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.

⚠ **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 ϕ12mm		Opaque material over ϕ75mm	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. 11,000ℓx, Incandescent lamp : Max. 3,000ℓx(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		ϕ3.5mm, 3P, Length:2m(Emitter of transmitted beam type : ϕ3.5mm, 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				

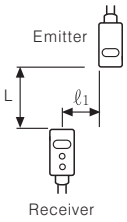
※(★) The sensing distance is extended to 0.1~4m or 0.1~5m when using optional reflector MS-2S or MS-3S.

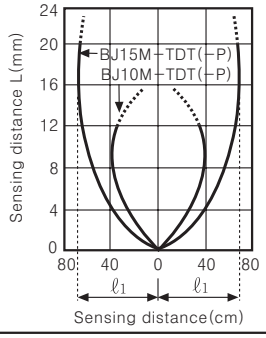
▣Feature data

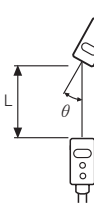
◎Transmitted beam type

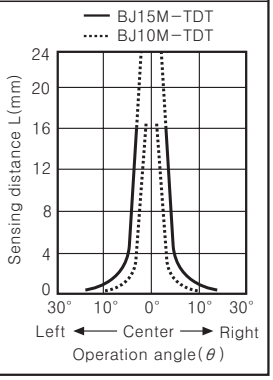
●BJ15M-TDT / BJ15M-TDT-P / BJ10M-TDT / BJ10M-TDT-P

Parallel shifting characterisitic		Angle characteristic	
Measuring method	Data	Measuring method	Data





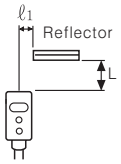


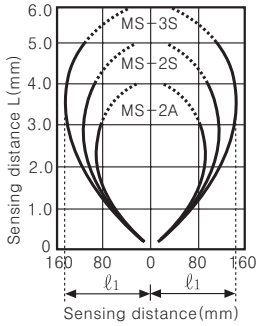


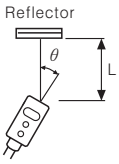
◎Polarized retroreflective type

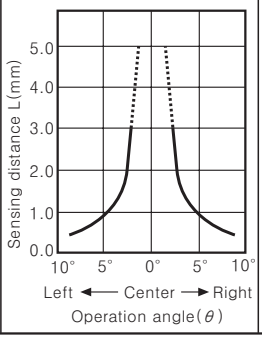
●BJ3M-PDT / BJ3M-PDT-P

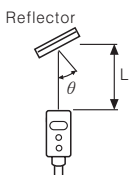
Parallel shifting characterisitic		Sensor angle characteristic		Reflector angle characteristic	
Measuring method	Data	Measuring method	Data	Measuring method	Data

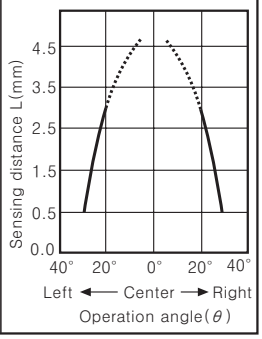








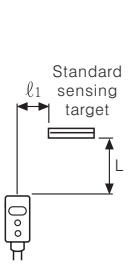


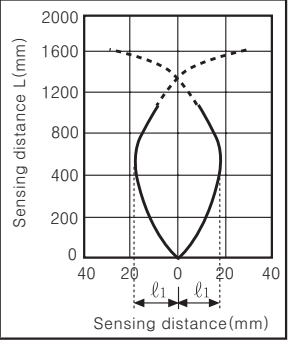


◎Diffuse reflective

●BJ1M-DDT / BJ1M-DDT-P

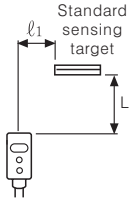
Sensing area characteristic	
Measuring method	Data

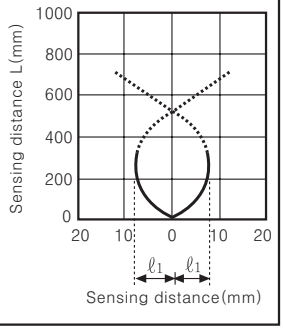




●BJ300-DDT / BJ300-DDT-P

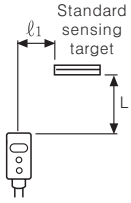
Sensing area characteristic	
Measuring method	Data

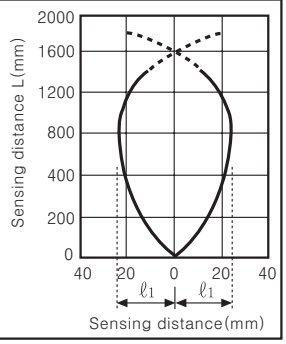




●BJ100-DDT / BJ100-DDT-P

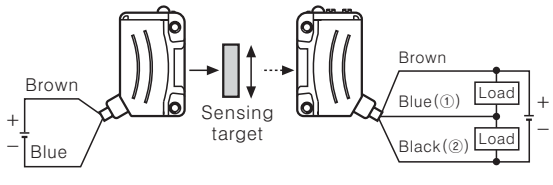
Sensing area characteristic	
Measuring method	Data



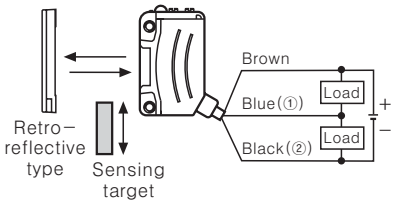


▣Connections

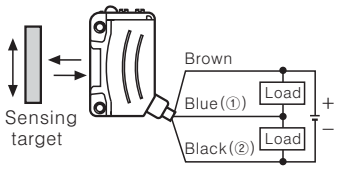
●Transmitted beam



●Polarized retroreflective type



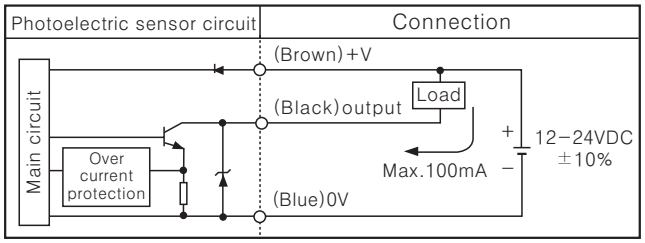
●Diffuse reflective



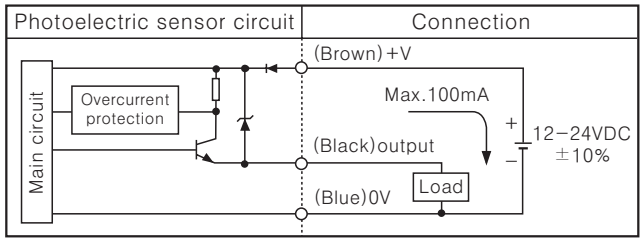
※① : The load connection of NPN open collector output, ② : The load connection of PNP open collector output

▣Control output diagram

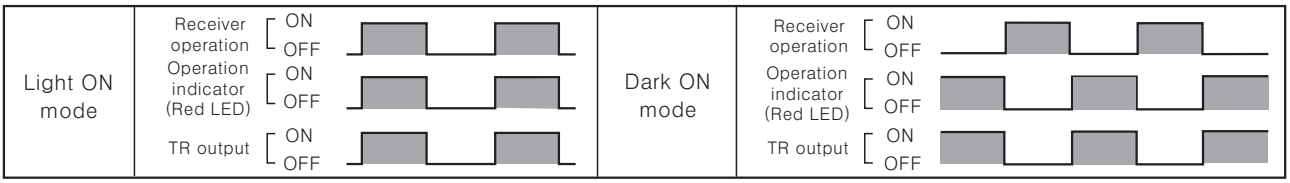
●NPN output



●PNP output



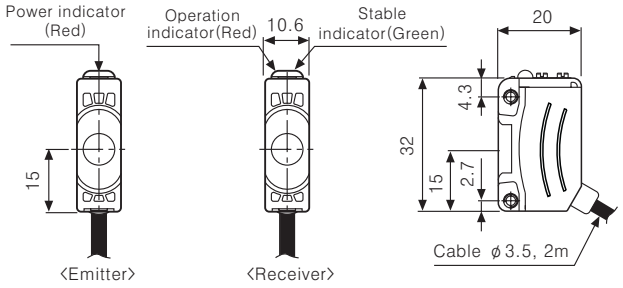
▣Operation mode



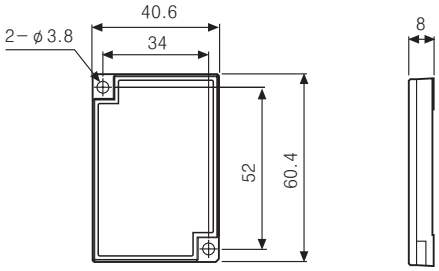
▣Dimensions

(Unit:mm)

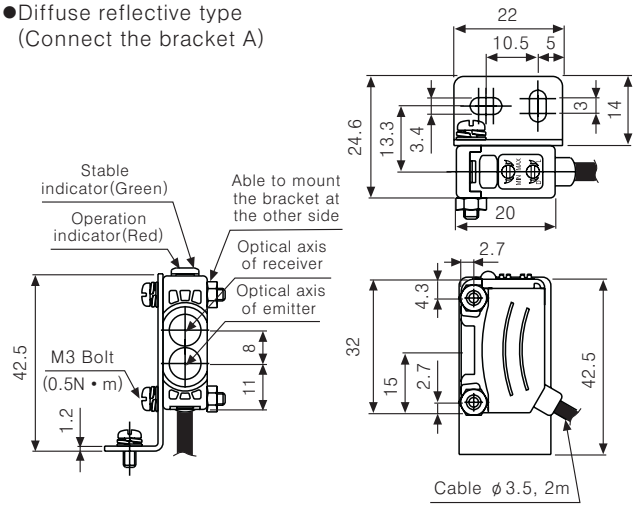
●Transmitted beam type



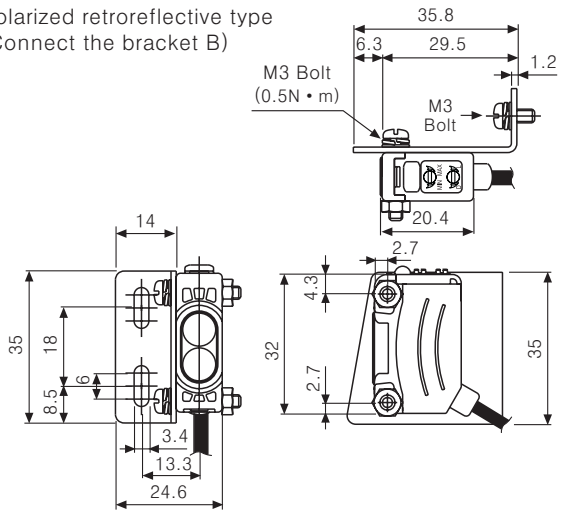
●Reflector(Include:MS−2A, Sold separately:MS−2S, MS−3S)



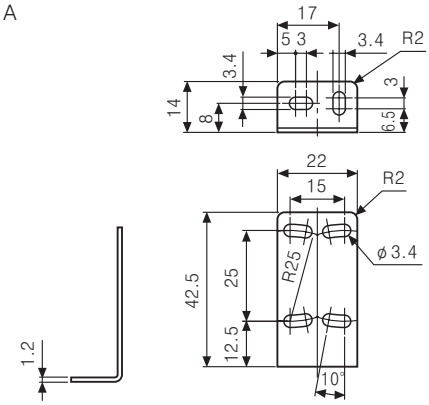
●Diffuse reflective type
(Connect the bracket A)



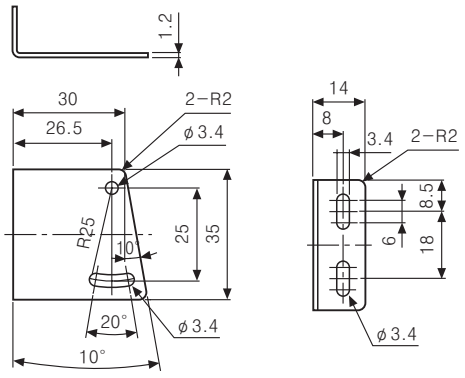
●Polarized retroreflective type
(Connect the bracket B)



●Bracket A

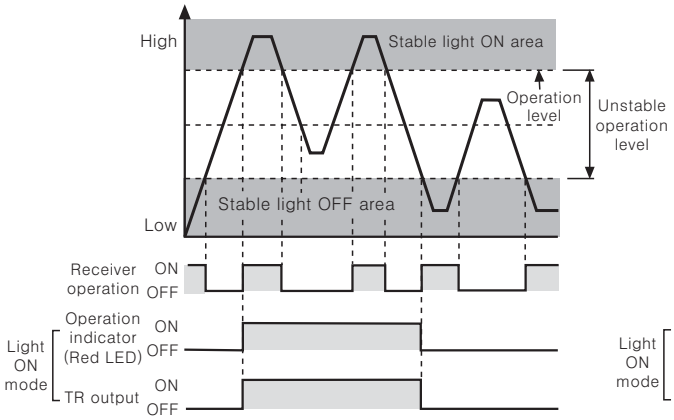


●Bracket B(Sold separately)

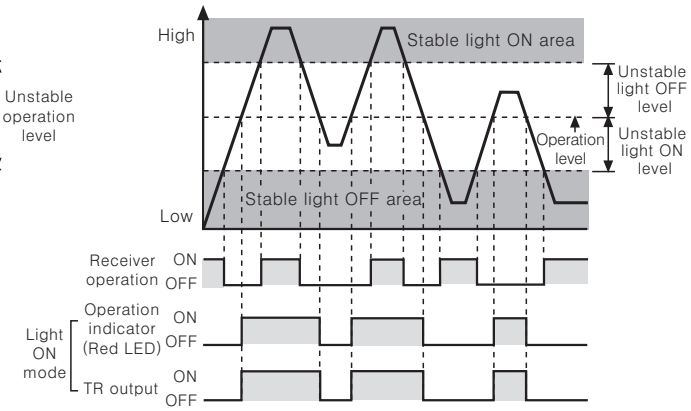


▣Operation mode and Timing diagram

◎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

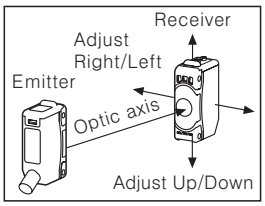
Light ON mode (Light ON)		Turn the operation switching adjuster to right(L direction), it is set as Light ON mode.
Light OFF mode (Dark ON)		Turn the operation switching adjuster to left(D direction), it is set as Light OFF mode.

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

◎Mounting

●Transmitted beam type

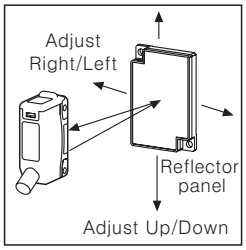
1. Place the emitter and receiver facing each other and apply the power.
2. After adjust the position of the emitter and receiver and check their stable indicating range, mount them in the middle of the range.
3. After mounting, check the operation of sensor and lighting of stable indicator in both status.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



※When the sensing target is translucent or small (Under ϕ16mm), it can be missed by the sensor because the light can penetrate it.

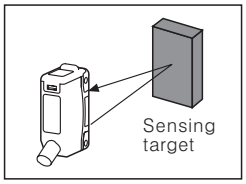
●Polarized retroreflective type

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)

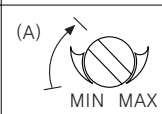
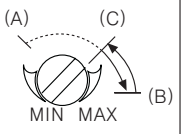
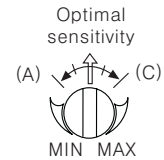


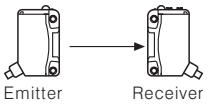
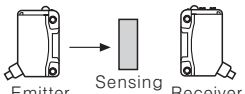
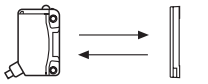
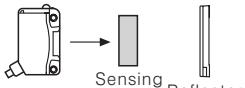
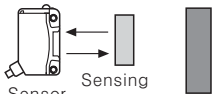
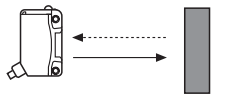
●Diffuse reflective type

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.