

Datenblatt
Profilsensor ZG2
 ZG2



Bezeichnung	ZG2
Typ	Profilsensor
Messbereich Z	Min. 20 ± 0,5 mm Max. 210 ± 30 mm
Messbereich X	Min. 3 mm Max. 70 mm
Oberfläche	Glas, Kunststoff, Metall, Papier, schwarzer Gummi, Spiegel
Auflösung	0,2 µm (Z) / 4 µm (X)
Linearität (±% d. Messbereichs)	0,5 %
Ansprechzeit	5 ms
Lichtstrahlform	Linienstrahl
Schutzart	Kopf: IP64/66, Controller: IP20
Anzahl der anschließbaren Sensoren	1
Funktionsmerkmale	Dickenmessung, Exzentrizität, Höhe, Schritt, Profil, Breite, Bergwert, Berg-Tal-Wert, Talwert, Messzeit-Trigger, Kalibrierung, PC-Software
Versorgungsspannung	21,6 - 26,4 VDC
Steuer-E/A	4 - 20 mA, Schaltausgang High / Pass / Low, Trigger

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Kommunikation

RS232C, USB 2.0

Betriebstemperatur

0°C ... 50°C

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2D Profile Measuring Sensors

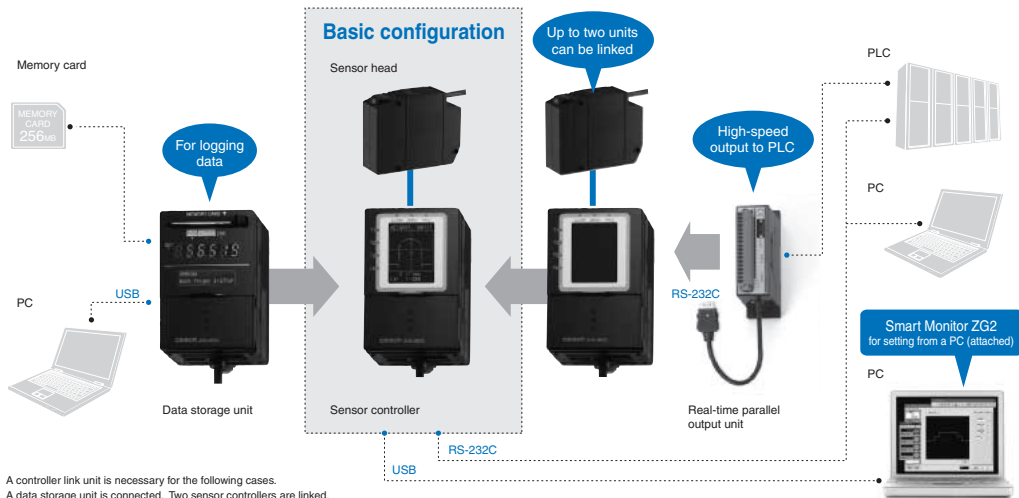
ZG2 - Smart Profile Sensor

The easy way to get your profile

- Easy to use - intuitive user interface
- Live - built-in LCD monitor for setup and immediate profile display
- Versatile - 18 measurement tools
- Accurate - 10 µm resolution
- Wide profiles - up to 70 mm
- Fast - 5 ms sampling time
- Smart - powerful PC software for configuration and post-processing (optional)



System configuration

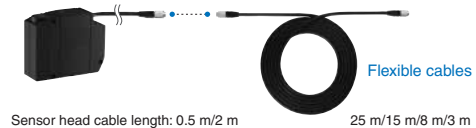


A controller link unit is necessary for the following cases.
 A data storage unit is connected. Two sensor controllers are linked.

27 m max.

Sensor Head Extension Cables

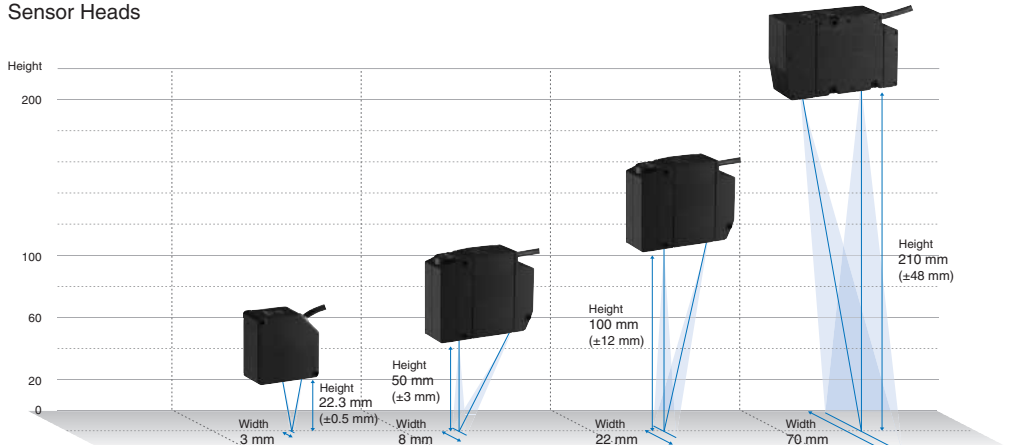
Highly-flexible extension cables of four different lengths are available. The distance between the sensor head and sensor controller can be extended up to 27 m without delaying image input periods.



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Ordering Information

Sensor Heads



Optical system		Regular reflective	Diffuse reflective	Regular reflective	Diffuse reflective	Regular reflective	Diffuse reflective	Diffuse reflective
Measurement range	Height direction	22.3 ±0.5 mm	10.6 ±0.4 mm	50 ±3 mm	44 ±2 mm	100 ±12 mm	94 ±10 mm	210 ±48 mm
	Width direction	3 mm (typical)		8 mm (typical)		22 mm (typical)		70 mm (typical)
Resolution	Height direction	0.25 µm		1 µm		2.5 µm		6 µm
	Width direction	5 µm (3mm/631pixels)		13 µm (8 mm/631 pixels)		35 µm (22 mm/631 pixels)		111 µm (70 mm/631 pixels)
Model		ZG2-WDS3VT		ZG2-WDS8T		ZG2-WDS22		ZG2-WDS70

Sensor Controllers

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

* Setup Support Software for PC is attached.

Data Storage Unit

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

Accessories (Order separately)

Real-time Parallel Unit (for the ZG-WDC-Series)

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

RS-232 Cable

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

Sensor Head Extension Cable (Robot cable)

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

Parallel Mounting Adaptor

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

Controller Link Unit

Appearance	Model
	ZS-XCN

Memory Card

Capacity	Model
128 MB	F160-N1285
256 MB	F160-N2565

Specifications

Sensor Heads

Item	Model	ZG2-WDS8T	ZG2-WDS22	ZG2-WDS70	ZG2-WDS3VT				
Optical system		Diffuse reflective	Regular reflective	Diffuse reflective	Regular reflective	Diffuse reflective			
Measurement range	Height direction	50±3 mm	44±2 mm	100±12 mm	94±10 mm	210±30 mm	20±0.5 mm	5.2±0.4 mm	
	Width direction	8 mm (typical)		22 mm (typical)		70 mm (typical)	3 mm (typical)		
Resolution	Height direction *1	1 µm		2.5 µm		6 µm	0.25 µm		
	Width direction	13 µm (8 mm/631 pixels)		35 µm (22 mm/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			
Light source	Type	Visible semiconductor laser							
	Wavelength	658 nm				650 nm			
	Output	5 mW max. output, 1 mW max. exposure (without using optical instruments)					1 mW max.		
	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		30 µm×24 mm (typical)	60 µm×45 mm (typical)	120 µm×75 mm (typical)	25 µm×4 mm (typical)				
LED		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 / transparent objects			Surface of non-transparent objects	Surface of non-transparent / transparent objects			
Environment resistance	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)							
	Ambient humidity	Operating and storage: 35 to 85% (with no condensation)							
	Degree of protection	IP66 (IEC 60529)				IP67 (IEC 60529)			
	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/s ² , 3 times each in 6 directions (up/down, right/left, forward/backward)							
Materials		Case: Aluminium diecast, Front cover: Glass, Cable insulation: Heat-resistive polyvinyl chloride (PVC), Connector: Zinc alloy or brass							
Cable length		0.5 m, 2 m (flexible cable)							
Weight		Approx. 500 g		Approx. 500 g		Approx. 650 g		Approx. 300 g	
Accessories		Laser labels (EN : 2 labels, FDA : 3 labels), Ferrite core (1), Instruction manual							

Note: 1. Obtained by setting an OMRON standard measurement object at the measurement center distance and determining the average height of the beam line. The conditions are given in the table below. However, satisfactory resolution cannot be attained in strong electromagnetic fields. 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.

Model	CCD Mode	Average No. of Operations	Measurement object	
			Regular reflective	Diffuse reflective
ZG2-WDS8T/ ZG2-WDS22/ ZG2-WDS70	High-precision mode	64	OMRON standard white alumina ceramic object	
ZG2-WDS3T			OMRON standard mirrored object	OMRON standard diffuse reflective object

2. 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.

Model	Measurement object	
	Regular reflective	Diffuse reflective
ZG2-WDS8T/ WDS22/WDS70	OMRON standard white alumina ceramic object	
ZG-WDS3T	OMRON standard mirrored object	OMRON standard diffuse reflective object

3. 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.

4. 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 measurement object.

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Sensor Controllers

Item	Model	ZG2-WDC11/WDC11A	ZG2-WDC41/WDC41A	
Input/output type		NPN	PNP	
No. of connectable Sensor Heads		1 per Controller		
No. of connectable Controllers		2		
Measurement cycle ^{*1}		16 ms (high-precision mode), 8 ms (standard mode), 5 ms (high-speed mode)		
Min. display unit		10 nm		
Display range		-999.99999 to 999.99999		
Display	LCD monitor	1.8 inch TFT color LCD (557x234 pixels)		
	LEDs	<ul style="list-style-type: none"> 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 		
External interface	Input/output signal lines	Analog outputs	Select voltage or current (using the sliding switch on the bottom surface) <ul style="list-style-type: none"> Voltage output: -10 to 10 V, output impedance: 40 Ω Current output: 4 to 20 mA, maximum load resistance: 300 Ω 	
		Judgment output (ALL-PASSING/ERROR)	NPN open collector 30 VDC, 50 mA max.	
		Trigger auxiliary output (ENABLE/GATE)	PNP open collector 50 mA max. Residual voltage: 1.2 V max.	
		Laser stop input (LD-OFF)		
		Zero reset input (ZERO)		
		Measurement trigger input (TRIG)	ON: 0 V short or 1.5 V max. OFF: Open (leakage current: 0.1 mA max.)	
	Bank switching input (BANK A, B)	ON: Power supply voltage short or power supply voltage -1.5 V min. OFF: Open (leakage current: 0.1 mA max.)		
	Serial I/O	USB2.0	1 port, full speed (12 Mbps), MINI-B	
		RS-232C	1 port, 115,200 bps max.	
	Parallel output ^{*2}	Output	18 - terminal	
Main functions	No. of setting banks	16		
	Sensitivity adjustment	Multi, High-speed multi, Auto, Fixed		
	Measurement items	Height, 2-point Step, 3-point Step, Edge position, Edge width, Angle, Intersection coordinates, Intersection angle, Sectional area (up to eight items can be measured simultaneously)		
	Auxiliary functions	Filter, Laser power adjustment, Position correction (height, position, lobe), Linked operation, Point of inflection measurement		
	Profiles saved	16 profiles (1 profile per bank)		
	Trigger modes	External trigger/continuous		
Ratings	Power supply voltage	21.6 to 26.4 VDC (including ripple current)		
	Current consumption	0.8 A max.		
	Insulation resistance	20 MΩ at 250 V between lead wires and Controller case		
	Dielectric strength	1,000 VAC, 50/60 Hz for 1 min between lead wires and Controller case		
Environmental resistance	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%		
	Degree of protection	IP20 (IEC 60529)		
	Vibration resistance (destruction)	Vibration frequency: 10 to 150 Hz, single amplitude: 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)		
Materials	Case: Polycarbonate (PC), Cable insulation: Heat-resistive polyvinyl chloride (PVC)			
Cable length	2 m			
Weight	Approx. 300 g (including cable) (Packed state: 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)			

Note: 1. The image input periode listed here are for fixed/auto sensitivity. The image input period will be longer for multi-sensitivity or other settings. Use the eco monitor in RUN mode to determine the actual image input period.
2. When ZG-RPD is mounted

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Data Storage Unit

Item	Model	ZG2-DSU11	ZG2-DSU41
Input/output type		NPN	PNP
No. of connectable Controllers ^{*1}		2	
Connectable Controllers		ZG2-WDC11/WDC41	
External interface	Input/output signal lines	Inputting starting/terminating logging	ON: 0 V short or 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.
	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)	
Materials		Case: Polycarbonate (PC)	
Cable length		2 m	
Weight		Approx. 280 g	
Accessories		Ferrite Core (1 piece), Instruction Manual	

- Note: 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.

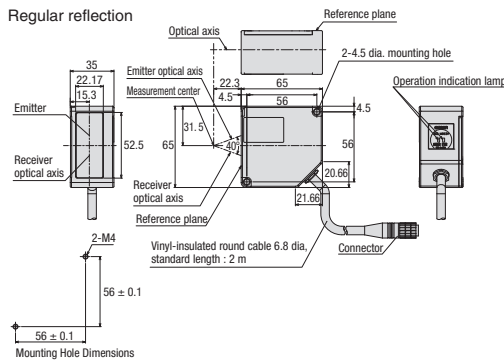
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Dimensions

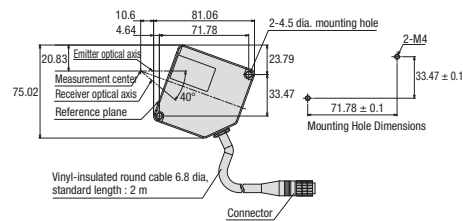
Sensor Heads

ZG2-WDS3VT

Regular reflection

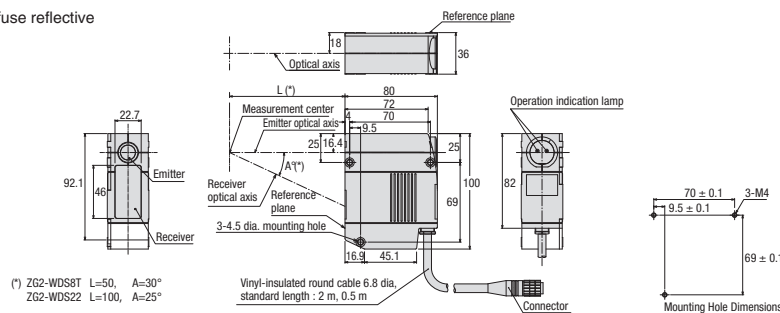


Diffuse reflective



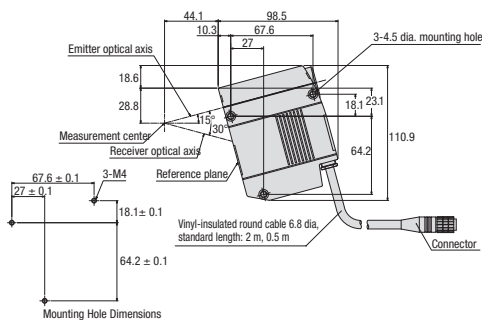
ZG2-WDS8T/WDS22

Diffuse reflective



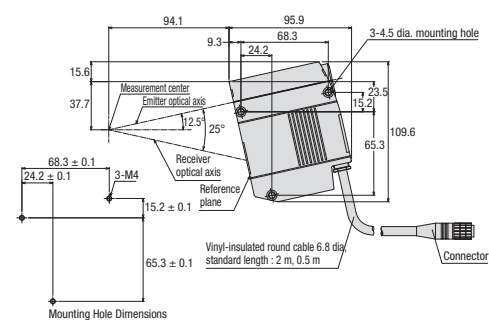
ZG2-WDS8T

Regular reflection



ZG2-WDS22

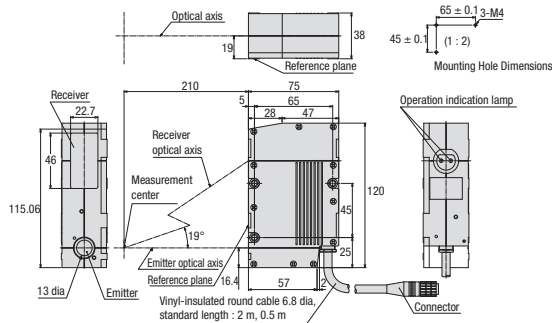
Regular reflection



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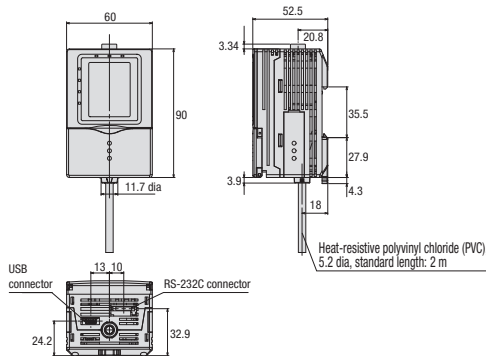
ZG2-WDS70

Diffuse reflective



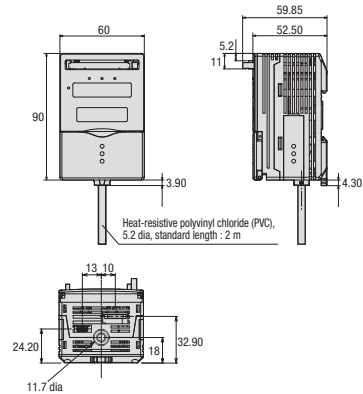
Sensor Controller

ZG2-WDC11/WDC41



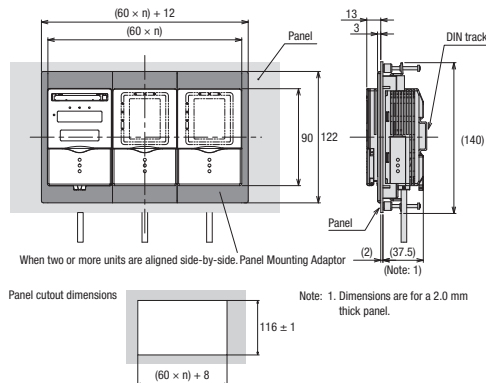
Data Storage Unit

ZG2-DSU11/DSU41



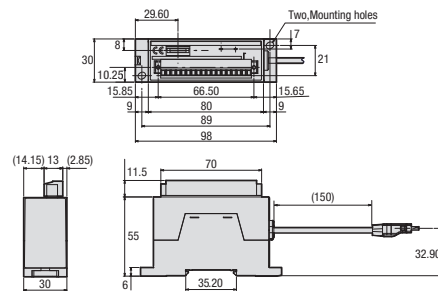
Panel Mounting Adaptor

ZS-XPM1/XPM2



Real-time Parallel Output Unit

ZG-RPD11/RPD41



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ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. Q24E-EN-02A

In the interest of product improvement, specifications are subject to change without notice.