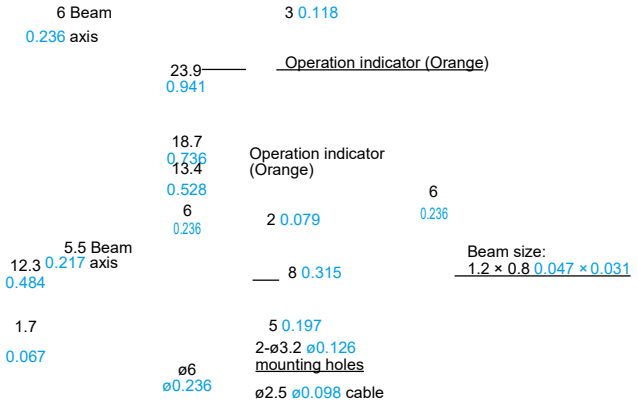


3) If the cable is extended to 20 m 65.617 ft or longer, confirm that the supply voltage at the end of the cable attached to the sensor is 4.5 V or higher.

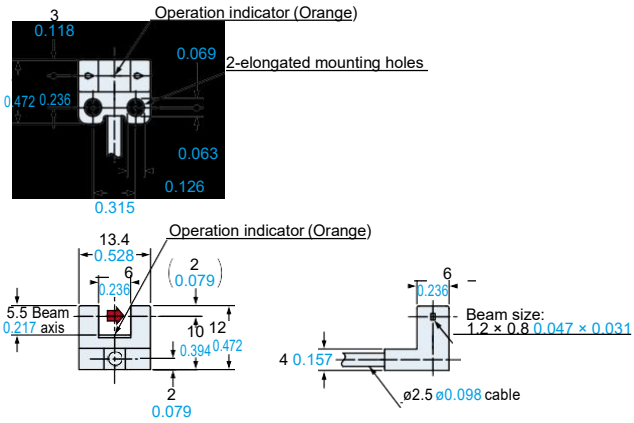
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

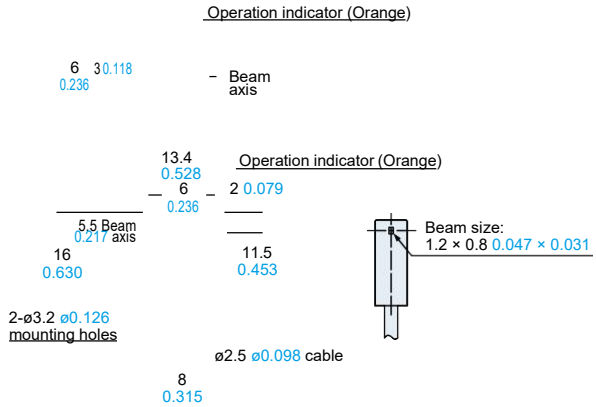
PM-K25□ Sensor



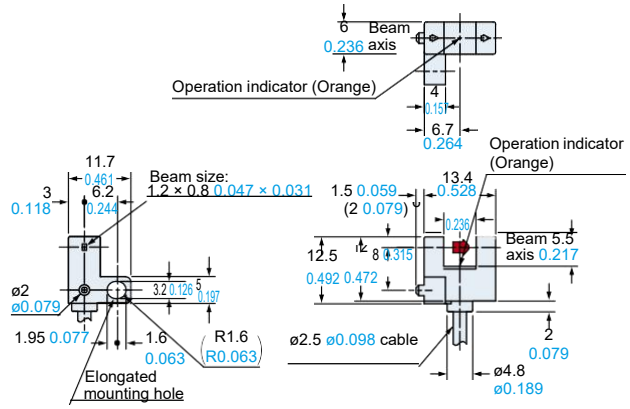
PM-L25□ Sensor



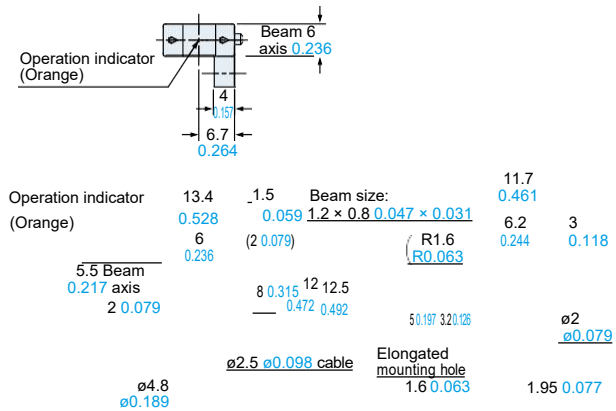
PM-U25□ Sensor



PM-F25□ Sensor



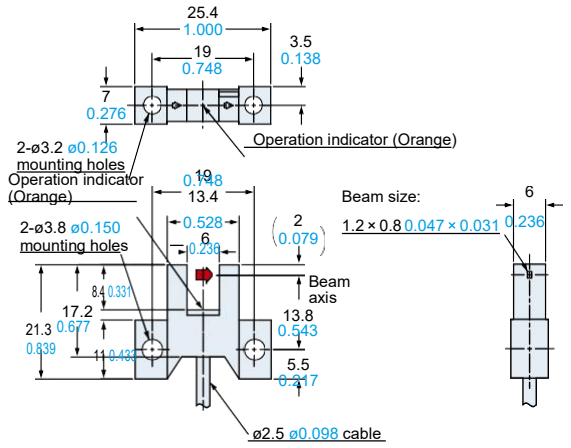
PM-R25□ Sensor



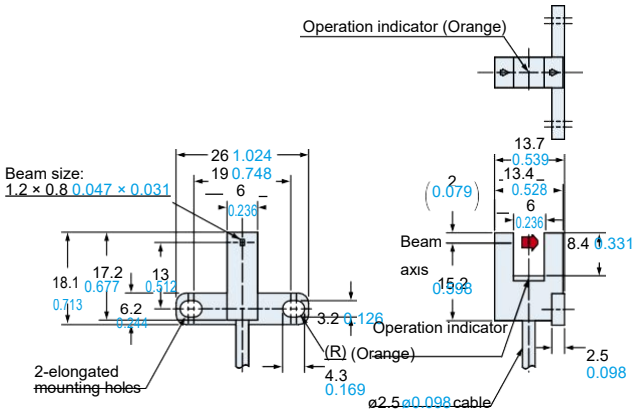
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

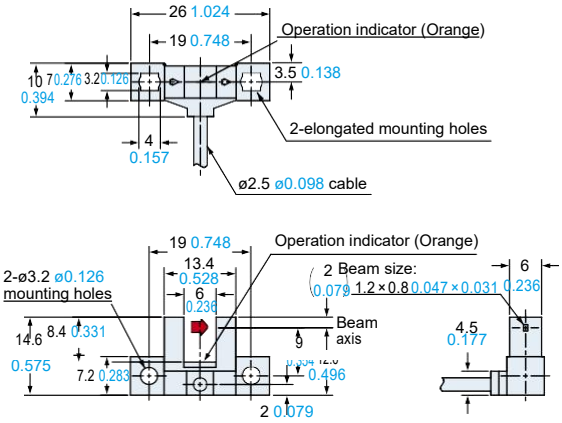
PM-K45□ Sensor



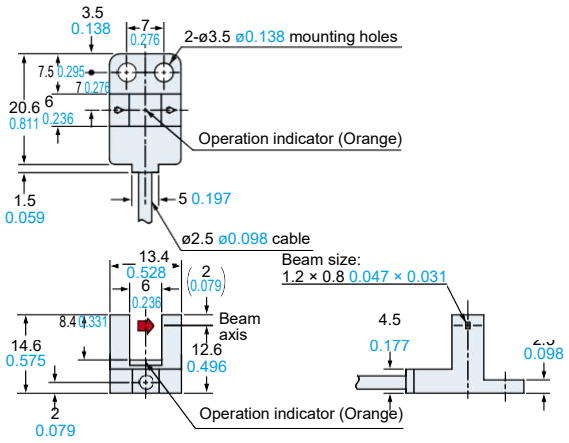
PM-T45□ Sensor



PM-L45□ Sensor



PM-Y45□ Sensor



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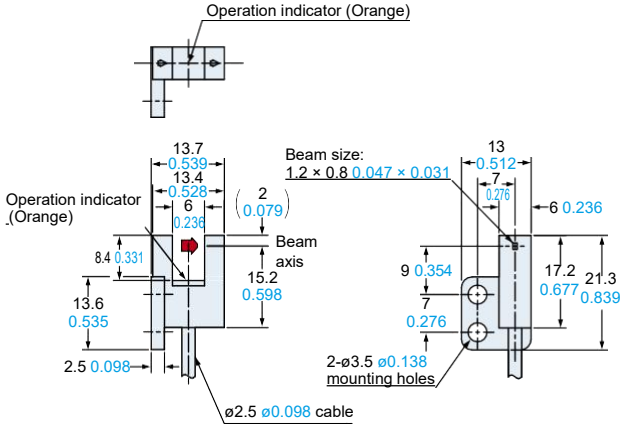
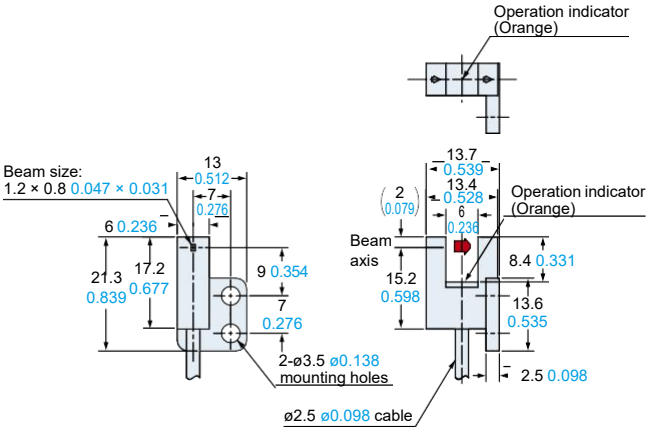


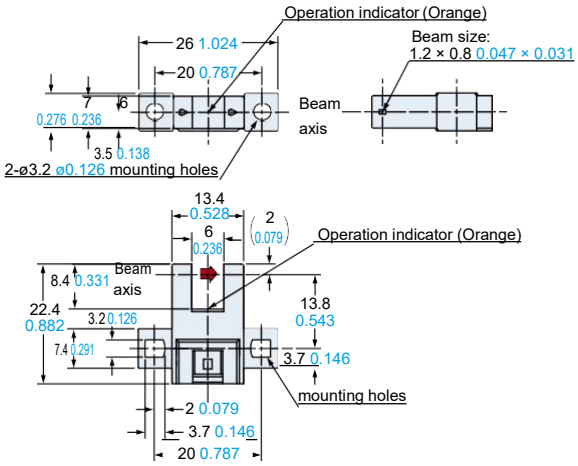
PM-R45□ Sensor



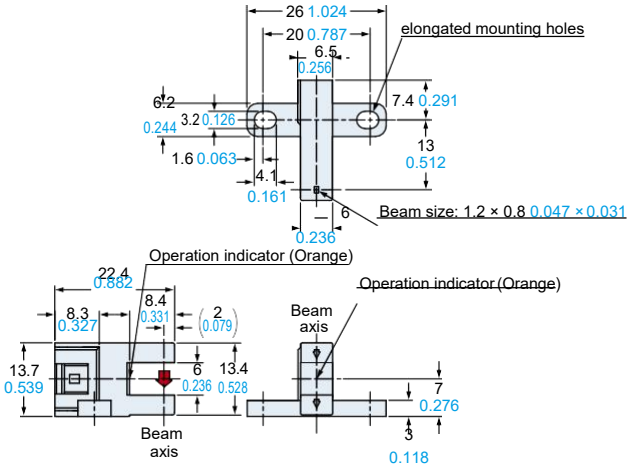
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

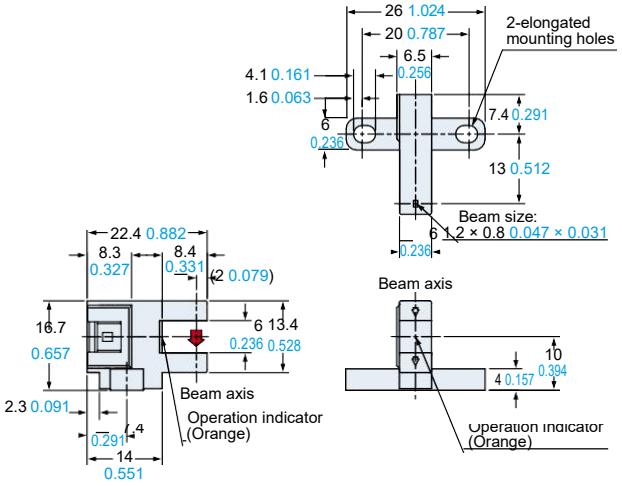
PM-K65 PM-K65-P Sensor



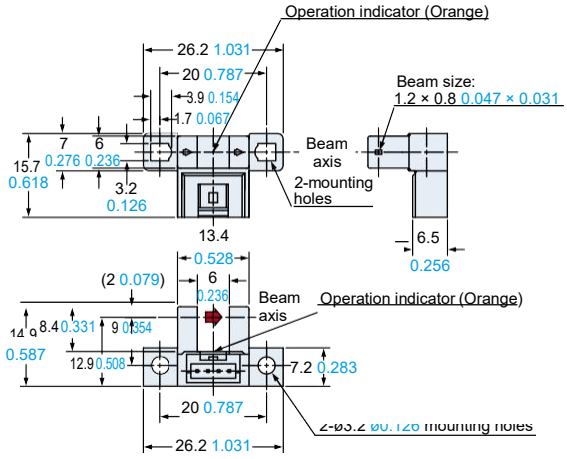
PM-T65 PM-T65-P Sensor



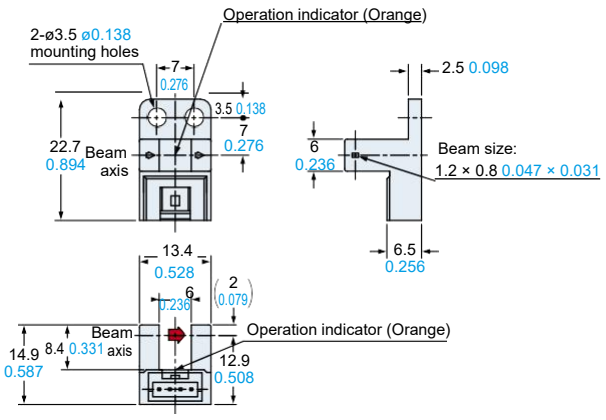
PM-T65W PM-T65W-P Sensor



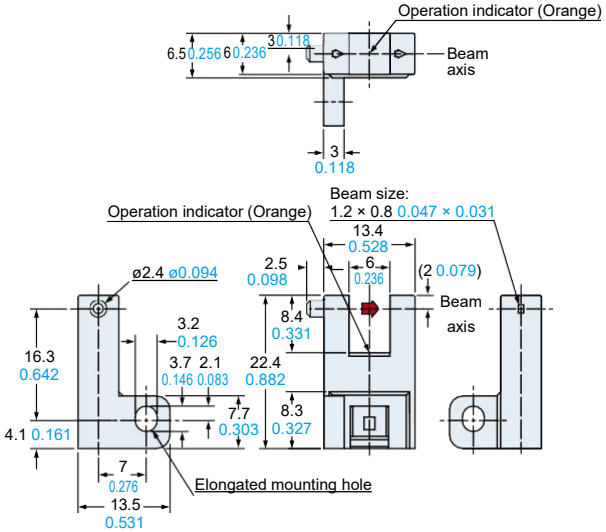
PM-L65 PM-L65-P Sensor



PM-Y65 PM-Y65-P Sensor



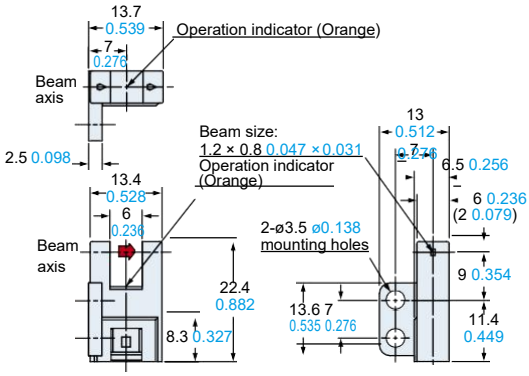
PM-F65 PM-F65-P Sensor



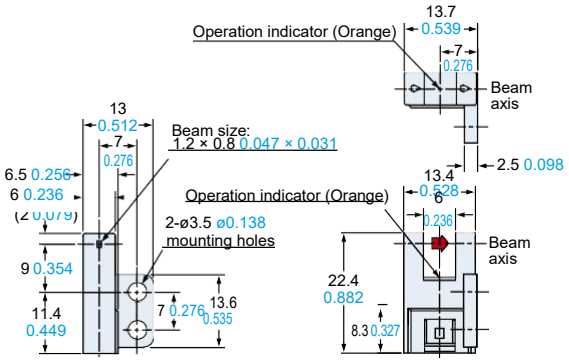
DIMENSIONS (Unit: mm in)

The CAD data can be downloaded from our website.

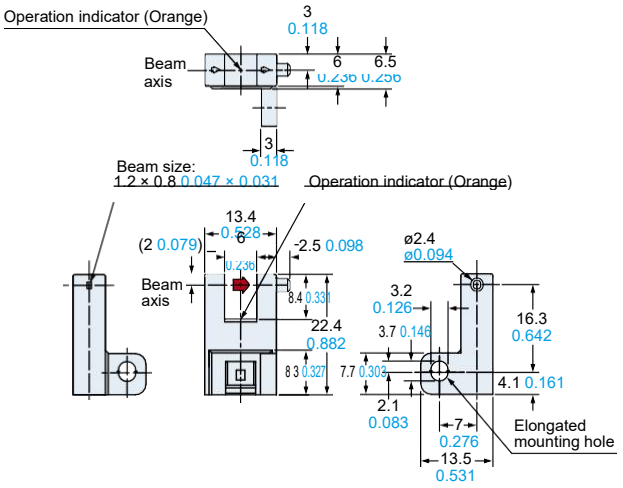
PM-F65W PM-F65W-P — Sensor



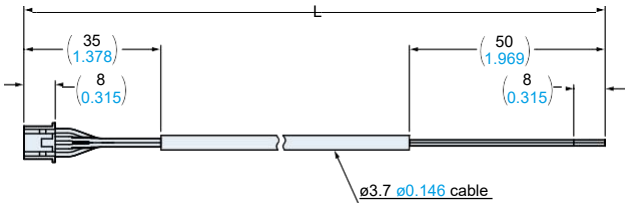
PM-R65W PM-R65W-P — Sensor



PM-R65 PM-R65-P — Sensor



CN-14A-C□ CN-14A-R-C□ — Connector attached cable (Optional)



• Length L

Model No.	Length L
CN-14A(-R)-C1	1,000 39.370
CN-14A(-R)-C2	2,000 78.740
CN-14A(-R)-C3	3,000 118.110
CN-14A(-R)-C5	5,000 196.850

MEMO