General Specifications

GS 11M12A01-01E

Model ZR22G, ZR402G, and ZR202G
Direct In Situ Zirconia Oxygen Analyzers and
High Temperature Humidity Analyzers

Overview

This analyzer consists basically of a probe and a converter that are used as both a Zirconia Oxygen Analyzer and High Temperature Humidity Analyzer. The probe is of direct insertion type, and the converter uses a digital display.

Two types of analyzers are available: separate type and integrated type. As its name implies, the integrated type combines probe and converter.

Separate and integrated type Zirconia oxygen analyzers need not use a sampling device, and allow direct installation of the probe in the wall of a flue or furnace to measure the concentration of oxygen in the stack gas. The converter displays the cell temperature and cell emf in addition to the oxygen concentration.

This analyzer is most suitable for monitoring the oxygen concentration of combustion gases in large or small boilers, various industrial furnace and combustion devices, or for the control of low-oxygen combustion.

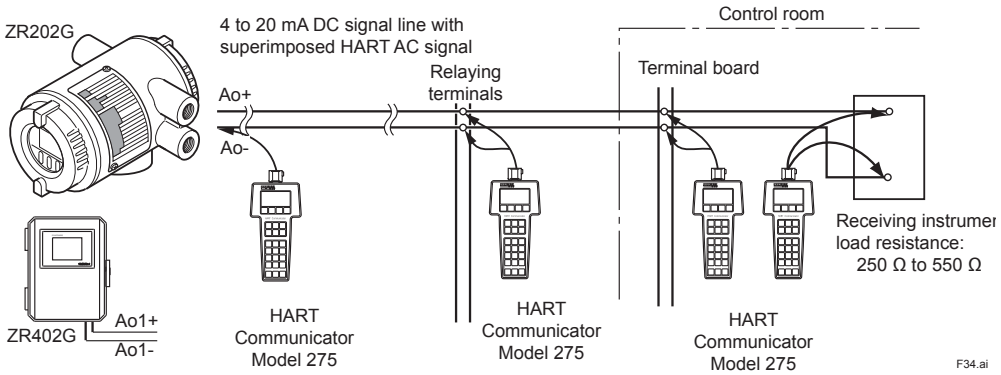
Separate type and integrated type Zirconia High Temperature Humidity Analyzers are used to measure the humidity of hot gases continuously in driers which use an electrical heater or hot gas as the heat source. They can also be used in a variety of manufacturing applications in humidifiers, as well as in driers, for humidity measurement and control. They can help improve productivity in these application fields.

- The built-in heater assembly of the probe can be replaced on site, reducing maintenance costs.
- The probe uses a long-life, high-reliability Zirconia sensor.
- The probe uses three-reference air supply methods (natural air convection, instrument air, and pressure compensated) in its applications.
- The separate type converter incorporates a LCD touchscreen for ease of operation.

Features:

- This converter can be used as an oxygen analyzer as well as a high temperature humidity analyzer.
- The integrated type integrates both probe and converter, to reduce wiring, piping, and installation costs. This type of unit uses an optical switch for ease of operation at the site.
- Remote maintenance using digital communications (HART) reduces maintenance costs. *1

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



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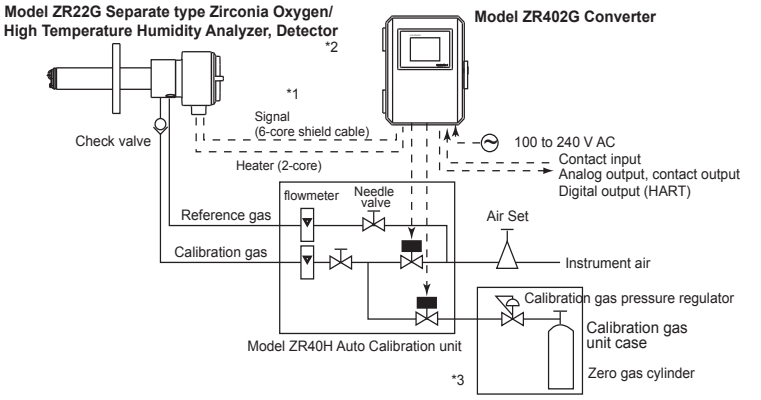
Basic System Configuration

System configuration - Separate type

System configuration Example 1 of Separate type Analyzer

- Automatic calibration system uses instrument air for reference gas.
  For the calibration gas, a standard gas cylinder may be used for more accurate calibration.
- Applications: Oxygen concentration monitoring and control in large boilers
  (for private power generation and for business use) and in heating furnaces, and the like.
  Humidity monitoring and control in drying furnaces and humidifiers.



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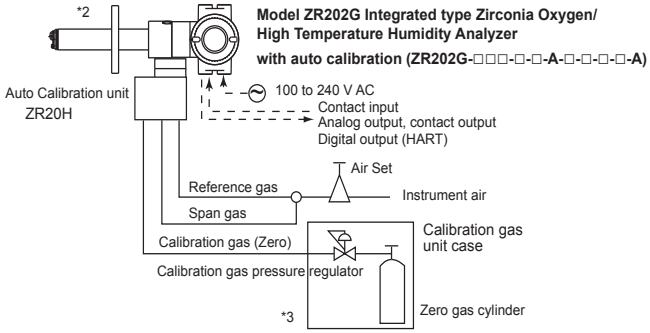
System configuration - Integrated type

System configuration Example 1 of Integrated type Analyzer

- For an integrated type as shown in the figure above.
- Applications: Oxygen concentration monitoring and control in large boilers
  (for private power generation and for business use) and in heating furnaces, and the like.
  Humidity monitoring and control in drying furnaces and humidifiers



Note:
The installation temperature limits range for integrated type analyzer is -20 to 55°C.

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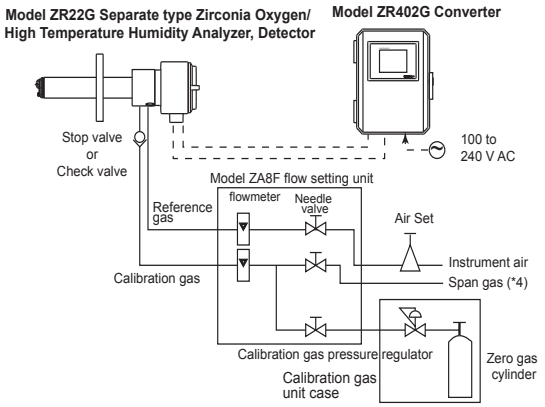
*1 Shield cable:
Use shielded signal cables, and connect the shields to the FG terminal of the converter.
*2 Select the desired probe from the Probe Configuration table on page 4.
*3 When a zirconia oxygen analyzer is used, 100% N_2 gas cannot be used as the zero gas. Use approx. 1 vol% O_2 gas (N_2-balanced).

Basic System Configuration

System configuration — Separate type

System configuration Example 2 of Separate type Analyzer

- Instrument air is used as the reference gas.
  A standard gas cylinder can be used for the calibration gas for more accurate calibration.
- Application example: Oxygen concentration monitoring and control in large boilers (for private power generation and for business use) and in heating furnaces.
  Humidity monitoring and control in drying furnaces and humidifiers.



*4 Calibration gas unit same as for zero gas.

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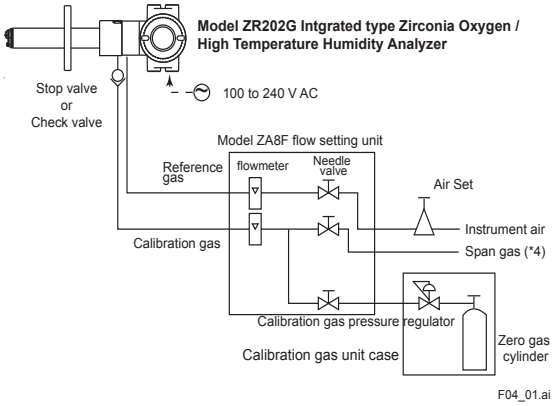
System configuration — Integrated type

System configuration Example 2 of Integrated type Analyzer

- Instrument air is used as the reference gas. A standard gas cylinder can be used for the calibration gas for more accurate calibration.
- Application example: Oxygen concentration monitoring and control in large boilers (for private power generation and for business use) and in heating furnaces.
  Humidity monitoring and control in drying furnaces and humidifiers.



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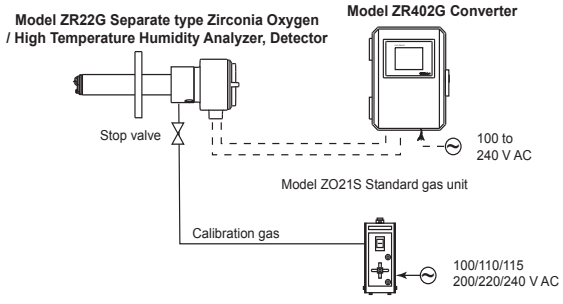
System configuration Example 3 of Separate type Analyzer

- Instrument air is used as the reference gas. A portable standard gas unit (ZO21S) is used for the calibration.
  This unit is connected only when the calibration is made.
- Application example:
  Oxygen concentration monitoring and control in packaged boilers
  Humidity monitoring and control in drying furnaces or a humidifiers



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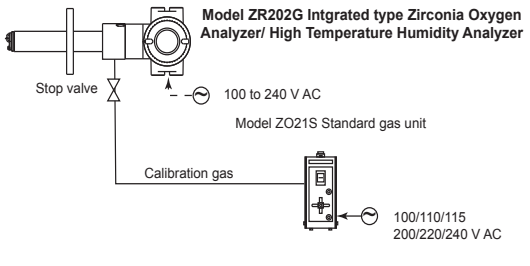
System configuration Example 3 of Integrated type Analyzer

- Instrument air is used as the reference gas.
  A portable standard gas unit (ZO21S) is used for the calibration.
  This unit is connected only when the calibration is made.
- Application example:
  Oxygen concentraion monitoring and control in packaged boilers
  Humidity monitoring and control in drying furnaces or a humidifiers



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Note: The installation temperature limits range for integrated type analyzer is -20 to 55 °C.

System Components

	System Components	Separate type			Integrated type		
		System config.			System config.		
		Ex.1	Ex.2	Ex.3	Ex.1	Ex.2	Ex.3
1	Model ZR22G Separate type Zirconia Oxygen Analyzers/ High Temperature Humidity Analyzers,Detector	●	●	●			
2	Model ZR402G Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Converter(*1)	●	●	●			
3	Model ZR202G Integrated type Zirconia Oxygen Analyzers/ High Temperature Humidity Analyzers				●	●	●
4	Model ZO21P Adapter for High Temperature Probe of separate type Zirconia Oxygen Analyzer	○	○	○			
5	E7046EC, E7046EN Auxiliary Ejector for High Temperature Probe of separate type Oxygen Analyzer	○	○	○			
6	Model ZO21R Probe Protector for Zirconia Oxygen Analyzers	○	○	○	○	○	○
7	K9471UA Filter for Oxygen Analyzer	○	○	○	○	○	○
8	K9471UC Dust Guard Protector	○	○	○	○	○	○
9	Model ZH21B Dust Protector for High Temperature Humidity Analyzers	○	○	○	○	○	○
10	Model ZO21S Standard Gas Unit			●			●
11	Model ZA8F Flow setting unit for manual calibration		●			●	
12	Model ZR40H Automatic Calibration Unit for Separate type Analyzer	●					
13	Model ZR20H Automatic Calibration Unit for Integrated type Analyzer (*2)				●		
14	L9852CB, G7016XH Stop Valve for Calibration-gas line		(●)	●		(●)	●
15	K9292DN,K9292DS Check Valve for Calibration-gas line	●	(●)			(●)	
16	G7003XF/K9473XK , G7004XF/K9473XG Air Set	●	●		●	●	
17	G7001ZC Zero-gas Cylinder	●	●		●	●	
18	G7013XF, G7014XF Pressure Regulator for Gas Cylinder	●	●		●	●	
19	E7044KF Case Assembly for Calibration-gas Cylinder	●	●		●	●	
20	ZR22A, ZR202A Heater Assembly for Spare Parts	○	○	○	○	○	○

● : Items required for the above system example
○ : To be selected depending on each application. For details, refer to Chapter of Options.
(●) : Select either
(*1): When used as a high temperature humidity analyzer, specify /HS options.
(*2): When Auto Calibration of (-A) or (-B) code is speified , ZR20H is installed in ZR202G.

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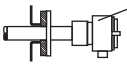
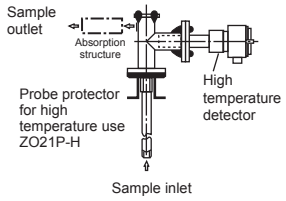
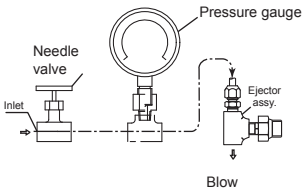
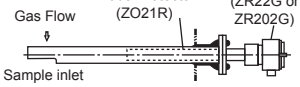
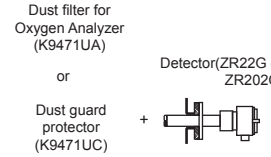
Detector Components

Process gas temperature 0 to 700°C				Process gas temperature 0 to 1400°C	
Mounting	Insertion length	General-use Probe	Application	High temperature detector	Application
Horizontal to vertical	0.4 to 2 m		Boiler Heating furnace	 Temperature: Probe material SUS310S 800°C Probe material SiC 1400°C Mounting: Vertical downwards Insertion length: 1.0 m, 1.5 m When duct pressure is atmospheric or negative, attach air ejector. High temperature auxiliary ejector (E7046EC, E7046EN) 	Heating furnace
Vertical	2.5 m or more				
Horizontal to vertical	3 m or less		For pulverized coal boiler with gas flow velocity 10 m/s or more		
Horizontal to vertical	0.4 to 2 m		Black liquid recovery boiler Cement Kiln		
Vertical	2.5 m or more				

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Application Example:
Separate and integrated type Zirconia Oxygen Analyzers

- Large, medium and small boilers (boilers for power generation: heavy oil, gas or coal)
- Various industrial furnaces (refinery process/iron manufacture heating furnace, coal kiln, and black liquid recovery boilers) For other applications, contact Yokogawa Electric Corporation.
- May not be applicable corrosive gas such as ammonia, chlorine is present-check with YOKOGAWA.

■STANDARD SPECIFICATIONS (Oxygen Analyzer)

General Specifications

Oxygen Analyzer

Measurement Object: Oxygen concentration in combustion exhaust gas and mixed gas (excluding inflammable gases). May not be applicable corrosive gas such as ammonia, chlorine is present-check with YOKOGAWA.
Measurement System: Zirconia system
Oxygen Concentration: 0.01 to 100 vol% O_2
Output Signal: 4 to 20 mA DC (maximum load resistance 550 Ω)
Measurement Range: Any setting in the range of 0 to 5 through 0 to 100 vol% O_2 (in 1 vol% O_2), or partial range
Digital Communication (HART): 250 to 550 Ω, depending on number of field devices connected to the loop (multi-drop mode).
Note: HART is a registered trademark of the HART Communication Foundation.
Display Range: 0 to 100 vol% O_2
Warm-up Time: Approx. 20 min.

Repeatability: (Excluding the case where the reference air is by natural convection)
± 0.5% Maximum value of set range. (less than 0 to 25 vol% O_2 range)
± 1% Maximum value of set range.
(0 to 25 vol% O_2 or more and up to 0 to 100 vol% O_2 range)
Linearity: (Excluding standard gas tolerance)
(Excluding the case where the reference air is by natural convection)
(Use oxygen of known concentration (with in the measuring range) as the zero and span calibration gases.)
± 1% Maximum value of set range.; less than 0 to 25 vol% O_2 range
(Sample gas pressure: within ± 4.9 kPa)
± 3% Maximum value of set range.; 0 to 25 vol% O_2 or more and less than 0 to 50 vol% O_2 range
(Sample gas pressure: within ± 0.49 kPa)
± 5% Maximum value of set range.; 0 to 50 vol% O_2 or more and up to 0 to 100 vol% O_2 range
(Sample gas pressure: within ± 0.49 kPa)
Drift: (Excluding the first two weeks in use)
(Excluding the case where the reference air is by natural convection.)
Both zero and span ± 2% Maximum value of set range/month
Response Time: Response of 90% within 5 seconds. (Measured after gas is introduced from calibration gas inlet and analog output starts changing.)

1. ZR22G Separate type Zirconia Oxygen Analyzer, Detector

Oxygen Analyzer

Sample Gas Temperature: 0 to 700°C (Probe only)
It is necessary to mount the cell using Inconel cell-bolts when the temperature is greater than 600°C.
700 to 1400°C (with High Temperature Probe Adapter)
For high-temperature sample gas, apply 0.15 m length probe and High Temperature Probe Adapter ZO21P-H.
Sample Gas Pressure: - 5 to + 250 kPa (When the pressure in the furnace exceeds 3 kPa, it is recommended that you compensate the pressure. When the pressure in the furnace exceeds 5 kPa, you must perform pressure compensation.) . For 0.15 m probe, 0.5 to 5 kPa. No pressure fluctuation in the furnace should be allowed.
Note: When the detector is used in conjunction with a check valve and a ZA8F Flow Setting Unit, the maximum pressure of sample gas is 150 kPa. When with a check valve and a ZR40H Auto Calibration Unit, it is 200 kPa. If the pressure of your sample gas exceeds these limits, consult with Yokogawa.
Probe Length: 0.15, 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0, 3.6, 4.2, 4.8, 5.4 m
Probe Material: SUS 316 (JIS)
Ambient Temperature: -20 to +150°C
Reference Air System: Natural Convection, Instrument Air, pressure compensated (other than for probe length 0.15 m)
Instrument Air System (excluding Natural Convection):
Pressure; 200 kPa + the pressure inside the furnace (It is recommended to use air which has been dehumidified by cooling to dew point -20°C or less, and dust or oil mist removed.)
Consumption; Approx. 1 Nl/min
Material in Contact with Gas: SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)
Construction: Heater and thermocouple replaceable construction. Non explosion-proof JIS C0920 / equivalent to IP44D. Equivalent to NEMA 4X/IP66 (Achieved when the cable entry is completely sealed with a cable gland in the recirculationpressure compensated version.)
Terminal Box Case: Material; Aluminium alloy
Terminal Box Paint Color: Case; Mint green (Munsell 5.6BG3.3/2.9)
Cover; Mint green (Munsell 5.6BG3.3/2.9)
Finish: Polyurethane corrosion-resistance coating
Gas Connection:Rc 1/4 or 1/4 FNPT
Wiring Connection: G1/2, Pg13.5, M20 by 1.5 mm, 1/2 NPT
Installation: Flange mounting
Probe Mounting Angle:
When the probe insertion length is 2 m or less, installing at angles from horizontal to vertical downward is possible.
When the probe insertion length is 2.5 or more, mount vertically downward (within

±5°), and if installing at angles from horizontal to vertically downward (within ±5°), use a probe protector.

Weight:
Insertion length of 0.4 m:approx. 6 kg (JIS 5K 65) / approx. 11 kg (ANSI 150 4)
Insertion length of 1.0 m:approx. 8 kg (JIS 5K 65) / approx. 13 kg (ANSI 150 4)
Insertion length of 1.5 m:approx. 10 kg (JIS 5K 65) / approx. 15 kg (ANSI 150 4)
Insertion length of 2.0 m:approx. 12 kg (JIS 5K 65) / approx. 17 kg (ANSI 150 4)
Insertion length of 3.0 m:approx. 15 kg (JIS 5K 65) / approx. 20 kg (ANSI 150 4)
Insertion length of 3.6 m:approx. 17 kg (JIS 5K 65) / approx. 22 kg (ANSI 150 4)
Insertion length of 4.2 m:approx. 19 kg (JIS 5K 65) / approx. 24 kg (ANSI 150 4)
Insertion length of 4.8 m:approx. 21 kg (JIS 5K 65) / approx. 26 kg (ANSI 150 4)
Insertion length of 5.4 m:approx. 23 kg (JIS 5K 65) / approx. 28 kg (ANSI 150 4)

2. ZR402G Separate type Zirconia Oxygen Analyzer, Converter

Oxygen Analyzer

Operated using an LCD touchscreen on the converter.

Display: LCD display of size 320 by 240 dot with touchscreen.
Output Signal: 4 to 20 mA DC, two points (maximum load resistance 550 Ω)
Contact Output Signal: four points (one is fail-safe, normally open)
Contact Input: two points
Auto-calibration Output: Two points (for dedicated auto-calibration unit)
Ambient Temperature: -20 to +55°C
Storage Temperature: -30 to +70°C
Humidity Range: 0 to 95% RH (non-condensing)
Installation Altitude: 2000 m or less
Category based on IEC 1010: II (Note)
Pollution degree based on IEC 1010: 2 (Note)
Note: Installation category, called over-voltage category, specifies impulse withstand voltage. Category II is for electrical equipment.
Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.
Power Supply Voltage: Ratings; 100 to 240 V AC
Acceptable range; 85 to 264 V AC
Power Supply Frequency: Ratings; 50/60 Hz
Acceptable range; 45 to 66 Hz
Power Consumption: Max. 300 W, approx. 100 W for ordinary use.
Safety and EMC conforming standards
Safety: Conforms to EN 61010-1: 1993
CSA C22.2 No.1010-1 certified
UL 3111-1 certified
EMC: Conforms to EN 61326: 1998
KC mark: KCC-REM-YHQ-EEN103-1-R1
Maximum Distance between Probe and Converter:
Conductor two-way resistance must be 10Ω or less (when a 1.25 mm^2 cable or equivalent is used, 300 m or less.
Construction: Outdoor installation, equivalent to NEMA 4X/IP66 (with conduit holes completely sealed with a cable gland)
Wiring Connection: G1/2, Pg13.5, M20 by 1.5 mm, 1/2 NPT (with plug), eight holes
Installation: Panel, wall or 2-inch pipe mounting
Case: Aluminum alloy
Paint Color: Door: Silver gray (Munsell 3.2PB7.4/1.2)
Case: Silver gray (Munsell 3.2PB7.4/1.2)
Finish: Polyurethane corrosion-resistance coating
Weight: Approx. 6 kg

Functions

Display Functions:
Value Display; Displays values of the measured oxygen concentration, etc
Graph Display; Displays trends of measured oxygen concentration
Data Display; Displays various useful data for maintenance, such as cell temperature, reference junction temperature, maximum/minimum oxygen concentration, or the like
Status Message; Indicates an alarm or error occurrence with flashing of the corresponding icon. Indicates status such as warming-up, calibrating, or the like by icons.
Alarm, Error Display; Displays alarms such as “Abnormal oxygen concentration” or errors such as “Abnormal cell e.m.f.” when any such status occurs.
Calibration Functions:
Auto-Calibration; Requires the Auto-calibration Unit. It calibrates automatically at specified intervals.
Semi-auto Calibration; Requires the Auto-calibration Unit. Input calibration direction on the touchscreen or contact, then it calibrates automatically afterwards.
Manual Calibration; Calibration with opening/closing the valve of calibration gas in operation interactively with an LCD touchscreen.
Blowback Function:
Output through the contact in the set period and time. Auto/semi-auto selectable.
Maintenance Functions:
Can operate updated data settings in daily operation and checking. Display data settings, calibration data settings, blowback data settings, current output loop check, input/output contact check.
Setup Functions:
Initial settings suit for the plant conditions when installing the converter. Equipment settings, current output data settings, alarm data settings, contact data settings, other settings.
Self-diagnosis:
This function diagnoses conditions of the converter or the probe and indicates when any abnormal condition occurs.
Password Functions:
Enter your password to operate the analyzer excepting data display. Individual passwords can be set for maintenance and setup.

Display and setting content:
- Measuring related items: Oxygen concentration (vol% O_2), Output current value (mA), air ratio, moisture quantity (in hot gases) (vol% H_2O)
- Display Items: Cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O_2), cell e.m.f. (mV), cell internal resistance (Ω), cell condition (in four grades), heater on-time rate (%), calibration record (ten times), time (year/month/day, hour/minute)
- Calibration Setting Items: Span gas concentration (vol% O_2), zero-gas concentration (vol% O_2), calibration mode (auto, semi-auto, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration period (day/hour), starting time (year/month/day, hour/minute)
- Equipment Related Items: Measuring gas selection
- Output Related Items: Analog output/output mode selection, output conditions when warmingup/ maintenance/calibrating (during blowback)/abnormal, 4 mA/20 mA point oxygen concentration (vol% O_2), time constant,preset values when warming-up/ maintenance/calibrating during blowback abnormal, output preset values on abnormal
- 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)
- Contact Related Items: Selection of contact input 1 and 2, selection of contact output 1 to 4 (abnormal, high-high alarm, high-alarm, low-alarm, low-low alarm, maintenance, calibrating, range switching, warming-up, calibration-gas pressure decrease, temperature high-alarm, blowback, flameout gas detection)

Converter Output: Two points mA analog output (4 to 20 mA DC (maximum load resistance of 550 Ω)) and one mA digital output point (HART) (minimum load resistance of 250 Ω).
- Range: any setting between 0 to 5 through 0 to 100 vol% O_2 in 1 vol% O_2, or partial range is available (Maximum range value/minimum range value 1.3 or more) For the log output, the minimum range value is fixed at 0.1 vol% O_2. 4 to 20 mA DC linear or log can be selected. Input/output isolation
- Output damping: 0 to 255 seconds. Hold/non-hold selection, preset value setting possible with hold

Contact Output: Four points, contact capacity 30 V DC 3 A, 250 V AC 3 A (resistive load) Three of the output points can be selected to either normally energized or normally deenergized status. Delayed functions (0 to 255 seconds) and hysteresis function (0 to 9.9 vol%O_2 can be added to high/low alarms. The following functions are programmable for contact outputs. (1) Abnormal, (2) High-high alarm, (3) Highalarm, (4) Low-low alarm, (5) Low-alarm, (6) Maintenance, (7) Calibration, (8) Range switching answer-back, (9) Warm-up, (10) Calibration-gas pressure decrease (answerback of contact input), (11) Temperature high-alarm, (12) Blowback start, (13) Flameout gas detection (answerback of contact input), (14) Calibration coefficient alarm, (15) Startup power stabilization timeout alarm Contact output 4 is set to normally operated, fixed error status.

Contact Input: Two points, contact input The following functions are programmable for contact inputs: (1) Calibration-gas pressure decrease alarm, (2) Range switching, (3) External calibration start, (4) Process alarm (if this signal is received, the heater power turns off), (5) Blow-back start

Contact capacity: Off-state leakage current: 3 mA or less

Self-diagnosis: Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, defective A/ D converter, defective digital circuit

Calibration:
- Method; zero/span calibration
- Calibration mode; automatic, semi-automatic and manual (All are operated interactively with an LCD touchscreen). Either zero or span can be skipped.
- Zero calibration-gas concentration setting range; 0.3 to 100 vol% O_2 (0.01 vol% O_2 in smallest units).
- Span calibration-gas concentration setting range; 4.5 to 100 vol% O_2 (0.01 vol% O_2 in smallest units). Use nitrogen-balanced mixed gas containing 0 to10 % scale of oxygen, and 80 to 100 % scale of oxygen for standard zero-gas and standard span-gas respectively.
- Calibration period; date/time setting: maximum 255 days

3. ZR202G Integrated type Zirconia Oxygen Analyzer

Oxygen Analyzer

Display: 6-digit LCD
Switch: Three optical switches
Output Signal: 4 to 20 mA DC, one point (maximum load resistance 550 Ω)
Digital Communication (HART): 250 to 550 Ω, depending on quantity of field devices connected to the loop (multi-drop mode).
Note: HART is a registered trademark of the HART Communication Foundation.
Contact Output Signal: Two points (one is fail-safe, normally open)
Contact Input Signal: Two points
Sample Gas Temperature: 0 to 700°C
It is necessary to mount the cell using Inconel cell-bolts when the temperature measures more than 600°C.
High-temperature service - greater than 700°C - is not available.
Sample Gas Pressure: - 5 to + 250 kPa (When the pressure in the furnace exceeds 3 kPa, it is recommended that you compensate the pressure. When the pressure in the furnace exceeds 5 kPa, you must perform pressure compensation.)
No pressure fluctuation in the furnace should be allowed.
Note: When the detector is used in conjunction with a check valve and a ZA8F Flow Setting Unit, the maximum pressure of sample gas is 150 kPa. When with a check valve and a ZR40H Auto Calibration Unit, it is 200 kPa. If the pressure of your sample gas exceeds these limits, consult with Yokogawa.
Probe Length: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0 m
Probe Material: SUS 316 (JIS)
Ambient Temperature: -20 to +55°C (- 5 to +70°C on the case surface)
Storage Temperature: -30 to +70°C
Humidity Range: 0 to 95 %RH (non-condensing)
Installation Altitude: 2000 m or less
Category based on IEC 1010: II (Note)
Pollution degree based on IEC 1010: 2 (Note)
Note: Installation category, called over-voltage category, specifies impulse withstand voltage.
Category II is for electrical equipment.
Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.
Power Supply Voltage: Ratings; 100 to 240 V AC
Acceptable range; 85 to 264 V AC
Power Supply Frequency: Ratings; 50/60 Hz
Acceptable range; 45 to 66 Hz
Power Consumption: Max. 300 W, approx. 100 W for ordinary use.
Safety and EMC conforming standards
Safety: Conforms to EN 61010-1: 1993
CSA C22.2 No.1010-1 certified
UL 3111-1 certified
EMC: Conforms to EN 61326: 1998
KC mark: KCC-REM-YHQ-EEN103-2-R1
Reference Air System: Natural Convection, Instrument Air, or Pressure Compensated
Instrument Air System (excluding Natural Convection):
Pressure; 200 kPa + the pressure inside the furnace (It is recommended to use air which is dehumidified to dew point -20°C or less, and dust or oil mist are removed.)
Consumption; Approx. 1 Nl/min
Material in Contact with Gas: SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)
Construction: Heater and thermocouple replaceable construction. Non explosion-proof JIS C0920 / equivalent to IP44D. Equivalent to NEMA 4X/IP66 (Achieved when the cable entry is completely sealed with a cable gland in the recirculationpressure compensated version.)
Gas Connection:Rc 1/4 or 1/4 FNPT
Wiring Connection: G1/2, Pg13.5, M20 by 1.5mm, 1/2 NPT select one type (4 pieces)
Installation: Flange mounting
Probe Mounting Angle:
Horizontal to vertically downward.
When the probe insertion length is 2 m or less, installing at angles from horizontal to vertical downward is available.
When the probe insertion length is 2.5 m or more, mount vertically downward (within ± 5), and if installing at angles from horizontal to vertically downward (within ± 5), use a probe protector.
When the probe insertion length exceeds 2.5 m, mount vertically downward (within ± 5) and use a probe protector.
Case: Aluminum alloy
Paint Color:Cover; Mint green (Munsell 5.6BG3.3/2.9)
Case: Mint green (Munsell 5.6BG3.3/2.9)
Finish: Polyurethane corrosion-resistance coating
Weight:
Insertion length of 0.4 m:approx. 8 kg (JIS 5K 65) / approx. 13 kg (ANSI 150 4)
Insertion length of 1.0 m:approx. 10 kg (JIS 5K 65) / approx. 15 kg (ANSI 150 4)
Insertion length of 1.5 m:approx. 12 kg (JIS 5K 65) / approx. 17 kg (ANSI 150 4)
Insertion length of 2.0 m:approx. 14 kg (JIS 5K 65) / approx. 19 kg (ANSI 150 4)
Insertion length of 3.0 m:approx. 17 kg (JIS 5K 65) / approx. 22 kg (ANSI 150 4)

Functions

Display Function: Displays values of the measured oxygen concentration, etc.
Alarm, Error Display: Displays alarms such as “AL-06” or errors such as “Err -01” when any such status occurs.
Calibration Functions:
Auto-calibration; Requires the Auto-calibration Unit. It calibrates automatically at specified intervals.
Semi-auto Calibration; Requires the Auto-calibration Unit. Input calibration start signal by optical switch or contact, then it calibrates automatically afterwards.
Manual Calibration; Calibration with opening/closing the valve of calibration gas in operation interactively with the optical switch.

Maintenance Functions:
Can operate updated data settings in daily operation and checking. Display data settings, calibration data settings, test settings (current output loop check, input/output contact check).

Setup Functions:
Initial settings suit for the plant conditions when installing the converter. Current output data settings, alarm data settings, contact data settings, other settings.

Display and setting content:

Display Related Items: Oxygen concentration (vol% O_2), Output current value (mA), air ratio, moisture quantity (in hot gases) (vol% H_2O), Cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O_2), cell e.m.f. (mV), cell internal resistance (Ω), cell condition (in four grades), heater on-time rate (%), calibration record (ten times), time (year/month/day/hour/minute)

Calibration Setting Items: Span gas concentration (vol% O_2), zero-gas concentration (vol% O_2), calibration mode (auto, semiauto, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration period (day/hour), starting time (year/month/day/hour/minute)

Output Related Items: Analog output/output mode selection, output conditions when warming- up/maintenance/calibrating/abnormal, 4 mA/20 mA point oxygen concentration (vol% O_2), time constant, preset values when warming-up/maintenance/calibrating/ abnormal, output preset values on abnormal

Alarm Related Items: Oxygen concentration highalarm/ high-high alarm limit values (vol% O_2), Oxygen concentration lowalarm/ low-low alarm limit values (vol% O_2), Oxygen concentration alarm hysteresis (vol% O_2), Oxygen concentration alarm detection, alarm delay (seconds)

Contact Related Items: Selection of contact input 1 and 2, selection of contact output 1 and 2 (abnormal, high-high alarm, high-alarm, low-alarm, low-low alarm, maintenance, calibrating, range switching, warming-up, calibration-gas pressure decrease, flameout gas detection (answerback of contact input)

Converter Output: One mA analog output point (4 to 20 mA DC (maximum load resistance of 550 Ω)) with mA digital output point (HART) (minimum load resistance of 250 Ω).

Range: any setting between 0 to 5 through 0 to 100 vol% O_2 in 1 vol% O_2, and partial range is available (Maximum range value/ minimum range value 1.3 or more)
For the log output, the minimum range value is fixed at 0.1 vol% O_2.
4 to 20 mA DC linear or log can be selected. Input/output isolation

Output damping: 0 to 255 seconds.
Hold/non-hold selection, preset value setting possible with hold.

Contact Output: Two points, contact capacity 30 V DC 3 A, 250 V AC 3 A (resistive load)
One of the output points can be selected to ether normally energized or normally deenergized status.
Delayed functions (0 to 255 seconds) and hysteresis function (0 to 9.9 vol% O_2) can be added to high/low-alarms.
The following functions are programmable for contact outputs.
(1) Abnormal, (2) High-high alarm, (3) High-alarm, (4) Low-low alarm, (5) Lowalarm, (6) Maintenance, (7) Calibration, (8) Range switching answer-back, (9) Warmup, (10) Calibration-gas pressure decrease (answerback of contact input), (11) Flameout gas detection (answerback of contact input).

Contact Input: Two points, voltage-free contacts
The following functions are programmable for contact inputs:
(1) Calibration-gas pressure decrease alarm, (2) Range switching (switched range is fixed), (3) External calibration start, (4) Process alarm (if this signal is received, the heater power turns off)

Self-diagnosis: Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, A/D converter abnormal, digital circuit abnormal

Calibration:

Method; zero/span calibration

Calibration mode; automatic, semiautomatic and manual (All are operated using optical switches). Either zero or span can be skipped.

Zero-calibration gas concentration setting range; 0.3 to 100 vol% O_2 (in 0.01 vol% O_2).

Span-calibration gas concentration setting range; 4.5 to 100 vol% O_2 (in 0.01 vol% O_2).
Use nitrogen-balanced mixed gas containing 0 to10 % scale of oxygen for standard zero-gas, and 80 to 100 % scale of oxygen for standard span-gas.

Calibration period; date/time setting:
maximum 255 days

■STANDARD SPECIFICATIONS (High Temperature Humidity Analyzer)

Examples of Application

Separate/Integrated type Zirconia High Temperature Humidity Analyzer

- Coloring processes in the textile industry
- Steam curing processes for concrete products
- Manufacturing processes in the cigarette, food, paper or pulp industries
- Drying processes in various manufacturing of building materials, lumber, plasterboard, food or the like
- Humidifying processes in various manufacturing of food or the like

Please contact us for other applications.

General Specifications

High Temperature Humidity Analyzer

Oxygen concentration in mixed gas which consists of water vapor and air is proportional to the volumetric ratio of oxygen in the air, so the volumetric ratio of water vapor can be calculated from the oxygen concentration.

Measurement output: Water vapor (in vol%) in mixed gases (air and water vapor)
Measurement System: Zirconia system
Measurement Range: 0.01 to 100 vol% O_2 ,0 to 100 vol% H_2O or 0 to 1.000 kg/kg
Output Signal: 4 to 20 mA DC (maximum load resistance 550 Ω)
Oxygen concentration; Any setting in the range of 0 to 5 through 0 to 100 vol% O_2 (in 1 vol% O_2), or partial range. Moisture quantity; 0 to 25 through 0 to 100 vol% H_2O (in 1 vol% H_2O), or partial range. Mixture ratio 0 to 0.2 through 0 to 1.000 kg/ kg (in 0.001 kg/kg), or partial range.
Digital Communication (HART): 250 to 550 Ω, depending on quantity of field devices connected to the loop (multi-drop mode).
Note: HART is a registered trademark of the HART Communication Foundation.
Display Range: Oxygen concentration 0 to100 vol% O_2 , Moisture quantity 0 to 100 vol% H_2O
Mixture ratio 0 to 1 kg/kg
Relative humidity 0 to 100% RH (Note)
Dew point -40 to 370°C (Note)
Note: These values are affected by temperature and absolute pressure, So accurate temperature and pressure values must be inputted to the converter.
Warm-up Time: Approx. 20 min.
These characteristics are calculated by oxygen concentration measured in air which include water vapor.
Repeatability: (see Note1)
± 1 vol% H_2O (sample gas pressure 2 kPa or less)
Linearity: (Excluding standard gas tolerance) (see Note1), (Use oxygen of known concentration (in the measuring range) as the zero and span calibration gas.)
± 2 vol% H_2O; (Sample gas pressure: within ± 0.49 kPa)
± 3 vol% H_2O; (Sample gas pressure: 2 kPa or less)
Drift: (Excluding the first two weeks in use) (see Note1)
both zero and span ± 3 vol% H_2O/month
Response Time: Response of 90% within 5 seconds. (Measures after gas is introduced from calibration-gas inlet and analog output start changing.)
(Note1) These tolerances do not apply to the pressure compensated version, or where natural convection is used for the reference air.

1. ZR22G Separate type Zirconia High Temperature Humidity Analyzer,Detector

High Temperature Humidity Analyzer

Sample Gas Temperature: 0 to 700°C (Probe only)
It is recommended to mount the cell using Inconel cell-bolts when the temperature measures more than 600°C.
Sample Gas Pressure: - 5 to + 20 kPa (When the pressure in the process exceeds 3 kPa, it is recommended that you compensate the pressure. When the pressure in the process exceeds 5 kPa, you must perform pressure compensation.)
No pressure fluctuation in the process should be allowed.
Probe Length: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0 m
Probe Material: SUS 316 (JIS)
Ambient Temperature: -20 to +150°C
Reference Air System: Natural Convection, Instrument Air,or pressure compensated
Instrument Air System (excluding Natural Convection): Pressure; 200 kPa + the pressure inside the furnace, (It is recommended to use air which is dehumidified to dew point - 20°C or less, and dust or oil mist are removed.)
Consumption; Approx. 1 Nl/min
Material in Contact with Gas: SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)
Construction: Heater and thermocouple replaceable construction. Non explosion-proof JIS C0920 / equivalent to IP44D. Equivalent to NEMA 4X/IP66 (Achieved when the cable entry is completely sealed with a cable gland in the recirculationpressure compensated version.)
Terminal Box Case: Material; Aluminium alloy
Terminal Box Paint Color: Case; Mint green (Munsell 5.6BG3.3/2.9)
Cover; Mint green (Munsell 5.6BG3.3/2.9)
Gas Connection: Rc 1/4 or 1/4 FNPT
Wiring Connection: G1/2, Pg13.5, M20 by 1.5mm, 1/2 NPT
Installation: Flange mounting
Probe Mounting Angle: Horizontal to vertically downward. When the probe insertion length is 2 m or less, installing at angles from horizontal to vertically downward is available.
When the probe insertion length exceeds 2.5 m, mount vertically downward (within ± 5°) and use a probe protector.

Weight:
Insertion length of 0.4 m: approx. 6 kg (JIS 5K 65) / approx. 11 kg (ANSI 150 4)

Insertion length of 1.0 m: approx. 8 kg (JIS 5K 65) / approx. 13 kg (ANSI 150 4)
Insertion length of 1.5 m: approx. 10 kg (JIS 5K 65) / approx. 15 kg (ANSI 150 4)
Insertion length of 2.0 m: approx. 12 kg (JIS 5K 65) / approx. 17 kg (ANSI 150 4)
Insertion length of 3.0 m: approx. 15 kg (JIS 5K 65) / approx. 20 kg (ANSI 150 4)

2. ZR402G Separate type Zirconia High Temperature Humidity Analyzer, Converter

High Temperature Humidity Analyzer

Operated using an LCD touchscreen on the converter.

Display: LCD display of size 320 by 240 dot with touchscreen.
Output Signal: 4 to 20 mA DC, two points (maximum load resistance 550 Ω)
Contact Output Signal: four points (one is fail-safe, normally open)
Contact Input: two points
Analog Input: one point (thermal input 4-20 mA)
Auto-calibration Output: Two points (for dedicated autocalibration unit)
Ambient Temperature: -20 to +55°C
Storage Temperature: -30 to +70°C
Ambient Humidity : 0 to 95 %RH (non-condensing)
Installation Altitude: 2000 m or less
Category based on IEC 1010: II (Note)
Pollution degree based on IEC 1010: 2 (Note)

Note: Installation category, called over-voltage category, specifies impulse withstand voltage. Category II is for electrical equipment. Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.

Power Supply Voltage: Ratings; 100 to 240 V AC
Acceptable range; 85 to 264 V AC
Power Supply Frequency: Ratings; 50/60 Hz
Acceptable range; 45 to 66 Hz
Power Consumption: Max. 300 W, approx. 100 W for ordinary use.
Safety and EMC conforming standards
Safety: Conforms to EN 61010-1: 1993
CSA C22.2 No.1010-1 certified
UL 3111-1 certified
EMC: Conforms to EN 61326: 1998
Maximum Distance between Probe and Converter: Conductor two-way resistance must be 10 Ω or less (when a 1.25 mm^2 cable or equivalent is used, 300 m or less.)
Construction: Outdoor installation, NEMA 4X/IP66 or equivalent (with conduit holes completely sealed with a plastic cable gland optional)
Wiring Connection: G1/2, Pg13.5, M20 by 1.5mm, 1/2 NPT (with plug)
, eight holes
Installation: Panel, wall or pipe mounting
Case: Aluminum alloy
Paint Color: Door; Silver gray (Munsell 3.2PB7.4/1.2)
Case; Silver gray (Munsell 3.2PB7.4/1.2)
Finish: Polyurethane corrosion-resistance coating
Weight: Approx. 6 kg

Functions

Display Functions:
Value Display; Displays values of the measured Oxygen concentration, moisture quantity,mixture ratio etc
Graph Display; Displays trends of measured oxygen concentration moisture quantity, mixture ratio etc.
Data Display; Displays various useful data for maintenance, such as cell temperature, reference junction temperature, maximum/ minimum moisture quantity, or the like.
Status Message; Indicates an alarm or error occurrence by flashing of the corresponding icon.
Indicates status such as warming-up, calibrating, or the like by the marks.
Alarm, Error Display: Displays alarms such as “Abnormal moisture quantity” or errors such as “Abnormal cell e.m.f.” when any such status occurs.
Calibration Functions:
Auto-Calibration; Requires the Auto-calibration Unit. It calibrates automatically at specified intervals.
Semi-auto Calibration; Requires the Auto-calibration Unit. Input calibration direction on the touchscreen or contact, then it calibrates automatically afterwards.
Manual Calibration; Calibration with opening/closing the valve of calibration gas in operation interactively with an LCD touchscreen.
Blowback Function:
Output through the contact in the set period and time. Auto/semi-auto selectable.
Maintenance Functions:
Can operate updated data settings in daily operation and checking. Display data settings, calibration data settings, blowback data settings, current output loop check, input/output contact check.
Setup Functions:
Initial settings suit for the plant conditions when installing the converter. Equipment settings, current output data settings, alarm data settings, contact data settings, other settings.
Self-diagnosis:
This function diagnoses conditions of the converter or the probe and indicates when any abnormal condition occurs.
Password Functions:
Enter your password to operate the analyzer excepting data display. Individual passwords can be set for maintenance and setup.
Display and setting content:
Measuring Related items: Oxygen concentration (vol% O_2), moisture quantity (vol% H_2O), mixture ratio (kg/kg), relative humidity (%RH) and dew point (°C)
Display Related Items: Oxygen concentration (vol% O_2), Moisture quantity (vol% H_2O), mixture ratio (kg/kg), relative humidity

(%RH), dew point (°C), cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/ average oxygen concentration (vol% O_2), maximum/ minimum/average moisture quantity (vol% H_2O), maximum/ minimum/average mixture ratio (kg/kg), cell e.m.f. (mV), output 1, 2 current (mA), cell response time (seconds), cell internal resistance (Ω), cell condition (in four grades), heater on-time rate (%), calibration record (ten times), time (year/month/day/hour/minute)

Calibration Setting Items: Span gas concentration (vol% O_2), zero gas concentration (vol% O_2), calibration mode (auto, semi-auto, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration period (day/hour), starting time (year/month/day/hour/minute)

Output Related Items: Analog output/output mode selection, output conditions when warmingup/ maintenance/calibrating/ abnormal, oxygen concentration at 4 mA/20 mA (vol% O_2), moisture quantity at 4 mA/20 mA (vol% H_2O), mixture ratio at 4 mA/20 mA (kg/ kg), time constant, preset values when warming-up/ maintenance/calibrating/ abnormal

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),Moisture quantity high-alarm/high-high alarm limit values (vol% H_2O), moisture quantity lowalarm/ low-low alarm limit values (vol% H_2O), mixture ratio high-alarm/high-high alarm limit value (kg/kg), mixture ratio low-alarm/lowlow alarm limit values (kg/kg), oxygen concentration alarm hysteresis (vol% O_2), moisture quantity alarm hysteresis (vol% H_2O), mixture ratio alarm hysteresis (kg/kg), oxygen concentration/moisture quantity/mixture ratio alarm detection, alarm delay (seconds).

Contact Related Items: Selection of contact input 1 and 2, selection of contact output 1 to 4 (abnormal, high-high alarm, high-alarm, low-alarm, low-low alarm, maintenance, calibrating, range switching, warming-up, calibration-gas pressure decrease, temperature high-alarm)

Converter Output: Two points mA analog output (4 to 20 mA DC (maximum load resistance of 550 Ω)) and one of two mA digital output points (HART) (minimum load resistance of 250 Ω).

Range: any setting between 0 to 5 through 0 to 100 vol% O_2, 0 to 25 through 0 to 100 vol% H_2O, 0 to 0.200 through 0 to 1.000 kg/ kg or partial range is available.
For the log output, the minimum range values are fixed to 0.1 vol% O_2 for the oxygen concentration, 0.1 vol% H_2O for the moisture quantity, and 0.01 kg/kg for the mixture ratio.
4 to 20 mA DC linear or log can be selected. Input/output isolation

Output damping: 0 to 255 seconds. Hold/non-hold selection, preset value setting possible with hold.

Contact Output: Four points, contact capacity 30 V DC 3 A, 250 V AC 3 A (resistive load).
Three of the output points can be selected to either normally energized or normally deenergized status.
Delayed functions (0 to 255 seconds) and hysteresis function (0 to 9.9 vol%O_2 can be added to high/low-alarms. The following functions are programmable for contact outputs.
(1) Abnormal, (2) High-high alarm, (3) Highalarm, (4) Low-low alarm, (5) Low-alarm, (6) Maintenance, (7) Calibration, (8) Range switching answer-back, (9) Warm-up, (10) Calibration-gas pressure decrease (answerback of contact input), (11) Temperature high-alarm, (12) Blowback start, (13) Flameout gas detection (answerback of contact input), (14) Calibration coefficient alarm, (15) Startup power stabilization timeout alarm
Contact output 4 is set to normally operated, fixed error status.

Converter Input: Thermal input one point (4 to 20 mA DC)

Contact Input: Two points, voltage-free contacts
The following functions are programmable for contact inputs:
(1) Calibration-gas pressure decrease alarm, (2) Range switching - fixed range if use range switching (3) External calibration start, (4) Process alarm (if this signal is received, the heater power turns off), (5) Blowback start

Contact capacity: Off-state leakage current: 3 mA or less

Self-diagnosis: Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, defective A/ D converter, defective digital circuit

Calibration:

Method; zero/span calibration

Calibration mode; automatic, semi-automatic and manual (All are operated interactively with an LCD touchscreen). Either zero or span can be skipped.

Zero calibration-gas concentration setting range; 0.3 to 100 vol% O_2 (minimum in 0.01 vol%).

Span calibration-gas concentration setting range; 4.5 to 100 vol% O_2 (minimum in 0.01 vol%).
Use nitrogen-balanced mixed gas containing 0 to10% scale of oxygen for standard zerogas, and 80 to 100% scale of oxygen for standard span-gas.

Calibration period; date/time setting: maximum 255 days

3. ZR202G Integrated type Zirconia High Temperature Humidity Analyzer

High temperature Humidity Analyzer
Can be operated in the field without opening the cover using optical switches.

Display: 6-digit LCD
Switch: Three optical switches
Output Signal: 4 to 20 mA DC, one point (maximum load resistance 550 Ω)
Digital Communication (HART): 250 to 550 Ω, depending on quantity of field devices connected to the loop (multi-drop mode).
Note: HART is a registered trademark of the HART Communication Foundation.
Contact Output Signal: Two points (one is fail-safe, normally open)
Contact Input Signal: Two points
Sample Gas Temperature: 0 to 700°C
It is necessary to mount the cell using Inconel cell-bolts when the temperature measures more than 600°C.
Sample Gas Pressure: - 5 to + 20 kPa (When the pressure in the process exceeds 3 kPa, it is recommended that you compensate the pressure. When the pressure in the process exceeds 5 kPa, you must perform pressure compensation.)
No pressure fluctuation in the process should be allowed.
Probe Length: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0 m
Probe Material: SUS 316 (JIS)
Ambient Temperature: -20 to +55°C (- 5 to +70°C on the case surface)
Storage Temperature: -30 to +70°C
Ambient Humidity: 0 to 95%RH (non - condensing)
Installation Altitude: 2000 m or less
Category based on IEC 1010: II (Note)
Pollution degree based on IEC 1010: 2 (Note)
Note: Installation category, called over-voltage category, specifies impulse withstand voltage. Category II is for electrical equipment. Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.
Power Supply Voltage: Ratings; 100 to 240 V AC
Acceptable range; 85 to 264 V AC
Power Supply Frequency: Ratings; 50/60 Hz
Acceptable range; 45 to 66 Hz
Power Consumption: Max. 300 W, approx. 100 W for ordinary use.
Safety and EMC conforming standards
Safety: Conforms to EN 61010-1: 1993
CSA C22.2 No.1010-1 certified
UL 3111-1 certified
EMC: Conforms to EN 61326: 1998
Reference Air System: Natural Convection, Instrument.Air, or pressure compensated
Instrument Air System (excluding Natural Convection): Pressure; 200 kPa + the pressure inside the furnace (It is recommended to use air which is dehumidified to dew point -20°C or less, and dust or oil mist are removed.)
Consumption; Approx. 1 Nl/min
Material in Contact with Gas: SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)
Construction: Heater and thermocouple replaceable construction. Non explosion-proof JIS C0920 / equivalent to IP44D. Equivalent to NEMA 4X/IP66 (Achieved when the cable entry is completely sealed with a cable gland in the recirculationpressure compensated version.)
Gas Connection: Rc 1/4 or 1/4 FNPT
Wiring Connection: G1/2, Pg13.5, M20 by 1.5mm, 1/2 NPT select one type (4 pieces)
Installation: Flange mounting
Probe Mounting Angle:
Horizontal to vertically downward.
When the probe insertion length is 2 m or less, installing at angles from horizontal to vertically downward is available.
When the probe insertion length is 2.5 m or more, mount vertically downward (within ± 5), and if installing at angles from horizontal to vertically downward (within ± 5), use a probe protector.
When the probe insertion length exceeds 2.5 m, mount vertically downward (within ± 5) and use a probe protector.
Case: Aluminum alloy
Paint Color:Cover; Mint green (Munsell 5.6BG3.3/2.9)
Case; Mint green (Munsell 5.6BG3.3/2.9)
Finish: Polyurethane corrosion-resistance coating
Weight: Insertion length of 0.4 m: approx. 8 kg (JIS 5K 65) / approx. 13 kg (ANSI 150 4)
Insertion length of 1.0 m: approx. 10 kg (JIS 5K 65) / approx. 15 kg (ANSI 150 4)
Insertion length of 1.5 m: approx. 12 kg (JIS 5K 65) / approx. 17 kg (ANSI 150 4)
Insertion length of 2.0 m: approx. 14 kg (JIS 5K 65) / approx. 19 kg (ANSI 150 4)
Insertion length of 3.0 m: approx. 17 kg (JIS 5K 65) / approx. 22 kg (ANSI 150 4)

Functions

Display Function: Displays values of the measured oxygen concentration, moisture quantity, mixture ratio etc
Alarm, Error Display: Displays alarms such as “AL-06” or errors such as “Err-01” when any such status occurs.
Calibration Functions:
Auto-calibration; Requires the Auto-calibration Unit. It calibrates automatically at specified intervals.
Semi-auto Calibration; Requires the Auto-calibration Unit. Input calibration direction on the optical switch or contact, then it calibrates automatically afterwards.
Manual Calibration; Calibration with opening/closing the valve of calibration gas in operation interactively with the optical switch.
Maintenance Functions:
Can operate updated data settings in daily operation and checking. Display data settings, calibration data settings, test settings (current output loop check, input/output contact check).
Setup Functions:
Initial settings suit for the plant conditions when installing the converter. Current output data settings, alarm data settings, contact data settings, other settings.

Display and setting content:
- Display Related Items: Oxygen concentration (vol% O_2), Moisture quantity (vol% H_2O), mixture ratio(kg/kg), relative humidity(%RH), dew point (°C), cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O_2), maximum/minimum/average moisture quantity (vol% H_2O), maximum/minimum/average mixture ratio (kg/kg), cell e.m.f. (mV), output 1, 2 current (mA), cell response time (seconds), cell internal resistance (Ω), cell condition (in four grades), heater on-time rate (%), calibration record (ten times), time (year/month/day/hour/minute)
- Calibration Setting Items: Span gas concentration (vol% O_2), zero-gas concentration (vol% O_2), calibration mode (auto, semi-auto, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration period (day/hour), starting time (year/month/day/hour/minute)
- Output Related Items: Analog output/output mode selection, output conditions when warmingup/ maintenance/calibrating/ abnormal, oxygen concentration at 4 mA/ 20 mA (vol% O_2), moisture quantity at 4 mA/ 20 mA (vol% H_2O), mixture ratio at 4 mA/ 20 mA (kg/kg), time constant, preset values when warming-up/maintenance/calibrating/ abnormal, output preset values on abnormal
- 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), Moisture quantity high-alarm/high-high alarm limit values (vol% H_2O), moisture quantity lowalarm/ low-low alarm limit values (vol% H_2O), mixture ratio high-alarm/high-high alarm limit values (kg/kg), mixture ratio low-alarm/lowlow alarm limit values (kg/kg), oxygen concentration alarm hysteresis (vol% O_2), moisture quantity alarm hysteresis (vol% H_2O), mixture ratio alarm hysteresis (kg/kg), oxygen concentration/moisture quantity/ mixture ratio detection, alarm delay (seconds)
- Contact Related Items: Selection of contact input 1 and 2, selection of contact output 1 and 2 (abnormal, high-high alarm, high-alarm, low-alarm, low-low alarm, maintenance, calibrating, range switching, warming-up, calibration-gas pressure decrease, flameout gas detection

Converter Output: One mA analog output point (4 to 20 mA DC (maximum load resistance of 550 Ω)) with mA digital output point (HART) (minimum load resistance of 250 Ω).
- Range; any setting between 0 to 25 through 0 to 100 vol% H_2O, and partial range is available (Maximum range value/ minimum range value 1.3 or more)
  For the log output, the minimum range values are fixed to 0.1 vol% O_2 for the oxygen concentration, 0.1 vol% H_2O for the moisture quantity, and 0.01 kg/kg for the mixture ratio.
  4 to 20 mA DC linear or log can be selected.
  Input/output isolation
- Output damping; 0 to 255 seconds. Hold/non-hold selection, preset value setting possible with hold.

Contact Output: Two points, contact capacity 30 V DC 3 A, 250 V AC 3 A (resistive load)
Normally energized or normally de-energized can be selected.
Delayed functions (0 to 255 seconds) and hysteresis function (0 to 9.9 vol% O_2) can be added to high/low-alarms.
The following functions are programmable for contact outputs.
(1) Abnormal, (2) High-high alarm, (3) Highalarm, (4) Low-low alarm, (5) Low-alarm, (6) Maintenance, (7) Calibration, (8) Range switching answer-back, (9) Warm-up, (10) Calibration-gas pressure decrease (answerback of contact input), (11) Flameout gas detection (answerback of contact input).

Contact Input: Two points, voltage-free contacts The following functions are programmable for contact inputs:
(1) Calibration-gas pressure decrease alarm, (2) Range switching - fixed ranges if use range switching, (3) External calibration start, (4) Process alarm (if this signal is received, the heater power turns off)

Contact capacity: Off-leakage current; 3 mA or less.

Self-diagnosis: Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, A/D converter abnormal, digital circuit abnormal

Calibration:
- Method; zero/span calibration Calibration mode; automatic, semi-automatic and manual (All are operated using optical switches). Either zero or span can be skipped.
- Zero calibration-gas concentration setting range; 0.3 to 100 vol% O_2 (0.01 vol% in smallest units).
- Span calibration-gas concentration setting range; 4.5 to 100 vol% O_2 (0.01 vol% in smallest units).
  Use nitrogen-balanced mixed gas containing 0 to10% scale of oxygen for standard zerogas, and 80 to 100% scale of oxygen for standard span-gas.
- Calibration period; date/time setting: maximum 255 days

■OPTIONS

4. ZO21P-H High Temperature Probe Adapter for separate type Oxygen Analyzer

Measuring O_2 in the high temperature gases (exceeds 700°C) requires a general-use probe ZR22G of 0.15 m length and a high-temperature prove adapter.

Sample gas temperature: 0 to 1400°C (when using SiC probe)
0 to 800°C (when using SUS 310S probe adapter)
Sample gas pressure: -0.5 to + 5 kPa. When using in the range of 0 to 25 vol% O_2 or more, the sample gas pressure should be in the range of -0.5 to +0.5 kPa. (Where the sample gas pressure for the high-temperature probe is negative, an auxiliary ejector is necessary.)
Insertion length: 0.5 m, 0.6 m, 0.7 m, 0.8 m, 0.9 m, 1 m, 1.5 m
Material in Contact with Gas: SUS 316 (JIS), SiC or SUS 310S, SUS 304 (JIS) (flange)
Probe Material: SiC, SUS 310S (JIS)
Installation: Flange mounting (FF type or RF type)
Probe Mounting Angle: Vertically downward within ± 5° Where the probe material is SUS 310S, horizontal mounting is available.
Construction: Non explosion-proof. Rainproof construction
Weight(example): Insertion length of 1.0 m: approx. 5.3 kg (JIS) / approx. 11.3 kg (ANSI)
Insertion length of 1.5 m: approx. 5.8 kg (JIS) / approx. 11.8 kg (ANSI)

5. E7046EC/E7046EN Auxiliary ejector for High Temperature of separate type Oxygen Analyzer

For use in cases where pressure of sample gas for high temperature detector is negative.

5.1 Ejector Assembly

Ejector Inlet Air Pressure: 29 to 68 kPa G
Air Consumption: Approx. 30 to 40 l/min
Suction gas flow rate: 3 to 7 l/min
Connection: Rc1/4 or 1/4 FNPT, SUS304 (JIS)
Tube Connection: (ø6/ ø4 or 1/4" copper tube or stainless tube)

5.2 Pressure Gauge Assembly

Pressure Gauge

Type: JIS B7505, A1.5U3/8 x75
Material in Contact with Gas: SUS316 (JIS)
Case Material: Aluminum alloy (Paint color; black)
Scale: 0 to 100 kPa G
Bushing (G3/8 x Rc1/4 or 1/4NPT, SUS304 (JIS))

5.3 Needle Valve

Connection: Rc1/4 or 1/4FNPT
Material: SUS316 (JIS)
(Note) Pipes and connectors are not provided.

6. ZO21R Probe Protector for Zirconia Oxygen Analyzer

Used when sample gas flow velocity is approx. 10m/ sec or more and dust particles wears the detector in cases such as pulverized coal boiler of fluidized bed furnace (or burner) to protect the detector from wearing by dust particles. When probe insertion length is 2.5 m or more and horizontal installation, specify the ZO21R-L-200-□*B to reinforce the probe.

Insertion Length: 1.05 m, 1.55 m, 2.05 m.
Flange: JIS 5K 65A FF equivalent. ANSI CLASS 150-4- FF (without serration) equivalent or DIN PN10-DN50-A equivalent. However, flange thickness is different.
Material: SUS316 (JIS), SUS304 (JIS) (Flange)
Weight: 1.05 m; Approx. 6/10/8.5 kg (JIS/ANSI/DIN), 1.55 m; Approx. 9/13/11.5 kg (JIS/ANSI/DIN), 2.05 m; Approx. 12/16/14.5 kg (JIS/ANSI/DIN)
Installation: Bolts, nuts, and washers are provided for detector, probe adapter and process-side flange.

7. Filter for Oxygen Analyzer K9471UA

This filter is used to protect the cell from corrosive dust components or high velocity dust in recovery boilers and cement kiln. Measured gas flow rate is needed to be 1m/ sec or more to replace gas inside zirconia sensor.

Mesh: 30 microns
Material: Carborundum (Filter), SUS316 (JIS)
Weight: Approx. 0.2 kg

8. Dust Guard Protector K9471UC

Recommended to be used when sample gas is likely to flow directly into the cell due to its flow direction in the stack or the like, flammable dust may go into the cell, or water drops are likely to fall and remain in the cell during downtime or the like due to the installation position.

Material: SUS316
Weight: Approx. 0.3 kg

9. ZH21B Dust Protector for High-temperature Humidity Analyzer

This protector is designed to protect the probe output from dust agitation (i.e., to prevent combustible materials from entering the probe cell) where humidity measurements are made under dusty environments.

Insertion length: 0.440 m
Flange: JIS 5K-80-FF equivalent or ANSI CLASS150-4-FF equivalent. (However, flange thickness is different.)
Material: SUS 316 (JIS), SUS 304 (JIS) (flange)
Weight: Approx. 6 kg (JIS), approx. 8.5 kg (ANSI)
Mounting: Mounted on the probe or process flange withbolts and the associated nuts and washers.

10. ZO21S Standard Gas Unit

Function: Portable unit for calibration gas supplyconsisting of span gas (air) pump, zero gas cylinder with sealed inlet, flow rate checker and flow rate needle valve.
Sealed Zero Gas Cylinders (6 provided): E7050BA
Capacity: 1 l
Filled pressure: Approx. 686 kPa G (at 35 °C)
Composition: 0.95 to 1.0 vol% O_2+N_2 balance
Power Supply: l00, 110, 115, 200, 220, 240V AC ± 10%, 50/60 Hz
Power Consumption: Max.5 VA
Paint Color:
Mainframe;Munsell 2.0 GY3.1/0.5 equivalent
Cover; Munsell 2.8 GY6.4/0.9 equivalent
Weight: Approx. 3 kg

11. ZA8F Flow Setting Unit

Used when instrument air is provided.

This unit controls flow rates of calibration gas and reference gas and consists of flowmeter and flow rate control valve.

Flowmeter: Calibration gas; 0.1 to 1.0 l/min.
Reference air; 0.1 to 1.0 l/min.
Construction: Dust-proof and rainproof construction
Case Material: SPCC (Cold rolled steel sheet)
Painting: Baked epoxy resin, Dark-green (Munsell 2.0 GY 3.1/0.5 or equivalent)
Tube Connections: Rc1/4 or 1/4FNPT
Reference Air pressure: Clean air supply of measured gas pressure plus approx. 50 kPa G measured gas pressure plus approx.150 kPa (maximum pressure rating is 300 kPa) when a check valve is used (pressure at inlet of the auto-calibration unit)
Air Consumption: Approx. 1.5 l/min
Weight: Approx. 2.3 kg

12. ZR40H Auto-calibration Unit (for Separate type)

Used when auto calibration is required for the separate type and instrument air is provided. The solenoid valves are provided as standard.

Construction: Dust-proof and rainproof construction: NEMA 4X/IP67 - only for case coating solenoid valve, not flowmeter (excluding flowmeter)
Mounting: 2-inch pipe or wall mounting, no vibration
Materials: Body: Aluminum alloy, Piping: SUS316 (JIS), SUS304 (JIS), Flowmeter: MA (Methacrylate resin) Bracket : SUS304 (JIS)
Finish: Polyurethane corrosion-resistance coating, Mint green (Munsell 5.6BG3.3/2.9)
Piping Connection: Refer to Model and Suffix Codes
Power Supply: 24V DC (from ZR402G), Power consumption: Approx. 1.3 W
Reference Air Pressure: Sample gas pressure + Approx. 150 kPa (690 kPa max.), (Pressure at inlet of auto-calibration unit)
Air Consumption: Approx. 1.5 l/min
Weight: Approx. 3.5 kg
Ambient Temperature: -20 to +55°C, no condensing and freezing
Ambient Humidity: 0 to 95%RH
Storage Temperature: -30 to +65°C

13. ZR20H Auto-calibration Unit (for Integrated type)

Used when automatic calibration is specified for the integrated type and instrument air is provided.

Equipped with the analyzer when automatic calibration is specified in the suffix code of the ZR202G Integrated type by selecting either “-A (Horizontal mounting)” or “-B (Vertical mounting)”. The ZR20H should be arranged when auto-calibration is to be required after the ZR202H has been installed. Ask Yokogawa service station for its mounting.

Construction: Dust-proof and rainproof construction: NEMA 4X/IP67 (excluding flowmeter)
Mounting: Mounted on ZR202G, no vibration
Materials: Body: Aluminum alloy, Piping: SUS316 (JIS), SUS304 (JIS), Flowmeter: MA (Methacrylate resin)
Finish: Polyurethane corrosion-resistance coating, Case: Mint green (Munsell 5.6BG3.3/2.9),Cover: Mint green (Munsell 5.6BG3.3/2.9)
Piping Connection: Refer to Model and Suffix Codes
Power Supply: 24V DC (from ZR202G), Power consumption: 1.3 W
Reference Air Pressure: Sample gas pressure + Approx. 150 kPa (690 kPa max.), (Pressure at inlet of auto-calibration unit)
Air Consumption: Approx. 1.5 l/min
Weight: Approx. 2 kg
Ambient Temperature: -20 to +55°C, no condensing and freezing
Ambient Humidity: 0 to 95%RH
Storage Temperature: -30 to +65°C

14. L9852CB/G7016XH Stop Valve

The stop valve is mounted on the calibration gas line. It is attached when the suffix code (/SV) is selected for the Zirconia Oxygen Analyzer/High-temperature Humidity Analyzer prove ZR22G or the Zirconia Oxygen Analyzer/ High-temperature Humidity Analyzer ZR202G.

Connection: Rc 1/4 or 1/4 FNPT
Material: SUS316 (JIS)
Weight: Approx. 80 g

15. K9292DN/K9292DS Check Valve

This is used to prevent entry of process gas into calibration gas line. Purpose is the same as stop valve, but is convenient, as it does not need to be opened or closed for calibration.

Mount directly on calibration gas inlet of detector in place of stop valve. However as source pressure of 150 kPa G or more is needed, standard gas unit cannot be used.

When option code “/CV” of the ZR22G or the ZR202G is specified, check valve is provided.

Connection: Rc1/4 or 1/4FNPT
Material: SUS304 (JIS)
Pressure: Between 70 kPa G or more 350 kPa G or less
Weight: Approx. 40 g

16. Air Set

G7003XF/K9473XK
Primary Pressure: Max. 1 MPa G
Secondary Pressure: 0.02 to 0.2 MPa G
Connection: Rc1/4 or 1/4FNPT with joint adapter

G7004XF/K9473XG
Primary Pressure: Max. 1 MPa G
Secondary Pressure: 0.02 to 0.5 MPa G
Connection: Rc1/4 or 1/4 FNPT with joint adapter

17. G7001ZC Calibration Gas Cylinder

Capacity: 3.4 l
Filled pressure: 9.8 to 12 MPa G
Composition: 0.95 to 1.0 vol% O_2 remaining N_2
(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

18. G7013XF/G7014XF Cylinder Pressure Regulator

Pressure gauge: Primary 0 to 25 MPa G,
Secondary 0 to 5 MPa G
Connection: Inlet W22 14 threads, right hand screw
Outlet Rc1/ 4 or 1/4FNPT
Material: Brass body

19. E7044KF Case Assembly of Calibration Cylinder

Case Paint: Baked epoxy resin,
Jade green (Munsell 7.5 BG 4/1.5)
Installation: 2B pipe mounting
Weight: Approx. 10 kg
(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

20. ZR22A, ZR202A Heater Assembly

ZR22A: Spare Parts for ZR22G
ZR202A: Spare Parts for ZR202G
(Note) Yokogawa shall not guarantee the heater assembly after its replacement.

STANDARD ACCESSARIES

ZR402G

Item	Parts. No.	Q'ty	Description
Fuse	A1113EF	1	3.15 A
Bracket	F9554AL	1	For pipe, panel,or wall mounting
Screws for Bracket	F9123GF	1	

ZR22G

Item	Parts. No.	Q'ty	Description
Allen wrench	L9827AB	1	For lock screw

ZR202G

Item	Parts. No.	Q'ty	Description
Fuse	A1113EF	1	3.15 A
Allen wrench	L9827AB	1	For lock screw

Model and Suffix Codes

1. 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
	-C	------	Chinese
Instruction manual	-J	------	Japanese
	-E	------	English
	-C	------	Chinese
--	-A		Always -A
Options		/HS	Set for Humidity Analyzer (*1)
		/H	Hood (*3)
Tag plates		/SCT	Stainless steel tag plate (*2)
		/PT	Printed tag plate (*2)
NAMUR NE43 compliant		/C2	Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less (*4)
		/C3	Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more (*4)

*1 For humidity measurements, be sure to specify /HS options.
*2 Specify either /SCT or /PT option code.
*3 Sun shield hood is still effective even if scratched.
*4 Output signal limits: 3.8 to 20.5 mA. Specify either /C2 or /C3 option code.
(Note) If AC line voltage is 125 V AC or greater, or in the EEC, the ZO21D cannot be used with the ZR402G.

Language / Model	Japanese	English	German	French
ZA8C	K9290LF	K9290KF	K9290MF	K9290MG
HA400 (kg)	K9293HT	K9293HU	K9293HW	K9293HV
HA400 (%)	K9293HP	K9293HQ	K9293HS	K9293HR
AV8C	K9296CN	K9296CN	K9296CN	K9296CN

Note for ZR22G combination use with existing older model converters

When the ZR22G is used with existing older model converters, ZA8C, AV8C and HA400, ROM replacement and addition of a cold junction temperature compensation board are required.

The part numbers of each language version of ROM refer to table below.

The part numbers of cold junction temperature compensation boards are K9471JA for the ZA8C and HA400 and K9471JB for the AV8C.

For replacing the ROM by using ROM extraction tool (Part No. K9471JT) and mounting the cold junction temperature compensation board, it is recommended that you ask Yokogawa service station.

2. Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Detectors

Style : S2

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) (*1)
	-040	----------	0.4 m
	-070	----------	0.7 m
	-100	----------	1.0 m
	-150	----------	1.5 m
	-200	----------	2.0 m
	-250	----------	2.5 m (*2)
	-300	----------	3.0 m (*2)
	-360	----------	3.6 m (*2)
	-420	----------	4.2 m (*2)
	-480	----------	4.8 m (*2)
	-540	----------	5.4 m (*2)
Wetted material	-S	----------	SUS316
	-C	----------	Stainless steel with Inconel calibration gas tube (*10)
Flange (*3)	-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) (*4)
	-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) (*11)
	-P	----------	Pressure compensated (*11)
Gas Thread	-R	----------	Rc 1/4
	-T	----------	1/4 NPT(Female)
Connection box thread	-P	----------	G1/2
	-G	----------	Pg13.5
	-M	----------	M20 x1.5 mm
	-T	----------	1/2NPT
	-Q	----------	Quick connect (*9)
Instruction manual	-J	----------	Japanese
	-E	----------	English
	-C	----------	Chinese
--	-A	----------	Always -A
Options		/C	Inconel bolt (*5)
	Valves	/CV	Check valve (*6)
		/SV	Stop valve (*6)
	Filter	/F1	Dust Filter (*7)
		/F2	Dust Guard Protector (*7)
	Tag plates	/SCT	Stainless steel tag plate (*8)
		/PT	Printed tag plate (*8)

*1 Used with the ZO21P High Temperature Probe Adapter. Select flange (-Q).
*2 When installing horizontally the probe whose insertion length is 2.5 meters or more, use the Probe Protector. Be sure to specifyZO21R-L-200-☐. Specify the flange suffix code either -C or -K.
*3 The thickness of the flange depends on its dimensions.
*4 Not used in conjunction with —P (pressure compensation) for reference air. The flange thickness does not conform to JIS specification
*5 Inconel probe bolts and U shape pipe are used. Use this option for high temperature use (ranging from 600 to 700 °C).
*6 Specify either /CV or /SV option code.
*7 Not used with the high temperature humidity analyzer.
*8 Specify either /SCT or /PT option code.
*9 Not waterproof, avoid rain. Operating maximum temperature is 80°C. Available only in the U.S.
*10 Recommended if measured gas contains corrosive gas like chlorine.
*11 Piping for reference air must be installed to supply reference air constantly at a specified flow rate.

3. 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 (*1)
	-300	----------	3.0 m (*1)
Wetted material	-S	----------	SUS316
	-C	----------	Stainless steel with Inconel calibration gas tube (*10)
Flange (*2)	-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 (*8)
	-B	----------	Vertical mounting (*8)
Reference air	-C	----------	Natural convection
	-E	----------	External connection (Instrument air) (*11)
	-P	----------	Pressure compensated (*11)
Gas Thread	-R	----------	Rc 1/4
	-T	----------	1/4 NPT (Female)
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		/C	Inconel bolt (*3)
		/HS	Set for Humidity Analyzer (*4)
Valves		/CV	Check valve (*5)
		/SV	Stop valve (*5)
		/H	Hood (*9)
		/F1	Dust Filter (*6)
		/F2	Dust Guard Protector (*6)
Tag plates		/SCT	Stainless steel tag plate (*7)
		/PT	Printed tag plate (*7)
NAMUR NE43 compliant		/C2	Failure alarm down-scale: Output status at CPU failure and hardware error is 3.6 mA or less (*12)
		/C3	Failure alarm up-scale: Output status at CPU failure and hardware error is 21.0 mA or more (*12)

*1 For the horizontally installed probe whose insertion length is 2.5 meters or more, use the Probe Protector. Be sure to specify ZO21R-L-200-☐. Specify the flange suffix code either -C or -K.
*2 The thickness of the flange depends on its dimensions.
*3 Inconel probe bolts and U shape pipe are used. Use this option for high temperature use (ranging from 600 to 700°C).
*4 For humidity measurements, be sure to specify /HS options. Pressure compensation of reference air can not be selected.
*5 Specify either /CV or /SV option code.
*6 Not used with the high-temperature humidity analyzer.
*7 Specify either /SCT or /PT option code.
*8 No need to specify the option codes, /CV and /SV, since the check valves are provided with the autocalibration unit.
Auto calibration cannot be used when natural convection is selected as reference air.
*9 Sun shield hood is still effective even if scratched. Hood is necessary for outdoor installation out of sun shield roof.
*10 Recommended if measured gas contains corrosive gas like chlorine.
*11 Piping for reference air must be installed to supply reference air constantly at a specified flow rate.
*12 Output signal limits: 3.8 to 20.5 mA. Specify either /C2 or /C3 option code.

4. Adapter for High Temperature Probe of separate type Oxygen Analyzer

Model	Suffix code	Option code	Description
ZO21P	-H	- - - - - - -	High Temperature Probe Adapter
Material	-A	- - - - - - -	SiC
	-B	- - - - - - -	SUS 310S
Insertion length	-050	- - - - - -	0.5 m
	-060	- - - - - -	0.6 m
	-070	- - - - - -	0.7 m
	-080	- - - - - -	0.8 m
	-090	- - - - - -	0.9 m
	-100	- - - - - -	1.0 m
	-150	- - - - - -	1.5 m
Flange	-J	- - - - - - -	JIS 5K 50 FF SUS304
	-N	- - - - - - -	JIS 10K 65 FF SUS304
	-M	- - - - - - -	JIS 10K 80 FF SUS304
	-L	- - - - - - -	JIS 10K 100 FF SUS304
	-A	- - - - - - -	ANSI Class 150 4 RF SUS304
	-R	- - - - - - -	ANSI Class 150 2 1/2 RF SUS304
	-Q	- - - - - - -	ANSI Class 150 3 RF SUS304
	-T	- - - - - - -	JPI Class 150 3 RF SUS304
	-S	- - - - - - -	JPI Class 150 4 RF SUS304
	-E	- - - - - - -	DIN PN10 DN50 A SUS304
Style code	*B	- - - - - - -	Style B
Option	Tag plate	/SCT	Stainless steel tag plate

Note: For this high-temperature use probe adapter, be sure to specify the ZR22G probe of its insertion length 0.15 meters.

High temperature Probes (Spare Parts)

Part No.	Description
K9292TP	SiC, insertion length 0.5 m
E7046CF	SiC, insertion length 0.6 m
K9292TQ	SiC, insertion length 0.7 m
E7046CG	SiC, insertion length 0.8 m
E7046CH	SiC, insertion length 0.9 m
E7046AL	SiC, insertion length 1.0 m
E7046BB	SiC, insertion length 1.5 m
K9292TV	SUS310S, insertion length 0.5 m
E7046CR	SUS310S, insertion length 0.6 m
K9292TW	SUS310S, insertion length 0.7 m
E7046CS	SUS310S, insertion length 0.8 m
E7046CT	SUS310S, insertion length 0.9 m
E7046AP	SUS310S, insertion length 1.0 m
E7046AQ	SUS310S, insertion length 1.5 m

5. Auxiliary Ejector for High Temperature Use of separate type Oxygen Analyzer

Part No.	Description
E7046EC	Rc1/4 Ø6 / Ø4 TUBE joint: SUS304 (JIS)
E7046EN	1/4 NPT, 1/4 TUBE joint: SUS304 (JIS)

6. Probe Protector for Zirconia Oxygen Analyzers

Model	Suffix code	Option code	Description
ZO21R	-L	- - - - - -	Probe Protector(0 to 700°C)
Insertion length	-100	- - - - - -	1.05 m (3.5 ft)
	-150	- - - - - -	1.55 m (5.1 ft)
	-200	- - - - - -	2.05 m (6.8 ft)
Flange (*1)	-J	- - - - - -	JIS 5K 65 FF SUS304
	-A	- - - - - -	ANSI Class 150 4 FF SUS304
Style code	*B	- - - - - -	Style B

*1 Thickness of flange depends on dimensions of flange.

7. Filter for Zirconia Oxygen Analyzers

Part No.	Description
K9471UA	Filter
K9471UX	Tool

8. Dust Guard Protector

Part No.	Description
K9471UC	Dust guard protector

9. Dust Protector for High Temperature Humidity Analyzers

Model	Suffix code	Option code	Description
ZH21B	- - - - -	- - - - - -	Dust protector (0 to 600°C)
Insertion length	-040	- - - - - -	0.440 m
Flange	-J	- - - - - -	JIS 5K 80 FF SUS304 *(1)
	-A	- - - - - -	ANSI Class 150 4B FF SUS304 *(2)
Style code	*B	- - - - - -	Style B

* The flange thickness varies.
Specify the probe ZR22G-040-☐-K or ZR202G-040-☐-K in case of (1)
ZR22G-040-☐-C or ZR202G-040-☐-C in case of (2)

10. Standard Gas Unit

Model	Suffix code	Option code	Description
ZO21S	- - - - -	- - - - - -	Standard gas unit
Power supply	-2	- - - - - -	200 V AC 50/60 Hz
	-3	- - - - - -	220 V AC 50/60 Hz
	-4	- - - - - -	240 V AC 50/60 Hz
	-5	- - - - - -	100 V AC 50/60 Hz
	-7	- - - - - -	110 V AC 50/60 Hz
	-8	- - - - - -	115 V AC 50/60 Hz
Panel	-J	- - - - - -	Japanese version
	-E	- - - - - -	English version
Style code	*A	- - - - - -	Style A

11. Flow setting unit for manual calibration (Needs instrument air.)

Model	Suffix code	Option code	Description
ZA8F	- - - - -	- - - - - -	Flow setting unit
Joint	-J -A	- - - - - - - - - - - -	Rc 1/4 With 1/4" NPT adapter
Style code	*C	- - - - - -	Style C

12. Automatic Calibration Unit for Separate type Analyzer (Needs instrument air.)

Model	Suffix code	Option code	Description
ZR40H	- - - - - - - - -	- - - - - - - -	Automatic calibration unit for ZR402G
Gas piping connection	-R -T	- - - - - - - - - - - - - - - -	Rc 1/4 1/4" NPT
Wiring connection	-P -G -M -T	- -	Pipe connection (G1/2) Pg 13.5 20 mm (M20 x 1.5) 1/2 NPT
--	*A	- - - - - - - -	Always -A

13. Automatic Calibration Unit for Integrated type Analyzer (Needs instrument air.)

Model	Suffix code	Option code	Description
ZR20H	- - - - - - - - - - - -	- - - - - - -	Automatic calibration unit for ZR202G *1
Gas piping connection	-R -T	- - - - - - - - - - - - - -	Rc 1/4 1/4" NPT
Reference air *2	-E -P	- - - - - - - - - - - - - -	Instrument air Pressure compensated
Mounting	-A -B	- - - - - - - - - - - - - -	Horizontal mounting Vertical mounting
–	*A	- - - - - - -	Always -A

*1 Ask Yokogawa service station for additional mounting of ZR20H to the preinstalled ZR202G.
*2 Select the appropriate reference air of ZR20H according to the one of ZR202G.

14. Stop Valve for Calibration-gas line

Part No.	Description
L9852CB	Joint: Rc 1/4, Material: SUS316 (JIS)
G7016XH	Joint: 1/4 NPT, Material: SUS316 (JIS)

15. Check Valve for Calibration-gas line

Part No.	Description
K9292DN	Joint: Rc 1/4, Material: SUS304 (JIS)
K9292DS	Joint: 1/4 NPT, Material: SUS304 (JIS)

16. Air Set

Part No.	Description
G7003XF	Joint: RC 1/4, Material: Zinc alloy
K9473XK	Joint: 1/4 FNPT, Material: Zinc alloy with adapter
G7004XF	Joint: RC 1/4, Material: Zinc alloy
K9473XG	Joint: 1/4 FNPT, Material: Zinc allo with adapter

17. Zero-gas Cylinder

Part No.	Description
G7001ZC	3.4 l container, 0.95 to 1.0 Vol % O_2 N_2 Bal.

(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

18. Pressure Regulator for Gas Cylinder

Part No.	Description
G7013XF	Inlet: W22 14 threads Outlet: Rc 1/4
G7014XF	Inlet: W22 14 threads Outlet: 1/4 FNPT

19. Case Assembly for Calibration-gas Cylinder

Part No.	Description
E7044KF	Calibration gas unit case

(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

20. Heater Assembly

Style: S2

Model	Suffix code	Option code	Description
ZR22A	---------	----------	Heater Assembly for ZR22G
Length (*1)	-015	----------	0.15 m
	-040	----------	0.4 m
	-070	----------	0.7 m
	-100	----------	1 m
	-150	----------	1.5 m
	-200	----------	2 m
	-250	----------	2.5 m
	-300	----------	3 m
Jig for change	-A	----------	with Jig (*2)
	-N	----------	None
Reference air (*3)	-A	----------	Reference air Natural convention External connection (Instrument air)
	-B	----------	Pressure compensated (for ZR22G S2)
	-C	----------	Pressure compensated (for ZR22G S1)

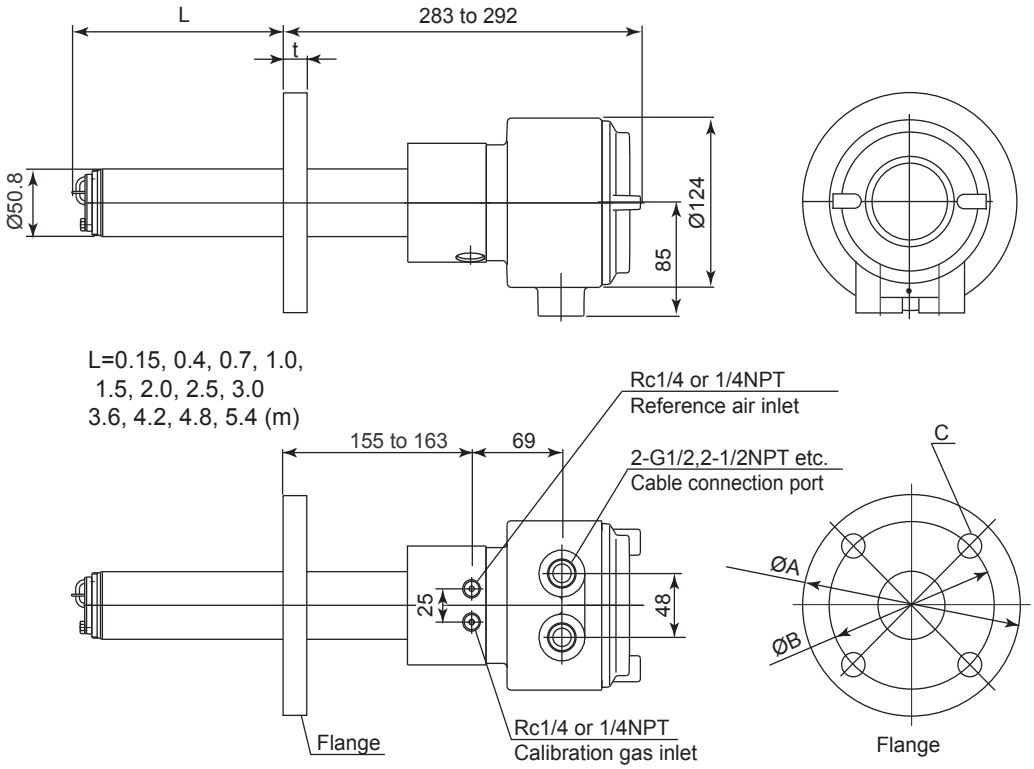
*1 Suffix code of length should be selected as same as ZR22G installed.
*2 Jig part no. is K9470BX to order as a parts after purchase.
*3 Select appropriately among "-A", "-B", "-C" according to the reference air supply method and style.
(Note) The heater is made of ceramic, do not drop or subject it to pressure stress.

Model	Suffix code	Option code	Description
ZR202A	---------	----------	Heater Assembly for ZR202G
Length (*1)	-040	----------	0.4 m
	-070	----------	0.7 m
	-100	----------	1 m
	-150	----------	1.5 m
	-200	----------	2 m
	-250	----------	2.5 m
	-300	----------	3 m
Jig for change	-A	----------	with Jig (*2)
	-N	----------	None
--	-A	----------	Always -A

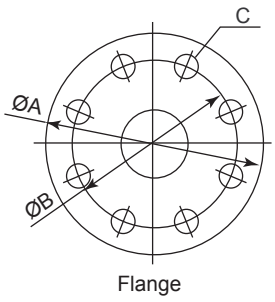
*1 Suffix code of length should be selected as same as ZR202G installed.
*2 Jig part no. is K9470BX to order as a parts after purchase.
(Note) The heater is made of ceramic, do not drop or subject it to pressure stress.

■EXTERNAL DIMENSIONS

1. Model ZR22G Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Detectors



Flange	A	B	C	t
ANSI Class 150 2 RF SUS304	152.4	120.6	4 - Ø19	19
ANSI Class 150 3 RF SUS304	190.5	152.4	4 - Ø19	24
ANSI Class 150 4 RF SUS304	228.6	190.5	8 - Ø19	24
DIN PN10 DN50 A SUS304	165	125	4 - Ø18	18
DIN PN10 DN80 A SUS304	200	160	8 - Ø18	20
DIN PN10 DN100 A SUS304	220	180	8 - Ø18	20
JIS 5K 65 FF SUS304	155	130	4 - Ø15	14
JIS 10K 65 FF SUS304	175	140	4 - Ø19	18
JIS 10K 80 FF SUS304	185	150	8 - Ø19	18
JIS 10K 100 FF SUS304	210	175	8 - Ø19	18
JIS 5K 32 FF SUS304	115	90	4 - Ø15	5
JPI Class 150 4 RF SUS304	229	190.5	8 - Ø19	24
JPI Class 150 3 RF SUS304	190	152.4	4 - Ø19	24
Westinghouse	155	127	4 - Ø11.5	14



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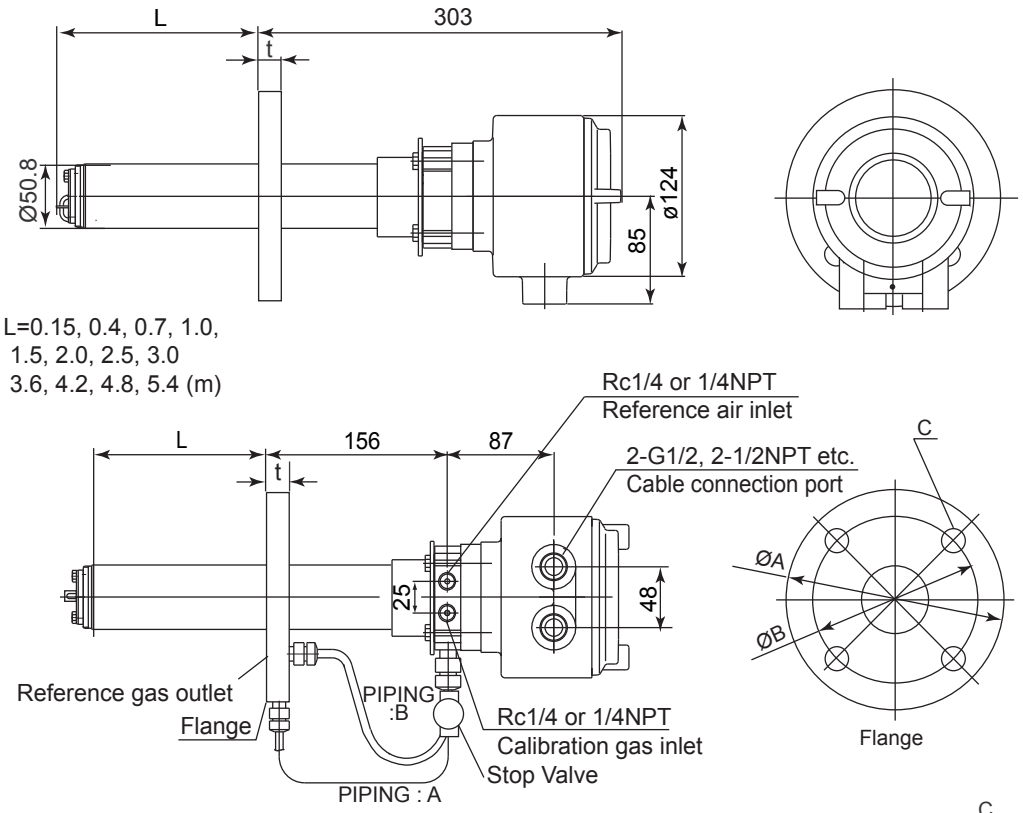
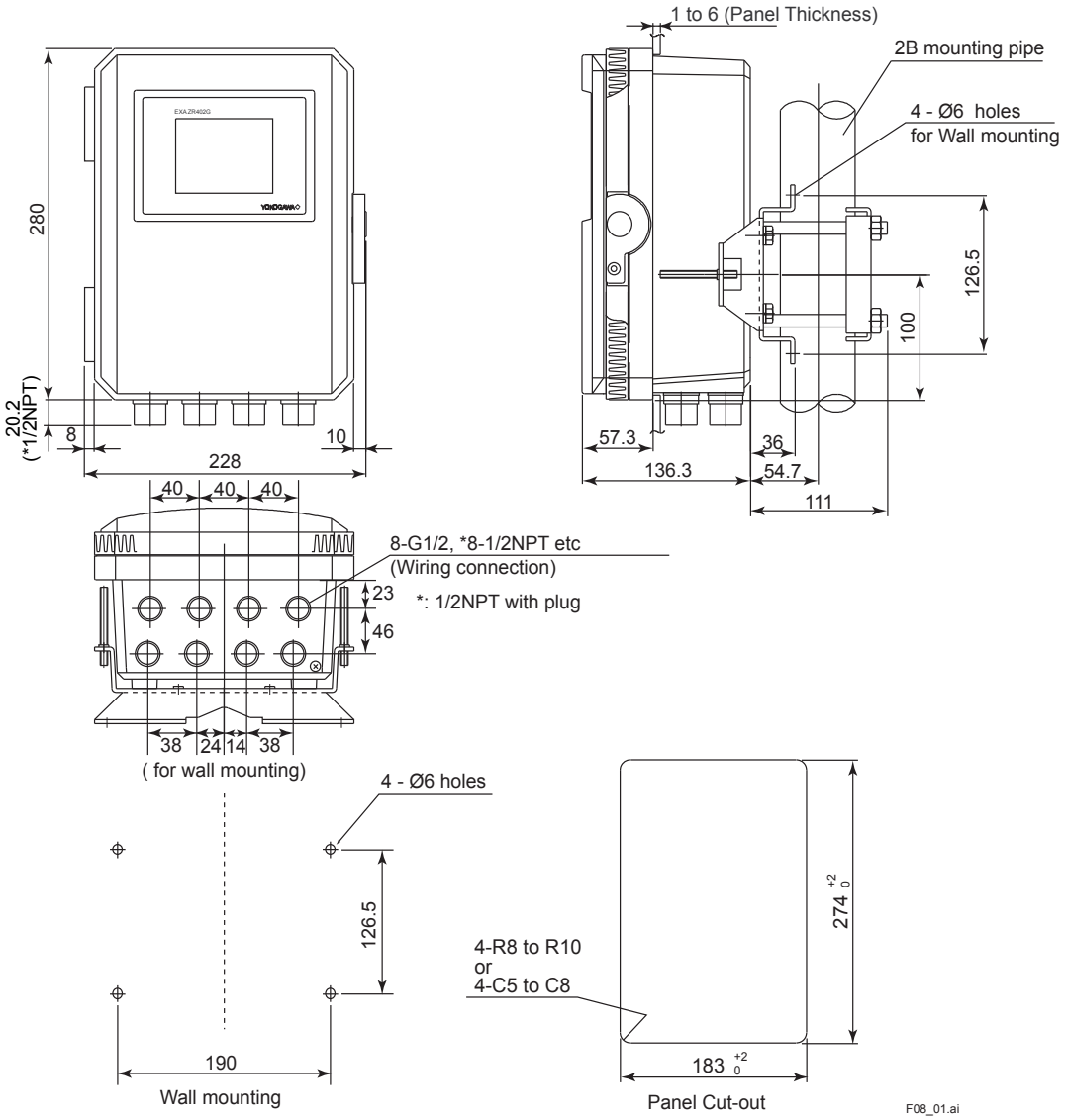
Model ZR22G...-P (with pressure compensated) Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Detectors

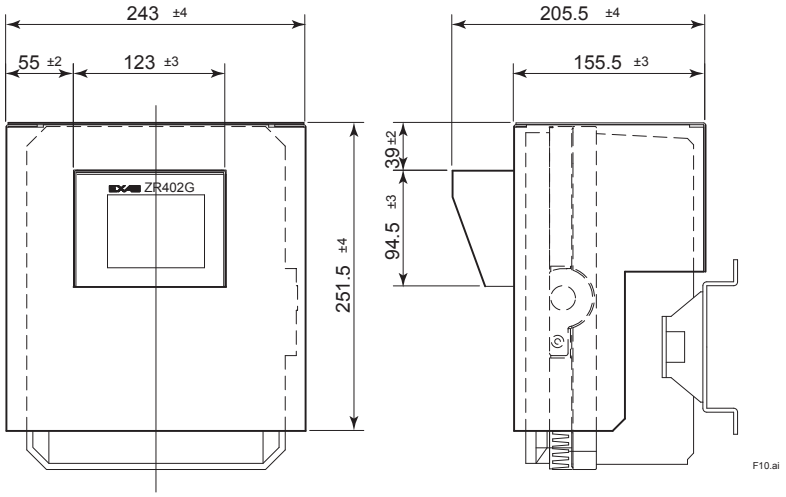


Flange	A	B	C	t	PIPING
ANSI Class 150 2 RF SUS304	152.4	120.6	4 - Ø19	19	A
ANSI Class 150 3 RF SUS304	190.5	152.4	4 - Ø19	24	B
ANSI Class 150 4 RF SUS304	228.6	190.5	8 - Ø19	24	B
DIN PN10 DN50 A SUS304	165	125	4 - Ø18	18	A
DIN PN10 DN80 A SUS304	200	160	8 - Ø18	20	B
DIN PN10 DN100 A SUS304	220	180	8 - Ø18	20	B
JIS 5K 65 FF SUS304	155	130	4 - Ø15	14	A
JIS 10K 65 FF SUS304	175	140	4 - Ø19	18	A
JIS 10K 80 FF SUS304	185	150	8 - Ø19	18	B
JIS 10K 100 FF SUS304	210	175	8 - Ø19	18	B
JPI Class 150 4 RF SUS304	229	190.5	8 - Ø19	24	B
JPI Class 150 3 RF SUS304	190	152.4	4 - Ø19	24	B
Westinghouse	155	127	4 - Ø11.5	14	A

2. Model ZR402G Separate type Zirconia Oxygen/ High Temperature Humidity Analyzer, Converter

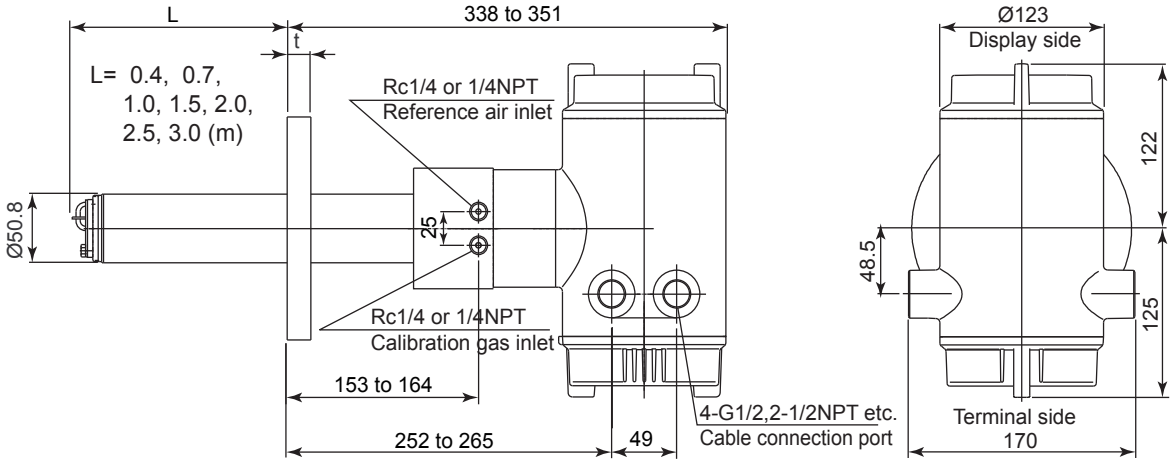


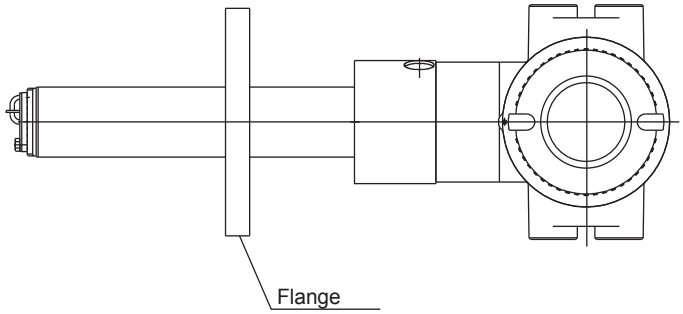
●With sun shield hood (option code /H)

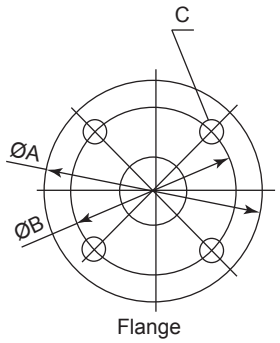


Material of HOOD : Aluminum

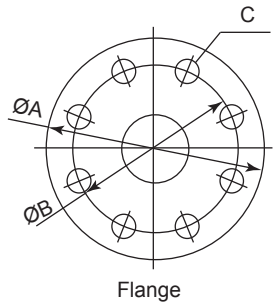
3. Model ZR202G Integrated type Zirconia Oxygen/ High Temperature Humidity Analyzers





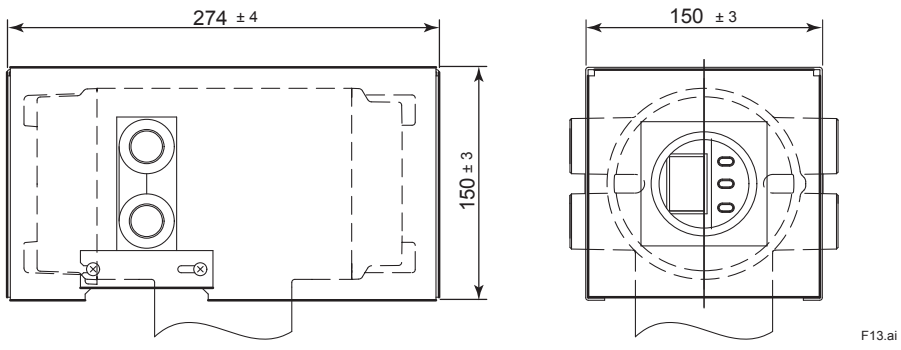


Flange	A	B	C	t
ANSI Class 150 2 RF SUS304	152.4	120.6	4 - Ø19	19
ANSI Class 150 3 RF SUS304	190.5	152.4	4 - Ø19	24
ANSI Class 150 4 RF SUS304	228.6	190.5	8 - Ø19	24
DIN PN10 DN50 A SUS304	165	125	4 - Ø18	18
DIN PN10 DN80 A SUS304	200	160	8 - Ø18	20
DIN PN10 DN100 A SUS304	220	180	8 - Ø18	20
JIS 5K 65 FF SUS304	155	130	4 - Ø15	14
JIS 10K 65 FF SUS304	175	140	4 - Ø19	18
JIS 10K 80 FF SUS304	185	150	8 - Ø19	18
JIS 10K 100 FF SUS304	210	175	8 - Ø19	18
JPI Class 150 4 RF SUS304	229	190.5	8 - Ø19	24
JPI Class 150 3 RF SUS304	190	152.4	4 - Ø19	24
Westinghouse	155	127	4 - Ø11.5	14



F11_01.ai

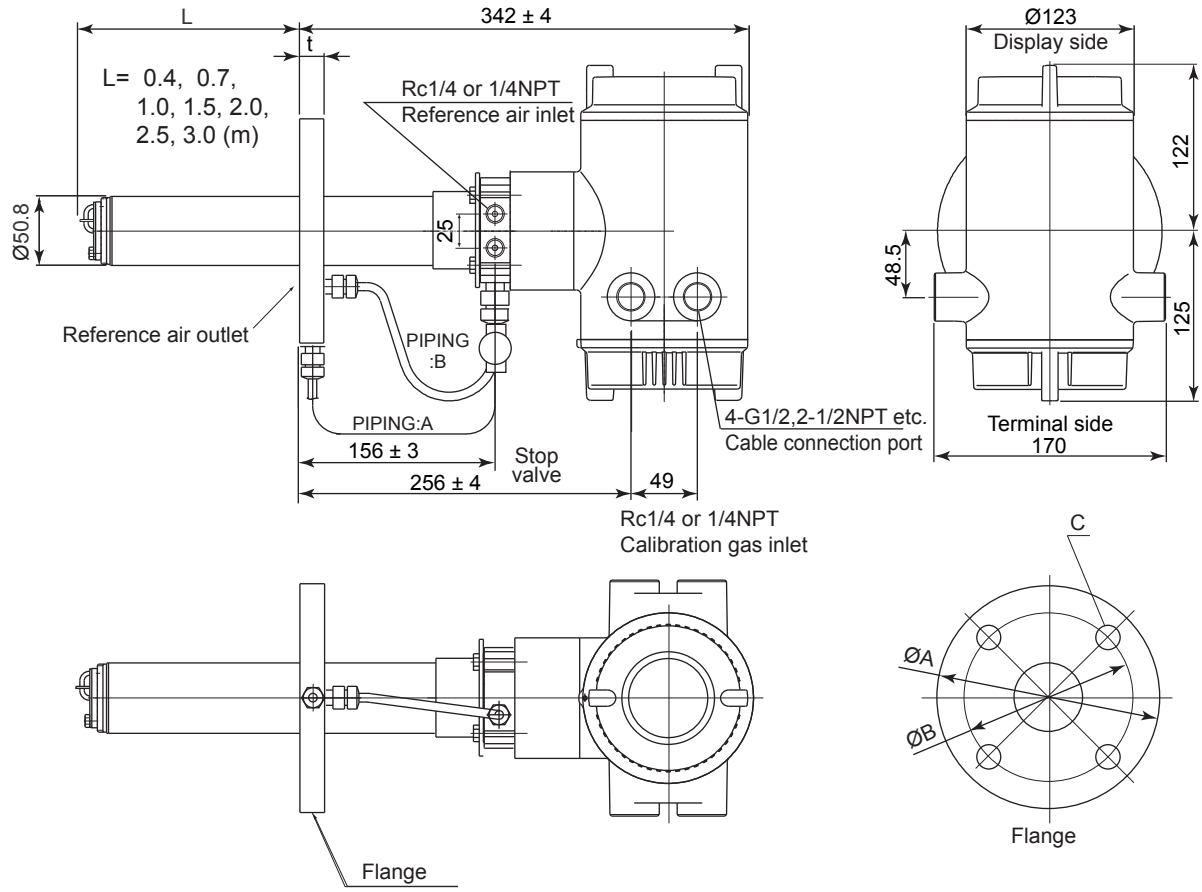
●With sun shield hood (option code /H)



F13.ai

Material of HOOD : Aluminum

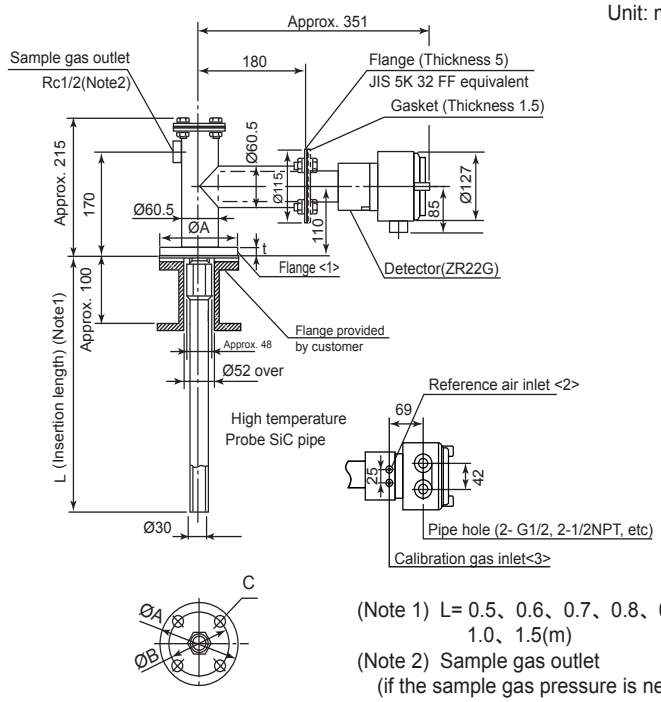
Model ZR202G...-P (with pressure compensated) Integrated type Zirconia Oxygen / High Temperature Humidity Analyzers



Flange	A	B	C	t	PIPING
ANSI Class 150 2 RF SUS304	152.4	120.6	4 - Ø19	19	A
ANSI Class 150 3 RF SUS304	190.5	152.4	4 - Ø19	24	B
ANSI Class 150 4 RF SUS304	228.6	190.5	8 - Ø19	24	B
DIN PN10 DN50 A SUS304	165	125	4 - Ø18	18	A
DIN PN10 DN80 A SUS304	200	160	8 - Ø18	20	B
DIN PN10 DN100 A SUS304	220	180	8 - Ø18	20	B
JIS 5K 65 FF SUS304	155	130	4 - Ø15	14	A
JIS 10K 65 FF SUS304	175	140	4 - Ø19	18	A
JIS 10K 80 FF SUS304	185	150	8 - Ø19	18	B
JIS 10K 100 FF SUS304	210	175	8 - Ø19	18	B
JPI Class 150 4 RF SUS304	229	190.5	8 - Ø19	24	B
JPI Class 150 3 RF SUS304	190	152.4	4 - Ø19	24	B
Westinghouse	155	127	4 - Ø11.5	14	A

4. Model ZO21P Adapter for High Temperature Probe of separate type Oxygen Analyzer

Unit: mm

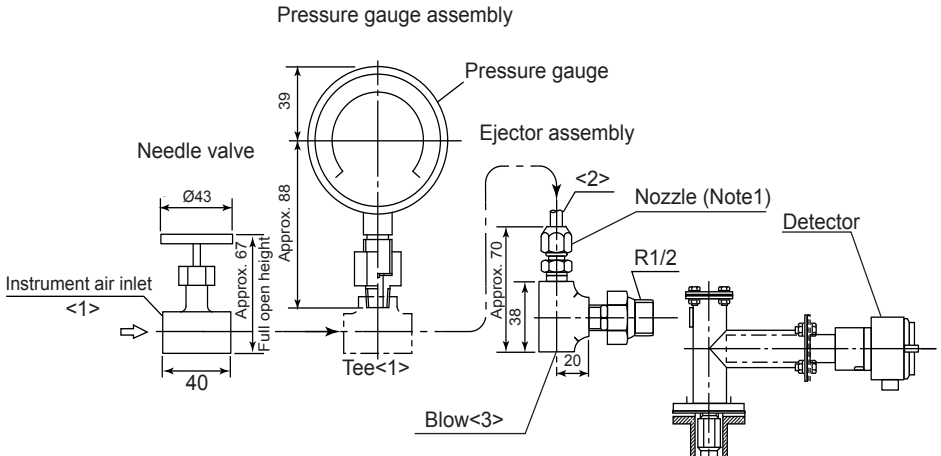


(Note 1) L= 0.5、0.6、0.7、0.8、0.9、1.0、1.5(m)
(Note 2) Sample gas outlet (if the sample gas pressure is negative, connect the auxiliary ejector.)

<1> Flange	<2>,<3> joint	A	B	C	t
JIS 5K 50 FF SUS304	Rc 1/4	130	105	4 - Ø15	14
ANSI Class 150 4 RF SUS304	1/4 FNPT	228.6	190.5	8 - Ø19	24

F12.ai

5. E7046EC, E7046EN Auxiliary Ejector for High Temperature Use of separate type Oxygen Analyzer

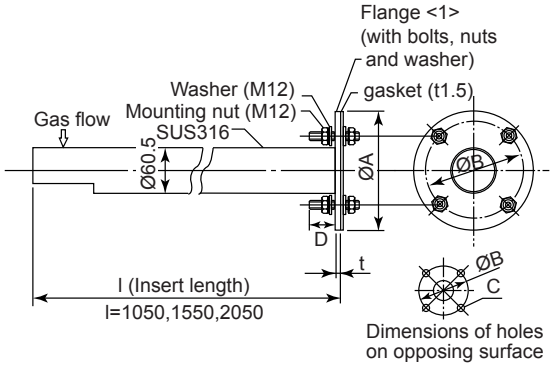


(Note1) The connecter of ejector assembly is a dedicated connecter with nozzle function.

<1> Rc1/4 or 1/4 NPT
<2> Ø6/Ø4 or 1/4 inch copper tube (stainless) with ejector to connect
<3> Rc1/4
E7046EC : Rc1/4
E7046EN : 1/4 NPT

F19.ai

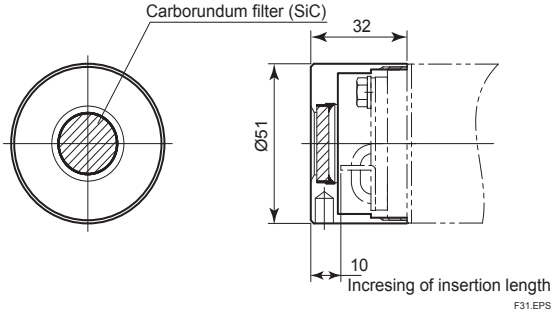
6. Model ZO21R Probe Protector for Zirconia Oxygen Analyzers



Flange<1>	A	B	C	t	D
JIS 5K 65 FF SUS304	155	130	4 - Ø15	5	40
ANSI Class 150 4 FF SUS304	228.6	190.5	8 -Ø19	12	50

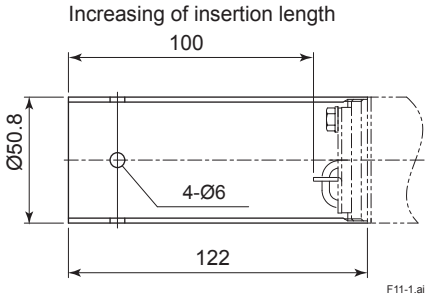
F17.ai

7. K9471UA Filter for Oxygen Analyzer



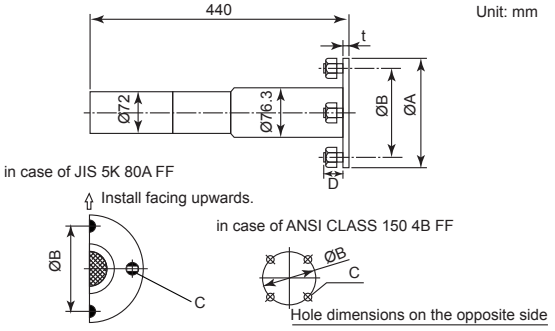
F31.EPS

8. K9471UC Dust Guard Protector



F11-1.ai

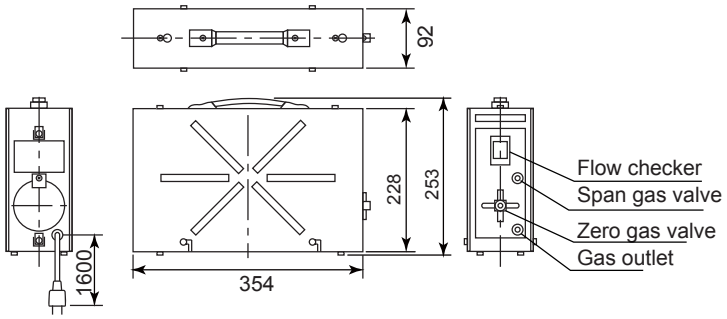
9. Model ZH21B Dust Protector for High Temperature Humidity Analyzers



Flange	A	B	C	t	D
JIS 5K 80 FF SUS304	180	145	4-Ø19	14	40
ANSI Class 150 4B FF SUS304	228.5	190.5	8-Ø19	12	50

F09.ai

10. Model ZO21S Standard Gas Unit

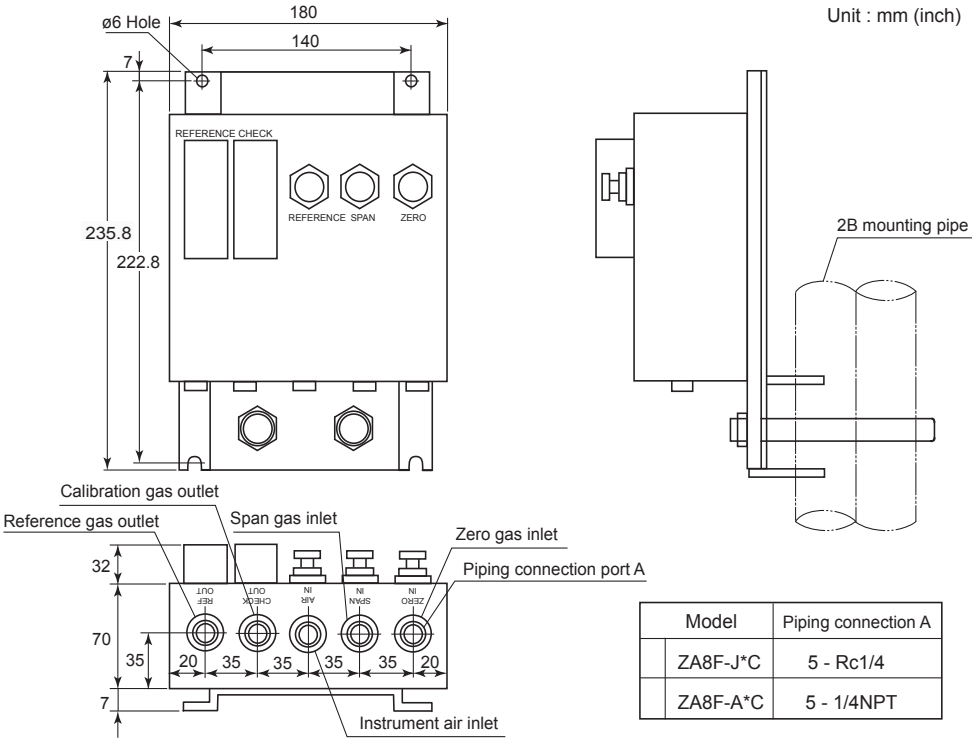


Zero gas cylinder (6 cylinder): E7050BA

F24.ai

11. Model ZA8F Flow setting unit for manual calibration

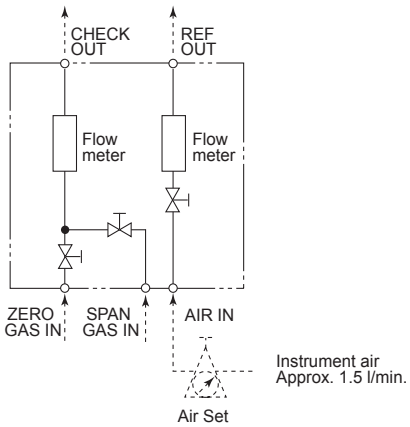
Unit : mm (inch)



Model	Piping connection A
ZA8F-J*C	5 - Rc1/4
ZA8F-A*C	5 - 1/4NPT

Weight : Approx. 2.3 kg

PIPNG INSIDE THE FLOW SETTING UNIT

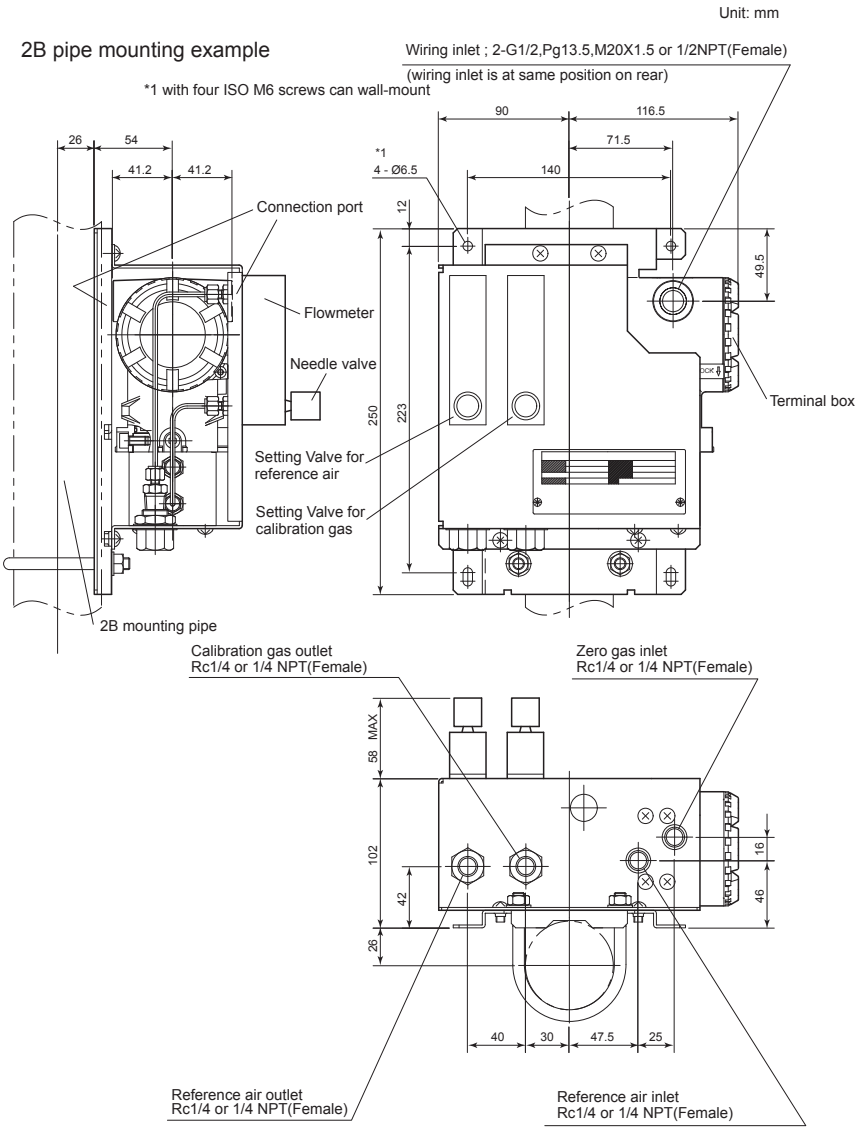


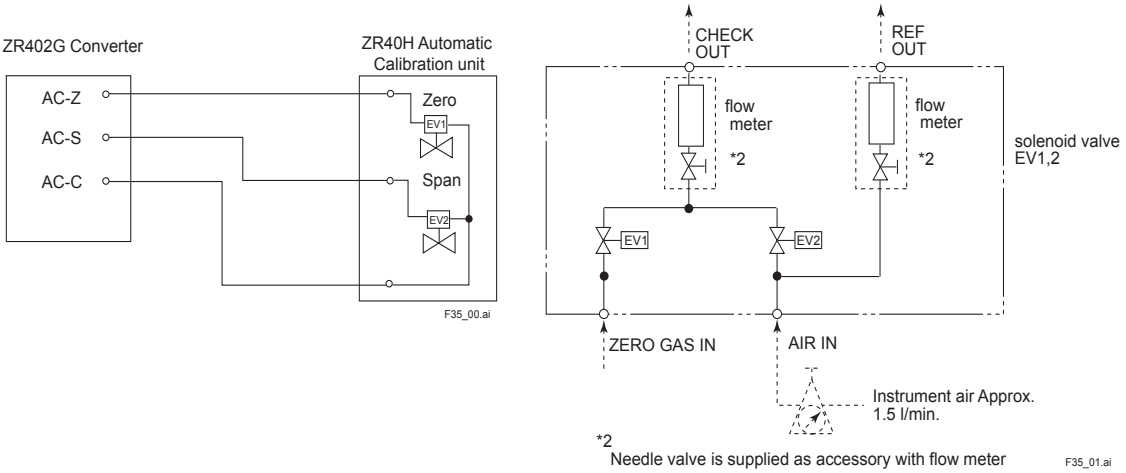
Air pressure ;
without check valve ; measured gas pressure + approx.50 kPaG
with check valve ; measured gas pressure + approx.150 kPaG

F2.6E.ai

12. Model ZR40H Automatic Calibration Unit for Separate type Analyzer

Unit: mm

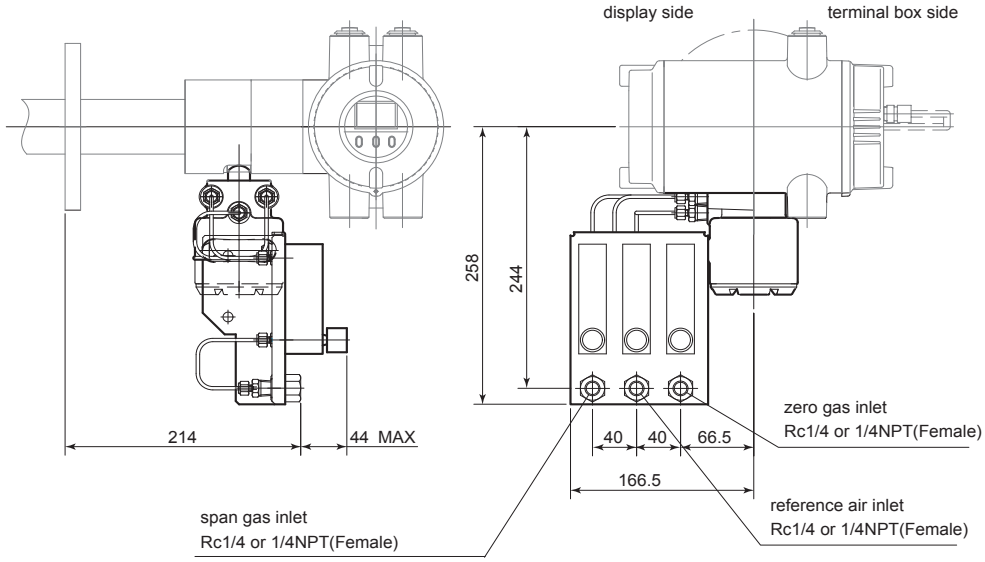




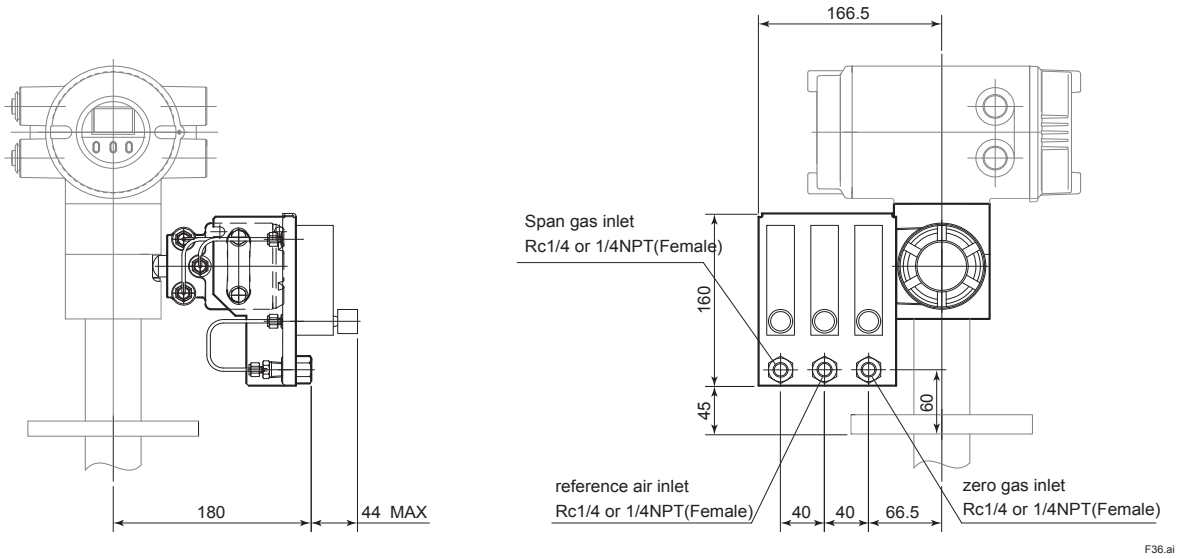
13. Model ZR20H Automatic Calibration Unit for Integrated type Analyzer

Unit: mm

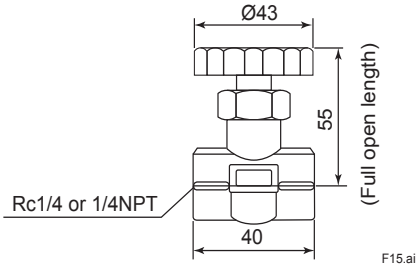
Horizontal mounting on the ZR202G (-A)



Vertical mounting on the ZR202G (-B)



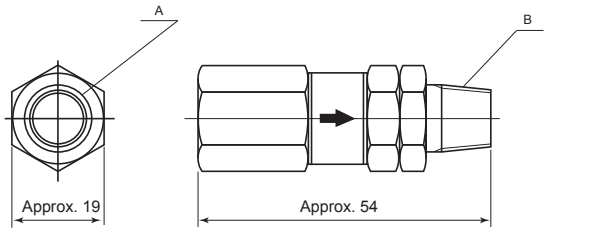
14. L9852CB /G7016XH Stop Valve for Calibration-gas line



15. K9292DN /K9292DS Check Valve for Calibration-gas line

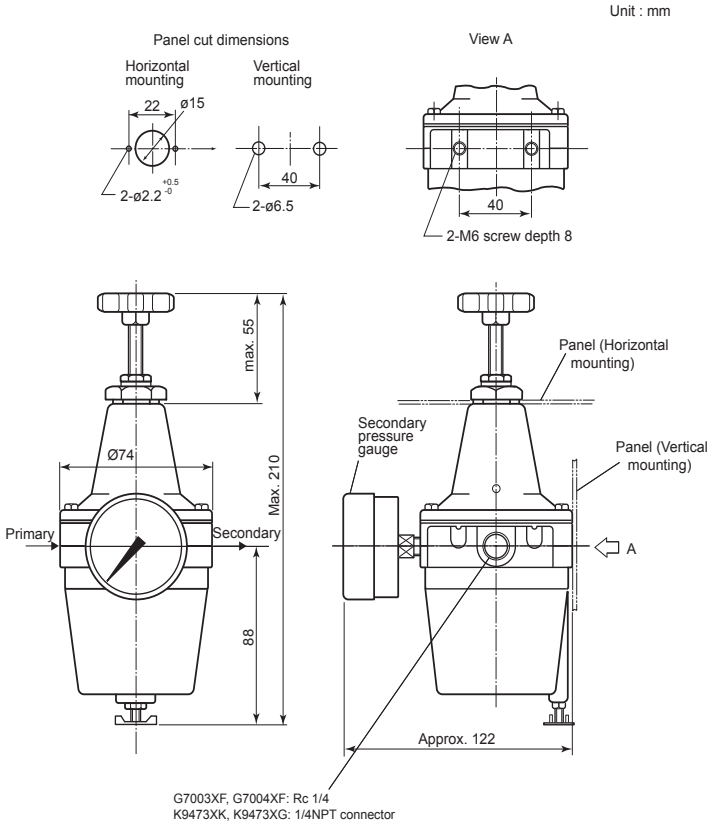
K9292DN : Rc 1/4(A),R 1/4(B)
K9292DS : 1/4FNPT(A),1/4NPT(Male)(B)

Unit: mm

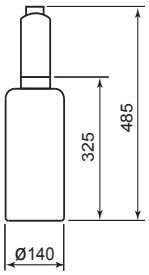


16. Air Set G7003XF/K9473XK, G7004XF/K9473XG

Unit : mm

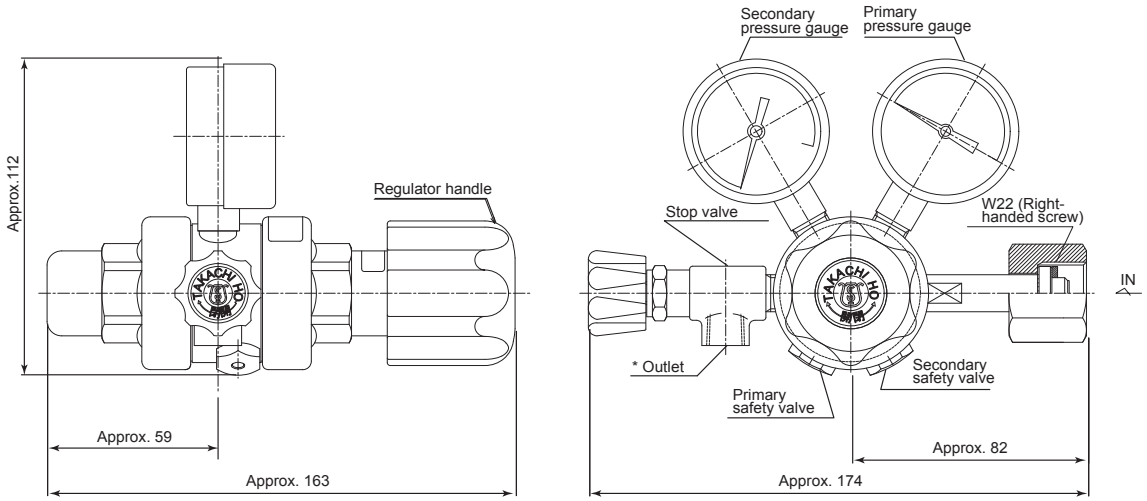


17. G7001ZC Zero-gas Cylinder



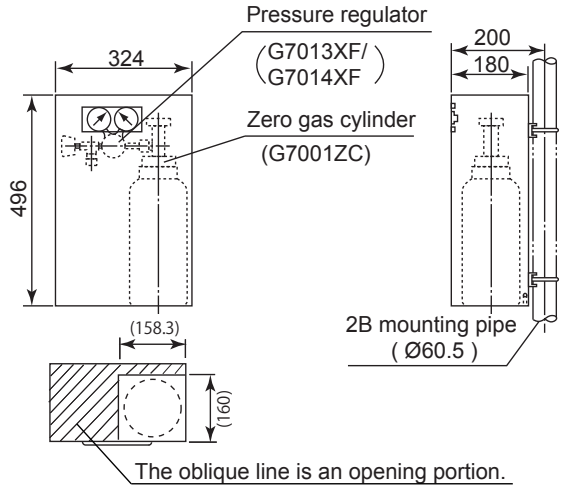
(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

18. G7013XF, G7014XF Pressure Regulator for Gas Cylinder



Part No.	* Outlet
G7013XF	Rc1/4
G7014XF	1/4 NPT female screw

19. E7044KF Case Assembly for Calibration-gas Cylinder



(Note)The zero gas cylinder and the regulator valve are not included in the E7044KF (case assembly)

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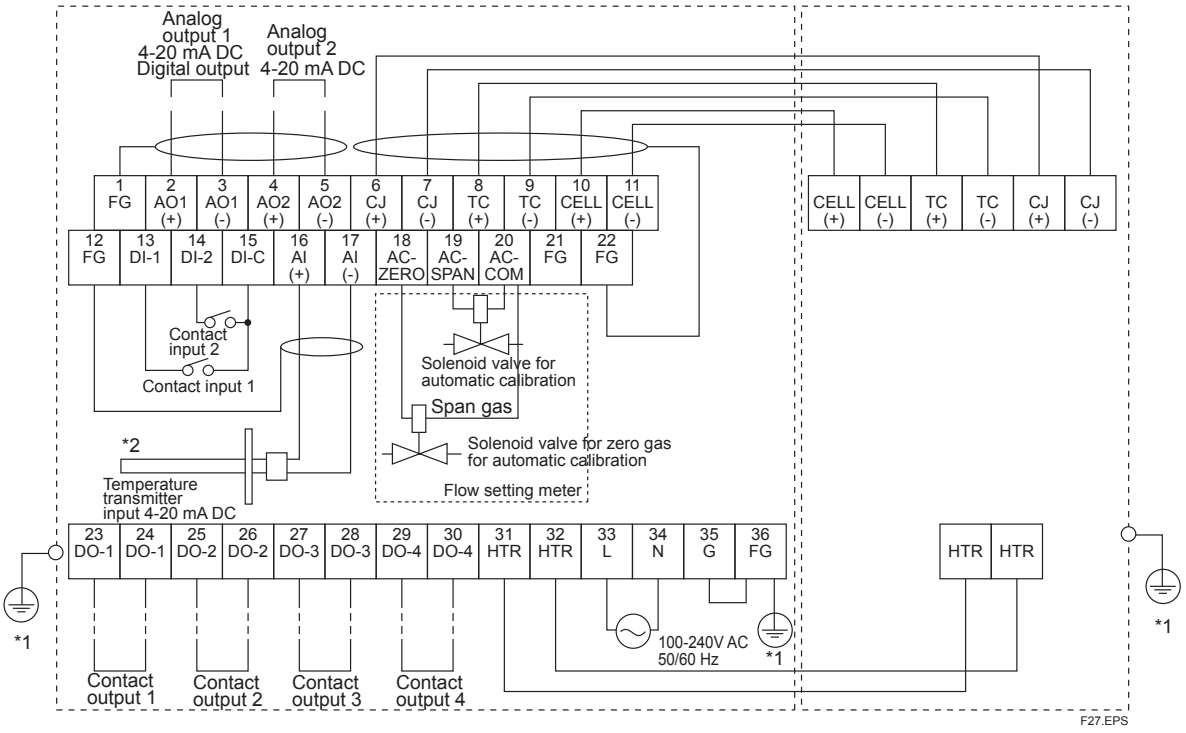
WIRING CONNECTIONS

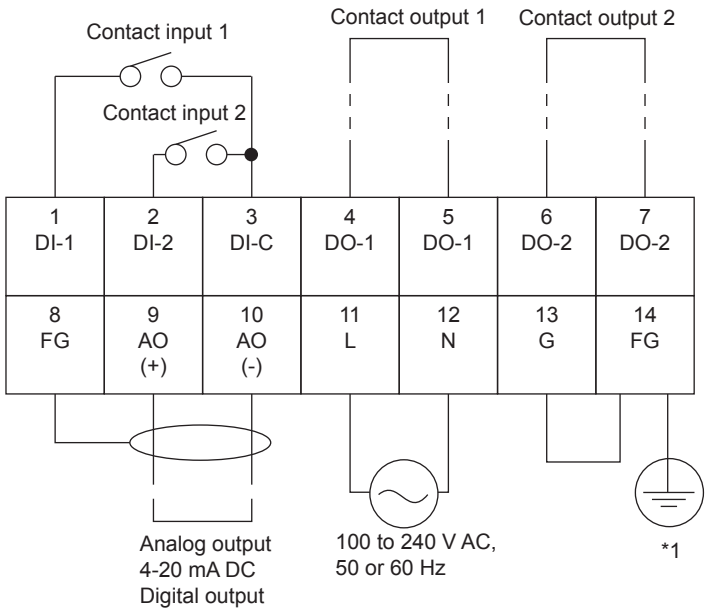
Model ZR402G Separate type Zirconia Oxygen Analyzer/
High Temperature Humidity Analyzer, Converter

Model ZR22G Separate type Zirconia Oxygen /
High Temperature Humidity Analyzer, Detector



*1 Grand resistance is 100 ohm or less.
*2 Option (Temperature transmitter provide by user) for humidity measurement.

Model ZR202G Integrated type Zirconia Oxygen / High Temperature Humidity Analyzer



*1 Ground resistance is 100 ohm or less.

Inquiry Sheet for Models ZR22G, ZR402G, and ZR202G Direct In Situ Zirconia Oxygen Analyzers and High Temperature Humidity Analyzers

Please place checkmarks in the appropriate boxes and fill in the necessary information in the blanks.

1. General information

Customer

Destination of delivery

Plant name

Measurement points

Type of analyzer : ☐ Oxygen Analyzer ☐ High Temperature Humidity Analyzer
☐ Separate type ☐ Integrated type

Object : ☐ indication ☐ record ☐ control ☐ alarm

Fuel : ☐ gas ☐ oil ☐ coal ☐_____

Power requirements _____V AC _____Hz

2. Process conditions

2.1 Measurement gas components

2.2 Oxygen concentration	Nor.	Min.		Max.	☐ vol% O_2,	☐
Moisture contents	Nor.	Min.		Max.	☐ kg/kg,	☐ Vol% H_2O
2.3 Temperature	Nor.	Min.		Max.	☐ °C,	☐
2.4 Pressure	Nor.	Min.		Max.	☐ kPa,	☐
2.5 Gas flow	Nor.	Min.		Max.	☐ m/sec,	☐
2.6 Dust type, Size	Nor.	Min.	mm	quantity	☐ g/Nm^3,	☐
2.7 Corrosive gas	☐ No gas	☐ Gas		, quantity	☐ ppm,	☐
				, quantity	☐ ppm,	☐
2.8 Combustible gas	☐ No gas	☐ Gas		, quantity	☐ ppm,	☐
				, quantity	☐ ppm,	☐

2.9 Others

3. Installation site conditions

3.1 Ambient temperature 1. Around Probe temp. from to °C, 2. Around Converter temp. from to °C

3.2 Vibration ☐ No vibration ☐ Vibration

3.3 1 Probe installation location ☐ Furnace ☐ Stack ☐ Others

2 Probe position ☐ Horizontal ☐ Vertical ☐ Others
☐ Indoor ☐ Outdoor ☐ Covered

3 Probe insertion length (m) (Note) ☐ 0.4, ☐ 0.7, ☐ 1.0, ☐ 1.5, ☐ 2.0, ☐ 2.5, ☐ 3.0, ☐ 3.6, ☐ 4.2, ☐ 4.8, ☐ 5.4

4 Flange ☐ DIN ☐ ANSI ☐ Others

3.4 Instrument air supply ☐ Cannot be used. ☐ Can be used. kPa

3.5 Converter location ☐ Indoor ☐ Outdoor ☐ Covered (under roof)

3.6 Cable length between probe and converter meters

3.7 Calibration method ☐ Manual ☐ Automatic

(Note) 3.6m or more is available only in the U.S.

4. Quotation data

Quotation			Qantity	Description
Probe		Model ZR22G General-use Probe		Refer to the Probe Configuration for probe selection.
		Model ZO21P-H High Temperature Use Probe Adapter		
		E7046EC /E7046EN Auxiliary Ejector for high temperature use.		
	Options (for general use)	Model ZH21B Dust Protector for high temperature humidity analyzer.		
		Model ZO21R Probe Protector for Oxgen Analyzer		
		K9471UA Filter for Oxgen Analyzer		
Model ZR402G Separate type Analyzer, Converter				
Model ZR202G Integrated type Zirconia Oxygen /High Temperature Humidity Analyzer				
Model ZO21S Standard Gas Unit				Select any one of Model ZO21S, ZA8F, ZR40H, ZR20H.
Model ZA8F Flow Setting Unit				
Model ZR40H, ZR20H Automatic Calibration Unit				
L9852CB /G7016XH Stop Valve				Not required if probe options are specified.
K9292DN /K9292DS Check Valve (*1)				
G7003XF/K9473XK, G7004XF/K9473XG Air Set				
G7001ZC Zero Gas Cylinder (*2)				
G7013XF /G7014XF Pressure Regulator				
ZR22A, ZR202A Heater Assembly (Spare Parts)				

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*1 When Auto Calibration of "-A" or "-B" code is specified, ZR20H is installed in ZR202G.

*2 Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.