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Model
9060Z
Zirconium Oxide Oxygen Analyzers

MODEL 9060Z - Zirconium Oxide Oxygen Analyzers

Optimizing combustion efficiency and minimizing exhaust emissions are important for proper operation of nearly every industrial process that burns fuel. From clean burning natural gas to dirty coal fired kilns, Teledyne's Model 9060Z provides reliable and efficient O_2 monitoring capabilities by combining field proven zirconium oxide sensor technology with a powerful and versatile microprocessor based controller.

Model 9060Z Control Unit

The 9060Z O_2 analyzer / transmitter provides in-situ analysis capability which can accept signals from up to two zirconia probes for averaging or backup purposes in furnaces, kilns, and boilers with sample temperatures ranging from ambient up to 1400° C. This unit is provided within a compact, steel, IP-54 (IP-65 without internal air reference pump), easily installed, gasketed enclosure suitable for wall mounting. Purged or explosion proof design enclosures rated for hazardous areas can also be supplied.

9060L Low-Cost Controller

Easy Set Up

Analyzer functions and adjustments are easily accessed via a membrane keyboard. By using the prompting keys and following the display codes from the 2 line alphanumeric LCD screen, the user can easily interface with and set up the 9060Z for field operation.

Easy Calibration / Self Diagnostic Features

The 9060Z provides standard programmable automatic calibration and auto-purge outputs. The user can program the cal/purge sequence to an alarm relay for external indication. The 9060Z has also been designed with a probe diagnostic loop to continuously monitor for probe impedance to ensure the sensor is functioning properly. The electronics self-calibrates all inputs every minute.

Easy Interface

The 9060Z provides two isolated 4-20mADC linearized control signal outputs. One is dedicated to the O2 signal and the other is user selectable from thirteen other variables. In addition, an RS-232 / RS-485 printer / computer interface capability is provided. One general diagnostic alarm and three field selectable alarms with switching are provided standard.

Additional Features

An integral automatic reference pump is provided as standard. This pump draws atmospheric air and delivers it to the zirconium sensor as reference air in lieu of customer supplied instrument air. If the operator desires, the pump can be bypassed and instrument air, at a flow of 50 cc/min, can be delivered to the sensor as required.

Applications

- Gas, oil, pulverized coal and black liquor boilers
- Cement, lime and ceramic kilns
- Refinery process heaters and furnaces
- Blast furnace ovens
- Soaking pit and heat treating furnaces
- Thermal cracking furnaces
- Catalyst regeneration
- Asphalt processes
- Utility boilers

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9060Z CONTROLLER SPECIFICATIONS:

Inputs
- One or two zirconia oxygen probes or sensors
- One zirconia sensor & auxiliary thermocouple type J, K, R or S
- Burner "On" signal (dry contact)
- Purge air flow switch

Outputs
- Four programmable alarm relays
- Two isolated 4-20mA or 0-20mA
- SSR outputs to purge & calibration check gas solenoid valves
- Settable parameters

Configurable Output Parameters
- Linear oxygen sensor 1
- Linear oxygen sensor 2
- Average oxygen
- Very low oxygen
- Logarithmic oxygen
- Reducing oxygen
- Oxygen deficiency
- Carbon dioxide
- Probe EMF
- Auxiliary temperature
- Combustibles
- Burner Efficiency

Alarms
- Normally open failsafe, 2A / 240 VAC and 30 VDC
- Common alarm relay with 20 user selectable instrument alarm functions.
- Three programmable process alarm relays for very low oxygen, low oxygen, high oxygen, oxygen deviation, probe temperature low, cal check in progress, purge in progress, plus any alarms that were not selected for the common alarm. Multiple selections can be made for all relays.

Range of Local Indication
- 0.01 ppm to 100% - automatically defaults to exponential format below 0.01 ppm, ppm reading up to 10,000 ppm, and percent above that

Serial / Network Interface
- RS232
- RS485 MODBUS™

Accuracy
- ± 1% of the actual oxygen reading with a repeatability of 0.5%.

Operating Temperature
- -13 to 131°F (-25 to 55°C), 5 – 95% RH (non-condensing)

Secondary Parameter Display
Any or all of the following can be selected for display on the lower line:
- Probe #1 temperature
- Probe #2 temperature
- Probe #1 EMF
- Probe #2 EMF
- Probe #1 impedance
- Probe #2 impedance
- Oxygen % probe #2
- Average oxygen %
- Auxiliary temperature
- Ambient temperature
- Ambient RH %
- Carbon dioxide
- Combustibles
- Oxygen deficiency
- Burner efficiency

Power Requirements (Controller only)
- 85 – 265 VAC 50/60 Hz, 5W power

Degree of Protection
- IP65
- IP54 with internal reference air pump

Dimensions
- 10.24" W x 6.30" H x 3.54" D (260 x 160 x 90 mm)

Weight
- Approximately 6.6 lbs

9060L CONTROLLER SPECIFICATIONS
(for single heated probe only)

- Ranges: 2 user-settable ranges, 0-1% to 0-100% Oxygen
- Display: 4-digit LED
- Outputs: 0-10 VDC, 4-20mA (negative ground), 0-10 VDC Range Identification
- Alarms: Sensor fail alarm, one settable high-concentration alarm, one settable low-concentration alarm. Form-C contacts, rated 5A / 250 VAC and 30 VDC
- Digital communications: RS-232
- Accuracy: ±1% of the oxygen reading
- Repeatability: ±0.5% of the oxygen reading
- Operating Temperature: 32 – 122°F (0 – 50°C)
- Power requirement: 100-240 VAC 50/60 Hz, 10 W
- Dimensions: 7.00" W x 6.75" H x 4.26" D (178 x 171 x 108 mm)

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9060 Probe SPECIFICATIONS:

General	9060H Heated	9060UL / UH Unheated
Temperature Range:	32 – 1,650°F (0 – 900°C)	UL: 1,290 – 1,830°F (700 – 1,000°C) UH: 1,290 – 2,550°F (700 – 1,400°C)
Standard Lengths:	10", 14", 20", 30", 40", 60"	20", 30", 40"
Process Connection:	1½" NPT	¾" NPT
Sheath OD:	1.34 inches (34 mm)	0.75 inches (19 mm)
Heater:	Yes	No
Power:	110 watts max, 110 VAC, 100% duty cycle 530 watts max, 240 VAC, 25% duty cycle	N/A
Internal Thermocouple:	Type "K"	Type "R"
Response Time (T90):	Typically < 4 seconds	Typically < 1 second
Head Temperature:	212°F (100°C) max	302°F (150°C) max
Reference Gas:	Air @ 50 sccm nominal flow. Integral air reference pump available with 9060Z controller.	
Check Gas Flow:	4 SCFH (2 SLPM) nominal	
Check Gas Connection:	$\frac{1}{8}$" NPT female	$\frac{1}{8}$" NPT female
Ref. Air Connection:	¼" tube	Integral air line through connector or ¼" tube
Particulate Filter (optional):	Removable titanium 30 µm standard, 15 µm optional	Not required

TAI Representative:

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