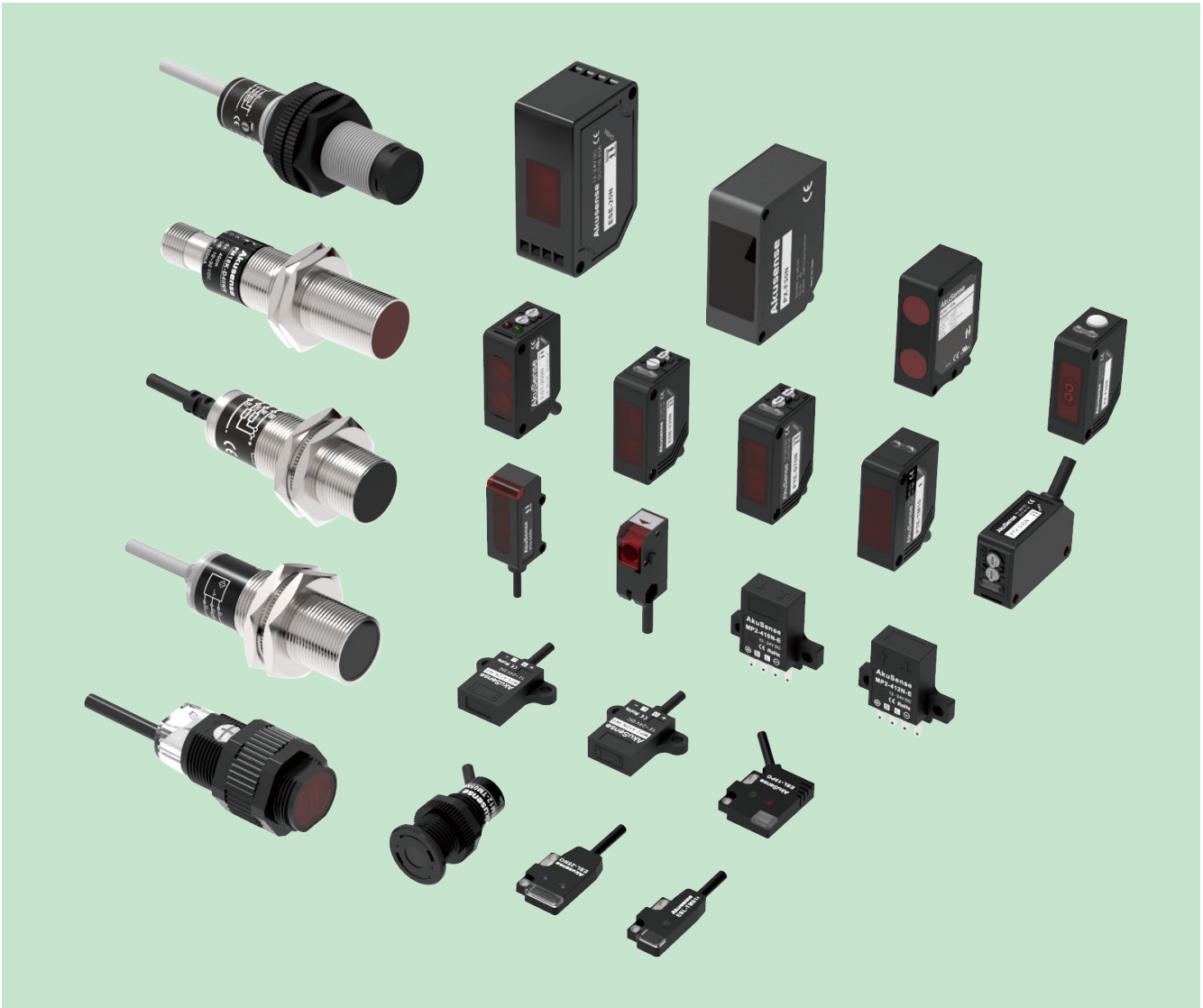
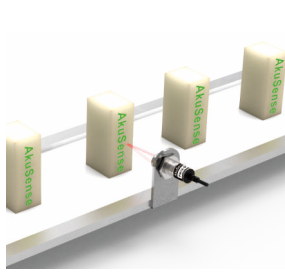


# Photoelectric Sensors



- Available in a variety of models, like thin type, square type, cylindrical type, transparent object detection type, background suppression type, etc.
- L.on and D.on switch freely.
- Solid and durable metal housing; Economical plastic housing and easy to install.
- Short circuit protection and reverse polarity protection.
- Switch frequency up to 5000Hz.

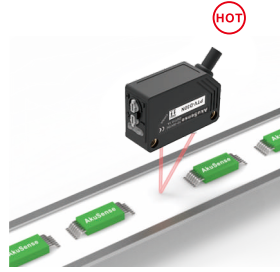


**NEW!**

### Cylindrical Type (PM/PSM/PXM Series)

- Epoxy resin fillings ,powerful in shock resistance
- The smallest diameter(8mm) in the industry
- Nickel plated brass, effectively resist chemicals' corrosion

**P.C-07**



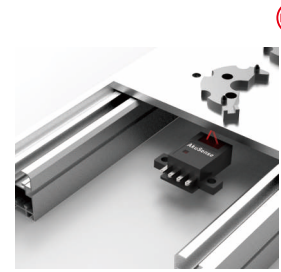
**HOT**

**NEW!**

### Square Type (PTE/PTEW/PTV/PTVW/PTN/PTJ-I Series)

- Traditional square housing with great performance
- 25.4mm standard hole pitch for simple installation
- Identifying the action clearly with dual LED indicators

**P.C-16**

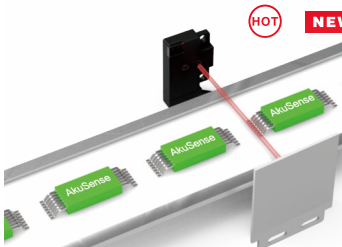


**HOT**

### Flat Type (MP2 Series)

- Sensing surfaces on top side and front side support various detections
- Can switch L.on and D.on switch flexibly
- Long distance detection up to 40mm(white cardboard)

**P.C-28**



**HOT**

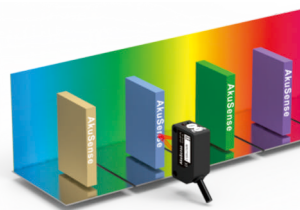
**NEW!**

Thickness is only 3.5mm

### Thin Type (ESL series)

- 3.5mm ultra-thin design, greatly saves installation space
- Ip67 Protection degree , excellent mechanical performance
- LED indicator is bright and can be clearly seen from the back

**P.C-30**



**NEW!**

**HOT**

### BGS Type (ESB Series)

- Free from objects and background colors with stable detection
- Built-in rotational knobs, with many turns for fine-tuning of sensitivity adjustment
- IP67 protection degree, with excellent mechanical performance

**P.C-32**



**HOT**

### Transparent Object Detection (EST Series)

- No blind spot (detection for every corner)
- Suitable for moving objects
- Best options for different kinds of glass or plastics

**P.C-35**



**NEW!**

RGB Light Source

### Color/Mark Detection (ESC/ESE Series)

- Built-in RGB light sources
- Automatic adjustment to the most suitable light source according to the detected color
- Two detection modes, mark and color

**P.C-37**



**NEW!**

### TOF Principle Type ( PM18-TF/PX series)

- Up to 3 meters range
- TOF principle, high stability
- Independent of object color, background color and reflectivity

**P.C-27**



### IP69K High Protection Type ( PM18K Series )

- AISI 316L stainless steel housing material
- Protection grade IP69K, excellent mechanical performance
- Applied in harsh environments.

**P.C-12**



### Anti-glare Type (PTL Series)

- Not interfered by glare, with stable detection
- Built-in multi-turn potentiometer for fine adjustment of sensitivity
- IP67, excellent mechanical performance

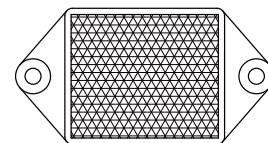
**P.C-19**



### IO-Link Type (PTZ-C Series)

- With IO function, contributing to industrial 4.0
- Identify the action clearly with dual LED indicators
- IP67, excellent mechanical performance

**P.C-23**



### Reflectors

- Made of special material (robust housing)
- Shapes as circular, square and combination etc
- Customization is available as requested by clients

**P.C-39**

|                      |
|----------------------|
| Fiber Optic          |
| Slot Sensors         |
| <b>Photoelectric</b> |
| Laser                |
| Proximity            |
| Displacement         |
| Magnetic             |
| Contact              |
| Area                 |
| Ultrasonic           |
| Vision               |
| Code Readers         |
| Vibration            |
| Temperature          |
| Accessories          |

#### Guidance

#### Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

#### Reflectors

Reflectors



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
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**Guidance**

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- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type
- Reflectors**
- Reflectors



| Type          | Light Source                         | Series                       |  |
|---------------|--------------------------------------|------------------------------|--|
| Photoelectric | Red Light/<br>Infrared Light/<br>RGB | Cylindrical Type             | PM/PSM/PXM Series                      |
|               |                                      | Square Type                  | PTE/PTEW/PTV/PTVW/<br>PTN/PTJ-I Series |
|               |                                      | Flat Type                    | MP2 Series                             |
|               |                                      | Thin Type                    | ESL Series                             |
|               |                                      | BGS Type                     | ESB Series                             |
|               |                                      | Transparent Object Detection | EST Series                             |
|               |                                      | Color/Mark Detection         | ESC/ESE Series                         |
|               |                                      | TOF Principle Type           | PM18-TF/PX Series                      |
|               |                                      | IP69K High Protection Type   | PM18K Series                           |
|               |                                      | Anti-glare Type              | PTL Series                             |
|               |                                      | IO-Link Type                 | PTZ-C Series                           |

## Cylindrical

| Series                    | Sensing type   | Sensing distance | Model No.  |                 | Pages |
|---------------------------|--|------------------|--|-----------------|-------|
|                           |  |                  | NPN L.on&D.on  | PNP L.on&D.on   |       |
| PM08                      |  (Infrared light)<br>Diffuse reflection | 3cm              | L.on:PM08-D03NO  | L.on:PM08-D03PO | C-07  |
| PM18<br>(Metal housing)   | Diffuse reflection   | 10cm             | PM18-D10NR   | PM18-D10PR      | C-08  |
|                           |  | 40cm             | PM18-D40NR   | PM18-D40PR      |       |
|                           | Thru-beam  | 1000cm           | PM18-TM10NR  | PM18-TM10PR     |       |
|                           |  | 2000cm           | PM18-TM20NR  | PM18-TM20PR     |       |
| PM18<br>(Economical Type) | Retro-reflection   | 300cm            | PM18-R300NR  | PM18-R300PR     | C-09  |
|                           | Diffuse reflection   | 10cm             | L.on:PM18-D10NO  | L.on:PM18-D10PO |       |
|                           |  | 500cm            | PM18-TM05NO  | PM18-TM05PO     |       |
|                           | Thru-beam  | 2000cm           | PM18-TM20NO  | PM18-TM20PO     |       |
| 2000cm                    |  | PM18-TM20NC      | PM18-TM20PC  |                 |       |
| PXM18<br>(PBT housing)    | Diffuse reflection   | 10cm             | PXM18-D10N   | PXM18-D10P      | C-15  |
|                           |  | 40cm             | PXM18-D40N   | PXM18-D40P      |       |
| PSM12                     | Thru-beam  | 500cm            | PSM12-TM05NO   | PSM12-TM05PO    | C-13  |
|                           |  |                  | PSM12-TM05NC   | PSM12-TM05PC    |       |
| PSM18                     | Diffuse reflection   | 10~40cm          | PSM18-D40N   | PSM18-D40P      | C-14  |

- Fiber Optic
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- Vibration
- Temperature
- Accessories

## Square


| Series | Sensing type       | Sensing distance      | Model No.  |  | Pages |           |
|--------|--------------------|-----------------------|--|--|-------|-----------|
|        |                    |                       | NPN L.on&D.on  | PNP L.on&D.on  |       |           |
| PTE    | Diffuse reflection | 1~30cm                | PTE-D30N  | PTE-D30P   | C-16  |           |
|        |                    | 0.5~100cm             | PTE-D70N   | PTE-D70P   |       |           |
|        |                    | Convergent reflective | 0.5~14cm   | PTE-X09N  |       | PTE-X09P  |
|        |                    |                       | Retro-reflection   | 1~20cm   |       | PTE-R20N  |
|        | 200cm              | PTE-R200N             |  | PTE-R200P  |       |           |
|        | 300cm              | PTE-R300N             | PTE-R300P  |  |       |           |
|        | Thru-beam          | 1000cm                | PTE-TM10NO   | PTE-TM10PO   |       | C-17      |
|        |                    |                       | PTE-TM10NC   | PTE-TM10PC   |       |           |
|        |                    | PTE-TM10AN            | PTE-TM10AP   |  |       |           |
| PTEW   | Diffuse reflection | 0.5~20cm              | PTEW-D20N  | PTEW-D20P  | C-18  |           |
| PTVW   |                    | 10cm                  | PTVW-D10N  | PTVW-D10P  |       |           |
|        |                    | 20cm                  | PTVW-D20N  | PTVW-D20P  |       |           |
| PTV    | Diffuse reflection | 1~30cm                | PTV-D30N   | PTV-D30P   | C-20  |           |
|        |                    | 0.5~100cm             | PTV-D70N   | PTV-D70P   |       |           |
|        |                    | Convergent reflective | 0.5~14cm   | PTV-X09N   |       | PTV-X09P  |
|        |                    |                       | Thru-beam  | 500cm  |       | PTV-T500N |
|        |                    | PTV-TM20NO            |  | PTV-TM20PO   |       |           |
|        | 2000cm             | PTV-TM20NC            |  | PTV-TM20NC   |       |           |
|        |                    | PTV-TM20AN            |  | PTV-TM20AP   |       |           |

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- IO-Link type
- Reflectors**
- Reflectors





# Guidance




## Square

|       |   |                    |                   |                   |                   |      |
|-------|---|--------------------|-------------------|-------------------|-------------------|------|
| PTN   | <br>(Infrared light) | Diffuse reflection | 5cm               | PTN-D05N          | PTN-D05P          | C-25 |
|       |   | Thru-beam          | 50cm              | PTN-T50N          | PTN-T50P          |      |
| PTJ-I | <br>(Infrared light) | Thru-beam          | 80cm              | D.on:PTJ-T80NO-I  | D.on:PTJ-T80PO-I  | C-26 |
|       |   |                    | L.on:PTJ-T80NC-I  | L.on:PTJ-T80PC-I  |                   |      |
|       |   | Thru-beam          | 150cm             | D.on:PTJ-T150NO-I | D.on:PTJ-T150PO-I |      |
|       |   |                    | L.on:PTJ-T150NC-I | L.on:PTJ-T150PC-I |                   |      |




## Thin Type

| Series | Sensing type  | Sensing distance      | Model No.     |               | Pages      |      |
|--------|---|-----------------------|---------------|---------------|------------|------|
|        |   |                       | NPN L.on&D.on | PNP L.on&D.on |            |      |
| ESL    | <br>(Infrared light) | Convergent reflective | 2~15mm        | ESL-15NO      | ESL-15PO   | C-30 |
|        |   | Diffuse reflection    | 2~25mm        | ESL-25NO      | ESL-25PO   |      |
|        | <br>(Red light)      | Thru-beam             | 500mm         | ESL-T50NO     | ESL-T50PO  |      |
|        |   | Thru-beam             | 100cm         | ESL-TM01NO    | ESL-TM01PO |      |

## BGS



| Series   | Sensing type  | Sensing distance   | Model No.     |               | Pages    |      |
|--|---|--------------------|---------------|---------------|----------|------|
|  |   |                    | NPN L.on&D.on | PNP L.on&D.on |          |      |
| ESB  | <br>(Red light)      | Diffuse reflection | 0.5~10cm      | ESB-S10N      | ESB-S10P | C-32 |
|  |   | Diffuse reflection | 0.5~15cm      | ESB-15N       | ESB-15P  |      |
|  |   | Diffuse reflection | 0~30cm        | ESB-30N       | ESB-30P  |      |
|  | <br>(Infrared light) | Diffuse reflection | 1~30cm        | ESB-V30N      | ESB-V30P | C-33 |
| <br>(Red light) |   | Diffuse reflection | 1~20cm        | ESB-C20N      | ESB-C20P |      |

## Flat



| Series             | Sensing type  | Sensing distance   | Model No.         |   | Pages             |      |
|--------------------|---|--------------------|-------------------|---|-------------------|------|
|                    |   |                    | NPN L.on&D.on     | PNP L.on&D.on   |                   |      |
| MP2<br>(Connector) | <br>(Infrared light) | Diffuse reflection | 40mm              | MP2-410N-E  | MP2-410P-E        | C-28 |
|                    |   | Diffuse reflection | 40mm              | MP2-412N-E  | MP2-412P-E        |      |
| MP2<br>(Pre-wired) | <br>(Infrared light) | Diffuse reflection | 2.5~8mm           | D.on: MP2-410N-WD   | D.on: MP2-410P-WD | C-29 |
|                    |   |                    | L.on: MP2-410N-WL | L.on: MP2-410P-WL   |                   |      |
|                    | Diffuse reflection  | 2.5~8mm            | D.on: MP2-412N-WD | D.on: MP2-412P-WD   |                   |      |
|                    |   | L.on: MP2-412N-WL  | L.on: MP2-412P-WL |   |                   |      |

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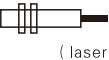

### Transparent Detection

| Series | Sensing type   | Sensing distance | Model No.               |  | Pages     |      |
|--------|--|------------------|-------------------------|--|-----------|------|
|        |  |                  | NPN                     | PNP  |           |      |
| EST    | <br>(Red light) | Retro-reflection | 1~200cm                 | EST-200N   | EST-200P  | C-35 |
|        |  |                  | 0~200cm<br>Coaxial beam | EST-X200N  | EST-X200P |      |


### Color/Mark Detection

| Series | Sensing type   | Sensing distance   | Model No. |         | Pages   |      |
|--------|--|--------------------|-----------|---------|---------|------|
|        |  |                    | NPN       | PNP     |         |      |
| ESC    |           | Diffuse reflection | 16~20mm   | ESC-18N | ESC-18P | C-37 |
| ESE    | <br>(RGB) | Diffuse reflection | 17~23mm   | ESE-20N | ESE-20P | C-38 |


### TOF Principle Type

| Series  | Sensing type  | Sensing distance | Model No. |             | Pages       |      |
|---------|---|------------------|-----------|-------------|-------------|------|
|         |   |                  | NPN       | PNP         |             |      |
| PM18-TF | <br>(Laser)           | Reflection       | 1.2m      | PM18-TF120N | PM18-TF120P | C-11 |
| PX      | <br>(Infrared light) | 1 Point teach-in | 1m        | PX-F09N     | PX-F09P     | C-27 |
|         |   | 1 Point teach-in | 3m        | PX-F30N     | PX-F30P     |      |


### IP69K High Protection Type

| Series | Sensing type  | Sensing distance   | Model No. | Pages       |      |
|--------|---|--------------------|-----------|-------------|------|
| PM18K  | <br>(Infrared light) | Diffuse reflection | 400mm     | PM18K-D40NR | C-12 |

### Anti-glare Type

| Series | Sensing type  | Sensing distance   | Model No. |          | Pages    |      |
|--------|---|--------------------|-----------|----------|----------|------|
|        |   |                    | NPN       | PNP      |          |      |
| PTL    |  | Diffuse reflection | 5~100mm   | PTL-D10N | PTL-D10P | C-19 |
|        |   |                    | 10~300mm  | PTL-D30N | PTL-D30P |      |

### IO-Link Type

| Series | Sensing type  | Sensing distance   | Model No. | Pages       |      |
|--------|---|--------------------|-----------|-------------|------|
| PTZ-C  |  | Diffuse reflection | 0~1m      | PTZ-D70N-C  | C-23 |
|        |   | Thru-beam          | 0~25m     | PTZ-TM25N-C |      |
|        |   | Retro-reflection   | 0.01~4m   | PTZ-R400N-C |      |

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- Reflectors

# Cylindrical

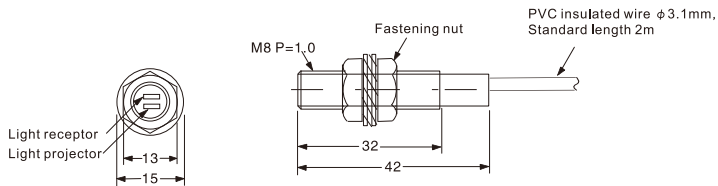
## PM08 Series



|                       |  |                           |
|-----------------------|--|---------------------------|
| Appearance            |  |                           |
| Sensing type          | Diffuse reflection   |                           |
| Sensing distance      | 30mm (White 30X30mm)   |                           |
| Hysteresis            | < 20%  |                           |
| Light source          | IR Diode(940nm)  |                           |
| Operating voltage     | 12~24V DC $\pm$ 10% ripple(p-p) < 10%  |                           |
| Current consumption   | $\leq$ 30mA  |                           |
| Control output        | NPN open-collector output  | PNP open-collector output |
| Switch mode           | L.on   |                           |
| Protection circuit    | Short circuit protection, reverse polarity protection, anti-interference protection  |                           |
| Response time         | Action/Reset: < 3ms  |                           |
| Ambient brightness    | Sunlight $\leq$ 10000lux, Incandescent Lamp $\leq$ 3000lux   |                           |
| Ambient temperature   | Operation: $-25^{\circ}\text{C}\sim+55^{\circ}\text{C}$ , Storage: $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$ (No freezing, No condensation) |                           |
| Ambient humidity      | Operation: 30~85%RH, Storage: 35~95%RH   |                           |
| Insulation resistance | > 20M $\Omega$   |                           |
| Withstand voltage     | 500 V/AC 50/60Hz 1min  |                           |
| Anti-vibration        | 10 to 55 Hz with 1.5mm up&down amplitude for 2 hours each in X, Y, and Z directions  |                           |
| Impact resistance     | 500m/s <sup>2</sup> for 3 times each in X, Y, Z directions   |                           |
| Degree of protection  | IP65   |                           |
| Connection method     | 2M 3core cable   |                           |
| Weight                | Approx 80g   |                           |
| Material              | Stainless steel  |                           |
| Accessories           | Mounting screws  |                           |
| Model No.             | <b>PM08-D03NO</b> <span style="border: 1px solid red; border-radius: 50%; padding: 2px;">HOT</span>  | <b>PM08-D03PO</b>         |

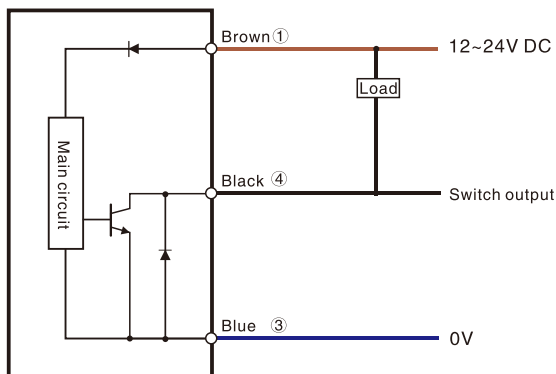
### Dimensions

Unit: mm

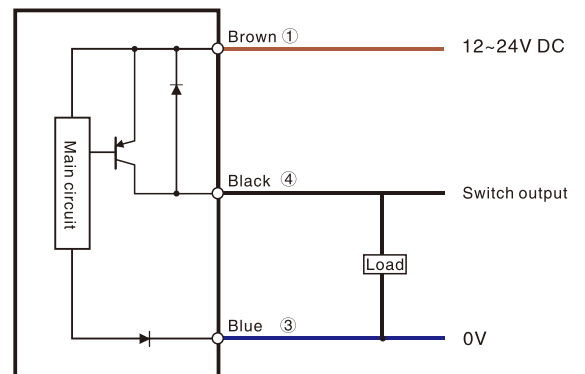


### Circuit diagram

#### NPN Output



#### PNP Output





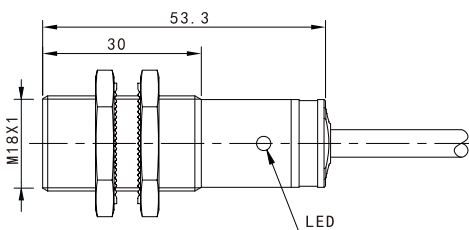
Appearance

|                      |   |                   |   |                    |                    |                    |
|----------------------|---|-------------------|---|--------------------|--------------------|--------------------|
| Sensing type         | Diffuse reflection                                |                   | Thru-beam                               |                    | Retro-reflection   |                    |
| Sensing distance     | 10cm(fixed)                                       | 40cm(adjustable)  | 1000cm(fixed)                           | 2000cm(fixed)      | 300cm(fixed)       |                    |
| Hysteresis           | 3~20%   |                   | ...                                     |                    |                    |                    |
| Repeat accuracy      | < 5%  |                   |   |                    |                    |                    |
| Output type          | NPN/PNP Open-collector                            |                   |   |                    |                    |                    |
| Switch type          | Selectable L.on/D.on                              |                   |   |                    |                    |                    |
| Indicator            | Yellow LED  |                   | Green LED(Emitter)/Yellow LED(Receiver) |                    | Yellow LED         |                    |
| Response time        | < 8.2 ms  |                   |   |                    |                    |                    |
| Light source         | Infrared LED(880nm)                               |                   |   |                    |                    |                    |
| Operating voltage    | 10~30V DC   |                   |   |                    |                    |                    |
| Voltage drop         | < 2.5V  |                   |   |                    |                    |                    |
| Current consumption  | < 25mA  |                   |   |                    |                    |                    |
| Load current         | < 200mA   |                   |   |                    |                    |                    |
| Protection circuit   | Reverse polarity, short circuit, surge protection |                   |   |                    |                    |                    |
| Ambient temperature  | -15°C~+55°C, No freezing                          |                   |   |                    |                    |                    |
| Ambient humidity     | 35%~95%RH, No condensation                        |                   |   |                    |                    |                    |
| Degree of protection | IP67  |                   |   |                    |                    |                    |
| Material             | Nickel copper alloy                               |                   |   |                    |                    |                    |
| Connection method    | 2M 4core cable                                    |                   |   |                    |                    |                    |
| Accessories          | Mounting screws                                   |                   |   |                    |                    |                    |
| Model No.            | NPN   | <b>PM18-D10NR</b> | <b>PM18-D40NR</b>                       | <b>PM18-TM10NR</b> | <b>PM18-TM20NR</b> | <b>PM18-R300NR</b> |
|                      | PNP   | <b>PM18-D10PR</b> | <b>PM18-D40PR</b>                       | <b>PM18-TM10PR</b> | <b>PM18-TM20PR</b> | <b>PM18-R300PR</b> |

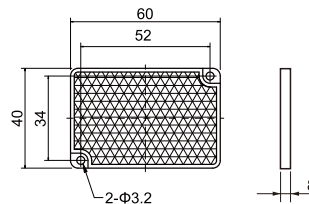
- Fiber Optic
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- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

### Dimensions

Unit: mm



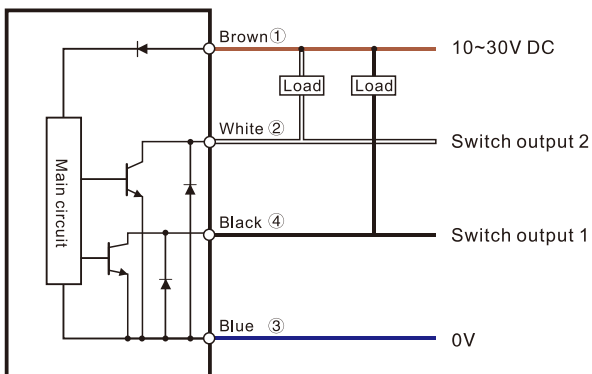
### Reflector for PM18-R300



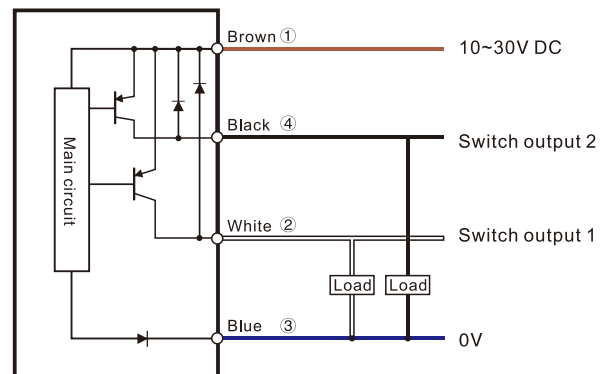
(Standard TD-09)

### Circuit diagram

#### NPN Output



#### PNP Output



#### Guidance

#### Photoelectric

#### Cylindrical

#### Square

#### Flat type

#### Thin type

#### BGS

#### Transparent detection

#### Color/Mark Detection

#### TOF type

#### IP59K high protection type

#### Anti-glare type

#### IO-Link type

#### Reflectors

#### Reflectors

# Cylindrical

## PM18 Series

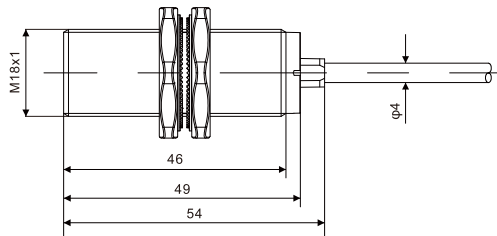
Economical Type



Appearance

|                      | Disffuse Reflection                                      | Thru-beam   |  |  |  |
|----------------------|--|---|--|--|--|
| Sensing type         | Disffuse Reflection                                      | Thru-beam   |  |  |  |
| Sensing distance     | 10cm(fixed)  | 5m(fixed)   | 20m(fixed)                               |  |  |
| Detected object      | 100mm × 100mm 90% whiteness white paper                  | > φ 18mm, opaque  |  |  |  |
| Output type          | NPN Open-collector                                       | NPN/PNP Open-collector  |  |  |  |
| Switch type          | L.on   | Selectable L.on/D.on  |  |  |  |
| Indicator            | Motion indicator light: yellow                           | Transmitter end: power indicator: green;<br>Receiving end: action indicator light: yellow |  |  |  |
| Response time        | 0.5ms  | 33ms  |  |  |  |
| Light source         | Infrared LED 940nm (modulation)                          | Infrared LED 850nm (modulation)   |  |  |  |
| Operating voltage    | 10~30V DC  | 12~24V DC   | 10~24V DC                                |  |  |
| Residual voltage     | < 2V   |   |  |  |  |
| Current consumption  | < 25mA   | Transmitter < 20 mA; Receiver < 20mA  | Transmitter < 25 mA; Receiver < 25mA     |  |  |
| Load current         | < 150mA  | < 100mA   |  |  |  |
| Circuit protection   | Reverse polarity, short circuit, surge protection        |   |  |  |  |
| Ambient temperature  | -20°C~+55°C, No freezing                                 | -20°C~+60°C, No freezing  |  |  |  |
| Storage temperature  | -25°C~+65°C  | -25°C~+70°C   | -20°C~+60°C                              |  |  |
| Ambient humidity     | 35~90%RH, No condensation                                |   |  |  |  |
| Storage humidity     | 35~90%RH   |   |  |  |  |
| Withstand Voltage    | ± 1000V 50/60Hz 60s                                      |   |  |  |  |
| Electrostatic        | ± 4000V  |   |  |  |  |
| group value          | ± 2000V  |   |  |  |  |
| Resistance           | 10~50Hz, 0.5mm amplitude, X, Y, Z direction 2 hours each |   |  |  |  |
| Ambient illuminance  | Incandescent lamp: < 3000lux, sunlight: < 10000lux       |   |  |  |  |
| Degree of protection | IP67   |   |  |  |  |
| Material             | Nickel copper alloy                                      |   |  |  |  |
| Connection method    | 2M 3core cable   |   |  |  |  |
| Accessories          | Mounting screws  |   |  |  |  |
| Model No.            | NPN<br>PNP   | <b>PM18-D10NO</b><br><b>PM18-D10NC</b>  | <b>PM18-TM05NO</b><br><b>PM18-TM05PO</b> | <b>PM18-TM20NO</b><br><b>PM18-TM20PO</b> | <b>PM18-TM20NC</b><br><b>PM18-TM20PC</b> |

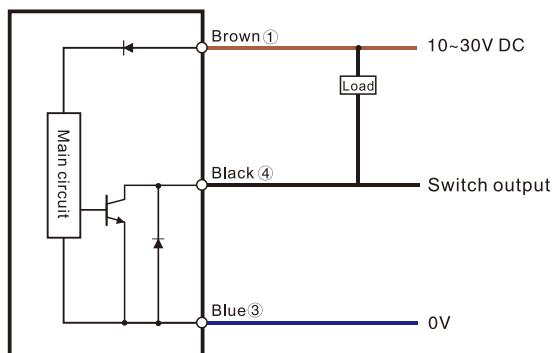
## Dimensions



Unit: mm

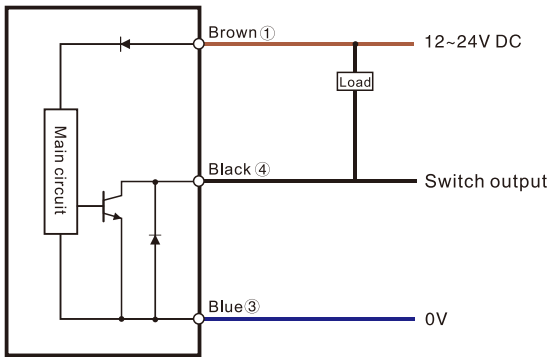
## PM18-D10NO(NC)

### NPN Output

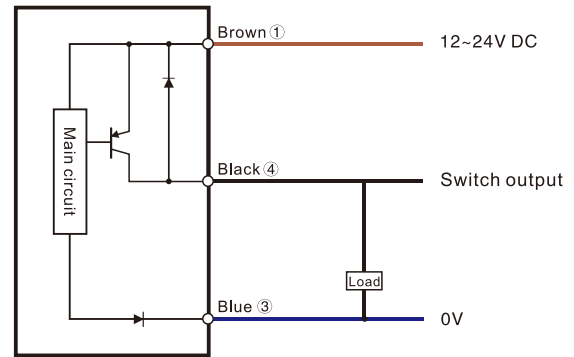


### PM18-TM05N(P)O

#### NPN Output

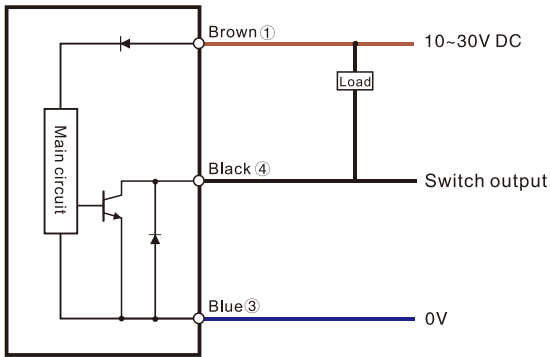


#### PNP Output

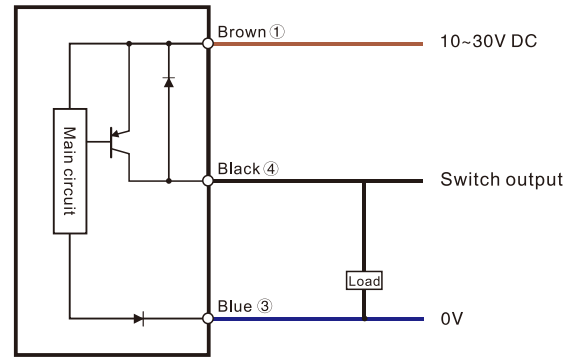


### PM18-TM20N(P)O(C)

#### NPN Output



#### PNP Output



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors



# TOF Type Photoelectric

## PM18-TF Series

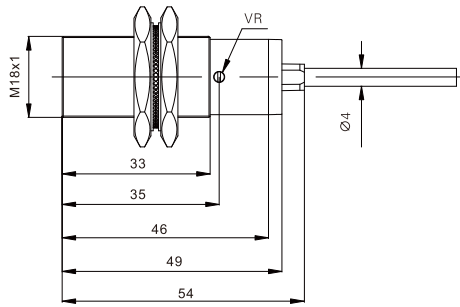
TOF Principle



Appearance

|                        |  |
|------------------------|--|
| Sensing type           | Reflection   |
| Sensing distance       | 1.2m   |
| Spot divergence angle  | 30°  |
| Output                 | NPN / PNP open collector                                   |
| Switch type            | L.on/ D.on selectable                                      |
| Indicator              | Operation: green, Motion: Red                              |
| Sensitivity adjustment | multi-turn adjuster  |
| Light source           | Laser 940nm ( Modulated), class 1                          |
| Operating voltage      | 10~30V DC  |
| Volatge drop           | < 1.5V   |
| Current consumption    | ≦20mA  |
| Load current           | ≦100mA   |
| Circuit protection     | Short circuit,reverse polarity,surge protection            |
| Ambient temperature    | -10°C~50°C No freezing                                     |
| Ambient humidity       | 35~85%RH, No condensation                                  |
| Withstand voltage      | ± 1000V 50/60Hz 60s  |
| Static electricity     | ± 8000V (air discharge)                                    |
| Group pulse            | ± 2000V ( 5kHz/50kHz )                                     |
| Impact resistance      | 10~55Hz amplitude 1.5mm;X, Y, Z 3 directions, 2 hours each |
| Ambient illuminance    | Incandescent lamp: <3,000 lux, Sunlight < 5,000 lux        |
| Degree of protection   | IP67   |
| Material               | Nickel-copper alloy  |
| Connection             | 2M 3-core cable  |
| Accessories            | Mounting screws  |
| Model No.              | NPN <b>PM18-TF120N</b><br>PNP <b>PM18-TF120P</b>           |

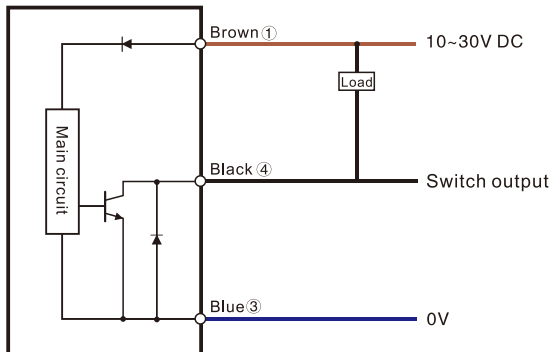
### Dimensions



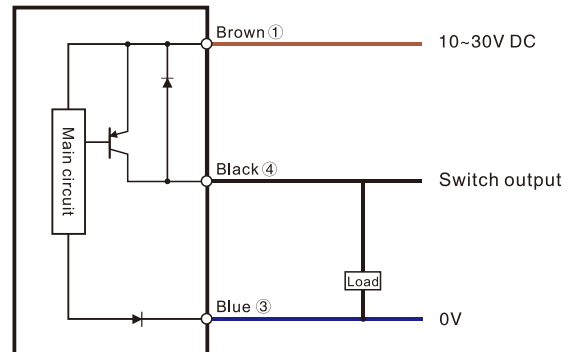
Unit: mm

### Circuit diagram

#### NPN Output



#### PNP Output



# Cylindrical

## PSM12 Series

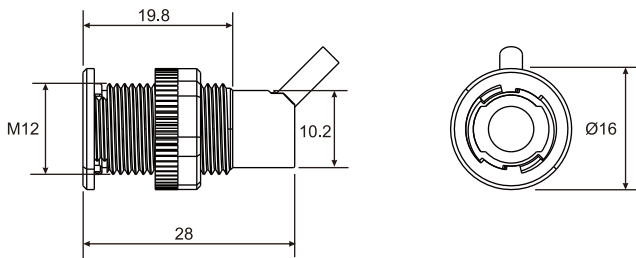


NEW!

|                      |  |                     |                     |                     |     |                     |                     |
|----------------------|--|---------------------|---------------------|---------------------|-----|---------------------|---------------------|
| Appearance           |  |                     |                     |                     |     |                     |                     |
| Sensing type         | Through beam   |                     |                     |                     |     |                     |                     |
| Sensing distance     | 5m   |                     |                     |                     |     |                     |                     |
| Light source         | Infrared LED   |                     |                     |                     |     |                     |                     |
| Detected object      | opaque object, $\phi > 8\text{mm}$   |                     |                     |                     |     |                     |                     |
| Output               | NPN / PNP for option   |                     |                     |                     |     |                     |                     |
| Switch type          | Light on/ Dark on selectable   |                     |                     |                     |     |                     |                     |
| Response time        | <2ms   |                     |                     |                     |     |                     |                     |
| Indicators           | Power: Green, Operation indicator: Orange  |                     |                     |                     |     |                     |                     |
| Power supply         | 12~24V DC $\pm 10\%$ Ripple P-P10% or less   |                     |                     |                     |     |                     |                     |
| Residual voltage     | < 1 V (When input current is equal to 50 mA)   |                     |                     |                     |     |                     |                     |
| Current consumption  | Emitter < 18 mA, Receiver < 15 mA  |                     |                     |                     |     |                     |                     |
| Load current         | <50mA  |                     |                     |                     |     |                     |                     |
| Circuit protection   | Short circuit protection   |                     |                     |                     |     |                     |                     |
| Ambient temperature  | Operation: $-25\sim 55^{\circ}\text{C}$ ; storage: $-30\sim 70^{\circ}\text{C}$ , no freezing  |                     |                     |                     |     |                     |                     |
| Ambient humidity     | Operation: 30~90% RH, storage: 35~85% RH, no condensation  |                     |                     |                     |     |                     |                     |
| Degree of protection | IP67   |                     |                     |                     |     |                     |                     |
| Material             | Housing, lens: PC  |                     |                     |                     |     |                     |                     |
| Connection           | Emitter: 2m 2 core cable; Receiver: 2m 2 core cable  |                     |                     |                     |     |                     |                     |
| Weight               | Approx.25g   |                     |                     |                     |     |                     |                     |
| Model No.            | <table border="1" style="width: 100%;"> <tr> <td>NPN</td> <td><b>PSM12-TM05NO</b></td> <td><b>PSM12-TM05NC</b></td> </tr> <tr> <td>PNP</td> <td><b>PSM12-TM05PO</b></td> <td><b>PSM12-TM05PC</b></td> </tr> </table> | NPN                 | <b>PSM12-TM05NO</b> | <b>PSM12-TM05NC</b> | PNP | <b>PSM12-TM05PO</b> | <b>PSM12-TM05PC</b> |
| NPN                  | <b>PSM12-TM05NO</b>  | <b>PSM12-TM05NC</b> |                     |                     |     |                     |                     |
| PNP                  | <b>PSM12-TM05PO</b>  | <b>PSM12-TM05PC</b> |                     |                     |     |                     |                     |

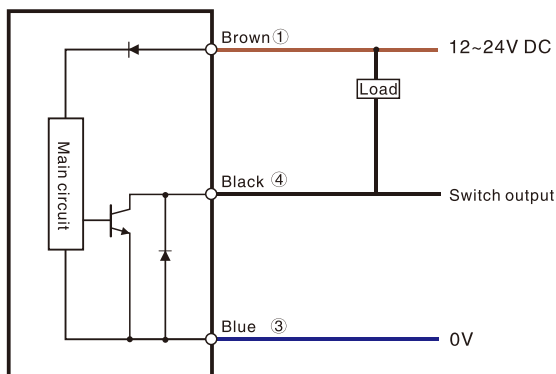
## Dimensions

Unit: mm

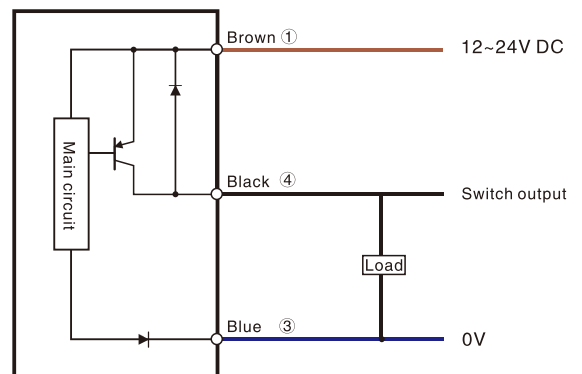


## Circuit diagram

### NPN Output



### PNP Output





**NEW!**

|                      |  |
|----------------------|--|
| Appearance           |  |
| Sensing type         | Diffuse reflective   |
| Sensing distance     | 10~40 cm (adjustable)  |
| Light source         | Red light LED  |
| Detected object      | opaque object, $\phi > 7$ mm                                 |
| Output               | NPN / PNP for option   |
| Switch Type          | Light on/ Dark on selectable                                 |
| Indicators           | Power: Green, Operation indicator: Red                       |
| Power supply         | 10~30V DC  |
| Residual voltage     | <1.5V  |
| Current consumption  | <25mA  |
| Load current         | <120mA   |
| Response time        | <2ms   |
| Circuit protection   | reverse polarity protection, short circuit protection        |
| Ambient temperature  | -15~55°C, no freezing  |
| Ambient humidity     | 35~90% RH, no condensation                                   |
| Ambient illuminance  | LED $\leq 450$ Lux   |
| Withstand voltage    | $\pm 1000V$ 50/60Hz 60s                                      |
| Static electricity   | $\pm 8000V$  |
| Group pulse          | $\pm 2000V$ 5KHz/100KHz                                      |
| Anti-vibration       | 10~50Hz, amplitude 0.5mm; 2 hours each in X, Y, Z directions |
| Degree of protection | IP67   |
| Material             | PC   |
| Connection           | 2m 4 wire cable  |
| Model No.            | NPN <b>PSM18-D40N</b><br>PNP <b>PSM18-D40P</b>               |

- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
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- Code Readers
- Vibration
- Temperature
- Accessories

### Guidance

#### Photoelectric

##### Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP59K high protection type

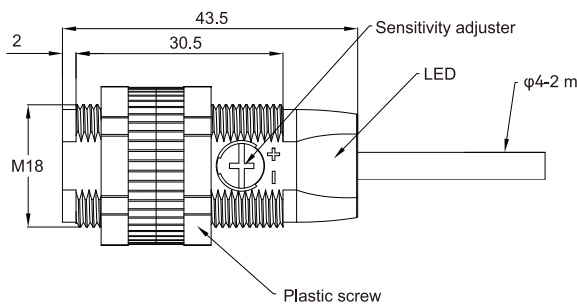
Anti-glare type

IO-Link type

#### Reflectors

Reflectors

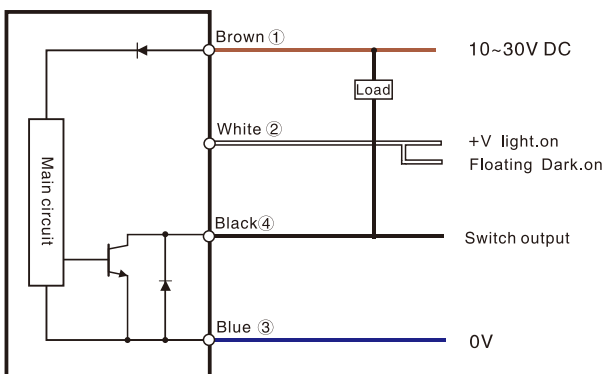
## Dimensions



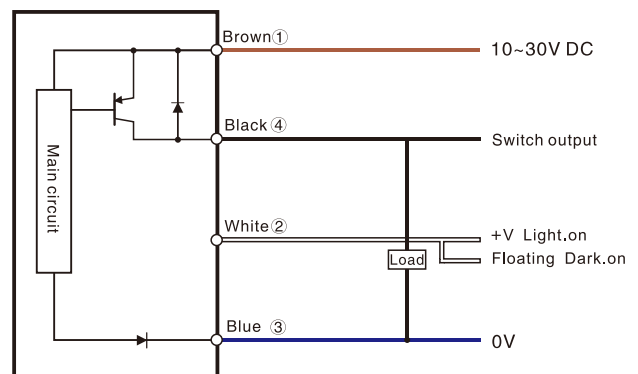
Unit: mm

## Circuit diagram

### NPN Output



### PNP Output



# Cylindrical

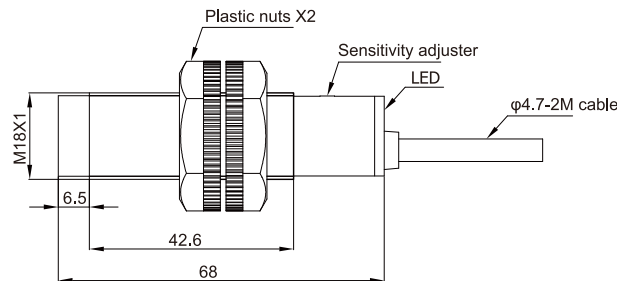
## PXM18 Series



Appearance

|                      |  |                   |
|----------------------|--|-------------------|
| Sensing type         | Diffuse reflection   |                   |
| Sensing distance     | 10cm(adjustable)   | 40cm(adjustable)  |
| Hysteresis           | ≤10%   |                   |
| Repeat accuracy      | 5%   |                   |
| Output type          | NPN/PNP Open-collector   |                   |
| Switch type          | Selectable L.on/D.on   |                   |
| Response time        | 20ms   |                   |
| Indicator            | Red LED(660nm)   | Red LED(880nm)    |
| Operating voltage    | 10~30V DC(±10%)  |                   |
| Voltage drop         | 2V max 1L=100mA  |                   |
| Leakage current      | 10 μA  |                   |
| Current consumption  | 30mA   |                   |
| Load current         | 100mA  |                   |
| Circuit protection   | Reverse polarity protection, output short circuit protection, pulse overvoltage protection |                   |
| Ambient temperature  | -25°C~+70°C, No freezing   |                   |
| Ambient illuminance  | Sunlight ≤10000 lux, Incandescent lamp ≤3000 lux   |                   |
| Degree of protection | IP67   |                   |
| Tightening torque    | 1Nm  |                   |
| Material             | Housing: PBT, Lens: PC   |                   |
| Weight               | ≈50g   |                   |
| Connection method    | 2M 4core cable   |                   |
| Accessories          | Mounting screws  |                   |
| Model No.            | NPN  | <b>PXM18-D10N</b> |
|                      | PNP  | <b>PXM18-D10P</b> |
|                      |  | <b>PXM18-D40N</b> |
|                      |  | <b>PXM18-D40P</b> |

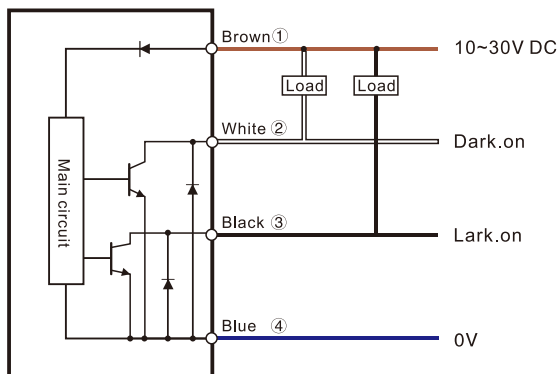
### Dimensions



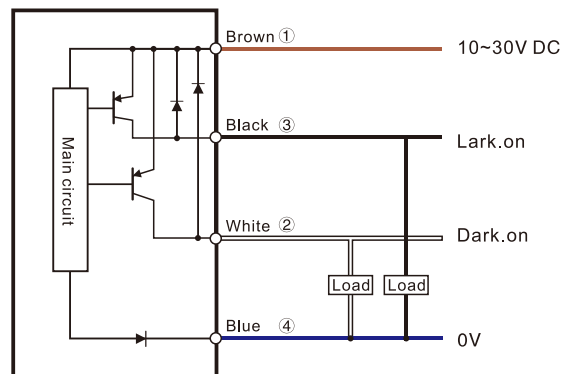
Unit: mm

### Circuit diagram

#### NPN Output



#### PNP Output



IP69K Type



|                      |  |
|----------------------|--|
| Appearance           |  |
| Sensing type         | Disffuse Reflection  |
| Sensing distance     | 400mm  |
| Light source         | IR 880 nm  |
| Hysteresis           | ≤10%   |
| Repeatability        | 5%   |
| Tolerance            | +15/-5% Sn   |
| Operating voltage    | 10-30V DC  |
| Ripple factor        | ≤10%   |
| No load current      | Max. 35mA (30V)  |
| Load current         | ≤100mA   |
| LED                  | Green: teach-in Yellow: Excess gain                            |
| Output voltage drop  | 2Vmax. IL=100mA  |
| Output type          | NPN  |
| Switch frequency     | 500Hz  |
| Start delay          | 200ms  |
| Ambient illuminance  | Incandescent lamp: <5,000 lux, Sunlight < 10,000 lux           |
| Ambient temperature  | -25°C-80°C , no condensation                                   |
| Circuit protection   | Reverse polarity protection, short-term overvoltage protection |
| Output protection    | Short circuit protection ( Automatic reset)                    |
| Sensitivity          | Teach-in   |
| Temperature drift    | 10%Sr  |
| Degree of protection | IP67; IP68 (1m, 7m /days); IP69K ( 40050-9 standard)           |
| Material             | stainless steel 316  |
| Accessories          | Mounting screws  |
| Model No.            | <b>PM18K-D40NR</b>   |

- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
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- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

Photoelectric

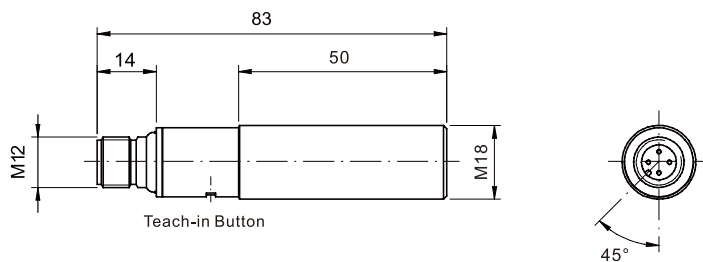
- Cylindrical**
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

Reflectors

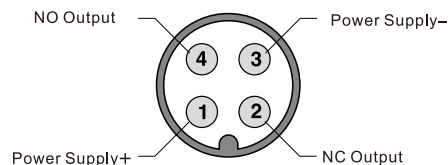
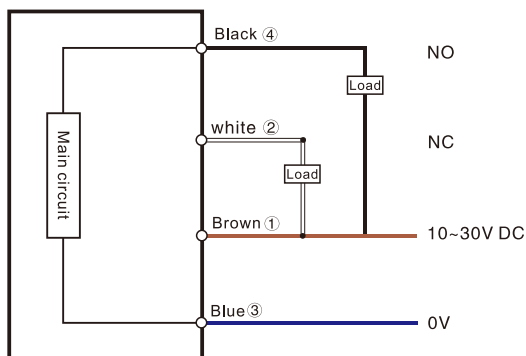
- Reflectors

Dimensions

Unit: mm



Circuit diagram





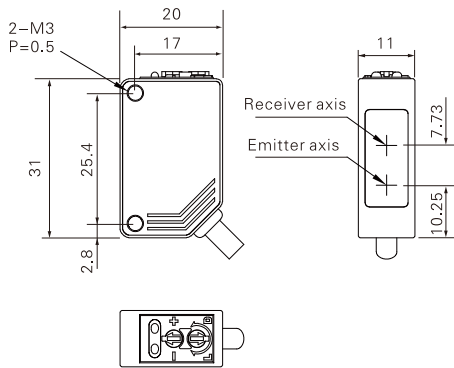
Economical Type

|                        |   |                   |                                 |                        |                 |                  |                  |
|------------------------|---|-------------------|---------------------------------|------------------------|-----------------|------------------|------------------|
| Appearance             |   |                   |                                 |                        |                 |                  |                  |
| Sensing type           | Diffuse reflection  |                   | Convergent reflective           | Retro-reflection       |                 |                  |                  |
| Sensing distance       | 10-300mm  | 5-1000mm          | 5-140mm                         | 10-200mm               | 2m              | 3m               |                  |
| Spot size              | ≈ φ 16mm / 300mm  | ≈ φ 50mm / 1000mm | ≈ φ 9mm / 140mm                 | φ 10mm / 20cm          | φ 50mm / 2m     | φ 90mm / 3m      |                  |
| Output type            | NPN or PNP open collector, ≤100mA ( 30V DC )  |                   |                                 |                        |                 |                  |                  |
| Switch type            | L.on / D.on Switchable  |                   |                                 |                        |                 |                  |                  |
| Indicator              | Motion indicator: Red ; Operating indicator: Green  |                   |                                 |                        |                 |                  |                  |
| Response time          | <1ms  |                   | 1ms                             | <1ms                   |                 |                  |                  |
| Sensitivity adjustment | Single-turn potentiometer   |                   |                                 |                        |                 |                  |                  |
| Light source           | Red light LED 623 nm (modulated)  |                   |                                 |                        |                 |                  |                  |
| Operating voltage      | 10-30V DC   |                   |                                 |                        |                 |                  |                  |
| Current consumption    | ≤25mA   |                   |                                 | ≤20mA                  |                 |                  |                  |
| Ambient illuminance    | Sunlight ≤ 10000 Lux; Incandescent Lamp ≤ 3000 Lux  |                   |                                 |                        |                 |                  |                  |
| Ambient temperature    | -25°C~+55°C, No freezing  |                   |                                 |                        |                 |                  |                  |
| Ambient humidity       | 35%~85%RH, No condensation  |                   |                                 |                        |                 |                  |                  |
| Anti-vibration         | 10 ~ 50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions  |                   |                                 |                        |                 |                  |                  |
| Circuit protection     | Power reverse polarity protection, output reverse polarity protection, surge protection, short circuit protection |                   |                                 |                        |                 |                  |                  |
| Degree of protection   | IP65  |                   |                                 |                        |                 |                  |                  |
| Connection method      | 2M/3 cores cable, φ 4mm   |                   |                                 |                        |                 |                  |                  |
| Material               | PBT+Fiberglass ( Housing ) , PMMA ( Lens )  |                   |                                 |                        |                 |                  |                  |
| Accessories            | Screwdriver   |                   | Screwdriver, reflective sticker | Screwdriver, reflector |                 |                  |                  |
| Model No.              | NPN   | <b>PTE-D30N</b>   | <b>PTE-D70N</b>                 | <b>PTE-X09N</b>        | <b>PTE-R20N</b> | <b>PTE-R200N</b> | <b>PTE-R300N</b> |
|                        | PNP   | <b>PTE-D30P</b>   | <b>PTE-D70P</b>                 | <b>PTE-X09P</b>        | <b>PTE-R20P</b> | <b>PTE-R200P</b> | <b>PTE-R300P</b> |

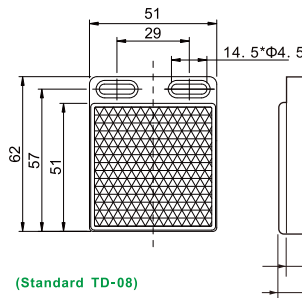
- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
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- Code Readers
- Vibration
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- Accessories

### Dimensions

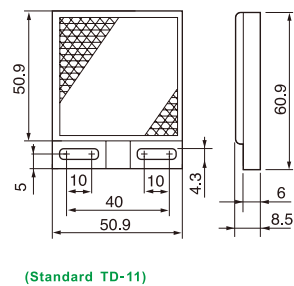
Unit: mm



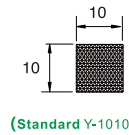
Reflector for PTE-R200



Reflector for PTE-R300

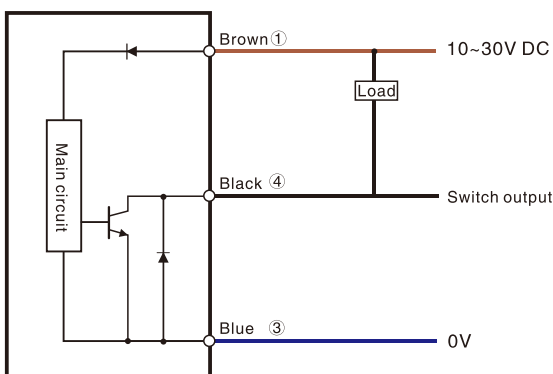


PTE-R20 Reflective Stickers

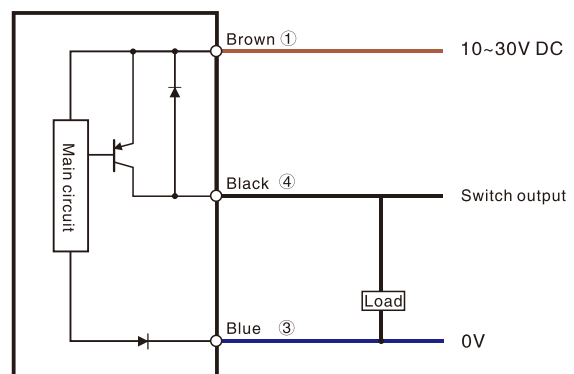


### Circuit diagram

NPN Output



PNP Output



### Guidance

#### Photoelectric

- Cylindrical
- Square**
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP59K high protection type
- Anti-glare type
- IO-Link type

#### Reflectors

- Reflectors



# Square

## PTE Series

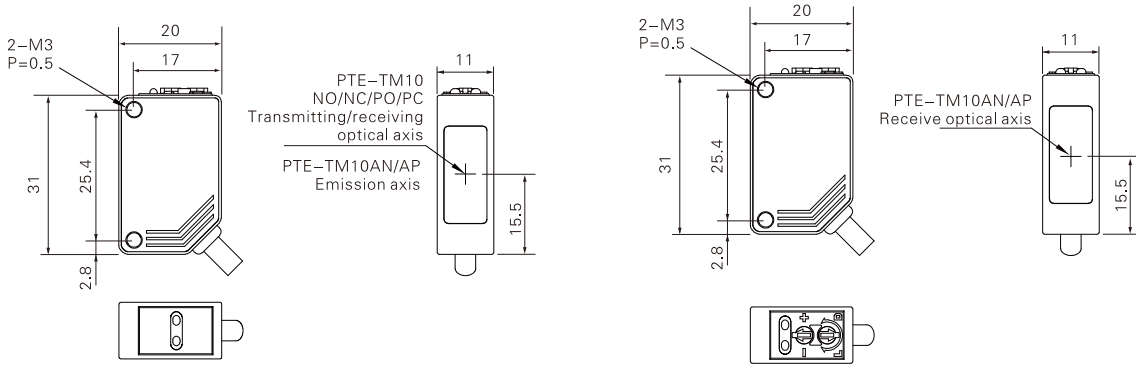


Economical Type

|                      |   |   |                           |
|----------------------|---|---|---------------------------|
| Appearance           |   |   |                           |
| Sensing type         | Thru-beam Reflection  |   |                           |
| Sensing distance     | 10m   |   |                           |
| Detected object      | $\phi > 12\text{mm}$ , opaque   |   |                           |
| Output type          | NPN / PNP open collector  |   |                           |
| Switch Type          | L.on/D.on selectable  | L.on/D.on switchable  |                           |
| Indicator            | Status indicator: green, output indicator: red                                | Emitter: Power: green;<br>Receiver: Operation: green, Motion: red |                           |
| Response time        | 33ms  |   |                           |
| Sensitivity          | Not adjustable  |   | Single turn potentiometer |
| Light source         | IR LED 623nm (modulated)  |   |                           |
| Operating voltage    | 10~30V DC   |   |                           |
| Current consumption  | Emitter $\leq 20\text{mA}$ ; Receiver $\leq 20\text{mA}$                      |   |                           |
| Ambient illuminance  | Sunlight $\leq 10,000\text{ Lux}$ , Incandescent lamp $\leq 3,000\text{ Lux}$ |   |                           |
| Ambient temperature  | $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$ , No freezing                  |   |                           |
| Ambient humidity     | 35%~85% RH, No condensation   |   |                           |
| Anti-vibration       | 10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions   |   |                           |
| Circuit protection   | Power reverse polarity protection, short circuit protection                   |   |                           |
| Degree of protection | IP65  |   |                           |
| Connection           | 2M / 3 cores cable 4mm diameter   |   |                           |
| Material             | Fiberglass (housing), PMMA(lens)  |   |                           |
| Accessories          | Screwdriver   |   |                           |
| Model No.            | NPN   | <b>PTE-TM10NO</b>   | <b>PTE-TM10NC</b>         |
|                      | PNP   | <b>PTE-TM10PO</b>   | <b>PTE-TM10PC</b>         |
|                      |   |   | <b>PTE-TM10AN</b>         |
|                      |   |   | <b>PTE-TM10AP</b>         |

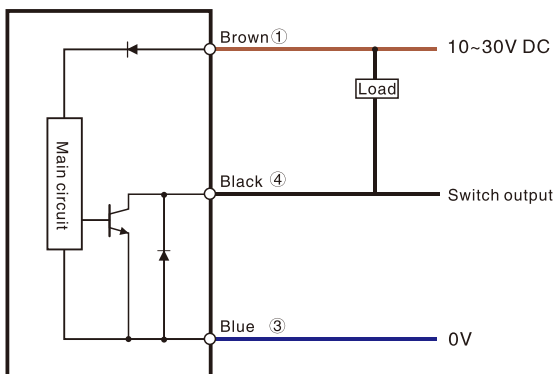
### Dimensions

Unit: mm

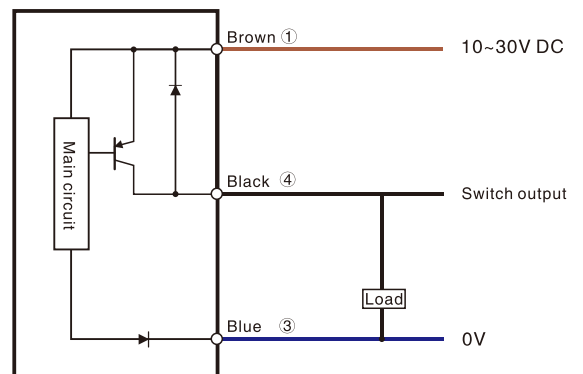


### Circuit diagram

#### NPN Output



#### PNP Output





Wide Facula Type

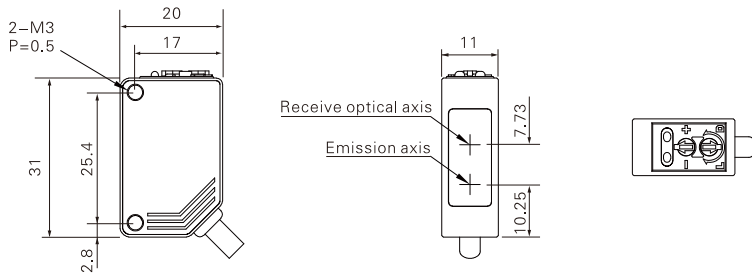
Appearance

|                      |   |                                 |                  |                  |
|----------------------|---|---------------------------------|------------------|------------------|
| Sensing type         | Disffuse refection  |                                 |                  |                  |
| Sensing distance     | 5-200mm   | 10cm                            | 20cm             |                  |
| Spot diameter        | 130*130mm/20cm  | -                               | -                |                  |
| Output type          | NPN / PNP open collector  |                                 |                  |                  |
| Switch type          | L.on /D.on selectable   |                                 |                  |                  |
| Indicator            | Operation indicator: Green, Motion indicator: Red   |                                 |                  |                  |
| Response time        | 1ms   |                                 |                  |                  |
| Sensitivity          | Single-turn potentiometer   |                                 |                  |                  |
| Light source         | Red LED 623nm (modulation)  | Infrared LED 940nm (modulation) |                  |                  |
| Operating voltage    | 10~30V DC   |                                 |                  |                  |
| Current consumption  | <25mA   | ≤20mA                           |                  |                  |
| Load current         | <100mA  | ≤100mA                          |                  |                  |
| Ambient illuminance  | Sunlight ≤10000Lux, Incandescent lamp ≤3000Lux  |                                 |                  |                  |
| Ambient temperature  | -25°C~+55°C, No freezing  |                                 |                  |                  |
| Ambient humidity     | 35%~85%RH, No condensation  |                                 |                  |                  |
| Anti-vibration       | 10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions                                       |                                 |                  |                  |
| Circuit protection   | Power reverse polarity protection, output reverse polarity protection, surge protection, short circuit protection |                                 |                  |                  |
| Degree of protection | IP65  |                                 |                  |                  |
| Connection           | 2M 3 core cable, φ 4mm  |                                 |                  |                  |
| Material             | PBT+Fiberglass (body), PMMA(lens)   |                                 |                  |                  |
| Accessories          | Screwdriver   |                                 |                  |                  |
| Model No.            | NPN   | <b>PTEW-D20N</b>                | <b>PTVW-D10N</b> | <b>PTVW-D20N</b> |
|                      | PNP   | <b>PTEW-D20P</b>                | <b>PTVW-D10P</b> | <b>PTVW-D20P</b> |

- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

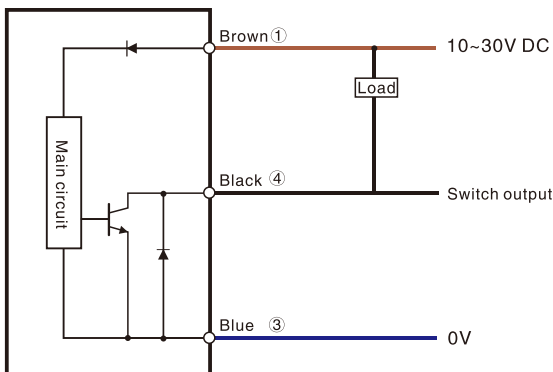
Dimensions

Unit: mm

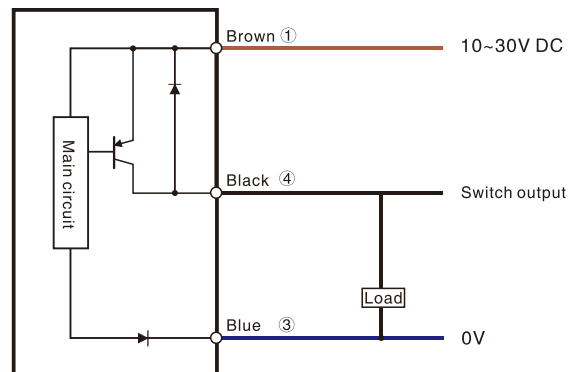


Circuit diagram

NPN Output



PNP Output



Guidance

Photoelectric

- Cylindrical
- Square**
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

Reflectors

- Reflectors

# Anti-glare Type

## PTL Series

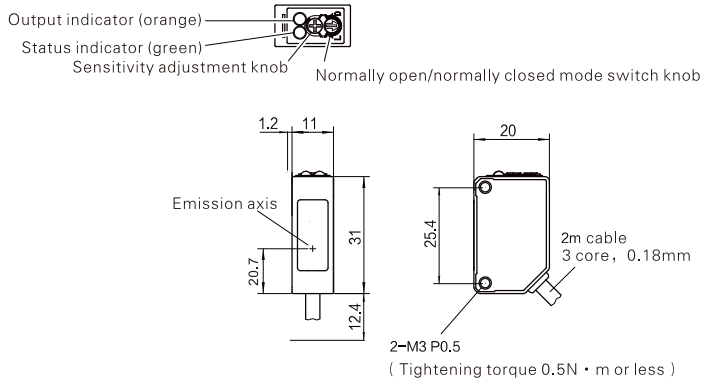


Anti-glare Type

|                      |   |                      |
|----------------------|---|----------------------|
| Appearance           |   |                      |
| Sensing type         | Diffuse reflection-BGS  |                      |
| Sensing distance     | 5~100mm   | 10~300mm             |
| Setting distance     | 20~100mm  | 50~300mm             |
| Spot diameter        | ≈ Ø10mm/100mm   | ≈ Ø30mm/300mm        |
| Hysteresis           | ≦3%   | ≦5%                  |
| Output type          | NPN / PNP open collector  |                      |
| Switch type          | L.on / D.on selectable  |                      |
| Indicator            | Operating indicator: orange, Status indicator: green                        |                      |
| Response time        | ≦1ms  |                      |
| Sensitivity          | 6-turn potentiometer  | 4-turn potentiometer |
| Light source         | Red LED   |                      |
| Operating voltage    | 10~30V DC   |                      |
| Current consumption  | ≦30mA   |                      |
| Load current         | ≦100mA  |                      |
| Ambient illuminance  | Sunlight ≦ 50,000 Lux, Incandescent lamp ≦ 5,000 Lux                        |                      |
| Ambient temperature  | -25°C~+55°C, No freezing  |                      |
| Ambient humidity     | 35%~85% RH, No condensation   |                      |
| Anti-vibration       | 10 to 50 Hz with 0.5mm amplitude for 2 hours each in X, Y, and Z directions |                      |
| Degree of protection | IP67  |                      |
| Connection           | ABS (body), PMMA (lens)   |                      |
| Accessories          | Screwdriver   |                      |
| Model No.            | NPN   | PTL-D10N             |
|                      | PNP   | PTL-D10P             |
|                      |   | PTL-D30N             |
|                      |   | PTL-D30P             |

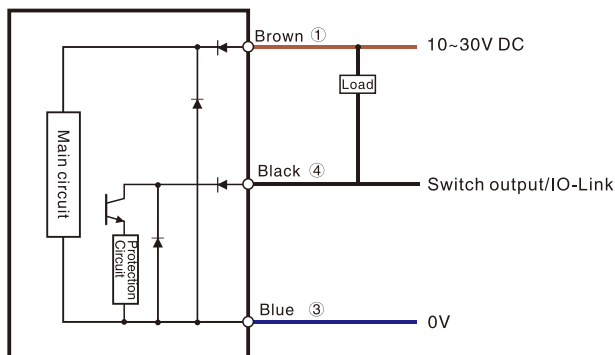
### Dimensions

Unit: mm

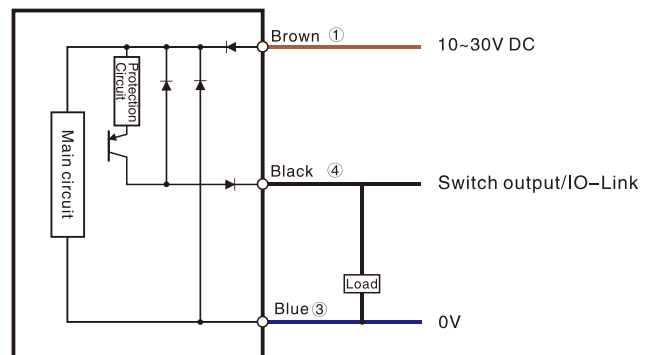


### Circuit diagram

#### NPN Output



#### PNP Output



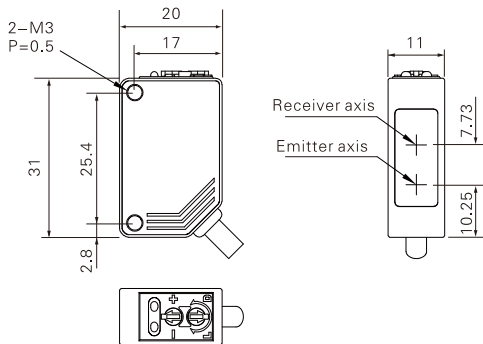


Appearance

|                        |   |  |                       |                 |
|------------------------|---|--|-----------------------|-----------------|
| Sensing type           | Diffuse reflection  |  | Convergent reflective |                 |
| Sensing distance       | 10–300mm  | 5–1000mm   | 5–140mm               |                 |
| Output type            | NPN/PNP Open-collector  |  |                       |                 |
| Switch type            | Selectable L.on/D.on  |  |                       |                 |
| Response time          | < 1ms   |  |                       |                 |
| Light source           | Infrared LED(940nm modulation)  |  |                       |                 |
| Operating voltage      | 10~30V DC   |  |                       |                 |
| No-load supply current | < 25mA  |  |                       |                 |
| Load current           | < 100mA   |  |                       |                 |
| Ambient temperature    | -25°C~+55°C, No freezing  |  |                       |                 |
| Ambient humidity       | 35%~85% RH, No condensation   |  |                       |                 |
| Circuit protection     | Power reverse polarity, output reverse polarity, surge, short circuit |  |                       |                 |
| Degree of protection   | IP65  |  |                       |                 |
| Material               | PBT+Fiberglass ( Housing ) , PMMA ( Lens )                            |  |                       |                 |
| Connection method      | 2M 3core cable  |  |                       |                 |
| Weight                 | ≈ 50g   |  |                       |                 |
| Accessories            | Screwdriver   |  |                       |                 |
| Model No.              | NPN   | <b>PTV-D30N</b> <span style="color:red">HOT</span> | <b>PTV-D70N</b>       | <b>PTV-X09N</b> |
|                        | PNP   | <b>PTV-D30P</b>                                    | <b>PTV-D70P</b>       | <b>PTV-X09P</b> |

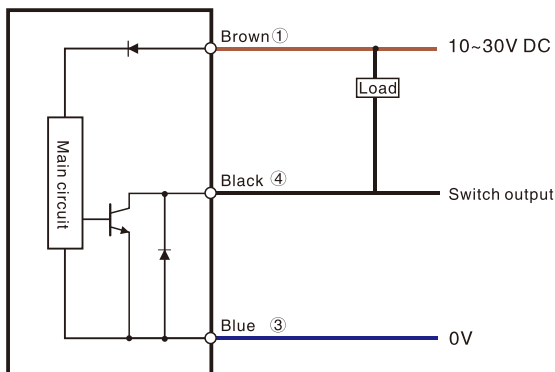
### Dimensions

Unit: mm

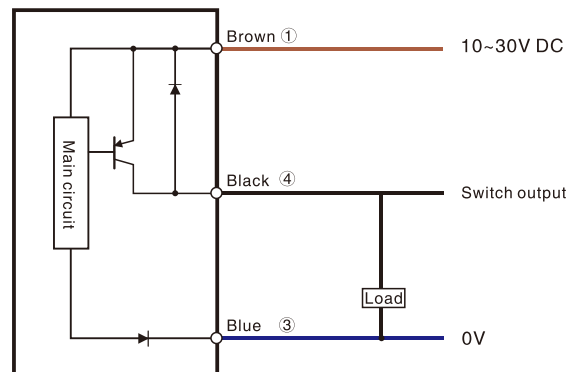


### Circuit diagram

#### NPN Output



#### PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

#### Guidance

#### Photoelectric

- Cylindrical
- Square**
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP59K high protection type
- Anti-glare type
- IO-Link type

#### Reflectors

- Reflectors

# Square

## PTV Series



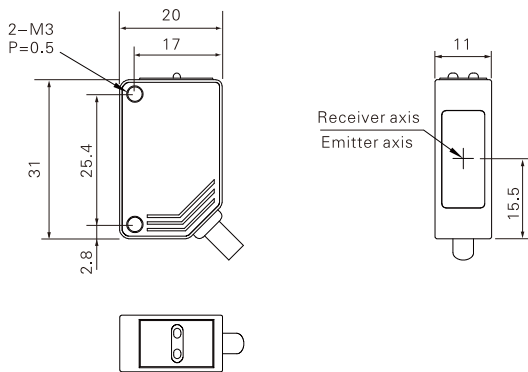
Appearance

|                        |  |                   |                      |                   |                  |
|------------------------|--|-------------------|----------------------|-------------------|------------------|
| Sensing type           | Thru-beam  |                   |                      |                   |                  |
| Sensing distance       | 20m(fixed)   | 20m               | 5m                   |                   |                  |
| Output type            | NPN/PNP Open-collector   |                   |                      |                   |                  |
| Switch type            | Selectable L.on/D.on, Model optional                               |                   | Selectable L.on/D.on |                   |                  |
| Response time          | < 5ms  |                   |                      |                   |                  |
| Light source           | Infrared LED(940nm modulation)                                     |                   |                      |                   |                  |
| Operating voltage      | 10~30V DC  |                   |                      |                   |                  |
| No-load supply current | Transmitter: <20mA; Receiver end: <20mA                            |                   |                      |                   |                  |
| Load current           | <100mA   |                   |                      |                   |                  |
| Ambient temperature    | -25°C~+55°C, No freezing   |                   |                      |                   |                  |
| Ambient humidity       | 35%~85%RH, No condensation   |                   |                      |                   |                  |
| Circuit protection     | Power reverse polarity,output reverse polarity,surge,short circuit |                   |                      |                   |                  |
| Degree of protection   | IP65   |                   |                      |                   |                  |
| Material               | PBT+Fiberglass ( Housing ) , PMMA ( Lens )                         |                   |                      |                   |                  |
| Connection method      | 2M 3core cable   |                   |                      |                   |                  |
| Weight                 | ≈50g   |                   |                      |                   |                  |
| Accessories            | Screwdriver  |                   |                      |                   |                  |
| Model No.              | NPN  | <b>PTV-TM20NO</b> | <b>PTV-TM20NC</b>    | <b>PTV-TM20AN</b> | <b>PTV-T500N</b> |
|                        | PNP  | <b>PTV-TM20PO</b> | <b>PTV-TM20PC</b>    | <b>PTV-TM20AP</b> | <b>PTV-T500P</b> |

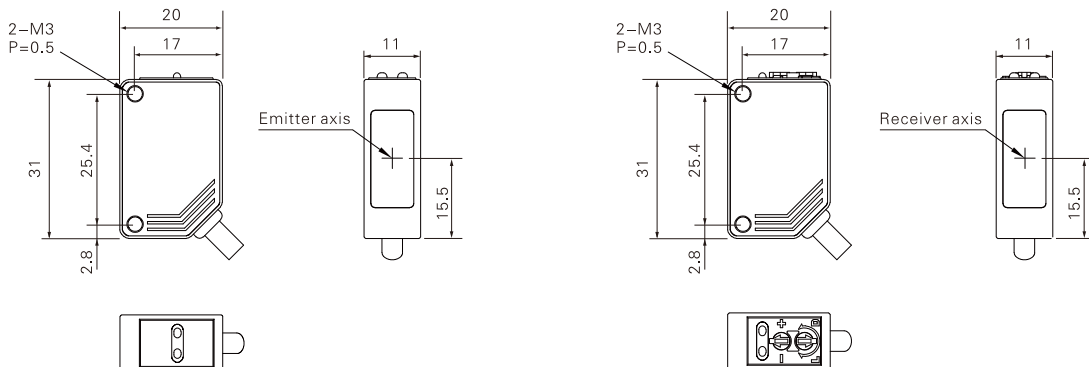
### Dimensions

Unit: mm

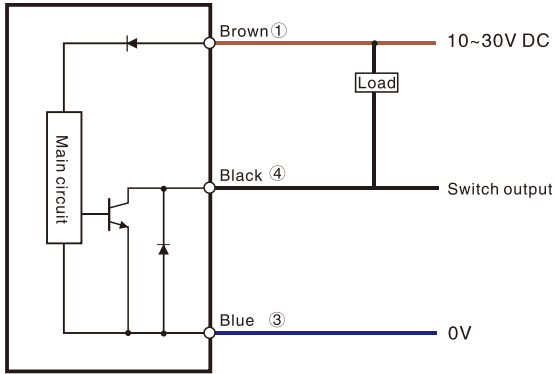
#### PTV-TM20NO/PO/NC/PC



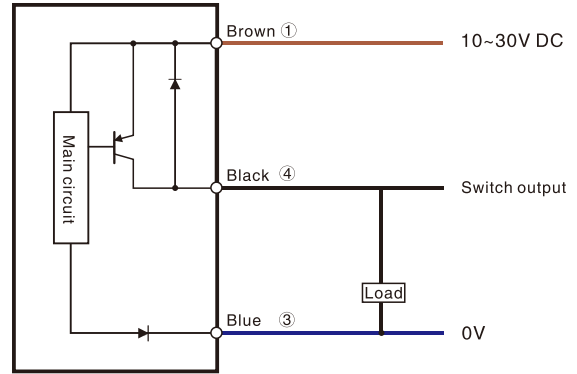
#### PTV-TM20AN/AP、PTV-T500N/P



### NPN Output



### PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

#### Guidance

#### Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

#### Reflectors

- Reflectors





IO-Link

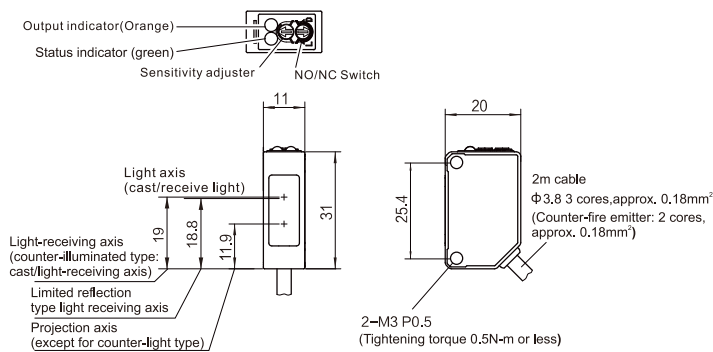
Appearance

|                      |   |                             |                         |                    |
|----------------------|---|-----------------------------|-------------------------|--------------------|
| Sensing type         | Diffuse reflection                                    | Thru-beam reflection        | Retro-reflection        |                    |
| Sensing distance     | 0~1m(white paper200X200mm)                            | 0~25m                       | 0.01~4m(with reflector) |                    |
| Spot diameter        | φ 75mm / 1m   | φ 1800mm / 25m              | φ 280mm / 4m            |                    |
| Output type          | NPN/PNP Open-collector                                |                             |                         |                    |
| Switch type          | L.on/D.on selectable                                  |                             |                         |                    |
| Indicator            | Input indicator: orange, Status indicator: green      |                             |                         |                    |
| Response time        | ≤500us  |                             |                         |                    |
| Sensitivity          | Single turn adjuster                                  |                             |                         |                    |
| Light source         | Red light LED   |                             |                         |                    |
| Operating voltage    | 10~30V DC ± 10%                                       |                             |                         |                    |
| Current consumption  | <20mA   | Emitter<14mA, Receiver<20mA | <20mA                   |                    |
| Load current         | ≤100mA  |                             |                         |                    |
| Hysteresis           | ≤20%  |                             | -                       |                    |
| Function             | IO-LINK   |                             |                         |                    |
| Ambient illuminance  | Sunlight≤5000Lux, Incandescent lamp≤5000Lux           |                             |                         |                    |
| Ambient temperature  | -25℃~+55℃, no freezing                                |                             |                         |                    |
| Ambient humidity     | 35%~85%RH, No condensation                            |                             |                         |                    |
| Degree of protection | IP67  |                             |                         |                    |
| Connection           | 2m 3 core cable(2m 2 core cable for thru-beam models) |                             |                         |                    |
| Material             | ABS (housing) +PMMA (lens)                            |                             |                         |                    |
| Accessories          | -   |                             |                         |                    |
| Model No.            | NPN   | <b>PTZ-D70N-C</b>           | <b>PTZ-TM25N-C</b>      | <b>PTZ-R400N-C</b> |
|                      | PNP   | <b>PTZ-D70P-C</b>           | <b>PTZ-TM25P-C</b>      | <b>PTZ-R400P-C</b> |

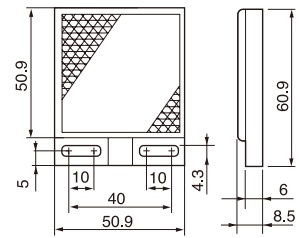
Guidance

### Dimensions

Unit: mm

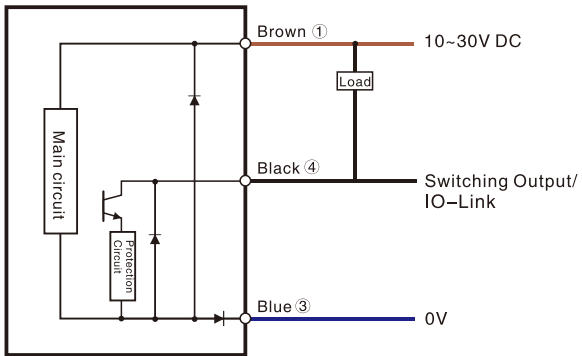


### Reflector for PTZ-R400-C

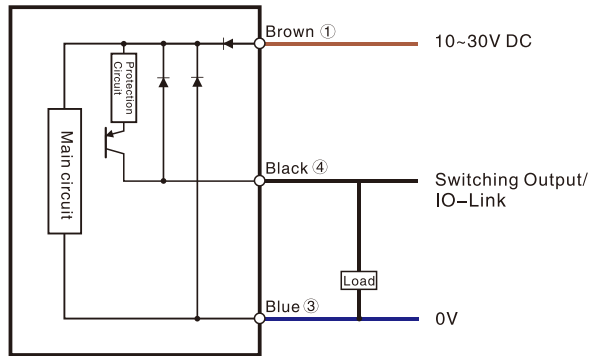


(Optional TD-11)

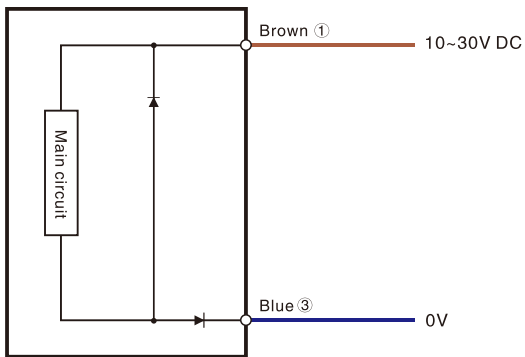
NPN Output



PNP Output



Thru-beam Emitter



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type**

Reflectors

- Reflectors

# Square

## PTN Series

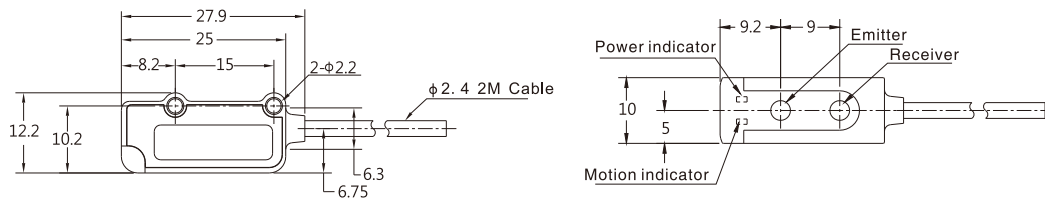


Appearance

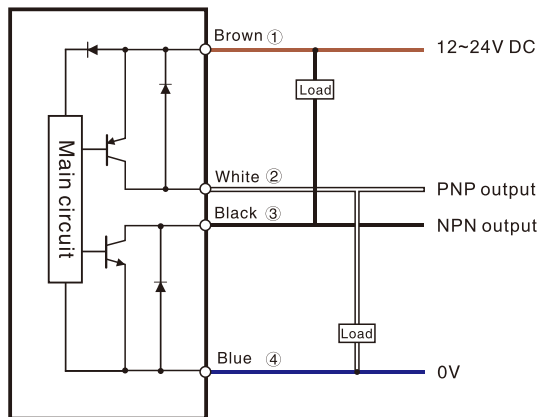
|                       |   |   |
|-----------------------|---|---|
| Sensing type          | Diffuse reflection                                    | Thru-beam   |
| Sensing distance      | 5cm, White board 100*100mm (> 5cm)                    | 50cm  |
| Output type           | NPN/PNP Open-collector                                |   |
| Switch type           | L.on  | D.on  |
| Response time         | ≤ 1 ms  |   |
| Light source          | Infrared LED (940nm)                                  |   |
| Operating voltage     | 12~24V DC ± 10%                                       |   |
| Current consumption   | ≤ 20mA  | ≤ 30mA  |
| Load current          | ≤ 100mA ( 24V DC )                                    |   |
| Circuit protection    | Reverse polarity protection, short circuit protection |   |
| Ambient temperature   | -10°C~+45°C, No freezing                              |   |
| Ambient humidity      | 35%~85% RH, No condensation                           |   |
| Storage temperature   | -10°C~+55°C, No freezing                              |   |
| Storage humidity      | 35%~95% RH, No condensation                           |   |
| Withstand voltage     | 1000 V/AC 50/60Hz 1min                                |   |
| Insulation resistance | ≥ 20MΩ/500V DC  |   |
| Degree of protection  | IP64  |   |
| Material              | ABS   |   |
| Connection method     | φ 2.4*2M 3core cable                                  | (Receiver) φ 2.4*2M 3core cable/ (Emitter) φ 2.4*2M 3core cable |
| Weight                | ≈ 20g   | ≈ 40g   |
| Accessories           | Mounting screws                                       |   |
| Model No.             | NPN   | PTN-D05N  |
|                       | PNP   | PTN-D05P  |
|                       |   | PTN-T50N  |
|                       |   | PTN-T50P  |

## Dimensions

Unit: mm



## Circuit diagram





|                      |   |               |              |
|----------------------|---|---------------|--------------|
| Appearance           |   |               |              |
| Sensing type         | Thru-beam   |               |              |
| Sensing distance     | 80cm (fixed)  | 150cm (fixed) |              |
| Detected object      | Opaque objects above $\phi 6\text{mm}$                                    |               |              |
| Output type          | NPN/PNP Open-collector  |               |              |
| Switch type          | Selectable L.on/D.on, Model optional                                      |               |              |
| Response time        | 33ms  |               |              |
| Indicator            | Transmitter: Power indicator: green; Receiver: Action indicator: yellow   |               |              |
| Light source         | Infrared LED 850nm (Modulated)  |               |              |
| Operating voltage    | 12~24V DC   |               |              |
| Residual voltage     | 2V or less (when the current is 50mA )                                    |               |              |
| Current consumption  | The transmitting end < 20mA, Receiving end < 20mA                         |               |              |
| Load current         | < 50mA  |               |              |
| Circuit protection   | Reverse polarity , short circuit  |               |              |
| Ambient illuminance  | Sunlight $\leq 10000\text{Lux}$ , Incandescent lamp $\leq 3000\text{Lux}$ |               |              |
| Ambient temperature  | $-20^{\circ}\text{C}\sim+50^{\circ}\text{C}$ , No freezing                |               |              |
| Voltage drop         | 35~90% RH, Storage: 35~90% RH   |               |              |
| Storage temperature  | $-30^{\circ}\text{C}\sim+70^{\circ}\text{C}$ , No freezing                |               |              |
| Withstand voltage    | $\geq 20\text{M}\Omega/500\text{V DC}$                                    |               |              |
| Pressure strength    | AC1000V(50/60Hz)1minute   |               |              |
| Shock resistance     | 10~55Hz reciprocating amplitude 1.5mm, X, Y, Z directions 2 hours         |               |              |
| Impact resistant     | 500m/s <sup>2</sup> XYZ three directions                                  |               |              |
| Degree of protection | IP 64   |               |              |
| Housing Material     | PC/ABS  |               |              |
| Connection method    | 2M 3core cable  |               |              |
| Accessories          | -   |               |              |
| Model No.            | NPN D.on  | PTJ-T80NO-I   | PTJ-T150NO-I |
|                      | NPN L.on  | PTJ-T80NC-I   | PTJ-T150NC-I |
|                      | PNP D.on  | PTJ-T80PO-I   | PTJ-T150PO-I |
|                      | PNP L.on  | PTJ-T80PC-I   | PTJ-T150PC-I |

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- Accessories

### Guidance

### Photoelectric

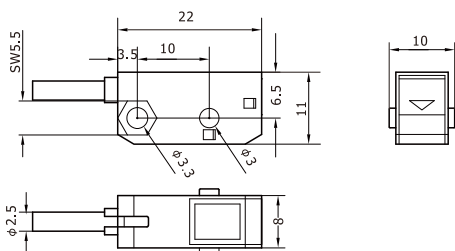
- Cylindrical
- Square**
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP59K high protection type
- Anti-glare type
- IO-Link type

### Reflectors

- Reflectors

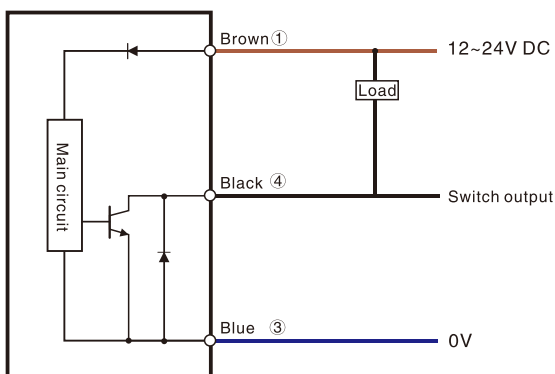
## Dimensions

Unit: mm

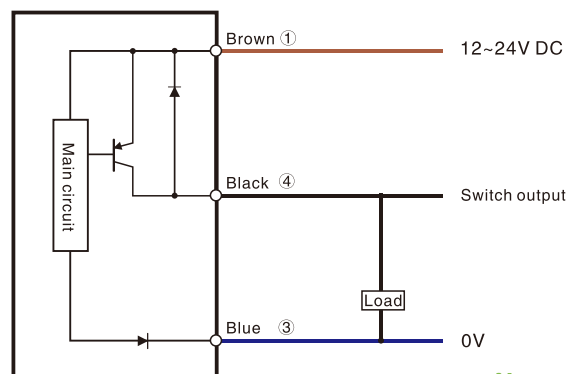


## Circuit diagram

### NPN Output



### PNP Output



# TOF Type

## PX Series



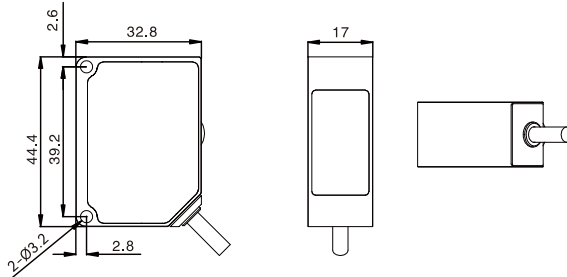
TOF Type

NEW!

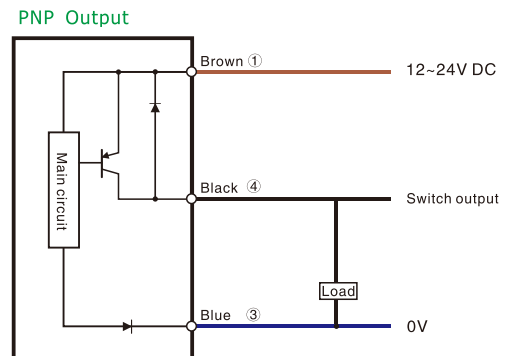
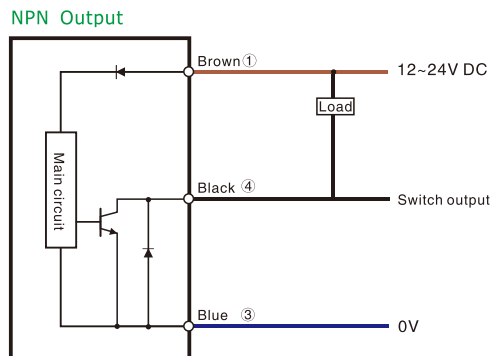
|                        |   |  |
|------------------------|---|--|
| Appearance             |   |  |
| Sensing type           | TOF ( Time of flight ) 1 point teaching   |  |
| Sensing distance       | 100cm   | 300cm  |
| Setting range          | 5 ~ 100cm ( White paper 200 × 200mm)  | 20 ~ 300cm (White paper 200 × 200mm)                                   |
| Light source           | Infrared LED ( 940nm )  | Infrared LED ( 850nm )   |
| Detected object        | above 200*200mm   | above 200*200mm  |
| Output                 | NPN/PNP Open-collector  |  |
| Sensitivity adjustment | Tech-in   |  |
| Indicators             | Power: green, output indicator: red,<br>When the teaching is successful: the green light flashes and then keeps on;<br>when the teaching fails: the red and green lights flash alternately for 6s |  |
| Response time          | < 30 ms   | < 100 ms   |
| Hysteresis             | Range 5~10cm, hysteresis < 1cm;<br>Range 10~100cm, hysteresis < 10%   | Range 20~50 cm, hysteresis < 4cm;<br>Range 50~300 cm, hysteresis < 10% |
| Repeatability          | Range 5~10cm, hysteresis < 0.5cm;<br>Range 10~100cm, hysteresis < 5 %   | < 1.5 cm   |
| Operating voltage      | 12~24V DC ± 10%   |  |
| Residual voltage       | < 1.5 V (load current < 125mA)  |  |
| Current consumption    | ≤ 30mA  | ≤ 25mA   |
| Load current           | ≤ 100mA ( 24V DC )  |  |
| Circuit protection     | reverse polarity protection, short circuit protection   |  |
| Ambient temperature    | Operation temperature: -10°C~60°C, no freezing; storage temperature: -20°C~70°C   |  |
| Ambient humidity       | Working: 35~90% RH ; storage: 35~90% RH, no condensation  |  |
| Withstand voltage      | ± 1000V 50/60Hz 60s   |  |
| Static electricity     | ± 4000V(Contact discharge)  |  |
| Group pulse            | ± 2000V/5kHz/100kHz   |  |
| Anti-vibration         | 10~50Hz, amplitude 0.5mm; 2 hours each in X, Y, Z directions  |  |
| Ambient light          | Incandescent light ≤ 5,000Lux   |  |
| Material               | Aluminum alloy  |  |
| Connection             | φ = 4mm, 2m 3 wire cable  |  |
| Model No.              | NPN<br>PX-F09N  | PXP-F09N<br>PX-F30N  |
|                        | PNP<br>PX-F09P  | PXP-F09P<br>PX-F30P  |

### Dimensions

Unit: mm



### Circuit diagram





|                       |     |  |             |             |
|-----------------------|-----|--|-------------|-------------|
| Appearance            |     | Front  | Head        |             |
| Detection surface     |     |  |             |             |
| Sensing type          |     | Diffuse reflection   |             |             |
| Sensing distance      |     | 2.5~8mm(black object 3mm)  |             |             |
| Hysteresis            |     | <20%   |             |             |
| Light source          |     | Infrared LED(880nm)  |             |             |
| Response time         |     | <1ms   |             |             |
| Operating voltage     |     | 12~24V DC  |             |             |
| Voltage drop          |     | <2.5V (load current is 100mA)  |             |             |
| Residual voltage      |     | Below 3V (load current 100mA/ 2m cable)  |             |             |
| Indicator             |     | Red LED  |             |             |
| Switch type           |     | L,on/D,on model selectable   |             |             |
| Circuit protection    |     | Surge protection, reverse polarity protection  |             |             |
| Storage temperature   |     | Operation: -10°C~55°C, Storage: -25°C~80°C(No freezing)  |             |             |
| Storage humidity      |     | Operation: 45%~85% RH, Storage: 35%~90% RH (No condensation)   |             |             |
| Ambient illuminance   |     | ≤3500Lux   |             |             |
| Voltage influence     |     | When the rated power supply voltage range fluctuates within ± 15%, the sensing distance will be changed within ± 1%. |             |             |
| Insulation resistance |     | > 50MΩ/500V DC   |             |             |
| Withstand voltage     |     | AC1000V, 50/60Hz, 1min   |             |             |
| Vibration resistance  |     | 10~55Hz, Upper and lower amplitude 1.5mm, 2 hours in X, Y, Z direction   |             |             |
| Impact resistance     |     | 500m/s <sup>2</sup> 10 times in X,Y,Z  |             |             |
| Degree of protection  |     | IP50   |             |             |
| Housing Material      |     | PC   |             |             |
| Connection method     |     | 2m 3 core cable  |             |             |
| Accessories           |     | -  |             |             |
| Model No.             | NPN | Dark.on  | MP2-410N-WD | MP2-412N-WD |
|                       |     | Light.on   | MP2-410N-WL | MP2-412N-WL |
|                       | PNP | Dark.on  | MP2-410P-WD | MP2-412P-WD |
|                       |     | Light.on   | MP2-410P-WL | MP2-412P-WL |

- Fiber Optic
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- Photoelectric**
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- Displacement
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- Vision
- Code Readers
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- Temperature
- Accessories

### Guidance

### Photoelectric

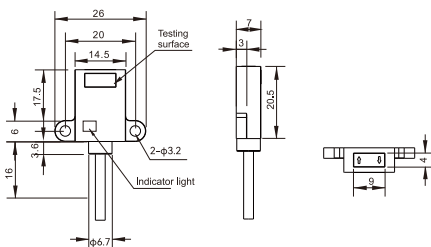
- Cylindrical
- Square
- Flat type**
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

### Reflectors

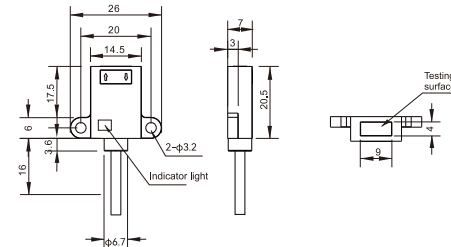
- Reflectors

## Dimensions

MP2-410□-WD



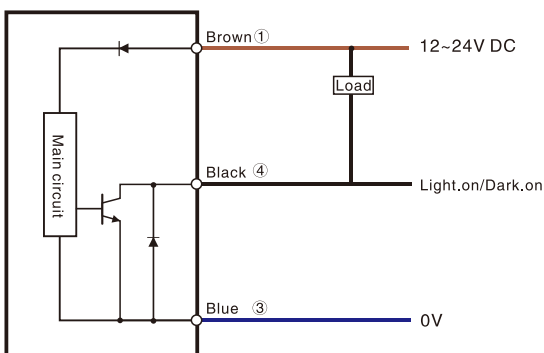
MP2-412□-WD



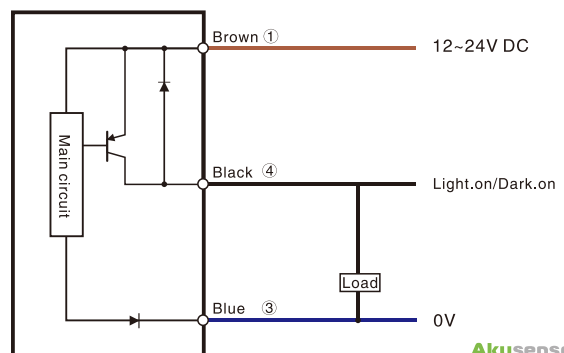
Unit: mm

## Circuit diagram

### NPN Output



### PNP Output





# Flat Type

## MP2 Series Connector Type

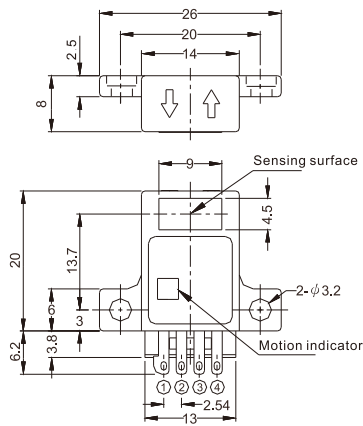


|                       |   |                         |                   |
|-----------------------|---|-------------------------|-------------------|
| Appearance            | Front   | Head                    |                   |
| Detection surface     | Diffuse reflection  |                         |                   |
| Sensing type          | 40mm (50 x 50 white matte paper)                            |                         |                   |
| Sensing distance      | < 20%   |                         |                   |
| Hysteresis            | NPN/PNP Open-collector                                      |                         |                   |
| Output type           | Selectable L.on/D.on  |                         |                   |
| Switch type           | < 1 ms  |                         |                   |
| Response time         | Infrared LED ( 850nm )                                      |                         |                   |
| Light source          | 12~24V DC   |                         |                   |
| Operating voltage     | < 20mA  | < 25mA                  |                   |
| Current consumption   | < 2.5V (load current is 100mA)                              |                         |                   |
| Voltage drop          | < 100mA(24V DC)   |                         |                   |
| Load current          | AC 1000V 50/60Hz 1min                                       |                         |                   |
| Withstand voltage     | Operation: -20°C~+55°C, Storage: -25°C~+80°C(No freezing)   |                         |                   |
| Ambient temperature   | Operation: 45%~+85%RH, Storage: 35%~90%RH (No condensation) |                         |                   |
| Ambient humidity      | > 20MΩ/500V DC  |                         |                   |
| Insulation resistance | Incandescent lamp ≦ 3000Lux, Sunlight ≦ 10000Lux            |                         |                   |
| Ambient illuminance   | IP50  |                         |                   |
| Degree of protection  | PC  |                         |                   |
| Material              | connector   |                         |                   |
| Connection method     | Mounting screws   |                         |                   |
| Accessories           | Model No.   |                         |                   |
|                       | NPN   | <b>MP2-410N-E</b> (HOT) | <b>MP2-412N-E</b> |
|                       | PNP   | <b>MP2-410P-E</b>       | <b>MP2-412P-E</b> |

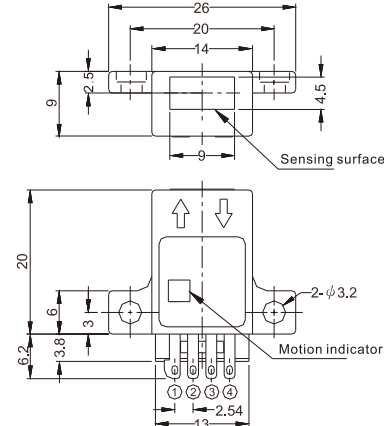
### Dimensions

Unit: mm

MP2-410N(P)-E



MP2-412N(P)-E

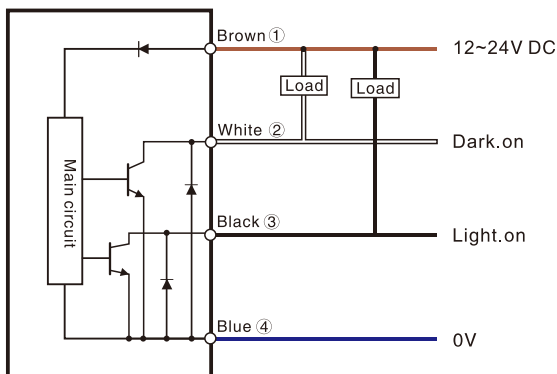


- ①: ○ Brown
- ②: ○ OUT1 White
- ③: ○ OUT2 Black
- ④: ○ Blue

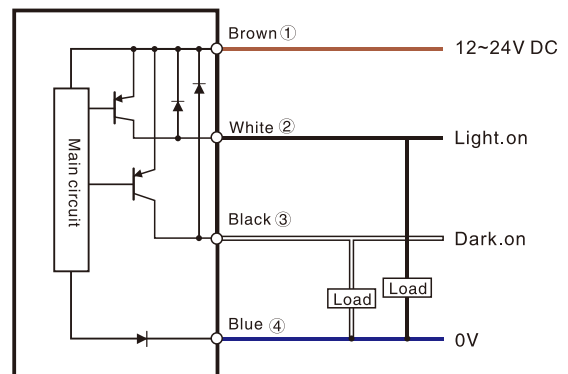
Connection cable: ME-1007 (To O-11)

### Circuit diagram

NPN Output



PNP Output





|                      |  |   |                       |              |          |           |           |            |            |
|----------------------|--|---|-----------------------|--------------|----------|-----------|-----------|------------|------------|
| Sensing type         | Convergent reflective  |   | Thru beam             |              |          |           |           |            |            |
| Sensing distance     | 2~15mm   | 2~25 mm (fixed)   | 500mm ( fixed )       | 1m ( fixed ) |          |           |           |            |            |
| Light source         | Infrared light 850nm ( modulated )   | Infrared light 950nm ( Modulated )                                    | Infrared light        | Red light    |          |           |           |            |            |
| Detectable object    | all objects  | 50*50mm white paper   | Opaque, $\phi > 2$ mm |              |          |           |           |            |            |
| Output               | NPN/PNP Open-collector, $\leq 100$ mA  |   |                       |              |          |           |           |            |            |
| Switch type          | L.on   |   |                       |              |          |           |           |            |            |
| Indicator            | Motion indicator: orange; Power: green   |   |                       |              |          |           |           |            |            |
| Response time        | 1.2ms  | $\leq 1.2$ ms   |                       |              |          |           |           |            |            |
| Power-up delay       | 50ms   |   | -                     |              |          |           |           |            |            |
| Operating voltage    | 10~30V DC $\pm 10\%$   |   |                       |              |          |           |           |            |            |
| Residual voltage     | $< 2$ V (load current $< 50$ mA)   |   |                       |              |          |           |           |            |            |
| Current consumption  | $\leq 20$ mA   |   |                       |              |          |           |           |            |            |
| Load current         | $< 100$ mA   | $< 50$ mA   |                       |              |          |           |           |            |            |
| Circuit protection   | Overload protection/reverse connection protection/short circuit protection   | Reverse polarity protection/surge protection/short circuit protection |                       |              |          |           |           |            |            |
| Ambient illuminance  | Sunlight $\leq 10,000$ Lux, Incandescent lamp $\leq 3,000$ Lux   |   |                       |              |          |           |           |            |            |
| Ambient temperature  | Working: $-25^{\circ}\text{C} \sim +55^{\circ}\text{C}$ , no freezing; storage: $-10^{\circ}\text{C} \sim +55^{\circ}\text{C}$ |   |                       |              |          |           |           |            |            |
| Ambient humidity     | Working: 35%~85%RH; Storage: 35%~95%RH, no condensation  |   |                       |              |          |           |           |            |            |
| Withstand voltage    | $\pm 500$ V 50/60Hz 60s  |   |                       |              |          |           |           |            |            |
| Static electricity   | $\pm 8000$ V   |   |                       |              |          |           |           |            |            |
| Group pulse          | $\pm 2000$ V ( 5kHz/50kHz/100kHz )   |   |                       |              |          |           |           |            |            |
| Anti-vibration       | 10~55Hz, amplitude 1.5mm, 2 hours each in X, Y, Z directions   | 10~50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions          |                       |              |          |           |           |            |            |
| Degree of protection | IP67   |   |                       |              |          |           |           |            |            |
| Connection           | $\phi 2.5$ * 2M /3 core cable  |   |                       |              |          |           |           |            |            |
| Material             | PC   |   |                       |              |          |           |           |            |            |
| Accessories          | Mounting screws  |   |                       |              |          |           |           |            |            |
| Model No.            | NPN  | ESL-15NO  | ESL-15NC              | ESL-25NO     | ESL-25NC | ESL-T50NO | ESL-T50NC | ESL-TM01NO | ESL-TM01NC |
|                      | PNP  | ESL-15PO  | ESL-15PC              | ESL-25PO     | ESL-25PC | ESL-T50PO | ESL-T50PC | ESL-TM01PO | ESL-TM01PC |

- Fiber Optic
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### Guidance

### Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type**
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

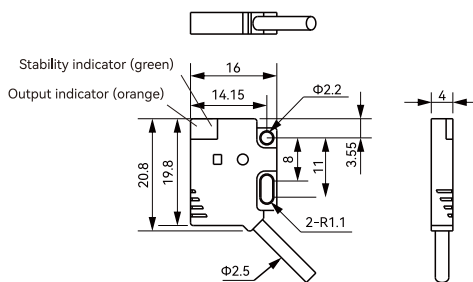
### Reflectors

- Reflectors

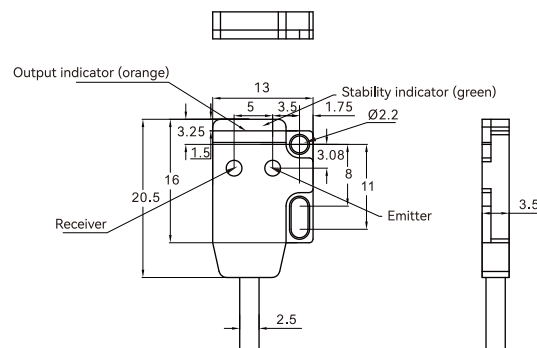
## Dimensions

Unit: mm

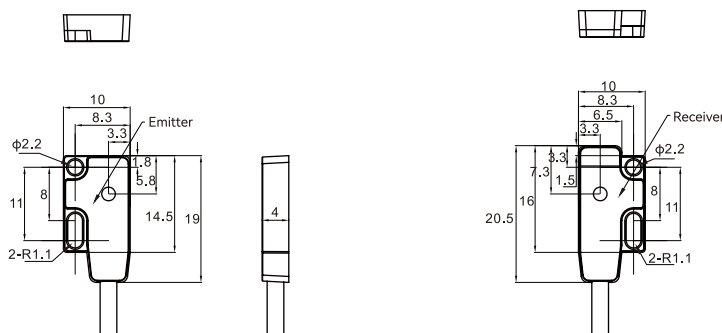
### ESL-15



### ESL-25



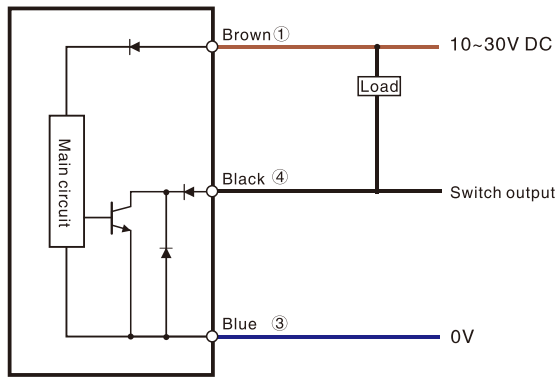
### ESL-T50/TM01



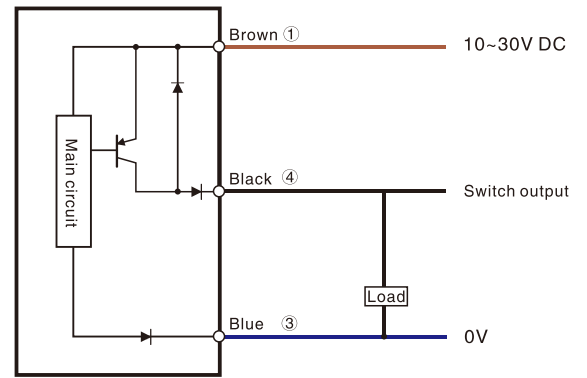
# Thin Type

## Circuit diagram

NPN Output



PNP Output



Fiber Optic

Slot Sensors

**Photoelectric**

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

**Guidance**

**Photoelectric**

Cylindrical

Square

Flat type

**Thin type**

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

**Reflectors**

Reflectors



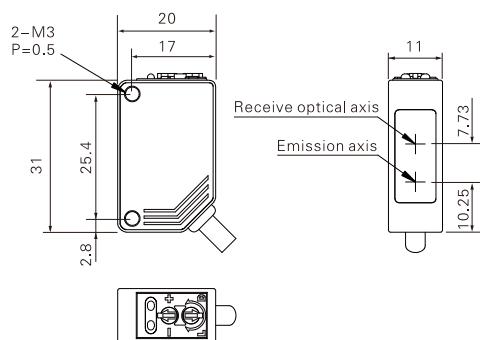
|                        |  |                                     |                                    |
|------------------------|--|-------------------------------------|------------------------------------|
| Appearance             |  |                                     |                                    |
| Sensing type           | Disffuse refection-BGS                           |                                     |                                    |
| Sensing distance       | 5 ~ 100mm(White non-glossy paper)                | 5mm ~ 150mm(White non-glossy paper) | 0 ~ 300mm (White non-glossy paper) |
| Setting distance       | 30 ~ 100mm                                       | 40 ~ 150mm                          | 40 ~ 300mm                         |
| Spot size              | ≈ Ø1.5mm/10cm                                    | ≈ Ø9mm/15cm                         | ≈ Ø16mm/30cm                       |
| Hysteresis             | ≤5%  | ≤20%                                | ≤5%                                |
| Output type            | NPN/PNP Open-collector, ≤100mA/30V DC            |                                     |                                    |
| Switch type            | L.on/D.on selectable                             |                                     |                                    |
| Indicator              | Operation indicator: Green Motion indicator: Red |                                     |                                    |
| Response time          | ≤2ms   | 5ms                                 | ≤2ms                               |
| Sensitivity adjustment | Adjuster(6 turns)                                | Adjuster (single turns)             | Adjuster(6 turns)                  |
| Light source           | Red LED small spot 623nm (modulation)            |                                     | Red LED 623nm (modulation)         |
| Operating voltage      | 10~30V DC ± 10%                                  | 10~24V DC ± 10%                     | 10~30V DC ± 10%                    |
| Current consumption    | <20mA  |                                     | <25mA                              |
| Load current           | <100mA   |                                     |                                    |
| Ambient illuminance    | Sunlight ≤5,000Lux, Incandescent lamp ≤3,000Lux  |                                     |                                    |
| Ambient temperature    | -25℃~55℃ no freezing                             |                                     |                                    |
| Ambient humidity       | 35~85%RH, No condensation                        |                                     |                                    |
| Degree of protection   | IP65   |                                     |                                    |
| Connection method      | 2M/3 core cable                                  |                                     |                                    |
| Material               | PBT+fiberglass(body); PMMA(Lens)                 |                                     |                                    |
| Accessories            | Screwdriver                                      |                                     |                                    |
| Model No.              | NPN  | <b>ESB-S10N</b>                     | <b>ESB-15N</b>                     |
|                        | PNP  | <b>ESB-S10P</b>                     | <b>ESB-15P</b>                     |
|                        |  |                                     | <b>ESB-30N</b>                     |
|                        |  |                                     | <b>ESB-30P</b>                     |

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- Temperature
- Accessories

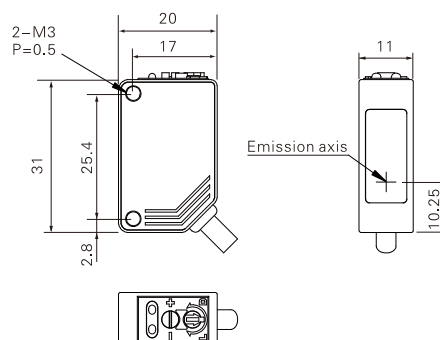
Dimensions

Unit: mm

ESB-S10/15N(P)

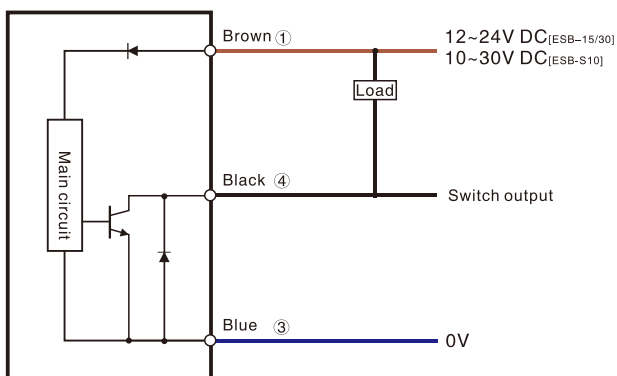


ESB-30N(P)

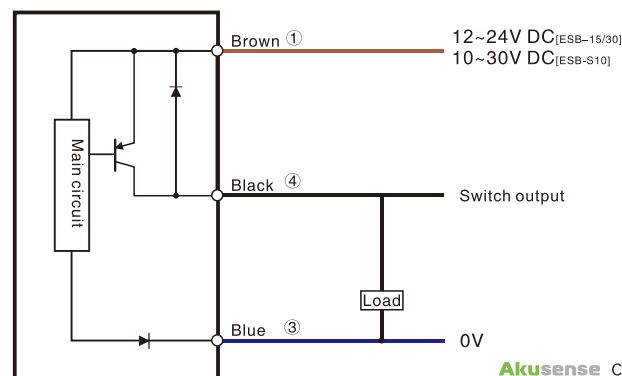


ESB-S10/15/30N(P)

NPN Output



PNP Output



- Photoelectric**
- Cylindrical
- Square
- Flat type
- Thin type
- BGS**
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type
- Reflectors**
- Reflectors

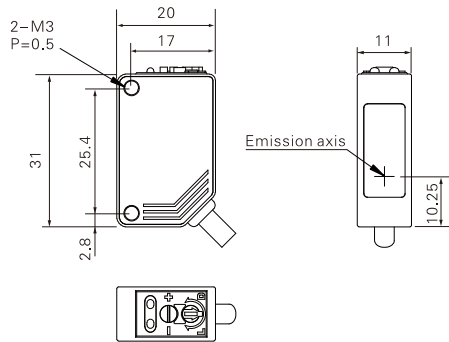


NEW!

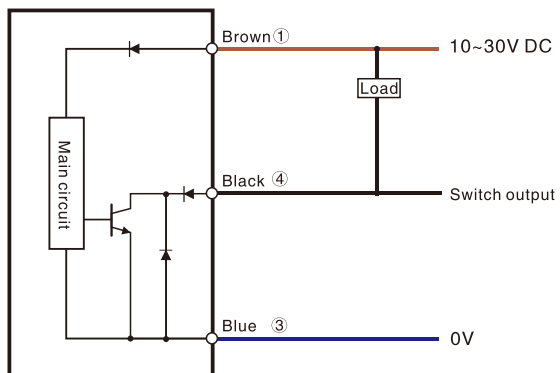
|                        |   |                            |
|------------------------|---|----------------------------|
| Sensing type           | Diffuse reflective – Background suppression                                 |                            |
| Sensing distance       | 10 ~ 300mm  | 10 ~ 200mm                 |
| Setting distance       | 40 ~ 300mm  | 40 ~ 200mm                 |
| Spot size              | -   | ≈ ∅12mm/200mm              |
| Hysteresis             | ≤ 5%  |                            |
| Output                 | NPN/PNP Open – collector  |                            |
| Switch type            | L.on /D.on switchable   |                            |
| Indicators             | Power: green; motion indicator: red   |                            |
| Response time          | ≤ 2ms   |                            |
| Sensitivity adjustment | 6 turns adjuster  |                            |
| Light source           | Infrared LED 940nm (modulation)   | Red LED 623nm (modulation) |
| Supply voltage         | 10~30V DC ± 10%   |                            |
| Residual voltage       | < 1.5V  |                            |
| Current consumption    | ≤ 25mA  |                            |
| Load current           | ≤ 100mA   |                            |
| Circuit protection     | Power reverse polarity protection/surge protection/short circuit protection |                            |
| Ambient illuminance    | Sunlight ≤ 5,000 lux, incandescent lamp ≤ 3,000 lux                         |                            |
| Ambient temperature    | Working temperature: -25°C~+55°C, no freezing; storage: -30 ~ +70°C         |                            |
| Ambient humidity       | Working: 35%~85%RH; storage: 35%~95%RH,; no condensation                    |                            |
| Insulation resistance  | 20MΩ  |                            |
| Withstand voltage      | ± 1000V 50/60Hz 60s   |                            |
| Static electricity     | ± 8000V   |                            |
| Group pulse            | ± 2000V ( 5kHz/50kHz )  |                            |
| Anti-vibration         | 10~50Hz, 0.5mm amplitude, 2 hours each in X, Y, Z directions                |                            |
| Degree of protection   | IP65  |                            |
| Connection             | ∅ 4 mm, 2 m 3 wire cable  |                            |
| Material               | PBT+glass fiber (housing); PMMA (lens)                                      |                            |
| Accessories            | screwdriver   |                            |
| Model No.              | NPN   | <b>ESB-V30N</b>            |
|                        | PNP   | <b>ESB-V30P</b>            |
|                        |   | <b>ESB-C20N</b>            |
|                        |   | <b>ESB-C20P</b>            |

Dimensions

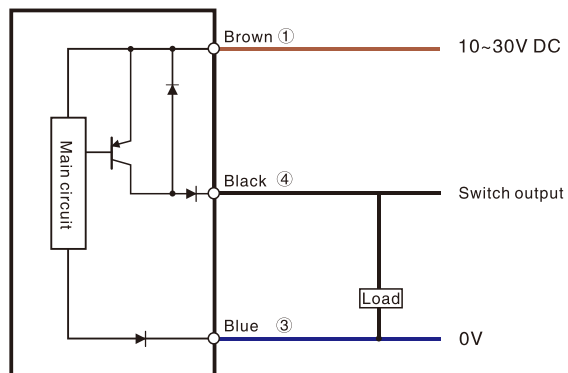
Unit: mm



NPN Output



PNP Output



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Guidance

Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type

BGS

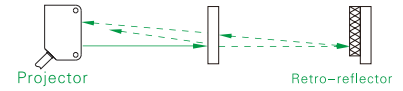
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

Reflectors

- Reflectors

# Transparent Detection

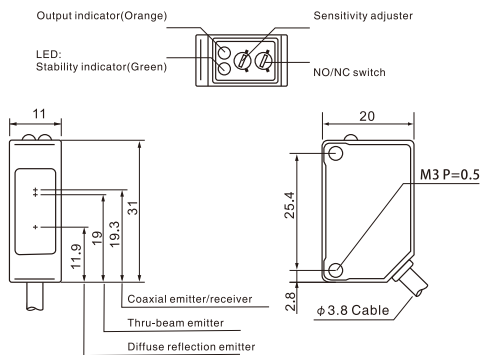
## EST Series



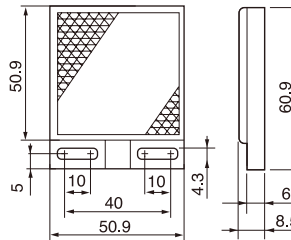
|                      |   |                                    |
|----------------------|---|------------------------------------|
| Appearance           |   |                                    |
| Sensing type         | Retro-reflection                                |                                    |
| Spot size            | General Type                                    | Coaxial beam                       |
| Sensing distance     | 0.01~2m   | 0~2m                               |
| Spot size            | φ 300mm/200cm                                   | φ 60mm/200cm                       |
| Output type          | NPN/PNP Open-collector, ≤100mA/30V DC           |                                    |
| Switch type          | Selectable L.on/D.on                            |                                    |
| Indicator            | Work indicator: Green; Output indicator: Orange | Output indicator: Orange           |
| Response time        | 0.5 ms  |                                    |
| Light source         | Red light LED(660nm)                            |                                    |
| Operating voltage    | 10~30V DC ± 10%                                 |                                    |
| Current consumption  | <20mA   |                                    |
| Load current         | ≤ 100mA   |                                    |
| Ambient illuminance  | Sunlight≤10000Lux, Incandescent lamp≤3000Lux    |                                    |
| Ambient temperature  | -25°C~+55°C, No freezing                        |                                    |
| Ambient humidity     | 35%~85%RH, No condensation                      |                                    |
| Degree of protection | IP67  |                                    |
| Connection method    | 2M 3 core cable                                 |                                    |
| Material             | ABS with glass fiber (Housing); PMMA(Lens)      |                                    |
| Accessories          | reflector                                       | Bracket, reflector, mounting screw |
| Model No.            | NPN<br>PNP                                      | EST-200N<br>EST-200P               |
|                      |   | EST-X200N (HOT)<br>EST-X200P       |

## Dimensions

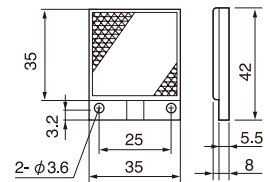
Unit: mm



### EST-200 Reflector:



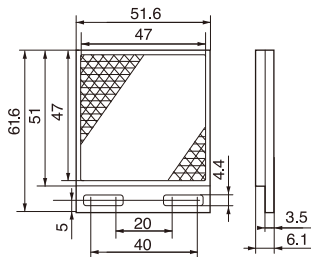
(Standard TD-11)



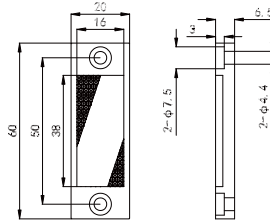
(Optional TD-12)

Noted:  
Coaxial products only have one orange LED output indicator.

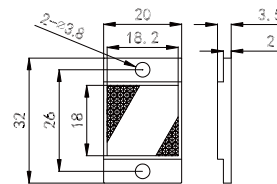
### EST-X200 Reflector:



(Standard TD-13)

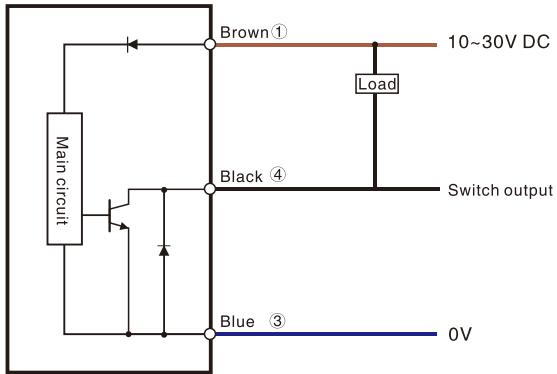


(Optional TD-14)

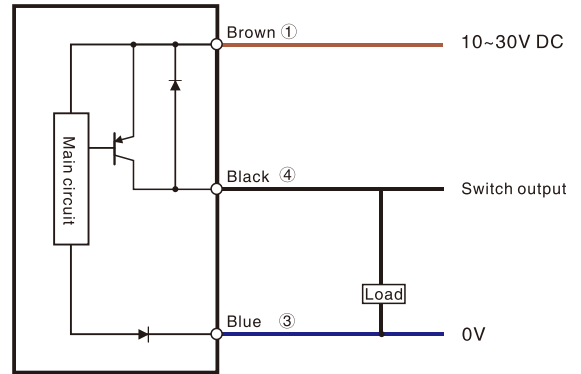


(Optional TD-15)

### NPN Output



### PNP Output



- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

#### Guidance

#### Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection**
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type
- Reflectors**
- Reflectors



# Color/Mark Detection

## ESC Series

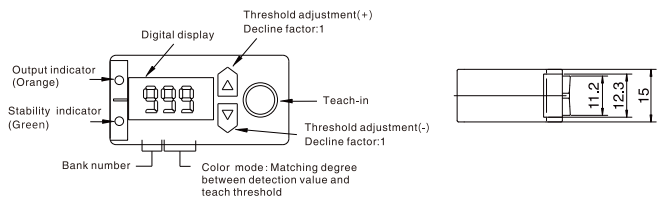
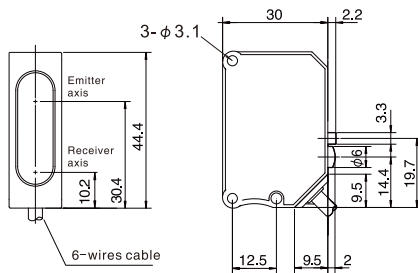


Appearance

|                       |  |
|-----------------------|--|
| Sensing type          | Diffuse reflection   |
| Sensing distance      | 18 ± 2mm   |
| Spot size             | φ 6mm/18mm   |
| Output type           | NPN/PNP Open-collector, ≤100mA/30V DC  |
| Switch type           | Selectable L.on/D.on   |
| Indicator             | Output indicator: Orange; Work indicator: Green  |
| Digital display       | 7 segments, 3 digit display(Red and Green LED)   |
| Response time         | Mask mode: H1/0.25 ms, H2/0.5 ms, L/1.2 ms<br>Color mode: H1/0.8 ms, H2/1.6 ms, L/4 ms |
| Time delay function   | OFF delay/ ON delay/ Single pulse delay (0~990ms:10ms; 1~10s unit:1s)                  |
| Light source          | RGB 3 color light source   |
| Operating voltage     | 10~30V DC ± 10%  |
| Current consumption   | ≤40mA  |
| Load current          | ≤100mA   |
| Ambient illuminance   | Sunlight≤10000Lux, Incandescent lamp≤3000Lux   |
| Ambient temperature   | -25°C~+55°C, No freezing   |
| Ambient humidity      | 35%~85%RH, No condensation   |
| Insulation resistance | ≥20 Ω (500V DC)  |
| Impact resistance     | 50G(500m/s <sup>2</sup> ), XYZ three directions  |
| Degree of protection  | IP67   |
| Connection method     | 2M 4 core cable  |
| Material              | Housing: ABS, Lens: PMMA   |
| Accessories           | Bracket, mounting screw  |
| Model No.             | NPN <b>ESC-18N</b><br>PNP <b>ESC-18P</b>   |

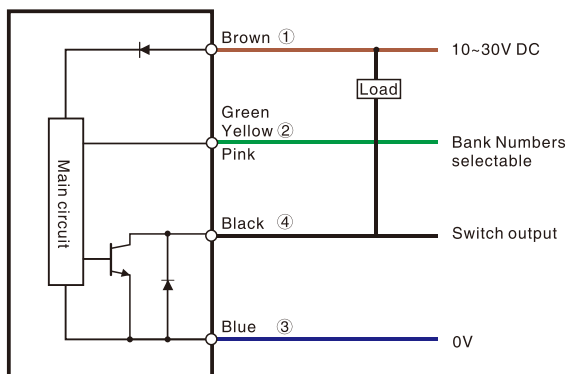
## Dimensions

Unit: mm

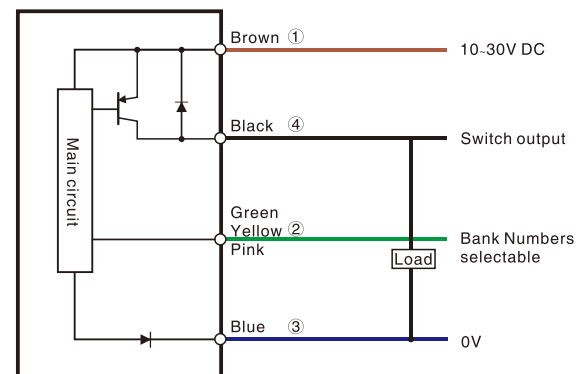


## Circuit diagram

### NPN Output



### PNP Output





**NEW!**

|                      |   |
|----------------------|---|
| Appearance           |   |
| Sensing type         | Diffuse reflective  |
| Sensing distance     | 20mm ± 3mm  |
| Spot size            | 1x5mm (setting distance: 20mm)                                |
| Output               | NPN / PNP for option  |
| Switch type          | L.on /D.on switchable   |
| Indicators           | Work indicator: Green, motion indicator: Red                  |
| Response time        | Mark mode: 0.5ms; color mode: 2ms                             |
| Digital display      | 4 digits  |
| Power supply         | 12~24V Dc ± 10%   |
| Residual voltage     | < 1.5 V (load current < 50 mA)                                |
| Current consumption  | <35mA (24V)   |
| Load current         | < 50mA  |
| Circuit protection   | Reverse polarity protection / short circuit protection        |
| Ambient temperature  | -10~55°C, no freezing   |
| Storage temperature  | -20°C~70°C  |
| Ambient humidity     | 35~85%RH, no condensation                                     |
| Storage humidity     | 35~85%RH  |
| Withstand voltage    | ± 1000V 50/60Hz 60s   |
| Static electricity   | ± 8000V   |
| Degree of protection | IP67  |
| Group pulse          | ± 2000V   |
| Anti-vibration       | 10~50Hz, amplitude 1.5 mm; 2 hours each in X, Y, Z directions |
| Ambient luminance    | Incandescent lamp: ≤3,000 lux, Sunlight: ≤10000 lux           |
| Model No.            | NPN <b>ESE-20N</b><br>PNP <b>ESE-20P</b>                      |

- Fiber Optic
- Slot Sensors
- Photoelectric**
- Laser
- Proximity
- Displacement
- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

### Guidance

#### Photoelectric

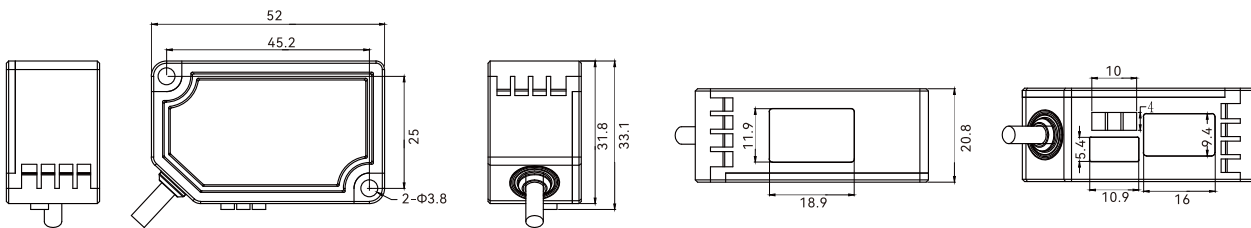
- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection**
- TOF type
- IP59K high protection type
- Anti-glare type
- IO-Link type

#### Reflectors

- Reflectors

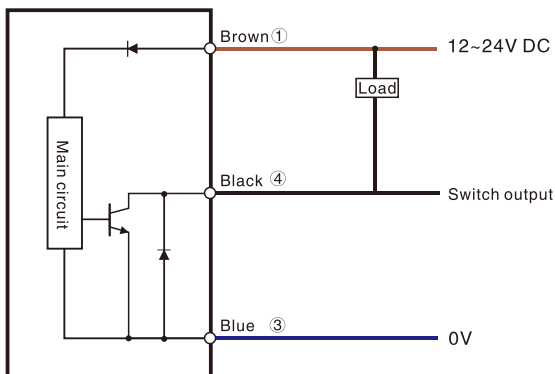
## Dimensions

Unit: mm

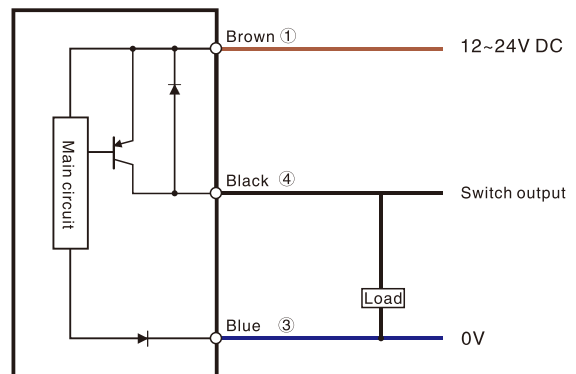


## Circuit diagram

### NPN Output



### PNP Output

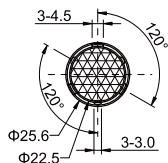


# Reflectors

Dimensions

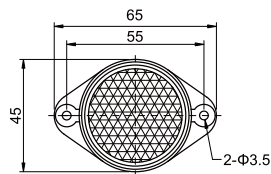
Unit:mm

**STD-06**



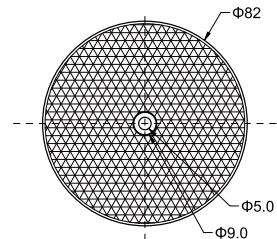
Thickness: 8mm

**TD-04**



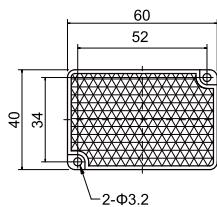
Thickness: 8mm

**TD-05**



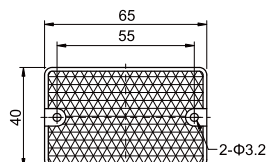
Thickness: 8mm

**TD-09**



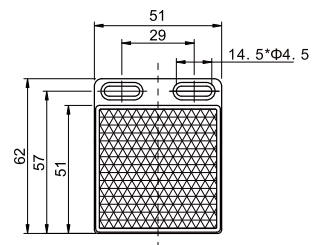
Thickness: 8mm

**TD-02**



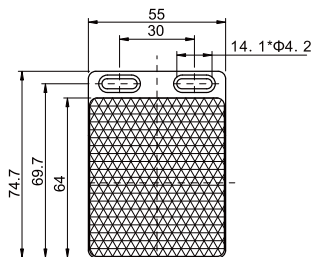
Thickness: 8mm

**TD-08**



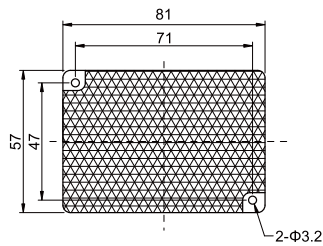
Thickness: 8mm

**TD-01**



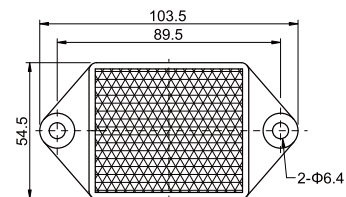
Thickness: 8mm

**TD-03**



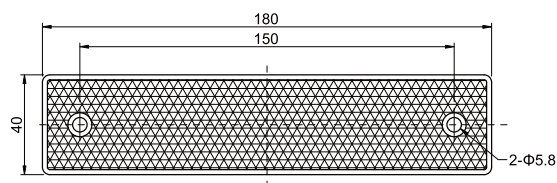
Thickness: 8mm

**TD-01-3**



Thickness: 8mm

**TD-10**



Thickness: 8mm

- Fiber Optic
- Slot Sensors
- Photoelectric
- Laser
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- Magnetic
- Contact
- Area
- Ultrasonic
- Vision
- Code Readers
- Vibration
- Temperature
- Accessories

Guidance

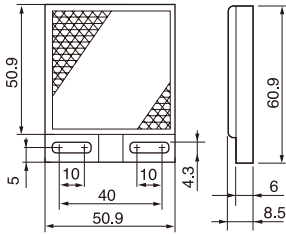
Photoelectric

- Cylindrical
- Square
- Flat type
- Thin type
- BGS
- Transparent detection
- Color/Mark Detection
- TOF type
- IP69K high protection type
- Anti-glare type
- IO-Link type

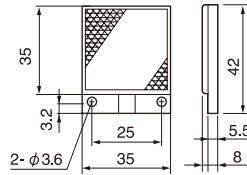
Reflectors

Reflectors

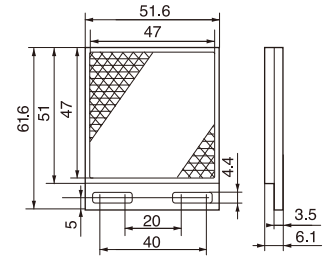
TD-11



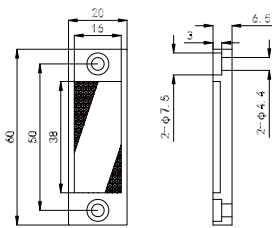
TD-12



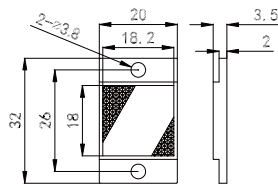
TD-13



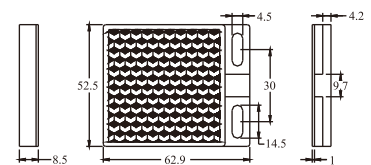
TD-14



TD-15



TD-22



Fiber Optic

Slot Sensors

Photoelectric

Laser

Proximity

Displacement

Magnetic

Contact

Area

Ultrasonic

Vision

Code Readers

Vibration

Temperature

Accessories

Guidance

Photoelectric

Cylindrical

Square

Flat type

Thin type

BGS

Transparent detection

Color/Mark Detection

TOF type

IP69K high protection type

Anti-glare type

IO-Link type

Reflectors

Reflectors