BMS Series

High speed response type with built-in output protection circuit

▣Features

- Reverse power polarity and overcurrent
- High speed response : Under 1ms
- Light ON/Dark ON mode selectable by control wire.
- Built-in the sensitivity adjuster.
  (Except for transmitted beam type)

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

CE

(MS-2) (MS-5)

※MS-5 is sold separately.

▣Specifications

Model	BMS5M-TDT BMS5M-TDT-P	BMS2M-MDT BMS2M-MDT-P	BMS300-DDT BMS300-DDT-P
Sensing type	Transmitted beam	Retroreflective	Diffuse reflective
Sensing distance	5m	(*1) 0.1 ~ 2m	(*2) 300mm
Sensing target	Opaque materials of min. φ10mm	Opaque materials of min. φ60mm	Transparent, Translucent, Opaque materials
Hysteresis	————		Max. 20% at rated setting distance
Response time	Max. 1ms		
Power supply	12-24VDC ±10%(Ripple P-P : Max. 10%)		
Current consumption	Max. 50mA	Max. 45mA	
Light source	Infrared LED(modulated)		
Sensitivity adjustment	————	Adjuster	
Operation mode	Light ON, Dark ON selectable by control wire		
Control output	●NPN open collector output ☞ Load voltage : Max. 30VDC, Load current : Max. 200mA, Residual voltage: Max. 1V ●PNP open collector output ☞ Output voltage : Min. (Power supply-2.5)V, Load current : Max. 200mA		
Protection circuit	Reverse power polarity, Output short-circuit(Overcurrent) protection circuit		
Indicator	Operation indicator : Red LED, Power indicator : Red LED(BMS5M-TDT1)		
Connection	Outgoing cable		
Insulation resistance	Min. 20MΩ (at 500VDC mega)		
Noise strength	±240V the square wave noise(pulse width:1μs) by the noise simulator		
Dielectric strength	1000VAC 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(Receiving illumination)		
Ambient temperature	-10 ~ +60℃(at non-freezing stauts), Storage : -25 ~ +70℃		
Ambient humidity	35 ~ 85%RH, Storage : 35 ~ 85%RH		
Material	Case:ABS, Lens:Acrylic(Retroreflective:PC)		
Cable	4P, φ5mm, Length : 2m(Emitter of transmitted beam type: 2P, φ5mm, length:2m)		
Accessories Individual	————	Reflector(MS-2), Adjustment Driver	Adjustment Driver
Accessories Common	Fixing bracket, Bolts/Nuts		
Approval	CE		
Unit weight	Approx. 180g	Approx. 110g	Approx. 100g

※(*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.
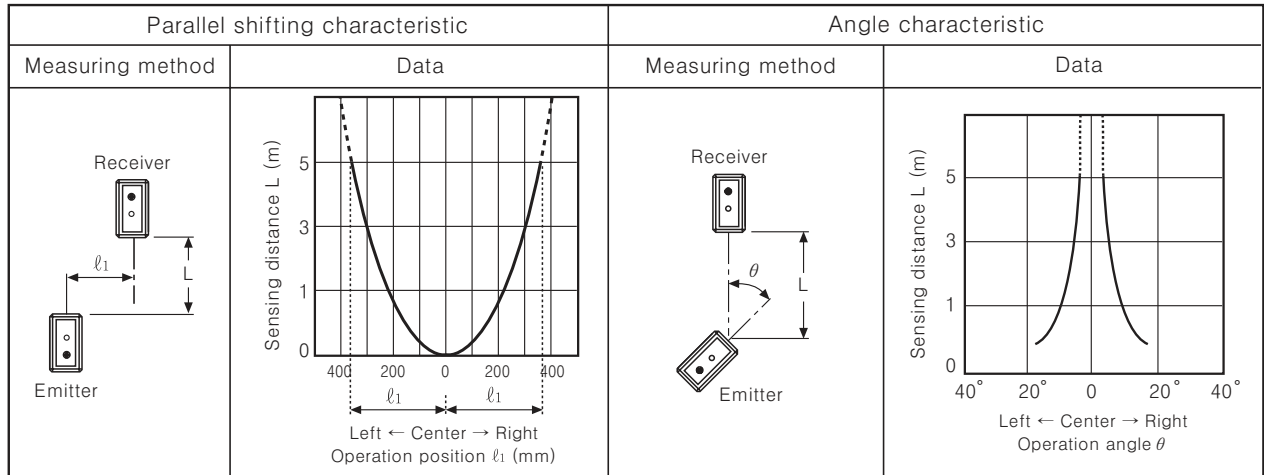※(*2) It is for Non-glossy white paper(100×100mm)
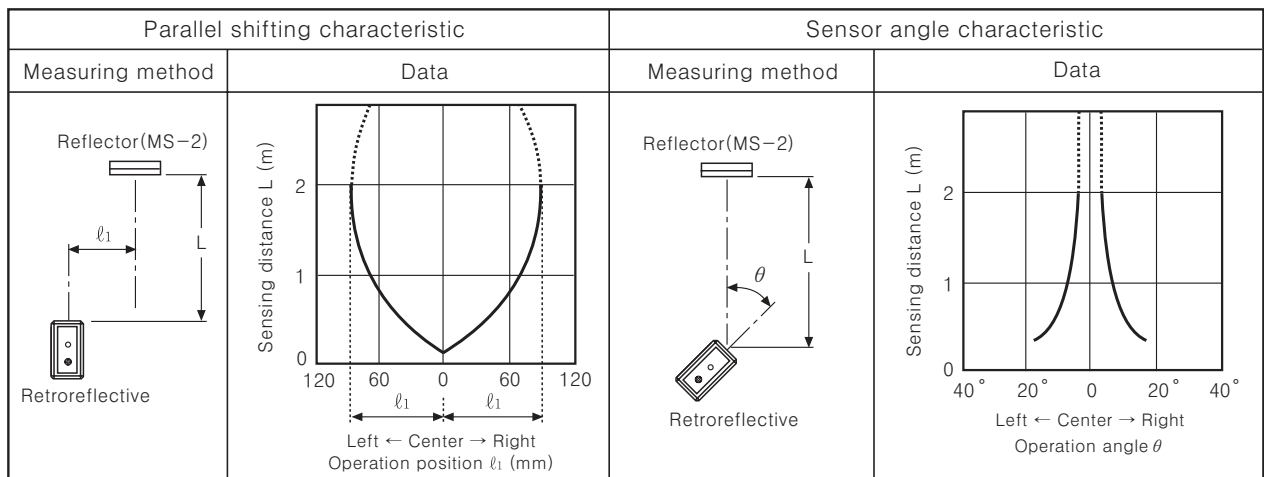
Side Sensing Type with Built-in Amplifier

(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

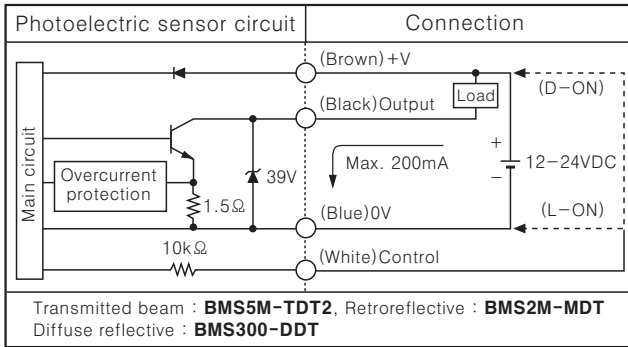(N)
Stepping
motor &
Driver &
Controller

(O)
Graphic
panel

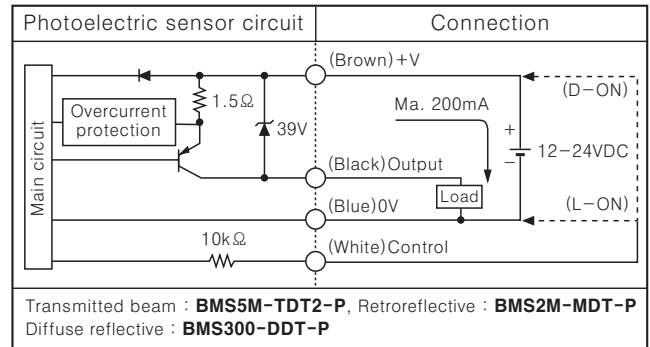(P)
Production
stoppage
models &
replacement

▣ Feature data

◎ Transmitted beam

● BMS5M-TDT   ● BMS5M-TDT-P

Parallel shifting characteristic		Angle characteristic	
Measuring method	Data	Measuring method	Data

◎ Retroreflective

● BMS2M-MDT   ● BMS2M-MDT-P

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

◎ Retroreflective

● BMS2M-MDT
● BMS2M-MDT-P

Reflector angle characteristic	
Measuring method	Data
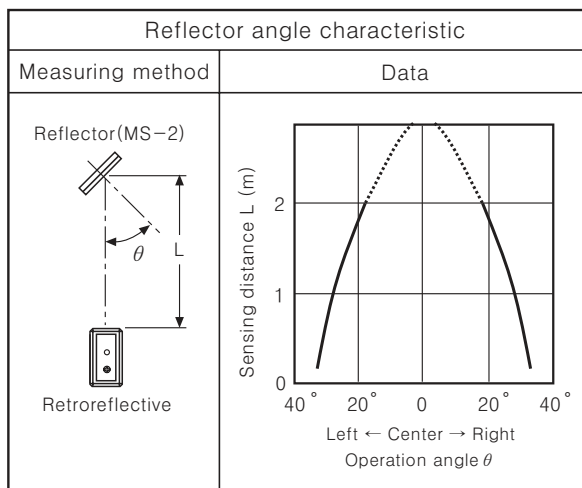
◎ Diffuse reflective

● BMS300-DDT
● BMS300-DDT-P

Sensing area characteristic	
Measuring method	Data
Standard sensing target : Non-glossy white paper 100×100mm	

BMS Series

▣ Control output diagram

● NPN open collector output

Photoelectric sensor circuit	Connection
Main circuit / Overcurrent protection / 1.5Ω / 39V / 10kΩ	(Brown) +V (D−ON) (Black) Output Load Max. 200mA / 12−24VDC (Blue) 0V (L−ON) (White) Control

Transmitted beam : **BMS5M-TDT2**, Retroreflective : **BMS2M-MDT**
Diffuse reflective : **BMS300-DDT**

● PNP open collector output

Photoelectric sensor circuit	Connection
Main circuit / Overcurrent protection / 1.5Ω / 39V / 10kΩ	(Brown) +V (D−ON) Ma. 200mA (Black) Output / 12−24VDC (Blue) 0V Load (L−ON) (White) Control

Transmitted beam : **BMS5M-TDT2-P**, Retroreflective : **BMS2M-MDT-P**
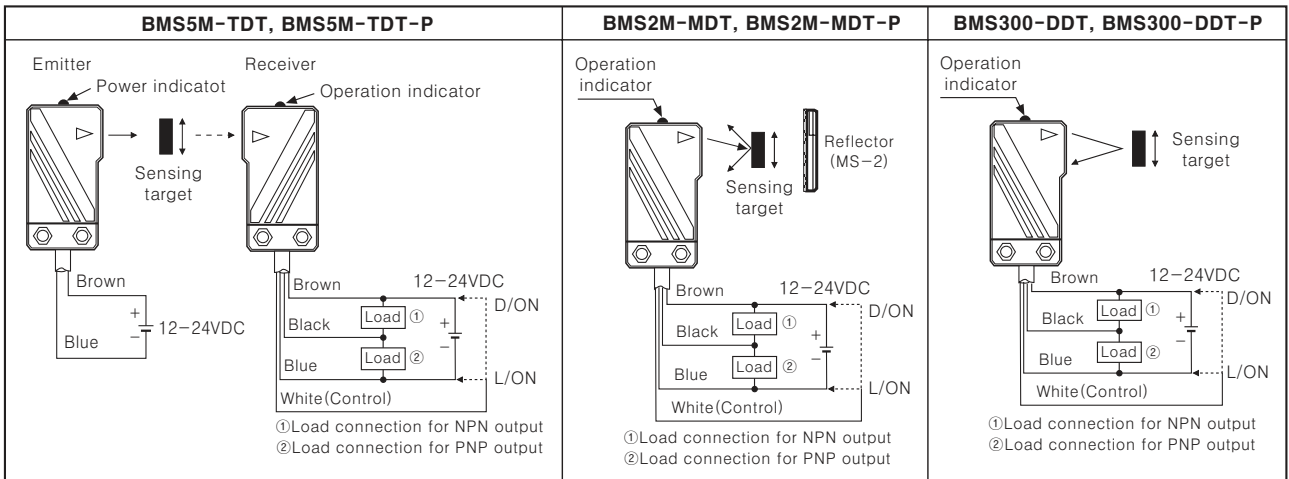Diffuse reflective : **BMS300-DDT-P**

※Light ON / Dark ON mode selectable by control wire(White) [Light ON : Connect control wire to 0V
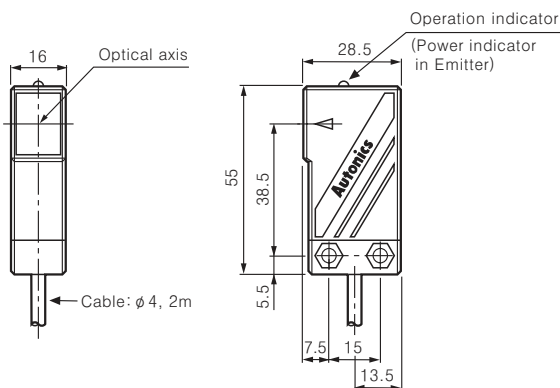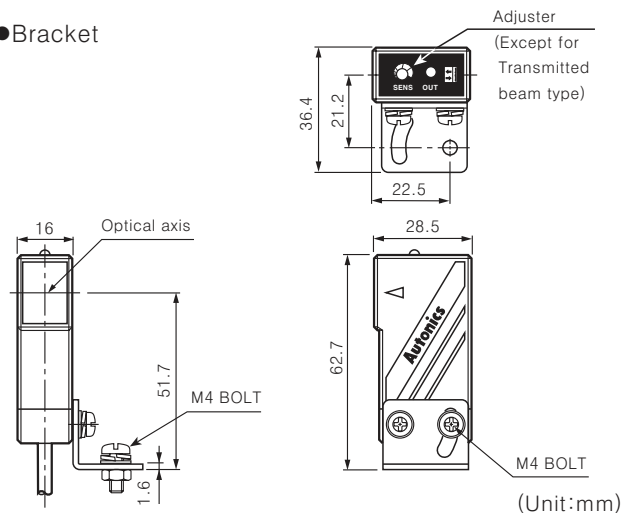Dark ON : Connect control wire to +V

▣ Operation mode

Light ON mode	Receiver	ON OFF		Dark ON mode	Receiver	ON OFF
	Operation indicator (LED)	ON OFF			Operation indicator (LED)	ON OFF
	TR output	ON OFF			TR output	ON OFF

▣ Connections

BMS5M-TDT, BMS5M-TDT-P	BMS2M-MDT, BMS2M-MDT-P	BMS300-DDT, BMS300-DDT-P
Emitter - Power indicator / Receiver - Operation indicator / Sensing target Brown +12−24VDC Blue − Brown 12−24VDC D/ON Black Load① + Blue Load② L/ON White(Control) ①Load connection for NPN output ②Load connection for PNP output	Operation indicator / Reflector (MS−2) / Sensing target Brown 12−24VDC D/ON Black Load① + Blue Load② L/ON White(Control) ①Load connection for NPN output ②Load connection for PNP output	Operation indicator / Sensing target Brown 12−24VDC D/ON Black Load① + Blue Load② L/ON White(Control) ①Load connection for NPN output ②Load connection for PNP output

※Dark ON mode is on when control line is opened.

▣ Dimensions

● Product

16 / Optical axis / 28.5 / Operation indicator (Power indicator in Emitter) / 55 / 38.5 / 5.5 / 7.5 / 15 / 13.5 / Cable: φ4, 2m

● Bracket

16 / Optical axis / 51.7 / M4 BOLT / 1.6

Adjuster (Except for Transmitted beam type) / SENS OUT / 36.4 / 21.2 / 22.5

28.5 / 62.7 / M4 BOLT

(Unit:mm)
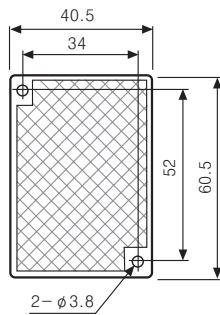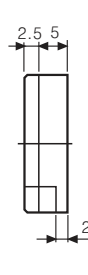
Side Sensing Type with Built-in Amplifier
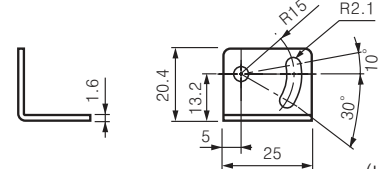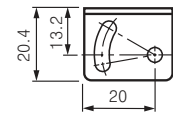
●Reflector

〈MS−2〉

〈MS−5〉

●Bracket

(Unit:mm)

▣Mounting and sensitivity adjustment

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

◎Optical axis adjustment

1. Transmitted beam type

   Set the photoelectric sensor in the middle of the operation range of indicator adjusting the receiver or emitter right and left, up and down.

   Adjust Right/Left
   Receiver
   Optical axis
   Emitter
   Adjust Up/Down
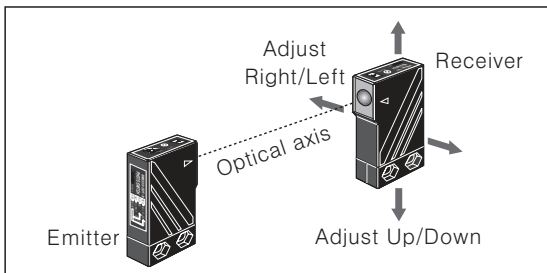
2. Retroreflective type

   Mount the photoelectric sensor and reflector face then fix them in the middle of operation range of indicator adjusting the reflector right and left, up and down.

   Adjust Right/Left
   Reflector (MS−2)
   Photoelectric sensor
   Optical axis
   Adjust Up/Down
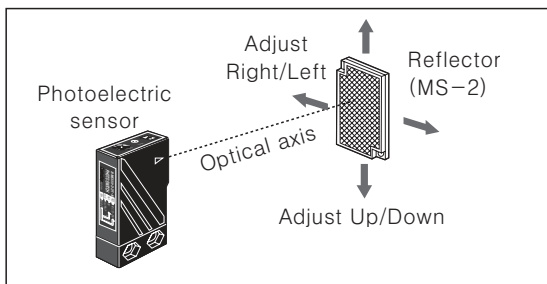
3. Diffuse reflective type

   Mount the photoelectric sensor and the target then fix them in the middle of operation range of indicator adjusting the photoelectric sensor right and left, up and down.

   Photoelectric sensor
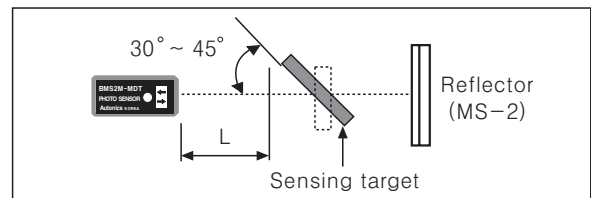   Sensing target
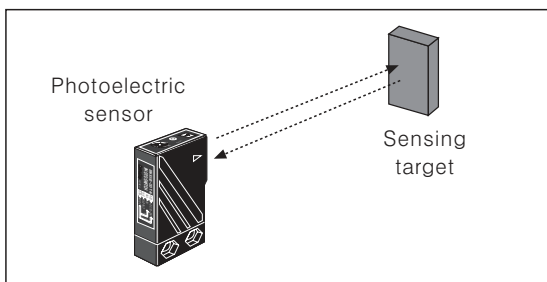
◎Sensitivity adjustment

1. Retroreflective type

   Fix the adjuster at max.position and then check if the sensor operate normally to pass the target within sensing area of the sensor.
   If the sensor does not work normally by noise or external shine, turn the adjuster slowly up to the position .

   ※If reflectance of target is higher than non−glossy white paper, it might cause malfunction by reflec−tion from the target when the target is near to photoelectric sensor.
   Therefore enough space between the target should be used and photoelectric sensor or the surface of target should be mounted at an angle of 30°~45° against optical axis.
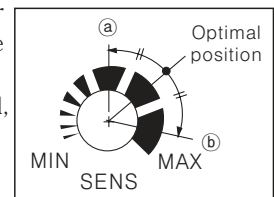
   30°~45°
   BMS2M-MDT PHOTO SENSOR Autonics korea
   L
   Reflector (MS−2)
   Sensing target

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

   〈MS−5〉

2. Diffuse reflective type

   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 up to position ⓐ which the indicator turn on from min. Take the target out of the sensing area, then turn the adjuster until position ⓑ where the indicator turns on.
   If position ⓑ is not checked, position ⓑ is the max. position. Set the adjuster in the middle of two switching position ⓐ, ⓑ.

   ⓐ
   Optimal position
   MIN
   SENS
   MAX
   ⓑ

   ※Please be aware not to make the unstable operation of sensor by background and mounting side.