In-Situ Stack Gas Oxygen Analyzer

ZIRCOMAT

KEY FEATURES:

• Detector Detaches, Probe Stays in Place
• Same Detector for All Zircomat Probes
• Automatic Calibration
• Programmable Range Selection
• Selectable Memory Hold Feature
• Hi-Lo and Self-diagnostic Alarms
• Interactive Message Panel
• Isolated 4-20 mA Output Signal
• Simple to Install and Maintain
• Extractive Sample Cell also available for C.E.M. Applications

STANDARD ZFK
ZTB SELF-CLEANING
ZFK-ST HIGH TEMPERATURE
ZTA HIGH TEMPERATURE

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ZIRCOMAT STACK GAS OXYGEN ANALYZER

The measurement of excess oxygen to improve energy efficiency has been well documented and is largely responsible for the reduced fuel consumption now common in power plants, refineries and even automobiles. Cosa Zircomat analyzers are proven performers in many tough, hot, and dirty industrial applications where other systems fail.

Cosa Zircomat Oxygen detectors are well-proven with thousands of installations in power plants, refinery process heaters, blast furnaces, coke ovens, incinerators and small boiler and furnace installations worldwide.

The small detector can easily be serviced or replaced while the probe remains in place, thus no disruption of the process is required. The sample gas diffuser protects the sensor from exposure to sample gas contaminants and a built in verification port exposes the sensor to calibration gas. Calibrations can be performed manually or automatically at user programmable intervals.

The detector remains the same for all Zircomat analyzers, regardless of probe configuration, materials, or lengths. Thus, inventory and maintenance requirements are greatly simplified.

UNIQUE PROBE MEASUREMENT CONCEPT

The Cosa Zircomat Oxygen Analyzer utilizes a unique probe measurement concept. Gas sample flow is deflected to the base of the probe where the detector is installed. The flow deflection is caused by one of two means - either by a specially designed flow guide tube taking advantage of the pressure of the stack (ZFK, ZTB), or by an eductor system, using a continuous small flow of compressed air. In either case, the probe remains in the stack while the detector can be replaced external of the stack.

ZIRCOMAT ELECTRONIC TRANSMITTER ZRM

The transmitter, housed in a weatherproof enclosure, receives its signal through a cable (1000 feet max.) that is terminated at the detector. Oxygen concentrations are displayed on a large 3-digit LED display. Alarm conditions and operating mode are indicated by three LEDs. A second LCD display is used to display additional information and for interactive setup of the instrument utilizing the keypad.

Connections of the detector cable are made on a clearly labeled screw-terminal block located at the bottom of the transmitter inside the weatherproof enclosure.

The measurement range of the transmitter is programmable from 0 to 2%(v) oxygen to 0 to 50%(v) oxygen in steps of 0.5%(v). The 4-20mA output signal is linear over the selected range and can be placed on hold for calibration and blowdown cycles.

The blowdown, calibration, zero and span reference gas values are user programmable and are stored in non-volatile memory.

The ZRM has four programmable alarm relays rated at 250VAC, 2A. Indications are HI/LO alarm, fault condition and operating mode (maintenance, calibration, blowdown).
Four Different Probe Types
Available In Different Lengths
For Demanding Combustion Situations

**STANDARD ZFK**
The ZFK is designed for oil or gas fired operations with stack gas temperatures up to 1150°F. This probe uses the natural pressure drop created from stack gas passing across the probe tip to deflect the sample gas past the oxygen detector for measurement. The detector detaches from the probe for service without removing the probe from the stack.

**ZTB SELF-CLEANING**
Designed for dirty applications with sample gas temperatures up to 1150°F, the ZTB probe uses plant air to clean the detector’s sample gas filter automatically at programmable time intervals and is recommended for coal and black liquor fired boilers or incinerator applications with high fly ash content. The detector detaches from the probe for service without probe removal.

**ZFK-ST HIGH TEMPERATURE**
This probe is manufactured from ceramic and can be used on applications burning oil or gas as a fuel with stack gas temperatures up to 2200°F. The detector detaches from the probe for service without removing the probe from the stack. For special applications, high temperature alloys can also be supplied.

**ZTA HIGH TEMPERATURE**
The ZTA probe is used for sample gas temperatures up to 2900°F and is available with a self-cleaning function. It uses compressed air to educt the sample from the stack. Applications include waste incinerators, soaking pits, and glass furnaces. A built-in heater maintains the sample above the dewpoint during start-up. The detector detaches for service without probe removal.
**SPECIFICATIONS**

**Detector ZFK**
- Gas measured: Oxygen in flue gas
- Sensor: Zirconia Oxide
- Measurement Range: 0-2%(v) to 50%(v), in 0.5%(v) increments
- Repeatability: ±0.5% of full scale
- Linearity: ±1.0% of full scale

**Sample gas temperature**
- With Standard Probe (ZFK): 4°F to 1150°F (621°C)
- With high-Temperature Probe (ZFK-ST): 4°F to 2200°F (1204°C)
- With High Temperature Probe (ZTA): 4°F to 2900°F (1593°C)

**Sample gas pressure**
- 3 kPa to +3 kPa

**Sample filter:** Alumina (50µm) and quartz paper

**Wetted parts:** Zirconia, 316 stainless steel, platinum

**Ambient temperature**
- 4°F to +140°F for cable section
- 316 stainless steel, for 1/4" tube

**Calibration gas inlet**
- Reference air inlet (optional): 1/8 NPT, 1/8"c

**Enclosure**
- Rating: IP55 equivalent
- Color: Silver 55 metallic
- Dimensions: 8.3" x 3.9" (length x diameter)
- Weight: 3.5 lbs
- Detector mounting: Flange, horizontal plane ±45°, ambient clean air surrounding

**ZTA (Ejector system)**
- Air flow: 5 - 10 liters/minute
- Blow down air pressure: 30 to 45 PSI
- Exhaust gas processing: Returned to flue
- Heater alarm: Alarm triggered when temperature drops below 212°F

**Transmitter ZRM**
- Indication: Oxygen concentration: 3 digit LED
- Mode display: 3 digit LED
- Setup and additional information: LCD with 2 lines @ 16 digits
- Output Signal: 4-20mA 500Ω or 0-1V 1000Ω
- Functions: Isolated, linear span over selected range

**Output contacts**
- 4 contacts, normally open

**Electrical rating**
- 250VAC, 2A

**Ambient temperature**
- 14°F to 122°F (-10, +50°C)

**Power supply**
- 90 to 220V or 230 VAC, 50/60 Hz

**Enclosure**
- Material: Steel
- Color: Munsell 2.5Y8.4/1.2
- Rating: IP53 (dust proof, rain proof)
- Dimensions: 8.4" x 6" x 5.7"
- Weight: 7.7 lbs
- Mounting: Flush, panel, pipe

**Multichannel O₂, CEM systems, and Portable Emission Analyzers are also available**

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**DIAGRAMS AND DIMENSIONS**

**ZTA SYSTEM DIAGRAM**

**PROBE**
- Compressed air
- Calibration gas
- 2-1/2" Teflon RF

**DETECTOR**
- Rain-proof flexible conduit with 20 feet of connecting cable
- Solenoid valves

**TRANSMITTER**
- Power supply
- Zero gas, Span gas
- 4-20 mA Output

**ZRM TRANSMITTER DIMENSIONS**

**ZFK-ZTB SYSTEM DIAGRAM**

**PROBE**
- Calibration gas
- Flow meter
- *Compressed air

**DETECTOR**
- Rain-proof flexible conduit with 20 feet of connecting cable
- Solenoid Valves

**TRANSMITTER**
- Power supply (15 V, 60 Hz)
- Span gas
- 4-20 mA output signal

**ZFK-ZTB PROBE DIMENSIONS**

**Represented by:**

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