

Autonics

FIBER OPTIC SENSOR BF3RX

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.
- Injury or danger may occur under special conditions.

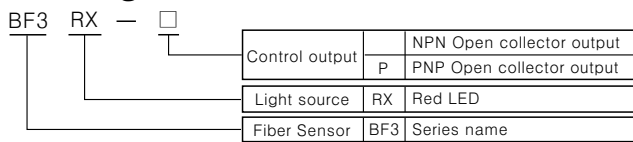
Warning

- 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.
- Do not disassemble and modify this unit, when it requires.
If needs, please contact us.
It may give an electric shock and cause a fire.

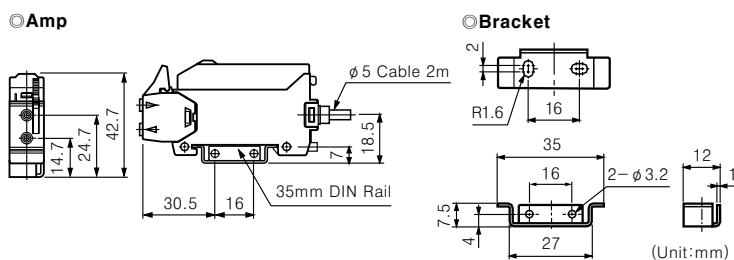
Caution

- This unit shall not be used outdoors.
It might shorten the life cycle of the product or give an electric shock.
- Do not use this unit in place where there is flammable or explosive gas.
It may cause a fire or explosion.
- Please observe voltage rating and do not supply AC 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 this unit in place where there is vibration or impact.
It may result in damage to this unit.
- In cleaning the unit, do not use water or an oil-based detergent.
It might cause an electric shock or fire that will result in damage to the product.

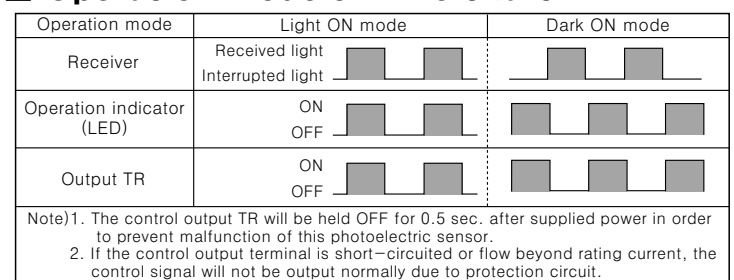
Ordering information



Dimension



Operation mode & Time chart

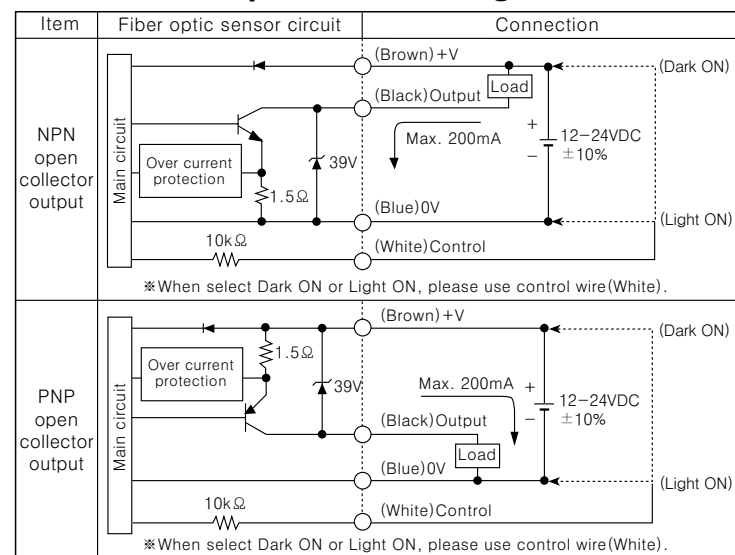


The above specifications are changeable without notice anytime.

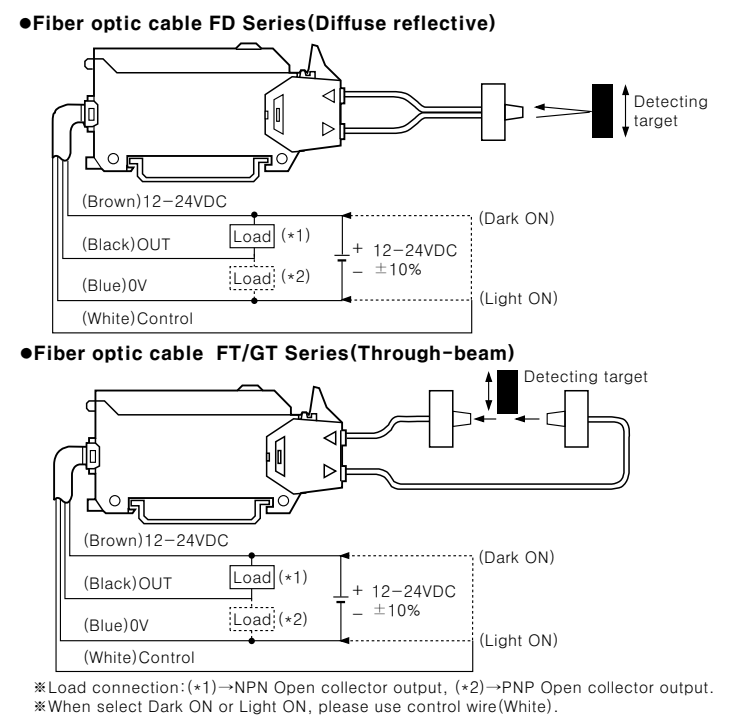
Specification

Model	BF3RX	BF3RX-P
Response time	Max. 1ms	
Power supply	12-24VDC ±10% (Ripple P-P: Max. 10%)	
Current consumption	Max. 40mA	
Light source	Red LED (modulated)	
Sensitivity adjustment	Adjustable VR (Double adjustment: Coarse adjustment, Fine adjustment)	
Operation mode	Selectable Light ON/Dark ON 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 Load voltage: Max. 30VDC, Load current: Max. 200mA, Output voltage: Min. (Power supply-2.5)V
	Protection circuit: Reverse polarity protection, Output short-circuit protection	
Indication	Operation indicator: Red LED	
Connection	Outgoing cable	
Insulation resistance	Min. 20MΩ (at 500VDC)	
Noise strength	±240V the square wave noise (pulse width: 1μs) by the noise simulator	
Dielectric strength	1,000VAC 50/60Hz for 1minute	
Vibration	1.5mm amplitude at frequency of 10 to 55Hz in each of X, Y, Z directions for 2 hours	
Shock	500m/s ² (50G) in X, Y, Z directions for 3 times	
Ambient illumination	Sunlight: Max. 11,000lx, Incandescent lamp: Max. 3,000lx	
Ambient temperature	Operating: -10 to 50°C (non-freezing condition), Storage: -25 to 70°C	
Ambient humidity	35 to 85%RH, Storage: 35 to 85%RH	
Material	Case: ABS	
Cable	4P, φ5mm, Length: 2m	
Accessory	Driver, Mounting bracket, Bolts/nuts	
Weight	Approx. 90g	

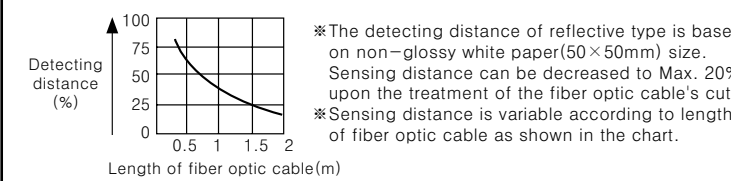
Control output circuit diagram



Connection



Characteristic of detecting distance by length of fiber optic cable



Mounting

- Amplifier
 - When mounting the amp
 - Hook the front part on DIN Rail(or Bracket)
 - Press the rear part on DIN Rail(or Bracket)
 - When releasing amp
 - Use screwdriver to move the stopper on rear of the amp. backward.
- Mounting fiber optic cable
 - Setting bolt (Max. M3)
 - Tighten torque (Max. 2kg f·cm)
 - Notice: Do not excess specified tightening torque rating not to damage (Crack).
- Connection of fiber optic cable & amp
 - Open the Lock lever (✓).
 - Insert the fiber optic cable slowly into the amp. (Depth: 15mm)
 - Close the Lock lever (✓).
- Sensitivity
 - Use by adjusting the optimal sensitivity according to the order written on the below table.
 - Please adjusting with confirming operation lamp, please observe below chart due to operation lamp will be changed by detecting method.

Order	Detection type		Adjusting	VR	
	Diffuse reflective	Through-beam		Coarse	Fine
1	Initial setting	Initial setting	VR(Coarse) should be fixed at min. and VR(Fine) should be fixed at center (▼).	Min.	(-) (+)
2	Received light	Received light	Fix VR(Coarse) at ON position with turning right slowly when it is the status of received light.	ON Min.	(-) (+)
3	Received light	Received light	Turning VR(Fine) until it is OFF toward (-), and turning until it is ON toward (+) again, then confirm that this will be A position.	A	ON OFF (-)(+)
4	Interrupted light	Interrupted light	And then turning VR(Fine) until it is ON toward (+), and turning until it is OFF toward (-) again in state of shading light. Then confirm that this position will be B position. (When it will not be ON, max. position will be B.)	B	OFF (-)(+) ON
5	—	—	Fix it at middle of A and B position. This will be the best position to set.	A B	(-) (+)
6	Received light	Received light	If it cannot adjust as above method, set VR(Fine) at max. position toward (+), then execute again.	Min.	(-) (+) Max.

Accessories

Model	Dimension	Features
FTH-310	M3×0.5, φ4.6, φ3, 12, 1000, 8	Fiber optic cable protection pipe (Shock, Vibration, Cable cut)
FTH-410	M4×0.7, φ5.8, φ4, 12, 1000, 8	
FDH-610	M6×0.75, φ7, φ5.5, 11, 1000, 8	

Fiber optic cable model

- Fiber optic cable model name(All models)
- FD-320-05 ●FDS-320-05 ●FD-620-10H ●FTCS-320-10 ●FT-420-10H
 - FD-420-05 ●FDS-420-05 ●FD-620-15H1 ●FTCS-220-05 ●FT-420-10H1
 - FD-620-10 ●FDS-620-10 ●FT-320-05 ●FTR-320-10 ●GT-420-14H2
 - FDC-320-05 ●FD-320-F ●FT-420-10 ●FTR-420-10
 - FD-320-05 ●FD-320-F1 ●FTS-320-05 ●FTS-420-10
 - FDP-320-10 ●FD-620-F2 ●FTC-220-05 ●FTS1-320-05

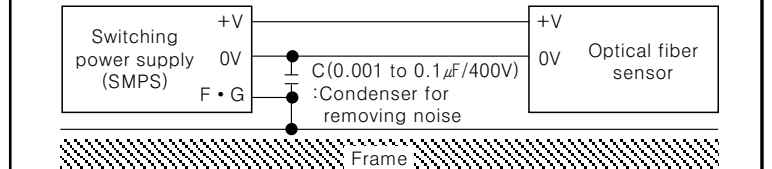
Specification(Example)

Detecting type	Model	Allowable band radius	Min. detecting object	Detecting distance (mm)	Dimension
Through-beam type	FT-320-05	15R	φ0.5	70	Adapter, 12, 2000, φ0.5, M3X0.5, φ1
	FT-420-10	30R	φ1	200	20, 2000, 3, 12, φ1, M4X0.7, φ2.2
Diffuse reflective type	FD-320-05	15R	φ0.03	20	Adapter, 12, 2000, 2-φ0.5, M3X0.5, 2-φ1
	FD-620-10	30R	φ0.03	50	18, 2000, 3, 15, 2-φ1, M6X0.75, 2-φ2.2

*Specification of other models is indicated in our general catalogue.
*Model with Adapter mark, it should be used with Adapter.

Caution for using

- Do not scratch the section of fiber optic cable.
- Intercept a strong source of light as like sunlight, spotlight within inclination angle range of photoelectric sensor.
- Do not apply a strong tensile force to fiber optic cable.
- In case of installing the fiber optic cable, be sure not to curve the fiber optic cable over tolerance that mentioned in our catalog.
- When wire the photoelectric sensor with high voltage line, power line in the same conduit, it may cause malfunction or mechanical trouble. Therefore please 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.
- In case of connecting inductive load such as DC relay at load, use shielded cable, diode and varistor in order to remove noise.
- The Amp. cable shall be used shortly, because it might cause malfunction by noise through the cable.
- When it is stained by dirt at a detecting part of the fiber optic cable, please clean the detecting part with dry cloth softly.
But don't use an organic materials such as alkali, acid, chromic acid.
- When the unit is supplied by switching power supply unit as a power source, please earth Frame ground(F.G) terminal, and connect condenser between 0V and F.G terminals to remove noise.



It may cause malfunction if above instructions are not followed.

Main products

- COUNTER
- TIMER
- TEMPERATURE CONTROLLER
- PANEL METER
- TACHOMETER
- LINE SPEED METER
- DISPLAY UNIT
- PROXIMITY SWITCH
- PHOTOELECTRIC SENSOR
- FIBER OPTIC SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- POWER CONTROLLER
- STEPPING MOTOR & DRIVER & CONTROLLER

Autonics Corporation
http://www.autonics.net

HEAD QUARTER :
41-5, Yongdang-Ri, Uingsang-Up, Yangsan-Shi, Kyung-Nam, Korea 626-847.

TRADE DEPARTMENT :
511 Ansung B/D, 410-13, Shindolim-Dong, Kuro-Gu, Seoul, Korea 152-070
TEL: 82-2-679-6585 / FAX: 82-2-679-6556
E-mail : sales@autonics.net

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