

Integrated and Separate Type In Situ Zirconia Oxygen/
High Temperature Humidity Analyzer
ZR202G/S, ZR402G, ZR22G/S
Averaging Converter
AV550G



ZR202G/S, ZR402G, ZR22G/S

Integrated and Separate Type In Situ Zirconia Oxygen/High Temperature Humidity Analyzer

AV550G

Averaging Converter

EXAxti

Bulletin 11M12A01-01E

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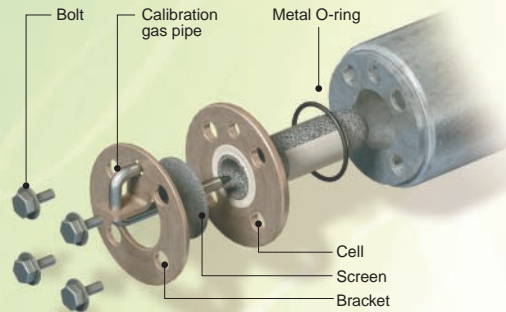
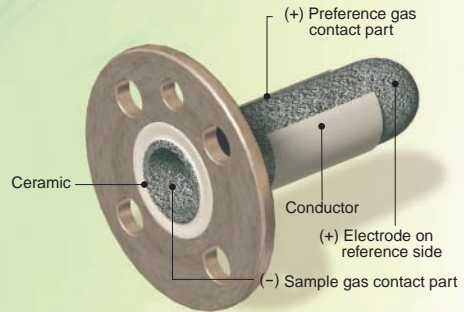
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The clear path to operational excellence

YOKOGAWA 

Yokogawa presents zirconia oxygen analyzers for saving energy and environmental protection

Get a Long Service Life and Stable Operation with a Zirconia Sensor Sensor Replacement is Easy

- A molecular bonding method completes installation of platinum electrodes, and its inherent connection prevents separation of platinum from the zirconia element.
- A lead-less electrode design eliminates electrical disconnection.
- Special coating protects the platinum and prevents the sensors from deteriorating or becoming damaged.
- No special tool is required for cell replacement. Whenever required, the cell is easily removed by removing four screws from the top of the probe. Down time ("from the time installation is started until it is completed") is minimized to approximately ten minutes. After the cell is replaced, the analyzer requires a zero and span calibration only once.

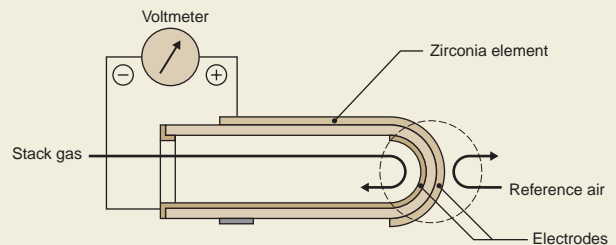


ZR202G/S

ZR22G/S

ZR402G

Principle of Zirconia Oxygen Analyzer



The principle of the zirconia oxygen analyzer is as follows:
At high temperatures the zirconia element, as a solid electrolyte, is a conductor of oxygen ions. Platinum electrodes are attached to the interior and exterior of the zirconia. Heating the element allows different partial oxygen concentrations of gases to come into contact with the opposite side of the zirconia creating an oxygen concentration cell. In other words, oxygen molecules gain electrons to form oxygen ions with higher partial oxygen concentrations. These ions travel through the zirconia element to the other electrode. At that point, electrons are released to form oxygen molecules (refer to the chemical formula). The Nernst expression can be applied to calculate the force by measuring the electromotive force E generated between the two electrodes.

Electrode with high oxygen partial pressure: $O+4e \rightarrow 2O^{2-}$ (Reference side)
Electrode with low oxygen partial pressure: $2O^{2-} \rightarrow O_2+4e$ (Measuring side)
Reactive electromotive force E(V) can be derived from Nernst's formula.

$$E = - \frac{RT}{nF} \ln \frac{P_x}{P_A}$$

R: Gas constant; T: Absolute temperature; n: 4; F: Faraday's constant;
Px: Oxygen partial pressure of zirconia element on the measuring air side(%);
PA: Oxygen partial pressure of zirconia element on the reference air side(%);
Atmospheric air: 20.6(%); Instrument air: 21.0(%)

For the ZR22 cell, temperature is 750°C and the correspondingly reactive electromotive force E =

$$E = -50.74 \log \frac{P_x}{P_A} \text{ [mV]}$$

$$P_x = P_A \cdot 10^{\frac{E}{50.74}}$$

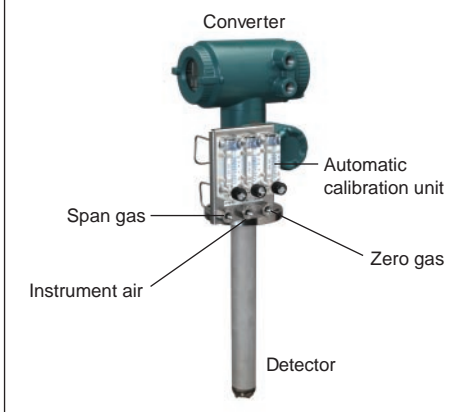
ZR202G/ZR202S

Integrated Type In Situ Zirconia Oxygen / High Temperature Humidity Analyzer

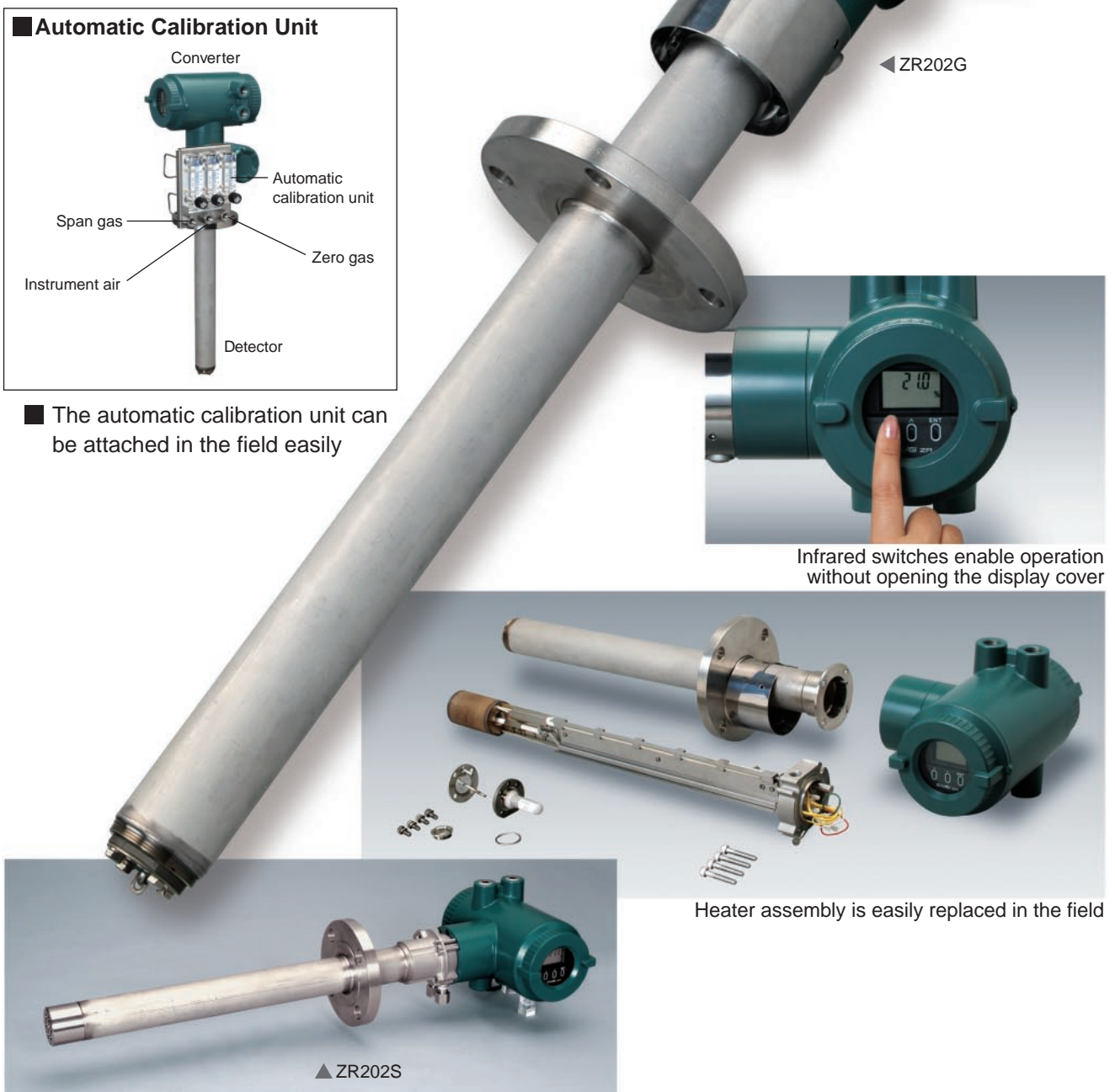
- Can cut wiring, piping and installation costs.
- Can be operated in the field without opening the cover using an infrared switch.
- Allows replacement of the zirconia cell and heater in the field.
- Can measure either oxygen concentration or humidity with a single analyzer.
- Remote maintenance using digital communication reduces maintenance cost.
- Explosionproof approval.

ATEX: EExd IIB + H2, Group II, Category 2GD, T2, T300°C
FM/CSA: Class I, Division 1, Groups B, C and D,
Class II/III, Division 1, Groups E, F and G, T2
IECEX: Exd II B + H2 T2, Ex tD A21 IP66 T300°C

■ Automatic Calibration Unit



- The automatic calibration unit can be attached in the field easily



Infrared switches enable operation without opening the display cover

Heater assembly is easily replaced in the field

ZR402G/ZR22G/ZR22S

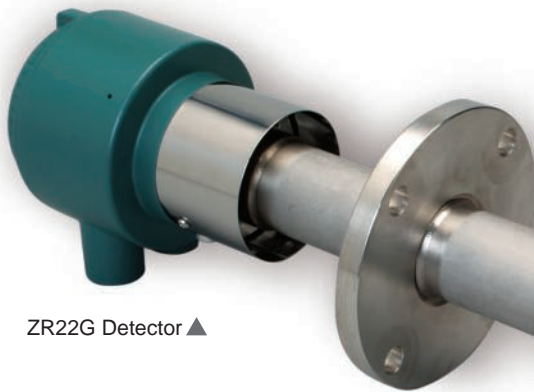
Separate Type In Situ Zirconia Oxygen / High Temperature Humidity Analyzer

- Liquid-crystal touch panel display provides easy operation.
- Interactive model displays instructions to follow, including those for: settings, oxygen concentration trends, and calibration operations.
- Digital communications features are provided as standard – this enables the analyzer to be maintenance-serviced remotely.
- Can measure either oxygen concentration or humidity with a single analyzer.
- Highly reliable measurements with trend-data graphs.
- The zirconia cell and heater assembly can be replaced in the field.
- Explosionproof approval.

ATEX: EExd IIB + H2, Group II, Category 2GD, T2, T300°C
 FM/CSA: Class I, Division 1, Groups B, C and D,
 Class II/III, Division 1, Groups E, F and G, T2
 IECEx: Exd II B + H2 T2, Ex tD A21 IP66 T300°C

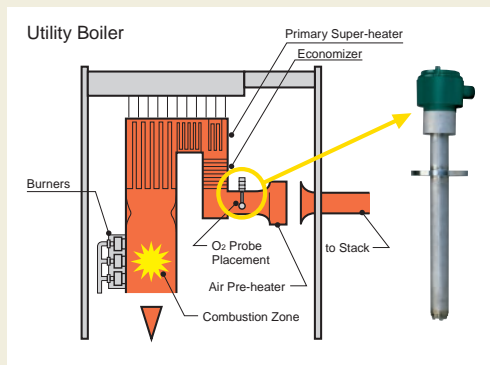


▲ ZR402G Converter



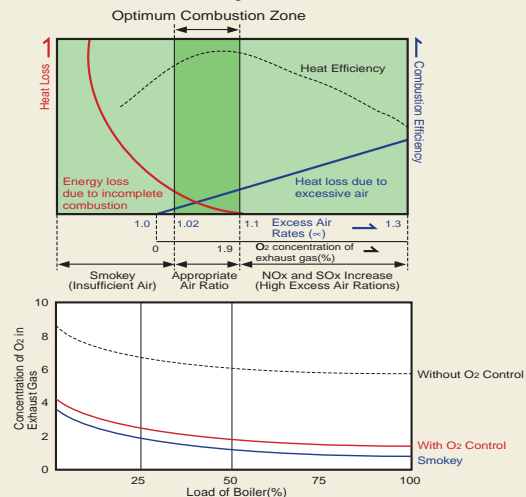
ZR22G Detector ▲

Achieving accurate O₂ measurement in exhaust gas



With the measurement of oxygen in the exhaust gas the flow of fuel can be controlled for optimum burner efficiency and minimum environmental effects.

The relationship between air Rates and Heat Efficiency



ZR402G Separate Type Converter

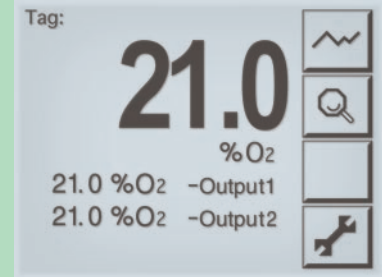
Complete Operation Display

- Interactive operations along with operation display.
- A variety of display modes – enabling you to select the operation mode freely.
- Back-lit LCD allows viewing even in the darkness.
- Error codes and details of errors can be checked in the field without the need to refer to the appropriate instruction manual.



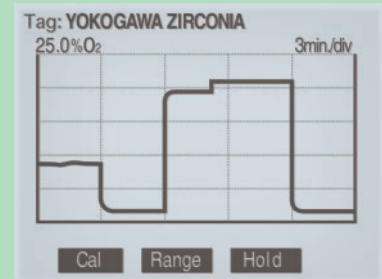
Typical Converter Displays

● Example of basic display



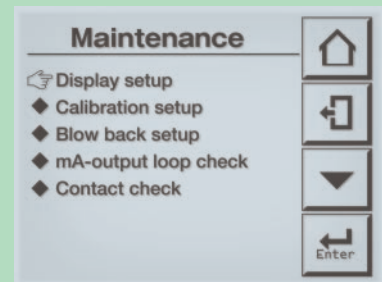
This display enables you to operate the analyzer while checking data on the display.

● Example of trend display – displays data changes



During automatic calibration, you can check stabilized display data while viewing oxygen trend data, thus providing highly reliable calibration.

● Example of setting data display – displays data changes



- One-touch interactive display operation
- User-friendly design providing easy operation without having to use the instruction manual.

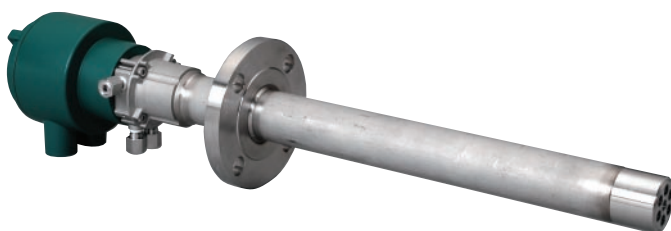
Self-testing suggests countermeasures for problems

If a problem occurs, the liquid-crystal display will provide an error code and the reason for the problem. This enables prompt and appropriate corrective action to be taken.

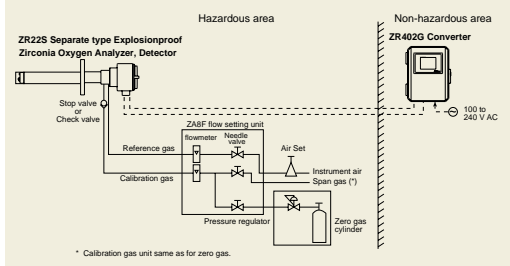
| Error code | Reason for error |
|------------|----------------------------------|
| E--1 | Cell failure |
| E--2 | Abnormal heater temperature |
| E--3 | Defective A/D converter |
| E--4 | Faulty EEPROM |
| ALARM1 | Abnormal oxygen concentration |
| ALARM2 | Abnormal moisture content |
| ALARM3 | Abnormal mixing ratio |
| ALARM6 | Abnormal zero calibration factor |
| ALARM7 | Abnormal span calibration factor |
| ALARM8 | Stabilization time over |

ZR22S Explosionproof version Detector

ZR22S Detector



System configuration



AV550G

Zirconia Oxygen Averaging Converter

The O₂mation, model AV550G, averaging converter was designed with a focus on practical performance. Yokogawa has refined its expertise in the combustion oxygen business into this new and creative product. It is packed with features designed to minimize plant down time and technical support for the oxygen measurement. Its intuitive color touch screen operation, powerful new process diagnostic tools and creative hardware design makes power boiler oxygen trim automation simple, predictable and reliable.

- Full color touch screen operation.
- Special trend graph functions with customer graph configuration.
- Multiple display modes shows average data, single detector or all detector gas concentrations.
- Handles input of up to 8 oxygen detectors.
- “Hot swap” of channel cards so the analyzer remains on line while maintenance is performed.
- Eight 4-20 mA outputs for individual detectors.
- Three 4-20 mA outputs for average oxygen concentration outputs.
- Failed, in calibration, or alarming, detectors are automatically excluded from average calculations.
- Allows contact input, calibration activation, range change and detector performance validation.
- Remote maintenance using digital communications (HART or FOUNDATION Fieldbus) reduces maintenance costs.*¹

*1:HART is a registered trademark of HART Communication Foundation.

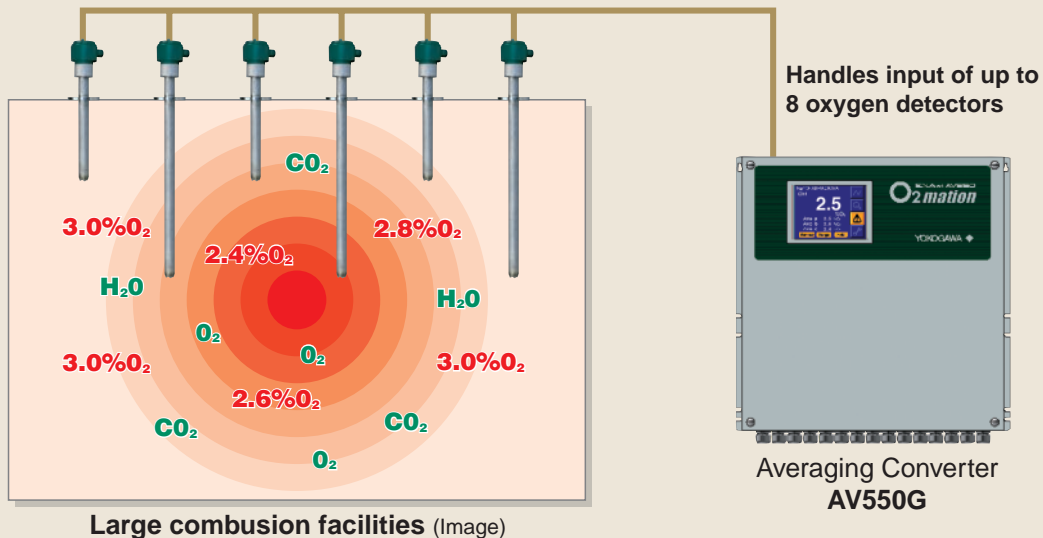
FOUNDATION is a registered trademark of Fieldbus foundation.



▲ AV550G Averaging Converter

Combustion control by a multiple point oxygen measurement

A multiple point oxygen measurement system is required for situations when gas stratification in the flue duct affects combustion control. The AV550G Averaging Converter can accept inputs from up to eight zirconia oxygen detectors. It sends output signals for the individual as well as averages of multiple oxygen concentrations. A robust multipoint converter reduces installation and maintenance costs.



AV550G Averaging Converter

Complete Operation Display

- A large 5.7-inch color touch screen operation.
- The trend graph of max 8 channels helps diagnose problems and view individual detector performance over time.
- Error codes and details of errors can be checked in the field without the need to refer to the appropriate instruction manual.



Easy Maintenance and Inspection

Maintenance and inspection are simplified by a modular hardware design. The **Hot Swap** feature allows changing channel modules without powering off the analyzer. Each channel card is fitted with spacious, and accessible, self-trapping terminal strips that make wiring and maintenance fast and easy.

Applications

Utility Boiler – With large boilers used in the utility industry, the oxygen concentration varies in different zones across the flue. In order to obtain the most reliable oxygen data, the most common method used is the averaging of several measuring points using an external averaging unit. The AV550G not only averages the signals but fully controls all of the individual detectors thereby eliminating the need for costly, redundant hardware or DCS programming.

Process Heater – Process industries, such as refining, use large numbers of individual oxygen analyzers to maximize the combustion efficiency of process heaters. The AV550G receives and controls inputs from oxygen detectors mounted on the same or multiple flues and transmits either individual or averaged output signals.

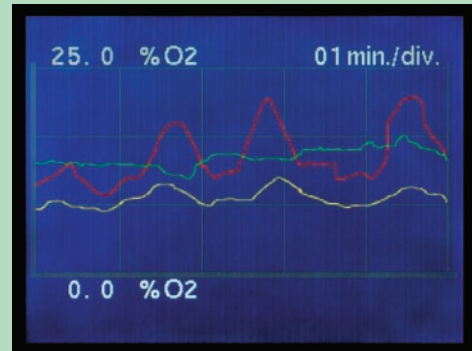
Typical Converter Displays

● Example of basic display

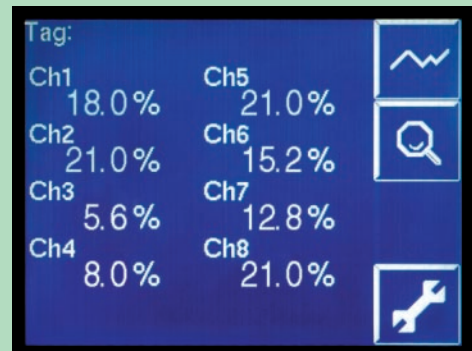


This display enables you to operate the analyzer while checking data on the display.

● Example of trend display



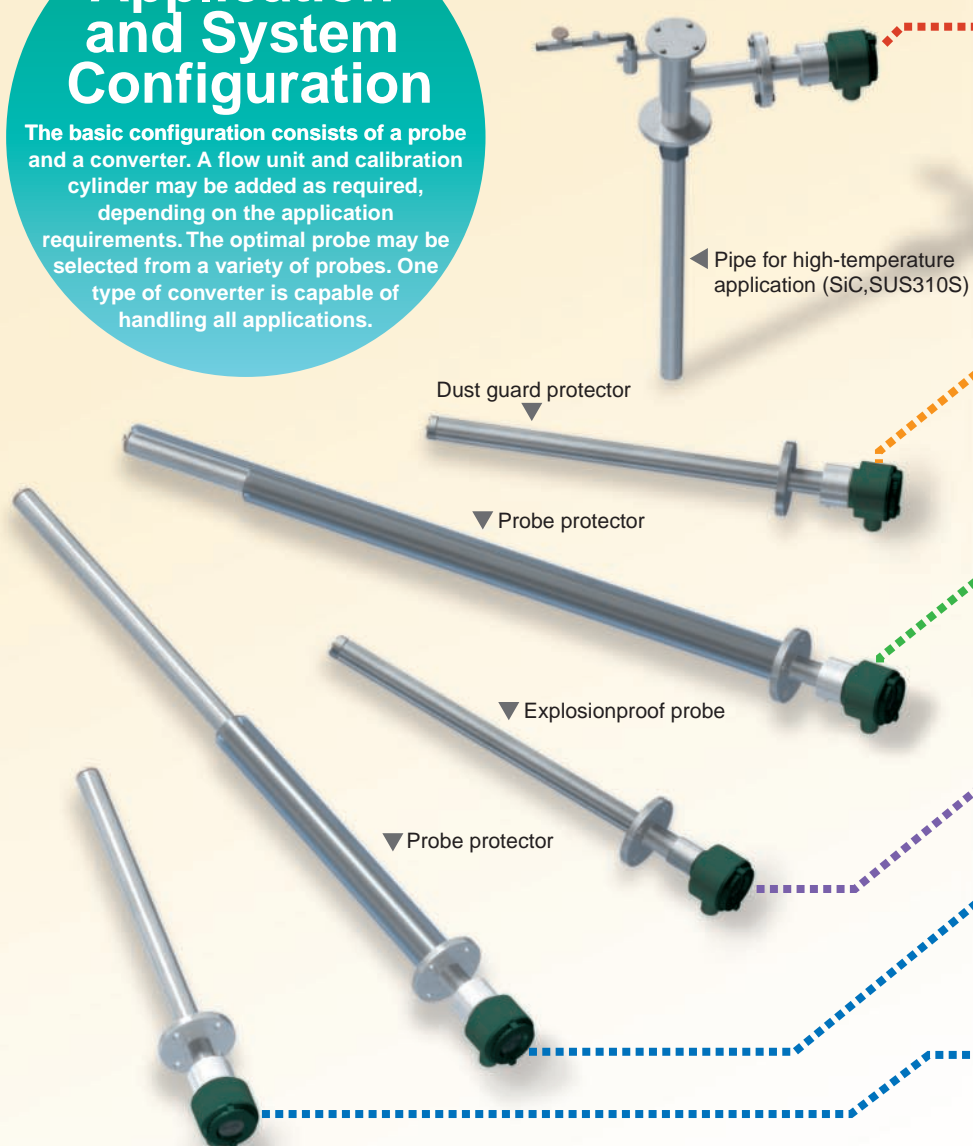
● Example of 8 channel data display



Easy Maintenance and Inspection

Application and System Configuration

The basic configuration consists of a probe and a converter. A flow unit and calibration cylinder may be added as required, depending on the application requirements. The optimal probe may be selected from a variety of probes. One type of converter is capable of handling all applications.



Detector

- High temperature probe (0 to 1400°C)**
For sample gas temperature over 700°C
- General purpose probe + Dust guard protector**
Protects probe against dust
- General purpose probe + probe protector**
Protectors prevent the probe from being eroded by fine particles
- Explosion proof probe**
- General purpose probe + probe supporter**
Protectors allow the probe to be installed horizontally
- General purpose probe (0 to 700°C)**
Various insertion lengths are available: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5 and 3.0 meters

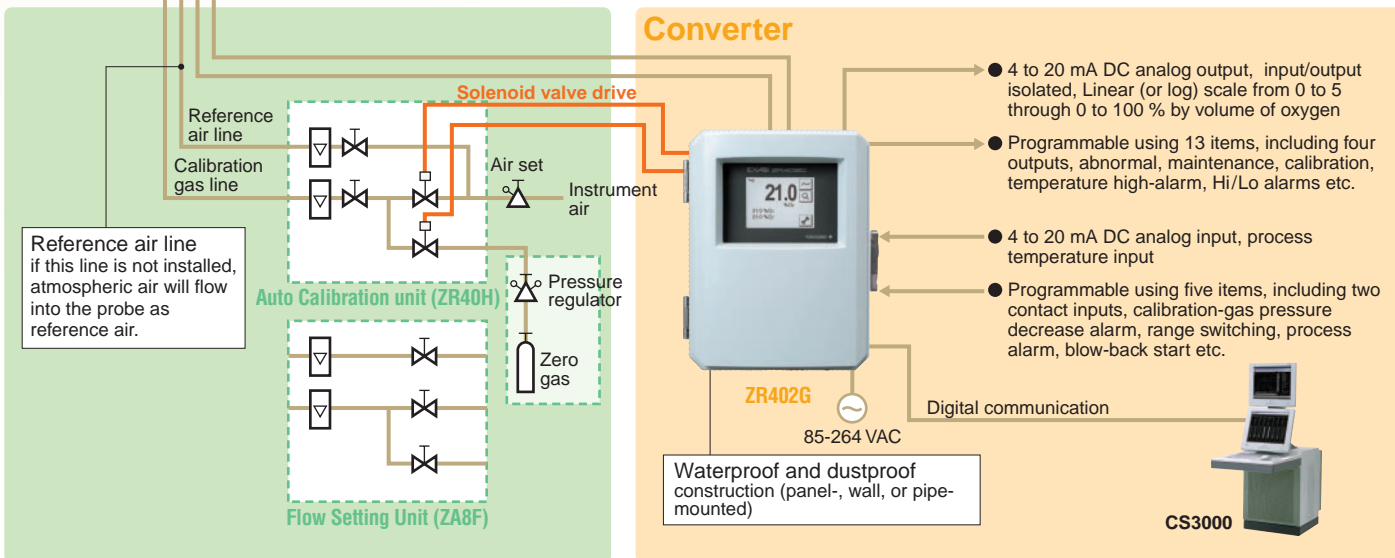
Application

| | | |
|---|--------------------|---------------|
| Boiler (fuel oil and gas) | Common | |
| Boiler (coal)(pulverized coal on fluidized bed) | | |
| Boiler (bark or wood chips) | Iron & steel | |
| Heating furnace | | |
| Soaking pit | | |
| Annealing furnace | | |
| Hot stove | Non-ferrous metals | |
| Coke oven | | |
| Sintering furnace | | |
| Melting furnace | Ceramics | |
| Heating and annealing furnaces | | |
| Lime kiln (rotary) | | |
| Lime kiln (vertical) | | |
| Cement kiln (cyclone exit) | | |
| Glass melting furnace (in furnace) | | |
| Glass melting furnace (in stack) | | |
| Ceramic baking furnace | | |
| Heating furnace | | Petroleum |
| Naphtha cracking furnace | | Petrochemical |
| Heating furnace | Pulp & paper | |
| Black liquor recovery boiler | | |
| Sludge kiln/boiler | Machinery | |
| Forging furnace | | |
| Heat treatment furnace | Others | |
| Window box | | |
| Drying furnace | | |
| Reaction furnace | | |
| Roasting furnace | | |
| Incinerator | | |
| Sludge burning furnace | | |
| Fermentation tank | | |
| Indoor oxygen-deficiency monitoring | | |

Signal line/heater line
Special cables not required. General-purpose shielded cables can be used. The distance between the probe and converter can be approximately 500 m if a 2 mm² cable is used and approximately 300 m if a 1.25 mm² cable is used.

Check valve

Calibration gas line
Check valve installed to prevent a reverse flow of the process gas.



Probe for high temperature use (process temperature of 0 to 1400°C)

If the process temperature exceeds 700°C, use the probe for high-temperature application. For other special application requirements, appropriate probes and associated attachments are available.

Air Ejector

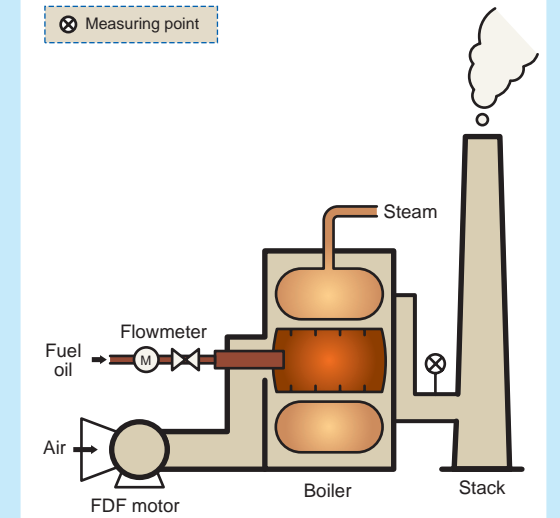
Process gas is ejected when the pressure is negative

Pipe

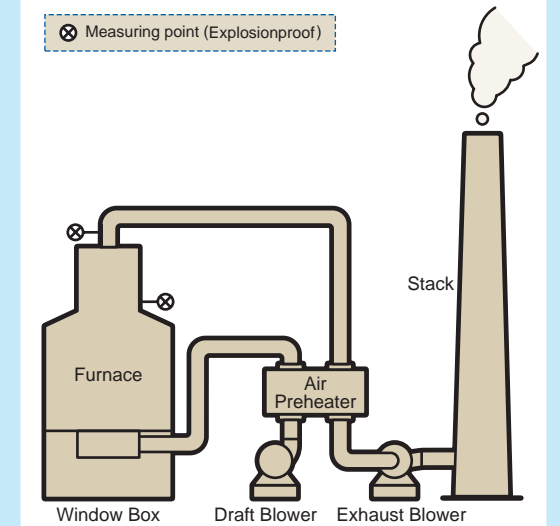
SiC (Silicon Carbide max. 1400°C) and SUS310S (Stainless steel max. 800°C) available. Insertion length 1.0m, 1.5m



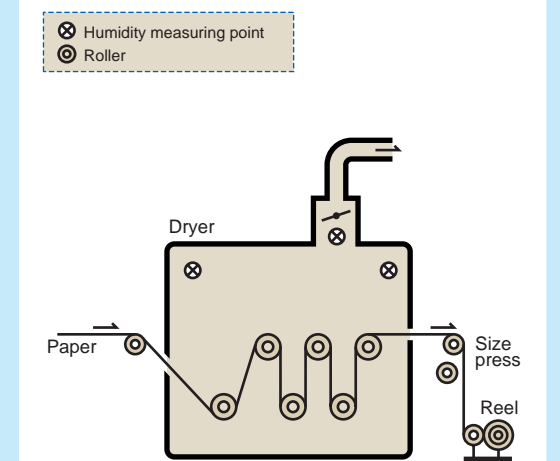
Application 1 Example of boiler instrumentation



Application 2 Petroleum refinery process fired heater



Application 3 paper machine drying process



SPECIFICATIONS AND EXTERNAL DIMENSIONS

General purpose version

| | |
|----------------------------|--|
| Model Name | ZR22G/ZR402G, ZR202G |
| Object of measurement | Oxygen Analyzer: Oxygen concentration in combustion exhaust gas and mixed gases (excluding inflammable gases) Humidity Analyzer: water vapor (in vol%) in mixed gases (air and water vapor) (Only non-explosionproof) |
| Measurement system | Zirconia |
| Measuring range | Display O ₂ : 0 to 100 vol% O ₂ (digital display) H ₂ O: 0 to 100 vol% H ₂ O or 0 to 1,000 kg/kg, % relative humidity, dew point Output O ₂ : Any setting in the range from 0 to 5 vol% O ₂ to 0 to 100 vol% O ₂ (1 vol% O ₂ scale) H ₂ O: Any setting in the range from 0 to 25 vol% H ₂ O to 0 to 100 vol% H ₂ O or 0 to 0.200 kg/kg to 0 to 1,000 kg/kg |
| Process gas pressure | O ₂ : -5 to +250 kpa (Non-explosionproof) H ₂ O: -5 to +20 kpa |
| Sample gas temperature | General purpose use: 0 to 700 °C High temperature use: 0 to 1400 °C |
| Insertion length | General purpose use: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5 or 3.0 meters High temperature use: 1.0 or 1.5 meters |
| Output signal | 4 to 20 mA DC analog output and Digital Communication |
| Contact output Selectable: | (1) Abnormal, (2) High-high-alarm, (3) High-alarm, (4) Low-low alarm, (5) Low-alarm, (6) Maintenance, (7) Calibration, (8) Range switching ZR202G; 2 points ZR402G; 4 points answer-back, (9) Warm-up, (10) Calibration-gas pressure decrease (answer-back of contact input), (11) Temperature high-alarm, (12) Blowback start, (13) Flameout gas detection (answerback of contact input) |
| Alarm Related Items | Oxygen concentration high-alarm/ high-high alarm limit values (vol% O ₂), Oxygen concentration low-alarm/ low-low alarm limit values (vol% O ₂), Oxygen concentration alarm hysteresis (vol% O ₂), Oxygen concentration alarm detection, alarm delay (seconds) |
| Self-diagnosis | Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, defective A/D converter, defective digital circuit |
| Calibration method | Manual, semi-auto or auto-matic calibration |
| Construction of detector | Waterproof construction, NEMA4X/IP66 |
| Construction of converter | Dustproof and waterproof construction, NEMA4X/IP66 |
| Ambient temperature | ZR22G: -20° to 150 °C; ZR402G: -20 to 55 °C; ZR202G: -20 to 55 °C |
| Power requirements | 85 to 264 V AC, 50/60 Hz |

* Refer to the GS11M12A01-01E for detailed specification.

Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Detector

| Model | Suffix code | Option code | Description |
|-----------------------|--|--|---|
| ZR22G | ----- | ----- | Separate type Zirconia Oxygen/ High Temperature Humidity Analyzer, Detector |
| Length | -015 -040 -070 -100 -150 -200 -250 -300 -360 -420 -480 -540 | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | 0.15 m (for high temperature use) 0.4 m 0.7 m 1.0 m 1.5 m 2.0 m 2.5 m 3.0 m 3.6 m 4.2 m 4.8 m 5.4 m |
| Wetted material | -S -C | ----- ----- | SUS316 Stainless steel with Inconel calibration gas tube |
| Flange | -A -B -C -E -F -G -K -L -M -P -Q -R -S -W | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | ANSI Class 150 2 RF SUS304 ANSI Class 150 3 RF SUS304 ANSI Class 150 4 RF SUS304 DIN PN10 DN50 A SUS304 DIN PN10 DN80 A SUS304 DIN PN10 DN100 A SUS304 JIS 5K 65 FF SUS304 JIS 10K 65 FF SUS304 JIS 10K 80 FF SUS304 JIS 10K 100 FF SUS304 JIS 5K 32 FF SUS304 (for high temperature use) JPI Class 150 4 RF SUS304 JPI Class 150 3 RF SUS304 Westinghouse |
| Reference air | -C -E -P | ----- ----- ----- | Natural convection External connection (Instrument air) Pressure compensated |
| Gas Thread | -R -T | ----- ----- | Rc 1/4 1/4 FNPT |
| Connection box thread | -P -G -M -T -Q | ----- ----- ----- ----- ----- | G1/2 Pg13.5 M20 x1.5 mm 1/2NPT Quick connect |
| Instruction manual | -J -E -C | ----- ----- ----- | Japanese English Chinese |
| — | -A | ----- | Always -A |
| Options | /D /C /CV /SV /F1 /F2 /SCT /PT | ----- ----- ----- ----- ----- ----- ----- ----- | DERAKANE coating Inconel bolt Check valve Stop valve Dust Filter Dust Guard Protector Stainless steel tag plate Printed tag plate |

Integrated type Zirconia Oxygen / High temperature Humidity Analyzer

| Model | Suffix code | Option code | Description |
|-----------------------|--|---|--|
| ZR202G | ----- | ----- | Integrated type Zirconia Oxygen/ High Temperature Humidity Analyzer |
| Length | -040 -070 -100 -150 -200 -250 -300 | ----- ----- ----- ----- ----- ----- ----- | 0.4 m 0.7 m 1.0 m 1.5 m 2.0 m 2.5 m 3.0 m |
| Wetted material | -S -C | ----- ----- | SUS316 Stainless steel with Inconel calibration gas tube |
| Flange | -A -B -C -E -F -G -K -L -M -P -R -S -W | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | ANSI Class 150 2 RF SUS304 ANSI Class 150 3 RF SUS304 ANSI Class 150 4 RF SUS304 DIN PN10 DN50 A SUS304 DIN PN10 DN80 A SUS304 DIN PN10 DN100 A SUS304 JIS 5K 65 FF SUS304 JIS 10K 65 FF SUS304 JIS 10K 80 FF SUS304 JIS 10K 100 FF SUS304 JPI Class 150 4 RF SUS304 JPI Class 150 3 RF SUS304 Westinghouse |
| Auto Calibration | -N -A -B | ----- ----- ----- | Not required Horizontal mounting Vertical mounting |
| Reference air | -C -E -P | ----- ----- ----- | Natural convection External connection (Instrument air) Pressure compensated |
| Gas Thread | -R -T | ----- ----- | Rc 1/4 1/4 FNPT |
| Connection box thread | -P -G -M -T -Q | ----- ----- ----- ----- ----- | G1/2 Pg13.5 M20x1.5 mm 1/2NPT Quick connect |
| Instruction manual | -J -E -C | ----- ----- ----- | Japanese English Chinese |
| — | -A | ----- | Always -A |
| Options | /D /C /HS /CV /SV /H /F1 /F2 /SCT /PT /C2 /C3 | ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- ----- | DERAKANE coating Inconel bolt Set for Humidity Analyzer Check valve Stop valve Hood Dust Filter Dust Guard Protector Stainless steel tag plate Printed tag Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more |

SPECIFICATIONS AND DIMENSIONS

Explosionproof version

| | |
|-------------------------|---|
| Model Name | ZR22S, ZR202S |
| Object of measurement | Oxygen Analyzer: Oxygen concentration in combustion exhaust gas and mixed gases (excluding inflammable gases) |
| Measuring range | Display O ₂ : 0 to 100 vol% O ₂ (digital display) Output O ₂ : Any setting in the range from 0 to 5 vol% O ₂ to 0 to 100 vol% O ₂ (1 vol% O ₂ scale) |
| Process gas pressure | -5 to +5 kpa |
| Insertion length | General purpose use: 0.4, 0.7, 1.0, 1.5 or 2.0 meters High temperature use: 1.0 or 1.5 meters |
| Explosionproof Approval | |
| ATEX: | EExd II B + H ₂ , Group II, Category 2GD, T2, T300°C |
| FM/CSA: | Class I, Division 1, Groups B, C and D, Class II/III, Division 1, Groups E, F and G, T2 Exd II B + H ₂ T2, Ex tD A21 IP66 T300 °C |
| IECEX: | ZR22S: -20 to 60 °C (-20 to 150 °C on the terminal box surface); ZR402G: -20 to 55 °C |
| Ambient temperature | ZR202S: -20 to 55 °C |
| Wiring Connection | |
| ATEX: | M20 by 1.5 mm or 1/2 NPT select one type |
| FM: | 1/2 NPT |
| CSA: | 1/2 NPT |
| IECEX: | Exd II B + H ₂ T2, Ex tD A21 IP66 T300 °C M20 by 1.5 mm or 1/2 NPT select one type |

Characteristics

| | |
|----------------|--|
| Repeatability | O ₂ : ± 0.5 % Maximum value of setting range H ₂ O: ± 1% Maximum value of setting range |
| Drift | O ₂ : ± 2 % Maximum value of settled range/month H ₂ O: ± 3% Maximum value of settled range/month |
| Response speed | 90 % response within 5 sec. (after gas is introduced from calibration gas inlet) |

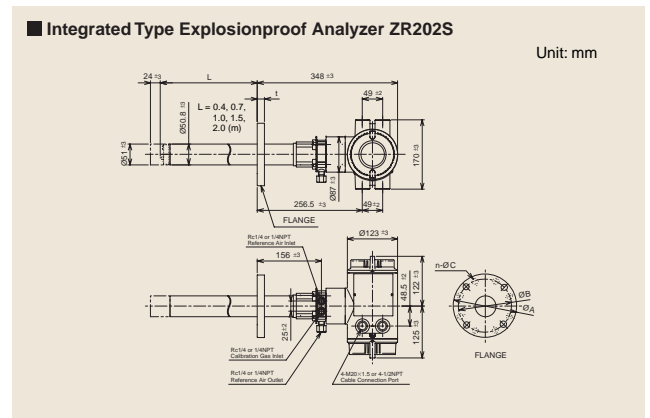
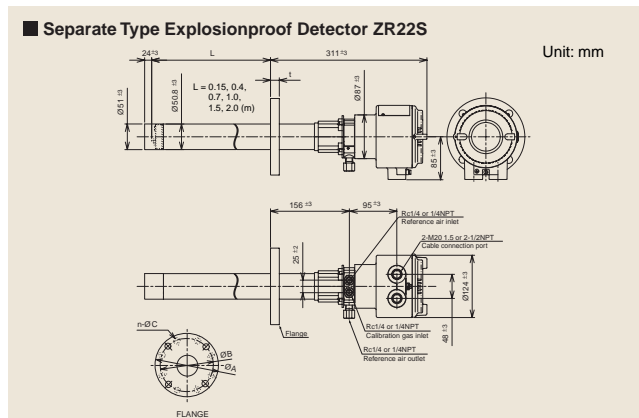
* Refer to the GS11M13A01-01E for detailed specification.

Separate type Explosionproof Zirconia Oxygen Analyzer, Detector

| Model | Suffix code | Option code | Description |
|--------------------------|--|---|---|
| ZR22S | ----- | ---- | Separate type Explosionproof Zirconia Oxygen Analyzer, Detector |
| Explosion proof Approval | -A -B -C -D | ---- | ATEX certified flameproof FM certified explosionproof CSA certified explosionproof IECEX certified flameproof |
| Length | -015 -040 -070 -100 -150 -200 | ---- | 0.15 m (for high temperature use) 0.4 m 0.7 m 1.0 m 1.5 m 2.0 m |
| Wetted material | -S -C | ---- | SUS316 Stainless steel with Inconel calibration gas tube |
| Flange | -A -B -C -E -F -G -Q -W | ---- | ANSI Class 150 2 RF SUS304 ANSI Class 150 3 RF SUS304 ANSI Class 150 4 RF SUS304 DIN PN10 DN50 A SUS304 DIN PN10 DN80 A SUS304 DIN PN10 DN100 A SUS304 JIS 5K 32 FF SUS304 (for high temperature use) Westinghouse |
| Reference air | -E | ---- | External connection (Instrument air) |
| Gas Thread | -R -T | ---- | Rc 1/4 1/4 NPT |
| Connection box thread | -M -T | ---- | M20 x 1.5 mm 1/2 NPT |
| Instruction manual | -E | ---- | English |
| — | -A | ---- | Always -A |
| Options | Valves Tag plates | /C /CV /SV /H /SCT /PT /C2 /C3 | Inconel bolt Check valve Stop valve Stainless steel tag plate Printed tag plate |

Integrated type Explosionproof Zirconia Oxygen Analyzer

| Model | Suffix code | Option code | Description |
|--------------------------|--|---|--|
| ZR202S | ----- | ---- | Integrated type Explosionproof Zirconia Oxygen Analyzer |
| Explosion proof Approval | -A -B -C -D | ---- | ATEX certified flameproof FM certified explosionproof CSA certified explosionproof IECEX certified flameproof |
| Length | -040 -070 -100 -150 -200 | ---- | 0.4 m 0.7 m 1.0 m 1.5 m 2.0 m |
| Wetted material | -S -C | ---- | SUS316 Stainless steel with Inconel calibration gas tube |
| Flange | -A -B -C -E -F -G -W | ---- | ANSI Class 150 2 RF SUS304 ANSI Class 150 3 RF SUS304 ANSI Class 150 4 RF SUS304 DIN PN10 DN50 A SUS304 DIN PN10 DN80 A SUS304 DIN PN10 DN100 A SUS304 Westinghouse |
| Auto Calibration | -N -A -B | ---- | Not required Horizontal mounting Vertical mounting |
| Reference air | -E | ---- | External connection (Instrument air) |
| Gas Thread | -R -T | ---- | Rc 1/4 1/4 NPT(F) |
| Connection box thread | -M -T | ---- | M20x1.5 mm 1/2 NPT |
| Instruction manual | -E | ---- | English |
| — | -A | ---- | Always -A |
| Options | Valves Tag plates NAMUR NE43 compliant | /C /CV /SV /H /SCT /PT /C2 /C3 | Inconel bolt Check valve Stop valve Stainless steel tag plate Printed tag plate Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more |



SPECIFICATIONS AND EXTERNAL DIMENSIONS

Standard Specification

| | |
|------------------------|---|
| Model name | AV550G |
| Object of measurement | Oxygen in combustion exhaust gas or non-flammable gas mixtures |
| Measurement system | Zirconia type |
| Measurement range | Display: 0 to 100% (3-digit display) Output: Any setting in the range from 0 to 5 vol% O ₂ to 0 to 100 vol% O ₂ |
| Number of detectors | 1 to 8 |
| Detector Compatibility | ZR22G, ZR22S, ZO21D, ZO21DW |
| Power Supply | 86 to 126.5 VAC, 50/60 Hz |
| Power Consumption | Max: 1 kw During Startup Max: 1.8 kw |
| Display | 5.7 inch full color display 320 × 240 touch screen |
| Analog output signal | (Average value outputs, individual channel outputs) Range: Settable in the range from 0 to 5% to 0 to 100% O ₂ 4 to 20 mA DC input/output isolated |
| Contact output signals | 5 points, contact rating 30 VDC 3A, 250 VAC 3A (resistive load) Normally energized or de-energized, selectable |
| Self-diagnostics | Cell, temperature, analog circuit, digital circuit, calibration, ROM/RAM error power loss |
| Calibration function | One-touch calibration, automatic calibration |
| Construction | Indoor installation (for outdoor installation, rainproof case is required) |
| Ambient Temperature | -5 to + 50 °C |

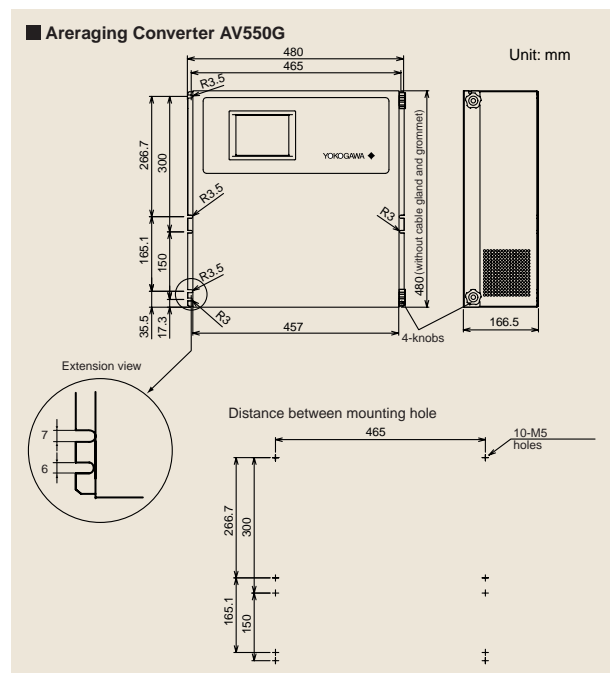
Characteristics

| | |
|----------------|---------------------------------------|
| Repeatability: | ±0.5% F.S. |
| Linearity: | ±1% F.S. (less than 0 to 25% range) |
| Drift: | ±2% F.S./month for both zero and span |
| Response: | 5 sec maximum for 90% response |

*Refer to the GS11M12D01-01E for detailed specification.

Averaging Converter

| Model | Suffix Code | Option Code | Specification |
|------------------------|-------------|-------------|--|
| AV550G | | | Averaging Converter |
| Base | -A | | 4 Channel Base |
| | -B | | 8 Channel Base |
| Number of Channel Card | -A1 | | 1 Oxygen Channel Card, Common Isolation |
| | -A2 | | 2 Oxygen Channel Cards, Common Isolation |
| | -A3 | | 3 Oxygen Channel Cards, Common Isolation |
| | -A4 | | 4 Oxygen Channel Cards, Common Isolation |
| | -A5 | | 5 Oxygen Channel Cards, Common Isolation |
| | -A6 | | 6 Oxygen Channel Cards, Common Isolation |
| | -A7 | | 7 Oxygen Channel Cards, Common Isolation |
| | -A8 | | 8 Oxygen Channel Cards, Common Isolation |
| Display | -B1 | | 1 Oxygen Channel Card, Individual Isolation |
| | -B2 | | 2 Oxygen Channel Cards, Individual Isolation |
| | -B3 | | 3 Oxygen Channel Cards, Individual Isolation |
| | -B4 | | 4 Oxygen Channel Cards, Individual Isolation |
| | -B5 | | 5 Oxygen Channel Cards, Individual Isolation |
| | -B6 | | 6 Oxygen Channel Cards, Individual Isolation |
| | -B7 | | 7 Oxygen Channel Cards, Individual Isolation |
| | -B8 | | 8 Oxygen Channel Cards, Individual Isolation |
| Display | -J | | Japanese |
| | -E | | English |
| | -G | | French German |
| Power supply | -1 | | 100 / 115 V AC |
| | -2 | | 230 V AC |
| Communication | -E | | HART communication |
| | -F | | FOUNDATION Fieldbus communication |
| Options | /SCT | | Stainless steel tag plate |
| | /24 | | 24 Voltage output for Solenoid valve |
| | /G □□ | | Cable gland (Numbers in □□) |

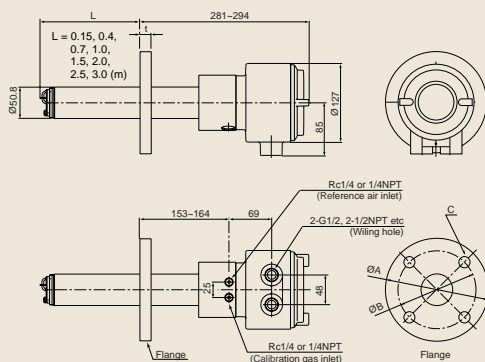


Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Converter

| Model | Suffix code | Option code | Description |
|--------------------|----------------------|-------------|---|
| ZR402G | - | - | Separate type Zirconia Oxygen/ High Temperature Humidity Analyzer, Converter |
| Converter thread | -P | - | G1/2 |
| | -G | - | Pg13.5 |
| | -M | - | M20x1.5 mm |
| | -T | - | 1/2NPT |
| Display | -J | - | Japanese |
| | -E | - | English |
| | -G | - | German |
| | -F | - | French |
| Instruction manual | -J | - | Japanese |
| | -E | - | English |
| | -C | - | Chinese |
| - | -A | - | Always -A |
| Options | /HS | - | Set for Humidity Analyzer |
| | /H | - | Hood |
| | /SCT | - | Stainless steel tag plate |
| | /PT | - | Printed tag plate |
| | NAMUR NE43 compliant | /C2 | - |
| /C3 | | - | Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more |

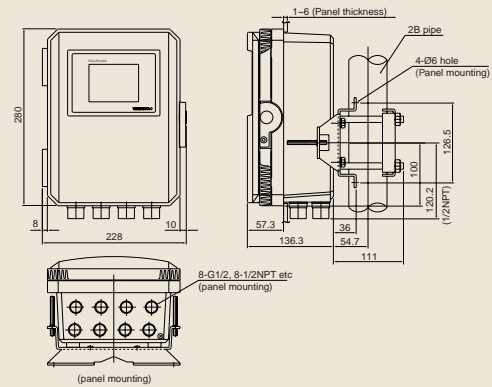
Separate Type General purpose Detector ZR22G

Unit: mm



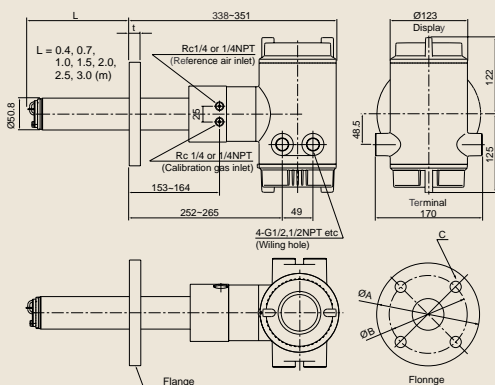
Separate Type General purpose Converter ZR402G

Unit: mm



Integrated Type General purpose Analyzer ZR202G

Unit: mm



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Represented by:

Vig-PMK-G·NL-10E

Printed in Japan, 909(KP) [Ed : 10/b]

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