

Zircomat Oxygen Analyzers



To order parts and items, go to www.Instrumentation.com or call (800) 346-4620

Finally... Hassle Free Stack Gas Oxygen Measurement

Many of the top fortune 500 companies have already discovered that installing a ZIRCOMAT Oxygen analyzer is the smart way to measure flue gas oxygen for today's combustion control systems. Controlling excess oxygen in the flue gas to reduce fuel consumption is a well established control tool that's well understood by energy management and process engineers worldwide. Please take a few moments to review how this modular system provides important installation, operation and service benefits when compared to other analyzers of conventional design. Field proven in over 25 years of service, the revolutionary ZIRCOMAT system contains the following components:



Oxygen Detector

The Oxygen detector mounts to the probe flange and can be quickly detached from the probe for any routine maintenance, including sample gas filter replacement. A 1/4" tube connection is provided for on-line calibration.

The same detector is used with any one of the five sample probes

System Overview

A complete ZIRCOMAT Oxygen analyzer system includes a probe, detector, transmitter, connecting cable and user's manual - ready for installation on site. All units feature a special oxygen detector that will mount to any model or length of probe during installation.

This unique patented design allows the oxygen detector and sample gas filter to be field serviced by the user without the need for probe removal from the hot process gas stream. This is a big maintenance time saver and safety issue for service and repair crews, especially when long probes are used or access to the mounting location is restricted. One person can quickly detach the detector from the probe mounting flange. The small hand held detector can be used as spare for all probe lengths regardless of probe type - drastically reducing space and inventory cost compared to other length and temperature specific designs from other vendors.



Oxygen Detector and Probe Assembly

Probe end showing the unique probe tip divided flow-path and flue gas entry/exit across the tip



Electronic Transmitter

The ZKM transmitter is a full featured single channel transmitter with menu driven software - keypad interface that includes auto-calibration, twelve programmable alarm functions (including fuel rich mode), programmable air purge (with memory hold) for sample gas filter - the unit is also fully self-diagnostic with LCD message center, event log, password data protection and can be remote mounted in a convenient location up to 1000 feet from the probes. Please see the specification section for further details

Combustion efficiency and RS-485 MODBUS communication are available options. Combustion efficiency requires a thermocouple input and provides a read-out in % efficiency using the Siegert formula. Rich mode is a display function with alarm contact for fuel rich conditions that can occur when the oxygen content in the flue gas is at or below zero.



Features

- Detachable oxygen detector
- Probe stays in process
- One Detector fits any probe
- Fast response to changes
- Programmable ranges
- Isolated 4-20mA output signal
- Simple to install and maintain

Applications

- Boilers
- Blast Furnaces
- Coke Ovens
- CEM - Diluent
- Incinerators
- Process Heaters
- And many more...



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In situ Probes

Select a Sample probe from the five types to suit your combustion fuel type, stack gas temperature range and insertion length. All probes are self-cleaning in applications where the fuel fired is oil or gas. For Coal or other applications with high fly ash, the sample gas filter is cleaned with a user programmable air purge – all without the need for operator involvement.

ZFK Probe

Suitable for oil or gas applications with flue gas temperatures up to 1150°F, the ZFK probe is available in nine standard lengths from 12" to 140". The probe design uses the natural flue gas flow to create a differential pressure across a unique divided flow path - from the end of the probe - past the oxygen detector and back out. Damage protection from any flying debris in the flue gas duct is provided by the probe tube.



ZTB Probe

Specified for fuels with high fly ash - all coal applications up to 1150°F, the ZTB probe is available in lengths from 12" to 140". On dirty and abrasive applications, the probe tube also serves as an abrasive shield and the flow path past the heated oxygen detector also eliminates any cold end corrosion between the probe and flange that can occur on other units. A blow back feature cleans the probe and sample gas filter in-process and the air solenoid valve is controlled by the ZKM transmitter.

ZFK-ST Probe

Designed for process heater and other oil or gas applications up to 2200°F, a choice of 24" or 44" probes provide cost effective oxygen measurement at high temperatures.



ZTB-ST Probe

The ZTB-ST probe has the same specifications as the ZFK-ST but with the addition of the blow back feature for use with high fly-ash content fuels typically found in incinerators and other high temperature applications



ZTA Probe

High temperature applications up to 2900°F are covered by the ZTA probe. With a choice of four probes up to 60" long, they are suitable for all fuel types and can be used with the blow back cleaning feature. The detector and sample gas filter are fully serviceable without probe removal from the process. A port is provided to view the inside of the probe/furnace during normal operation.

Optional Accessories

A full range of optional accessories are available and includes an Automatic Calibration module unit for use with the ZKM transmitter - fully piped and wired in a weatherproof enclosure for easy installation by the customer at the job site. Special ISA type "Z" purge or explosion proof packages or a process gas flame arrestor for the detector is available for applications in areas classified as hazardous by the NEC and NFPA



ZKM "Z" Purge Panel



ZKM Ex-Proof Enc.



Auto Calibration Unit



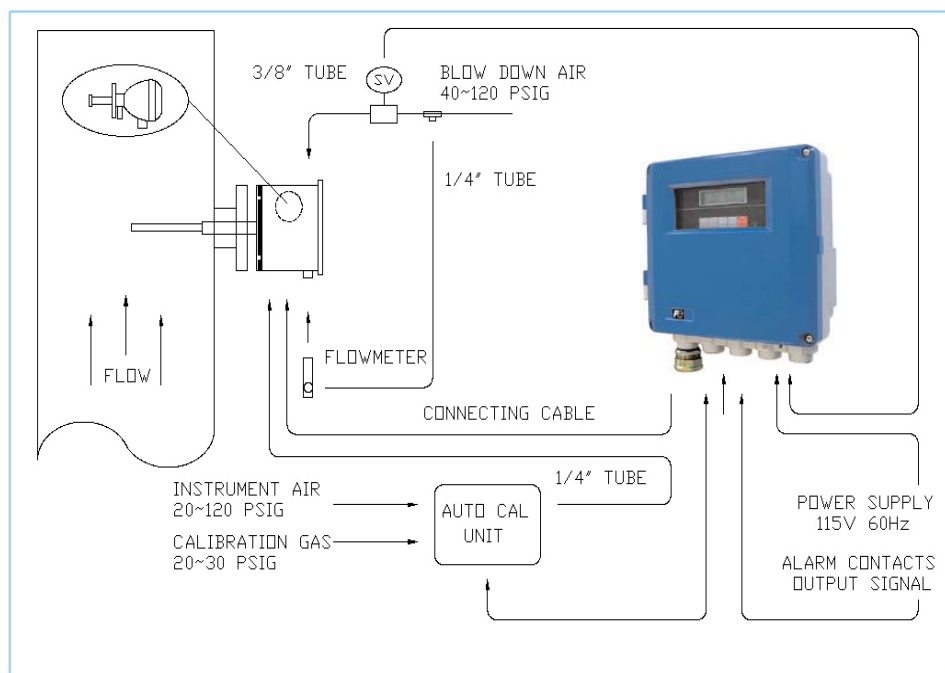
ZFK Ex Proof Detector



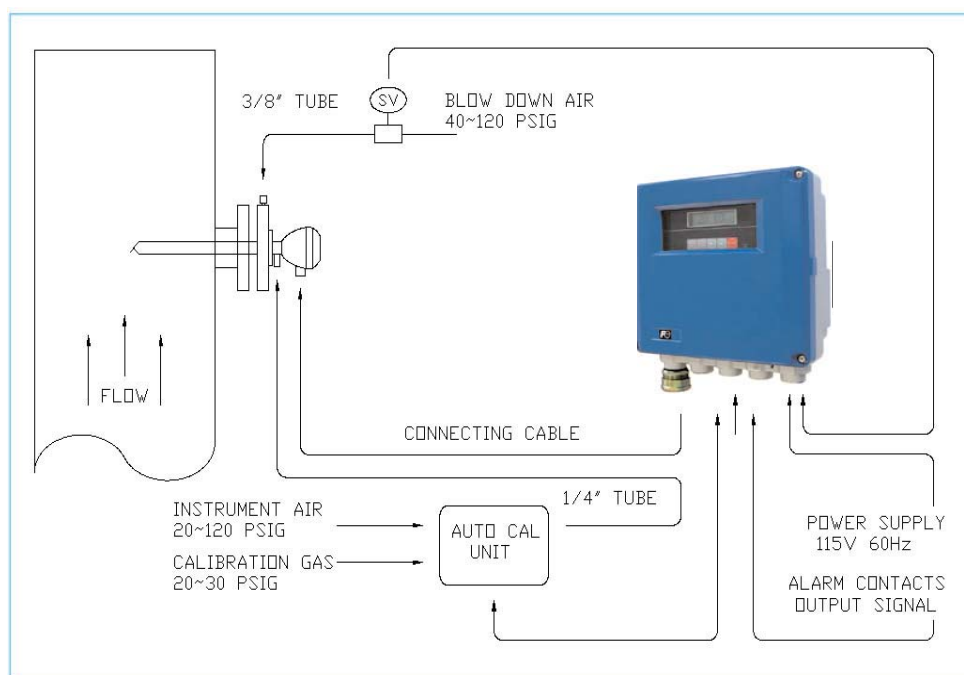
ZFK Flame Arrestor

Consult the specification page for more details or contact us if you have any questions

System Schematics



ZKM-ZTA



ZKM Shown above

DELTA INSTRUMENT

Finally... Hassle Free Stack Gas Oxygen Measurement***Product Code*****ZIRCOMAT IN SITU OXYGEN ANALYZERS****High Speed Measurement of Excess Oxygen in Stack or Furnace Gases**

Complete Oxygen analyzer package comprising of Probe, Oxygen Detector, Transmitter, connecting cable and users manual. All probes feature a special oxygen detector that is detachable during installation. The unique removable detector allows field service to be carried out on the probe without the need for probe removal from the process stream!

Model ZKM

Features a local display with interactive message center and keypad. User programmable measuring ranges, 0-2% to 50%, in 1% steps and includes manual or automatic calibration at user programmable intervals, self diagnostic check of eleven parameters with fault alarm, hi-lo alarm contacts and 4-20mA DC isolated output signal. The Nema 4x enclosure is suitable for wall or 2" pipe mounting in a convenient location.

ZKM-ZFK	ZKM Transmitter with ZFK Oxygen Detector, ZFK Probe, and Users Manual
ZKM-ZFK-ST	ZKM Transmitter with ZFK Oxygen Detector, ZFK-ST Probe, and Users Manual
ZKM-ZTB	ZKM Transmitter with ZFK Oxygen Detector, ZTB Probe, and Users Manual
ZKM-ZTB-ST	ZKM Transmitter with ZFK Oxygen Detector, ZTB-ST Probe, and Users Manual
ZKM-ZTA	ZKM Transmitter with ZFK Oxygen Detector, ZTA Probe, and Users Manual

<u>PROBE LENGTH: (In inches)</u>	<u>FLANGE</u>	<u>FUEL FIRED</u>	<u>MAX. TEMP</u>
12 20 30 ZFK or ZTB	4" 150lb	Oil or Gas (ZFK) – Coal (ZTB)	1150°F
24 44 ZFK-ST or ZTB -ST	4" 150lb	Oil or Gas	2200°F
20 30 ZTA	3" 150lb	Oil, Gas or Coal	2900°F

Probe Length (In inches) Price Adder for Additional Lengths

40, 60, 80, 100, 120, 140

40 ZTA, 60 ZTA

OPTIONS for ZKM Transmitter:

N	No Blow Down or Automatic Calibration functions (Manual Calibration only)
B	Blow Down and Auto Cal: (Required for ZTB series and ZTA probes with Blow Down)
C	Communications: RS485, Comb. Efficiency Display, Blow Down and Auto Cal (Requires a thermocouple input)

CONNECTING CABLE:

20	Connecting Cable 20 ft long with terminals (Supplied without Liquiddite flexible conduit)
X	Extra Connecting Cable without conduit. Per ft (Up to 1000ft)

OPTIONAL EQUIPMENT:

N	None
M	Calibration Panel with 3 way valve for calibration gas selection (use with ZKM opt. N Only)
A	Auto Calibration Unit for use with ZKM Auto Cal opt. B or C only)

ZKM-ZFK - 40 - N - 20 - N Sample Order Code

Other Optional Accessories:**Delta Part#**

Solenoid valve for ZKM- ZTB and ZTA self cleaning probes (cv 4.0)
 "Z" Purge kit for ZKM Transmitter: for Class 1 Zone 2 hazardous areas
 ZKM Transmitter Configured for Class 1, Zone 1, Grp. B, C & D areas
 Oxygen Detector configured for Hazardous Areas: Class 1 Zone 1 Grp. B,C,D areas
 Oxygen Detector for 220V 50/60 Hz
 Pipe Mounting Bracket for ZKM Transmitter
 Flame Arrestor Assembly - Process Gas Protection (Grp. B, C & D)
 ZKM - Users Manual (One supplied per instrument)

ZTB-DS-075
 ZKM-DS-020
 ZKM-DS-100
 ZFK-RE-005
 ZFK-R-005A
 ZKM-A-060
 ZFK-DS-020

Specifications

General:	ZKM	Comments
Sensor (ZrO ₂):	O ₂	Net Oxygen percentage in flue gas
Measuring range:	0-2~50%	ZKM - configurable in 1.0% steps
Accuracy:	±1.0%	Reading or 0.05% O ₂ if greater
Repeatability:	±0.5%	Full Scale/Max output
Response time:	7 sec./90%	Initial response 0.1 sec.
Output signal:	4-20mA	Isolated, 500 ohm maximum load
Communications:	Yes	RS-485 - see transmitter options
Power supply:	115V/60Hz	.65VA (250VA during 3min start-up)
Electrical Approvals:	CE, FM, TÜV	EN 15267-1 FM Electrical Safety TÜV 25932/2010

Transmitters:

Display:	LCD	Display resolution - 0.1 and 0.01%
Rich mode	Yes	Rich mode (< 0.01% O ₂ alarm)
Alarm contacts:	6 For 12 items	Configurable - N/O (3 amp @ 250v)
Calibration:	Manual/Auto	User configurable with error alarm
Signal hold:	Yes	User configurable - Cal + B/Down
Contact inputs:	3	Remote auto cal start/cal inhibit
Power supply:	90~230V	ZKM - 230VAC 50/60Hz option
Ambient temp:	-10 to 50°C	High or low temperature options
Enclosure rating:	NEMA 4x	IP67 - Wall mount - pipe option
Size (HWD):	10 x 10 x 4"	(244x244x95)
Weight:	10 lb	(4.5 kg)
Connecting cable:	20ft (6m)	Up to 1000ft (365m) cable spool
Transmitter Options:	Yes	3-way manual cal. selector valve
	Yes	ISA "Z" Purge panels - BCD areas
	Yes	Remote Cal. Unit - wall mounting
	Yes	RS-485 and Combustion efficiency
	Yes	ZKM - Ex proof C1 D1, BCD areas

Detector:

Calibration gas:	O ₂ /N ₂	1/4" Tube fitting for calibration gas
Reference air:	N/A	Ambient air reference
Material (wetted):	316S/S	ZrO ₂ , Pt, Alumina and Viton™
Sample gas pressure:	± 20" H ₂ O	Higher pressure option
Power supply:	115V	230 VAC 50/60Hz - Optional
Ambient temp:	(-20 to 100°C)	140°F (60°C) max.
Enclosure rating:	NEMA 4x	IP67 - Gen purpose - see options
Weight:	2.4lb	(1.1 kg). Ex-proof 4lb (1.8 kg)
Detector Options for	Yes	Detector for C1 D1, BCD areas
Classified Areas:	Yes	Flue gas flame arrestor - Grp BCD

Probes:	Probe Length:		Flue Gas Temp	Probe and Flange:
ZFK	12 to 140" (0.3-3.5m)	Yes	Yes	0-1150°F (600°C) .304S/S- 304S/S
ZFK-ST	24 or 44" (0.5or1m)	Yes	Yes	0-2200°F (1200°C) .Ceramic-304S/S
ZTA	20 to 60" (0.5-1.5m)	Yes	Yes	0-2900°F (1590°C) .Ceramic-304S/S
ZTB	12 to 140" (0.3-3.5m)	N/A	Yes	0-1150°F (600°C) .304S/S - 304S/S
ZTB-ST	24 or 44" (0.5or1m)	N/A	Yes	0-2200°F (1200°C) .Ceramic- 304S/S

Probe type:	ZFK	ZFK-ST	ZTA	ZTB	ZTB-ST	See details below:
Fuel type:						Select a probe for fuel and temp
Oil or Gas	Yes	Yes	Yes	Yes	Yes	Self cleaning probe and filter
Coal & other fuels	N/A	N/A	Yes	Yes	Yes	Blow down for high fly-ash fuels
Flange size:	4.0"	4.0"	3.0"	4.0"	4.0"	150# RF flange supplied standard
Probe Diameter:	2.38"	1.0"	1.25"	2.38"	1.0"	
Probe options:						Probe material options
	N/A	Yes	N/A	N/A	Yes	Inconel - Alumina/Mullite is standard
	N/A	N/A	Yes	N/A	N/A	Inconel - Silicon Carbide is standard
	N/A	N/A	Yes	Yes	Yes	Blown down solenoid valve 115VAC
Blow down:	N/A	N/A	Yes	Yes	Yes	1/2" NPT port - ZTA has 1/4" NPT port
Blow down air:	N/A	N/A	20	20	20 CFM	Inst. air - 6~10 sec. @ 40~100 psig
Solenoid valve:	N/A	N/A	Yes	Yes	Yes	Option - 1/2" NPT (port CV = 4.0)
Weight (Approx):	18 lbs	19 lbs	35 lbs	19 lbs	20 lbs	For 20" probe - without detector

Specifications subject to change without notice.

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