

OPTEX FA

Fiberoptic Sensor
Digital Level Indication
DRF/DGF

·DRF-T □ □
·DGF-T □ □

INSTRUCTION MANUAL

● Confirm if the item meets your needs.
● Before the use, you should first thoroughly read this manual and operate correctly as mentioned.
● You should keep this manual at hand for proper use.

Specification

Type	Standard	Mark sensing
cable type	DRF-T (N,P)	DGF-T (N,P)
connector type	DRF-T (CN,CP)	DGF-T (CN,CP)
light source	Red LED	Green LED
supply voltage	DC10 ~ 30V including 10% ripple(P-P)	
current consumption	40mA max.(24V), 20mA max.(24V) (indication:off)	
response time	0.4ms(High Speed), 1ms(Standard), 4ms(Long)	
timer function	Timer off/ OFF delay / ON delay / One shot timer	
sensitivity adjustment	Teaching / manual setting	
indicator	Output indicator(orange LED)	
digital indicator	7 segment, 7 digits 2 colors (red/ green) LED	
control output	NPN/ PNP open collector DC30V 100mA max.	
operation mode	Light ON / Dark ON switchable	
circuit protection	Reverse polarity / output over current / short circuit protection	
ambient temp/ humid	-25~55°C *1/ 35~85%	
ambient illuminance	sunlight: 10,000 lx max. Incandescent light: 3,000 lx max.	
protection category/material	IE Standard IP66 housing: ABS cover: PC	
weight	cable type: about 21g / connector type: about 23g	

*1 extension 3-8pcs -25~50°C

Fiber unit:

○ Fine diameter adapter

① Fully turn adapter cap anticlockwise, and insert fiber as much as needed. Then fully turn back to clockwise and lock.

② Cut necessary fiber by fiber cutter.

Caution: Fiber cutter will lose its performance by repeated use and faltering.

Sensitivity setting (Teaching)

Best detection can be available with four varieties of teaching mode (Detecting mode). Choose the best way for your application and set up correctly.

① Move "SET/RUN switch" to "SET" position.
② Choose teaching mode by select button.

Manual setting

Manual setting is available with ADJ button.

Setting value: By pressing button, present value indication (red) changes to setting value indication (green).

Area teaching: threshold of both Near and Far can be set with ADJ button.

For setting "Near", press one.
For setting "Far", press one.

Setting value: near (near) far (far)

Easy check of mode

*Return to "RUN" 3 sec later after releasing button.

Change of factory default

Press and hold mode button for 0.5-2 sec.

High speed: Detecting high-speed work in short distance.
Standard: For normal use.
Long: For the case of light shortage in standard mode.

Light ON / Dark ON

Time is off

Setting of timer: OFF delay, ON delay, One shot. Hold keys for faster changing.

APC setting: OFF: Normal detection, ON: Precise detection

Reset function: NO: Undo, YES: Default

Default setting:

Response time	Standard
Operation mode	Light ON
Timer function	OFF
APC setting	OFF
Indicator setting	Digital
Counter function	OFF

Easy monitor function

By easy button operation, present setting can be confirmed.

Function items present setting

① Press button briefly (change from present setting (red) to monitor indicator (green)).
* Back to normal indicator 3 sec later after releasing button.

Key lock

Nullify all button operation: Push T & O at the same time for 3 sec.

* Same operation to cancel Key lock function

lock

Hint!: for extension, all zero reset, all teaching and all copy of key-locked amplifier have no effect.

Input/Output circuit design

Pin configuration

①	DC10~30V
②	-
③	0V
④	Control output

Set up fiber unit

① Open protection cover
② Push down locker (unlock).
③ Fully push fiber into the unit.
④ Lift up locker to complete stop (lock).

● For pulling out fiber, push down locker (unlock) and pull out fiber.

* Coaxial type---set white-lined fiber or single-cored fiber to emitter, and plural-cored fiber to receiver.

Parts name

locker, Operator indicator, Select/ADT button, SET/RUN switch, Teaching button, Protection cover, Digital monitor, Present value (red), Teaching mode indicator (green), Mode/Enter button, Extension terminal, Removal cable.

* Connector protection cover is separated from the amplifier body at the factory default. Set protection cover to the amplifier after take off inside two-sided tape.

Set up amplifier unit

● Set up ① Attach sensor forehead to bracket or DIN rail.
② Pop down sensor back to bracket or DIN rail.

● Removal: Slide sensor to the direction arrow indicates, and lift fore part to release.

Cable In/Out

● In: Insert cable until pop

● Out: Pull out with lever down.

! Overpower to lever will cause mechanical damages.

Amplifier extension

● Extension
① Open protection cover of extension amplifier.
② Set extension connector to amplifier.
③ Set on DIN rail and slide to appropriate position one by one.

● Removal
Slide aside and remove from DIN rail.

! In case of using more than 3 extensions, ambient temp. must be in the range of -25~55°C
! In case of using extensions, fixture should be used.
! Should switch off while amplifier set up
! Should take out protection cover only from the extended amplifier.

BEF-EB01-W190

Slide

Extension connector: Fit to socket to base amplifier

Warnings

○ Usage in the following environment must cause damages.
● Dusty and vaporous place
● Corrosive gas environment
● Water and oil scattering environment
● Intense shock and shake

○ In case of switching regulator, frame ground (FG) must be grounded.

○ Warm-up period (apprx. 100 sec.) must be secured.

○ Should avoid parallel wiring with high-voltage wire and/or power line.
Never install in same conduit.

Must not use this item as safety equipment for the purpose of human body protection.

1. Full Power (Max sensitivity setting)

③ Push teaching button once (follow the condition below).
Through-beam: with objective
Reflection: without objective
④ Slide "SET/RUN switch" to "RUN" position.

2. 1-point teaching (No objective)

③ Push teaching button once without objective
④ Slide "SET/RUN switch" to "RUN" position.

3. 2-point teaching

③ Push teaching button once with objective
④ Push teaching button once without objective
⑤ After "Good" appears on the panel, slide "SET/RUN switch" to "RUN" position.

4. Full Automatic

③ Press and hold teaching button more than 3 sec with objective flowing. After indicating "Good", release button. Now sampling is on.
* Adjust sensitivity by light quantity until the next teaching button push.
④ After blinking "Good" (green) appears, slide "SET/RUN switch" to "RUN" position.

5. Heavy duty mode

③ Push teaching button once without objective.
④ Push teaching button once with objective.
⑤ After blinking "Good" (green) appears, slide "SET/RUN switch" to "RUN" position.

6. Area teaching (only for Reflection type)

④ Push teaching button once with objective (no-objective: background)
⑤ After blinking "Good" (green) appears, slide "SET/RUN switch" to "RUN" position.

background, Far, Near, area

* Threshold of both Near and Far can be set by manual setting.

7. Glass teaching

③ Push teaching button once without objective.
④ After blinking "Good" (green) appears, slide "SET/RUN switch" to "RUN" position.

Mirror, Reflection type fiber

* We suggest glass teaching with both mirror and reflection type fiber.

* Stable position is available if present value is more than +10% to setting value.
* After setting, setting value is blinking in green and present will appear in red.
* No gain between the value leads to the blinking indication "Error" in red.

Function set up

Following additional functions can be set as occasional demands.

Counter setting function (For single use)

Press and hold mode button for 0.5-2 sec.

Set counter interval (1-9999 max.)
Counter in operation

On counter function, slide "SET/RUN" switch from "SET" position to "RUN" position to back the indicator "zero"

One shot setting function (For extension use)

Set in the same way of single use.

All copy function
(Copy setting of operation to extension amplifier)
finish all copy (green indicator)

All zero reset
(Back all indicator of extension to zero)
finish all zero reset (green indicator)

All teaching
(Copy teaching setting to extension amplifier) (1-point teaching)
Finish setting (Green indicator)
! After finish setting, sensitivity adjustment is on

Deviation sensing mode
Finish setting (Green indicator)
Cancel deviation sensing mode/ Undo

Deviation sensing mode

Deviation sensing makes stable detection possible to detect little gap by searching light quantity between two sensors.

Green: Setting value (gap of reflection: B-A) mode indicator

Example:
① Choose Deviation sensing
② Set fiber
③ Set "SET/RUN switch" to "SET" position background
④ Press teaching button
⑤ Slide "SET/RUN switch" to "RUN" position

Output by the range of ±10% to setting value.

* In Deviation sensing, gap of light quantity is always displayed on the panel of base unit (in red).
* In case of changing response time, teaching reset is needed.

Other functions

Zero reset (single use)

Zero reset is available by button operation.

Zero reset: Press button for more than 3 sec.
Cancel: Press and hold T & O at the same time for more than 3 sec.

* All procedures in "Function set up", no button operations for more than 10 sec return to RUN.
* In procedures of "Function set up", press mode button for 3 sec to return to RUN
! (Mode button): press for jumping EXIT operation.

Other functions

Zero reset: Press button for more than 3 sec.
Cancel: Press and hold T & O at the same time for more than 3 sec.

* For cancellation, same operation is needed.

Dimensions

(unit: mm)

10.5, 5, 76.5, 3.2, 11.6, 2-φ2.4, 8, 9.5, 4.3, 25.5, 4.3, φ4.2, 9, 10, 7, 74.3, 2-R2.1, Removal cable φ3.8 3core Cable (base cable) φ2.8 1core Cable (sub cable), 2-R1.6, 9, 9.5, 8, 2-R1.6, 6.7, 11.6, M8 4P Connector

Options

○ Cable

Base cable: DOL-LL1903-02M, DOL-LL1903-05M
Sub cable: DOL-LL1901-02M, DOL-LL1901-05M

○ Protection cover for extension connector (2 pcs): BF-WLL190-01

○ Attachment: BEF-EB01-W190

○ Extension connector for cable type: STE-WLL190-05P, for connector type: STE-WLL190-03P

○ Fixture: BEF-EB01-W190

● Specifications and equipment are subject to change without any obligations on the part of manufacture.
● For more information, questions and comments regarding products, please contact us below.

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