

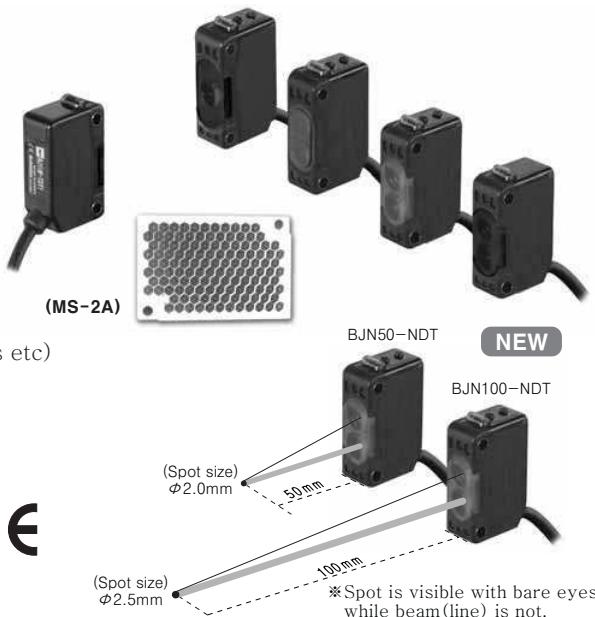
# BJ Series

## Compact and Long sensing distance/Micro spot type

### ■ Features

#### ■ Long distance sensing type

- Long sensing distance with high quality lens
- Detects up to 15m (Transmitted beam type)
- Long sensing distance : Diffuse reflective type 1m, Polarized reflective type 3m (MS-2A)
- M.S.R (Mirror Surface Rejection) function (Polarized retroreflective type)



#### ■ Transparent glass sensing type / Micro spot type

- Stable detection for transparent object (LCD, PDP, glass etc) by BJT300-DDT.
- Easy to check sensing location with Red LED
- Suitable for sensing small objects (Min. sensing object: Ø0.2mm pure copper wire)

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



### ■ Specifications

Model	NPN Open collector output	BJ15M-TDT	BJ10M-TDT	BJ7M-TDT	BJ3M-PDT	BJ1M-DDT	BJ300-DDT	BJ100-DDT									
	PNP Open collector output	BJ15M-TDT-P	BJ10M-TDT-P	BJ7M-TDT-P	BJ3M-PDT-P	BJ1M-DDT-P	BJ300-DDT-P	BJ100-DDT-P									
Sensing type	Through-beam			Polarized retroreflective	Diffuse reflective												
Sensing distance	0~15m	0~10m	0~7m	(★) 0.1~3m (MS-2A)	1m (Non-glossy white paper 300×300mm)	300mm (Non-glossy white paper 100×100mm)	100mm (Non-glossy white paper 100×100mm)										
Sensing target	Opaque material over Ø12mm			Opaque material over Ø8mm	Translucent, Opaque materials												
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 (Point light source 650nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	Infrared LED (850nm)										
Sensitivity adjustment	Built-in VR																
Operation mode	Light ON/Dark ON mode selectable																
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's power indicator : Green)																
Connection	Outgoing cable type																
Insulation resistance	Max. 20MΩ (at 500VDC megger)																
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/s <sup>2</sup> X, Y, Z directions for 3 times																
Ambient illumination	Sunlight : Max. 11,000lx, Incandescent lamp : Max. 3,000lx (Receiver illumination)																
Ambient temperature	Operation : -25 ~ 55°C, Storage : -40 ~ 70°C (at non-freezing, at non-dew status)																
Ambient humidity	(at non-freezing, at non-dew status)																
Protection	IP65 (IEC standard)																
Material	Case : PC+ABS, Lens : PMMA, LED Cap : PC																
Cable	Ø 3.5mm, 3P, Length : 2m (Emitter of transmitted beam type : Ø 3.5mm, 2P, Length : 2m) 22AWG, Core wire diameter: 0.08mm, No. of core wire: 60																
Accessory	Common	Mounting bracket, Bolt, Nut, VR adjustment driver															
	Individual	Reflector (MS-2A)															
Approval																	
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.

# Long sensing distance/Micro spot type

## ■ Specifications

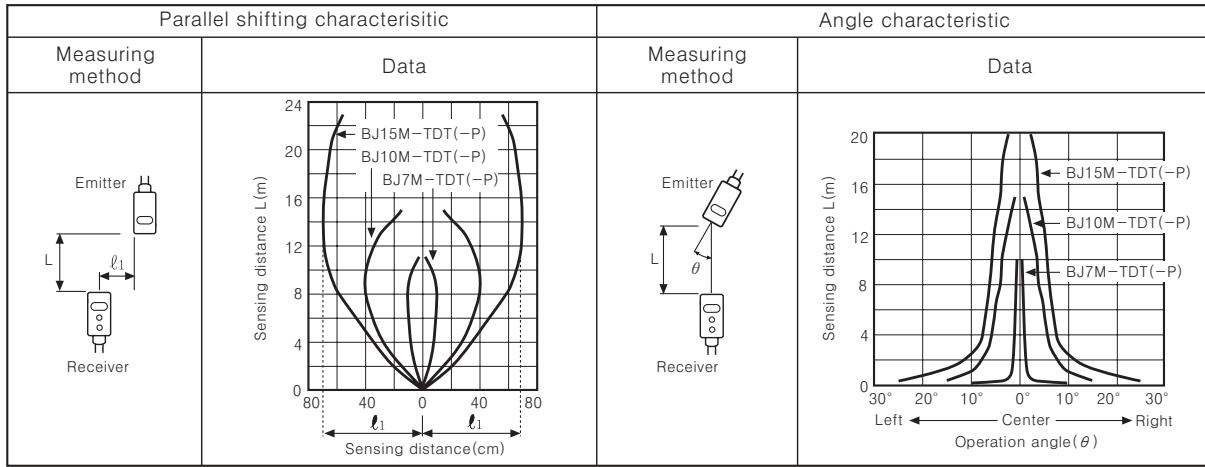
Model	NPN open collector output PNP open collector output	BJG30-DDT	BJN50-NDT	BJN100-NDT
Sensing type	Diffuse reflective	—	Diffuse reflective (Narrow beam)	—
Power supply	—	12~24VDC ±10% (Ripple P-P : Max.10%)	—	—
Current consumption	—	Max. 30mA	—	—
Min. diameter of transmitting SPOT	—	Approx. $\phi$ 2.0mm	—	Approx. $\phi$ 2.5mm
Min. sensing target	—	Approx. min. $\phi$ 0.2mm (Copper wire)	—	—
Sensing distance	0~30mm	0~15mm	30~70mm	70~130mm
Sensing target	100×100mm Non-glossy white paper	Transparent glass 50×50mm (t=3.0mm)	—	Transparent, Translucent, Opaque materials (100×100mm Non-glossy white paper)
Hysteresis	Max. 20% at sensing distance	—	Max. 25% at sensing distance	Max. 20% at sensing distance
Light source / Wavelength	Infrared LED (850nm)	—	Pin Point LED (Point source) / 650nm	—
Control output	NPN Open collector type • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage	—	NPN or PNP Open collector type • Load voltage : Max. 26.4VDC • Load current : Max. 100mA • Residual voltage $\Rightarrow$ NPN : Max. 1V, PNP : Min. (Power voltage -2.5V)	—
Operation mode	Light ON mode fixed	—	Light ON / Dark ON mode selectable (Short rotator adjuster)	—
Protection circuit	Reverse polarity protection, Output short-circuit protection, Interference prevention function	—	—	—
Response time	—	Max. 1ms	—	—
Sensitivity adjustment	—	Short rotation VR (210°)	—	—
Ambient illumination	Sunlight : Max. 11,000lx, Incandescent lamp : Max. 3,000lx (Receiver illumination)	—	—	—
Ambient temperature	Operation: -25~55°C, Storage: -40~70°C (at non-freezing, non-dew status)	—	—	—
Ambient humidity	Operation & Storage : 35~85%RH (at non-dew status)	—	—	—
Insulation resistance	Min. 20MΩ (at 500VDC megger)	—	—	—
Dielectric strength	1,000VAC 50/60Hz for 1 minute	—	—	—
Vibration	1.5mm or 300m/s <sup>2</sup> amplitude at frequency of 10~55Hz in each of X, Y, Z directions for 2 hours	—	—	—
Shock	500m/s <sup>2</sup> X, Y, Z directions for 3 times	—	—	—
Protection	IP65 (IEC standard)	—	—	—
Connection	Outgoing cable type	—	—	—
Indicator	Operation indicator : Red, Stability indicator : Green	—	—	—
Material	Case : PC+ABS, Lens : PMMA, LED CAP : PC	—	—	—
Cable	φ 3.5mm, 3P, Length : 2m	—	—	—
Accessory	Mounting bracket, Bolt	—	Mounting bracket, Bolt, Adjustment driver	—
Approval	—	—	CE	—
Unit weight	—	—	Approx. 45g	—

- (A) Counter
- (B) Timer
- (C) Temp. controller
- (D) Power controller
- (E) Panel meter
- (F) Tacho/ Speed/ Pulse meter
- (G) Display unit
- (H) Sensor controller
- (I) Switching power supply
- (J) Proximity sensor
- (K) Photo electric sensor
- (L) Pressure sensor
- (M) Rotary encoder
- (N) Stepping motor & Driver & Controller
- (O) Graphic panel
- (P) Field network device
- (Q) Production stoppage models & replacement

## ■ Feature data

### ◎ Through-beam

● BJ15M-TDT / BJ15M-TDT-P / BJ10M-TDT / BJ10M-TDT-P / BJ7M-TDT / BJ7M-TDT-P

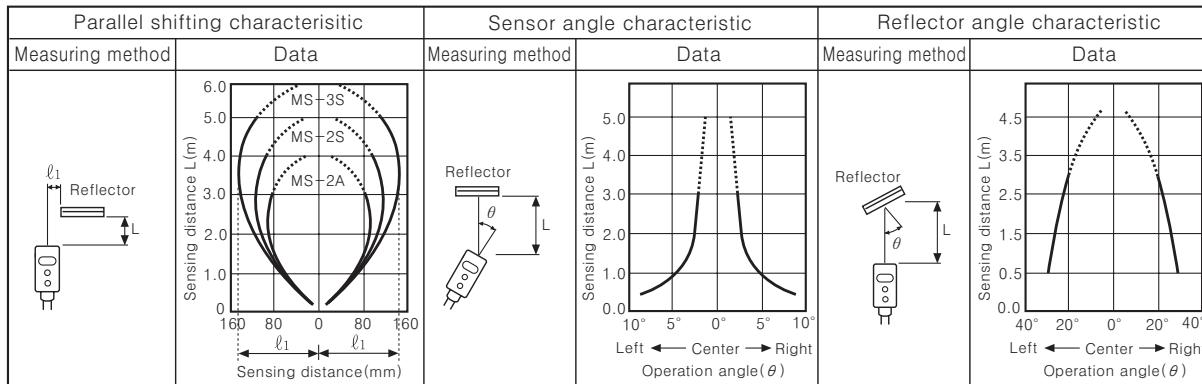


# BJ Series

## ■ Feature data

### ◎ Polarized retroreflective

#### ● BJ3M-PDT / BJ3M-PDT-P

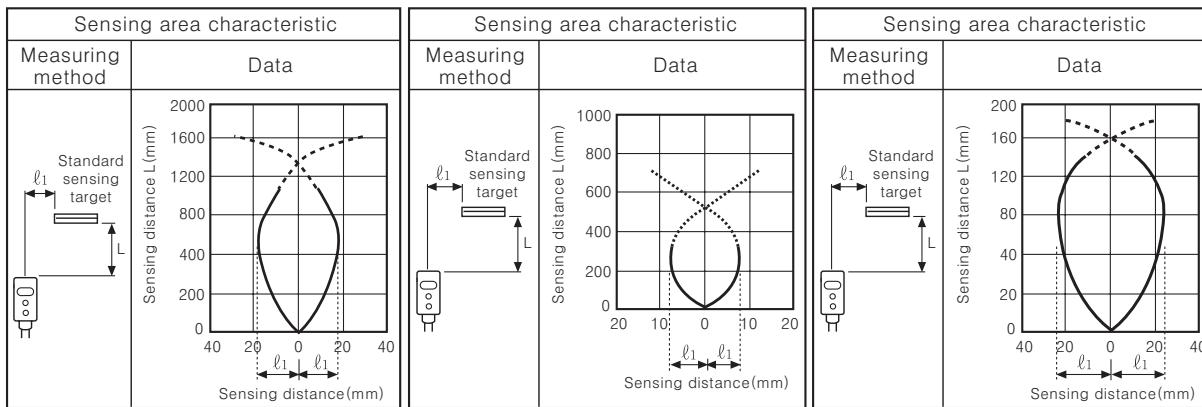


### ◎ Diffuse reflective

#### ● BJ1M-DDT / BJ1M-DDT-P

#### ● BJ300-DDT / BJ300-DDT-P

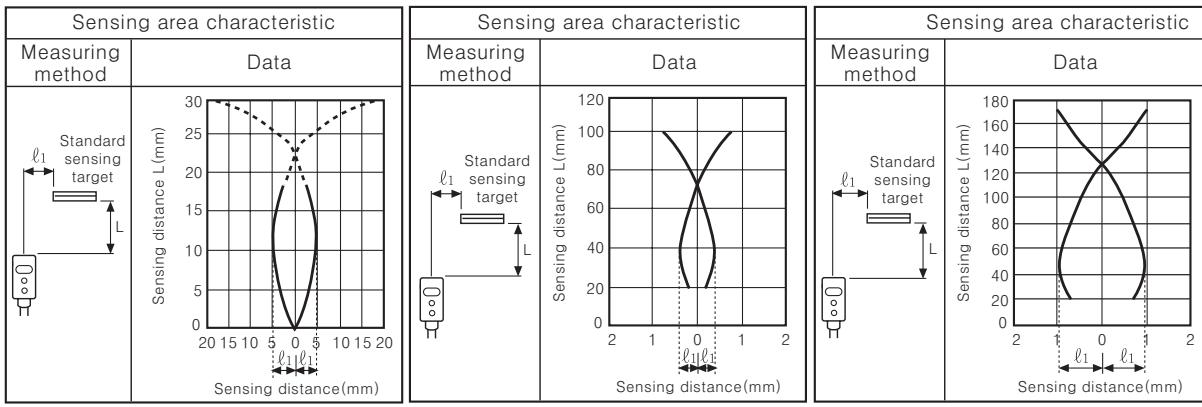
#### ● BJ100-DDT / BJ100-DDT-P



#### ● BJJG30-DDT

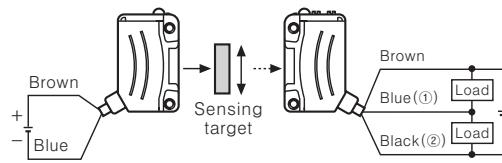
#### ● BJJN50-NDT / BJJN50-NDT-P

#### ● BJJN100-NDT / BJJN100-NDT-P

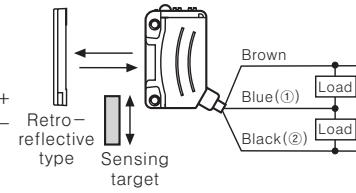


## ■ Connections

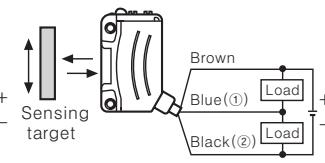
### ● Through-beam



### ● Polarized retroreflective type



### ● Diffuse reflective

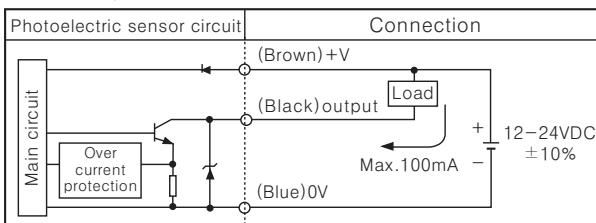


※① : The load connection of NPN open collector output, ② : The load connection of PNP open collector output

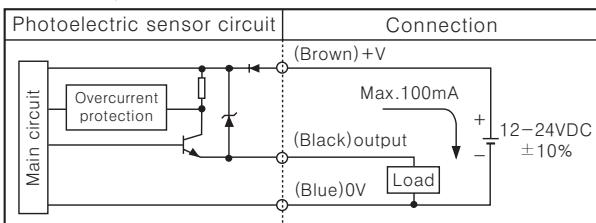
## Long sensing distance/Micro spot type

## □ Control output diagram

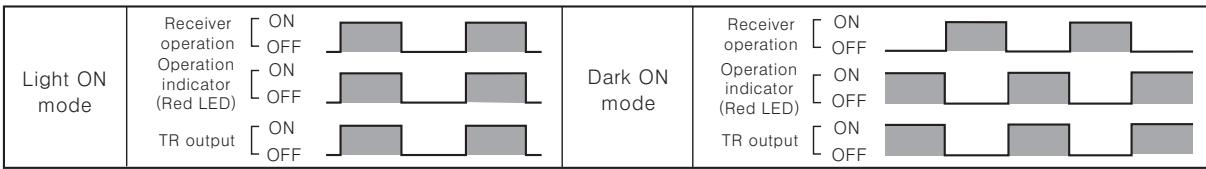
- NPN output



- PNP output



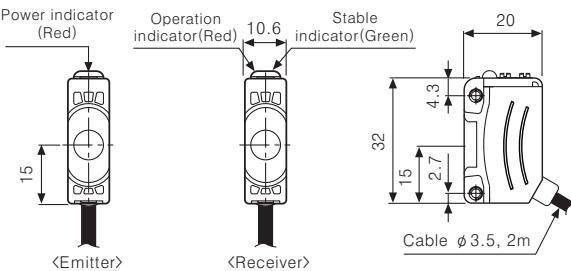
## ■ Operation mode



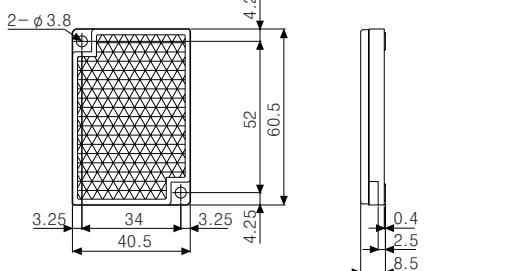
## □ Dimensions

(Unit:mm)

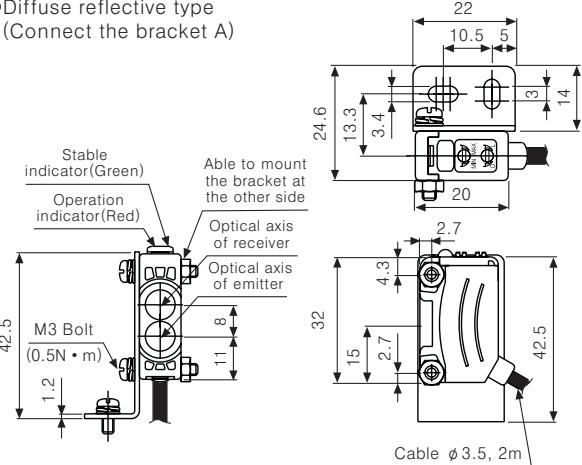
- Through-beam type



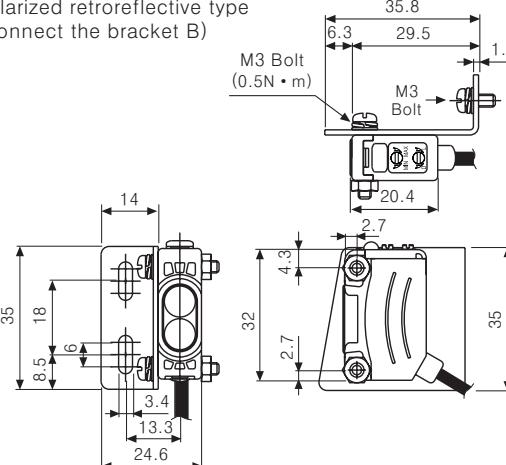
- Reflector (Include: MS-2A, Sold separately: MS-2S, MS-3S)



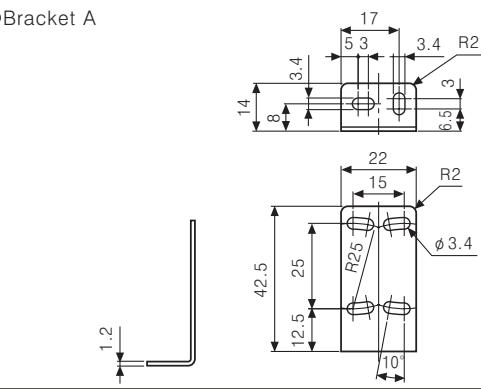
- Diffuse reflective type  
(Connect the bracket A)



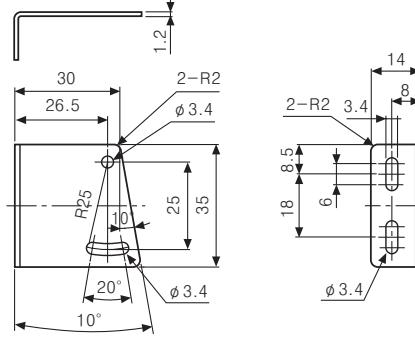
- Polarized retroreflective type  
(Connect the bracket B)



### ● Bracket A



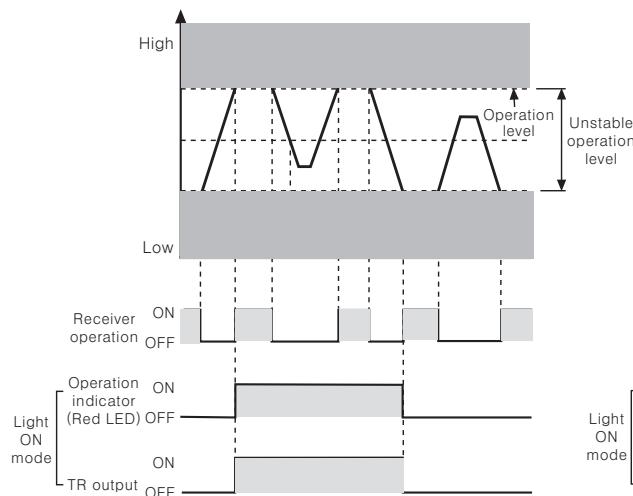
- Bracket B (Sold separately)



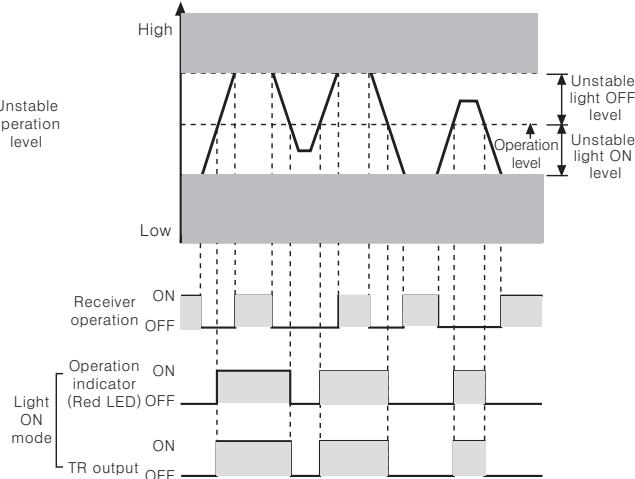
# BJ Series

## ■ Operation mode and Timing diagram

### ◎ Emitter



### ◎ Diffuse reflective/Polarized retroreflective

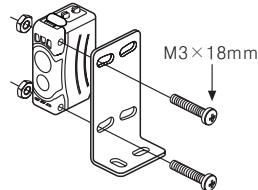


※ The waveform of 'Operation mode indicator' and 'TR output' is for Light ON mode, it is operated as reverse in Dark ON mode.

## ■ Mounting and sensitivity adjustment

### ◎ For mounting

Please use screw M3 for mounting of sensor, set the tightening torque under 0.5 N·m.



### ◎ Switching of operation mode

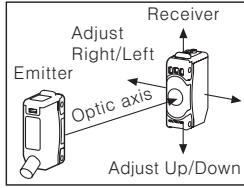
Light ON mode (Light ON)		Turn the operation switching adjuster to right(L direction), it is set as Light ON mode.
Light OFF mode (Dark ON)		Turn the operation switching adjuster to left(D direction), it is set as Light OFF mode.

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

### ◎ Mounting

#### ● Through-beam type

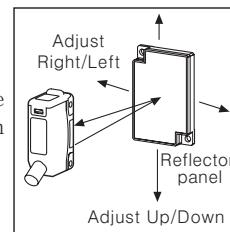
1. Place the emitter and receiver facing each other and apply the power.
2. After adjust the position of the emitter and receiver and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicator in both status.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



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

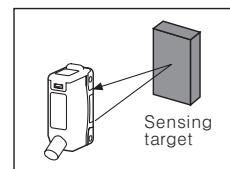
#### ● Polarized retroreflective type

1. Place the Sensor and retroreflective facing each other and apply the power.
2. After adjust the position of the Sensor and retroreflective 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)

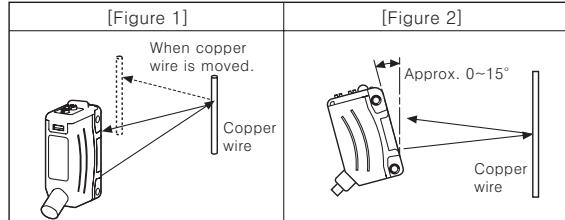


#### ● Diffuse reflective type

- 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.



#### ● Object (Copper wire) detection <Micro spot type>

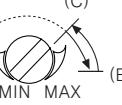


※ Mount sensor slanted at an angle ranged  $0\sim 15^\circ$  shown above as [Figure 2] for stable detection to detect as shown in [Figure 1].

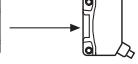
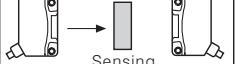
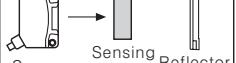
# Long sensing distance/Micro spot type

## ■ Sensitivity adjustment

### ◎ Sensitivity adjustment

Order	Position	Description
1	(A) 	Turn the sensitivity adjuster to the right of min. and check position(A) where the indicator is turned on in "Light ON status".
2	(A) 	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	Optimal sensitivity (A) 	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.

※No sensitivity adjustment function available for BJJ30-DDT models

	"Light ON status"	"Light OFF status"
Through-beam type		
Polarized retro-reflective type		
Diffuse reflective		

※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.

(A) Counter
(B) Timer
(C) Temp. controller
(D) Power controller
(E) Panel meter
(F) Tacho/ Speed/ Pulse meter
(G) Display unit
(H) Sensor controller
(I) Switching power supply
(J) Proximity sensor
<b>(K) Photo electric sensor</b>
(L) Pressure sensor
(M) Rotary encoder
(N) Stepping motor & Driver & Controller
(O) Graphic panel
(P) Field network device
(Q) Production stoppage models & replacement