TAKEX

Auto-teaching type Digital Fiber optic sensor

F80R · F80RPN

INSTRUCTION MANUAL

· Outline

This sensor is an auto-teaching type fiber optic amplifier for FA use, which is designed to incorporate a large-scaled display of 4-digit figure for received-light level.

Slowly expression is provided for received-light level variation to be clearly readable.

Long range mode or high-speed mode is selectable to meet detection purpose.

Specifications

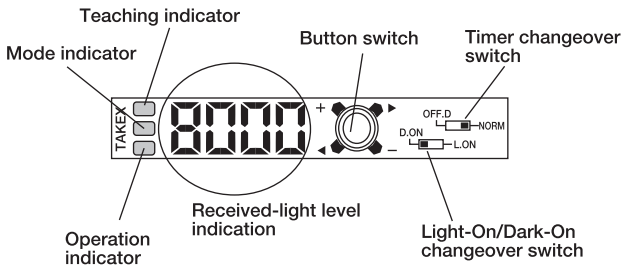
Model	NPN type	F80R
	PNP type	F80RPN
Power supply		12 to 24VDC ±10% Ripple 10% or less
Power consumption	NPN type	650mW Max. (25mA Max. /24V)
	PNP type	830mW Max. (32mA Max. /24V)
Output Mode	NPN type	NPN open collector Rating : Sink current 100mA (30VDC Max.) Remain voltage 1V Max.
	PNP type	PNP open collector Rating : Source current 100mA (30VDC Max.) Remain voltage 2V Max.
Operating Mode		Light-On/Dark-On selectable by slide switch
	Timer	Off delay/No timer selectable by slide switch
		Timer time = 45ms. fixed
Response time ※1)		High-speed mode : 190 μs Max.
		Long range mode : 1.8 ms Max.
Light source (Wave length)		Red LED (660nm)
Indicators		Operation indicator : Orange LED, Mode indicator : Yellow LED, Teaching indicator : Green LED
Display		Received light level indication : Orange LED 4-dight (0～8000)
Switch		Output mode changeover switch : 1, Timer changeover switch : 1
		Bushing for teaching and sensitivity adjustment + 4-direction switch×1
Sensitivity setting system (Teaching system)		Full auto-teaching / Auto-teaching
Sensitivity adjustment		Built-in (Manual adjustment for sensitivity)
Protection circuit		Reverse connection protection, Short circuit protection, Surge absorption
Materials		Polycarbonate
Wiring		Flying lead 2m (Outer dia. ϕ3.7) 0.2mm²×3 wicks
Weight		Approx. 60g (including cord 2m and mounting bracket)
Accessory		Mounting bracket, Instruction manual

※1) Wait for warming-up time approx. 1.5sec. just after power is supplied because output is deactivated during the warming-up time for initial setting and checking. Long range mode is set at factory.

■ Environmental performance

Ambient light	Incandescent lamp : 3,500 lx Max.
Temperature range	When 1 to 5 units are closely used : −25℃ to +55℃ When 6 or more units are closely used : −25℃ to +50℃
	Storage : −40℃ to +70℃ (without condensation)
Humidity	35 to 85%RH (without condensation)
Enclosure protection	I P40
Vibration resistance	10 to 55 Hz, 1.5mm double amplitude, 2 hr. each in X,Y and Z directions
Shock resistance	500m/s² 3 times each in X,Y and Z directions

Operation panel face



Teaching indicator (Green LED) : Flashing for teaching.
Mode indicator (Yellow LED) : Lights for long range mode.
Remains Off for high-speed mode.
Operation indicator (Orange LED) : Lights for output ON.
Received light level indication : Received light level is indicated by 4-digit figure from 0 to 8000. The figure is slowly indicated to be easily readable.
Light level when received (or interrupted) is indicated more slowly for instantaneous light-received action (light-interrupted action).
The light level when received and the light level when interrupted are indicated alternately for an application that sequential ON/OFF is repeated.

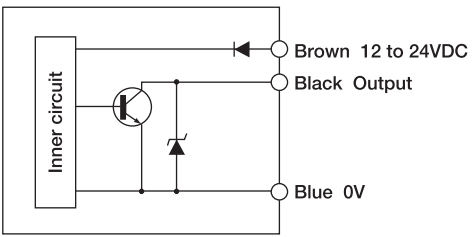
Eco mode

The figure indication lights brightly just after power is supplied or while switch is being operated. Approx. 7 sec. after power supply or switch operation is completed, the figure indication gets dim to shift to Eco mode under which current consumption is reduced.

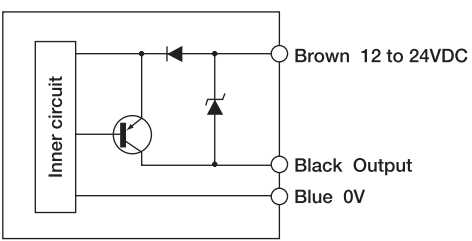
Button switch : Is used for teaching or sensitivity adjustment.
Bushing and 4-direction switch.
Timer selectable switch : Switches over to select off-delay timer.
OFF.D. : Off-delay timer
NORM : No timer
Light-On/Dark-On changeover switch : Output mode is selected.
L.ON : Light-On (Output On when light is received.)
D.ON : Dark-On (Output On when light is interrupted.)
Supply power again or repeat ON/Off manually if Light-On/Dark-On is changed after power supplied.

Output circuit

NPN output

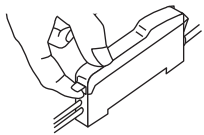


PNP output



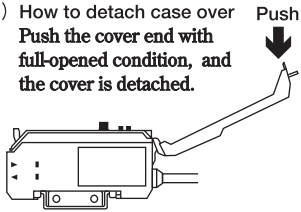
Amplifier unit – Installation –

■ How to attach / detach case cover

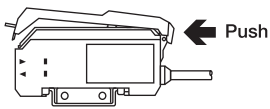


1) How to open case cover
Pull up a case cover tab with holding the front part of the case cover.

2) How to detach case over
Push the cover end with full-opened condition, and the cover is detached.

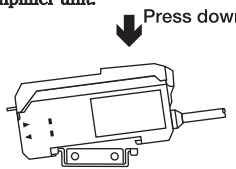


3) How to attach case cover
Put the detached cover on an amplifier unit and push a hinge shown on the figure.

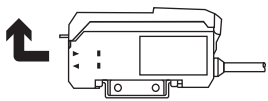


■ How to install DIN rail / mounting bracket

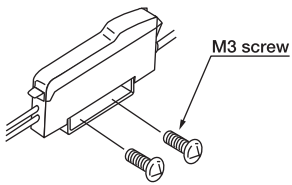
1) How to attach
Engage a front hook of the amplifier unit onto a rail (or a mounting bracket) and press a rear part of the amplifier unit.



2) How to detach
Lift up the front with pushing the amplifier unit forward, and the hook will be released.



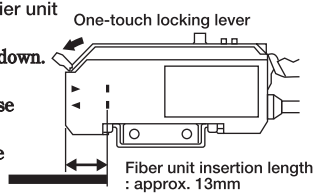
3) Side mounting of Amplifier unit
Fasten with screws by making use of the attached mounting bracket. The tightening torque should be 0.8Nm Max.



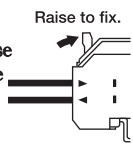
Fiber unit – Installation –

■ How to insert Fiber unit to Amplifier unit

- Make a one-touch locking lever go down.
- Push a fiber unit all the way.
- You can find some marks on the case side showing the insertion length. Please make use of them as a gauge to avoid a mistake when inserting the fiber unit.

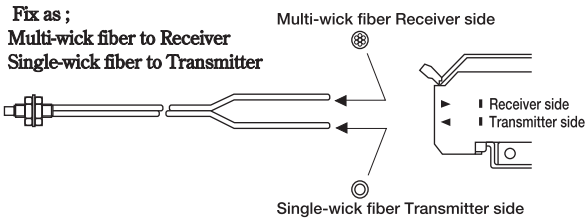


- After the fiber unit is inserted, raise the locking lever until you hear the locking click



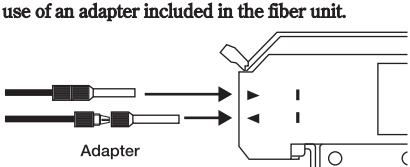
■ How to insert coaxial reflection fiber to Amplifier unit

Fix as ;
Multi-wick fiber to Receiver
Single-wick fiber to Transmitter



■ How to insert small diameter fiber to Amplifier unit

When mounting a small diameter fiber unit,
make use of an adapter included in the fiber unit.



Sensitivity setting

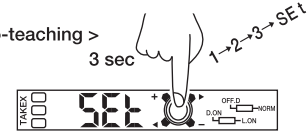
■ Setting condition is shown after sensitivity setting has been completed.

good [Good]	Optimum teaching
high [High]	Maximum sensitivity is set.
HArd [Hard]	Severe condition due to small hysteresis Shown even for positioning teaching.
SAtu [Saturated]	Teaching is not optimum due to too high power. Change to small diameter fiber when thick diameter fiber is used. High-speed mode is recommendatory when long range mode is selected.

■ Setting with stationary object < Auto-teaching >

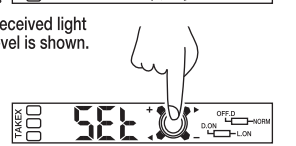
[In case of reflection type].

① Press button for 3 sec. without any object. 3 sec. 1 → 2 → 3 → SEt is shown.



Release the button after SEt is shown.

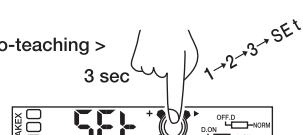
② Press button with an object placed on the required position.
Release the button after SEt is shown. Completed.



[Note] There is no problem if the order of the presence/absence of an object is reverse on the above sensitivity setting procedure.

■ Setting with moving object < Full auto-teaching >

① Press button for 3 sec.
1 → 2 → 3 → SEt is shown.

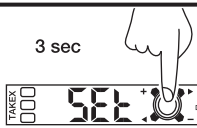


Release the button after SEt is shown.

Received light level is shown.

Sensitivity setting

② Press the button for 3 sec. again.



・ S E t is shown while the button is being pressed.

・ Release the button after Auto is shown. LEDs on both ends flashes alternately

Received light level is shown

③ Alternately flashing LEDs mean full auto-teaching condition.
Make an object passing through on this condition.
There is no time restriction.

LEDs on both ends flashes alternately

④ Finally press the button. Completed.

Received light level is shown

■ Maximum sensitivity setting

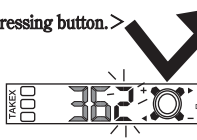
[Through-beam type]
Interrupt light by an object or etc. (Make light-interrupted condition.)
Set sensitivity under this condition.

[Reflection type]
No light-interrupted operation is likely to be obtained when reflection type fiber unit is used at maximum sensitivity. Do not fail to set sensitivity with using an object.

Sensitivity adjustment −Manual adjustment of operation level−

<Flashing numerical value can be changed by pressing button.>

① Press button once.
The present operation level is shown and the flashing figure can be changed.



・Press to + side, and operation level will be up = sensitivity will be reduced.
・Press to − side, and operation level will be down = sensitivity will be increased.

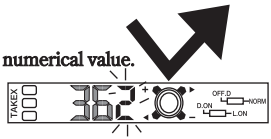
[Note] Hold the button pressed, and it will be fast forward.

・Press to ◀ or ▶ side, and variable digit will shift.

② Press the button once after the adjustment has finished. Completed.

Operation level check — when operation level is currently expected—

① Press button once.
Operation level is shown by flashing numerical value.
Shown as ;

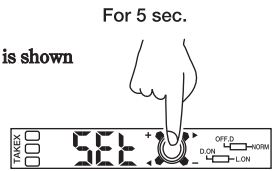


- The value of On at light-received for Light-On
- The value of On at light-interrupted for Dark-On

② Press the button once. Completed.

Changeover of long range mode and high-speed mode

Hold button pressed for approx. 5 sec.
Release the button when Long or H-SP is shown on the display part. Completed.



High-speed mode

Long range mode

Central yellow LED lights for long range mode

Use correctly

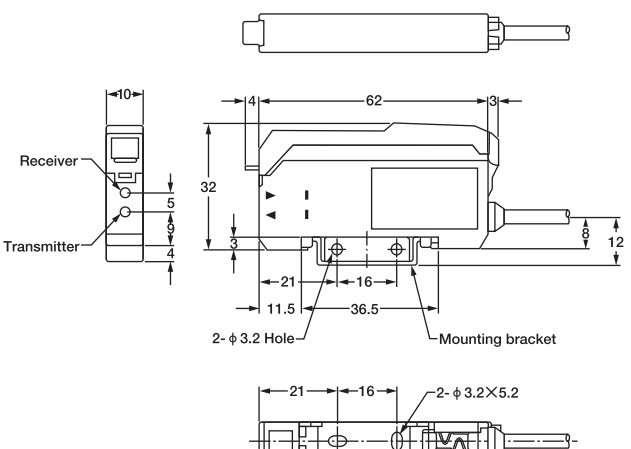
■ Precautions

- Incoming light level on the display part shows an average value for a certain period. Therefore there may be a difference of ± 1 to 2 between the indicated figure and a practical operating value.
- Light-interrupted operation may not be obtained when reflection type fiber unit is used with maximum sensitivity. Do not fail to set sensitivity by using an object.
- Supply the power again or manually turn On/Off repeatedly when Light-On and Dark-On are switched over under power-supplied situation.
- Do not fail to turn the power off before wiring work.
- Cable extension should be 100m Max. by using 0.3mm^2 or more cable.
- Be sure to wire Amplifier unit line separately from high-voltage line/power line as wiring in the same conduit may cause damage or malfunction due to noise.
- Check power supply variation not to exceed the rating for power input.
- Do not fail to ground Frame ground terminal or Ground terminal when an ordinary switching regulator is used.
- Output is not activated during warming up time (approx. 1.5 sec.) just after power is supplied due to initial setting/checking.
- Do not use Amplifier unit where it is subject to vapor, a lot of dust, or direct splash of oil/water.
- Do not use unit outdoors or where external light may shine on the light-receiving face directly.
- Use power supply which is limited the current (2A) in accordance with the lead wire size of the sensor.

■ Notes

- The product is warranted for 12 months after delivery.
- During the warranty period, we will only repair any defective parts or replace any defective products provided that the defectives are caused by our own responsibility.
- This product is not designed to prevent disaster or accident. Please note that we shall not be responsible for any disaster or accident occurred when equipment with this product built-in is used.
- The values described in various features are representative example values. These values are sampling values from optional production allotment and do not warrant "Product Rating/Specifications". Make use of them as a reference.

External dimensions



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