

PRODUCT DATA SHEET

CEM Humox

Measurement of moisture in flue gas

The CEM/Humox moisture in flue gas analyzer consists of two CEM/Oxygen (O₂) sensors (one dry and one wet) and a special version of the Series 2000 control unit. It is designed to measure net O₂ and moisture content in flue gas and process applications to calculate emissions on a dry or wet basis. The O₂ and moisture data is used to correct emissions, assure product quality, or minimize stack corrosion. The analyzer indicates moisture, O₂ wet and O₂ dry concentrations in percent by volume.

Extractive analyzers

Extractive analyzers are located remotely from the sample point. The sample can be delivered to the analyzer through a heated sample line (hot or wet) or cooled to remove the moisture (dry). With zirconium oxide (ZrO₂) either method can be used. Most of the sample passes straight through the analyzer. A portion flows into the convection loop and is measured by the O₂ cell.



KEY BENEFITS

- Hot Wet or Cold Dry extractive continuous emissions monitoring (CEMS)
- O₂ wet/dry calculation software for correlated flue gas moisture measurement



APPLICATIONS

- CEMS
- Hot Wet extractive CEMS
- Emissions and compliance
- Instrumentation panels



KEY MARKETS

- CEMS
- Stack moisture (O₂ wet/dry)

PERFORMANCE SPECIFICATIONS

Sensor Specs

Principle of operation	Z ₂ O ₂ - one sensor for hot wet sample; one sensor for dry sample
Operating range	O ₂ : 0.1% to 100% . Moisture: 5% to 85% by volume
Accuracy	O ₂ : ±0.75% of reading or ±0.05% absolute . Moisture: ±3% of reading or ±1% absolute, whichever is greater
Response time	<4 seconds at 2 scfh over one decade
Max Inlet temperature	400°F (204°C)
Sample flow	0.1 to 1.0 L/min (0.6 L/min is recommended)
Environment	Ambient temperature: -18°C to 50°C (0°F to 122°F). Relative Humidity: 10% to 90%, noncondensing
Power requirements	115 VAC, ±10%, 47-63 Hz; 230 VAC, ±10%, 47- 63 Hz; 313 VA max
Enclosure	Indoor use only
Calibration gas requirements	Use calibration gases at 0.1 to 1.0 L/min. (0.6 L/min recommended). Zero gas: From 0.1 to 10% O ₂ , balance N ₂ Span Gas: Minimum one decade above zero gas (10 times greater)

Series 2000 Control Unit Specs

Display	Four-line x 20-character vacuum fluorescent. Displays combinations of % moisture, oxygen (wet or dry), time and date, cell temperature (wet or dry), cooler temperature, user programmable text, thermocouple mV (wet or dry) or cell mV (wet or dry) Password protection, programmable pressure compensation and context-sensitive help are also provided
Analog output	Three isolated linear current outputs. Each output can be 4-20 mA, 0-20 mA, 20-4 mA or 20-0 mA and is fully scalable Hold or track during calibration and select degree of damping. Maximum load 1200 ohms
Alarms	Four 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	0.5A, 30V, 10VA max. noninductive load, AC or DC
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 temperature: 14 to 122°F (-10 to 50°C). Relative humidity: 10% to 80%, noncondensing
Enclosure	Standard: 19" rack mount. Optional: GP (general purpose) wall mount, GP panel mount, weatherproof NEMA 4 (IP 56) wall/panel mount, and stainless steel weatherproof NEMA 4X (IP 56) wall/panel mount. All are UL Listed for NEC Class I, Division 2 areas
Calibration	Oxygen cell lifetime extender. Calibrate or verify calibration. Store last calibration and verification data. Selectable calibration gas run time and process recovery time. Timed automatic calibration with optional remote calibration unit. (Bias adjustment [±2%] for process calibration to EPA Method 4 if required)
Power requirement	Nominal 115- 230 VAC ±10%; 47-63 Hz; 75 VA max
System compliance	EMC Directive 2004/108/EC. Low Voltage Directive 73/23/EEC

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