

STANDARD

OMRON

Model **E3Z-□8□-IL□-UL**

PHOTOELECTRIC SENSOR

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:

Importer in EU:
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The Netherlands

Manufacturer:
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The following notice applies only to products that carry the CE mark:

Notice:
In a residential environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

CE

IO-Link

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■Dimensions

E3Z-□81/-□82-UL

Operation indicator *

Stability indicator (IO-Link Communication indicator) *

Optical axis

10.8

10.4

20

17

25.4

2-M3

Vinyl insulated round cord
Standard length 2m 4dia.

Potentiometer **

Operation mode switch **

Operation mode switch	Operation	Factory setting
	Dark ON	Through-beam type Retro-reflective type
	Light ON	Diffuse reflective type Narrow beam type

** Slowly revolve the operation selector switch and potentiometer using a small flat-head screwdriver according to the switch shape. If revolving it too strong, it might be damaged.

* Only power indicator (IO-Link Communication indicator) is on Emitter of Through-beam type.

** The form differs because Emitter of Through-beam type does not have it.

E3Z-□86-IL□/-□87-IL□-UL

Operation indicator *

Stability indicator (IO-Link Communication indicator) *

Optical axis

10.8

10.4

20

17

25.4

2-M3

9.75

M8×1

Potentiometer **

Operation mode switch **

Operation mode switch	Operation	Factory setting
	Dark ON	Through-beam type Retro-reflective type
	Light ON	Diffuse reflective type Narrow beam type

** Slowly revolve the operation selector switch and potentiometer using a small flat-head screwdriver according to the switch shape. If revolving it too strong, it might be damaged.

* Only power indicator (IO-Link Communication indicator) is on Emitter of Through-beam type.

** The form differs because Emitter of Through-beam type does not have it.

■Mounting

Use tightening torque
0.5N·m max.

Mounting bracket (option)
Type E39-L104

■Time Chart

	Operation mode *1	operation zone	Stability	Instability operation zone	operation zone	Stability
Standard I/O mode (SIO mode)	L ON					
		ON OFF	Stability indicator (Green) *5			
		ON OFF	Operation indicator (Orange)			
		ON OFF	Control output 1 *2			
D ON	D ON					
		ON OFF	Stability indicator (Green) *5			
		ON OFF	Operation indicator (Orange)			
		ON OFF	Control output 1 *2			
IO-Link mode	L ON					
		ON OFF	Flashing Communication indicator (Green) (1sec cycles)			
		ON OFF	Operation indicator (Orange)			
		ON OFF	Control output 1 (Byte1_bit0) *2			
D ON	D ON					
		ON OFF	Control output 2 *2,*3			
		ON OFF	Instability detection (Light receiving) (Byte1_bit4) *4,*5			
		ON OFF	Instability detection (Non-Light receiving) (Byte1_bit3) *4,*5			

*1 The operation mode can be changed by the IO-Link communications.

*2 The timer function can be set up using the IO-Link communications for control output 1 and 2 separately. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1-4000ms (T).)

*3 In the IO-Link mode, if the ON/OFF speed of the sensor is slow, high-speed response of 1ms or less can be realized using control output2 as a sensor.

*4 The judgment time for the instability detection diagnosis can be selected using the IO-Link communications. (For the ON delay timer function to detect instability, the setting can be selected from 0 (invalid), 10, 50, 100, 300, 500, or 1000ms.

*5 The judgment condition for the incoming/blocked light instability detection function can be selected using the IO-Link communications. (Setting of incoming light instability detection threshold: 500%/400%/300%/200%/140%, setting of blocked light instability detection threshold: 70%/50%)

	Sensing object	Present	Not Present	Present	Not Present
On-delay	L ON	ON 1	OFF 0		
	D ON	ON 1	OFF 0		
Off-delay	L ON	ON 1	OFF 0		
	D ON	ON 1	OFF 0		
One shot	L ON	ON 1	OFF 0		
	D ON	ON 1	OFF 0		

■Output Circuit Diagrams

Reflective / Receiver of Through-beam type

E3Z-□8□-IL□-UL

Using as a general sensor

Photoelectric Sensor

Using as connected with the IO-Link master unit

Photoelectric Sensor

IO-Link Master

Emitter of Through-beam type

E3Z-T8□-L-IL□-UL

Using as a general sensor

Photoelectric Sensor

IO-Link Master

Connector pin arrangement

Connector Models(M8)

E3Z-□86-IL□-UL

E3Z-□87-IL□-UL

E3Z-T86-L-IL□-UL

OMRON adaptive connector cord:
Connector Models(M8) : XS3 series (only UL certified products)

Pre-wired smartclick connector Models(M12)

E3Z-□81-M1TJ-IL□-UL

E3Z-D82-M1TJ-IL□-UL

OMRON adaptive connector cord:
Connector Models(M12) : XS5 series (only UL certified products)

■Wiring

In the IO-Link mode, the cord between the IO-link master and sensor must have a length of 20m or less.

■Specifications

Detection system	Through-beam type	Retro-reflective type	Diffuse reflective type	Narrow beam type			
Type	E3Z-T81-IL□-UL E3Z-T86-IL□-UL	E3Z-R81-IL□-UL E3Z-R86-IL□-UL	E3Z-D82-IL□-UL E3Z-D87-IL□-UL	E3Z-L81-IL□-UL E3Z-L86-IL□-UL			
Detecting distance	15m	0.1 to 4m (with E39-R1S) 0.1 to 3m (with E39-R1)	1m	90±30mm			
Operating angle	Emitter/Receiver: 3 to 15°	2 to 10°	—	—			
Light source (luminescence wavelength)	Infrared LED (870nm)	Red LED(660nm)	Infrared LED (860nm)	Red LED(650nm)			
Supply voltage	10 to 30V DC (including 10% ripple(p-p)), Class2						
Current consumption	Emitter: 25mA max. Receiver: 25mA max.	30mA max.					
Control output	Load supply voltage: 30V DC max. Load current: 100mA max. PNP Open collector output Light ON/Dark ON switch selectable						
Residual voltage	1V or less : Load current less than 10mA. 2V or less : Load current less than 10 to 100mA.						
Response time	Operate or reset: 1 ms max.						
Sensitivity adjustment	Potentiometer / IO-Link communications						
Ambient temperature	Operating:-25 to +55°C, Storage:-40 to +70°C(no freezing and condensation)						
Ambient humidity	Operating:35 to 85%RH, Storage:35 to 95%RH(no condensation)						
Degree of protection	IEC60529 : IP67						
Indicator	In the Standard I/O mode (SIO mode): Operation and stability are indicated by orange-color/lighting and green/lighting, respectively. In the IO-Link mode: Operation and communications are indicated by orange-color/lighting and green/blinking (at 1s intervals), respectively.						
Material	Case	Polybutylene Terephthalate resin (PBT)					
	Display	Polycarbonate resin (PC)					
	Lens	Denatured polyallylate	Methacrylate resin (PMMA)	Denatured polyallylate			
Major IO-Link functions (I): factory setting)	• Operation modes switching between Light ON and Dark ON Through-beam type or Retro-reflective type Diffuse reflective type or Narrow beam type [Dark ON] [Light ON] • Setup of a teaching level and execution of teaching [1000%] [1023] • Setup of light receiving sensitivity level [Instability(Light receiving) : 140%] [Instability(Non-light receiving) : 70%] • Timer function of the control output and timer time selecting (Select from Disable, ON Delay, OFF Delay, or One Shot.) (Select a timer time of 1-4000ms) [Disable] [5ms] • Instability output (IO-Link mode) ON delay timer time selecting (0 (Disable)-1000ms) [300ms] • Monitor output (PD output indicating a relative detection quantity (Byte 0) • Operating hours read-out (unit: h) • Initial reset (factory setting)						
IO-Link communications specification	IO-Link specification	Ver 1.1					
	Baudrate	-IL3 : COM3 (230.4kbps) , -IL2 : COM2 (38.4kbps)					
	Data length	PD size :2byte, OD size :1byte (M-sequence type: TYPE_2_2)					

Note 1. Altitude: Up to 2000m, Pollution degree: 3, Enclosure type: type 1.

■Error indication (common to the Standard I/O mode (SIO mode) and IO-Link mode)

Indication	Cause	Action
	The sensor might be broken internally.	Start up (turn ON) the sensor again. If the error occurs again, replace the sensor.
	Control output 1 or 2 has become load short-circuit.	Check the wiring and connector connection again.
	Inconsistency has occurred on the settings (service data) written in by the IO-Link communications.	Execute the system command to "Restore the factory settings" to initialize the settings. Refer to index 2 of servie data.

■Sensitivity adjustment

Sensor's sensitivity can be adjusted using the potentiometer or using the IO-Link communications.

The value which is set newer either using the potentiometer or using the IO-Link communications is reflected as the sensor's sensitivity

The sensitivity levels adjusted through IO-Link communications do not correspond to the levels the potentiometer indicates.

Setup method	Setup range
potentiometer	
IO-Link communications	min:0 max:1023

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

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