Overview

Two types are available explosionproof direct in situ zirconia oxygen analyzer. Model ZR22S/ZR402G is a separate type which consists of a ZR22S explosionproof probe and a ZR402G non-explosionproof converter. Model ZR202S is an integrated type which combines a probe and a converter.

Separate and integrated type Zirconia oxygen analyzers do not need 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 combustion and controlling the low-oxygen combustion of various industrial furnaces in explosive atmosphere at petroleum refinery, petrochemical plant, and natural gas plant.

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 separate type converter ZR402G incorporates a LCD touch-screen for ease of operation.
- The integrated type ZR202S integrates both probe and converter, to reduce wiring, piping, and installation costs. ZR202S 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 Explosionproof

Example 1

- 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 boilers.
  (for private and public power generation) and in heating furnaces.

System configuration - Integrated type Explosionproof

Example 1

- For an integrated type as shown in the figure above.
- Applications: Oxygen concentration monitoring and control in boilers.
  (for private and public power generation)

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 Explosionproof

Example 2

- 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 boilers.
  (for private and public power generation) and in heating furnaces.

System configuration — Integrated type Explosionproof

Example 2

- 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 boilers.
  (for private and public power generation)
System Components

<table>
<thead>
<tr>
<th>System Components</th>
<th>Separate type</th>
<th>Integrated type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>System config.</td>
<td>System config.</td>
</tr>
<tr>
<td></td>
<td>Ex.1</td>
<td>Ex.2</td>
</tr>
<tr>
<td></td>
<td>Ex.1</td>
<td>Ex.2</td>
</tr>
<tr>
<td><strong>1. ZR22S Separate type Explosionproof Zirconia Oxygen Analyzers Detector</strong></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>*<em>2. ZR402G Separate type Zirconia Oxygen Analyzer, Converter(<em>1)</em></em></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>3. ZR202S Integrated type Explosionproof Zirconia Oxygen Analyzers</strong></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>4. ZO21P Adapter for High Temperature Probe of separate type Zirconia Oxygen Analyzer</strong></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>5. E7046EC, E7046EN Auxiliary Ejector for High Temperature Probe of separate type Oxygen Analyzer</strong></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>6. ZO21R Probe Protector for Zirconia Oxygen Analyzers</strong></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>*<em>7. ZO21S Standard Gas Unit (<em>3)</em></em></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>8. ZA8F Flow setting unit for manual calibration</strong></td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>9. ZR40H Automatic Calibration Unit for Separate type Analyzer</strong></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>*<em>10. Automatic Calibration Unit for Integrated type Analyzer (<em>2)</em></em></td>
<td>(●)</td>
<td>(●)</td>
</tr>
<tr>
<td><strong>11. L9852CB, G7016KH Stop Valve for Calibration-gas line</strong></td>
<td>(●)</td>
<td>(●)</td>
</tr>
<tr>
<td><strong>12. K9292DN, K9292DS Check Valve for Calibration-gas line</strong></td>
<td>●</td>
<td>(●)</td>
</tr>
<tr>
<td><strong>13. K9473XH/K9473XJ, G7004XF/K9473XG Air Set</strong></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>14. G7013XF, G7014XF Pressure Regulator for Gas Cylinder</strong></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>15. ZR22A, ZR202A Heater Assembly for Spare Parts</strong></td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

- ○: Items required for the above system example
- ●: To be selected depending on each application. For details, refer to Chapter of Options.
- (●): Select either
  - (*1): When used as a high temperature humidity analyzer, specify /HS options.
  - (*2): When Auto Calibration of (-A) or (-B) code is specified, Auto Calibration Unit is installed in ZR202S.
  - (*3): Non CE mark

Detector Components

<table>
<thead>
<tr>
<th>Mounting</th>
<th>Insertion length</th>
<th>General-use Probe</th>
<th>Application</th>
<th>Process gas temperature 0 to 700°C</th>
<th>Process gas temperature 0 to 1400°C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal to vertical</td>
<td>2 m or less</td>
<td>General-use Probe</td>
<td>Boiler Heating furnace</td>
<td>Sample outlet</td>
<td>Sample inlet</td>
</tr>
<tr>
<td>Gas Flow</td>
<td>Probe Protector (ZO21R)</td>
<td>Detector (ZR22S or ZR202S)</td>
<td>For pulverized coal boiler with gas flow velocity 10 m/s or more</td>
<td>Boiler</td>
<td>Heating furnace</td>
</tr>
<tr>
<td>Pressure gauge</td>
<td>Blow</td>
<td>Temperature:</td>
<td>Probe material SUS310S 800°C</td>
<td>Mounting: Vertical downwards</td>
<td>Insertion length: 1.0m, 1.5m</td>
</tr>
</tbody>
</table>

Application Example:
Separate and integrated type Zirconia Oxygen Analyzers
- Large, medium and small boilers (boilers for power generation: heavy oil, gas or coal)
- Various industrial furnaces (refinery process/iron manufacture heating furnace, coal kiln, and black liquid recovery boilers)
- For other applications, refer to TI 11M12A01-01E.
- May not be applicable corrosive gas such as ammonia and chlorine.
## STANDARD SPECIFICATIONS

### General Specifications

**Measurement Object:** Oxygen concentration in combustion exhaust gas and mixed gas (excluding inflammable gases). May not be applicable to corrosive gas such as ammonia and chlorine.

**Measurement System:** Zirconia system

**Explosionproof Approval:**
- **ZR202S-A (ATEX):** EExd II B + H₂, Group II, Category 2GD, T2, T300°C
- **ZR22S-A (ATEX):** EExd II B + H₂, Group II, Category 2GD, T2, T300°C
- **ZR202S-B (FM):** Class I, Division 1, Groups B, C and D, Class I/II, Division 1, Groups E, F and G, T2
- **ZR22S-B (FM):** Class I, Division 1, Groups B, C and D, Class I/II, Division 1, Groups E, F and G, T2
- **ZR202S-C (CSA):** Class I, Division 1, Groups B, C and D, Class I/II, Division 1, Groups E, F and G, T2
- **ZR22S-C (CSA):** Class I, Division 1, Groups B, C and D, Class I/II, Division 1, Groups E, F and G, T2
- **ZR202S-D (IECEx):** Exd II B + H₂, T2, Ex tD A21 IP66 T300°C
- **ZR22S-D (IECEx):** Exd II B + H₂, T2, Ex tD A21 IP66 T300°C

**Display Range:** 0 to 100 vol% O₂

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

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

**Display Range:** 0 to 100 vol% O₂

**Repeatability:**
- ± 0.5% Maximum value of set range, (less than 0 to 25 vol% O₂ range)
- ± 1% Maximum value of set range, (0 to 25 vol% O₂ or more and up to 0 to 100 vol% O₂ range)

**Linearity:**
- (Excluding standard gas tolerance)
- (Use oxygen of known concentration (with in the measuring range) as the zero and span calibration gases.)
- ±1% Maximum value of set range, less than 0 to 25 vol% O₂ range
- (Sample gas pressure: within ± 4.9 kPa)
- ±3% Maximum value of set range, 0 to 25 vol% O₂ or more and less than 0 to 50 vol% O₂ range
- (Sample gas pressure: within ± 0.49 kPa)
- ±5% Maximum value of set range, 0 to 50 vol% O₂ or more and up to 0 to 100 vol% O₂ range
- (Sample gas pressure: within ±0.49 kPa)

**Drift:**
- (Excluding the first two weeks in use)
- Both zero and span ± 2% Maximum value of set range/month

**Oxygen Concentration:** 0.01 to 100 vol% O₂

**Sample Gas Pressure:** -5 to +5 kPa
- For 0.15 m probe, -0.5 to +5 kPa.
- No pressure fluctuation in the furnace should be allowed.

**Reference Air System:** Instrument Air

**Ambient Temperature:** -20 to +60°C (-20 to +150°C on the terminal box surface)

**Instrument Air System:** Pressure; 50 kPa + the pressure inside the furnace (It is recommended to use air which has been dehumidified by cooling to dew point -20°C or less, and dust or oil mist removed.)

**Material in Contact with Gas:** SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)

**Construction:**
- Heater and thermocouple replaceable construction.
- Equivalent to NEMA 4X/IP66. (Achieved when pipes are installed at calibration gas and reference air inlets and pipe is installed so that reference air can be exhausted to clean atmosphere. Excluding probe top. And achieved when the cable entry is completely sealed with a cable grand.)

**Material of Insulation Foil:**
- Case: Mint green (Munsell 5.6BG3.3/2.9)
- Finish: Polyurethane corrosion-resistance coating
- Terminal Box Case: Material: Aluminium alloy

**Terminal Box Paint Color:**
- Case: Mint green (Munsell 5.6BG3.3/2.9)
- Cover: Mint green (Munsell 5.6BG3.3/2.9)

**Finish:**
- Polyurethane corrosion-resistance coating

**Gas Connection:**
- Rc 1/4 or 1/4 NPT
- IECEx; M20 by 1.5 mm or 1/2 NPT select one type (2 pieces)
- FM; 1/2 NPT (2 pieces)
- CSA; 1/2 NPT (2 pieces)
- IECEx; M20 by 1.5 mm or 1/2 NPT select one type (2 pieces)

**Wiring Connection:**
- ATEX; M20 by 1.5 mm or 1/2 NPT select one type (2 pieces)
- FM; 1/2 NPT (2 pieces)
- CSA; 1/2 NPT (2 pieces)
- IECEx; M20 by 1.5 mm or 1/2 NPT select one type (2 pieces)

**Installation:**
- Flange mounting

**Probe Mounting Angle:**
- Installing at angles from horizontal to vertical downward is possible.

**Weight:**
- Insertion length of 0.4 m: approx. 13 kg (ANSI 150 4)
- Insertion length of 0.7 m: approx. 14 kg (ANSI 150 4)
- Insertion length of 1.0 m: approx. 15 kg (ANSI 150 4)
- Insertion length of 1.5 m: approx. 17 kg (ANSI 150 4)
- Insertion length of 2.0 m: approx. 19 kg (ANSI 150 4)

**Available Converter:** ZR402G, AV550G
2. **ZR402G Separate type General purpose Zirconia Oxygen Analyzer, Converter**

Converter must not be located in hazardous area.

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
- **Auto-calibration Output:** Two points (for dedicated auto-calibration unit)

**Ambient Temperature:** -20 to +55°C
**Storage Temperature:** -30 to +70°C
**Humidity Range:** 0 to 95% RH (non-condensing)
**Installation Altitude:** 2000 m or less
**Contact Output Signal:** four points (one is fail-safe, normally open)
**Contact Input:** two points
**Auto-calibration Output:** Two points (for dedicated auto-calibration unit)

**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.

**Data Display:** Displays various useful data for maintenance, such as cell temperature, reference junction temperature, maximum/minimum oxygen concentration, or the like
**Status Message:** Indicates an alarm or error occurrence with flashing of the corresponding icon. Indicates status such as warming-up, calibrating, or the like by icons.
**Alarm, Error Display:** Displays alarms such as “Abnormal oxygen concentration” or errors such as “Abnormal cell e.m.f.” when such status occurs.

**Calibration Functions:**
- **Auto-Calibration:** Requires the Auto-calibration Unit. It calibrates automatically at specified intervals.
- **Semi-auto Calibration:** Requires the Auto-calibration Unit. Input calibration direction on the touchscreen or contact, then it calibrates automatically afterwards.
- **Manual Calibration:** Calibration with opening/closing the valve of calibration gas in operation interactively with an LCD touchscreen.

**Blowback Function:** Output through the contact in the set period and time. Auto/semi-auto selectable.

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

**Self-diagnosis:** This function diagnoses conditions of the converter or the probe and indicates when any abnormal condition occurs.

**Password Functions:**
Enter your password to operate the analyzer excepting data display. Individual passwords can be set for maintenance and setup.

**Display and setting content:**
- **Measuring related items:** Oxygen concentration (vol% 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 (auto, semi-auto, manual), calibration type and method (zero-span calibration, zero calibration only, span calibration only), stabilization time (min.sec), calibration time (min.sec), calibration period (day/hour), starting time (year/month/day, hour/minute)

Equipment Related Items: Measuring gas selection
Output Related Items: Analog output/output mode selection, output conditions when warming-up/maintenance/calibrating (during blowback/abnormal, 4 mA/20 mA point oxygen concentration (vol% O₂), time constant, preset values when warming-up/maintenance/calibrating during blowback abnormal, output preset values on abnormal alarm

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 to 4 (abnormal, high-high alarm, high-low alarm, low-low alarm, maintenance, calibration, range switching, warming-up, calibration-gas pressure decrease, temperature high-alarm, blowback, flameout gas detection)

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

Range: any setting between 0 to 5 through 0 to 100 vol% O₂ in 1 vol% O₂ or partial range is available (Maximum range value/minimum range value 1.3 or more)

For the log output, the minimum range value is fixed at 0.1 vol% 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: 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 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.

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

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

Contact capacity: Off-state leakage current: 3 mA or less
Self-diagnosis: Abnormal cell, abnormal cell temperature (low/high), abnormal calibration, defective A/D converter, defective digital circuit

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

Zero calibration-gas concentration setting range: 0.3 to 100 vol% O₂ (0.01 vol% O₂ in smallest units).

Span calibration-gas concentration setting range: 4.5 to 100 vol% O₂ (0.01 vol% O₂ in smallest units).

Use nitrogen-balanced mixed gas containing 10 vol% O₂ scale of oxygen, and 80 to 100 vol% O₂ scale of oxygen for standard zero-gas and standard span-gas respectively.

Calibration period; date/time setting: maximum 255 days

3. ZR202S Integrated type Explosionproof Zirconia Oxygen Analyzer

Display: 6-digit LCD
Switch: Three optical switches
Output Signal: 4 to 20 mA DC, one point (maximum load resistance 550Ω)

Digital Communication (HART): 250 to 5550Ω, depending on quantity of field devices connected to the loop (multi-drop mode).

Note: HART is a registered trademark of the HART Communication Foundation.

Contact Output Signal: Two points (one is fail-safe, normally open)

Contact Input Signal: Two points

Sample Gas Temperature: 0 to 700°C
It is necessary to mount the cell using Inconel cell-bolts when the temperatures measures more than 600°C. High-temperature service – greater than 700°C – is not available.

Sample Gas Pressure: -5 to +5 kPa
No pressure fluctuation in the furnace should be allowed.

Probe Length: 0.4, 0.7, 1.0, 1.5, 2.0
Probe Material: SUS 316 (JIS)

Ambient Temperature: -20 to +55°C (-5 to +70°C on the case surface)

Storage Temperature: -30 to +70°C
Humidity Range: 0 to 95 %RH (non-condensing)
Installation Altitude: 2000 m or less
Category based on IEC 1010: II (Note)
Pollution degree based on IEC 1010: 2 (Note)
  Note: Installation category, called over-voltage category, specifies impulse withstand voltage. Category II is for electrical equipment. Pollution degree indicates the degree of existence of solid, liquid, gas or other inclusions which may reduce dielectric strength. Degree 2 is the normal indoor environment.
Power Supply Voltage: Ratings: 100 to 240 V AC
Acceptable range: 85 to 264 V AC
Power Supply Frequency: Ratings: 50/60 Hz
Acceptable range: 45 to 66 Hz
Power Consumption: Max. 300 W, approx. 100 W for ordinary use.
Safety and EMC conforming standards
  Safety: EN61010-1
  CSA C22.2 No.61010-1
  UL61010-1
  EMC: EN 61326 Class A
  EN 55011 Class A Group 1
  EN 61000-3-2
  AS/NZS CISPR 11
Reference Air System: Instrument Air
Instrument Air System:
  Pressure: 50 kPa + the pressure inside the furnace 150 kPa + the pressure inside the furnace with auto calibration unit. (It is recommended to use air which is dehumidified by cooling to dew point -20˚C or less, and filtering to remove dust or oil mist.)
  Consumption: Approx. 1.5Nl/min
Material in Contact with Gas: SUS 316 (JIS), Zirconia, SUS 304 (JIS) (flange), Hastelloy B, (Inconel 600, 601)
Construction: Heater and thermocouple replaceable construction.
  NEMA 4X/IP66
  (Achieved when pipes are installed at calibration gas and reference air inlet and exhaust pipe is installed so that reference air can be exhausted to clean atmosphere. Excluding probe top.)
  (Achieved when the cable entry is completely sealed with a cable gland.)
Gas Connection: Rc 1/4 or 1/4 NPT
Wiring Connection: ATEX: M20 by 1.5mm, 1/2 NPT select one type (4 pieces)
  FM: 1/2 NPT (4 pieces),
  CSA: 1/2 NPT (4 pieces),
  IECEx: M20 by 1.5mm or 1/2 NPT select one type (4 pieces)
Installation: Flange mounting
Probe Mounting Angle:
  Horizontal to vertically downward.
  Installing at angles from horizontal to vertical downward is available.
Case: Aluminum alloy
Paint Color: Cover: Mint green (Munsell 5.6BG3.3/2.9)
Case: Mint green (Munsell 5.6BG3.3/2.9)
Finish: Polyurethane corrosion-resistance coating
Weight:
  Insertion length of 0.4 m: approx. 15 kg (ANSI 150 4)
  Insertion length of 0.7 m: approx. 16 kg (ANSI 150 4)
  Insertion length of 1.0 m: approx. 17 kg (ANSI 150 4)
  Insertion length of 1.5 m: approx. 19 kg (ANSI 150 4)
  Insertion length of 2.0 m: approx. 21 kg (ANSI 150 4)

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

Display and setting content:
  Display Related Items: Oxygen concentration (vol% 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), Output current value (mA), zero-gas concentration (vol% O₂), 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)
  Output Related Items: Analog output/output mode selection, output conditions when warming-up/maintenance/calibrating/abnormal, 4 mA/20 mA point oxygen concentration (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, calibrating, range switching, warming-up, calibration-gas pressure decrease, flameout gas detection (answerback of contact input))

**Converter Output:**
- One mA analog output point (4 to 20 mA DC (maximum load resistance of 550 Ω)) with mA digital output point (HART)
- 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:
  1. Abnormal
  2. High-high alarm
  3. High-alarm
  4. Low-low alarm
  5. Low-alarm
  6. Maintenance
  7. Calibration
  8. Range switching answer-back
  9. Warm-up
  10. Calibration-gas pressure decrease (answerback of contact input)
  11. Flameout gas detection (answerback of contact input)
- Contact output 2 is set to normally operated, fixed error status.

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

**Calibration:**
- Method: zero/span calibration
  - Calibration mode: automatic, semi-automatic and manual (All are operated using optical switches). Either zero or span can be skipped.
  - Zero-calibration gas concentration setting range: 0.3 to 100 vol% O₂ (in 0.01 vol% O₂).
  - Span-calibration gas concentration setting range: 4.5 to 100 vol% O₂ (in 0.01 vol% O₂).
  - Use nitrogen-balanced mixed gas containing 10 vol% O₂ scale of oxygen for standard zero-gas, and 80 to 100 vol% O₂ scale of oxygen for standard span-gas.
  - Calibration period: date/time setting: maximum 255 days

**4. ZO21P-H High Temperature Probe Adapter**

Measuring O₂ in the high temperature gases (exceeds 700 °C) requires the ZR225S of 0.15m length and a high-temperature probe adapter.

**Sample gas temperature:**
- 0 to 1400°C (when using SiC probe)
- 0 to 800°C (when using SUS 310S probe adapter)

**Sample gas pressure:**
- -0.5 to +5 kPa. When using in the range of 0 to 25 vol% O₂ or more, the sample gas pressure should be in the range of -0.5 to +0.5 kPa. (Where the sample gas pressure for the high-temperature probe is negative, an auxiliary ejector is necessary.)

**Insertion length:**
- 1 m, 1.5 m

**Material in Contact with Gas:**
- SUS 316 (JIS), Zirconia, SiC or SUS 310S, SUS 304 (JIS) (flange)
- Probe Material: SiC, SUS 310S (JIS)
- Installation: Flange mounting (FF type or RF type)
- Probe Mounting Angle: Vertically downward within ±5°
- Where the probe material is SUS 310S, horizontal mounting is available.

**Construction:**
- Non explosion-proof. Rainproof construction

**Weight:**
- Insertion length of 1.0 m: approx. 6.5 kg (JIS) / approx. 8.5 kg (ANSI)
- Insertion length of 1.5m: approx. 7.5 kg (JIS) / approx. 9.5 kg (ANSI)

**5. E7046EC/E7046EN Auxiliary ejector**

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

**5.1 Ejector Assembly**

Ejector Inlet Air Pressure: 28 to 68 kPa G
Air Consumption: Approx. 30 to 40 l/min
Suction gas flow rate: 3 to 7 l/min
Connection: E7046EC R1/4 or E7046EN 1/4 NPT, SUS304 (JIS)
Tube Connection: (6/4 or 1/4 inch copper tube or stainless tube)
5.2 Pressure Gauge Assembly

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

5.3 Needle Valve
- Connection: Rc1/4 or 1/4NPT
- Material: SUS316 (JIS)
- (Note) Pipes and connectors are not provided.

6. ZO21R Probe Protector
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.
- Insertion Length: 1.05 m
- Flange: JIS 5K 65A FF equivalent. ANSI CLASS 150-4-FF (without serration) equivalent or DIN PN10-DN50-A equivalent. However, flange thickness is different.
- Material: SUS316 (JIS), SUS304 (JIS) (Flange)
- Weight: 1.05 m; Approx. 6/10/8.5 kg (JIS/ANSI/DIN), Installation: Bolts, nuts, and washers are provided for detector, probe adapter and process-side flange.

7. ZO21S Standard Gas Unit (+)
- Standard Gas Unit must not be located in hazardous area.
- 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% O₂+N₂ balance
- Power Supply: 100, 110, 115, 200, 220, 240V AC±10%, 50/60 Hz
- Power Consumption: Max.5 VA
- Paint Color: Mainframe; Munsell 2.0GY3.1/0.5 equivalent
- Cover; Munsell 2.8GY6.4/0.9 equivalent
- Weight: Approx. 3 kg
- (+) Non CE Mark.

8. ZA8F Flow Setting Unit
Used when instrument air is provided.
- This unit controls flow rates of calibration gas and reference gas and consists of flowmeter and flow rate control valve.
- Flowmeter: Calibration gas: 0.1 to 1.0 l/min. Reference air: 0.1 to 1.0 l/min.
- Construction: Dust-proof and rainproof construction
- Case Material: SPCG (Cold rolled steel sheet)
- Painting: Baked epoxy resin, Dark-green (Munsell 2.0GY 3.1/0.5 or equivalent)
- Tube Connections: Rc1/4 or 1/4 NPT
- Reference Air pressure: Clean air supply of measured gas pressure plus approx. 50 kPa G measured gas pressure plus approx. 150kPa (pressure rating is 70 to 100 kPa) when a check valve is used (pressure at inlet of the auto-calibration unit)
- Air Consumption: Approx. 1.5 l/min
- Weight: Approx. 2.3 kg

9. ZR40H Auto-calibration Unit for Separate type Analyzer
- Auto-calibration Unit must be located in Non-hazardous area.
- Used when auto calibration is required for the separate type and instrument air is provided. The solenoid valves are provided as standard.
- Construction: Dust-proof and rainproof construction:
  - NEMA 4X / IP67 - only for case coating solenoid valve, not flowmeter (excluding flowmeter)
- Mounting: 2-inch pipe or wall mounting, no vibration
- Finish: Polyurethane corrosion-resistance coating, Mint green (Munsell 5.6BG3.3/2.9)
- Piping Connection: Refer to Model and Suffix Codes
- Power Supply: 24V DC (from ZR402G), Power consumption: Approx. 1.3 W
- Reference Air Pressure: Sample gas pressure + Approx. 150 kPa (Pressure at inlet of auto-calibration unit)
- Air Consumption: Approx. 1.5 l/min
- Weight: Approx. 3.5 kg
- Ambient Temperature: -20 to +55 °C, no condensing and freezing
- Ambient Humidity: 0 to 95%RH
- Storage Temperature: -30 to +65°C

10. Automatic Calibration Unit for Integrated type Analyzer
- When Auto Calibration of (-A) or (-B) code is specified, Auto Calibration Unit is installed in ZR202S.
- Only Auto Calibration Unit is not available.

11. L9852CB/G7016XH Stop Valve
- The stop valve and the nipple are mounted on the calibration gas line.
- The nipple is used to connect the stop valve. They are attached when the suffix code (/SV) is selected for the ZR22S or the ZR202S.
- Connection: L9852CB Rc 1/4 or G7016XH 1/4 NPT
- Material: SUS316 (JIS)
- Weight: Approx. 80 g

12. K9292DN/K9292DS Check Valve
- This is used to prevent entry of process gas into calibration gas line. Purpose is the same as stop valve, but is convenient, as it does not need to be opened or closed for calibration.
Mount directly on calibration gas inlet of detector in place of stop valve. However as source pressure of 150 kPa G or more is needed, standard gas unit cannot be used. When option code “/CV” of the ZR22S or the ZR202S is specified, check valve is provided.

- **Connection**: K9292DN Rc1/4 or K9292DS 1/4 NPT
- **Material**: SUS304 (JIS)
- **Pressure**: Between 70 kPa G or more 350 kPa G or less
- **Weight**: Approx. 40g

13. **Air Set**

**K9473XH/K9473XJ**
- **Primary Pressure**: Max. 2 MPa G
- **Secondary Pressure**: 0 to 250 kPa G
- **Connection**: K9473XH Rc1/4 or K9473XJ 1/4 NPT with joint adapter

**G7004XF/K9473XG**
- **Primary Pressure**: Max. 1 MPa G
- **Secondary Pressure**: 20 to 500 kPa G
- **Connection**: G7004XF Rc1/4 or K9473XG 1/4 NPT with joint adapter

14. **G7013XF/G7014XF Cylinder Pressure Regulator**
- **Primary Pressure**: 14.8 MPa G
- **Secondary Pressure**: 0 to 0.4 MPa G
- **Connection**: Inlet W22 14 threads, right hand screw
- **Outlet**: G7013XF Rc1/4 or G7014XF 1/4NPT
- **Material**: Brass body

15. **ZR22A, ZR202A Heater Assembly**
- **ZR22A**: Spare Parts for ZR22S
- **ZR202A**: Spare Parts for ZR202S
- **(Note)** Yokogawa shall not guarantee the heater assembly after its replacement.

16. **E7044KF Case Assembly of Calibration Cylinder**
- **Case Paint**: Baked epoxy resin, Jade green (Munsell 7.5 BG 4/1.5)
- **Installation**: 2B pipe mounting
- **Weight**: Approx. 10kg
- **(Note)** Export of such high pressure filled gas cylinders to most countries is prohibited or restricted.

**STANDARD ACCESSARIES**

**ZR402G**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parts No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse</td>
<td>A1113EF</td>
<td>1</td>
<td>3.15A</td>
</tr>
<tr>
<td>Bracket</td>
<td>F9054AL</td>
<td>1</td>
<td>For pipe, panel or wall mounting</td>
</tr>
<tr>
<td>Screws for Bracket</td>
<td>F9123GF</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**ZR22S**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parts No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allen wrench</td>
<td>L9827AB</td>
<td>1</td>
<td>For lock screw</td>
</tr>
</tbody>
</table>

**ZR202S**

<table>
<thead>
<tr>
<th>Item</th>
<th>Parts No.</th>
<th>Qty</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuse</td>
<td>A1113EF</td>
<td>1</td>
<td>3.15A</td>
</tr>
<tr>
<td>Allen wrench</td>
<td>L9827AB</td>
<td>1</td>
<td>For lock screw</td>
</tr>
</tbody>
</table>
# Model and Suffix Codes

## 1. Separate type Explosionproof Zirconia Oxygen Analyzer, Detectors

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR202S</td>
<td>-A</td>
<td></td>
<td>Integrated type Explosionproof Zirconia Oxygen Analyzer</td>
</tr>
<tr>
<td></td>
<td>-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-C</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-D</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Explosion proof Approval

<table>
<thead>
<tr>
<th>Length</th>
<th>0.4 m</th>
<th>0.7 m</th>
<th>1.0 m</th>
<th>1.5 m</th>
<th>2.0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>-040</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-070</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- ATEX certified flameproof (*11)
- FM certified explosionproof
- CSA certified explosionproof
- IECEx certified flameproof (*12)

### Wetted material

<table>
<thead>
<tr>
<th>Length</th>
<th>SUS316</th>
<th>Stainless steel with Inconel calibration gas tube (*7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-040</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-070</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Flange

<table>
<thead>
<tr>
<th>Flange</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>P</th>
<th>R</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>-A</td>
<td>ANSI 150 2 RF SUS304 (*10)</td>
<td>ANSI 150 3 RF SUS304</td>
<td>ANSI 150 4 RF SUS304</td>
<td>DIN PN10 DN50 A SUS304 (*10)</td>
<td>DIN PN10 DN80 A SUS304</td>
<td>DIN PN10 DN100 A SUS304</td>
<td>JIS 5K 65 FF SUS304</td>
<td>JIS 10K 65 FF SUS304</td>
<td>JIS 10K 80 FF SUS304</td>
<td>JIS 10K 100 FF SUS304</td>
<td>JPI Class 150 4 RF SUS304</td>
<td>JPI Class 150 3 RF SUS304</td>
<td>Westinghouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Auto Calibration

<table>
<thead>
<tr>
<th>Auto Calibration</th>
<th>N</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>-N</td>
<td>Not required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reference air

<table>
<thead>
<tr>
<th>Reference air</th>
<th>E</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>-E</td>
<td>External connection (Instrument air) (*8)</td>
<td></td>
</tr>
<tr>
<td>-E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Gas Thread

<table>
<thead>
<tr>
<th>Gas Thread</th>
<th>R</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>-R</td>
<td>Rc 1/4</td>
<td></td>
</tr>
<tr>
<td>-T</td>
<td>1/4 NPT(F)</td>
<td></td>
</tr>
</tbody>
</table>

### Connection box thread

<table>
<thead>
<tr>
<th>Connection box thread</th>
<th>M20x1.5 mm</th>
<th>1/2 NPT</th>
</tr>
</thead>
<tbody>
<tr>
<td>-M</td>
<td>M20x1.5 mm</td>
<td></td>
</tr>
<tr>
<td>-T</td>
<td>1/2 NPT</td>
<td></td>
</tr>
</tbody>
</table>

### Instruction manual

<table>
<thead>
<tr>
<th>Instruction manual</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>-E</td>
<td>English</td>
</tr>
<tr>
<td>-E</td>
<td></td>
</tr>
</tbody>
</table>

### Options

<table>
<thead>
<tr>
<th>Options</th>
<th>-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>-A</td>
<td>Always -A</td>
</tr>
</tbody>
</table>

### Notes

*1 The thickness of the flange depends on its dimensions.
*2 Inconel probe bolts and U shape pipe are used. Use this option for high temperature use (ranging from 600 to 700°C).
*3 Specify either /CV or /SV option code. Please select /CV or /SV.
*4 Specify either /SCT or /PT option code.
*5 No need to specify the option codes, /CV and /SV, since the check valves are provided with the autocalibration unit.
*6 Sun shield hood is still effective even if scratched. Hood is necessary for outdoor installation out of sun shield roof.
*7 Recommended if measured gas contains corrosive gas like chlorine.
*8 Piping for reference air must be installed to supply reference air constantly at a specified flow rate.
*9 When selecting code -B (FM certified explosionproof) or -C (CSA certified explosionproof), select code -T(1/2 NPT).
*10 Confirm inside diameter of pipe attached to customer’s flange in case that -A or -E is selected.
*11 Certified cable glands that meet or exceed the requirements for Exd II B+H; Ip66, provide at least 6 threads engaged when installed, and resist heat so that they can be used in the operating environment, should be used.
*12 Certified cable glands that meet or exceed the requirements for Exd II B+H; T2; Ex d A21 Ip66 T300°C, provide at least 6 threads engaged when installed, and resist heat so that they can be used in the operating environment, should be used.
## 2. Separate type General Purpose Zirconia Oxygen Analyzer, Converter

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR402G</td>
<td>-</td>
<td>-</td>
<td>Separate type Zirconia Oxygen Analyzer, Converter</td>
</tr>
<tr>
<td>Converter thread</td>
<td>-P</td>
<td>-</td>
<td>G1/2</td>
</tr>
<tr>
<td></td>
<td>-G</td>
<td>-</td>
<td>Pg13.5</td>
</tr>
<tr>
<td></td>
<td>-M</td>
<td>-</td>
<td>M20x1.5 mm</td>
</tr>
<tr>
<td></td>
<td>-T</td>
<td>-</td>
<td>1/2NPT</td>
</tr>
<tr>
<td>Display</td>
<td>-J</td>
<td>-</td>
<td>Japanese</td>
</tr>
<tr>
<td></td>
<td>-E</td>
<td>-</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td>-G</td>
<td>-</td>
<td>German</td>
</tr>
<tr>
<td></td>
<td>-F</td>
<td>-</td>
<td>French</td>
</tr>
<tr>
<td>Instruction manual</td>
<td>-J</td>
<td>-</td>
<td>Japanese</td>
</tr>
<tr>
<td></td>
<td>-E</td>
<td>-</td>
<td>English</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-A</td>
<td>Always -A</td>
</tr>
<tr>
<td>Options</td>
<td>Tag plates</td>
<td>/H</td>
<td>Hood (*2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/SCT</td>
<td>Stainless steel tag plate (*1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/PT</td>
<td>Printed tag plate (*1)</td>
</tr>
</tbody>
</table>

*1 Specify either /SCT or /PT option code.
*2 Sun shield hood is still effective even if scratched.
### 3. Integrated type Explosionproof Zirconia Oxygen Analyzer

<table>
<thead>
<tr>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR22S</td>
<td>------------</td>
<td>-----------</td>
<td>Separate type Explosionproof Zirconia Oxygen Analyzer, Detector</td>
</tr>
</tbody>
</table>

**Explosion proof Approval**
- A
- B
- C
- D
- E
- F
- G
- H
- I
- K
- L
- M
- N
- P
- Q
- R
- S
- T
- U
- V
- W
- X
- Y
- Z

**Length**
- 0.15 m (for high temperature use) (*1)
- 0.4 m
- 0.7 m
- 1.0 m
- 1.5 m
- 2.0 m

**Wetted material**
- S
- C
- Stainless steel with Inconel calibration gas tube (*7)

**Flange**
(*2)
- A
- B
- C
- E
- F
- G
- H
- I
- J
- K
- L
- M
- N
- P
- Q
- R
- S
- T
- W
- A

**Reference air**
(*3)
- E
- External connection (Instrument air)

**Gas Thread**
- R
- T
- Re 1/4
- 1/4 NPT

**Connection box thread**
- M
- T
- M20 x 1.5 mm
- 1/2 NPT

**Instruction manual**
(*9)
- E
- English

**Options**
(*4)
- /C
- Inconel bolt
- /CV
- Check valve
- /SV
- Stop valve
- /SCT
- Stainless steel tag plate
- /PT
- Printed tag plate

*1 Used with the ZO21P High Temperature Probe Adapter. Select flange (-Q).
*2 The thickness of the flange depends on its dimensions.
*3 The flange thickness does not conform to JIS specification.
*4 Inconel probe bolts and U shape pipe are used. Use this option for high temperature use (ranging from 600 to 700°C).
*5 Specify either /CV or /SV option code. Please select /CV or /SV.
*6 Specify either /SCT or /PT option code.
*7 Recommended if measured gas contains corrosive gas like chlorine.
*8 Piping for reference air must be installed to supply reference air constantly at a specified flow rate.
*9 When selecting code -B (FM certified explosionproof) or -C (CSA certified explosionproof), select code -T (1/2 NPT).
*10 Confirm inside diameter of pipe attached to customer’s flange in case that -A or -E is selected.
*11 Certified cable glands that meet or exceed the requirements for EExd II B+H: IP66, provide at least 6 threads engaged when installed, and resist heat so that they can be used in the operating environment, should be used.
*12 Certified cable glands that meet or exceed the requirements for Exd II B+H: T2, Ex tD A21 IP66 T300°C, provide at least 6 threads engaged when installed, and resist heat so that they can be used in the operating environment, should be used.
4. Adapter for High Temperature Probe of 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>SiC, insertion length 1.0 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>SUS 310S, insertion length 1.5 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>JIS 5K 50 FF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>JIS 10K 65 FF SUS304t</td>
<td></td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>JIS 10K 60 FF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>JIS 10K 100 FF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>ANSI Class 150 4 RF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>ANSI Class 150-2 1/2 RF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O</td>
<td>ANSI Class 150 3 RF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>T</td>
<td>JPI Class 150 3 RF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>JPI Class 150 4 RF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>DIN PN10 DN50 A SUS304</td>
<td></td>
</tr>
</tbody>
</table>

Note: For this high-temperature use probe adapter, be sure to specify the ZR22S probe of its insertion length 0.15 meters.

High temperature Probes (Spare Parts)

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E7046AL</td>
<td>SiC, insertion length 1.0 m</td>
</tr>
<tr>
<td>E7046BB</td>
<td>SiC, insertion length 1.5 m</td>
</tr>
<tr>
<td>E7046AP</td>
<td>SUS310S, insertion length 1.0 m</td>
</tr>
<tr>
<td>E7046AQ</td>
<td>SUS310S, insertion length 1.5 m</td>
</tr>
</tbody>
</table>

5. Auxiliary Ejector for 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>Rc 1/4 6/8 TUBE joint: SUS304 (JIS)</td>
</tr>
<tr>
<td>E7046EN</td>
<td>1/4 NPT, 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℃)</td>
</tr>
<tr>
<td></td>
<td>-100</td>
<td>1.05 m (3.5 ft)</td>
<td></td>
</tr>
<tr>
<td>Flange (*1)</td>
<td>J</td>
<td>JIS 5K 65 FF SUS304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>ANSI Class 150 4 FF SUS304</td>
<td></td>
</tr>
<tr>
<td>Style code</td>
<td>B</td>
<td>Style B</td>
<td></td>
</tr>
</tbody>
</table>

*1 Thickness of flange depends on dimensions of flange.

7. 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></td>
<td>200 V AC 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>-3</td>
<td></td>
<td>220 V AC 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>-4</td>
<td></td>
<td>240 V AC 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>-5</td>
<td></td>
<td>100 V AC 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>-7</td>
<td></td>
<td>110 V AC 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>-8</td>
<td></td>
<td>115 V AC 50/60 Hz</td>
</tr>
</tbody>
</table>

Panel

<table>
<thead>
<tr>
<th>J</th>
<th>Japanese version</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>English version</td>
</tr>
</tbody>
</table>

Style code

* A Style A

8. 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></td>
<td>Rc 1/4</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>With 1/4&quot; NPT adapter</td>
<td></td>
</tr>
</tbody>
</table>

Style code

* A Style B
9. 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>-R</td>
<td>-T</td>
<td>Automatic calibration unit for ZR402G</td>
</tr>
</tbody>
</table>

- R piping connection: Rc 1/4
- T piping connection: 1/4" NPT
- P wiring connection: Pipe connection (G1/2)
- G wiring connection: Pg 13.5
- M wiring connection: 20 mm (M20 x 1.5)
- T wiring connection: 1/2 NPT

(+) CE marking (pending).

10. Automatic Calibration Unit for Integrated type Analyzer ZR202S

When Auto Calibration of (-A) or (-B) code is specified, Auto Calibration Unit is installed in ZR202S.
When (-N) is selected, Auto Calibration Unit is not available.

11. Stop Valve for Calibration-gas line

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

<table>
<thead>
<tr>
<th>Nipple</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7209XA</td>
<td>R c 1/4, Material: SUS316 (JIS)</td>
<td></td>
</tr>
<tr>
<td>K9470ZN</td>
<td>1/4 NPT, Material: SUS316 (JIS)</td>
<td></td>
</tr>
</tbody>
</table>

12. Check Valve for Calibration-gas line

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

13. Air Set

<table>
<thead>
<tr>
<th>Air set</th>
<th>Part No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>K9473XH</td>
<td>Joint: Rc 1/4, Material: Aluminum</td>
<td></td>
</tr>
<tr>
<td>K9473XJ</td>
<td>Joint: 1/4 NPT(F), Material: Body: Aluminum Adapter: Zinc alloy</td>
<td></td>
</tr>
<tr>
<td>G7004XF</td>
<td>Joint: Rc 1/4, Material: Zinc alloy</td>
<td></td>
</tr>
<tr>
<td>K9473XG</td>
<td>Joint: 1/4 NPT(F), Material: Zinc alloy with adapter</td>
<td></td>
</tr>
</tbody>
</table>

14. 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: Rc 1/4</td>
</tr>
<tr>
<td>G7014XF</td>
<td>Inlet: W22 14 threads Outlet: 1/4 NPT(F)</td>
</tr>
</tbody>
</table>

15. Heater Assembly

<table>
<thead>
<tr>
<th>Heater Assembly</th>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR22A</td>
<td>-040</td>
<td>-070</td>
<td>-100</td>
<td>-150</td>
</tr>
<tr>
<td></td>
<td>0.15 m</td>
<td>0.4 m</td>
<td>0.7 m</td>
<td>1.5 m</td>
</tr>
</tbody>
</table>

- Jig for change (-A) with Jig (Note): All A
- None

1. Suffix code of length should be selected as same as ZR22S 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.
Yokogawa shall not guarantee the heater assembly after its replacement.

<table>
<thead>
<tr>
<th>Heater Assembly</th>
<th>Model</th>
<th>Suffix code</th>
<th>Option code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZR202A</td>
<td>-040</td>
<td>-070</td>
<td>-100</td>
<td>-150</td>
</tr>
<tr>
<td></td>
<td>0.4 m</td>
<td>0.7 m</td>
<td>1.0 m</td>
<td>1.5 m</td>
</tr>
</tbody>
</table>

- Jig for change (-A) with Jig (Note): All A
- None

1. Suffix code of length should be selected as same as ZR202 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.
Yokogawa shall not guarantee the heater assembly after its replacement.
### EXTERNAL DIMENSIONS

1. ZR22S Separate type Explosionproof Zirconia Oxygen Analyzer, Detectors

<table>
<thead>
<tr>
<th>L (m)</th>
<th>Tolerance (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>±4</td>
</tr>
<tr>
<td>0.4</td>
<td>±5</td>
</tr>
<tr>
<td>0.7</td>
<td>±7</td>
</tr>
<tr>
<td>1.0</td>
<td>±8</td>
</tr>
<tr>
<td>1.5</td>
<td>±10</td>
</tr>
<tr>
<td>2.0</td>
<td>±12</td>
</tr>
</tbody>
</table>

![Diagram](F2.1E.EPS)

<table>
<thead>
<tr>
<th>Flange</th>
<th>A</th>
<th>B</th>
<th>n</th>
<th>C</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANSI Class 150 2 RF SUS304</td>
<td>152.4</td>
<td>120.6</td>
<td>4</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>ANSI Class 150 3 RF SUS304</td>
<td>190.5</td>
<td>152.4</td>
<td>4</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>ANSI Class 150 4 RF SUS304</td>
<td>228.6</td>
<td>190.5</td>
<td>8</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>DIN PN10 DN50 A SUS304</td>
<td>165</td>
<td>125</td>
<td>4</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>DIN PN10 DN80 A SUS304</td>
<td>200</td>
<td>160</td>
<td>8</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>DIN PN10 DN100 A SUS304</td>
<td>220</td>
<td>180</td>
<td>8</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>JIS 5K 65 FF SUS304</td>
<td>155</td>
<td>130</td>
<td>4</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>JIS 10K 65 FF SUS304</td>
<td>175</td>
<td>140</td>
<td>4</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 80 FF SUS304</td>
<td>185</td>
<td>150</td>
<td>8</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 100 FF SUS304</td>
<td>210</td>
<td>175</td>
<td>8</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 5K 32 FF SUS304</td>
<td>115</td>
<td>90</td>
<td>4</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>JPI Class 150 4 RF SUS304</td>
<td>229</td>
<td>190.5</td>
<td>8</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>JPI Class 150 3 RF SUS304</td>
<td>190</td>
<td>152.4</td>
<td>4</td>
<td>19</td>
<td>24</td>
</tr>
<tr>
<td>Westinghouse</td>
<td>155</td>
<td>127</td>
<td>4</td>
<td>11.5</td>
<td>14</td>
</tr>
</tbody>
</table>
2. ZR402G Separate type Zirconia Oxygen Analyzers, Converter

- With sun shield hood (option code /H)
3. ZR202S Integrated type Explosionproof Zirconia Oxygen Analyzers

<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 SUS304</td>
<td>152.4</td>
<td>120.6</td>
<td>4 - Ø19</td>
<td>19</td>
</tr>
<tr>
<td>ANSI Class 150 3 RF SUS304</td>
<td>190.5</td>
<td>152.4</td>
<td>4 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>ANSI Class 150 4 RF SUS304</td>
<td>228.6</td>
<td>190.5</td>
<td>8 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>DIN PN10 DN60 SUS304</td>
<td>165</td>
<td>125</td>
<td>4 - Ø18</td>
<td>18</td>
</tr>
<tr>
<td>DIN PN10 DN80 SUS304</td>
<td>200</td>
<td>160</td>
<td>8 - Ø18</td>
<td>20</td>
</tr>
<tr>
<td>DIN PN10 DN100 SUS304</td>
<td>220</td>
<td>180</td>
<td>8 - Ø18</td>
<td>20</td>
</tr>
<tr>
<td>JIS SK 65 FF SUS304</td>
<td>155</td>
<td>130</td>
<td>4 - Ø15</td>
<td>14</td>
</tr>
<tr>
<td>JIS 10K 65 FF SUS304</td>
<td>175</td>
<td>140</td>
<td>4 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 80 FF SUS304</td>
<td>185</td>
<td>150</td>
<td>8 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JIS 10K 100 FF SUS304</td>
<td>210</td>
<td>175</td>
<td>8 - Ø19</td>
<td>18</td>
</tr>
<tr>
<td>JPI Class 150 4 RF SUS304</td>
<td>229</td>
<td>190.5</td>
<td>8 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>JPI Class 150 3 RF SUS304</td>
<td>190</td>
<td>152.4</td>
<td>4 - Ø19</td>
<td>24</td>
</tr>
<tr>
<td>Westinghouse</td>
<td>155</td>
<td>127</td>
<td>4 - Ø11.5</td>
<td>14</td>
</tr>
</tbody>
</table>

- With sun shield hood (option code /H)

Material of HOOD : Aluminum
ZR202S Integrated type Explosionproof Zirconia Oxygen Analyzers

With Auto Calibration Unit (Horizontal Mount)

With Auto Calibration Unit (Vertical Mount)
4. ZO21P Adapter for High Temperature Probe of separate type Oxygen Analyzer

Unit: mm

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

Unit: mm

(Note 1) The connector of ejector assembly is a dedicated connector with nozzle function.

E7046EC: RC1/4 connection
E7046EN: 1/4 NPT connection
6. ZO21R Probe Protector for Zirconia Oxygen Analyzers

<table>
<thead>
<tr>
<th>Flange&lt;1&gt;</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>l</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>JIS 5K 65 FF SUS304</td>
<td>155</td>
<td>130</td>
<td>4- φ15</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>ANSI Class 150 4 FF SUS304</td>
<td>228.6</td>
<td>190.5</td>
<td>8- φ19</td>
<td>12</td>
<td>50</td>
</tr>
</tbody>
</table>

7. ZO21S Standard Gas Unit (Non CE Mark)

Flow checker
Span gas valve
Zero gas valve
Gas outlet

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

Reference air outlet
Cal. gas outlet
Span gas inlet
Zero air inlet

Reference Check
REFERENCE SRAN ZERO
CHECK
GAS IN
AIR IN

Instrument air
Approx. 1.5 l/min.

Air pressure:
- Without check valve: approx. 50 kPaG
- With check valve: approx. 150 kPaG

All Rights Reserved. Copyright © 2005, Yokogawa Electric Corporation
9. ZR40H Automatic Calibration Unit for Separate type Analyzer

**2B pipe mounting example**

- **Flowmeter**
- **Setting Valve for reference air**
- **Setting Valve for calibration gas**
- **Calibration gas outlet** Rc1/4 or 1/4 NPT(Female)
- **Zero gas inlet** Rc1/4 or 1/4 NPT(Female)
- **Reference air inlet** Rc1/4 or 1/4 NPT(Female)
- **Reference air outlet**

*With four ISO M6 screws can wall-mount

**Wiring inlet : 2 G1/2, Pg13.5, M20×1.5 or 1/2NPT(Female)**

(wiring inlet is at the same position on rear)

**Flowmeter**

**Setting Valve for reference air**

**Setting Valve for calibration gas**

**Calibration gas outlet** Rc1/4 or 1/4 NPT(Female)

**Zero gas inlet** Rc1/4 or 1/4 NPT(Female)

**Reference air inlet** Rc1/4 or 1/4 NPT(Female)

**Reference air outlet**

*1 With four ISO M6 screws can wall-mount

**F21.EPS**

**CHECK OUT**

**REF OUT**

**solenoid valve EV1,2**

**flow meter**

**flow meter**

**Instrument air Approx. 1.5 l/min.**

*2 Needle valve is supplied as accessory with flow meter

**F22.EPS**

---

ZR402G Converter

- **AC-Z**
- **AC-S**
- **AC-C**

ZR40H Automatic Calibration unit

- **Zero**
- **Span**

---

Instrument air Approx. 1.5 l/min.
10. Automatic Calibration Unit for Integrated type Analyzer
When Auto Calibration of (-A) or (-B) code is specified, Auto Calibration Unit is installed in ZR202S.
Refer to the 20 Pages for the figure.
When (-N) is selected, Auto Calibration Unit is not available.

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

12. K9292DN /K9292DS Check Valve for Calibration-gas line
13. Air Set

K9473XH /K9473XJ

G7004XF /K9473XG

Unit: mm
Dimensions in parentheses are approximate.

14. G7013XF, G7014XF Pressure Regulator for Gas Cylinder

Part No.  | + Outlet
----------|----------
G7013XF   | Rc1/4    
G7014XF   | 1/4 NPT female screw
WIRING CONNECTIONS

**ZR402G Separate type Zirconia Oxygen Analyzer Converter**

- Analog output 1: 4-20 mA DC with Digital output
- Analog output 2: 4-20 mA DC

**ZR22S Separate type Zirconia Oxygen Analyzer, Detector**

- Contact input 1
- Contact output 1
- Contact output 2
- Contact output 3
- Contact output 4

**ZR202S Integrated type Zirconia Oxygen Analyzer**

- Contact input 1
- Contact input 2
- Contact output 1
- Contact output 2

*1 Ground resistance is 100 ohm or less.
Inquiry Sheet for Models ZR22S, ZR402G, and ZR202S Direct In Situ Zirconia Oxygen Analyzers

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

1. General information
   
   Customer: 
   Destination of delivery: 
   Plant name: 
   Measurement points: 
   Object: 
   Fuel: 
   Power requirements: 

2. Process conditions

   2.1 Measurement gas components
   - Nor. Min. Max. □ vol% O₂, □

   2.2 Oxygen concentration
   - Nor. Min. Max. □

   2.3 Temperature
   - Nor. Min. Max. □ °C, □

   2.4 Pressure
   - Nor. Min. Max. □ kPa, □

   2.5 Gas flow
   - Nor. Min. Max. □ m/sec, □

   2.6 Dust type, Size
   - Nor. Min. □ μm quantity □ g/Nm³, □

   2.7 Corrosive gas
   - □ No gas □ Gas □ ppm, □
   - □ quantity □ ppm, □

   2.8 Combustible gas
   - □ No gas □ Gas □ ppm, □
   - □ quantity □ ppm, □

   2.9 Others

3. Installation site conditions

   3.1 Ambient temperature
   - 1. Around Probe temp. from □ to □ °C, 2. Around Converter temp. from □ to □ °C
   - □ No vibration □ Vibration

   3.2 Vibration
   - □ Furnace □ Stack □ Others

   3.3 1. Probe installation location
   - □ Horizontal □ Vertical □ Others

   3.4 Cable length between probe and converter
   - □ Indoor □ Outdoor □ Covered (under roof)

   3.5 Probe position
   - □ Indoor □ Outdoor □ Covered

   3.6 Probe insertion length (m) (Note)
   - □ 0.15, □ 0.4, □ 0.7, □ 1.0, □ 1.5, □ 2.0

   3.7 Flange
   - □ DIN □ ANSI □ Others

4. Quotation data

<table>
<thead>
<tr>
<th>Quotation</th>
<th>Quantity</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probe</td>
<td></td>
<td>Refer to the Probe Configuration for probe selection.</td>
</tr>
<tr>
<td>ZR22S Explosionproof Probe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZO21P-H High Temperature Use Probe Adapter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E7046EC/E7046EN Auxiliary Ejector for high temperature use.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZO21R Probe Protector for Oxgen Analyzer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZR402G Separate type Analyzer, Converter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZR202S Integrated type Explosionproof Zirconia Oxygen Analyzer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZO21S Standard Gas Unit</td>
<td></td>
<td>Select any one of Model ZO21S, ZABF, ZR40H.</td>
</tr>
<tr>
<td>ZABF Flow Setting Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZR40H Automatic Calibration Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L9852CB/G7016XH Stop Valve</td>
<td></td>
<td>Not required if probe options are specified.</td>
</tr>
<tr>
<td>K9292DN/K9292DS Check Valve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K9473XH/K9473XJ, G7024XK/K9473XG Air Set</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G7013XK/G7014XK Pressure Regulator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZR22A, ZR202A Heater Assembly (Spare Parts)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>