



Handi+

INSTRUCTIONS FOR USE
INDUSTRIAL



NOTE: The latest edition of this operating manual can be downloaded from our website at www.maxtec.com

CLASSIFICATION

Protection against electric shock..... Internally powered equipment
 Protection against water.....IPX4
 Mode of Operation.....Continuous
 Flammable anesthetic mixture.....Not suitable for use in presence
 of a flammable anesthetic mixture



Product Disposal Instructions:
















The sensor, batteries, and circuit board are not suitable for regular trash disposal. Return sensor to Maxtec for proper disposal or dispose according to local guidelines. Follow local guidelines for disposal of other components.

WARRANTY

Maxtec warrants to the original purchaser, that the HANDI+ analyzer to be free from defects in material and workmanship for a period of two-(2) years from the date of shipment from Maxtec or from one of Maxtec's authorized dealers. Parts found to be defective as determined by Maxtec, will be repaired or replaced free of charge if shipped prepaid to the factory in the original shipping carton. This warranty is void if the product has been subject to misuse or abuse, including but not limited to: exposure to water, humidity- temperature- shock or pressure outside of the listed specifications, or has not been operated in accordance with instructions, or if the identifying markings on the product label have been altered or removed. Routine maintenance items are excluded from this warranty. The seller assumes no liability for consequential damages of any kind, and the buyer, by acceptance through purchase of this product, will assume all liability for the consequences of its use or misuse by the buyer, his employees, or others. It is the sole responsibility of the buyer/user to determine if this product is suitable for the intended application.

SYMBOL GUIDE

The following symbols and safety labels are found on the Handi+:

	ON/OFF Key		CAL (Calibration Key)
	Do not throw away. Follow local guidelines for disposal		Attention, consult accompanying documents
	Serial Number		Calibration Reminder
	Corrosive		Lot code/Batch code
	DO NOT		Meets ETL standards
	Contains Lead		Manufacturer
	Caution		Warning
	Ingress Protection Rating		

1.0 INTRODUCTION

Intended Use: The HANDI+ is a flexible tool, which is ideal for many applications. Compact and easy to operate, the HANDI+ can quickly monitor oxygen deficiency in ambient air or check process gas streams.

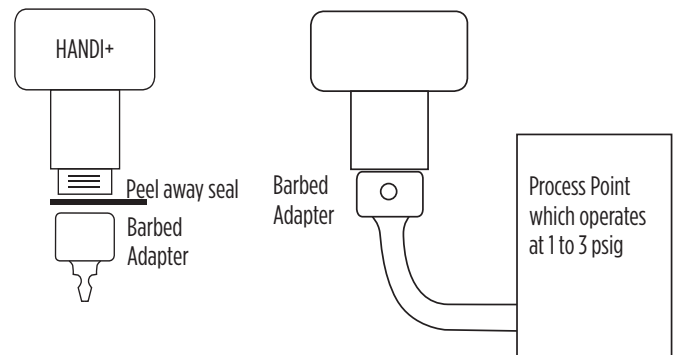
The HANDI+ features the model MAX-250 oxygen sensor that offers superior performance over conventional sensors. Based on a weak acid electrolyte, the MAX-250 is unaffected by CO₂ or other combustion gases. Additionally, the MAX-250 sensor offers extra life and excellent stability.

The sensing port of the HANDI+ is threaded to adapt to a wide variety of sampling accessories. With the barbed fitting, the HANDI+ can be quickly connected to a flexible tube for checking nitrogen or oxygen sources. With the flow through head accessory, the HANDI+ can be connected to process gas streams for a quick check of oxygen.

2.0 OPERATION

2.1 General

The plastic freshness seal on the sensing port should be removed and discarded when you are ready to use the HANDI+ for the first time. This seal ensured freshness of the HANDI+ during shipping and storage. Once the seal is removed, you should expect to obtain the normal life from the HANDI+. Included in the kit you will find the barbed adapter, which will screw onto the sensing port.



3.0 CALIBRATION

To simplify operation the Handi+ Analyzer automatically determines the calibration gas being used as compressed air (20.9%) or high grade (100%).

For best performance and accuracy, the HANDI+ should be calibrated on a frequent basis. It is preferable to calibrate each day it will be used or at least once a month on a known source of oxygen. Clean, dry compressed air is a suitable cal gas.

Clean dry air typically contains approximately 20.9% oxygen. Expose the HANDI+ to air (compressed or ambient) and push the "CAL" button. The display will indicate the concentration of oxygen of the Calibration gas. It is recommended that the calibration gas be controlled to a pressure and flow rate equivalent to the measured gas. This may be accomplished by using the same gas sampling apparatus for calibration as for measuring in the intended application. For example, if the HANDI+ is used to check a nitrogen gas line, use the same sampling setup


when calibrating. If the intended use is for checking room air, then calibrate the HANDI+ on clean ambient air (20.9% Oxygen). After adjusting the display to 20.9%, the HANDI+ is now calibrated and may be used to verify oxygen concentrations.

Always recalibrate the HANDI+ if the point of use elevation has changed by 500 feet. If unable to adjust the calibration pot so the display correctly indicates the value of the calibration gas, the HANDI+ has probably expired. If still within the warranty period, the unit should be returned to the factory for evaluation.

4.0 CALIBRATION ERRORS AND ERROR CODES

The Handi+ analyzers have a self test feature built into the software to detect faulty calibrations, oxygen sensor failures, and low operating voltage. These are listed below, and include possible actions to take, if an error code occurs.

E03: No valid calibration data available

Make sure unit has reached thermal equilibrium. Press and hold the Calibration Button  for three seconds to manually force a new calibration.

E04: Battery below minimum operating voltage

Unit is at end of life, see page I for proper disposal.


CAL Err St: O2 Sensor reading not stable

Wait for displayed oxygen reading to stabilize when calibrating the device at 100% oxygen. Wait for unit to reach thermal equilibrium (Please note that this can take up to one half hour, if the device is stored in temperatures outside the specified operating temperature range).

CAL Err lo: Sensor voltage too low

Press and hold the Calibration Button  for three seconds to manually force a new calibration. If unit repeats this error more than three times, contact Maxtec Customer Service for possible replacement.

CAL Err hi: Sensor voltage too high

Press and hold the Calibration Button  for three seconds to manually force a new calibration. If unit repeats this error more than three times, contact Maxtec Customer Service for possible replacement.

CAL Err Bat: Battery voltage too low to recalibrate

Unit is at end of life, see page I for proper disposal.

5.0 CLEANING, MAINTENANCE, AND DISPOSAL

The HANDI+ analyzer requires little maintenance. For best performance and accuracy, the HANDI+ should be calibrated on a frequent basis. For general use, it is recommended the HANDI+ be calibrated once a month on a known source of oxygen such as clean dry (compressed) air. Reference the calibration section in this manual for more details.

If the unit becomes wet, it should be dried off immediately with a soft dry towel. The display may indicate low concentrations of oxygen if the sample port of the sensor becomes wet. In this case, remove the barbed adapter and thoroughly dry inside and out with a soft dry towel or cotton applicator tip. Additionally, dry the face of the sensor with a cotton applicator tip and allow to air dry for one half-hour (or until the oxygen display returns to normal). Exposure of the HANDI+ to water or extremely high RH may result in shortened life or cause the electronic circuit or battery to fail. Disposal: Please note the materials of construction for proper disposal.

The material of the HANDI+ housing is a polycarbonate and ABS blend. The sensing portion of the HANDI+ contains lead and acetic acid. The HANDI+ contains a printed circuit board and a Lithium Battery.

6.0 SPECIFICATIONS

6.1 Analyzer Specifications

Sensor Type:.....Maxtec MAX-250 galvanic cell w/ Temperature Compensation (Non-Replaceable). Extra-Life Oxygen Sensor, galvanic cell type.

Measurement Range:..... 0.0 - 100.0% oxygen (gas)
The three digit LCD indicates values between 0.0 - 99.9% oxygen.

Over range indicated by one decimal point on display located after the first digit.

Accuracy and Linearity:± 1% of full scale at constant temperature, R.H. and @ 15°C - 40°C pressure when calibrated at full scale
± 3% actual oxygen level over full operating temperature.

Response Time:< 15 seconds for 90% step change. (at 25°C)

Warm-up Time:None required

Operating Temperature:.....15°C - 40°C (59°F - 104°F)

Storage Temperature:.....-15°C - 50°C (5°F - 122°F)

Operating Pressure:Atmospheric pressure to 3 psig.

Environmental:.....General purpose housing equivalent to NEMA 1.

The Handi+ is not waterproof. 0-95% RH, non-condensing.

Warranty:Twenty-four months in normal operating conditions.

Power Requirements:.....Powered by one internal, non-replaceable Lithium battery, CR2450.

Power on push button automatically shuts off after 80 seconds time-out.

Electronics rated general purpose; not for use in hazardous areas or for use with flammable gases.

Weight:.....Approx. 60 grams

Battery Life:.....Approx. 1850 hours (74,000 cycles)

Sample Port:M16 x1 Thread with barbed tubing adapter.

Operating Pressure:Atmospheric pressure to 3 psig

Expected Storage Life:Two months with freshness seal on sensor.



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