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

ZR202G/S, ZR402G, ZR22G/

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

AV550G

Averaging Converter

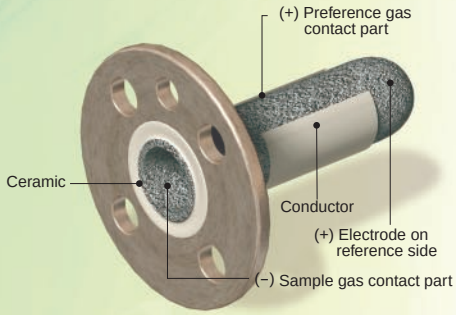
EXAxt

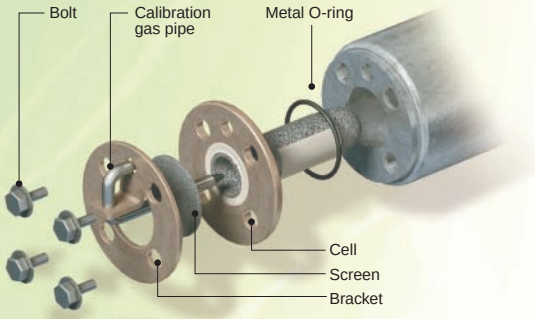
Bulletin 11M12A01-01E

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.



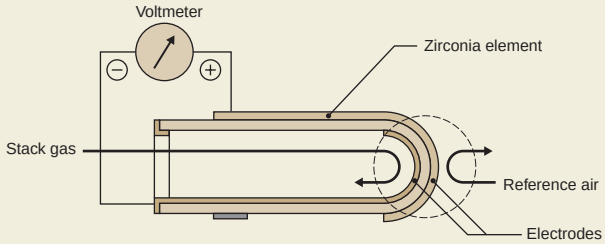


ZR202G/S

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: $0+4e \rightarrow 2O^{2-}$ (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 Nemst'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 gas 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℃ and the correspondingly reactive electromotive force E =

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

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

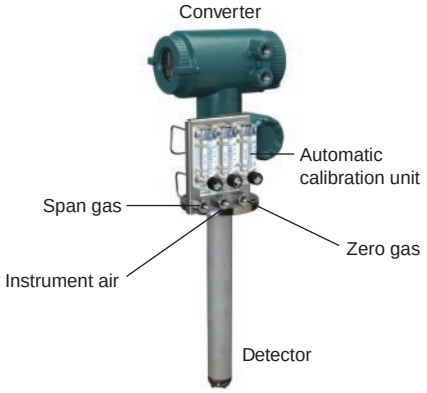
ZR202G/ZR202S

Integrated Type In Situ Zirconia Oxygen / High Temperature Humidity Analyzer

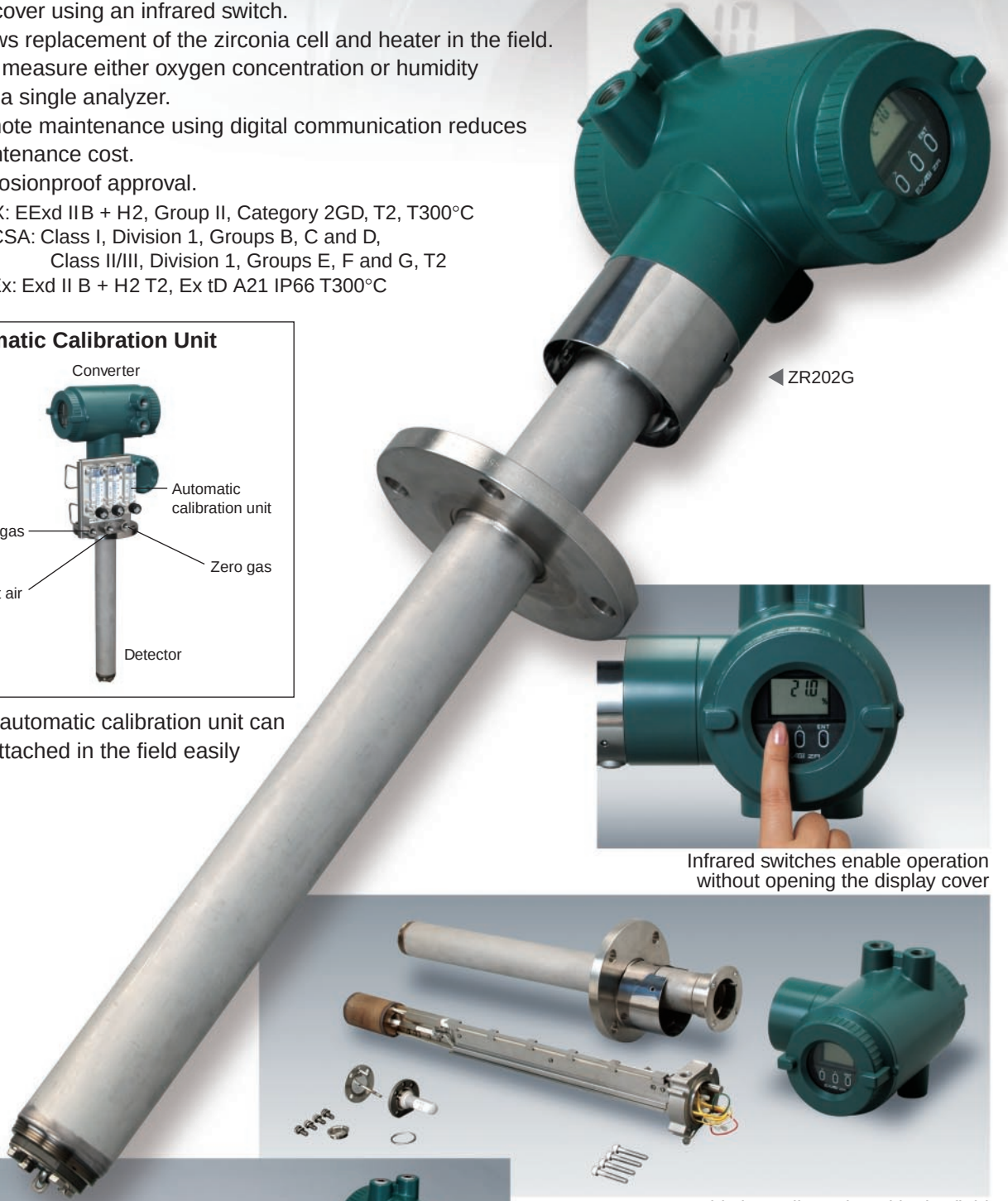
- Can cut wiring, piping and installation costs.
- Can be operated in the field without opening the cover using an infrared switch.
- Allows replacement of the zirconia cell and heater in the field.
- Can measure either oxygen concentration or humidity with a single analyzer.
- Remote maintenance using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



◀ 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

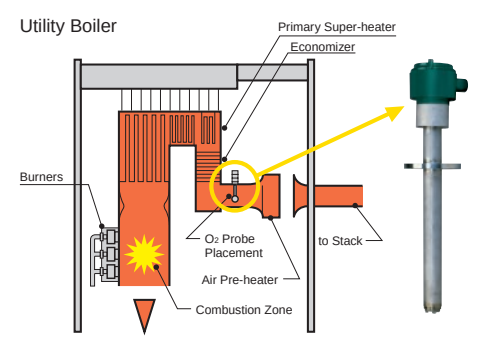
- Liquid-crystal touch panel display provides easy operation.
- Interactive model displays instructions to follow, including those for: settings, oxygen concentration trends, and calibration operations.
- Digital communications features are provided as standard – this enables the analyzer to be maintenance-serviced 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: 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

ZR22G Detector ▲

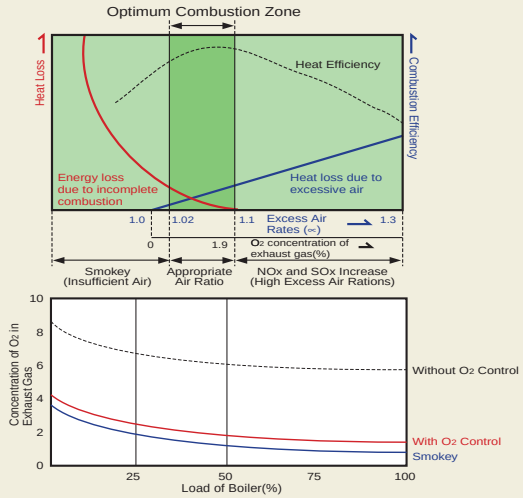
▲ ZR402G Converter

Achieving accurate O_2 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.

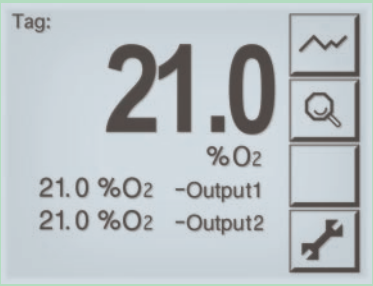
Self-testing suggests countermeasures for problems

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

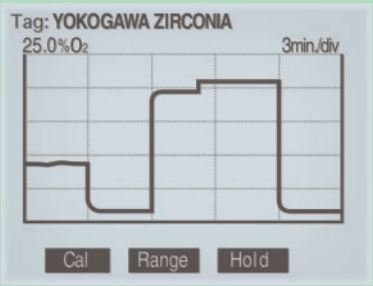
Typical Converter Displays

● Example of basic display



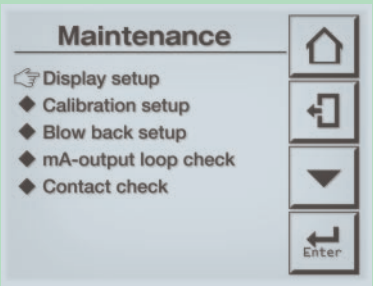
This display enables you to operate the analyzer while checking data on the display.

● 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.

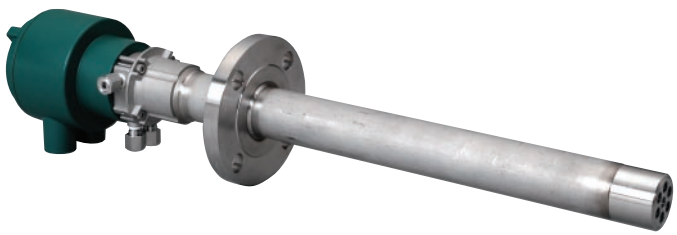
● Example of setting data display – displays data changes



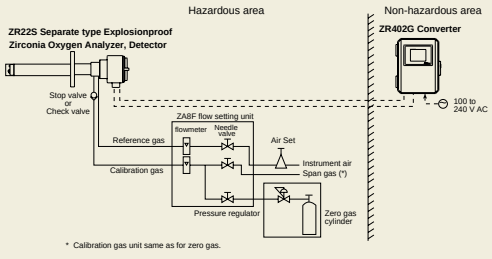
- One-touch interactive display operation
- User-friendly design providing easy operation without having to use the instruction manual.

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.

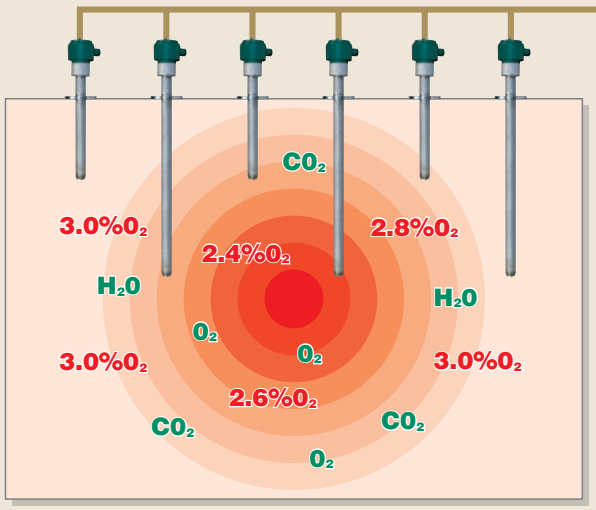
- Full color touch screen operation.
- Special trend graph functions with customer graph configuration.
- Multiple display modes shows average data, single detector or all detector gas concentrations.
- Handles input of up to 8 oxygen detectors.
- "Hot swap" of channel cards so the analyzer remains on 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.



Large combusion facilities (Image)

Handles input of up to 8 oxygen detectors

Averaging Converter
AV550G

AV550G Averaging Converter

Complete Operation Display

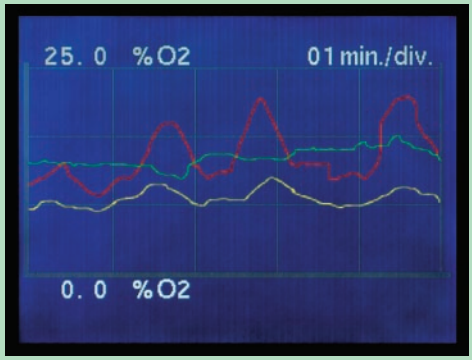
- A large 5.7-inch color touch screen operation.
- The trend graph of max 8 channels helps diagnose problems and view individual detector performance over time.
- Error codes and details of errors can be checked in the field without the need to refer to the appropriate instruction manual.

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

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

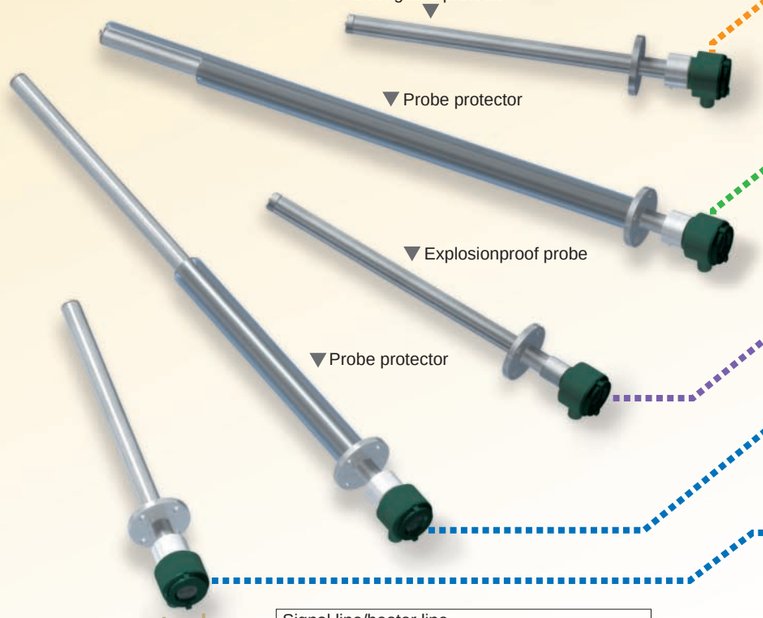
Utility Boiler – With large boilers used in the utility industry, the oxygen concentration varies in different zones across the flue. In order to obtain the most reliable oxygen data, the most common method used is the averaging of several measuring points using an external averaging unit. The AV550G 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.

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

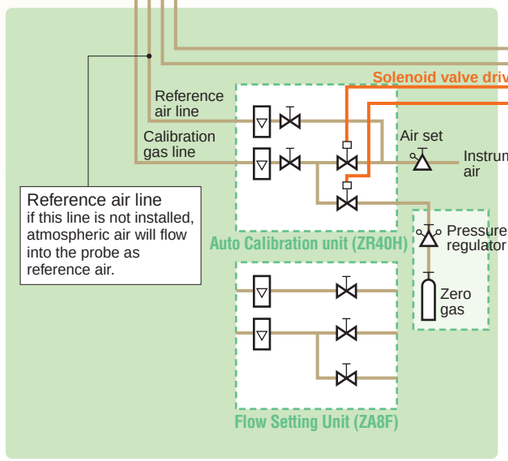
Application

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

Check valve ▶

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.

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



Reference air line
if this line is not installed, atmospheric air will flow into the probe as reference air.

Converter

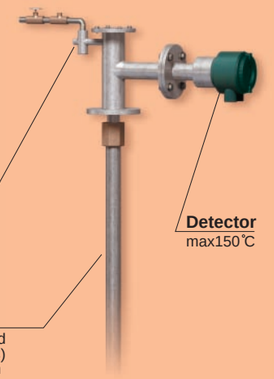
- 4 to 20 mA DC analog output, input/output isolated, Linear (or log) scale from 0 to 5 through 0 to 100 % by volume of oxygen
- Programmable using 13 items, including four outputs, abnormal, maintenance, calibration, temperature high-alarm, Hi/Lo alarms etc.
- 4 to 20 mA DC analog input, process temperature input
- Programmable using five items, including two contact inputs, calibration-gas pressure decrease alarm, range switching, process alarm, blow-back start etc.

Digital communication

Waterproof and dustproof construction (panel-, wall, or pipe-mounted)

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

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

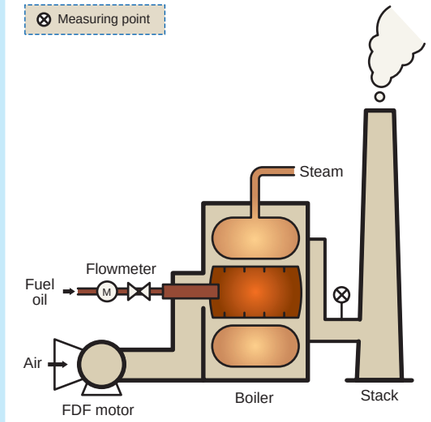


Air Ejector
Process gas is ejected when the pressure is negative

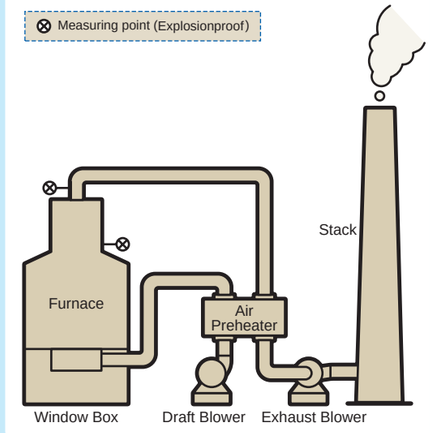
Detector
max150℃

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

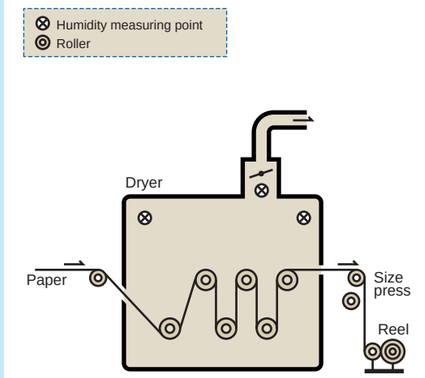
Application 1
Example of boiler instrumentation



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_2O: 0 to 100 vol% H_2O 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_2O: Any setting in the range from 0 to 25 vol% H_2O to 0 to 100 vol% H_2O 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_2O: -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: ZR202G; 2 points ZR402G; 4 points	(1) Abnormal, (2) High-high-alarm, (3) High-alarm, (4) Low-low alarm, (5) Low-alarm, (6) Maintenance, (7) Calibration, (8) Range switching 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	- - - - -	0.15 m (for high temperature use)
	-040	- - - - -	0.4 m
	-070	- - - - -	0.7 m
	-100	- - - - -	1.0 m
	-150	- - - - -	1.5 m
	-200	- - - - -	2.0 m
	-250	- - - - -	2.5 m
	-300	- - - - -	3.0 m
	-360	- - - - -	3.6 m
	-420	- - - - -	4.2 m
	-480	- - - - -	4.8 m
	-540	- - - - -	5.4 m
Wetted material	-S	- - - - -	SUS316
	-C	- - - - -	Stainless steel with Inconel calibration gas tube
Flange	-A	- - - - -	ANSI Class 150 2 RF SUS304
	-B	- - - - -	ANSI Class 150 3 RF SUS304
	-C	- - - - -	ANSI Class 150 4 RF SUS304
	-E	- - - - -	DIN PN10 DN50 A SUS304
	-F	- - - - -	DIN PN10 DN80 A SUS304
	-G	- - - - -	DIN PN10 DN100 A SUS304
	-K	- - - - -	JIS 5K 65 FF SUS304
	-L	- - - - -	JIS 10K 65 FF SUS304
	-M	- - - - -	JIS 10K 80 FF SUS304
	-P	- - - - -	JIS 10K 100 FF SUS304
	-Q	- - - - -	JIS 5K 32 FF SUS304 (for high temperature use)
	-R	- - - - -	JPI Class 150 4 RF SUS304
	-S	- - - - -	JPI Class 150 3 RF SUS304
	-W	- - - - -	Westinghouse
Reference air	-C	- - - - -	Natural convection
	-E	- - - - -	External connection (Instrument air)
	-P	- - - - -	Pressure compensated
Gas Thread	-R	- - - - -	Rc 1/4
	-T	- - - - -	1/4 FNPT
Connection box thread	-P	- - - - -	G1/2
	-G	- - - - -	Pg13.5
	-M	- - - - -	M20 x1.5 mm
	-T	- - - - -	1/2NPT
	-Q	- - - - -	Quick connect
Instruction manual	-J	- - - - -	Japanese
	-E	- - - - -	English
	-C	- - - - -	Chinese
—	-A	- - - - -	Always -A
Options		/D	DERAKANE coating
		/C	Inconel bolt
Valves		/CV	Check valve
		/SV	Stop valve
Filter		/F1	Dust Filter
		/F2	Dust Guard Protector
Tag plates		/SCT	Stainless steel tag plate
		/PT	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	- - - -	0.4 m
	-070	- - - -	0.7 m
	-100	- - - -	1.0 m
	-150	- - - -	1.5 m
	-200	- - - -	2.0 m
	-250	- - - -	2.5 m
	-300	- - - -	3.0 m
Wetted material	-S	- - - -	SUS316
	-C	- - - -	Stainless steel with Inconel calibration gas tube
Flange	-A	- - - -	ANSI Class 150 2 RF SUS304
	-B	- - - -	ANSI Class 150 3 RF SUS304
	-C	- - - -	ANSI Class 150 4 RF SUS304
	-E	- - - -	DIN PN10 DN50 A SUS304
	-F	- - - -	DIN PN10 DN80 A SUS304
	-G	- - - -	DIN PN10 DN100 A SUS304
	-K	- - - -	JIS 5K 65 FF SUS304
	-L	- - - -	JIS 10K 65 FF SUS304
	-M	- - - -	JIS 10K 80 FF SUS304
	-P	- - - -	JIS 10K 100 FF SUS304
	-R	- - - -	JPI Class 150 4 RF SUS304
	-S	- - - -	JPI Class 150 3 RF SUS304
	-W	- - - -	Westinghouse
Auto Calibration	-N	- - - -	Not required
	-A	- - - -	Horizontal mounting
	-B	- - - -	Vertical mounting
Reference air	-C	- - - -	Natural convection
	-E	- - - -	External connection (Instrument air)
	-P	- - - -	Pressure compensated
Gas Thread	-R	- - - -	Rc 1/4
	-T	- - - -	1/4 FNPT
Connection box thread	-P	- - - -	G1/2
	-G	- - - -	Pg13.5
	-M	- - - -	M20x1.5 mm
	-T	- - - -	1/2NPT
Instruction manual	-J	- - - -	Japanese
	-E	- - - -	English
	-C		Chinese
—	-A	- - - -	Always -A
Options		/D	DERAKANE coating
		/C	Inconel bolt
		/HS	Set for Humidity Analyzer
		/CV	Check valve
		/SV	Stop valve
		/H	Hood
		/F1	Dust Filter
		/F2	Dust Guard Protector
		/SCT	Stainless steel tag plate
		/PT	Printed tag
NAMUR NE43 compliant		/C2	Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less
		/C3	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_2O: ± 1% Maximum value of setting range
Drift	O_2: ± 2 % Maximum value of setted range/month
	H_2O: ± 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

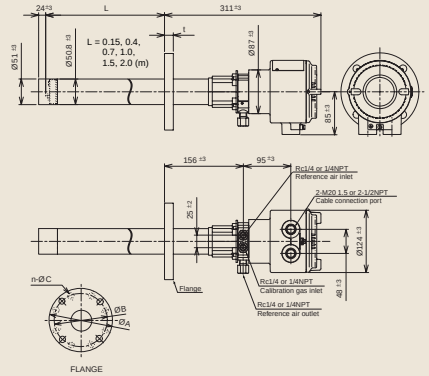
Model	Suffix code	Option code	Description
ZR22S	- - - - - - - - -	- - - -	Separate type Explosionproof Zirconia Oxygen Analyzer, Detector
Explosion proof Approval	-A	- - - -	ATEX certified flameproof
	-B	- - - -	FM certified explosionproof
	-C	- - - -	CSA certified explosionproof
	-D	- - - -	IECEx certified flameproof
Length	-015	- - - -	0.15 m (for high temperature use)
	-040	- - - -	0.4 m
	-070	- - - -	0.7 m
	-100	- - - -	1.0 m
	-150	- - - -	1.5 m
	-200	- - - -	2.0 m
Wetted material	-S	- - - -	SUS316
	-C	- - - -	Stainless steel with Inconel calibration gas tube
Flange	-A	- - - -	ANSI Class 150 2 RF SUS304
	-B	- - - -	ANSI Class 150 3 RF SUS304
	-C	- - - -	ANSI Class 150 4 RF SUS304
	-E	- - - -	DIN PN10 DN50 A SUS304
	-F	- - - -	DIN PN10 DN80 A SUS304
	-G	- - - -	DIN PN10 DN100 A SUS304
	-Q	- - - -	JIS 5K 32 FF SUS304 (for high temperature use)
	-W	- - - -	Westinghouse
Reference air	-E	- - - -	External connection (Instrument air)
Gas Thread	-R	- - - -	Rc 1/4
	-T	- - - -	1/4 NPT
Connection box thread	-M	- - - -	M20 x1.5 mm
	-T	- - - -	1/2 NPT
Instruction manual	-E	- - - -	English
—	-A	- - - -	Always -A
Options		/C	Inconel bolt
	Valves	/CV	Check valve
		/SV	Stop valve
	Tag plates	/SCT	Stainless steel tag plate
		/PT	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	- - - - -	ATEX certified flameproof
	-B	- - - - -	FM certified explosionproof
	-C	- - - - -	CSA certified explosionproof
	-D	- - - - -	IECEx certified flameproof
Length	-040	- - - - -	0.4 m
	-070	- - - - -	0.7 m
	-100	- - - - -	1.0 m
	-150	- - - - -	1.5 m
	-200	- - - - -	2.0 m
Wetted material	-S	- - - - -	SUS316
	-C	- - - - -	Stainless steel with Inconel calibration gas tube
Flange	-A	- - - - -	ANSI Class 150 2 RF SUS304
	-B	- - - - -	ANSI Class 150 3 RF SUS304
	-C	- - - - -	ANSI Class 150 4 RF SUS304
	-E	- - - - -	DIN PN10 DN50 A SUS304
	-F	- - - - -	DIN PN10 DN80 A SUS304
	-G	- - - - -	DIN PN10 DN100 A SUS304
	-W	- - - - -	Westinghouse
Auto Calibration	-N	- - - - -	Not required
	-A	- - - - -	Horizontal mounting
	-B	- - - - -	Vertical mounting
Reference air	-E	- - - - -	External connection (Instrument air)
Gas Thread	-R	- - - - -	Rc 1/4
	-T	- - - - -	1/4 NPT(F)
Connection box thread	-M	- - - - -	M20x1.5 mm
	-T	- - - - -	1/2 NPT
Instruction manual	-E	- - - - -	English
—	-A	- - - - -	Always -A
Options	Valves	/C	Inconel bolt
		/CV	Check valve
		/SV	Stop valve
		/H	Hood
	Tag plates	/SCT	Stainless steel tag plate
		/PT	Printed tag plate
	NAMUR NE43 compliant	/C2	Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less
		/C3	Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more

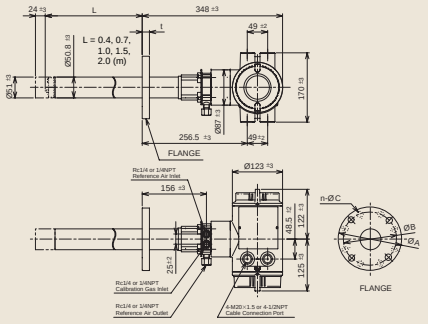
■ Separate Type Explosionproof Detector ZR22S

Unit: mm



■ Integrated Type Explosionproof Analyzer ZR202S

Unit: mm



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

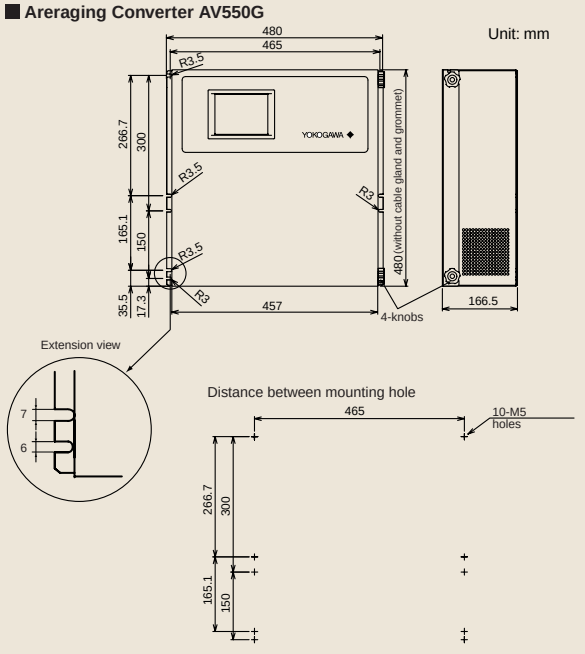
Repeatability:	±0.5% F.S.
Linearity:	±1% F.S. (less than 0 to 25% range)
Drift:	±2% F.S./month for both zero and span
Response:	5 sec maximum for 90% response

*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
	-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□□)

■ **Areraging Converter AV550G**

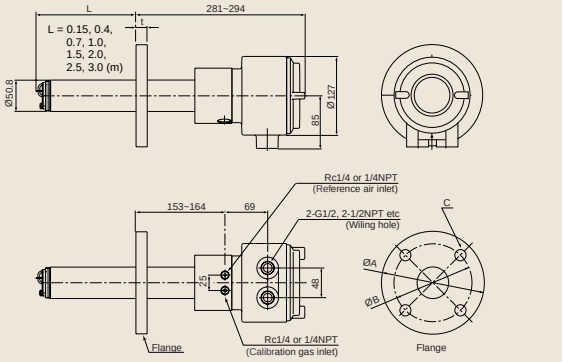


Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Converter

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
	Tag plates	/SCT	Stainless steel tag plate
		/PT	Printed tag plate
	NAMUR NE43 compliant	/C2	Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 ma or less
		/C3	Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more

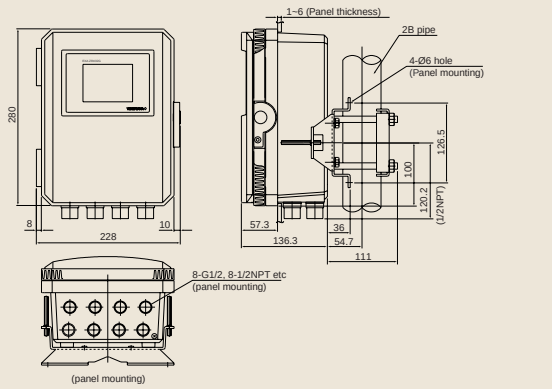
■ Separate Type General purpose Detector ZR22G

Unit: mm



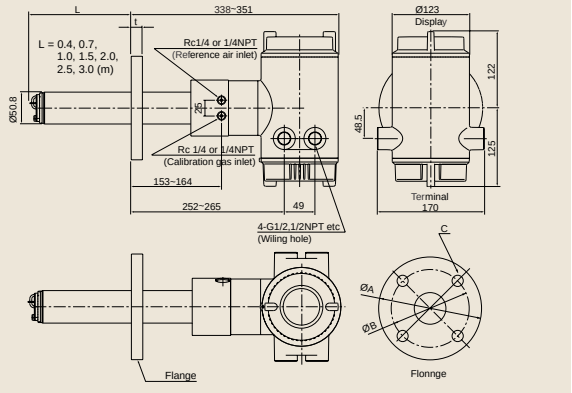
■ Separate Type General purpose Converter ZR402G

Unit: mm



■ Integrated Type General purpose Analyzer ZR202G

Unit: mm



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