

TELEDYNE ANALYTICAL INSTRUMENTS



SERIES 311 *Portable Oxygen Analyzer*

Analysis of oxygen contamination has become a part of every industry that uses or produces gases or gas mixtures. Teledyne's 311 Series of Portable Oxygen Analyzers provides this vital analysis in a compact, portable package which operates without an external power source. Oxygen concentration in the sample gas stream is measured by Teledyne's Micro-fuel Cell sensor. The cell is specific to the measurement of oxygen, has an absolute zero, and produces a linear output.

As a result, the high-accuracy, fast-response Model 311 is ideal for measuring O₂ in hydrogen, nitrogen, argon, helium, acetylene, ethylene, butadiene, and many other gases.

The 311 trace version features four switch-selectable ranges: 0-10, 0-100, 0-1000 and 0-10,000 ppm O₂, plus a CAL range allowing calibration with ambient air. Power is supplied by rechargeable NiCad batteries, and a convenient integral AC recharge circuit is included.

This instrument is Factory Mutual (FM) approved intrinsically safe for use in Class I, Division 1 hazardous areas.

Maintenance Free Sensor

The 311 uses the Class B-2C Micro-Fuel Cell to measure trace O₂ in a sample gas (B-1 for percent). The B-2C sensor sets industry standards for accuracy, sensitivity and ease of use. And because every Teledyne sensor undergoes stringent testing and quality procedures, the end user is assured of outstanding reliability and performance.

Like all Micro-fuel Cells, the B-2C is a sealed electrochemical device with no electrolyte to change or electrodes to clean, making it virtually maintenance free. This sensor is specific to oxygen and is capable of accurately monitoring gas streams containing up to 100% hydrocarbons.

Easy Calibration

The Micro-fuel Cell produces an output that is linear from 0 to 100%. This means the end user can utilize ambient air (209,500 ppm O₂) for calibration, eliminating the need for costly span gases. Or, if faster calibration is required, a certified trace O₂ span gas can be used.

Long Life Rechargeable Batteries

The low operating power requirement of the 311 is satisfied by two internally mounted, 750 milliampere-hour nickel cadmium batteries. Fully charged, these batteries provide enough capacity to operate the instrument continuously for 45 days. An overnight charge once a month keeps these batteries in service for many years. An integral charging circuit and detachable power cord allow convenient charging from any 105-125 VAC, 50/60 Hz outlet (100 or 220 VAC recharge circuit is available).

Model Designations

311	trace battery powered
311D	trace, with digital meter, battery powered
311TC	trace, battery powered, CENELEC approved
311PC	percent, battery powered, CENELEC approved

SERIES 311 PORTABLE OXYGEN ANALYZERS

Applications

- Air separation and liquefaction
- Pure, gaseous hydrocarbon stream monitoring
- Semiconductor manufacturing
- Protective atmosphere blanketing of primary liquid feedstocks and flammable liquids
- Process analysis of gaseous monomers - vinyl chloride, propylene, butadiene, isoprene, or ethylene
- Gas purity certification
- Glove box leak detection
- Natural gas treatment and transmission
- Catalyst protection
- Inert gas welding of exotic metals
- Heat treating and bright annealing
- Nuclear fuel processing and isotope separation
- Analysis of chemical reactions

Options

- 100 or 220 VAC operation
- Stainless steel quick disconnect gas fittings (nickel-plated brass is standard)
- Wetted parts: stainless steel
- Special ranges
- Carrying case

Features

- Four linear ranges plus a calibration range
- High accuracy and sensitivity, fast response
- Unaffected by hydrocarbons and other oxidizable gases
- Ideal for measuring O₂ in hydrogen, nitrogen, argon, helium, acetylene, ethylene, butadiene and many other gases
- FM approved intrinsically safe
- Long life, maintenance free Micro-fuel Cell oxygen sensor
- Wetted parts: nickel plated, brass and nylon

Specifications

Ranges: 0-10, 0-100, 0-1000, 0-10,000 ppm (Trace) oxygen plus CAL range for air calibration; (Percent) 0-1, 0-2.5, 0-5, 0-10% oxygen plus calibration range

Sensitivity: 0.5% of full scale

Accuracy: $\pm 2\%$ of full scale (except ± 1 ppm for 0-10 ppm range) at constant temperature and pressure (temperature and pressure of calibration)

$\pm 5\%$ of full scale (except ± 1 ppm for 0-10 ppm range) over operating temperature range (once temperature equilibrium has been achieved).

Response time: 90% in 61 seconds

System operating temperature: 0 to 50°C

Reproducibility: $\pm 1\%$ at constant temperature

Sensor type: Class B-2C (Trace)
Class B-1 (Percent)
Others available; contact factory

System power AC power for battery requirements: recharge circuit of two current limited rechargeable NiCad batteries, 115 VAC, 50/60 Hz (100 / 220 VAC optional) 0.25 amps

Weight: 6 lbs. (2.71 kg)

Approvals: Intrinsically safe (Class I, Division 1, Groups A, B, C, and D) Factory Mutual (FM) approved

(CENELEC) BASEEFA certified for EExibICT4 intrinsically safe for zone 1 and 2; hydrogen, ethylene, oxide; temperature class - no surface temperatures above 135°C

TELEDYNE **ANALYTICAL INSTRUMENTS**

A Teledyne Technologies Company

16830 Chestnut Street
City of Industry, California 91748, USA

TEL: 626-934-1500 or 888-789-8168
FAX: 626-934-1651 EMAIL: ask_tai@teledyne.com
www.teledyne-ai.com

Warranty

Instrument is warranted for 1 year against defects in material or workmanship

NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.

