# Ratings and Specifications

## Sensor Heads

| Item | | ZG2-WDS8T | | ZG2-WDS22 | | ZG2-WDS70 | ZG2-WDS3VT | |
|---|---|---|---|---|---|---|---|---|
| Optical system | | Diffuse reflective | Regular reflective | 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 ± 48 mm (In the high-precision mode) | 22.3 ± 0.5 mm | 10.6 ± 0.4 mm |
| | Width direction | 8 mm (typical) | | 22 mm (typical) | | 70 mm (typical) | 3 mm (typical) | |
| Resolution | Height direction (See note 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) (See note 2.) | | ± 0.1 %F.S. | | | | | | |
| Temperature characteristic (See note 3.) | | 0.03 %F.S./℃ | | 0.02 %F.S./℃ | | | 0.08 %F.S./℃ | |
| 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<br>Class IIIB of FDA (21CFR 1040.10 and 1040.11) | | | | | Class 2 of EN60825-1 / IEC60825-1<br>Class II of FDA (21CFR 1040.10 and 1040.11) | |
| Beam shape (at measurement center distance) (See note 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 | |
| Environmental resistance | Ambient light intensity | Illumination on the photo-receiving face 7,000 lx max. : Incandescent lamp | | | | | | |
| | Ambient temperature | Operating : 0 to 50℃, Storage : -15 to 60℃ (with no icing or condensation) | | | | | | |
| | Ambient humidity | Operating and storage : 35 to 85 % (with no condensation) | | | | | | |
| | Degree of protection | IP66 (IEC60529) | | | | | IP67 (IEC60529) | |
| | 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 times each in 6 directions (up / down, right / left, forward / backward) | | | | | | |
| Materials | | Case: Aluminum 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 e 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-WDS3VT | | | OMRON standard mirrored object | OMRON standard diffuse reflective object |

Note : 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 standard mode is used. Linearity varies depending on the measurement object.

| Model | Measurement object | |
|---|---|---|
| | Regular reflective | Diffuse reflective |
| ZG2-WDS8T/ZG2-WDS22/ZG2-WDS70 | OMRON standard white alumina ceramic object | |
| ZG2-WDS3VT | OMRON standard mirrored object | OMRON standard diffuse reflective object |

Note : 3. A value attained by using an aluminum jig to secure the distance between the Head and the measurement object. The CCD standard mode is used.
Note : 4. Defined as $1/e^2$ (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 measurement object.

## Sensor Controllers

| Item | | | 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 (See note 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 (557 x 234 pixels) | |
| | | LEDs | • Judgment indicators for each task (indication color : orange) : T1, T2, T3, T4<br>• Laser indicator (indication color : green) : LD_ON<br>• Zero reset indicator (indication color : green) : ZERO<br>• 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)<br>• Voltage output : -10 to 10 V, output impedance : 40 Ω<br>• Current output : 4 to 20 mA, maximum load resistance : 300 Ω | |
| | | Judgment output (ALL-PASS/NG/ERROR) | NPN open collector<br>30 VDC, 50 mA max.<br>Residual voltage : 1.2 V max. | PNP open collector<br>50 mA max.<br>Residual voltage : 1.2 V max. |
| | | Trigger auxiliary output (ENABLE/GATE) | | |
| | | Laser stop input (LD-OFF) | ON : 0 V short or 1.5 V max.<br>OFF : Open (leakage current : 0.1 mA max.) | ON : Power supply voltage short or power supply voltage -1.5 V max.<br>OFF : Open (leakage current : 0.1 mA max.) |
| | | Zero reset input (ZERO) | | |
| | | Measurement trigger input (TRIG) | | |
| | | Bank switching input (BANK A~D) | | |
| | Serial I/O | USB2.0 | 1 port, full speed (12 Mbps), MINI-B | |
| | | RS-232C | 1 port, 115,200 bps max. | |
| | Parallel output (when ZG-RPD is mounted) | 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, lope), 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. (per sensor head) | |
| | | 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℃, Storage : -15 to 60℃ (with no icing or condensation) | |
| | | Ambient humidity | Operating and storage : 35 to 85 % (with no condensation) | |
| | | Degree of protection | IP20 (IEC60529) | |
| | | Vibration resistance (destruction) | Vibration frequency : 10 to 150 Hz, single amplitude : 0.35 mm, acceleration : 50 m/s² | |
| | | Shock resistance (destruction) | 150 m/s², 3 times each in 6 directions (up / down, right / left, forward / backward) | |
| Material | | | Case : Polycarbonate (PC),<br>Cable insulation : Heat-resistive polyvinyl chloride (PCV) | |
| 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<br>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 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 | | | ZG2-DSU11 | ZG2-DSU41 |
|---|---|---|---|---|
| Input/output type | | | NPN | PNP |
| No. of connectable Controllers | | | 2 (See note 1.) | |
| Connectable Controllers | | | ZG2-WDC11/WDC41 | |
| External interface | Input/output signal lines | Inputting starting/terminating logging | ON : 0 V short or 1.5 V max.<br>OFF : Open (leakage current : 0.1 mA max.) | ON : Power supply voltage short or power supply voltage -1.5 V max.<br>OFF : Open (leakage current : 0.1 mA max.) |
| | | Judgment output (HIGH/PASS/LOW/ERROR) | NPN open collector<br>30 VDC, 50 mA max.<br>Residual voltage : 1.2 V max. | PNP open collector<br>50 mA max.<br>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 (See note 2.) | Memory of the main unit | Profiles saved : 5,120 profiles<br>Measurement values saved : 65,000 values max. (See note 3.) | |
| | | Memory card (256 MB) (See note 4.) | Profiles saved : 35,328 profiles max. (256 profiles x 138 files)<br>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℃, Storage : 0 to 60℃ (with no icing or condensation) | |
| | Ambient humidity | | Operating and storage : 35 to 85% (with no condensation) | |
| Material | | | Case : Polycarbonate (PC) | |
| Cable length | | | 2 m | |
| Weight | | | Approx. 280 g | |
| Accessories | | | Ferrite Core (1 piece), Instruction Manual | |

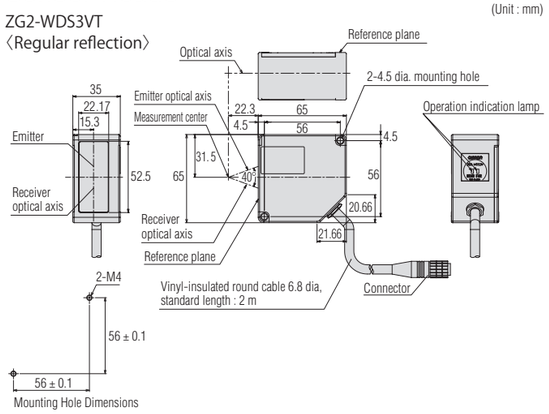
Note : 1. The controller link unit is necessary for linking.
Note : 2. Data is saved in the memory of the main unit during logging. The data is automatically saved in a memory card after logging is completed.The maximum number of logging differs according to set conditions. For details, refer to the Users Manual.
Note : 3. Measurement values for 65,000 measurements can be saved even when two sensor controllers are connected and each performs eight tasks.
Note : 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.

# Dimensions

## Sensor Heads

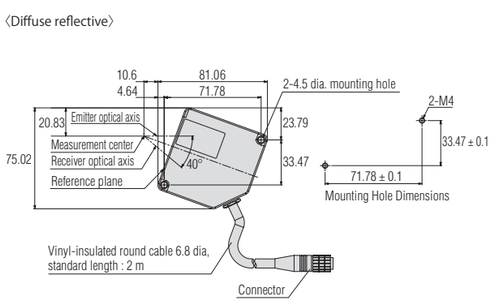
ZG2-WDS3VT
〈Regular reflection〉

(Unit : mm)




〈Diffuse reflective〉

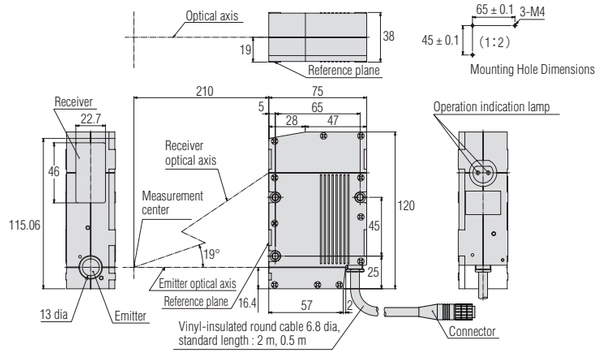
(Unit : mm)




## Sensor Heads

ZG2-WDS70
〈Diffuse reflective〉

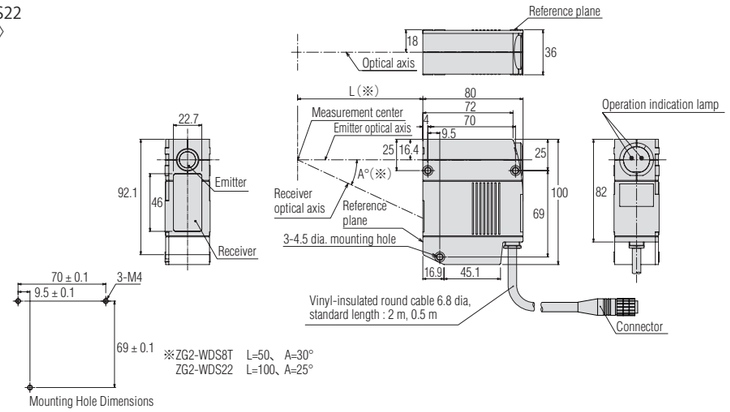
(Unit : mm)




## Sensor Heads

ZG2-WDS8T/WDS22
〈Diffuse reflective〉

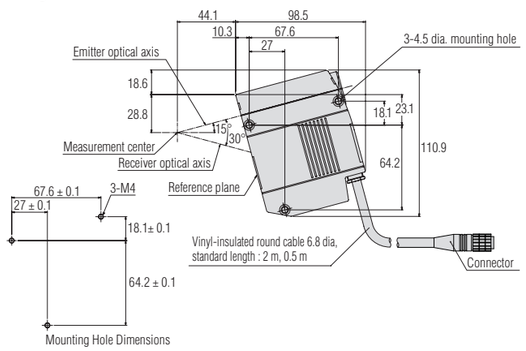
(Unit : mm)




## Sensor Heads

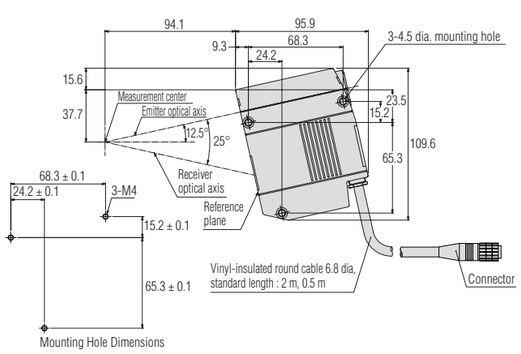
ZG2-WDS8T
〈Regular reflection〉

(Unit : mm)




ZG2-WDS22
〈Regular reflection〉

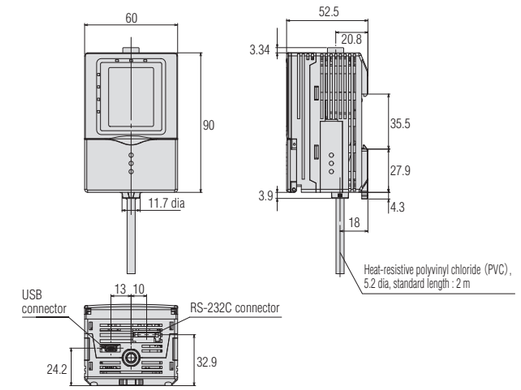
(Unit : mm)




## Sensor Controller

ZG2-WDC11/WDC41

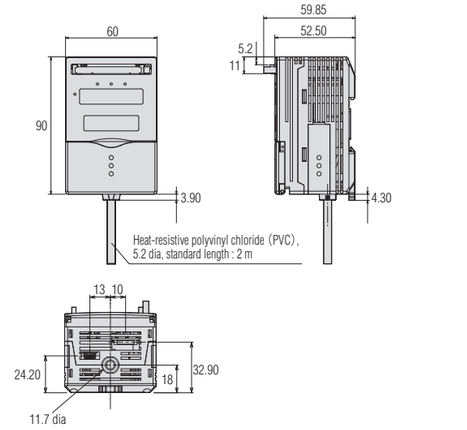
(Unit : mm)




## Data Storage Unit

ZG2-DSU11/DSU41

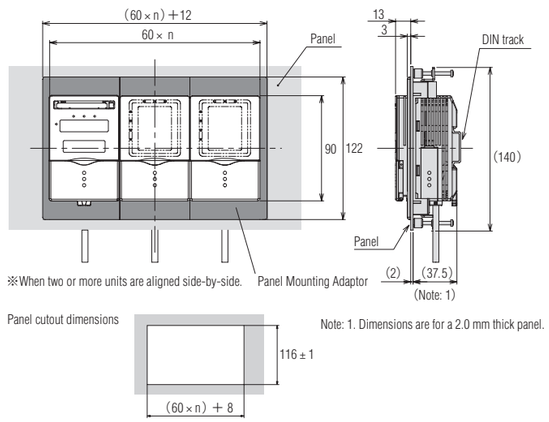
(Unit : mm)




## Panel Mounting Adaptor

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

(Unit : mm)




Note: 1. Dimensions are for a 2.0 mm thick panel.

## Real-time Parallel Output Unit

ZG-RPD11/RPD41

(Unit : mm)