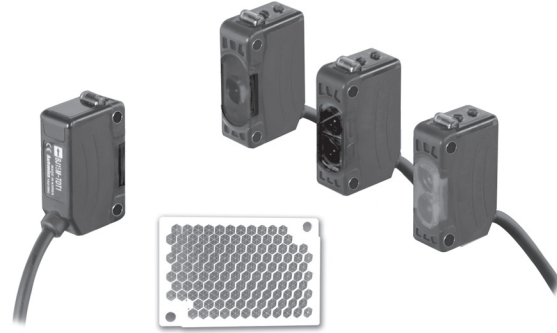


Autonics

PHOTOELECTRIC SENSOR
BJ SERIES

M A N U A L



Thank you very much for selecting Autonics products.
For your safety, please read the following before using.

Caution for your safety

- ※Please keep these instructions and review them before using this unit.
- ※Please observe the cautions that follow;
 - Warning** Serious injury may result if instructions are not followed.
 - Caution** Product may be damaged, or injury may result if instructions are not followed.
- ※The following is an explanation of the symbols used in the operation manual.
 - △ Caution: Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machinery (Ex: nuclear power control, medical equipment, ship, vehicle, train, airplane, combustion apparatus, safety device, crime/disaster prevention equipment, etc) which may cause damages to human life or property, it is required to install fail-safe device.**
It may cause a fire, human injury or damage to property.
- Do not disassemble or modify this unit. Please contact us if it is required.**
It may cause electric shock or a fire.

Caution

- This unit shall not be used outdoors.**
It might shorten the life cycle of the product or give an electric shock. Use this product inside only. Do not use the product outdoors or location subject to temperatures or humidity outside.(Ex: rain, dirty, frost, sunlight, condensation, etc.)
- Do not use this unit in place where there is flammable or explosive gas.**
It may cause a fire or explosion.
- Please observe the rated specifications.**
It may shorten the life cycle or damage to the product.
- Please observe the rated voltage and do not supply AC power.**
It may cause damage to this unit.
- Please check the polarity of power and wrong wiring.**
It may cause damage to this unit.
- Do not use this unit in place where there is vibration or impact.**
It may cause damage to this unit.
- In cleaning the unit, do not use water or an oil-based detergent.**
It may cause electric shock or fire.

Ordering information

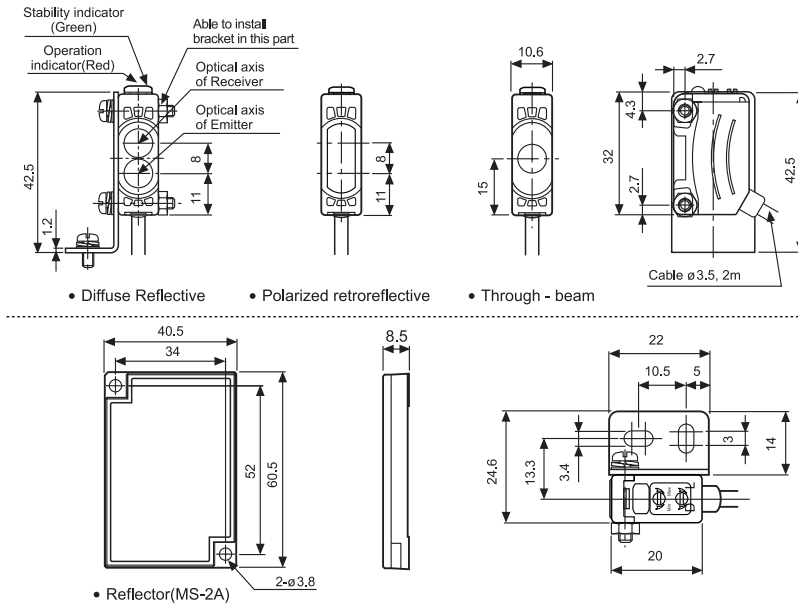
BJ	15	M	T	D	T	1	P
Output type							
							NPN open collector output
							PNP open collector output
Output mode							
							Single body type
						1	Emitter
						2	Receiver
Power Supply							
							DC power
Sensing type							
							Through - beam
							Polarized retroreflective
							Diffuse Reflective
Sensing distance unit							
							mm
							m
Sensing distance							
						Number	Sensing distance
						BJ	Compact long sensing type

※The above specifications are subject to change and some models may be discontinued without notice.

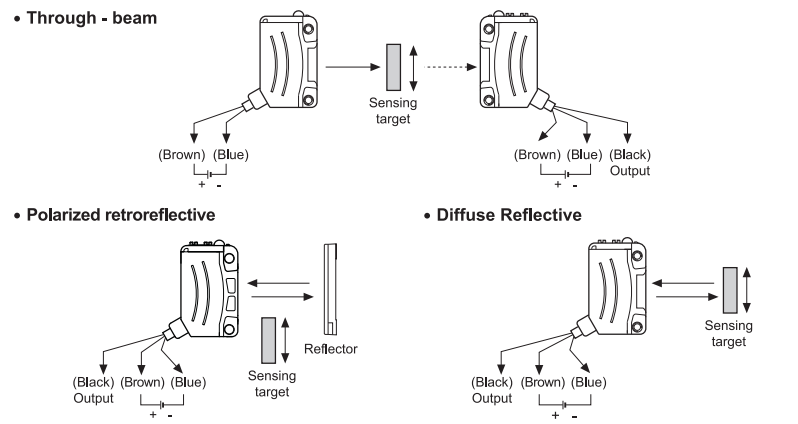
Specifications

Model	NPN output	BJ15M-TDT	BJ10M-TDT	BJ7M-TDT	BJ3M-PDT	BJ1M-DDT	BJ300-DDT	BJ100-DDT
PNP output	BJ15M-TDT-P	BJ10M-TDT-P	BJ7M-TDT-P	BJ3M-PDT-P	BJ1M-DDT-P	BJ300-DDT-P	BJ100-DDT-P	
Sensing type	Through - beam			Polarized retroreflective		Diffuse Reflective		
Sensing distance	15m	10m	7m	0.1 to 3m (MS-2A)*1	1m (Non-glossy white paper 300×300mm)	300mm (Non-glossy white paper 100×100mm)	100mm (Non-glossy white paper 100×100mm)	
Sensing target	Opaque materials of Min. ø12mm			Opaque materials of Min. ø8mm		Translucent, Opaque materials		
Hysteresis						Max. 20% at sensing distance		
Response time	Max. 1ms							
Power supply	12-24VDC ±10%(Ripple P-P: Max. 10%)							
Power consumption	Emitter: Max. 20mA Receiver: Max. 20mA			Max. 30mA				
Light source / Wavelength	Infrared LED (850nm)	Red LED (660nm)	Red LED (Point light source 650nm)	Red LED (660nm)	Infrared LED (850nm)	Red LED (660nm)	Infrared LED (850nm)	
Sensitivity adjustment	Built-in VR							
Operation mode	Light ON/Dark ON Selectable							
Control output	NPN or PNP open collector output • Load voltage : Max. 26.4VDC • Residual voltage - NPN: Max. 1V, PNP: Max. 2.5V • Load current : Max. 100mA • Output short-circuit(overcurrent) protection circuit							
Protection circuit	Reverse polarity protection circuit, Output short-circuit(overcurrent) protection circuit			Reverse polarity protection circuit, Interference prevention function, Output short-circuit(overcurrent) protection circuit				
Indicator	Operation indicator: Red, Stability indicator: Green (Emitter of power indicator for transmitted beam: Green)							
Insulation resistance	Min. 20MΩ (500VDC megger)							
Noise strength	± 240V the square wave noise(pulse width: 1μs) by the noise simulator							
Dielectric strength	1,000VAC 50/60Hz for 1 minute							
Vibration	1.5mm or 300m/s ² amplitude at frequency of 10~55Hz(for 1min.) in each X, Y, Z direction for 2 hours							
Shock	500m/s ² in X, Y, Z directions for 3 times							
Ambient illumination	Sunlight : Max. 11,000lx, Incandescent lamp : Max 3,000lx (Receiver illumination)							
Ambient Temperature	-25~55°C, Storage: -40~70°C							
Ambient humidity	35~85%RH, Storage: 35~85%RH							
Protection	IP65(IEC standards)							
Material	Case: PC+ABS, LED CAP: PC, Sensing part: PMMA							
Cable	ø 3.5mm, 3-wire, Length: 2m (Emitter: ø 3.5mm, 2-wire, Length: 2m) (AWG24, Core diameter: 0.08mm, Number of cores: 40, Insulator diameter: ø 1mm)							
Accessories	Common	Mounting bracket, Bot. Nut, VR adjustment driver		Reflector (MS-2A)				
Approval								
Unit weight	Approx. 90g	Approx. 60g		Approx. 45g				
※1: If reflector MS-2S, MS-3S(Sold separately) are used, sensing distance will be lengthened as 0.1 to 4m, 0.1 to 5m. ※The temperature or humidity mentioned in Environment indicates a non freezing or condensation environment.								

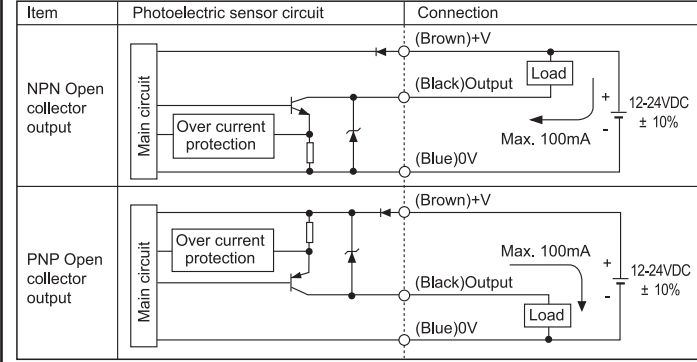
Dimensions



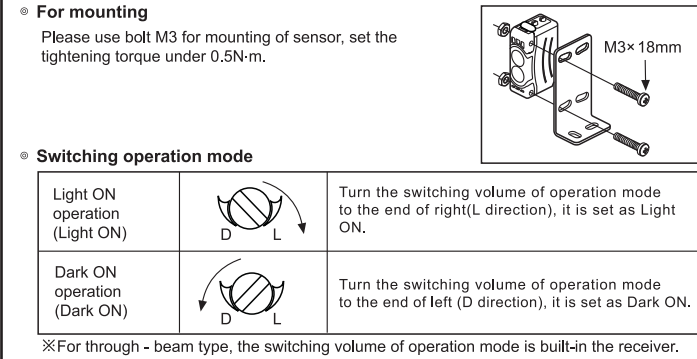
Connections



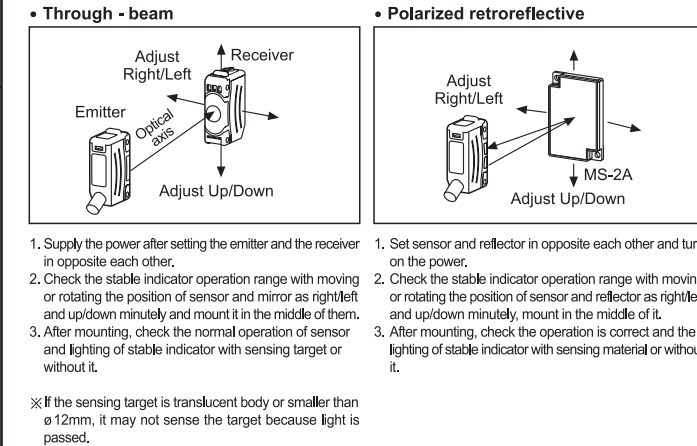
Control output circuit diagram



Mounting & Adjustment

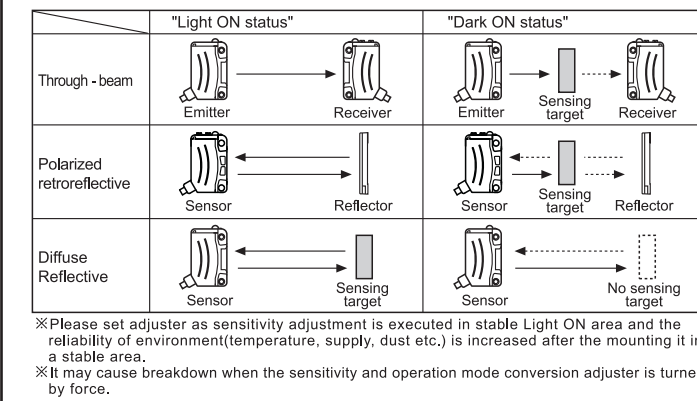


Optical axis adjustment

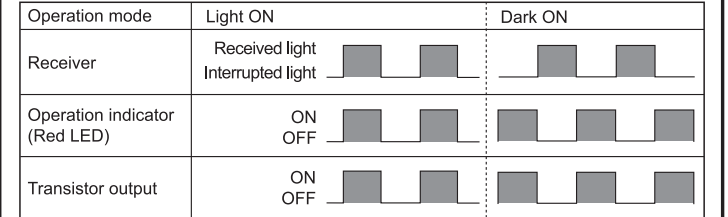


Sensitivity adjustment

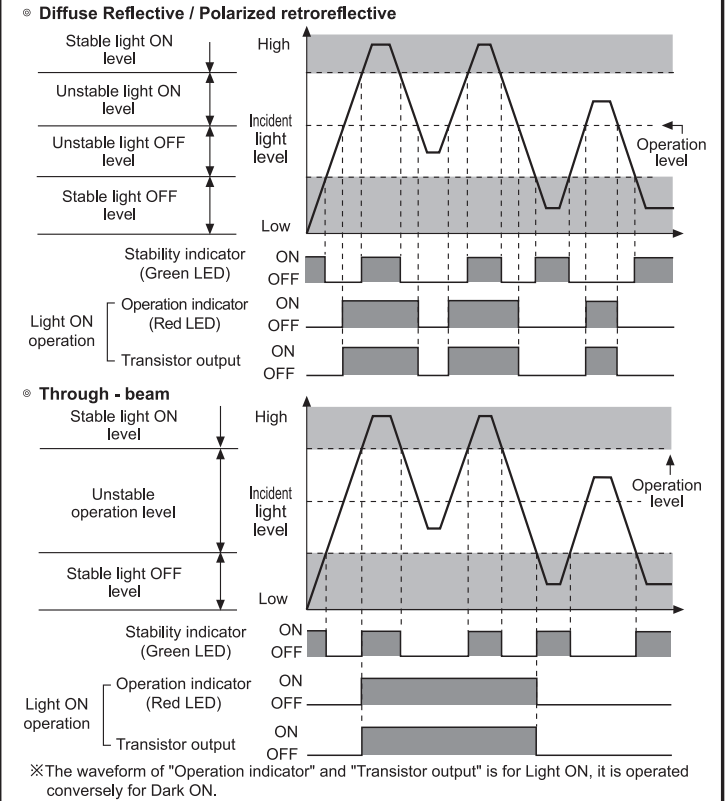
Order	Sensitivity adjuster	Description
1	(A) MIN MAX	Turn the sensitivity adjuster to the right from min. sensitivity position and check(A) where the indicator is turned on in "Light ON status".
2	(A) MIN MAX (B) MIN MAX (C)	Turn the sensitivity adjuster more to the right from min. sensitivity position, check(B) where the indicator is turned on and turn the adjuster to the left, check(C) where the indicator is turned off in "Dark ON status". *If the indicator is not lighted although the adjuster is turned to the max. position, the max. position is(C).
3	(A) MIN MAX (C)	Set the adjuster at the center of (A) and (C). Also setting of the optimum sensitivity, check the operation is correct and lighting of stable indicator with sensing target or without it. If the indicator is not lighted, please check the sensing method again because sensitivity is unstable.



Operation mode



Operation timing diagram



Caution for using

- The sensor will be in a detectable status within 500ms after supply the power.
 - If the power line of the load and the sensor is different, supply power voltage to the sensor first.
 - Shade a strong source of light as like sunlight, spotlight not to be let in the inclination angle range of photoelectric sensor directly.
 - The photoelectric sensor may cause malfunction under the fluorescent lamp light, be sure to use the cover or the shutter to shade the light.
 - When more than 2 sets of through - beam types sensors are used closely, it might cause interference each other. Be sure to put enough space between them in order to avoid malfunction.
 - If photoelectric sensor is installed at flat part, it may cause malfunction by reflection light from flat part. Be sure to put space between photoelectric sensor and ground.
 - When wiring the photoelectric sensor with high voltage line, power line in a same conduit, it may cause malfunction or mechanical problem, please do wire separately or use different conduit.
 - Avoid install the unit in place with corrosive gas, oil or dust, strong flux, noise, sunlight, strong alkali and acid.
 - In case of connecting relay as inductive load to output, please remove surge by using diode or varistor.
 - Photoelectric sensor cable shall be used as short as possible, because it may cause malfunction by noise through the cable.
 - When it is stained by dirt at lens, please clean the lens with dry cloth, do not use an organic materials such as alkali, acid and chromic acid.
 - When use switching power supply as the source of supplying power, F.G. terminal shall be grounded and a condenser for removing noise shall be installed between 0V and F.G. terminal.
- Switching power supply (SMPS)

+V
0V
F.G.

C(0.001 to 0.1μF/400V)

Photoelectric sensor

Condenser for removing noise

Frame
- Installation environment
 - ⊙It shall be used indoor
 - ⊙Pollution Degree 3
 - ⊙Altitude Max. 2,000m
 - ⊙Installation Category II
- ※It may cause malfunction if above instructions are not followed.

Major products

- Photoelectric sensors
- Fiber optic sensors
- Door sensors
- Door side sensors
- Area sensors
- Proximity sensors
- Pressure sensors
- Rotary encoders
- Connector/sockets
- Switching mode power supplies
- Control switches/Lamps/Buzzers
- IO Terminal Blocks & Cables
- Stepper motors/divers/injection controllers
- Graphic/Logic panels
- Field network devices
- Laser marking system(Fiber, CO₂, Nd:YAG)
- Laser welding/soldering system
- Temperature controllers
- Temperature/Humidity transducers
- SSR/Power controllers
- Counters
- Timers
- Panel meters
- Tachometer/Pulse(Rate)meters
- Display units
- Sensor controllers

Autonics Corporation
http://www.autonics.com

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■ HEAD QUARTERS:
18, Bansong-ro 513beon-gil, Haeundae-gu, Busan, Korea

■ OVERSEAS SALES:
#402-404, Bucheon Techno Park, 655, Pyeongcheon-ro, Wornji-gu, Bucheon, Gyeonggi-do, Korea
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail: sales@autonics.com