TOF type

TOF-3V series

Long Sensing Distance Sensor

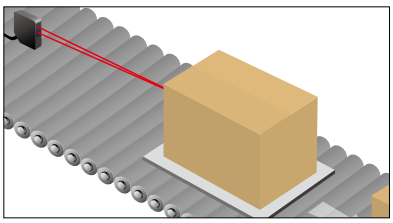
- **TOF, Time Of Flight, method forms the technical basis for maximum reliability and high precision**
- **Immune to object color and angle**

Related products

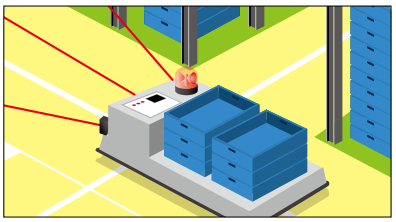
Compact type
TOF-L ● P.364

Display & Analog output
TOF-DL ● P.370

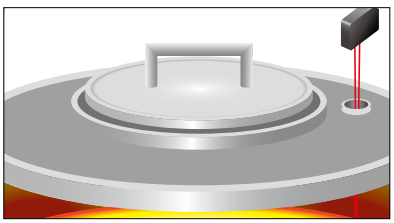
Position detection of items on moving palette.



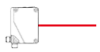
Position detection of automated guided vehicle.



Level detection of melted aluminum liquid.



Selection table

Type	Shape	Sensing distance	Control output	Model (Models in parentheses are connector types)	
				NPN type	PNP type
Diffuse-reflective		0.3 to 3 m	1CH	**TOF-3V300N1 (TOF-3V300CN1)**	**TOF-3V300P1 (TOF-3V300CP1)**
			2CH	**TOF-3V300N (TOF-3V300CN)**	**TOF-3V300P (TOF-3V300CP)**
Retro-reflective		0 to 20 m	1CH	**TOF-3V2000N (TOF-3V2000CN)**	**TOF-3V2000P (TOF-3V2000CP)**

Options/Accessories

Reflectors for TOF-3V2000□

Standard (included)

V-61
Sensing distance: 0.01 to 20 m

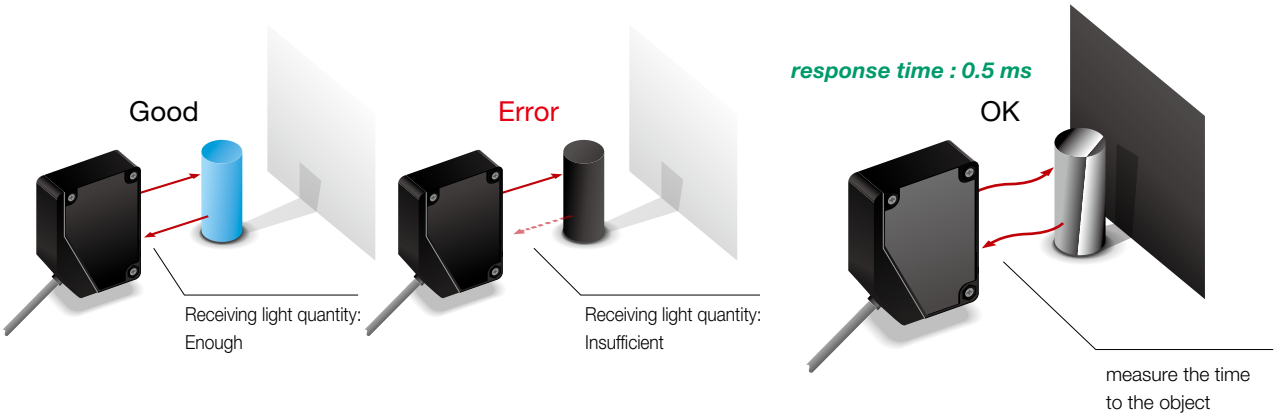
Connector cable

DOL-1205-G02M
Cable length: 2 m

*5 m and 10 m cables are separately available.
*Robot cables are also available.

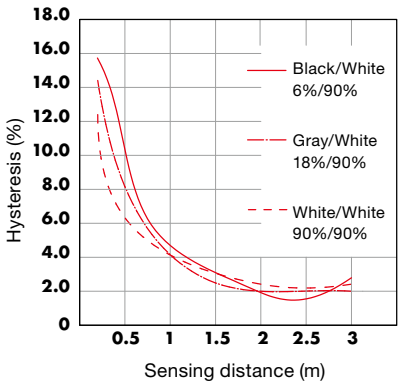
Standard diffuse-reflective sensor

TOF (Diffuse-reflective)



Super tight hysteresis (Diffuse-reflective)

Optex FA's skill in TOF technology design provides super tight hysteresis between black and white objects (2% at 3 m distance)

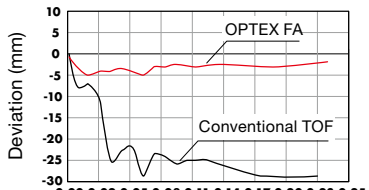


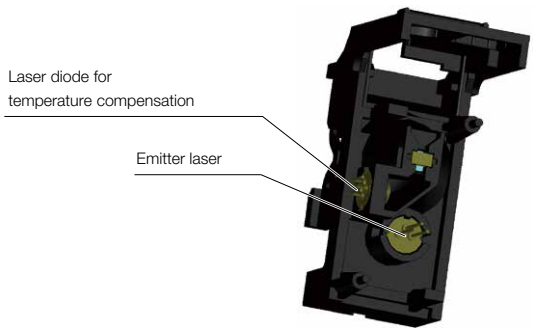
Crosstalk prevention-2pcs MAX.

Up to 2pcs can be mounted side by side.

Dual laser system

The sensor uses two laser diodes in order to compensate for temperature drift of the laser pulse rise time. One laser diode is inside the case and emits directly to a receiver element. The other emits on the outside of the case. By compensating for the time difference between the two laser pulses , the time measurement remains consistent regardless of temperature changes.





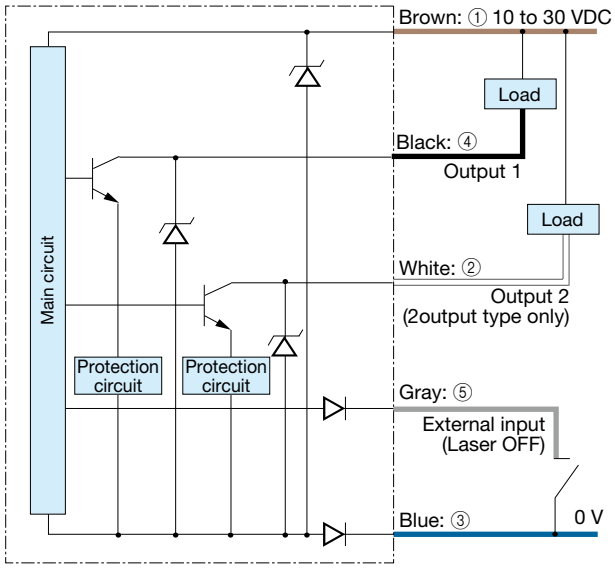
TOF type **TOF-3V** series

Specifications

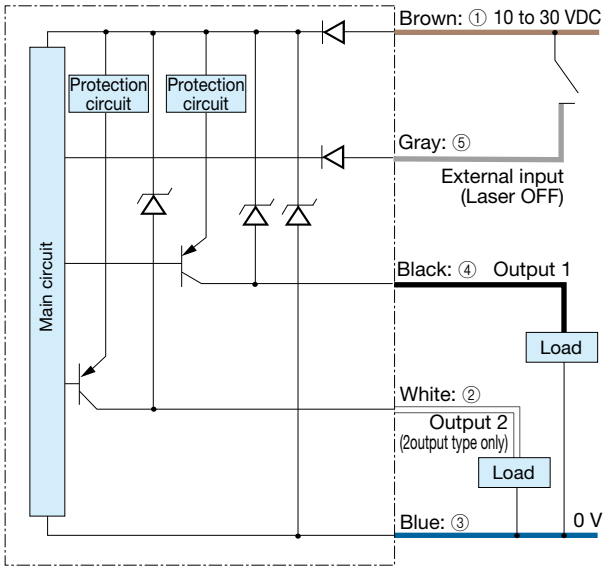
Type				Diffuse Reflective	Retro Reflective
Model	Cable type	NPN	Output: 1CH	**TOF-3V300N1**	**TOF-3V2000N**
			Output: 2CH	**TOF-3V300N**	–
		PNP	Output: 1CH	**TOF-3V300P1**	**TOF-3V2000P**
			Output: 2CH	**TOF-3V300P**	–
	Connector type	NPN	Output: 1CH	**TOF-3V300CN1**	**TOF-3V2000CN**
			Output: 2CH	**TOF-3V300CN**	–
		PNP	Output: 1CH	**TOF-3V300CP1**	**TOF-3V2000CP**
			Output: 2CH	**TOF-3V300CP**	–
Detecting object/target				Opaque (Reflectance: 6 to 90%)	Reflector : V-61
Sensing distance				3000 mm (90% white)	20 m with Reflector V-61
Light source				Red laser diode, wavelength: 650 nm, Maximum output: 5 mW	
Laser class				FDA: Class I JIS/IEC: Class1	
Spot size				ø12 mm at 3 m distance	ø50 mm at 20 m distance
Optical angle deviation				0.5°(9 mrad) or less	
Hysteresis				15% Max : 300 to 1500 mm / 6% Max : 1500 to 3000 mm	10% Max : 1 to 4 m / 3% Max : 4 to 20 m
Repeat accuracy				2 mm	10 mm
Response time				0.5 ms	2 ms
Output mode				Light ON/ Dark ON selectable	
Environmental illuminance				Sunlight : 4,000 lx, Incandescent lamp : 3,000 lx (at 1 m)	
Indicator				Output indicator: Orange x 2 (2-output type), Stable indicator : Green	
Distance adjustment				4-turn Potentiometer	12-turn Potentiometer.
External input				Laser OFF	
Crosstalk prevention				Up to 2 pcs.	
Supply voltage				10 to 30 VDC ±10%, 70 mA max.	
Circuit protection				Reverse connection protection, Over current protection	
Control output				NPN/PNP Open collector, 30V/100mA, (Residual voltage 1.8 V max.)	
Connection (cable)				ø3.8 2 m cable 5 wires (2-output type) , 4 wires (1-output type)	
Connection (M12 connector)				M12, 5-pin connector	
EMC				EN60497-5-2	
Initialization time				300 ms	
Internal short circuit				according to VDE 160	
Materials				ABS/PMMA	
Degree of protection				IP67	
Vibration resistance				10 to 55 Hz, Double amplitude 1.5 mm, X, Y, Z for 2 Hours	
Shock resistance				500m/s^2 (approx. 50G) X, Y, Z 3 times each	
UL				cUL	
CE				EMC directive	
Operating temp. humidity				-10 to +50°C, 35 to 85% RH	
Storage temp. humidity				-40 to +70°C, 35 to 95% RH	
Temperature drift				±1% max.	

I/O circuit diagram

NPN output type

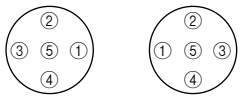


PNP output type



Connector type

(Pin configuration) Sensor side Connector cable side



① 10 to 30 VDC
② Output 2
(2 Output type only)
③ 0 V
④ Output 1
⑤ External input
(Laser OFF)

Notes

- When using a switching regulator for the power supply, be sure to ground the frame ground terminal.
- Because wiring sensor wires with high-voltage wires or power supply wires can result in malfunctions due to noise, which can cause damage, make sure to wire separately.
- Avoid using the transient state while the power is on (approx. 300 ms).

Connecting

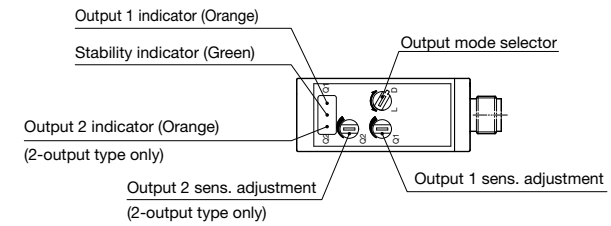
- When not used for control output 2 or external input, cut the lead wire and wrap it individually with insulating tape, and do not connect it to any other terminal.
- ① to ⑤ correspond to connector pin No.

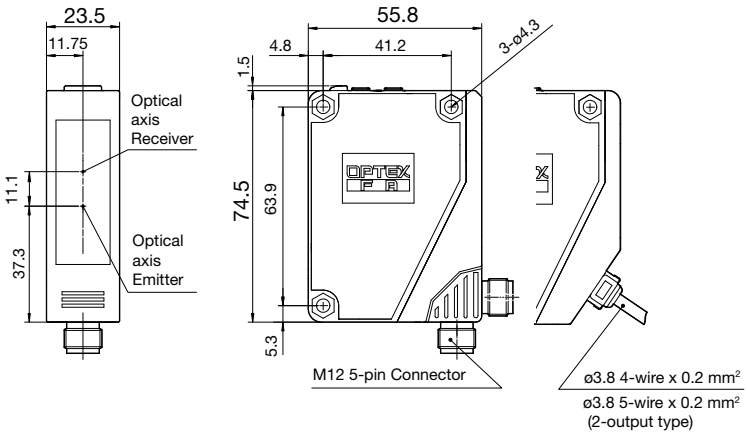
Dimensions

Sensor

(Unit: mm)

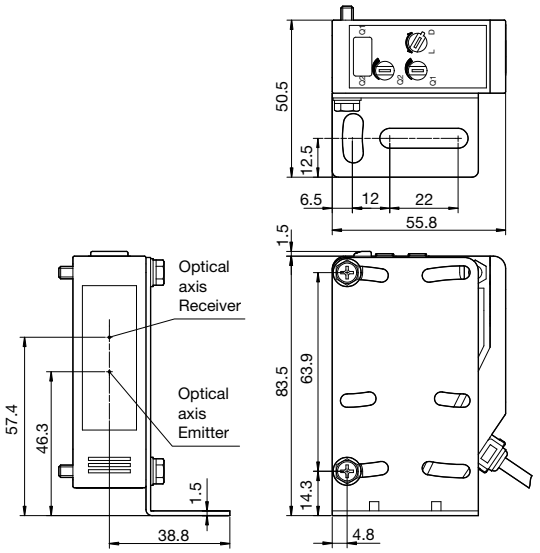
Connector type/cable type



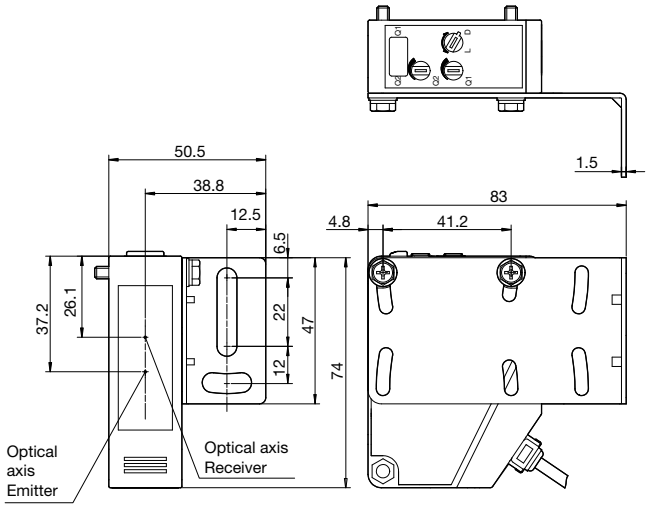


Mounting bracket

Floor-mounted

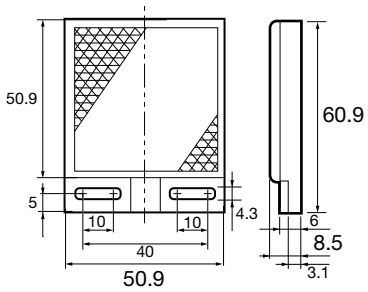


Wall-mounted



Reflectors for TOF-3V2000□

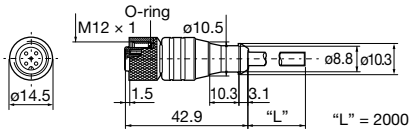
■ **V-61: Standard type reflector**



Connector cable

■ **Cable for M12 connector type**

DOL-1205-G02M

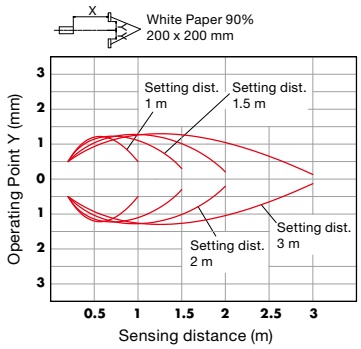


Cable section material: PVC
Conductor cross-section: 5-wire × 0.5 mm²

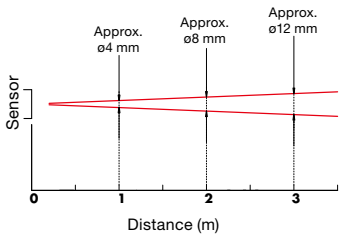
Typical characteristic data

TOF-3V300□

Sensing Area

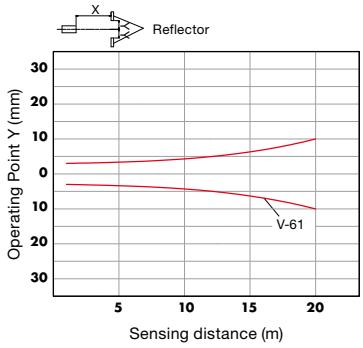


Spot Size



TOF-3V2000□

Sensing Area



Spot Size