

DC Cylindrical Housing Type

Upgraded cylindrical photoelectric sensor

■ Features

- Detects up to 20m (Transmitted beam type)
- Noise resistant with digital signal processing
- Narrow beam type diffuse reflective sensor using in a narrow space
- 1ms High speed response time
- Reverse power polarity and short-circuit (Overcurrent) protection circuit
- External sensitivity adjustment (Diffuse reflective type, Retroreflective type)
- High environmental resistance BR4M Series with mirror lens

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



■ Specifications

| Model | NPN open collector | BRP100-DDT | BR100-DDT | BRP400-DDT | BR400-DDT | BRP200-DDTN | BR200-DDTN | BRP3M-MDT | BR3M-MDT | BR4M-TDTD BR20M-TDTD | BR4M-TDTL BR20M-TDTL |
|------------------------|---|--|----------------------|--------------|---------------------------------------|---------------|---|-------------|--------------------------------------|--|-----------------------------|
| | PNP open collector | 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 |
| Sensing type | Diffuse reflective (Diffusion type) | | | | Diffuse reflective (Narrow beam type) | | Retroreflective | | Transmitted beam | | |
| Sensing distance | 100mm (★1) | | 400mm (★2) | | 200mm (★2) | | 0.1~3m (★3) | | 4m / 20m | | |
| Sensing target | Transparent, Translucent, Opaque materials | | | | | | Opaque materials of Min. ϕ 60mm | | Opaque materials of Min. ϕ 15mm | | |
| Hysteresis | Max. 20% at rated setting distance | | | | | | — | | | | |
| Response time | Max. 1ms | | | | | | | | | | |
| Power supply | 12~24VDC \pm 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 | Adjustable (VR) | | | | | | | | | Fixed | |
| Operation mode | Light ON / Dark ON selectable by control wire (White) | | | | | | | | | Dark ON | Light ON |
| Control output | NPN open collector output \Rightarrow Load voltage:Max. 30VDC, Load current:Max. 200mA, Residual voltage:Max. 1V PNP open collector output \Rightarrow Output voltage:Min. power voltage-2.5V, Load current:Max. 200mA | | | | | | | | | | |
| Protection circuit | Short-circuit protection, Reverse polarity protection | | | | | | | | | | |
| Indication | Power indicator (Emitter):Red LED, Operation indicator (Receiver):Red LED | | | | | | | | | | |
| Connection | Outgoing cable | | | | | | | | | | |
| Insulation resistance | Min. 20M Ω (at 500VDC mega) | | | | | | | | | | |
| Noise strength | \pm 240V the square wave noise (pulse width:1 μ s) by the noise simulator | | | | | | | | | | |
| Dielectric strength | 1000VAC 50/60Hz for 1 minute | | | | | | | | | | |
| Vibration | 1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours | | | | | | | | | | |
| Shock | 500m/s ² (50G) in X, Y, Z directions for 3 times | | | | | | | | | | |
| Ambient illumination | Sunlight : Max. 11,000lx, Incandescent lamp : Max. 3,000lx | | | | | | | | | | |
| Storage temperature | -10 ~ +60 $^{\circ}$ C (at non-freezing status) Storage : -25 ~ +70 $^{\circ}$ C | | | | | | | | | | |
| Ambient humidity | 35 ~ 85%RH, Storage : 35 ~ 85%RH | | | | | | | | | | |
| Protection | IP66 (IEC standard) | | | | | | | | | | |
| Material | <ul style="list-style-type: none"> • BR \Rightarrow Case : Brass (Cr-plate), Lens : PC • BRP \Rightarrow Case : PA (Nylon, Black), Lens : PC | | | | | | <ul style="list-style-type: none"> • Case \Rightarrow BR3M : Brass (Cr-plate) BRP3M : PA (Nylon, Black) • Lens \Rightarrow PMMA | | | <ul style="list-style-type: none"> • Case \Rightarrow Brass (Cr-plate) • Lens \Rightarrow BR4M-Glass BR2M-PC | |
| Cable | 4P, ϕ 5mm, Length : 2m | | | | | | | | | Emitter:2P, ϕ 5mm, Length:2m Receiver:3P, ϕ 5mm, Length:2m | |
| Accessory | Individual | Adjustment driver | | | | | Adjustment driver, Reflector (MS-2) | | — | | |
| | Common | BR : Fixing nuts, Washer / BRP : Fixing nuts | | | | | | | | | |
| Approval | CE | | | | | | | | | | |
| Unit weight | • BR series : Approx. 120g | | | | • BRP series : Approx. 100g | | | | Approx. 300g | | |

※ (★1) Non-glossy white paper 50×50mm (★2) Non-glossy white paper 100×100mm.

(★3) Detecting distance and detecting target for Retroreflective type is rated based on mirror (MS-2). Detecting distance indicates possible reflective mirror setting range. Sensing under 0.1m is also available.

(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

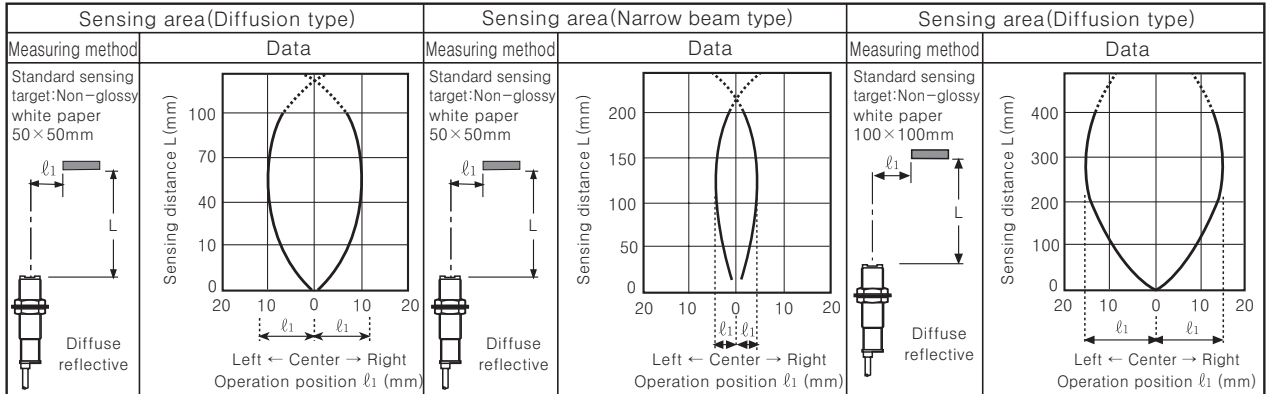
(P) Production stoppage models & replacement

BR Series

Feature data

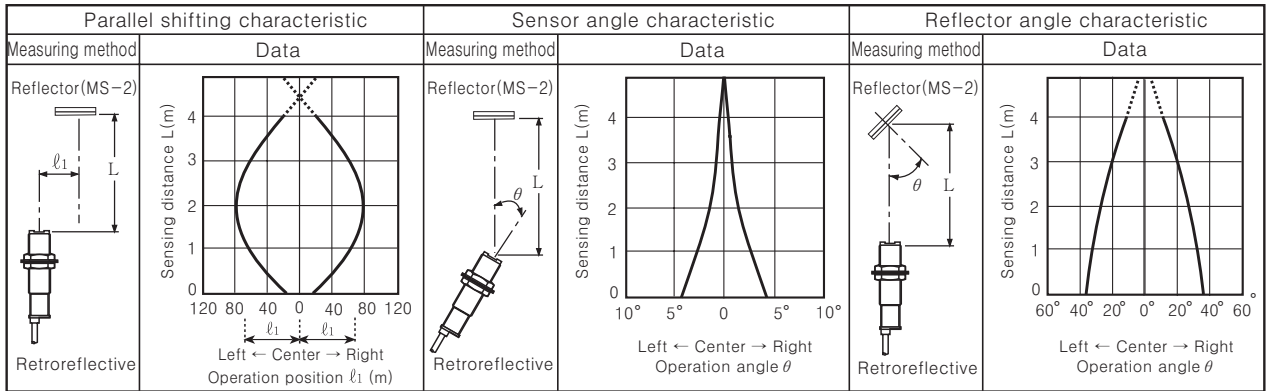
Diffuse reflective

●BR100-DDT(-P)/BRP100-DDT(-P) ●BR200-DDTN(-P)/BRP200-DDTN(-P) ●BR400-DDT(-P)/BRP400-DDT(-P)



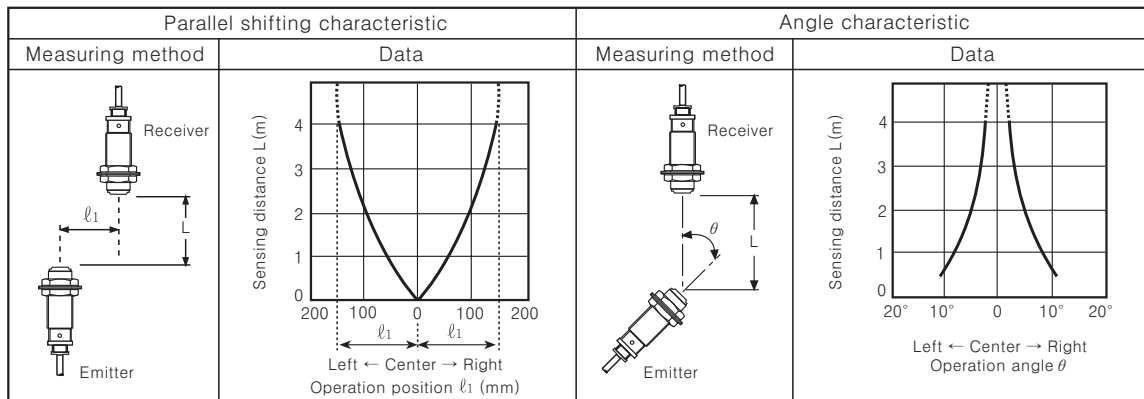
Retroreflective

●BR3M-MDT(-P) / BRP3M-MDT(-P)

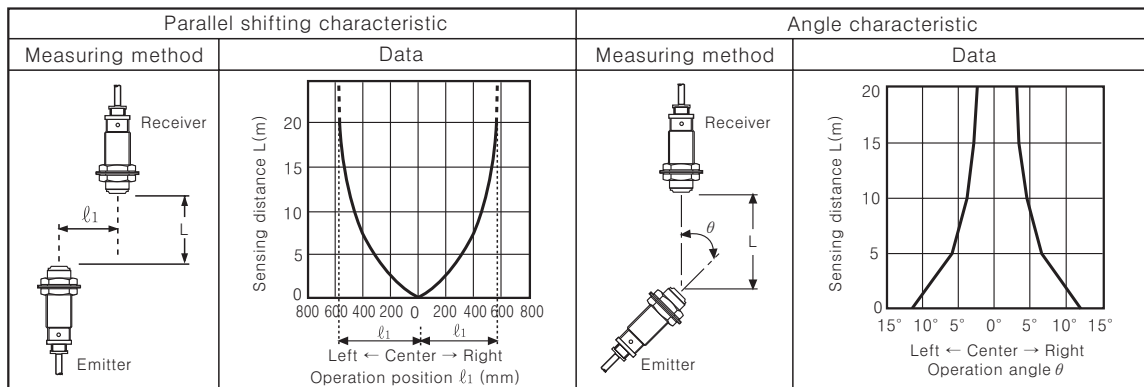


Through-beam

●BR4M-TDT□ / BR4M-TDT□-P



●BR20M-TDTD(-P) / BR20M-TDTL(-P)

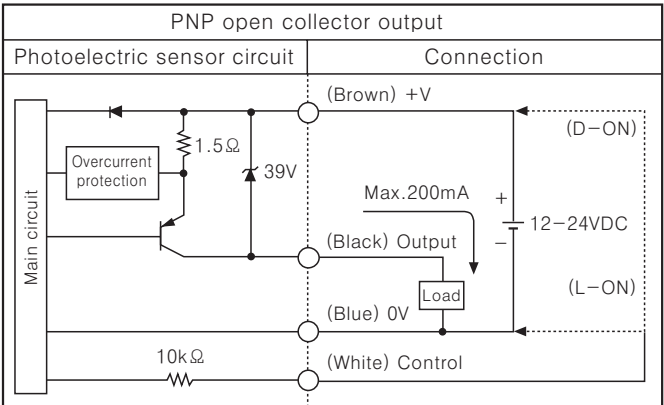
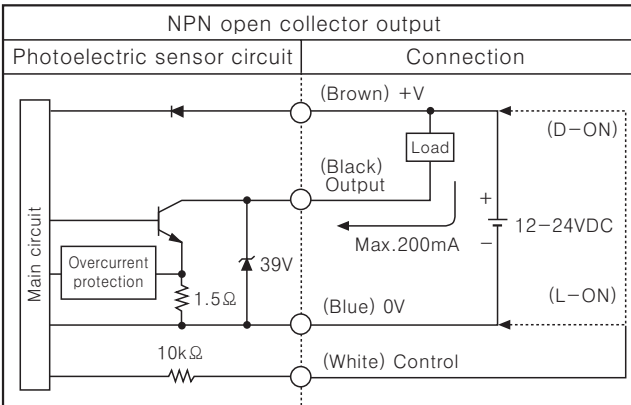


DC Cylindrical Housing Type

Control output diagram

- BR(P)100-DDT / BR(P)200-DDTN / BR(P)400-DDT
- BR(P)3M-MDT
- BR20M-TDTD2 / BR20M-TDTL2 (Receiver)

- BR(P)100-DDT-P / BR(P)200-DDTN-P / BR(P)400-DDT-P
- BR(P)3M-MDT-P
- BR20M-TDTD2-P / BR20M-TDTL2-P (Receiver)



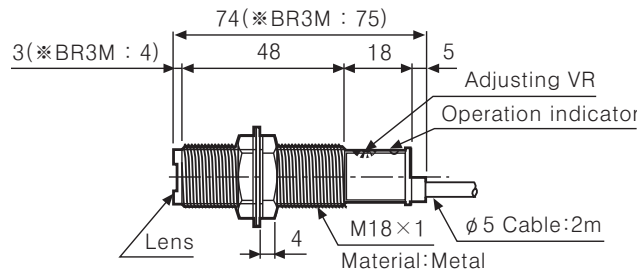
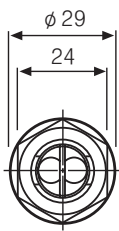
※Select Light ON / Dark ON by control wire. Light ON : Connect control wire to 0V
 Dark ON : Connect control wire to +V

※Control wire is available only for diffuse reflective type and retroreflective type.

Dimensions

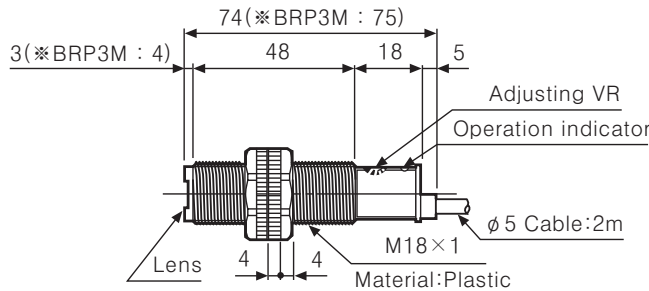
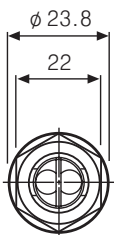
- BR100-DDT / BR100-DDT-P
- BR400-DDT / BR400-DDT-P

- BR200-DDTN / BR200-DDTN-P
- BR3M-MDT / BR3M-MDT-P (※)

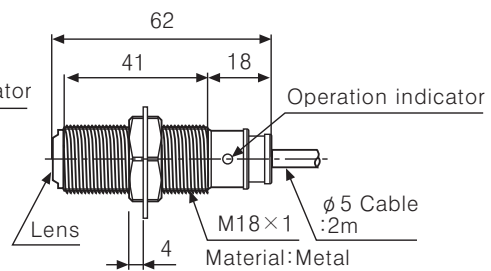
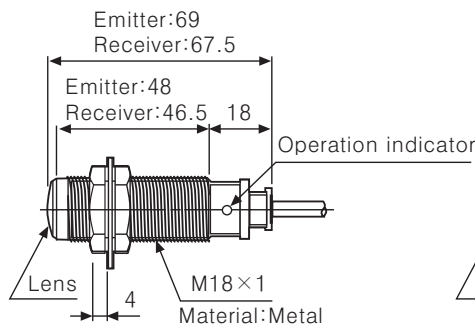
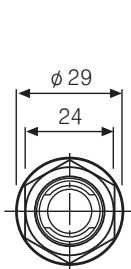


- BRP100-DDT / BRP100-DDT-P
- BRP400-DDT / BRP400-DDT-P

- BRP200-DDTN / BRP200-DDTN-P
- BRP3M-MDT / BRP3M-MDT-P (※)



- BR4M-TDTD / BR4M-TDTD-P / BR4M-TDTL / BR4M-TDTL-P
- BR20M-TDTD / BR20M-TDTD-P / BR20M-TDTL / BR20M-TDTL-P



< BR4M Series >

< BR20M Series >

(Unit:mm)

(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

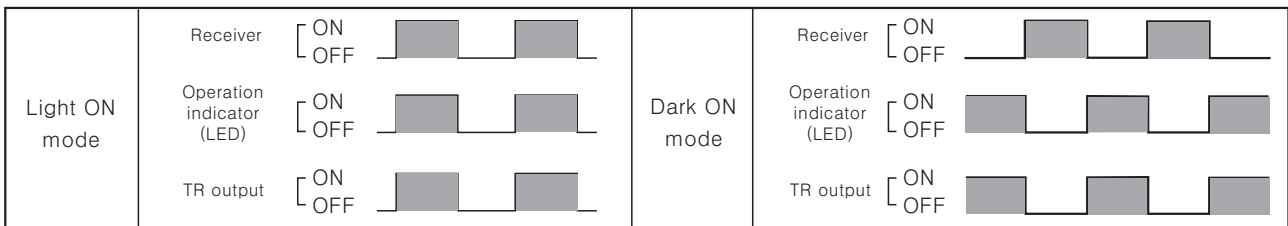
(N) Stepping motor & Driver & Controller

(O) Graphic panel

(P) Production stoppage models & replacement

BR Series

Operation mode

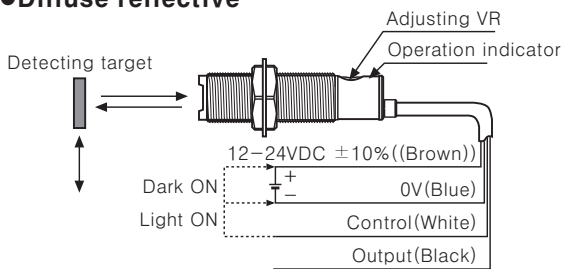


※The control output TR will be held OFF for 0.5 sec. after supplied power in order to prevent malfunction of this photoelectric sensor (Diffuse reflective, retroreflective).

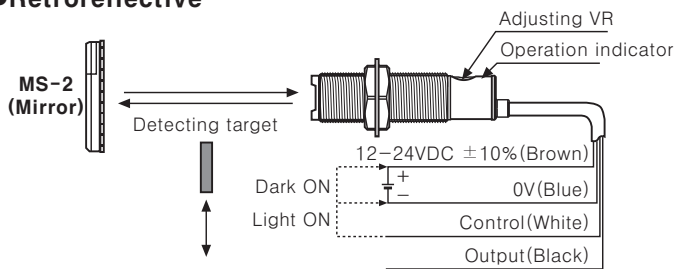
※If the control output terminal is short-circuited or flow beyond rating current, the control signal will not be output normally due to protection circuit.

Connections

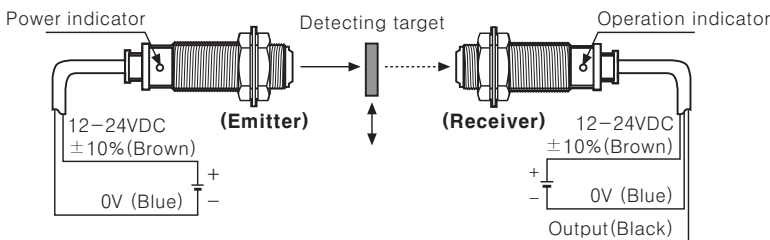
Diffuse reflective



Retroreflective



Transmitted beam

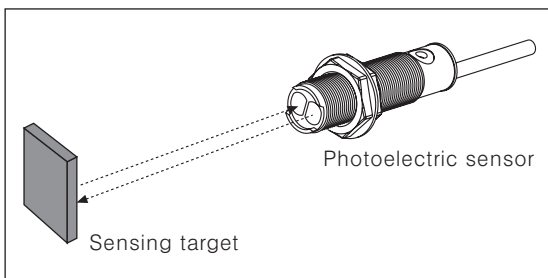


Mounting and sensitivity adjustment

Please supply the power to the sensor after mount the emitter and the receiver facing each other, and then adjust an optical axis and the sensitivity as follow;

Diffuse Reflective type

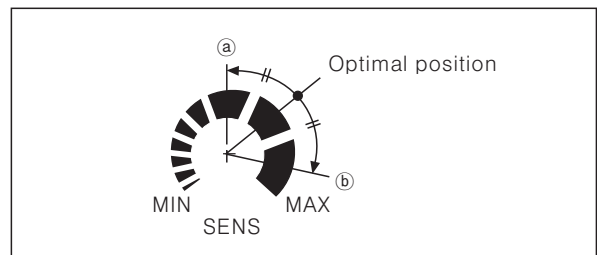
1. The sensitivity should be adjusted depending on a sensing target or mounting place.



2. Set the target at a position to be detected by the beam, then turn the adjuster until position ① in the middle of the operation range of indicator from Min. position of the adjuster.

3. Take the target out of the sensing area, then turn the adjuster until position ② in the middle of the operation range of indicator. If the indicator does not turn on, max. position is position ②.
4. Set the adjuster in the middle of two switching position ①, ②.

※The sensing distance indicated in the specification chart is that of non-glossy white paper in the target size 50×50mm. Be sure that it can be different by size, surface and gloss of target.

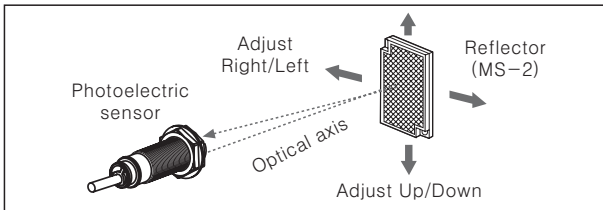


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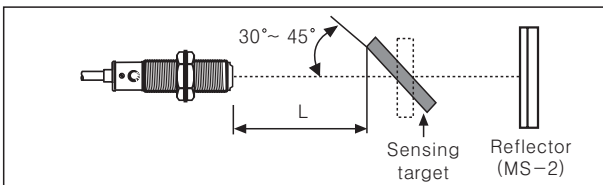
○Retroreflective type

1. Supply the power to the photoelectric sensor, after set the photoelectric sensor and the reflector (MS-2) facing each other.
2. Set the photoelectric sensor in the middle of the operation range of indicator adjusting the reflector or the sensor right and left, up and down.
3. Adjust up and down direction as the same.
4. After adjustment, check the stability of operation putting the object at the optical axis.

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



- ※If use more than 2 photoelectric sensors in parallel, the space between 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 photo sensor. Therefore put enough space between the target and photoelectric sensor or the surface of target should be installed at an angle of $30^\circ \sim 45^\circ$ against optical axis. (When detecting target with high reflectance near by, photoelectric sensor with the polarizing filter should be used.)
- ※Sensitivity adjustment : Please refer to the diffuse reflective type.

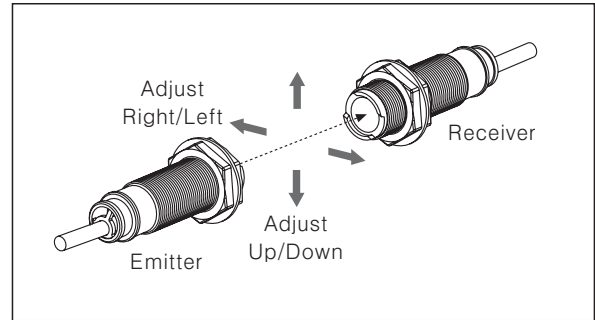


- ※If the mounting place is too small, please use MS-4 instead of MS-2 for same sensing distance.



○Transmitted Beam type

1. Supply the power to the photoelectric sensor, after mount 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 adjusting the receiver and the emitter right and left, up and down.
3. Fix both units tightly after checking that the unit detect the target.



(A) Counter

(B) Timer

(C) Temp. controller

(D) Power controller

(E) Panel meter

(F) Tacho/Speed/Pulse meter

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