

WDG-HUMOX

Percent Moisture/Oxygen in Flue Gas

Thermox®

The right analyzer for your application

Thermox introduces the first analyzer that measures both percent moisture and percent oxygen in flue gases. This 2-in-1 analyzer is designed for flue gas applications up to 3200°F (1760°C) containing up to 85% moisture! It is ideal for direct-fired applications where accurate measurement of moisture and oxygen is critical for process control or emissions-related monitoring.

FEATURES/BENEFITS

- Get both an oxygen and moisture measurement in one analyzer instead of needing two separate analyzers.
- Zirconium oxide cells are contained in a single, compact enclosure, leading to lower installation costs, fewer spare parts, and less maintenance.
- No sample conditioning required. Takes readings right from the stack or sample line.
- Ideal for direct-fired combustion applications because it works in processes up to 3200°F (1760°C) where the oxygen and moisture content can continuously change.
- Provides oxygen reading on a wet or dry basis, as well as a moisture reading. Continuous moisture reading allows for correction between wet and dry gas readings to facilitate the needs of various regulatory agencies.

THE COMPANY

Thermox has more than 30 years' experience in a wide range of applications, having pioneered the industrial use of zirconium oxide to measure oxygen in 1967. The company is supported by more than 80 sales representative and distributor organizations worldwide. Thermox products are manufactured at our ISO-9001 facility in Pittsburgh, PA.



WDG-Humox Sensor



**Series 2000
Control Unit**

APPLICATIONS

Can be used anywhere you need to measure the percent moisture content in flue gas or combustion-fired process gas. This ranges from utilities requiring the readings for emissions purposes to processes using direct-fired combustion air that require a specific moisture level in the process gas for manufacturing, drying control or other quality purposes.

HOW IT WORKS

The WDG-Humox calculates percent moisture by volume in the flue gas or process gas on a continuous basis by measuring the difference between a wet oxygen and a dry oxygen reading. The analyzer uses zirconium oxide technology to measure the oxygen content. The zirconium oxide sensors are contained within a single sensor enclosure, improving the reliability and accuracy of the instrument.

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SERIES 2000 CONTROL UNIT

Display: 4-line x 20-character vacuum fluorescent display. 3 lines user program-mable for cell mV (wet or dry), cell temp, percent O₂ (wet or dry), percent moisture, custom text. Password protection, programmable pressure compensation and context-sensitive help are also provided.

Alarms: Two independent sensor alarms, each high or low selectable. One alarm can be allocated to % moisture, calibrate or verify. Set relays to energize or de-energize on alarm. Contact rating max. 30VA, 30V max. noninductive load.

Recorder Output: Three isolated, linear current outputs. Select % moisture, % O₂ (wet or dry), cell temp, thermocouple mV or cell mV. Each output can be 4-20 mA, 0-20 mA, 20-4 mA or 20-0 mA, and is fully scaleable. Hold or track during cal and select degree of damping. Maximum load 1200 ohms.

Diagnostics: Watchdog timer and service alarms. System test for A/D, RAM, EEPROM and keypad. Display line 4 reserved for full-text error and diagnostic messages. Twenty-entry event log.

Communications: RS-485 2-way addressable.

Environment:

Ambient Temp: 14°F to 122°F (-10°C to 50°C)

Relative Humidity: 0% to 80%, non-condensing

Enclosure: Choice of general purpose wall mount, general purpose 19"-rack mount, general purpose panel mount, weatherproof NEMA 4 wall/panel mount, and stainless steel weatherproof NEMA 4X wall/panel mount. All are UL Listed for NEC Class I, Division 2 areas.

Calibration: Oxygen cell lifetime extender. Calibrate or verify. Store last calibration and verify data. Selectable cal gas run time and process recovery time. Timed automatic calibration with optional Remote Calibration Unit.

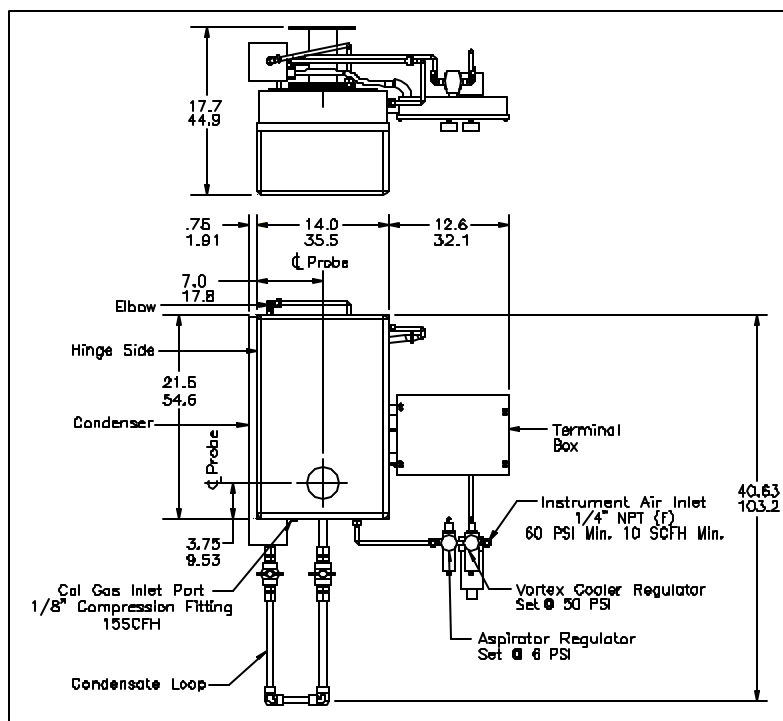
Power Requirements: Nominal 95-230 VAC, ± 10%, 47-63 Hz.

Power Dissipation: 75 VA max.

Compliance:

Low Voltage Directive 73/23/EEC (UL 3101-1)

- Safety requirement for electrical equipment for measurement, control and laboratory use, EN 61010-1 (IEC 1010-1)



WDG-Humox Dimensions and Plumbing Connections

SENSOR

Oxygen Range: 0.1% to 100% O₂
Moisture Range: 5% to 85% moisture by volume
Weight: 90 lb. (40.86 kg)
Enclosure: Weatherproof, stainless steel hinged enclosure

Power Source: 115 VAC, ± 10%, 50-60 Hz., 1000 VA Max.
 230 VAC, ± 10%, 50-60 Hz., 1780 VA Max.

Process Temp. Limit: 3200°F (1760°C)

Max. Opacity: 10%

Air Requirement: Instrument Grade Air, minimum 10 scfm (283 L/min.) at 60 psig

Environment:

Ambient Temp: 35°F to 122°F (2°C to 50°C);

-10°F to 122°F (-23°C to 50°C) with winter cover option.

Relative Humidity: 10% to 90%, non-condensing

O₂ Accuracy: ± 2% measured value or ± 0.1%, whichever is greater.

Moisture Accuracy: ± 5% measured value or ± 1%, whichever is greater.

Response Time (wet O₂, dry O₂, and moisture): 63% of step change in 23 sec.; 90% of step change in 37 sec.

Calibration Gas:

O₂ Span Gas: Air or from 1.0% to 100% O₂, balance N₂ (must be a factor of 10 higher than the zero gas)

O₂ Zero Gas: From 0.1 to 10% O₂, balance N₂