Small and light, common type photoelectric sensor

▣Features

- ●Easy to mount at a narrow space with small size and light weight.
- ●Convenient to adjust the sensitivity by external sensitivity adjustment contol. (Applied to diffuse reflective type only)
- ●Easy to mount by screw type in mounting hole.
- ●Reverse power polarity protection circuit.

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

(MS-2) (MS-5)

※MS-5 is sold separately.

▣Specifications

Model		BM3M-TDT	BM1M-MDT	BM200-DDT
Sensing type		Transmitted beam	Retroreflective	Diffuse reflective
Sensing distance		3m	(*1) 0.1 ~ 1m	(*2) 200mm
Sensing target		Opaque materials of Min. ϕ8mm	Opaque materials of Min. ϕ60mm	Transparent, Translucent, Opaque materials
Hysteresis		————		Max. 10% at rated setting distance
Response time		Max. 3ms		
Power supply		12-24VDC ±10%(Ripple P-P : Max. 10%)		
Current consumption		Max. 45mA	Max. 40mA	
Light source		Infrared LED(modulated)		
Sensitivity adjustment		Fixed		Adjuster
Operation mode		Dark ON		Light ON
Control output		NPN open collector output ☞ Load voltage : Max. 30VDC, Load current : Max. 100mA, Residual voltage : Max. 1V		
Protection circuit		Reverse polarity protection		
Indication		Operation indicator : Red LED		
Connection		Outgoing cable		
Insulation resistance		Min. 20MΩ(at 500VDC mega)		
Noise strength		±240V the square wave noise(pulse width:1㎲) by the noise simulator		
Dielectric strength		1,000VAC 50/60Hz for 1minute		
Vibration		1.5mm amplitude at frequency of 10 ~ 55Hz in each of X, Y, Z directions for 2 hours		
Shock		500m/s² (50G) in X, Y, Z directions for 3 times		
Ambient illumination		Sunlight : Max. 11,000ℓx, Incandescent lamp : Max. 3,000ℓx		
Ambient temperature		-10 ~ +60℃(at non-freezing status), Storage : -25 ~ +70℃		
Ambient humidity		35 ~ 85%RH, Storage : 35 ~ 85%RH		
Material		Case : ABS, Lens : PMMA		
Cable		3P(2P for Transmitted beam type), ϕ4mm, Length : 2m		
Accessories	Individual	————	Reflector(MS-2)	Adjustment driver
	Common	Fixing bracket, Bolts/nuts		
Approval		CE		
Unit weight		Approx. 170g	Approx. 105g	Approx. 88g

※**(*1)**It is mounting distance between sensor and reflector MS-2 and it is same when MS-5 is used. It is detectable under 0.1m.

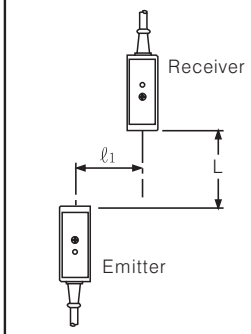
※**(*2)**It is for Non-glossy white paper(100×100mm)

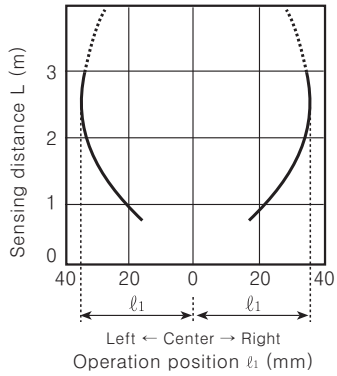
▣Feature data

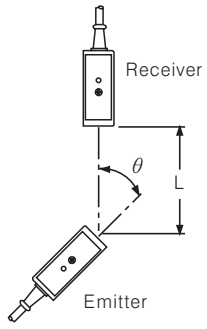
◎Transmitted beam

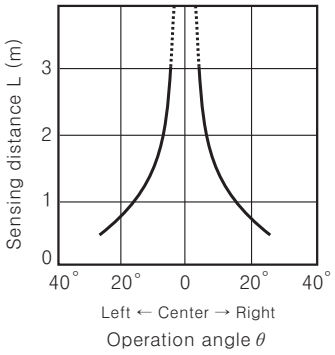
●BM3M-TDT

Parallel shifting characteristic		Angle characteristic	
Measuring method	Data	Measuring method	Data





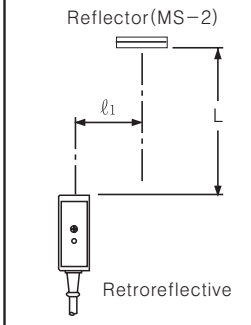


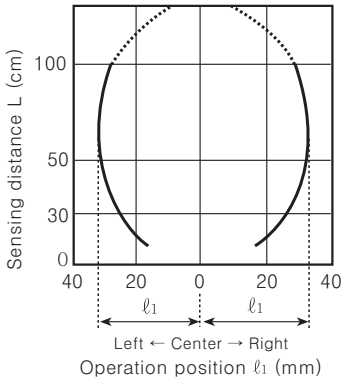


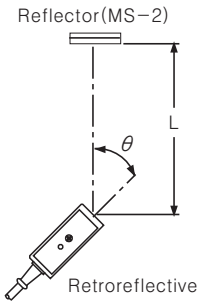
◎Retroreflective

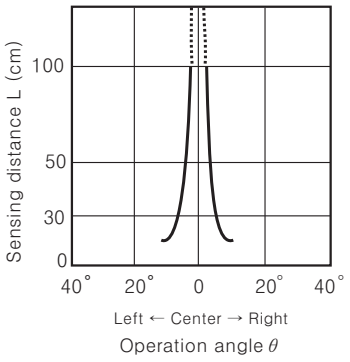
●BM1M-MDT

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





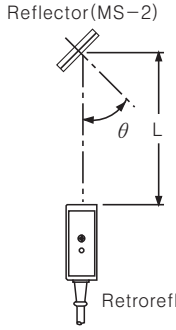


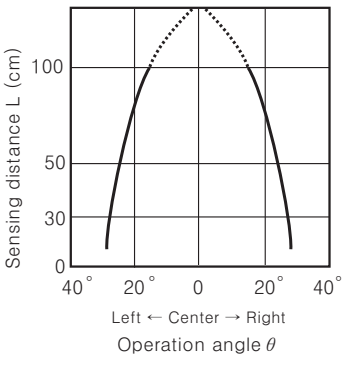


◎Retroreflective

●BM1M-MDT

Reflector angle characteristic	
Measuring method	Data



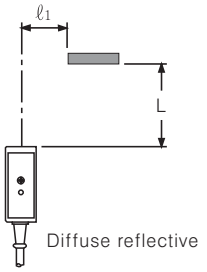


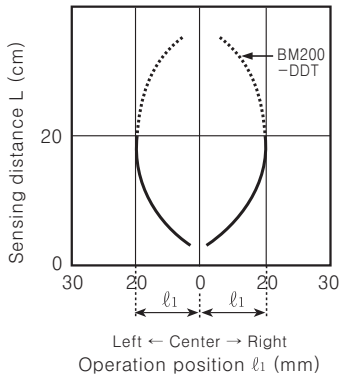
◎Diffuse reflective

●BM200-DDT

Sensing area characteristic	
Measuring method	Data

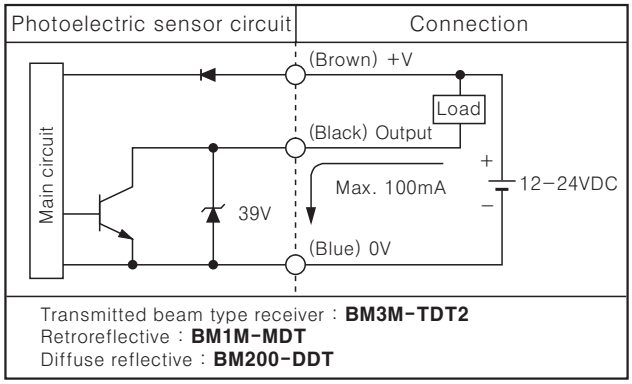
Standard sensing target
: Non-glossy white paper
200×200mm





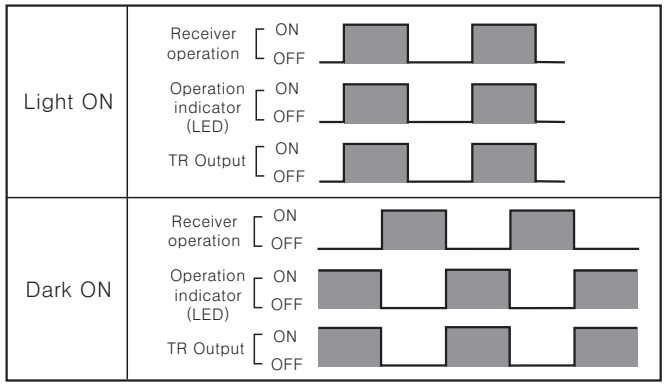
Amplifier Built-in Type for General Purpose

▣Control output diagram

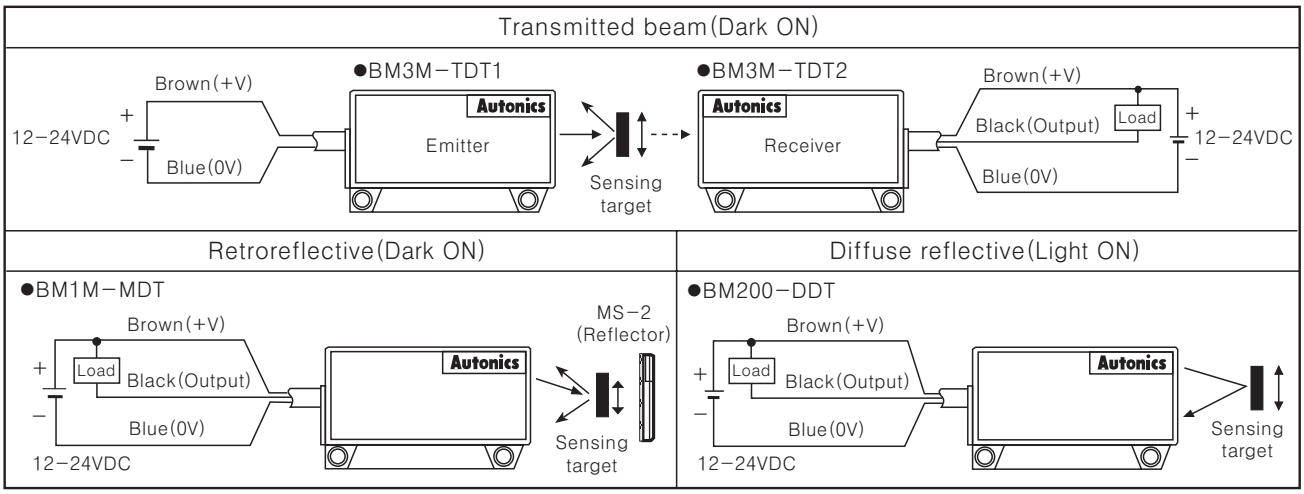


Transmitted beam type receiver : **BM3M-TDT2**
Retroreflective : **BM1M-MDT**
Diffuse reflective : **BM200-DDT**

▣Operation mode

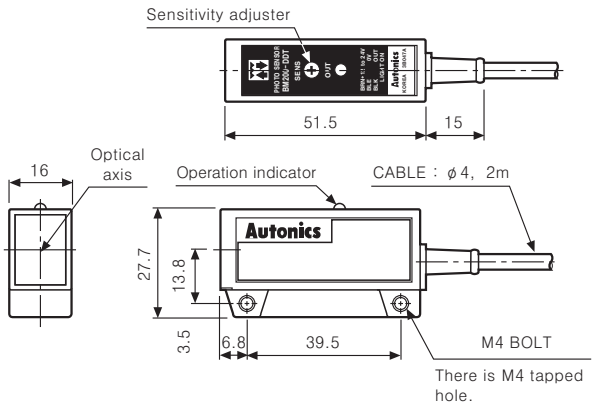


▣Connections

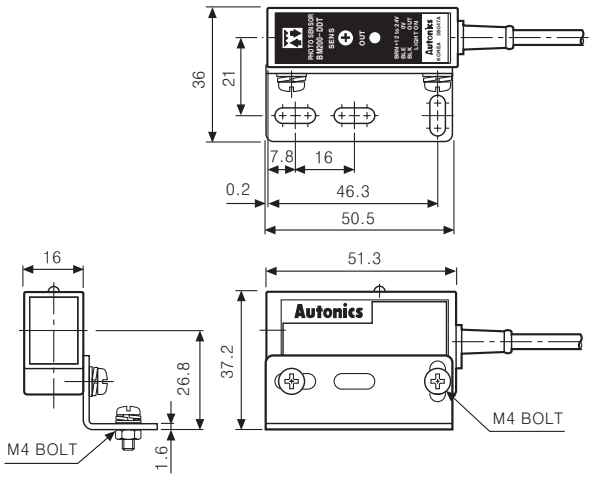


▣Dimensions

●Product

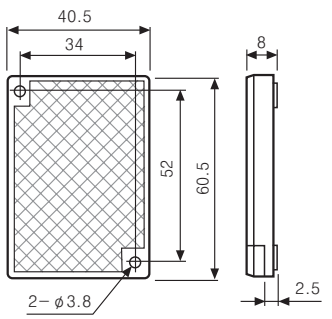


●Bracket

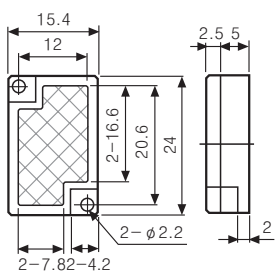


●Reflector

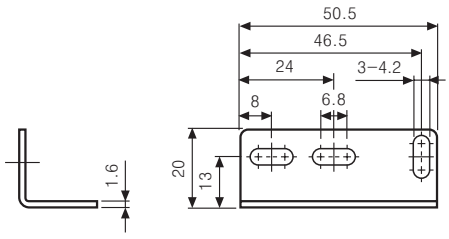
〈 MS-2 〉



〈 MS-5 〉



●Bracket



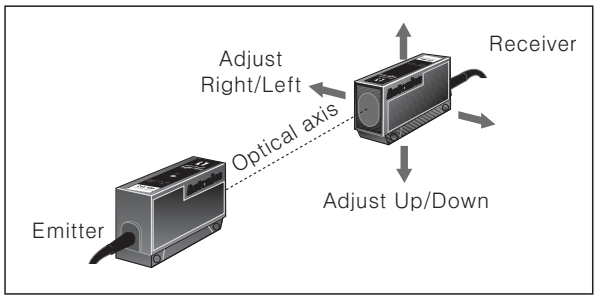
(Unit:mm)

▣Mounting and sensitivity adjustment

◎Transmitted beam type

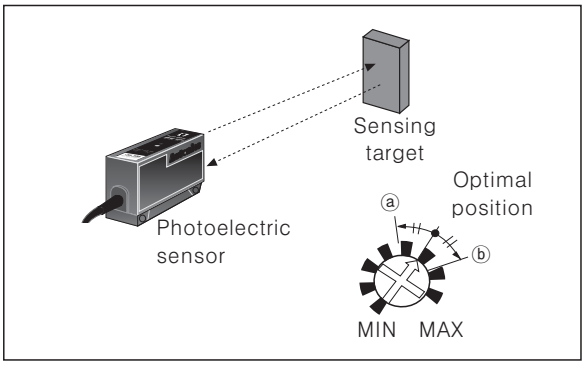
1. Supply the power to the photoelectric sensor, after set the emitter and the receiver facing each other.
2. Set the receiver in the middle of the operation range of indicator adjusting the receiver or the emitter right and left, up and down.
3. Adjust up and down direction as the same.
4. After adjustment,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

※If the sensing target is translucent body or smaller than ϕ8mm, it can be missed by sensor because light penetrate it.



◎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 ⓐ where the indicator turns on from min. position of the adjuster.
3. Take the target out of the sensing area, then turn the adjuster until position ⓑ where the indicator turns on. If the indicator does not turn on, Max. position is position ⓑ.
4. Set the adjuster at the center of two switching position ⓐ, ⓑ.

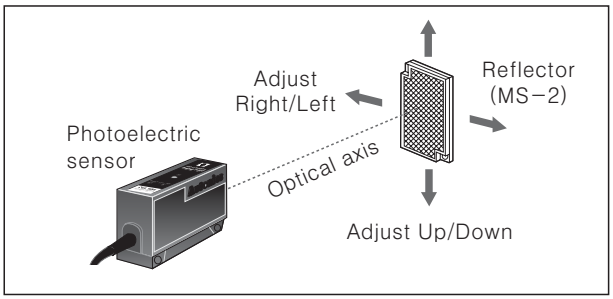


※The sensing distance indicated on specification chart is for 200×200mm of non-glossy white paper. Be sure that it can be different by size, surface and gloss of target.

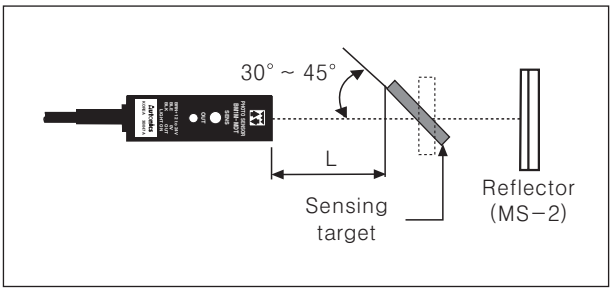
◎Retroreflective type

1. Supply the power to the photoelectric sensor, after set the emitter and the reflector(MS-2) facing to each other.
2. Set the reflector or photoelectric sensor in the middle of the operation range of indicator adjusting the mirror 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 reflectance of target is higher than non-glossy white paper, it might cause malfunction by reflection from the target when thr target is nead to photoelectric sensor.
Therefore enough space between the target should be used and photoelectric sensor or the surface of target should be installed at an angle of 30° ~45° against optical axis.



※If the installing place is too small, please use MS-5 instead of MS-2 for same sensing distance.