OMRON

Smart Laser Head

Model E3NC-LH□□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.

TRACEABILITY INFORMATION:

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The Netherlands

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The following notice applies only to products that carry the CE mark:
Notice:
This is a class A product. In residential areas it may cause radio interference, in which case the user may be required to take adequate measures to reduce interference.

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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

The E3NC-LH uses a laser as the light source. Lasers are classified based on EN standard (EN 60825-1)

●Alert Statements

・E3NC-LH@@ Sensor Head: Class 1

⚠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-LH has the description label regarding laser on the side of the Sensor Head as shown on the right figure.

When using devices in which E3NC-LH is installed in the U.S., the devices are subjected to the U.S. FDA (Food and Drug Administration) laser regulations. E3NC-LH series is classified into Class1 by the standard of IEC/EN60825-1 according to deviations of Laser Notice NO.50 of this standard, and is scheduled to report to CDRH (Center for Devices and Radiological Health).

Description label

Authentication label

Using in Europe
The E3NC-LH is categorized as a Class 1 device as stipulated in EN60825-1.

PRECAUTIONS FOR SAFE USE

Please observe the following precautions for safe use of the products.
(1)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.
(2)Power Supply and Wiring
・Be sure to use a dedicated amplifier unit (E3NC-LA@@/E3NC-LA0). Connecting to other amplifier unit may cause damage or fire.
・When shortening cables, be sure to connect wires according to the specifications. Misconnection may cause damage of 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.
(3)Installation
・Use screws for mounting and be sure to tighten screws with a specified torque. (tightening torque: M3, 0.5N・m)
(4)Other Rules
・Do not attempt to disassemble, deform by pressure, incinerate, repair, or modify this product. Rotate the adjustment volume (LH02) with 40mN·m max. Otherwise damage or fire may result.
・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

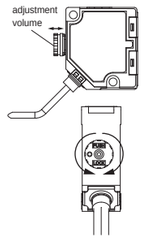
Please observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.
(1)Do not install the product in locations subjected to the following conditions:
・Surrounding air temperature outside the rating
・Rapid temperature fluctuations (causing 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
(2)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.
(3)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.
(4)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

Adjusting beam size (3NC-LH02)

The beam size can be switched between locked state and adjustable state (unlocked) by pushing or pulling the beam size adjustment volume.
・Volume pushed ... Beam size is locked.
・Volume pulled ... Beam size can be adjusted (unlocked).
When unlocked, the beam shape can be adjusted for setting distance by rotating the beam size adjustment volume.
By rotating the volume counterclockwise, the direction of the spot position shifts to close range, and by rotating the volume clockwise the direction of the spot position shifts to long range. After adjusting the beam size, push the volume to lock the beam size.
When the volume is pulled out, water or foreign object may enter the Sensor Head due to insufficient sealing. (IP65 only applies when it is locked.) Be sure to rotate the beam size adjustment volume with 40 mN·m or less. Otherwise damage to the volume may result.



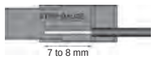
■ Shortening the connection cable for use

■ Procedure to connect the connector

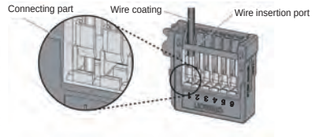
Push the operation lever at the operation slot with the slotted screwdriver and pull out the wire to adjust the cable length.
The tip of the screwdriver must be 2 mm or less. The type of screwdriver whose tip width becomes broaden toward its root cannot be used.

□ Procedure to connect the connector

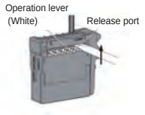
(1) According to "STRIP GAUGE" shown on the side of the product, strip the coating of the shield for 20 mm or less, strip the coating of the core wire for 7 to 8 mm, and twist the wire for several times.



(2) Insert the wire all the way to the wire insertion slot. Make sure that the wire coating is located inside the wire insertion 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).



(3) 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.

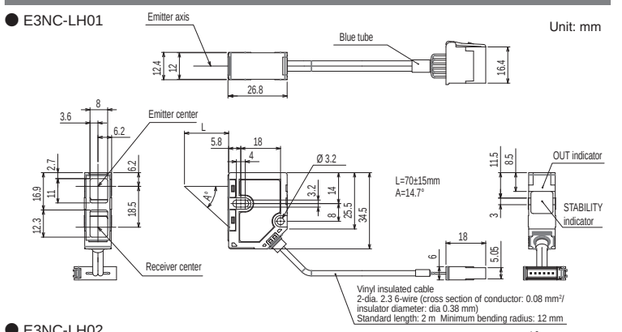


(4) Check that the operation lever recovers and the wire coating enters into the wire insertion slot. The shield wire cover must not be shorted circuited. (The wires are connected when you pull the wire and feel a resistance.)

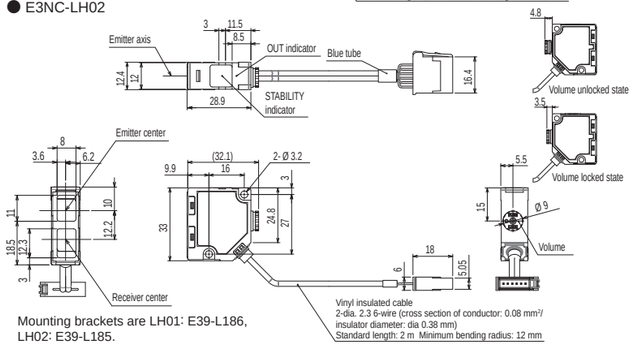
1.Dimensions

Unit: mm

● E3NC-LH01

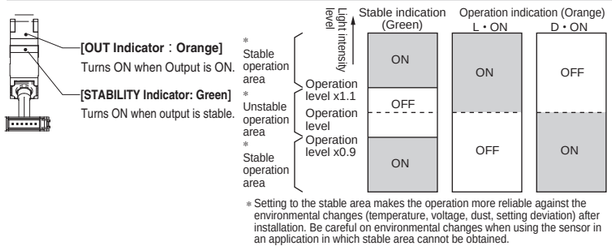


● E3NC-LH02



Mounting brackets are LH01: E39-L186, LH02: E39-L185.

2.Sensor Head Display

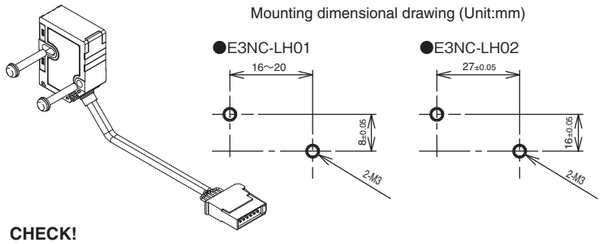


* Setting to the stable area makes the operation more reliable against the environmental changes (temperature, voltage, dust, setting deviation) after installation. Be careful on environmental changes when using the sensor in an application in which stable area cannot be obtained.

3.Installing Sensor Heads

Fix the Reflective type sensor head with screws (M3). (tightening torque: M3, 0.5N・m)

Mounting dimensional drawing (Unit:mm)

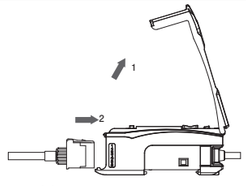


CHECK!

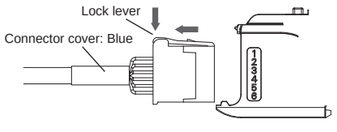
When mounting a Sensor Head, take care not to touch the emitter and receiver. Adhesion of finger marks may hinder correct measurements. If you have touched them, wipe them with a clean soft cloth.
・Secure the connector to avoid vibration or shocks.

4.Mounting the sensor head

1. Open the protection cover.
2. 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-LH is blue.
Connect the cable correctly.



5.Specifications

Item		Limited reflective type	Diffuse reflective type
	Detection method	Limited reflective type	Diffuse reflective type
	Model	E3NC-LH01	E3NC-LH02
Light source (wavelength)*1		Visible-light semiconductor laser (660nm) 315μW max. (JIS standard Class 1, IEC/EN Class1, FDA Class1)	
Sensing distance *2	Giga power mode (GIGA)	70±15 ㎜	1,200 mm
	Standard mode (Stnd)		750 mm
	High speed mode (HS)		250 mm
	Highest speed mode (SHS)		200 mm
Spot size *3		0.1 mm (distance at 70 mm)	0.8 mm (distance at 300 m)
Differential travel		10 % max. of sensing distance	
Indicator		OUT indicator (Orange), STABILITY indicator (Green)	
Ambient illumination		Illuminance on receiving optical side 10,000 lx max. (incandescent light), 20,000 lx max. (sun light)	
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 or 100 m/s² 2 hours each in X, Y, and Z directions	
Shock resistance		500m/s² 3 times each in X, Y, and Z directions	
Degree of protection		IEC standard, IP65 (For LH02, it applies only when the volume is locked.)	
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)		Approx. 115 g/ approx. 65 g	
Accessories		Instruction Sheet	

*1. The E3NC-LH is classified into Class 1 by the standard of EN60825-1 according to deviations of Laser Notice No.50 of FDA standard, and will be reported to CDRH (Center for Devices and Radiological Health).
*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.

Suitability for Use

THE PRODUCTS CONTAINED IN THIS SHEET ARE NOT SAFETY RATED. THEY ARE NOT DESIGNED OR RATED FOR ENSURING SAFETY OF PERSONS, AND SHOULD NOT BE RELIED UPON AS A SAFETY COMPONENT OR PROTECTIVE DEVICE FOR SUCH PURPOSES.
Please refer to separate catalogs for OMRON's safety rated products.

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the products in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.
Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCTS 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 IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.
See also Product catalog for Warranty and Limitation of Liability.

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