



MODEL 901 CALIBRATION PROCEDURE

v. 4.01 2021

ATTRIBUTE	RECOMMENDATION	NOTES
SPAN FREQUENCY	Check 20.9% reading every two weeks	Can be done at end user location, see "calibration of span"
ZERO FREQUENCY	Check zero reading once a year	Can be done at end user location, see "calibration of zero"
FACTORY CALIBRATION	Return to factory within 24 months for full operational check, and every 12 months thereafter	Ship back to Quantek in Grafton, Massachusetts
EXPECTED SENSOR LIFE	5 years after manufacture	Sensor replacement typically performed at Quantek, but it is user replaceable
REQUIRED MATERIALS FOR CALIBRATION	pure zero gas (such as nitrogen, or mix of nitrogen / CO ₂)*, calibration tube (included with analyzer)	Quantek can provide handheld cylinder of nitrogen in the US – customers outside the US should check with local gas supplier

* zero gas should be certified by gas supplier or GC methodology; some cylinders marketed as pure nitrogen may contain as much as 0.3% oxygen.

OPERATIONAL CHECK

Plug the power module into an AC outlet and insert the plug into the jack on the side of the unit. Depress the power switch to turn the unit

on. Allow the analyzer approximately 30 seconds to warm up and equilibrate.

The sensor will compensate for temperature variations, but equilibration may take longer after sudden, large temperature changes.

INITIAL CALIBRATION

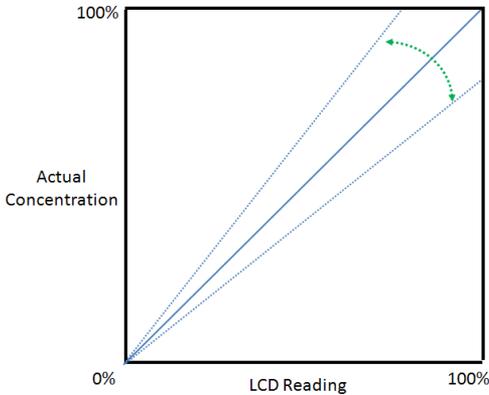
The response of the sensor is linear, therefore, it is recommended that you calibrate it to only room air and 0.0%.

To compensate for drift at the zero point, you may wish to calibrate zero as “0.1%”, as this will reduce the likelihood of negative numbers appearing.

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.

For customers who care less about the accuracy at 20.9%, and more about the accuracy (for example) at 90%, then can obtain a 90% oxygen cylinder, and follow the instructions below, using 90% as their “span” point.

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.



CALIBRATION OF SPAN (20.9%)

IDLE READING: If the unit is idle for a time the O₂ reading will gradually drift downward to about 20%. This is normal, as the sensor requires some small flow of air over the electrode to create a reading. Introduce fresh room air before attempting to calibrate.

- 1) Remove needle and filter from end of probe
- 2) Press pump button to draw in a fresh sample of room air.
- 3) If the reading on the LCD is not 20.9%, adjust the SPAN potentiometer on the

left side of the instrument until the reading shows 20.9%. The oxygen content of room air is a constant 20.9%, and can be used as a standard to set the calibration of the analyzer.

- 4) The range of the side span is about +/- 3%, so if you are unable to turn the span up to 20.9%, then the sensor may be expired.

VERY LOW READING: If the instrument reads below 10% after this procedure, typically the sensor inside has been contaminated. A completely contaminated sensor will read below 1% with room air in it. Open the top cover and inspect the tubing for water droplets.

ELEVATION: Our analyzers are manufactured and calibrated at 510 ft (or about 150m) above sea level. Self-calibration upon delivery will be required if at a significantly different elevation, unless we have calibrated to that elevation ahead of time. Press the pump button and adjust the span as noted.

CALIBRATION OF ZERO

- 1) attach a known cylinder of nitrogen to the rear vent of the instrument
- 2) Flow a very light flow of nitrogen into the analyzer – do not pressurize it as this may damage the sensor. Flow rates of

200cc/min or less are acceptable, but the lighter, the better.

- 3) If the reading on the LCD is not 0.1%, adjust the ZERO potentiometer on the back of the instrument until the reading shows 0.1%.

ADDENDUM – CALIBRATION WITH PUMP RUNNING CONTINUOUSLY

The instructions in this document pertain to calibration of the 901 after the pump has stopped running, and the internal pressure of the instrument has equilibrated to 1.0 atm.

For units with a red pump switch, the instrument is calibrated exactly the same, but the pump should be running while calibration is performed. While the pump is running, there will be a slight vacuum created inside the instrument.

For the “calibration of span”, for 901 units with a red pump switch, the section will read as follows:

- 1) Remove needle and filter from end of probe
- 2) Click the pump switch into place so that it is running continuously.
- 3) If the reading on the LCD is not 20.9%, adjust the SPAN potentiometer on the left side of the instrument until the reading shows 20.9%. The oxygen content of room air is a constant 20.9%, and can be used as a standard to set the calibration of the analyzer.

- 4) The range of the side span is about +/- 3%, so if you are unable to turn the span up to 20.9%, then the sensor may be expired.
- 5) When the pump is turned off, the reading will increase slightly (to somewhere between 21.1% and 23%). This is normal. Do not make any adjustments unless the pump is running.

VIDEO LINKS

Please see this video for standard calibration of Model 901, such as for use in package testing:

https://youtu.be/A25czoj6_QQ

Please see this video for demonstration of calibrating a 901 with red switch to 95% oxygen:

<https://youtu.be/tON15CmEzKI>