AMETEK®
PROCESS INSTRUMENTS

MEASURES: O_2

PRODUCT DATA SHEET

WDG-V UOP/RP CCR Oxygen Analyzer

Oxygen analyzer for continuous catalytic regeneration (CCR) platforming processes

The UOP CCR Platforming[1] 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. This is achieved through careful control of the oxygen level in the process.

Proven design
The WDG-V 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.

Safe servicing
Dual isolation valves allow the sensor to be replaced without shutting down the CCR process, allowing very high availability to be maintained.

Robust and corrosion-resistant
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.

(1) CCR Platforming is a registered trademark of Honeywell UOP



KEY BENEFITS

- Highly reliable design proven for CCR
- Hastelloy probe tube
- Proven integral flow sensor
- 316 SS wetted parts (Hastelloy C optional)
- All wetted parts heated
- Dual isolation valves for serviceability
- Predictive diagnostics and proactive alarms designed for SIL 2

APPLICATIONS

- Continuous catalytic regeneration (CCR)
- Catalytic reforming/platforming

KEY MARKETS

- Petrochemical
- Refining

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PERFORMANCE SPECIFICATIONS

Sensor specifications

Principle of operation	Close-coupled nitrogen-aspirated oxygen (O_2) analyzer analyzer using zirconium oxide for net O_2 measurement
Output range	From 0-1% to 0-100%
Accuracy	±0.75% of measured value or ±0.05% oxygen, whichever is greater
Response	90% of a process step change < 12 secs
Drift	< 0.1% of cell output per month (< 0.005% O_2 per month with 2% O_2 applied)
Aspirator requirements	Use nitrogen (N_2), 10-20 scfh (4.72-9.4 L/min) @ at 0.35 kg/cm^3 above process pressure (or within 15-100 psig or 1.05-7.04 kg/cm^3)
Analog output	3 isolated linear current outputs for oxygen. Each output can be 4-20 mA, 0-20 mA, 20-4 mA or 20-0 mA and is fully scalable. NAMUR configurable. Hold or track during calibration. Max. load 1200 ohms
Alarms	5 independent, NO alarms. Set relays to energize or de-energize on alarm
Contact rating	0.5A, 30V, 10VA max. non-inductive load, AC or DC
Digital communication	2-wire Modbus RTU, 57.6 KBaud
Configuration	Modbus RTU, AMETEK configuration software, or AMEVision HMI. HART® option available
Diagnostics	Low sample flow, cell and detector age tracking, cell resistance, calibration required, analog current verification
Calibration	Calibrate or verify calibration. Stored calibration and verification data. Selectable calibration gas run time and process recovery time Timed automatic calibration with optional Remote Calibration Unit
Sample pressure	14.69 psig up to 60 psig (101.28 kPa up to 413.7 kPa)
Max sample dew point	200°C (392°F)
Probe type / length	Hastelloy C / 18" (46cm) or 27" (69cm)
Environment	Ambient temperature: -20 to 60°C (-5 to 140°F); Max. Altitude: 2000 meters Relative humidity: 10 to 90%, non-condensing
Enclosure	Hinged IP65
Power requirement	115 VAC, ±10%, 47 to 63 Hz, 740 VA max 230 VAC, ±10%, 47 to 63 Hz, 740 VA max
Calibration gas requirement	Use calibration gases @ 3.0 SCFH (1.4 L/min.) O_2 span gas: O_2 Span Gas: Air or from 1.0 to 100% O_2, balance N_2 O_2 zero gases: 2% or from 0.1 to 10% O_2, balance N_2

AMEVision HMI specifications

Display	4.2" color 1/4W VGA with graphical user interface. Password-protected
Keypad	18-key membrane
Input	Two-wire Modbus RTU (19200 Baud rate, even parity, 1 stop bit) from analyzer. Host capable of up to eight analyzers
Digital outputs	Two or four-wire Modbus RTU, TCP/IP Ethernet with embedded web server (RJ45 connection), USB port for data collection or software update
Environment	Ambient temperatures from -20 to 55°C (-4 to 131°F)
Power requirements	Nominal 115 to 230 VAC ±10%, 47 to 63 Hz, 75 VA max
Enclosure	IP65 (NEMA 4X)
System compliance	EMC Directive 2004/108/EC; Low Voltage Directive 73/23/EEC. Two hazardous area configurations: NEC/CEC Class 1, Div 2 and ATEX Zone 2

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