

PRODUCT DATASHEET

Zirconat™

In-Situ Stack Gas Oxygen Analyzer



Fast

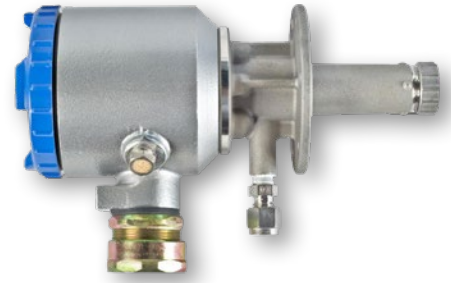
Accurate

Low Maintenance

- Efficient stack gas oxygen analyzer
- Ideal for power plants, refinery process heaters, blast furnaces, coke ovens, incinerators and small boiler and furnace installations
- Great for harsh, dirty and "hot" environments

Zirconium 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 automotive. Zirconium (ZRM) stack gas oxygen analyzers are proven performers in many tough, hot, and dirty industrial applications where other systems fail.



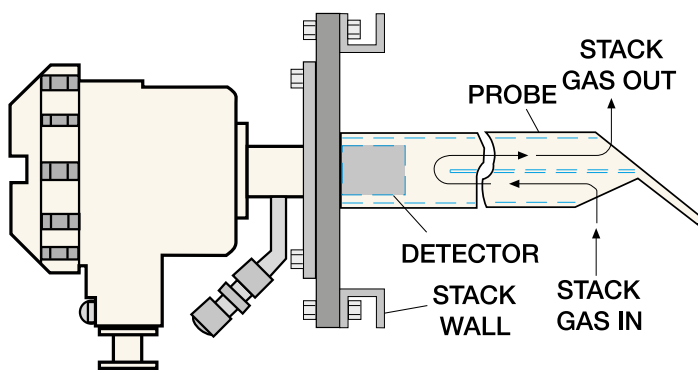
The Zirconium Oxygen Analyzers are well-proven with thousands of installations in power plants, refinery process heaters, blast furnaces, coke ovens, incinerators and small boiler and furnace installations worldwide.

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.

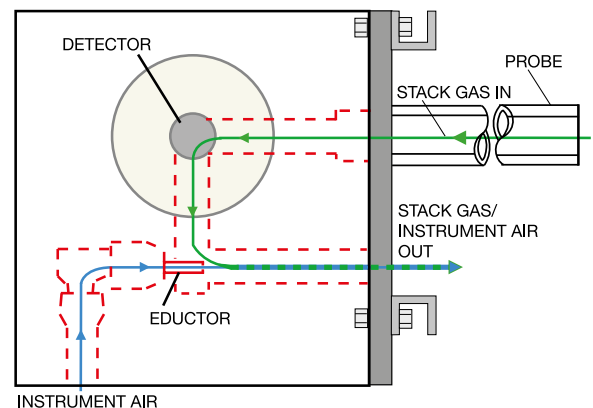
The detector remains the same for all Zirconium stack gas oxygen analyzers, regardless of probe configuration, materials, or lengths. Thus, inventory and maintenance requirements are greatly simplified.

Unique Probe Measurement Concept

The Zirconium stack gas 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.



ZFK, ZTB



High Temperature ZTA

Zirconium Electronic Transmitter

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.
- 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 blow-down cycles.
- Blow-down, calibration, zero and span reference gas values are user programmable and are stored in non-volatile memory.
- Has four programmable alarm relays rated at 250VAC, 2A. Indications are HI/LO alarm, fault condition and operating mode (maintenance, calibration, blow-down).

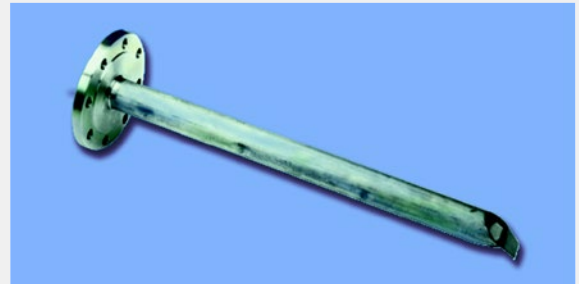


Probe Choices

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.



Standard ZFK

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.



ZTB Self-Cleaning

ZFK-St High Temperature

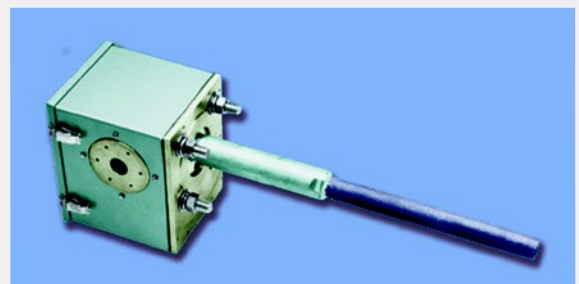
This probe is manufactured from ceramic and can be used on applications burning oil or gas as a fuel with stack gas temperatures up to 2200°F. The detector detaches from the probe for service without removing the probe from the stack. For special applications, high temperature alloys can also be supplied.



ZFK-St High Temperature

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.



ZTA High Temperature

SPECIFICATIONS

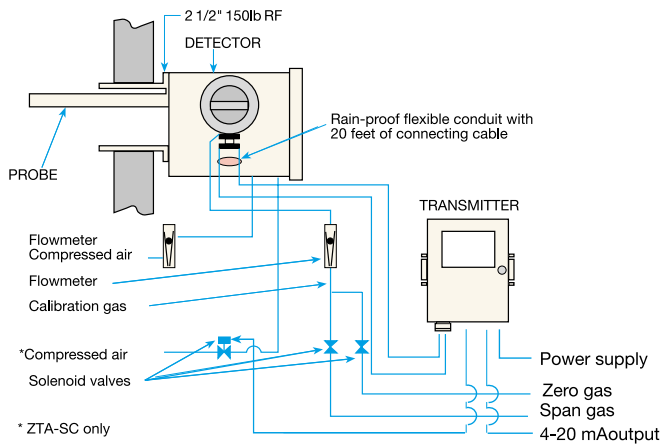
Detector ZFK	
Gas measured	Oxygen in flue gas
Sensor	Zirconia Oxide
Measurement Range	0-2%(v) - 50%(v), in 0.5%(v) increments
Repeatability	±0.5% of full scale
Linearity	±1.0% of full scale
Sample gas temperature	With Standard Probe (ZFK) -4°F to 1150°F (621°C) With High-Temperature Probe (ZFK-ST) -4°F 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 to +140°F for cable section <260°F at flange surface when powered up
Calibration gas inlet	316 stainless steel, for 1/4" tube
Reference air inlet (optional):	1/8 NPT, 1/8rc
Enclosure	Rating: IP55 equivalent Color: Silver SS 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	30-45 PSI
Exhaust gas processing	Returned to flue
Heater alarm	Alarm triggered when temperature drops below 212°F

Transmitter ZRM

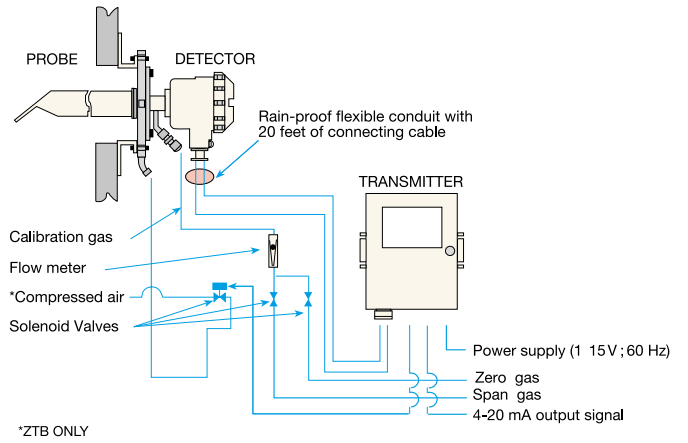
Indication	Oxygen concentration: 3 digit LED Mode display: 3 digit LED Setup and additional information: LCD with 2 lines @ 16 digits
Output Signal	4-20mA 500Ω or 0-1V 100Ω isolated, linear span over selected range. Output signal on hold during calibration and maintenance; hold can be released.
Communications	RS 485 (optional)
Output contacts	4 contacts, normally open Electrical rating: 250VAC, 2A Function: Under maintenance, under cleaning, span gas, zero gas
Selectable alarms	High limit, low limit, high/low limit, fault alarm
Input contacts	2 contacts Electrical rating: ON at 1Ω or less Functions: Start automatic calibration, disable calibration
Calibration procedures	Manual with key operation, autocalibration (standard function) Programmable at intervals from 0 day 0 hours to 90 days 60 hours
Calibration range gas settings	Zero gas: 0.010%-50.000% O ₂ Span gas: 8.000%-23.000% O ₂
Features	<p>Blowdown function (optional probe): Probe is periodically cleaned by blow-down with compressed air. Intervals between and duration of cleanings are programmable. (Interval: 00 hour 00 minutes to 99 hours 60 minutes; duration: 00 minutes 00 seconds to 9 minutes 60 seconds)</p> <p>Optional combustion efficiency display: Calculates and displays combustion efficiency (requires K or R type thermocouple).</p> <p>Rich mode display: When detector output voltage exceeds 200mV (0.0023%(vol) O₂), the LCD display indicates fuel rich condition and the LED displaying the detector output voltage flickers.</p> <p>Self diagnosis: Error indication in event of detector temperature fault, zero calibration fault, span calibration fault, calibration disable, detector output fault.</p>
Ambient temperature	14°F to 122°F (-10, +50C)
Power supply	90 to 220 or 230 VAC, 50/60 Hz
Enclosure	Material: Steel Color: Munsell 2.5Y8.4/1.2 Rating: IP53 (dust proof, rain proof) Dimensions: 8.6" x 7.6" x 3.5" Weight: 7.7 lbs Mounting: Flush, panel, pipe

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

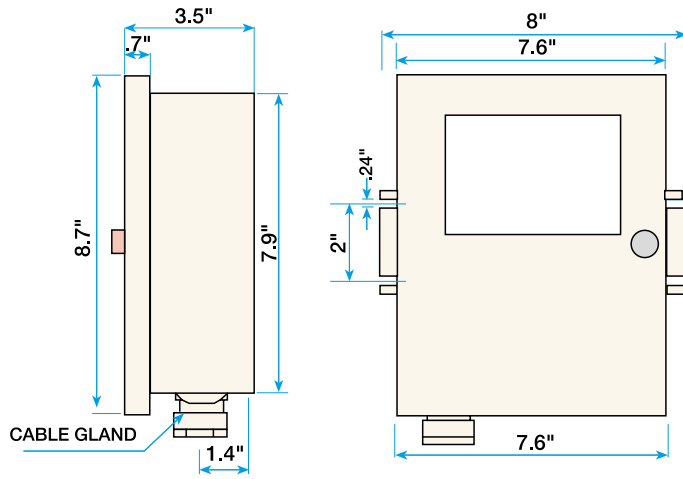
Diagrams and Dimensions



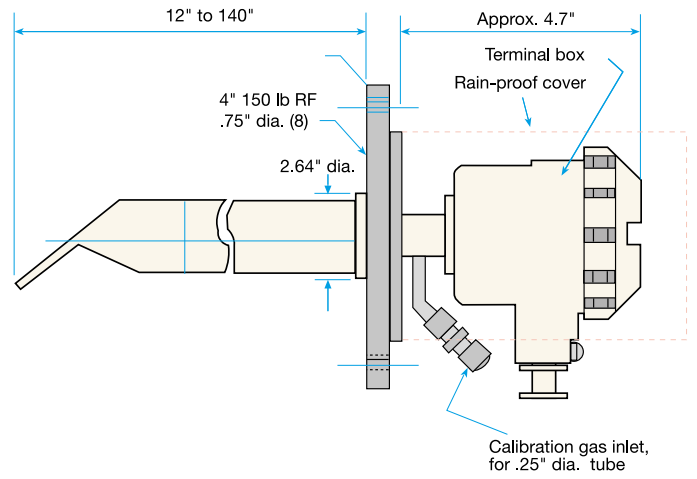
ZTA System Diagram



ZFK-ZTB System Diagram



ZRM Transmitter Dimensions



ZFK-ZTB Probe Dimensions

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REVOLUTIONIZING MEASUREMENT

EVERYWHERE