FASTUS
Good Thinking, Good Future

INSTRUCTION MANUAL

Photoelectric Sensor

Z4 SERIES

Z4T-2500□□ Z4D-100□□
Z4R-400□□ Z4D-L09□□
Z4D-W20□□

IO-Link

OPTEX FA CO., LTD.

- Please confirm if specifications fulfill your needs.
- Please read this manual carefully before the use and keep this for future reference.

Safety Precautions

CAUTION

- It is dangerous to wire or attach/remove the connector with the power on.
- 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 or impact.
- The product is not designed for outdoor use.
- Do not use the sensor in transient state after power on (approx. 250 ms).
- 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 may depend on the individual units or the condition of detected product.
- Do not use the product in water.
- Do not disassemble, repair, or convert the product. Failure to do this may cause failure, fire, or electric shock.
- Operate within the rated range.
- Do not bend the cable when below the freezing point. This may cause the cable to break.

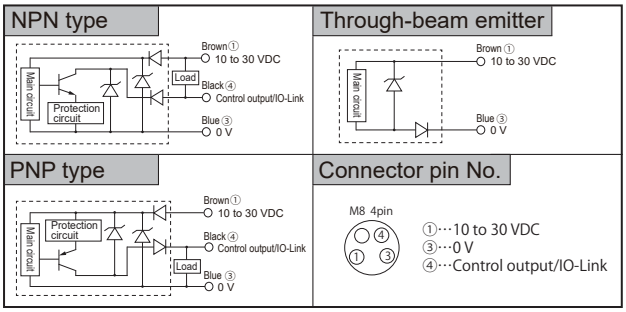
This product cannot be used as a safety device to protect human body.

Specifications

		Through-beam	Retro-reflective	Diffuse-reflective	Limited diffuse reflective	Wide angle diffuse reflective
Cable type		Z4T-2500(Z*1)(N/P)	Z4R-400(Z*1)(N/P)	Z4D-100(N/P)	Z4D-L09(N/P)	Z4D-W20(N/P)
Connector type		Z4T-2500(Z*1)C(N4/P4)	Z4R-400(Z*1)C(N4/P4)	Z4D-100C(N4/P4)	Z4D-L09C(N4/P4)	-
Sensing distance*2		25 m	0.01 to 4 m	0 to 1 m	10 to 90 mm	1 to 200 mm
Light Source		Red LED				
Spot size		φ 1800 mm /25 m	φ 280 mm /4 m	φ 75 mm /1m	φ 8 mm /90 mm	□ 45 mm /50 mm
Supply voltage		10 to 30 VDC including ripple (P-P)10 %				
Current consumption		Emitter: 14 mA Max.	20 mA Max.			
		Receiver: 20 mA Max.				
Response time		500 µs Max.	550 µs Max.			
Hysteresis		—	—	20% Max.	10% Max.	20% Max.
Control output		NPN/PNP Open collector 100 mA Max./30 VDC Max.(Residual voltage 1.8 V Max.)				
Output mode		Light ON, Dark ON selectable by switch				
IO-Link specification		Ver.1.1 transmisson rate COM 3 (230.4 kbps), Process data length : 2 byte, Min. cycle time : 0.5 ms				
Sensitivity adjustment		1-turn volume				
Indicators		Output indicator (orange LED), Stability indicator (green LED)				
Applicable regulations	EMC	EMC directive (2014/30/EU)				
	Environment	RoHS directive (2011/65/EU), China RoHS (M II T Order No.32)				
Applicable standards		EN 60947-5-2				
Company standards		Noise resistance : Feilen Level 3 cleared				
Ambient temp. / Humidity		-25 to 55℃ /35 to 85%RH (No condensation or freezing)				
Storage temp. / Humidity		-40 to 70℃ /35 to 95%RH (No condensation or freezing)				
Ambient illuminance		Sunlight: 50,000 lx or less, Incandescent lamp: 5,000 lx or less				
Weight		Emitter unit of through-beam sensor : Approx. 50g with Cable; Approx. 8g with connector Receiver unit of through-beam sensor: approx. 55g with cable; Approx. 10g with connector				
Degree of protection / material		IP67 / Case : ABS , Front Cover : PMMA				

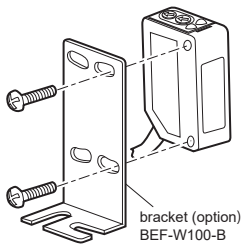
*1 The models with Z in the model numbers are set at a different pulse frequency of light emittance form those without Z.
*2 Sensing distance showed in above table is typical value in each type.
• Retro-reflective type: Reflector V-61 (Option) • Diffuse-reflective type: White paper 200x200 mm • Limited diffuse reflective type: White paper 100x100 mm • Wide angle diffuse reflective: White paper 300x300 mm

Input and output circuit diagram



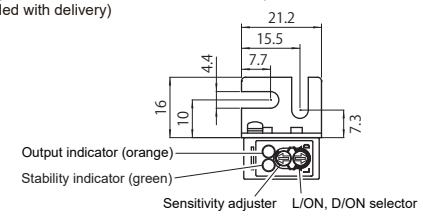
Attachment

- Tightening torque need to be under 0.5N•m.
- Use M3 screw to mount.(more than 7.5mm insert)

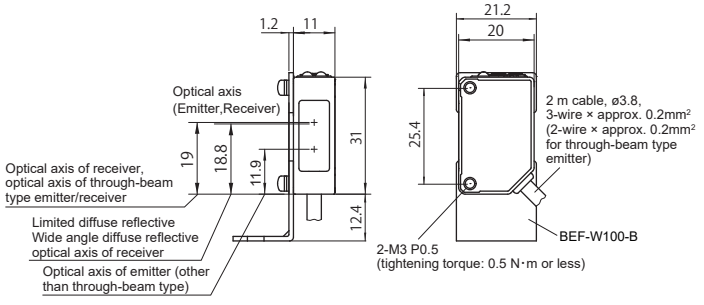


Dimensions

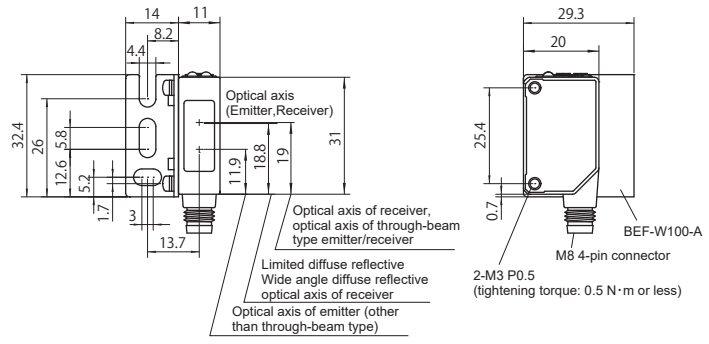
If mounting brackets are needed, order additionally.
(Not included with delivery)



Cable type : When using brackets of BEF-W100-B (option)



Connector type : When using brackets of BEF-W100-A (option)



This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
* This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Adjusting the potentiometer

①		Set the detectable object at the detection position and turn the potentiometer from MIN toward MAX until the output indicator(orange) light up. Call it position A.
②		Remove detectable object and turn the potentiometer from MAX toward MIN position where the output indicator(orange) is extinguished. Call it position B.
③		Point C midway between A and B is the optimum sensitivity position. The position A and B may reverse by types and detecting situation.

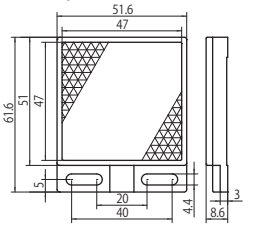
- Normally use the through-beam type and the retro-reflective type with the sensitivity adjustment potentiometer at the MAX position. If adjustment is necessary, do so according to the procedure on the left.
- Turn the potentiometer slowly. It may be damaged if turned with excessive force.

* The output indicator lighting (in orange) and turning off may be reversed depending on the output mode (light ON/dark ON).

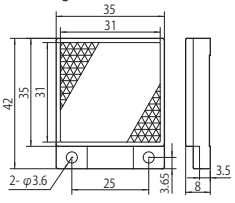
Reflectors (option)

It is necessary for retro-reflective types.
Select the appropriate reflector according to the sensing distance and the installation conditions.
(Reflectors are optional and not included with delivery)

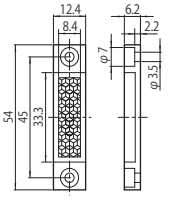
● Standard reflector model: V-61
Sensing distance: 0.01 to 4 m



● Small reflector model: V-42
Sensing distance: 0.01 to 2.4 m



● Vertical type reflector model: P45A
Sensing distance: 0.01 to 1.4 m



Stability indicator functions

Indicator status	Description
Lit continuously	Stable detection is being performed.
Lit for 0.1 seconds + off for 0.4 seconds	Indicates that detection is unstable. In detail, the indicator starts flashing when the detection margin drops below 10% and stops flashing when the detection margin meets or exceeds 10%.

• Support for the China RoHS directive
For details on the support for the China RoHS (the Administrative Measure on the Control of Pollution Caused by Electronic Information Products), see the following website.
https://www.optex-fa.com/rohs_cn/

UL Satisfaction Ratings c UL us
Emitter only
Input : 10 – 24 Vdc, Class 2, max. 40 mA
Maximum surrounding air temperature: 40℃
Enclosure Type Rating: Type 1
Others
Input : 10 – 24 Vdc, Class 2, max. 40 mA
Output : 10 – 24 Vdc, Class 2, max. 20 mA
Maximum surrounding air temperature: 40℃
Enclosure Type Rating: Type 1

Download the IO-Link index list and setting file (IODD file) from the Optex FA website.
https://www.optex-fa.com

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