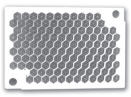
Cylindrical (Ø18mm) Type

▣ Features

- Realizes long sensing distance (20m) (through-beam type)
- Superior noise resistance with digital signal processing
- High-speed response time under 1ms
- Power reverse polarity protection circuit, output short over current protection circuit
- Suitable for sensing in narrow space (narrow beam type)
- External sensitivity adjustment (except through-beam type)
- Light ON, Dark ON switchable by control wire (except through-beam type)
- Excellent environment-resistance performance with glass lens(BR4M)
- Protection structure IP66 (IEC standard)

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

Cable type



(MS-2)

Connector Type

(MST-□)

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

▣ Specifications

model	NPN open collector output	BRP100-DDT	BR100-DDT	BRP400-DDT	BR400-DDT	BRP200-DDTN	BR200-DDTN	BRP3M-MDT	BR3M-MDT	BR4M-TDTD	BR20M-TDTD	BR4M-TDTL	BR20M-TDTL
		BRP100-DDT-C	BR100-DDT-C	BRP400-DDT-C	BR400-DDT-C	BRP200-DDTN-C	BR200-DDTN-C	BRP3M-MDT-C	BR3M-MDT-C	BR4M-TDTD-C	BR20M-TDTD-C	BR4M-TDTL-C	BR20M-TDTL-C
	PNP open collector output	BRP100-DDT-P	BR100-DDT-P	BRP400-DDT-P	BR400-DDT-P	BRP200-DDTN-P	BR200-DDTN-P	BRP3M-MDT-P	BR3M-MDT-P	BR4M-TDTD-P	BR20M-TDTD-P	BR4M-TDTL-P	BR20M-TDTL-P
		BRP100-DDT-C-P	BR100-DDT-C-P	BRP400-DDT-C-P	BR400-DDT-C-P	BRP200-DDTN-C-P	BR200-DDTN-C-P	BRP3M-MDT-C-P	BR3M-MDT-C-P	BR4M-TDTD-C-P	BR20M-TDTD-C-P	BR4M-TDTL-C-P	BR20M-TDTL-C-P
Case		Plastic	Metal	Plastic	Metal	Plastic	Metal	Plastic	Metal	Metal			
Sensing type		Diffuse reflective type				Narrow beam reflective type		Retroreflective type		Through-beam type			
Sensing distance		100mm※1		400mm※2		200mm※2		3m※3		4m	20m	4m	20m
Sensing target		Opaque, translucent materials						Opaque materials of min. Ø60mm		Opaque materials of min. Ø15mm			
Hysteresis		Max. 20% at rated sensing distance						—					
Response time		Max. 1ms											
Power supply		12-24VDC⎓±10% (ripple P-P: max. 10%)											
Current consumption		Max. 45mA											
Light source		Infrared LED (940nm)		Infrared LED (850nm)				Red LED (660nm)		Infrared LED (850nm)			
Sensitivity adjustment		Sensitivity adjuster								Fixed			
Operation mode		Selectable Light ON or Dark ON by control wire (white)								Dark ON		Light ON	
Control output		NPN or PNP open collector output ●Load voltage: max. 30VDC⎓ ●Load current: max. 200mA ●Residual voltage - NPN: max. 1VDC⎓, PNP: max. 2.5VDC											
Protection circuit		Power reverse polarity protection circuit, output short over current protection circuit											
Indicator		Operation indicator: red LED, power indicator: red LED (only for emitter of through-beam type)											
Connection		Cable type, connector type											
Insulation resistance		Over 20MΩ (at 500VDC megger)											
Noise immunity		±240V the square wave noise (pulse width: 1μs) by the noise simulator											
Dielectric strength		1000VAC 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/s² (approx. 50G) in each X, Y, Z direction for 3 times											
Environment	Ambient illumination	Sunlight: max. 11,000lx, incandescent lamp: max. 3,000lx (receiver illumination)											
	Ambient temperature	-10 to 60℃, storage: -25 to 75℃											
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH											
Protection structure		IP66 (IEC standard) (BR20M Series: IP67)											
Material		●Case - BRP: polyamide (black) BR: brass, ni-plate ●Sensing part - polycarbonate lens						●Case - BRP: polyamide (black) BR: brass, ni-plate ●Sensing part - acrylic lens		●Case - brass, ni-plate ●Sensing part - BR4M: glass lens BR20M: polycarbonate lens			
Cable	Cable type	Ø5mm, 4-wire, 2m (emitter of through-beam type: Ø5mm, 2-wire, 2m / receiver: Ø5mm, 3-wire, 2m) (AWG22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.25mm)											
	Connector type	M12 connector											
Acce-ssory	Individual	Adjustment screwdriver						Adjustment screwdriver, Reflector (MS-2)		—			
	Common	● BR: M18 fixing nut: 2, washer: 1 ● BRP: M18 fixing nut: 2								● BR: M18 fixing nut: 4, washer: 2 ● BRP: M18 fixing nut: 4			
Approval		CE											
Weight※4		●BRP: approx. 140g (approx. 100g) ●BR: approx. 160g (approx. 120g) ●BRP-C: approx. 70g (approx. 30g) ●BR-C: approx. 90g (approx. 50g)								●BR: approx. 340g (approx. 300g) ●BR-C: approx. 150g (approx.110g)			

※1: Non-glossy white paper 50×50mm. ※2: Non-glossy white paper 100×100mm.
※3: The sensing distance is specified with using the MS-2 reflector. The distance between the sensor and the reflector should be set over 0.1m. When using reflective tapes, the reflectivity will vary by the size of the tape. Please refer to the catalog or website.
※4: The weight includes packaging. The weight in parenthesis is for unit only.
※Tightening torque for connector is 0.39 to 0.49N·m.
※The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

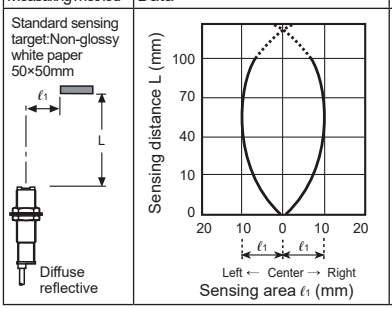
▣ Feature Data

◎ Diffuse reflective type / Narrow beam reflective type

●BR100-DDT-□(-P)/BRP100-DDT-□(-P)

Sensing area characteristic

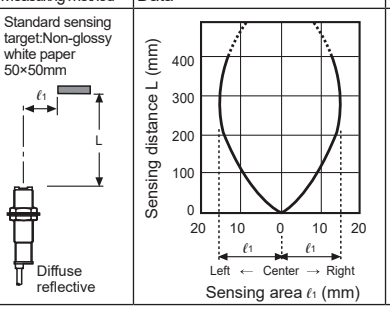
Measuring method | Data



●BR400-DDT-□(-P)/BRP400-DDT-□(-P)

Sensing area characteristic

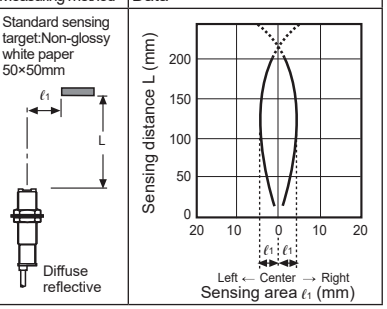
Measuring method | Data



●BR200-DDTN-□(-P)/BRP200-DDTN-□(-P)

Sensing area characteristic

Measuring method | Data

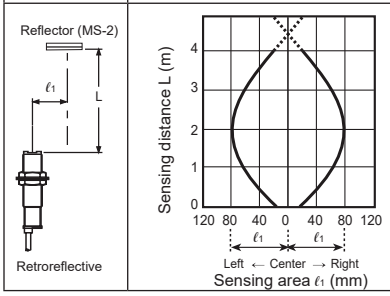


◎ Retroreflective type

● BR3M-MDT-□(-P) / BRP3M-MDT-□(-P)

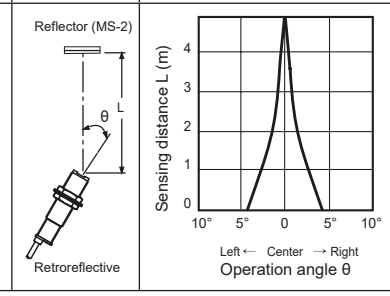
Parallel shifting characteristic

Measuring method | Data



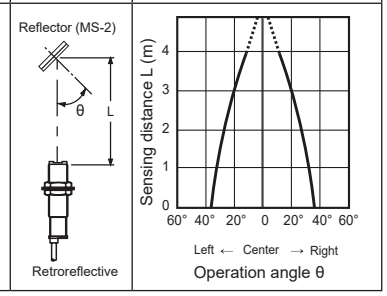
Parallel shifting characteristic

Measuring method | Data



Parallel shifting characteristic

Measuring method | Data

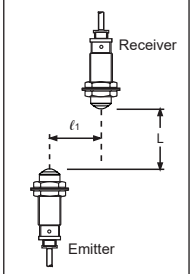


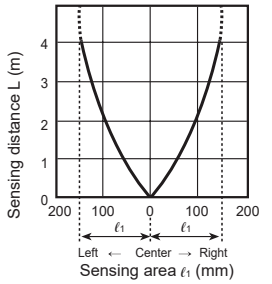
◎ Through-beam type

● BR4M-TDT□-□ / BR4M-TDT□-□-P

Parallel shifting characteristic

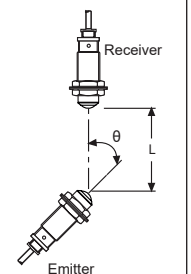
Measuring method | Data

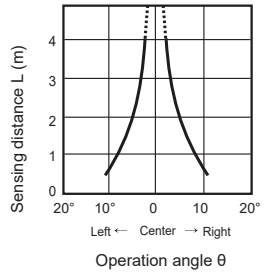




Angle characteristic

Measuring method | Data

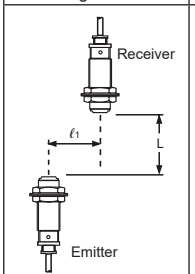


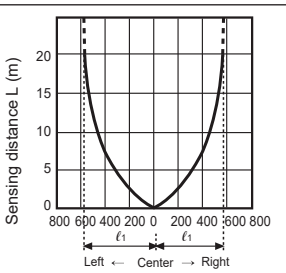


● BR20M-TDT□-□ / BR20M-TDT□-□-P

Parallel shifting characteristic

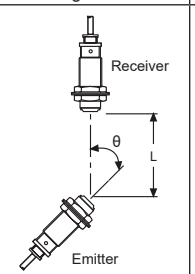
Measuring method | Data

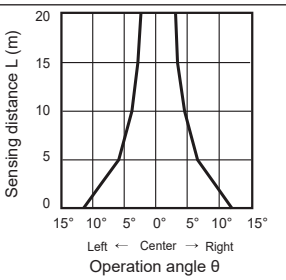




Angle characteristic

Measuring method | Data



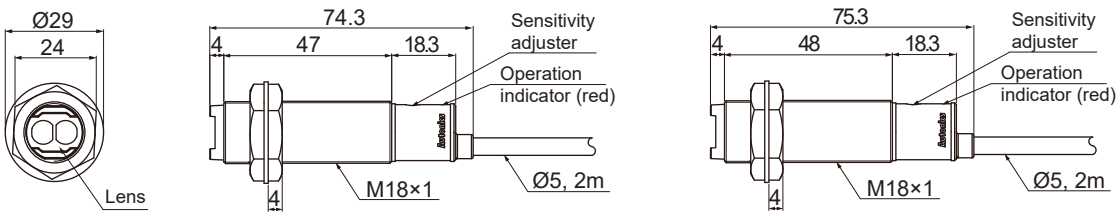


▣ Dimensions

(unit: mm)

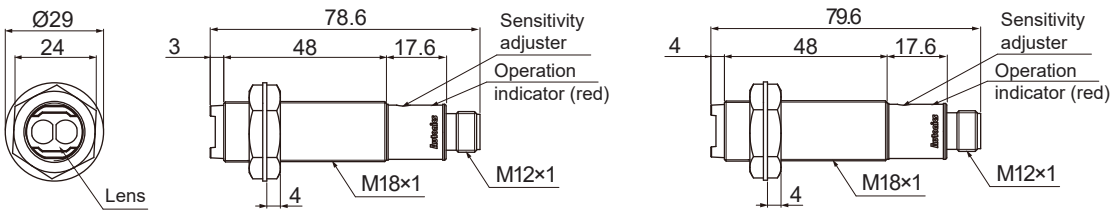
◎ Diffuse reflective/Narrow beam reflective/Retroreflective type

- **BR100-DDT(-P)** • **BR200-DDTN(-P)**
- **BR400-DDT(-P)**



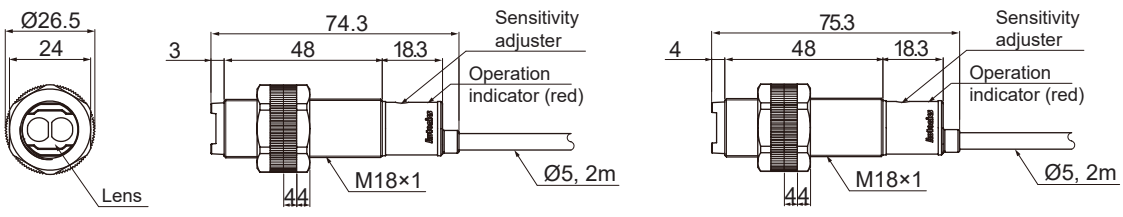
- **BR3M-MDT(-P)**

- **BR100-DDT-C(-P)** • **BR200-DDTN-C(-P)**
- **BR400-DDT-C(-P)**



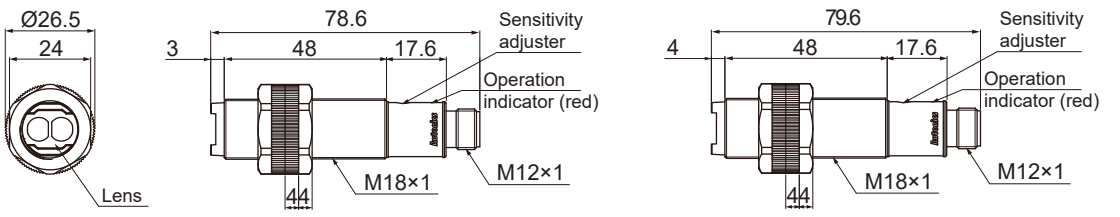
- **BR3M-MDT-C(-P)**

- **BRP100-DDT(-P)** • **BRP200-DDTN(-P)**
- **BRP400-DDT(-P)**



- **BRP3M-MDT(-P)**

- **BRP100-DDT-C(-P)** • **BRP200-DDTN-C(-P)**
- **BRP400-DDT-C(-P)**



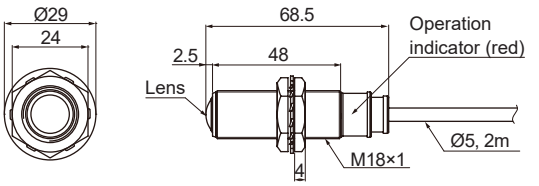
- **BRP3M-MDT-C(-P)**

◎ Through-beam type

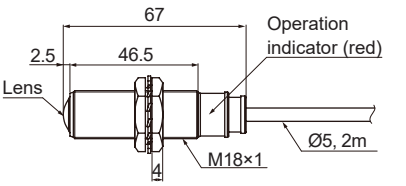
(unit: mm)

• BR4M-TDTD(-P) / BR4M-TDTL(-P)

<Emitter>

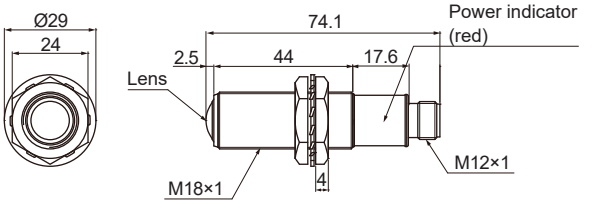


<Receiver>

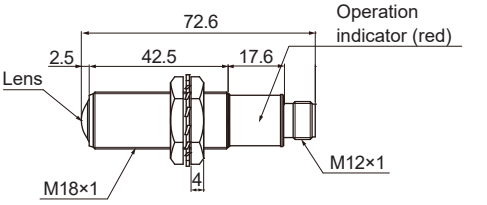


• BR4M-TDTD-C(-P) / BR4M-TDTL-C(-P)

<Emitter>

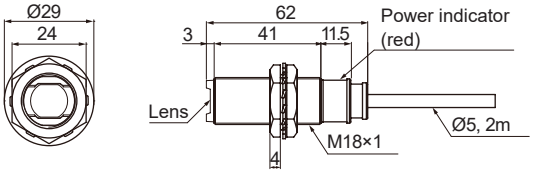


<Receiver>

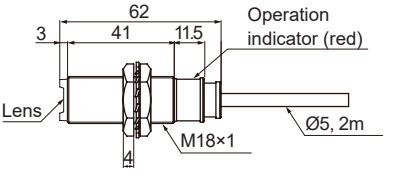


• BR20M-TDTD(-P) / BR20M-TDTL(-P)

<Emitter>

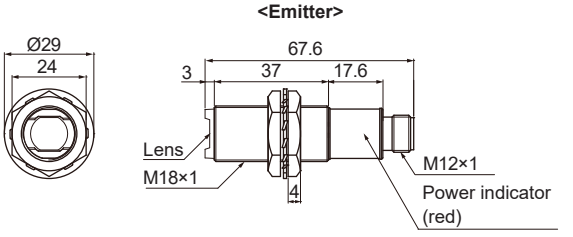


<Receiver>

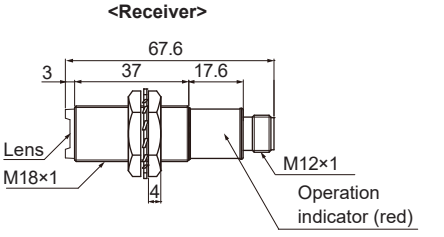


• BR20M-TDTD-C(-P) / BR20M-TDTL-C(-P)

<Emitter>

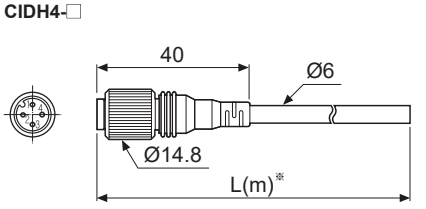


<Receiver>

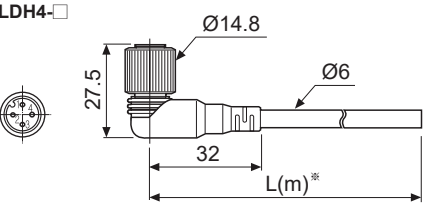


• Connection cable (sold separately)

· CIDH4-□

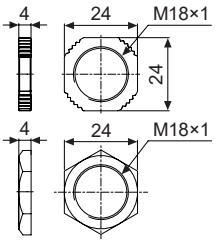


· CLDH4-□



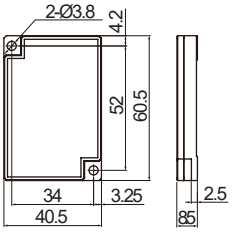
※Specifi cation of connector cable: Ø6mm, 4-wire, 2m/3m/5m/7m
(AWG22, core diameter: 0.08mm, number of cores: 60, insulator out diameter: Ø1.65mm)

● **M18 fixing nut**

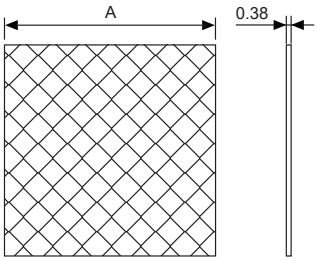


● **Reflector**

· **MS-2**



● **Reflective tape (sold separately)**



(unit: mm)

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

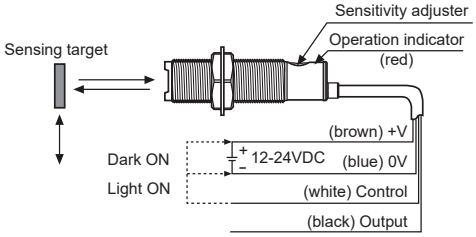
▣ Operation Mode

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	ON OFF	ON OFF

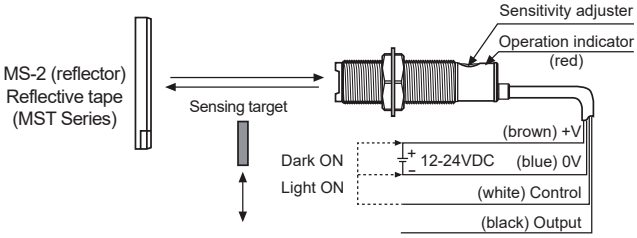
※The transistor output will be held OFF for 0.5 sec after supplied power in order to prevent malfunction of this photoelectric sensor (except through-beam type).

▣ Connections

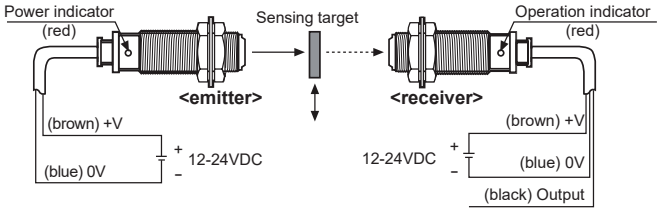
● **Diffuse reflective type / Narrow beam reflective type**



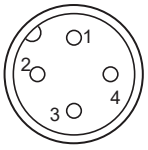
● **Retroreflective type**



● **Through-beam type**



▣ Connections for Connector Part



M12 Connector pin

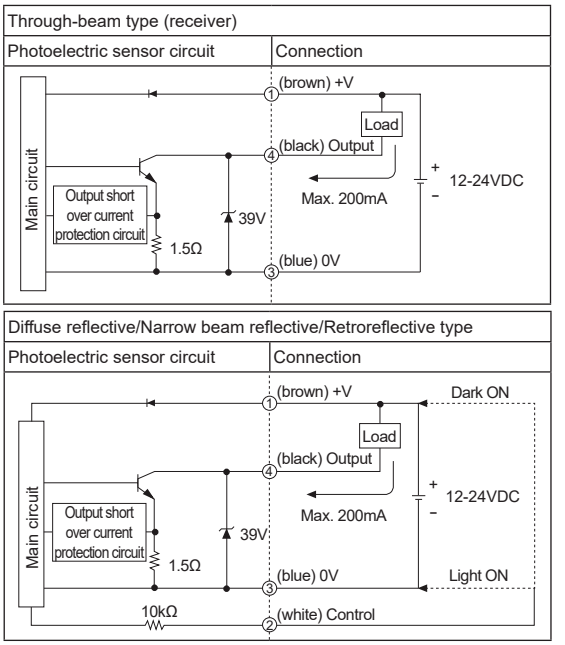
Pin No.	Cable color	Application		
		Diffuse/ Narrow beam reflective/ Retroreflective type	Through-beam type	
			Emitter	Receiver
1	Brown	24VDC	24VDC	24VDC
2	White	CONTROL	N·C	GND
3	Blue	GND	GND	GND
4	Black	OUTPUT	N·C	OUTPUT

● Connector cable (sold separately)

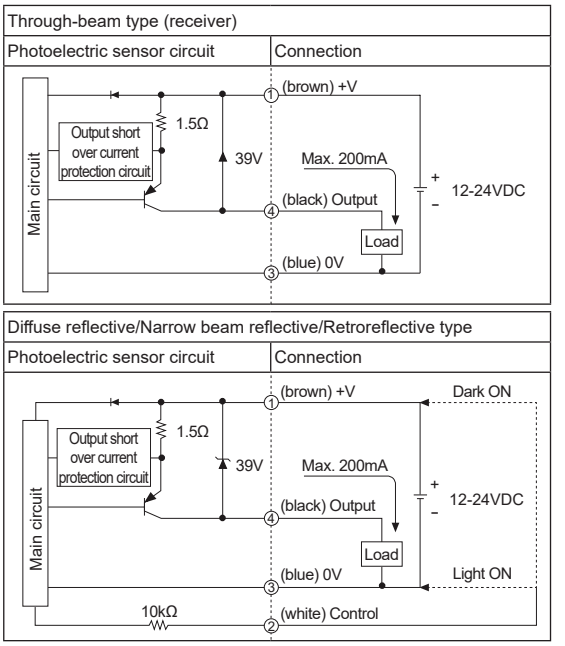
※Please refer to the connector cable section.

▣ Control Output Diagram

● NPN open collector output



● PNP open collector output



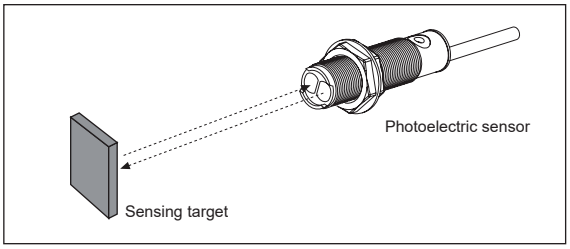
※Before using this unit, select Light ON/Dark ON with control wire. (light on: connect control wire 0V / dark on: connect control wire with +V)
※Control wire is only for Diffuse reflective/Narrow beam reflective/Retroreflective type.
※If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

▣ Installation and Sensitivity Adjustment

Install the sensor to the desired place and check the connections. Supply the power to the sensor and adjust the optical axis and the sensitivity as following.
When using 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 0.39N·m for BRP and to 14.7N·m for BR.

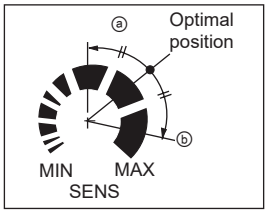
◎ Diffuse reflective/Narrow beam reflective type

1. The sensitivity should be adjusted depending on a sensing target or mounting place.



2. Set the target at a position to be detected by the beam, then turn the sensitivity adjuster until position ⓐ where the operation indicator turns ON from min. position of the sensitivity adjuster.
3. Take the target out of the sensing area, then turn the sensitivity adjuster until position ⓑ where the operation indicator turns ON. If the indicator dose not turn ON, max. position is ⓑ.
4. Set the sensitivity adjuster at the center of two switching position ⓐ, ⓑ.

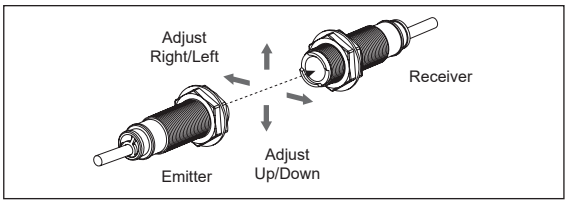
※Be sure that it can be different by size, surface and gloss of target.



◎ Through-beam type

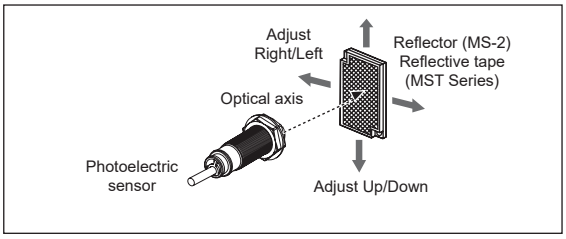
1. Supply the power to the photoelectric sensor, after setting the emitter and the receiver facing each other.
2. Set the receiver in center of position in the middle of the operation range of indicator by adjusting the receiver or the emitter right and left, up and down.
3. After the adjustment, check the stability of operation putting the object at the optical axis.

※If the sensing target is translucent body or smaller than Ø15, it can be missed by sensor cause light penetrate it.



◎ Retroreflective type

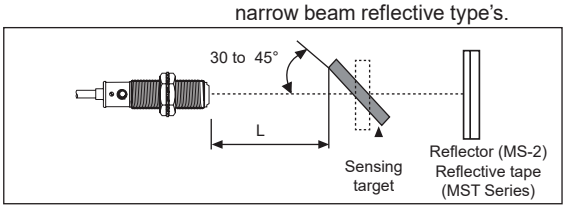
1. Supply the power to the photoelectric sensor, after setting the photoelectric sensor and the reflector (MS-2) or reflective tape face to face.
2. Set the photoelectric sensor in the position which indicator turns on, as adjusting the reflector or the sensor right and left, up and down.
3. Fix both units tightly after checking that the unit detects the target.



※If using more than 2 photoelectric sensors in parallel, the space among them should be more than 30cm.

※If reflectance of target is higher than non-glossy white paper, it might cause malfunction by reflection from the target when the target is near to photoelectric sensor. Therefore put enough space between the target and the photoelectric sensor or the surface of the target should be installed at angle of 30 to 45° against optical axis. (when a sensing target with high reflectance near by, photoelectric sensing with the polarizing filter should be used.)

※Sensitivity adjustment: Refer to the diffuse reflective/ narrow beam reflective type's.



※If the mounting place is too narrow, please use MS-4 instead of MS-2.

※Please use reflective tape (MST Series) for where a reflector is not installed.


<MS-4>

▣ Reflectivity by Reflective Tape Model

MST-50-10 (50×50mm)	80%
MST-100-5 (100×100mm)	120%
MST-200-2 (200×200mm)	140%

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

※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.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Photoelectric Sensors ***category:***

Click to view products by Autonics ***manufacturer:***

Other Similar products are found below :

E3JM-DS70R4T-US E3L2DC4 E3RA-DN12 2M E3RA-DP12 2M E3S5LE4S E3S-AD38 E3S-CR11 5M E3SCT11D5M E3SCT11M1J03M E3T-SL14R E3T-SL24 5M E3T-ST12R E3X-CN02 E3X-CN11 5M E3X-CN21 10M E3ZM-B66 E3ZM-CL81H 2M E3Z-T62 2M NJL5303R-TE1 PB10CNT15PO PD60CNX20BP CX-491-P-J CX-491-Z XUM2BKCNL2T XUM2BKCNL2T XUM2BNANL2R Y92E-ES30M Y92E-GS08SS ZXTDS04T ZX-XC4A 4M E3E23Y2US E3JM-DS70S4-US E3RA-RN11 2M E3S5LE42M E3S-LS20XB4 5M E3TFD14N E3T-FD14R E3T-SL21 5M E3T-SL21M E3T-ST11R E3T-ST12 5M E3X-DA41-S-M1J 0.3M E3X-DAB6 E3X-DAG8 E3ZM-B86 E3ZM-CR81 2M E3ZM-CR86 E3Z-T61A-L 2M ZX-XGC2R ZX-XB1A