

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.

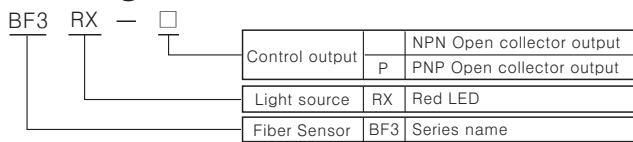
Warning

- 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.

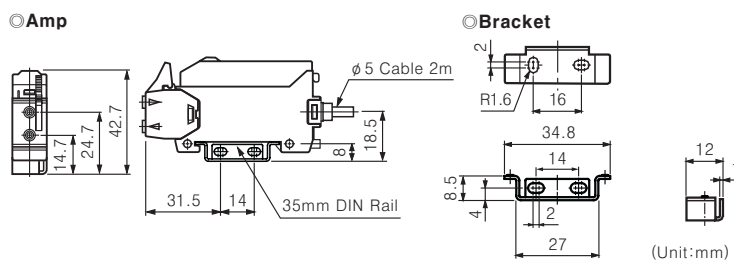
Caution

- 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

Operation mode	Light ON mode	Dark ON mode
Receiver	Received light	Interrupted light
Operation indicator (LED)	ON	OFF
Output TR	ON	OFF

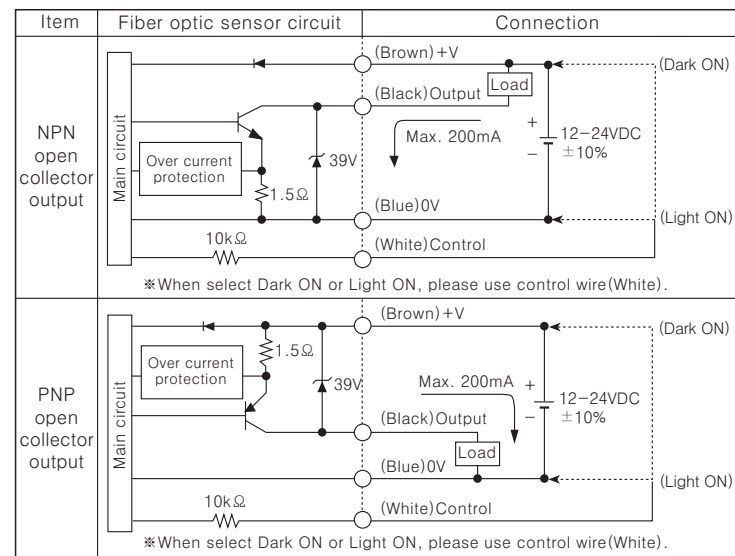
Note)1. The control output TR will be held OFF for 0.5 sec, after supplied power in order to prevent malfunction of this photoelectric sensor.
2. If the control output terminal is short-circuited or flow beyond rating current, the control signal will not be output normally due to protection circuit.

The above specifications are changeable at anytime without notice.

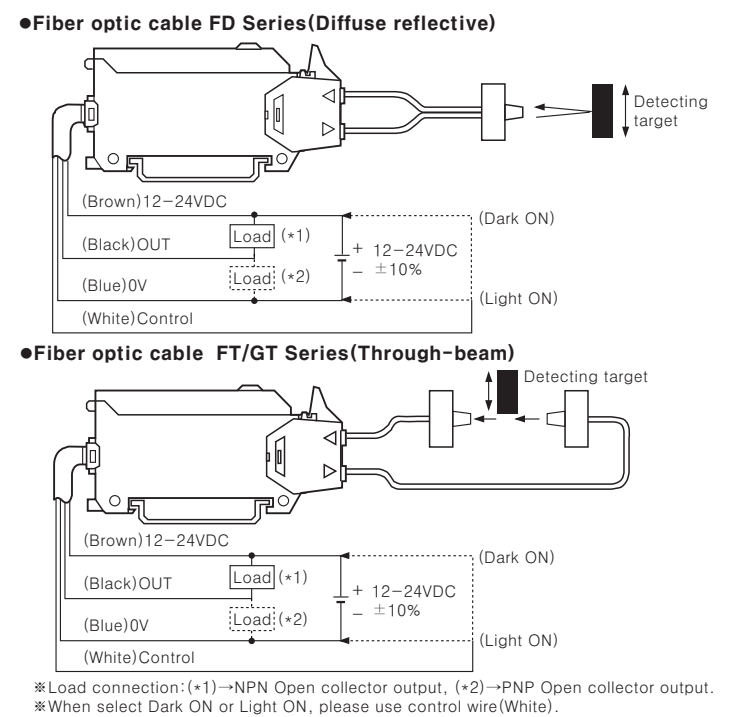
Specification

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
	Reverse polarity protection, Output short-circuit protection	
Protection circuit	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	

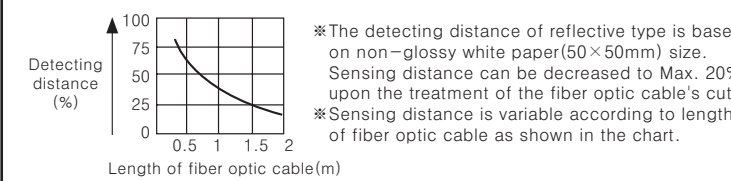
Control output circuit diagram



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		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, φ6, 12, 1000, 8	
FTH-410	M4×0.7, φ5.8, φ4, φ7, 12, 1000, 8	Fiber optic cable protection pipe (Shock, Vibration, Cable cut)
FDH-610	M6×0.75, φ7, φ5.5, φ9, 11, 1000, 8	

Fiber optic cable model

- Fiber optic cable model name(All models)**
- FD-320-05, FD-420-05, FD-620-10, FDC-320-05, FD-320-05, FDP-320-10
 - FDS-320-05, FDS-420-05, FDS-620-10, FD-320-F, FD-620-F2
 - FD-620-10H, FD-620-15H1
 - FTCS-220-05, FT-320-10, FT-420-10, FT-420-10H, FT-420-10H1, FT-420-10, FT-420-10, FT-420-10, FT-420-10, FT-420-10, FT-420-10
 - FTS-320-05, FTS-420-10, FTS1-320-05

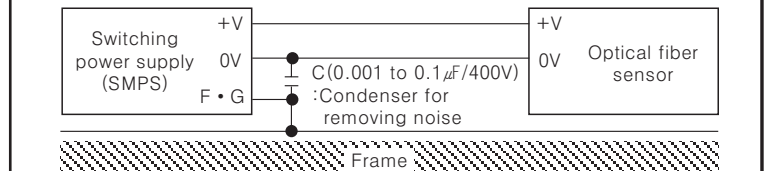
Specification(Example)

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.

Major products

- PROXIMITY SENSOR
- PHOTOELECTRIC SENSOR
- AREA SENSOR
- FIBER OPTIC SENSOR
- DOOR/DOOR SIDE SENSOR
- PRESSURE SENSOR
- ROTARY ENCODER
- SENSOR CONTROLLER
- SWITCHING POWER SUPPLY
- TEMPERATURE CONTROLLER
- TEMPERATURE/HUMIDITY TRANSDUCER
- POWER CONTROLLER
- RECORDER
- TACHOMETER/PULSE(RATE) METER
- PANEL METER
- INDICATOR
- SIGNAL CONVERTER
- COUNTER
- TIMER
- DISPLAY UNIT
- GRAPHIC PANEL
- STEPPING MOTOR & DRIVER
- MOTION CONTROLLER

Autonics Corporation
http://www.autonics.com

Satisfiable Partner For Factory Automation

HEAD QUARTERS : 41-5, Yongdang-dong, Yangsan-si, Gyeongsang, 626-847, Korea

OVERSEAS SALES : Bldg. 402 3rd Fl., Bucheon Techno Park, 193, Yakdae-dong, Wonmi-gu, Bucheon-si, Gyeonggi-do, 420-734, Korea
TEL: 82-32-610-2730 / FAX: 82-32-329-0728
E-mail : sales@autonics.com

The proposal of a product improvement and development : Product@autonics.com