

# 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:**  
 Representative in EU: Omron Europe B.V., Weeglaan 67-69, 2152 JD Hoofddorp, The Netherlands  
 Manufacturer: Omron Corporation, Shokoji Horikawa, Shimogyo-ku, Kyoto 600-8530 JAPAN, Ayabe Factory, 3-2 Nanatani, Nakayama-cho, Ayabe-shi, Kyoto 624-0105 JAPAN

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.

© OMRON Corporation 2014 All Rights Reserved.

## 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.

Description label



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 Class 1 by the standard of IEC/EN60825-1 according to details of Laser Notice No.50 of this standard, and is scheduled to report to CDRH (Center for Devices and Radiological Health).

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.

- 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-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)
- Other Rules

- Do not attempt to disassemble (e.g. peeling off the label), deform by pressure, incinerate, repair, or modify this product. 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.

- 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
- Warning Lip**
  - 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: Material with extremely high transmission, objects smaller than the spot diameter. The product may not operate properly when a white object approaches the sensor head when the product is used for a long distance.
- Ferrite core**
  - 5m cable type is mounted ferrite core to the sensor head side.
  - Do not remove it and change the position.
  - Do not bend the cable at both ends of within 12mm the ferrite core. Cable may be damaged.

## Checking the package contents

- Sensor head x1
- Manual (this paper) x1
- The reflector is sold separately. Please purchase E39-R21, E39-R22, E39-RS10, or E39-RS11.

## Detecting transparent objects

- Check if the product operates properly before using it under the environment in which the temperature changes greatly.
- Use of the DPC function (E3NC-LA□□) is recommended to minimize the impact of temperature changes.
- When measuring a minute light intensity level difference with high transparency, be sure to have a warm-up time of at least 30 minutes after the power supply is turned on.
- Use of 2-point Tuning or Percentage Tuning is recommended to set a threshold. Correct threshold setting may not be possible if other tunings are used.
- The distance to the workpiece must be within 3.5 m (within 5 m to the reflector).

## Shortening the connection cable for use

### Procedure to connect the connector

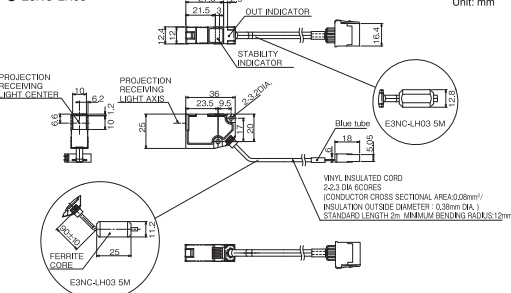
Push the operation lever at the operation slot with the slotted screwdriver and pull out the wire to adjust the cable length. The tip of the screwdriver must be 2 mm or less. The type of screwdriver whose tip width becomes broader toward its root cannot be used.

### 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 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: Purple, No.6: Shield (Brown, Purple 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

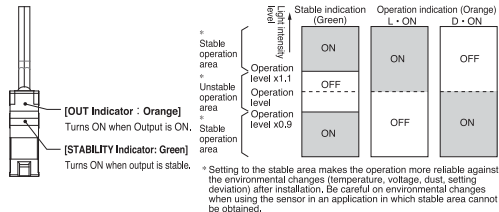
### E3NC-LH03



Ferrite core is mounted only E3NC-LH03 5M.

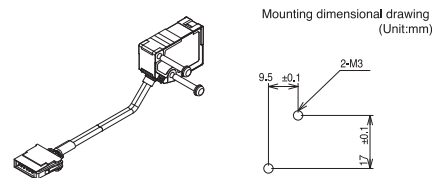
The mounting bracket is E39-L190.

## 2. Sensor Head Display



## 3. Installing Sensor Heads

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



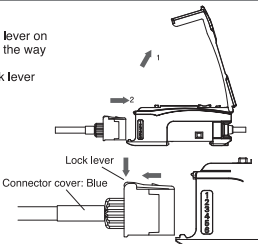
### CHECK!

- 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.

## 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-LH is blue. Connect the cable correctly.



## 5. Specifications

Item	Detection method Model	Retro-reflective type E3NC-LH03
Light source (wavelength)*1		Visible-light semiconductor laser (660nm) JIS standard Class 1, IEC/EN Class1, FDA Class1
Sensing distance *2	GIGA	8 m
	STND	6 m
	HS	3.5 m
	SHS	2 m
Spot size *3		Approx. 2 mm (distance at 1 m)
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) (with no icing or condensation)
Ambient temperature		Operating: -10 to 55°C, storage: -25 to 70°C
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/s <sup>2</sup> 2 hours each in X, Y, and Z directions
Shock resistance		500m/s <sup>2</sup> 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	Unit case	PBT
	Lens cover	PMMA
	Cable	PVC
Weight (packed state/ main unit only)		Approx. 110 g/approx. 70 g (Cable length 2 m)
		Approx. 180 g/approx. 130 g (Cable length 5 m)
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 E39-R21, E39-R22, E39-RS10 and E39-RS11. Use of other reflectors is not recommended.  
 \*3. Defined at the 1/θ° (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

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. See also Product catalog for Warranty and Limitation of Liability.

- EUROPE**  
 OMRON EUROPE B.V. Sensor Business Unit  
 Carl-Benz Str.4, D-71154 Nufringen Germany  
 Phone: 49-7032-811-0 Fax: 49-7032-811-199
- NORTH AMERICA**  
 OMRON ELECTRONICS LLC  
 One Commerce Drive Schaumburg, IL 60173-5302 U.S.A.  
 Phone: 1-847-843-7900 Fax: 1-847-843-7787
- ASIA-PACIFIC**  
 OMRON ASIA PACIFIC PTE. LTD.  
 No. 438A Alexandra Road #05-05-08(Lobby 2),  
 Alexandra Technopark, Singapore 119967  
 Phone: 65-6835-3011 Fax: 65-6835-2711
- CHINA**  
 OMRON(CHINA) CO., LTD.  
 Room 2211, Bank of China Tower,  
 200 Yin Cheng Zhong Road,  
 Pudong New Area, Shanghai, 200120, China  
 Phone: 86-21-5037-2222 Fax: 86-21-5037-2200

OMRON Corporation

D|Q Jul, 2013