

Photoelectric Sensor

**FASTUS**

# TOF-L450SERIES

- TOF-L450□□
- TOF-L450D□□

## INSTRUCTION MANUAL

- Thank you for purchasing TOF-L series. We hope you are satisfied with its performance.
- Please read this manual carefully and keep it for future reference.

**WARNING** Indicates a possible hazard that may result in death, serious injury, WARNINGS or serious property damage if the product is used without observing the stated instructions.

- WARNING**
- The light source of this product applies the visible light semiconductor laser. Do not allow the laser beam to enter an eye, either directly or reflected from reflective object. If the laser beam enters an eye, it may cause blindness.
  - This product is not an explosion proof construction. Do not use the product under flammable, explosive gas or liquid environment.
  - Do not disassemble or modify the product since it is not designed to automatically stop the laser emission when open. Disassembling or modifying at customer's end it may cause personal injury, fire or electric shock.
  - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

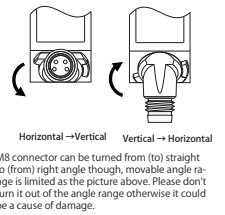
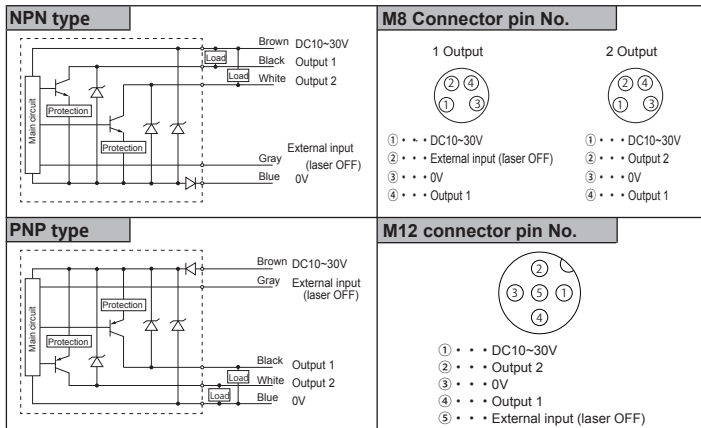
- CAUTION**
- It is dangerous to wire or attach/remove the connector with the power on. Make sure to turn off the power before operation.
  - Installing in the following places may result in malfunction.
    1. A dusty or steamy place.
    2. A place generating corrosive gas.
    3. A place directly receiving scattering water or oil.
    4. A place suffered from heavy vibration to impact.
  - The product is not designed for outdoor use.
  - Do not use the sensor on transient state after power on (approx.300ms).
  - Do not wire with the high voltage cable or the power line. Failure to do this will cause malfunction by induction or damage.
  - The sensor performance or digital display values may depend on the individual units or the condition if detected product.
  - Operate with in the rated range.
  - Don't bend the cable when the temperature of the cable or atmosphere is below freezing.

**This product cannot be used as a safety device to protect human body.**

## SPECIFICATIONS

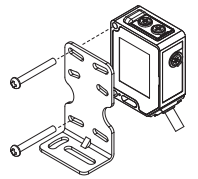
Type	Diffused Reflection type					
	1 Output			2 Output		
Output quantity	1 Output			2 Output		
Connection	M8 connector	2m cable	M12 connector cable	M8 connector	2m cable	M12 connector cable
Model	TOF-L450C(N/P)	TOF-L450(N/P)	TOF-L450M12(N/P)	TOF-L450DC(N/P)	TOF-L450D(N/P)	TOF-L450DM12(N/P)
Supply Voltage	DC10~30V Including ripple (P-P)10%					
Current Consumption	85mA max.					
Sensing distance <sup>1)</sup>	4.5m (white 90%)					
Light source	Red laser diode (wave length : 650nm, maximum output 64mW, pulse length 9ns, light projection period 16.67MHz)					
Laser class	CLASS 1 Laser product (IEC60825-1 / Laser Notice No.50)					
Spot size	φ17mm / 4.5m					
Hysteresis	15% max.					
Response time	0.5ms max.					
Operating mode	Light ON / Dark ON selectable by volume					
Indicator	Output indicator (orange LED) / Stable indicator (Green LED) / Unstable indicator (Red LED)					
Sensitivity adjustment	4 turn volume					
Control output	NPN/PNP open collector DC30V, 100mA max. (Residual 1.8V max)					
External input	Laser OFF (NPN : Low active, PNP : High active)			Laser OFF (NPN : Low active, PNP : High active)		
Number of cross talk prevention	2 Units max.					
Circuit Protection	Reverse polarity, Over current					
Ambient Temp./ Humidity	-10~50°C/35~85%RH					
Storage Temp./ Humidity	-40~70°C/35~95%RH					
Ambient illuminance	Sun light			Incandescent Light		
	4,000lx max.			3,000lx max.		
Vibration resistance	10~55Hz amplitude 1.5mm X, Y, Z each 2h					
Shock resistance	500m/s <sup>2</sup> X, Y, Z each 3 times					
Protection category	IP67					
Material	Case : ABS / Lens : PMMA					

## Input and output circuit diagram

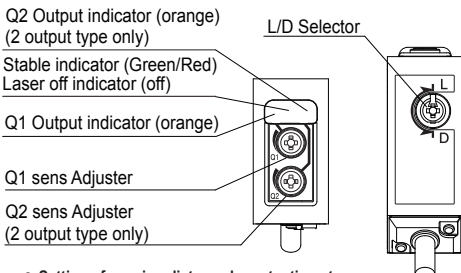


## Installation

Tightening torque: 0.5N·m Max.



## Name of the parts and setup



- **Setting of sensing distance by potentiometer**
  1. Turn the potentiometer counter clockwise slowly until the output indicator LED (orange) turns OFF.
  2. Turn the potentiometer clockwise slowly until both of the output indicator LED (orange) and stable indicator LED (green) turn ON. Then, setting of sensing distance is completed.

※ 2 Output type have two sens. Adjusters and individual setting is possible.
- **Switching Light ON / Dark ON**

You can select output polarity by the potentiometer SW as follows.

Light ON (L) : Output is ON when the sensor detects the reflected light.

Light OFF (D) : Output is ON when the sensor doesn't detect the reflected light.

※ Default setting is "Light ON"

## Precautions for using laser

This product is classified as Class 1 Laser Product by JIS C6802/IEC60825-1 Laser Safety Standard.

When exporting this product to USA, it's necessary to follow laser regulation of USA FDA.

This product has been already reported to CDRH (Center for Devices and Radiological Health). For details, contact our customer service.

Complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007

**OPTEX FA CO.,LTD.**  
91 Awata-cho Chudoji Shimogyo-ku Kyoto 600-8815 Japan  
Place of manufacture: OFROM CO.,LTD.  
Manufactured:

**CLASS 1 LASER PRODUCT**

IEC60825-1 : 2007

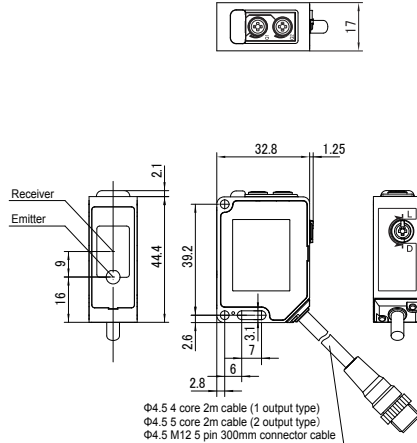
FDA Certification label

Spec of laser diode built in:  
Wave length : 650nm, Maximum output 7mW, Beam width angle 9 deg.

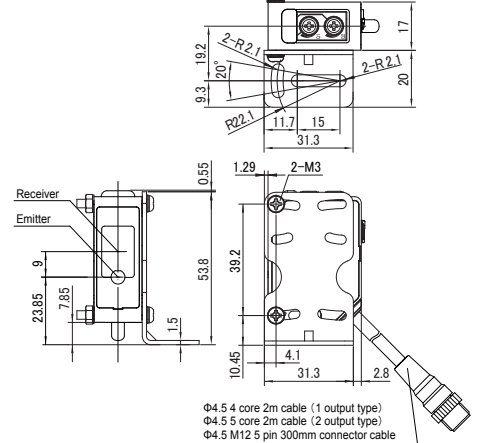
## Dimensions

### ■ Cable, M12 type

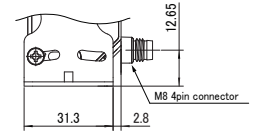
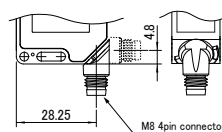
- Without mounting bracket



- With mounting bracket



### ■ M8 Connector type



**UL Satisfaction Ratings**

**Output x1 model**  
Input : 10 - 30 V dc, Class 2, max. 100 mA  
Output : 10 - 30 V dc, Class 2, max. 100 mA  
Resistive x1

**Output x2 model**  
Input : 10 - 30 V dc, Class 2, max. 200 mA  
Output : 10 - 30 V dc, Class 2, max. 100 mA  
Resistive x2

**All Model**  
Maximum surround air Temperature +50°C

- Specifications are subject to change without notice
- For more information, questions and comments regarding products, please contact us below.

**OPTEX FA CO.,LTD.**

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