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The Oxygen Product Selection Guide is designed to assist you in the selection of the appropriate oxygen analyzer system for your application. To make the most appropriate selection, you will need to know a few things about your application such as temperature, pressure, flow-rate, and area rating. If you should find that your application requires equipment beyond what is shown here, please fill out the application data sheet at the back of this document and forward to your local Yokogawa representative.

To use this guide, begin with the Oxygen Analyzer selection (page 3) and follow the flow charts to build your model codes as you answer “yes” or “no” questions. Use Figure 1 below as an example.

After completing the Analyzer, Detector, Calibration Unit, Cabling, and Separate Line Item Accessories portions of the guide, you should have all the model codes required for your oxygen analyzer system. It is recommended that you review the General Specifications for the models selected to ensure that they meet your particular application requirements.

Where the part number would equal ZR22G-015-C for a 0.15 meter Zirconia oxygen probe with an inconel cal gas tube.
Oxygen Analyzer Selection Guide

Multiple Probes for Power Generation?

YES

Go To AV550G Oxygen Averaging Converter (Pg. 4)

NO

Single Point Remote Mounted?

YES

Go To ZR402G Oxygen Averaging Converter (Pg. 5)

NO

Single Point Integral Analyzer/Detector (Ambient Temp, <55°C)

YES

Explosion Proof?

YES

Go To ZR202S Explosion Proof Oxygen Detector with Integral Analyzer (Pg. 12)

NO

Go To ZR202G Oxygen Detector with Integral Analyzer (Pg. 11)
AV550G Oxygen Averaging Converter

Note 2: Requires the /G option.

Note 1: Individual Isolation should be selected when the AV550G installation may be subjected to high levels of noise interference on the output signal(s).

Choose Base Type

Choose Number of Channels

- 1 Oxygen Channel Card Common Isolation
- 6 Oxygen Channel Cards Common Isolation
- 7 Oxygen Channel Cards Common Isolation
- 2 Oxygen Channel Cards Individual Isolation
- 3 Oxygen Channel Cards Individual Isolation
- 4 Oxygen Channel Cards Individual Isolation
- 5 Oxygen Channel Cards Individual Isolation
- 8 Oxygen Channel Cards Individual Isolation

Choose Communication Protocol

HART Communications

Foundation Fieldbus

Choose Options

Stainless Steel Tag?

24 Volt Output for Solenoid Valve for use with IAC24 Integral Auto-Cal*

*N117A Enclosure with Vortex Cooler

*N117A Enclosure with Clear Door (Required when /24 option is selected)

Choose Options

1 to 8 Detector Inputs?

YES

4 Channel Card

NO

1 to 4 Detector Inputs?

Choose Communication Protocol

HART Communications

Foundation Fieldbus

Choose Base Type

AV550G

Note 2: Requires the /G option.
ZR402G Single Point, Remote Mounted Oxygen Analyzer

Options → Preset for Humidity Measurement → Hood → Stainless Steel Tag

GO TO OXYGEN PROBE SELECTION (Pg. 6)
Oxygen Probe Selection Guide

IS SAMPLE TEMP >700°C (1292°F)

Will Probe be Installed in a Hazardous Area? (Class, Div)

NO

YES

Go to ZR22S

Explosion Proof (Pg. 8)

YES

Go to ZR22G

General Purpose (Pg. 7)

NO

Go to ZR22P

High Temperature Tee (Pg. 9)
ZR22G General Purpose

Choose Insertion Length

Choose Process Flange

Choose Stainless Steel with Inconel Cal Gas Tube

Choose Options

Choose Connection Box Thread

Choose Pressure Compensation

Is Process Pressure >20" H2O (+5 kPa)?

Is Process Positive Pressure?

Choose Check Valve

Integral auto-calibration unit mounted

Derekane coating for high sulfur applications

Is process/application corrosive?

Choose Inconel bolt, O-ring

Stainless Steel Tag?

Is Detector used with ZA8C?

Is Detector used with AV8C?

Stainless Steel Tag?

Is Detector used with HA400?

Is Detector used with ZAIC?

Is Detector used with AVIC?

Go to Calibration Unit Selection (Pg. 13)
ZR22S Explosion-Proof

Note 1: Quick disconnects are not suitable for Hazardous Area Applications

GO TO CALIBRATION UNIT SELECTION (Pg. 13)
Note 1: /HT and /AV options are NOT suitable for Hazardous Areas.

ZR22P High Temperature Tee. SAMPLE TEMP>700°C (1292°F)

Choose Tee Configuration
- Basic Design (Side Eductor Port)
- Basic Design (Bottom Port)
- Split Design (For Blowback)

Choose Transport Tube Material (By Temperature)
- Up to 1427°C / 2600°F Silicon Carbide (SiC)
- Up to 1082°C / 1980°F 310 Stainless Steel
- Up to 1871°C / 3400°F Alumina Ceramic
- No Transport tube

Insertion Length
- 0.33 meter
- 0.50 meter
- 1.0 meter
- 1.5 meter
- No Transport tube

Choose Options
- /HT Insulated Heater Control Module
  Prevents process sample from reaching dew point.
  *Note 1
- /AV Split Design w/ Automatic Blow Back Valve
  (Requires -S Tee)
  *Note 1

Optional Blowback Valve
(This option should be chosen when there is a probability of process particles clogging the sampling system.)

Eductor Options: To draw the sample through the tee.
(Required if process Pressure is negative)

Stainless Steel Tag

NOTE: REQUIRES ZR22 PROBE!!!
GO TO ZR22G/ZR22S PROBE SELECTION FOR HIGH TEMPERATURE TEE (Pg. 10)
Note 1: Quick disconnects are not suitable for Hazardous Area Applications
ZR202G Oxygen/Humidity Detector with Integral Analyzer

Choose Insertion Length

- 0.15 meter
- 0.40 meter
- 0.70 meter
- 1.0 meter
- 1.5 meter
- 2.0 meter
- 2.5 meter
- 3.0 meter (Note 1)

SAMPLE TEMP
Between 600°C - 700°C

Choose Stainless Steel with Inconel Cal Gas Tube

Choose Process Flange
- 2” 150# ANSI CLASS Flange
- 3” 150# ANSI CLASS Flange
- 4” 150# ANSI CLASS Flange

Choose Options
- Stainless Steel Tag? [SCT]
- Is Process Pressure > 20” OF H2O (+ 5 kPa)? [CV]
- Is Process Positive Pressure? [H]

Options Selection
- Westinghouse
- Integral auto-calibration unit mounted
- Derekane coating for high sulfur applications
- Is process/application corrosive? [C]
- Is Process Pressure Compensation [E]
- Hood?
- Stainless Steel Tag?

GO TO SEPARATE LINE ITEM OPTIONS SELECTION (Pg. 18)
ZR202S Explosion Proof Oxygen/Humidity Detector with Integral Analyzer

1. Choose Certification
   - ATEX CERTIFIED
   - FM CERTIFIED
   - CSA CERTIFIED

2. Choose Insertion Length
   - 0.15 meter
   - 0.40 meter
   - 0.70 meter
   - 1.0 meter
   - 1.5 meter
   - 2.0 meter

3. Sample Temp
   - BETWEEN 600°C - 700°C
     - YES
     - NO
       - Choose Stainless Steel with Inconel Cal Gas Tube

4. Choose Stainless Steel
   - S
   - NO

5. Choose Process Flange
   - 2" 150# ANSI CLASS Flange
   - 3" 150# ANSI CLASS Flange
   - 4" 150# ANSI CLASS Flange
   - Westinghouse

6. Choose Options
   - Stainless Steel Tag?
   - Derekane coating for high sulfur applications
   - GO TO SEPARATE LINE ITEM OPTIONS SELECTION (Pg. 18)

GO TO SEPARATE LINE ITEM OPTIONS SELECTION (Pg. 18)
Calibration Unit Selection

Remote Mounted Single Probe Calibration?

YES

Go to MC1 & AC1 Remote Mounted Single Channel Calibration (Pg. 14)

NO

Remote Mounted Multi-Point Probe Calibration?

YES

Go to Multi Point Auto Calibration for AV550 (Pg. 15)

NO

Integral Mount Automatic Calibration?

YES

Go to IAC24 Integral Auto Calibration Unit (Pg. 16)
Remote Mounted Single Channel Calibration

Choose Power Supply

For use with ZA8C
For use with ZR4B2G
Requires separate 115 VAC Supply

Choose Enclosure Type

NEMA 4 Metal Enclosure
NEMA 4X Fiberglass Enclosure

Choose Tubing & Fittings

1/4 inch Copper Tubing & Brass Fittings
1/4 inch Stainless Steel Tubing & Fittings

Choose Options

Stainless Steel Tag?

GO TO CABLE SELECTION (Pg. 17)
Remote Mounted Multi Point Auto Calibration for AV550

Choose Quantity of Detectors

Choose Enclosure Classification

Choose Plumbing

Choose Options

Stainless Steel Tag?

C-R-U

S-R-U

NEMA 4

NEMA 4X

Stainless Steel Tubing & Fittings

Copper Tubing, Brass Fittings

1 to 4

1 to 8

Auto-Calibration Unit 4 Channel System

Auto-Calibration Unit 8 Channel System

Choose Quantity of Detectors

NEMA 4X

AC4

AC8

GO TO CABLE SELECTION (Pg. 17)
IAC24 Integral Mounted Auto Calibration Unit

Note: If the IAC24 option is selected for the ZR22G or the ZR202G, a separate IAC24 does not need to be ordered.

GO TO CABLE SELECTION
(Pg. 17)
ZR22 Wiring and Cabling

STEP 1.
Choose Heater Cable

Does the system utilize an Integral IAC24 Auto-Cal Unit?

YES

WZ-H-6H

NO

WZ-H-3H

STEP 2.
Choose Signal Cable

WZ-H-6S

Choose Options

Choose Cable Length

5 ft   -0005
10 ft  -0010
15 ft  -0015
20 ft  -0020
25 ft  -0025
30 ft  -0030
40 ft  -0040
50 ft  -0050
75 ft  -0075
100 ft -0100
200 ft -0200
500 ft -0500

Choose Options

Quick Disconnect with Flex Conduit Adapter

/QF
Note 1, 2

Note 1: The/QF option is NOT rated for hazardous area applications
Note 2: Must choose the Quick Connect option on the ZR22G Probes.
Note 3: Each ZR22 probe requires (1) heater cable and (1) signal cable

GO TO SEPARATE LINE ITEM OPTIONS SELECTION (Pg. 18)
Separate Line Item Options

### STEP 1.

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>Gas</th>
<th>Oil</th>
<th>Coal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>No Items Needed</td>
<td>E7642Q Filter Assy.</td>
<td>M1234SE-A, High Temp Flyash Filter</td>
<td>Contact YCA for recommendation</td>
</tr>
<tr>
<td>Other</td>
<td>Choose ZR22R Low Temperature Probe Protector</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Is the Gas Flow Velocity > 10m/sec (33ft/sec)?

**YES**

- Choose ZR22R Low Temperature Probe Protector

**NO**

Go to Step 2

### STEP 2.

<table>
<thead>
<tr>
<th>ZR22R</th>
<th>Insertion Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.40 meter</td>
</tr>
<tr>
<td></td>
<td>-040-C*U</td>
</tr>
</tbody>
</table>

Is Probe > 3.0m in length?

**YES**

- Is Probe used with ZR22R Low Temperature Probe Protector?
  - **YES**: No further items necessary
  - **NO**: ZR22V Low Temperature Probe Support is Recommended

**NO**

No further items necessary

ZR22V-150-C*U
1. General:

<table>
<thead>
<tr>
<th>Application:</th>
<th>Boiler</th>
<th>Furnace</th>
<th>Explosion</th>
<th>Other:</th>
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</thead>
<tbody>
<tr>
<td>Fuel:</td>
<td>Gas</td>
<td>Oil</td>
<td>Coal</td>
<td>Other:</td>
</tr>
<tr>
<td>Operation:</td>
<td>Record</td>
<td>Control</td>
<td>Alarm</td>
<td>Indication</td>
</tr>
<tr>
<td>Classification:</td>
<td>Gen Purp</td>
<td>FM</td>
<td>CSA</td>
<td>ATEX</td>
</tr>
</tbody>
</table>

2. Instrument Specifications & Process Conditions:

<table>
<thead>
<tr>
<th>Description of Process:</th>
<th>Min</th>
<th>Norm</th>
<th>Max</th>
<th>Engineering Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Temperature:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Pressure:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oxygen Concentration:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample Gas Flow:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dust Content:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SO2 Content:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CO/HCl/No Content:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combustible Content:</td>
<td></td>
<td></td>
<td></td>
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</table>

Specific Properties of Process:

3. Installation Data:

<table>
<thead>
<tr>
<th>Detector Location:</th>
<th>Furnace</th>
<th>Stack</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting:</td>
<td>Horizontal</td>
<td>Vertical</td>
<td></td>
</tr>
<tr>
<td>Detector Length:</td>
<td>0.4m</td>
<td>1.0m</td>
<td>1.5m</td>
</tr>
<tr>
<td>other length:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flange:</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>Instrument Air Connection:</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Auto Cal:</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Converter Location:</td>
<td>Indoor</td>
<td>Outdoor</td>
<td></td>
</tr>
<tr>
<td>Distance of Detector to Converter:</td>
<td></td>
<td>ft</td>
<td>m</td>
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For Yokogawa Use Only

4. Notes: Recommendation:

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<tr>
<td>ZR22G</td>
</tr>
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<td>ZR22P</td>
</tr>
<tr>
<td>ZR22R/V</td>
</tr>
<tr>
<td>ZR202G</td>
</tr>
<tr>
<td>ZR22S</td>
</tr>
<tr>
<td>ZR402G</td>
</tr>
<tr>
<td>AV8C</td>
</tr>
<tr>
<td>AV550G</td>
</tr>
<tr>
<td>MC1</td>
</tr>
<tr>
<td>AC1</td>
</tr>
<tr>
<td>AC4</td>
</tr>
<tr>
<td>AC8</td>
</tr>
<tr>
<td>IAC24</td>
</tr>
<tr>
<td>Explosion Proof</td>
</tr>
<tr>
<td>Non-explosion</td>
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</tbody>
</table>