

Multi-Dimensional Sensor Z550

- Inline profile inspections for workpieces made of metal, plastic, or other materials all at one time



Z550

Features

Measurement width: 70 mm

Measurement height: 60 mm

Long distance: 210 mm

Turn

Height

Width

Inclination

Cross-sectional area

into precise numeric evaluation criteria!

High-precision Measurements Over a Wide Area

Height of measurement range: 60 mm, width of measurement range: 70 mm

Cross-sectional Measurements without Moving the Sensor or Target Object

OMRON's unique 2-dimensional SW-CCD element and light sensitivity control ensure consistent measurements even on workpieces with curves and other surface shapes.

Complete Measurement Menus

Menu selections include items for measuring heights, 2- or 3-pt steps, edge positions, widths, edge centers, peaks/bottoms, cross-sectional areas, inclinations, average roughness, and maximum roughness. There are also menu items for user-defined continuous measurements (unrestricted calculations), trigger measurements, and logging measurements.

Image Monitor

This window is a conceptualization and not an actual window.

Scn 0
Run
99.60ms

| | | |
|-------|------------|-----------|
| NEAR | Sen0 | LV [15] |
| | PEAK | [170] |
| | Sen1 | LV [] |
| | PEAK | [] |
| FAF | LV | [] |
| OUT 0 | Zero's OFF | |

+005.188000 mm PASS

S+←/→: Display S+ENT: Adjust

Workpiece shape and measurement results can be checked at a glance.

Profile Monitor

This window is a conceptualization and not an actual window.

Sen 0
Tdiv 1: 0.996 [s]
Vr 0.1250 [mm]

+005.188000 mm PASS

S+←/→: Display S+ENT: Adjust

Profiles that change sequentially as the workpiece moves can be checked through images with 3-D shading.

Specifications

Z550-MC10/MC15 Controller

| Model | Z550-MC10 | Z550-MC15 |
|--------------------------------|--|-----------|
| I/O type | NPN | PNP |
| Power supply voltage | 21.6 to 26.4 V DC | |
| Current consumption | 1 A max. (with 2 sensors connected) | |
| Insulation resistance | Between the group of external DC terminals and the ground terminal: 20 MΩ max. (at 100 V DC) (when the built-in surge absorber is removed) | |
| Dielectric strength | Between the group of external DC terminals and the ground terminal: 1000 V AC at 50/60 Hz (when the built-in surge absorber is removed) | |
| Leakage current | 10 mA max. | |
| Noise resistance | 1,500 Vp-p; Pulse width: 0.1 ms/1 ms; Rising edge: 1-ns pulse | |
| Vibration resistance | 10 to 150 Hz (at a double amplitude of 0.1 mm) for 8 minutes each in the X, Y, and Z directions | |
| Shock resistance | 200 m/s ² ; 3 times each in 6 directions | |
| Ambient temperature | 0 to +50 °C at operation, -15 to +60 °C at storage (no icing or condensation) | |
| Ambient humidity | Operating and storage: 35% to 85% (no condensation) | |
| Ambient environment | No corrosive gases | |
| Ground | D-type ground (ground resistance of 100 W or less) * conventional class 3 ground | |
| Degree of protection | IEC60529 IP20 (in-panel) | |
| Materials | Console: ABS | |
| Weight | Approx. 0.7 kg | |
| Number of connectable sensors | Up to two Z550-SW70 sensors can be connected. | |
| Number of scenes | 16 | |
| Averagin number | 9 levels (1 to 256 times) | |
| Sensor control | 6 levels (varies depending on the sensor) | |
| Area specification function | Available | |
| Control of quantity of light | Multi-sensitivity adjustment (dynamic range or sampling interval takes precedence) fixed sensitivity, automatic sensitivity adjustment | |
| Measurement time ^{*1} | 100 ms (at fixed sensitivity) 120 ms (at automatic sensitivity) 100 ms to 250 ms (when sampling interval takes precedence) 100 ms to 620 ms (when dynamic range takes precedence) | |
| Run Mode | Continuous measurement or trigger measurement | |
| Image pre-processing | Noise removal | |
| Measurement pre-processing | Interpolation processing, filter processing, Inclination compensation processing, Height and position compensation processing | |
| Detection method | Height position method, Reflectance method | |
| Measurement item | Height, Step: 2 pts, Step: 3 pts, Edge position, Width, Edge center, Peak/Bottom, Cross-sectional area, Inclination, Roughness, User-defined | |
| Logging function | The measurement results of up to 3,000 measurements can be stored. (It is possible to select the number of measurements after which the measurement results will be stored.) | |
| Output pre-processing | Forced zero, Offset/span adjustment | |
| Profile data output | Up to 1024 height profiles can be output in one batch. The output format may be either ASCII code or binary format (when sending via XMODEM) | |
| Results output | Terminal block: Judgment result Analog: Measurement result RS-232C: Measurement result, judgment result, profile data | |
| Screen display | Image monitor, Trend monitor, Digital monitor, Profile monitor | |
| Tool function | Peripheral image display function, test measurement function | |
| Terminal blocks | 11 input points: TRIGGER, LD-OFF, RESET, DI0 to DI7 21 output points: DO0 to DO19 and GATE | |
| RS-232C (Baud rate) | Up to 115 kbps (at XMODEM transmission, external trigger measurement) Normally 38.4 kbps | |
| Monitor interface | 1 channel (for pin jack or overscan monitor) | |
| Analog output resolution | The full output scale can be divided into a maximum of 40,000 divisions. Resolution ^{*2} : 0.25 mV (±5 V), 0.4 mA (4 to 20 mA) | |

*1. The sampling interval varies depending on the measurement settings. Check the actual sampling interval on the image monitor.

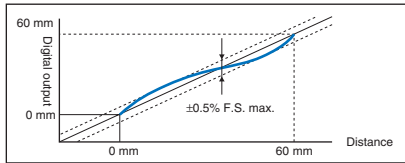
*2. When performing measurement taking the average of every 64 measurements with an OMRON K3AS linear sensor controller connected.

Z550-SW70 Sensor

| | | |
|---|-----------------------------------|---|
| Sensor installation | | Diffuse reflection only |
| Reference distance (direction of height) | | 210 mm (for 60-mm measurement range mode) |
| Measurement range | Direction of width | 70 mm (at 200 mm-reference distance) |
| | Direction of height ^{*1} | ±30 mm max. (for 60-mm measurement range mode) |
| Light source | | Visible semiconductor laser (wave length: 658 nm, 15 mW max, class 3B) |
| Beam dimensions ^{*2} | | 120 μm x 75 mm typical at the 200 mm-reference distance |
| Resolution in the direction of width ^{*3} | | 0.1 mm |
| Resolution in the direction of height ^{*4} | | 10 μm |
| Linearity in the direction of height ^{*5} | | ±0.5% F.S. |
| LED indicator lamp | | Lit when the laser is on |
| Temperature characteristic ^{*6} | | 0.1% F.S./°C |
| Operation environment robustness | Degree of protection | IP66 |
| | Ambient operating illumination | Illumination at light-receiving surface: 3,000 lx max., incandescent light |
| | Ambient temperature | 0 to +50°C at operation, -15 to +60°C at storage (no icing) |
| | Ambient humidity | Operating and storage: 35% to 85% (no condensation) |
| | Vibration (durability) | 10 to 150 Hz (at a double amplitude of 0.35 mm) for 8 minutes each in the X, Y, and Z directions |
| Materials | | Body: Aluminum die-cast Cable sheathing: Heat-resistant PVC Connector: Zinc alloy and brass |
| Cable length | | 0.5 m |
| Minimum bending radius | | 68 mm |
| Weight | | Approx. 550g |
| Accessory | | CLASS 3B Warning label (IEC60825-1: 1993 +A1: 1997) x 2 |

- *1. For 60-mm measurement range mode
- *2. Defined as $1/e^2$ (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.
- *3. When an OMRON-standard workpiece (alumina ceramics) is placed at 200-mm distance, and edge position is measured. 60-mm measurement range mode is used. The average of 16 measurements is taken. Note that the resolution performance may not be satisfied in the presence of strong magnetic fields.
- *4. When an OMRON-standard workpiece (alumina ceramics) is placed 200-mm away and the average height of all lines is measured. The measuring range is 60 mm and the average of 16 measurements is taken. Resolution performance, however, may not be satisfied in the presence of strong magnetic fields.
- *5. The error in relation to an ideal straight line when the average height of all lines on an OMRON-standard workpiece (alumina ceramics) is measured. The measuring range is 60 mm. The degree of linearity may change depending on the workpiece.

60-mm Range Mode



- *6. The value obtained at measurement with the space between the sensor and the workpiece fixed with an aluminum jig. The measurement range is 60 mm.

Z550

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.