

Autonics

PHOTOELECTRIC SENSOR BEL 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.
- Warning** Injury or danger may occur under special conditions.

Warning

- In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required.
- It may result in serious damage, fire or human injury.
- It may give an electric shock and cause a fire.

Caution

- This unit shall not be used outdoors.
- It may shorten the life cycle of the product or give an electric shock.
- Do not use this unit in the place where there is flammable or explosive gas. It may cause a fire or explosion.
- Please observe specification rating.
- It may shorten the life cycle or damage to the product.
- Do not use this unit beyond rating power.
- It may result in damage to this unit.
- Please check the polarity of power and wrong wiring.
- It may result in damage to this unit.
- Do not use the load beyond rated switching capacity of relay contact.
- It may cause insulation failure, contact melt, contact failure, relay broken, fire etc.
- Do not use this unit in the place where there is vibration or impact.
- It may result in damage to this unit.
- When cleaning the unit, do not use water or an oil-based detergent.
- It may cause an electric shock or fire that will result in damage to the product.

Connections

BEL10M-TFR1

24-240VAC
24-240VDC

< Emitter >

Detecting target

< Receiver >

24-240VAC
24-240VDC

(Brown) (Blue)

(White) (Black)

Tc Ta

24-240VAC
24-240VDC

(Brown) (Blue)

(White) (Black)

Tc Ta

24-240VAC
24-240VDC

(Brown) (Blue)

(White) (Black)

Tc Ta

24-240VAC
24-240VDC

(Brown) (Blue)

(White) (Black)

Tc Ta

Specifications

	BEL10M-TFR-D	BEL10M-TFR-L
Detecting distance	10m	
Detecting target	Opaque materials of Min. ϕ 16mm	
Response time	Max. 20ms	
Power supply	24-240VAC \pm 10% 50/60Hz, 24-240VDC \pm 10% (Ripple P-P: Max. 10%)	
Power consumption	24VAC at max. 3VA	
Light source	infrared LED(modulated)	
Operation mode	Dark ON	Light ON
Control composition	Relay contact output 1a	
Relay capacity	30VDC 3A resistive load, 250VAC 3A resistive load	
Relay life cycle	Mechanically: Min. 50,000, 000 operation. Electrically: Min. 100,000 operation	
Light receiving element	Photo IC	
Indication	Emitter: Power indicator (Red LED). Receiver: Operation indicator (Red LED)	
Connection type	Outgoing cable	
Insulation resistance	Min. 20M Ω (500VDC)	
Insulation type		
Noise strength	(*) \pm 1000V the square wave noise (pulse width: 1ms) by the noise simulator	
Dielectric strength	1,500VAC 50/60Hz for 1 minute	
Vibration	1,5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Mechanical	1,5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 10 minutes	
Shock	500m/s ² (50G) in X, Y, Z directions for 3 times	
Malfunction	100m/s ² (10G) in X, Y, Z directions for 3 times	
Ambient illumination	Sunlight: Max. 11,000lx, incandescent lamp: Max. 3,000lx	
Ambient temperature	-20 to +55°C (non-freezing condition). Storage: -25 to +70°C	
Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH	
Protection	IP65(IEC standard)	
Material	• Emitter: ϕ 5.0mm, 2P, Length: 2m • Receiver: ϕ 5.0mm, 4P, Length: 2m	
Cable	• Case, Case cover: Heat resistant ABS • Lens: PC	
Accessories	Mounting bracket, Bolts • nuts	
Weight	Approx. 360g	

* (*) Mark indicates the product protected throughout by double insulation or reinforced insulation.

Dimensions

Product

81
12.5
50
5
18
Indicator (Red)

Bracket

4-R3.2
6.6
22
39
7
58
2
2- ϕ 4.5
40
20
55
60
45
45
Cable ϕ 5, 2m

Product with a bracket

18
40
7
39
12
60
35
Cable ϕ 5, 2m

Optical axis

M6 Bolt

Operation indicator (Red)

M4 Bolt

Optical axis

M6 Bolt

Operation indicator (Red)

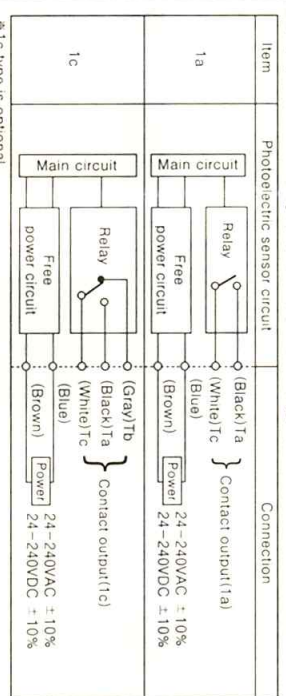
M4 Bolt

Optical axis

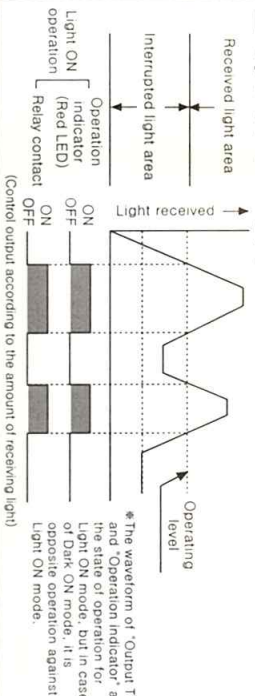
M6 Bolt

Operation indicator (Red)

Control output circuit diagram



Operation mode



Mounting & Adjustment

- Supply the power to the photoelectric sensor after setting the emitter and the receiver in face to face.
- Set the receiver in the center of the position where indicator turns on, as adjusting the receiver or the emitter right and left, up and down lightly.
- Fix both units tightly after checking that the unit detects the target. * If the detecting target is translucent or small (max. ϕ 16mm), it may not detect the target cause light passed.

Caution for using

- Intercept a strong source of light as like sunlight, spotlight within inclination angle range of photoelectric sensor.
- The photoelectric sensor may cause malfunction under the fluorescent lamp light, so be sure to use cut-off light with panel.
- 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 might cause malfunction by reflection light from flat part. Be sure to put space between photoelectric sensor and ground.
- When wire the photoelectric sensor with high voltage line, power line in the same conduit, it may cause malfunction or mechanical trouble. Therefore phase wire separately or use different conduit.
- Avoid installing the unit as following place.
- Corrosive gas, oil or dust, strong flux, noise, sunlight, strong alkali, acid.
- The photoelectric sensor cable should be used as short as possible, because it may cause malfunction by noise through the cable.
- When it is stranded by dirt at lens, please clean the lens with dry cloth, but don't use an organic materials such as alcohol, acid, chromic acid.
- When using switching power supply as the source of supplying power, F.G terminal shall be good earth ground and condenser for removing noise shall be installed between OV and F.G terminal.

Main products

COUNTER

TEMPERATURE CONTROLLER

PANEL METER

DISP. LINE SPEED PULSE METER

PROXIMITY SENSOR

PHOTOELECTRIC SENSOR

FIBER OPTIC SENSOR

PRESSURE SENSOR

ROTARY ENCODER

SENSOR CONTROLLER

STEPPING MOTOR & DRIVER & CONTROLLER

Autonics Corporation
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Satisfiable Partner For Factory Automation

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