

WDG-IV UOP/RP

OXYGEN ANALYZER FOR UOP CCR PLATFORMING PROCESS

ISOLATION VALVE OPTION ALLOWS SENSOR REPLACEMENT WHILE THE PROCESS IS OPERATING

The Process Defined

The UOP CCR Platforming¹ process is widely used in the petrochemical industries to convert paraffins and naphthenes to aromatics with little ring-opening or cracking. A key part of the process is the continuous catalyst regeneration (CCR) in which coke deposits are removed from the catalyst by oxidation. The rate of oxidation must be controlled to prevent thermal damage to the catalyst, and this is achieved through careful control of the oxygen level in the process.

The WDG-IV UOP/RP is the latest in a series of ThermoX analyzers, which have been specifically designed to monitor oxygen content in CCR processes since 1980. It uses a nitrogen-operated aspirator to draw a sample of gas from the catalyst regenerator. A portion of this gas passes over the zirconia sensor. Because the aspirator gas contains no oxygen, the sample can simply be returned to the regenerator.

The dual isolation valve option allows the sensor to be replaced without shutting down the CCR process, allowing very high availability to be maintained.

The entire sample stream is heated above the sample dew point, so there is no risk of corrosion. For added protection, an all-Hastelloy sample stream is available as an option.

Benefits include

- ▶ High reliability
- ▶ Hastelloy probe tube
- ▶ 316 SS Wetted parts (Hastelloy C optional)
- ▶ All Wetted parts heated
- ▶ Dual isolation valves (optional)

¹CCR Platforming is a registered trademark of Universal Oil Products



SENSOR

Principle of Operation: Close-coupled nitrogen-aspirated oxygen analyzer using zirconium oxide for net oxygen measurement.

Output Range: From 0-1% to 0-100%

Accuracy: $\pm 0.75\%$ of measured value or $\pm 0.05\%$ oxygen, whichever is greater.

Response Time: 90% of a step change <30 seconds

Aspirator Requirements: 10 to 25 scfh (4.72 to 9.4 L/min) @ 15 to 100 psig (1.05 to 7.04 kg/cm²)

Probe Length/Type: 27" / Hastelloy C - standard

Max. Sample Dewpoint: 392°F (200°C)

Sample Pressure: Max. 60 psig (413.7 kPa)

Environment:

Ambient Temp.: -5°F to 140°F (-20°C to 60°C) with the Div. 2 enclosure

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

Enclosure: Weatherproof, purged, stainless steel - wall or panel mount NEMA 4X. Bolted explosion-proof optional.

Power Requirements: 115 VAC, $\pm 10\%$, 47-63 Hz, 600 VA max.; 230 VAC, $\pm 10\%$, 47-63 Hz; 1850 VA max.

Calibration Gas Requirements:

Use calibration gases @ 45 psig (3.16 kg/cm²)

O₂ Span Gas: Air

O₂ Zero gas: 1% O₂, balance N₂

Hazardous Area: UL Listed for NEC Class I, Division 2 with the Division 2 option.

SERIES 2000 CONTROL UNIT

Display: Four-line x 20-character vacuum fluorescent. Displays oxygen, time and date, cell temperature, user-programmable text, thermocouple mV or cell mV.

Analog Output: Two isolated linear current outputs for oxygen. Select O₂, cell temperature, thermocouple mV or cell mV. Hold or track during calibration and select degree of damping. Maximum load 1200 ohms.

Alarms: Two independent oxygen alarms, each high or low selectable. One alarm can be allocated to % oxygen, 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 Temp: 14°F to 122°F (-10°C to 50°C)

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

Hazardous Area: UL Listed for NEC Class I, Division 2 areas.

Enclosure: Weatherproof UL Type 4 (NEMA 4) wall/panel mount, and stainless steel weatherproof UL Type 4X (NEMA 4X) wall/panel mount. All are UL Listed for NEC Class I, Division 2 areas. Purged and explosion-proof versions also available.

Calibration: Oxygen cell lifetime extender. Calibrate or verify calibration. Timed automatic calibration with optional remote calibration unit.

Power Requirements: Nominal 115-230 VAC $\pm 10\%$, 47-63 Hz. max., 75 VA max.

System Compliance:

EMC Directive 2004/108/EC

Low Voltage Directive 73-23/EEC

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