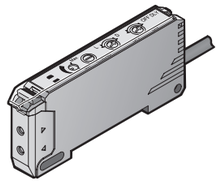
FASTUS
Good Thinking, Good Future

INSTRUCTION MANUAL

Fiber Amplifier

V2RF Series

V2RF-P V2RF-CP
V2RF-N V2RF-CN



OPTEX FA CO.,LTD.

- Thank you for purchasing this Fiber Amplifier V2RF.
- Before using this product, please read this manual carefully to ensure proper use.
- Read this manual thoroughly, and then keep this manual at hand so that it can be used whenever necessary.
- The warranty period of this product is one year after delivery. However, any fault attributable to natural disasters or any other similar disasters or modification or repair will be excluded from the scope of the warranty.

Safety Precautions

Safety precautions for ensuring safe operation of this product are displayed as follows with the following symbols.
Precautions listed here describe important information about safety. Make sure to follow them accordingly.

Safety Symbols

⚠WARNING	Indicates that any improper operation or handling may result in moderate or minor injury, and in rare cases, serious injury or death. Also indicates a risk of serious property damage.
⚠CAUTION	Indicates that any improper operation or handling may result in minor injury or property damage.

⚠WARNING	
	Do not disassemble, repair, modify, deform under pressure, or attempt to incinerate this product. Doing so may cause injury or fire.
	This product is not explosion-proof and should not be used around flammable or explosive gases or liquids. Doing so may cause ignition resulting in an explosion or fire.
	Do not use air dusters or any spray that uses flammable gas around the product or on the inside of the product. Doing so may cause ignition resulting in an explosion or fire.
	Do not install this product in any of the following locations. Doing so may cause a fire, damage, or a malfunction. 1. Locations where dust, salt, iron powders, or vapor (steam) is present. 2. Locations subjected to corrosive gases or flammable gases. 3. Locations where oil or chemical splashes may occur. 4. Locations where heavy vibrations or impacts may occur. 5. Locations where the ambient temperature exceeds the rated range. 6. Locations subject to rapid temperature changes (or where condensation occurs). 7. Locations with strong electric or magnetic fields. 8. Outdoor locations or locations subject to direct light.
	This is a class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.
	This product is not intended for use with nuclear power, railways, aviation, vehicles, medical equipment, food-handling equipment, or any application where particular safety measures are required. Absolutely do not use this product for any of these fields.
	This product cannot be used in applications that directly or indirectly detect human bodies for the purpose of ensuring safety. Do not use this product as a detection device for protecting the human body.
	What to do in the event of a malfunction such as smoke being emitted from the product If you detect any malfunction including emission of smoke, abnormal smells or sounds, or the body becoming very hot, immediately stop operating the product and turn off the sensor power. Failure to do so may cause a fire. Repairing the product is dangerous and should in no way be performed by the customer. Contact an Optex FA sales representative for repairs.

⚠CAUTION
• Make sure to turn the power off before wiring the cable or connecting/disconnecting the connector. Connecting or disconnecting while energized may damage the product or cause electric shock. • Avoid using the transient state while the power is on (100 ms). Output could become unstable, causing unexpected operation. • Do not wire with high voltage cables or power lines. Doing so may cause malfunction or damage by induction. • Do not bend the cable when below the freezing point. This may cause the cable to break. • Do not drop the product or subject the product to strong impacts. Doing so may damage the product. • Follow the instructions in this manual or the specified instruction manual when wiring the product or the dedicated controller for the correct wiring method. Incorrect wiring can damage the product or the controller, or cause a malfunction. • When disconnecting the connector, be careful not to touch the terminals inside the connector, and do not allow foreign objects to enter the connector. • Install this product as far away as possible from high-voltage equipment, power equipment, equipment that generates large switching surges, inverter motors, welders, or any equipment that can be a source of noise. • When connecting or disconnecting the cable, make sure to hold it by the connector portion, and do not apply excessive force to the cable.

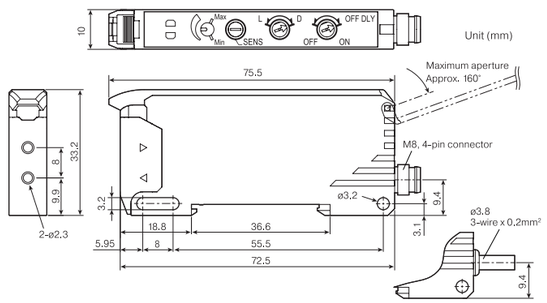
NOTICE

- After carefully considering the intended use, required specifications, and usage conditions, install and use the product within the specified ranges.
- All specifications may be changed without notice.
- When using this product, it is the responsibility of the customer to ensure necessary safety designs in hardware, software, and systems in order to prevent any threat to life, physical health, and property due to product malfunction or failure.
- Do not use this product for the development of weapons of mass destruction, for military use, or for any other military application. Moreover, if this product is to be exported, comply with all applicable export laws and regulations, including the "Foreign Exchange and Foreign Trade Act" and the "Export Administration Regulations," and carry out the necessary procedures pursuant to the provisions therein.
- For more details on conformity to the Restriction of Hazardous Substances Directive for this product, please contact an Optex FA sales representative. Before using this product, fully examine the applicable environmental laws and regulations, and operate the product in conformity to such laws and regulations. Optex FA does not assume any responsibility for damages or losses occurring as a result of noncompliance with applicable laws and regulations.
- Detection characteristics may vary depending on the state of the target object and variations among individual products.

1. Included Accessories

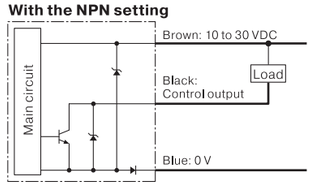
This instruction manual

2. Dimensions

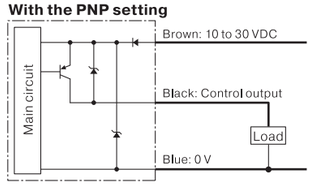


3. I/O Circuit Diagram

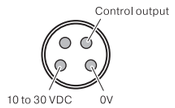
With the NPN setting



With the PNP setting



M8 connector pin configuration

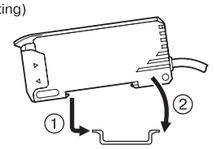


4. Mounting

When mounting screws, use M3 screws with a tightening torque of 0.5 N·m or less.

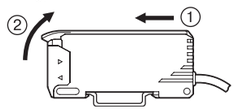
Mounting the amplifier (DIN-rail mounting)

Hook the fiber unit connector side tab to the DIN-rail ①, and press down until the hook locks ②.



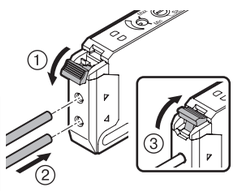
Removing the amplifier (DIN-rail mounting)

While pressing the amplifier body in the direction of ①, lift the fiber unit connector side to remove ②.



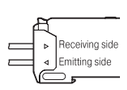
Mounting the fiber unit

Tilt the fiber lock lever ①, and insert the fiber through the insertion opening until it stops ②.
Return the fiber lock lever to the stop position ③.



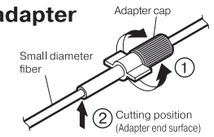
CAUTION

When using a coaxial reflective type fiber, install single-core fiber or fiber containing white wire on the emitting side, and multi-core fiber on the receiving side.

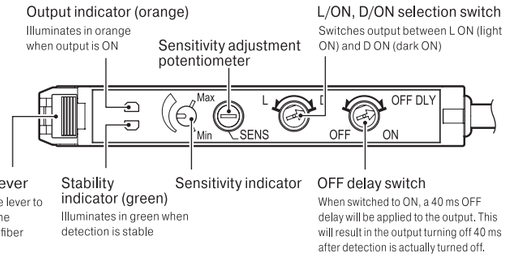


How to use the small diameter adapter

1. With the adapter cap turned all the way to the left, insert the fiber the necessary length and turn the adapter cap to the right to lock it.
2. Cut the unnecessary parts of the fiber with fiber cutters.



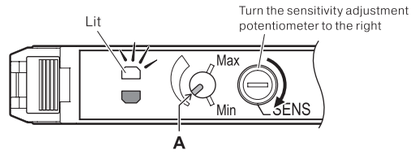
5. Part Names



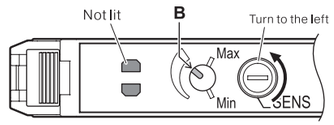
6. Sensitivity Adjustment

In the case of through-beam type fibers, usage at the maximum position of the sensitivity adjustment potentiometer is normally possible.
If using reflective type fibers or when detecting semi-transparent objects, etc., using the through-beam type, adjust sensitivity using the following procedure.

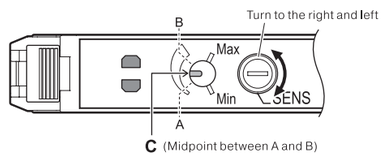
1. Turn the sensitivity adjustment potentiometer to the left using a flathead screwdriver, etc., so that the sensitivity indicator is at the Min position.
2. Set the object for detection in the detection position and turn the sensitivity adjustment potentiometer to the right, gradually raising from the Min position.
   Position A is where the output indicator will light up.



3. Turn the sensitivity adjustment potentiometer to the right so that the sensitivity indicator is at the Max position.
4. Remove the object for detection and turn the sensitivity adjustment potentiometer to the left, gradually lowering from the Max position.
   Position B is where the output indicator will go out.



5. Position C between positions A and B is the optimal position for sensitivity.



* Positions A and B may be reversed depending on the fiber model and the detection conditions.

7. Specifications

Item		V2RF-N (P)
Light source		Red LED
Supply voltage		10 to 30 VDC (including 10% ripple)
Current consumption (power)		30 mA max.
Response time		250 µs
Control output		NPN (PNP), Open collector, 30 V/100 mA, Residual voltage 1.8 V max.
Warm-up time		100 ms
Sensitivity adjustment		8-turn potentiometer with indicator
Mode switching		Selectable by switch
Timer		Fixed at 40 ms, selectable by switch
Indicators		Output indicator: Orange, Stability indicator: Green
Protection circuit		Reverse connection protection, Overcurrent protection, 30 V max.
Cross talk prevention		Max. 2 units
Degree of protection		IP66
Ambient temperature/ humidity		-25 to +55°C / 35 to 85% (no freezing or condensation)*
Storage temperature/ humidity		-40 to +70°C / 35 to 95% (no freezing or condensation)
Ambient illuminance		Sunlight: 10,000 lx or less, Incandescent light: 3,000 lx or less
Vibration resistance		10 to 55 Hz; Double amplitude 1.5 mm; 2 hours in each of the X, Y, and Z directions
Shock resistance		50 G (500 m/s²), 3 times in each of the X, Y, and Z directions
Mounting		Machine screw: M3 × 2, Rail: 35 mm DIN-rail
Connection type		Cable type: 3-wire 2 m cable, Connector type: M8, 4-pin
Connection		1/Brown: 10 to 30 VDC, 3/Blue: 0 V, 4/Black: Control output
Material		Housing, cover: Polycarbonate (PC)
Outer dimensions		10 × 33.2 × 75.5 (mm)
Included accessories		Instruction manual
Options		Mounting bracket
Applicable regulations	EMC	EMC directive (2014/30/EU)
	Environment	RoHS directive (2011/65/EU), China RoHS (Directive No. 32)
Applicable standards		EN 60947-5-2

*: Conditions vary depending on the number of closely mounted units.
1 to 2 units: -25 to +55°C, supply voltage 30 V, output current 100 mA
3 to 10 units: -25 to +50°C, supply voltage 24 V, output current 100 mA
11 to 16 units: -25 to +50°C, supply voltage 24 V, output current 20 mA

Model naming rules

V2RF-C□N
Common
N: NPN type / P: PNP type
C: Connector type / No symbol: Cable type

- Support for the China RoHS directive

For details on the support for the China RoHS directive (the Administrative Measure on the Control of Pollution Caused by Electronic Information Products), see the following website.
http://www.optex-fa.com/rohs_cn/

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