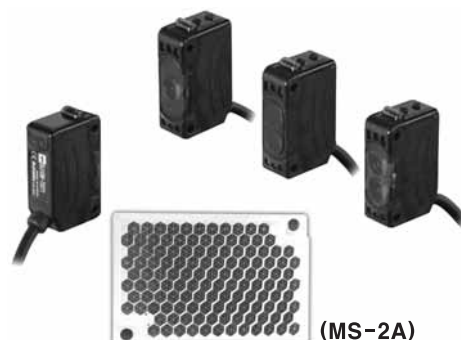


BJ Series

Miniature and built-in amplifier for long sensing distance

■ Features

- Long sensing distance with high functional lens
- Waterproof structure IP67 by rubber injection(IEC standard)
- Compact size
- Detects up to 15m(Transmitted beam type)
- Long sensing distance : Diffuse reflective type 1m,
Polarized reflective type 5m(MS-3S)
- Light ON / Dark ON selectable
- Built-in sensitivity adjustment VR
- Mutual interference prevention function
(Retroreflective type, Diffuse reflective type)



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



■ Specifications

Model	NPN Open collector output	BJ15M-TDT	BJ10M-TDT	BJ3M-PDT	BJ1M-DDT	BJ300-DDT	BJ300-DDT
	PNP Open collector output	BJ15M-TDT-P	BJ10M-TDT-P	BJ3M-PDT-P	BJ1M-DDT-P	BJ300-DDT-P	BJ300-DDT-P
Sensing type		Transmitted beam		Polarized retroreflective	Diffuse reflective		
Sensing distance		15m	10m	0.1~3m(MS-2A)	1m	300mm	100mm
Sensing target		Opaque material over ϕ 15mm		Opaque material over ϕ 75mm	Non-glossy white paper 300×300mm	Non-glossy white paper 100×100mm	
Hysteresis		—————		—————	Max. 20% at rated setting distance		
Response time		Max. 1ms					
Power supply		12-24VDC \pm 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)
Sensitivity adjustment		Short rotator volume(210°)					
Operation mode		Light ON/Dark ON selectable					
Control output		NPN or PNP open collector output • Load voltage : Max. 26.4VDC • Load current : Max.100mA • Residual voltage \Rightarrow NPN : Max. 1V, PNP : 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. 20M Ω (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/s ² X, Y, Z directions for 2 hours					
Ambient illumination		Sunlight : Max. 11,000lx, Incandescent lamp : Max. 3,000lx(Receiving illumination)					
Ambient temperature		-25 ~ 55℃ (Storage : -40 ~ 70℃) at non-freezing status					
Ambient humidity		35 ~ 85%RH(at non-freezing status)					
Protection		IP67(IEC standard)					
Material		Case : PC+ABS, Lens : Acrylic(PMMA)					
Cable		ϕ 3.5mm, 3P, Length:2m(Emitter of transmitted beam type : ϕ 3.5mm, 2P, Length:2m)					
Accessory	Common	Fixing bracket, Bolt, Adjustment driver					
	Individual	—————		Reflector (MS-2A)	—————		
Approval		CE					
Unit weight		Approx. 90g		Approx. 60g	Approx. 45g		

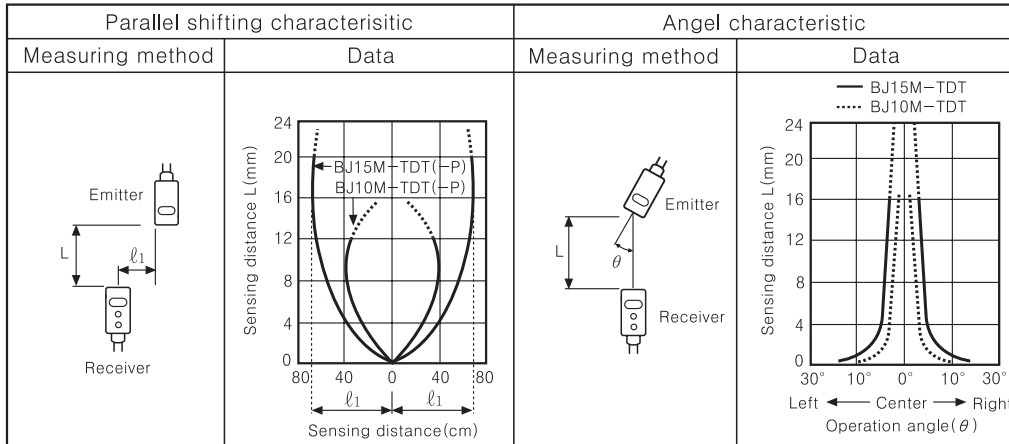
※(★) The sensing distance is extended to 0.1~4m or 0.1~5m when using optional reflector MS-2S or MS-3S.

Miniature and built-in amplifier for long sensing distance

■ Feature data

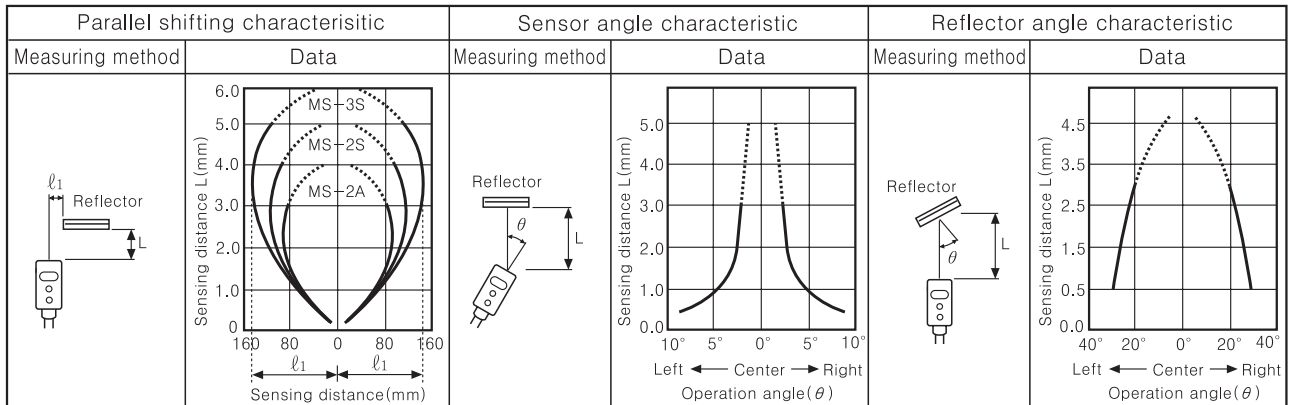
◎ Transmitted beam type

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



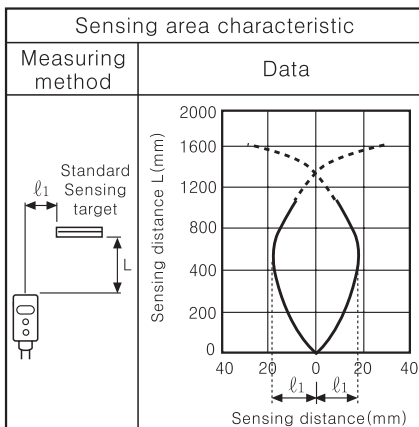
◎ Polarized retroreflective type

● BJ3M-PDT / BJ3M-PDT-P

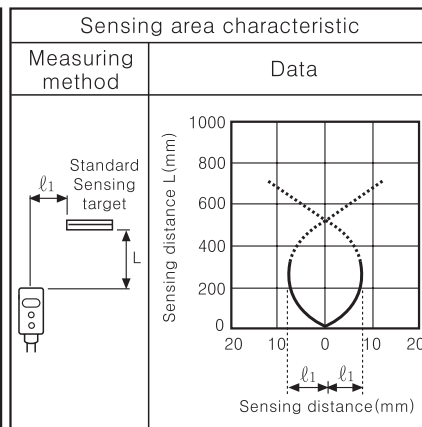


◎ Diffuse reflective

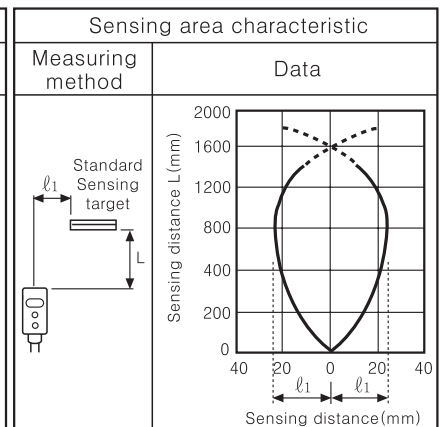
● BJ1M-DDT / BJ1M-DDT-P



● BJ300-DDT / BJ300-DDT-P

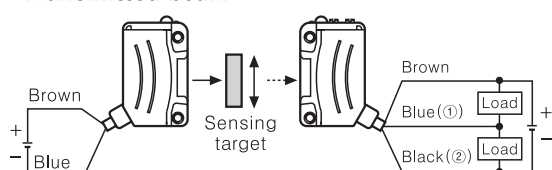


● BJ100-DDT / BJ100-DDT-P

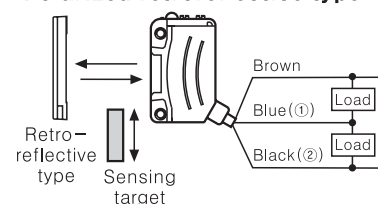


■ Connections

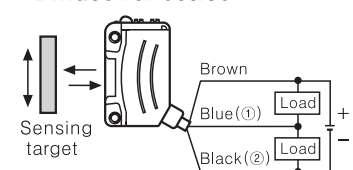
● Transmitted beam



● Polarized retroreflective type



● Diffuse reflective



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

(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

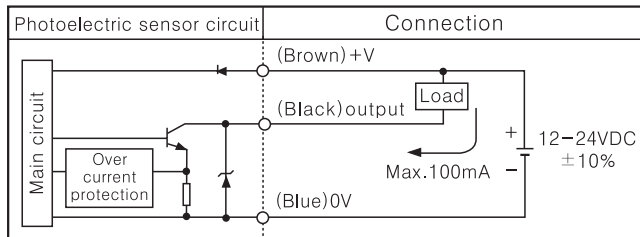
(O)
Graphic
panel

(P)
Production
stoppage
models &
replacement

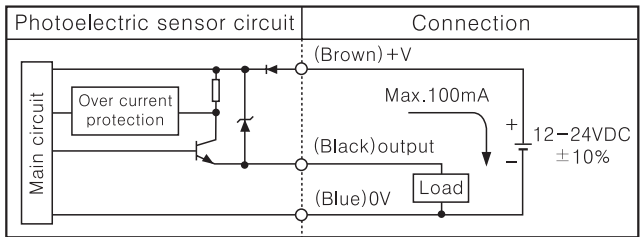
BJ Series

Control output diagram

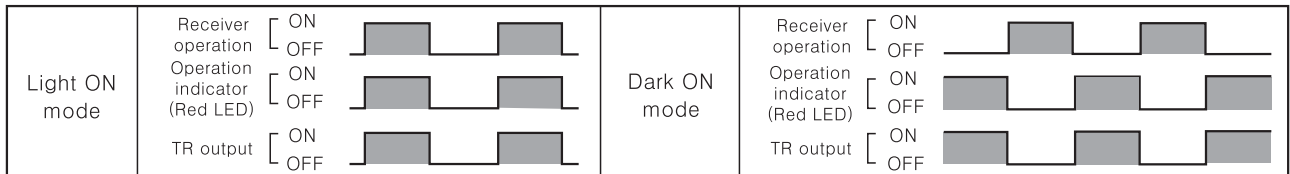
●NPN output



●PNP output



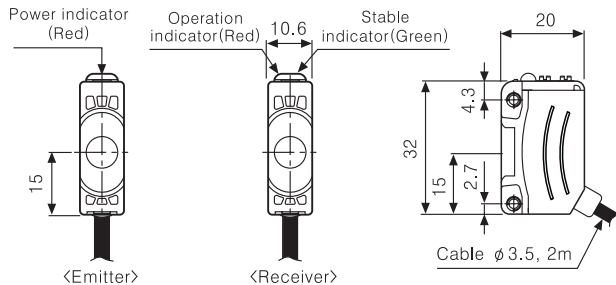
Operation mode



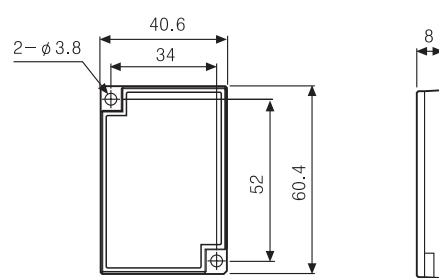
Dimensions

(Unit:mm)

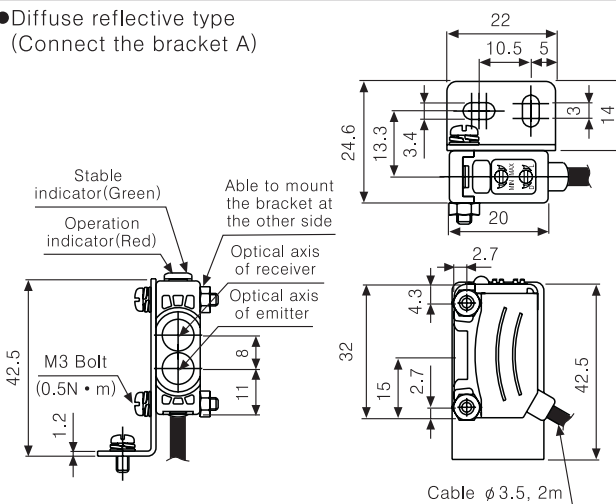
●Transmitted beam type



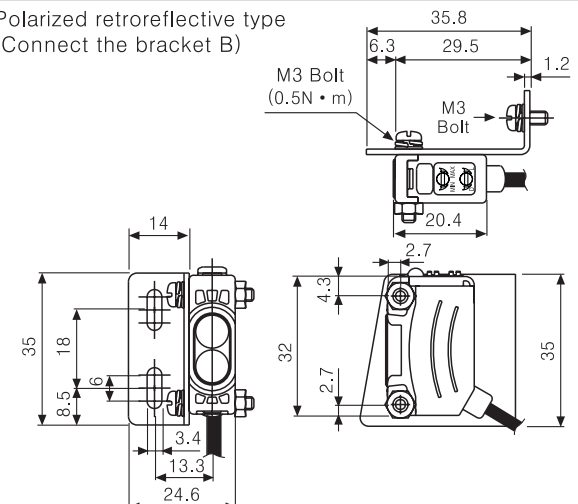
●Reflector (Include: MS-2A, Option: MS-2S, MS-3S)



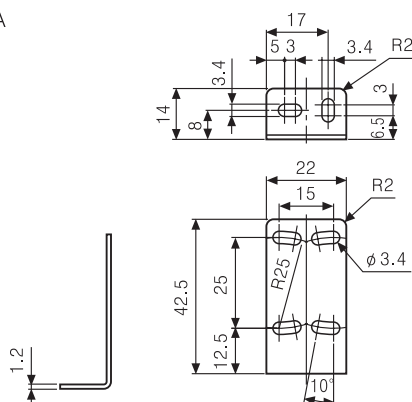
●Diffuse reflective type (Connect the bracket A)



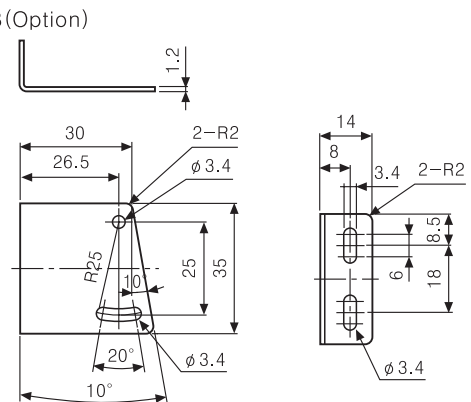
●Polarized retroreflective type (Connect the bracket B)



●Bracket A



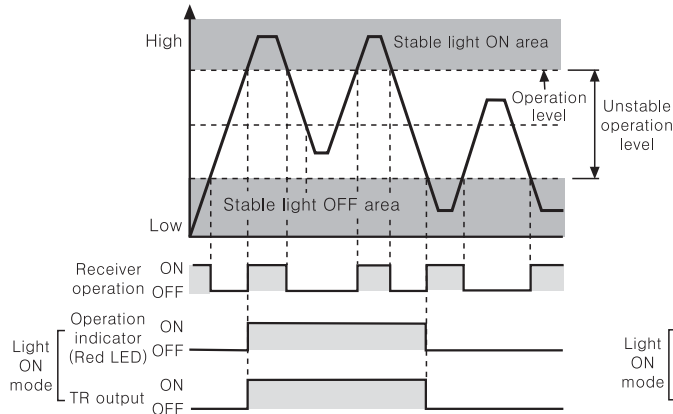
●Bracket B (Option)



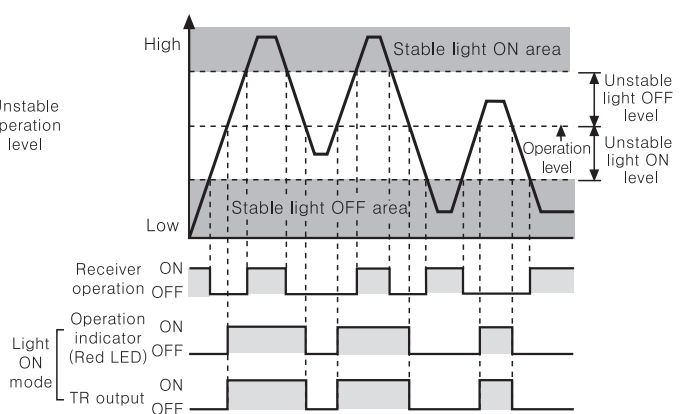
Miniature and built-in amplifier for long sensing distance

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

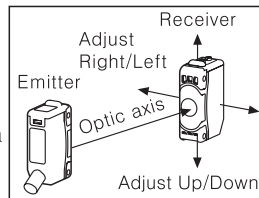
Light ON mode (Light ON)		Turn the operation switching adjuster right (L direction), it is set as Light ON mode.
Light OFF mode (Dark ON)		Turn the operation switching adjuster to left (D direction), it is set as Light OFF mode.

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

Mounting

Transmitted beam type

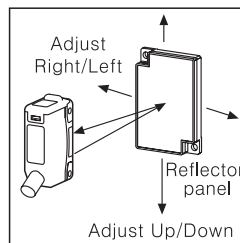
- Place the emitter and receiver facing each other and apply the power.
- After adjust the position of the emitter and receiver and check the stable indicating range, mount them in the middle of the range.
- After mounting, check the operation of sensor and lighting of stable indicator in both status.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



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

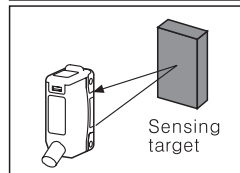
Polarized retroreflective type

- Place the Sensor and retroreflective facing each other and apply the power.
- After adjust the position of the Sensor and retroreflective and check the stable indicator range, mount them in the middle of the range.
- 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, fix it in center of position where the indicator is operated adjusting the sensor to up • down, left • right.



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) (B) (C)	Turn the sensitivity adjuster more to the right 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) (C)	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 effective		

※ 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 power, 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
- (K) Photo electric sensor
- (L) Pressure sensor
- (M) Rotary encoder
- (N) Stepping motor & Driver & Controller
- (O) Graphic panel
- (P) Production stoppage models & replacement