ABRAF

FIBER OPTIC SENSOR
ABF4 SERIES

M A N U A L

CE

Thank you very much for selecting ABRAF products.
For your safety, please read the following before using.

▣ Caution for your safety

⚠**Warning** Serious injury may result if instructions are not followed.
⚠**Caution** Product may be damaged, or injury may result if instructions are not followed.

⚠ Warning

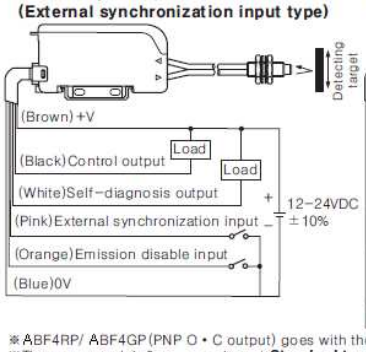
1. **In case of using this unit with machineries(Nuclear power control, medical equipment, vehicle, train, airplane, combustion apparatus, entertainment or safety device etc), it requires installing fail-safe device, or contact us for information on type required.**
   It may result in serious damage, fire or human injury.
2. **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

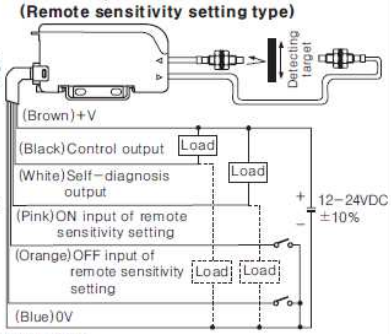
1. **This unit shall not be used outdoors.**
   It might shorten the life cycle of the product or give an electric shock.
2. **Do not use this unit in place where there is flammable or explosive gas.**
   It may cause a fire or explosion.
3. **Please observe voltage rating and do not supply AC power.**
   It may result in damage to this unit.
4. **Do not use this unit in place where there is vibration or impact.**
   It may result in damage to this unit.

▣ Connection

● ABF4R-E/ABF4G-E (External synchronization input type)



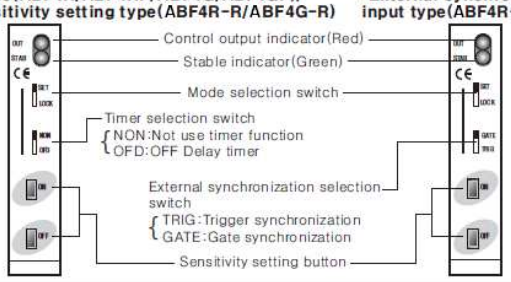
● ABF4R-R/ABF4G-R (Remote sensitivity setting type)



※ABF4RP/ ABF4GP(PNP O • C output) goes with the dotted line.
※There are no pink & orange wires at **Standard type(ABF4R/ABF4RP/ABF4G/ABF4GP).**
※This connection is for diffuse reflective type fiber cable. It also can be used with through-beam type one.

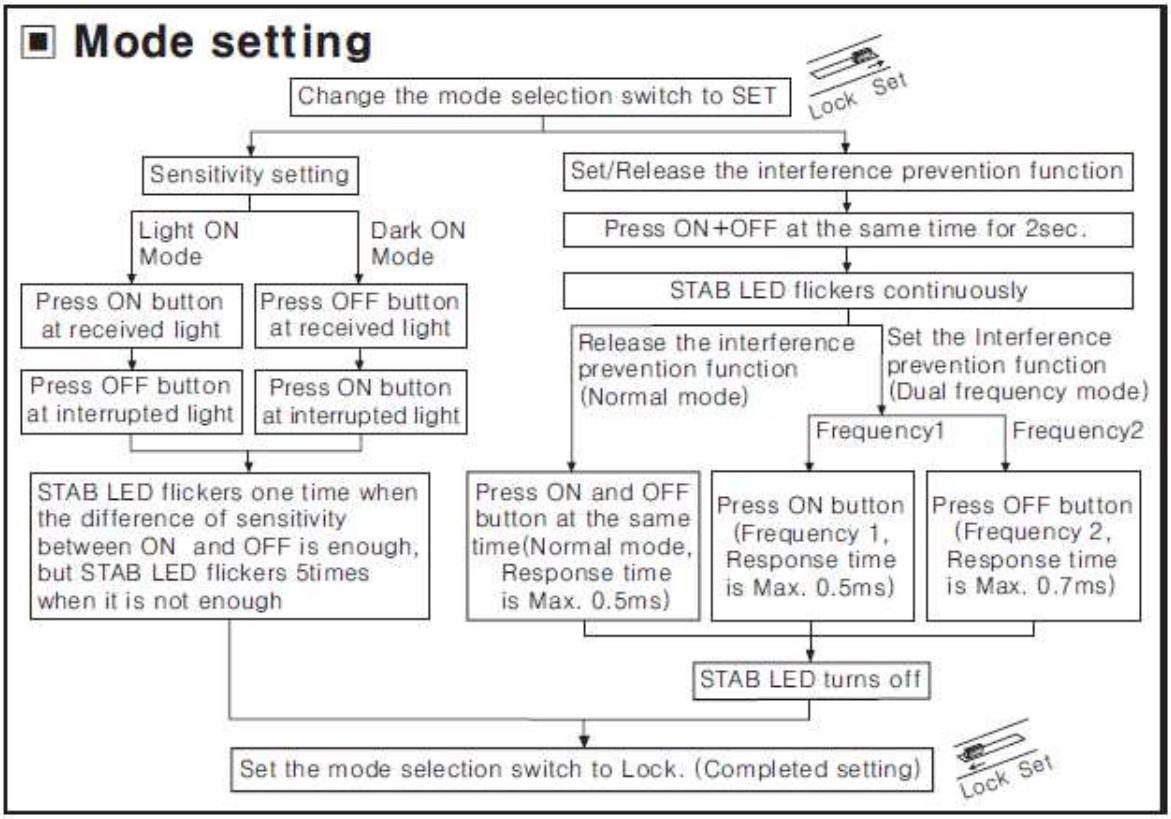
▣ Part names

●Standard type(ABF4R/ABF4RP/ABF4G/ABF4GP)/ Remote sensitivity setting type(ABF4R-R/ABF4G-R)

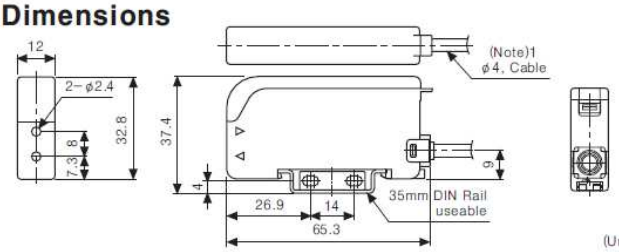


●External synchronization input type(ABF4R-E/ABF4G-E)

▣ Mode setting



▣ Dimensions



(Unit:mm)

▣ Major products

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■ AREA SENSOR ■ FIBER OPTIC SENSOR
■ DOOR/DOOR SIDE SENSOR ■ PRESSURE SENSOR
■ ROTARY ENCODER ■ COUNTER
■ TIMER ■ TEMPERATURE CONTROLLER
■ TEMPERATURE/HUMIDITY TRANSDUCER
■ POWER CONTROLLER ■ PANEL METER
■ TACHO/LINE SPEED/PULSE METER
■ DISPLAY UNIT ■ SENSOR CONTROLLER
■ SWITCHING POWER SUPPLY
■ GRAPHIC PANEL
■ 5-PHASE STEPPING MOTOR & DRIVER & CONTROLLER
■ LASER MARKING SYSTEM(CO_2, Nd:YAG)

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▣ Function

◎Sensitivity adjustment

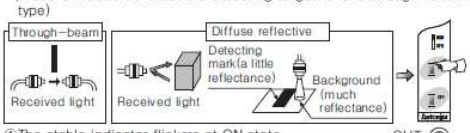
●Adjustment by the sensitivity setting button(All models)

-Light ON Mode

①Mount the fiber optic cable within detecting distance.

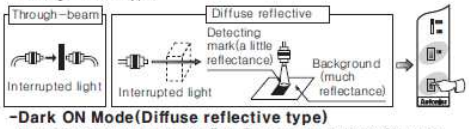
②Change the mode selection switch to Set.

③Press **ON** button in state of installed the detecting target.
(Press **ON** button without the detecting target for the through-beam type)



④The stable indicator flickers at ON state.
(Check the target position)

⑤Press **OFF** button in state of removed detecting target.
(Press **OFF** button at state of installed the detecting target for the through-beam type)



⑥When there is enough sensitivity difference between ON state and OFF state, the STAB indicator flickers one time only at stable sensing area.
When there is not enough sensitivity difference between ON state and OFF state, the STAB indicator flickers five times at unstable sensing area. (Note)

⑦Change the mode selection switch to LOCK, even though somebody touches the sensitivity setting button, setting sensitivity shall not be changed.

(Note)The sensitivity can be set at unstable detecting area.
※Setting sensitivity is memorized when power turns off.
※Do not touch the fiber optic cable after adjusting the sensitivity.

-Dark ON Mode(Diffuse reflective type)

Most of adjustments except ③ & ⑤ are same as Light ON mode.
- Press ON button without the detecting target. (③ state)
- Press OFF button with the detecting target. (⑤ state)

-Light ON mode:The control output turns on at state(Received light) and turns off at state(Interrupted light).
-Dark ON mode:The control output turns off at state(Received light) and turns on at state(Interrupted light).

-In case of setting as max. sensitivity

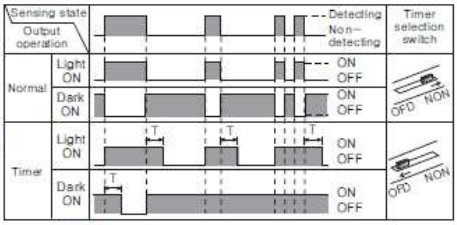
①Set the mode selection switch to SET mode.
② **• In case of Light ON mode**
Press ON/OFF button **from ON to OFF** without the detecting target. (Or set ON input for remote sensitivity setting to Low level, and then set OFF input for remote sensitivity setting to Low level)
• In case of Dark ON mode
Press ON/OFF button **from OFF to ON** without the detecting target. (Or set OFF input for remote sensitivity setting to Low level, and then set ON input for remote sensitivity setting to Low level)
③Set the mode selection switch to LOCK mode.

〈Application〉
- In case of extend detecting distance as the diffusive reflection type.
- In case of use the through-beam type at bad environment.

◎OFF Delay timer function

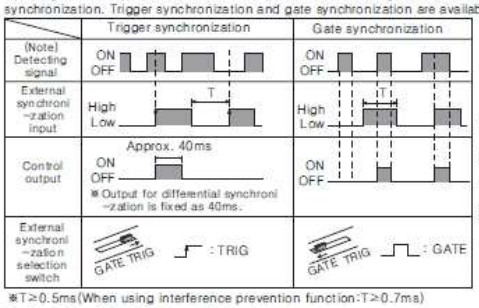
The timer works when the timer selection switch is set to 'OFD'. The output turns off after turnning on for 40ms at OFF position of the sensing output. It is useful when the response time of the connected device is slow or when the sensing signal from a tiny object is too short.

T≒40ms



◎External synchronization input function

By using external synchronization function, the time for making detection can be specified by External synchronization. Trigger synchronization and gate synchronization are available.



〈Input signal condition for External synchronization〉

State	Signal condition
High	4.5-30VDC or Open
Low	0-1VDC

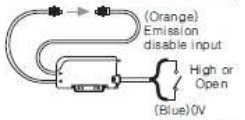
※(Note)Inner signal state before sending as control output for detecting signal which the sensor detects.

※T≥0.5ms(When using interference prevention function:T≥0.7ms)

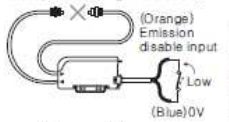
◎Emission disable function -Operation Test

●Below test is available under Light ON state only.
●If Emission disable input is at Low state, Emission light will be disable.
●It can check normal or abnormal state of the sensor without moving the target.

[If Emission disable input is at High or open state, Emission light floods]

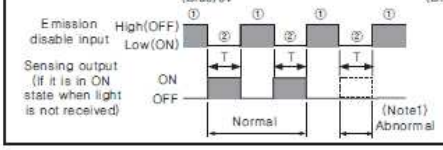


[If Emission disable input is at Low state, Emission light is disable]



〈Input signal condition for Emission disable〉

State	Signal condition
High	4.5-30VDC or Open
Low	0-1VDC

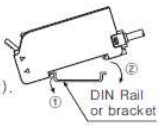


※① : Emission area
※② : Emission stopped area
※(Note1)If Emission stops, control output must turn on, but if control output does not turn on, it seems that sensor has some problems.
※T≥0.5ms(When using interference prevention function T≥0.7ms)

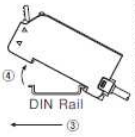
▣ Mounting

1. Amplifier

●When mounting the Amp.
①Hook the amp on the front of DIN Rail(or Bracket).
②Press the rear part of the amp on DIN Rail(or Bracket).

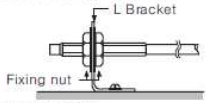


●In case of seperating Amp Push the back of Amp toward ③ and lift the hole for fiber toward ④ up then simply take it out without tools.

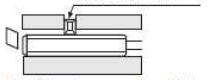


2. Installation of fiber optic cable

●In case of using L bracket

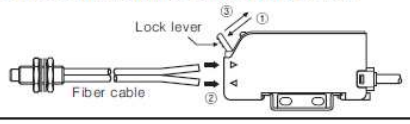


●In case of screw



※Notice:Do not excess specified tightening torque rating not to damage(Crack).

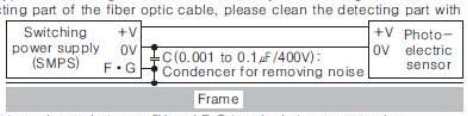
3. Connection of fiber optic cable & Amp.



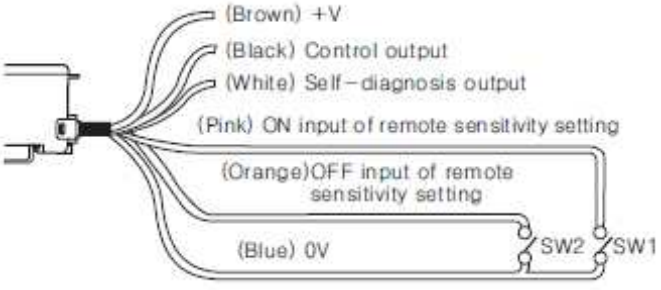
①Open the Lock lever to "↓" direction.
②Insert the fiber optic cable in the Amp. slowly. (Depth:10mm)
③Close the Lock lever to "↗" direction.

▣ Caution for using

1. Do not scratch the section of fiber optic cable.
2. Intercept a strong source of light as like sunlight, spotlight within inclination angle range of photoelectric sensor.
3. Do not apply a strong tensile force to fiber optic cable.
4. In case of installing the fiber optic cable, be sure not to curve the fiber optic cable over tolerance that mentioned in our catalog.
5. 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 seperately or use different conduit.
6. Avoid installing the unit as following place.
   Corrosive gas, oil or dust, strong flux, noise, sunlight, strong alkali, acid.
7. In case of connecting inductive load such as DC relay at load, use shielded cable, diode and varistor in order to remove noise.
8. The amp. cable shall be used shortly, because it might cause malfunction by noise through the cable.
9. 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.
10. 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.



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