Autonics

Photoelectric Sensor BR SERIES

INSTRUCTION MANUAL









Reflector Reflective tap (MST Series)

(MS-2)

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.

Warning 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.

△ Warning

- 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.

 2. Do not disassemble or modify the unit.
 Failure to follow this instruction may result in fire.

- Failure to follow this instruction may result in fire.

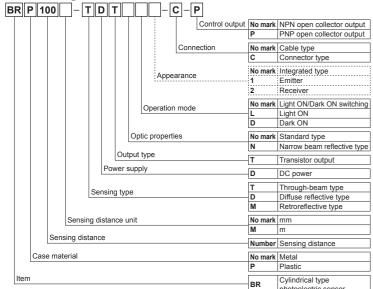
 3. Do not connect, repair, or inspect the unit while connected to a power source.
 Failure to follow this instruction may result in fire.

 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/explosive/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.

Ordering Information



This information is intended for product management of through-beam type (no need to refer when selecting model)

Operation Mode

Operation mode	Light ON	Dark ON	
Receiver operation Operation indicator (red LED)	Received light	Received light	
	Interrupted light	Interrupted light	
	ON	ON	
	OFF	OFF	
Transistor output	ON	ON	
	OFF	OFF	

- XThe transistor output will be held OFF for 0.5 sec after supplied power in order to prevent malfunction of this
- *The above specifications are subject to change and some models may be discontinued without notice.
 *Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog,

Specifications

Model	output	(-C)	-DDT (-C)	-DDT (-C)	-DDT (-C)	(-C)	-DDTN (-C)	MDT(-C)		-TDTD (-C)	-TDTD (-C)	-TDTL (-C)	-TDTL (-C)
	collector		-DDT	BRP400 -DDT (-C)-P	-DDT		BR200 -DDTN (-C)-P	BRP3M- MDT (-C)-P	RK3M-MD1			BR4M -TDTL (-C)-P	-TDTL (-C)-P
Case		Plastic	Metal	Plastic	Metal	Plastic	Metal	Plastic	Metal	Metal			
Sensing type Diffuse reflective type						Narrow reflectiv		Retrorefled	Through-beam type				
Sensing distance 100mm ^{*1} 40			400mm	 2	200mm ^{ж2} 3m ^{ж3}			4m	20m	4m	20m		
Se	Sensing target Opaque, translucent materials						Opaque materials of min. Ø60mm min. Ø15mm						
Hy:	lysteresis Max. 20% at rated sensing distance						_						
Response time Max. 1ms													
Power supply 12-24VDC ±10% (ripple P-P: max. 10%)													
Current consumption Max. 45mA													
Lig	ht source	Infrared LED (850)			50nm)		Red LED (660nm)	im) Infrared LED (850nm)	
Sa	acitivity.												

NPN open | BRP100 | BRP400 | BRP400 | BRP200 | BR200 | BR200 | BR200 | BR4M | BR20M | BR4M | BR20M | B

Sensitivity adjuster
Operation mode Selectable I inht Of lectable Light ON or Dark ON by control wire (white) Dark ON Light ON Control output

Control 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 Operation indicator: red LED, Power indicator: red LED (only for emitter of through-beam type)

onnection Cable type, connector type ulation resistance Over 20MΩ (at 500VDC megger)

Noise immunity ±240V the square wave noise (pulse width: 1µs) by the noise simulator

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 each X, Y, Z direction for 3 times

Ambient illu. Sunlight: max. 11,000lx, Incandescent lamp: max. 3,000lx (receiver illumination

Ambient temp. -10 to 60°C, storage: -25 to 75°C

Ambient humi. 35 to 85%RH, storage: 35 to 85%RH
Protection structure IP66 (IEC standard) (BR20M Series: IP67

 Case - BRP: Polyamide (black)
 BR: Brass, Ni-plate
 Sensing part - Polycarbonate Lens Case -BRP: Polyamide (black) BRP: Polyamide (black)
BR: Brass, Ni-plate
BR4M: Glass Lens,
BR20M: Polycarbonate Ler Cable 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) Cable

Connector type M12 connector

Individual Adjustment screwdriver BR: M18 fixing nut: 4, sory BR: M18 fixing nut: 2, washer: 1 BRP: M18 fixing nut: 2 BRP: M18 fixing nut: 4 Approval BRP: Approx. 140g (approx. 100g)
 BRP: Approx. 160g (approx. 120g)
 BRP-C: Approx. 70g (approx. 30g)
 BR-C: Approx. 90g (approx. 50g) Weight*

X1: Non-glossy white paper 50×50mm.
X2: Non-glossy white paper 100×100mm.
X3: 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.

32.2 of the cape. Prease released the calculation of weight in parenthesis is for unit only.
 34.3 The weight includes packaging. The weight in parenthesis is for unit only.
 35.4 The temperature or humidity mentioned in Environment indicates a non freezing or condensation.

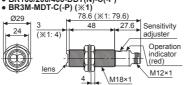
Dimensions

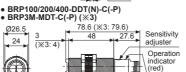
• BR3M-MDT(-P) (%2) 74 (%2: 75

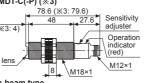
BRP100/200/400-DDT(N)-P

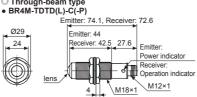
BRP3M-MDT(-P) (※4)

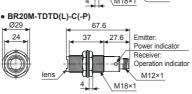
BR100/200/400-DDT(N)-C(-P) • BR100/200/400-DDT(N)-P









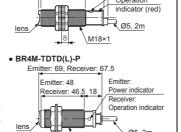


*Specification of Connector Cable: Ø6mm, 4-wire, 2m/3m/5m/7m

Connection cable (sold separately)

\ø14.8

CIDH4.



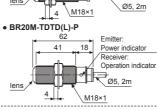
M18×1

Operation

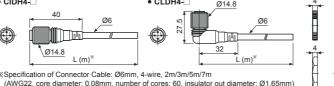
____ ï5, 2m

indicator (red)

adiuster



M18 fixing nut CLDH4-24 Ø14.8



■ 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 installing the product, tighten the screw with a tightening torque of 0.39N.m for BRP and to 14.7N.m for BR alc alc

Diffuse reflective/Narrow beam reflective type

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

 2. Set the target at a position to be detected by the beam, then turn the Sensitivity adjuster until position

 ON from min. position of the Sensitivity adjuster.
- ※Be sure that it can be different by size, surface and gloss of target

- 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. XIf using more than 2 photoelectric sensors in parallel, the space among
- sensing with the polarizing filter should be sed.) Sensitivity adjustment: Refer to the diffuse reflective/narrow beam

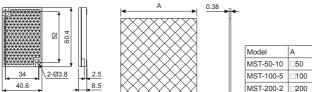
Through-beam type

M18×1

- 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.

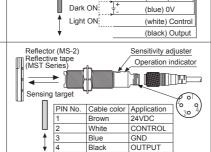
• Reflective tape (sold separately)



12-24VDC (brown) +V Dark ON (blue) 0V Light ON (white) Control (black) Output

Sensitivity adjuster

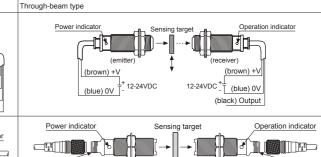
Operation indicator

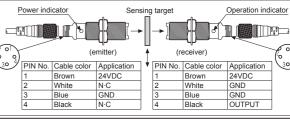


Retroreflective type

Reflector (MS-2)

Reflective tape (MST Series)





Control Output Circuit Diagram

PIN No. | Cable color | Application

White

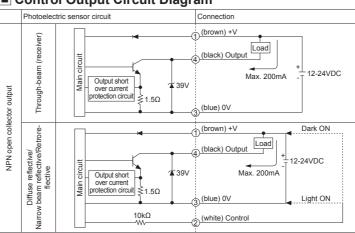
Connections

Sensing target

Diffuse reflective/Narrow beam reflective type

Dark ON

Light ON



Sensitivity adjuster

Operation indicator

12-24VDC (brown) +V

(blue) 0V

24VDC CONTROL

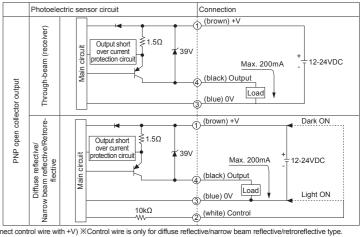
OUTPUT

(white) Contro

(black) Output

Sensitivity adjuster

Operation indicator



*Before using this unit, select Light ON/Dark ON with control wire. (Light ON: connect control wire with 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.

> Optimal position MAX

> > Adjust Un-Down

MIN

Right-Left Right-Left Optical axis

30 to 45°

Sensing target

1**1-------**----

SENS

When using photoelectric sensors closely over two units, it may result in malfunction due to mutual interference.

- 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 (a), (b).

Retroreflective type

- Supply the power to the photoelectric sensor, after setting the photoelectric sensor and the reflector (MS-2) or reflective tape face to 2. Set the photoelectric sensor in the position which indicator turns on, as
- them should be more than 30cm. XIf 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

Reflector (MS-2)

*If the sensing target is translucent body or smaller than Ø15mm, it can be missed by sensor cause light penetrate it.

Right-Left

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
- noise. 6. 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
- ①Indoors (in the environment condition rated in 'Specifications') ②Altitude max. 2.000m

■ SSRs/Power Controllers

3Pollution degree 2 (4) Installation category II

Major Products

■ Photoelectric Sensors
■ Temperature Controllers ■ Fiber Optic Sensors ■ Temperature/Humidity Transducers

■ Timers

- Door Sensors
- Door Side Sensors
- Area Sensors ■ Proximity Sensors
- Panel Meters ■ Pressure Sensors
 ■ Tachometer/Pulse (Rate) Meters
- Rotary Encoders ■ Display Units
- Connectors/Sockets Sensor Controllers
- Switching Mode Power Supplies
- Control Switches/Lamps/Buzzers
- ■I/O Terminal Blocks & Cables
- Stepper Motors/Drivers/Motion Controllers
- Graphic/Logic Panels
- Field Network Devices
- Laser Marking System (Fiber, CO₂, Nd: YAG)
- Laser Welding/Cutting System

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