E3AS Series
Distance-settable Photoelectric Sensors

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OMRON

E3AS Reflective Sensors

Reducing commission time and improving detection in automotive applications

IO-Link

ECOLAB

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E3AS Series Sensors

E3AS-F
(TOF) Time of Flight
Link

- Detect target regardless of color, texture, or sheen

Features:
- Minimal color influence on sensing distance
- 50mm to 1500mm sensing range
- Single 2 point teach button
- IO Link distance output monitoring

E3AS-HL
CMOS Photoelectric Sensor
Link

- Detects from 35-150 & 35-500 sensing distance
- Parts detection for small, color variations or transparent objects
- Line beam option for uneven surfaces
- Foreground and back ground setting (window setting)
- Teach locally or through IO-Link
- Wide angular displacement
- Easy teach button and OLED display

E3AS-L
Distance Settable Photo Sensor
Link

- Detects from 10mm to 80mm & 10mm to 200mm
- Background suppression sensor for enhanced detection of low-reflectivity objects.

Applications:
- Conveyor items of various size targets and colors.
- Detection of mesh or perforated objects
- Multiple conveyor lines which require sensor teaching

Primary Benefits:
- Use one sensor for multiple sensing distance, environments and object shapes or sizes
- Compact size and easy to use

UL CERTIFIED CE ECOLAB IO-Link

- SUS316L Construction
- IP69k & IP67G
- Antifouling coating on sensing lens
- Single point teach via local or IO Link

Distance-settable Photoelectric Sensor TOF Laser Sensor
E3AS-F Series

Optimal sensing distance (50 to 1,500 mm) for use on conveyor lines

- Wide sensing distance of 50 to 1,500 mm*, enabling use on any conveyor line width
- Time of flight (TOF) type sensors for use with any type of conveyed object
- Compact body can be mounted anywhere
- (Metal body (SUS316L), Plastic body type (PBT/PC))
- Teaching method allows anyone to set optimal threshold values
- Manufactured using Omron's proprietary laser sealing method (IP67/IP69K/IP67G)
- Antifouling coatings reduce the cleaning frequency on the lens.
- IO-Link reduces time required for startups and changeovers

* The sensing distance of the E3AS-F1500 series.

Refer to *Safety Precautions* on page 9.

For the most recent information on models that have been certified for safety standards, refer to your Omron website.

Ordering Information

Sensors [Refer to *Dimensions* on page 11.]

SUS 316L Body

Infrared light

Connection method	Sensing distance (white paper)	Output	Model		
			NPN output	PNP output	PNP output
		IO-Link baud rate	---	COM2 (38.4 kbps)	COM3 (230.4 kbps)
Pre-wired (2 m) [1]	50 mm – 1,500 mm		E3AS-F1500IMN 2M	E3AS-F1500IMD 2M	E3AS-F1500IMT 2M
M8 Connector			E3AS-F1500IMN M3	E3AS-F1500IMD M3	E3AS-F1500IMT M3
M8 Pre-wired Connector			E3AS-F1500IMN-M3J 0.3M	E3AS-F1500IMD-M3J 0.3M	E3AS-F1500IMT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-F1500IMN-M1TJ 0.3M	E3AS-F1500IMD-M1TJ 0.3M	E3AS-F1500IMT-M1TJ 0.3M
Pre-wired (2 m) [1]	50 mm – 1,000 mm		E3AS-F1000IMN 2M	E3AS-F1000IMD 2M	E3AS-F1000IMT 2M
M8 Connector			E3AS-F1000IMN M3	E3AS-F1000IMD M3	E3AS-F1000IMT M3
M8 Pre-wired Connector			E3AS-F1000IMN-M3J 0.3M	E3AS-F1000IMD-M3J 0.3M	E3AS-F1000IMT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-F1000IMN-M1TJ 0.3M	E3AS-F1000IMD-M1TJ 0.3M	E3AS-F1000IMT-M1TJ 0.3M

PBT Body

Connection method	Sensing distance (white paper)	Output	Model		
			NPN output	PNP output	PNP output
		IO-Link baud rate	---	COM2 (38.4 kbps)	COM3 (230.4 kbps)
Pre-wired (2 m) [1]	50 mm – 1,500 mm		E3AS-F1500IPN 2M	E3AS-F1500IPD 2M	E3AS-F1500IPT 2M
M8 Connector			E3AS-F1500IPN M3	E3AS-F1500IPD M3	E3AS-F1500IPT M3
M8 Pre-wired Connector			E3AS-F1500IPN-M3J 0.3M	E3AS-F1500IPD-M3J 0.3M	E3AS-F1500IPT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-F1500IPN-M1TJ 0.3M	E3AS-F1500IPD-M1TJ 0.3M	E3AS-F1500IPT-M1TJ 0.3M
Pre-wired (2 m) [1]	50 mm – 1,000 mm		E3AS-F1000IPN 2M	E3AS-F1000IPD 2M	E3AS-F1000IPT 2M
M8 Connector			E3AS-F1000IPN M3	E3AS-F1000IPD M3	E3AS-F1000IPT M3
M8 Pre-wired Connector			E3AS-F1000IPN-M3J 0.3M	E3AS-F1000IPD-M3J 0.3M	E3AS-F1000IPT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-F1000IPN-M1TJ 0.3M	E3AS-F1000IPD-M1TJ 0.3M	E3AS-F1000IPT-M1TJ 0.3M

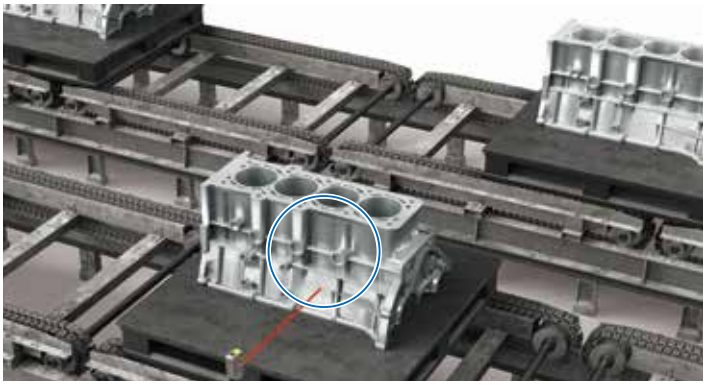
1. Models with 5-m cable length are also available with “5M” suffix. (Example: E3AS-F1500IMN 5M/E3AS-F1500IPN 5M)
2. The Pre-wired Connector (M12) is Smartclick Connector.

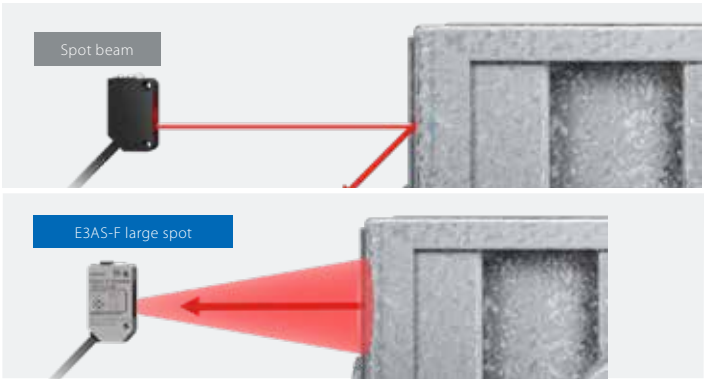
Flexible installation saves design time

Sensor space limitations make equipment design and retrofit work complicated. The E3AS Series is small and has a wide angular displacement to allow for various mounting configurations.

E3AS-F for large workpieces with various colors or rough surfaces

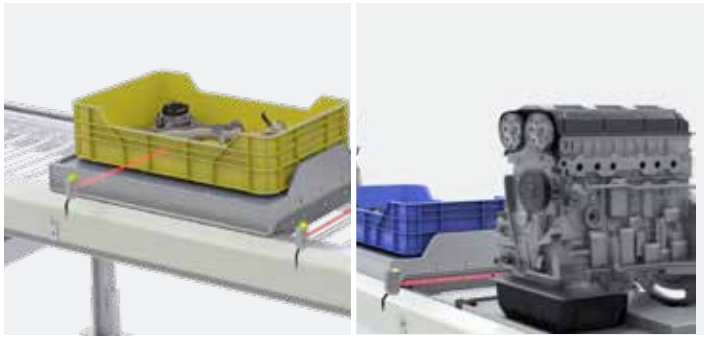
Reliable detection of metal workpieces with rough surfaces





With a spot beam, detection can be unstable if the reflected light does not reach the sensor depending on the profile of the workpiece surface. With the large spot of the E3AS-F Sensor, detection is less affected by the surface roughness.

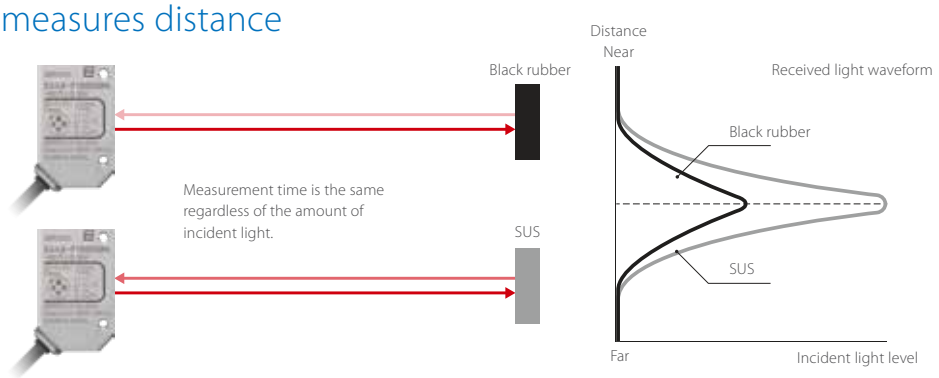
Reliable detection of workpieces in various colors



E3AS-F Sensors use TOF technology reducing the effects of changes in color on detection distance providing stable detection for different colored containers or engine blocks without changing the set distance.

TOF detects varying targets and measures distance

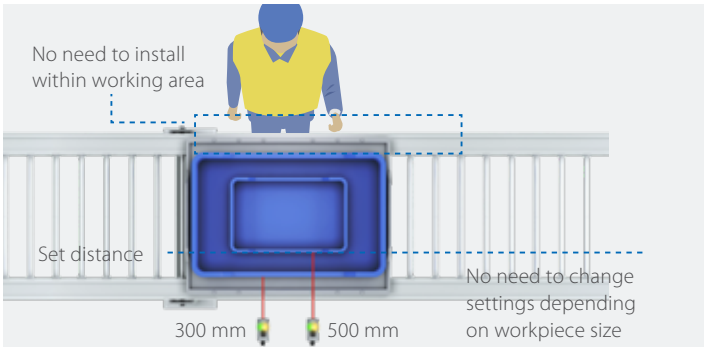
In the time-of-flight method, distance is calculated based on the time elapsed between the light emission and its reception by the sensor once it is reflected off the target. Detection is therefore not affected by changes in the color or material of the target.



Return

E3AS-F for long-distance sensing

Install reflective sensors instead of through-beam sensors



Reflective E3AS-F Sensors for long-distance sensing can be installed outside the working area, which is difficult with through-beam sensors. The TOF method ensures that only the desired range is detected.

Installation minimally affected by background

Reflectors are required behind workpieces to avoid effects of the background.

The TOF method that measures distance based on the elapsed time is hardly affected by the background, making design easy.

Accessories enhance sensor usability

The E3AS Series comes with a lineup of accessories that shorten sensor adjustment time upon commissioning and reduce the frequency of false detections during production.

They can be used with non-E3AS sensors with a standard mounting hole pitch of 25.4 mm as well.

Flexible Mounting Bracket

Optical axis can be adjusted in three directions: vertical, horizontal, and angular.

Air Blow Unit

Blows paper dust and cleaning solutions off the sensing surface.

Front Protection Cover[3]

Protects sensing surfaces from collisions with workpieces, containers, and pallets.

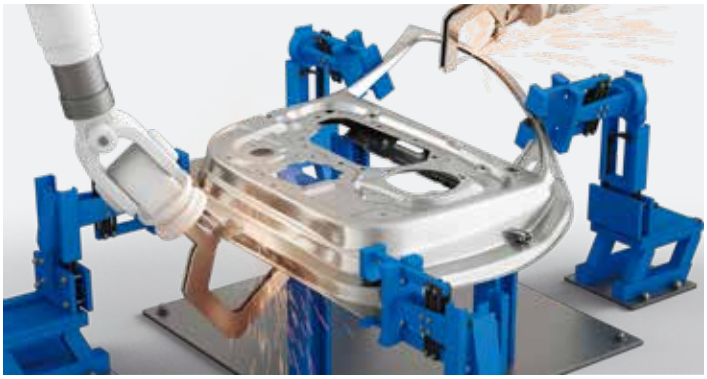
1. Patent pending in Japan and patented in Japan. (As of May 2020)

Return

Antifouling coating on sensing surface ensures stable operation even in harsh environments

Front protection cover reduces sensor failures

Welding spatter on the sensing surface or collision during operation can cause a sensor failure. Mounting the front protection cover prevents sensor failures. When any problems occur with the front protection cover, just replace it.



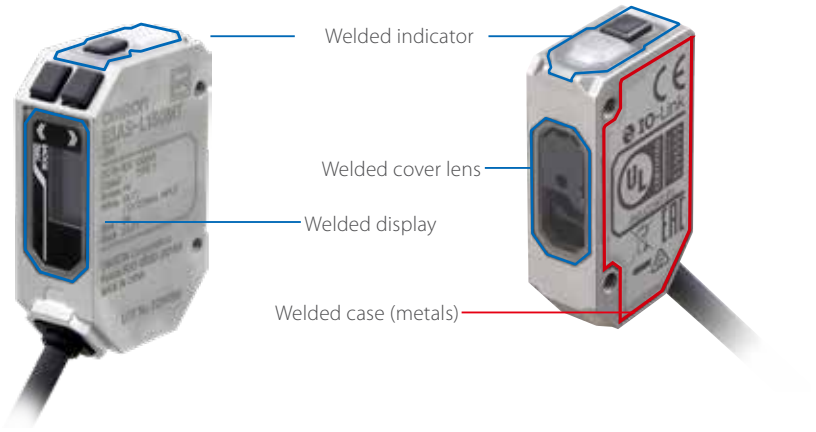
Unique case design reduces the frequency of replacements caused by failure

The sensor case is made of stainless steel (SUS316L). OMRON's unique laser welding technology for mixed materials enhances the sealing and adhesion between the stainless steel and resin. The laser welding technology for metals are used to weld the case and cover of the E3AS-F Sensor for secure sealing and adhesion between the stainless steel.

IP69K
High temperatures/
high water pressure

IP67G
Oil resistance

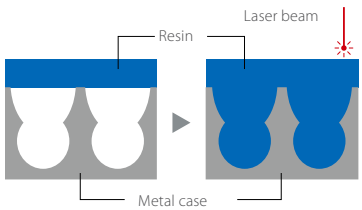
ECOLAB
Detergent resistance



Laser welding technology for mixed materials

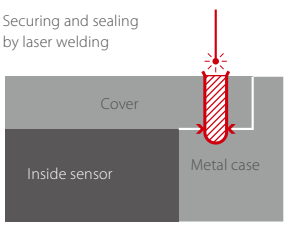
PATENTED[1]

Lasers are used to weld different materials, resin and metal. Tiny holes are bored into the metal case, then the resin part is melted in by a laser for secure sealing and adhesion.



TOF E3AS-F

The metal case and cover are welded by a laser beam to seal the gaps. This ensures high airtightness compared to adhesives, keeping out water and oil to reduce failures.



1. "PATENTED" means that we obtained a patent in Japan. (As of September 2020)

Return

When a sensor malfunction due to the environment causes a line stoppage during mass production, it can take a long time to restart. With the protected sensing surface, the E3AS Series helps minimize line downtime and maximize uptime.

Antifouling coating on sensing surface reduces false detection and cleaning frequency

INDUSTRY FIRST[1]

PATENT PENDING[2]

A dirty sensing surface can cause false detection. The E3AS Series has an industry-first antifouling coating on the sensing surface which prevents soot and dust from sticking to the sensing surface and keeps the lens from fogging as well. This reduces false detection and sensing surface cleaning frequency.


Antifouling coating

Water


Antifouling coating

Cutting oil


Antifouling coating

Dust


Antifouling coating

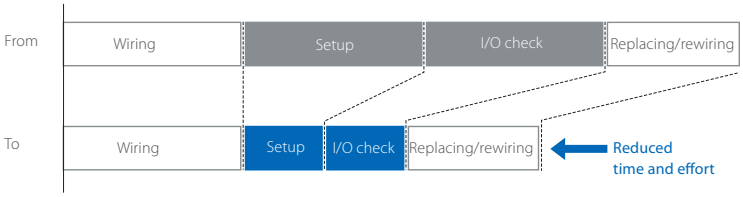
Water vapor

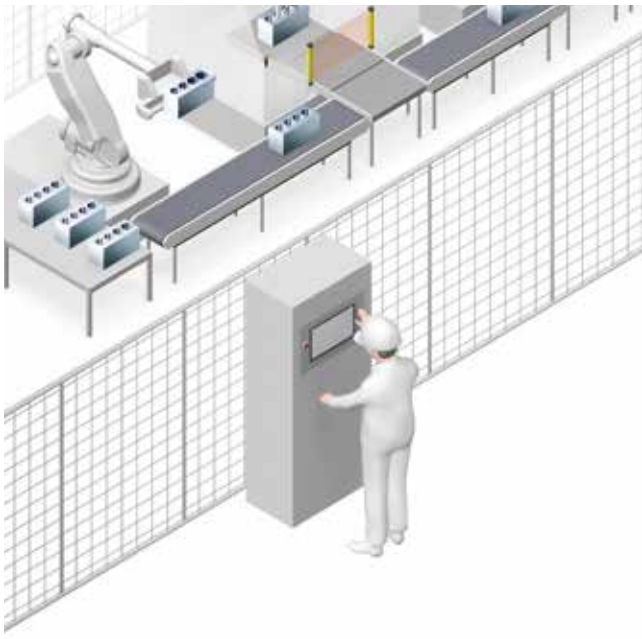
1. Based on OMRON investigation in September 2019.

2. "PATENT PENDING" means that we applied for a patent in Japan, and "PATENTED" means that we obtained a patent in Japan. (As of September 2020)

IO-Link speeds up line commissioning and reduces maintenance

Reduce commissioning time by batch-setting the sensors and cut troubleshooting time during mass production by utilizing field data.



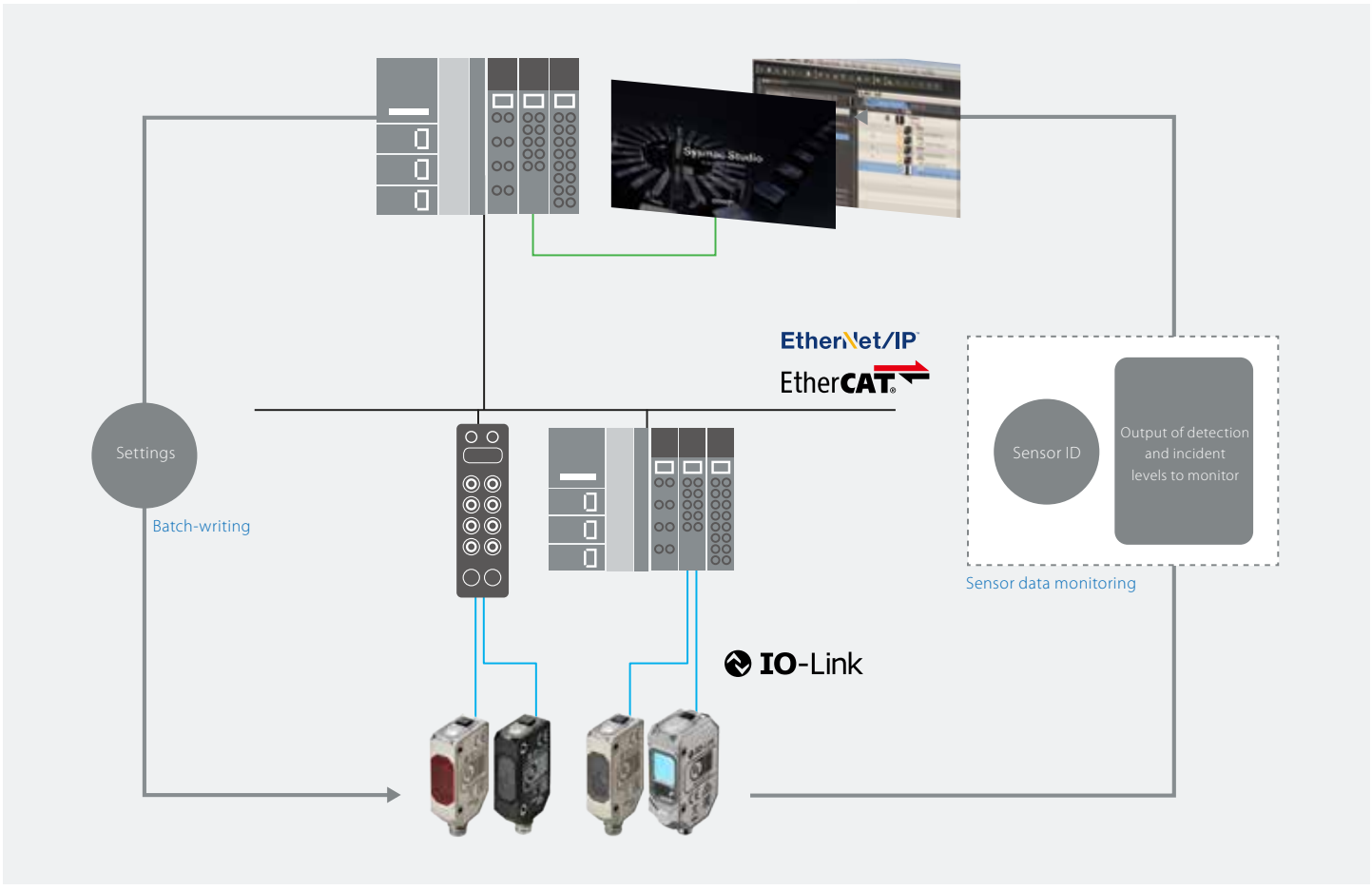


Sensor data monitoring improves predictive maintenance and supports quick recovery

Setting information can be batch-written to thousands of sensors on a line, effectively reducing commissioning time and inconsistent settings.

Predictive monitoring and quick recovery by checking and monitoring sensor data

The monitor shows light intensity decrease due to sensing surface contamination allowing users to take proactive actions to prevent potential false detections. This reduces the frequency of unexpected failures.



Return

Model lineup

	E3AS-HL	E3AS-F	
Appearance			
Case	SUS316L	SUS316L	PBT/PC
Sensing distance	35 to 500 mm 35 to 150 mm	50 to 1500 mm 50 to 1000 mm	50 to 1500 mm 50 to 1000 mm
Standard detectable difference (mm)/ differential travel (%)	35 to 50 mm: 1 mm 50 to 100 mm: 2 mm 100 to 150 mm: 4 mm (E3AS-HL150: When response time is 10 ms)	15% max.	15% max.
Setting method of threshold level	Teaching method/ Manual operation	Teaching method	
OLED display	✓	—	—
Antifouling coating	✓	✓	✓
Mutual interference prevention function	Up to 4 units	—	—
Degree of protection	IP67/69K/67G/Ecolab		

Short-distance sensing models also available

OMRON's unique light emitting element for stable detection of workpieces with low reflectivity

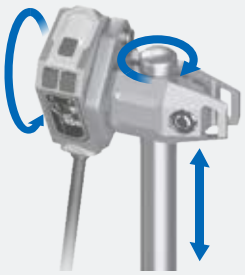
Distance-settable Photoelectric Sensors E3AS-L

Sensing range: 10 to 80 mm/10 to 200 mm

More flexible mounting with flexible mounting bracket

PATENT PENDING[1]

360°



Temporarily hold with a hand to avoid misalignment

Optical axis can be easily adjusted in three directions: vertical, horizontal, and angular. This bracket can be mounted to any photoelectric sensor with a 25.4 mm mounting hole pitch as well as the E3AS Sensors.

No special safety measures required for Class 1 laser

The E3AS Series is classified as Class 1, so laser safety measures are not required.

1. "PATENT PENDING" means that we applied for a patent in Japan. (As of September 2020)

Return

Accessories (Sold Separately)

Sensor I/O Connectors (Sockets on One Cable End)

(Models for Connectors / Pre-wired Connectors)
A Sensor I/O Connector is not provided with the Sensor. Order separately.
Round Water-resistant Connectors XS3F-M8 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M8 Connector Straight type 	PVC cable	5 dia.	Straight	2	**XS3F-M8PVC4S2M**
				5	**XS3F-M8PVC4S5M**
Right-angle type 			Right-angle	2	**XS3F-M8PVC4A2M**
				5	**XS3F-M8PVC4A5M**

Note: 1. The XS3W (Socket and Plug on Cable Ends) is also available. Refer to *XS3W-M8/XS3F-M8 Series Datasheet* (Cat. No. G140).
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Round Water-resistant Connectors XS5 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M12 Smartclick Connector Straight type 	PVC robot cable	6 dia.	Straight	2	**XS5F-D421-D80-F**
				5	**XS5F-D421-G80-F**
Right-angle type 			Right-angle	2	**XS5F-D422-D80-F**
				5	**XS5F-D422-G80-F**

Note: 1. The XS5W (Socket and Plug on Cable Ends) is also available. Refer to *XS5* on your Omron website for details.
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Mounting Brackets [Refer to *Dimensions* on page 12.]

A Mounting Bracket is not enclosed with the Sensor. Order as needed.

Appearance	Model (material)	Applicable Sensor E3AS series			
		Pre-wired	M8 Pre-wired Connector	M12 Pre-wired Smartclick Connector	M8 Connector
L-shaped Mounting Bracket 	E39-L201 (SUS304)	Yes	Yes	Yes	---
Horizontal Protective Cover Bracket 	E39-L202 (SUS304)	Yes	Yes	Yes	---
Rear Mounting Bracket 	E39-L203 (SUS304)	Yes	Yes	Yes	Yes [2]
Robust Mounting Bracket 	E39-L204 (SUS304)	Yes	Yes	Yes	---
L-shaped Mounting Bracket 	E39-L211 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]
Horizontal Protective Cover Bracket 	E39-L212 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]
Robust Mounting Bracket 	E39-L214 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]

1. Can be used for Pre-wired models, M8 Pre-wired Connector models, and M12 Pre-wired Smartclick Connector models. However, confirm the bracket shape in advance.
2. Confirm the installation environment and bracket shape of the Sensor I/O Connector to be connected.
3. Use an L-shaped Sensor I/O Connector. Straight types cannot be installed.

E3AS-F Series

Ratings and Specifications

Item				
Model	Sensing method	TOF (Time of flight)		
	Type	Metal case (□: M), Plastic case (□: P)		
	NPN output	E3AS-F1500I□N	E3AS-F1000I□N	
	PNP output/ COM2	E3AS-F1500I□D	E3AS-F1000I□D	
	PNP output/ COM3	E3AS-F1500I□T	E3AS-F1000I□T	
Sensing distance		50 mm to the set distance (White paper or black paper 200 × 200 mm)	50 mm to the set distance (White paper or black paper 200 × 200 mm)	
Setting range		100 to 1,500 mm (White paper 200 × 200 mm) 100 to 1,000 mm (Black paper 200 × 200 mm)	100 to 1,000 mm (White paper 200 × 200 mm) 100 to 500 mm (Black paper 200 × 200 mm)	
Spot diameter (reference value)		95 mm dia. (at distance of 1,000 mm)		
Differential travel		15% max. of set distance (Set distance 200 mm min.)		
Reflectivity characteristic (black/white error)		10% max. of set distance (Set distance 200 mm min.)		
Light source (wavelength)		Infrared laser (940 nm) Class1 (IEC/EN60825-1:2014)		
Power supply voltage		10 to 30 VDC (including 10% ripple (p-p)), Class2		
Current consumption		30 mA max.		
Input/output	Control output	Load power supply voltage: 30 VDC max., Class2, Load current: 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max.) Open-collector output (NPN/PNP output depending on model)		
	NPN	OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed)		
	PNP/COM2 PNP/COM3	OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed)		
Protection circuits		Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection		
Response time		Operate or reset: 150 ms max.	Operate or reset: 90 ms max.	
Distance setting		Teaching method/IO-Link communications		
Ambient illumination (Receiver side)		Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.		
Ambient temperature range		Operating: -20 to 55°C, Storage: -40 to 70°C (with no icing or condensation)		
Ambient humidity range		Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)		
Insulation resistance		20 MΩ min. at 500 VDC		
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min		
Vibration resistance		10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance		500 m/s^2 for 3 times each in X, Y, and Z directions		
Degree of protection		IP67 (IEC60529) and IP67G[1] (JIS C 0920 Annex 1), IP69K (ISO20653)		
Indicators		Operation indicator (orange), stability/communication indicator (green [2])		
Connection method		Pre-wired (standard cable length: 2 m), M8 Connector, M8 Pre-wired Connector (standard cable length: 0.3m), M12 Pre-wired Smartclick Connector (standard cable length: 0.3m)		
Weight (packed state/ Sensor only)	Pre-wired (2 m)	Metal case type: Approx. 135 g/approx. 90 g Plastic case type: Approx. 115 g/approx. 70 g		
	M8 Connector	Metal case type: Approx. 75 g/approx. 30 g Plastic case type: Approx. 60 g/approx. 15 g		
	M8 Pre-wired Connector (0.3m)	Metal case type: Approx. 85 g/approx. 40 g Plastic case type: Approx. 70 g/approx. 25 g		
	M12 Pre-wired Smartclick Connector (0.3m)	Metal case type: Approx. 95 g/approx. 50 g Plastic case type: Approx. 75 g/approx. 30 g		
Materials	Case	Metal case type: Main unit/mounting part/connector part Stainless steel (SUS316L) Plastic case type: Main unit Polybutylene terephthalate (PBT) /polycarbonate (PC), Mounting part/connector part Nickel-plated brass		
	Lens	Methacrylate resin (PMMA)		
	Display	Metal case type: Polyamide 11 (PA11) Plastic case type: Polyethersulfone (PES)		
Main IO-Link functions		Operation mode switching between NO and NC, execution of teaching (2-point teaching, Background teaching), setup of the threshold, timer function of the control output and timer time selecting, monitor output (Detection level, Incident light level), Restore Factory Settings, Key Lock (Unlock, Lock, Lock (No Button))		
IO-Link Communication specifications	IO-Link specification	Ver. 1.1		
	Baud rate	COM2 (38.4 kbps), COM3 (230.4 kbps)		
	Data length	PD size: 4 bytes, OD size: 1 byte (M-sequence type: TYPE_2_V)		
	Minimum cycle time	COM2: 3.5 ms, COM3: 1.2 ms		
Accessories		Instruction manual, compliance sheet, index list (attached for IO-Link type only) and FDA certification label Note: Mounting Brackets must be ordered separately.		

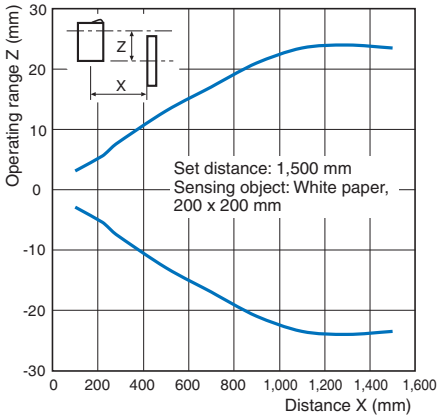
1. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards). The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.
2. IO-Link mode: blinking

Engineering Data (Reference Value)

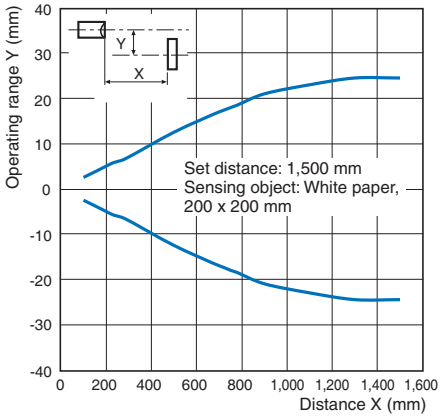
Operating Range

E3AS-F1500□

Z directions

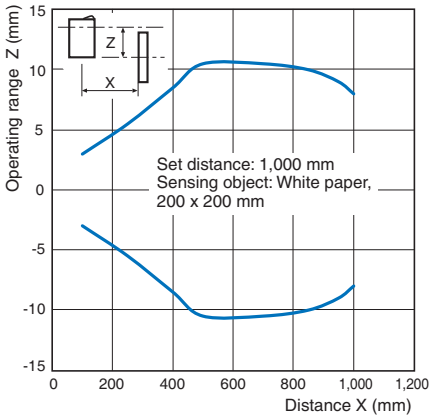


Y directions

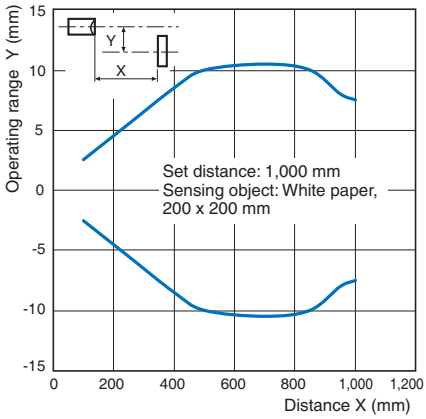


E3AS-F1000□

Z directions

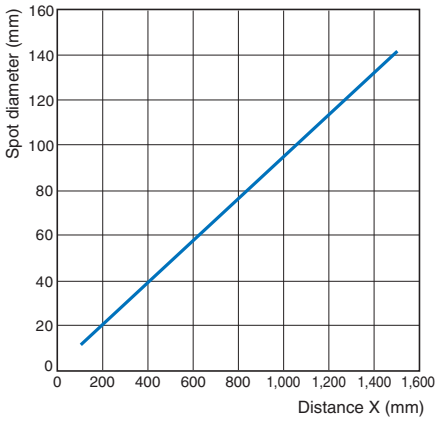


Y directions



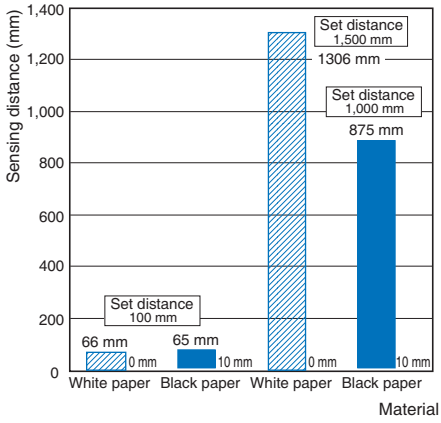
Spot Diameter vs. Sensing Distance

E3AS-F1500□
E3AS-F1000□

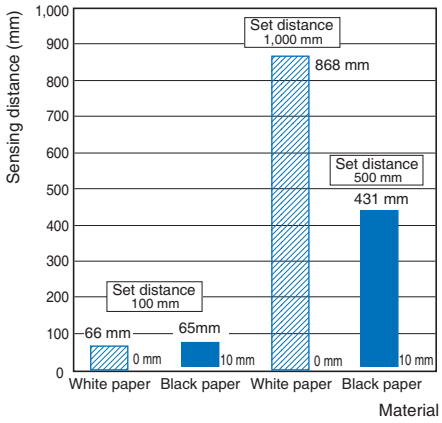


Close-range Characteristics

E3AS-F1500□

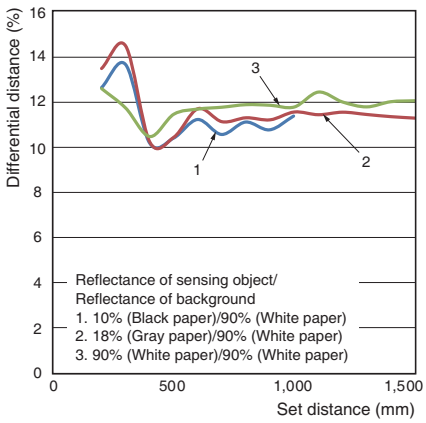


E3AS-F1000□

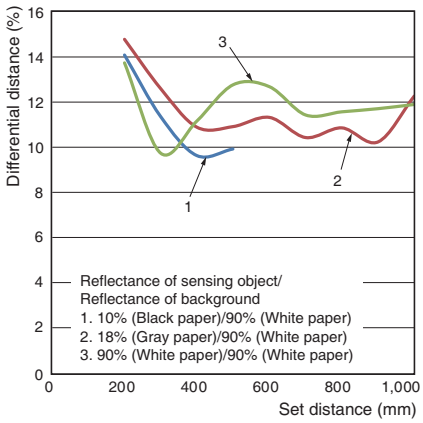


Differential distance for each sensing object Vs. Distance

E3AS-F1500□



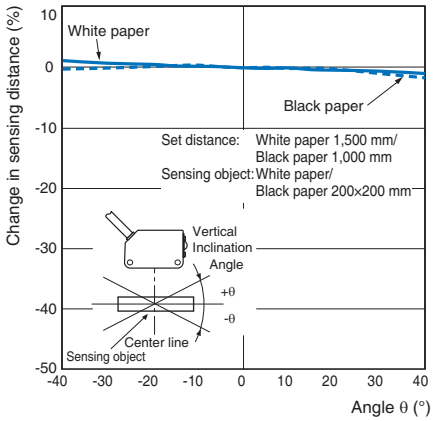
E3AS-F1000□



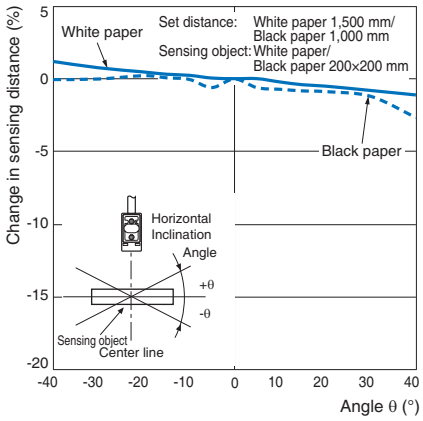
Sensing Object Angle Characteristics

E3AS-F1500□

Vertical

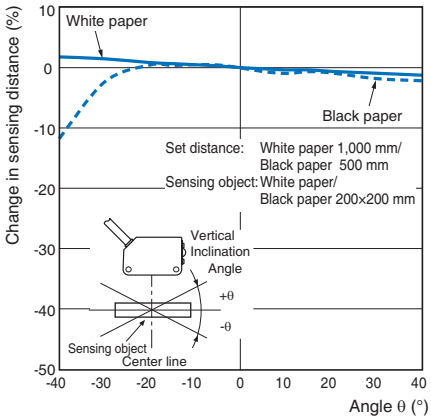


Horizontal

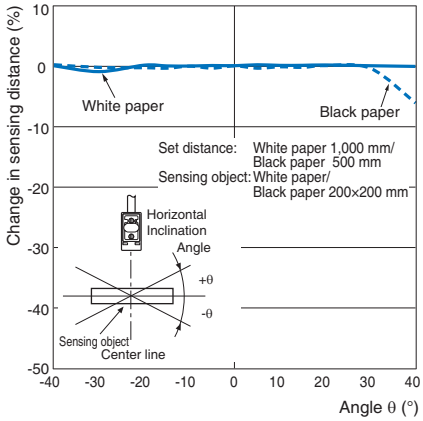


E3AS-F1000□

Vertical

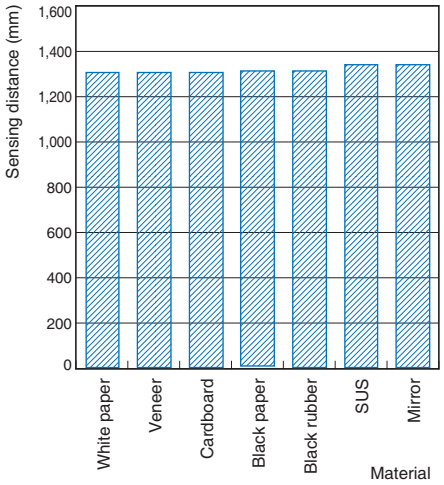


Horizontal

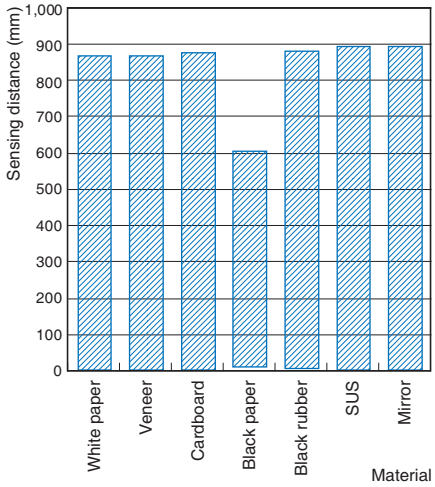


Sensing Distance vs. Sensing Object Material

E3AS-F1500□
(Set Distance of 1,500 mm using White Paper)

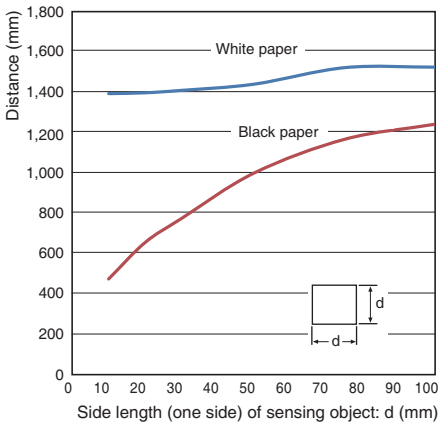


E3AS-F1000□
(Set Distance of 1,000 mm using White Paper)

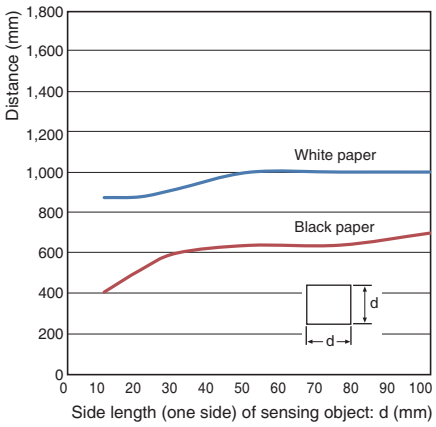


Sensing Object Size vs. Sensing Distance

E3AS-F1500□

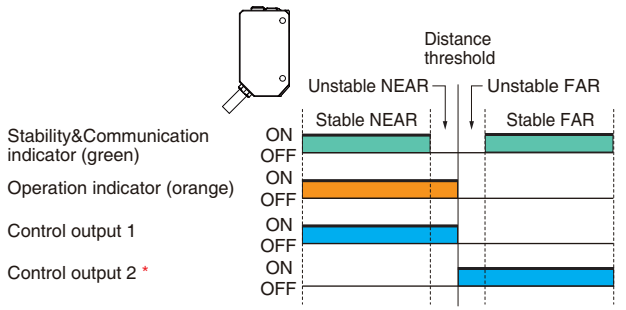
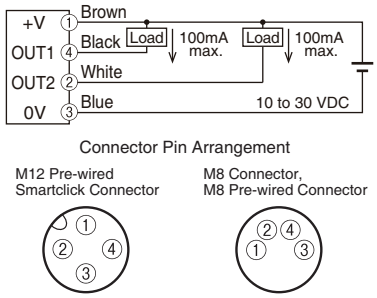


E3AS-F1000□



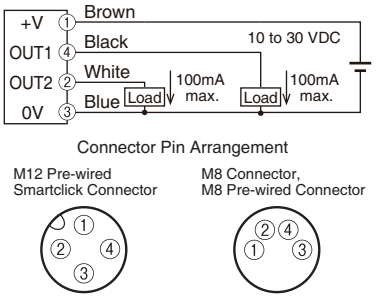
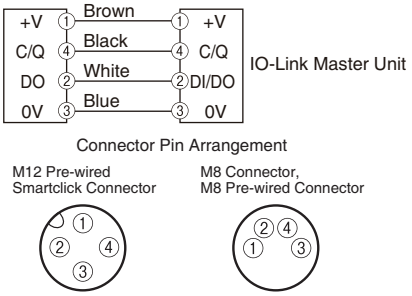
I/O Circuit Diagrams/ Timing Charts

NPN Output

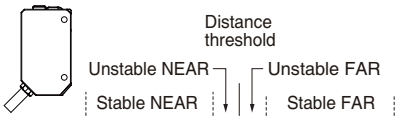
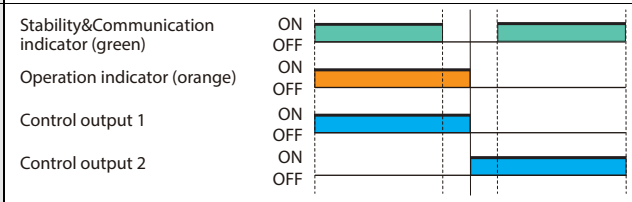
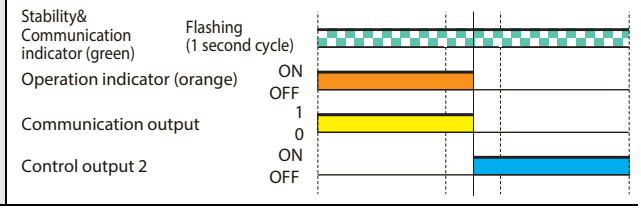
Model	Timing chart	Output circuit
E3AS-F1500I□N□ E3AS-F1000I□N□		

* The initial value of control output 2 is reverse of control output 1.

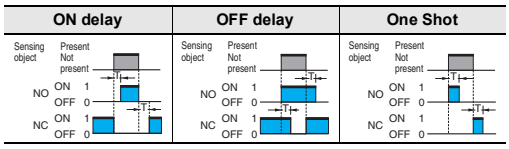
PNP Output

Model	Output circuit	
	Standard I/O mode (SIO mode) [1]	IO-Link Communication mode (COM mode) [2]
E3AS-F1500I□D□ E3AS-F1500I□T□ E3AS-F1000I□D□ E3AS-F1000I□T□		

1. Standard I/O mode is used as PNP ON/OFF output.
2. IO-Link Communication mode is used for communications with the IO-Link Master. C/Q performs IO-Link communications. Sensor output DO performs ON/OFF output.

	Timing charts
Output mode	
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

1 The initial value of control output 2 is reverse of control output 1.
2. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

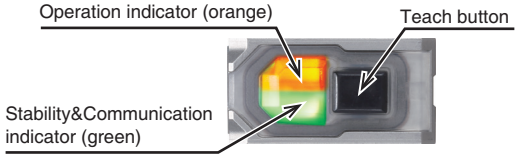


Please contact your Omron sales representative regarding the IO-Link setup file (IODD file).

Note: Shown above are the factory settings. Refer to the index list for the default settings at time of shipment from factory.
PNP/COM output logic can be reversed by IO-Link communication.
The operation indicator (orange) lights up when control output 1 is ON or communication output is 1.

Nomenclature

E3AS-F1500□
E3AS-F1000□



Note: The indicators work differently depending on sensor status.

Safety Precautions

Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.

Warning Indications

⚠ WARNING	**Warning level** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
⚠ CAUTION	**Caution level** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Meaning of Product Safety Symbols

	**General prohibition** Indicates the instructions of unspecified prohibited action
	**Caution, explosion** Indicates the possibility of explosion under specific conditions
	**Laser Caution** Indicates information related to laser safety

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purpose.

⚠ CAUTION

Never use the product with an AC power supply. Otherwise, explosion may result.

To safely use laser products

⚠ WARNING

Do not expose your eyes to the laser beam either directly or indirectly (i.e., after reflection from a mirror or shiny surface). The laser beam has a high power density and exposure may result in loss of sight.

Laser safety measures for laser equipment are stipulated in Japan and other countries. For usage in Japan and for export to other countries combined with other products, follow the instructions described below categorized in three cases respectively.

1. **Usage in Japan**
   The JIS C6802:2014 standard stipulates the safety precautions that users must take according to the class of the laser product. This product is classified into Class 1 defined by this standard.
2. **Usage in U.S.**
   When this product is installed in a device and exported to the U.S., it is subjected to the U.S. FDA (Food and Drug Administration) laser regulations. This product is classified into Class 1 by the IEC 60825-1:2007 standard according to the provisions of Laser Notice No. 50 of the FDA standard. This product is already reported to CDRH (Center for Devices and Radiological Health).
   Accession Number: 1920014-000
   Because the product is small, we can not attach an FDA certification label on the main body, so we enclose it in the packing box. When exporting a device equipped with the product to the U.S., attach an FDA certification label near the sensor mounting of customer equipment.

FDA certification label

3. **Usage in China**
   This product is classified into Class 1 by the IEC60825-1:2007 standard.
4. **Usage in a country other than U.S. and China.**
   This product is classified into Class 1 by the IEC60825-1:2014 standard.

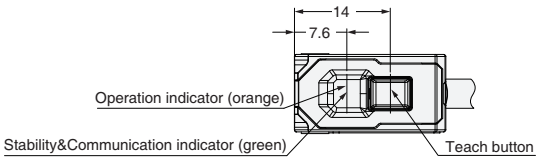
Dimensions

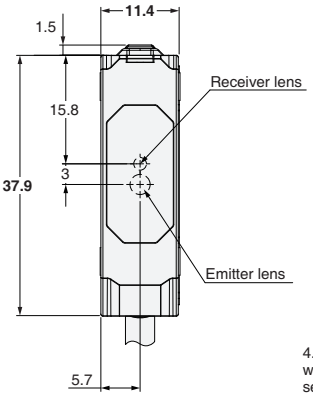
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensors

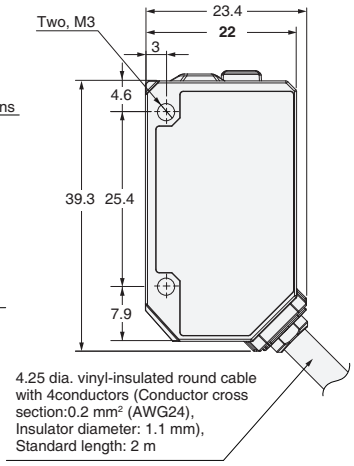
Pre-wired Models/Pre-wired Connector Models

E3AS-F1500□ (-M1TJ/-M3J)
E3AS-F1000□ (-M1TJ/-M3J)



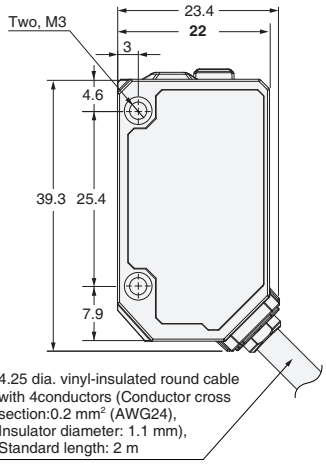


Metal case type



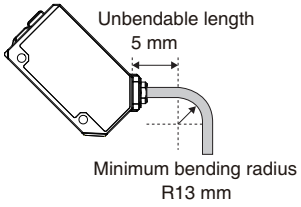
4.25 dia. vinyl-insulated round cable with 4conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m

Plastic case type

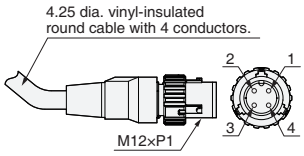


4.25 dia. vinyl-insulated round cable with 4conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m

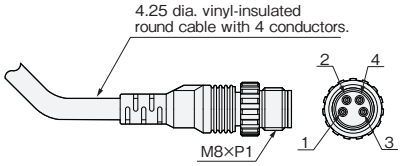
Minimum bending radius/unbendable length of cord



M12 Pre-wired Smartclick Connector type
E3AS-F1500□-M1TJ/E3AS-F1000□-M1TJ

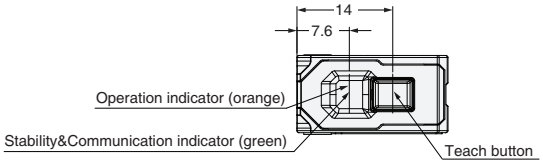


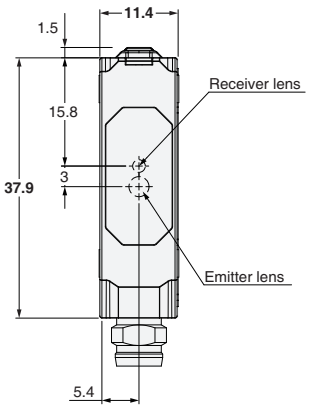
M8 Pre-wired connector type
E3AS-F1500□-M3J/E3AS-F1000□-M3J

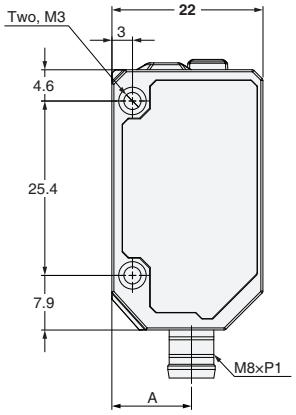


Connector Models

E3AS-F1500□ M3
E3AS-F1000□ M3





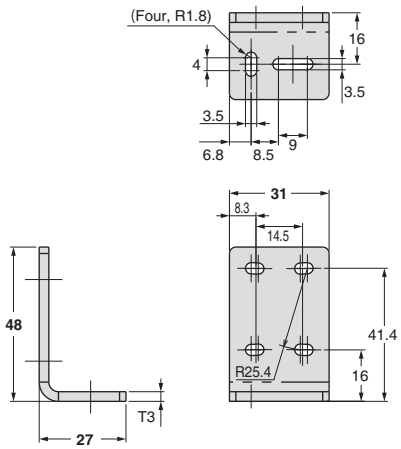


A:
Metal case type (E3AS-F□M□ M3) :9.6m
Plastic case type (E3AS-F□P□ M3) :11.6

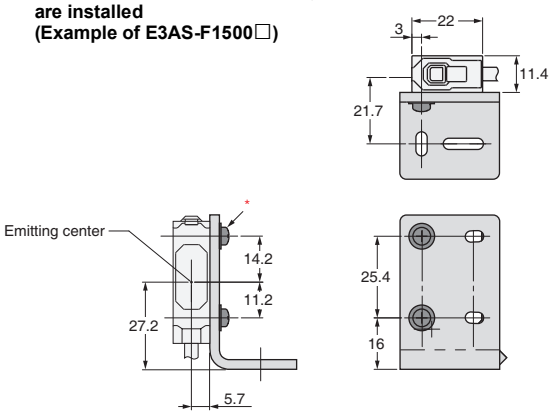
Accessories (Sold Separately)

Mounting Brackets

E39-L201

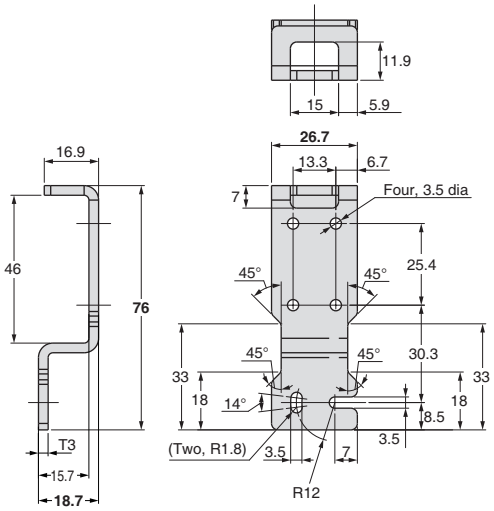


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

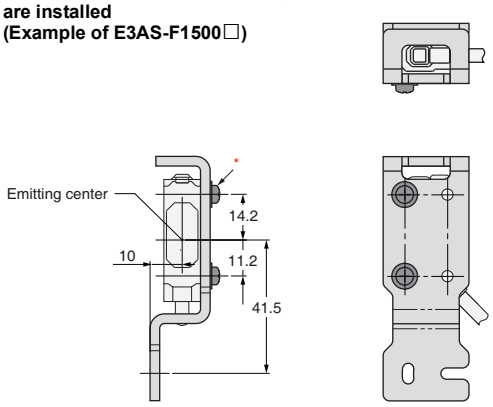


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L202

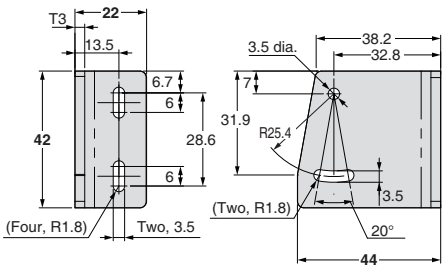


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

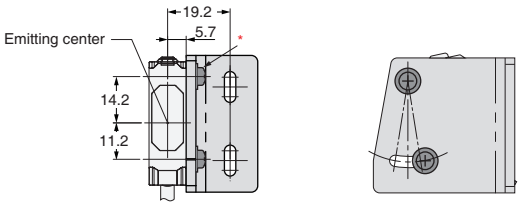


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L203

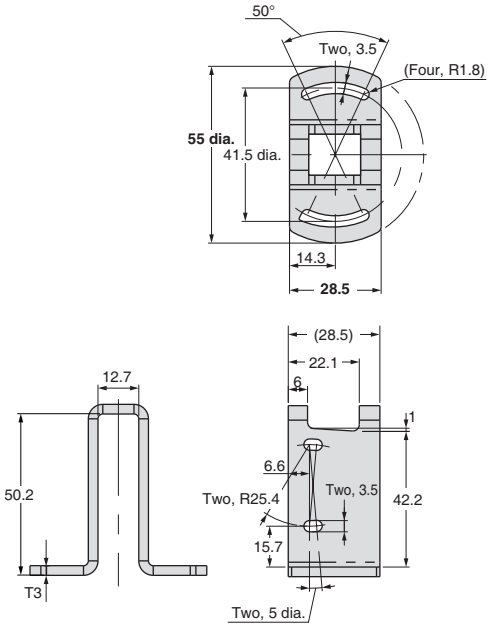


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

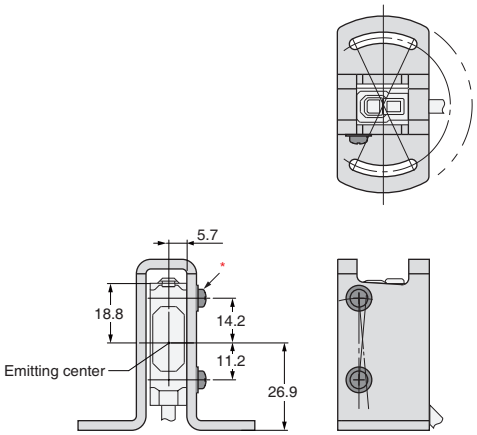


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L204

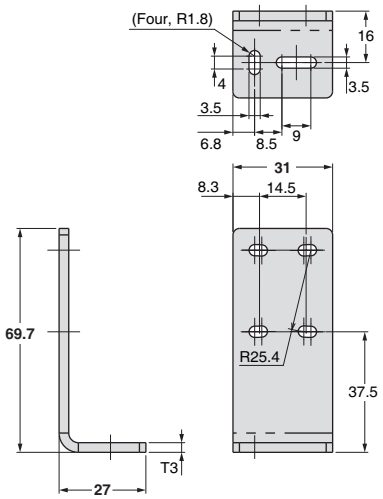


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

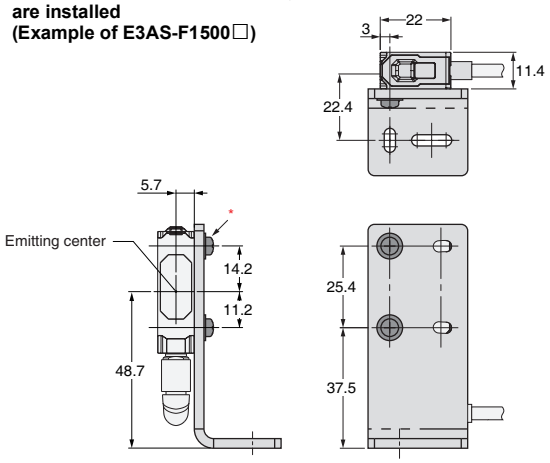


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L211

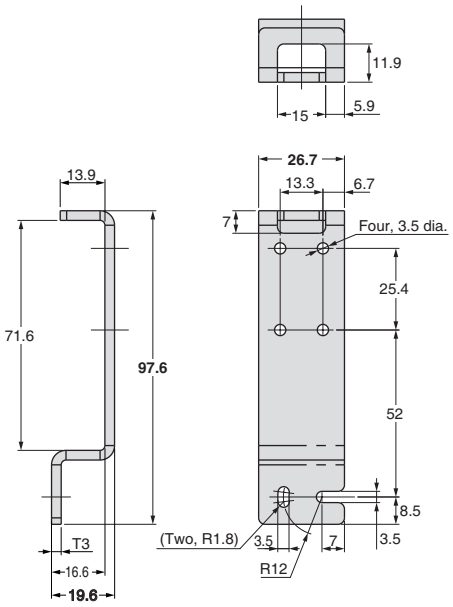


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

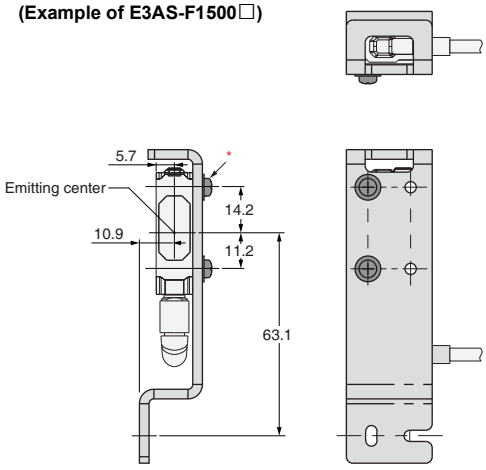


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L212

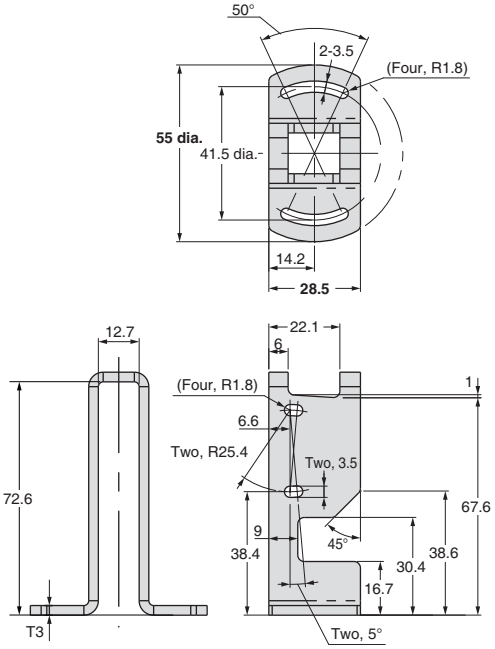


Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)

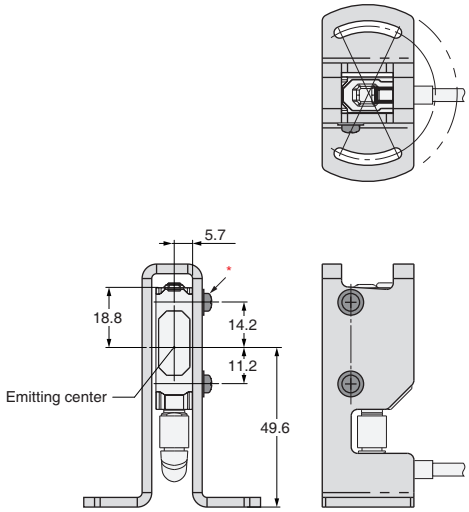


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L214



Photoelectric Sensor Accessory are installed (Example of E3AS-F1500☐)



Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

Distance-settable Photoelectric Sensors

E3AS-HL Series

E3AS-HL Series CMOS Photoelectric Sensor for precise part detection

- CMOS photoelectric sensor for advanced part detection capabilities
- Spot beam and line beam options for small part or uneven surfaces
- 500mm and 150mm sensing options fit for most sensing applications
- Antifouling coating prevents contamination on the sensing surface
- Ecolab certified in addition to IP67/69K/67G protection
- All models with IO-Link connectivity allowing users to collect and use measurement values (NPN type excluded)

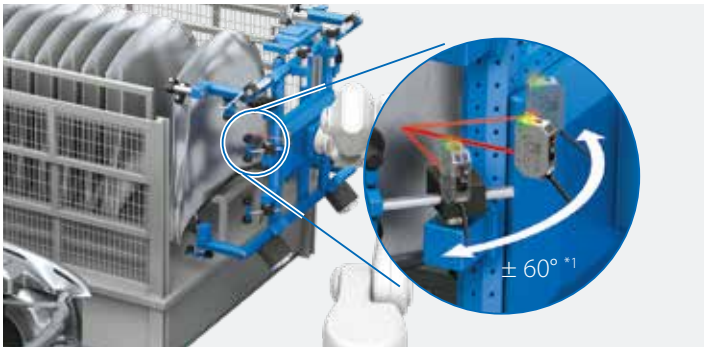
For the most recent information on models that have been certified for safety standards, refer to your Omron website.

Refer to *Safety Precautions* on page 13.

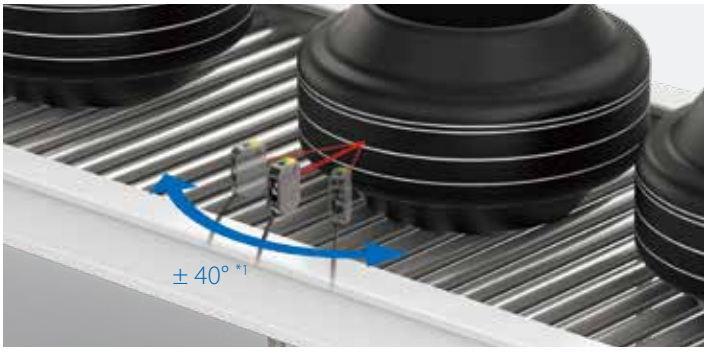
issioning time

E3AS-HL in inclined and close mounting scenarios

Install regardless of workpiece shape and angle



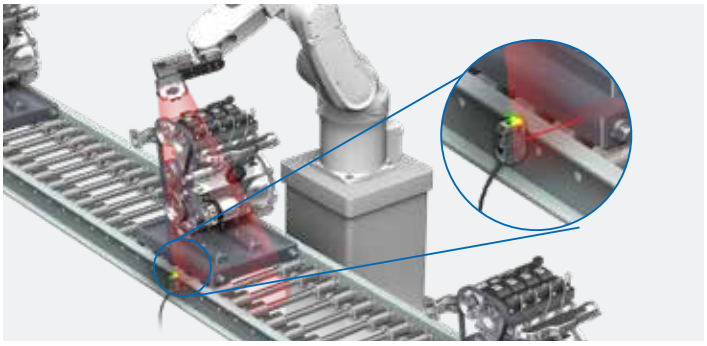
Curved surfaces of metal workpieces tend to affect detection, and it is time consuming to design the mounting angle. E3AS-HL Sensors can be mounted at a wide angle, making setup easy.



Curved surfaces of low-reflective workpieces affect consistent detection, E3AS-HL Sensors can be mounted at a wide angle without a need for a reflector.

Install in confined spaces or near lights

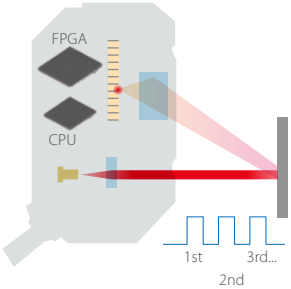
Interference with other sensors must be considered during design. E3AS-HL Sensors prevent mutual interference between up to 4 sensors, allowing close installation for applications like item identification for hole positions.



E3AS-HL Sensors can be operated under ambient illumination of 20,000 lx, which reaches the best in class level[2].

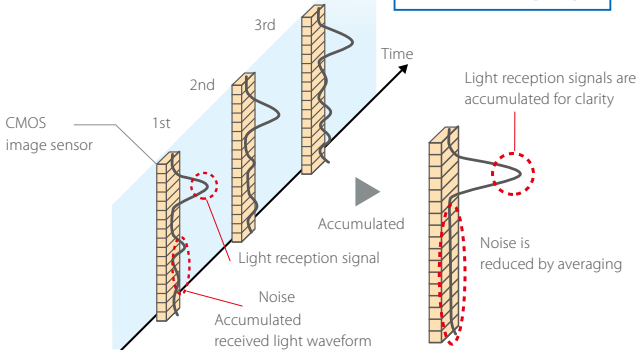
Advanced sensing algorithms detect minimal reflected light from curved surfaces, which is impossible with reflective sensors

The E3AS-HL Sensor is the industry's first CMOS laser sensor that comes equipped with an FPGA[3]. It performs high-speed sampling of received light waveforms at 10,000 times per second and unique Omron accumulation processing, significantly increasing its sensitivity. It amplifies the slightest amount of light to reliably detect workpieces from which it is difficult to receive reflected light.



INDUSTRY FIRST[1]

PATENT PENDING[2]



Note: Not applicable to transparent objects.

1. The reference values were measured using the Omron standard sensing object. 2. Based on an Omron investigation in September 2019. 3. FPGA = Field Programmable Gate Array

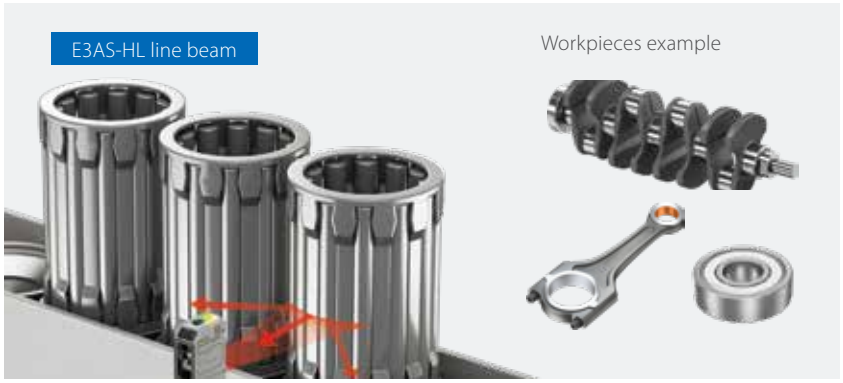
Reliable detection reduces equipment design and comm

When difficult-to-detect workpieces (curved, glossy, or casting surfaces) cannot be detected repeatably, sensors need to be reselected or adjusted. The E3AS Series provides reliable detection, reducing design and commissioning time.

E3AS-HL for workpieces with curved or irregular surfaces and glossy workpieces

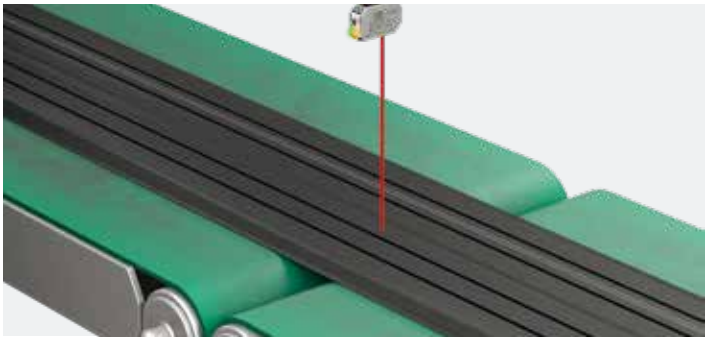
Reliable detection of metal workpieces with curved or irregular surfaces

With spot beam, detection is unstable since the reflected light does not reach the sensor depending on the profile of the surface.

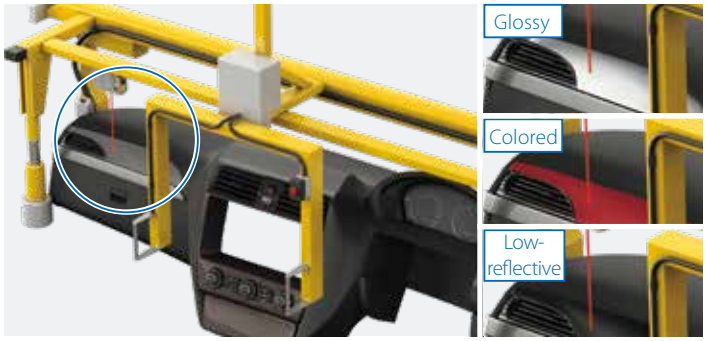


With the line beam E3AS-HL Sensor, detection is less affected by the profile of the surface since the reflected light reaches the sensor from any part of the surface. Glossy objects and oily metal workpieces also minimally affect detection.

Reliable detection of various colored or glossy workpieces



Level differences between low-reflective thin workpieces and the background sometimes cannot be detected. E3AS-HL Sensors, which are minimally affected by material type or color, can detect small level differences.

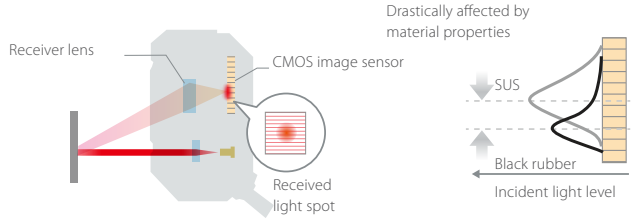


Detection is prone to instability because the sensing distance varies depending on the workpiece material and color. E3AS-HL Sensors, require no adjustment for each workpiece.

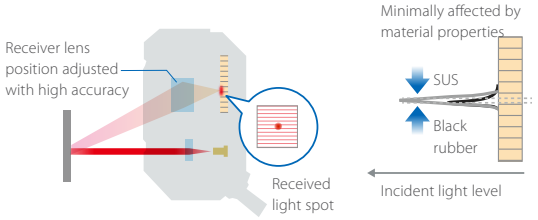
CMOS sensing with built-in lens alignment technology minimizes the influence of material properties

PATENT PENDING[1]

From Material properties greatly affect detection because the receiver lens does not do a position adjustment resulting in a blurred spot on the CMOS image array.



To Material properties minimally affect detection because the receiver lens position is automatically adjusted to the micrometer level to minimize the received light spot.



1. Patent pending in Japan. (As of September 2020)

OLED display and teach button enhance ease of use

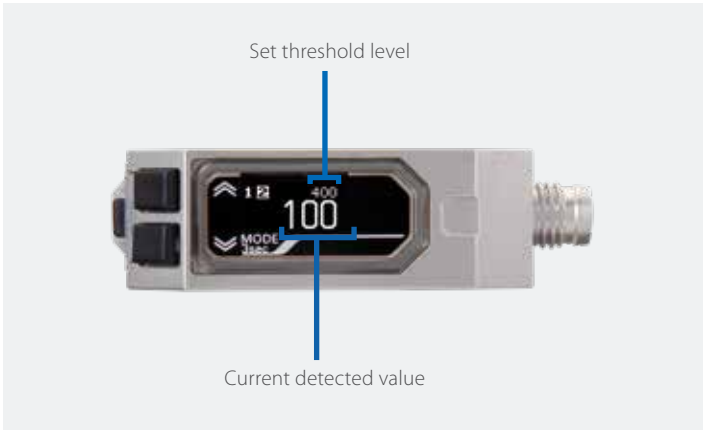
E3AS Sensors allow virtually anyone to set optimal settings on the easy-to-read OLED display using the teaching method. Moreover, easy-to-standardize operability makes remote instructions simple.

Easy-to-read, easy-to-understand OLED display

CMOS E3AS-HL

Threshold level and detected value display on the same screen making threshold level setting easy. Moreover, wide viewing angle and display inverting allow on-site workers to easily see the display.

Detected value and threshold level at a glance



Detection display switching based on purpose

Bar display to see detection margin at a glance

ON/OFF display to easily check control output status

Easy-to-read setup menu display

Wide viewing angle allows reading from an angle

Invert display depending on sensor installation orientation

Inverting: Disabled

Inverting: Enabled

Single teach button prevents setting inconsistencies

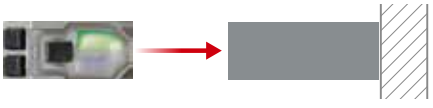
Easily and consistently set the optimal threshold level using the teach button

Background teaching

Set the threshold level at a point before the background (reference surface).

Two-point teaching

Set the threshold level at a value halfway between that when a workpiece is present and when one is not.



Key locking

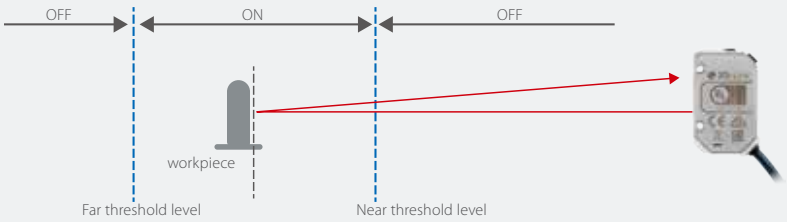
The key locking function prevents malfunction after setting.

Object teaching for detecting workpieces within specified range

CMOS E3AS-HL

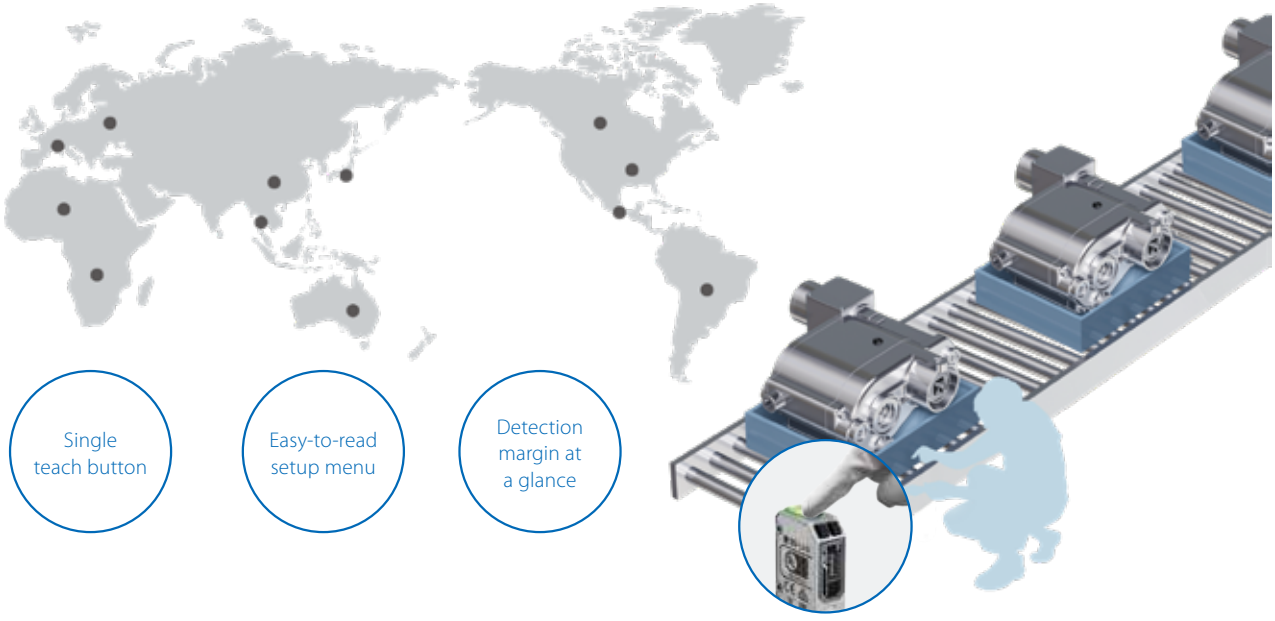
Object teaching allows you to easily set upper and lower threshold levels just by holding the teach button. Ideal for presence detection of workpieces within a specified distance range.

Simply hold the button to set the threshold levels on the near and far sides of the workpiece position (reference position) at the same time. This teaching is used for presence detection of workpieces in the predetermined position.



Easy-to-standardize operations reduce commissioning time

The teaching method common to the E3AS Series enables you to standardize the operation procedures, facilitating remote instruction.

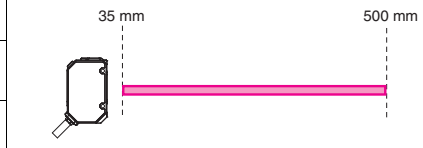
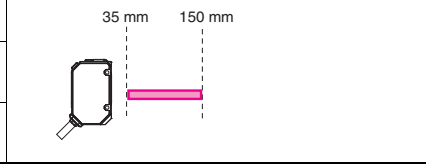


Ordering Information

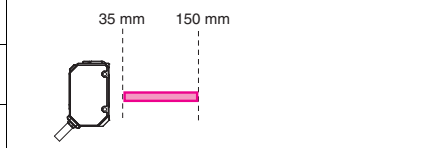
E3AS-HL models [Refer to *Dimensions* on page 15]

Red light

Line beam type

Connection method	Sensing distance (white paper)	Output	Model	
			NPN output	PNP output
		IO-Link baud rate	---	COM3 (230.4 kbps) [3]
Pre-wired (2 m) [1]			E3AS-HL500LMN 2M	E3AS-HL500LMT 2M
M8 Connector			E3AS-HL500LMN M3	E3AS-HL500LMT M3
M12 Pre-wired Smartclick Connector (0.3m) [2]			E3AS-HL500LMN-M1TJ 0.3M	E3AS-HL500LMT-M1TJ 0.3M
Pre-wired (2 m) [1]			E3AS-HL150LMN 2M	E3AS-HL150LMT 2M
M8 Connector			E3AS-HL150LMN M3	E3AS-HL150LMT M3
M12 Pre-wired Smartclick Connector (0.3m) [2]			E3AS-HL150LMN-M1TJ 0.3M	E3AS-HL150LMT-M1TJ 0.3M

Spot type

Connection method	Sensing distance (white paper)	Output	Model	
			NPN output	PNP output
		IO-Link baud rate	---	COM3 (230.4 kbps) [3]
Pre-wired (2 m) [1]			E3AS-HL500MN 2M	E3AS-HL500MT 2M
M8 Connector			E3AS-HL500MN M3	E3AS-HL500MT M3
M12 Pre-wired Smartclick Connector (0.3m) [2]			E3AS-HL500MN-M1TJ 0.3M	E3AS-HL500MT-M1TJ 0.3M
Pre-wired (2 m) [1]			E3AS-HL150MN 2M	E3AS-HL150MT 2M
M8 Connector			E3AS-HL150MN M3	E3AS-HL150MT M3
M12 Pre-wired Smartclick Connector (0.3m) [2]			E3AS-HL150MN-M1TJ 0.3M	E3AS-HL150MT-M1TJ 0.3M

Note: 1. Models with 5-m cable length are also available with “5M” suffix. (Example: E3AS-HL500MN 5M/E3AS-HL500LMN 5M)
2. M8 Pre-wired Connector Models are also availavble. When ordering, add "-M3J 0.3M" to the end of the model number (e.g., E3AS-HL500MN-M3J 0.3M/E3AS-HL500LMN-M3J 0.3M).
3. COM2 (38.4kbps) Models are also available.

Accessories (Sold Separately)

Sensor I/O Connectors (Sockets on One Cable End)

(Models for Connectors / Pre-wired Connectors)

A Sensor I/O Connector is not provided with the Sensor. It must be ordered separately as required.

Round Water-resistant Connectors XS3F-M8 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M8 Connector Straight type 	PVC cable	5 dia.	Straight	2	**XS3F-M8PVC4S2M**
				5	**XS3F-M8PVC4S5M**
Right-angle type 			Right-angle	2	**XS3F-M8PVC4A2M**
				5	**XS3F-M8PVC4A5M**

Note: 1. The XS3W (Socket and Plug on Cable Ends) is also available. Refer to *XS3 Series Datasheet* (Cat. No. G147).
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Round Water-resistant Connectors XS2 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M12 Connector Straight type 	PVC robot cable	6 dia.	Straight	2	**XS2F-M12PVC4S2M**
				5	**XS2F-M12PVC4S5M**
Right-angle type 			Right-angle	2	**XS2F-M12PVC4A2M**
				5	**XS2F-M12PVC4A5M**

Note: 1. The XS2W (Socket and Plug on Cable Ends) is also available. Refer to *XS2* on your OMRON website for details.
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Mounting Brackets

A Mounting Bracket is not enclosed with the Sensor. Order a Mounting Bracket separately if required.

For E3AS-HL series [Refer to *Dimensions* on page 16]

Appearance	Model (material)	Pre-wired	M12 Pre-wired Smartclick Connector	M8 Connector
L-shaped Mounting Bracket 	E39-L221 (SUS304)	Yes	Yes	---
Horizontal Protective Cover Bracket 	E39-L222 (SUS304)	Yes	Yes	---
Rear Mounting Bracket 	E39-L223 (SUS304)	Yes	Yes	Yes [2]
Robust Mounting Bracket 	E39-L224 (SUS304)	Yes	Yes	---
L-shaped Mounting Bracket 	E39-L231 (SUS304)	--- [1]	--- [1]	Yes [3]
Horizontal Protective Cover Bracket 	E39-L232 (SUS304)	--- [1]	--- [1]	Yes [3]
Robust Mounting Bracket 	E39-L234 (SUS304)	--- [1]	--- [1]	Yes [3]
Front Protection Cover 	E39-E19 [4]	Yes	Yes	Yes

Note: 1. Can be used for Pre-wired models and M12 Pre-wired Smartclick Connector models. However, confirm the bracket shape in advance.
2. Confirm the installation environment and bracket shape of the Sensor I/O Connector to be connected.
3. Use an L-shaped Sensor I/O Connector. Straight types cannot be installed.
4. Front Protection Cover is Accessory for E3AS-HL. E3AS-F model and E3AS-L model cannot be installed.

E3AS-HL series [Refer to *Dimensions* on page 19]

A Mounting Bracket is not enclosed with the Sensor. Order a Mounting Bracket separately if required.

Appearance	Model (material)	Pre-wired	M12 Pre-wired Smartclick Connector	M8 Connector
Flexible Mounting Bracket 	**E39-L261** [1] **(SUS304)**	Yes	Yes	Yes
Post 50 mm 	**E39-L262**	Yes	Yes	Yes
Post 100 mm 	**E39-L263**	Yes	Yes	Yes
Air Blow Unit 	**E39-E16** [2]	Yes	Yes	Yes

Note: 1. The Flexible Mounting Bracket is not provided with a Post (E39-L262/E39-L263). It must be ordered separately.
2. The tube for air is not included.

Ratings and Specifications

E3AS-HL models

Item	Model	Sensing method	Triangulation			
		NPN Output	E3AS-HL500MN	E3AS-HL500LMN	E3AS-HL150MN	E3AS-HL150LMN
		PNP Output/COM3	E3AS-HL500MT	E3AS-HL500LMT	E3AS-HL150MT	E3AS-HL150LMT
Sensing distance [1]			35 mm to the set distance		35 mm to the set distance	
Setting range [1]			35 to 500 mm		35 to 150 mm	
Standard detectable difference [1]			35 to 180 mm: 9 mm 180 to 300 mm: 18 mm 300 to 400 mm: 30 mm 400 to 500 mm: 45 mm at 10 m sec		35 to 50 mm: 1 mm 50 to 100 mm: 2 mm 100 to 150 mm: 4 mm at 10 m sec	
Display minimum unit value			1 mm		0.1 mm	
Spot size (reference value) [2]			2.5 mm × 1.5 mm at distance of 500 mm	18 mm × 1.5 mm at distance of 500 mm	2.5 mm × 1.3 mm at distance of 150 mm	8 mm × 1.3 mm at distance of 150 mm
Light source (wavelength)			Red laser (660 nm), Class1 (IEC/EN60825-1:2014)			
Power supply voltage			10 to 30 VDC (including 10% ripple (p-p)), Class2			
Current consumption			100 mA max.			
Input/ output	Control output		Load power supply voltage 30 VDC max. (Class2), the total load current of the two outputs is 100 mA max. Residual voltage (Load current 10 mA max.: 1 VDC max., Load current 10 to 100 mA: 2 VDC max.) Open-collector output (NPN/PNP output depending on model) N.O. (Normally Open) / N.C. (Normally Close) selectable			
		NPN	OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed)			
		PNP/COM3	OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed)			
	External input		Laser OFF / Teaching / Zero reset selectable NPN ON time: 0 V short-circuit or 1.5 V or less, OFF time: Power supply voltage short-circuit or open PNP ON time: Power supply voltage short-circuit or within power supply voltage - 1.5 V, OFF time: 0 V short-circuit or open			
Response time			1.5 ms / 10 ms / 50 ms selectable			
Threshold setting method			Teaching method / Manual Operations / IO-Link communications			
Mutual interference prevention			4 units max. (when using the mutual interference prevention function)			
Ambient illumination			Receiver surface illuminance: Incandescent lamp: 20,000 lx max., Sunlight: 25,000 lx max. at distance of 250 mm Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max. at distance of 500 mm		Receiver surface illuminance: Incandescent lamp: 8,000 lx max., Sunlight: 16,000 lx max.	

Note: 1. Measured with OMRON's standard workpiece (White ceramic).

2. Defined by D4σ method at the maximum sensing distance. Detection may be influenced if there is light leakage outside the defined region and the surroundings of the target object have a high reflectance in comparison to the target object. Also, when detecting a workpiece that is smaller than the spot size, a correct value may not be obtained.

E3AS-HL Series

E3AS-HL models

Series		E3AS-HL
Protection circuits		Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection
Ambient temperature range		Operating: -10 to 50°C, Storage: -25 to 70°C (with no icing or condensation)
Ambient humidity range		Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)
Insulation resistance		20 MΩ min. at 500 VDC
Dielectric strength		1,000 VAC, 50/60 Hz for 1 min
Vibration resistance		10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions
Shock resistance		500 m/s^2 for 3 times each in X, Y, and Z directions
Degree of protection		IP67 (IEC60529) and IP67G [1] (JIS C 0920 Annex 1), IP69K (ISO20653)
Indicators		OLED Display (White), Power/Communication indicator (Green*), Operation indicator (Orange) * IO-Link Communication mode: blinking
Connection method		Pre-wired (standard cable length: 2 m), M8 Connector, M12 Pre-wired Smartclick Connector (standard cable length: 0.3m)
Weight (packed state/ Sensor only)	Pre-wired (2 m)	Approx. 180 g/approx. 110 g
	M8 Connector	Approx. 120 g/approx. 50 g
	M12 Pre-wired Smartclick Connector (0.3m)	Approx. 150 g/approx. 80 g
Materials	Case	Stainless steel (SUS316L)
	Lens cover and Display	Methacrylic resin (PMMA) (Lens cover: Antifouling coating)
	Indicator	Polyamide 11 (PA11)
Main IO-Link functions		Operation mode switching between NO and NC, execution of teaching (2-point teaching, Background teaching), setup of the threshold, timer function of the control output and timer time selecting, Restore Factory Settings, Key Lock (Unlock, Lock, Lock (No Button)), monitor output* (Detection level, Incident light level) * Only for E3AS-HL and E3AS-F
IO-Link Communication specifications	IO-Link specification	Ver. 1.1
	Baud rate	COM3 (230.4 kbps)
	Data length	PD size: 4 bytes, OD size: 1 byte (M-sequence type: TYPE_2_V)
	Minimum cycle time	COM3: 1.2 ms
Accessories		Instruction manual, compliance sheet, index list (attached for IO-Link type only) E3AS-HL: FDA certification label and Warning label E3AS-F: FDA certification label Note: Mounting Brackets must be ordered separately.

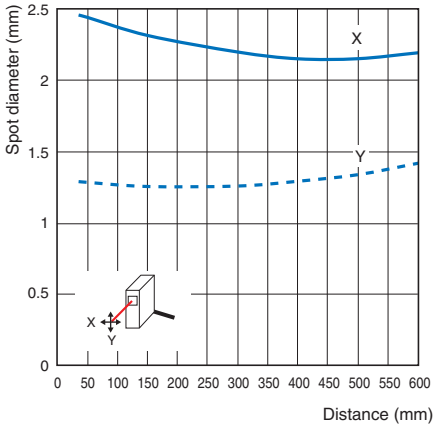
Note: The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).
The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.

Engineering Data (Reference Value)

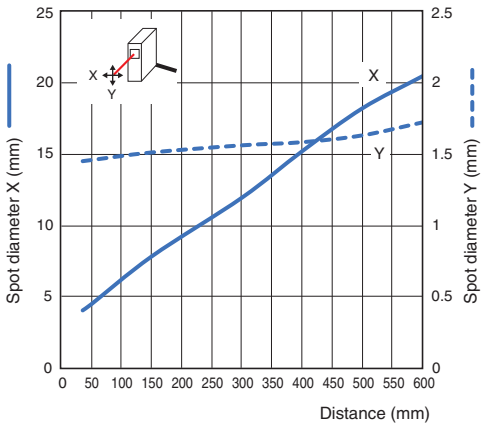
E3AS-HL models

Spot Diameter vs. Sensing Distance

Spot type
E3AS-HL500□
E3AS-HL150□

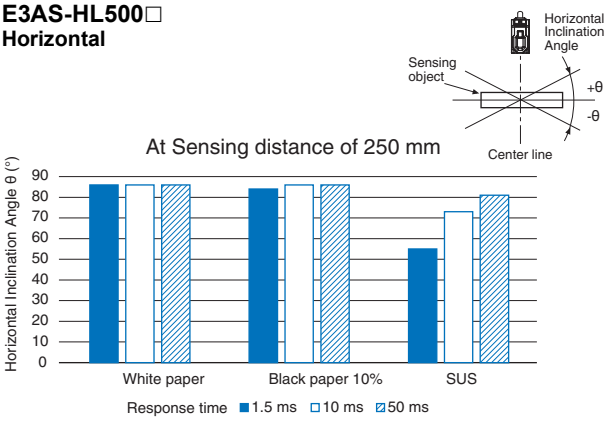


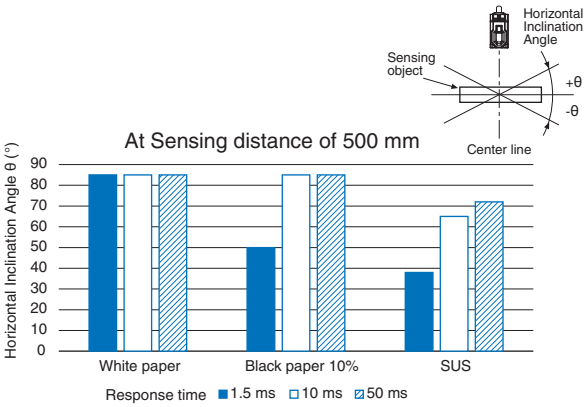
Line beam type
E3AS-HL500L□
E3AS-HL150L□



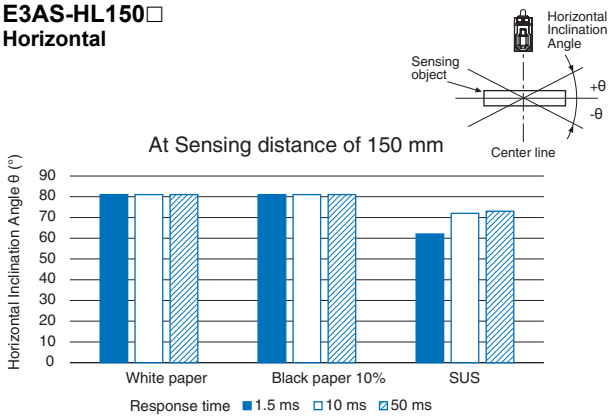
Sensing Object Angle Characteristics

Spot type/Line beam type
E3AS-HL500□
Horizontal





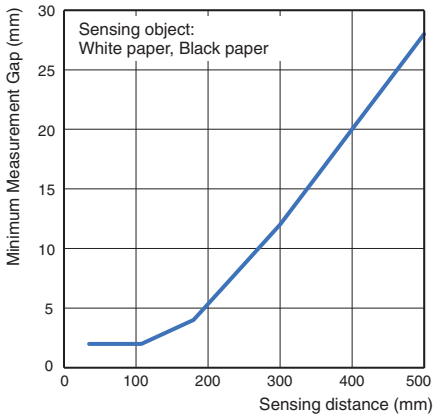
E3AS-HL150□
Horizontal



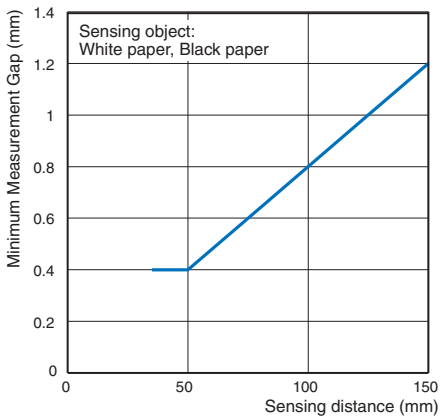
Minimum Measurement Gap Vs. Distance

Spot type/Line beam type

E3AS-HL500□



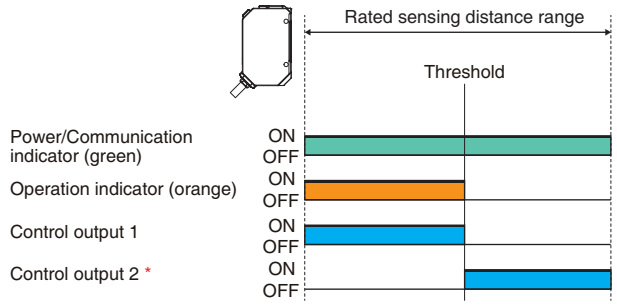
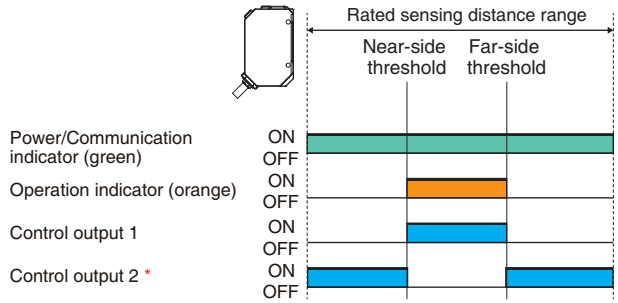
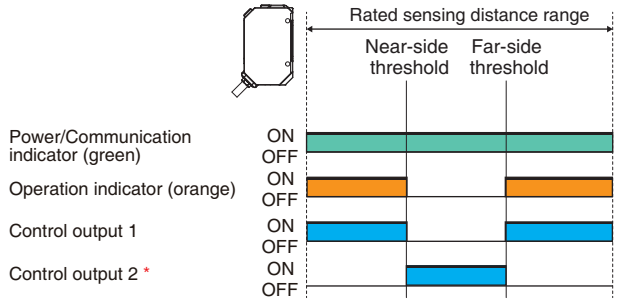
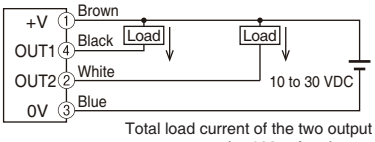
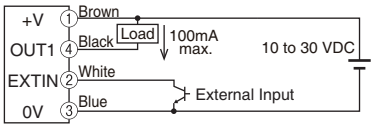
E3AS-HL150□



I/O Circuit Diagrams/ Timing Charts

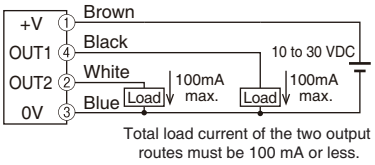
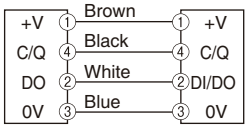
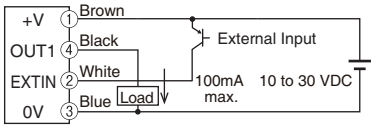
E3AS-HL models

NPN Output

Model	Timing chart	Output circuit
E3AS-HL500□N□ E3AS-HL150□N□	**Single Point Mode [Single]**  **Window BGS mode [Window BGS]**  **Window FGS mode [Window FGS]** 	**Using Pin2 (white wire) as output**  Total load current of the two output routes must be 100 mA or less. **Using Pin2 (white wire) as external input**  **External Input** / **NPN** **ON time** / 0V short-circuit or 1.5V or less **OFF time** / Power supply voltage short-circuit or open Connector Pin Arrangement M12 Pre-wired Smartclick Connector  M8 Connector 

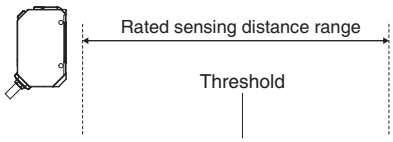
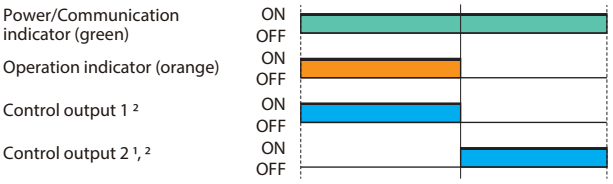
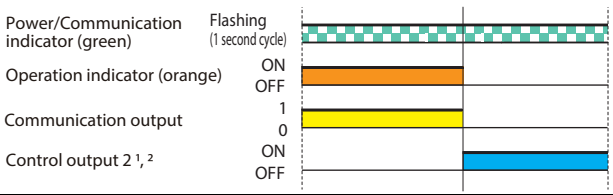
Note: The initial value of control output 2 is reverse of control output 1.

PNP Output

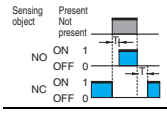
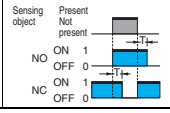
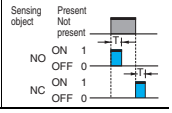
Model	Output circuit	
	Standard I/O mode (SIO mode) [1]	IO-Link Communication mode (COM mode) [2]
E3AS-HL500□T□ E3AS-HL150□T□	**Using Pin2 (white wire) as output**  Total load current of the two output routes must be 100 mA or less.	**Using Pin2 (white wire) as output**  IO-Link Master
	Using Pin2 (white wire) as external input  **External Input** / **PNP** **ON time**: Power supply voltage short-circuit or within power supply voltage - 1.5V **OFF time**: 0V short-circuit or open	---
	Connector Pin Arrangement M12 Pre-wired Smartclick Connector  M8 Connector 	

Note: 1. Standard I/O mode is used as PNP ON/OFF output.
2. IO-Link Communication mode is used for communications with the IO-Link Master. C/Q performs IO-Link communications. Sensor output DO performs ON/OFF output.

Single Point Mode [Single]

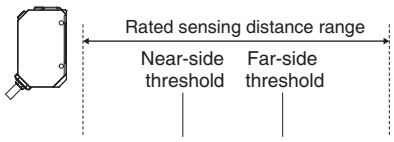
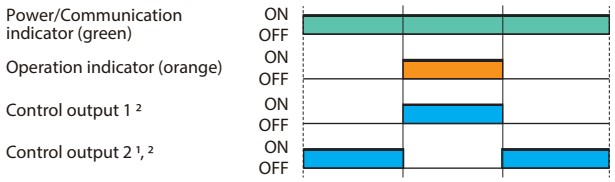
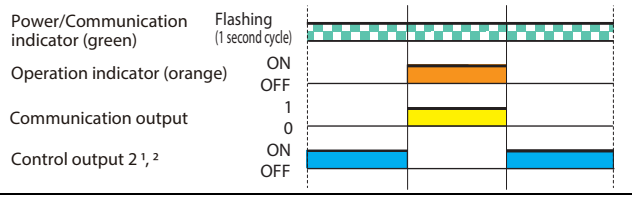
	Timing charts
Output mode	
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

Note: 1. The initial value of control output 2 is reverse of control output 1.
2. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

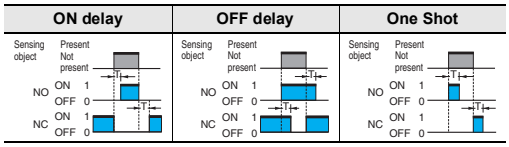
ON delay	OFF delay	One Shot
		

Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

Window BGS mode [Window BGS]

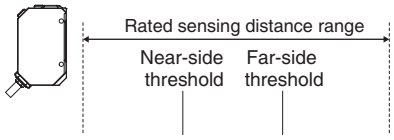
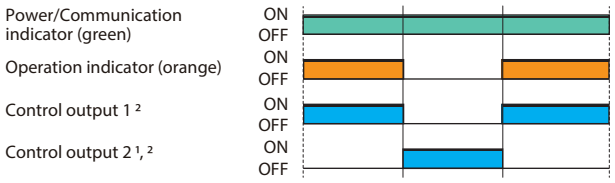
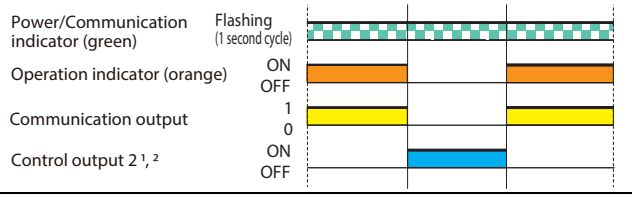
	Timing charts
Output mode	
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

Note: 1. The initial value of control output 2 is reverse of control output 1.
2. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

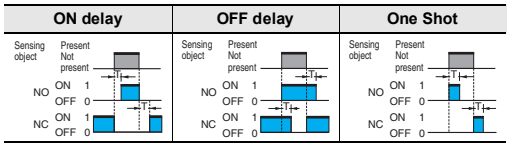


Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

Window FGS mode [Window FGS]

	Timing charts
Output mode	
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

Note: 1. The initial value of control output 2 is reverse of control output 1.
2. The timer function of the control output can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

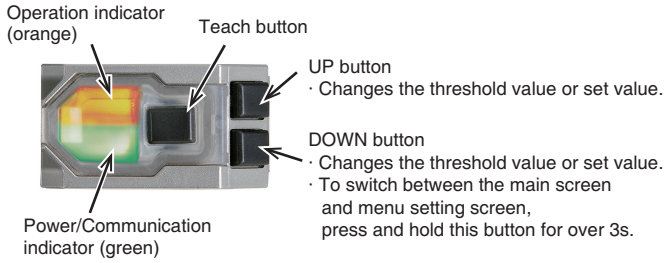


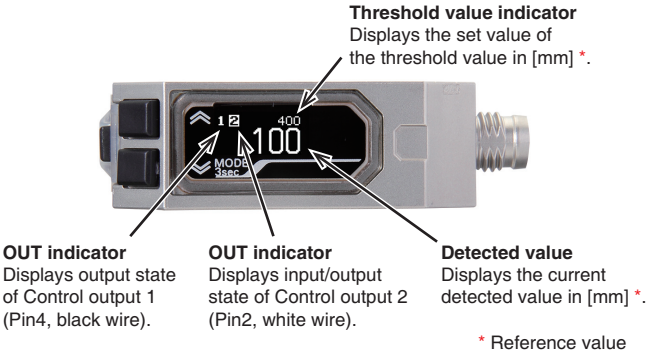
Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

Note: Shown above are the factory settings. Refer to the index list for the default settings at time of shipment from factory.
PNP/COM output logic can be reversed by IO-Link communication.
The operation indicator (orange) lights up when control output 1 is ON or communication output is 1.

Nomenclature

E3AS-HL500□
E3AS-HL150□





* Reference value

Note: The indicators work differently depending on sensor status.

Safety Precautions

Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.

Warning Indications

⚠ WARNING	**Warning level** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
⚠ CAUTION	**Caution level** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Meaning of Product Safety Symbols

	**General prohibition** Indicates the instructions of unspecified prohibited action
	**Caution, fire** Indicates the possibility of fires under specific conditions.
	**General caution** Indicates unspecified general alert.
	**Caution, explosion** Indicates the possibility of explosion under specific conditions
	**Laser Caution** Indicates information related to laser safety
	**Disassembly prohibited** Prohibit the disassembly of a device because of the possibility of injuries due to electric shock.

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly. Do not use it for such purposes.

Do not use it exceeding the rated voltage. There is a possibility of failure and fire.

⚠ CAUTION

Its component may be damaged and/or degree of protection may be degraded. Please do not apply high pressure water intensively at one place during cleaning.

Never use the product with an AC power supply. Otherwise, explosion may result.

E3AS-HL and E3AS-F models

To safely use laser products

⚠ WARNING

Do not expose your eyes to the laser beam either directly or indirectly (i.e., after reflection from a mirror or shiny surface). The laser beam has a high power density and exposure may result in loss of sight.

Do not disassemble this product. Doing so may cause exposure to the built-in light source which can damage eyes and skin. Never disassemble it.

Laser safety measures for laser equipment are stipulated by the country of use. Follow the instructions described below categorized in four cases.

1. Usage in Japan

The JIS C6802:2014 standard stipulates the safety precautions that users must take according to the class of the laser product. This product is classified into class 1 defined by this standard.

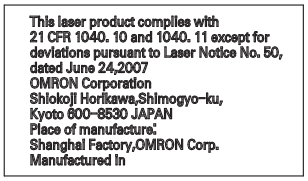
2. Usage in U.S.

This product is subjected to the U.S. FDA (Food and Drug Administration) laser regulations. This product is classified into Class 1 by the IEC 60825-1:2014 standard according to the regulations of Laser Notice No.56 of the FDA standard. This product is already reported to CDRH (Center for Devices and Radiological Health).

Accession Number: 1920014-001

When using a device equipped with the product in the U.S., attach an FDA certification label near the sensor mounted on customer equipment.

FDA certification label



3. Usage in China

This product is classified into Class 2 by the GB7247.1:2012 (IEC60825-1:2007) standard.

When using a device equipped with the product in China, attach a Warning label near the sensor mounted on customer equipment.

Warning label

4. Usage in countries other than U.S. and China

This product is classified into Class 1 by the IEC/EN 60825-1:2014 standard.

Precautions for Safe Use

The following precautions must be observed to ensure safe operation.

1. Do not reverse the power supply connection or connect to an AC current.
2. Do not short the load.
3. Be sure that before making supply the supply voltage is less than the maximum rated supply voltage (30 VDC).
4. Do not use the product in environments subject to flammable or explosive gases.
5. Do not use the product under a chemical or an oil environment without prior evaluation.
6. Do not attempt to modify the product.
7. Do not touch the metal surface with your bare hands when the temperature is low. Touching the surface may result in a cold burn.
8. Burn injury may occur. The product surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Attention must be paid during operation or cleaning.

Precautions for Correct Use

1. Do not hit the product using a hammer for installation.
2. The product must be installed with the specified torque or less. For M8 connector, the proper tightening torque is from 0.3 to 0.4 N·m. In case of M12 smartclick connector, manually tighten the connector.
3. Tightening torque for the mounting hole is 0.6 N·m or less (M3 screw).
4. Do not use the product in any atmosphere or environment that exceeds the ratings.
5. Output pulses may occur when the power supply is turned OFF. We recommend that you turn OFF the power supply to the load or load line first.
6. Use an extension cable less than 100 m long for Standard I/O mode and less than 20 m for IO-Link Communication mode.
7. Do not pull on the cable with excessive strength.
8. Be sure to turn off the power supply when connecting or disconnecting the cable.
9. Please wait for at least 600 ms (E3AS-HL), 500 ms (E3AS-F), 100 ms (E3AS-L) after turning on the product's power until it is available for use.
10. Though this is type IP67, do not use in the water, rain or outdoors.
11. If the Sensor wiring is placed in the same conduits or ducts as high-voltage or high-power lines, inductive noise may cause malfunction or damage. Wire the cables separately or use a shielded cable.
12. Do not use the product in locations subject to direct sunlight.
13. Do not use the product where humidity is high and dew condensation may occur.
14. Do not use the product where corrosive gases may exist.
15. If high-pressure washing water and so on hits the button, it might lead to malfunctioning. So, consider use of the key lock function.
16. Do not apply high-pressure washing water directly to the sensor's light emitting / receiving surface from a short distance. As the antifouling feature may be impaired, keep a sufficient distance from the light emitting / receiving surface.
17. Do not use the product at a location subject to shock or vibration.
18. To use a commercially available switching regulator, FG (frame ground) must be grounded.
19. Do not use organic solvents (e.g. paint thinner and alcohol) for cleaning. Otherwise optical properties and protective structure may deteriorate.
20. Be sure to check the influence caused by surrounding environments such as background objects and LED lighting before using the product.
21. Do not exceed 100,000 writing operations of the EEPROM (non-volatile memory). Setting information is written to the EEPROM when a threshold value change, teaching, or zero reset is executed.
22.  Please dispose in accordance with applicable regulations.

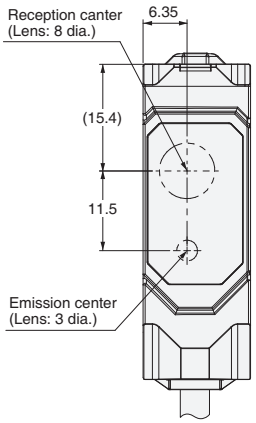
Dimensions

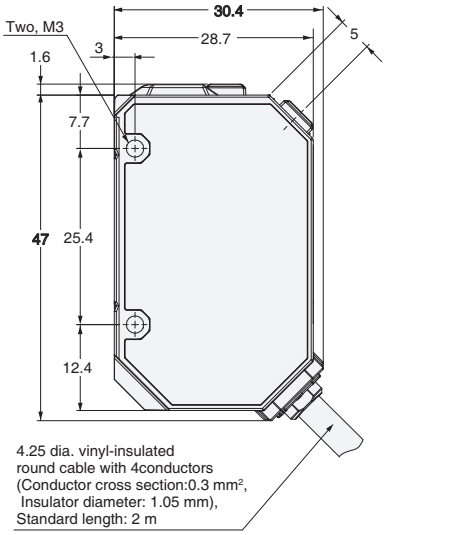
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensors

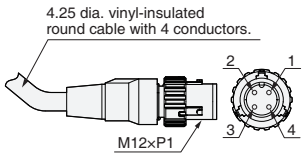
Pre-wired Models/Pre-wired Connector Models

E3AS-HL500□ (-M1TJ)
E3AS-HL150□ (-M1TJ)

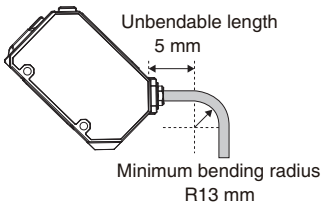




Pre-wired Connector Models
E3AS-HL500□-M1TJ
E3AS-HL150□-M1TJ

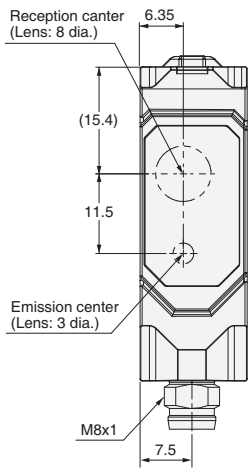


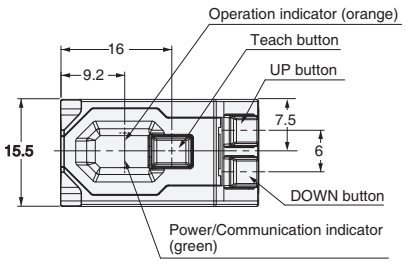
Minimum bending radius/unbendable length of cord

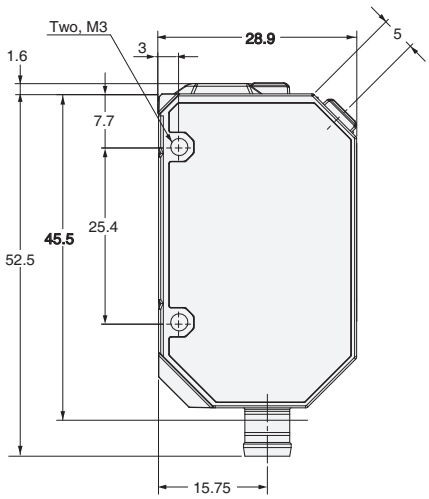


Connector Models

E3AS-HL500□ M3
E3AS-HL150□ M3





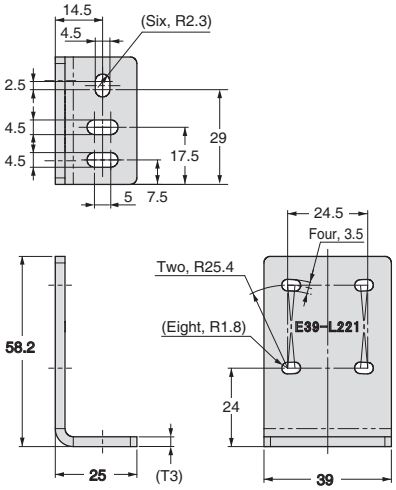


Accessories (Sold Separately)

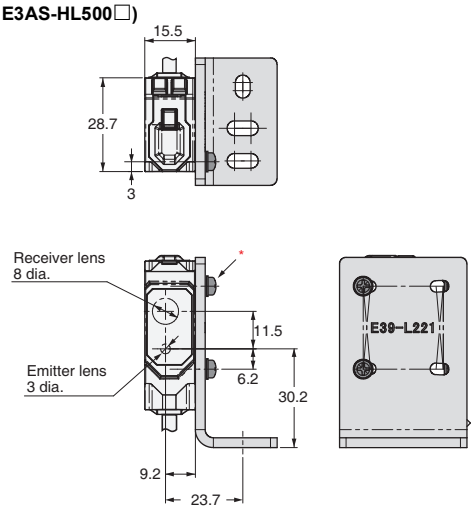
Mounting Brackets

For E3AS-HL models

E39-L221

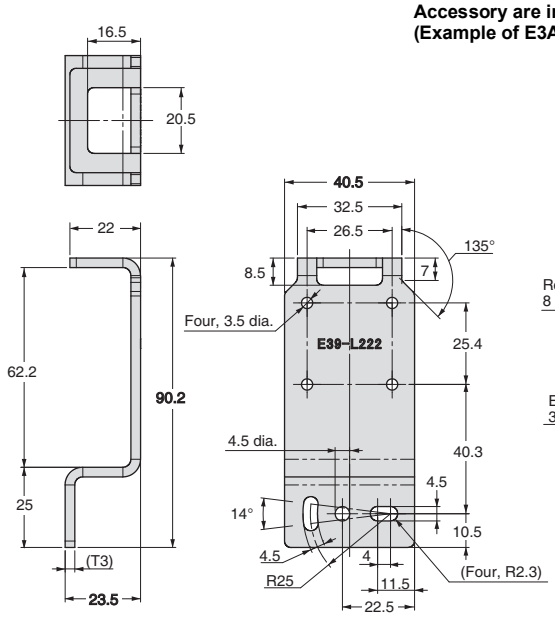


Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)

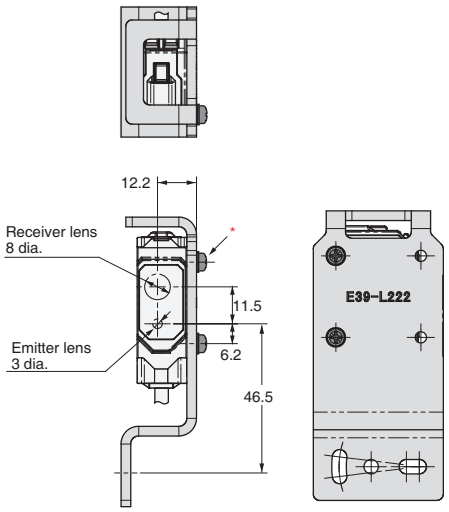


Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L222

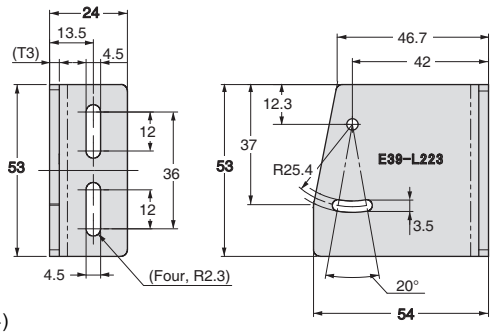


Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)

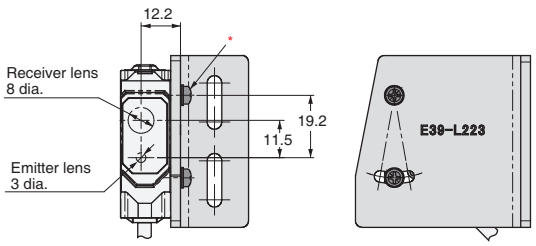


Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L223

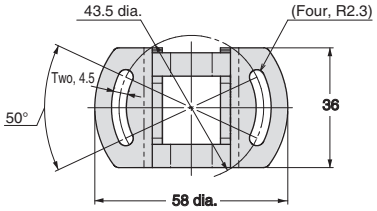


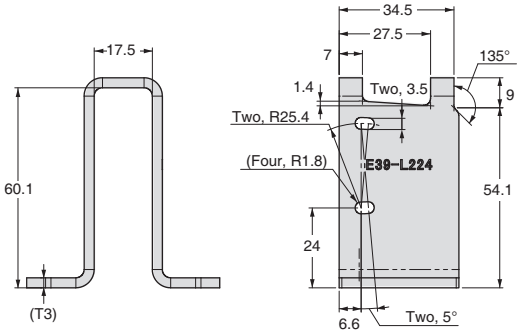
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)



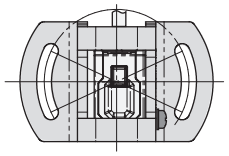
Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

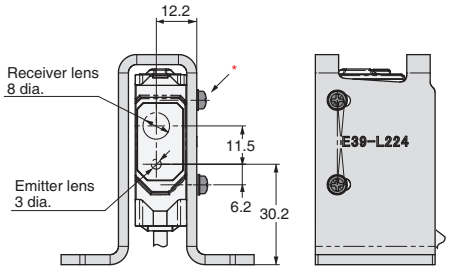
E39-L224





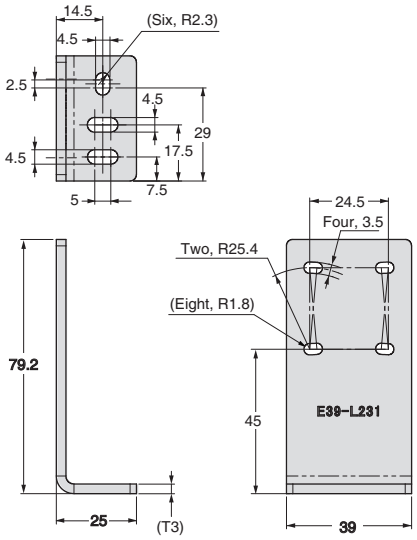
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)



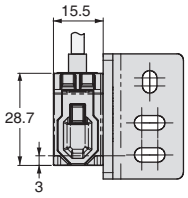


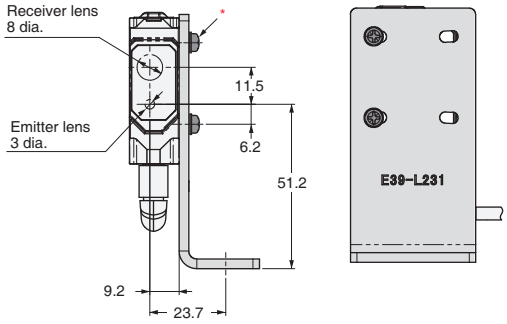
Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L231



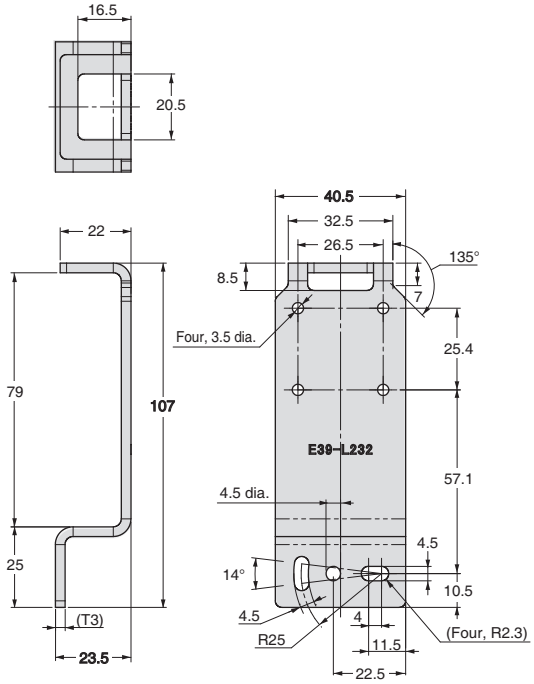
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)



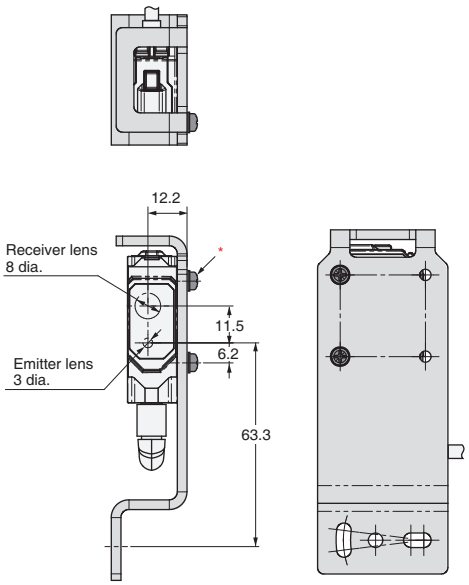


Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L232

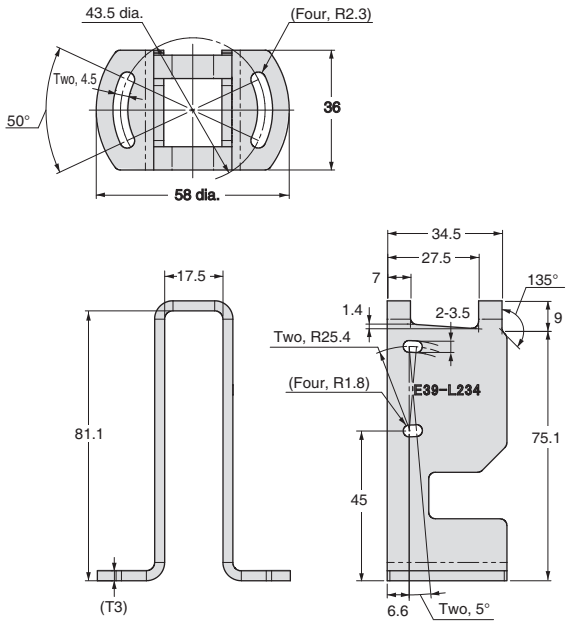


Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)

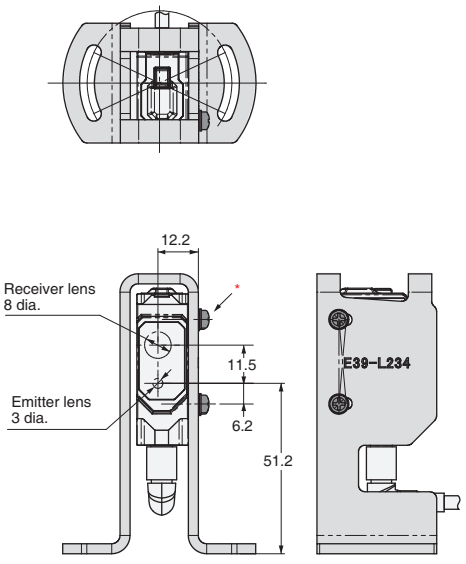


Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L234



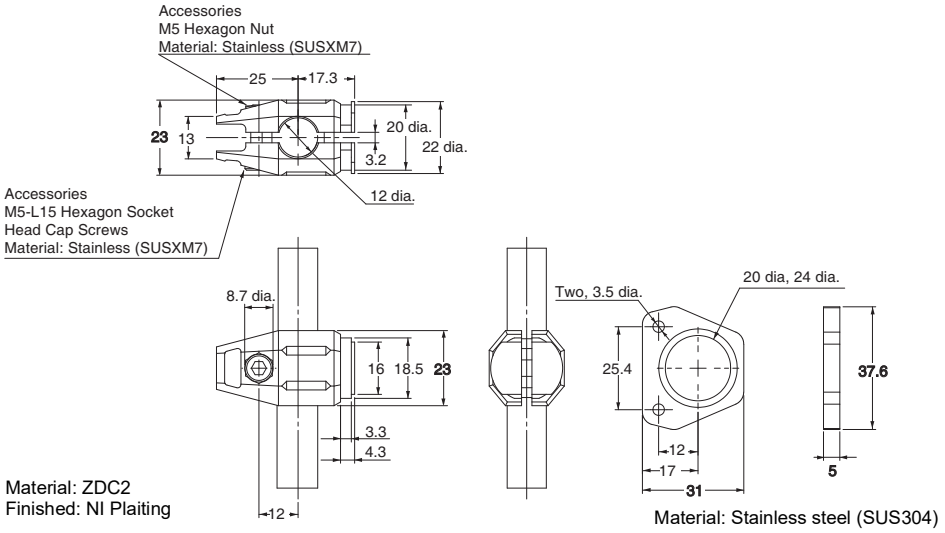
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)



Material: Stainless steel (SUS304)
* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

Common to E3AS series

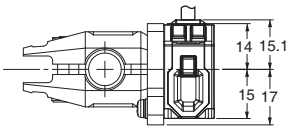
Flexible Mounting Bracket
E39-L261

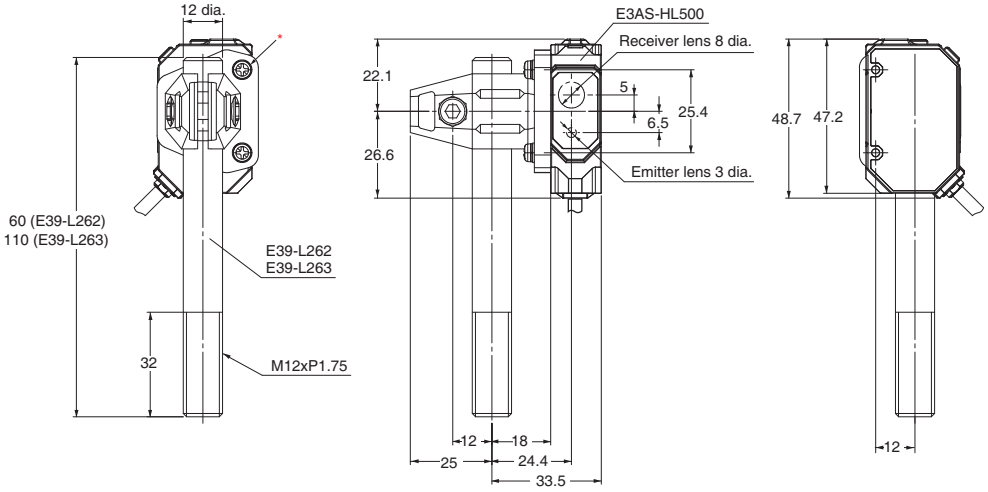


Material: ZDC2
Finished: NI Plaiting

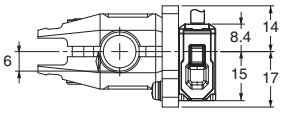
Material: Stainless steel (SUS304)

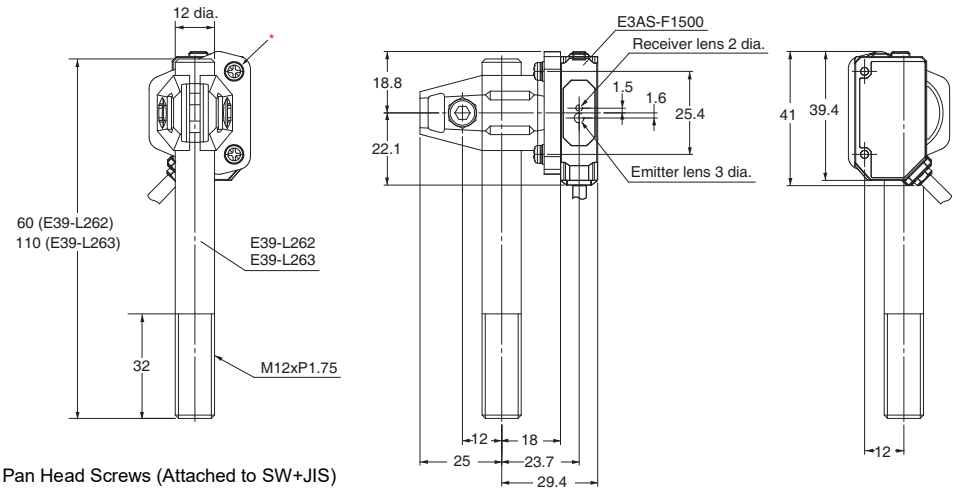
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)





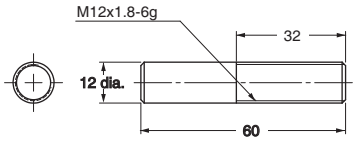
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)

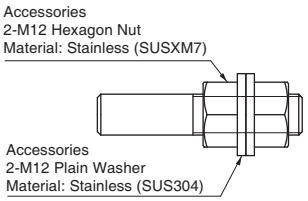




* Accessories 2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS)

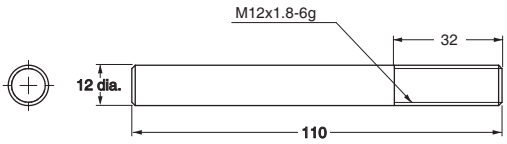
Post 50 mm
E39-L262

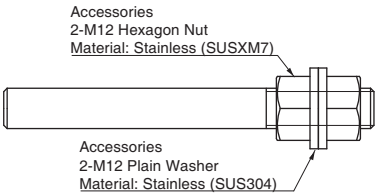




Material: Stainless steel (SUS304)

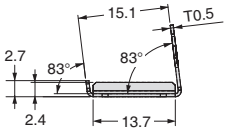
Post 100 mm
E39-L263

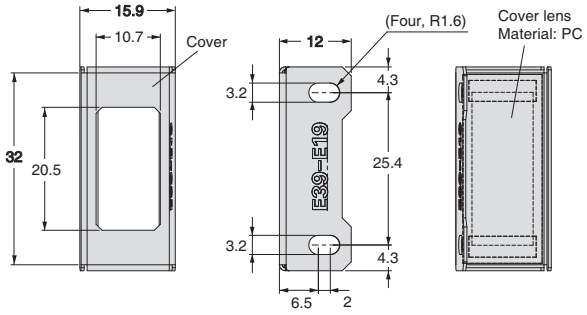




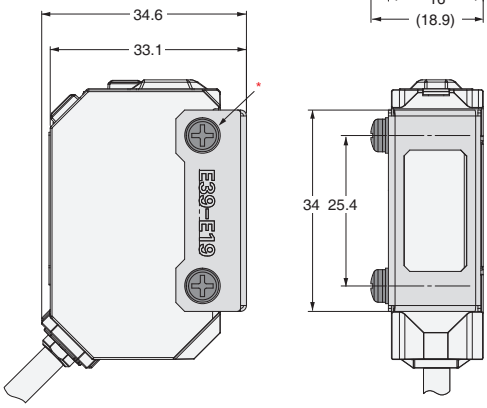
Material: Stainless steel (SUS304)

E39-E19





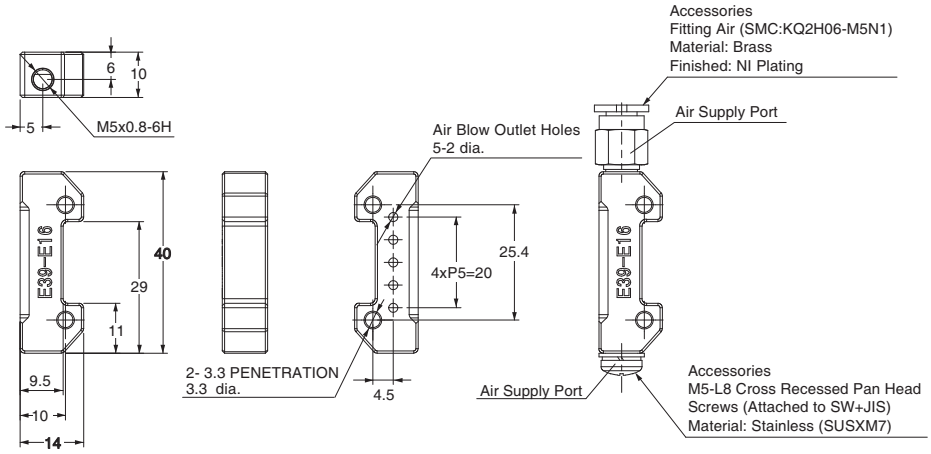
Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)



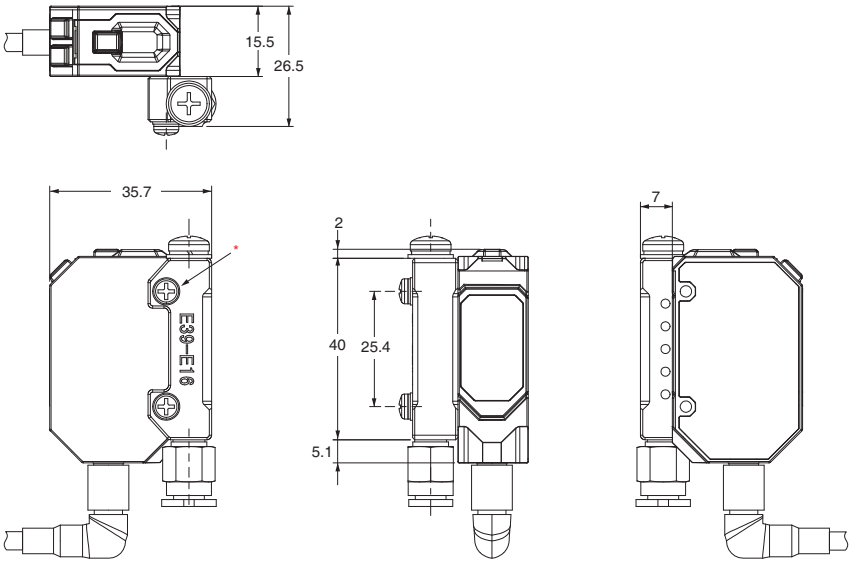
Material: Stainless steel (SUS304)

* Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

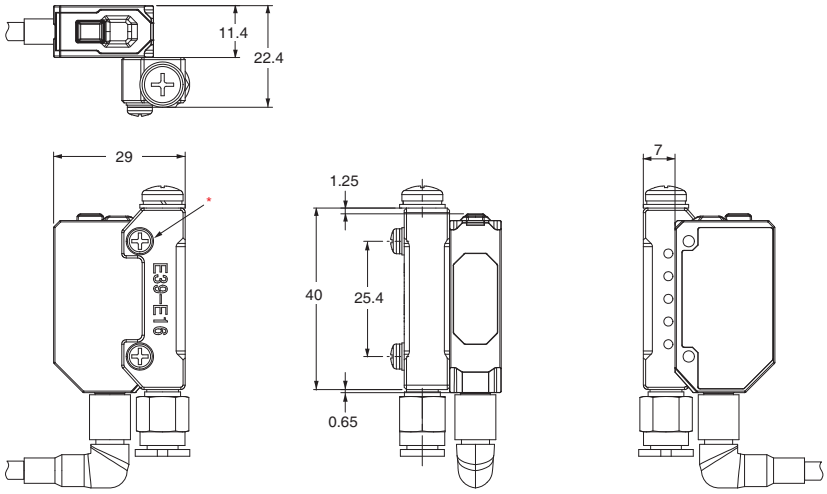
Air Blow Unit
E39-E16



Photoelectric Sensor
Accessory are installed
(Example of E3AS-HL500□)



Photoelectric Sensor
Accessory are installed
(Example of E3AS-HL500□)



Material: ZDC2
Finished: NI Plaiting
* Accessories 2-M3-L16 Cross Recessed Pan Head Screws (Attached to SW+JIS)

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Switches & Relays
• Limit Switches • Pushbutton Switches • Electromechanical Relays
• Solid State Relays

Software
• Programming & Configuration • Runtime

E60I-E-01 Note: Specifications are subject to change. Printed in U.S.A.

Printed on recycled paper.

Distance-settable Photoelectric Sensor
E3AS-L Series

Background suppression sensor for enhanced detection low-reflectivity objects

- Equipped with Omron's proprietary light emitting element for stable detection of low-reflective workpieces
- Teaching method allows anyone to set optimal threshold values
- Manufactured using Omron's proprietary laser sealing method (IP67/IP69K/IP67G *)
- Antifouling coating prevents contamination on the sensing surface
- IO-Link reduced time required for startups and changeovers

* Only for sensor units.

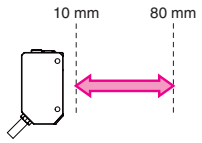
⚠ Refer to *Safety Precautions* on page 8.

For the most recent information on models that have been certified for safety standards, refer to your Omron website.

Ordering Information

Sensors [Refer to *Dimensions* on page 9.]

Red light

Connection method	Sensing distance (white paper)	Output	Model		
			NPN output	PNP output	PNP output
		IO-Link baud rate	---	COM2 (38.4 kbps)	COM3 (230.4 kbps)
Pre-wired (2 m) [1]			E3AS-L200MN 2M	E3AS-L200MD 2M	E3AS-L200MT 2M
M8 Connector			E3AS-L200MN M3	E3AS-L200MD M3	E3AS-L200MT M3
M8 Pre-wired Connector			E3AS-L200MN-M3J 0.3M	E3AS-L200MD-M3J 0.3M	E3AS-L200MT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-L200MN-M1TJ 0.3M	E3AS-L200MD-M1TJ 0.3M	E3AS-L200MT-M1TJ 0.3M
Pre-wired (2 m) [1]			E3AS-L80MN 2M	E3AS-L80MD 2M	E3AS-L80MT 2M
M8 Connector			E3AS-L80MN M3	E3AS-L80MD M3	E3AS-L80MT M3
M8 Pre-wired Connector			E3AS-L80MN-M3J 0.3M	E3AS-L80MD-M3J 0.3M	E3AS-L80MT-M3J 0.3M
M12 Pre-wired Connector [2]			E3AS-L80MN-M1TJ 0.3M	E3AS-L80MD-M1TJ 0.3M	E3AS-L80MT-M1TJ 0.3M

1. Models with 5-m cable length are also available with “5M” suffix. (Example: E3AS-L200MN 5M)
2. The Pre-wired Connector (M12) is Smartclick Connector.

Return

Accessories (Sold Separately)

Sensor I/O Connectors (Sockets on One Cable End)

(Models for Connectors / Pre-wired Connectors)

A Sensor I/O Connector is not provided with the Sensor. Order separately as needed.

Round Water-resistant Connectors XS3F-M8 series

Appearance	Cable specification	Cable diameter (mm)	No. of cable cores (Poles)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M8 Connector Straight type 	PVC cable	5 dia.	4	Straight	2	**XS3F-M8PVC4S2M**
					5	**XS3F-M8PVC4S5M**
Right-angle type 				Right-angle	2	**XS3F-M8PVC4A2M**
					5	**XS3F-M8PVC4A5M**

Note: 1. The XS3W (Socket and Plug on Cable Ends) is also available. Refer to *XS3W-M8/XS3F-M8 Series Datasheet* (Cat. No. G140).
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Round Water-resistant Connectors XS5 series

Appearance	Cable specification	Cable diameter (mm)	Cable connection direction	Cable length (m)	Sensor I/O Connector model number
M12 Smartclick Connector Straight type 	PVC robot cable	6 dia.	Straight	2	**XS5F-D421-D80-F**
				5	**XS5F-D421-G80-F**
Right-angle type 			Right-angle	2	**XS5F-D422-D80-F**
				5	**XS5F-D422-G80-F**

Note: 1. The XS5W (Socket and Plug on Cable Ends) is also available. Refer to *XS5* on your Omron website for details.
2. The connectors will not rotate after they are connected.
3. The cable is fixed at an angle of 180° from the sensor emitter/receiver surface.

Mounting Brackets [Refer to *Dimensions* on page 10.]

A Mounting Bracket is not enclosed with the Sensor. Order separately as needed.

Appearance	Model (material)	Applicable Sensor E3AS series			
		Pre-wired	M8 Pre-wired Connector	M12 Pre-wired Smartclick Connector	M8 Connector
L-shaped Mounting Bracket 	E39-L201 (SUS304)	Yes	Yes	Yes	---
Horizontal Protective Cover Bracket 	E39-L202 (SUS304)	Yes	Yes	Yes	---
Rear Mounting Bracket 	E39-L203 (SUS304)	Yes	Yes	Yes	Yes [2]
Robust Mounting Bracket 	E39-L204 (SUS304)	Yes	Yes	Yes	---
L-shaped Mounting Bracket 	E39-L211 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]
Horizontal Protective Cover Bracket 	E39-L212 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]
Robust Mounting Bracket 	E39-L214 (SUS304)	--- [1]	--- [1]	--- [1]	Yes [3]

1. Can be used for Pre-wired models, M8 Pre-wired Connector models, and M12 Pre-wired Smartclick Connector models. However, confirm the bracket shape in advance.
2. Confirm the installation environment and bracket shape of the Sensor I/O Connector to be connected.
3. Use an L-shaped Sensor I/O Connector. Straight types cannot be installed.

E3AS-L Series

Ratings and Specifications

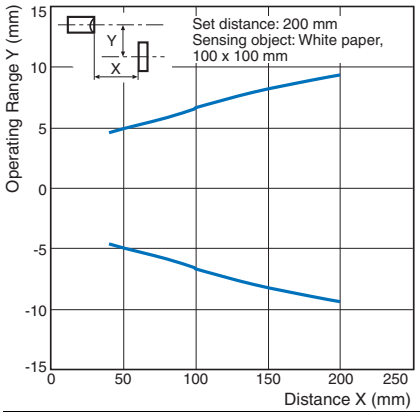
Item		Sensing method	Distance-settable	
	Model	NPN output	E3AS-L200MN	E3AS-L80MN
		PNP output/ COM2	E3AS-L200MD	E3AS-L80MD
		PNP output/ COM3	E3AS-L200MT	E3AS-L80MT
Sensing distance			10 mm to the set distance (White paper or black paper 100 × 100 mm)	
Setting range			40 to 200 mm (White paper or black paper 100 × 100 mm)	20 to 80 mm (White paper or black paper 100 × 100 mm)
Spot diameter (reference value)			25 × 25 mm at distance of 200 mm	4 mm dia. (at distance of 80 mm)
Differential travel			10% max. of set distance	White paper: 2% max. of set distance Black paper: 5% max. of set distance
Reflectivity characteristic (black/white error)			10% max. of set distance	5% max. of set distance
Light source (wavelength)			Red LED (624 nm)	Red LED (650 nm)
Power supply voltage			10 to 30 VDC (including 10% ripple (p-p)), Class2	
Current consumption			35 mA max.	
Input/output	Control output		Load power supply voltage: 30 VDC max., Class2, Load current: 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max.) Open-collector output (NPN/PNP output depending on model)	
		NPN	OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed)	
		PNP/COM2 PNP/COM3	OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed)	
Protection circuits			Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection	
Response time			Operate or reset: 1 ms max.	
Distance setting			Teaching method/IO-Link communications	
Ambient illumination (Receiver side)			Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max.	
Ambient temperature range			Operating: -25 to 55°C, Storage: -40 to 70°C (with no icing or condensation)	
Ambient humidity range			Operating: 35% to 85%, Storage: 35% to 95% (with no condensation)	
Insulation resistance			20 MΩ min. at 500 VDC	
Dielectric strength			1,000 VAC, 50/60 Hz for 1 min	
Vibration resistance			10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions	
Shock resistance			500 m/s^2 for 3 times each in X, Y, and Z directions	
Degree of protection			IP67 (IEC60529) and IP67G [1] (JIS C 0920 Annex 1), IP69K (ISO20653)	
Indicators			Operation indicator (orange), Stability & Communication indicator (green [2])	
Connection method			Pre-wired (standard cable length: 2 m), M8 Connector, M8 Pre-wired Connector (standard cable length: 0.3m), M12 Pre-wired Smartclick Connector (standard cable length: 0.3m)	
Weight (packed state/ Sensor only)	Pre-wired (2 m)		Approx. 135 g/approx. 90 g	
	M8 Connector		Approx. 75 g/approx. 30 g	
	M8 Pre-wired Connector (0.3 m)		Approx. 85 g/approx. 40 g	
	M12 Pre-wired Smartclick Connector (0.3m)		Approx. 95 g/approx. 50 g	
Materials	Case		Stainless steel (SUS316L)	
	Lens		Methacrylate resin (PMMA)	
	Display		Polyamide 11 (PA11)	
Main IO-Link functions			Operation mode switching between NO and NC, execution of teaching (2-point teaching, Background teaching), setup of the threshold, timer function of the control output and timer time selecting, Restore Factory Settings, Key Lock (Unlock, Lock, Lock (No Button))	
IO-Link Communication specifications	IO-Link specification		Ver. 1.1	
	Baud rate		COM2 (38.4 kbps), COM3 (230.4 kbps)	
	Data length		PD size: 1 byte, OD size: 1 byte (M-sequence type: TYPE_2_1)	
	Minimum cycle time		COM2: 3.5 ms, COM3: 1.2 ms	
Accessories			Instruction manual, compliance sheet and index list (attached for IO-Link type only), Note: Mounting Brackets must be ordered separately.	

1. The IP67G is the degree of protection which is defined according to the JIS (Japanese Industrial Standards).
   The IP67 indicates the same level of protection as defined by the IEC, and the G indicates that a device has resistance to oil.
2. IO-Link Communication mode: blinking

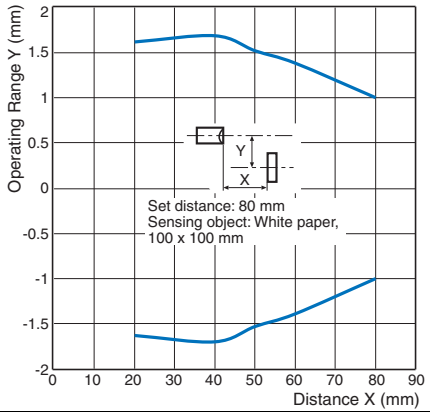
Engineering Data (Reference Value)

Operating Range

E3AS-L200

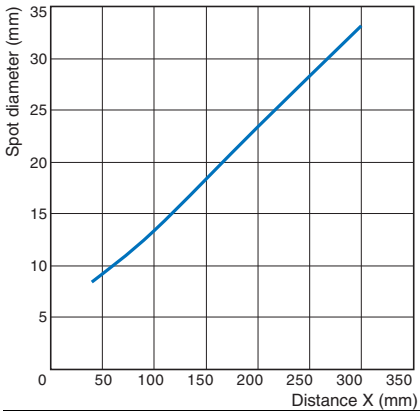


E3AS-L80

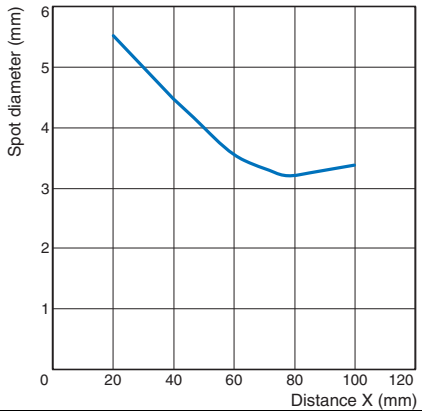


Spot Diameter vs. Sensing Distance

E3AS-L200

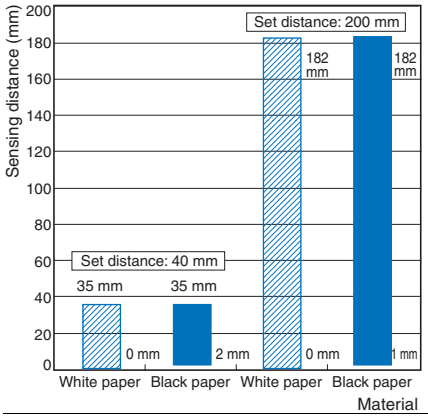


E3AS-L80

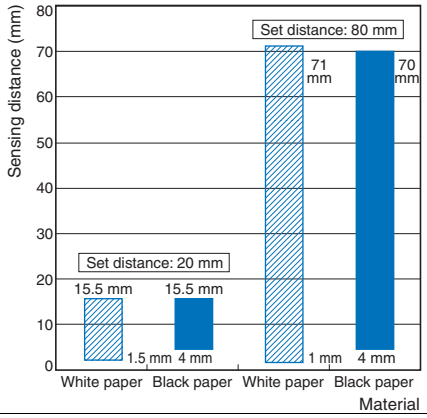


Close-range Characteristics

E3AS-L200

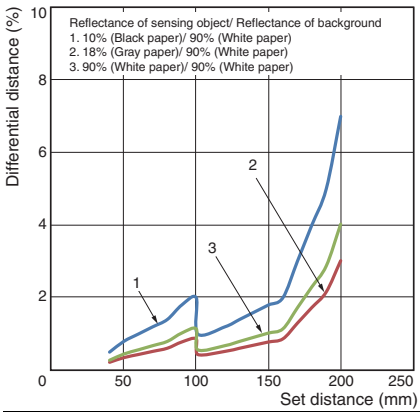


E3AS-L80

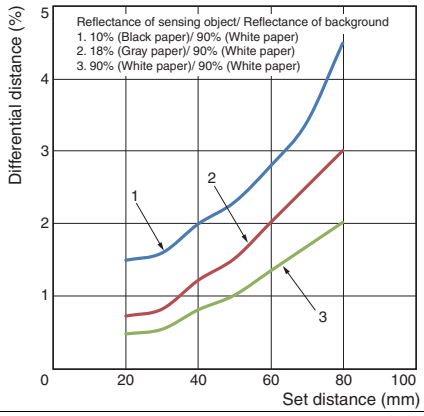


Differential distance for each sensing object Vs. Distance

E3AS-L200



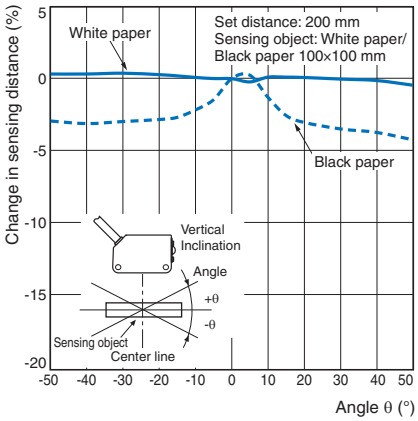
E3AS-L80



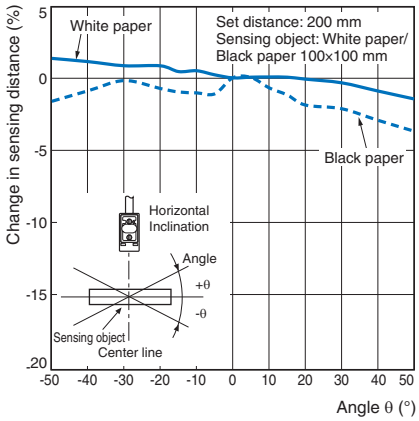
Sensing Object Angle Characteristics

E3AS-L200

Vertical

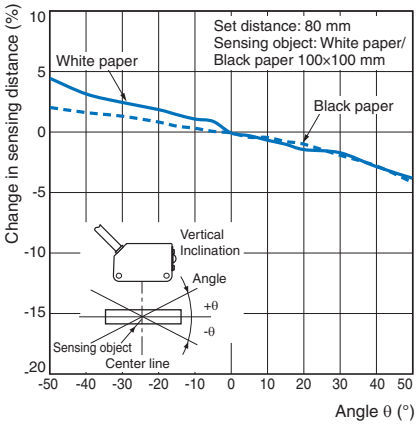


Horizontal

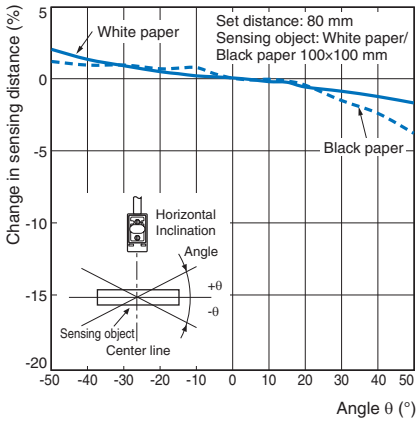


E3AS-L80

Vertical

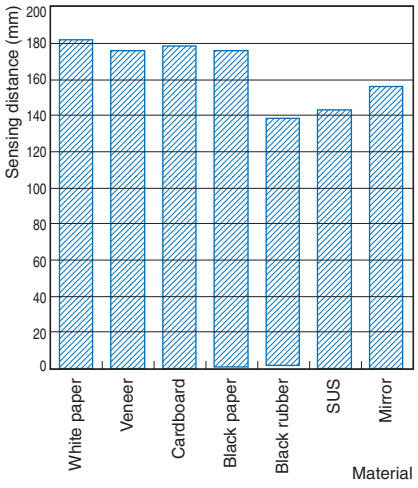


Horizontal

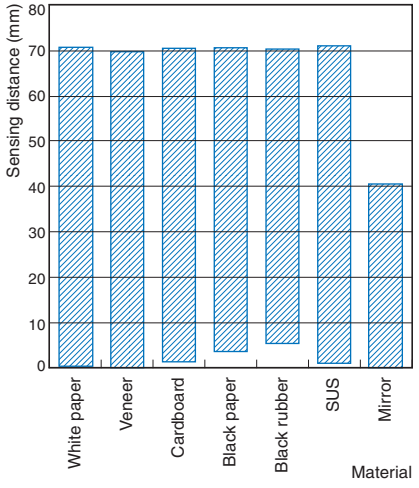


Sensing Distance vs. Sensing Object Material

E3AS-L200
(Set Distance of 200 mm using White Paper)

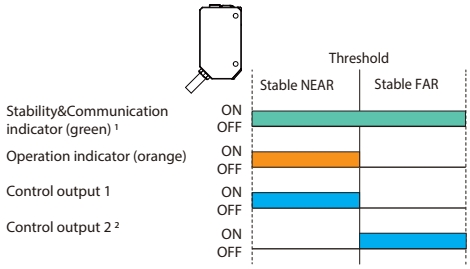
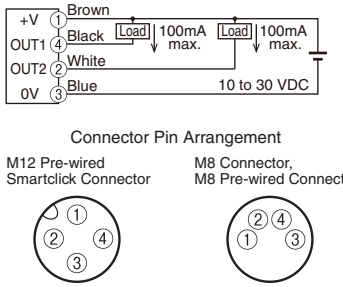


E3AS-L80
(Set Distance of 80 mm using White Paper)



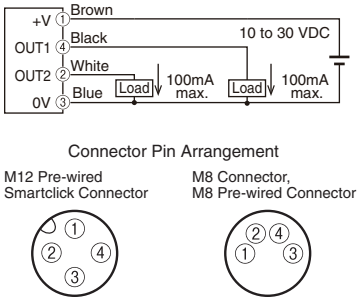
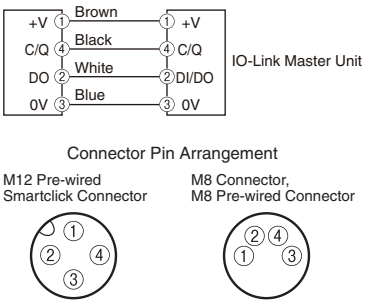
I/O Circuit Diagrams/ Timing Charts

NPN Output

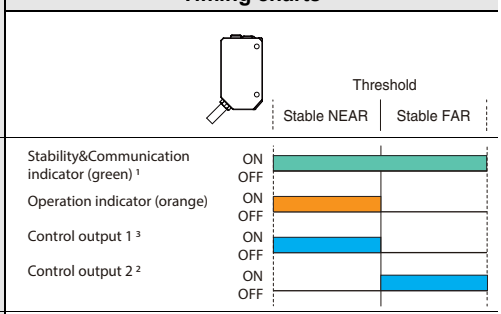
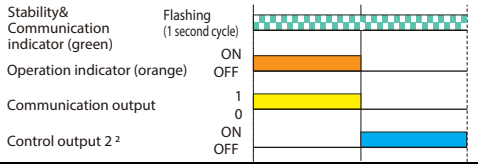
Model	Timing chart	Output circuit
E3AS-L□N		

1. Turns off when there is insufficient margin for incident light. In that case, place the workpiece closer to ensure sufficient receiving light intensity.
2. The initial value of control output 2 is reverse of control output 1.

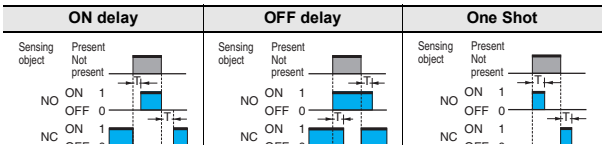
PNP Output

Model	Output circuit	
	Standard I/O mode (SIO mode) 1	IO-Link Communication mode (COM mode) 2
E3AS-L□D E3AS-L□T		

1. Standard I/O mode is used as PNP ON/OFF output.
2. IO-Link Communication mode is used for communications with the IO-Link Master. C/Q performs IO-Link communications. Sensor output DO performs ON/OFF output.

Output mode	Timing charts
Standard I/O mode (SIO mode)	
IO-Link Communication mode (COM mode)	

1. Turns off when there is insufficient margin for incident light. In that case, place the workpiece closer to ensure sufficient receiving light intensity.
2. The initial value of control output 2 is reverse of control output 1.
3. The timer function of the control output 2 can be set up by the IO-Link communications. (It is able to select ON delay, OFF delay, or one-shot function and select a timer time of 1 to 9,999 ms (T).)

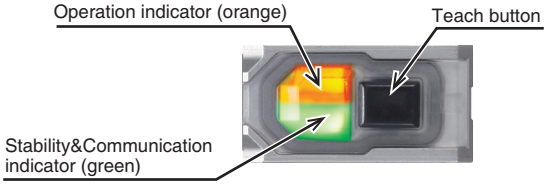


Please contact your Omron sales representative regarding the IO-Link setup file (IODD file).

Note: Shown above are the factory settings. Refer to the index list for the default settings at time of shipment from factory.
PNP/COM output logic can be reversed by IO-Link communication.
The operation indicator (orange) lights up when control output 1 is ON or communication output is 1.

Nomenclature

E3AS-L200
E3AS-L80



Note: The indicators work differently depending on sensor status.

Safety Precautions

Be sure to read the precautions for all models in the website at: http://www.ia.omron.com/.

Warning Indications

⚠ WARNING	**Warning level** Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.
⚠ CAUTION	**Caution level** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or in property damage.
Precautions for Safe Use	Supplementary comments on what to do or avoid doing, to use the product safely.
Precautions for Correct Use	Supplementary comments on what to do or avoid doing, to prevent failure to operate, malfunction or undesirable effect on product performance.

Meaning of Product Safety Symbols

	**General prohibition** Indicates the instructions of unspecified prohibited action
	**Caution, fire** Indicates the possibility of fires under specific conditions
	**General Caution** Indicates unspecified general alert
	**Caution, explosion** Indicates the possibility of explosion under specific conditions

⚠ WARNING

This product is not designed or rated for ensuring safety of persons either directly or indirectly.
Do not use it for such purpose.

Do not use the product with voltage in excess of the rated voltage.
Excess voltage may result in malfunction or fire.

⚠ CAUTION

Its component may be damaged and/or degree of protection may be degraded.
Please do not apply high pressure water intensively at one place during cleaning.

Never use the product with an AC power supply.
Otherwise, explosion may result.

Precautions for Safe Use

The following precautions must be observed to ensure safe operation.

(1) Do not reverse the power supply connection or connect to an AC current.
(2) Do not short the load.
(3) Be sure that before making supply the supply voltage is less than the maximum rated supply voltage (30 VDC).
(4) Do not use the product in environments subject to flammable or explosive gases.
(5) Do not use the product under a chemical or an oil environment without prior evaluation.
(6) Do not attempt to modify the product.

Precautions for Correct Use

(1) Do not hit the product using a hammer for installation.
(2) The product must be installed with the specified torque or less. For M8 connector, the proper tightening torque is from 0.3 to 0.4 N·m. For M12 connector, the proper tightening torque is from 0.39 to 0.49 N·m. In case of M12 smartclick connector, manually tighten the connector.
(3) Do not use the product in any atmosphere or environment that exceeds the ratings.
(4) Output pulses may occur when the power supply is turned OFF. We recommend that you turn OFF the power supply to the load or load line first.
(5) Use an extension cable less than 100 m long for Standard I/O mode and less than 20 m for IO-Link Communication mode.
(6) Do not pull on the cable with excessive strength.
(7) Please wait for at least 100 ms after turning on the product's power until it is available for use.
(8) Though this is type IP67, do not use in the water, rain or outdoors.
(9) If the Sensor wiring is placed in the same conduits or ducts as high-voltage or high-power lines, inductive noise may cause malfunction or damage. Wire the cables separately or use a shielded cable.
(10) Do not use the product in locations subject to direct sunlight.
(11) Do not use the product where humidity is high and dew condensation may occur.
(12) Do not use the product where corrosive gases may exist.
(13) If high-pressure washing water and so on hits the teach button, it might lead to malfunctioning. So, consider use of the key lock function.
(14) Do not apply high-pressure washing water directly to the sensor's light emitting / receiving surface from a short distance. As the antifouling feature may be impaired, keep a sufficient distance from the light emitting / receiving surface.
(15) Do not use the product at a location subject to shock or vibration.
(16) To use a commercially available switching regulator, FG (frame ground) must be grounded.
(17) Do not use organic solvents (e.g. paint thinner and alcohol) for cleaning. Otherwise optical properties and protective structure may deteriorate.
(18) Be sure to check the influence caused by surrounding environments such as background objects and LED lighting before using the product.
(19)  Please dispose in accordance with applicable regulations.

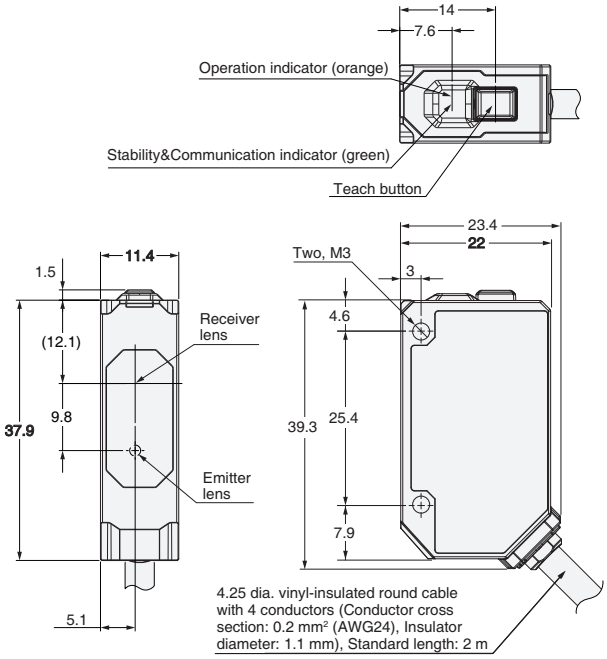
Dimensions

(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

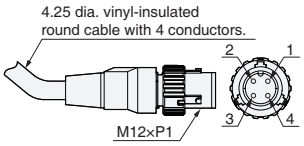
Sensors

Pre-wired Models/Pre-wired Connector Models

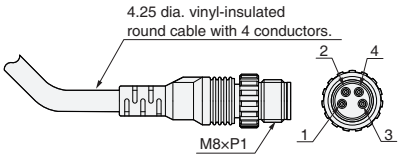
E3AS-L200□ (-M1TJ/-M3J)
E3AS-L80□ (-M1TJ/-M3J)



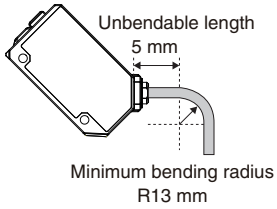
M12 Pre-wired Smartclick Connector type
E3AS-L200□-M1TJ/E3AS-L80□-M1TJ



M8 Pre-wired connector type
E3AS-L200□-M3J/E3AS-L80□-M3J

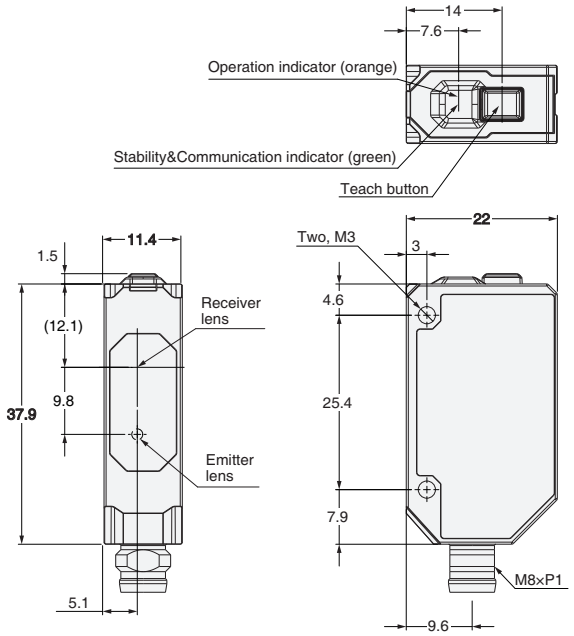


Minimum bending radius/unbendable length of cord



Connector Models

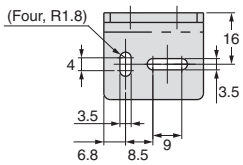
E3AS-L200□ M3
E3AS-L80□ M3

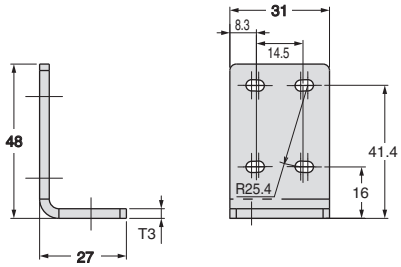


Accessories (Sold Separately)

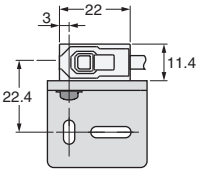
Mounting Brackets

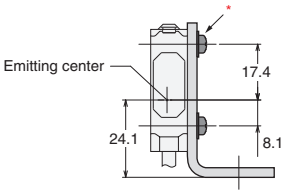
E39-L201

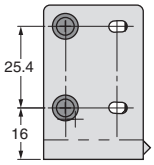




Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)

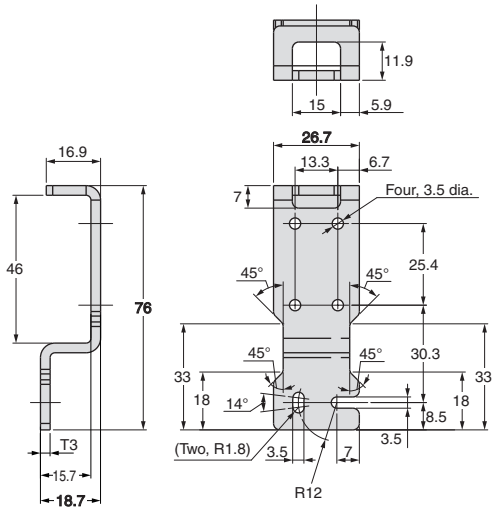




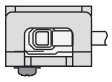


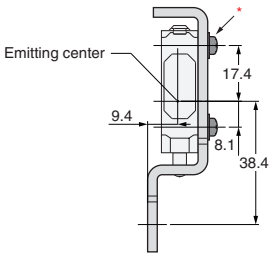
Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

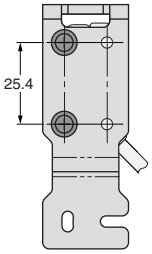
E39-L202



Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)

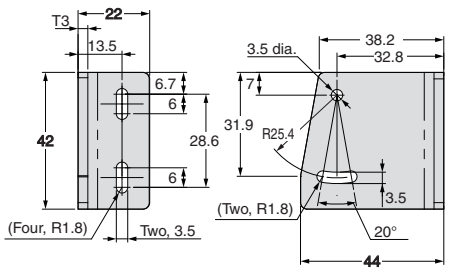




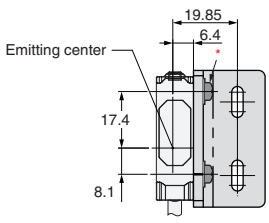


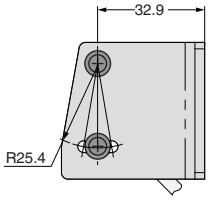
Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L203



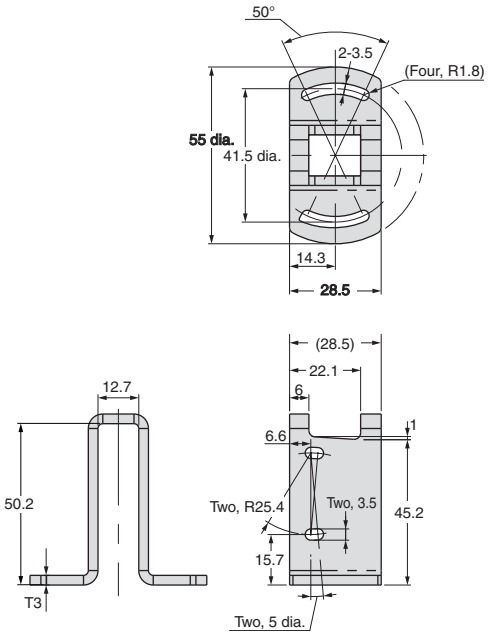
Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)



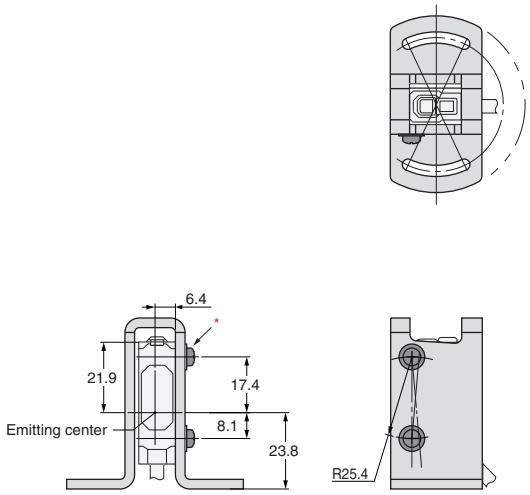


Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L204

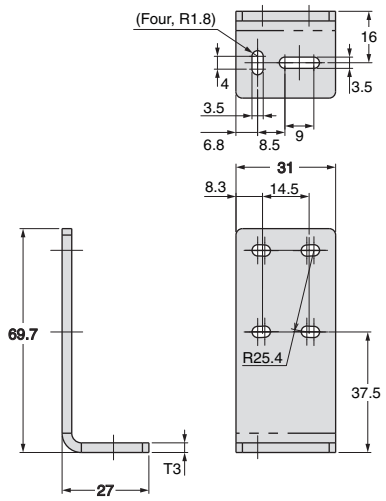


Photoelectric Sensor Accessory are installed (Example of E3AS-L200□)

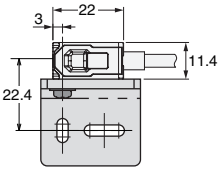


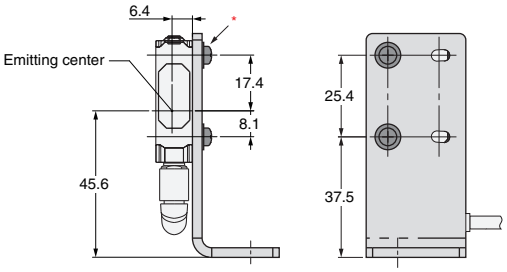
Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L211



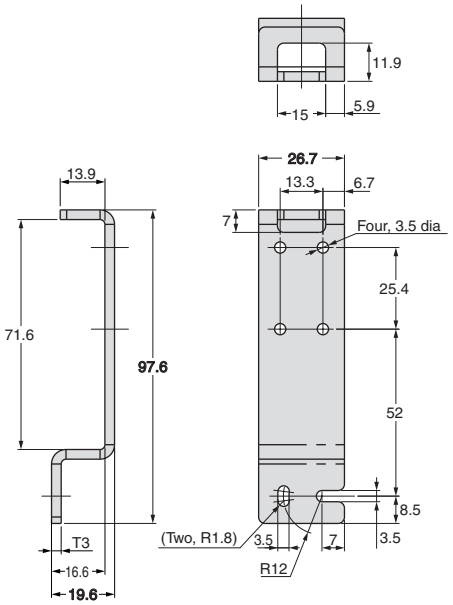
Photoelectric Sensor Accessory are installed (Example of E3AS-L200□)



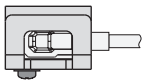


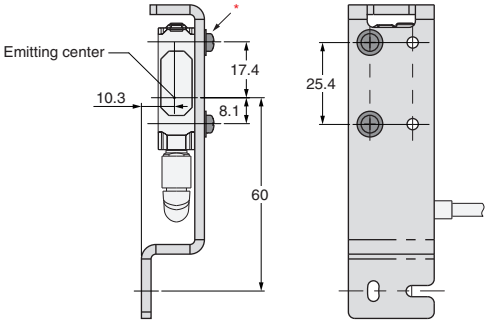
Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L212



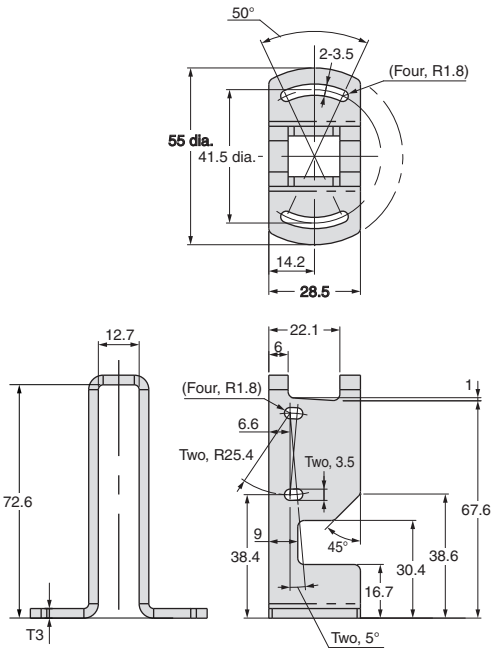
Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)



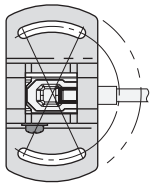


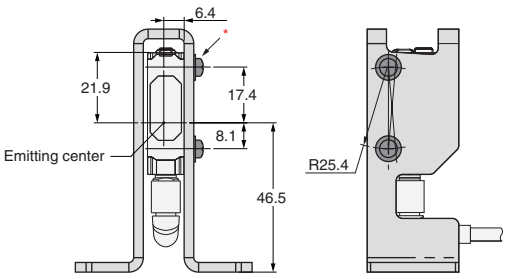
Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

E39-L214



Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)





Material: Stainless steel (SUS304)
* Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

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