

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*

**EXAxt**

Bulletin 11M12A01-01E

[www.yokogawa.com/an/](http://www.yokogawa.com/an/)

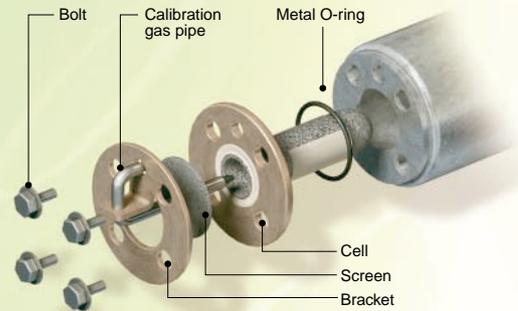
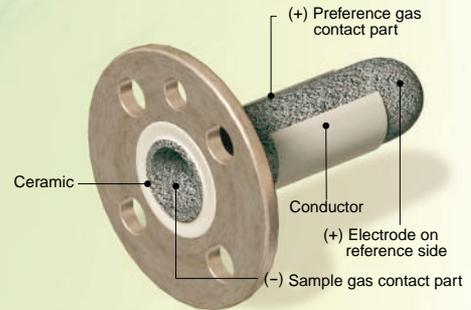
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The clear path to operational excellence

**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.



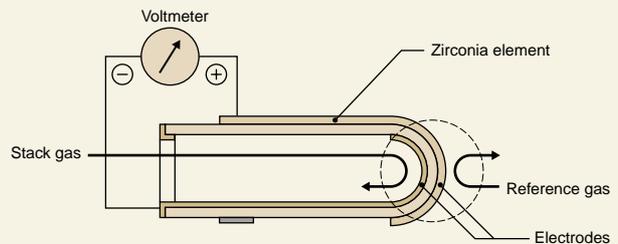
ZR202G/S

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;  
 P<sub>x</sub>: Oxygen partial pressure of zirconia element on the measuring gas side(%);  
 P<sub>A</sub>: Oxygen partial pressure of zirconia element on the reference gas 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.

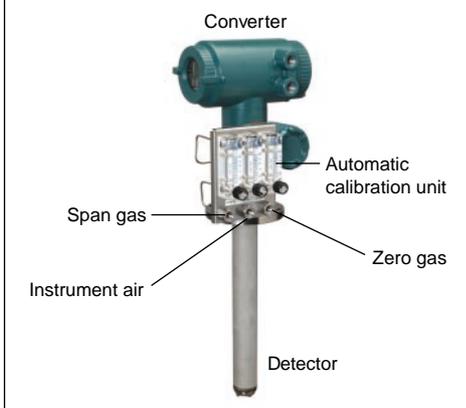
ATEX: EEx d IIB + H2, Group II, Category 2GD, T2, T300°C

FM/CSA: Class I, Division 1, Groups B, C and D,

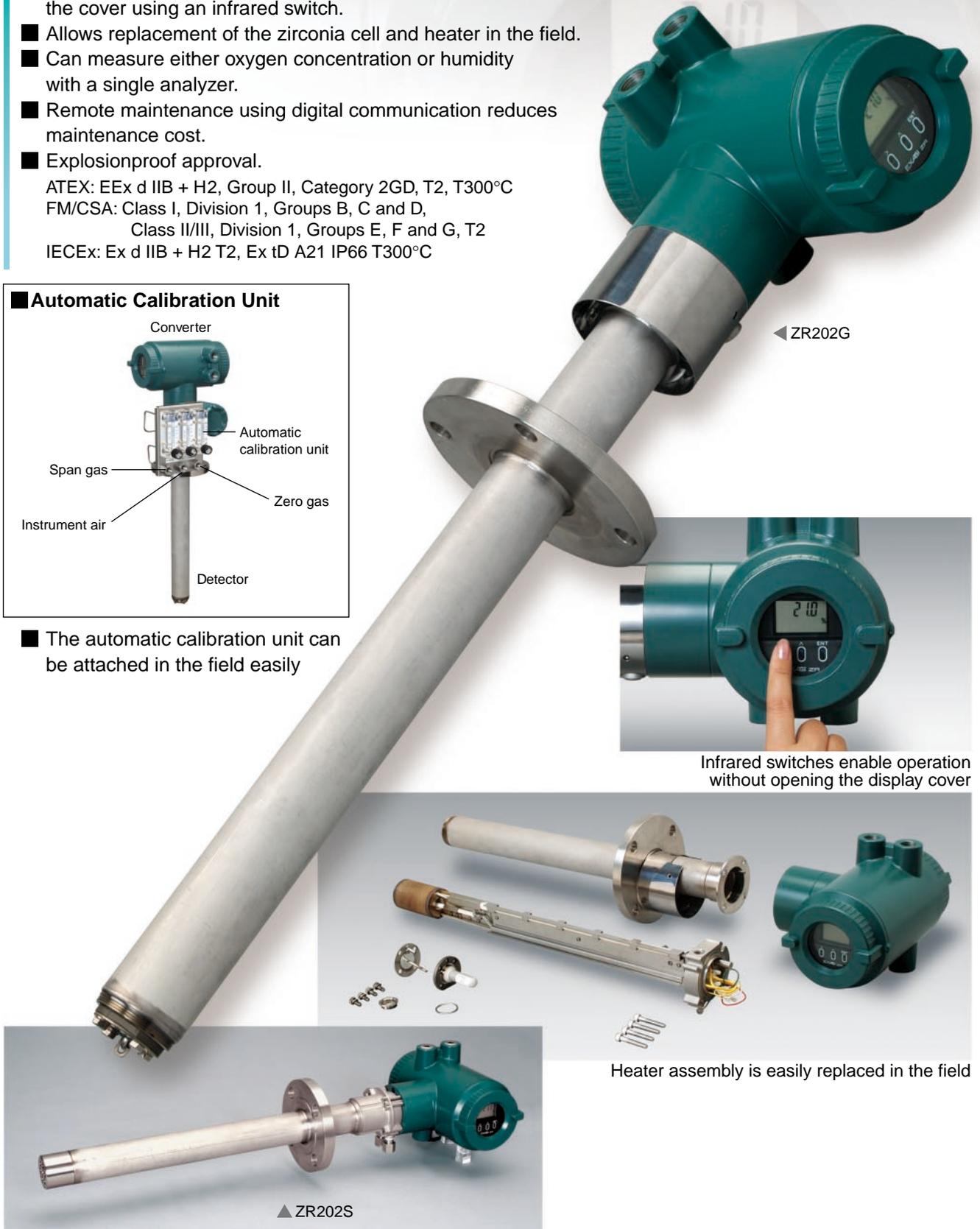
Class II/III, Division 1, Groups E, F and G, T2

IECEX: Ex d IIB + H2 T2, Ex tD A21 IP66 T300°C

## ■ Automatic Calibration Unit



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



◀ ZR202G

Infrared switches enable operation without opening the display cover

Heater assembly is easily replaced in the field

▲ ZR202S

# 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.

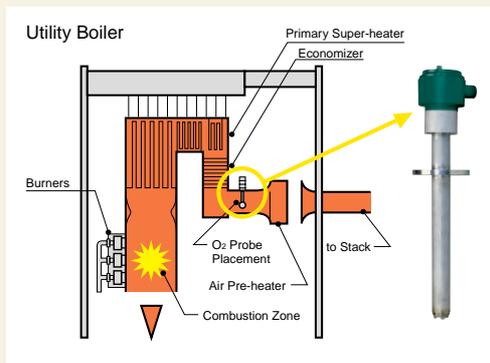
ATEX: EEx d IIB + H2, Group II, Category 2GD, T2, T300°C  
 FM/CSA: Class I, Division 1, Groups B, C and D,  
 Class II/III, Division 1, Groups E, F and G, T2  
 IECEx: Ex d IIB + H2 T2, Ex tD A21 IP66 T300°C



ZR22G Detector ▲

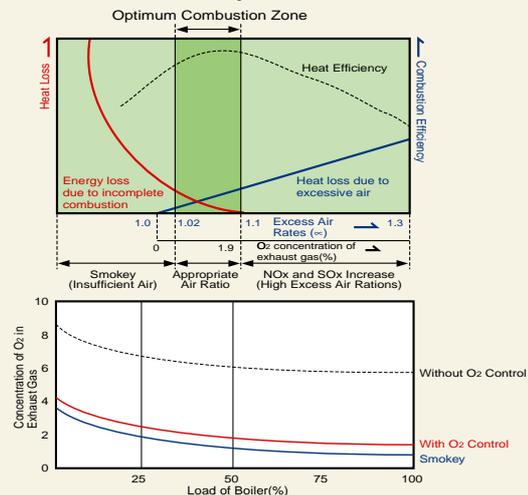
▲ ZR402G Converter

## Achieving accurate O<sub>2</sub> 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

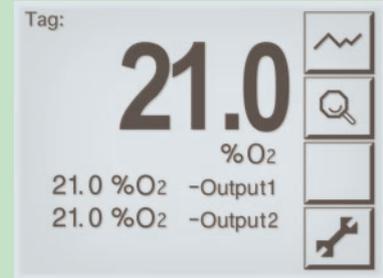
## Complete Operation Display

- 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



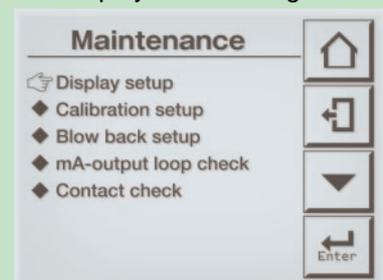
This display enables you to operate the analyzer while checking data on the display.

### ● 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.

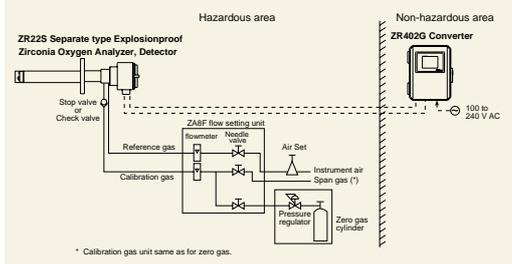
Error code	Reason for error
E--1	Cell failure
E--2	Abnormal heater temperature
E--3	Defective A/D converter
E--4	Faulty EEPROM
ALARM1	Abnormal oxygen concentration
ALARM2	Abnormal moisture content
ALARM3	Abnormal mixing ratio
ALARM6	Abnormal zero calibration factor
ALARM7	Abnormal span calibration factor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

# ZR22S Explosionproof version Detector

## ZR22S Detector



## System configuration



# AV550G

## Zirconia Oxygen Averaging Converter

The O<sub>2</sub>mation, 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.\*<sup>1</sup>

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

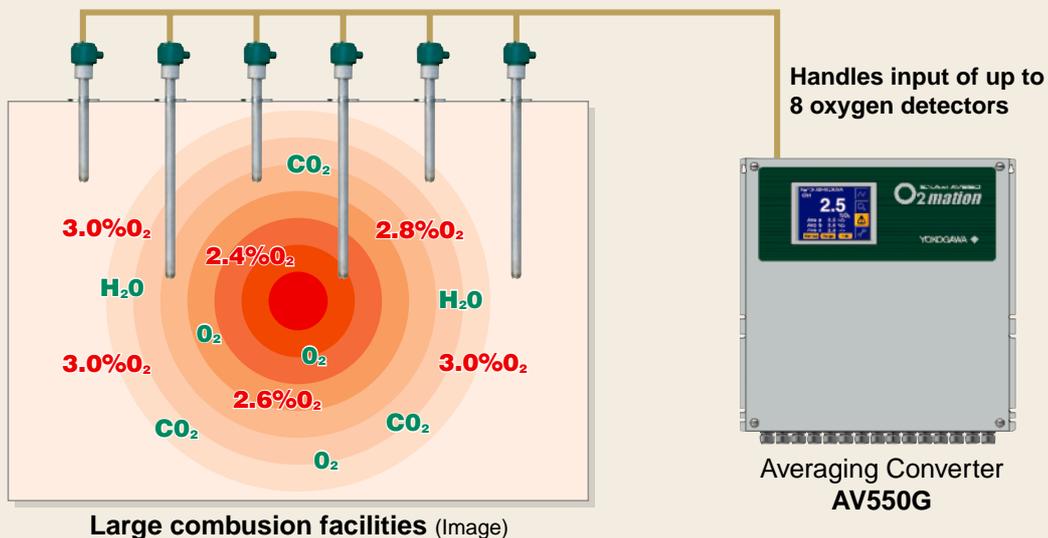
FOUNDATION is a registered trademark of Fieldbus foundation.



▲ 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.

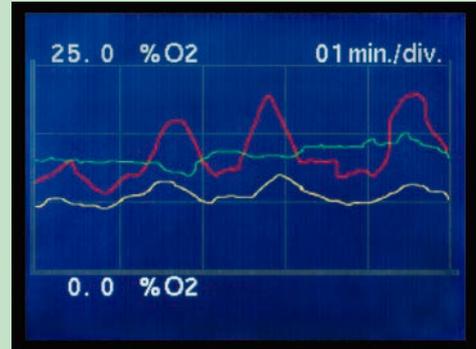
## Typical Converter Displays

### ● Example of basic display



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

### ● Example of trend display



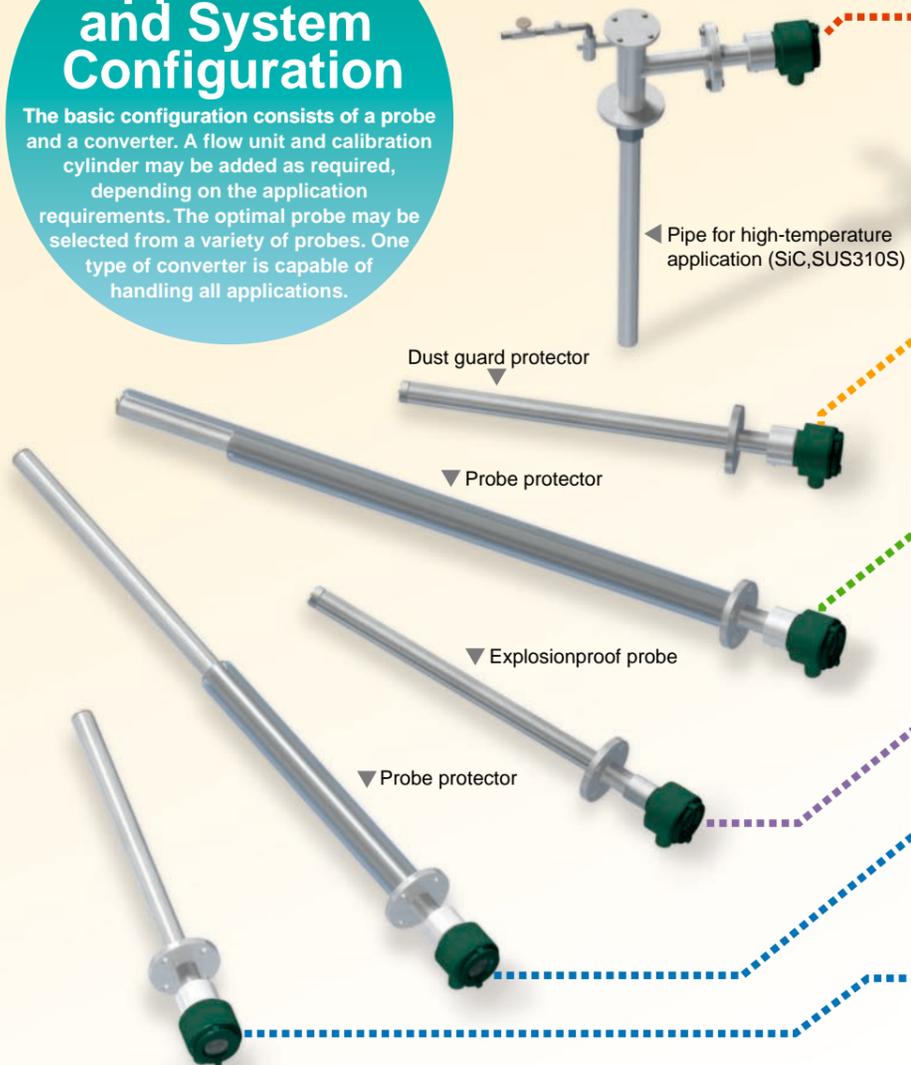
### ● Example of 8 channel data display



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**

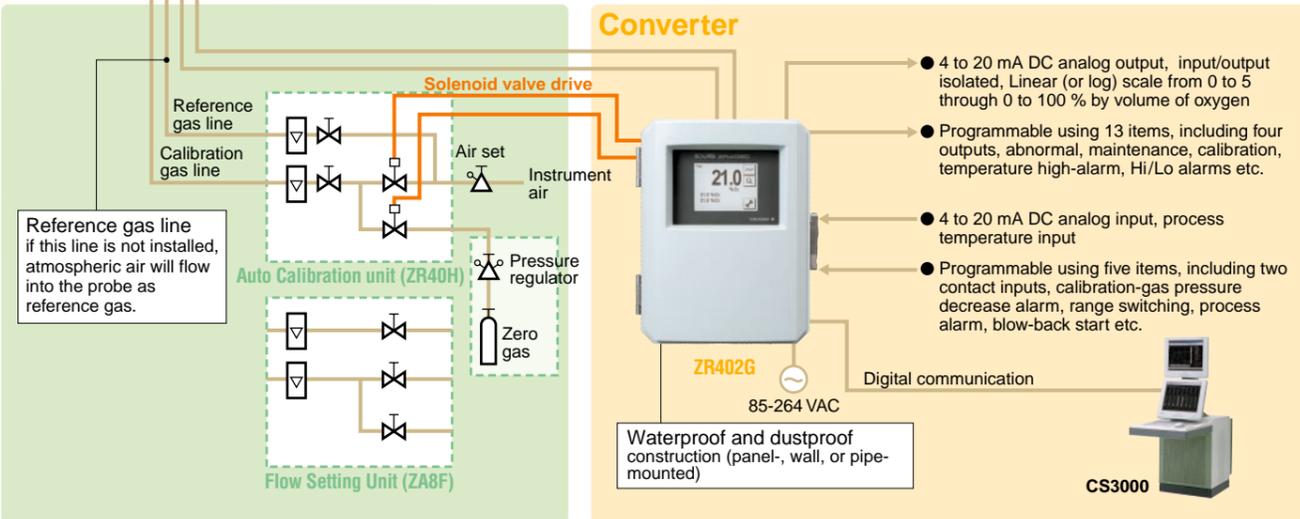
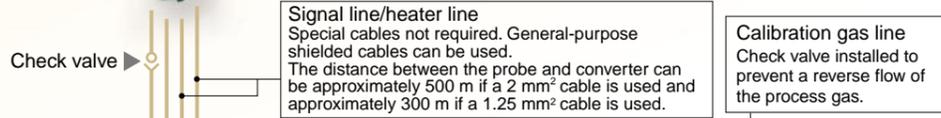
Protectors allow the probe to be installed horizontally

**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)	Others
Glass melting furnace (in furnace)	
Glass melting furnace (in stack)	
Ceramic baking furnace	
Heating furnace	
Naphtha cracking furnace	
Heating furnace	
Black liquor recovery boiler	
Sludge kiln/boiler	
Forging furnace	
Heat treatment furnace	
Window box	Petroleum
Drying furnace	Petrochemical
Reaction furnace	Pulp & paper
Roasting furnace	Machinery
Incinerator	Electric power
Sludge burning furnace	Others
Fermentation tank	
Indoor oxygen-deficiency monitoring	



## 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

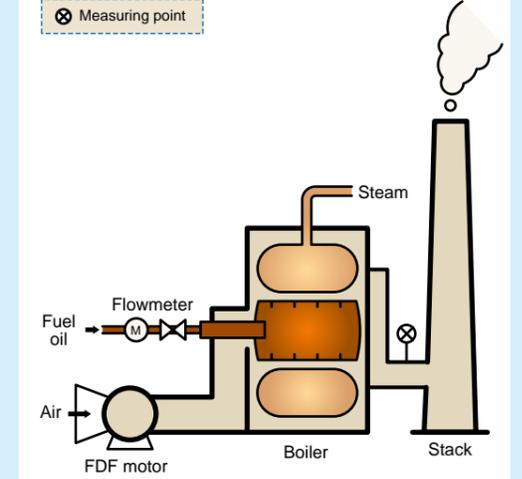
Process gas is ejected when the pressure is negative

### Pipe

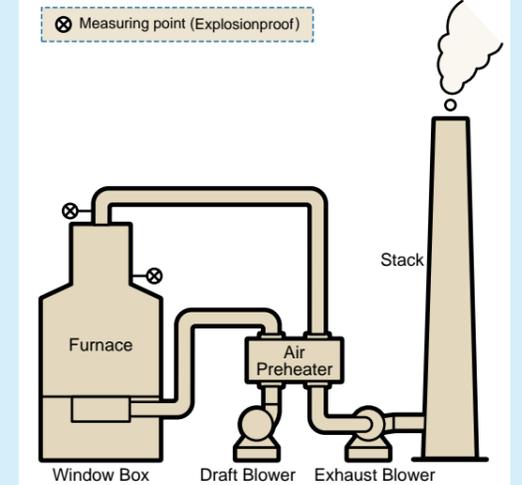
SiC (Silicon Carbide max. 1400°C) and SUS310S (Stainless steel max. 800°C) available. Insertion length 1.0m, 1.5m



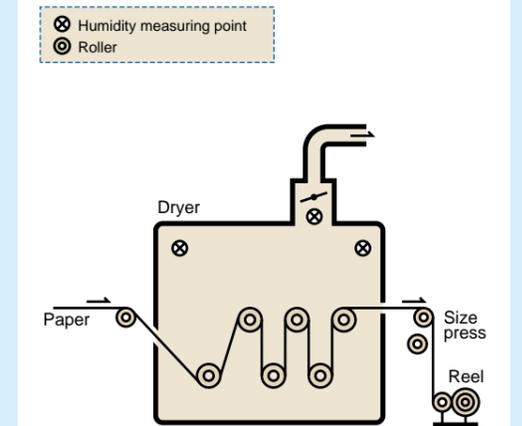
## Application 1 Example of boiler instrumentation



## 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 <sub>2</sub> : 0 to 100 vol% O <sub>2</sub> (digital display) H <sub>2</sub> O: 0 to 100 vol% H <sub>2</sub> O or 0 to 1,000 kg/kg, % relative humidity, dew point Output O <sub>2</sub> : Any setting in the range from 0 to 5 vol% O <sub>2</sub> to 0 to 100 vol% O <sub>2</sub> (1 vol% O <sub>2</sub> scale) H <sub>2</sub> O: Any setting in the range from 0 to 25 vol% H <sub>2</sub> O to 0 to 100 vol% H <sub>2</sub> O or 0 to 0.200 kg/kg to 0 to 1,000 kg/kg
Process gas pressure	O <sub>2</sub> : -5 to +250 kpa (Non-explosionproof) H <sub>2</sub> 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 <sub>2</sub> ), Oxygen concentration low alarm/ low-low alarm limit values (vol% O <sub>2</sub> ), Oxygen concentration alarm hysteresis (vol% O <sub>2</sub> ), 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 gas	-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 gas	-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
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 <sub>2</sub> : 0 to 100 vol% O <sub>2</sub> (digital display) Output O <sub>2</sub> : Any setting in the range from 0 to 5 vol% O <sub>2</sub> to 0 to 100 vol% O <sub>2</sub> (1 vol% O <sub>2</sub> 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: EEx d IIB + H <sub>2</sub> , 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: Ex d IIB + H <sub>2</sub> T2, Ex tD A21 IP66 T300 °C
Ambient temperature	ZR22S: -20 to 60 °C (-20 to 150 °C on the terminal box surface); ZR402G: -20 to 55 °C 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: M20 by 1.5 mm or 1/2 NPT select one type

## Characteristics

Repeatability	O <sub>2</sub> : ± 0.5 % Maximum value of setting range H <sub>2</sub> O: ± 1% Maximum value of setting range
Drift	O <sub>2</sub> : ± 2 % Maximum value of setted range/month H <sub>2</sub> O: ± 3% Maximum value of setted 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.

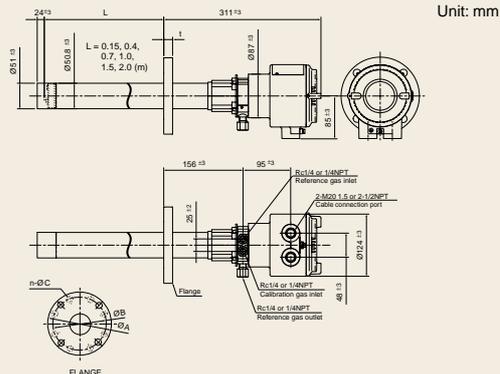
## Separate type Explosionproof Zirconia Oxygen Analyzer, Detector

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 gas	-E	----	External connection (Instrument air)
Gas Thread	-R -T	----	Rc 1/4 1/4 NPT
Connection box thread	-M -T	----	M20x1.5 mm 1/2 NPT
Instruction manual	-E	----	English
Options	-A	----	Always -A
Valves	/C /CV /SV	----	Inconel bolt Check valve Stop valve
Tag plates	/SCT /PT	----	Stainless steel tag plate Printed tag plate

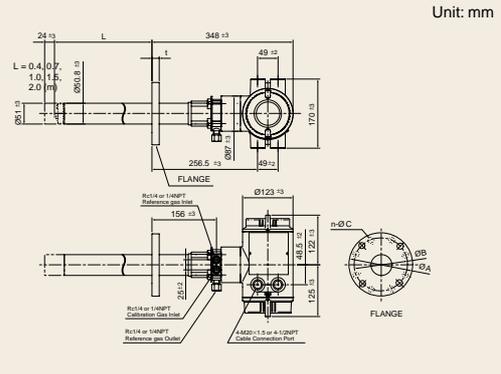
## Integrated type Explosionproof Zirconia Oxygen Analyzer

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 -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 Westinghouse
Auto Calibration	-N -A -B	----	Not required Horizontal mounting Vertical mounting
Reference gas	-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
Options	-A	----	Always -A
Valves	/C /CV /SV	----	Inconel bolt Check valve Stop valve
Tag plates	/H /SCT /PT /C2	----	Hood 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
NAMUR NE43 compliant	/C3	----	

## Separate Type Explosionproof Detector ZR22S



## Integrated Type Explosionproof Analyzer ZR202S



# 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 <sub>2</sub> to 0 to 100 vol% O <sub>2</sub>
Number of detectors	1 to 8
Detector Compatibility	ZR22G, ZR22S, ZO21D, ZO21DW
Power Supply	86 to 126.5 VAC, 50/60 Hz
Power Consumption	100 V type : Max: 40 W + (120 W) (Number of detectors) for steady operation, Max: 40 W + (220 W) (Number of detectors) for warm-up. 200 V type : Max: 40 W + (140 W) (Number of detectors) for steady operation, Max: 40 W + (220 W) (Number of detectors) for warm-up.
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 <sub>2</sub> 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

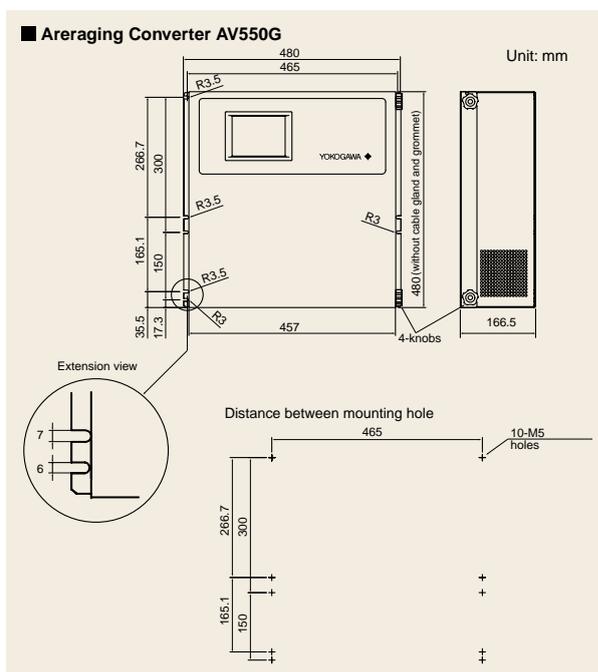
## Characteristics

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
	-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
	-F	-----	French
	-G	-----	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 □□ )

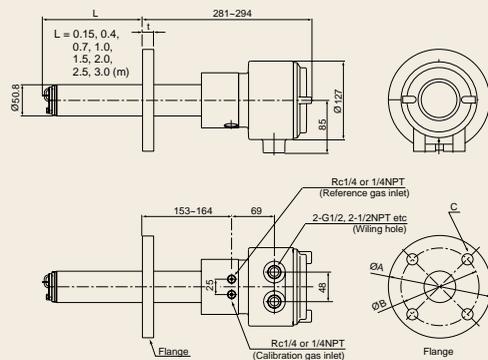


## Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Converter

Model	Suffix code	Option code	Description
ZR402G	-----	-----	Separate type Zirconia Oxygen/ High Temperature Humidity Analyzer, Converter
Converter thread	-P -G -M -T	-----	G1/2 Pg13.5 M20x1.5 mm 1/2NPT
Display	-J -E -G -F	-----	Japanese English German French
Instruction manual	-J -E -C	-----	Japanese English Chinese
—	-A	-----	Always -A
Options		/HS /H /SCT /PT /C2 /C3	Set for Humidity Analyzer Hood 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
Tag plates			
NAMUR NE43 compliant			

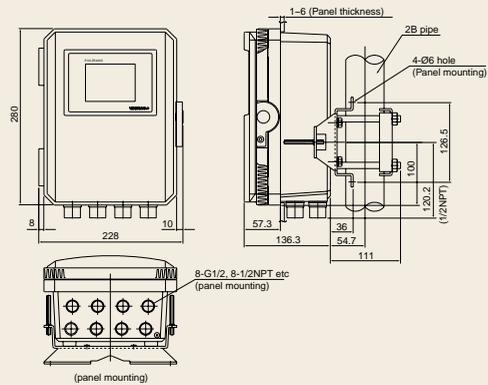
### Separate Type General purpose Detector ZR22G

Unit: mm



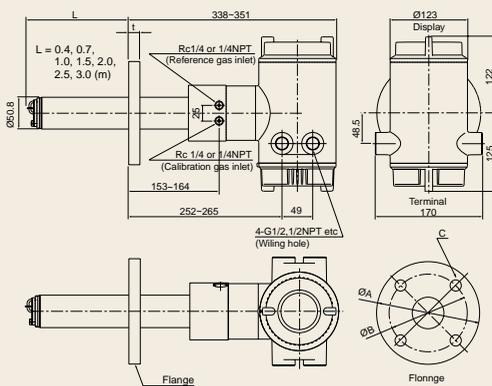
### Separate Type General purpose Converter ZR402G

Unit: mm



### Integrated Type General purpose Analyzer ZR202G

Unit: mm



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