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Guide

U-shaped

Convergent  
ReflectivePM-25/PM-45/  
PM-65**Ultra-small / Cable type PM-25 SERIES****Easy mounting with M2/M3 screws!**

|            |            |                    |                    |                                      |
|------------|------------|--------------------|--------------------|--------------------------------------|
| Cable type | 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 |



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

**ORDER GUIDE**

| Type                     | Appearance (mm in) | Sensing range         | Model No. | Cable length                          | Output                        | Output operation                                 |
|--------------------------|--------------------|-----------------------|-----------|---------------------------------------|-------------------------------|--------------------------------------------------|
| Ultra-small / Cable type |                    | 6 mm 0.236 in (fixed) | PM-K25    | 1 m 3.281 ft                          | NPN open-collector transistor | Incorporated with 2 outputs:<br>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 |                                                  |
|                          |                    |                       | 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 |                                                  |
|                          |                    |                       | 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 |                                                  |
|                          |                    |                       | 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 |                                                  |
|                          |                    |                       | 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 |                                                  |

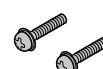
Note: The suffix "-R" in the model No. indicates a bending-resistant cable type. The suffix "-C3" indicates a 3 m 9.843 ft cable length type.

**OPTIONS**

| Designation    | Model No.    | Description                                                                                                                       |
|----------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Mounting screw | <b>MS-M2</b> | 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

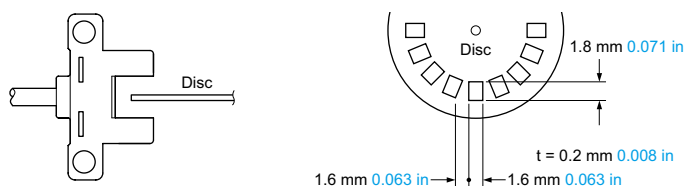


M2 (length 10 mm 0.394 in) screw  
with a spring washer

**SPECIFICATIONS**

|                                 |                                 | Type                                                                                                                                                                                                                                                                                                        | Ultra-small / Cable type                                                           |                                                       |                                                      |
|---------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|
|                                 |                                 |                                                                                                                                                                                                                                                                                                             |                                                                                    | Bending-resistant cable                               | 3 m 9.843 ft cable                                   |
| Item                            | 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><br>NPN open-collector transistor <ul style="list-style-type: none"><li>Maximum sink current: 50 mA</li><li>Applied voltage: 30 V DC or less (between output and 0 V)</li><li>Residual voltage: 2 V or less (at 50 mA sink current)<br/>1 V or less (at 16 mA sink current)</li></ul>      |                                                                                    |                                                       |                                                      |
|                                 |                                 | <PNP output type><br>PNP open-collector transistor <ul style="list-style-type: none"><li>Maximum source current: 50 mA</li><li>Applied voltage: 30 V DC or less (between output and +V)</li><li>Residual voltage: 2 V or less (at 50 mA source current)<br/>1 V or less (at 16 mA source current)</li></ul> |                                                                                    |                                                       |                                                      |
|                                 |                                 |                                                                                                                                                                                                                                                                                                             |                                                                                    |                                                       |                                                      |
|                                 | Output operation                | Incorporated with 2 outputs: Light-ON/Dark-ON                                                                                                                                                                                                                                                               |                                                                                    |                                                       |                                                      |
|                                 | Short-circuit protection        | Incorporated                                                                                                                                                                                                                                                                                                |                                                                                    |                                                       |                                                      |
| Response time                   |                                 | Under light received condition: 20 μs or less<br>Under light interrupted condition: 80 μs or less<br>(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: 15 g 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.



- 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.
- Note that the cable of **PM-□25-R** loses its flexibility when the ambient temperature decreases to about -10 °C +14 °F.
- 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.
- When storing **PM-□25-R**, make sure that the cable does not come into contact with the sensing section or operation indicator.
- 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.

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