## Miniature and built-in amplifier for long sensing distance

### ▣Features

- ●Long sensing distance with high quality lens
- ●Waterproof structure IP65 by rubber injection (IEC standard)
- ●Compact size
- ●Detects up to 15m (Transmitted beam type)
- ●Long sensing distance : Diffuse reflective type 1m, Polarized reflective type 3m (MS-3S)
- ●Light ON / Dark ON selectable
- ●Built-in sensitivity adjuster (Except for BJG30-DDT)
- ●Mutual interference prevention function (Retroreflective type, Diffuse reflective type)
- ●Stable detection for transparent object (LCD, PDP, glass etc) by BJG30-DDT.

(MS-2A)

⚠ Please read "Caution for your safety" in operation manual before using.

CE

### ▣Specifications

| Model | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| NPN Open collector output | BJ15M-TDT | BJ10M-TDT | BJ3M-PDT | BJ1M-DDT | BJ300-DDT | BJ100-DDT | BJG30-DDT | |
| PNP Open collector output | BJ15M-TDT-P | BJ10M-TDT-P | BJ3M-PDT-P | BJ1M-DDT-P | BJ300-DDT-P | BJ100-DDT-P | ——— | |
| Sensing type | Transmitted beam | | Polarized retroreflective | Diffuse reflective | | | | |
| Sensing distance | 0~15m | 0~10m | 0.1~3m(★) | 0~1m | 0~300mm | 0~100mm | 0~30mm | 0~15mm |
| Sensing target | Opaque material over ø12mm | | Transparent material over ø75mm | Non-glossy white paper 300×300mm | Non-glossy white paper 100×100mm | | | Transparent glass 50×50mm (t=3.0mm) |
| Hysteresis | ——— | | ——— | Max. 20% at rated setting distance | | | | |
| Response time | Max. 1ms | | | | | | | |
| Power supply | 12-24VDC ±10% (Ripple P-P: Max.10%) | | | | | | | |
| Current consumption | Emitter/Receiver : Max.20mA | | Max.30mA | | | | | |
| Light source | Infrared LED (850nm) | Red LED (660nm) | Red LED (660nm) | Infrared LED (850nm) | Red LED (660nm) | Infrared LED (850nm) | Infrared LED (850nm) | |
| Sensitivity adjustment | Short rotator adjuster (210° ) | | | | | | ——— | |
| Operation mode | Light ON/Dark ON selectable | | | | | | Light ON mode fixed | |
| Control output | NPN open collector output • Load voltage : Max. 26.4VDC • Load current : Max.100mA • Residual voltage : Max. 1V | | | | | | | |
| | PNP open collector output • Load voltage : Max. 26.4VDC • Load current : Max.100mA • Residual voltage : Min. (Power supply-2.5V) | | | | | | ——— | |
| Protection circuit | Reverse polarity protection, Output short-circuit protection | | Reverse polarity protection, Interference prevention function, Output short-circuit protection | | | | | |
| Indicator | Operation : Red, Stable : Green (Emitter of power indicator for transmitted beam : Red) | | | | | | | |
| Connection | Outgoing cable type | | | | | | | |
| Insulation resistance | Max. 20MΩ (at 500VDC ) | | | | | | | |
| Dielectric strength | 1000VAC 50/60Hz for 1minute | | | | | | | |
| Vibration | 1.5mm or 300mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours | | | | | | | |
| Shock | 500m/s² X, Y, Z directions for 3 times | | | | | | | |
| Ambient illumination | Sunlight : Max. 11,000*lx*, Incandescent lamp : Max. 3,000*lx* (Receiver illumination) | | | | | | | |
| Ambient temperature | -25 ~ 55℃ (Storage : -40 ~ 70℃) at non-freezing status | | | | | | | |
| Ambient humidity | 35 ~ 85%RH (at non-freezing status) | | | | | | | |
| Protection | IP65 (IEC standard) | | | | | | | |
| Material | Case : PC+ABS, Lens : PMMA, LED Cap : PC | | | | | | | |
| Cable | ø3.5mm, 3P, Length:2m (Emitter of transmitted beam type : ø3.5mm, 2P, Length:2m) | | | | | | | |
| Accessory | Common | Fixing bracket, Bolt, Adjustment driver | | | | | | Fixing bracket, Bolt |
| | Individual | ——— | | Reflector (MS-2A) | ——— | | | |
| Approval | CE | | | | | | | |
| Unit weight | Approx. 90g | | Approx. 60g | Approx. 45g | | | | |

※(★) The sensing distance is extended to 0.1~4m or 0.1~5m when using optional reflector MS-2S or MS-3S.

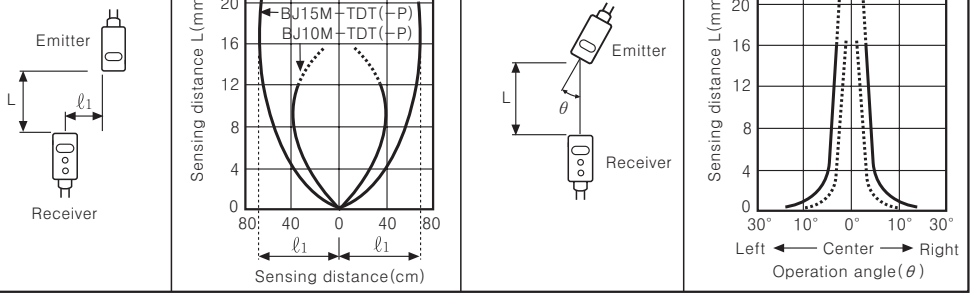
# Miniature and built-in amplifier for long sensing distance

## ▣Feature data

### ◎Transmitted beam type

#### ●BJ15M-TDT / BJ15M-TDT-P / BJ10M-TDT / BJ10M-TDT-P

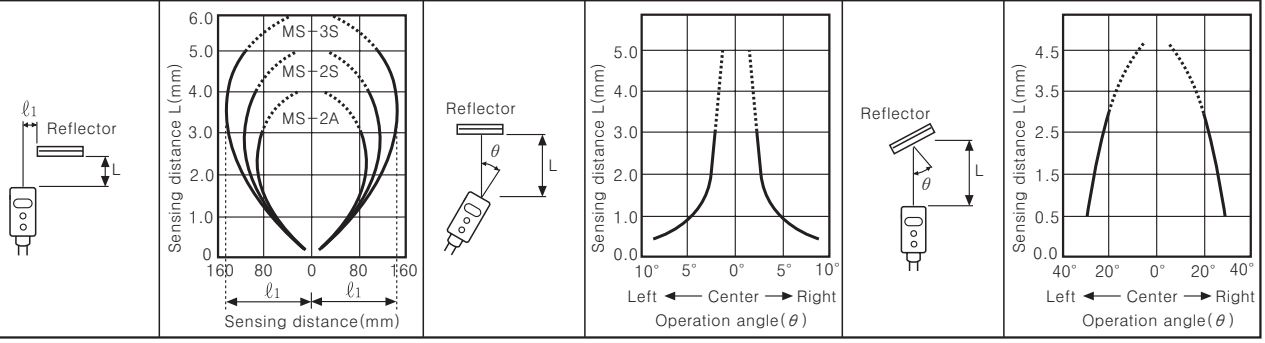
| Parallel shifting characterisitic | | Angle characteristic | |
|---|---|---|---|
| Measuring method | Data | Measuring method | Data |




### ◎Polarized retroreflective type

#### ●BJ3M-PDT / BJ3M-PDT-P

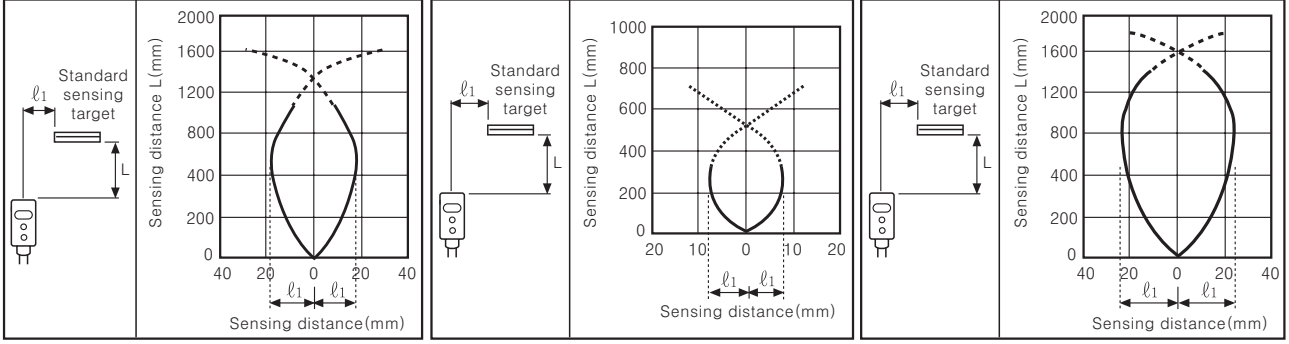
| Parallel shifting characterisitic | | Sensor angle characteristic | | Reflector angle characteristic | |
|---|---|---|---|---|---|
| Measuring method | Data | Measuring method | Data | Measuring method | Data |




### ◎Diffuse reflective

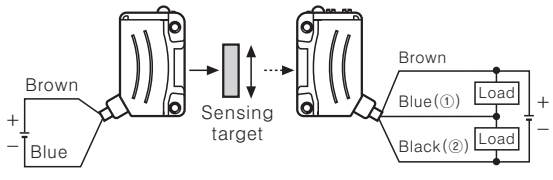
#### ●BJ1M-DDT / BJ1M-DDT-P ●BJ300-DDT / BJ300-DDT-P ●BJ100-DDT / BJ100-DDT-P

| Sensing area characteristic | | Sensing area characteristic | | Sensing area characteristic | |
|---|---|---|---|---|---|
| Measuring method | Data | Measuring method | Data | Measuring method | Data |

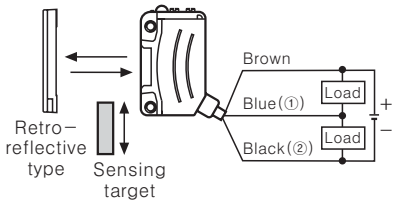



## ▣Connections

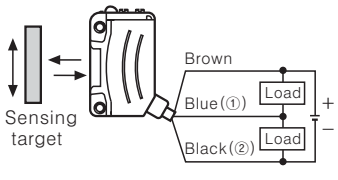
#### ●Transmitted beam




#### ●Polarized retroreflective type



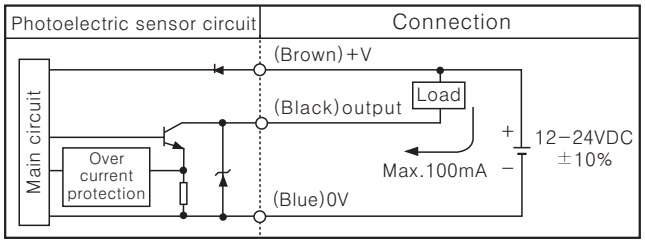

#### ●Diffuse reflective



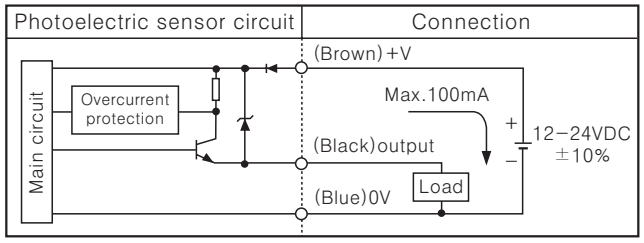

※① : The load connection of NPN open collector output, ② : The load connection of PNP open collector output

## ▣Control output diagram

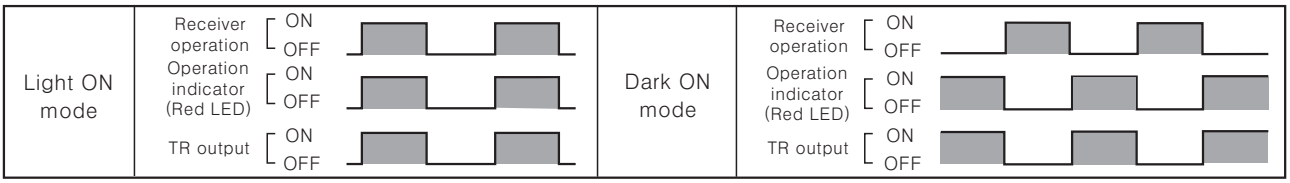
●NPN output




●PNP output



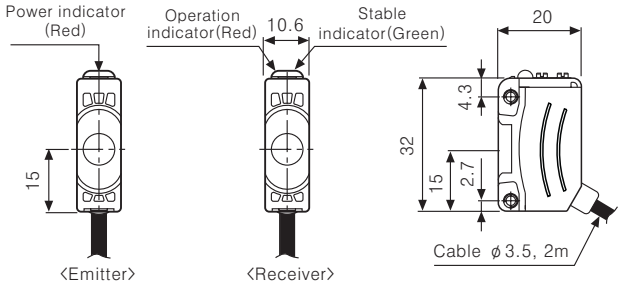

## ▣Operation mode



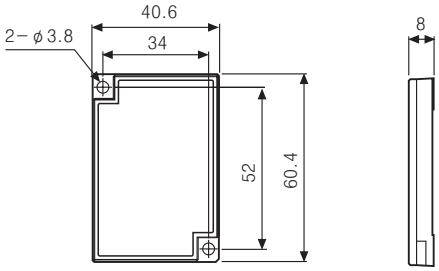

## ▣Dimensions

(Unit:mm)

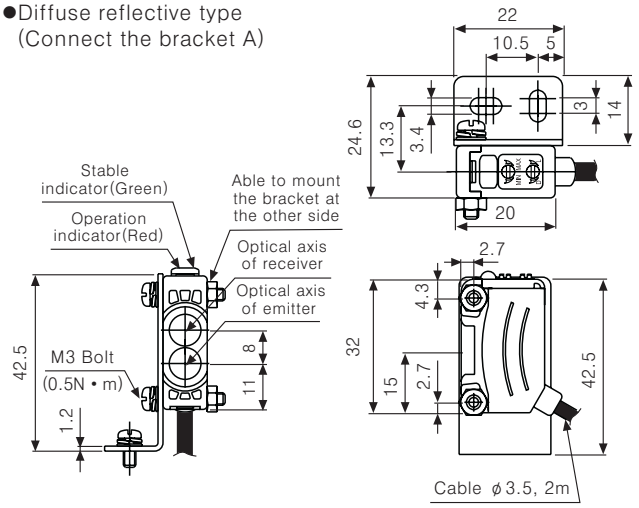
●Transmitted beam type



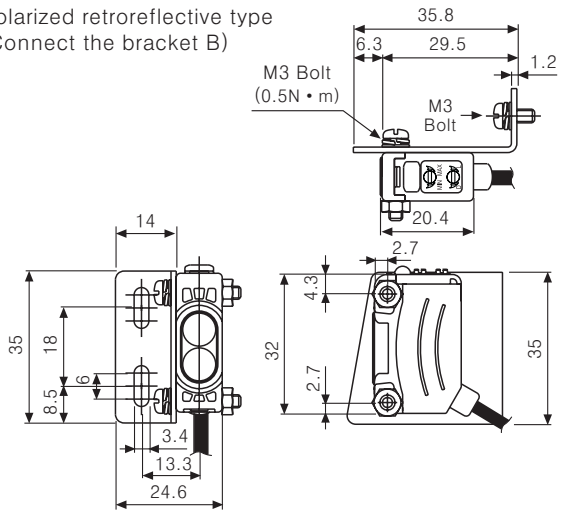

●Reflector(Include:MS−2A, Sold separately:MS−2S, MS−3S)



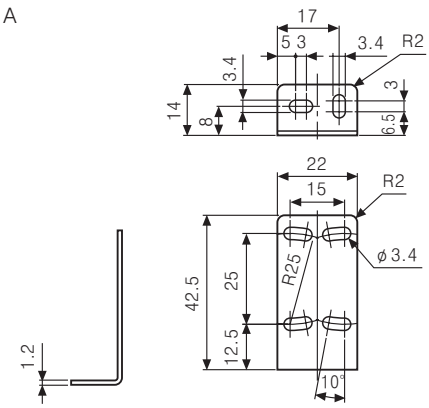

●Diffuse reflective type
(Connect the bracket A)



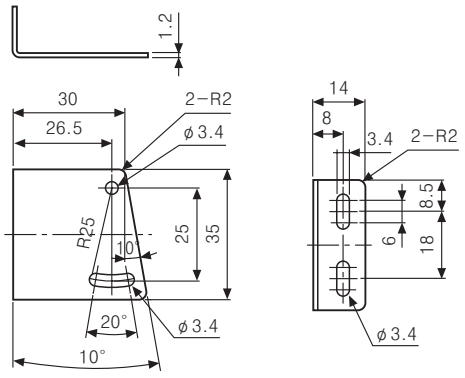

●Polarized retroreflective type
(Connect the bracket B)




●Bracket A

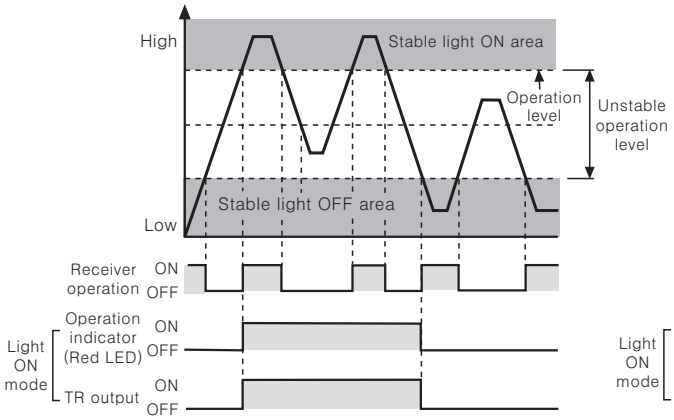



●Bracket B(Sold separately)

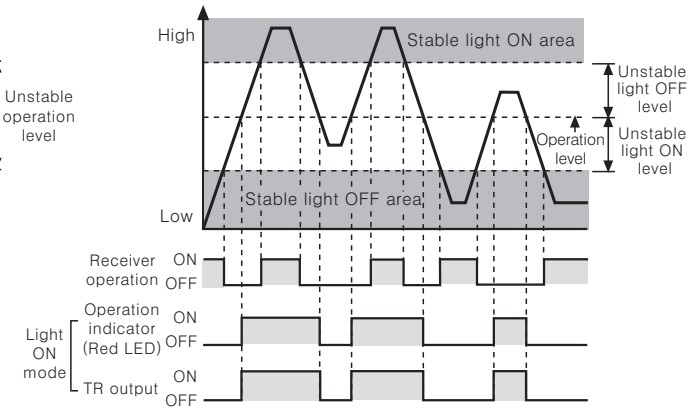


## ▣Operation mode and Timing diagram

◎Emitter




◎Diffuse reflective/Polarized retroreflective




※The waveform of 'Operation mode indicator' and 'TR output' is for Light ON mode, it is operated as reverse in Dark ON mode.

## ▣Mounting and sensitivity adjustment

◎Switching of operation mode

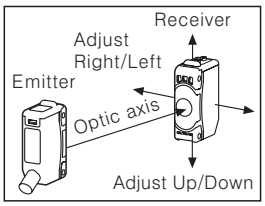
| | | |
|---|---|---|
| Light ON mode (Light ON) |   | Turn the operation switching adjuster to right(L direction), it is set as Light ON mode. |
| Light OFF mode (Dark ON) |   | Turn the operation switching adjuster to left(D direction), it is set as Light OFF mode. |

※The operation switching adjuster is installed in the receiver for transmitted beam type.

◎Mounting

●Transmitted beam type

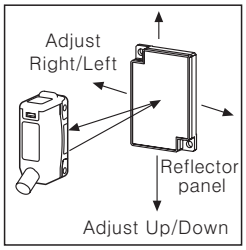
1. Place the emitter and receiver facing each other and apply the power.
2. After adjust the position of the emitter and receiver and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicator in both status. (None or sensing target status)




※When the sensing target is translucent or small (Under $\phi$16mm), it can be missed by the sensor because the light can penetrate it.

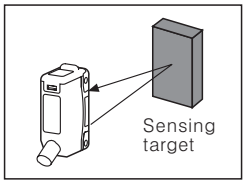
●Polarized retroreflective type

1. Place the Sensor and retroreflective facing each other and apply the power.
2. After adjust the position of the Sensor and retro-reflective and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicating in both status. (None or sensing target status)

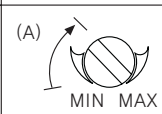
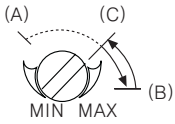
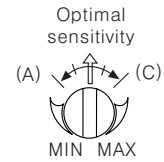


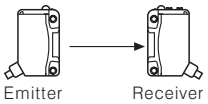
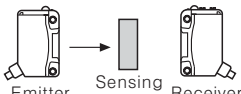
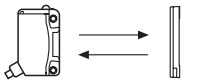
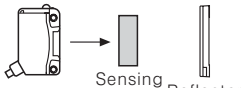
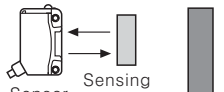
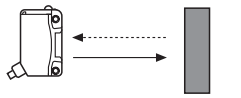

●Diffuse reflective type

After place a sensing target, adjust the sensor to up • down, left • right. Then, fix the sensor in center of position where the indicator is operating.




◎Sensitivity adjustment

| Order | Position | Description |
|---|---|---|
| 1 |   | Turn the sensitivity adjuster to the right of min. and check position(A) where the indicator is turned on in "Light ON status". |
| 2 |   | Turn the sensitivity adjuster more to the right of position(A), check position(B) where the indicator is turned on. And turn the adjuster to the left, check position(C) where the indicator is turned off in "Dark ON status". ※If the indicator is not lighted although the adjuster is turned to the max. position, the max. position is(C). |
| 3 |   | Set the adjuster at the center of (A) and (C). To set the optimum sensitivity, check the operation and lighting of stable indicator with sensing target or without it. If the indicator is not lighted, please check the sensing method again because sensitivity is unstable. |

| | "Light ON status" | "Light OFF status" |
|---|---|---|
| Transmitted beam type |   |   |
| Polarized retro-reflective type |   |   |
| Diffuse eflective |   |   |

※Set the sensitivity to operate in a stable light ON area, the reliability for the environment(Temperature, voltage, dust etc) will be increased.

※Do not apply an excessive force on adjuster, it can be broken.