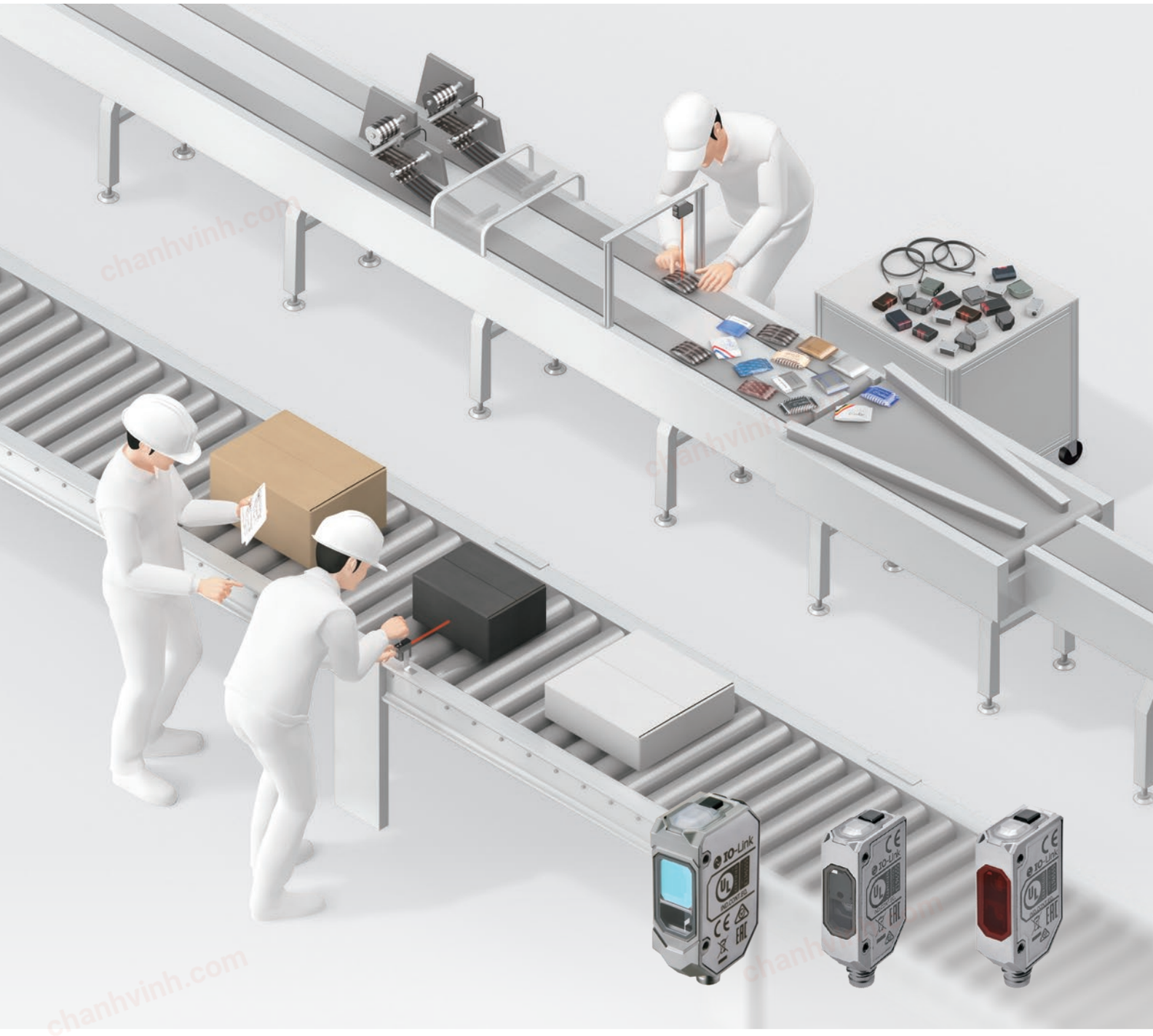
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Distance-settable Photoelectric Sensors
E3AS Series

OMRON

# Reliable detection of difficult workpieces helps reduce equipment design and commissioning time



IO-Link ECOLAB

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# E3AS Series changes the “way of using” reflective photoelectric sensors

In order to satisfy various consumers' needs, products have become more diversified, and got shorter life cycles. As a result of advanced equipment and shortage of skilled workers, quick equipment design and stable operation are critical issues at manufacturing sites. OMRON’s E3AS Series offers new ways of using reflective photoelectric sensors to reduce equipment commissioning time.



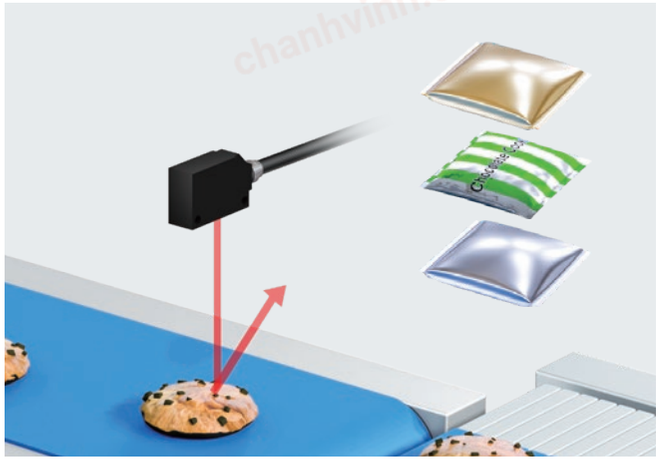

TOF Laser Sensor
E3AS-F

CMOS Laser Sensor
E3AS-HL

Distance-settable
Photoelectric Sensor
E3AS-L

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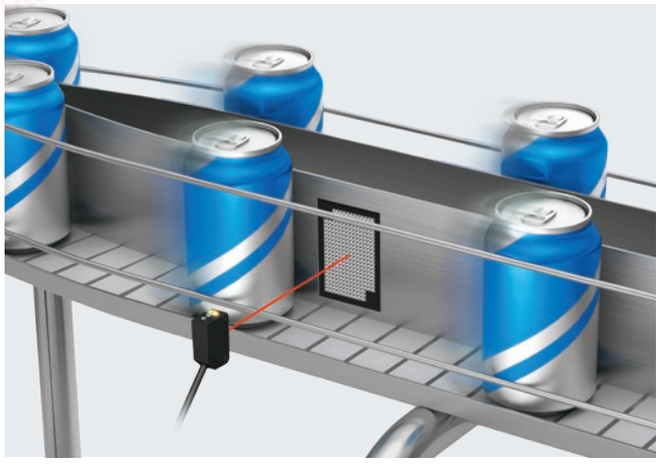
## Complex-shaped, colored, patterned, or glossy surfaces can be detected



Design

Stable detection for variable workpiece eliminates the need for redesign P.4

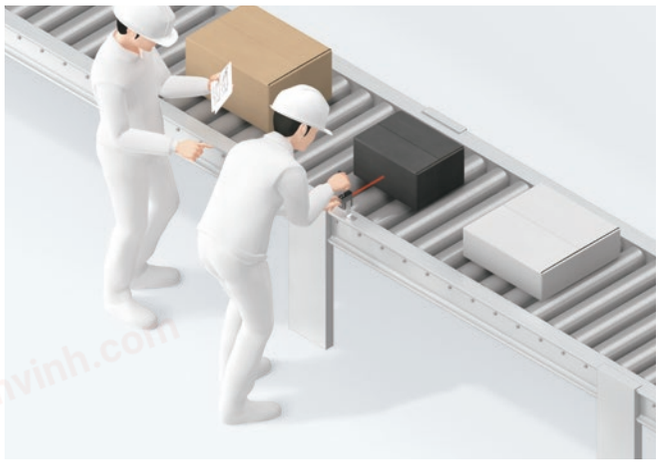
## Flexible to design with no need for reflectors



Design

Compact body overcomes space limitations, increasing design flexibility P.6

## Easy to commission and maintain with no reliance on people's skills



Commissioning

Teaching enables easy, quick, and optimal setting P.8

Maintenance

Enhanced environmental resistance reduces line downtime and maintenance frequency P.10

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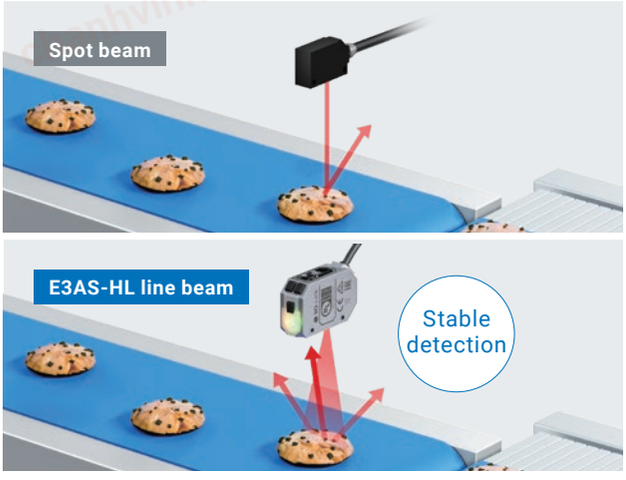
# Stable detection for variable workpieces eliminates the need for redesign

Conventional sensors have to be selected each time the shape, color, pattern, or reflectivity of the workpiece changes, so the equipment sometimes need to be redesigned. The E3AS Series can detect workpieces without being significantly affected by variable shapes, colors, and materials, saving redesign time.

## E3AS-HL for complex-shaped, colored, patterned, or glossy workpieces

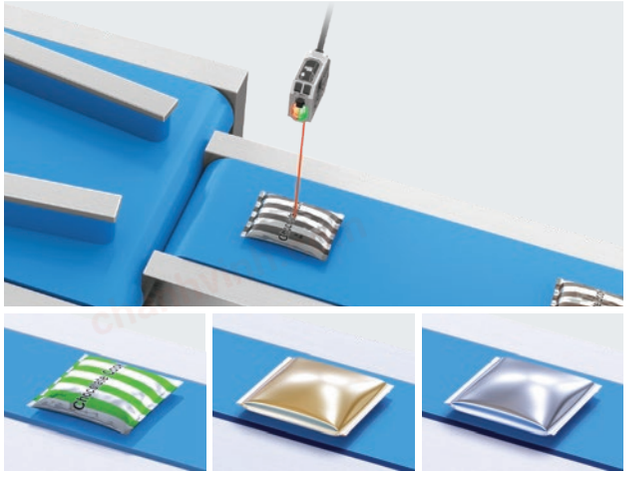



## Stable detection for uneven surfaces




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

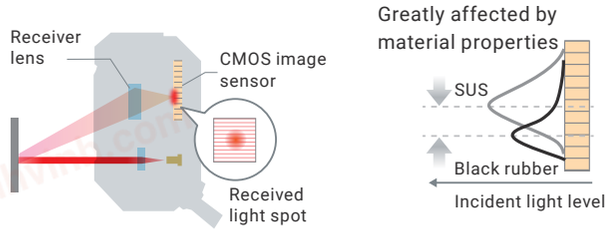
## Stable detection for various colored, patterned, or glossy workpieces



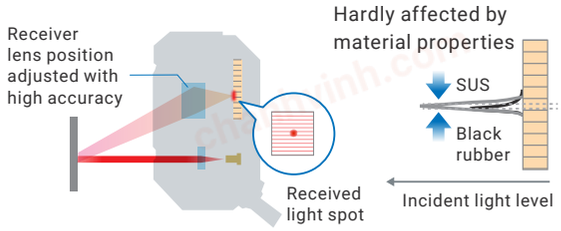
Detection is prone to be unstable because color, pattern, or reflectivity affects the sensing distance. The E3AS-HL Sensor is less likely to be affected by them, providing stable detection even when packaging materials change.

## CMOS sensing with built-in lens alignment technology minimizes the influence of material properties PATENT PENDING *1

**From** Material properties greatly affect the detection due to blurred received light spot on CMOS as a result of low position adjustment accuracy of the receiver lens.

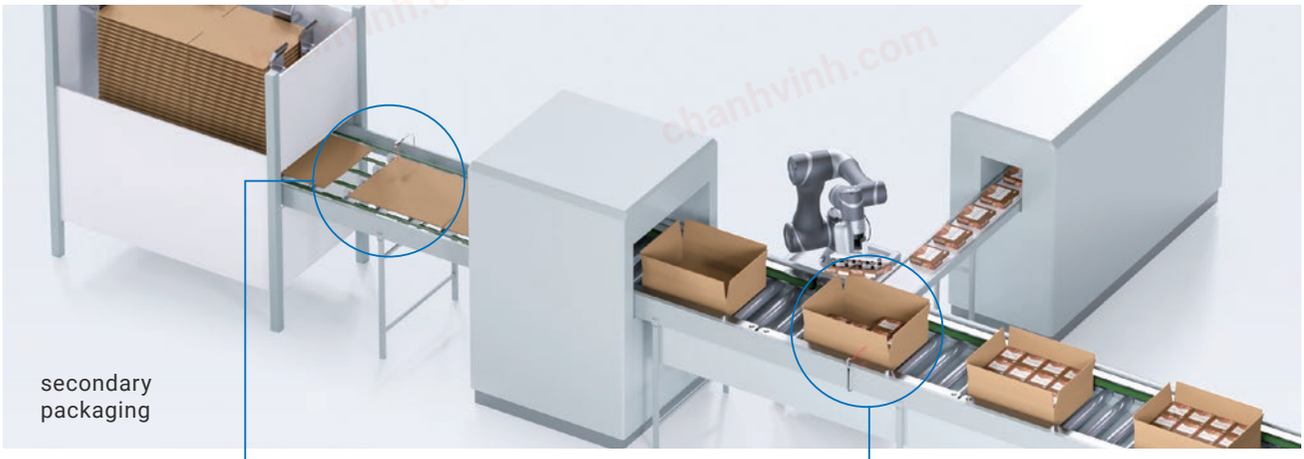



**To** Material properties hardly affect the detection since the receiver lens position is automatically adjusted to the micrometer level to minimize the received light spot.

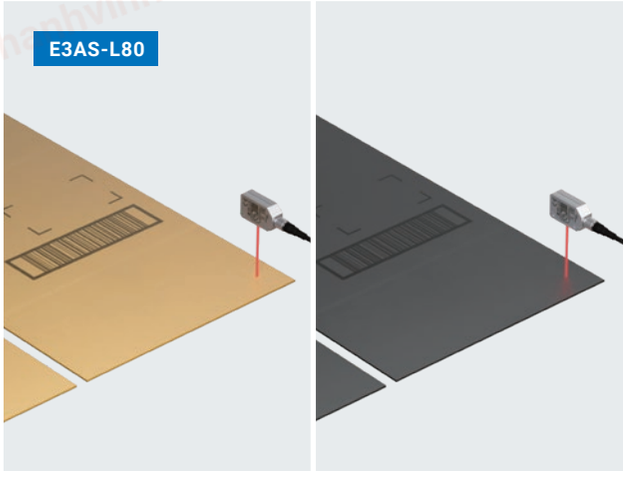


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## E3AS-L for simple-shaped, low-reflective workpieces

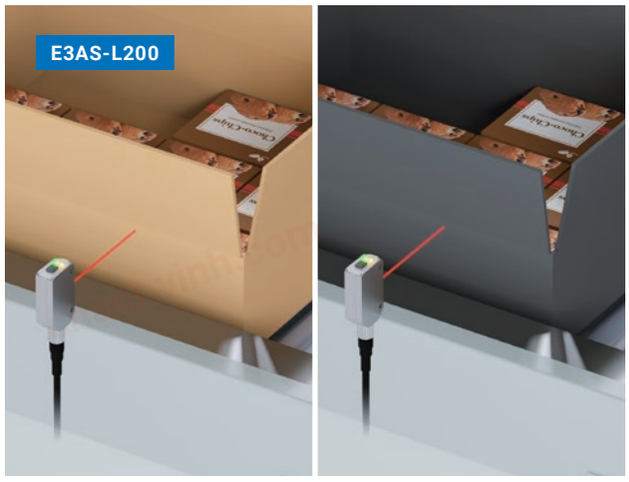



### Stable level difference detection for various colored workpieces




Detection may become unstable as differential travel varies depending on the workpiece color. The E3AS-L80 Sensor can reliably detect level difference regardless of color since its differential travel for black paper is 5%.

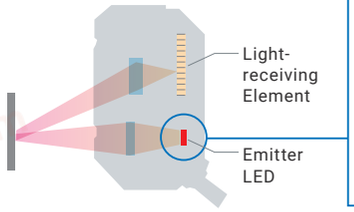
### Stable detection for various colored boxes




When the workpiece is low-reflective black paper, detection may become unstable due to insufficient sensing distance. The E3AS-L200 Sensor can stably detect at the same distance regardless of color since its sensing distance for both white paper and black paper is 200 mm.

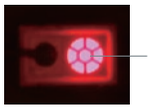
### OMRON's unique LED package stably detects low-reflective workpieces

The E3AS-L Sensor is equipped with an emitter 6 times more powerful than those of conventional models [*2], and delivers stable detection due to its ability of receiving light reflected by low-reflective workpieces.



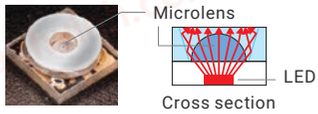

E3AS-L80

High-efficiency custom point light source LED with improved light extraction efficiency




E3AS-L200

High-efficiency combined LED package with microlens hat increases light density




*1. "Patent pending" means that we applied for a patent in Japan. (As of December 2021) *2. Comparison with E3Z-LS products.

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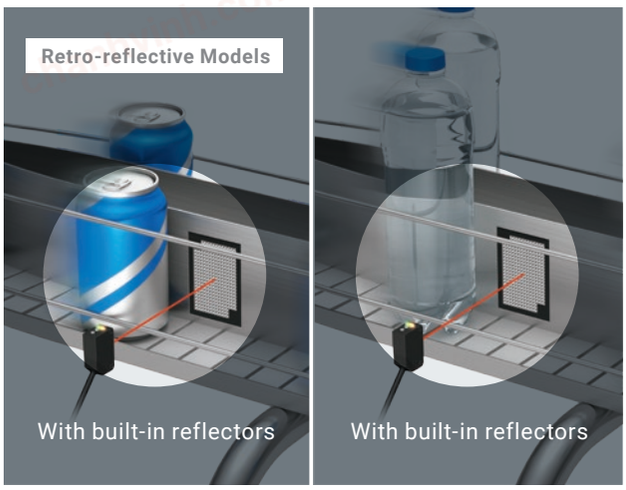
# Overcomes space limitations, increasing design flexibility

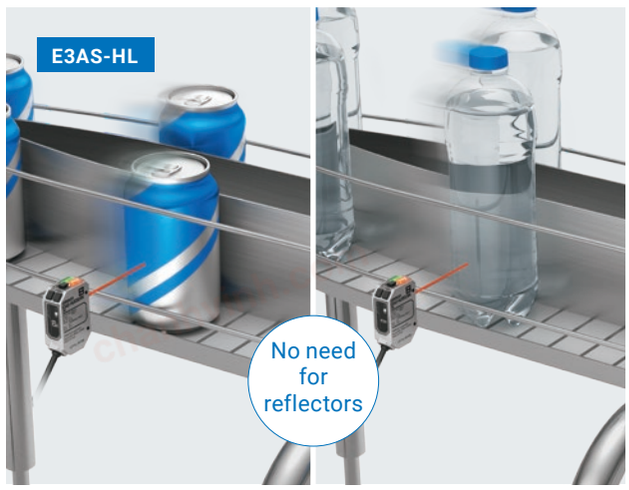
Retro-reflective sensors are used to detect difficult workpieces or where long sensing distance is needed. Designing with retro-reflective sensors is time consuming due to installation space constraints as the equipment gets sophisticated and complex. On the other hand, the E3AS Series allows for designing without reflectors.

## E3AS-HL for multi-lane conveyor lines of workpieces with curved surface




## Stably detects cans and plastic bottles without reflectors




Retro-reflective sensors are used to detect poorly reflective curved surfaces of cans and transparent plastic bottles, but securing installation space for reflectors on multi-lane conveyor lines is difficult.

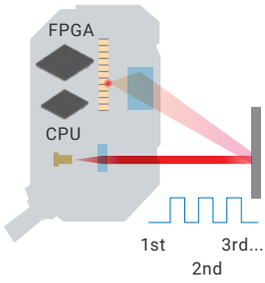
The E3AS-HL Sensor, a reflective model capable of detecting the slightest change in the incident light level or distance, can stably detect cans and plastic bottles without reflectors.

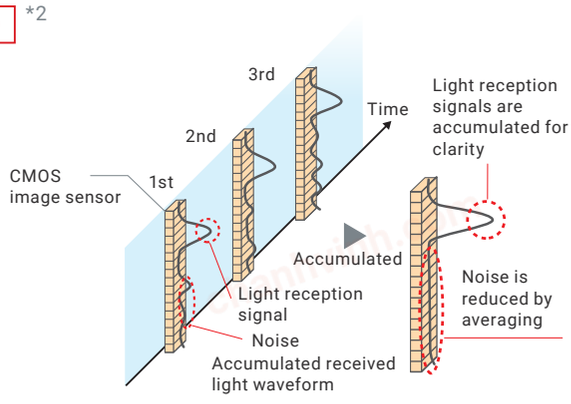
## Sensing algorithm detects minimal reflected light from curved surface

Industry First *1 PATENTED *2

E3AS-HL Sensors equipped with FPGA use the industry-first sensing algorithm to perform high-speed sampling of received light waveforms at 10,000 times per second and OMRON's unique accumulation processing, significantly increasing its sensitivity. They amplify the slightest amount of light to stably detect workpieces with glossy or uneven surfaces, complex shaped workpieces, or other workpieces from which it is difficult to receive reflected light.

Note: Not applicable to transparent objects.



## E3AS-F for long-distance sensing on converging and diverging lines

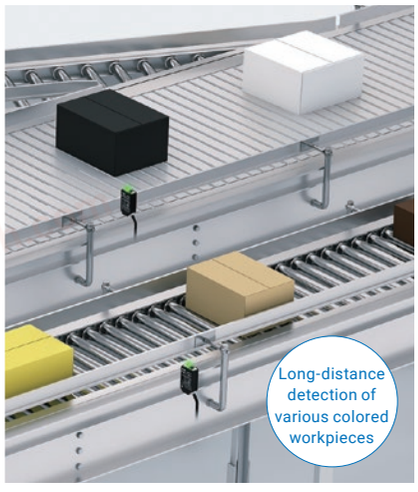



## No reflector is required to design long-distance sensing unaffected by color or material of workpieces







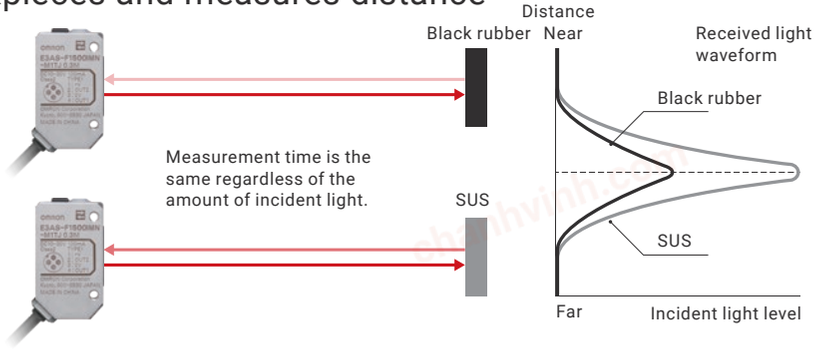



Although retro-reflective sensors are used for long-distance sensing in converging and diverging lines, it is difficult to find installation space for reflectors.

The E3AS-F Sensor, a reflective model with long sensing distance, does not require reflectors. Moreover, it is less likely to be affected by color even from long distances.

## TOF detects varying workpieces and measures distance

In the TOF (Time of Flight) method, the distance is measured based on the elapsed time instead of the amount of incident light received. Measurements therefore are not affected by changes in the color or material of the workpiece. This means that low-reflective workpieces, such as black rubber, can be detected from longer distances.




*1. Based on OMRON investigation in September 2019. *2. "PATENTED" means that we obtained a patent in Japan. (As of December 2021)

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# Teaching enables easy, quick, and optimal setting

E3AS Sensors allow virtually anyone to easily set optimal settings using the teaching method, eliminating rework due to problems during commissioning. Moreover, easy-to-standardize operability makes remote work instructions simple.

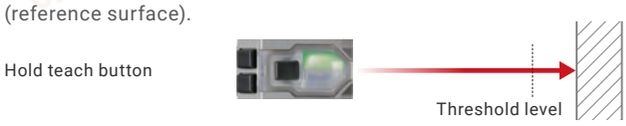
## Single teach button prevents inconsistent settings

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



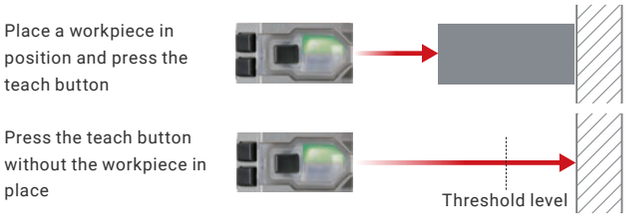

### Background teaching

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

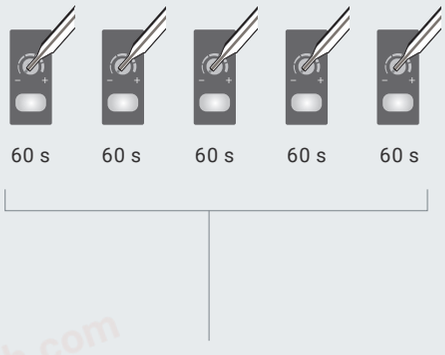
The key locking function prevents malfunction after setting.

## Fast and easy setup also when setting a large number of sensors

Sensitivity adjustment using the conventional adjuster method requires experience, finesse as well as time since the threshold level must be adjusted one unit at a time.
With the E3AS Series, just press the teach button to automatically set the threshold level, enabling fast and easy setting.

**Adjuster method**

The adjuster must be turned to the left and right with a screwdriver for each and every unit because sensitivity differs depending on the installation location.




60 s x 5 units = 300 s in total

**Teaching method (E3AS)**

Setup can be completed by simply pressing the teach button on each sensor unit for 3 seconds.




3 s x 5 units = 15 s in total

## Background Reference Teaching (sensitive) for easy setup of transparent object detection PATENT PENDING *1

CMOS E3AS-HL

Previously, the setup of sensors for transparent objects required the experience and finesse of skilled workers, but it can now be done with just the press of a button. The E3AS-HL Sensor detects presence of workpieces from the variation (correlation) of background distance information and incident light level information.

1. Correlation is 100% without a workpiece in place.




Without workpiece
(Correlation is 100%)

2. A transparent object (e.g., glass or plastic bottle) passing through is detected as the correlation with the background changes.




With workpiece
(Example: Correlation is 40%)

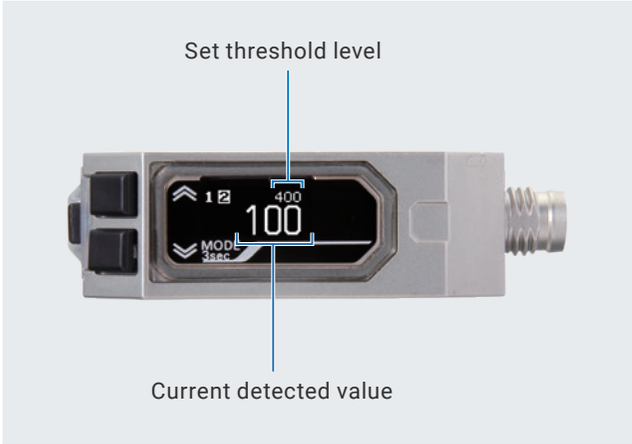


## Easy-to-read, easy-to-understand OLED display

CMOS E3AS-HL

Threshold level and detected value display on the same screen makes 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 grasp 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




*1. “Patent pending” means that we applied for a patent in Japan. (As of December 2021)

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# Enhanced environmental resistance reduces line downtime and maintenance frequency

When a sensor malfunction due to the environment causes a line stoppage during mass production, it can take a long time to restart. With enhanced environmental resistance, the E3AS Series will be realized 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 due to the principle of photoelectric sensors. The E3AS Series has an industry-first antifouling coating on the sensing surface which prevents water droplets and paper dust from sticking to the sensing surface and keeps the lens from fogging as well. This reduces false detections.







Water




Paper dust




Water vapor

## Air blow unit enhances the effectiveness of antifouling coating PATENTED *2

Using an air blow unit greatly reduces the frequency of false detections since it prevents the sensing surface of sensors installed in confined, difficult to clean locations from becoming contaminated. It can be mounted to any photoelectric sensor with a 25.4 mm mounting hole pitch as well as the E3AS Sensors.







The air blow unit can be mounted on either side of any photoelectric sensor with a 25.4 mm mounting hole pitch




Air inlet position can be inverted

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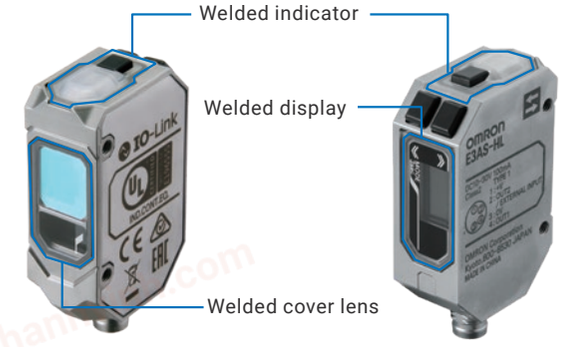
## Unique case design reduces the frequency of replacements caused by failure

The sensor case is made of stainless steel (SUS316L). OMRON's unique laser welding technology for different materials enhances the sealing and adhesion between the stainless steel and resin.

**IP69K**
High temperatures/ high water pressure

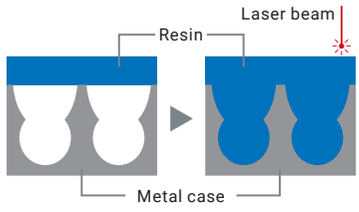
**IP67G**
Oil resistance

**ECOLAB**
Detergent resistance




### Laser welding technology for different materials PATENTED *2

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




## False detections due to environmental changes can be prevented

CMOS E3AS-HL

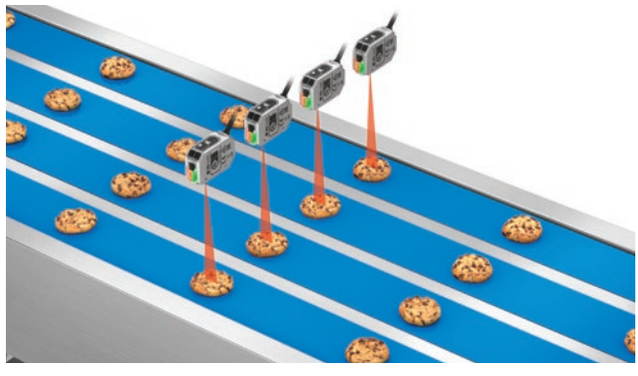
False detection may occur due to the effects of lights for vision sensors or nearby sensors after the production line layout is changed.
E3AS-HL Sensors can be operated in high ambient illumination conditions and have the mutual interference prevention function, reducing the frequency of false detections.

**Operation under high ambient illumination**



E3AS-HL Sensors can be operated under ambient illumination of 20,000 lx, which reaches the best in class level*3, preventing malfunctions caused by camera lights or sunlight.

**Mutual interference prevention**



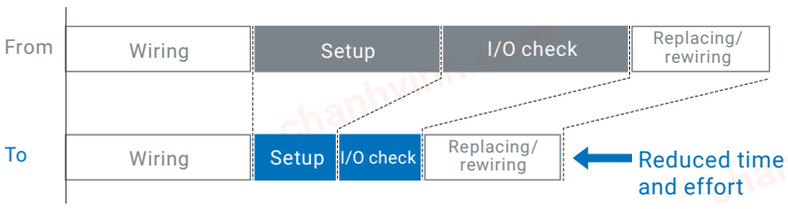
The mutual interference prevention function covers up to 4 units, allowing for false detections occurring upon sensor addition to be quickly resolved.

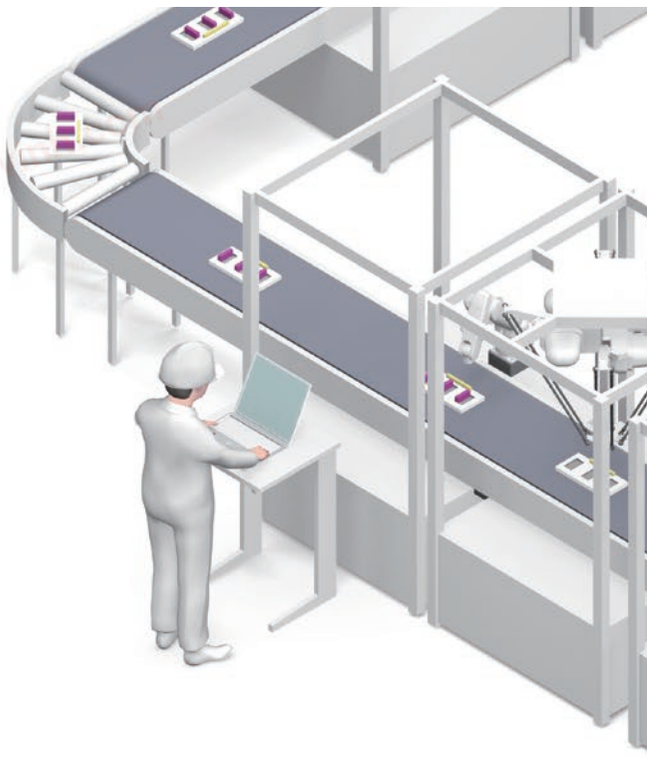
*1. Based on OMRON investigation in September 2019.
*2. "Patent pending" means that we applied for a patent in Japan, and "Patented" means that we obtained a patent in Japan. (As of December 2021)
*3. Based on OMRON investigation in September 2020.

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# Line commissioning and maintenance with less people in less time with IO-Link

With IO-Link, reduce commissioning time by batch-setting the sensors and cut troubleshooting time during mass production by utilizing field data.



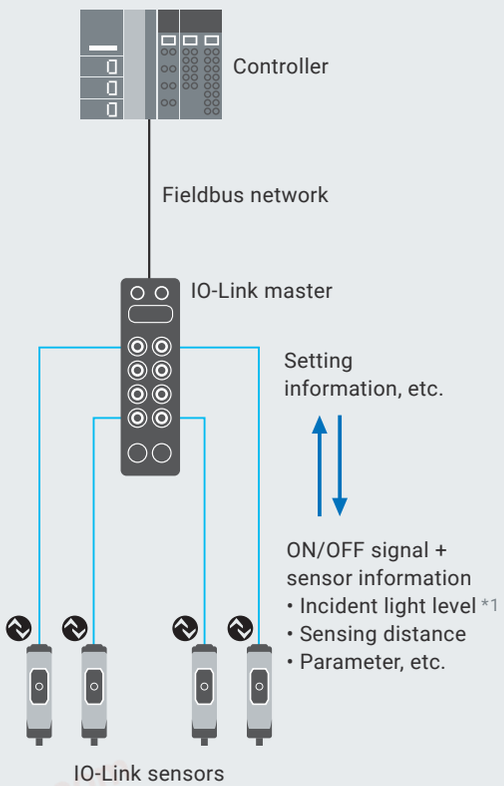



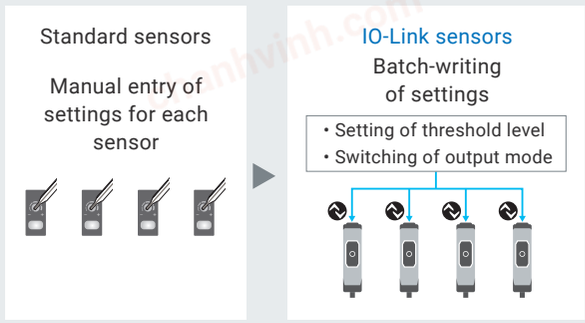
## Reduce commissioning time by batch-writing settings from IO-Link device configuration tool

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

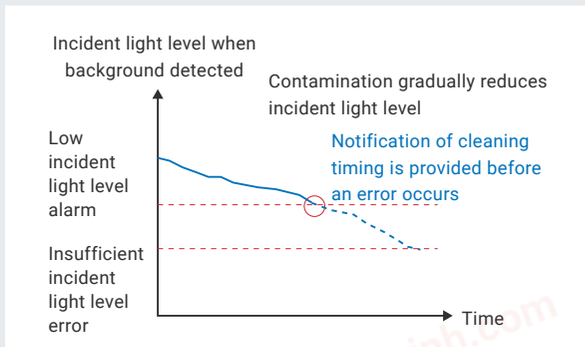
## Predictive monitoring and quick recovery by checking and monitoring sensor data

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




Batch-writing




Sensor data checking and monitoring

(Example) Incident light level output function *1

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## Model lineup

| | E3AS-HL | E3AS-F | E3AS-L |
|---|---|---|---|
| Appearance |  |  |  |
| Case | SUS316L | SUS316L or PBT/PC | SUS316L |
| Sensing distance | 35 to 500 mm<br>35 to 150 mm | 50 to 1500 mm<br>50 to 1000 mm | 10 to 200 mm<br>10 to 80 mm |
| Standard detectable difference (mm)/ differential travel (%) | 35 to 50 mm: 1 mm<br>50 to 100 mm: 2 mm<br>100 to 150 mm: 4 mm<br>(E3AS-HL150: When response time is 10 ms) | 15% max. | 2% max.<br>(E3AS-L80: White paper)<br>10% max.<br>(E3AS-L200) |
| 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 | | |

## 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.



PATENT PENDING *2

**Flexible Mounting Bracket**

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



PATENTED *2

**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. E3AS-HL and E3AS-F only
*2. “PATENT PENDING” means that we applied for a patent in Japan, and “PATENTED” means that we obtained a patent in Japan. (As of December 2021)
*3. E3AS-HL only. Note: For details on ratings and specifications, refer to the *Ratings and Specifications* in this catalog.

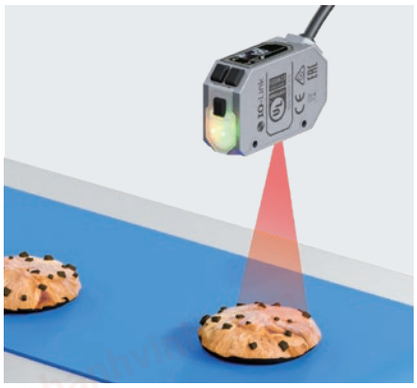
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# Applications and target workpieces



For workpieces with curved or irregular surfaces and colored, glossy workpieces

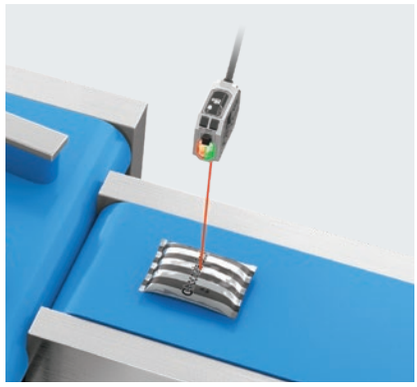
CMOS Laser Sensor E3AS-HL



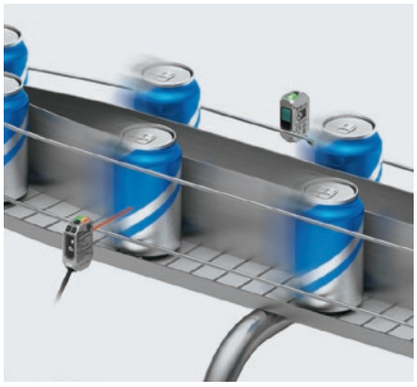
Presence detection of cookies



Presence detection of pizzas



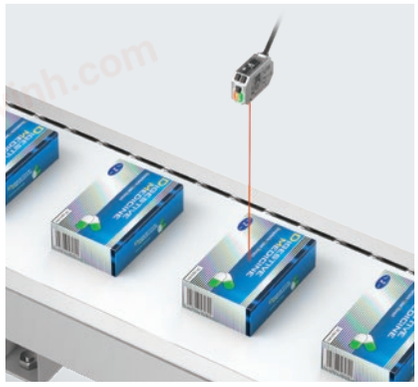
Presence detection of packaged workpieces



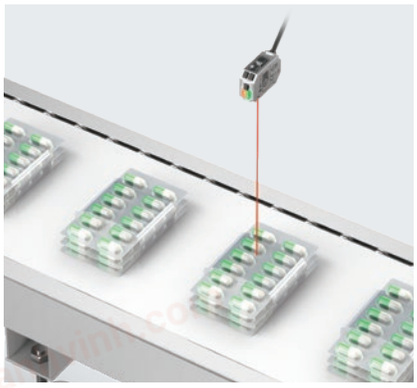
Presence detection of cans



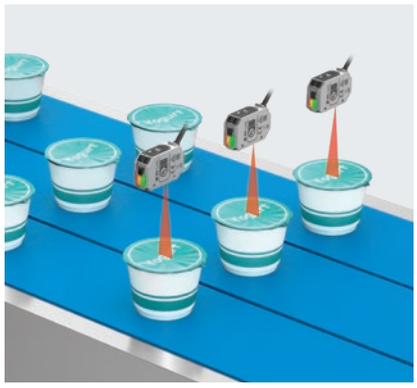
Presence detection of plastic bottles



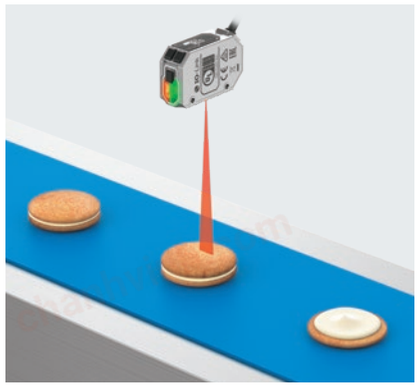
Presence detection of pharmaceutical packages



Detection of the number of tablet sheets



Presence detection of cups



Detection of the number of cookies

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Reliable detection of difficult workpieces

The demonstration videos show the detection performance.





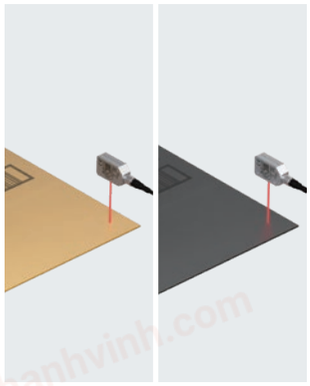
For simple-shaped, low-reflective workpieces

Distance-settable Photoelectric Sensor E3AS-L

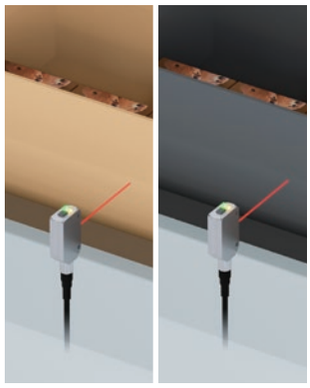


For long-distance sensing on converging and diverging lines

TOF Laser Sensor E3AS-F



Presence detection of unassembled cardboard boxes

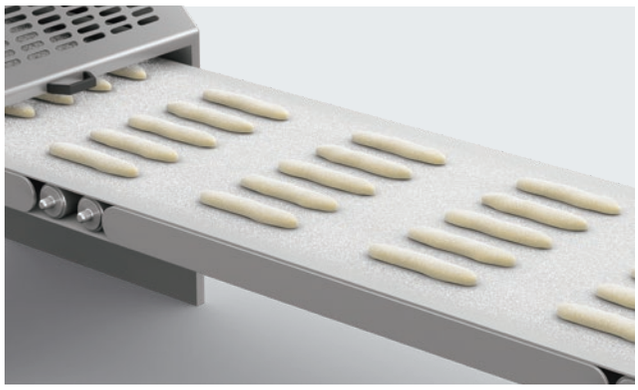


Presence detection of assembled cardboard boxes



Presence detection of workpieces on converging and diverging lines

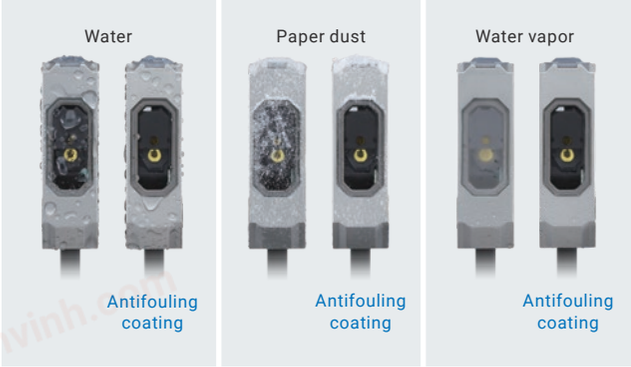
## Reliable operation even in water splashing or powder floating environments







The videos show the antifouling feature of the antifouling coating and air blow unit.







Water splashing or powder floating environments

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MEMO

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OMRON

## Distance-settable Photoelectric Sensors

# E3AS Series

### E3AS Series changes the “way of using” reflective photoelectric sensors

- Complete lineup of photoelectric sensors for various applications
- Teaching method allows anyone to set optimal threshold values
- Antifouling coating prevents contamination on the sensing surface
- Ecolab certified in addition to IP67/69K/67G protection
- All models with IO-Link connectivity (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 38.

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**I/O Circuit Diagrams/ Timing Charts** ..... **page 33**
**Nomenclature** ..... **page 35**
**Safety Precautions** ..... **page 38**
**Dimensions** ..... **page 40**

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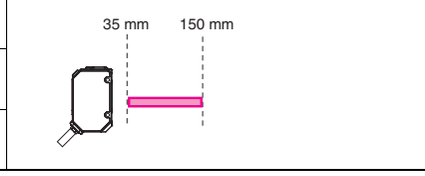
# E3AS Series

# Ordering Information

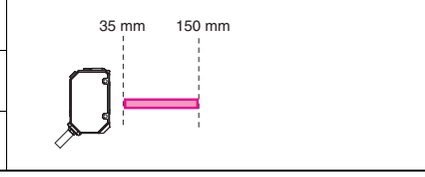
## E3AS-HL models [Refer to *Dimensions* on page 40]

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 |

**∗1.** Models with 5-m cable length are also available with “5M” suffix. (Example: E3AS-HL500LMN 5M/E3AS-HL500MN 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-HL500LMN-M3J 0.3M/E3AS-HL500MN-M3J 0.3M).
**∗3.** COM2 (38.4kbps) Models are also availavble. When ordering, add "D" to the end of the model number (e.g., E3AS-HL500LMD 2M/ E3AS-HL500MD 2M).

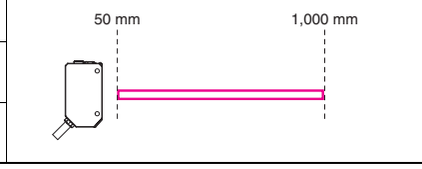
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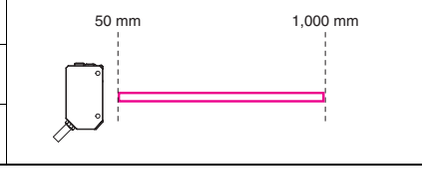
## E3AS-F models [Refer to *Dimensions* on page 41]

Infrared light

### Metal case type

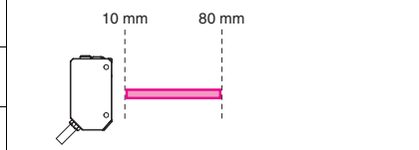
| Connection method | Sensing distance (white paper) | Output | Model | |
|---|---|---|---|---|
| | | | NPN output | PNP output |
| | | IO-Link baud rate | --- | COM3 (230.4 kbps) *3 |
| Pre-wired (2 m) *1 |   | | E3AS-F1500IMN 2M | E3AS-F1500IMT 2M |
| M8 Connector | | | E3AS-F1500IMN M3 | E3AS-F1500IMT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-F1500IMN-M1TJ 0.3M | E3AS-F1500IMT-M1TJ 0.3M |
| Pre-wired (2 m) *1 |   | | E3AS-F1000IMN 2M | E3AS-F1000IMT 2M |
| M8 Connector | | | E3AS-F1000IMN M3 | E3AS-F1000IMT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-F1000IMN-M1TJ 0.3M | E3AS-F1000IMT-M1TJ 0.3M |

### Plastic case 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-F1500IPN 2M | E3AS-F1500IPT 2M |
| M8 Connector | | | E3AS-F1500IPN M3 | E3AS-F1500IPT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-F1500IPN-M1TJ 0.3M | E3AS-F1500IPT-M1TJ 0.3M |
| Pre-wired (2 m) *1 |   | | E3AS-F1000IPN 2M | E3AS-F1000IPT 2M |
| M8 Connector | | | E3AS-F1000IPN M3 | E3AS-F1000IPT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-F1000IPN-M1TJ 0.3M | E3AS-F1000IPT-M1TJ 0.3M |

## E3AS-L models [Refer to *Dimensions* on page 42]

Red light

| 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-L200MN 2M | E3AS-L200MT 2M |
| M8 Connector | | | E3AS-L200MN M3 | E3AS-L200MT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-L200MN-M1TJ 0.3M | E3AS-L200MT-M1TJ 0.3M |
| Pre-wired (2 m) *1 |   | | E3AS-L80MN 2M | E3AS-L80MT 2M |
| M8 Connector | | | E3AS-L80MN M3 | E3AS-L80MT M3 |
| M12 Pre-wired Smartclick Connector (0.3m) *2 | | | E3AS-L80MN-M1TJ 0.3M | E3AS-L80MT-M1TJ 0.3M |

**∗1.** Models with 5-m cable length are also available with “5M” suffix. (Example: E3AS-F1500IMN 5M/E3AS-F1500IPN 5M/E3AS-L200MN 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-F1500IMN-M3J 0.3M/E3AS-F1500IPN-M3J 0.3M/E3AS-L200MN-M3J 0.3M).
**∗3.** COM2 (38.4kbps) Models are also availavble. When ordering, add "D" to the end of the model number (e.g., E3AS-F1500IMD 2M/ E3AS-F1500IPD 2M/E3AS-L200MD 2M).

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## 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<br>Straight type<br> | PVC robot cable | 4 dia. | Straight | 2 | **XS3F-M421-402-R** |
| | | | | 5 | **XS3F-M421-405-R** |
| Right-angle type<br> | | | Right-angle | 2 | **XS3F-M422-402-R** |
| | | | | 5 | **XS3F-M422-405-R** |

**Note: 1.** The XS3W (Socket and Plug on Cable Ends), Cable length 1m and 10m 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 XS5 series**

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

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## 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 43]

| 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 |

*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.

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### For E3AS-F/L models [Refer to *Dimensions* on page 47]

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

***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.

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**Common to E3AS series** [Refer to *Dimensions* on page 50]

**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 |

**∗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.

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# E3AS Series

# 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<br>180 to 300 mm: 18 mm<br>300 to 400 mm: 30 mm<br>400 to 500 mm: 45 mm<br>at 10 m sec | | 35 to 50 mm: 1 mm<br>50 to 100 mm: 2 mm<br>100 to 150 mm: 4 mm<br>at 10 m sec | |
| Display minimum unit value | | 1 mm | | 0.1 mm | |
| Spot size (reference value) *2 | | 2.5 mm × 1.5 mm<br>at distance of 500 mm | 18 mm × 1.5 mm<br>at distance of 500 mm | 2.5 mm × 1.3 mm<br>at distance of 150 mm | 8 mm × 1.3 mm<br>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.<br>Residual voltage (Load current 10 mA max.: 1 VDC max., Load current 10 to 100 mA: 2 VDC max.)<br>Open-collector output (NPN/PNP output depending on model)<br>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<br>NPN ON time: 0 V short-circuit or 1.5 V or less, OFF time: Power supply voltage short-circuit or open<br>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:<br>Incandescent lamp: 20,000 lx max., Sunlight: 25,000 lx max. at distance of 250 mm<br>Incandescent lamp: 5,000 lx max., Sunlight: 10,000 lx max. at distance of 500 mm | | Receiver surface illuminance:<br>Incandescent lamp: 8,000 lx max., Sunlight: 16,000 lx max. | |

*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-F models

| 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/ COM3 | E3AS-F1500I□T | E3AS-F1000I□T | |
| Sensing distance | | 50 mm to the set distance<br>(White paper or black paper 200 × 200 mm) | 50 mm to the set distance<br>(White paper or black paper 200 × 200 mm) | |
| Setting range | | 100 to 1,500 mm (White paper 200 × 200 mm)<br>100 to 1,000 mm (Black paper 200 × 200 mm) | 100 to 1,000 mm (White paper 200 × 200 mm)<br>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.<br>(Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max.)<br>Open-collector output (NPN/PNP output depending on model) | | |
| | NPN | OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed) | | |
| | PNP/COM3 | OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed) | | |
| Response time | | Operate or reset: 150 ms max. | Operate or reset: 90 ms max. | |
| Threshold setting method | | Teaching method/IO-Link communications | | |
| Ambient illumination | | Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max. | | |

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## E3AS-L models

| Item \ Model | Sensing method | Triangulation | |
|---|---|---|---|
| | NPN Output | E3AS-L200MN | E3AS-L80MN |
| | 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<br>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.<br>(Residual voltage: Load current of less than 10 mA: 1 V max. Load current of 10 to 100 mA: 2 V max.)<br>Open-collector output (NPN/PNP output depending on model) | |
| | NPN | OUTPUT 1: NO (Normally open), OUTPUT 2: NC (Normally closed) | |
| | PNP/COM3 | OUTPUT 1: NO (Normally open)/COM□, OUTPUT 2: NC (Normally closed) | |
| Response time | | Operate or reset: 1 ms max. | |
| Threshold setting method | | Teaching method/IO-Link communications | |
| Ambient illumination | | Incandescent lamp: 3,000 lx max., Sunlight: 10,000 lx max. | |

## Common to E3AS series

| Series | | E3AS-HL | E3AS-F | E3AS-L |
|---|---|---|---|---|
| Protection circuits | | Power supply reverse polarity protection, Output short-circuit protection, and Output reverse polarity protection | | |
| Ambient temperature range | | Operating: -10 to 50°C,<br>Storage: -25 to 70°C<br>(with no icing or condensation) | Operating: -20 to 55°C,<br>Storage: -40 to 70°C<br>(with no icing or condensation) | Operating: -25 to 55°C,<br>Storage: -40 to 70°C<br>(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)<br>* IO-Link Communication mode: blinking | Operation indicator (orange), Stability & Communication indicator (green*)<br>* 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 | Metal case type: Approx. 135 g/approx. 90 g<br>Plastic case type: Approx. 115 g/approx. 70 g | Approx. 135 g/approx. 90 g |
| | M8 Connector | Approx. 120 g/approx. 50 g | Metal case type: Approx. 75 g/approx. 30 g<br>Plastic case type: Approx. 60 g/approx. 15 g | Approx. 75 g/approx. 30 g |
| | M12 Pre-wired Smartclick Connector (0.3m) | Approx. 150 g/approx. 80 g | Metal case type: Approx. 95 g/approx. 50 g<br>Plastic case type: Approx. 75 g/approx. 30 g | Approx. 95 g/approx. 50 g |
| Materials | Case | Stainless steel (SUS316L) | Metal case type:<br>Main unit/mounting part/connector part<br>Stainless steel (SUS316L)<br>Plastic case type: Main unit<br>Polybutylene terephthalate (PBT) / polycarbonate (PC),<br>Mounting part/connector part<br>Nickel-plated brass | Stainless steel (SUS316L) |
| | Lens cover and Display | Methacrylic resin (PMMA) (Lens cover: Antifouling coating) | | |
| | Indicator | Polyamide 11 (PA11) | Metal case type: Polyamide 11 (PA11)<br>Plastic case type: Polyethersulfone (PES) | 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) | | PD size: 1 byte, OD size: 1 byte (M-sequence type: TYPE_2_1) |
| | Minimum cycle time | COM3: 1.2 ms | | |
| Accessories | | Instruction manual, compliance sheet, index list (attached for IO-Link type only)<br>E3AS-HL: FDA certification label and Warning label<br>E3AS-F: FDA certification label<br>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.

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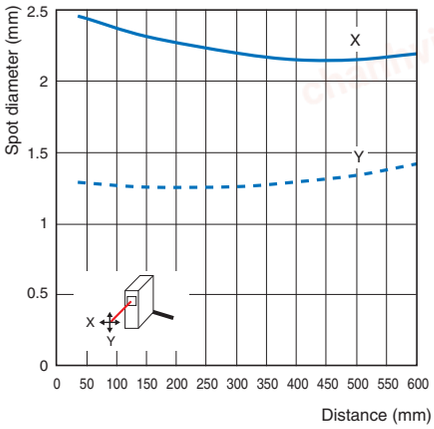
# E3AS Series

# Engineering Data (Reference Value)

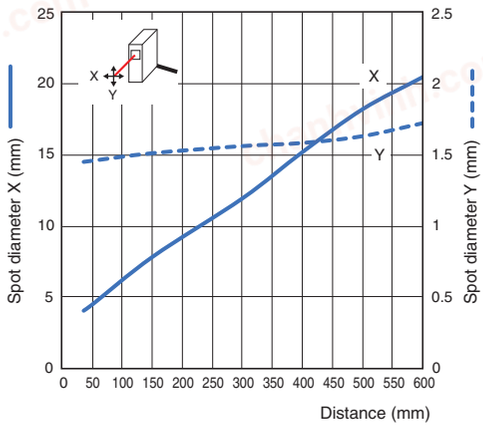
## E3AS-HL models

### Spot Diameter vs. Sensing Distance

**Spot type**
**E3AS-HL500□**
**E3AS-HL150□**

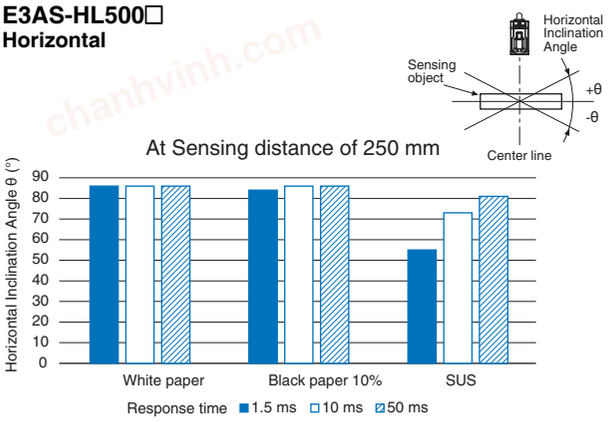


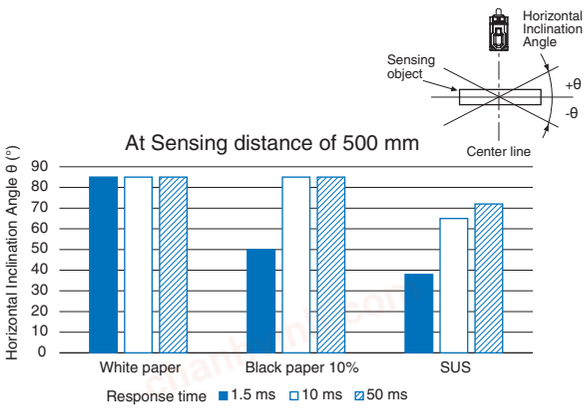

**Line beam type**
**E3AS-HL500L□**
**E3AS-HL150L□**



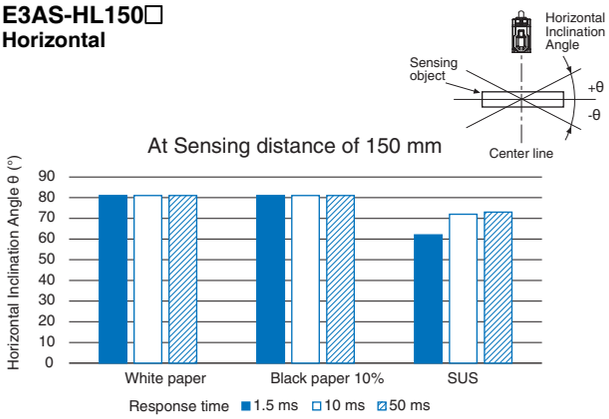

### Sensing Object Angle Characteristics

**Spot type/Line beam type**
**E3AS-HL500□**
**Horizontal**




**E3AS-HL150□**
**Horizontal**



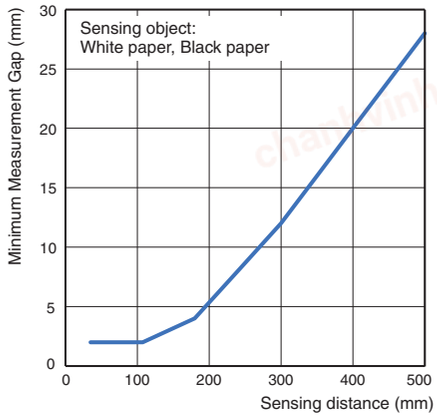
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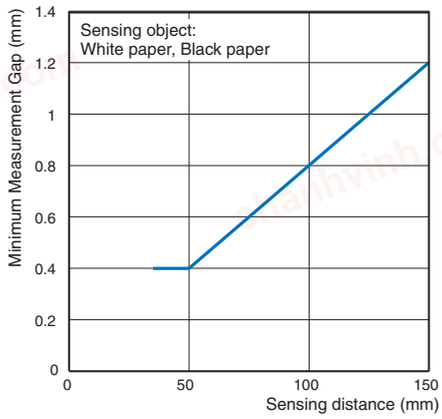
## Minimum Measurement Gap Vs. Distance

**Spot type/Line beam type**

**E3AS-HL500□**




**E3AS-HL150□**



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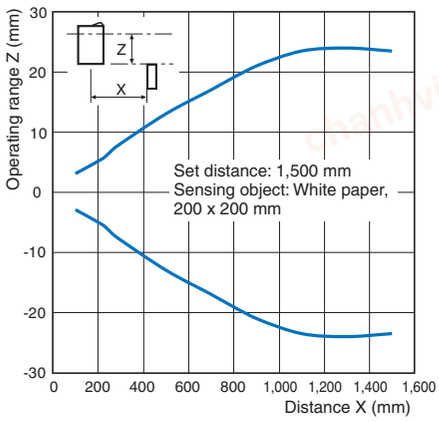


## E3AS-F models

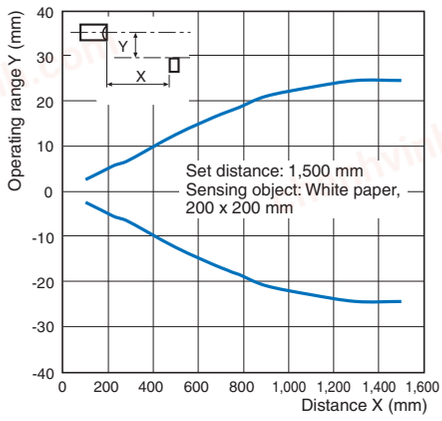
### Operating Range

**E3AS-F1500□**

**Z directions**

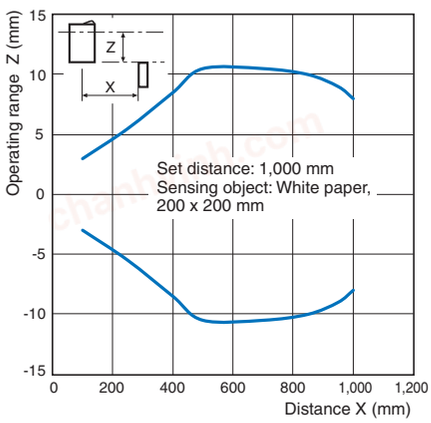



**Y directions**

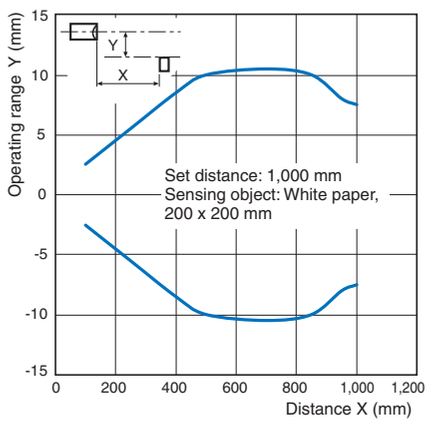



**E3AS-F1000□**

**Z directions**



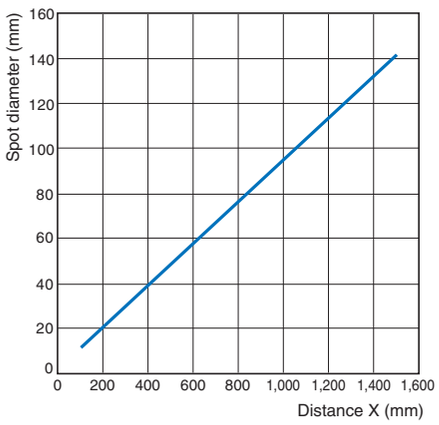

**Y directions**




### Spot Diameter vs. Sensing Distance

**E3AS-F1500□**

**E3AS-F1000□**

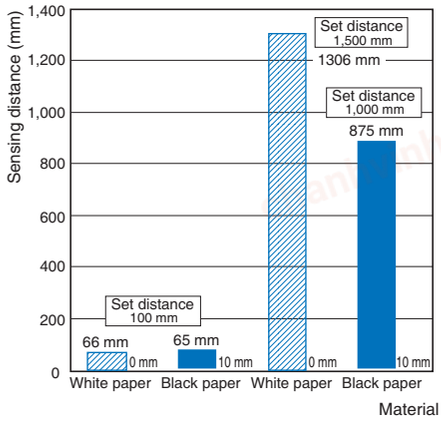


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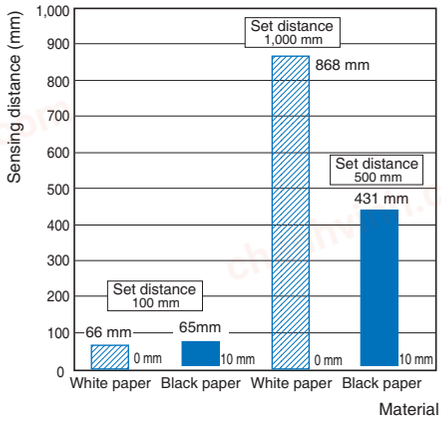


## Close-range Characteristics

### E3AS-F1500□

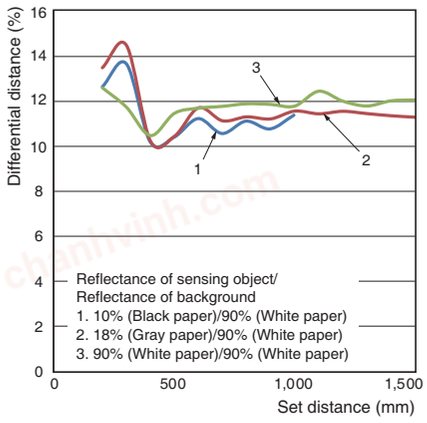



### E3AS-F1000□

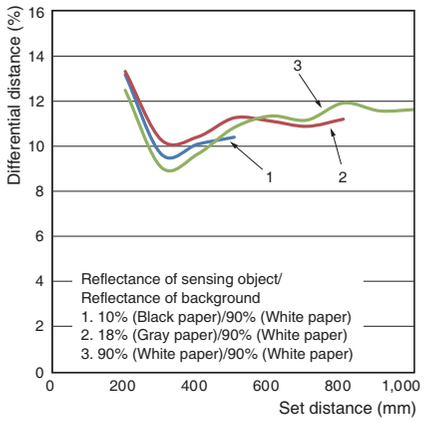



## Differential distance for each sensing object Vs. Distance

### E3AS-F1500□



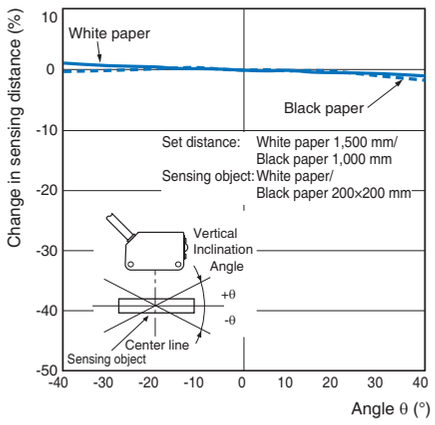

### E3AS-F1000□



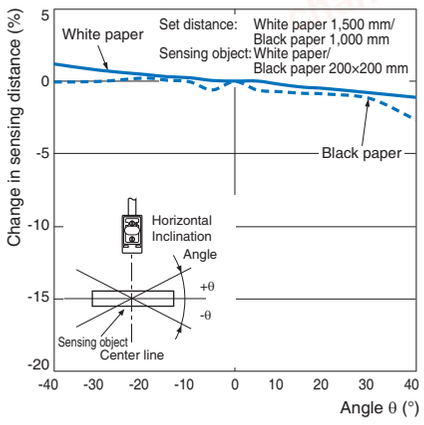

## Sensing Object Angle Characteristics

### E3AS-F1500□

#### Vertical




#### Horizontal

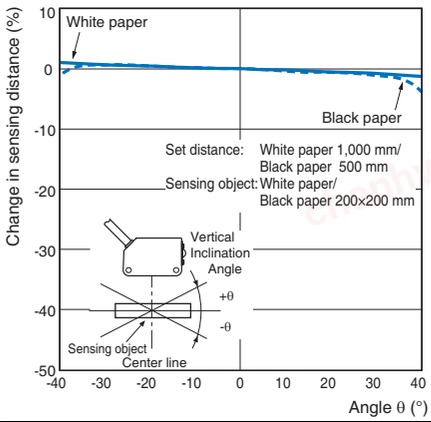


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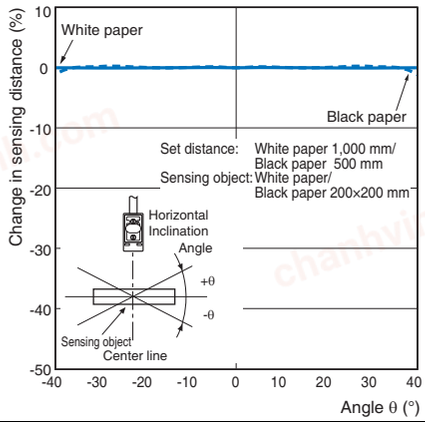


### E3AS-F1000□

**Vertical**



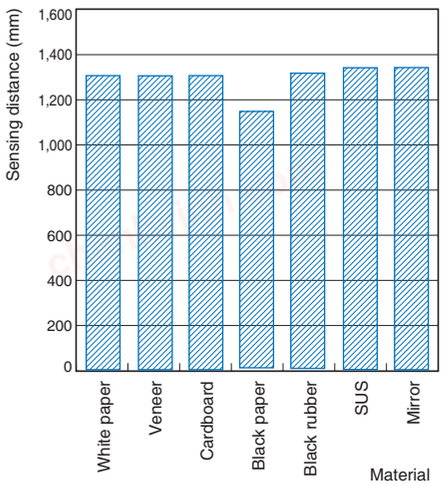

**Horizontal**




## Sensing Distance vs. Sensing Object Material

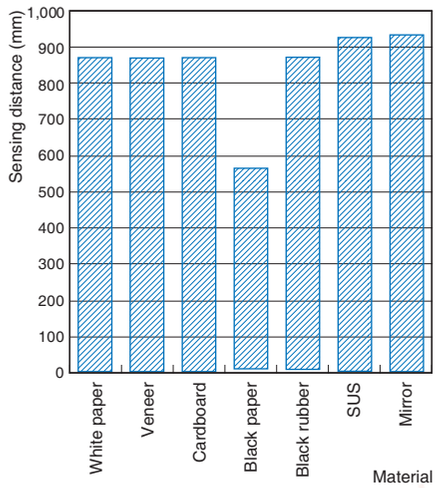
### E3AS-F1500□

**(Set Distance of 1,500 mm using White Paper)**



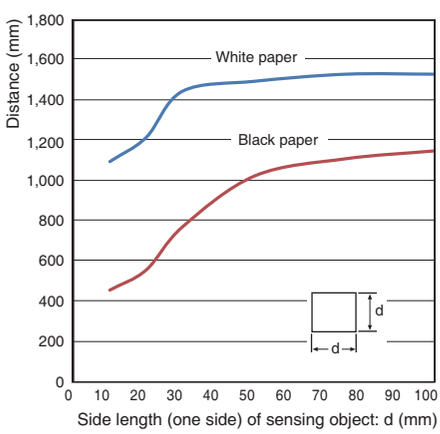

### E3AS-F1000□

**(Set Distance of 1,000 mm using White Paper)**

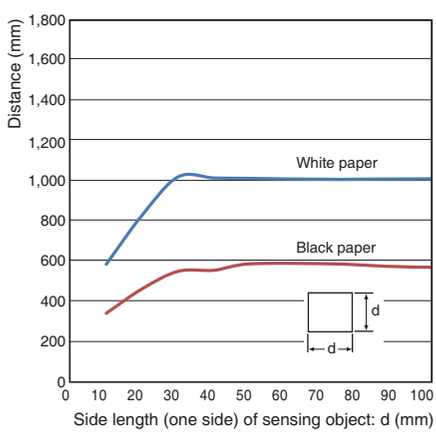



## Sensing Object Size vs. Sensing Distance

### E3AS-F1500□




### E3AS-F1000□



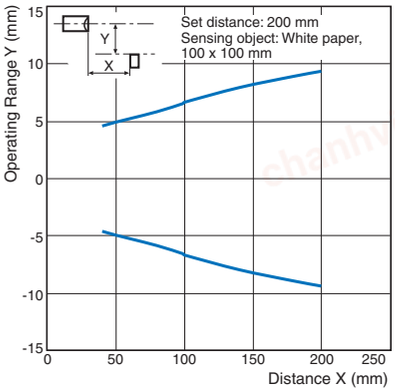
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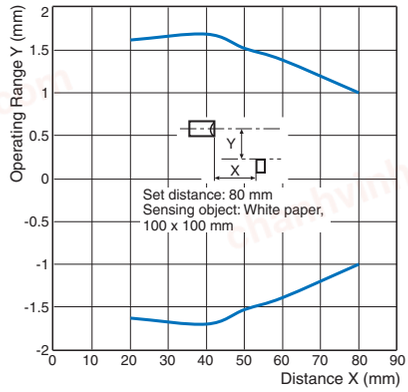
# E3AS-L models

## Operating Range

### E3AS-L200

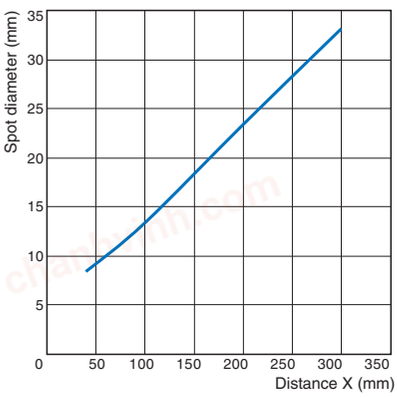



### E3AS-L80

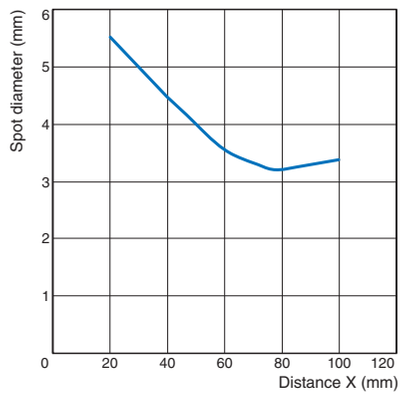



## Spot Diameter vs. Sensing Distance

### E3AS-L200

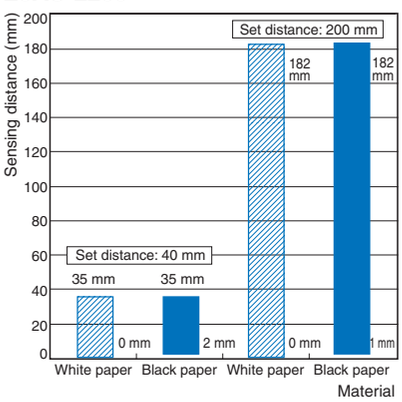



### E3AS-L80

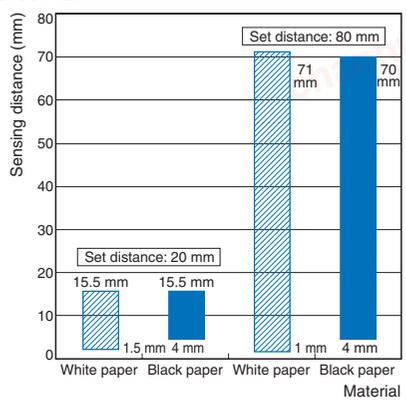



## Close-range Characteristics

### E3AS-L200

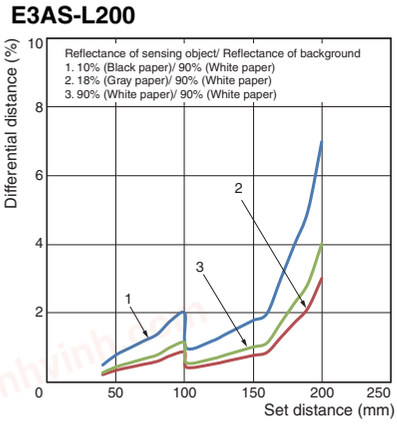



### E3AS-L80

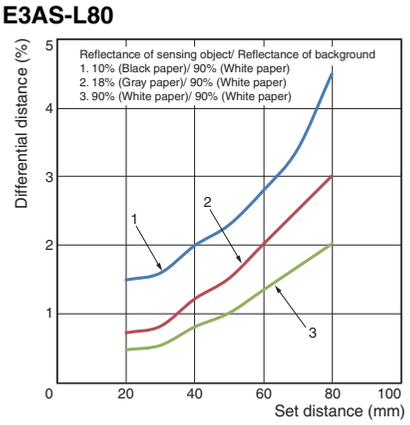



## Differential distance for each sensing object Vs. Distance

### E3AS-L200




### E3AS-L80



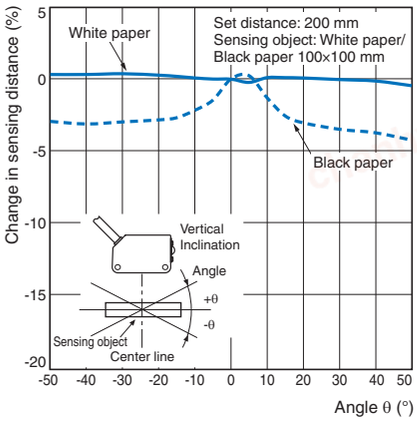
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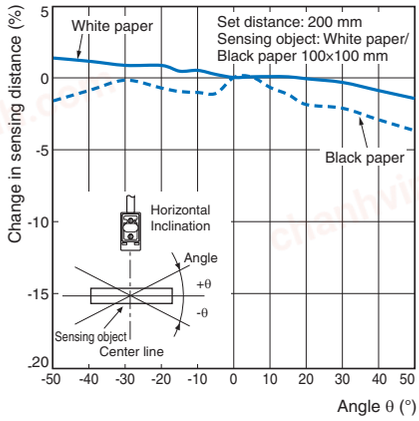
## Sensing Object Angle Characteristics

### E3AS-L200

#### Vertical

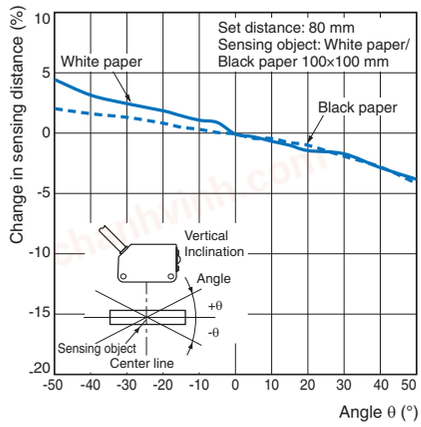



#### Horizontal

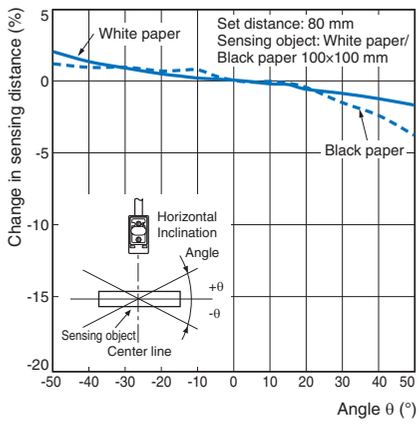



### E3AS-L80

#### Vertical



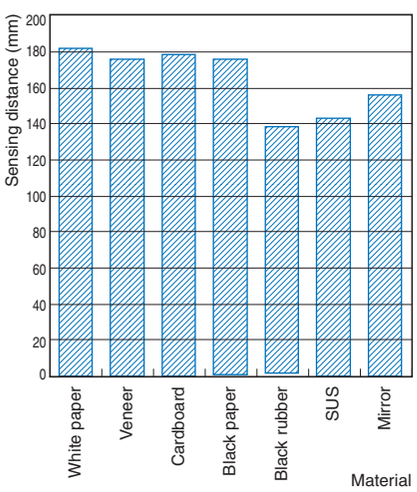

#### Horizontal




## Sensing Distance vs. Sensing Object Material

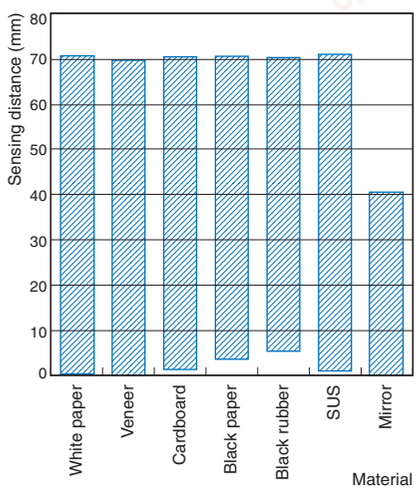
### E3AS-L200

**(Set Distance of 200 mm using White Paper)**




### E3AS-L80

**(Set Distance of 80 mm using White Paper)**



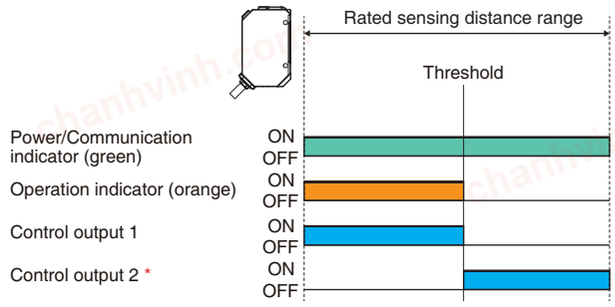
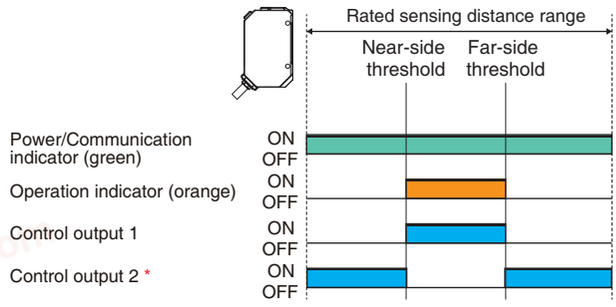
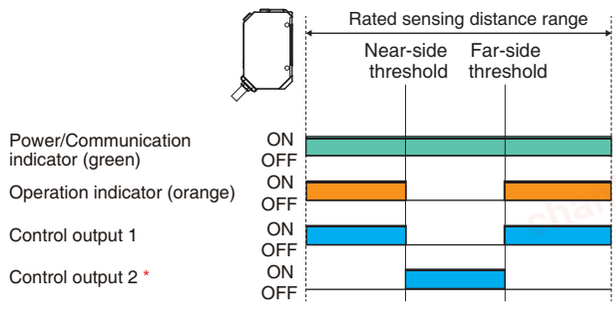
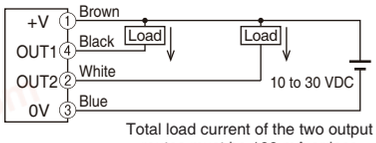
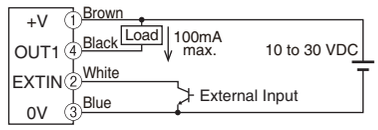
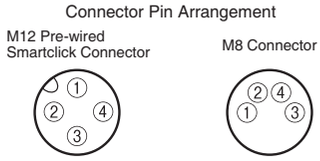
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# I/O Circuit Diagrams/ Timing Charts

## E3AS-HL models

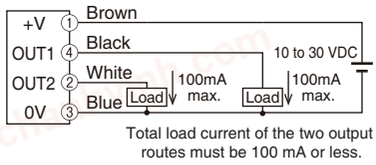
### NPN Output

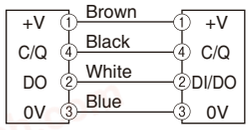
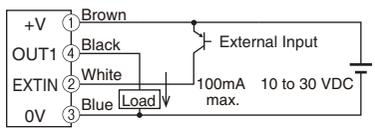
| Model | Timing chart | Output circuit |
|---|---|---|
| E3AS-HL500□N□<br>E3AS-HL150□N□ | **Single Point Mode [Single]**<br><br>**Window BGS mode [Window BGS]**<br><br>**Window FGS mode [Window FGS]**<br> | **Using Pin2 (white wire) as output**<br><br>Total load current of the two output routes must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

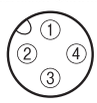
✻ The initial value of control output 2 is reverse of control output 1.

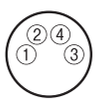
# E3AS Series

## PNP Output

<table>
<tr><th rowspan="2">Model</th><th colspan="2">Output circuit</th></tr>
<tr><th>Standard I/O mode (SIO mode) *1</th><th>IO-Link Communication mode (COM mode) *2</th></tr>
<tr><td rowspan="2">E3AS-HL500□T□<br>E3AS-HL150□T□</td><td>Using Pin2 (white wire) as output<br>

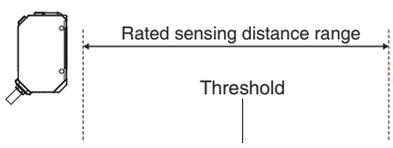
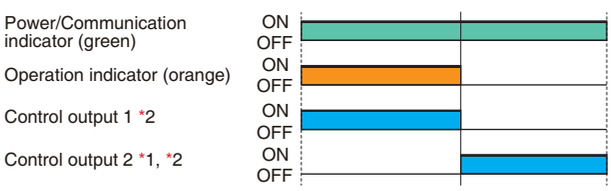
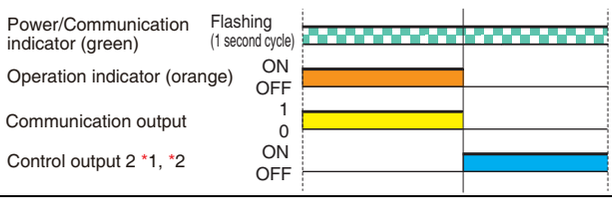
Total load current of the two output routes must be 100 mA or less.</td><td>Using Pin2 (white wire) as output<br>
</td></tr>
<tr><td>Using Pin2 (white wire) as external input<br>

<table>
<tr><th>External Input</th><th>PNP</th></tr>
<tr><td>ON time</td><td>Power supply voltage short-circuit or within power supply voltage - 1.5V</td></tr>
<tr><td>OFF time</td><td>0V short-circuit or open</td></tr>
</table></td><td>---</td></tr>
<tr><td colspan="2">Connector Pin Arrangement<br>M12 Pre-wired Smartclick Connector<br>

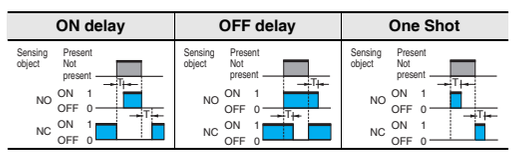
M8 Connector<br>
</td></tr>
</table>

*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]

<table>
<tr><th></th><th>Timing charts</th></tr>
<tr><td>Output mode</td><td>
</td></tr>
<tr><td>Standard I/O mode (SIO mode)</td><td>
</td></tr>
<tr><td>IO-Link Communication mode (COM mode)</td><td>
</td></tr>
</table>

*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).)

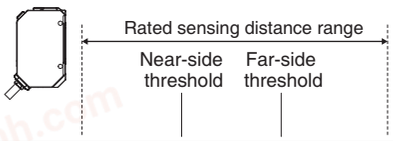
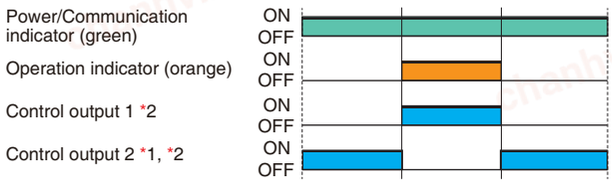
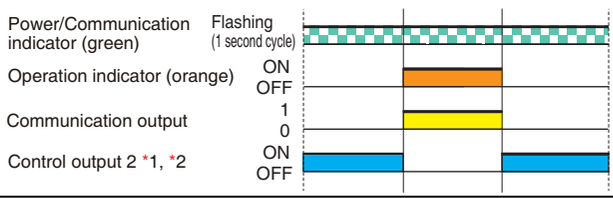



Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

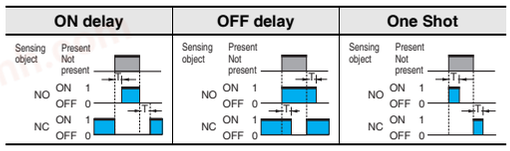
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### Window BGS mode [Window BGS]

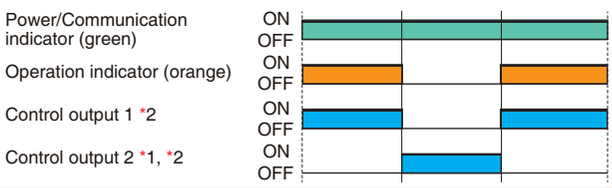
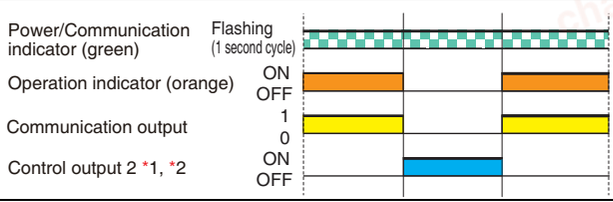
| | Timing charts |
|---|---|
| **Output mode** |  |
| **Standard I/O mode (SIO mode)** |  |
| **IO-Link Communication mode (COM mode)** |  |

*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).)

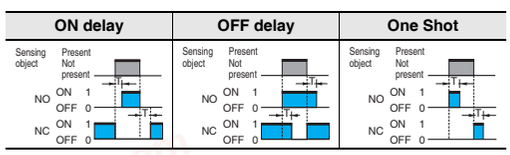



Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

### Window FGS mode [Window FGS]

| | 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).)

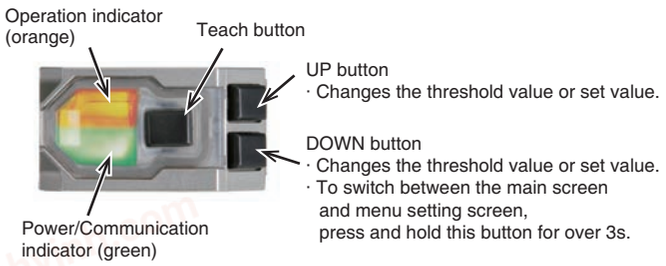


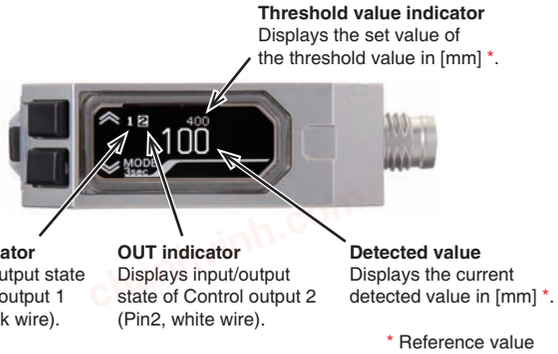

Please contact your OMRON sales representative regarding the IO-Link setup file (IODD file).

**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-HL500□**
**E3AS-HL150□**



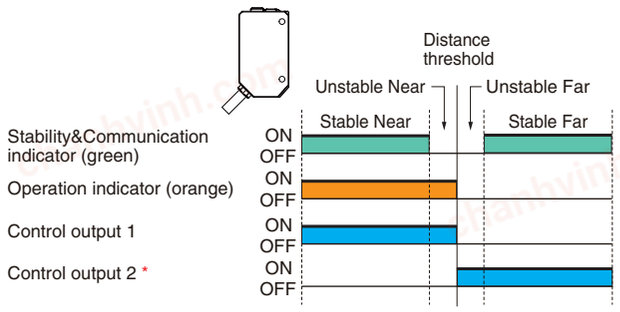
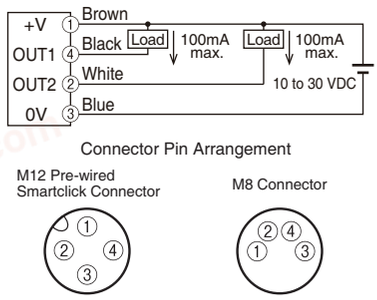




✻The indicators work differently depending on sensor status.

# E3AS Series

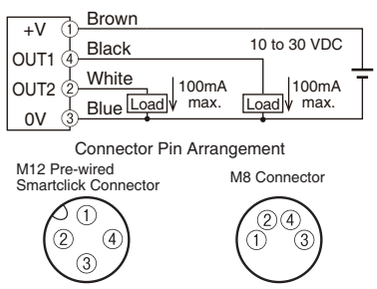
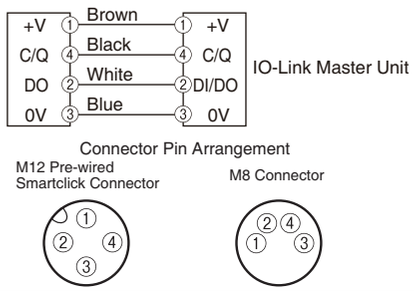
## E3AS-F models

### NPN Output

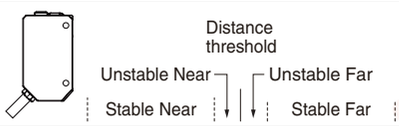
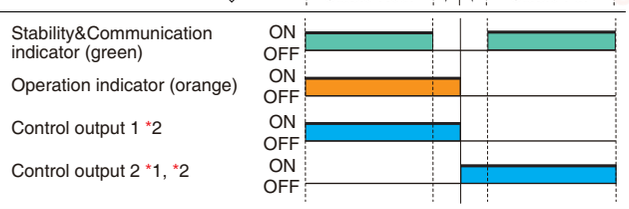
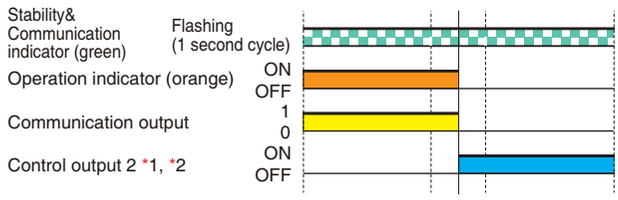
| Model | Timing chart | Output circuit |
|---|---|---|
| E3AS-F1500I□N□<br>E3AS-F1000I□N□ |  |  |

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

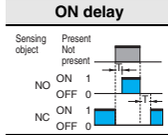
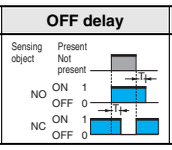
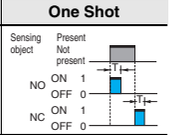
### PNP Output

| Model | Output circuit | |
|---|---|---|
| | Standard I/O mode (SIO mode) *1 | IO-Link Communication mode (COM mode) *2 |
| E3AS-F1500I□T□<br>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).)

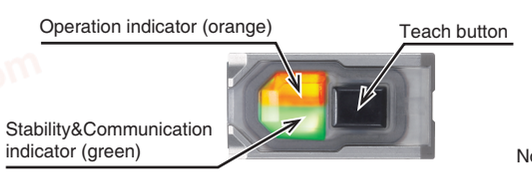
| ON delay | OFF delay | One Shot |
|---|---|---|
|  |  |  |

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□**



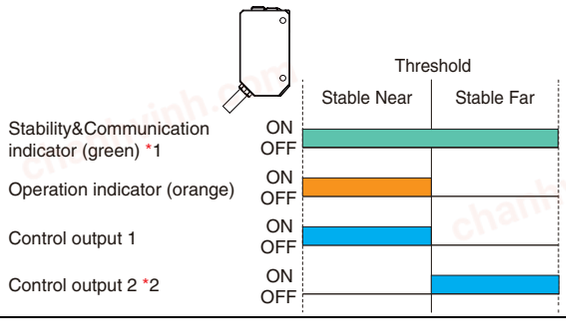
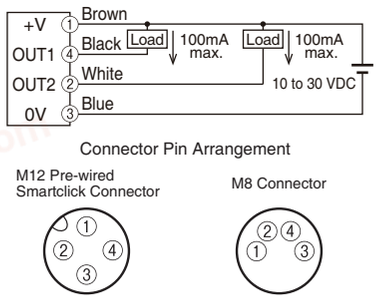

Note: The indicators work differently depending on sensor status.

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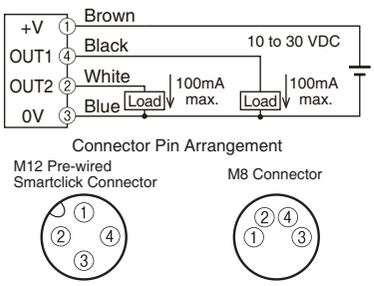
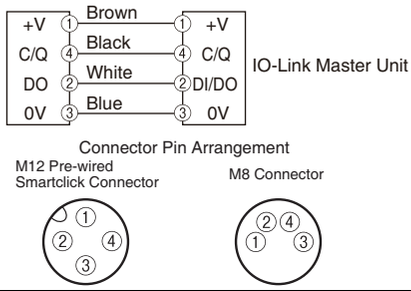
# E3AS-L models

## NPN Output

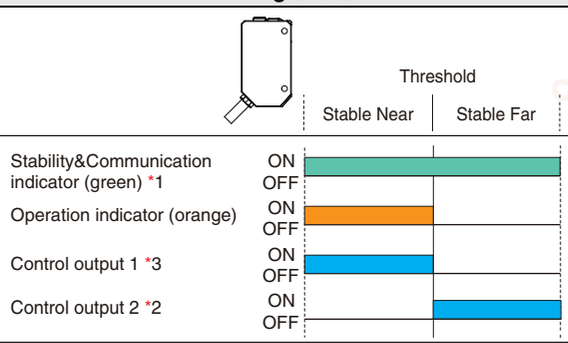
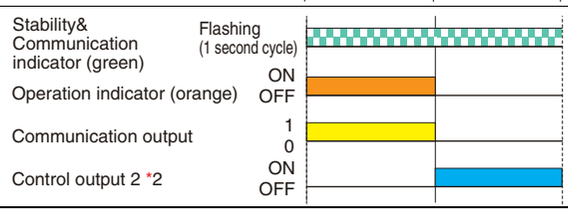
| Model | Timing chart | Output circuit |
|---|---|---|
| E3AS-L□N |  |  |

*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.

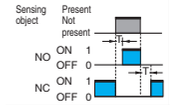
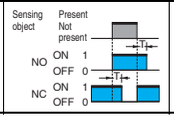
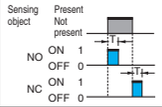
## PNP Output

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

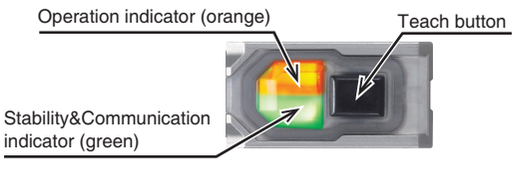
| ON delay | OFF delay | One Shot |
|---|---|---|
|  |  |  |

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.

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# E3AS Series

# 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**<br>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**<br>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**<br>Indicates the instructions of unspecified prohibited action |
|  | **Caution, fire**<br>Indicates the possibility of fires under specific conditions. |
|  | **General caution**<br>Indicates unspecified general alert. |
|  | **Caution, explosion**<br>Indicates the possibility of explosion under specific conditions |
|  | **Laser Caution**<br>Indicates information related to laser safety |
|  | **Disassembly prohibited**<br>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

This laser product complies with 21 CFR 1040. 10 and 1040. 11 except for deviations pursuant to Laser Notice No. 50, dated June 24,2007
OMRON Corporation
Shiokoji Horikawa,Shimogyo-ku,
Kyoto 600-8530 JAPAN
Place of manufacture:
Shanghai Factory,OMRON Corp.
Manufactured in

**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.**

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## 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.

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# E3AS Series

## Dimensions

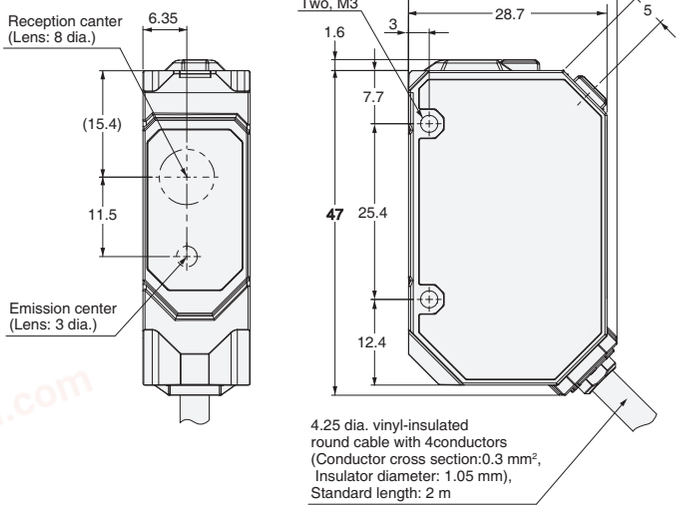
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

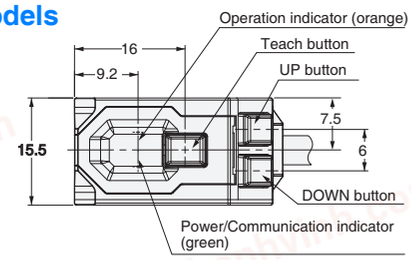
## Sensors

### Pre-wired Models/Pre-wired Connector Models

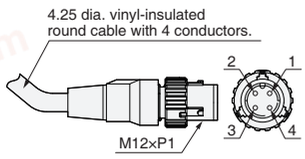
**E3AS-HL500□ (-M1TJ)**
**E3AS-HL150□ (-M1TJ)**



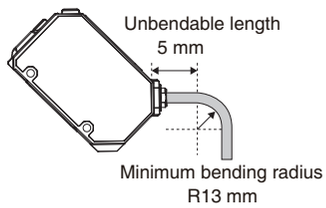



**Pre-wired Connector Models**
**E3AS-HL500□-M1TJ**
**E3AS-HL150□-M1TJ**



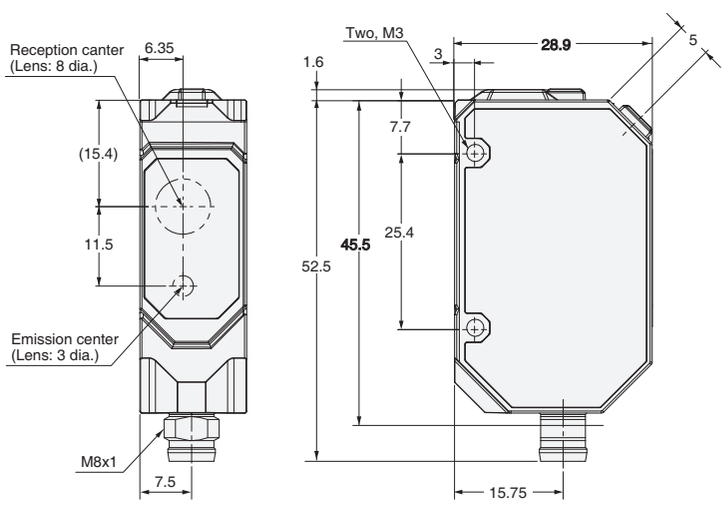

**Minimum bending radius/unbendable length of cord**

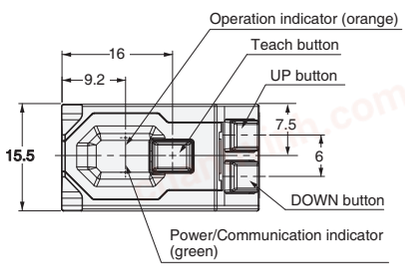



### Connector Models

**E3AS-HL500□ M3**
**E3AS-HL150□ M3**





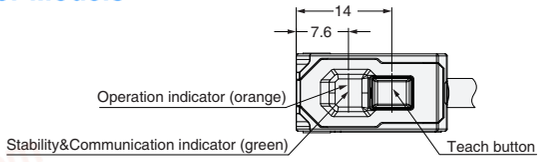
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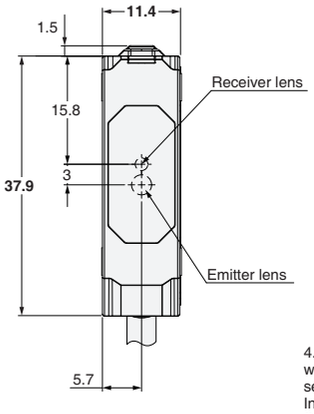


## Pre-wired Models/Pre-wired Connector Models

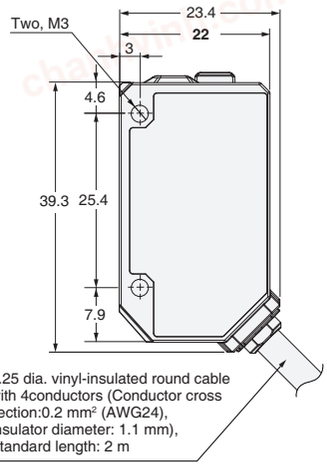
**E3AS-F1500□ (-M1TJ)**
**E3AS-F1000□ (-M1TJ)**





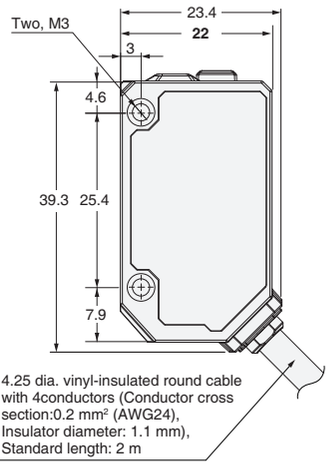




**Metal case type**



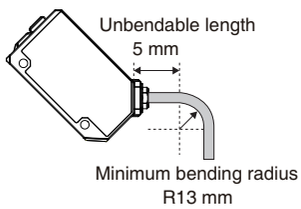

4.25 dia. vinyl-insulated round cable with 4conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m

**Plastic case type**

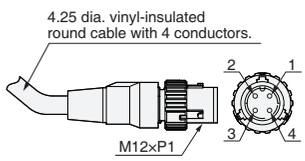



4.25 dia. vinyl-insulated round cable with 4conductors (Conductor cross section:0.2 mm² (AWG24), Insulator diameter: 1.1 mm), Standard length: 2 m

**Minimum bending radius/unbendable length of cord**



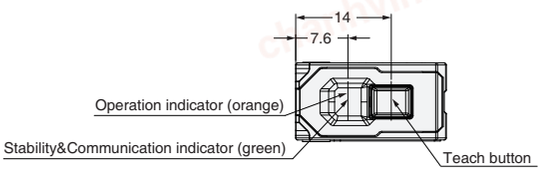

**M12 Pre-wired Smartclick Connector type**
**E3AS-F1500□-M1TJ/E3AS-F1000□-M1TJ**

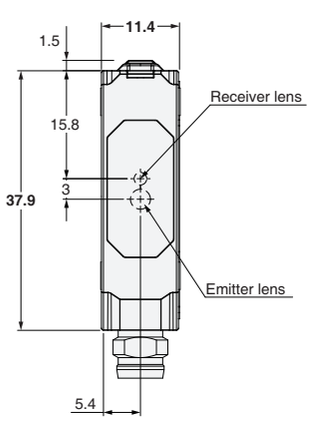


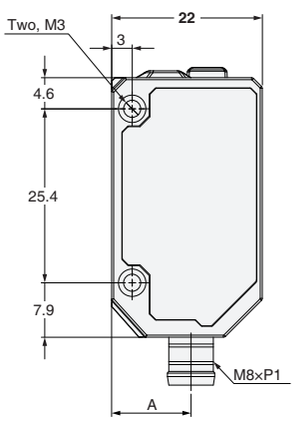

## Connector Models

**E3AS-F1500□ M3**
**E3AS-F1000□ M3**





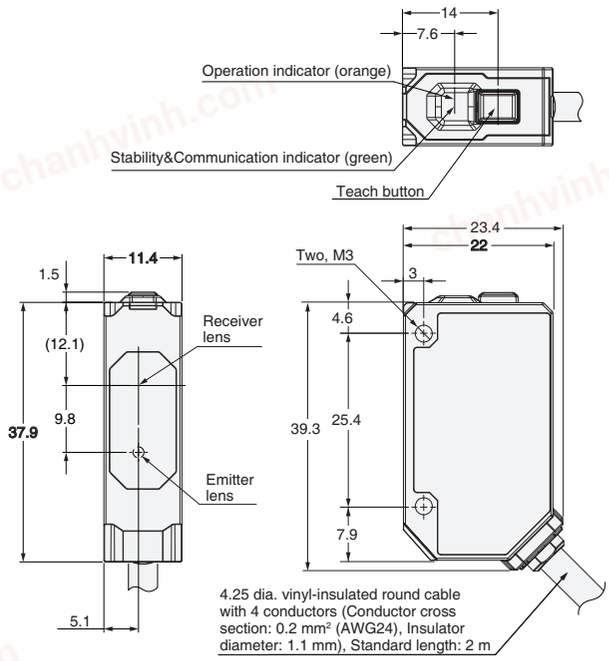

A:
Metal case type (E3AS-F□M□ M3) :9.6mm
Plastic case type (E3AS-F□P□ M3) :11.6mm

# E3AS Series

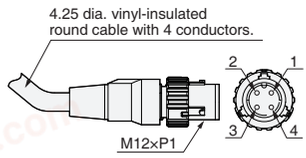
## Pre-wired Models/Pre-wired Connector Models

**E3AS-L200□ (-M1TJ)**
**E3AS-L80□ (-M1TJ)**

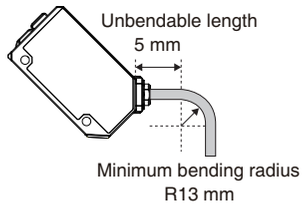





**M12 Pre-wired Smartclick Connector type**
**E3AS-L200□-M1TJ/E3AS-L80□-M1TJ**



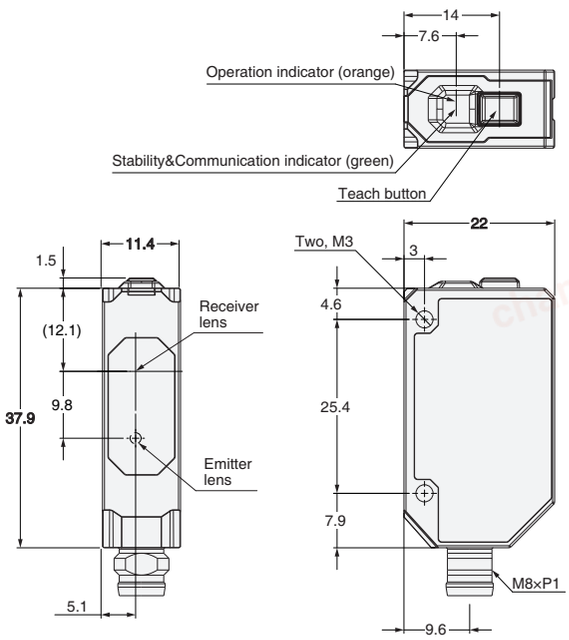

**Minimum bending radius/unbendable length of cord**




## Connector Models

**E3AS-L200□ M3**
**E3AS-L80□ M3**





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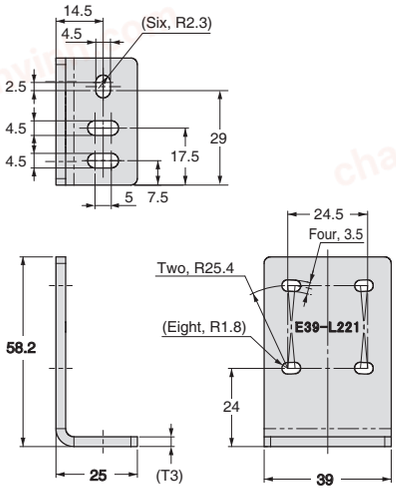
# Accessories (Sold Separately)

## Mounting Brackets

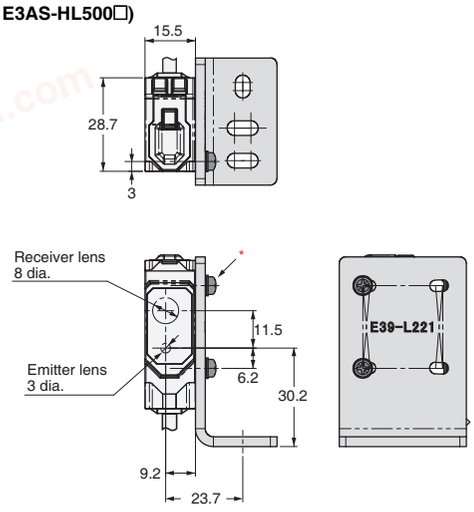
### For E3AS-HL models

### E39-L221





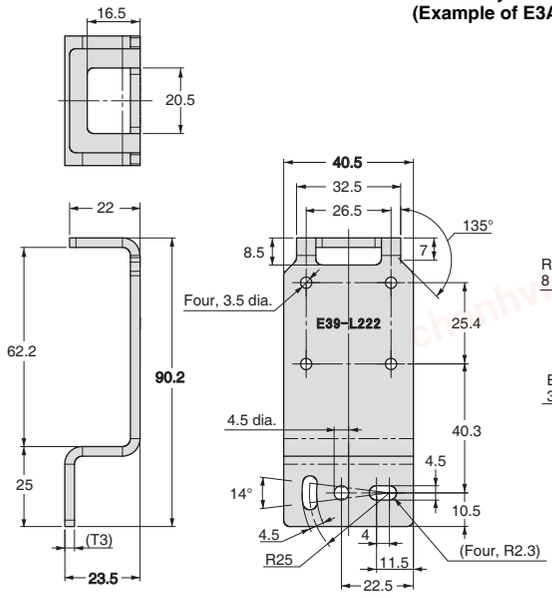

**Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)**



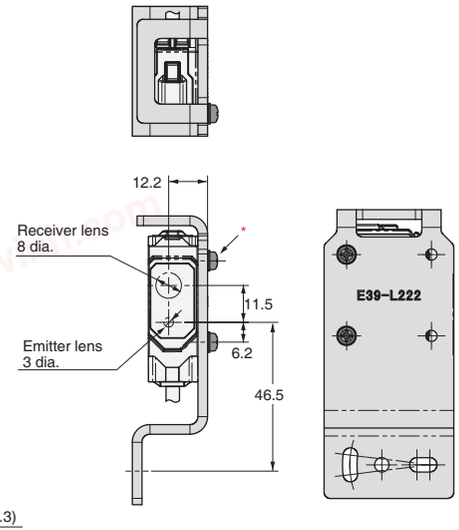

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

### E39-L222





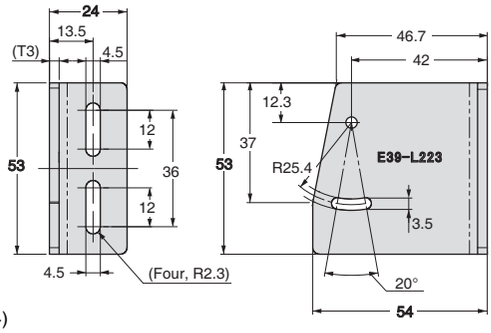

**Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)**



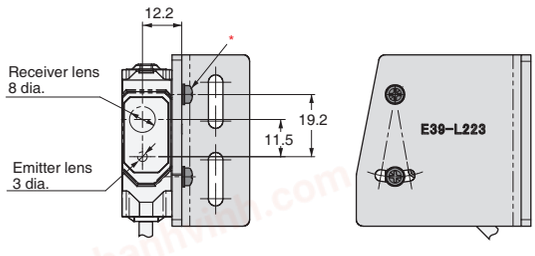

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

### E39-L223






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

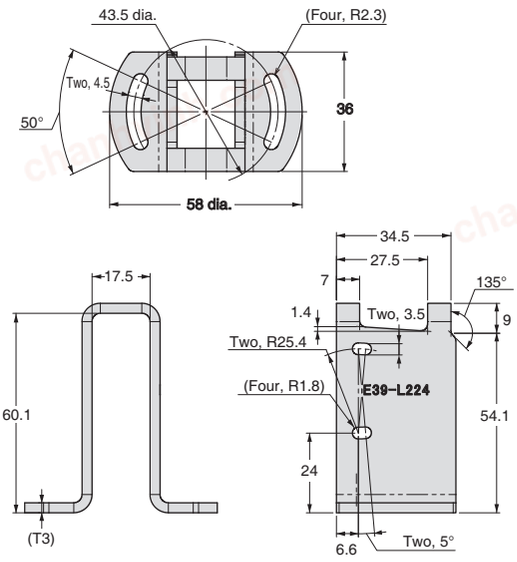



Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

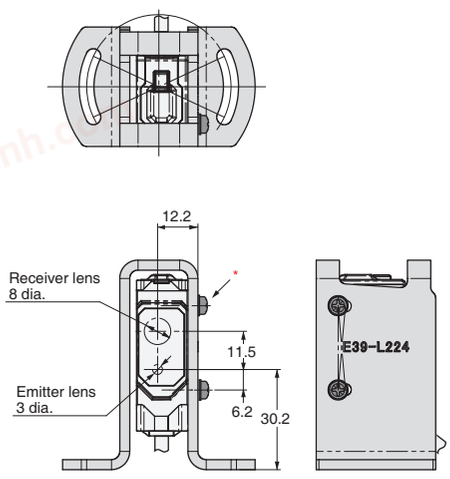
# E3AS Series

## E39-L224





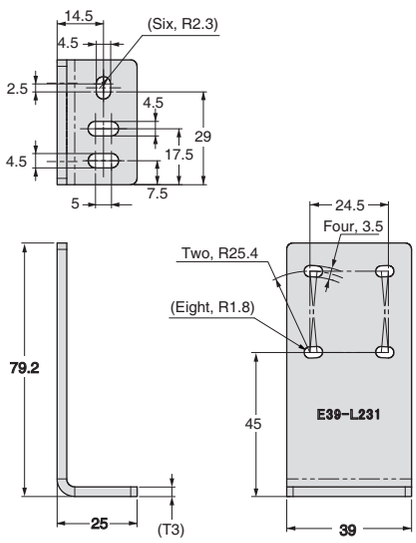

**Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)**



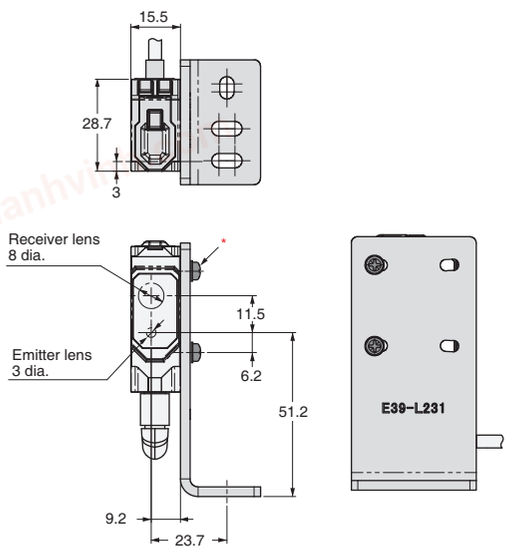

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

## E39-L231






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



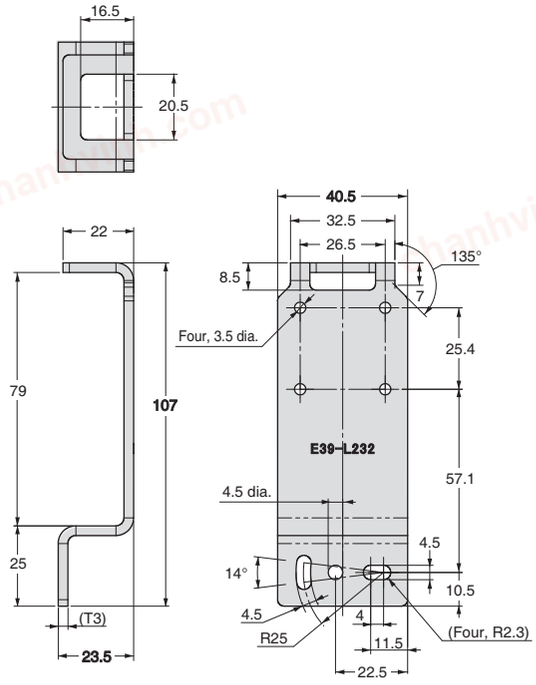

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

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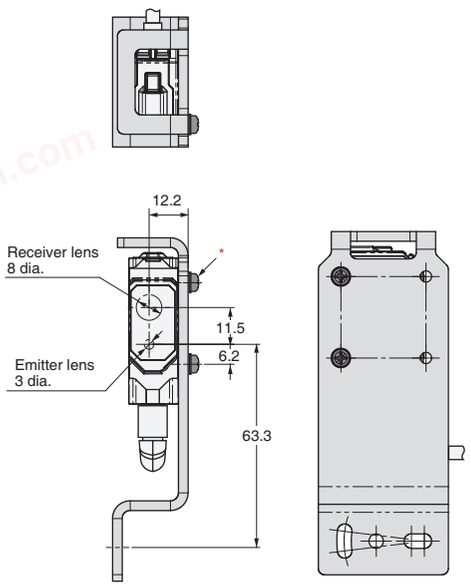


## E39-L232





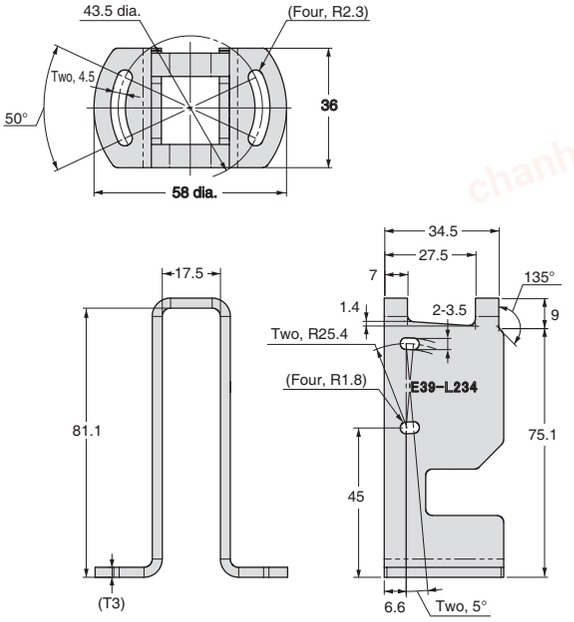

**Photoelectric Sensor Accessory are installed (Example of E3AS-HL500□)**



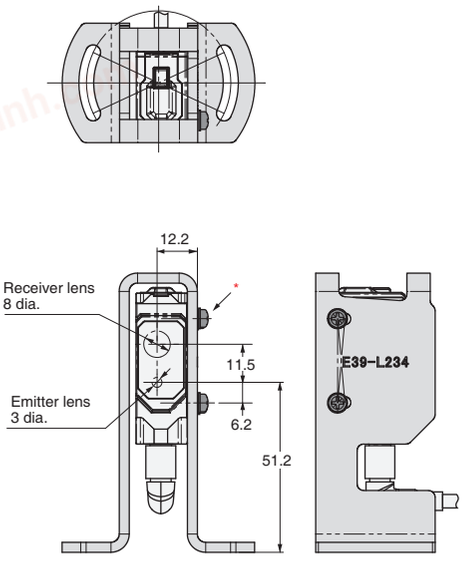

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

## E39-L234






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



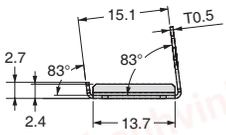

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

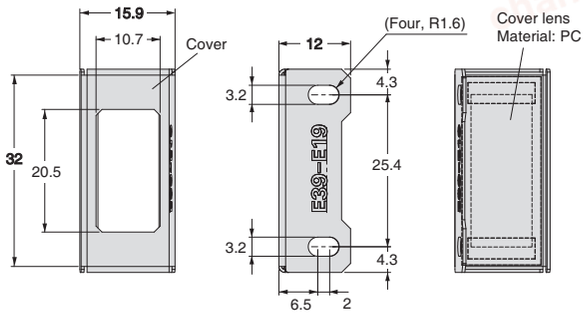
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# E3AS Series

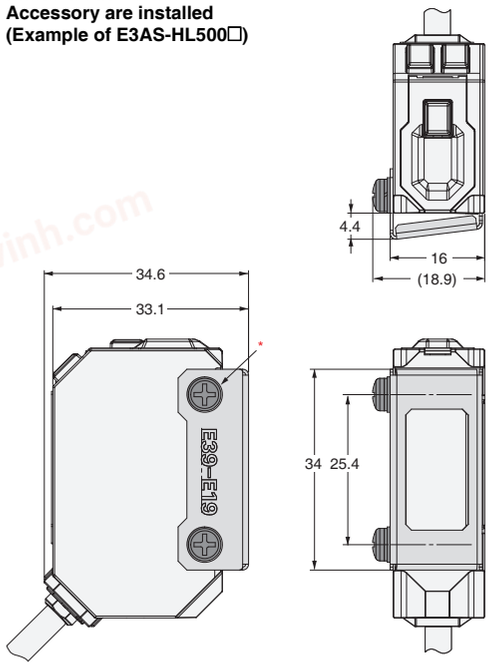
## E39-E19






**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)

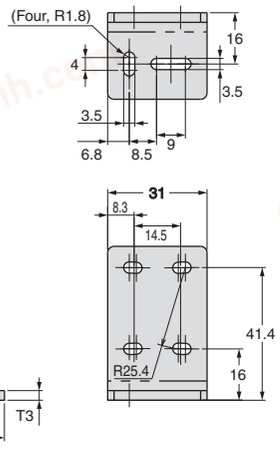
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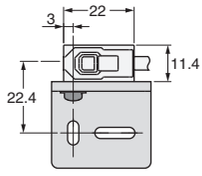
## For E3AS-F/L models

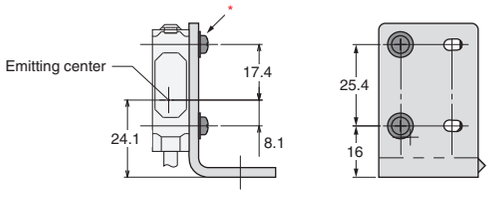
### E39-L201






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

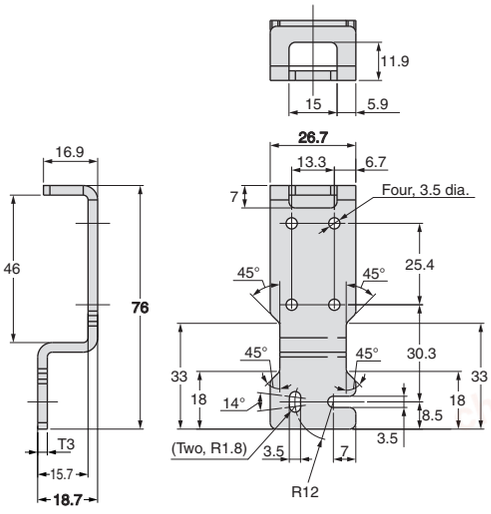


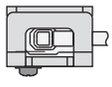

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

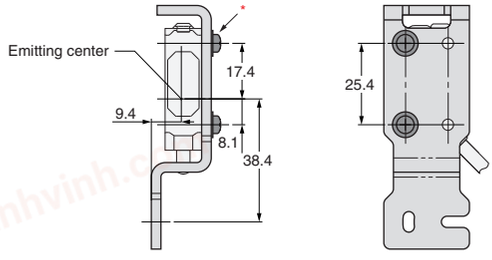
### E39-L202






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

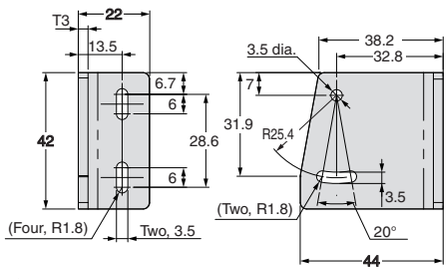




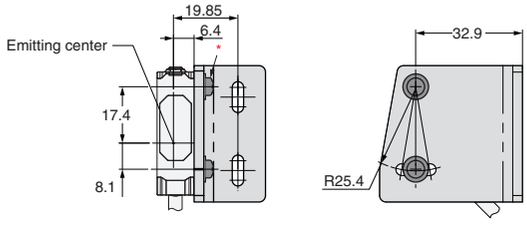

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

### E39-L203






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

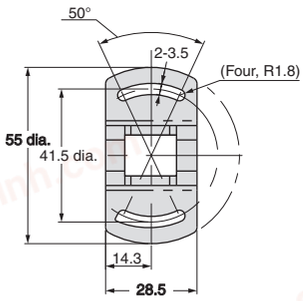



Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

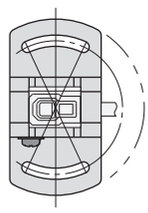
# E3AS Series

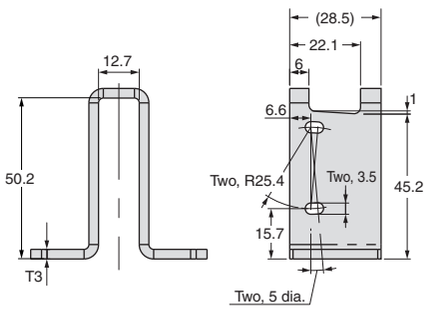
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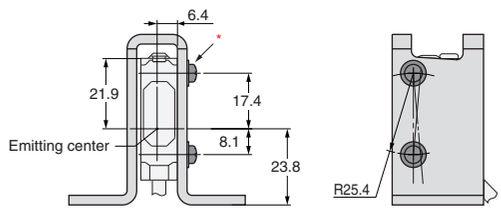





**Photoelectric Sensor Accessory are installed (Example of E3AS-L200□)**





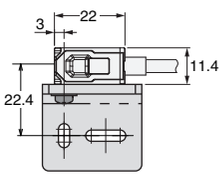



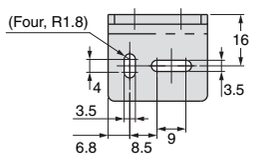

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

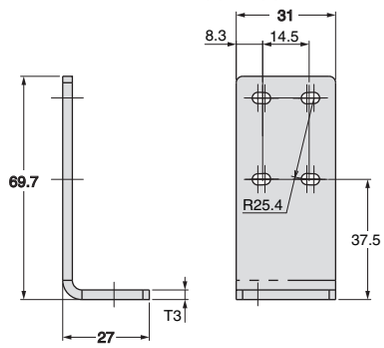
## E39-L211

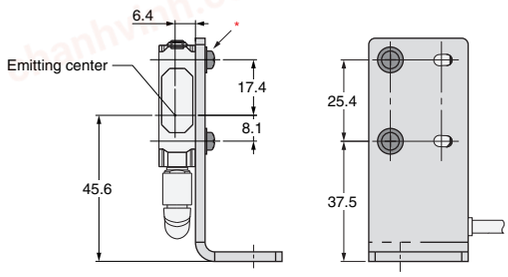


**Photoelectric Sensor Accessory are installed (Example of E3AS-L200□)**



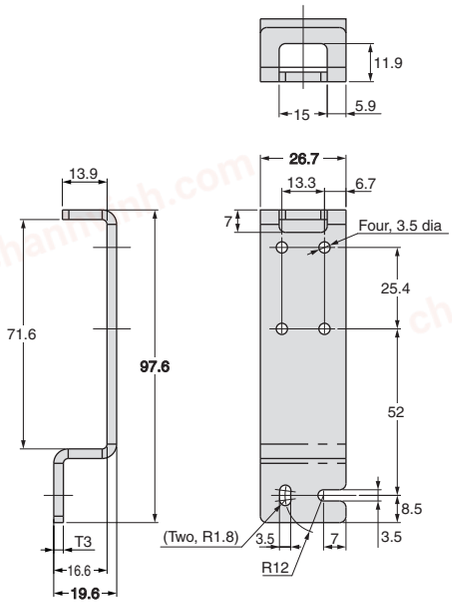

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

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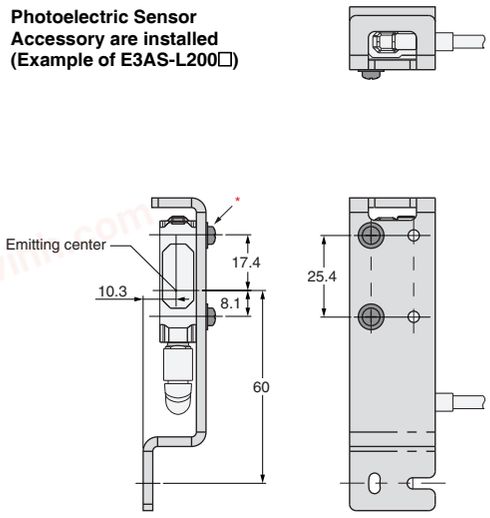


## E39-L212





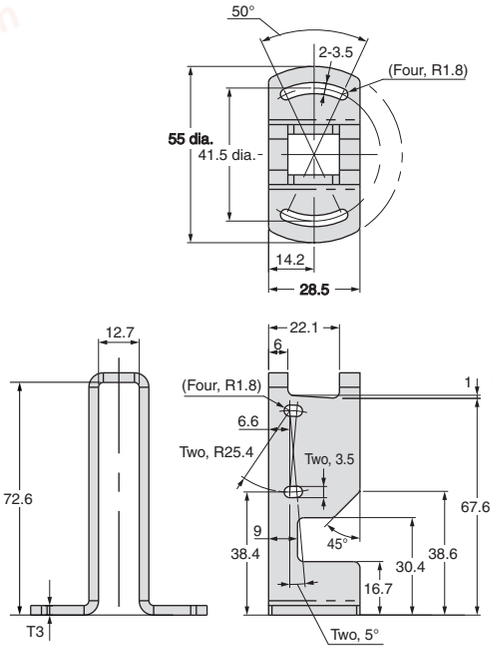

**Photoelectric Sensor Accessory are installed (Example of E3AS-L200☐)**



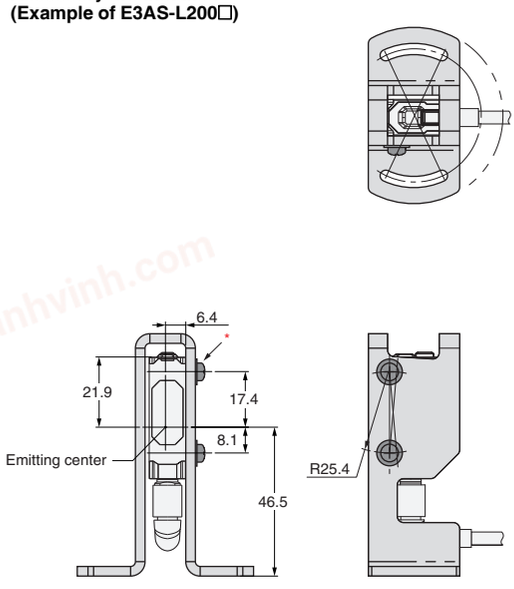

Material: Stainless steel (SUS304)
✻ Accessories
2-M3-L12 Cross Recessed Pan Head Screws (Attached to SW+JIS W)

## 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)

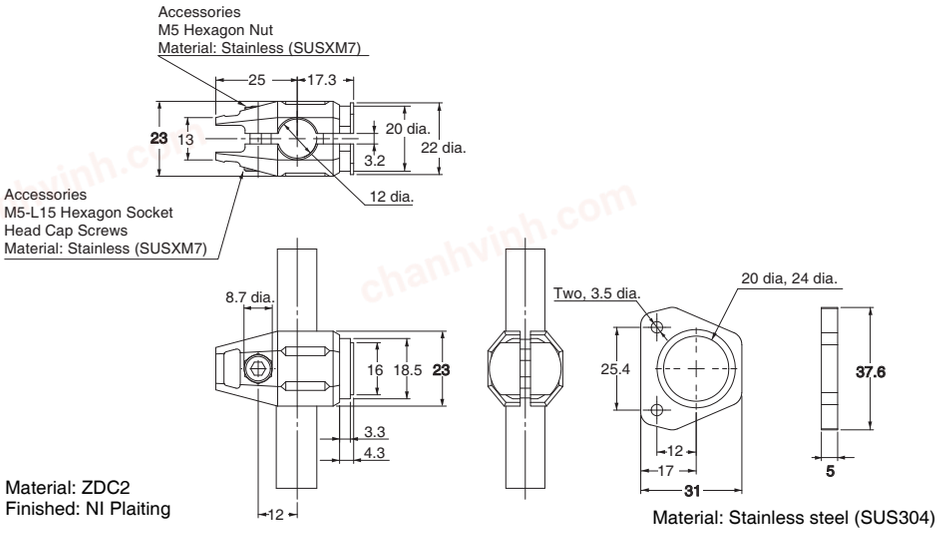
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# E3AS Series

## Common to E3AS series

### Flexible Mounting Bracket
### E39-L261

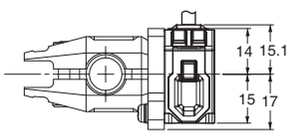


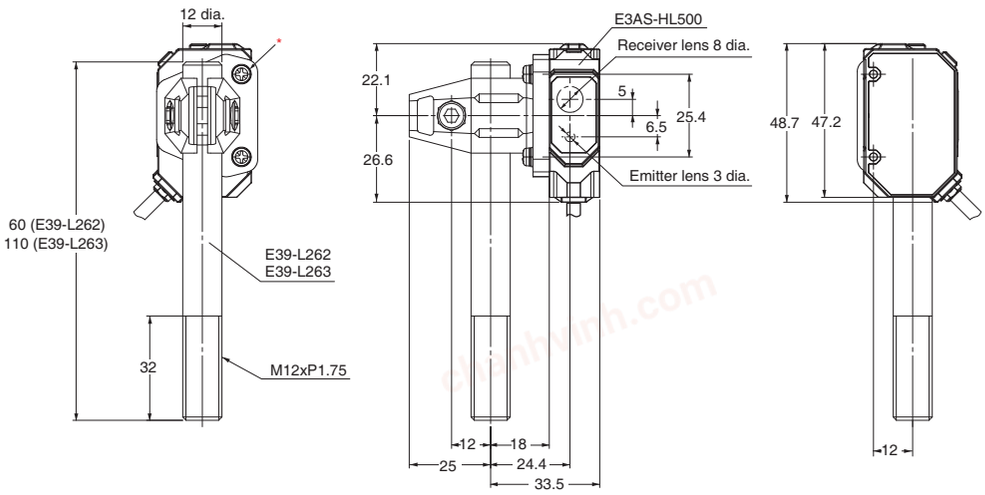



Material: ZDC2
Finished: NI Plaiting

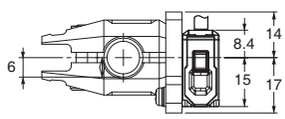
Material: Stainless steel (SUS304)

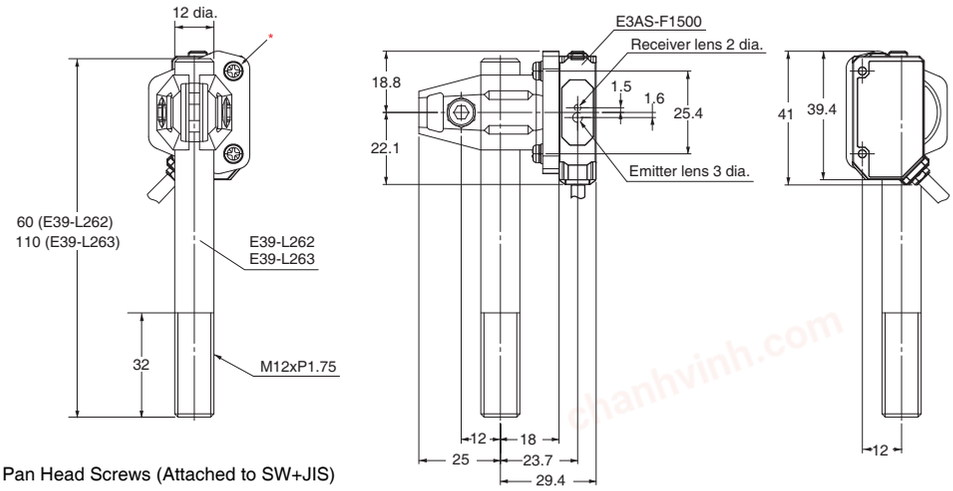
**Photoelectric Sensor Accessory are installed (Example of E3AS-HL500☐)**




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



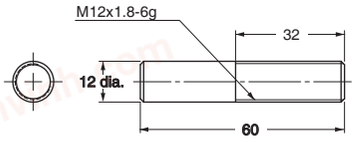

✻ Accessories 2-M3-L10 Cross Recessed Pan Head Screws (Attached to SW+JIS)

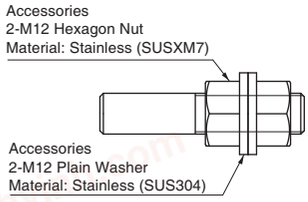
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## Post 50 mm
## E39-L262



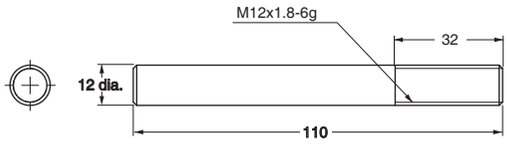


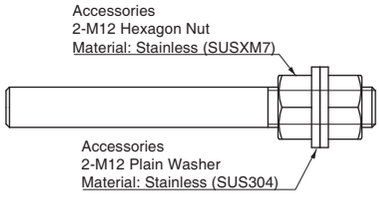




Material: Stainless steel (SUS304)

## Post 100 mm
## E39-L263





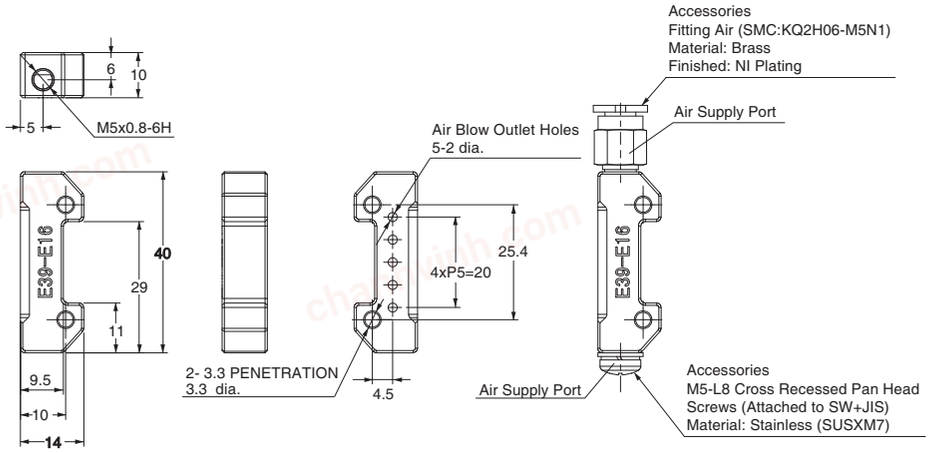




Material: Stainless steel (SUS304)

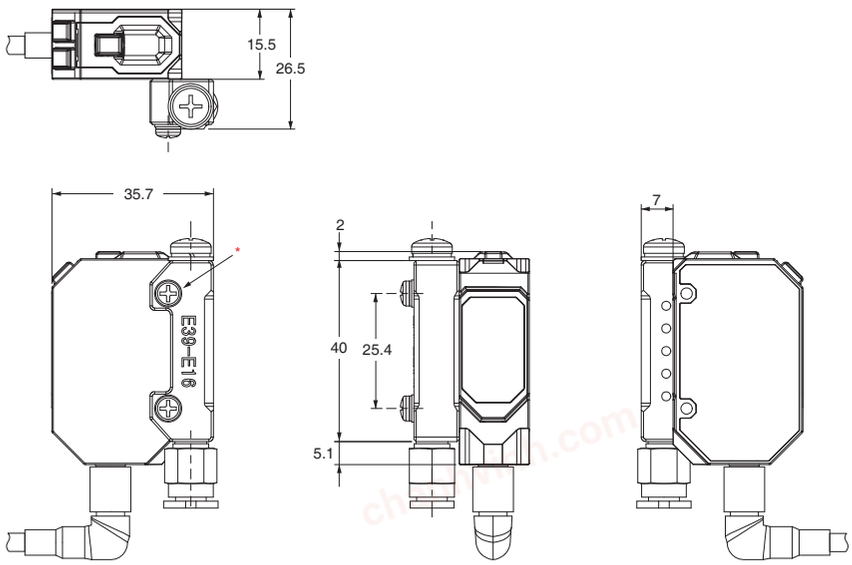
# E3AS Series

## Air Blow Unit
## E39-E16

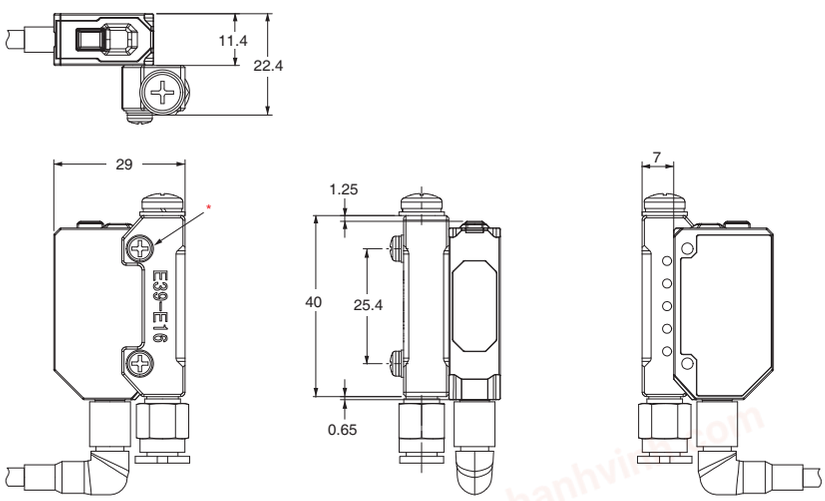





**Photoelectric Sensor**
**Accessory are installed**
**(Example of E3AS-HL500☐)**




**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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E3S-DB

Cat. No. E440-E1




Color Mark Sensors
E3S-DC/E3NX-CA Series

Cat. No. Y216-E1




IO-Link Series

Cat. No. Y229-E1

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