

OMRON

ZG2-WDS22

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,
Shiohiko 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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PRECAUTIONS ON SAFETY

●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.

☠ Laser beam

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-WDS22 is classified into class 2 defined by this standard. The ZG2-WDS22 has the following warning label on the side of sensors.

Laser Emission Opening Label

警告

レーザ放射

レーザー光線が直接または反射により人目に照らすと、失明や失明の恐れがあります。

●放射出力 : 5mW

●波長 : 650nm

●パルス持続時間 : 2000μs

●パルス繰り返し率 : 500pps

●クラス : CLASS II LASER PRODUCT

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Class 3B Danger Label

DANGER

LASER RADIATION

DO NOT STARE INTO BEAM

●RADIATION CLASS: CLASS III

●LASER PRODUCT CLASS: CLASS III

Class 3B Danger Label

DANGER

LASER RADIATION

DO NOT STARE INTO BEAM

●RADIATION CLASS: CLASS III

●LASER PRODUCT CLASS: CLASS III

Certification Label

This laser product complies with 21 CFR 1040.10 and 1040.11

OMRON Corporation

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

Place of manufacture:
AVISO Factory, OMRON Corp.

Manufactured in:

(3)China

The ZG2-WDS22 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.

警告

激光辐射

激光辐射可能直接伤害人眼，造成失明或永久性视力损伤。

●辐射功率 : 5mW

●波长 : 650nm

●脉冲持续时间 : 2000μs

●脉冲重复频率 : 500pps

●符合标准 : GB/T 7247.1-2024

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●符合标准 : GB/T 7247.1-2024

(4)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-WDS22. When exporting to Europe, labels fall under EU standard EN 60825-1:2014+A11:2021. The ZG2-WDS22 is classified into Class 2 by the IEC 60825-1:2014 / EN 60825-1:2014+A11:2021 standard.

- 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, malfunctions, or undesirable effects on product 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 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 30 minutes 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,prerent the light from being incident into the sensor head.

Sensor Specifications		
Model		ZG2-WDS22
Sensor Installation		Diffuse reflectionMirror reflection
Reference distance (direction of height)		100mm94mm
Measure-ment range	Direction of width	22mmTYP
	Direction of height	
		±12mm±10mm
Light source		Visible Semiconductor Laser (Wave length:658nm,5mW max [MAX2MUM EXPOSURE WITHOUT OPTICAL INSTRUMENTS:1mW], IEC class 2,FDA class3B)
Beam dimensions		*160μm×45mm typical at the reference distance
Resolution in the direction of width		35μm(22mm/631pix)
Resolution in the direction of hight		*22.5μm
Linearity in the direction of hight		*3±0.1%FS
LED indicator lamp		There are two indicators for the laser status. *4“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/Transparent object
Temperature characteristic		*50.02°F.S/°C
Operation environment robustness	Degree of protection	IP66(IEC60529)
	Ambient operating illumination	Illumination at light-receiving surface:7,000 lx max,incandescent light
	Ambient temperature	Operating:0 to +50°C
	Ambient humidity	Storage: -15 to +60°C(no freezing and condensation)
	Vibration(durability)	Operating and strage:35% to 85%(no condensation)
Materials	Impact(durability)	10 to 150Hz (amplitude of one side:0.35mm)X,Y,Z Direction 80min each
		150m/s ² (6 directions and 3 times for each)
		Body:Aluminum die-cast Cable sheating: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.500g (2m)
Accessories		Laser Label (EN:2 FDA:3 GB:2),Ferrite core(2 pcs)

*1 Defined as 1/e² (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 reference 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.

Diffuse reflection mode (Drawing1)

112mm

Digital output

88mm

88mm

112mm

Distance

±0.1% F.S.max

(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

Lightening axis

Center

Receiving axis

Standard surface

Lightening part

Receiving part

3-Dia.4.5 mounting holes

92.1

22.7

46

100

80

72

70

4

9.5

16.4

125

35°

18

36

R154

25

68

100

16.9

45.1

Vinyl insulated round cord

Dia.6.8 standard length 0.5m,2m

Connector

Standard surface

70±0.1

9.5±0.1

Mounting Screw Holes

3-M4

68±0.1

Operation indicator

8

Dia.21

9.5(1.5)

82

5

(Unit: mm)

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.

Within 100 mm

Within 100 mm

Ferrite core (standard accessory)

Ferrite core (standard accessory)

Suitibility 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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