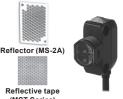
## **Autonics**

# **Threaded/Side Mounting Photoelectric Sensor BH SERIES**

## INSTRUCTION







Retroreflective type Diffuse reflective type Thank you for choosing our Autonics product.

Please read the following safety considerations before use.

#### ■ Safety Considerations

×Please observe all safety considerations for safe and proper product operation to avoid hazards.

★ Symbol represents caution due to special circumstances in which hazards may occur.

**Marning** Failure to follow these instructions may result in serious injury or death. ▲ Caution Failure to follow these instructions may result in personal injury or product damage.

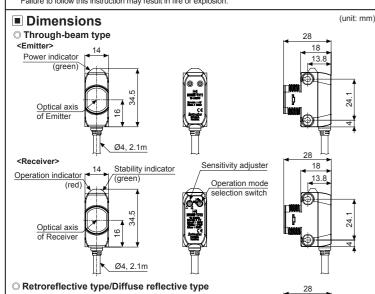
1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss. (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)

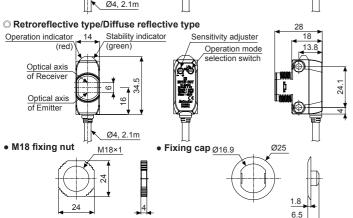
Failure to follow this instruction may result in fire, personal injury, or economic loss.

- Do not disassemble or modify the unit.
   Failure to follow this instruction may result in fire
- 3. Do not connect, repair, or inspect the unit while connected to a power source.
- Failure to follow this instruction may result in fire. 4. Check 'Connections' before wiring.
- Failure to follow this instruction may result in fire.

#### **⚠** Caution

- 1. Use the unit within the rated specifications.
- Failure to follow this instruction may result in fire or product damage. 2. Use dry cloth to clean the unit, and do not use water or organic solvent
- Failure to follow this instruction may result in fire.
- 3. Do not use the unit in the place where flammable
- corrosive gas, humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present. Failure to follow this instruction may result in fire or explosion.





X Be sure to follow cautions written in the instruction manual and the technical descriptions

## ■ Model

Model	Sensing distance	Sensing type	Power supply	Output	ı
BH20M-TDT	20m	Through-beam type			ı
BH4M-PDT		Retroreflective type (built-in polarized filter)	112_24\/110	Transistor output (NPN/PNP)	
BH1M-DDT	1m	Diffuse reflective type		(NPN/PNP)	ı
BH300-DDT	300mm	Diliuse reliective type			1

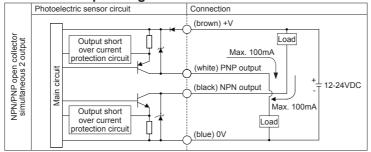
#### Specifications

Model		BH20M-TDT	BH4M-PDT	BH1M-DDT	BH300-DDT	
Sensing ty	уре	Through-beam	Retroreflective (built-in polarized filter)	Diffuse reflective		
Sensing d	listance	20m	4m <sup>*1</sup>	1m <sup>×2</sup>	300mm <sup>*3</sup>	
Sensing to	arget	Opaque material over Ø20mm	Opaque material over Ø75mm	_		
Hysteresis	S	_		Max. 20% at sensing distance		
Response	time	Max. 1ms				
Power sup	oply	12-24VDC= ±10% (ripple P-P: max. 10%)				
Current co	onsumption	Emitter/Receiver : max. 20mA	Max. 30mA	Max. 35mA	Max. 30mA	
Light sour	ce	Red LED (660nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	
Sensitivity adjustment		Sensitivity adjuster				
Operation	mode	Light ON / Dark ON	ight ON / Dark ON selectable by switch			
Control ou	utput	NPN / PNP open collector simultaneous 2 output  Load voltage: max. 26.4VDC				
Protection	circuit	Interference prevention function (except through-beam type), Power reverse polarity protection circuit, Output short over current protection circuit				
Indicator Operation indicator: red LED, Stability indicator: green LED (emitter of through-beam type's power indicator:				ower indicator: green)		
Connection Cable type						
Insulation resistance		Over 20MΩ (at 500VDC megger)				
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/s² (approx. 50G) in X, Y, Z direction for 3 times				
Environ- ment Ambient illu. Sunlight: max. Ambient temp25 to 55°C, sto Ambient humi. 35 to 85%RH,				amp: max. 3,000lx (r	eceiver illumination)	
Protection structure		IP67 (IEC standard)				
Material		Case: polycarbonates, LED indicator: polycarbonates, sensing part: polymethyl methacrylate acrylic				
Cable		Ø4mm, 4-wire, 2.1m (emitter of through-beam type: Ø4mm, 2-wire, 2.1m) (AWG24, core diameter: 0.08mm, number of cores: 40, insulator out diameter: Ø1.03mm)				
Acce- (	l can 1 M3 holt 2 M3 nut 2			8 fixing nut: 1, fixing		
l lī	ndividual		Reflector (MS-2A)	_		
Approval		C € (№) 15 12720		1		
Weight <sup>**4</sup>		Approx. 190g (approx. 120g)	Approx. 140g (approx. 60g)	Approx. 130g (appr	ox. 60g)	

- X1: 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 the size of the tape.
- Please refer to the catalog or web site. \*2: Non-glossy white paper 300×300mm.
- ※3: Non-glossy white paper 100×100mm
- \*4: The weight includes packaging. The weight in parenthesis is for unit only.

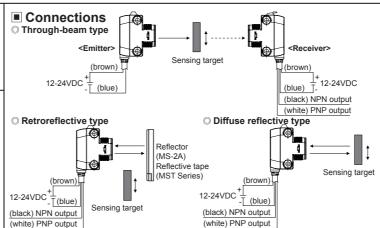
  \*The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

### Control Output Diagram



XIf 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.

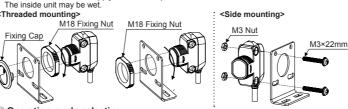
# Bracket Reflector (MS-2A) 34 2-Ø3.8 40.6 Reflective tape (sold separately) Model MST-50-10 □50 2-30° 4-R1.7 MST-100-5 100 MST-200-2



### Installation and Sensitivity Adjustment

© For mounting
Please use M18 fixing nut or M3 bolt and nut to mount the sensor, and make sure that the tightening orque is under 0.5N·m 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. \*Exercise caution. Do not apply excessive impact to the unit or bend the cable section.



	Operat	Operation mode selecting			
	Light ON	D/0 L/0	Turn the operation mode selection switch to L/O direction (the end of right).		
	Dark ON	D/O O/U	Turn the operation mode selection switch to D/O direction (the end of left).		
*For through-heam type, the switch is built-in the receiver			the switch is built-in the receiver.		

#### Optical axis adjustment Through-beam type

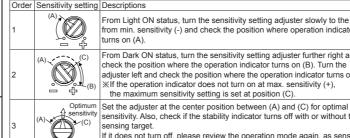
and adjust these up-down, right-left after to check the point operating the stability indicator. Fix the emitter and the receiver at the center of the point

#### Retroreflective type

Set the photoelectric sensor and the reflector (MS-2A) or reflective tape facing each other and adjust the reflector up down, right left after to check the point operating the stability indicator. Make sure that the sensing side of the sensor is parallel with the reflector. Diffuse reflective type

After place a sensing target, fix it in the middle of position where the stability indicator operates adjusting the sensor to up-down, right-left. Make sure that the sensing side of the sensor is parallel with the surface of each sensing target.

# Sensitivity adjustment



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).

Moves up-down Moves right let

Optical

Reflector(MS-2A)

Reflective tape

(MST Series)

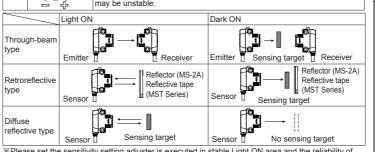
Moves right-left Sensing target

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) XIf the operation indicator does not turn on at max. sensitivity (+), the maximum sensitivity setting is set at position (C).



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.



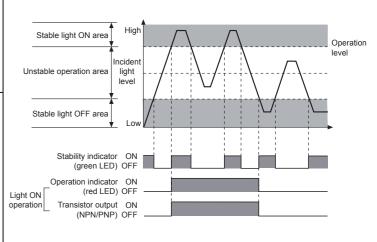
Please set the sensitivity setting adjuster is executed in stable Light ON area and the reliability of environment (temperature, supply, dust etc.) is increased after the mounting it in a stable area. XIt may cause breakdown when the sensitivity setting adjuster or the operation mode selection switch

### Operation Mode

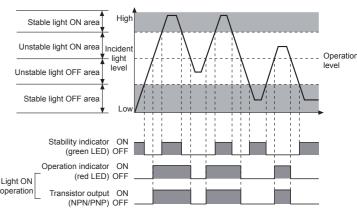
_ opolatioi	· iiiouo		
Operation mode	Light ON	Dark ON	
Receiver operation	Received light Interrupted light	Received light Interrupted light	
Operation indicator (red LED)	ON OFF	ON OFF	
Transistor output (NPN/PNP)	ON OFF	ON OFF	

## Operation Timing Diagram

#### ○ Through-beam type



#### Retroreflective type / Diffuse reflective type



\*The waveforms of "Operation indicator" and "Transistor output" are for Light ON, The waveforms are reversed for Dark ON.

Cautions during Use Follow instructions in 'Cautions during Use'. Otherwise, it may cause unexpected accidents.

- 2. When connecting a DC relay or other inductive load to the output, remove surge by using diodes or varistors.
- . Use the product, 0.5 sec after supplying power.
- When using separate power supply for the sensor and load, supply power to sensor first.

  12-24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power
- supply device. . Wire as short as possible and keep away from high voltage lines or power lines, to prevent inductive
- i. When using switching mode power supply to supply the power, ground F.G. terminal and connect a condenser between 0V and F.G. terminal to remove noise
- . When using sensor with the equipment which generates noise (switching regulator, inverter, servo
- motor, etc.), ground F.G. terminal of the equipment. . This unit may be used in the following environments

■ Temperature Controller

■ Temperature/Humidity Transducers

- ①Indoors (UL Type 1 Enclosure)
- ②Altitude max. 2,000m
- ③Pollution degree 3
- (4) Installation category II

#### Major Products



- itching Mode Power S
- ntrol Switches/Lamps/Buzzers
- O Terminal Blocks & Cables epper Motors/Drivers/Motion Controllers
- raphic/Logic Panels

### Autonics Corporation http://www.autonics.com

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