



OMRON

Smart Laser Head(CMOS)

Model **E3NC-SH□□Series**

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product. Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal. Refer to the user's manual for details.

PRECAUTIONS ON SAFETY

●Keys to Warning Symbols

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury,or may result in serious injury or death. Additionally there may be significant property damage.

●Explanation of signs

	●Laser beam Cautions to indicate potential Laser beam hazard
	●Resolution prohibition Indicates prohibition when there is a risk of minor injury from electrical shock or other source if the product is disassembled.

SAFETY PRECAUTIONS FOR USING LASER EQUIPMENT

Laser safety measures for laser devices are stipulated both in Japan and overseas. Here,four cases are described: Application in Japan and Application in a device to be shipped overseas.

- Usage in Japan
The JIS C6802:2014 standard stipulates the safety precautions that users must take according to the class of the laser product. The E3NC-SH□□ and E3NC-SH□□H are classified into class 1 defined by this standard.

●Alert Statements

- E3NC-SH□□Sensor Head: Class1 / E3NC-SH□□H Sensor Head: Class1

⚠ WARNING

Do not expose your eyes to the laser radiation either directly (i.e., after reflection from a mirror or shiny surface). Loss of sight may possibly occur in case of the exposure to laser high power density.

Do not disassemble the product. Doing so may cause the laser beam to leak,resulting in the danger of visual impairment.

The E3NC-SH has the following WARNING label or explanatory label on the side of the sensors.

2. USA

This product is subjected to the U.S. FDA (Food and Drug Administration) laser regulations.This product is already reported to CDRH (Center for Devices and Radiological Health).

Accession Number: 1220691

- The E3NC-SH□□ is classified into Class 1 by the IEC 60825-1:2007 standard according to the regulations of Laser Notice No.50 of the FDA standard. An authentication label and explanatory label are attached on the sensor the E3NC-SH□□ .
- The E3NC-SH□□H is classified into Class 2 by the IEC 60825-1:2007 standard according to the regulations of Laser Notice No.50 of the FDA standard. An authentication label is attached on the sensor the E3NC-SH□□ H. Replace the warning label with corresponding English label(FDA).

3. China

- The E3NC-SH□□ is classified into Class 1 by the GB7247.1:2012 standard. (1类激光产品)
- The E3NC-SH□□H is classified into Class 2 by the GB7247.1:2012 standard.When using in China, warning labels must be replaced by Chinese ones supplied with the product.

- Usage in countries other than Japan, U.S. and China
When Usage in countries other than Japan, U.S. and China, the E3NC-SH□□ and E3NC-SH□□H are classified into Class 1 by the IEC 60825-1:2014 / EN 60825-1:2014 standard.When Usage of E3NC-SH□□ H in countries other than Japan, U.S. and China, replace the warning label with corresponding English label.

PRECAUTIONS FOR SAFE USE

Please observe the following precautions for safe use of the products.

- Installation Environment
 - Do not use the product in environments where it can be exposed to inflammable/explosive gas.
 - To secure the safety of operation and maintenance, do not install the product close to high-voltage devices and power devices.
- Power Supply and Wiring
 - Be sure to use a dedicated amplifier unit (E3NC-SA□□/E3NC-SA0). Connecting the sensor to other amplifier unit may cause damage or fire.
 - When short circuiting the cable, be sure to connect wires correctly according to the specification. Improper connection may cause damage or fire.
 - High-Voltage lines and power lines must be wired separately from this product. Wiring them together or placing them in the same duct may cause induction, resulting in malfunction or damage.
 - Always turn off the power of the unit before connecting or disconnecting cables.
- Installation
 - Use screws for mounting and be sure to tighten screws with a specified torque. (tightening torque: M3, 0.5N·m)
- Other Rules
 - Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product.
 - When disposing of the product, treat as industrial waste.
 - 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.

PRECAUTIONS FOR CORRECT USE

Please observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

- Do not install the product in locations subjected to the following conditions:
 - Surrounding air temperature outside the rating
 - Rapid temperature fluctuations (causing condensation)
 - Relative humidity outside the range of 35 to 85%
 - Presence of corrosive or flammable gases
 - Presence of dust, salt, or iron particles
 - Direct vibration or shock
 - Reflection of intense light (such as other laser beams, electric arc-welding machines, or ultra-violet light)
 - Direct sunlight or near heaters
 - Water, oil, or chemical fumes or spray, or mist atmospheres
 - Strong magnetic or electric field
- Warming Up
 - The circuitry is not stable immediately after turning the power ON, and the values gradually change until the Sensor Head is completely warmed up.
- Maintenance and inspection
 - Always turn off the power of the unit before connecting or disconnecting cables.
 - Do not use thinner, alcohol, benzene, acetone, or kerosene to clean the sensor.
 - If considerable foreign matter or dust collects on the front of sensor, use a blower brush (for camera lenses) to blow off the foreign matter. Avoid blowing it off with your breath. For a small amount of foreign matter or dust, gently wipe with a soft cloth. Do not wipe hard. If the surface is damaged, false detection may result.
- Sensing Object For Reflective Type Sensor Head
 - The product cannot accurately measure the following types of objects:Transparent objects, objects with an extremely low reflective sensor ratio, objects smaller than the spot diameter, objects with a large curvature, excessively inclined objects,etc.

Checking the package contents

- Sensor head ×1 ·Manual (this paper) ×1
- Laser WARNING label : 1 (English)(The WARNING label is attached to E3NC-SH□□H)

■ Shortening the connection cable for use

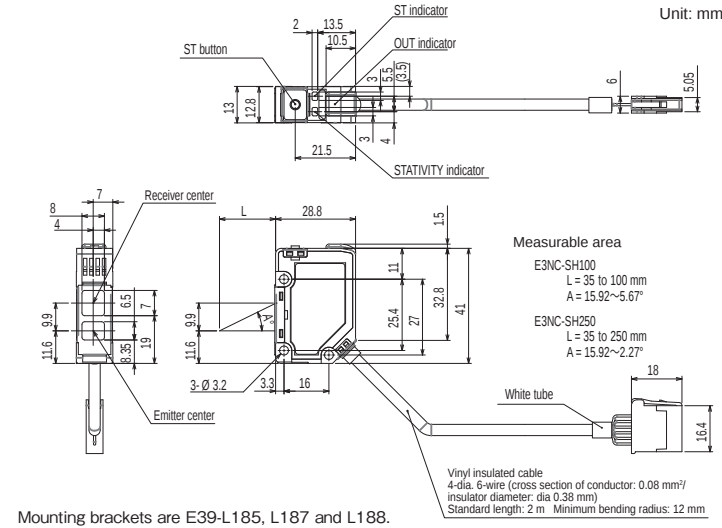
■ Shortening the connection cable for use

Push the operation lever at the operation slot with the slotted screwdriver and pull out the wire to adjust the cable length. The tip of the screwdriver must be 2 mm or less. The type of screwdriver whose tip width becomes broaden toward its root cannot be used.

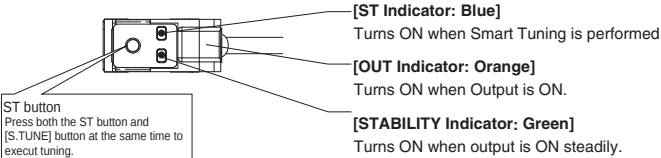
■ Procedure to connect the connector

- According to "STRIP GAUGE" shown on the side of the product, strip the coating of the shield for 20 mm or less, strip the coating of the core wire for 7 to 8 mm, and twist the wire for several times.
- Insert the wire all the way to the wire insertion slot. Make sure that the wire coating is located inside the wire inserting slot and the tip of the conductor passes through the connection part. Connect wires as follows. Terminal No.1: Shield (Red, White sides), No.2: White, No.3: Red, No.4: Brown, No.5: Blue, No.6: Shield (Brown, Blue side).
- Push the slotted screwdriver all the way to the releasing slot and pry the slotted screwdriver up and down lightly. When you feel a click on the slotted screwdriver, pry it to the reverse direction of the wire insertion direction. The operation lever will recover with a click sound.
- Check that the operation lever recovers and the wire coating enters into the wire insertion slot. The shield wire cover must not be shorted circuited. (The wires are connected when you pull the wire and feel a resistance.)

1.Dimensions

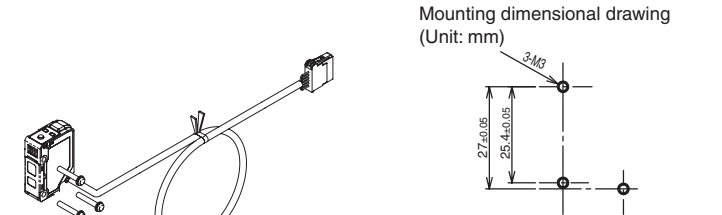


2.Sensor Head Display



3.Installing Sensor Heads

Fix the Reflective type sensor head with screws (M3). (tightening torque: M3, 0.3 N·m)

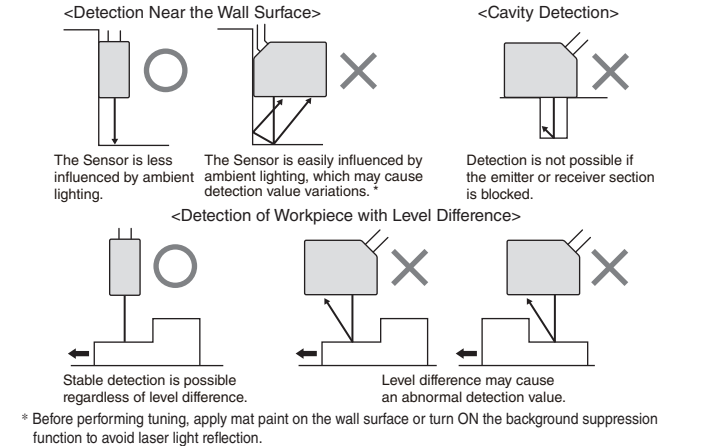


CHECK!

When mounting a Sensor Head, take care not to touch the emitter and receiver. Adhesion of finger marks may hinder correct measurements. If you have touched them, wipe them with a clean soft cloth.

- Secure the connector to avoid vibration or shocks.

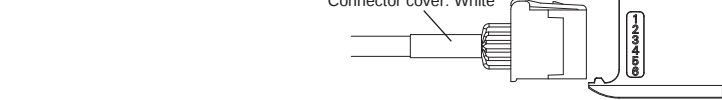
■ Caution on Mounting Direction



4.Mounting the sensor head

- Open the protection cover.
- Insert the sensor head, with the lock lever on its connector area facing upward, all the way into the connector port. To remove it, press and hold the lock lever then pull the sensor head out.

The connector cover of E3NC-SH is white. Connect the cable correctly.



5.Specifications

Item	Detection method	Distance configuration model		
	Model	E3NC-SH100	E3NC-SH250	E3NC-SH250H
Light source (wavelength)* 1		Visible-light semiconductor laser (660nm)		
FDA class *1		class 1(0.5mW max.)		class 2(1mW max.)
JIS IEC/EN class		class 1(0.5mW max.)		class 1(0.5mW max.)
Measurement range		35 to 100 mm	35 to 250 mm	
Standard measurement gap*2		35 to 50 mm: 1.5 mm 50 to 100mm: 3 mm	35 to 180 mm: 9 mm 180 to 250 mm: 25 mm	
Spot size *3		Approx. 0.5 mm (distance at 100 mm)	Approx. 1 mm (distance at 250 mm)	
Indicator		OUT indicator (Orange), STABILITY indicator (Green), ST indicator (Blue)		
Ambient illumination		Illuminance on receiving optical side 4,000 lx max. (incandescent light) Sunlight: 8,000lx max.	Illuminance on receiving optical side 2,000 lx max. (incandescent light) Sunlight: 4,000lx max.	Illuminance on receiving optical side 4,000 lx max. (incandescent light) Sunlight: 8,000lx max.
Ambient temperature		Operating: -10 to 55°C, storage: -25 to 70°C (with no icing or condensation)		
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)		
Insulation resistance		20 MΩ min. (500 VDC)		
Dielectric strength		1000 VAC 50/60 Hz 1min		
Vibration resistance		10 to 55 Hz. 1.5-mm double amplitude 2 hours each in X, Y, and Z directions		
Shock resistance		500m/s ² 3 times each in X, Y, and Z directions		
Degree of protection		IEC standard, IP67		
Connection method		Connector joint model (standard cable length: 2 m)		
Material	Case	Polybutylene terephthalate		
	Lens	Methacrylate resin		
	Cable	PVC		
Weight (packed state/main unit only)		Cable length 2m:Approx.125g/approx.75g Cable length 5m:Approx.200g/approx.150g		
Accessories		Instruction Sheet		Instruction Sheet, Laser WARNING label

*1. The E3NC-SH is classified into Class 1 or Class 2 by the standard of IEC 60825-1:2007 according to deviations of Laser Notice No.50 of FDA standard, and is already reported to CDRH(Center for Devices and Radiological Health). Accession Number 1220691

*2. Measured using Omron's reference sensing object (white paper).

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

Suitability for Use

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

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

