



QAQC LAB

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MODEL 201 OPERATING INSTRUCTIONS

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MODEL 201 QUICK START

Power the unit on; remove the tape covering the sensor inlet. Allow the instrument to stabilize for 2 minutes. Inject fresh air using a syringe or just let the instrument sit. Adjust the SPAN reading so that the instrument reads 20.9%.

DO NOT BREATHE INTO THE ANALYZER – the humidity in your breath will damage the sensor.

GENERAL DESCRIPTION

This manual describes the function, operation and maintenance of the Quantek Model 201 hand-held oxygen analyzer. A member of Quantek Instrument's line of oxygen analyzers, the Model 201 utilizes Quantek's proprietary oxygen sensor and is engineered for fast response, maximum reliability and stable performance. The Model 201 is designed for spot-checking oxygen concentration in a wide variety of applications.

The Model 201 should be used in general purpose areas only. It is not for safety or medical applications.

The sensor of the Model 201 Oxygen Analyzer has been tested with various gases present and found to have acceptable low interference for the O₂ reading.



WARNING: The device in its entirety (including electronics) is not suitable for use in the presence of flammable gases or vapors. Operating the oxygen analyzer in flammable or explosive atmospheres may result in fire or explosion.

Use of the Model 201 near devices that generate electrical fields, e.g. walkie-talkies, may cause erratic readings.

If the Model 201 is ever exposed to liquids (from spills or immersion) or to any other physical abuse, turn the instrument OFF and then ON. This will allow the unit to go through its self test and make sure everything is operating correctly.



CAUTION: Never autoclave, immerse or expose the Model 201 (including sensor) to high temperatures (>70°C) or liquids. Never expose the device to pressure, irradiation vacuum, steam, or chemicals.

Do not throw away. Dispose of properly in accordance with local regulations.

BASE UNIT DESCRIPTION

The Model 201 analyzer provides unparalleled performance and reliability, due to an advanced design that includes the following features and operational benefits:

- Fast-responding, oxygen-specific sensor that achieves 90% of final value in approximately 12 seconds at room temperature with flow injected.
- Extra-life oxygen sensor, typical 4-5 years in most normal applications.
- Adaptable sample input connection and internal sensor.
- Operation using either 4 AA battery or a 5V DC power adapter
- Durable, compact case that permits comfortable, hand-held operation.
- Large, easy-to-read, 3 1/2-digit LCD display for readings in the 0-100% range.

- Simple operation and calibration using SPAN and ZERO adjustments
- Self-diagnostic check of analog and circuitry.

CALIBRATION

Before you begin:

The Model 201 Oxygen Analyzer should be calibrated upon receipt. Thereafter, Quantek recommends calibration on a weekly basis. However, more frequent calibration will not adversely affect product performance. More frequent calibration is required when:

- 1) the geographic elevation at which the product is being used changes by more than 500 feet. Changes in elevation result in calibration error of approximately 1% of reading per 250 feet
- 2) the user is unsure when the last calibration procedure was performed or if the measurement value displayed is in question. It is best to calibrate the Model 201 analyzer to a known documented oxygen concentration at a pressure and flow similar to your application. Calibrating the Model 201 analyzer at lower concentrations with a known oxygen value is

also acceptable and may provide additional accuracy if the calibration gas is closer to the environment in which the Model 201 analyzer will be used.

NOTE: Before beginning calibration the Model 201 sensor must be in thermal equilibrium.

Calibration to Room Air

The Model 201 analyzer can quickly be calibrated to room air (20.9%) using the side span, which has a wide range.

Introduce room air into the analyzer using a syringe. If you don't have a syringe, you can simply set the analyzer in the room and allow it to fully adjust to ambient conditions.

As the life of the sensor degrades, the room air reading will begin declining. You should adjust the SPAN setting at least once a month to 20.9%.

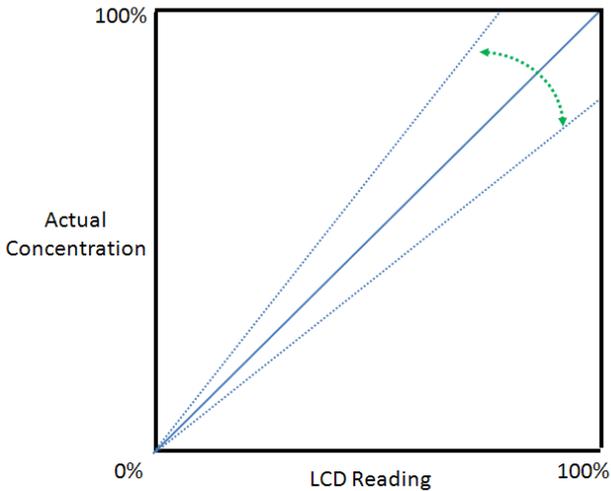
To check the zero point, introduce a flow of nitrogen (or other inert gas) into the inlet fitting. Turn the zero adjuster after this flow has been running for 1-2 minutes. The zero drift is rated at less than 0.1% per month, so this should only need to be checked every 6-9 months.

To Calibrate the MODEL 201 Analyzer using a point other than room air:

NOTE: The response of the Model 201 oxygen sensor is linear; however, for better accuracy you may want to calibrate to a different oxygen concentration. You can calibrate to a known concentration between 2% and 96%.

Please note that the entirety of the curve is affected if you calibrate the analyzer in the lower end of the curve; i.e. calibrating to a 5% O₂ standard will have a greater effect on the upper readings and may reduce the accuracy slightly at the upper end of the curve.

The table below demonstrates this effect – the green line represents the adjustment you can make. Please note that the actual corrective adjustment (the distance between the two dashed lines) is approximate. In reality it is quite a bit wider.



Should you choose to calibrate to a different concentration, or to a known concentration with a high flow rate, follow these steps:

- 1) Connect the sample hose to the barbed fitting on the bottom of the unit.
- 2) Attach the other end of the sample hose to the source of the known oxygen concentration and initiate flow of the calibration gas to the unit. Flow rate is not critical, but should be sufficient for an adequate response time.

3) Using the ON/OFF key, make sure the unit is in the power on mode.

4) Allow the oxygen reading to stabilize. This will normally take about 30 seconds or more.

5) Adjust the SPAN. For example if you are flowing 95% oxygen into the instrument, and it reads 94.6%, turn the span so that it reads 95%.

OPERATION INSTRUCTIONS – FLOW



To check the oxygen concentration of a sample gas with flow (after the unit has been calibrated):

1) Using the ON/OFF key, make sure the unit is in the power on mode.

2) Connect the sample hose to the barbed fitting on the bottom of the unit. Attach the other end of the sample hose to the sample gas source and initiate flow of the sample to the unit at a rate of 0.1 to 1 liters per minute.

3) Allow the oxygen reading to stabilize. This will normally take about 30 seconds or more.

OPERATION INSTRUCTIONS – AMBIENT / CHAMBER



1) Using the ON/OFF key, make sure the unit is in the power on mode.

2) Set the instrument in a chamber and ensure that the T-fitting has been removed from the white cylindrical fitting.

SENSOR REMOVAL AND REPLACEMENT

The Model 201 is shipped with a new oxygen sensor installed. Although the sensor has a very long expected life, eventually the sensor will require replacement, in about 4-5 years.

Removing or installing a sensor, when necessary, is a very simple procedure. To remove and install a new sensor:

- 1) Remove the black plugs and disassemble the unit.
- 2) Remove the cylindrical fitting from the panel.
- 3) Disconnect the sensor cable and remove the old sensor.
- 4) Install the new sensor and cable.

CLEANING AND MAINTENANCE

When cleaning the MODEL 201 analyzer is needed, take appropriate care to prevent any liquids from entering the instrument.

The MODEL 201 analyzer's surface may be cleaned using a cloth or paper towel dampened with mild soap solution.

Store the MODEL 201 analyzer in a clean, dry environment.

APPLICATIONS

Calibration Techniques in Pressurized Systems

The Model 201 sensor measures the partial pressure of oxygen in a gas stream. This is correlated to read “percent oxygen” on the Model 201 analyzer. It is important to note that the sensor output is directly proportional to the pressure of oxygen. Thus, one must take into consideration the effect of exposing the sensor to various gas sample pressures.

For example, if an analyzer is calibrated to read 20.9% in ambient air (atmospheric pressure) and then exposed to a pressurized gas sample containing a known concentration of oxygen, the analyzer will display a reading greater than the actual oxygen percentage. This is because the analyzer was originally calibrated at atmospheric pressure (0 psig) then exposed to a higher pressure sample (eg, 5 psig). The greater the difference in pressure, the greater the difference in sensor signal (oxygen reading on the analyzer).

Depending on the fitting used, the pressure can be allowed to vent (thus greatly reducing

the pressure), or the T-fitting can be used to keep the system closed and at a constant pressure.

By the same token, if an analyzer is calibrated on a pressurized gas sample containing a known concentration of oxygen and then exposed to ambient air (atmospheric pressure), the analyzer will display a reading less than the actual oxygen percentage.

You can correct for differences in pressure by:

1) calibrating the analyzer to 20.9% (assuming that your chamber contains ambient room air),
or

2) by applying a corrective factor to the reading seen on the LCD if you know the pressure of the sample.

For example, if placed in a chamber that is at 1.2atm, and contains ambient concentration of oxygen, the reading will show 25.1%.

Use the following formula:

$(1 / 1.2) \times 25.1\% = 20.9\%$ (pressure corrected reading)

$(1 / (\text{actual pressure})) \times \%O_2 = \text{pressure corrected reading}$

Humidity

Humidity has no effect on the performance of the Model 201 analyzer other than diluting the gas, as long as there is no condensation. Environments where condensation may occur are to be avoided since condensate may obstruct passage of gas to the sensing surface, resulting in erroneous readings and slower response time. For this reason avoid usage in environments greater than 95% relative humidity.

Technical Specifications

Range	0.1 to 100% Oxygen
Resolution:	0.1% Oxygen
Accuracy:	+/- 1% of the reading (20.9% may read 20.7 to 21.1%)
Sensor:	Electrochemical Cell, proprietary design, expected life 4-5 years
Power Supply:	Battery version: four "AA" batteries AC Version: AC to DC adapter; 5V DC, center positive, 2.1mm barrell
Battery Life:	3000 hours
Size:	7 x 3.5 x 1.5 in.
Weight:	.75 lbs
Operating Temp	5 to 40 C

Maximum Storage Temp	-15 to 50 C
Response Time	15 seconds to 95% of reading with flow; less than 20 seconds to 90% of the final reading with no flow, about 45 seconds for final reading across entire range
Humidity Recommendation	5% to 95% RH, non condensing

SPARE PARTS AND ACCESSORIES

Contact us for current pricing and a list of spares:

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