



FLO2 Handheld Flue Oxygen Analyzer



Features

- Fast response time
- Digital display for easy readings
- Rugged, Battery-powered and handheld for portability in any environment
- Easy calibration procedures
- Particulate and moisture filters for inexpensive and easy maintenance.

Does your furnace take too long to reach operating temperature?

Are you losing product yield due to oxidation and scale build-up?

Are you wasting fuel?

These are symptoms of excess air and/or tramp air in your furnace. Excess air is that which enters the furnace through the burners, in excess of what is needed for combustion. Tramp air is that which enters the furnace through leaking seals and miscellaneous openings in the furnace. Extra air can cause longer heat-up times, product loss due to increased oxidation, and fuel waste.

Flue O2 Analyzer Saves You Money

As an example, let's say your furnace is designed to run at 2.2% O₂ (10% excess air), and 2000°F, but is now running at 6.6% O₂ (40% excess air). Because you must heat this additional air, you now require 10% more fuel to run at the same temperature.

% Fuel Lost to Heat Excess & Tramp Air to Flue Temp

O ₂ %/vol (Dry Basis)	%Excess Air	Furnace Flue Temperature(°F)								
		1,400	1,500	1,600	1,700	1,800	1,900	2,000	2,100	2,200
2.2%	10.0%	2.4%	2.6%	2.8%	3.0%	3.1%	3.3%	3.5%	3.7%	3.8%
3.1%	15.0%	3.7%	3.9%	4.2%	4.4%	4.7%	5.0%	5.2%	5.5%	5.8%
4.0%	20.0%	4.9%	5.2%	5.6%	5.9%	6.3%	6.6%	7.0%	7.3%	7.7%
4.7%	25.0%	6.1%	6.5%	7.0%	7.4%	7.8%	8.3%	8.7%	9.2%	9.6%
5.4%	30.0%	7.3%	7.8%	8.4%	8.9%	9.4%	9.9%	10.5%	11.0%	11.5%
6.1%	35.0%	8.5%	9.2%	9.8%	10.4%	11.0%	11.6%	12.2%	12.8%	13.4%
6.7%	40.0%	9.8%	10.5%	11.2%	11.9%	12.6%	13.3%	14.0%	14.7%	15.3%
7.2%	45.0%	11.0%	11.8%	12.6%	13.3%	14.1%	14.9%	15.7%	16.5%	17.3%
7.7%	50.0%	12.2%	13.1%	14.0%	14.8%	15.7%	16.6%	17.4%	18.3%	19.2%
8.2%	55.0%	13.4%	14.4%	15.3%	16.3%	17.3%	18.2%	19.2%	20.1%	21.1%
8.6%	60.0%	14.7%	15.7%	16.7%	17.8%	18.8%	19.9%	20.9%	22.0%	23.0%

These problems are often correctable through proper burner adjustment, furnace pressure control, or by repairing door or hearth seals.

How do you know you're addressing the relevant problem? The answer is the easy to use and cost effective Combustion 911 FLO₂ Flue Gas Analyzer. This device reads the oxygen in your furnace, which is directly related to the excess air, as air contains 20.9% oxygen. Armed with the FLO₂, you can pinpoint the problem, take steps to correct it, and verify the results.

If you maintain industrial furnaces, the FLO₂ belongs in your toolkit!

Inexpensive Versatile Instrument

The FLO₂ is a battery powered, handheld oxygen analyzer with internal pump, perfect for industrial environments and furnace maintenance professionals. The internal pump draws a sample, and the analyzer quickly provides an easy-to-read digital LED display of 0-25%.

Easy to Maintain

The integral moisture trap and line filter protect the oxygen sensor from potential contaminants. The inexpensive, disposable oxygen sensor calibrates with the push of a button in ambient air and is simple to replace.

Two Sampling Modes

The FLO₂'s internal pump draws the sample to the oxygen sensor for analysis. The FLO₂ features two sampling modes, selected by a 3-way OFF/ON/CAL switch. The timed mode ON provides for repeatability in multiple samples and maximizes battery life. In its continuous mode CAL, the FLO₂'s pump draws a sample and displays its oxygen concentration continuously.

Common Uses

The FLO₂ is ideally suited for monitoring excess oxygen in combustion tuning, as well as measuring low oxygen concentrations for high purity welding.

Flue O2 Analyzer Up Close (Front)

Filter Cap

Unscrew to change or clean filter as required.
HAND-TIGHTEN ONLY.

Digital Display

LED display clearly shows % Oxygen

ON/OFF/CAL Switch

Selects operation mode.

Timed Pump Driven Period:
With this switch in the ON position, and the START switch pressed, the FLO2 takes a 20 second timed sample and displays the percentage of oxygen for 30 seconds.

Continuous Pump Driven Sampling: With this switch in the CAL position, the FLO2 will sample and display continuously. This position is used to calibrate the instrument to 20.9% oxygen with the calibration knob, or for continuous oxygen monitoring.

Positive Pressure Sampling: With this switch in the CAL position, samples of 0-5 PSIG may be measured while pump continues to run. The OFF position is used for storage or when there are long periods between tests.

Low Battery LED

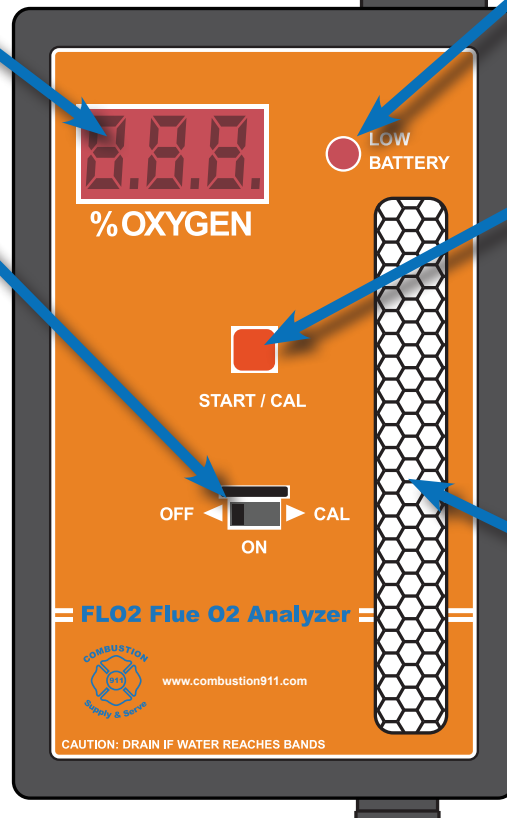
Indicates the need to replace batteries.

START Button

With the OFF/OFF/CAL switch in the ON position, depress this button once to activate the 20-second sampling sequence. The oxygen reading is held on the digital display for 30 seconds.

Water Trap Sight Window

Provides visual indication of moisture build-up. If moisture reaches the stripes on the instrument, turn off the FLO2 and empty the trap by tapping the water out. Water drains through the Automatic Water Trap Drain.



Automatic Water Trap Drain

Automatically discharges moisture during operation. It is normal to feel a slight stream of air coming from the drain during operation. Make sure that the drain is not covered during operation.

Flue O2 Analyzer Up Close (Rear)

Filter Cap

Unscrew to change or clean filter as required.
HAND-TIGHTEN ONLY.

Stainless Steel Sample Probe

Conveniently folds away when not in use. Neoprene hose may be slipped over probe for positive pressure and other sampling applications.

Stand-Off

Prevents damage caused by contact with the hot stack. Folds away when not in use.

(-) Negative Sensor Lead Screw

Attach black sensor lead to this screw.

(+) Positive Sensor Lead Screw

Attach red sensor lead to this screw.

Oxygen Sensor (Housing Door Removed)

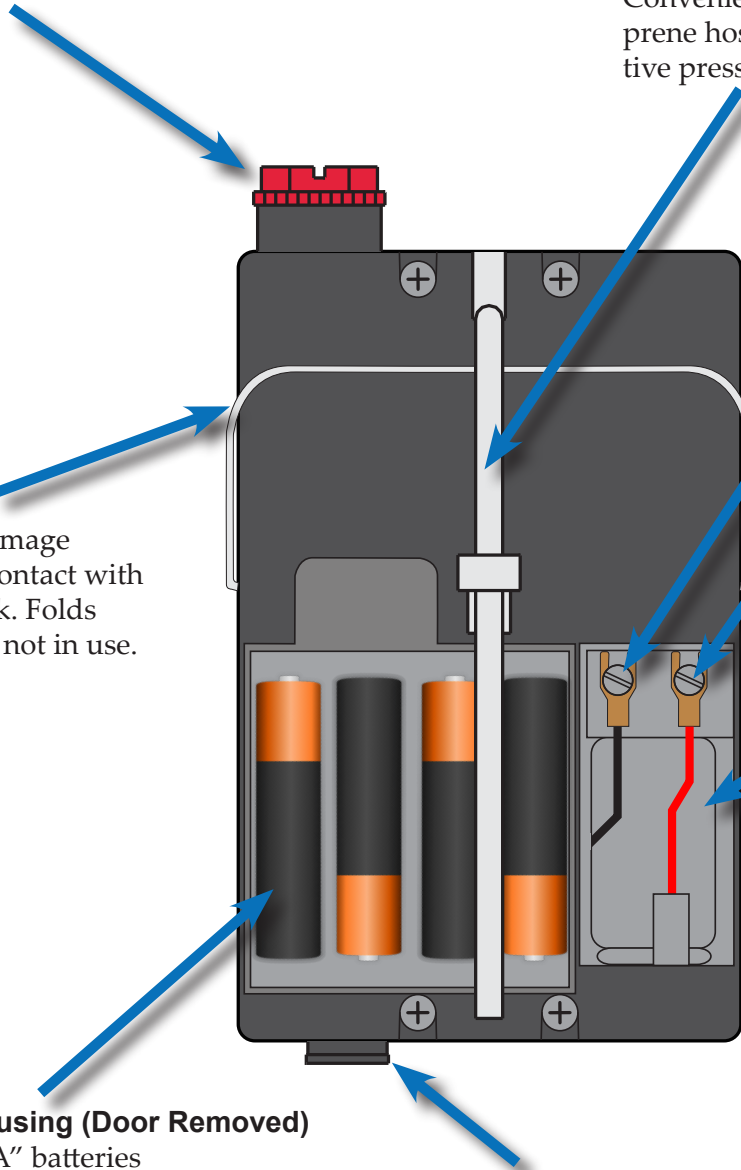
Remove sensor lead screws to remove oxygen sensor. Note that the sensor is installed plain end up.

Battery Housing (Door Removed)

Holds 4 "AA" batteries

Automatic Water Trap Drain

Automatically discharges moisture during operation. It is normal to feel a slight stream of air coming from the drain during operation. Make sure that the drain is not covered during operation.



Specifications

Sensor	Electrochemical Fuel Cell Life: 6-9 Months Warranty: 6 Months Calibration Gas: Ambient Air Calibration Period: Weekly	Accuracy	0-5% Range: 2% of measurement range at 25°C 5.1-25% Range: 0.5% of measurement range at 25°C
Measurement Range	0-25% Oxygen by Volume	Warm-up	Instantaneous
Resolution	0-5%, X.XX (2 decimals) 5-25%, X.X (1 decimals)	Sampling	Built in stainless steel sample probe. Integral particulate and condensate filter.
Display	0.4" LED	Enclosure	Material: Molded High-Impact Plastic Size: 5.5" x 3.5" x 1.5" Weight: 1 lb. with sensor and batteries.
Response Time	T90 < 10 seconds	Power	Four AA Batteries Battery life: up to 8 hours continuous

Ordering Information

Model #	Description
FLO2	Handheld Flue Oxygen Analyzer with internal pump. Includes 4 AA batteries, O2 Cell, and sample extension tube.
FLO2 Cell	Replacement electrochemical fuel cell sensor.
FLO2 Ext	Spare sample tube extension. 1/4" stainless extension tube. 33 inch length.



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