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.

Features:
• 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 gas 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.

• 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
**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.

**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.

**System configuration - Integrated type**

- **System configuration Example 1 of Integrated 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.

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

*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% N₂ gas cannot be used as the zero gas. Use approx. 1 vol% O₂ gas (N₂-balanced).
Basic System Configuration

System configuration — Separate type

- 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.

System configuration Example 2 of Separate type Analyzer

- ZR22G Separate type Zirconia Oxygen/High Temperature Humidity Analyzer, Detector
- ZR402G Converter
- Reference gas
- Calibration gas
- Needle valve
- Flowmeter
- Instrument air
- Air
- Set
- Pressure regulator
- Zero gas cylinder
- Calibration gas unit case
- Stop valve or Check valve

*1  Shield cable: Use shielded signal cables, and connect the shields to the FG terminal of the converter.

*4  Calibration gas unit same as for zero gas.

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.

System configuration Example 3 of Separate type Analyzer

- Ambient 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.

System configuration Example 3 of Integrated type Analyzer

- Ambient 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.

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

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System Components

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Separate type</th>
<th>Integrated type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR22G</td>
<td>Separate type Zirconia Oxygen / High Temperature Humidity Analyzers, Detector</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZR402G</td>
<td>Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Converter (*1)</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZR202G</td>
<td>Integrated type Zirconia Oxygen / High Temperature Humidity Analyzers</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZR21P</td>
<td>High Temperature Probe Adapter for separate type Zirconia Oxygen Analyzer</td>
<td>specifiers</td>
<td>specifiers</td>
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<tr>
<td>E7046EC, E7046EN</td>
<td>Auxiliary Ejector Assembly for High Temperature Probe of separate type Oxygen Analyzer</td>
<td>specifiers</td>
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</tr>
<tr>
<td>ZO21R</td>
<td>Probe Protector for Zirconia Oxygen Analyzers</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZO21UC</td>
<td>Dust Guard Protector</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZH21B</td>
<td>Dust Protector for High Temperature Humidity Analyzers</td>
<td>specifiers</td>
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</tr>
<tr>
<td>ZO21P</td>
<td>High Temperature Probe Adapter for separate type Zirconia Oxygen Analyzer</td>
<td>specifiers</td>
<td>specifiers</td>
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<tr>
<td>ZA8F</td>
<td>Flow Setting Unit for manual calibration</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZR40H</td>
<td>Automatic Calibration Unit for separate type Analyzers (*2)</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>ZR20H</td>
<td>Automatic Calibration Unit for integrated type Analyzers (*2)</td>
<td>specifiers</td>
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</tr>
<tr>
<td>L5452CB, G7016KH</td>
<td>Stop Valve for Calibration gas line</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
<tr>
<td>K9292DN, K9292DS</td>
<td>Check Valve for Calibration gas line</td>
<td>specifiers</td>
<td>specifiers</td>
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<tr>
<td>G7003FX/K9473XX, G7004FX/K9473XG</td>
<td>Air Set</td>
<td>specifiers</td>
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<tr>
<td>G7001ZX</td>
<td>Zero gas Cylinder</td>
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<tr>
<td>G7013FX, G7014FX</td>
<td>Pressure Regulator for Gas Cylinder</td>
<td>specifiers</td>
<td>specifiers</td>
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<tr>
<td>E7044KF</td>
<td>Case Assembly for Calibration gas Cylinder</td>
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<tr>
<td>ZR22A, ZR202A</td>
<td>Heater Assembly for Spare Parts</td>
<td>specifiers</td>
<td>specifiers</td>
</tr>
</tbody>
</table>

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Detector Components

**Sample gas temperature 0 to 700°C**

<table>
<thead>
<tr>
<th>Mounting</th>
<th>Insertion length</th>
<th>General-use Probe</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal to vertical</td>
<td>0.4 to 2 m</td>
<td>Detector (ZR22G or ZR202G)</td>
<td>Boiler heating furnace</td>
</tr>
<tr>
<td>Vertical</td>
<td>2.5 m or more</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horizontal to vertical</td>
<td>3 m or less</td>
<td>Probe Protector (Z021R) or</td>
<td>Sample inlet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Detector (ZR22G or ZR202G)</td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>2.5 m or more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sample gas temperature 700 to 1400°C**

<table>
<thead>
<tr>
<th>Mounting</th>
<th>Insertion length</th>
<th>General-use Probe</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal to vertical</td>
<td>0.4 to 2 m</td>
<td>Dust filter for Oxygen Analyzer (K9471UA) or</td>
<td>Sample inlet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>or Detector (ZR22G or ZR202G)</td>
<td></td>
</tr>
<tr>
<td>Vertical</td>
<td>2.5 m or more</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Items required for the above system example

- Items required for the above system example
- Items required for the above system example

(*1): When used as a high temperature humidity analyzer, specify /HS options.

(*2): When Automatic Calibration of (-A) or (-B) code is specified, ZR20H is installed in ZR202G.
### STANDARD SPECIFICATIONS

**Oxygen Analyzer**

#### Example of Application

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.

#### 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

**Measurement Range:** 0.01 to 100 vol% O₂

**Output Signal:** 4 to 20 mA DC (maximum load resistance 550 Ω)

**Setting Range:** Any setting in the range of 0 to 5 through 0 to 100 vol% O₂ (in 1 vol% O₂), or partial range

**Display Range:** 0 to 100 vol% O₂

**Digital Communication (HART):** 250 to 550 Ω, depending on number of field devices connected to the loop (multi-drop mode).

**Warm-up Time:** Approx. 20 min.

**Repeatability:** (Excluding the case where the reference gas is by natural convection)

± 0.5% Maximum value of set range; range from 0 to 5 vol% O₂ or more and less than 0 to 25 vol% O₂ range

± 1% Maximum value of set range; range from 0 to 25 vol% O₂ or more and up to 0 to 100 vol% O₂ range

**Linearity:** (Excluding standard gas tolerance)

(Excluding the case where the reference gas is by natural convection) ± 1% Maximum value of set range; 0 to 5 vol% O₂ or more and less than 0 to 25 vol% O₂ range

± 2% Maximum value of set range; 0 to 25 vol% O₂ or more and less than 0 to 50 vol% O₂ range

± 5% Maximum value of set range; 0 to 50 vol% O₂ or more and up to 0 to 100 vol% O₂ range

**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:** SUS316 (JIS)

**Sample Gas Temperature:** 0 to 700°C (Probe only)

For high temperature sample gas (700 to 1400°C), 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 to use pressure compensated type. When the pressure in the furnace exceeds 5 kPa, pressure compensated type is required.) For 0.15 m probe, -0.5 to 5 kPa. No pressure fluctuation in the furnace should be allowed.

**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

**Reference Gas System:** Natural Convection, Instrument Air, Pressure compensated (other than for probe length 0.15 m)

**Probe Material:** SUS316 (JIS)

**Ambient Temperature:** -20 to +150°C

**Response Time:** Response of 90% within 5 seconds. (Measured after gas is introduced from calibration gas inlet and analog output starts changing.)

**Safety:** EMC and RoHS conformity standards for the ZR22G, ZR402G and ZR022G

- Pollution degree based on IEC 61010: 2000 m or less
- Pollution degree based on IEC 61010: II (Note)

**Installation altitude based on IEC 61010:** 2000 m or less

**Pollution degree based on IEC 61010:** 2 (Note)

**EMC Regulatory Arrangement in Australia and New Zealand (RCM):**

- EN61326-1 Class A
- Korea Electromagnetic Conformity Standard

**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.

**Supply Voltage:** 230 V±10%, 50 Hz ± 1 Hz

**Configuration:** 1/2 Din Type, 4 1/2 Digit Indicator, 3 1/2 Digit Output

**Information of the WEEE Directive**

This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply.

The WEEE Directive is only valid in the EU.

**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.

For high temperature sample gas (700 to 1400°C), 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 to use pressure compensated type. When the pressure in the furnace exceeds 5 kPa, pressure compensated type is required.)

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 the ZAF8 Flow Setting Unit, the maximum pressure of sample gas is 150 kPa.

When with a check valve and the ZR40H Automatic 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:** SUS316 (JIS)

**Ambient Temperature:** -20 to +150°C
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 are removed.)

Consumption; Approx. 1 Nl/min

Wetted Material: SUS316 (JIS), Zirconia, SUS304 (JIS) or ASTM grade 304 (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 recirculation pressure compensated version.)

Terminal Box Case: Material; Aluminum alloy
Terminal Box Paint Color: Case; Mint green (Munsell 5.6BG3.3/2.9)
Finish: Polyurethane corrosion-resistance coating
Gas Connection: Rc1/4 or 1/4 NPT (Female)
Wiring Connection: G1/2, Pg 13.5, M20 × 1.5, 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 possible.
When the probe insertion length is 2.5 m or more, 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)
- 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 550Ω)
Contact Output Signal: Four points (one is fail-safe, normally open)
Contact Input: Two points

Automatic Calibration Output: Two points (for dedicated automatic calibration unit)
Ambient Temperature: -20 to +55°C

Storage Temperature: -30 to +70°C
Ambient Humidity: 0 to 95% RH (non-condensing)
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.

Maximum Distance between Detector and Converter:
Conductor two-way resistance must be 10 Ω or less (when a 1.25 mm² 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, Pg 13.5, M20 × 1.5, 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)
Finish: Polyurethane corrosion-resistance coating
Weight: Approx. 8 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 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 oxygen concentration” or errors such as “Abnormal cell e.m.f.” when any such status occurs.
Calibration Functions:
Automatic Calibration; Requires the ZR40H Automatic Calibration Unit. It calibrates automatically at specified intervals.
Semi-automatic Calibration; Requires the ZR40H Automatic 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 detector 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% O₂), output current value (mA), air ratio, moisture quantity (in hot gases) (vol% H₂O)
Display Items: Cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O₂), 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% O₂), zero gas concentration (vol% O₂), calibration mode (automatic, semi-automatic, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min. sec), calibration interval (day/hour), starting time (year/month/day, hour/minute)
Equipment Related Items: Measuring gas selection, Converter Output: Two points mA analog output (4 to 20 mA DC linear or log can be selected. Input/output isolation.

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, calibration, range switching, warming-up, calibration gas pressure decrease, temperature high alarm, blowback, flameout gas detection, calibration coefficient alarm, stabilization timeout.)
Contact Output: Four points, contact capacity 30 V DC 3 A, 250 V AC 3 A (resistive load).

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.

The following functions are programmable for contact outputs:

Contact output 4 is set to normally operated, and fixed error status.

Contact Input: Two points, voltage-free contacts.

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) 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% O₂ (minimum setting: 0.01 vol% O₂).
Span calibration gas concentration setting range; 4.5 to 100 vol% O₂ (minimum setting: 0.01 vol% O₂).
Use N₂-balanced mixed gas containing 0 to 10% scale of oxygen, and 80 to 100% %scale of oxygen for standard zero gas and standard span gas respectively.

Calibration interval; date/time setting; maximum 255 days
3. ZR202G Integrated type Zirconia Oxygen Analyzer

Oxygen 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 number of field devices connected to the loop (multi-drop mode).
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 is greater 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 to use pressure compensated type. When the pressure in the furnace exceeds 5 kPa, pressure compensated type is required.)

No pressure fluctuation in the furnace should be allowed.

Note: When the detector is used in conjunction with a check valve and the ZA8F Flow Setting Unit, the maximum pressure of sample gas is 150 kPa. When with a check valve and the ZR20H Automatic Calibration Unit, it is 200 kPa. If the pressure of your sample gas exceeds these limits, consult with Yokogawa.

Probes:
- Length: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0 m
- Material: JIS SUS316 stainless steel
- Temperature: -20 to +55°C (When the temperature is greater than +70°C on the case surface)
- Storage Temperature: -30 to +70°C
- Ambient Humidity: 0 to 95%RH (non-condensing)
- Power Supply Voltage: 100 to 240 V AC
- Power Supply Frequency: 50/60 Hz
- Power Consumption: Max. 300 W, approx. 100 W for ordinary use.

Reference Gas System:
- Natural Convection, Instrument Air, or Pressure Compensated

Instrument Air System (excluding Natural Convection):
- Pressure: 200 kPa plus the pressure inside the furnace (It is recommended to use air which is dehumidified by cooling to dew point -20°C or less, and dust or oil mist are removed.)
- Consumption: Approx. 1 Nl/min

Wetted Material:
- SUS316 (JIS), Zirconia, SUS304 (JIS) or ASTM grade 304 (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 recirculation pressure compensated version.)

Gas Connection: Rc1/4 or 1/4 NPT(Female)
Wiring Connection: G1/2, Pg 13.5, M20 x 1.5, 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 use a probe protector.

Case:
- Aluminum alloy
Paint:
- Color: 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:
- Automatic Calibration: Requires the ZR20H Automatic Calibration Unit. It calibrates automatically at specified intervals.
- Semi-automatic Calibration: Requires the ZR20H Automatic 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% O₂), output current value (mA), air ratio, moisture quantity (in hot gases) (vol% H₂O), Cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O₂), 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% O₂), zero gas concentration (vol% O₂), calibration mode (automatic, semi-automatic, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration interval (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, oxygen concentration at 4 mA/20 mA (vol% O₂), 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% O₂), oxygen concentration low alarm/low-low alarm limit values (vol% O₂), oxygen concentration alarm hysteresis (vol% O₂), 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, calibration, range switching, warming-up, calibration gas pressure decrease, flameout gas detection (answer-back 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% O₂ in 1 vol% O₂, 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% O₂. 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 either normally energized or normally de-energized status. Delayed functions (0 to 255 seconds) and hysteresis function (0 to 9.9 vol% O₂) can be added to high/low alarms. The following functions are programmable for contact outputs.


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 using optical switches). Either zero or span can be skipped.

Zero calibration gas concentration setting range; 0.3 to 100 vol% O₂ (minimum setting: 0.01 vol% O₂).

Span calibration gas concentration setting range; 4.5 to 100 vol% O₂ (minimum setting: 0.01 vol% O₂).

Use N₂-balanced mixed gas containing 0 to 10% scale of oxygen for standard zero gas, and 80 to 100% scale of oxygen for standard span gas.

Calibration interval; date/time setting: maximum 255 days.
### 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 Object: Water vapor (in vol%) in mixed gases (air and water vapor)
- Measurement System: Zirconia system
- Measurement Range: 0.01 to 100 vol% O₂, 0 to 100 vol% H₂O or 0 to 1.000 kg/kg
- Output Signal: 4 to 20 mA DC (maximum load resistance 550 Ω)
- Setting Range: Any setting in the range of 0 to 5 through 0 to 100 vol% O₂ (in 1 vol% O₂), or partial range.
- Moisture quantity: 0 to 25 through 0 to 100 vol% H₂O (in 1 vol% H₂O), or partial range.
- Mixture ratio: 0 to 0.2 through 0 to 1.000 kg/kg (in 0.001 kg/kg), or partial range.
- Display Range: Oxygen concentration; 0 to 100 vol% O₂, Moisture quantity; 0 to 100 vol% H₂O, Mixture ratio; 0 to 1 kg/kg, Relative humidity; 0 to 100% RH (Note), Dew point; -40 to 370°C (Note)
- Digital Communication (HART): 250 to 550 Ω, depending on number of field devices connected to the loop (multi-drop mode).
- Warm-up Time: Approx. 20 min.
- These characteristics are calculated by oxygen concentration measured in air which include water vapor.
- Repeatability: (see Note 1) ± 1 vol% H₂O; (Sample gas pressure 2 kPa or less)
- Linearity: (Excluding standard gas tolerance) (see Note 1), (Use oxygen of known concentration (in the measuring range) as the zero and span calibration gas.) ± 2 vol% H₂O; (Sample gas pressure: within ± 0.49 kPa) ± 3 vol% H₂O; (Sample gas pressure: 2 kPa or less)
- Drift: (Excluding the first two weeks in use) (see Note 1) Both zero and span ± 3 vol% H₂O/month

#### Response Time:

Response Time: Response of 90% within 5 seconds. (Measured after gas is introduced from calibration gas inlet and analog output starts changing.)

(Note 1) These tolerances do not apply to the pressure compensated version, or where natural convection is used for the reference gas.

**Safety, EMC and RoHS conformity standards for the ZR402G and ZR202G**

- Installation altitude based on IEC 61010: 2000 m or less
- Category based on IEC 61010: II (Note)
- Pollution degree based on IEC 61010: 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.

**Safeties:** EN 61010-1, EN 61010-2-030, CAN/CSA-C22.2 No. 61010-1, UL Std. No. 61010-1

**EMC:** EN 61326-1 Class A, Table 2 (For use in industrial locations)

**Technologies for products in the EU:**

- **RoHS:** EN 50581
- Information of the WEEE Directive

This product is purposely designed to be used in a large scale fixed installations only and, therefore, is out of scope of the WEEE Directive. The WEEE Directive does not apply.

The WEEE Directive is only valid in the EU.

### 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 is greater than 600°C.
  - Sample Gas Pressure: ± 5 to ± 20 kPa (When the pressure in the furnace exceeds 3 kPa, it is recommended to use pressure compensated type. When the pressure in the furnace exceeds 5 kPa, pressure compensated type is required.)
  - 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: JIS SUS316 stainless steel
  - Ambient Temperature: -20 to +150°C
  - **Reference Gas System:** Natural Convection, Instrument Air, or Pressure compensated
  - **Instrument Air System** (excluding Natural Convection): Pressure: 200 kPa plus 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 are removed.)
  - **Consumption:** Approx. 1 Nl/min
  - **Wetted Material:** SUS316 (JIS), Zirconia, SUS304 (JIS) or ASTM grade 304 (flange), Hastelloy B, (Inconel 600, 601)
Operated using an LCD touchscreen on the converter.

High Temperature Humidity Analyzer

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

Automatic Calibration Output: Two points (for dedicated automatic calibration unit)

Ambient Temperature: -20 to +55°C

Storage Temperature: -30 to +70°C

Ambient Humidity: 0 to 95 %RH (non-condensing)

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.

Maximum Distance between Detector and Converter: Conductor two-way resistance must be 10 Ω or less (when a 1.25 mm² 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, Pg 13.5, M20 × 1.5, 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:
Automatic Calibration: Requires the ZR40H Automatic Calibration Unit. It calibrates automatically at specified intervals.

Semi-automatic Calibration: Requires the ZR40H Automatic Calibration Unit. Input calibration direction on the touchscreen or contact, then it calibrates automatically afterwards.


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 detector 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% O₂), moisture quantity (vol% H₂O), mixture ratio (kg/kg), relative humidity (%RH) and dew point (°C)

Display Items: Oxygen concentration (vol% O₂), moisture quantity (vol% H₂O), mixture ratio (kg/kg), relative humidity (%RH), dew point (°C), cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O₂), maximum/minimum/average moisture quantity (vol% H₂O), 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% O₂), zero gas concentration (vol% O₂), calibration mode (automatic, semi-automatic, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration interval (day/ hour), starting time (year/month/day, hour/minute)

Output Related Items: Analog output/output mode selection, output conditions when warmup/maintenance/calibrating/abnormal, oxygen concentration at 4 mA/20 mA (vol% O₂), moisture quantity at 4 mA/20 mA (vol% H₂O), mixture ratio at 4 mA/20 mA (kg/kg), time constant.

Alarm Related Items: Oxygen concentration high alarm/low-low alarm limit values (vol% O₂), oxygen concentration low alarm/low-low alarm limit values (vol% O₂), moisture quantity high alarm/high-high alarm limit values (vol% H₂O), moisture quantity low alarm/low-low alarm limit values (vol% H₂O), mixture ratio high alarm/high-high alarm limit values (kg/kg), mixture ratio low alarm/low-low alarm limit values (kg/kg), oxygen concentration alarm hysteresis (vol% O₂), moisture quantity alarm hysteresis (vol% H₂O), 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 blowback, flameout gas detector calibration, coefficient alarm, stabilization timeout)

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

Range: Any setting between 0 to 5 through 0 to 100 vol% O₂, 0 to 25 through 0 to 100 vol% H₂O, 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% O₂ for the oxygen concentration, 0.1 vol% H₂O 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%O₂) can be added to high/low alarms.

The following functions are programmable for contact outputs.


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% O₂ (minimum setting: 0.01 vol% O₂).
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 number of field devices connected to the loop (multi-drop mode).
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 is less than 600°C.
Sample Gas Pressure: -5 to +20 kPa (When the pressure in the furnace exceeds 3 kPa, it is recommended to use pressure compensated type. When the pressure in the furnace exceeds 5 kPa, pressure compensated type is required.) No pressure fluctuation in the process should be allowed.
Probes Length: 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0 m
Probes Material: JIS SUS316 stainless steel
Ambient Temperature: -20 to +55°C (-5 to +70°C on the case surface)
Ambient Humidity: 0 to 95%RH (non-condensing)
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.
Reference Gas System: Natural Convection, Instrument Air, or Pressure Compensated Instrument Air System (excluding Natural Convection): Pressure: 200 kPa plus the pressure inside the process (It is recommended to use air which is dehumidified by cooling to dew point -20°C or less, and dust or oil mist are removed.)
Consumption: Approx. 1 Nl/min
Wetted Material SUS316 (JIS), Zirconia, SUS304 (JIS) or ASTM grade 304 (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 recirculation pressure compensated version.)

Gas Connection: Rc1/4 or 1/4 NPT (Female)
Wiring Connection: G1/2, Pg 13.5, M20 × 1.5, 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 use a probe protector.
Case: Aluminum alloy
Paint Color: Cover; Mint green (Munsell 5.6BG3.2/2.9)
Finish: Polyurethane corrosion-resistant 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 (JIS 5K 65)
Insertion length of 1.5 m: approx. 12 kg (JIS 5K 65) / approx. 17 kg (JIS 5K 65)
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:
Automatic Calibration; Requires the ZR20H Automatic Calibration Unit. It calibrates automatically at specified intervals.
Semi-automatic Calibration; Requires the ZR20H Automatic 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% O2), moisture quantity (vol% H2O), mixture ratio (kg/kg), relative humidity (%RH), dew point (°C), cell temperature (°C), thermocouple reference junction temperature (°C), maximum/minimum/average oxygen concentration (vol% O2), maximum/minimum/average moisture quantity (vol% H2O), 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% O2), zero gas concentration (vol% O2), calibration mode (automatic, semi-automatic, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration interval (day/month/year), starting time (year/month/day/hour/minute)

Output Related Items: Analog output/output mode selection, output conditions when warming-up/maintenance/calibrating/abnormal, oxygen concentration at 4 mA/20 mA (vol% O2), moisture quantity at 4 mA/20 mA (vol% H2O), 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% O2), oxygen concentration low alarm/low-low alarm limit values (vol% O2), moisture quantity high alarm/high-high alarm limit values (vol% H2O), moisture quantity low alarm/low-low alarm limit values (vol% H2O), mixture ratio high alarm/high-high alarm limit values (kg/kg), mixture ratio low alarm/low-low alarm limit values (kg/kg), oxygen concentration alarm hysteresis (vol% O2), moisture quantity alarm hysteresis (vol% H2O), 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% H2O, 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% O2 for the oxygen concentration, 0.1 vol% H2O 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% O2) can be added to high/low alarms. The following functions are programmable for contact outputs.

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)

Contact capacity: Off-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 using optical switches). Either zero or span can be skipped.

Zero calibration gas concentration setting range; 0.3 to 100 vol% O2 (minimum setting: 0.01 vol% O2).

Span calibration gas concentration setting range; 4.5 to 100 vol% O2 (minimum setting: 0.01 vol% O2).

Use N2-balanced mixed gas containing 0 to 10% scale of oxygen for standard zero gas, and 80 to 100% scale of oxygen for standard span gas.

Calibration interval; date/time setting: maximum 255 days
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 probe adapter.

- **Sample gas temperature:** 0 to 1400°C (when using SiC probe) 0 to 800°C (when using SUS310S 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 ejector assembly is necessary.)
- **Insertion length:** 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.5 m
- **Material in Contact with Gas:** SUS316 (JIS), SiC or SUS310S, SUS304 (JIS) or ASTM grade 304 (flange)
- **Probe Material:** SiC, SUS310S (JIS)
- **Installation:** Flange mounting (FF type or RF type)
- **Probe Mounting Angle:** Vertically downward within ± 5°. Where the probe material is SUS310S, horizontal mounting is available.
- **Construction:** Non explosion-proof. Rainproof

**Material in Contact with Gas:**
- SUS316 (JIS)
- SiC
- SUS310S
- SUS304 (JIS)

**Probes:**
- ZO21S: 0.95 to 1.0 vol% \( O_2 \) (N2-balanced)
- Capacity: 1 l
- Sealed Zero Gas Cylinders (6 provided): E7050BA
- Flange: JIS 5K 65A FF equivalent. ANSI Class 150 4 FF (without serration) equivalent. However, flange thickness is different.
- **Material:** SUS316 (JIS), SUS304 (JIS) or ASTM grade 304 (flange)
- **Weight:** Approx. 3 kg

5. **E7046EC/E7046EN Ejector Assembly for High Temperature Detector of separate type Oxygen Analyzer**

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

- **5.1 Needle Valve**
  - **Connection:** Rc1/4 or 1/4 NPT (Female)
  - **Material:** SUS316 (JIS)
  - **Paint Color:** Munsell 2.8 GY6.4/0.9 equivalent
  - **Power Consumption:** Max. 5 VA

- **5.2 Pressure Gauge Assembly**
  - **Material in Contact with Gas:** SUS316 (JIS)
  - **Case Material:** Aluminum alloy (Paint color; black)
  - **Scale:** 0 to 100 kPa G
  - **Connection:** R1/4 or 1/4 NPT, SUS304 (JIS)
  - **Weight:** Approx. 0.2 kg

- **5.3 Ejector**
  - **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, SUS304 (JIS)
  - **Tube Connection:** (ø6/ø4 mm or 1/4 inch copper tube or stainless tube)

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-CB to reinforce the probe.

- **Insertion Length:** 1.05, 1.55, 2.05 m
- **Flange:** JIS 5K 65A FF equivalent. ANSI Class 150 4 FF (without serration) equivalent. However, flange thickness is different.
- **Material:** SUS316 (JIS), SUS304 (JIS) or ASTM grade 304 (flange)
- **Weight:** 1.05 m; Approx. 8/10/8.5 kg (JIS/ANSI), 1.55 m; Approx. 9/13/11.5 kg (JIS/ANSI), 2.05 m; Approx. 12/16/14.5 kg (JIS/ANSI)
- **Installation:** Bolts, nuts, and washers are provided for detector, probe adapter and process-side flange.

7. **K9471UA Dust Filter for Oxygen Analyzer**

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

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

8. **K9471UC Dust Guard Protector**

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 (JIS)
- **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 65A FF equivalent or ANSI Class 150 4 FF equivalent. (However, flange thickness is different.)
- **Material:** SiC, SUS316 (JIS), SUS304 (JIS) or ASTM grade 304 (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**

The ZO21S does not conform to CE marking.

- **Function:** Portable unit for calibration gas supply consisting 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% \( O_2 \) (N2-balanced)
- **Power Supply:** 100, 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 consists of flowmeter and flow control valve to controls flow rates of calibration gas and reference gas.
Flowmeter Scale: Calibration gas; 0.1 to 1.0 l/min.
Reference gas; 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 1/4 NPT (Female)
Reference Gas Pressure: Clean air supply of sample gas pressure plus approx. 50 kPa G (or sample gas pressure plus approx. 150 kPa G when a check valve is used.) Pressure at inlet of the flow setting unit. (Max. 300 kPa G)
Air Consumption: Approx. 1.5 l/min
Weight: Approx. 2.3 kg

12. ZR40H Automatic Calibration Unit (for Separate type)
Used when automatic 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: Rc1/4 or 1/4 NPT (Female)
Power Supply: 24V DC (from ZR402G), Power consumption: Approx. 1.3 W
Reference Gas Pressure: Sample gas pressure plus approx. 150 kPa G (or more) is needed, standard gas unit cannot be used. When option code “/CV” of the ZR22G or the Zirconia Oxygen Analyzer/High Temperature Humidity Analyzer prove ZR202G.
Connection: Rc1/4 or 1/4 NPT (Female)
Material: SUS316 (JIS)
Weight: Approx. 150 g

13. ZR20H Automatic 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 automatic 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: Rc1/4 or 1/4 NPT (Female)
Power Supply: 24V DC (from ZR202G), Power consumption: 1.3 W
Reference Gas Pressure: Sample gas pressure plus approx. 150 kPa G (or more)
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 (S/V) is selected for the Zirconia Oxygen Analyzer/High Temperature Humidity Analyzer prove ZR22G or the Zirconia Oxygen Analyzer/High Temperature Humidity Analyzer ZR202G.
Connection: Rc1/4 or 1/4 NPT (Female)
Material: SUS316 (JIS)
Weight: Approx. 150 g

15. K9292DN/K9292DS Check Valve
This is used to prevent entry of sample gas into calibration gas line. Purpose is the same as stop valve, but it 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 1/4 NPT (Female)
Material: SUS316 (JIS)
Pressure: Between 70 kPa G or more 350 kPa G or less
Weight: Approx. 90 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 1/4 NPT (F) 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 NPT (F) with joint adapter

17. G7001ZC Zero Gas Cylinder
Capacity: 3.4 l
Filled pressure: 9.8 to 12 MPa G
Composition: 0.95 to 1.0 vol% O2 (N2-balanced)
(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.
18. **G7013XF/G7014XF Pressure Regulator for Gas Cylinder**
Primary Pressure: Max. 14.8 MPa G,
Secondary Pressure: 0 to 0.4 MPa G
Connection: Inlet W22 14 threads, right hand screw
Outlet Rc1/4 or 1/4 NPT (Female)
Material: Brass body

19. **E7014KF Case Assembly of Calibration Gas 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 ACCESSORIES**

**ZR402G**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parts. No.</th>
<th>Q’ty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1</td>
<td>3.15 A</td>
</tr>
<tr>
<td>Bracket</td>
<td>F9554AL</td>
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<tr>
<td>Screws for Bracket</td>
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**ZR22G**

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<thead>
<tr>
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</thead>
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<td>For lock screw</td>
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**ZR202G**

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<th>Parts. No.</th>
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<th>Description</th>
</tr>
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<td>Fuse</td>
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<td>1</td>
<td>3.15 A</td>
</tr>
<tr>
<td>Allen wrench</td>
<td>L9827AB</td>
<td>1</td>
<td>For lock screw</td>
</tr>
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**Model and Code**

1. **Separate type General Purpose Zirconia Oxygen / High Temperature Humidity Analyzer, Converter**

<table>
<thead>
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<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>ZR402G</td>
<td>-</td>
<td>-</td>
<td>Separate type Zirconia Oxygen Analyzer, Converter</td>
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Converter thread:
- P
- G
- M
- T

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<tr>
<th>Display</th>
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<th>Language</th>
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<td>Japanese</td>
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<tr>
<td>-E</td>
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<td>English</td>
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</tr>
<tr>
<td>-C</td>
<td>Chinese</td>
<td>Chinese</td>
<td></td>
</tr>
</tbody>
</table>

Tag plate:
- /SCT
- /PT

NAMUR NE43 compliant:
- /C2
- /C3

Option:
- /HS
- /H

Instruction manual:
- /J
- /E
- /C
- /A

Standard:
- /EQ
- /ER

*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.
*5 "/EQ" is EAC with Pattern Approval for Russia.
"/ER" is EAC for Kazakhstan and Belarus.
(Note) If AC line voltage is 125 V AC or greater, or in the EEC, the ZO21D cannot be used with the ZR402G.

**Model**

<table>
<thead>
<tr>
<th>Language</th>
<th>Japanese</th>
<th>English</th>
<th>German</th>
<th>French</th>
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<td>K9293HU</td>
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<td>K9293HP</td>
<td>K9293HQ</td>
<td>K9293HS</td>
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<td>K9296CN</td>
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<td>K9296CN</td>
<td>K9296CN</td>
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</tbody>
</table>

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.
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

<table>
<thead>
<tr>
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<th>Option code</th>
<th>Description</th>
</tr>
</thead>
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<tr>
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<td>-480</td>
<td></td>
<td>4.8 m (*2)</td>
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<tr>
<td></td>
<td>-540</td>
<td></td>
<td>5.4 m (*2)</td>
</tr>
</tbody>
</table>

Wetted material

- **S**: Stainless steel
- **C**: Stainless steel with Inconel calibration gas tube (*10)

Flange

- **(“3)**
  - **A**: ANSI Class 150 2 RF
  - **B**: ANSI Class 150 3 RF
  - **C**: ANSI Class 150 4 RF
  - **E**: DIN PN10 DN50 A
  - **F**: DIN PN10 DN80 A
  - **G**: DIN PN10 DN100 A
  - **K**: JIS 5K 65 FF
  - **L**: JIS 10K 65 FF
  - **M**: JIS 10K 80 FF
  - **P**: JIS 10K 100 FF
  - **Q**: JIS 5K 32 FF (for high temperature use) (*4)
  - **R**: JPI Class 150 4 RF
  - **S**: JPI Class 150 3 RF
  - **W**: Westlinghouse

Reference gas

- **C**: Natural convection
- **E**: External connection (Instrument air) (*11)
- **P**: Pressure compensated (*11)

Gas Thread

- **R**: Rc1/4
- **T**: 1/4NPT (Female)

Connection box thread

- **P**: G1/2
- **G**: Pg13.5
- **M**: M20 x1.5
- **T**: 1/2 NPT
- **Q**: Quick connect (*9)

Instruction manual

- **J**: Japanese
- **E**: English
- **C**: Chinese

Options

- **C**: Inconel bolt (*5)
- **CV**: Check valve (*6)
- **SV**: Stop valve (*6)
- **F1**: Dust Filter (*7)
- **F2**: Dust Guard Protector (*7)
- **SCT**: Stainless steel tag plate (*8)
- **PT**: Printed tag plate (*8)
- **EQ**: EAC with PA (*12)
- **ER**: EAC (*12)

---

*1 Used with the ZO21P High Temperature Probe Adapter. Select flange (-Q).
*2 When installing horizontally the probe whose insertion length is 2.5 m or more, use the Probe Protector. Be sure to specify ZO21R-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 gas. 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 sample gas contains corrosive gas like chlorine.
*11 Piping for reference gas must be installed to supply reference gas constantly at a specified flow rate.
*12 "/EQ" is EAC with Pattern Approval for Russia. "/ER" is EAC for Kazakhstan and Belarus.
### 3. Integrated type Zirconia Oxygen / High temperature Humidity Analyzer

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
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<tbody>
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<td>ZR202G</td>
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<td>Integrated type Zirconia Oxygen/ High Temperature Humidity Analyzer</td>
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<tbody>
<tr>
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<td>Stainless steel / Stainless steel with Inconel calibration gas tube</td>
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<table>
<thead>
<tr>
<th>Flange</th>
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<td>-B</td>
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<td>-C</td>
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<td>-R</td>
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<td>JPI Class 150 4 RF</td>
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<td>-S</td>
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<tr>
<td>-W</td>
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<table>
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<table>
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<td>External connection (Instrument air)</td>
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<td>-T</td>
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<td>Inconel bolt (*3)</td>
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<tr>
<td>/HS</td>
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<td>Set for Humidity Analyzer (*4)</td>
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</tr>
<tr>
<td>/CV</td>
<td></td>
<td>Check valve (*5)</td>
<td></td>
</tr>
<tr>
<td>/SV</td>
<td></td>
<td>Stop valve (*5)</td>
<td></td>
</tr>
<tr>
<td>/H</td>
<td></td>
<td>Hood (*9)</td>
<td></td>
</tr>
<tr>
<td>/F1</td>
<td></td>
<td>Dust Filter (*6)</td>
<td></td>
</tr>
<tr>
<td>/F2</td>
<td></td>
<td>Dust Guard Protector (*6)</td>
<td></td>
</tr>
<tr>
<td>/SCT</td>
<td></td>
<td>Stainless steel tag plate (*7)</td>
<td></td>
</tr>
<tr>
<td>/PT</td>
<td></td>
<td>Printed tag plate (*7)</td>
<td></td>
</tr>
<tr>
<td>/C2</td>
<td></td>
<td>Failure alarm down-scale:</td>
<td></td>
</tr>
<tr>
<td>/C3</td>
<td></td>
<td>&quot;Output status at CPU failure and hardware error is 3.6 mA or less&quot; (*)12</td>
<td></td>
</tr>
<tr>
<td>/EAC</td>
<td></td>
<td>&quot;Failure alarm up-scale:&quot;</td>
<td></td>
</tr>
<tr>
<td>/PA</td>
<td></td>
<td>&quot;Output status at CPU failure and hardware error is 21.0 mA or more&quot; (*)12</td>
<td></td>
</tr>
<tr>
<td>/PA /C2</td>
<td></td>
<td>&quot;EAC with PA&quot; (*13)</td>
<td></td>
</tr>
<tr>
<td>/EAC /C3</td>
<td></td>
<td>&quot;EAC&quot; (*13)</td>
<td></td>
</tr>
</tbody>
</table>

*1 For the horizontally installed probe whose insertion length is 2.5 m 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 gas 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 Automatic Calibration Unit. Automatic 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 sample gas contains corrosive gas like chlorine.

*11 Piping for reference gas must be installed to supply reference gas constantly at a specified flow rate.

*12 Output signal limits: 3.8 to 20.5 mA. Specify either /C2 or /C3 option code.

*13 "/EQ" is EAC with Pattern Approval for Russia. "/ER" is EAC for Kazakhstan and Belarus.
4. High Temperature Probe Adapter for Separate type Oxygen Analyzer

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZO21P</td>
<td>-H</td>
<td>-</td>
<td>High Temperature Probe Adapter</td>
</tr>
<tr>
<td></td>
<td>-A</td>
<td>-B</td>
<td>SIC, SUS 310S (JIS)</td>
</tr>
</tbody>
</table>

**Insertion length**
-050 -060 -070 -090 -100 -150
0.5 m 0.6 m 0.7 m 0.9 m 1.0 m 1.5 m

<table>
<thead>
<tr>
<th>Flange</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-J</td>
<td>-N</td>
<td>JIS 5K 50 FF</td>
</tr>
<tr>
<td>-M</td>
<td>-L</td>
<td>JIS 10K 60 FF</td>
</tr>
<tr>
<td>-A</td>
<td>-R</td>
<td>ANSI Class 150 4 RF</td>
</tr>
<tr>
<td>-Q</td>
<td>-T</td>
<td>ANSI Class 150 3 RF</td>
</tr>
<tr>
<td>-S</td>
<td>-E</td>
<td>DIN PN10 DN50 A</td>
</tr>
</tbody>
</table>

**Style code**
*B - Style B

**Option**
/EJ1 - Ejector Assy with E7046EC
/EJ2 - Ejector Assy with E7046EN
/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.

5. Ejector Assembly or High Temperature Use of separate type Oxygen Analyzer

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E7046EC</td>
<td>Needle valve; Rc1/4, Pressure gauge; R1/4, Ejector; 26/24 mm TUBE joint: SUS304 (JIS)</td>
</tr>
<tr>
<td>E7046EN</td>
<td>Needle valve; 1/4 NPT(F), Pressure gauge; 1/4 NPT(M), Ejector; 1/4 TUBE joint: SUS304 (JIS)</td>
</tr>
</tbody>
</table>

6. Probe Protector for Zirconia Oxygen Analyzers

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZO21R</td>
<td>-L</td>
<td>-</td>
<td>Probe Protector (0 to 700°C)</td>
</tr>
</tbody>
</table>

**Insertion length**
-100 -150 -200
1.05 m 1.55 m 2.05 m

**Flange**
-1J -1N
JIS 5K 65 FF ANSI Class 150 4 FF

**Style code**
*B - Style B

7. Dust Filter for Zirconia Oxygen Analyzers

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K9471UA</td>
<td>Filter</td>
</tr>
<tr>
<td>K9471UX</td>
<td>Tool</td>
</tr>
</tbody>
</table>

8. Dust Guard Protector

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K9471UC</td>
<td>Dust guard protector</td>
</tr>
</tbody>
</table>

9. Dust Protector for High Temperature Humidity Analyzers

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZH21B</td>
<td>-</td>
<td>-040</td>
<td>Dust Protector (0 to 600°C)</td>
</tr>
</tbody>
</table>

**Insertion length**
0.440 m

**Flange**
-J -A
JIS 5K 60 FF ANSI Class 150 4B FF

**Style code**
*B - Style B

*1 Thickness of flange depends on dimensions of flange.

10. Standard Gas Unit

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZO21S</td>
<td>-2</td>
<td>-3</td>
<td>Standard gas unit</td>
</tr>
</tbody>
</table>

**Power supply**
-2 -3 -4 -5 -7 -8
200 V AC 50/60 Hz 220 V AC 50/60 Hz 240 V AC 50/60 Hz 100 V AC 50/60 Hz 110 V AC 50/60 Hz 115 V AC 50/60 Hz

**Panel**
-J -E
Japanese version English version

**Style code**
*A - Style A
### 11. Flow Setting Unit for manual calibration (Needs instrument air.)

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZA8F</td>
<td>-</td>
<td>-</td>
<td>Flow setting unit</td>
</tr>
<tr>
<td>Joint</td>
<td>-J</td>
<td>-A</td>
<td>Rc1/4 With 1/4 NPT (F) adapter</td>
</tr>
<tr>
<td>Style code</td>
<td>&quot;C&quot;</td>
<td>-</td>
<td>Style C</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR40H</td>
<td>-</td>
<td>-</td>
<td>Automatic calibration unit for ZR402G</td>
</tr>
<tr>
<td>Gas piping connection</td>
<td>-R</td>
<td>-T</td>
<td>G1/2 1/4 NPT (F)</td>
</tr>
<tr>
<td>Wiring connection</td>
<td>-P</td>
<td>-G</td>
<td>M20 x 1.5 1/2 NPT</td>
</tr>
<tr>
<td>-</td>
<td>-A</td>
<td>-</td>
<td>Always -A</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR20H</td>
<td>-</td>
<td>-</td>
<td>Automatic calibration unit for ZR202G *1</td>
</tr>
<tr>
<td>Gas piping connection</td>
<td>-R</td>
<td>-T</td>
<td>Rc1/4 1/4 NPT (F)</td>
</tr>
<tr>
<td>Reference air</td>
<td>*2</td>
<td>-E</td>
<td>Pressure compensated</td>
</tr>
<tr>
<td>Mounting</td>
<td>-A</td>
<td>-B</td>
<td>Vertical mounting</td>
</tr>
<tr>
<td>-</td>
<td>-A</td>
<td>-</td>
<td>Always -A</td>
</tr>
</tbody>
</table>

*1 Ask Yokogawa service station for additional mounting of ZR20H to the preinstalled ZR202G.

*2 Select the appropriate reference gas of ZR20H according to the one of ZR202G.

### 15. Check Valve for Calibration-gas line

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K9292DN</td>
<td>Joint: Rc1/4, Material: SUS304 (JIS)</td>
</tr>
<tr>
<td>K9292DS</td>
<td>Joint: 1/4 NPT (F), Material: SUS304 (JIS)</td>
</tr>
</tbody>
</table>

### 16. Air Set

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7003XF</td>
<td>Joint: Rc1/4, Material: Zinc alloy</td>
</tr>
<tr>
<td>K9473XX</td>
<td>Joint: 1/4 NPT (F), Material: Zinc alloy with adapter</td>
</tr>
<tr>
<td>G7004XF</td>
<td>Joint: Rc1/4, Material: Zinc alloy</td>
</tr>
<tr>
<td>K9473XG</td>
<td>Joint: 1/4 NPT (F), Material: Zinc alloy with adapter</td>
</tr>
</tbody>
</table>

### 17. Zero gas Cylinder

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7001ZC</td>
<td>3.4 l container, 0.95 to 1.0 vol % O2, N2-balanced.</td>
</tr>
</tbody>
</table>

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

### 18. Pressure Regulator for Gas Cylinder

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7013XF</td>
<td>Inlet: W22 14 threads, Outlet: Rc1/4</td>
</tr>
<tr>
<td>G7014XF</td>
<td>Inlet: W22 14 threads, Outlet: 1/4 NPT (F)</td>
</tr>
</tbody>
</table>

### 19. Case Assembly for Calibration-gas Cylinder

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E7044KF</td>
<td>Calibration gas unit case</td>
</tr>
</tbody>
</table>

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

### 14. Stop Valve for Calibration gas line

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>L9852CB</td>
<td>Joint: Rc1/4, Material: SUS316 (JIS)</td>
</tr>
<tr>
<td>G7016XH</td>
<td>Joint: 1/4 NPT (F), Material: SUS316 (JIS)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7209XA</td>
<td>Nipple: R1/4, Material: SUS304 (JIS)</td>
</tr>
<tr>
<td>K9470ZN</td>
<td>Nipple: 1/4 NPT, Material: SUS304 (JIS)</td>
</tr>
</tbody>
</table>
## 20. Heater Assembly

### Style: S2

<table>
<thead>
<tr>
<th>Model</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR22A</td>
<td>-</td>
<td>Heater Assembly for ZR22G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length (*1)</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-015</td>
<td>0.15 m</td>
</tr>
<tr>
<td></td>
<td>-040</td>
<td>0.4 m</td>
</tr>
<tr>
<td></td>
<td>-070</td>
<td>0.7 m</td>
</tr>
<tr>
<td></td>
<td>-100</td>
<td>1 m</td>
</tr>
<tr>
<td></td>
<td>-150</td>
<td>1.5 m</td>
</tr>
<tr>
<td></td>
<td>-200</td>
<td>2 m</td>
</tr>
<tr>
<td></td>
<td>-250</td>
<td>2.5 m</td>
</tr>
<tr>
<td></td>
<td>-300</td>
<td>3 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jig for change</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-A</td>
<td>with Jig (*2)</td>
</tr>
<tr>
<td></td>
<td>-N</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference gas (*3)</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-A</td>
<td>Natural convention, External connection (Instrument air)</td>
</tr>
<tr>
<td></td>
<td>-B</td>
<td>Pressure compensated (for ZR22G S2)</td>
</tr>
<tr>
<td></td>
<td>-C</td>
<td>Pressure compensated (for ZR22G S1)</td>
</tr>
</tbody>
</table>

*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 gas supply method and style.

(Note) The heater is made of ceramic, do not drop or subject it to pressure stress.

### Style: S2

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR202A</td>
<td>-</td>
<td>-</td>
<td>Heater Assembly for ZR202G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length (*1)</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-040</td>
<td>0.4 m</td>
</tr>
<tr>
<td></td>
<td>-070</td>
<td>0.7 m</td>
</tr>
<tr>
<td></td>
<td>-100</td>
<td>1 m</td>
</tr>
<tr>
<td></td>
<td>-150</td>
<td>1.5 m</td>
</tr>
<tr>
<td></td>
<td>-200</td>
<td>2 m</td>
</tr>
<tr>
<td></td>
<td>-250</td>
<td>2.5 m</td>
</tr>
<tr>
<td></td>
<td>-300</td>
<td>3 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jig for change</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-A</td>
<td>with Jig (*2)</td>
</tr>
<tr>
<td></td>
<td>-N</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference gas</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-A</td>
<td>Always -A</td>
</tr>
</tbody>
</table>

*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

![Diagram of model ZR22G](F07_01.ai)

Unit : mm

<table>
<thead>
<tr>
<th>Flange</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI Class 150 2 RF</td>
<td>152.4</td>
<td>120.6</td>
<td>4 - Ø19</td>
<td>19</td>
</tr>
<tr>
<td>ANSI Class 150 3 RF</td>
<td>190.5</td>
<td>152.4</td>
<td>4 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>ANSI Class 150 4 RF</td>
<td>228.6</td>
<td>190.5</td>
<td>8 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>DIN PN10 DN50 A</td>
<td>165.0</td>
<td>125.0</td>
<td>4 - Ø18</td>
<td>18</td>
</tr>
<tr>
<td>DIN PN10 DN60 A</td>
<td>200.0</td>
<td>160.0</td>
<td>8 - Ø18</td>
<td>20</td>
</tr>
<tr>
<td>DIN PN10 DN100 A</td>
<td>220.0</td>
<td>190.0</td>
<td>8 - Ø18</td>
<td>20</td>
</tr>
<tr>
<td>JIS 5K 65 FF</td>
<td>155.0</td>
<td>130.0</td>
<td>4 - Ø15</td>
<td>14</td>
</tr>
<tr>
<td>JIS 10K 65 FF</td>
<td>175.0</td>
<td>140.0</td>
<td>4 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 80 FF</td>
<td>185.0</td>
<td>150.0</td>
<td>8 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 100 FF</td>
<td>210.0</td>
<td>175.0</td>
<td>8 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 5K 32 FF</td>
<td>115.0</td>
<td>99.0</td>
<td>4 - Ø15</td>
<td>5</td>
</tr>
<tr>
<td>JPI Class 150 4 RF</td>
<td>229.0</td>
<td>190.5</td>
<td>8 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>JPI Class 150 3 RF</td>
<td>190.0</td>
<td>152.4</td>
<td>4 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>Westinghouse</td>
<td>155.0</td>
<td>127.0</td>
<td>4 - Ø11.5</td>
<td>14</td>
</tr>
</tbody>
</table>
Model ZR22G...-P (with pressure compensated) Separate type Zirconia Oxygen / High Temperature Humidity Analyzer, Detectors

L = 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)

Flange

<table>
<thead>
<tr>
<th>Flange</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>I</th>
<th>PIPING</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI Class 150 2 RF</td>
<td>152.4</td>
<td>120.6</td>
<td>Ø19</td>
<td>19</td>
<td>A</td>
</tr>
<tr>
<td>ANSI Class 150 3 RF</td>
<td>190.5</td>
<td>152.4</td>
<td>Ø19</td>
<td>24</td>
<td>B</td>
</tr>
<tr>
<td>ANSI Class 150 4 RF</td>
<td>228.6</td>
<td>190.5</td>
<td>Ø19</td>
<td>24</td>
<td>B</td>
</tr>
<tr>
<td>DIN PN10 DN50 A</td>
<td>165</td>
<td>125</td>
<td>Ø18</td>
<td>18</td>
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</tbody>
</table>

Unit: mm
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

- $L = 0.4, 0.7, 1.0, 1.5, 2.0, 2.5, 3.0$ (m)

- Reference gas inlet
- Calibration gas inlet

<table>
<thead>
<tr>
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<th>C</th>
<th>t</th>
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<td>Westinghouse</td>
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<td>127</td>
<td>4 - Ø11.5</td>
<td>14</td>
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</table>

- With sun shield hood (option code /H)

- Material of HOOD: Aluminum

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

Unit: mm

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</table>
4. Model ZO21P Adapter for High Temperature Probe of separate type Oxygen Analyzer

Unit: mm

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</tbody>
</table>
5. **E7046EC, E7046EN Auxiliary Ejector Assembly for High Temperature Detector of separate type Oxygen Analyzer**

![Diagram](F15.ai)

(Unit: mm)

- Needle valve
- Pressure gauge assembly
- Instrument air inlet
- Blow Rc1/4
- Tee
- Nozzle (Note1)
- Ejector
- Detector
- Rc1/4 or 1/4NPT (F)
- Ø6/Ø4 mm or 1/4 inch copper tube (stainless) with ejector to connect
- R1/4 or 1/4 NPT (F)

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

6. **Model ZO21R Probe Protector for Zirconia Oxygen Analyzers**

![Diagram](F17.ai)

(Unit: mm)

- Flange <1> (with bolts, nuts and washer)
- Gas flow
- Washer (M12)
- Mounting nut (M12)
- SUS316 (JIS)
- Dimensions of holes on opposing surface

<table>
<thead>
<tr>
<th>Flange &lt;1&gt;</th>
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<th>l</th>
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</table>

7. **K9471UA Dust Filter for Oxygen Analyzer**

![Diagram](F18.ai)

(Unit: mm)

- Carbonium filter (SiC)
- Screw
- Increasing of insertion length
8. **K9471UC Dust Guard Protector**

Increasing of insertion length

Unit: mm

9. **Model ZH21B Dust Protector for High Temperature Humidity Analyzers**

Install facing upwards.

in case of JIS 5K 80A FF

in case of ANSI CLASS 150 4B FF

Hole dimensions on the opposite side

<table>
<thead>
<tr>
<th>Flange</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>t</th>
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10. **Model ZO21S Standard Gas Unit**

Zero gas cylinder (6 cylinder): E7050BA
11. Model ZA8F Flow setting unit for manual calibration

**Piping inside the flow setting unit**

- **Reference gas outlet**
- **Span gas inlet**
- **Zero gas inlet**

**Model ZA8F-J°C**
- Piping connection port A: 5 - Rc1/4

**Model ZA8F-A°C**
- Piping connection port A: 5 - 1/4 NPT (F)

- **Weight**: Approx. 2.3 kg

- **Unit**: mm

**Dimensions**:
- ø6 Hole: 140 mm
- 235.8 mm
- 222.8 mm
- 8 mm

**Flowmeter**
- **Zero gas inlet**
- **Span gas inlet**
- **Instrument air inlet**

**Air pressure**:
- **Without check valve**: Sample gas pressure + approx. 50 kPaG
- **With check valve**: Sample gas pressure + approx. 150 kPaG
12. Model ZR40H Automatic Calibration Unit for Separate type Analyzer

2B pipe mounting example

Unit: mm

- Wiring inlet: 2-G1/2,Pg 13.5, M20 X 1.5 or 1/2 NPT(F)
  (wiring inlet is at same position on rear)

- *1 with four ISO M6 screws can wall-mount

- Flowmeter
- Needle valve
- Setting Valve for reference gas
- Setting Valve for calibration gas
- Connection port
- Zero gas inlet
- Zero gas outlet
- Reference gas inlet
- Reference gas outlet
- Calibration gas outlet

- 2B pipe mounting example

- ZR402G Converter
- ZR40H Automatic Calibration unit

- CHECK OUT
- REF OUT
- AIR IN
- Instrument air Approx. 1.5 l/min.

- *2 Needle valve is supplied as accessory with flowmeter

- ZR402G Converter
- AC-Z
- AC-S
- AC-C

- Flowmeter
- Flowmeter
- Solenoid valve EV1, 2

- *2 Needle valve is supplied as accessory with flowmeter

- ZR402G Converter
- ZR40H Automatic Calibration unit

- CHECK OUT
- REF OUT
- AIR IN
- Instrument air Approx. 1.5 l/min.

- *2 Needle valve is supplied as accessory with flowmeter
13. Model ZR20H Automatic Calibration Unit for Integrated type Analyzer

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 : Rc1/4(A), R1/4(B)
K9292DS : 1/4 NPT(A), 1/4 NPT(Male)(B)

Unit: mm

16. G7003XF/K9473XK, G7004XF/K9473XG Air Set

Unit: mm

17. G7001ZC Zero gas Cylinder

Unit: mm

(Note) Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.
18. G7013XF, G7014XF Pressure Regulator for Gas Cylinder

Unit: mm

19. E7044KF Case Assembly for Calibration gas Cylinder

Unit: mm

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

Model ZR402G Separate type Zirconia Oxygen / 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.

The protective grounding for the analyzer shall be connected either the protective ground terminal in the equipment or the ground terminal on the case.
Standard regarding grounding: Ground to earth, ground resistance: 100Ω 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:
   - Type of analyzer: □ Oxygen Analyzer □ High Temperature Humidity Analyzer
   - Destination of delivery:
   - Plant name:
   - Object: □ indication □ record □ control □ alarm
   - Measurement points:
   - Fuel: □ gas □ oil □ coal □ others
   - Power requirements: □ V AC □ Hz

2. Process conditions
   - 2.1 Measurement gas components
   - 2.2 Oxygen concentration
   - 2.3 Temperature
   - 2.4 Pressure
   - 2.5 Gas flow
   - 2.6 Dust type, Size
   - 2.7 Corrosive gas
   - 2.8 Combustible gas
   - 2.9 Others

3. Installation site conditions
   - 3.1 Ambient temperature
   - 3.2 Vibration
   - 3.3 1 Probe installation location
   - 3.4 Instrument air supply
   - 3.5 Converter location
   - 3.6 Cable length between probe and converter
   - 3.7 Calibration method

4. Quotation data
   - Quotation Quantity Description
   - Options (for general use)

---
*1 When Automatic 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.