

Smart Sensor **OMRON**

Model **ZX2-LD** □ □

Laser Displacement Sensor CMOS type
Sensor head unit For Model ZX2-LDA □ □

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 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.


● **Alert Statements**

- 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.

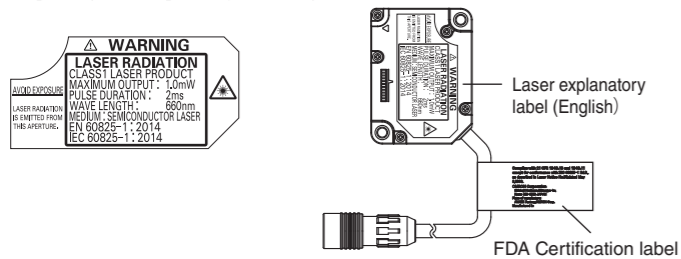
SAFETY PRECAUTIONS FOR USING LASER EQUIPMENT

Laser safety measures for laser devices are stipulated both in Japan and overseas. Here, four cases are described.

- (1) 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 ZX2-LD □ □ is classified into class 1 defined by this standard.

- **Labeling on Laser Use**
 The ZX2-LD has the following Explanatory label on the side of the sensors.
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- (2) USA
 This product is subjected to the U.S. FDA (Food and Drug Administration) laser regulations. The ZX2-LD □ □ is classified into Class 1 by the IEC 60825-1 2014 standard according to the regulations of Laser Notice No.56 of the FDA standard. This product is already reported to CDRH (Center for Devices and Radiological Health).
 Accession Number: 1020665-003
 When using a device equipped with the ZX2-LD □ □ in the U.S., attach an FDA certification label on the sensor at the correct location as indicated, and replace the explanatory label with corresponding Laser explanatory label (English).



- (3) China
 The ZX2-LD □ □ is classified into Class 2 by the GB7247.1:2012 standard. When using in China, an explanatory label must be replaced by Chinese ones supplied with the product.



- (4) Usage in countries other than Japan, U.S. and China
 When Usage in countries other than Japan, U.S. and China, the ZX2-LD □ □ is classified into Class 1 by the IEC 60825-1:2014 / EN 60825-1:2014 standard. When Usage of ZX2-LD □ □ in countries other than Japan, U.S. and China, replace the explanatory label with corresponding Laser explanatory label (English).



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
 · Use only products that have been made expressly for the Controller
 · 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
 · Make sure to tighten all installation screws securely. (tightening torque: M3, 0.5N·m)
- (4) 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.

- (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) Power Supply and Wiring
 · Use only products that have been made expressly for the Controller
 · To extend the cable from the sensor head, an optional extension cable (ZX2-XC □ R) must be used.

- (3) Warning Up
 · After turning on the power supply, allow the Controller to stand for at least 10 minutes before use. The circuits are unstable immediately after the power supply is turned on and attempting measurement may result in inconsistent measurement values.

- (4) 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.

- (5) 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.
 · Set scaling regularly to maintain accurate detection.

- (6) Mutual interference
 · Inserting a calculation unit between amplifier units can prevent mutual interference between sensor heads. However, this may not work efficiently if Amount of light received of one sensor head is saturated because of the luster of work-pieces and a laser beam of the other sensor head is input. If you are interested in installing a calculation unit in order to prevent mutual interference, carry out a test using the actual system beforehand.

Checking the package contents

- Sensor head ×1
- Ferrite core ×1
- Laser WARNING label (chinese) ×1
- FDA Certification label ×1
- Manual (this paper) ×1
- Laser explanatory label ×1 (Japanese, English)

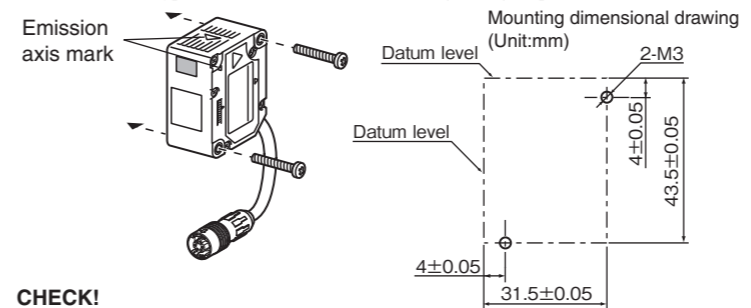
1. Specifications

Item	Model	ZX2-LD50L	ZX2-LD50	ZX2-LD100L	ZX2-LD100
Applicable Amplifier Units		ZX2-LDA □			
Measuring center distance		50mm		100mm	
Measuring range		±10mm		±35mm	
Light source		Red semiconductor laser (λ = 660nm, 1mW max., IEC/EN 60825-1(2014) Class1 · FDA Class1)			
Beam diameter (*1)		Approx. 60μm × 2.6mm	Approx. 60μm-dia.	Approx. 110μm × 2.7mm	Approx. 110μm-dia.
Resolution (*2)		1.5μm		5μm	
Linearity (*3)	Full range	±0.1%F.S.	±0.15%F.S.	±0.1%F.S.	±0.15%F.S.
	Half range	±0.05%F.S. (40-50 mm)	±0.1%F.S. (40-50 mm)	±0.05%F.S. (65-100 mm)	±0.1%F.S. (65-100 mm)
Temperature characteristic (*4)		0.02%F.S. / °C			
Surrounding air temperature		Operating: 0 to 50°C, Storage: -15 to 70°C (with no icing or condensation)			
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)			
Operating ambient illumination		Illuminance on receiving optical side 10,000 lx (incandescent light)			
Dialectic strength		1,000 VAC, 50/60 Hz for 1 min			
Vibration resistance (destructive)		10 to 150 Hz, 0.7-mm double amplitude, 80 min each in X, Y, and Z directions			
Shock resistance (destructive)		300 m/s ² 3 times each in six directions (up/down, left/right, forward/backward)			
Degree of protection		IP67			
Materials		PBT (Case), Glass (Lensfilter), PVC (Cable)			
Weight (packed state)		Approx. 160g (sensor head: Approx. 75g)			

- F.S.: Full scale of measurement
 (*1) Beam diameter: Value of minimum diameter in measuring range. The typical value at the measuring center distance is shown. Defined as 1/e² (13.5%) of the center intensity. The beam diameter may sometimes be affected by the ambient condition of the object such as leaked light from the main beam.
 (*2) Resolution: Fluctuation width of linear outputs when connected to Amplifier Unit (With response time set to 128ms and the standard work (white ceramics) placed at the measuring center distance) This value is repetition accuracy of the static condition work, and not distance accuracy. In a strong electromagnetic field, the performance of resolution might not be able to be satisfied.
 (*3) Linearity: The error in relation to the ideal displacement output straight line when the standard work is measured
 (*4) Temperature characteristic: Value obtained when the sensor and object (standard work) are fixed with an aluminum jig. (Measured at the measuring center distance)

2. Installing Sensor Heads

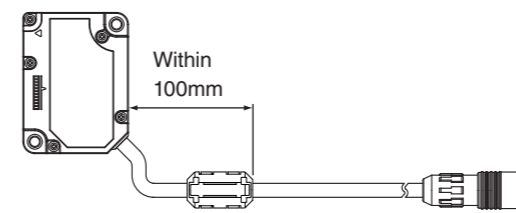
Fix the Reflective type sensor head with screws (M3). (tightening torque: M3, 0.5N·m)



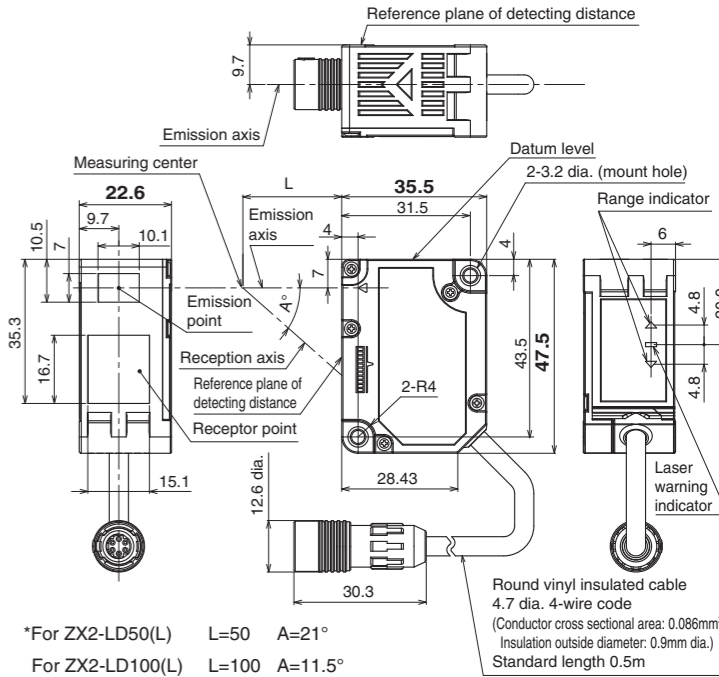
- CHECK!**
 When mounting a Sensor Head, take care not to touch the emitter and receiver. Adhesion of finger marks may hinder correct measurements. If you have touched them, wipe them with a clean soft cloth.

3. Sensor connections

A ferrite core (supplied with the sensor head) must be attached to the sensor cable. The ferrite cores can be connected within 100 mm from the sensor.



4. Dimensions



*For ZX2-LD50(L) L=50 A=21°
 For ZX2-LD100(L) L=100 A=11.5°

(UNIT:mm)

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.

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