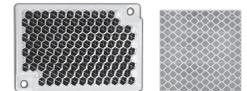


## Long Distance Sensing Compact Type Photoelectric Sensor

### ■ Features

- Long sensing distance with high quality lens  
: Through-beam type 30m, Diffuse reflective type 1m, Polarized retroreflective type 3m (MS-2A)
- M.S.R. (Mirror Surface Rejection) function (polarized retroreflective type)
- Compact size: W20×H32×L11mm
- IP65 protection structure (IEC standard)
- Light ON/Dark ON operation mode switch
- Sensitivity adjuster
- Built-in reverse polarity protection circuit and output short overcurrent protection circuit
- Mutual interference prevention function (except through-beam type)
- Excellent noise immunity and minimal influence from ambient light



(MS-2A) (MST-□)

**⚠ Please read "Safety Considerations" in the instruction manual before using.**



※The model name with '-C' is connector type.  
※MST-□ is sold separately.

### ■ Specifications

Model	NPN open collector output		BJX30M-TDT BJX30M-TDT-C		BJX15M-TDT BJX15M-TDT-C		BJX10M-TDT BJX10M-TDT-C		BJX3M-PDT BJX3M-PDT-C		BJX1M-DDT BJX1M-DDT-C		BJX300-DDT BJX300-DDT-C		BJX100-DDT BJX100-DDT-C		
	PNP open collector output		BJX30M-TDT-C-P		BJX15M-TDT-C-P		BJX10M-TDT-C-P		BJX3M-PDT-C-P		BJX1M-DDT-C-P		BJX300-DDT-C-P		BJX100-DDT-C-P		
Sensing type	Through-beam type								Retroreflective type (built-in polarizing filter)		Diffuse reflective type						
Sensing distance			30m		15m		10m		3m <sup>※1</sup>		1m <sup>※2</sup>		300mm <sup>※3</sup>		100mm <sup>※3</sup>		
Sensing target	Opaque material over Ø15mm								Opaque material over Ø75mm		Opaque, translucent materials						
Hysteresis	—								Max. 20% at sensing distance								
Response time	Max. 1ms																
Power supply	10-30VDC <sup>—</sup> ±10% (ripple P-P: max. 10%)																
Power consumption	Emitter / Receiver: max. 20mA								Max. 30mA								
Light source	Red LED (660nm)		Infrared LED (850nm)		Red LED (660nm)		Red LED (660nm)		Red LED (660nm)		Red LED (660nm)		Red LED (660nm)		Infrared LED (850nm)		
Sensitivity adjustment	Sensitivity adjuster																
Operation mode	Light ON / Dark ON selectable by switch																
Control output	NPN or PNP open collector output • Load voltage: max. 30VDC <sup>—</sup> • Load current: max. 100mA • Residual voltage - NPN: max. 1VDC <sup>—</sup> , PNP: max. 2VDC																
Protection circuit	Power reverse polarity protection circuit, output short over current protection circuit								Power reverse polarity protection circuit, output short over current protection circuit, interference prevention function								
Indicator	Operation indicator: yellow LED, stability indicator: green LED (emitter's power indicator: red LED)																
Insulation resistance	Over 20MΩ (500VDC megger)																
Noise immunity	±240V the square wave noise (pulse width: 1μs) by the noise simulator																
Dielectric strength	1,000VAC 50/60Hz for 1 minute																
Vibration	1.5mm amplitude at frequency of 10 to 55Hz (for 1 min) in each X, Y, Z direction for 2 hours																
Shock	500m/s <sup>2</sup> (approx. 50G) in each X, Y, Z direction for 3 times																
Environment	Ambient illu.	Sunlight: max. 11,000lx, incandescent lamp: max. 3,000lx (receiver illumination)															
	Ambient temp. <sup>※4</sup>	-25 to 60°C, storage: -40 to 70°C															
	Ambient humi.	35 to 85%RH, storage: 35 to 85%RH															
Protection structure	IP65 (IEC standard)																
Material	Case: polycarbonate, LED CAP: polycarbonate, sensing part: polymethyl methacrylate acrylic,																
Cable <sup>※5</sup>	Ø4mm, 3-wire, 2m (emitter of through-beam type: Ø4mm, 2-wire, 2m) (AWG26, core diameter: 0.52mm, number of cores: 20, insulator out diameter: Ø1mm)																
Accessory	Common	Mounting bracket <sup>※6</sup> , M3 bolt: 4, adjustment screwdriver								Mounting bracket <sup>※6</sup> , M3 bolt: 2, adjustment screwdriver							
	Individual	—								Reflector (MS-2A)		—					
Approval																	
Weight <sup>※7</sup>	Cable type	Approx. 145g (approx. 95g)								Approx. 115g (approx. 50g)		Approx. 100g (approx. 50g)					
	Connector type	Approx. 65g (approx. 12g)								Approx. 75g (approx. 6g)		Approx. 60g (approx. 6g)					

※1: The sensing distance is specified with using the MS-2A reflector. The distance between the sensor and the reflector should be set over 0.1m. When using reflective tapes, the reflectivity will vary by size of the tape. Please refer to the catalog or website.

※2: Non-glossy white paper 300×300mm. ※3: Non-glossy white paper 100×100mm.

※4: UL approved surrounding air temperature 40°C

※5: M8 connector cable is sold separately, (AWG22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.25mm)

※6: Cable type includes bracket A and connector type includes bracket B.

※7: The weight includes packaging. The weight in parenthesis is for unit only.

※ The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

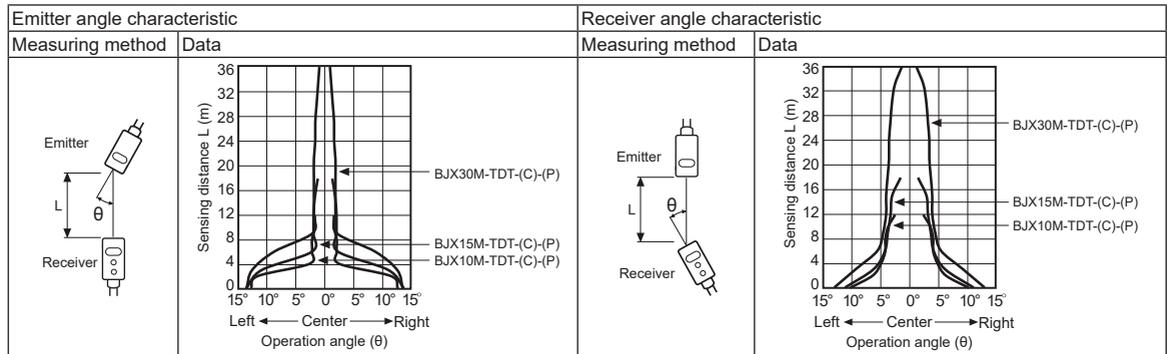
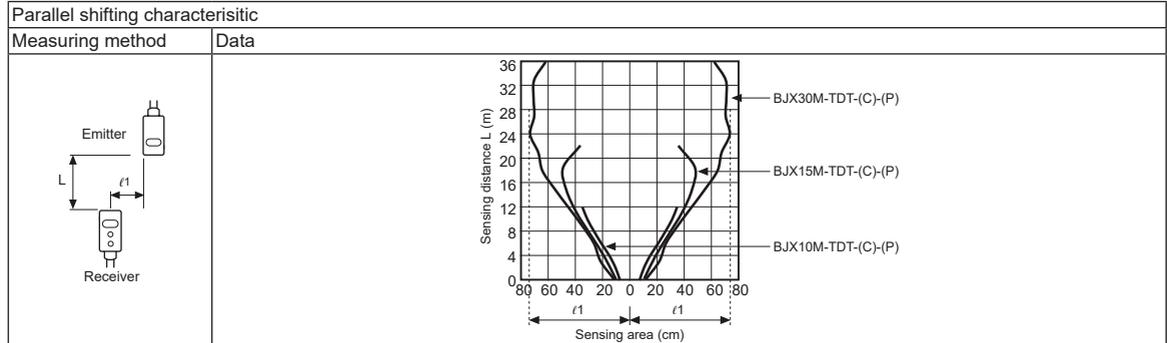
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

# BJX Series

## ■ Feature Data

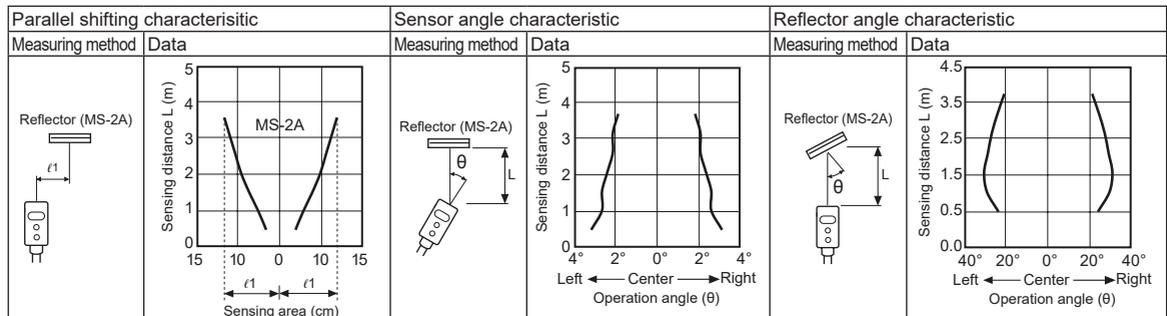
### ◎ Through-beam type

- BJX30M-TDT-(C)-(P) / BJX15M-TDT-(C)-(P) / BJX10M-TDT-(P)



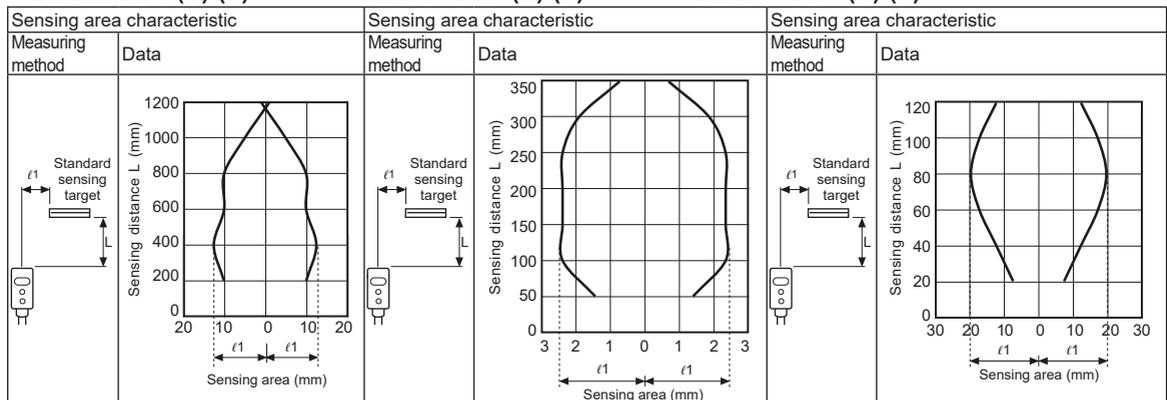
### ◎ Retroreflective type

- BJX3M-PDT-(C)-(P)



### ◎ Diffuse reflective type

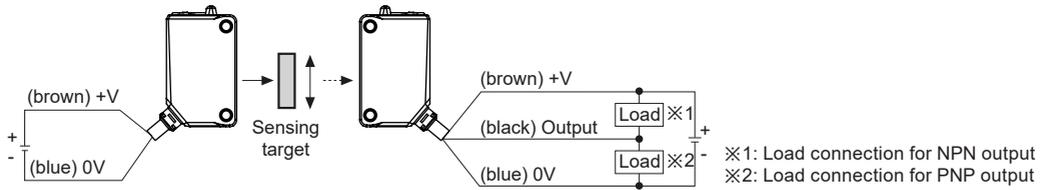
- BJX1M-DDT-(C)-(P)      • BJX400-DDT-(C)-(P)      • BJX100-DDT-(C)-(P)



# Long Distance Sensing Compact Type

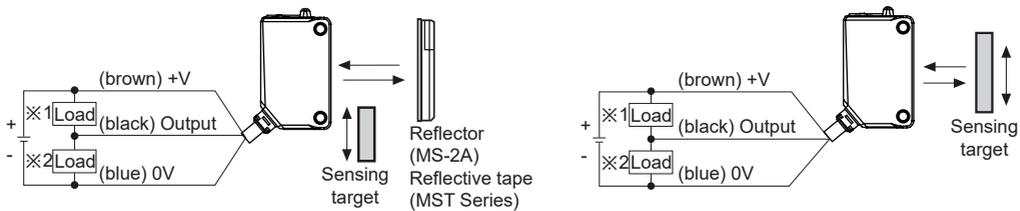
## ■ Connections

### ● Through-beam type



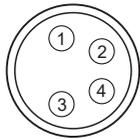
### ● Retroreflective type

### ● Diffuse reflective type



## ◎ Connections for connector part

### ● Connector type

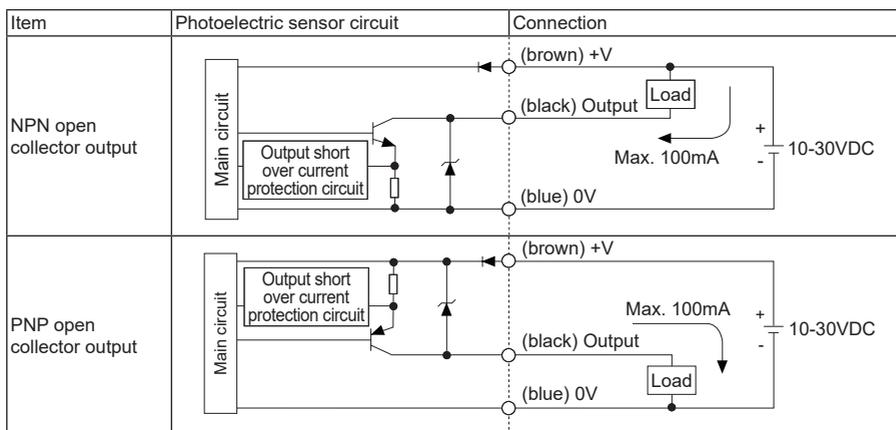


[M8 connector pin]

Connections for cable connector part			
Connector pin No.	Cable colors	Functions	Etc.
①	Brown	Power Source (+V)	Connector cable (sold separately) • CIDH408-□ • CLDH408-□
②	White	N-C	
③	Blue	Power Source (0V)	
④	Black	Output	

※Connector pin ② is N-C (Not Connected) terminal.

## ■ Control Output Diagram



※If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

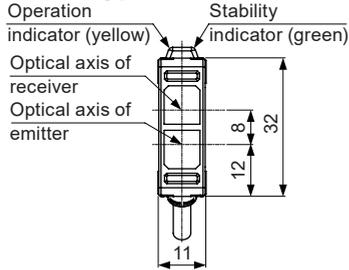
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

# BJX Series

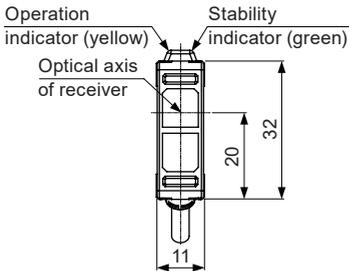
(unit: mm)

## ■ Dimensions

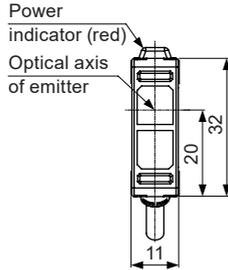
### ◎ Cable type



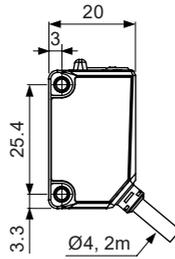
[Retroreflective/Diffuse type]



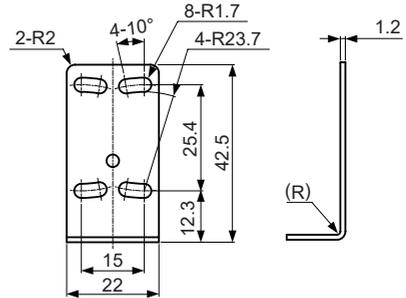
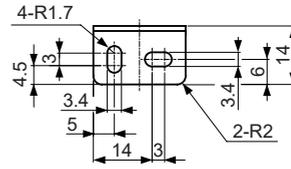
[Through-beam type (receiver)]



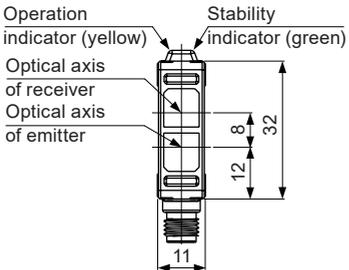
[Through-beam type (emitter)]



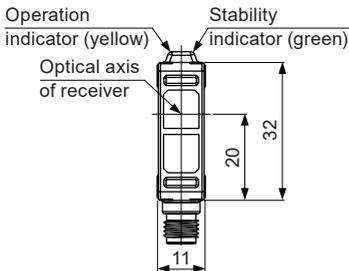
### ● Bracket A



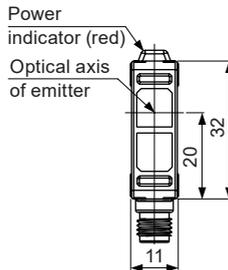
### ◎ Connector type



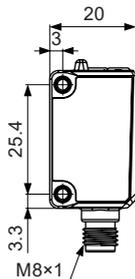
[Retroreflective/Diffuse type]



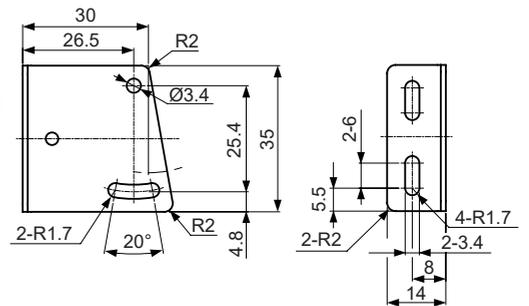
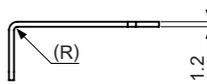
[Through-beam type (receiver)]



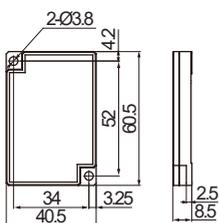
[Through-beam type (emitter)]



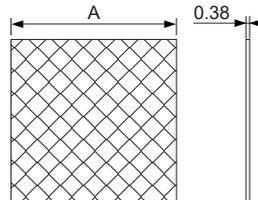
### ● Bracket B



### ● Reflector (MS-2A)



### ● Reflective tape (sold separately)



Model	A
MST-50-10	□50
MST-100-5	□100
MST-200-2	□200

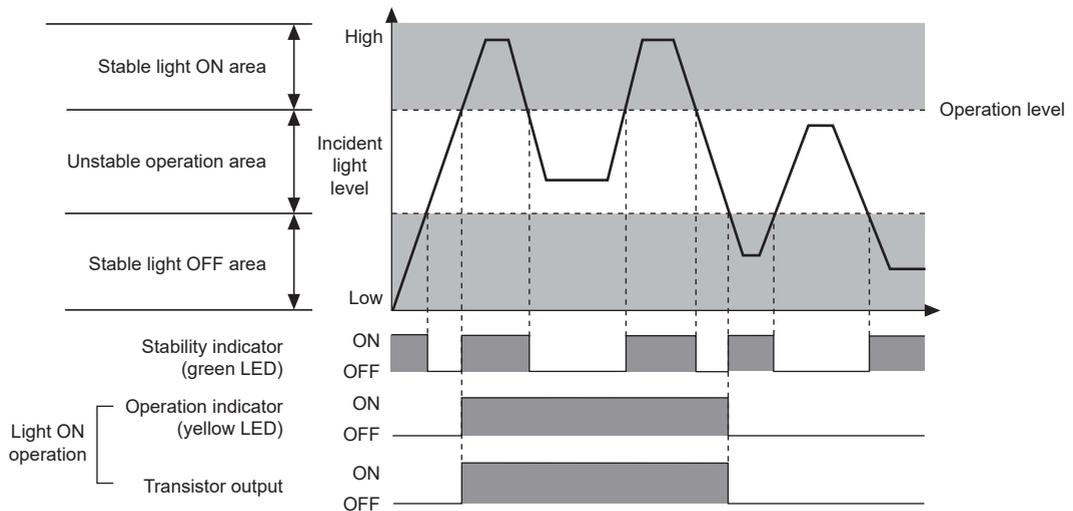
# Long Distance Sensing Compact Type

## ■ Operation Mode

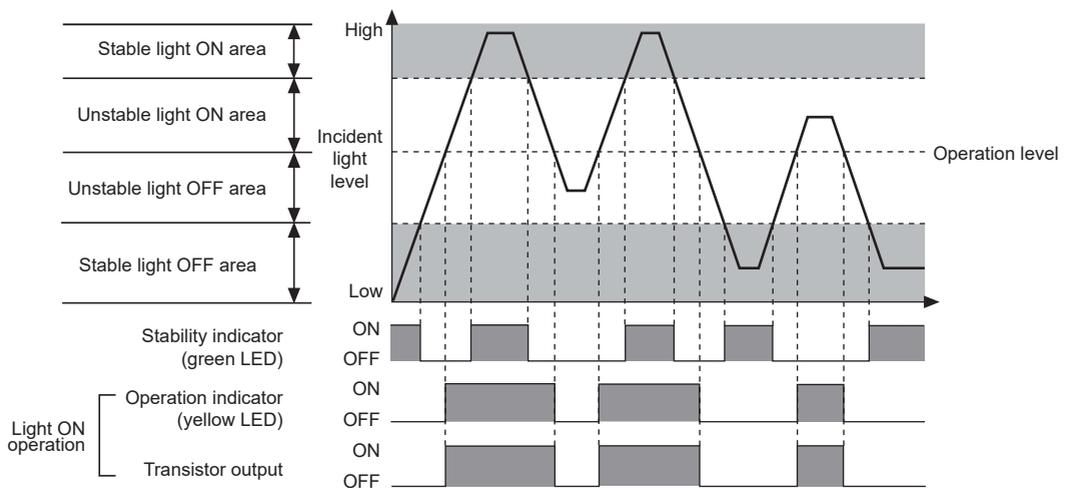
Operation mode	Light ON	Dark ON
Receiver operation	Received light Interrupted light 	Received light Interrupted light 
Operation indicator (red LED)	ON OFF 	ON OFF 
Transistor output (NPN/PNP)	ON OFF 	ON OFF 

## ■ Operation Timing Diagram

### ◎ Through-beam type



### ◎ Retroreflective type/Diffuse reflective type



※The waveforms of 'Operation indicator' and 'Transistor output' are for Light ON operation. The waveforms are reversed for Dark ON operation.

SENSORS

CONTROLLERS

MOTION DEVICES

SOFTWARE

(A) Photoelectric Sensors

(B) Fiber Optic Sensors

(C) LIDAR

(D) Door/Area Sensors

(E) Vision Sensors

(F) Proximity Sensors

(G) Pressure Sensors

(H) Rotary Encoders

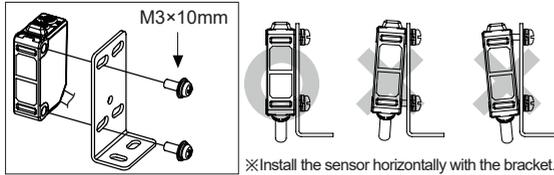
(I) Connectors/ Connector Cables/ Sensor Distribution Boxes/ Sockets

## ■ Installation and Adjustment

### ○ For mounting

When using the reflective type photoelectric sensors closely over three units, it may result in malfunction due to mutual interference. When using the through-beam type photoelectric sensors closely over two units, it may result in malfunction due to mutual interference.

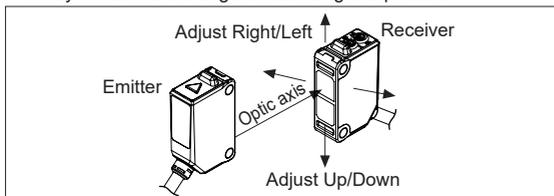
When installing the product, tighten the screw with a tightening torque of 0.5 N·m.



### ○ Optical axis adjustment

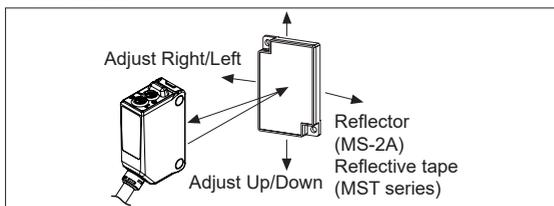
#### ● Through-beam type

- Place the emitter and the receiver facing each other and supply the power.
  - After adjusting the position of the emitter and the receiver and check their stable indicating range, mount them in the middle of the range.
  - After mounting this unit, check the operation of the sensor and lighting of the stability indicator in both status. (none or sensing target status)
- ※If the sensing target is translucent body or smaller than  $\varnothing 15\text{mm}$ , it may not sense the target because light is passed.



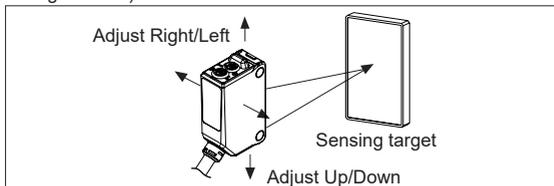
#### ● Retroreflective type

- Place the sensor and the reflector (or reflective tape) facing each other and supply the power.
  - After adjusting the position of the sensor and reflector (or reflective tape) and checking their stable indicating range, mount them in the middle of the range. (none or sensing target status)
  - After mounting this unit, check the operation of the sensor and in both status. (none or sensing target status)
- ※Please use reflective tape (MST Series) for where a reflector is not installed.



#### ● Diffuse reflective type

- Place the emitter and the receiver facing each other and supply the power.
- After adjusting the position of the emitter and the receiver and check their stable indicating range, mount them in the middle of the range.
- After mounting this unit, check the operation of the sensor and lighting of the stability indicator in both status. (none or sensing target status)



### ○ Operation mode switching

Light ON		Turn the switch all the way to the right (towards L) to select Light ON operation.
Dark ON		Turn the switch all the way to the left (towards D) to select Dark ON operation.

※For through-beam type, the switch is built-in the receiver.

### ○ Sensitivity adjustment

Order	Sensitivity setting	Descriptions
1		From Light ON status, turn the sensitivity setting adjuster slowly to the right from MIN sensitivity and check the position where operation indicator turns on (A).
2		From Dark ON status, turn the sensitivity setting adjuster further right and check the position where the operation indicator turns on (B). Turn the adjuster left and check the position where the operation indicator turns off (C). ※If the operation indicator does not turn on at MAX sensitivity, the maximum sensitivity setting is set at position (C).
3		Set the adjuster at the center position between (A) and (C) for optimal sensitivity. Also, check if the stability indicator turns off with or without the sensing target. If it does not turn off, please review the operation mode again, as sensitivity may be unstable.

	Light ON	Dark ON
Through-beam type		
Retro-reflective type		
Diffuse reflective type		

※Please set the sensitivity setting adjuster is executed in stable Light ON area and the reliability of environment (temperature, supply, dust etc.) is increased after the mounting it in a stable area.

※When adjusting sensitivity or switching operation modes, please use the Autonics adjustment screwdriver (included accessory).

Using a screwdriver with a bigger diameter than the adjuster buttons may cause errors when making adjustments.

※ It may cause breakdown when the sensitivity setting adjuster or the operation mode selection switch is turned by force.

## ■ Reflectivity by Reflective Tape Model

MST-50-10(50×50mm)	35%
MST-100-5(100×100mm)	45%
MST-200-2(200×200mm)	55%

※This reflectivity is based on the reflector (MS-2A).

※Reflectivity may vary depending on usage environment and installation conditions.

The sensing distance and minimum sensing target size increase as the size of the tape increases.

Please check the reflectivity before using reflective tapes.

※For using reflective tape, installation distance should be min. 20mm.