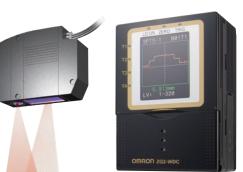
Smart Sensor 2D CMOS Laser Type ZG2

- Twelve times the sensitivity to stably measure surfaces with black coatings or black rubber.
- Two and half times more resistance to the influence of tilting for stable measurement of transparent and glossary surfaces.
- Ten times the speed for stable measurement even on highspeed lines.



For the most recent information on models that have been certified for safety standards, refer to your OMRON website.

Be sure to read *"Safety Precautions"* on page 4.

Ordering Information

Sensor Heads

Ontinal avatam	Measurement range		Reso	lution	Model		
Optical system	Height direction	Width direction	Height direction	Width direction	Cable length 2m	Cable length 0.5m	
Regular reflective	22.3±0.5 mm		0.05	5 µm	ZG2-WDS3VT 2M	ZG2-WDS3VT 0.5M	
Diffuse reflective	10.6±0.4 mm	3 mm (typical)	0.25 µm	(3mm/631pixels)	ZG2-WD53V1 2IM	ZG2-WD53V1 0.5W	
Diffuse reflective	50±3 mm	0		13 µm	ZG2-WDS8T 2M ZG2-WD		
Regular reflective	44±2 mm	8 mm (typical)		(8 mm/631 pixels)		ZG2-WDS8T 0.5M	
Diffuse reflective	100±12 mm	00	0.5	35 µm	ZG2-WDS22 2M	ZG2-WDS22 0.5M	
Regular reflective	94±10 mm	22 mm (typical)	2.5 µm	(22 mm/631 pixels)	ZG2-WD522 2M	ZG2-WD522 0.5M	
Diffuse reflective	210±48 mm	70 mm (typical)	6 µm	111 μm (70 mm/631 pixels)	ZG2-WDS70 2M	ZG2-WDS70 0.5M	

Note: For details, see the Ratings and Specifications Table.

Sensor Controllers

Appearance	Power supply	Output type	Model
T		NPN	ZG2-WDC11A *
	24 VDC	NPN	ZG2-WDC11
			ZG2-WDC41A *
		PNP	ZG2-WDC41

* Setup support software for PC is attached.

Accessories (Order Separately)

Real-time Parallel Output Unit

Appearance	Output type	Model
	NPN	ZG-RPD11
	PNP	ZG-RPD41

Note: Models with 1.5-m cable and 2-m cable are available.

RS-232C Cable

Connecting device	Model	Qty
For PLC/PT connection (2 m)	ZS-XPT2	1
For personal computer connection (2 m)	ZS-XRS2	Ι

Model

Controller Link Unit



ZS-XCN

Data Storage Unit

Appearance	Power supply	Output type	Model
			ZG2-DSU11
	24 VDC	PNP	ZG2-DSU41

Sensor Head Extension Cable (Robot Cable)

Appearance	Cable length	Model	Qty
	25 m	ZG2-XC25CR	
	15 m	ZG2-XC15CR	- 1
U	8 m	ZG2-XC8CR	
	3 m	ZG2-XC3CR	

Parallel Mounting Adaptor

Appearance	Model
	ZS-XPM1 For 1 Unit
	ZS-XPM2 For 2 Units or more

Memory Card

Capacity	Model
256 MB	HMC-EF283
512 MB	HMC-EF583

CE

Ratings and Specifications

Sensor Heads

Item Model		ZG2-	WDS8T	ZG2-	WDS22	ZG2-WDS70	ZG2-W	DS3VT	
Optical system		Diffuse reflective	Regular reflective	Diffuse reflective	Regular reflective	Diffuse reflective	Regular reflective	Diffuse reflective	
Measurement	Height direction	50±3 mm	44±2 mm	100±12 mm	94±10 mm	210±48 mm (In the high-precision mode)	22.3±0.5 mm	10.6±0.4 mn	
range	Width direction *5	8 mm (typical)	22 mm (typical)		70 mm (typical)	3 mm (typical)		
Resolution Height direction *1 Width direction		1 μm 2.5 μm 6			6 µm	0.2 µm			
		13 µm (8 mm	/ 631 pixels)	35 µm (22 mr	n / 631 pixels)	111 µm (70 mm / 631 pixels)	5 µm (3 mm /	631 pixels)	
Linearity (in the	height direction) *2	±0.1 %F.S.							
Temperature characteristic *3		0.03 %F.S./°C	>	0.02 %F.S./°C	>		0.08 %F.S./°C		
Туре		Visible semice	onductor laser						
	Wavelength	658 nm					650 nm		
	Output	5 mW max. o	utput, 1 mW ma	x. exposure (wi	thout using opti	cal instruments)	1 mW max		
Light source	Laser class	Class 2M of EN60825-1 / IEC60825-1 Class IIIB of FDA (21CFR 1040.10 and 1040.11)					Class 2 of EN60825-1 / IEC60825-1 Class II of FDA (21CFR 1040.10 and 1040.11)		
Beam shape (at measurement center distance) *4 LED		30 μ m \times 24 mm (typical) 60 μ m \times 45 mm (typical) 120 μ m \times 75 mm (typical) 25 μ m \times 4 mm (typical)						n (typical)	
		STANDBY : Lights when laser irradiation preparation is complete (indication color : green)							
		LD_ON : Lights when the laser is irradiating (indication color : green)							
Measurement object					Surface of non-transparent objects	Surface of nor transparent of			
Ambient light intensity		Illumination on the photo-receiving face 7,000 lx max. : Incandescent lamp							
	Ambient temperature	Operating : 0 to 50 °C, Storage : -15 to 60°C (with no icing or condensation)							
Environmental	Ambient humidity	Operating and storage : 35 to 85 % (with no condensation)							
resistance	Degree of protection *6	IP66 (IEC605	29)				IP67 (IEC6052	29)	
	Vibration resistance (destruction)	10 to 150 Hz with 0.35 mm single amplitude for 80 min each in X, Y, and Z directions							
	Shock resistance (destruction)	150 m/s², 3 tir	mes each in 6 d	irections (up / d	own, right / left,	forward / backward)			
Materials			um diecast, Fro inc alloy or bras		, Cable insulati	on : Heat-resistive polyvinyl chlo	oride (PVC),		
Cable length		0.5 m, 2 m (flexible cable)							
Minimum bendi	ng radius	68 mm							
Weight		Approx. 500 g	1	Approx. 500 g)	Approx. 650 g	Approx. 300 g		
Accessories		Laser labels (English labels), Ferrite core (2), Instruction manual							

Model	CCD mode	Average No. of	Measurement object		
Model	CCD mode operatio		Regular reflective	Diffuse reflective	
ZG2-WDS8T/ZG2-WDS22/ ZG2-WDS70	High-resolution	64	OMRON standard white alumina ceramic object		
ZG2-WDS3VT	mode	04	OMRON standard mirrored object	OMRON standard diffuse reflective object	

Note: The minimum resolution of the ZG2-WDS8T/WDS3VT is 0.25 µm, even when the average number of operations is increased. Resolution does not go any lower. The tolerance for and ideal straight line obtained by determining the average height of and OMRON standard measurement object for the beam line. The CCD high-resolution mode is used. Linearity varies depending on the measurement object. *2

Model	CCD mode	Average No. of	Measurement object		
Model		operations	Regular reflective	Diffuse reflective	
ZG2-WDS8T/ZG2-WDS22/ ZG2-WDS70	High-resolution	ode I	OMRON standard white alumina ceramic object		
ZG2-WDS3VT	mode		OMRON standard mirrored object	OMRON standard diffuse reflective object	

A value attained by using an aluminum jig to secure the distance between the Sensor Head and the measurement object. The CCD standard mode is used.
 Defined as 1/e2 (13.5%) of the center light intensity. This may be influenced when light leakage also exists outside the defined area and the reflectivity of the light around the measurement object is higher than that of the user around the measurement object is higher than that

of the measurement object.
*5 A typical value of the measurement range (width direction) near the measurement center distance. This is not a guaranteed value.
*6 Protection structure of connector area is IP40.

Sensor Controllers

	Item		ZG2-WDC11/WDC11A	ZG2-WDC41/WDC41A			
Input/output ty	ре		NPN PNP				
No. of connect	able Sensor Heads	3	1 per Controller				
No. of connecta	able Controllers		2				
Measurement o	cycle *		16 ms (high-precision mode), 8 ms (standard mode), 5 ms (high-speed mode)				
Min. display un	it		10 nm				
Display range			-999.99999 to 999.99999				
		LCD monitor	1.8-inch TFT color LCD (557 x 234 pixels)				
Display LED:		LEDs	 Judgment indicators for each task (indication color : orange):T1, T2, T3, T4 Laser indicator (indication color : green): LD_ON Zero reset indicator (indication color : green): ZERO Trigger indicators (indication color : green): TRIG 				
		Analog outputs	Select voltage or current (using the sliding switt • Voltage output : -10 to 10 V, output impedan • Current output : 4 to 20 mA, maximum load r	ce : 40 Ω			
		Judgment output (ALL-PASS/NG/ERROR)	NPN open collector	PNP open collector			
	Input/output	Trigger auxiliary output (ENABLE/GATE)	30 VDC, 50 mA max. Residual voltage : 1.2 V max.	50 mA max. Residual voltage : 1.2 V max.			
	signal lines	Laser stop input (LD-OFF)					
External		Zero reset input (ZERO)	1				
interface		Measurement trigger input (TRIG)	ON : 0 V short or 1.5 V max. OFF : Open (leakage current : 0.1 mA max.)	ON : Power supply voltage short or power supply voltage -1.5 V max. OFF : Open (leakage current : 0.1 mA max.			
		Bank switching input (BANK A~D)					
	Querial I/Q	USB2.0	1 port, full speed (12 Mbps), MINI-B				
Parallel output		RS-232C	1 port, 115,200 bps max.				
		Output	18 - terminal				
		No. of setting banks	16				
		Sensitivity adjustment	Multi, High-speed multi, Auto, Fixed				
Main functions		Measurement items	Height, 2-point Step, 3-point Step, Edge position, Edge width, Angle, Intersection coordinate Intersection angle, Sectional area, Calculations between tasks (up to eight items can be measured simultaneously)				
		Auxiliary functions	Filter, Laser power adjustment, Position correction (height, position, lope), Linked operation, Point of inflection measurement				
		Profiles saved	16 profiles (1 profile per bank)				
		Trigger modes	External trigger / continuous				
		Power supply voltage	21.6 to 26.4 VDC (including ripple current)				
Potinge		Current consumption	0.8 A max. (per sensor head)				
Ratings		Insulation resistance	20 $M\Omega$ at 250 V between lead wires and Control	bller case			
		Dielectric strength	1,000 VAC, 50 / 60 Hz for 1 min between lead	wires and Controller case			
		Ambient temperature	Operating : 0 to 50°C, Storage : -15 to 60°C (with no icing or condensation)				
		Ambient humidity	Operating and storage : 35 to 85 % (with no co	ndensation)			
Environmental		Degree of protection	IP20 (IEC60529)				
resistance		Vibration resistance (destruction)	Vibration frequency : 10 to 150 Hz, single ampl	itude : 0.35 mm, acceleration : 50 m/s ²			
Shock resistance (destruction)			150 m/s ² , 3 times each in 6 directions (up / down, right / left, forward / backward)				
Material			Case : Polycarbonate (PC), Cable insulation : H	leat-resistive polyvinyl chloride (PCV)			
Cable length			2m				
Minimum bend	ing radius		57 mm				
Weight			Approx. 300 g (including cable)(Packed state: A	Approx. 450 g)			
Accessories			ZG2-WDC_1 : Large Ferrite Core (1 piece), Instruction Manual ZG2-WDC_1A : Large Ferrite Core (1 piece), Small Ferrite Core(2 pieces), Instruction Manual Setup Support Software (CD-ROM), USB cable (1 m)				

The image input periods listed here are for fixed/auto sensitivity. The image input period will be longer for multi-sensitivity, high-speed multi-sensitivity, or other settings. When the high-power mode is ON, the shortest image input period is 95 ms regardless of the setting of the CCD mode. Use the eco monitor in the RUN mode to determine the actual image input period.

Data Storage Unit

Item		1	ZG2-DSU11	ZG2-DSU41
Input/output type			NPN	PNP
No. of connectable Controllers			2 *1	1
Connectable Controllers			ZG2-WDC11/WDC41	
External interface	Input/output signal lines	Inputting starting/ terminating logging	ON : O V short or 1.5 V max. OFF : Open (leakage current : 0.1 mA max.)	ON : Power supply voltage short or power supply voltage -1.5 V max. OFF : Open (leakage current : 0.1 mA max.
		Judgment output (HIGH/PASS/LOW/ERROR)	NPN open collector 30 VDC, 50 mA max. Residual voltage : 1.2 V max.	PNP open collector 50 mA max. Residual voltage : 1.2 V max.
	Serial I/O	USB2.0	1 port, full speed (12 Mbps), MINI-B	
		RS-232C	1 port, 115,200 bps max.	
Functions	No. of logged data *2	Memory of the main unit	Profiles saved : 5,120 profiles Measurement values saved : 65,000 values max. *3	
		Memory card (256 MB) *4	Profiles saved : 35,328 profiles max. (256 profiles x 138 files) Measurement values saved : 7,150,000 values max. (65,000 values x 110 files)	
	Logging trigger functions		External triggers, data triggers (self-triggers), and time triggers	
	External banks functions		4096	
	Other functions		Alarm output functions	
Ratings	Power supply voltage		21.6 to 26.4 VDC (including ripple current)	
	Current consumption		0.5 A max.	
Environmental resistance	Ambient temperature		Operating : 0 to 50°C, Storage: 0 to 60°C (with no icing or condensation)	
	Ambient humidity		Operating and storage : 35 to 85% (with no condensation)	
Degree of protection			IP20 (IEC60529)	
Material			Case : Polycarbonate (PC)	
Cable length			2 m	
Minimum bending radius			52 mm	
Weight			Approx. 280 g	
Accessories			Ferrite Core (1 piece), Instruction Manual	

***1** The controller link unit is necessary for linking.

*2 Data is saved in the memory of the main unit during logging. The data is automatically saved in a memory card after logging is completed. The maximum number of logging differs according to set conditions. For details, refer to the Users Manual.

*3 Measurement values for 65,000 measurements can be saved even when two sensor controllers are connected and each performs eight tasks.
 *4 The value is the maximum number achieved in the following conditions.

One sensor controller performs one measurement task.

• Either profiles or measurement values are logged.

Safety Precautions

This product is not designed or rated for ensuring safety of persons either directly or indirectly.

Do not use it for such purposes.

Do not expose your eyes to the laser radiation either directly or indirectly (i.e., after reflection from a mirror or shiny surface). The laser radiation has a high power density and exposure may result in loss of sight.



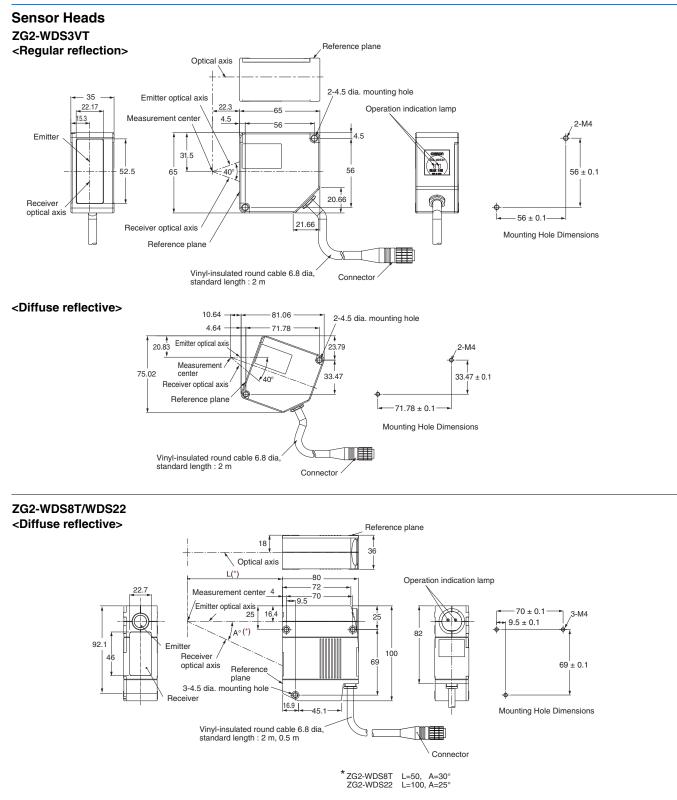
The warning and explanatory label on the side of the Sensor Head in the ZG2 Series is in Japanese. Replace it with the English label that comes with the product.

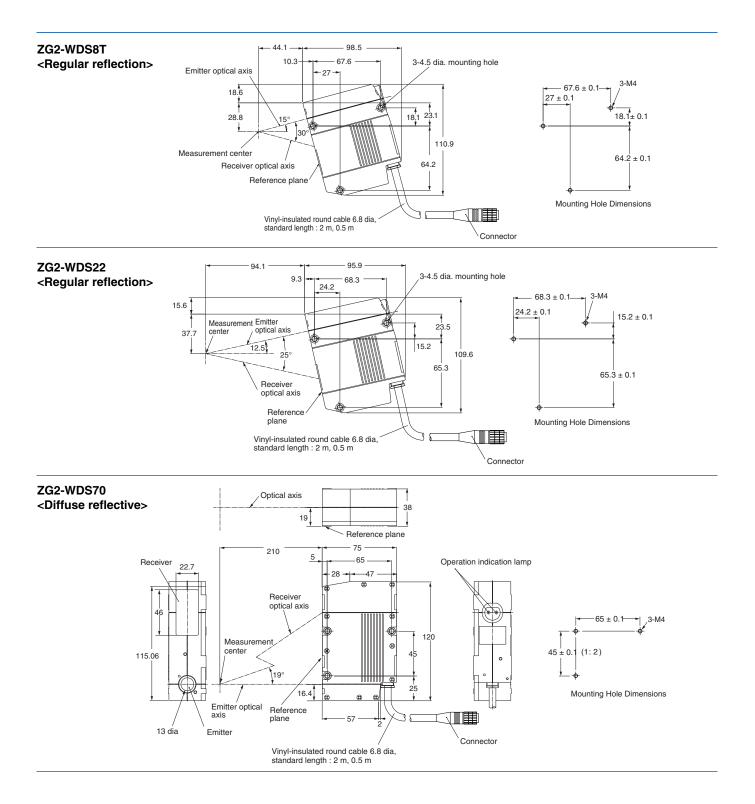


For details, including precautions for correct use, refer to the "ZG2 Smart Sensor User's manual" (Cat. No. Z288) on your OMRON website.

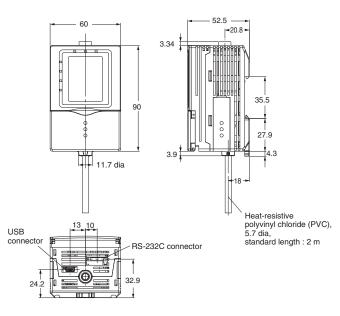
• For technical information and product FAQs, refer to the "Technical Guide" at your OMRON website.

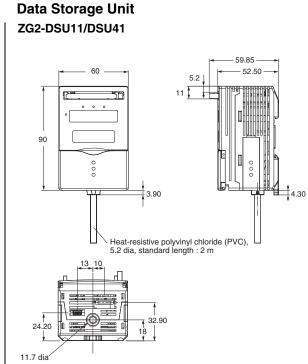
Dimensions



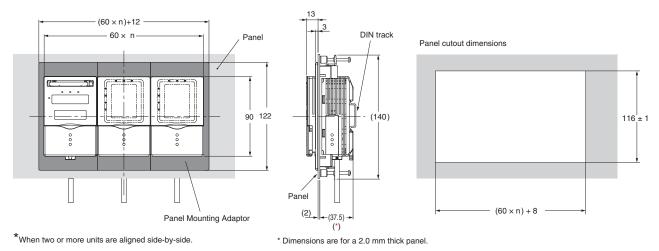


Sensor Controller ZG2-WDC11/WDC41

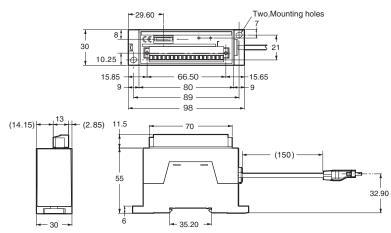




Panel Mounting Adaptor ZS-XPM1/XPM2 (Dimensions for mounting on a control panel)



Real-time Parallel Output Unit ZG-RPD11/RPD41



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