





OMRON

ZG2-WDS70

Sensor Head for  
Profile Measuring Sensor  
ZG2-WDC□□

INSTRUCTION SHEET

Please read and understand this instruction sheet before storing, installing, programming, operating, maintaining, or disposing of the products. Please consult your OMRON representative if you have any questions or comments.

Please refer to the Controller Operating Manual for detailed instructions on usage.

TRACEABILITY INFORMATION:  
Importer in EU :  
Omron Europe B.V.  
Wegalaan 67-69  
2132 JD Hoofddorp,  
The Netherlands

Manufacturer:  
Omron Corporation,  
Shiokoji Horikawa, Shimogyo-ku,  
Kyoto 600-8530 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.

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MEANINGS OF SIGNAL WORDS

●Meanings of Signal Words

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.

●Meanings of Alert Symbols

Laser beam

Cautions to indicate potential laser beam hazard

●Alert Statements

WARNING

Do not expose your eyes to the laser radiation either directly or indirectly (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.

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 ZG2-WDS70 is classified into class 2 defined by this standard. The ZG2-WDS70 has the following warning label on the side of sensors.



(2) USA

When a laser device is exported to the USA, it falls under the laser regulations of the FDA(Food and Drug Administration). The ZG2-WDS70 is classified as a class-3B laser by 21CFR1040, and it has already been registered with the CDRH(Center for Devices and Radiological Health). Ask your OMRON representative for details.

Technical standards have been provided with the ZG2-WDS70. When exporting to the USA, refer to the following illustration and replace the label with the caution label.

It is assumed that the ZG2-WDS70 will be incorporated into a final system device. When incorporating the ZG2-WDS70, comply with the following technical standards:

US Federal Law 21 CFR 1040.10 and 1040.11.

Laser Radiation Opening Label

AVOID EXPOSURE

Laser radiation is emitted from this aperture

Class 3B Danger Label

DANGER

LASER RADIATION

AVOID DIRECT EXPOSURE TO BEAM

MAXIMUM OUTPUT : 5mW

WAVELENGTH : 650nm

CLASS3B LASER PRODUCT

Certification Label

This laser product complies with 21 CFR 1040.10 and 1040.11

OMRON Corporation

Shioji Horikawa, Shimogyo-ku, Kyoto 600-8530, JAPAN

Place of manufacture: JPN/ECN: CN/ECN: CN

Manufactured in:

Laser Emission Opening Label

Certification Label

Laser Emission Opening Label

(3) China

The ZG2-WDS70 is classified into Class 2 by the GB/T 7247.1-2024 standard. When using in China, warning labels must be replaced by Chinese ones supplied with the product.

(4) For countries other than Japan, U.S. and China

For countries other than Japan, U.S. and China

When usage in countries other than Japan, U.S. and China, warning labels must be replaced by suitable for the area ones supplied with the ZG2-WDS70. When exporting to Europe, labels fall under EU standard EN 60825-1:2014+A11:2021. The ZG2-WDS70 is classified into Class 2 by the IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 standard.

When using devices in which a ZG2 is installed in the U.S., the devices are subjected to the U.S. FDA (Food and Drug Administration) laser regulations.

### • Safety Devices

The ZG2 is equipped with laser radiation warning lamp and laser off input circuit. Interlocking unit can be configured in the external circuit.

### • Usage

- Use laser enclosure device to prevent specular object from reflecting laser beam. When used without an enclosure, be sure to avoid a laser path from eye level.
- Although the safety distance (NOHD) is approximately 1 m; it is advisable, however, to terminate the laser on its path if possible. Non-reflective, flattening material is recommendable for termination.

## Outline of IEC 60825-1 Standard

The following are the safety measures to be taken by the user for each type of laser equipment.

Classification Required Items	Class 1	Class 1M	Class 2	Class 2M	Class 3R	Class 3B	Class 4			
Laser safety officer	Not required			Not required for visible light type Required for invisible light type.	Required					
Remote interlock	Not required				Connect to room or door circuits.					
Key control	Not required				Remove key when not in use.					
Beam attenuator	Not required				When in use prevents inadvertent exposure.					
Emission indicator device	Not required			Not required for visible light type Required for invisible light type.	Indicates laser is energized.					
Warning signs	Not required				Follow precautions on warning signs.					
Beam path	Not required	Note1	Not required	Note2.	Terminate beam at end of useful length.					
Specular reflection	Not required	Note1	Not required	Note2.	Prevent unintentional reflections.					
Eye protection	Not required				Required if engineering and administrative procedures not practicable and MPE exceeded.					
Protective clothing	Not required				Sometimes Specific required requirements					
Training	Not required	Note1	Not required	Note2.	Required for all operator and maintenance personnel					
Note1. Class 1M laser product on condition 1 in table 10 in IEC 60825-1 is required. Class 1M laser product on condition 2 is not required.										
Note2. Class 2M laser product on condition 1 in table 10 in IEC 60825-1 is required. Class 2M laser product on condition 2 is not required.										

## PRECAUTION FOR SAFE USE

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

- (1) Do not use the product in environments where it can be exposed to inflammable/explosive gas.
- (2) Do not install the product close to high-voltage devices and power devices in order to secure the safety of operation and maintenance.
- (3) Make sure to use the product with the power supply voltage specified.
- (4) Make sure to tighten all installation screws securely.
- (5) Do not disassemble, repair, or modify the product.
- (6) Dispose of this product as industrial waste.

## PRECAUTION FOR CORRECT USE

Please observe the following precautions to prevent failure to operate,malfunctoins, or undesirable effects performance.

- (1) Do not install the product in locations subjected to the following conditions:
  - Direct sunlight or near heaters
  - Condensation caused by high humidity
  - Sudden changes in humidity
  - Cold conditions that may cause freezing
  - Presence of corrosive or flammable gases
  - Direct vibration or shock
  - Build-up of dust or metal chips
  - Spraying by organic solvents,water,oil or other liquids
  - Strong magnetic or electric field
  - Reflection of intense light (such as other laser beams or electric arc-welding machines) or generation of strong electromagnetic waves
- (2) Component
  - Use only products that have been made expressly for the controller.
- (3) Sensor
  - Install the sensor in a clean environment and keep the optical filter on the front panel of the sensor free from oil and dust.
  - If affected by oil or dust,clean the filter as follows:Use a blower brush(normally used to clean camera lenses) to blow large dust particles away from the surface. Do not blow the dust away with your mouth.
  - Gently wipe small dirt or dust particles off with a soft cloth (such as a lens cleaning cloth) dampened with a small amount of alcohol.
  - Do not wipe too vigorously.Scratches on the filter may cause errors later.
- (4) Environment
  - The sensor cannot detect the following types of objects accurately:Materials with extremely small reflectances, objects with small curvatures,or objects tilted to a large degree.
- (5) Warning Up
  - After turning on the power supply,allow the controller to stand for at least 30minutes before use. The circuits are unstable immediately after the power supply is turned on and attempting measurement may result in inconsistent measurement values.
- (6) Influence of external light

- Do not install a sensor head under the condition that strong light.
- When a target is glossy,the target might reflect another light such as fluorescent from ceiling into the sensor head, which might cause malfunction.In this case,perent the light from being incident into the sensor head.

## ■Sensor Specifications

Model	ZG2-WDS70	
Sensor Installation	Diffuse reflection	
Reference distance (direction of height)	210mm	
Measure-ment range	Direction of width	70mmTYP
	Direction of height	±48mm (for HI-REO mode)
Light source	Visible Semiconductor Laser(Wave length:658nm,5mW max [MAX2MUM EXPOSURE WITHOUT OPTICAL INSTRUMENTS:1mW],IEC class 2,FDA class 3B)	
Beam dimensions	*1	120μm×75mm typical at the reference distance
Resolution in the direction of width	111μm(70mm/631pix)	
Resolution in the direction of hight	*2	6μm
Linearity in the direction of hight	*3	±0.1%FS
LED indicator lamp	*4	There are two indicators for the laser status. “STANDBY”:The laser is ready to emit light."LD ON":The laser is emitting light. Both indicators are OFF until the sensor is ready to work after power turns ON.
Detection object	Opaque object	
Temperature characteristic	*5	0.02°F.S/°C
Operation environment robustness	Degree of protection	IP66(IEC60529)
	Ambient operating illumination	Illumination at light-receiving surface:7000 lx max,incandescent light
	Ambient temperature	Operating:0 to +50°C Storage:15 to +60°C(no freezing and condensation)
	Ambient humidity	Operating and strage:35% to 85%(no condensation)
	Vibration(durability)	10 to 150Hz (amplitude of one side:0.35mm)X,Y,Z Direction 80min each
	Impact(durability)	150m/s <sup>2</sup> (6directions and 3times for each)
Materials	Body:Aluminum die-cast Cable sheathing:Heart-resistant PVC Connector:Zinc alloy and brass Front Cover:glass	
Cable length	0.5m 2m(Crooked-proof cable)	
Minimum bending radius	68mm	
Weight	Approx.650g	
Accessories	Laser Label (EN:2,FDA:3,GB:2),Ferrite core(2 pcs)	

- \*1 Defined as 1/e<sup>2</sup> (13.5%) of the central light intensity. Leakage of light is also present in areas other than those defined. Thus, there are some influences in cases where the reflection factor of the area surrounding the workpiece is higher than that of the workpiece itself.
- \*2 When an OMRON-standard workpiece (alumina ceramics) is placed at 210-mm distance, and its average height of all lines is measured. The average of 64 measurements is taken. Note that the resolution performance may not be satisfied in the presence of strong magnetic fields.The CCD mode is HI-RESO.
- \*3 The error in relation to the ideal straight line when the average height of all lines on an OMRON-standard workpiece (alumina ceramics) is measured. The degree of linearity may change depending on the workpiece.(Drawing1) The CCD mode is HI-RESO.
- \*4 The lighting operation is Table1.

Indicator	During start-up	RUN/ADJ/FUN mode	
		LD is OFF.	LD is ON.
Standby Indicator	OFF	ON	ON
Laser Indicator	OFF	OFF	ON

- \*5 The value obtained at measurement with the space between the sensor and the workpiece fixed with an aluminum jig. The CCD mode is nomal.

## ■External Dimensions

## SENSOR CONNECTIONS

Three ferrite cores (supplied with the controller) must be attached to the sensor cable. Ferrite cores can be connected within 100 mm from the sensor and within 100 mm from the controller's connector, respectively.

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.

OMRON Corporation Industrial Automation Company

Kyoto, JAPAN Contact: [www.ia.omron.com](http://www.ia.omron.com)

Regional Headquarters

■ OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp  
The Netherlands  
Tel: (31) 2356-81-300/Fax: (31) 2356-81-388

■ OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200  
Hoffman Estates, IL 60169 U.S.A.  
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

■ OMRON ASIA PACIFIC PTE. LTD.

438B Alexandra Road, #08-01/02 Alexandra  
Technopark,Singapore 119968  
Tel: (65) 6835-3011 / Fax: (65) 6835-3011

■ OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,  
200 Yin Cheng Zhong Road,  
PuDong New Area, Shanghai, 200120, China  
Tel: (86) 21-6023-0333 / Fax: (86) 21-5037-2388

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