

NEW

OMRON

N-Smart

Presence Detection Measurement

Smart Laser Sensors
E3NC-L/E3NC-S

Laser Sensors That Give You a Choice

Select the Best Laser Sensor at the Best Price for Your Application

Compact
Laser Sensors
E3NC-L

Ultra-compact
CMOS Laser Sensors
E3NC-S

realizing

EtherCAT 

N-Smart

Presence

Detection

Measurement

Simpler and More Dependable

The N-Smart Lineup of Next-generation Fiber Sensors and Laser Sensors will quickly solve your problems and therefore increase equipment operation rates and minimize downtime with optimum cost performance.

Advanced
Performance
for Ultra-stable,
Ultra-easy
Detection

E3NX-FA
Fiber Amplifier
Units

Stable Detection
Even for 1.5-mm
Differences in
Levels

E3NC-S
Ultra-compact CMOS
Laser Sensors

From Minute
Workpieces to
Long-distance
Detection

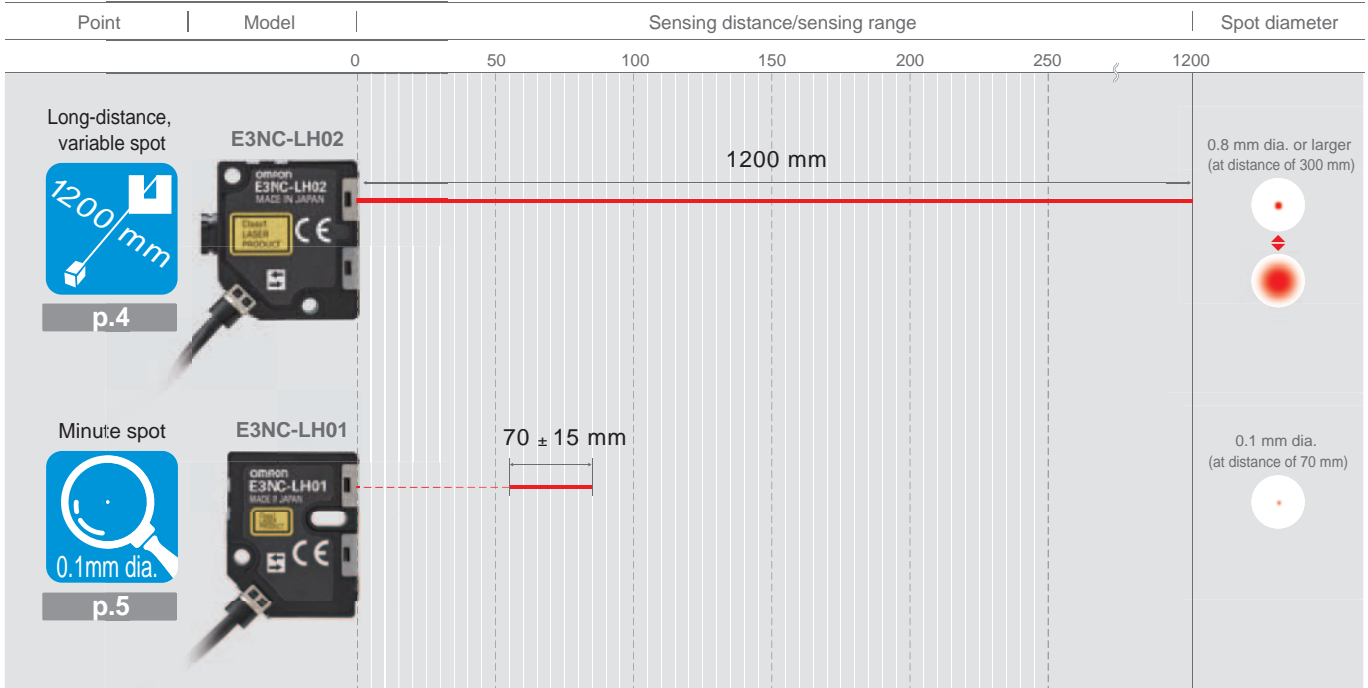
E3NC-L
Compact
Laser Sensors

Laser Sensors That Give You a Choice

Select the Best Laser Sensor at the Best Price for Your Application

Smaller Spots and Longer Sensing Distances Than Possible with Photoelectric and Fiber Sensors.

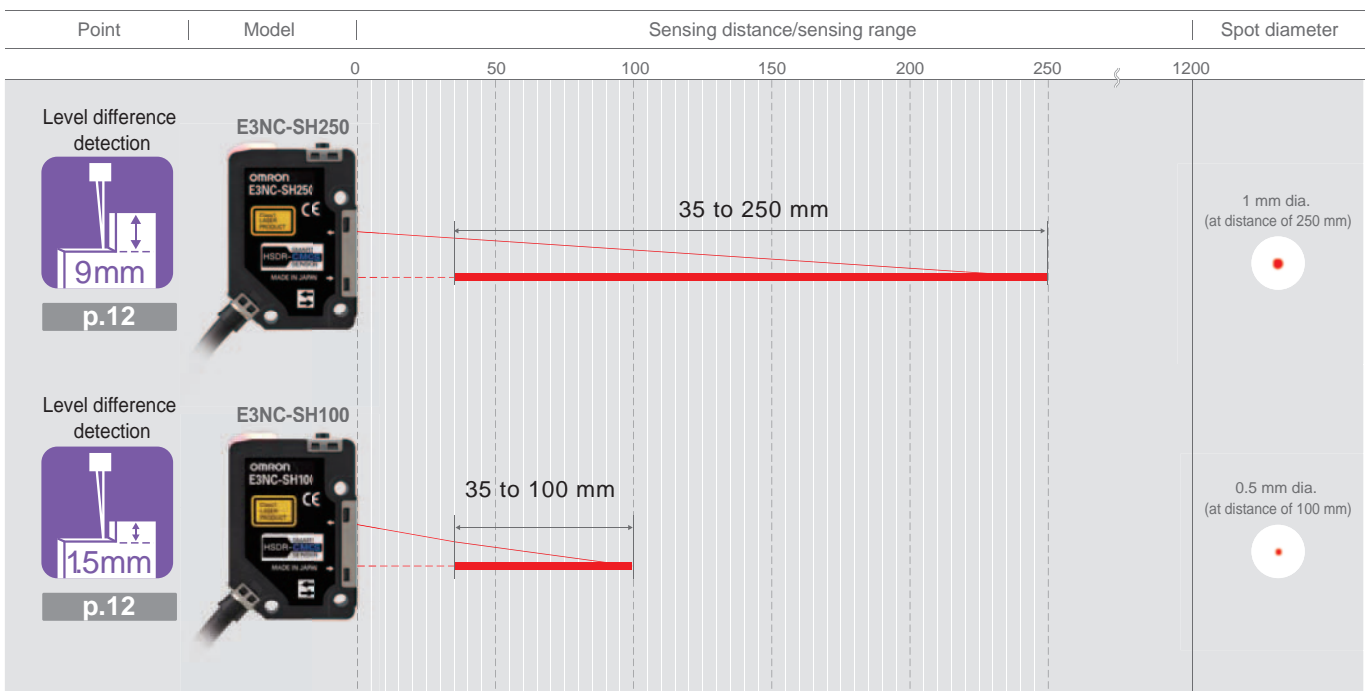
Presence E3NC-L series of Compact Laser Sensors



Dependable Detection under Difficult Conditions:

Glossy Workpieces, Low-reflectance Workpieces, Workpieces with Inconsistent Surface Conditions or Colors, and More.

Detection E3NC-S series of Ultra-compact CMOS Laser Sensors



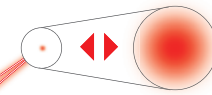


Long Distance, Variable Spot

E3NC-LH02

Flexible Adjustment to the Application with a Variable Spot for Stable Detection from Near or Far

0.8 mm dia. or larger



Easy

No Tools Required to Lock the Spot Adjuster

Winding Crown Locking System PAT.P

Stable Easy

Adjust the Spot to the Workpiece or Application for Stable Detection.

Variable Spot

Stable Easy

Visible Spot Even from a Distance with No Spreading.

Maximum Sensing Distance: 1,200 mm



Reliable

Superior Flexibility Even for Application on Moving Parts

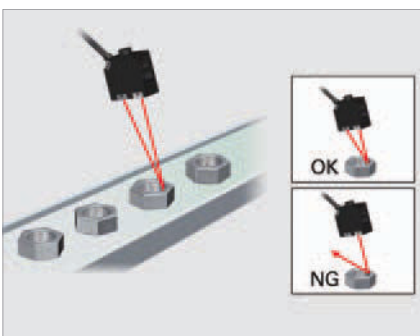
Robot Cables

IP65 (only when adjuster is locked)

Laser Class 1

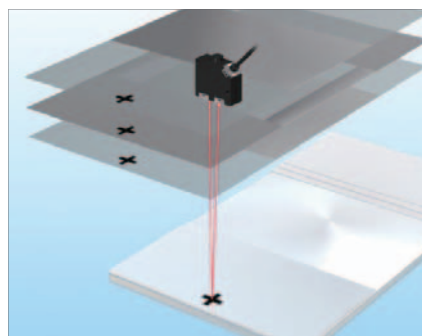
Application

Thread Presence Detection



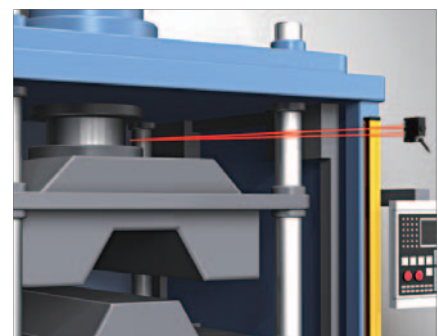
The spot is made wider so that the presence of threading in the nuts can be detected.

Glass Substrate Mark Detection



With a maximum sensing distance of 1,200 mm, long-distance mark detection is stable.

Workpiece Presence Detection through Narrow Gaps



Even detailed locations that are recessed in machines can be stably detected from a distance.



Minute Spot E3NC-LH01

Pinpoint Precision for Stable Detection of Minute Workpieces Even at Close Range

Stable

Stable Detection of Minute Workpieces

Minute Spot

0.1 mm dia.



Stable

Limited-reflective Model to Eliminate Background Influence

**Sensing Distance:
70 ±15 mm**

Easy

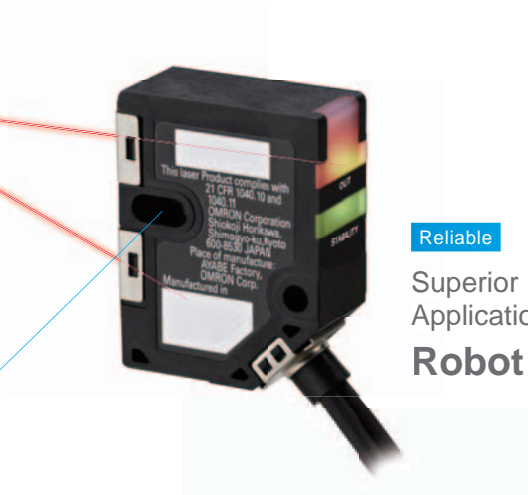
Easy Fine-tuning of Installation Distance

Slide Adjustment

Reliable

Superior Flexibility Even for Application on Moving Parts

Robot Cables

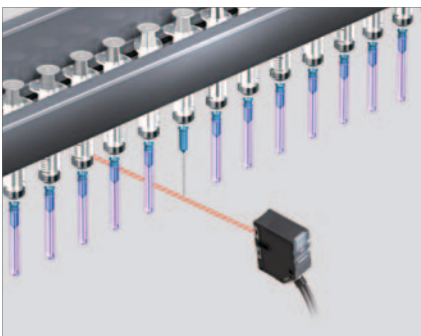


IP65

Laser Class 1

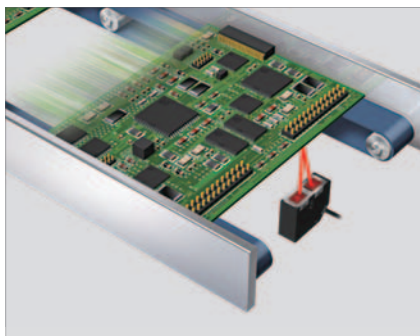
Application

Detecting Presence of Needle Caps



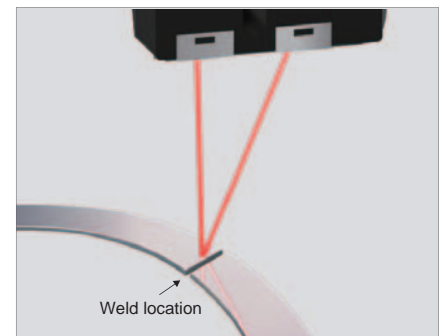
The minute 0.1-mm spot is targeted only at the end of the cap for stable detection.

Board Arrival Confirmation



The laser beam forms a minute spot to detect arrival with high precision.

Ring Joint Location Detection



The minute, sharp laser beam stably detects 0.1 mm seams.

Laser Amplifier Units
E3NC-LA

Consistent Operating Methods for All N-Smart Amplifier Units

Easy

Clear, Reliable Confirmation Even from a Distance

Industry First! White on black display characters for high visibility.

*Based on November 2012 OMRON investigation.



Easy Stable

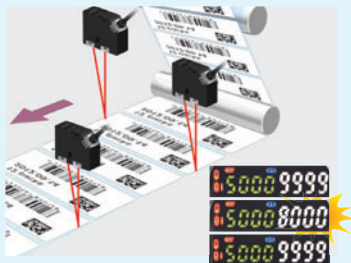
Select the Best Model According to the Application

Smart Tuning



Basic Tuning
Two-point Tuning

The larger incident level between measurements with and without a workpiece is set to 9,999.



Procedure

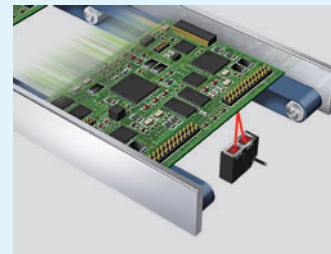
- Press **TUNE** once with a workpiece.
- Press **TUNE** once without a workpiece.

Point

The values are displayed together to immediately show changes in incident levels.

High-precision Positioning
Position Tuning

High-precision, pinpoint workpiece positioning is possible.

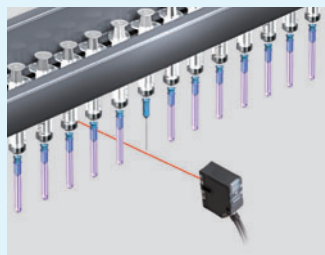


Procedure

- Press **TUNE** once without a workpiece.
- Place workpiece in desired position and press **TUNE** for at least 3 seconds.

High-speed Workpieces
Full Auto Tuning

You can adjust to moving workpieces without stopping the line.



Procedure

- Press **TUNE** for at least 7 seconds without a workpiece. When "Auto" appears on the green digital display, send a workpiece pass the Sensor. Release your finger after the workpiece passes.

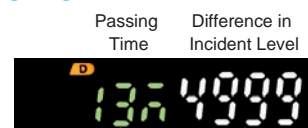
Point



Easy, Dependable Setup for Detection of Minute Moving Workpieces

Solution Viewer

The passing time and difference in incident level are displayed when a workpiece passes. The display of the differences in incident level lets you determine if the threshold is the best. The display of the passing time lets you determine if the response time is best so that you can achieve reliable operation.





The passing time is "13ms", so it is OK with Standard Mode.




The difference is 4,999, so threshold is 7,500.

Ordering Information

Sensor Heads

Sensing method	Appearance	Focus	Model
Diffuse-reflective		Variable spot	E3NC-LH02 2M
Limited-reflective		Spot	E3NC-LH01 2M

Amplifier Units



Connecting method	Appearance	Inputs/outputs	Model	
			NPN output	PNP output
Pre-wired (2 m)		2 outputs + 1 input	E3NC-LA21 2M	E3NC-LA51 2M
Wire-saving Connector		1 output + 1 input	E3NC-LA7	E3NC-LA9
Connector for Sensor Communications Unit		2 outputs	E3NC-LA0	Available soon.

Accessories (Sold Separately)

Sensor Head Accessories

Sensor Head Mounting Brackets


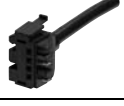
A Mounting Bracket is not provided with the Sensor Head. It must be ordered separately as required.

Applicable Sensor Head	Appearance	Model	Quantity	Contents
E3NC-LH02		E39-L185	1	Mounting Bracket: 1 Nut plate: 1 Phillips screws (M3x18): 2
E3NC-LH01		E39-L186	1	

Amplifier Unit Accessories

Wire-saving Connectors (Required for models for Wire-saving Connectors.)

A Connector is not provided with the Amplifier Unit. It must be ordered separately. *Protective stickers are provided.

Type	Appearance	Cable length	No. of conductors	Model
Master Connector		2 m	4	E3X-CN21
Slave Connector			2	E3X-CN22

* This catalog mentions factors necessary to choice mainly.
For details, refer to OMRON website (www.ia.omron.com).

Sensor Heads

Item	Sensing method	Diffuse-reflective	Limited-reflective
	Model	E3NC-LH02	E3NC-LH01
Light source (wavelength)*1		Visible semiconductor laser diode (660 nm), 315 μW max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)	
Sensing distance*2	Giga-power mode (GIGA)	1,200 mm	70±15 mm
	Standard mode (Std)	750 mm	
	High-speed mode (HS)	250 mm	
	Super-high-speed mode (SHS)	200 mm	
Spot diameter*3		Approx. 0.8 mm (at distances up to 300 mm)	Approx. 0.1 mm (at distances up to 70 mm)
Differential distance*4		10% of sensing distance	
Ambient illumination		Illumination on received light surface: 10,000 lx max. of incandescent light, 20,000 lx max. of sunlight	
Ambient temperature range		Operating: -10 to 55°C; Storage: -25 to 70°C (with no icing or condensation)	
Ambient humidity range		Operating and storage: 35% to 85% (with no condensation)	
Vibration resistance (destruction)		10 to 55 Hz with a 1.5-mm double amplitude or 100 m/s ² for 2 hours each in X, Y, and Z directions	
Shock resistance (destruction)		500 m/s ² for 3 times each in X, Y, and Z directions	
Degree of protection		IEC IP65 (E3NC-LH02: Applies only when adjuster is locked.)	
Connecting method		Pre-wired connector (standard length: 2 m)	
Materials		Case: Polybutylene terephthalate (PBT), Lens: Methacrylic resin, Cable: PVC	
Weight (packed state/Sensor Head only)		Approx. 115 g/approx. 65 g	
Accessories		Instruction Manual	

- *1. These Sensors are classified as Class 1 laser devices under IEC 60825-1 and the regulations of Laser Notice No. 50 for FDA certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number : 1220690)
- *2. The values were measured using the OMRON standard sensing object (white paper).
- *3. Defined as 1/e² (13.5%) of the central light intensity at the measurement distance.
The spot diameter is sometimes influenced by the ambient conditions of the workpiece, such as light that leaks from the main beam, if the reflection factor of the area surrounding the workpiece is higher than that of the workpiece.
- *4. Measured at the rated sensing distance.

Amplifier Units

Item	Type	Standard models		Model for Sensor Communications Unit	
	Connecting method	NPN output	E3NC-LA21	E3NC-LA7	E3NC-LA0 Available soon.
		PNP output	E3NC-LA51	E3NC-LA9	
		Pre-wired	Wire-saving Connector	Connector for Sensor Communications Unit	
Inputs/outputs	Outputs	2 outputs	1 output	2 outputs	
	External inputs	1 input	1 input	---	
Power supply voltage		10 to 30 VDC, including 10% ripple (p-p)			
Power consumption*1		At Power Supply Voltage of 24 VDC Normal mode: 1,560mW max. (Current consumption: 65mA max.) Power saving eco mode: 1,200 mW max. (Current consumption: 50 mA max.)			
Control outputs*2		Load power supply voltage: 30 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifiers: 100 mA max., Groups of 4 to 30 Amplifiers: 20 mA max. Residual voltage: At load current of less than 10 mA: 1 V max. At load current of 10 to 100 mA: 2 V max. OFF current: 0.1 mA max.		---	
External inputs		Refer to *3.			
Protection circuits		Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection		Power supply reverse polarity protection and output short-circuit protection	
Response time		Super-high-speed mode (SHS)*4: Operate or reset: 80 μs, High-speed mode (HS): Operate or reset: 250 μs, Standard mode (Std): Operate or reset: 1 ms, Giga-power mode (GIGA): Operate or reset: 16 ms			
Sensitivity adjustment		Smart Tuning (2-point tuning, full auto tuning, position tuning, maximum sensitivity tuning, power tuning, or percentage tuning (-99% to +99%)), or manual adjustment.			
No. of Units for mutual interference prevention		Super-high-speed mode (SHS)*4: 0, High-speed mode (HS): 2, Standard mode (Std): 2, Giga-power mode (GIGA): 4			
Functions		Dynamic power control (DPC) / Timer / Zero reset / Resetting settings / Eco mode / Bank switching (select from banks 1 to 4) / Power tuning / Output 1 / Output 2 (except E3NC-LA7 and E3NC-LA9) / External input (except E3NC-LA0) / Hysteresis width			

- *1. At Power Supply Voltage of 10 to 30 VDC.
Normal mode: 1,650 mW max. (Current consumption: 55 mA max. at 30 VDC, 115 mA max. at 10 VDC)
Power saving eco mode: 1,350 mW max. (Current consumption: 45 mA max. at 30 VDC, 80 mA max. at 10 VDC)
- *2. The total for both outputs of a model with 2 outputs is 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max., Load current of 10 to 100 mA: 2 V max.)
- *3. The following details apply to the input.

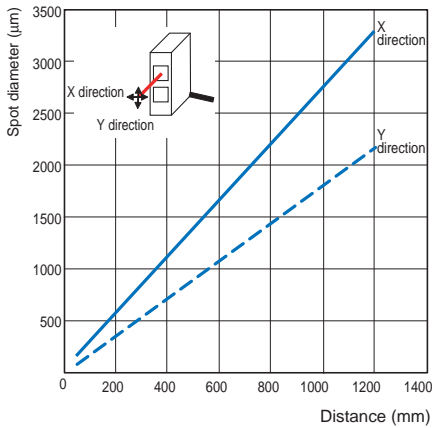
	Contact input (relay or switch)	Non-contact input (transistor)	Input time
NPN	ON: Shorted to 0 V (Sourcing current: 1 mA max.). OFF: Open or shorted to Vcc.	ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc - 1.5 V to Vcc (Leakage current: 0.1 mA max.)	ON: 2 ms min. OFF: 20 ms min.
PNP	ON: Shorted to Vcc (Sinking current: 3 mA max.). OFF: Open or shorted to 0 V.	ON: Vcc - 1.5 V to Vcc (Sinking current: 3 mA max.) OFF: 1.5 V max. (Leakage current: 0.1 mA max.)	

- *4. The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.

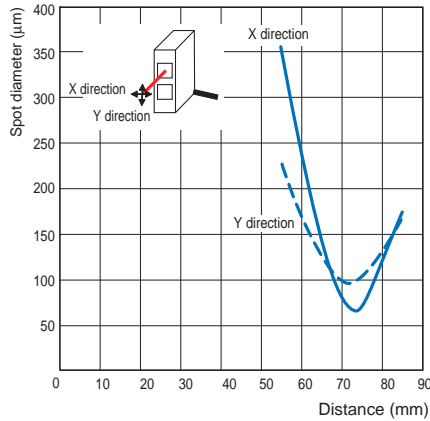
Item	Type	Standard models		Model for Sensor Communications Unit
	NPN output	E3NC-LA21	E3NC-LA7	E3NC-LA0 Available soon.
	PNP output	E3NC-LA51	E3NC-LA9	
Connecting method	Pre-wired	Wire-saving Connector	Connector for Sensor Communications Unit	
Maximum connectable Units	30			
Ambient temperature range	Operating: Groups of 1 or 2 Amplifiers: -25 to 55°C, Groups of 3 to 10 Amplifiers: -25 to 50°C, Groups of 11 to 16 Amplifiers: -25 to 45°C, Groups of 17 to 30 Amplifiers: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation)		Operating: Groups of 1 or 2 Amplifiers: 0 to 55°C, Groups of 3 to 10 Amplifiers: 0 to 50°C, Groups of 11 to 16 Amplifiers: 0 to 45°C, Groups of 17 to 30 Amplifiers: 0 to 40°C Storage: -30 to 70°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)			
Vibration resistance (destruction)	10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			
Shock resistance (destruction)	500 m/s ² for 3 times each in X, Y, and Z directions		150m/s ² for 3 times each in X, Y, and Z directions	
Weight (packed state/Amplifier Unit only)	Approx. 115 g/approx. 75 g	Approx. 60 g/approx. 20 g	Approx. 65 g/approx. 25 g	
Materials	Case: Polycarbonate (PC), Cover: Polycarbonate (PC), Cable: PVC			
Accessories	Instruction Manual			

Engineering Data (Reference Value)

Spot Diameter Vs. Distance E3NC-LH02



E3NC-LH01

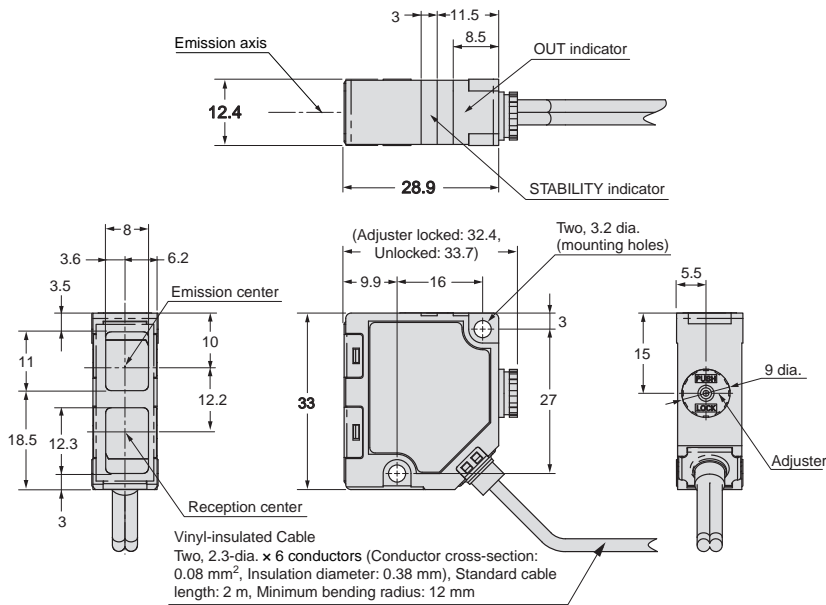


Dimensions

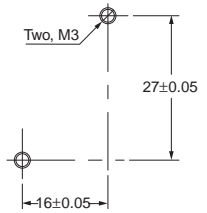
(Unit: mm)
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Heads

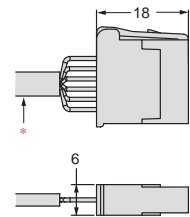
E3NC-LH02



Mounting Holes

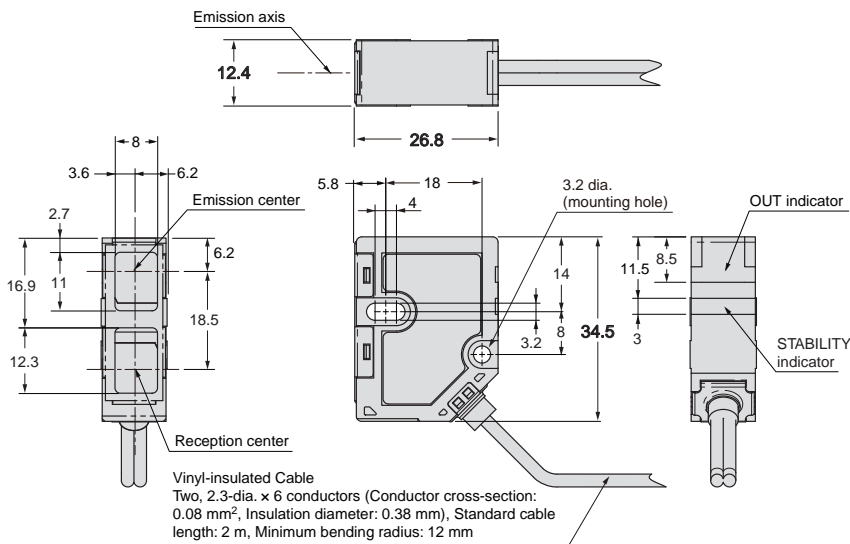


Connector

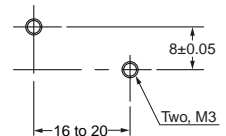


* A blue ID tube is attached.

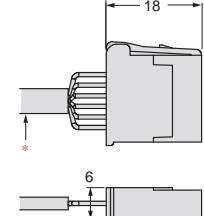
E3NC-LH01



Mounting Holes



Connector



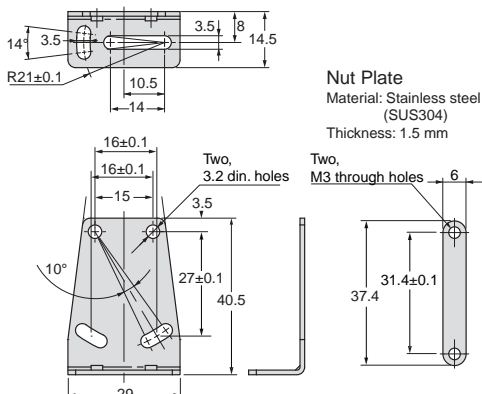
* A blue ID tube is attached.

Accessories (Sold Separately)

Sensor Head Mounting Brackets E39-L185 (for E3NC-LH02)



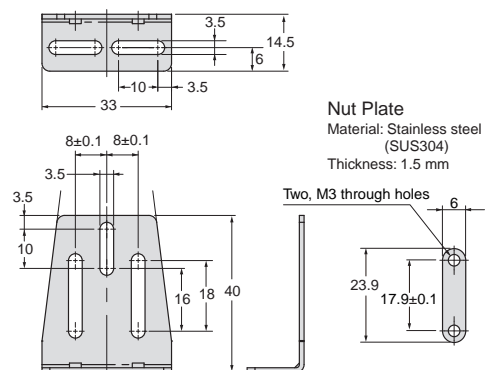
Mounting Bracket
Material: Stainless steel (SUS304)
Thickness: 1.2 mm
Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2
Nut plate: 1



Sensor Head Mounting Brackets E39-L186 (for E3NC-LH01)



Mounting Bracket
Material: Stainless steel (SUS304)
Thickness: 1.2 mm
Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2
Nut plate: 1



Amplifier Units

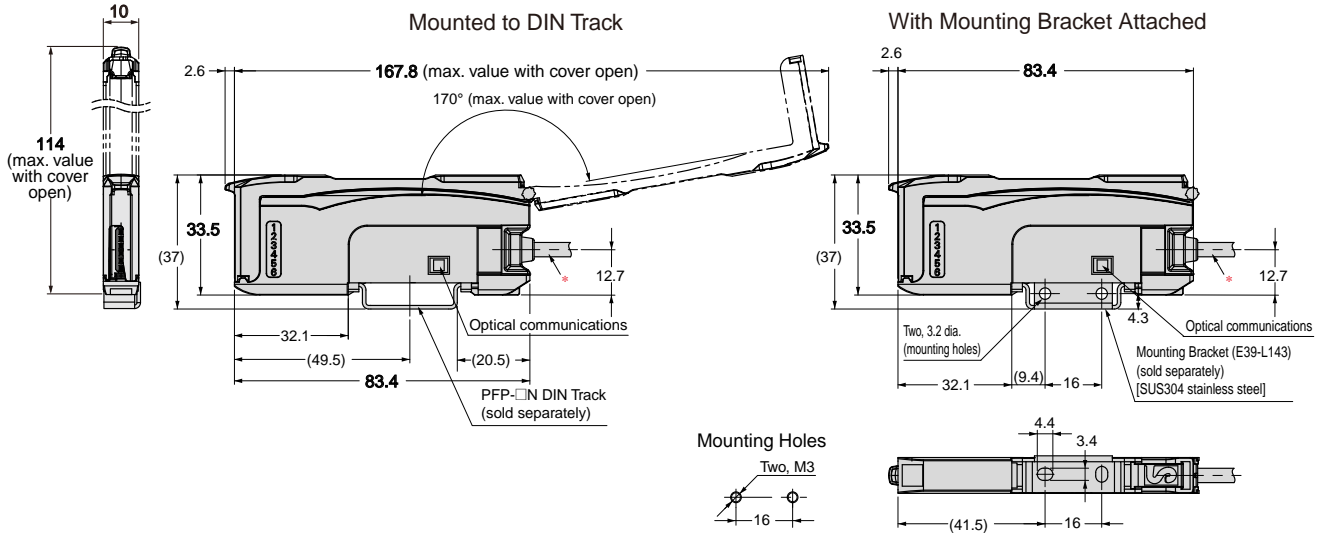
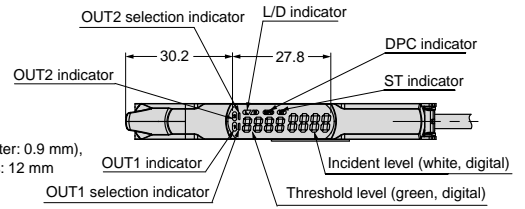
Pre-wired Amplifier Units

E3NC-LA21
E3NC-LA51



***Cable Specifications**

Round vinyl-insulated cable, 4 dia. x 5 conductors
(Conductor cross-section: 0.2 mm², Insulation diameter: 0.9 mm),
Standard cable length: 2 m, Minimum bending radius: 12 mm



E3NC-L series

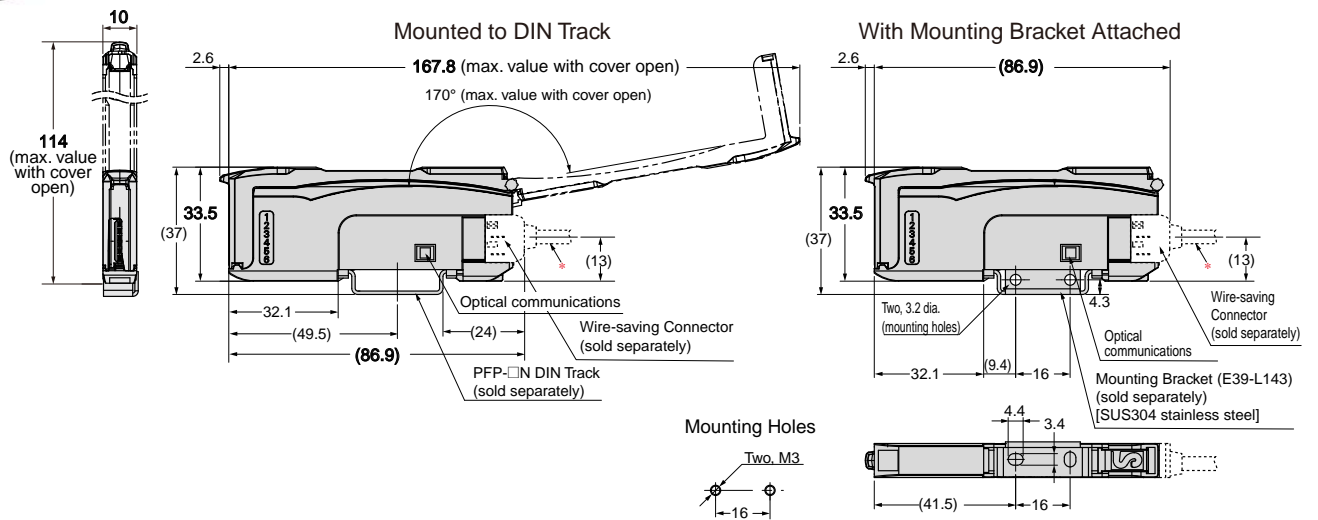
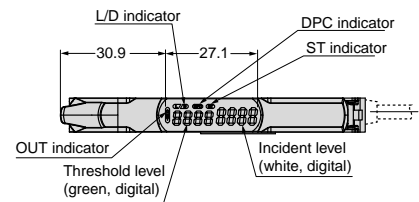
Amplifier Units with Wire-saving Connectors

E3NC-LA7
E3NC-LA9



***Cable Specifications**

Model	Outer diameter	No. of conductors
E3X-CN22	4.0 dia.	2
E3X-CN21	4.0 dia.	4





E3NC-SH100/SH250

A Compact Body That Delivers Stable Detection Even for Differences in Color, Material, or Surface Conditions

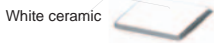
Stable Reliable

OMRON's Unique HSDR-CMOS (High Speed and Dynamic Range)

Dynamic Range of 500,000 Times

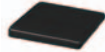
The shutter time of the CMOS is adjusted to the workpiece. And then the emission power is adjusted to optimize the amount of dispersed light that is received.

Measuring Bright Workpieces



White ceramic

Measuring Dark Workpieces



Black rubber



Short CMOS shutter time



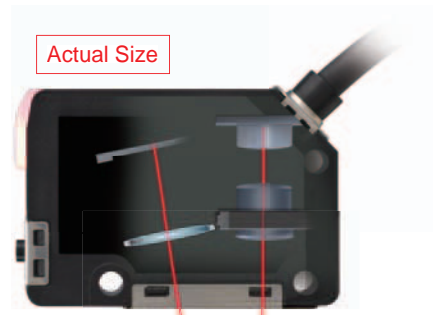
Long



Weak Laser emission power

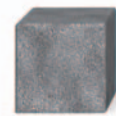


Strong



Actual Size

*This is a conceptual illustration.



Cast metal



Glossy metal



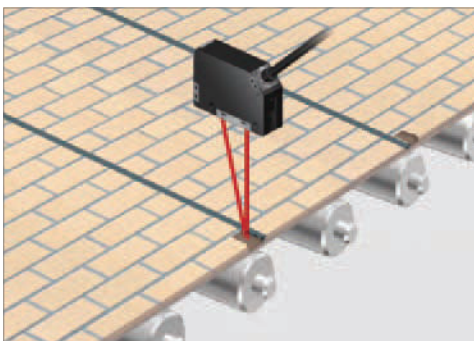
Black rubber



White ceramic

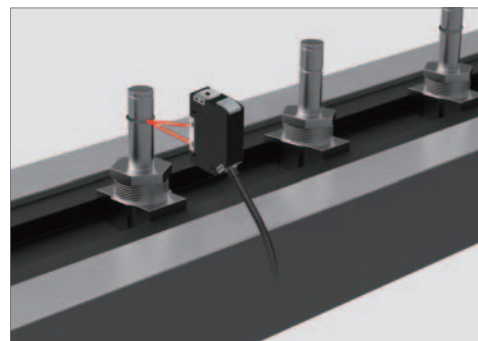
Application

Detecting the Presence of Exterior Wall Material



With the CMOS Sensor, stable detection is possible even if the workpiece's color or surface conditions are not consistent.

O-ring Presence Detection

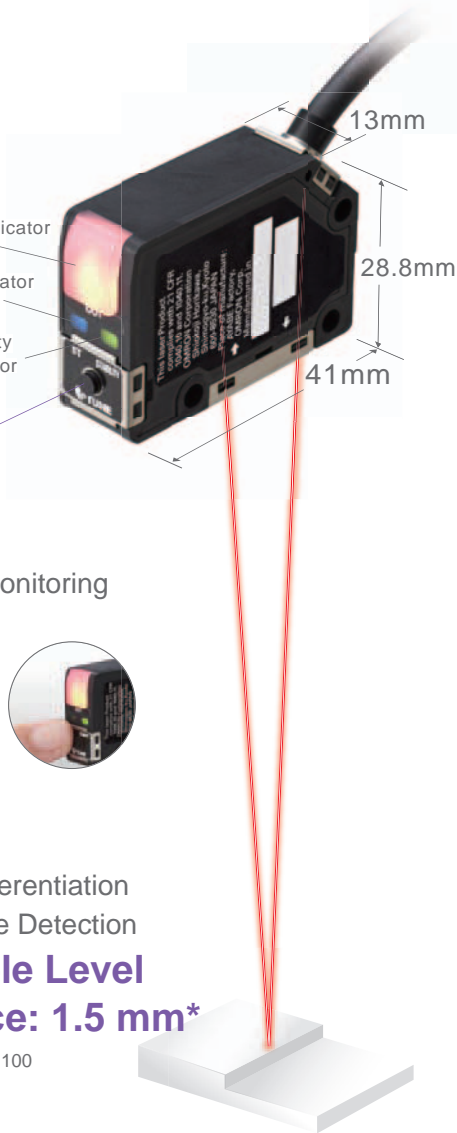


With the CMOS Sensor, stable detection is possible even with low-reflectance workpieces.

Stable | Reliable

Large Indicators to Easily See the Status
**OUT indicator ,
ST indicator**

OUT indicator
ST indicator
Stability indicator



Reliable

Superior Flexibility Even for Application on Moving Parts
Robot Cables

Easy | Reliable

Installation in Limited Space
The industry's smallest CMOS laser head*.

*Based on November 2012 OMRON investigation.

Easy

Perform Tuning While Monitoring the Workpiece



TUNE Button PAT.P



Stable

Distance Differentiation Means Stable Detection

**Detectable Level
Difference: 1.5 mm***

*With the E3NC-SH100

Reliable

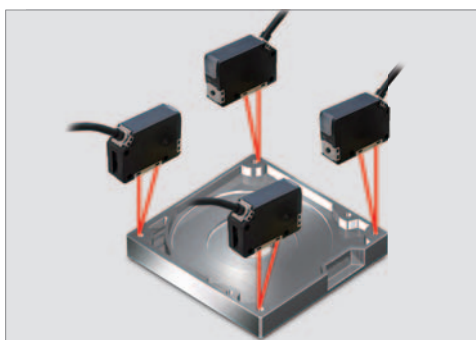
Applicable in Essentially Any Equipment Environment

IP67

Laser Class 1

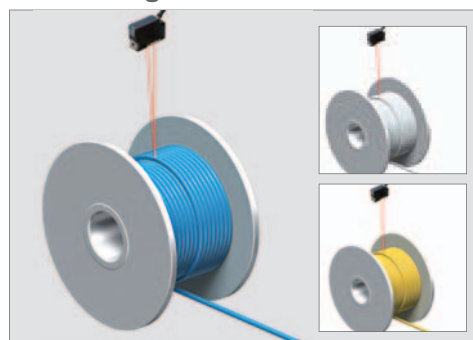
Application

Detecting Holes Made in Metal Parts



The Sensors are influenced very little by the surface conditions of the workpiece, so level differences on metal surfaces can be stably detected.

Detecting the Amount of Remaining Cable



The Sensors are influenced very little by the color of the workpiece, so readjustment is not necessary when switching to a different color of cable.

Laser Amplifier Units (CMOS Type)
E3NC-SA

Consistent Operating Methods for All N-Smart Amplifier Units

Easy

Clear, Reliable Confirmation Even from a Distance

Industry First!* White on black display characters for high visibility.

* Based on November 2012 OMRON investigation.

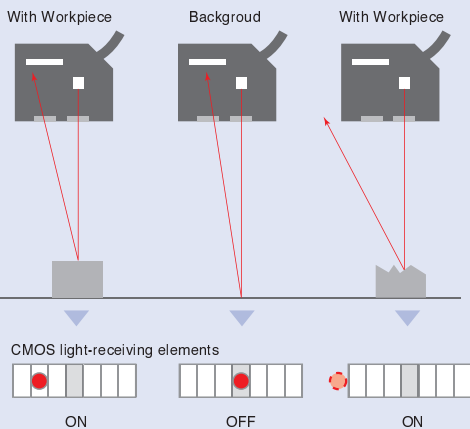


Easy Stable

Stable Detection of Everything But the Background

Tuning without a Workpiece

The background is used as a reference to detect everything but the reference. The surface conditions or inclination of the workpiece do not influence detection, so stable detection is maintained without changing the settings even if the workpiece is changed.



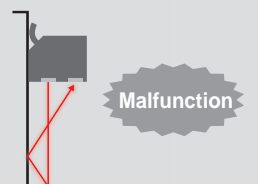
Stable

Malfunction Prevention for Stray Light

Background Suppression PAT.P

Previously:
Unexpected Malfunctions

CMOS sensors are highly sensitive and even detect weak light that has reflected off of the walls or surrounding objects.



With the E3NC-SA:
Background Suppression and Prevent Malfunctions TUNE

The incident light level from the workpiece is recorded as the reference level and outputs are given only for values that are near that level. This prevents malfunctions from stray light.

ST indicator lights

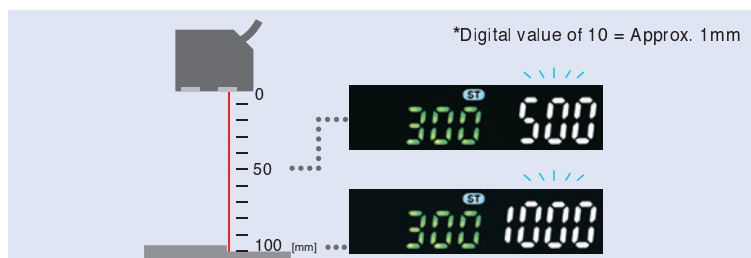


Point





Easy Adjustment after Head Installation
Easy-to-understand Distance Display (*Target)

You can see the distance at a glance, which simplifies adjustment. After Head installation, you can reduce adjustment time after line switchovers and reduce line stoppage time.






Ordering Information

Sensor Heads

Appearance	Sensing distance				Model
	35 to 250 mm				E3NC-SH250 2M
	35 to 100 mm				E3NC-SH100 2M

Amplifier Units



Connecting method	Appearance	Inputs/outputs	Model	
			NPN output	PNP output
Pre-wired (2 m)		2 outputs + 1 input	E3NC-SA21 2M	E3NC-SA51 2M
Wire-saving Connector		1 output + 1 input	E3NC-SA7	E3NC-SA9
Connector for Sensor Communications Unit		2 outputs	E3NC-SA0	Available soon.

Accessories (Sold Separately)

Sensor Head Accessories

Sensor Head Mounting Brackets



A Mounting Bracket is not provided with the Sensor Head. It must be ordered separately as required.

Applicable Sensor Head	Appearance	Model	Quantity	Contents
E3NC-SH250 E3NC-SH100		E39-L187	1	Mounting Bracket: 1 Nut plate: 1 Phillips screws (M3x18): 2
		E39-L188	1	

Amplifier Unit Accessories

Wire-saving Connectors (Required for models for Wire-saving Connectors.)

A Connector is not provided with the Amplifier Unit. It must be ordered separately. *Protective stickers are provided.

Type	Appearance	Cable length	No. of conductors	Model
Master Connector		2 m	4	E3X-CN21
Slave Connector			2	E3X-CN22

* This catalog mentions factors necessary to choice mainly.
For details, refer to OMRON website (www.ia.omron.com).

Sensor Heads

Item	Sensing method Model	Distance-settable	
		E3NC-SH250	E3NC-SH100
Light source (wavelength)*1	Visible semiconductor laser diode (660 nm), 100 μW max. (JIS Class 1, IEC/EN Class 1, and FDA Class 1)		
Measurement range	35 to 250 mm (display value: 350 to 2,500)		35 to 100 mm (display value: 350 to 1,000)
Standard detected level difference *2	35 to 180mm: 9 mm 180 to 250 mm: 25 mm		35 to 50 mm: 1.5 mm 50 to 100 mm: 3 mm
Spot diameter*3	Approx. 1 mm (at 250 mm)		Approx. 0.5 mm (at 100 mm)
Ambient illumination	Illumination on received light surface: 2,000 lx max. of incandescent light, 4,000 lx max. of sunlight		Illumination on received light surface: 4,000 lx max. of incandescent light, 8,000 lx max. of sunlight
Ambient temperature range	Operating: -10 to 50°C; Storage: -25 to 70°C (with no icing or condensation)		
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)		
Vibration resistance (destruction)	10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions		
Shock resistance (destruction)	500 m/s ² 3 times each in X, Y, and Z directions		
Degree of protection	IEC IP67		
Connecting method	Pre-wired connector (Standard cable length: 2 m)		
Materials	Case: Polybutylene terephthalate (PBT), Lens: Methacrylic resin, Cable: PVC		
Weight (packed state/Sensor Head only)	Approx. 125 g/approx. 75 g		
Accessories	Instruction Manual		

Note: Incorrect detection may occur outside the measurement range if the object has a high reflection factor.

*1. These Sensors are classified as Class 1 laser devices under IEC 60825-1 and the regulations of Laser Notice No. 50 for FDA certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number : 1220691)

*2. The values were measured at the center of the sensing distance using OMRON's standard sensing object (white ceramic).

*3. Spot diameter: Defined as 1/e² (13.5 %) of the minimum diameter (actual value) in the measurement range.

False detections can occur 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, correct measurement values may not be obtained if the workpiece is smaller than the spot diameter.

Amplifier Units

Item	Type	Standard models		Model for Sensor Communications Unit
	NPN output	E3NC-SA21	E3NC-SA7	E3NC-SA0 Available soon.
	PNP output	E3NC-SA51	E3NC-SA9	
Connecting method	Pre-wired	Wire-saving Connector	Connector for Sensor Communications Unit	
Inputs/ outputs	Outputs	2 outputs	1 output	2 outputs
	External inputs	1 input	1 input	---
Power supply voltage	10 to 30 VDC, including 10% ripple (p-p)			
Power consumption *1	At Power Supply Voltage of 24 VDC Normal mode: 1,920 mW max. (Current consumption: 80 mA max.) Power saving eco mode: 1,680 mW max. (Current consumption: 70 mA max.)			
Control outputs *2	Load power supply voltage: 30 VDC max., open-collector output Load current: Groups of 1 to 3 Amplifiers: 100 mA max., Groups of 4 to 30 Amplifiers: 20 mA max. (Residual voltage: At load current of less than 10 mA: 1 V max. At load current of 10 to 100 mA: 2 V max.) OFF current: 0.1 mA max.		---	
External inputs	Refer to *3.			
Protection circuits	Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection		Power supply reverse polarity protection and output short-circuit protection	
Response time	Super-high-speed mode (SHS) *4: Operate or reset: 1.5 ms, High-speed mode (HS): Operate or reset: 5 ms, Standard mode (Std): Operate or reset: 10 ms, Giga-power mode (GIGA): Operate or reset: 50 ms			
Sensitivity adjustment	Smart Tuning (2-point tuning, full auto tuning, 1-point tuning, tuning without workpiece, 2-point area tuning, 1-point area tuning, or area tuning without workpiece), or manual adjustment			
No. of Units for mutual interference prevention	Super-high-speed mode (SHS) *4: 0, High-speed mode (HS): 2, Standard mode (Std): 2, Giga-power mode (GIGA): 2			
Functions	Timer / Zero reset / Resetting settings / Eco mode / Bank switching (select from banks 1 to 4) / Output 1 / Output 2 (except E3NC-SA7 and E3NC-SA9) / External input (except E3NC-SA0) / Keep function *5 / Background suppression *6 / Hysteresis width			

*1. At Power Supply Voltage of 10 to 30 VDC.

Normal mode: 2,250 mW max. (Current consumption: 75 mA max. at 30 VDC, 145 mA max. at 10 VDC)

Power saving eco mode: 1,950 mW max. (Current consumption: 65 mA max. at 30 VDC, 125 mA max. at 10 VDC)

*2. The total for both outputs of a model with 2 outputs is 100 mA max. (Residual voltage: Load current of less than 10 mA: 1 V max., Load current of 10 to 100 mA: 2 V max.)

*3. The following details apply to the input.

	Contact input (relay or switch)	Non-contact input (transistor)	Input time
NPN	ON: Shorted to 0 V (Sourcing current: 1 mA max.). OFF: Open or shorted to Vcc.	ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc - 1.5 V to Vcc (Leakage current: 0.1 mA max.)	ON: 2 ms min. OFF: 20 ms min.
PNP	ON: Shorted to Vcc (Sinking current: 3 mA max.). OFF: Open or shorted to 0 V.	ON: Vcc - 1.5 V to Vcc (Sinking current: 3 mA max.) OFF: 1.5 V max. (Leakage current: 0.1 mA max.)	

*4. The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.

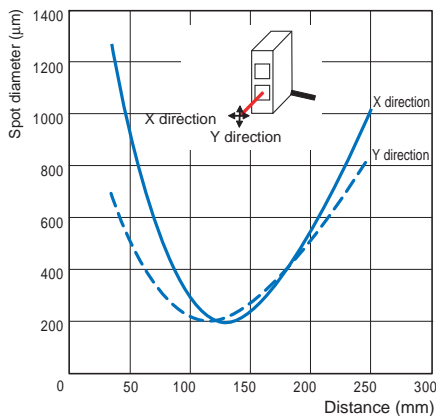
*5. The output for a measurement error is set. ON: The value of the output from before the measurement error is retained. OFF: The output is turned OFF when a measurement error occurs.

*6. Only the sensing object is detected when tuning.

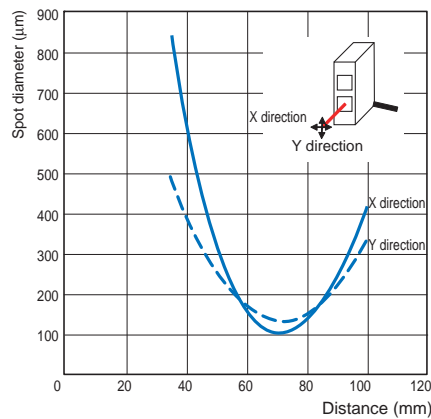
Item	Type	Standard models		Model for Sensor Communications Unit
	NPN output	E3NC-SA21	E3NC-SA7	E3NC-SA0 Available soon.
	PNP output	E3NC-SA51	E3NC-SA9	
Connecting method	Pre-wired	Wire-saving Connector	Connector for Sensor Communications Unit	
Maximum connectable Units	30			
Ambient temperature range	Operating: Groups of 1 or 2 Amplifiers: -25 to 55°C, Groups of 3 to 10 Amplifiers: -25 to 50°C, Groups of 11 to 16 Amplifiers: -25 to 45°C, Groups of 17 to 30 Amplifiers: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation)		Operating: Groups of 1 or 2 Amplifiers: 0 to 55°C, Groups of 3 to 10 Amplifiers: 0 to 50°C, Groups of 11 to 16 Amplifiers: 0 to 45°C, Groups of 17 to 30 Amplifiers: 0 to 40°C Storage: -30 to 70°C (with no icing or condensation)	
Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)			
Vibration resistance (destruction)	10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions			
Shock resistance (destruction)	500 m/s ² for 3 times each in X, Y, and Z directions		150 m/s ² for 3 times each in X, Y, and Z directions	
Weight (packed state/Amplifier Unit only)	Approx. 115 g/approx. 75 g	Approx. 60 g/approx. 20 g	Approx. 65 g/approx. 25 g	
Materials	Case: Polycarbonate (PC), Cover: Polycarbonate (PC), Cable: PVC			
Accessories	Instruction Manual			

Engineering Data (Reference Value)

Spot Diameter Vs. Distance E3NC-SH250



E3NC-SH100



Dimensions

(Unit: mm)

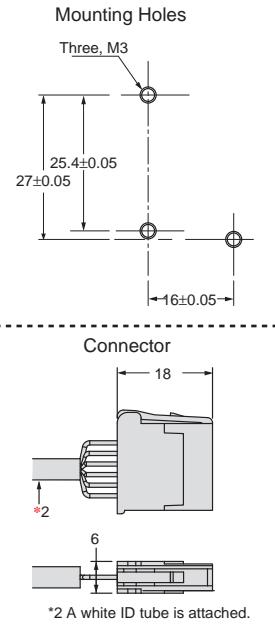
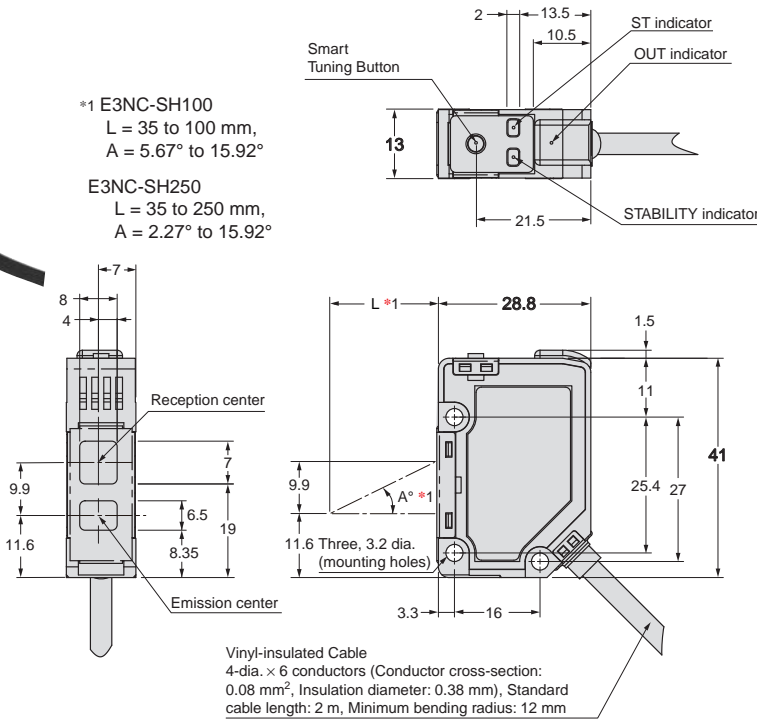
Tolerance class IT16 applies to dimensions in this data sheet unless otherwise specified.

Sensor Heads

E3NC-SH250
E3NC-SH100



*1 E3NC-SH100
L = 35 to 100 mm,
A = 5.67° to 15.92°
E3NC-SH250
L = 35 to 250 mm,
A = 2.27° to 15.92°



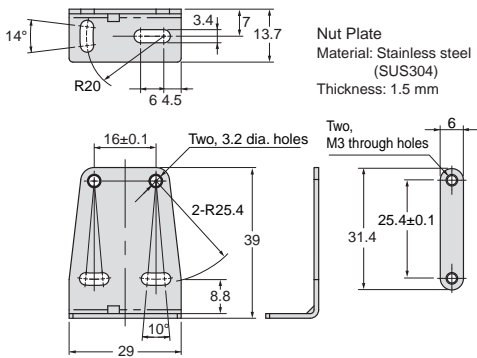
Accessories (Sold Separately)

Sensor Head Mounting Brackets

E39-L187



Mounting Bracket
Material: Stainless steel (SUS304)
Thickness: 1.2 mm
Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2
Nut plate: 1

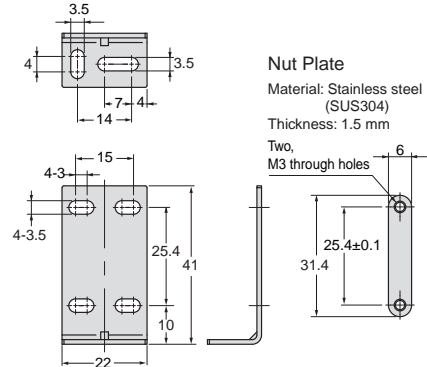


Sensor Head Mounting Brackets

E39-L188



Mounting Bracket
Material: Stainless steel (SUS304)
Thickness: 1.2 mm
Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2
Nut plate: 1



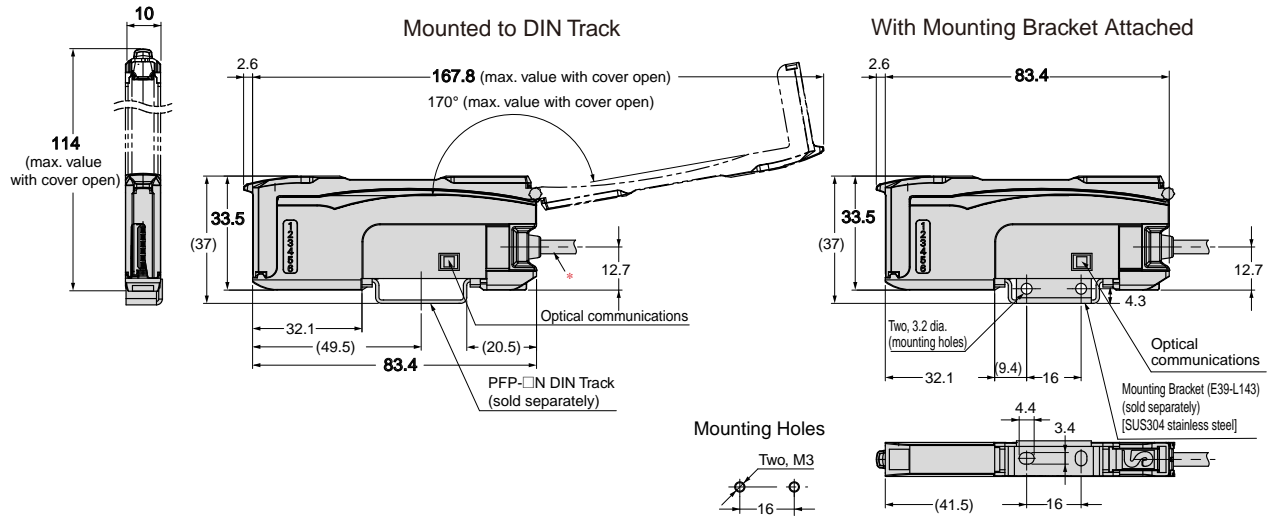
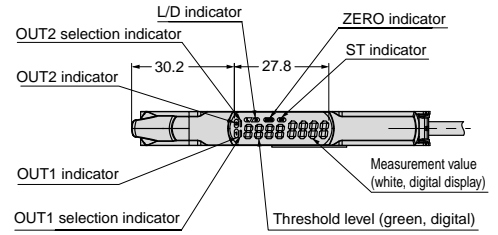
Amplifier Units

Pre-wired Amplifier Units

E3NC-SA21
E3NC-SA51



*Cable Specifications
Round vinyl-insulated cable, 4 dia. x 5 conductors (Conductor cross-section: 0.2 mm², Insulation diameter: 0.9 mm), Standard cable length: 2 m, Minimum bending radius: 12 mm



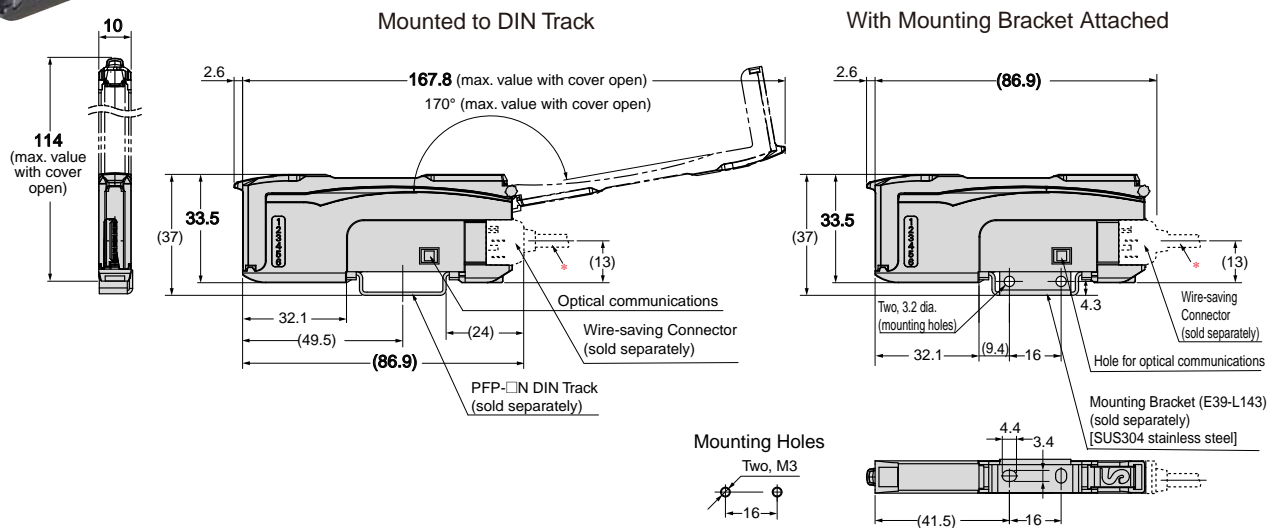
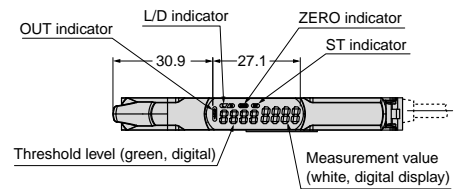
Amplifier Units with Wire-saving Connectors

E3NC-SA7
E3NC-SA9



*Cable Specifications

Model	Outer diameter	No. of conductors
E3X-CN22	4.0 dia.	2
E3X-CN21	4.0 dia.	4



The N-Smart Lineup

E3NX-FA
Fiber Amplifier Units
Cat. No. E426

N-Smart Amplifier Units
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E3NC-S
Ultra-compact CMOS Laser Sensors

E3NC-L
Compact Laser Sensors

E3NW
Sensor Communications Units
Cat. No. E428

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N-Smart
Presence Detection Measurement

Applications with Many Sensors:
More convenience and even lower costs with a network.

Laser Sensor Introduction

OMRON provides many models of Laser Sensors.

CMOS Laser Sensors with Built-in Amplifier
ZX1

Catalog No. E416



CMOS Laser Displacement Sensors
ZX2

Catalog No. E406



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OMRON Corporation Industrial Automation Company
Tokyo, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.
Sensor Business Unit
Carl-Benz-Str. 4, D-71154 Nufringen, Germany
Tel: (49) 7032-811-0/Fax: (49) 7032-811-199

OMRON ELECTRONICS LLC
One Commerce Drive Schaumburg,
IL 60173-5302 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.
No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.
Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

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