E3NC

CSM_E3NC_DS_E_2_1

Ideal for Applications That Cannot Be Handled with Fiber Sensors or Photoelectric Sensors

- A wide variety of easy-to-use Laser Photoelectric Sensor Heads.
 - Coaxial Retro-reflective Models (E3NC-LH03).
 - Long-distance, variable spot, Diffuse-reflective Models (E3NC-LH02)
 - Small-spot (0.1 mm dia.), Limited-reflective Models (E3NC-LH01).
 - CMOS Reflective Models (E3NC-SH series).
- Smart Tuning to achieve stable detection with easy setup.
- White on black display characters for high visibility.
- Robot cables for reliable operation in harsh environments.



Refer to the *Safety Precautions* on page 14.



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

Features

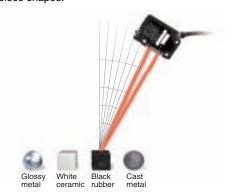
Retro-reflective Models: E3NC-LH03

- Maximum sensing distance of 8 m.
- Stable detection of many types of workpieces.
- Stable detection of highly transparent films.

8 m

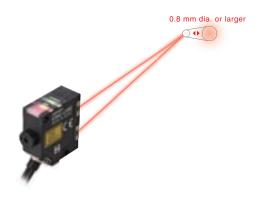
CMOS Laser, Reflective Models: E3NC-SH250H/SH250/SH100

- Stable detection even for different workpiece colors and materials.
- Stable detection for inclined Head installation and different workpiece shapes.



Diffuse-reflective Models: E3NC-LH02

- Long-distance detection at up to 1.2 m.
- Spot can be adjusted to the workpiece or application.



Amplifier Units

- Same shape as Fiber Amplifier Units plus easy operation.
- Smart Tuning with one button.



Ordering Information

Sensor Heads: E3NC-L Compact Laser Sensor Series (Dimensions → page 17)

| Sensing method | Appearance | Beam shape | Sensir | ng distan | се | Laser class | Cable length | Model | | | | | | | |
|-----------------------------------|------------|---------------|--------------|-----------|----------|----------------|---------------|---------------|---------------|---------------|------------|--------------|---------|---------|--------------|
| Coaxial Retro- reflective with | | Spot | | | 18 m * | | 2 m | E3NC-LH03 2M | | | | | | | |
| MSR function | | Эрог | |)) | 0 111 | | 5 m | E3NC-LH03 5M | | | | | | | |
| Diffuse- | | Variable spot | Variable spo | Variable | | | Variable spot | Variable spot | Variable spot | Variable spot | Market and | Warishla and | Class 1 | 2 m | E3NC-LH02 2M |
| reflective | | | | | Valiable | variable spot | | | | | | 1.2 m | | Class I | 5 m |
| Limited- | | Const | 70+1 | 5 mm | | | 2 m | E3NC-LH01 2M | | | | | | | |
| reflective | 议 | Spot | 70±1 | S IIIII | | | 5 m | E3NC-LH01 5M | | | | | | | |

^{*} These values apply when an E39-R21, E39-R22, E39-RS10, or E39-RS11 Reflector is used. A Reflector is not included. Purchase a Reflector separately to match the intended use of the Sensor.

Note: Only an E3NC-LA□□ Amplifier Unit can be connected.

Amplifier Units: E3NC-L Compact Laser Sensor Series (Dimensions → page 19)

| Connecting method | Annogranco | Appearance Inputs/outputs | | odel |
|---|------------|---------------------------|--------------|--------------|
| Connecting method | Appearance | inputs/outputs | 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 |
| M8 Connector | | 1 output + 1 input | E3NC-LA24 | E3NC-LA54 |
| Connector for Sensor Communications Unit * | | | E3NC-LA0 | |

 $^{^{\}star}\,$ A Sensor Communications Unit is required if you want to use the Amplifier Unit on a network. Note: Only an E3NC-LH Sensor Head can be connected.

Sensor Heads: E3NC-S Ultra-compact CMOS Laser Sensor Series (Dimensions → page 18)

| Sensing method | Appearance | Beam shape | Measurement range | Laser class | Cable length | Model |
|-------------------|------------|------------|-------------------|----------------|--------------|----------------|
| | | | 35 to 250 mm | Class 2 | 2 m | E3NC-SH250H 2M |
| Distance-settable | | Spot | 35 to 250 min | | 2 m | E3NC-SH250 2M |
| | | | 35 to 100 mm | Class 1 | 2 m | E3NC-SH100 2M |

Note: Only an E3NC-SA□□ Amplifier Unit can be connected.

Amplifier Units: E3NC-S Ultra-compact CMOS Laser Sensor Series (Dimensions → page 19)

| Connecting method | Appearance Inputs/outputs – | | M | odel |
|---|-----------------------------|---------------------|--------------|--------------|
| Connecting method | Appearance | inputs/outputs | 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 |
| M8 Connector | | 1 output + 1 input | E3NC-SA24 | E3NC-SA54 |
| Connector for Sensor Communications Unit * | | | E3NC-SA0 | |

^{*} A Sensor Communications Unit is required if you want to use the Amplifier Unit on a network. **Note:** Only an E3NC-SH□□ or E3NC-SH□□H Sensor Head can be connected.

Accessories (Sold Separately) Sensor Head Accessories

Reflectors for Retro-reflective Sensors (Dimensions → page 21)

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

| Applicable Sensor Head | Appearance | Model | Quantity |
|------------------------|------------|----------|----------|
| | | E39-R21 | |
| Fano Luca | | E39-R22 | 4 |
| E3NC-LH03 | | E39-RS10 | 1 |
| | | E39-RS11 | |

Lens Attachments for Sensor Heads (Dimensions → page 21)

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

| Applicable Sensor Head | Appearance | Model | Quantity |
|---------------------------|------------|---------|----------|
| E3NC-LH03 | | E39-P51 | |
| E3NC-LH02 | 100 | E39-P52 | 1 |

Note: You can combine the Lens Attachment with an applicable Sensor Head to create a line beam.

Sensor Head Mounting Brackets (Dimensions → page 22)

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-LH03 | (· · · · | E39-L190 | | |
| E3NC-LH02 | | E39-L185 | | |
| E3NC-LH01 | | E39-L186 | 1 | Mounting Bracket: 1 Nut plate: 1 Phillips screws (M3×18): 2 |
| E3NC-SH250H E3NC-SH250 | | E39-L187 | | |
| E3NC-SH100 | | E39-L188 | | |

Amplifier Unit Accessories

Wire-saving Connectors (Required for models for Wire-saving Connectors.) (Dimensions → page 26)
Connectors are not provided with the Amplifier Unit and must be ordered separately. *Protective stickers are provided.

| Туре | Appearance | Cable length | No. of conductors | Model |
|------------------|------------|--------------|-------------------|----------|
| Master Connector | * | 2 m | 4 | E3X-CN21 |
| Slave Connector | * | 2 111 | 2 | E3X-CN22 |

Sensor I/O Connectors (Required for models for M8 Connectors.) (Dimensions → page 26)

Connectors are not provided with the Amplifier Unit and must be ordered separately.

| Size | Cable | Appe | arance | Cable | e type | Model |
|------|----------------|---|--------|-------|-----------------|-----------------|
| | | Straight | | 2 m | | XS3F-M421-402-A |
| MO | Ctondord coblo | Straight | 5 m | 4 | XS3F-M421-405-A | |
| M8 | Standard cable | L-shaped | | 2 m | 4-wire | XS3F-M422-402-A |
| | | _ = =================================== | | 5 m | | XS3F-M422-405-A |

Note: For details, refer to XS3 which can be accessed from your OMRON website.

Amplifier Unit Mounting Bracket (Dimensions → page 27)

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

| Appearance | Model | Quantity |
|------------|----------|----------|
| | E39-L143 | 1 |

Note: For details, refer to Mounting Brackets on E39-L/E39-S/E39-R which can be accessed from your OMRON website.

DIN Track (Dimensions → page 27)

A DIN Track is not provided with the Amplifier Unit. It must be ordered separately as required.

| Appearance | Туре | Model | Quantity |
|------------|----------------------------------|----------|----------|
| | Shallow type, total length: 1 m | PFP-100N | |
| | Shallow type, total length: 0.5m | PFP-50N | 1 |
| | Deep type, total length: 1 m | | |

End Plate (Dimensions → page 27)

Two End Plates are provided with the Sensor Communications Unit. End Plates are not provided with the Amplifier Unit. They must be ordered separately as required.

| Appearance | Model | Quantity |
|------------|-------|----------|
| 3 | PFP-M | 1 |

Related Products

Sensor Communications Units

| Туре | Appearance | Model |
|--|------------|----------|
| Sensor Communications Unit for EtherCAT | | E3NW-ECT |
| Sensor Communications Unit for CompoNet *1 | | E3NW-CRT |
| Sensor Communications Unit for CC-Link *1 | * | E3NW-CCL |
| Distributed Sensor Unit *2 | | E3NW-DS |

*1. Refer to your OMRON website for details.

EtherCAT® is a registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

CompoNet is a registered trademark of the ODVA. CC-Link is a registered trademark of Mitsubishi Electric Corporation. The trademark is managed by the CC-Link Partner Association.

^{*2.} The Distributed Sensor Unit can be connected to any of the Sensor Communications Units.

Ratings and Specifications

Compact Laser Sensors: E3NC-L

Sensor Heads

| Sensing method | | ng method | | ro-reflective I function | Diffuse- | reflective | Limited- reflective |
|-----------------------------|----------------------------|-------------|---|---|----------------------------------|--|---------------------------------|
| Item | | Model | E3NC-LH03 | E3NC-LH03+ E39-P51 | E3NC-LH02 | E3NC-LH02+ E39-P52 | E3NC-LH01 |
| Light source | (wavelength) | '1 | | or laser diode (660 n N Class 1, and FDA C | | ge output: 315 μW) | |
| | Giga-power (GIGA) | mode | 8 m | | 1,200 mm | 1,000 mm | |
| Sensing | Standard mo | de (Stnd) | 6 m | 0.5 m | 750 mm | 600 mm | 70±15 mm |
| distance*2 | High-speed | mode (HS) | 3.5 m | 0.5 111 | 250 mm | 200 mm | 70±15 IIIII |
| | Super-high-s mode (SHS) | speed | 2 m | | 200 mm | 150 mm | |
| Beam shape | | | Spot | Line | Spot | Line | Spot |
| Beam size*3 | | | Approx. 2 mm dia. at 1 m | Line length: Approx. 25 mm at 250 mm Line length: Approx. 50 mm at 500 mm | Approx. 0.8 mm dia. at 300 mm | Line length: Approx. 45 mm at 500 mm Line length: Approx. 100 mm at 1,000 mm | Approx. 0.1 mm dia. at 70 mm |
| Differential d | istance*4 | | 10% of sensing distance max. | | | | |
| Indicators | | | OUT indicator (orange) and STABILITY indicator (green) | | | | |
| Ambient illun | nination (Rece | eiver side) | Incandescent lamp: Sunlight: 20,000 lx r | | | | |
| Ambient tem | perature rang | е | Operating: -10 to 55°C; Storage: -25 to 70°C (with no icing or condensation) | | | | |
| Ambient hum | nidity range | | Operating and storage: 35% to 85% (with no condensation) | | | | |
| Insulation res | sistance | | 20 MΩ min. (at 500 VDC) | | | | |
| Dielectric str | ength | | 1,000 VAC at 50/60 Hz for 1 min | | | | |
| Vibration res | istance (destr | uction) | 10 to 55 Hz with a 1.5-mm double amplitude or 100 m/s² for 2 hours each in X, Y, and Z directions | | | | nd Z directions |
| Shock resista | ance (destruc | tion) | 500 m/s² for 3 times each in X, Y, and Z directions | | | | |
| Degree of pro | otection | | IEC IP67*5 | | IEC IP65 (E3NC-LF locked.)*5 | 102: Applies only whe | n adjuster is |
| Connecting r | nethod | | Pre-wired connector (standard length: 2 m) | | | | |
| | 0 | Case | Polybutylene terephthalate (PBT) | | | | |
| | Sensor Head | Lens | Methacrylic resin (P | · | | | |
| Materials | | Cable | Vinyl chloride (PVC) | | <u> </u> | | |
| | Lens | Case | | ABS | | ABS | |
| | Attachment | Lens | | Methacrylic resin (PMMA) | | Methacrylic resin (PMMA) | |
| Woight (poeks d | Models with | | Approx. 120 g/appro | ox. 70 g | Approx. 115 g/appr | ox. 65 g | |
| Weight (packed state/Sensor | Models with | 5-m cable | Approx. 180 g/appro | x. 130 g | Approx. 175 g/appr | ox. 125 g | |
| Head only) | Lens Attachn | nent | | Approx. 25 g/ approx. 2 g | | Approx. 25 g/ approx. 2 g | |
| Accessories | | | Instruction Manual | | | • | |

^{*1.} These Sensors excluding the E3NC-LH03 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)
Application to the CDRH (Center for Devices and Radiological Health) is scheduled for the E3NC-LH03.
The values were measured using the OMRON standard sensing object (white paper) for the E3NC-LH01, E3NC-LH02, and E3NC-LH02 + E39-P52.

Measured at the rated sensing distance.

The values for the E3NC-LH03, and E3NC-LH03 + E39-P51 apply when an E39-R21, E39-R22, E39-RS10, or E39-RS11 Reflector is used. Other Reflectors are

 $^{^{\}star}3$. Defined at the 1/e² (13.5%) of the central intensity at the measurement distance. Measurement 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.

The E39-P5 contains a packing to prevent entry of foreign matter. The degree of protection between the E3NC-LH and E39-P5 is not specified.

Amplifier Units

| | | Туре | | Standard models | | Model for Sensor Communications Unit | |
|----------------------------|-----------------|---|---|---|--|--|--|
| | | NPN output | E3NC-LA21 | E3NC-LA7 | E3NC-LA24 | | |
| | | PNP output | E3NC-LA51 | E3NC-LA9 | E3NC-LA54 | E3NC-LA0 | |
| Item | | Connecting method | Pre-wired | Wire-saving Connector | M8 Connector | Connector for Sensor Communications Unit | |
| Inputs/ | Outputs | | 2 outputs | 1 output | | *1 | |
| outputs | External inputs | | 1 input | <u> </u> | | 1 | |
| Power supply voltage | | | 10 to 30 VDC, including 1 | 0% ripple (p-p) | | Supplied from the connector through the communications units | |
| Power consu | mption *2 | | | of 24 VDC / max. (Current consumptions: 1,200 mW max. (Current c | | .) | |
| | | | Load power supply voltag Load current: Groups of 1 Amplifier Units: 20 mA ma | e: 30 VDC max., open-colle to 3 Amplifier Units: 100 mA ax. | ctor output a max., Groups of 4 to 30 | | |
| Control outpu | ıts*3 | | Residual voltage: At load current of less At load current of 10 to | than 10 mA: 1 V max. o 100 mA: 2 V max. | | | |
| | | | OFF current: 0.1 mA max. | | | | |
| External inpu | ts | | Refer to *4. | | | | |
| Indicators | | | 7-segment displays (Sub digital display: green, Main digital display: white) Display direction: Switchable between normal and reversed. OUT indicator (orange), L/D indicator (orange), ST indicator (blue), DPC indicator (green), and OUT selectior indicator (orange, only on models with 2 outputs) | | | | |
| 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 | | |
| | Super-high-spe | eed mode (SHS)*5 | Operate or reset: 80 μs | | | | |
| Response | High-speed mo | ode (HS) | Operate or reset: 250 μs | | | | |
| time | Standard mode | e (Stnd) | Operate or reset: 1 ms | | | | |
| | Giga-power mo | ode (GIGA) | Operate or reset: 16 ms | | | | |
| Sensitivity ad | justment | | | ing, full auto tuning, position to +99%)), or manual adjus | | vity tuning, power tuning, or | |
| No. of Units | Super-high-spe | eed mode (SHS)*5 | 0 | | | | |
| for mutual | High-speed mo | ode (HS) | 2 | | | | |
| interference prevention | Standard mode | e (Stnd) | 2 | | | | |
| | Giga-power mo | ode (GIGA) | 4 | | | | |
| | Dynamic powe | r control (DPC) | Provided | | | | |
| | Timer | | Select from timer disabled, OFF-delay, ON-delay, one-shot, or ON-delay + OFF-delay timer: 1 to 9,999 ms | | | | |
| | Zero reset | | Negative values can be d | isplayed. (Threshold value is | s shifted.) | | |
| | Resetting setti | ngs*6 | , | actory defaults) or user reser | | | |
| | Eco mode | | Select from OFF (digital d | lisplays lit) or ECO (digital di | splays not lit). | | |
| | Bank switching | 9 | Select from banks 1 to 4. | | | | |
| Functions | Power tuning | | Select from ON or OFF. | | | | |
| | Output 1 | | Select from Normal Detec | tion Mode or Area Detection | n Mode. | + | |
| | Output 2 | | Select from normal detection mode, alarm output mode, or error output mode. | _ | | Select from normal detection mode, alarm output mode, or error output mode. | |
| | External input | | Select from input OFF, tu switching. | ning, power tuning, laser OF | F, zero reset, or bank | | |
| | Hysteresis wid | | Select from standard setti | | | 1 | |

^{*1.} Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings.

Normal mode: 1,650 mW max. (Current consumption: 55 mA max. at 30 VDC, 115 mA max. at 10 VDC)

^{*4.} The following details apply to the input.

| | | Contact input (relay or switch) | Non-contact input (transistor) | Input time*4-1 |
|----|----|---------------------------------|---|-----------------|
| NP | PN | | ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc – 1.5 V to Vcc (Leakage current: 0.1 mA max.) | ON: 9 ms min. |
| PN | IP | | ON: Vcc - 1.5 V to Vcc (Sinking current: 3 mA max.) OFF: 1.5 V max. (Leakage current: 0.1 mA max.) | OFF: 20 ms min. |

At Power Supply Voltage of 10 to 30 VDC.

Power saving eco mode: 1,350 mW max. (Current consumption: 45 mA max. at 30 VDC, 80 mA max. at 10 VDC)
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: *3. 2 V max.).

^{*4-1.}Input time is 25 ms (ON)/(OFF) only when (in tUnE) or (in PtUn) input is selected.

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

The bank is not reset by the user reset function or saved by the user save function.

| | Туре | | Model for Sensor Communications Unit | | | |
|---|-------------------|---|---|--------------|--|--|
| | NPN output | E3NC-LA21 | E3NC-LA7 | E3NC-LA24 | E3NC-LA0 | |
| | PNP output | E3NC-LA51 | E3NC-LA9 | E3NC-LA54 | E3NC-LAU | |
| Item | Connecting method | Pre-wired | Wire-saving Connector | M8 Connector | Connector for Sensor Communications Unit | |
| Maximum connectable | Units | 30 | | | | |
| Ambient temperature range | | Operating: Groups of 1 or 2 Amplifier Units: -25 to 55°C, Groups of 3 to 10 Amplifier Units: -25 to 50°C, Groups of 11 to 16 Amplifier Units: -25 to 45°C, Groups of 17 to 30 Amplifier Units: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation) | | | Operating: Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units: 0 to 40°C, Storage: -30 to 70°C (with no icing or condensation) | |
| Ambient humidity rang | е | Operating and storage: 35% to 85% (with no condensation) | | | | |
| Insulation resistance | | 20 MΩ (at 500 VDC) | | | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 min | | | | |
| Vibration resistance (d | estruction) | 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/s² for 3 times each in X, Y, and Z directions | | | 150m/s² 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 | | | | |
| | Case | Polycarbonate (PC) | <u> </u> | - | | |
| Materials | Cover | Polycarbonate (PC) | | | | |
| | Cable | Vinyl chloride (PVC) | Vinyl chloride (PVC) | | | |
| Accessories | | Instruction Manual | | | | |

Accessories

Reflectors

| | | | T. | | |
|--------------------------------------|---|---|---------------------------|--------------------------|--|
| Item Model | E39-R21 | E39-R22 | E39-RS10 | E39-RS11 | |
| Ambient temperature | Operating: -10 to 55°C; S | Storage: -25 to 70°C (with i | no icing or condensation) | | |
| Ambient humidity | Operating/storage: 35% | to 85% (with no condensat | ion) | | |
| Vibration resistance (destruction) | 10 to 55 Hz with a 1.5-mi | 10 to 55 Hz with a 1.5-mm double amplitude or 100 m/s² 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 (E39-R21 and E39-R22 only) | | | | |
| Materials | Reflective surface: Metha Back surface: Polybutyle | | Methacrylic resin (PMMA | .) | |
| Weight (packed state/Reflector only) | Approx. 30 g/approx. 5 g | Approx. 35 g/approx. 10 g | Approx. 26 g/approx. 1 g | Approx. 30 g/approx. 5 g | |
| Accessories | Instruction manual | | | | |

Ultra-compact CMOS Laser Sensor: E3NC-S

Sensor Heads

| Sensing method | | Distance-settable | | | |
|------------------------------|--------------------------|---|--|--|--|
| Item | Model | E3NC-SH250H | E3NC-SH250 | E3NC-SH100 | |
| Light source (wavelength)*1 | | Visible semiconductor laser diode (660 nm), 1 mW (average output: 220 μW) (JIS Class 2, IEC/EN Class 2, and FDA Class 2) Visible semiconductor laser diode output: 100 μW) (JIS Class 1, IEC | | | |
| Measureme | nt range | 35 to 250 mm (display value: 350 | to 2,500) | 35 to 100 mm (display value: 350 to 1,000) | |
| Standard de | etected level difference | 35 to 180mm: 9 mm 180 to 250 mm: 25 mm | | 35 to 50 mm: 1.5 mm 50 to 100 mm: 3 mm | |
| Beam size*3 | 3 | Approx. 1 mm dia. at 250 mm | | Approx. 0.5 mm dia. at 100 mm | |
| Indicators | | OUT indicator (orange), STABILIT | TY indicator (green), and ST indica | tor (blue) | |
| Ambient illu (Receiver si | | Incandescent lamp: 4,000 lx max., Sunlight: 8,000 lx max. | Incandescent lamp: 2,000 lx max., Sunlight: 4,000 lx max. | Incandescent lamp: 4,000 lx max., Sunlight: 8,000 lx max. | |
| Ambient ter | nperature range | Operating: -10 to 50°C; Storage: -25 to 70°C (with no icing or condensation) | | | |
| Ambient hu | midity range | Operating and storage: 35% to 85% (with no condensation) | | | |
| Insulation re | esistance | 20 MΩ min. (at 500 VDC) | | | |
| Dielectric st | rength | 1,000 VAC at 50/60 Hz for 1 min | | | |
| Vibration re | sistance (destruction) | 10 to 55 Hz with a 1.5-mm double amplitude for 2 hours each in X, Y, and Z directions | | | |
| Shock resis | tance (destruction) | 500 m/s ² 3 times each in X, Y, and Z directions | | | |
| Degree of p | rotection | IEC IP67 | | | |
| Connecting | method | Pre-wired connector (Standard cable length: 2 m) | | | |
| | Case | Polybutylene terephthalate (PBT) | | | |
| Materials | Lens | Methacrylic resin (PMMA) | | | |
| Cable | | Vinyl chloride (PVC) | | | |
| Weight (pac only) | ked state/Sensor Head | Approx. 125 g/approx. 75 g | | | |
| Accessories | S | Instruction Manual, laser warning | label (E3NC-SH250H only) | | |

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

Also, when detecting a workpiece that is smaller than the beam size, a correct value may not be obtained.

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)

Beam size: Defined at the 1/e² (13.5 %) of the central intensity at the measurement center distance.

Measurement 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.

Amplifier Units

| | | Туре | | Standard models | | Model for Sensor Communications Unit | |
|----------------------------|-----------------|-------------------|--|---|---------------------------|--|--|
| | | NPN output | E3NC-SA21 | E3NC-SA7 | E3NC-SA24 | | |
| | | PNP output | E3NC-SA51 | E3NC-SA9 | E3NC-SA54 | E3NC-SA0 | |
| Item | | Connecting method | Pre-wired | Wire-saving Connector | M8 Connector | Connector for Sensor Communications Unit | |
| Inputs/ | Outputs | ! | 2 outputs | 1 output | | *1 | |
| outputs | External inputs | | 1 input | | | | |
| Power supply | / voltage | | 10 to 30 VDC, including 1 | 0% ripple (p-p) | | Supplied from the connector through the communications units | |
| Power consu | mption *2 | | | of 24 VDC V max. (Current consumptio : 1,680 mW max. (Current o | |) | |
| | | | | e: 30 VDC max., open-colle to 3 Amplifier Units: 100 m/ x. | | | |
| Control outpo | uts *3 | | Residual voltage: At load current of less At load current of 10 to | than 10 mA: 1 V max. o 100 mA: 2 V max. | | | |
| | | | OFF current: 0.1 mA max. | | | | |
| External inpu | its | | Refer to *4. | | | | |
| Indicators | | | 7-segment displays (Sub digital display: green, Main digital display: white) Display direction: Switchable between normal and reversed. OUT indicator (orange), L/D indicator (orange), ST indicator (blue), ZERO indicator (green), and OUT selection indicator (orange, only on models with 2 outputs) | | | | |
| Protection ci | rcuits | | Power supply reverse polarity protection, output short-circuit protection, and output reverse polarity protection | | | Power supply reverse polarity protection and output short-circuit protection | |
| | Super-high-sp | eed mode (SHS) *5 | Operate or reset: 1.5 ms | | | | |
| Response | High-speed m | ode (HS) | Operate or reset: 5 ms | | | | |
| time | Standard mod | le (Stnd) | Operate or reset: 10 ms | | | | |
| | Giga-power m | ode (GIGA) | Operate or reset: 50 ms | | | | |
| Sensitivity ac | ljustment | | 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 | | | | |
| N411-4- | Super-high-sp | eed mode (SHS) *5 | 0 | | | | |
| No. of Units for mutual | High-speed m | ode (HS) | 2 | | | | |
| interference prevention | Standard mod | le (Stnd) | 2 | | | | |
| prevention | Giga-power m | ode (GIGA) | 2 | | | | |
| | Timer | | Select from timer disabled | l, OFF-delay, ON-delay, one | e-shot, or ON-delay + OFF | delay timer: 1 to 9,999 ms | |
| | Zero reset | | Negative values can be displayed. (Threshold value is shifted.) | | | | |
| | Resetting sett | ings *6 | Select from initial reset (fa | ctory defaults) or user reset | (saved settings). | | |
| | Eco mode | | Select from OFF (digital displays lit) or ECO (digital displays not lit). | | | | |
| | Bank switchin | ıg | Select from banks 1 to 4. | | | | |
| | Output 1 | | Select from Normal detec | tion mode, Area detection m | ode, or hold mode. | | |
| Functions | Output 2 | | Select from Normal detection mode or Error output mode. | _ | - | Select from Normal detection mode or Error output mode. | |
| | External input | | Select from input OFF, tur | ning, laser OFF, zero reset, | or bank switching. | | |
| | Keep function | *7 | Select from ON or OFF. | | | | |
| | Background s | uppression*8 | Select from ON or OFF. | | | | |
| | Hysteresis wid | dth | Select from standard setti | ng or user setting. | | | |

Two sensor outputs are allocated in the programmable logic controller PLC I/O table. PLC operation via Communications Unit enables reading detected values and changing settings. 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)

| | Contact input (relay or switch) | Non-contact input (transistor) | Input time*4-1 |
|-----|---|---|-----------------|
| NPN | | ON: 1.5 V max. (Sourcing current: 1 mA max.) OFF: Vcc – 1.5 V to Vcc (Leakage current: 0.1 mA max.) | ON: 9 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.) | OFF: 20 ms min. |

Power saving eco mode: 1,950 mW max. (Current consumption: 65 mA max. at 30 VDC, 125 mA max. at 10 VDC)
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: *3. 2 V max.). The following details apply to the input.

^{*4-1.}Input time is 25 ms (ON)/(OFF) only when (in tUnE) input is selected.
*5. The mutual interference prevention function is disabled if the detection mode is set to super-high-speed mode.
*6. The bank is not reset by the user reset function or saved by the user save function.

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.

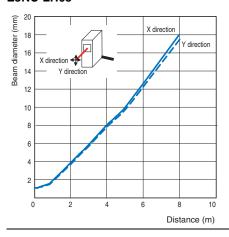
^{*8.} Only the sensing object is detected when tuning.

| | Туре | | Standard models | | Model for Sensor Communications Unit | |
|---|-------------------|---|---------------------------|---|---|--|
| | NPN output | E3NC-SA21 | E3NC-SA7 | E3NC-SA24 | E3NC-SA0 | |
| | PNP output | E3NC-SA51 | E3NC-SA9 | E3NC-SA54 | ESINC-SAU | |
| Item | Connecting method | Pre-wired | Wire-saving Connector | M8 Connector | Connector for Sensor Communications Unit | |
| Maximum connectable l | Units | 30 | | | | |
| Ambient temperature range | | Operating: Groups of 1 or 2 Amplifier Units: -25 to 55°C, Groups of 3 to 10 Amplifier Units: -25 to 50°C, Groups of 11 to 16 Amplifier Units: -25 to 45°C, Groups of 17 to 30 Amplifier Units: -25 to 40°C Storage: -30 to 70°C (with no icing or condensation) | | | Operating: Groups of 1 or 2 Amplifier Units: 0 to 55°C, Groups of 3 to 10 Amplifier Units: 0 to 50°C, Groups of 11 to 16 Amplifier Units: 0 to 45°C, Groups of 17 to 30 Amplifier Units: 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) | | | | |
| Insulation resistance | | 20 MΩ (at 500 VDC) | | | | |
| Dielectric strength | | 1,000 VAC at 50/60 Hz for 1 min | | | | |
| Vibration resistance (de | estruction) | 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/s² for 3 times each in X, Y, and Z directions | | 150 m/s² 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 | | |
| | Case | Polycarbonate (PC) | | | | |
| Materials | Cover | Polycarbonate (PC) | | | | |
| | Cable | Vinyl chloride (PVC) | | | | |
| Accessories | | Instruction Manual | | | | |

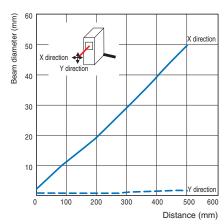
Engineering Data (Reference Value)

Beam Diameter Vs. Distance

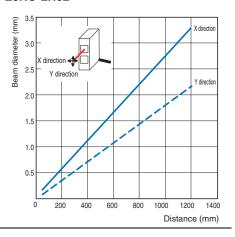
Retro-reflective Model E3NC-LH03



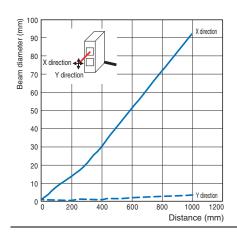
Retro-reflective Model E3NC-LH03 + E39-P51



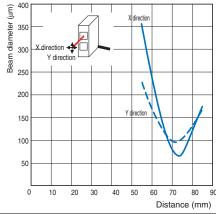
Diffuse-reflective Model E3NC-LH02



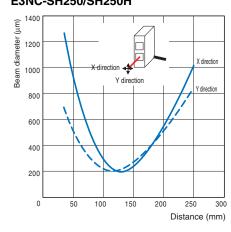
Diffuse-reflective Model E3NC-LH02 + E39-P52



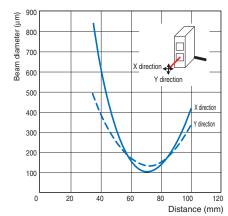
Limited-reflective Model E3NC-LH01



Distance-settable Model E3NC-SH250/SH250H



Distance-settable Model E3NC-SH100

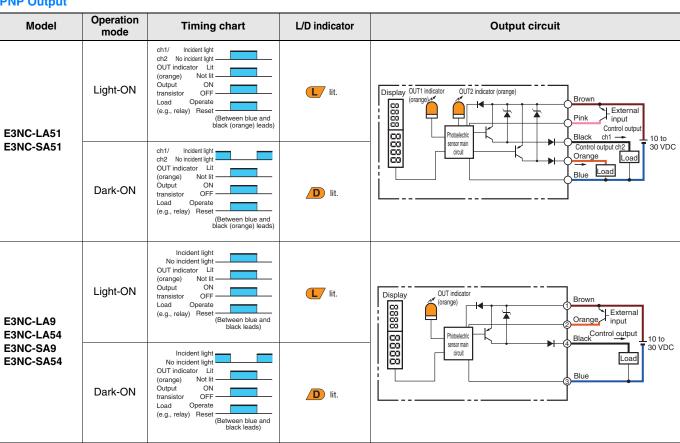


I/O Circuit Diagrams

NPN Output

| Model | Operation mode | Timing chart | L/D indicator | Output circuit |
|--|----------------|---|---------------|--|
| E3NC-LA21 | Light-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black (orange) leads) | L lit. | Display OUTI indicator OUT2 indicator (orange) Brown Control output Load Orange ch1 10 to |
| E3NC-SA21 | Dark-ON | ch1/ Incident light ch2 No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black (orange) leads) | D lit. | Photoeledric sersor main clicult Prink ch2 External Blue input Photoeledric sersor main clicult Prink ch2 External input |
| E3NC-LA7 E3NC-LA24 E3NC-SA7 E3NC-SA24 | Light-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads) | L lit. | Display OUT indicator (orange) Brown Black Load Control output 10 to |
| | Dark-ON | Incident light No incident light OUT indicator Lit (orange) Not lit Output ON transistor OFF Load Operate (e.g., relay) Reset (Between brown and black leads) | D lit. | Photoeledic sersor man divisit and a sersor ma |

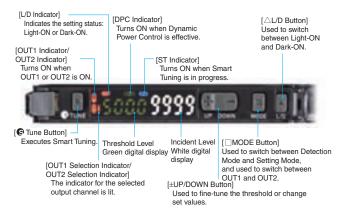
PNP Output



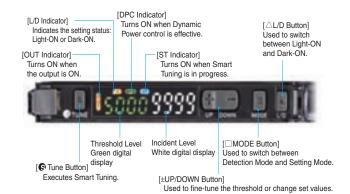
Nomenclature

Compact Laser Sensors

E3NC-LA21/LA51/LA0

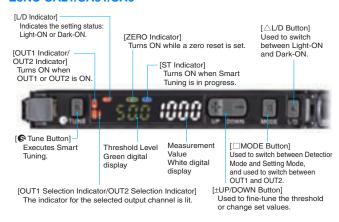


E3NC-LA7/LA9/LA24/LA54

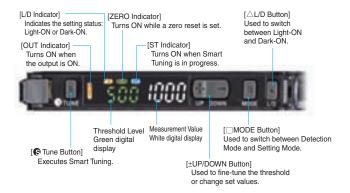


Ultra-compact CMOS Laser Sensors

E3NC-SA21/SA51/SA0

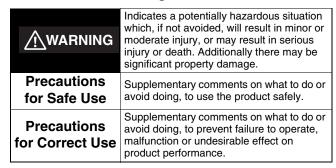


E3NC-SA7/SA9/SA24/SA54



Safety Precautions

To ensure safe operation, be sure to read and follow the Instruction Manual provided with the Sensor. Indication and Meaning for Safe Use



Sensor Heads

Laser Safety

Various safety standards regarding laser devices are stipulated in Japan and abroad. When this Sensor Head is used in Japan and when it is assembled in Japan but exported to a foreign country, the safety standards are classified into three cases.

1. When Using the Sensor Head in Japan

JIS C6802 stipulates the safety measures that must be observed by the user for each type of laser equipment.

E3NC-LH□□ Sensor Heads: Class 1 E3NC-SH□□ Sensor Heads: Class 1 E3NC-SH□□H Sensor Heads: Class 2



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 the Sensor Head. Doing so may cause the laser beam to leak, resulting in a risk of visual impairment.



 The following laser warning label and laser description labels are attached to the sides of the Sensor Heads.

E3NC-LH03





E3NC-LH01 /E3NC-LH02





E3NC-SH□□









2. Using in the USA

When using devices in which the Sensor Head is installed in the USA, the devices are subject to FDA (Food and Drug Administration) laser regulations of the USA.

E3NC-LH03:

These Sensor Heads are classified as Class 1 laser devices under IEC/EN 60825-1 and the regulations of Laser Notice No. 50 for this certification. Application to the CDRH (Center for Devices and Radiological Health) is scheduled.

E3NC-LH01, E3NC-LH02:

These Sensor Heads are classified as Class 1 laser devices under IEC/EN 60825-1 and the regulations of Laser Notice No. 50 for this certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number: 1220690)

E3NC-SH \square , E3NC-SH \square H:

These Sensor Heads are classified as Class 1 or Class 2 laser devices under IEC/EN 60825-1 and the regulations of Laser Notice No. 50 for this certification. CDRH (Center for Devices and Radiological Health) registration has been completed. (Accession Number: 1220691)

For countries other than Japan
Replace the warning label with the corresponding
English label (supplied with SH
H).



3. Using in Europe

E3NC-LH , E3NC-SH ::

These Sensor Heads are classified in Class 1 under EN 60825-1. E3NC-SH□□H:

These Sensor Heads are classified in Class 2 under EN 60825-1.

Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the Sensor Head.

- 1. Installation Environment
- Do not use the Sensor Head in an environment where explosive or flammable gas is present.
- To secure the safety of operation and maintenance, do not install the Sensor Head close to high-voltage devices or power devices.
- 2. Power Supply and Wiring
- Always use an E3NC-LA□□, E3NC-LA0, E3NC-SA□□ or E3NC-SA0 Amplifier Unit. If a different Amplifier Unit is used, damage or fire may occur.
- If you short the cable, reconnect it as specified. If the connections are not correct, damage or fire may occur.
- High-voltage lines and power lines must be wired separately from the Sensor Head. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
- Always turn OFF the power supply before connecting or disconnecting the connectors.
- 3. Installation
- Use screws for installation and tighten the screws securely, but do not exceed the specified tightening torque.
 Specified torque (M3): 0.5 N·m
- 4. Others
- Never disassemble (including removing labels), repair, modify, deform by pressure, or incinerate the Sensor Head. Do not turn the adjuster on the E3NC-LH02 with a force that is greater than 40 mN·m. Damage or fire may occur.
- Dispose of the Sensor Head as industrial waste.
- If you notice any abnormalities, immediately stop using the Sensor Head, turn OFF the power supply, and contact your OMRON representative.

Precautions for Correct Use

Observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on Sensor Head performance.

1. Installation Environment

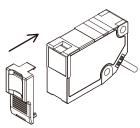
Do not install the Sensor Head in locations subject to the following conditions:

- · Ambient temperatures outside of the rated range
- · Condensation caused by rapid changes in temperature
- Relative humidity that is not between 35% and 85%
- · Corrosive or flammable gas
- · Dust, salt, or iron particles
- Direct vibration or shock
- Strong external light interference (such as other laser beams or electric arc-welding machines)
- · Direct sunlight or near heaters
- Water, oil, or chemical fumes or spray
- · Strong magnetic or electric fields
- 2. Warming Up
- The circuits will be unstable just after the power supply is turned ON, so measurement values may fluctuate gradually.
- For accurate measurements, allow the product to stand for at least 10 minutes after turning ON the power supply before use. (E3NC-S Series)

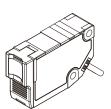
- 3. Maintenance and Inspection
- Always turn OFF the power supply before adjusting or connecting/ disconnecting the Sensor Head.
- Do not use thinner, benzene, acetone, or kerosene to clean the Sensor Head.
- If large dust particles or dirt adheres to the filter on the front of the Sensor Head, use a blower brush (such as one used to clean camera lenses) to blow it off. Do not blow the dust particles or dirt with your mouth. To remove dust particles or dirt, wipe it off gently with a soft cloth (such as one for cleaning lenses) moistened with a small amount of alcohol. Do not wipe it off with excessive force. Scratches on the filter may cause errors.
- 4. Sensing Object
- The Sensor Head cannot accurately measure objects with the following materials and shapes: Transparent objects (with the E3NC-LH03, objects that are extremely transparent), objects with an extremely low reflection ratio, objects smaller than the spot diameter, objects with a large curvature, excessively inclined objects, etc. Also, for long-distance detection, the Sensor may falsely operate if a white object approaches near the Sensor Head (E3NC-LH03).
- 5. The degree of protection is IP67, but do not use the Sensor Head in water, rain, or outdoors. (E3NC-S Series)
- 6. A ferrite core is attached to the Sensor Head end of the cable connected to the E3NC-LH03 5M. Do not remove the ferrite core or change its position. Also, do not bend the cable within 12 mm of each end of the ferrite core. Doing so may damage the cable.

Attaching a Lens Attachment (E39-P51 or E39-P52)

 Check the widths of the slots in the Sensor and the widths of the tabs on the Lens Attachment and attach the Lens Attachment as shown below. (The Lens Attachment must be in the correct orientation, so the widths of the tabs on the Lens Attachment are different on the top and bottom.)



2. After you attach the Lens Attachment, make sure that the tabs are completely engaged in the slots in the Sensor.



Amplifier Units

♠ WARNING

This Amplifier Unit is not designed or rated for ensuring safety of persons either directly or indirectly.



Do not use the Amplifier Unit with voltage in excess of the rated voltage.

Excess voltage may result in malfunction or fire.



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



Precautions for Safe Use

The following precautions must be observed to ensure safe operation of the Amplifier Unit. Doing so may cause damage or fire.

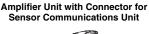
- 1. Do not install the Amplifier Unit in the following locations.
- · Locations subject to direct sunlight
- · Locations subject to condensation due to high humidity
- · Locations subject to corrosive gas
- · Locations subject to vibration or mechanical shocks exceeding the rated values
- · Locations subject to exposure to water, oil, chemicals
- · Locations subject to steam
- Locations subjected to strong magnetic field or electric field
- 2. Do not use the Amplifier Unit in environments subject to flammable or explosive gases.
- 3. Do not use the Amplifier Unit in any atmosphere or environment that exceeds the ratings.
- 4. To secure the safety of operation and maintenance, do not install the Amplifier Unit close to high-voltage devices or power devices.
- 5. High-voltage lines and power lines must be wired separately from the Amplifier Unit. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
- 6. Do not apply any load exceeding the ratings. Otherwise, damage or fire may result.
- Do not short the load. Otherwise, damage or fire may result.
- 8. Do not use the Amplifier Unit if the case is damaged.
- 9. Burn injury may occur. The Amplifier Unit surface temperature rises depending on application conditions, such as the ambient temperature and the power supply voltage. Use caution when operating or cleaning the Amplifier Unit.
- 10. When setting the sensor, be sure to check safety such as by stopping the equipment.
- .Be sure to turn off the power supply before connecting or disconnecting wires.
- 12.Do not attempt to disassemble, repair, or modify the Amplifier Unit in anv wav.
- 13. When disposing of the Amplifier Unit, treat it as industrial waste.

Precautions for Correct Use

- 1. Connect the load correctly.
- Do not miswire such as the polarity of the power supply.
- 3. Be sure to mount the unit to the DIN track until it clicks.
- 4. When using the Amplifier Units with Wire-saving Connectors, attach the protective stickers (provided with E3X-CN-series Connectors) on the unused power pins to prevent electrical shock and short circuiting.

Attach the protective cap when using a model with a connector for a Sensor Communications Unit.

Amplifier Unit with Wiresaving Connector







- connecting terminals 5. Use an extension cable with a minimum thickness of 0.3 $\,\mathrm{mm^2}$ and less than 100 m long.
- Do not apply the forces on the cord exceeding the following limits: Pull: 40 N; torque: 0.1 N·m; pressure: 20 N; bending: 29.4 N
- 7. Do not apply excessive force (9.8 N max.) such as tension, compression or torsion to the connector of the Sensor Head that is fixed to the Amplifier Unit.
- Always keep the protective cover in place when using the Amplifier Unit. Not doing so may cause malfunction.
- 9. It may take time until the received light intensity and measured value become stable immediately after the power is turned on depending on use environment.
- 10. The product is ready to operate 200 ms after the power supply is turned ON.
- 11. The Mobile Console E3X-MC11, E3X-MC11-SV2 and E3X-MC11-S cannot be connected.
- 12. The mutual interference prevention function does not work when in combination with E3C/E2C/E3X.
- 13.If the unit receives excessive sensor light, the mutual interference prevention function may not work properly, resulting in malfunction of the unit. In such case, increase the threshold.
- 14.Standard models (E3NC-□A21/51/7/9)

The Sensor Communications Unit E3X-DRT21-S, E3X-CRT, E3X-ECT and E3NW cannot be connected.

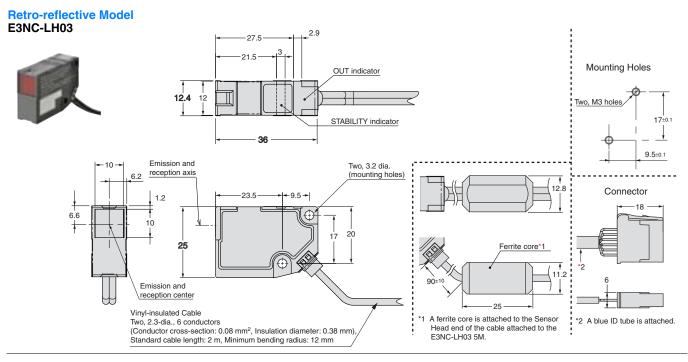
Model for Sensor Communications Unit (E3NC-□A0)

The Sensor Communications Unit E3NW can be connected. E3X-DRT21-S, E3X-CRT, E3X-ECT cannot be connected.

- 15. If you notice an abnormal condition such as a strange odor, extreme heating of the unit, or smoke immediately stop using the product, turn off the power, and consult your dealer.
- 16.Do not use thinner, benzene, acetone, and lamp oil for cleaning.

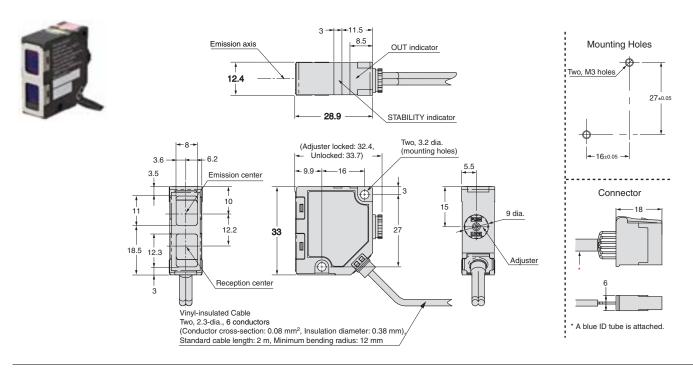
Dimensions

Sensor Heads



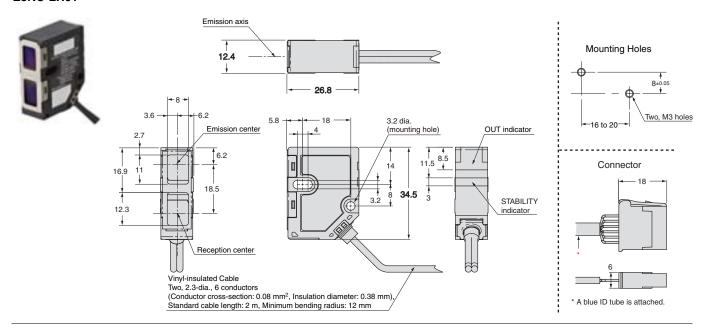
Diffuse-reflective Model

E3NC-LH02



Limited-reflective Model

E3NC-LH01



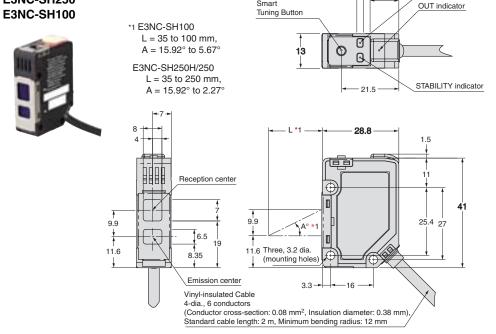
- 13.5 *-*

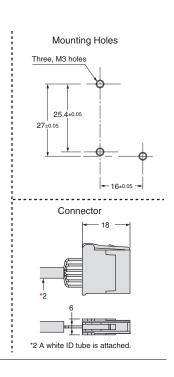
10.5

ST indicator

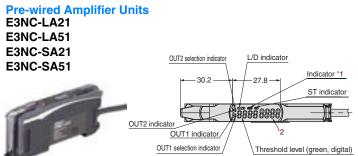
Distance-settable Models







Amplifier Units



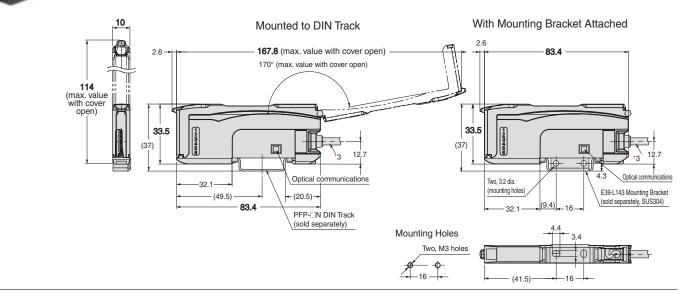
*1. The indicators are as follows:

E3NC-SA51

- E3NC-LA21 E3NC-LA51 DPC indicator E3NC-SA21 ZERO indicator
- *2. The display is as follows:

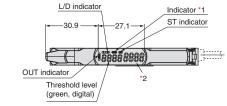
| | Incident level (white, digital) |
|-----------|---------------------------------|
| E3NC-SA21 | Measurement value |
| E3NC-SA51 | (white, digital) |

Round vinyl-insulated cable, 4 dia., 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





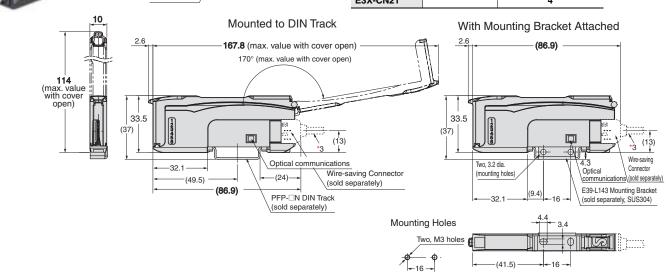
| i. The indicators are as | | 3 arc as ionow. |
|--------------------------|----------|-----------------|
| | E3NC-LA7 | DPC |
| | E3NC-LA9 | indicator |
| | E3NC-SA7 | ZERO |
| | E3NC-SA9 | indicator |

The indicators are as follows: *2. The display is as follows:

| E3NC-LA7 E3NC-LA9 | Incident level (white, digital) |
|----------------------|------------------------------------|
| | Measurement value (white, digital) |

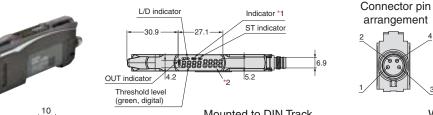
*3. Cable Specifications

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



Amplifier Units with M8 Connectors

E3NC-LA24 E3NC-LA54 E3NC-SA24 E3NC-SA54

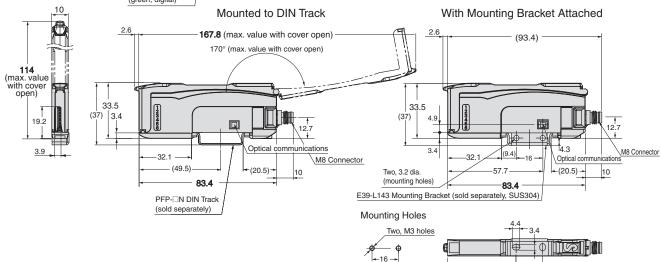


*1. The indicators are as follows: E3NC-LA24 DPC E3NC-LA54 indicator E3NC-SA24 E3NC-SA54 7FRO

*2. The display is as follows:

| E3NC-LA24 E3NC-LA54 | Incident level (white, digital) |
|------------------------|------------------------------------|
| E3NC-SA24 E3NC-SA54 | Measurement value (white, digital) |

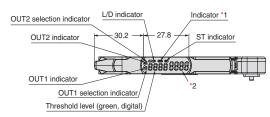
indicator



Amplifier Units with Connectors for Sensor Communications Unit

E3NC-LA0 E3NC-SA0



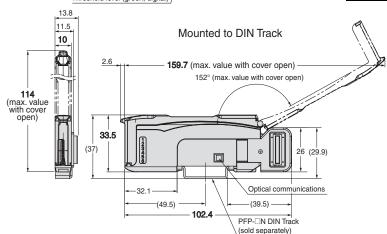


| 1. The mulcators are as follows. | |
|----------------------------------|-------------------|
| E3NC-LA0 | DPC |
| | indicator |
| E3NC-SA0 | ZERO indicator |

The display is as follows

-(41.5)

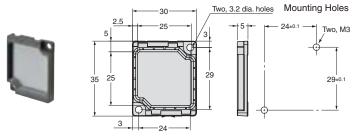
| | The display i | o ao ionowo. |
|---|---------------|------------------------------------|
| E | SNC-LA0 | Incident level (white, digital) |
| E | SNC-SA0 | Measurement value (white, digital) |



Accessories (Sold Separately)

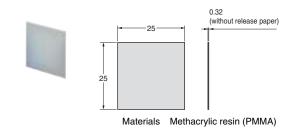
Reflectors for Retro-reflective Sensors

E39-R21

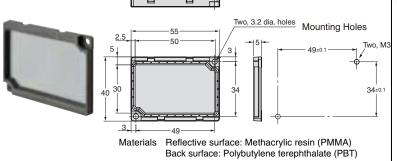


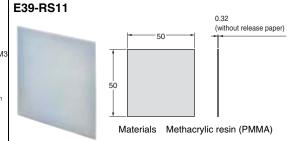
Materials Reflective surface: Methacrylic resin (PMMA)
Back surface: Polybutylene terephthalate (PBT)

E39-RS10



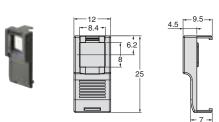
E39-R22





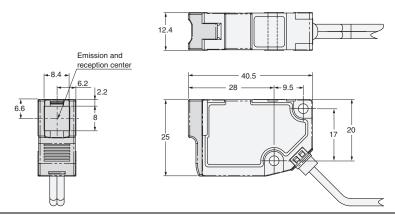
Lens Attachment

E39-P51

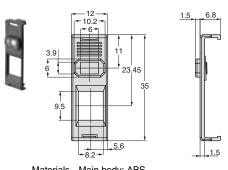


Materials Main body: ABS Lens: Methacrylic resin (PMMA)

With E39-P51 Lens Attachment Attached

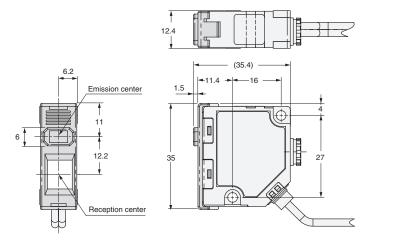


E39-P52



Materials Main body: ABS
Lens: Methacrylic resin (PMMA)

With E39-P52 Lens Attachment Attached



Sensor Head Mounting Brackets

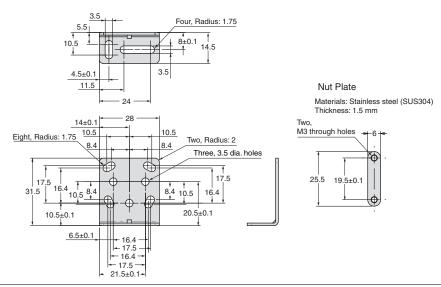
E39-L190

Mounting Bracket

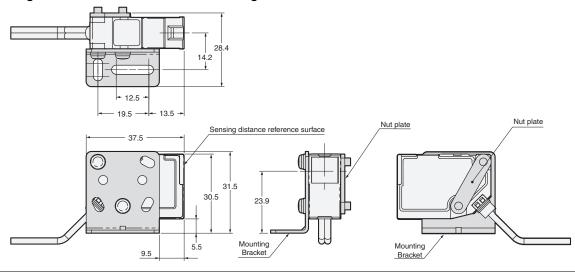
Materials: Stainless steel (SUS304) Thickness: 1.2 mm

Accessories: Phillips screws (M3×18, P = 0.5, stainless steel): 2, Nut plate: 1

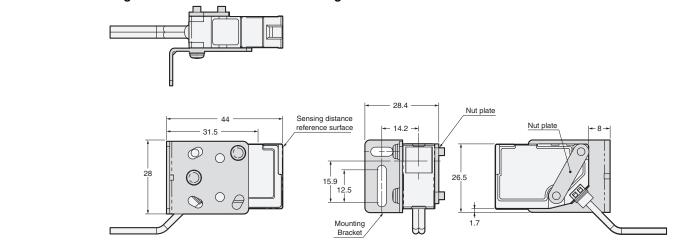




With E39-L190 Mounting Bracket Attached for Bottom Mounting



With E39-L190 Mounting Bracket Attached for Back Mounting



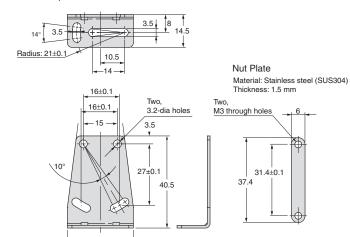
E39-L185



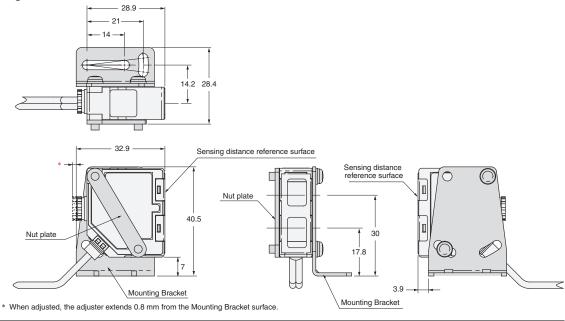
Mounting Bracket

Material: Stainless steel (SUS304) Thickness: 1.2 mm

Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2 Nut plate: 1



With E39-L185 Mounting Bracket Attached



E39-L186

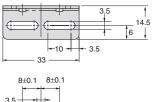


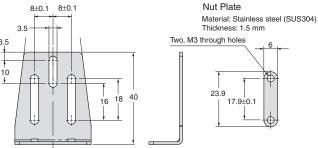
Mounting Bracket

Material: Stainless steel (SUS304)

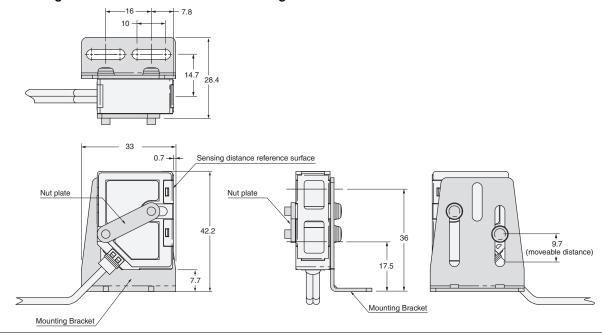
Thickness: 1.2 mm
Accessories: Phillips screws (M3x18, P = 0.5, stainless steel): 2

Nut plate: 1

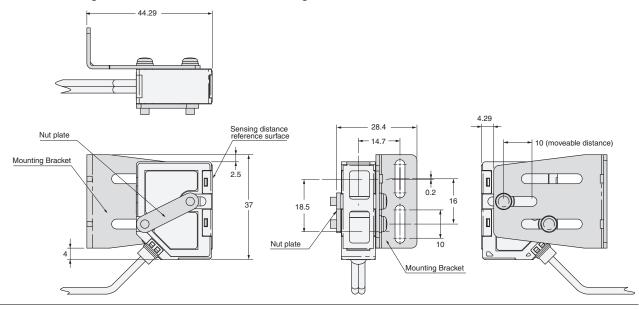




With E39-L186 Mounting Bracket Attached for Bottom Mounting

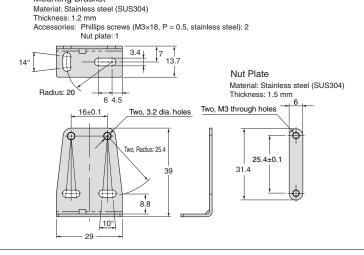


With E39-L186 Mounting Bracket Attached for Back Mounting

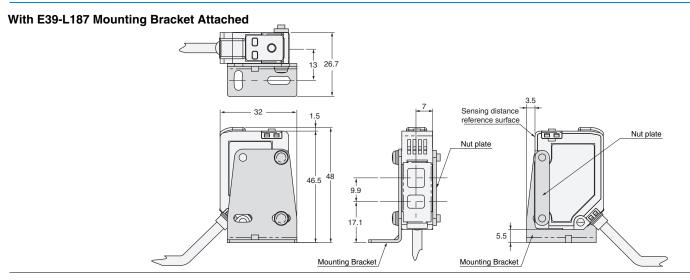




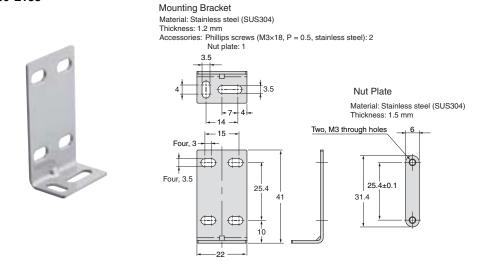




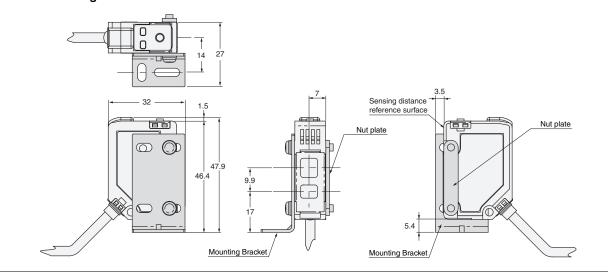
Mounting Bracket



E39-L188



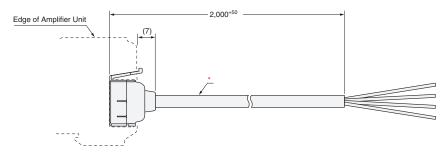
With E39-L188 Mounting Bracket Attached



Wire-saving Connectors

Master Connector E3X-CN21

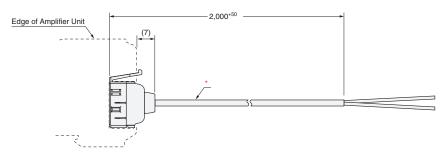




*4-dia. cable with 4 conductors, Standard cable length: 2 m (Conductor cross-section: 0.2 mm² (AWG24), Insulation diameter: 1.1 mm)

Slave Connector E3X-CN22





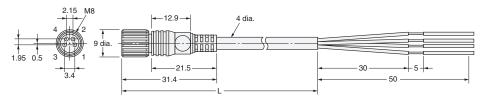
*4-dia. cable with 2 conductors, Standard cable length: 2 m (Conductor cross-section: 0.2 mm² (AWG24), Insulation diameter: 1.1 mm)

Sensor I/O Connectors

Straight

XS3F-M421-40□-A

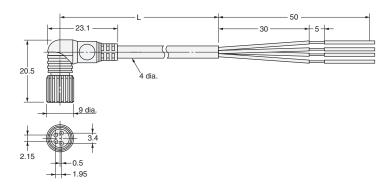




L-shaped

XS3F-M422-40□-A



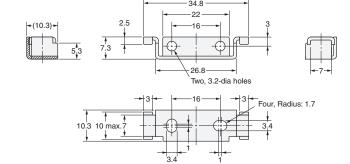


Amplifier Unit Mounting Bracket E39-L143





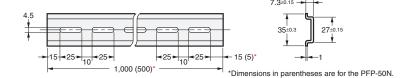
Material: Stainless steel (SUS304)





DIN Track PFP-100N PFP-50N

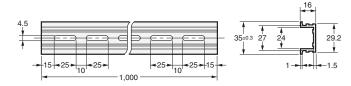




Material: Aluminum

PFP-100N2



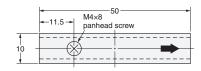


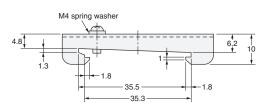
Material: Aluminum

End Plate

PFP-M







Materials: Iron, zinc plating

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