



OXY I

OXYGEN ANALYZER

5 PPM – 1000 PPM



INSTRUCTIONS

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GENERAL INSTRUCTIONS

This operating manual describes the components, functionality, operations and safety precautions when using the WS OXY I Oxygen Analyzer.

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SIKKERHEDSANVISNINGER

Individuals need to read and understand this manual before using the oxygen analyzer. There is no need to open the housing of this unit. Only authorized personnel should open for service concerns and to not void the warranty.

If authorized to open the unit, please ensure that all power sources are turned off. Unplug from power supply and press the On/Off button on the front of the unit, to eliminate battery power. **WARNING!** The use of this measuring device in potentially explosive environments is forbidden. For example, when reading forming gases the hydrogen content must be below 10% concentration.

Any used rechargeable batteries (NiMH) should be disposed of according to local regulations

SCOPE OF DELIVERY

Included with the analyzer are the following:

- Unit with attached special measuring hose and probe
- Case
- Calibration certificate
- Universal plug 100 V - 240 V AC / 12 V DC 1.2 Ah
- Manual

APPLICATIONS

This oxygen analyzer is designed to constantly measure oxygen levels in inert gases as well as in special forming gases, specifically hydrogen (H₂) mixtures with a maximum concentration of 10% H₂.

This unit is especially suited to the welding industry and corresponding applications. The very high quality pipe welds that were required for the semi conductor industry of the past are now common for the aerospace, pharmaceutical, dairy, brewery and other industries. This oxygen analyzer enables welders to accurately recognize when extremely low rest oxygen atmospheres are in the weld environment. This environment permits the welder to potentially reach a high quality weld today that was difficult to reach in the past.

A few of the features of the WS Oxy I (+Premium)

- a. Internal power source recognition for 100 V - 240 V AC
- b. Programmable audio alert
- c. Analog data interface 0 - 5 V DC (0 ppm - 1000 ppm)
- d. Integrated NiMH rechargeable battery (5x 3200 mAh)
- e. Color coded display
- f. Graphic display
- g. Multi language, English, French, German (June 2009)
- h. Documentation (optional or upgradeable)
- i. RS 232 interface and Bluetooth
- j. Can-Bus interface for data logging via PC

DESIGN

Amperometric oxygen sensors incorporate an electro-chemical oxygen sensor made of zirconium oxide. If a current is applied to the cell, oxygen ions are pumped from the cathode to the anode. This reaction occurs in a closed and insulated sensor at a temperature of 580°C. A particulate filter that is also insulated against heat loss protects the sensor.

Behind the sensor a pump is positioned that pulls the sample medium through the sensor. Using low permeability hoses that are temperature resistant, the resulting resistance is processed by the electronics and is displayed on the colored LCD screen. With the integrated and easy to use software, the operator has the opportunity to set a variety of parameters with acoustic and visual signals.

DESCRIPTION AND OPERATION



DIFFERENT COLORED DISPLAY SCREENS

The multi colored display allows a variety of colors to be used. This innovative feature allows the operator a quick visual glance to see the current situation.

The unit uses the following colors to indicate:

Blue Display: Sensor warming up

Turquoise: Stand By Mod.

Red Display: Sensor ready (approx. 580°C)

Green Display: Upper limit O₂ crossed

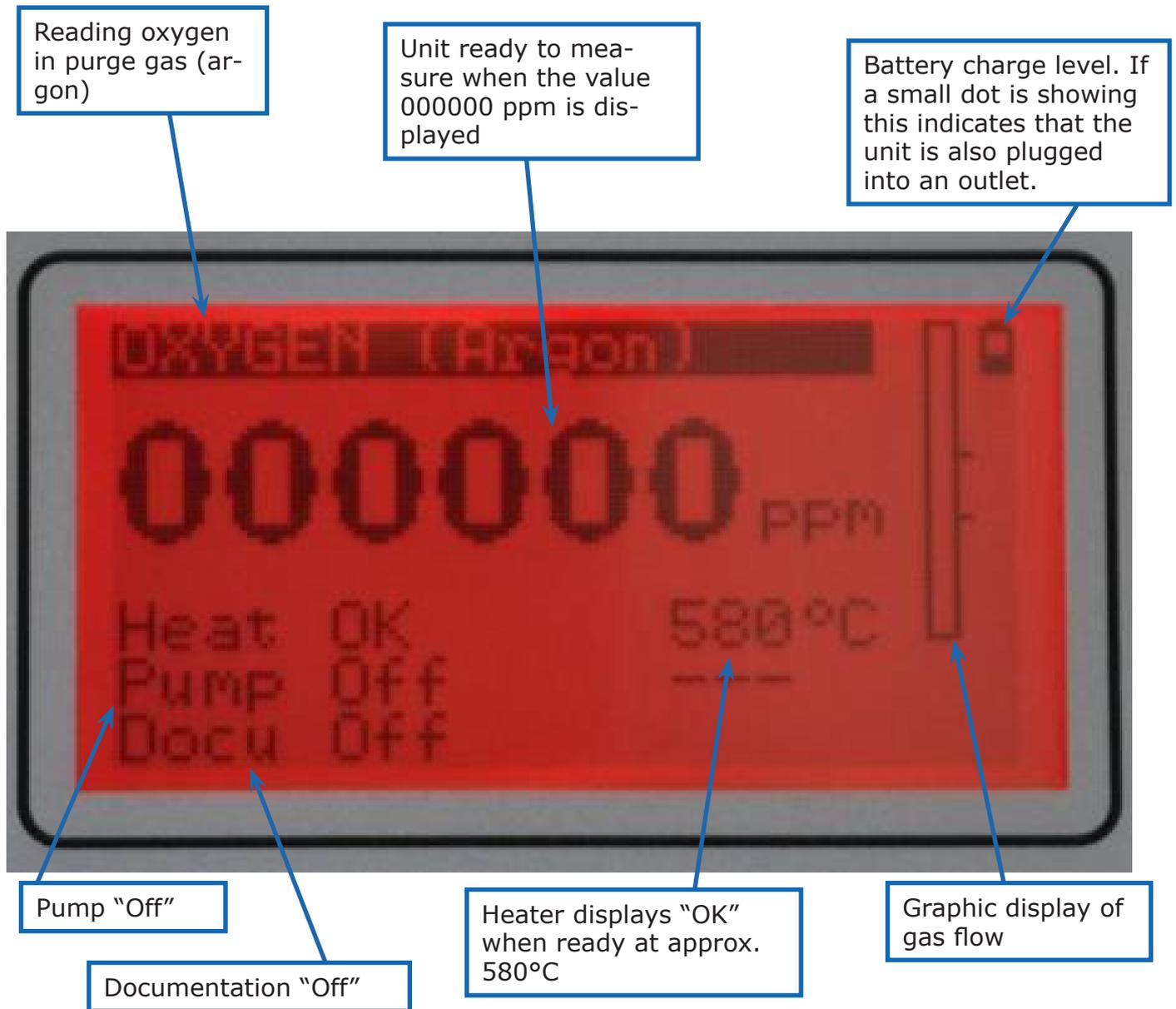
Yellow Display: Programming mode



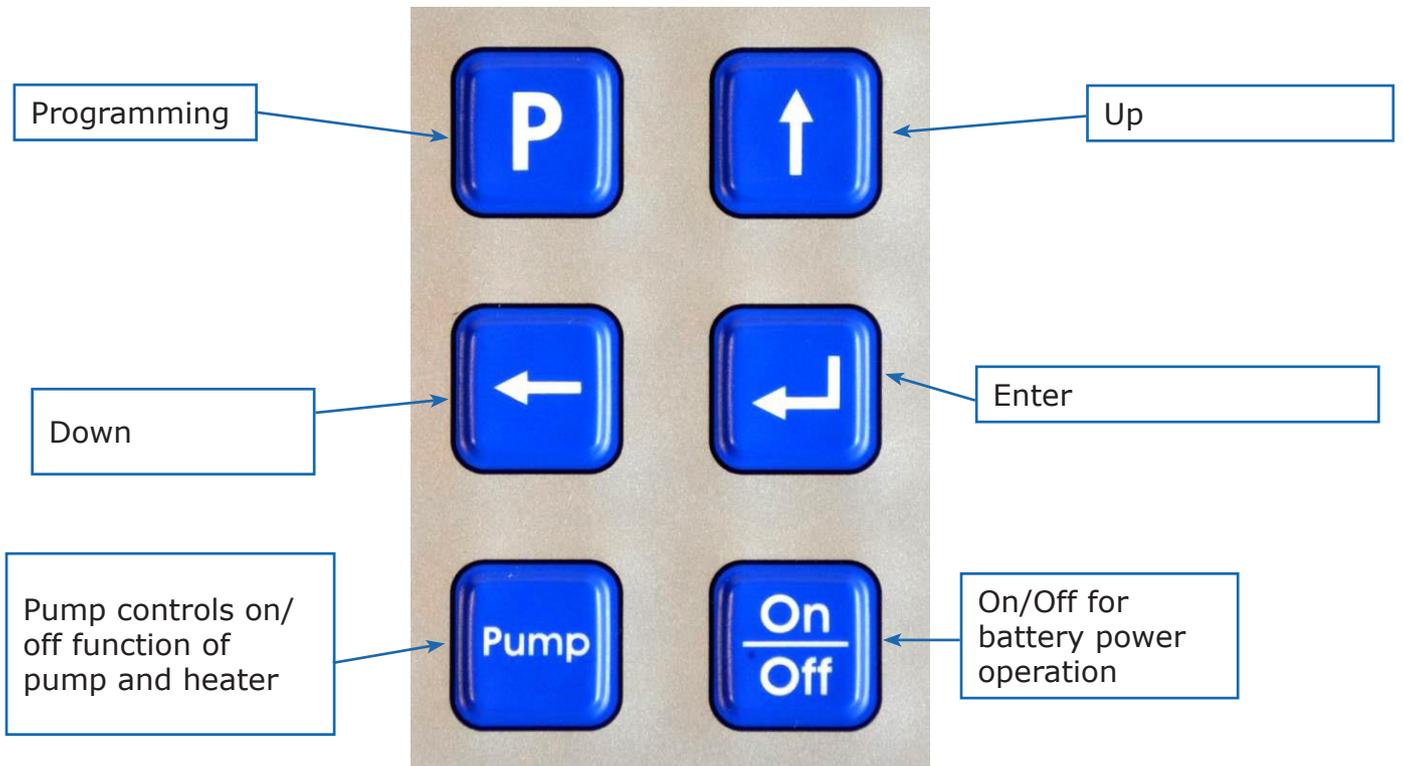
OPERATION

Zirconium cells need a high temperature to function, to achieve this the sensor is heated. In approx. 3 minutes the sensor has reached it's operating temperature of approx. 480°C. The color in the display is turquoise (Standby). Then do you press the Button Pump, the temperature go to the end of heating (580°C). During this phase the display will be blue. If the "Signal Sound" is set to "On", the unit after reaching 550°C will beep 5 X in order to alert the operator that the unit will be ready shortly. After the sensor has reached it's operating temperature, the display will switch to red and "000000" will be flashing. When the "Pump" is activated, the display switches to "1000" ppm, which is the highest value this unit will indicate.

MAIN MENU



OPERATING BUTTONS



The keyboard is user-friendly and allows for function display changes even with work gloves or welding gloves. Through the audible "click" of the operation keys, choices are confirmed. The WS Oxy I can be programmed for a variety of functions, including audible and visual settings.



On/Off button



Holding down this button for approx. 2 seconds will turn on the device

Pump button

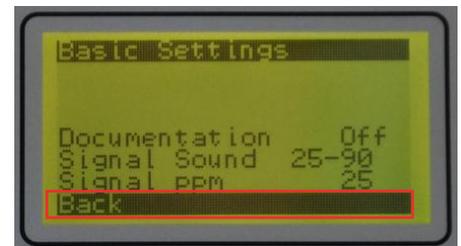


Holding down this button will turn on/off the pump.

Enter button



Pressing this button engages the selected line item on the screen.



Down button



This button is used to move back through the menu as well as to reduce a programmable value.

Up button



This button is used to move forward through the menu as well as to increase a programmable value.

Program button



This button allows for movement through a multitude of menus. It enables the unit to be programmed and can document the results, as well. Default parameters can be changed so that the unit can visually and acoustically alert information and much more.

MENU

Basic Settings (Yellow Display)



In the menu "Basic Settings" the values for the "Signal Sound" and "Signal ppm", which are visual and acoustic alerts, can be changed. "Documentation" can also be turned on or off.

DESCRIPTION OF TERMINOLOGY IN "BASIC SETTINGS".

"Signal ppm"

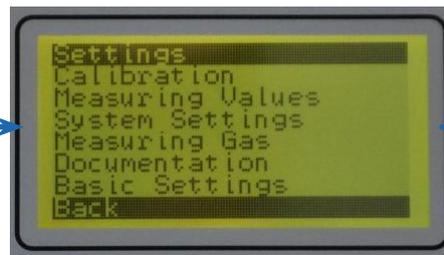
If the set value has not been reached, the display will flash red. When the readout drops below the set value in ppm, the display will flash green.

"Signal Sound"

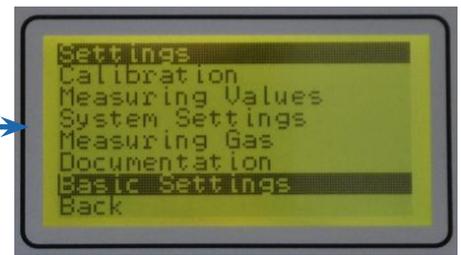
An acoustic "beeping" alert can be programmed, for example within the 30 ppm – 100 ppm range, see last three pictures that show an "audible" signal setting of 30 ppm.



To access Settings, press **P**



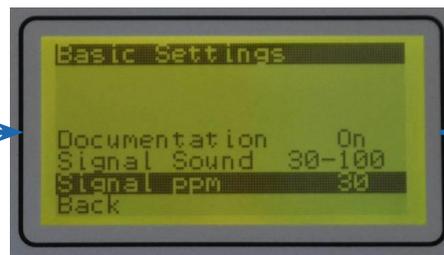
Press **↑** to navigate to Basic Settings



Press **↵** to access the menu option



To navigate the menu, press **↑** or **←**



To access a value, press **↵**



Press **↑** to increase the value, and **←** to decrease it. Press **↵** to navigate the menu again



Navigate to Back with **←** and press **↵** to return to the main screen.



Navigate to Back with **←** and press **↵** to return to the main screen.



Navigating menus and changing values works in a similar fashion across all menus in this device.

Documentation (Yellow display) (PREMIUM ONLY)

The device can log welds where it has been in use. To access this function, do as follows:



Measuring Gas

The default setting is "Argon" but the unit can be programmed to measure inert gases such as Argon or Forming Gases with hydrogen (H2) components.

The percentage of hydrogen components CANNOT EXCEED 10%, as there is a danger of explosion!

To change from default, select "Argon - H2" (Forming Gas with 10% or less hydrogen content)



System settings

To access System settings, do as follows:

ADDITIONAL INFO

Standard-language:

German/English or Danish/English

Baud-rate:

9600 (printer, PC connection, Bluetooth Dongle)

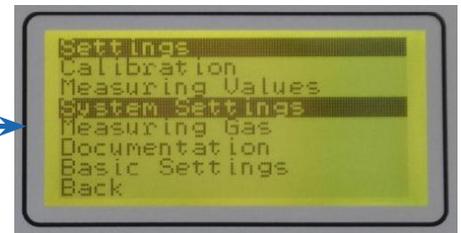
19200 exclusively for administration and software updates



To access Settings, press **P**



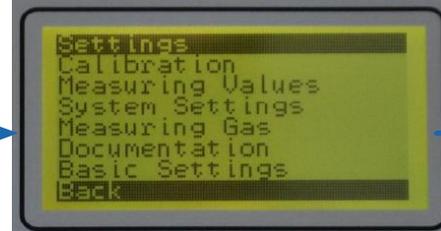
Press **↑** to navigate to System Settings.



Press **←** to access the menu option



Values are edited in the same way as any other menu on the device. Navigate to and press Back when finished.



Navigate to Back with **←** and press **↓** to return to the main screen.



Navigating menus and changing values works in a similar fashion across all menus in this device.

Measuring values

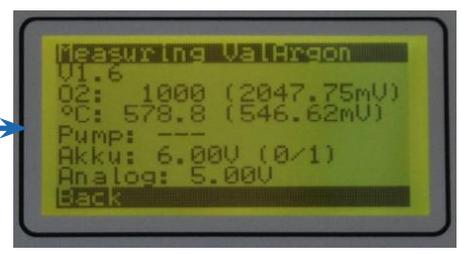
To view the devices measuring values, do as follows:



To access Settings, press **P**



Press **↑** to navigate to Measuring Gas

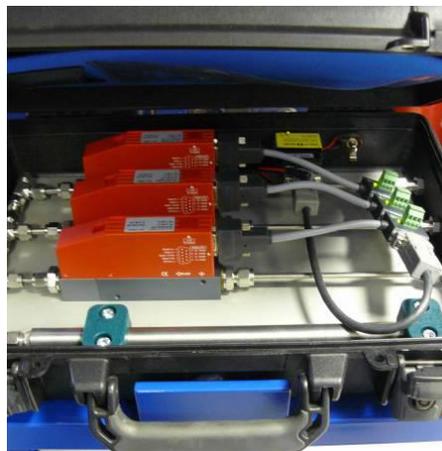
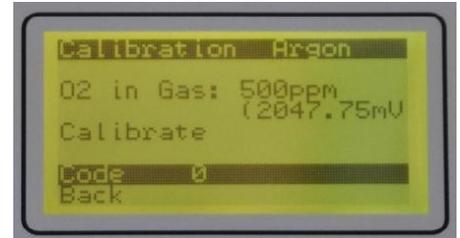


These values are exclusively informative and cannot be edited. Press **←** to return to Settings.

CALIBRATION

Only the manufacturer or an authorized calibration facility can do the calibration and not void the warranty. During this process the unit is calibrated against two reference gases to insure a linear and accurate calibration.

A code is entered under calibration in the Settings menu. When the correct code is entered, the calibration functionality is unlocked, and the administrator will be guided through the process.



The WS Oxy I is calibrated on a state of the art calibration station. With certified reference gases the unit is calibrated to give a linear readout throughout the whole measuring range of 10 – 1000 ppm. After calibration is completed, the unit is delivered with a calibration certificate for quality control purposes.

In the calibration station, all connections for the high purity gases (rated quality 5.0) are manufactured from stainless steel to avoid any leaks and potential permeability. The flow meters used in this operation are also designed for high purity applications.

TECHNICAL DATA

Measuring Data:

Measuring Range:	1000 ppm - 10 ppm
Accuracy:	< 10 ppm
Measuring gas flow:	approx. 2 l/h
Max. temperature of the measuring gas:	80° C at gas entry

Specifications:

Dimensions (LxWxH):	220 mm x 100 mm x 40 mm
Weight:	1 kg
Gas entry and exit ports:	3 mm hose barb
Operating conditions:	10 - 45°C, relative humidity <80% at 20 °C
Storage conditions:	-20 - 60°C, relative humidity <95% at 20 °C

Specifications (Electronics):

Voltage:	100-240 VAC, 47- 63 Hz, 1.2 Ah
Internal battery:	7 VDC, 3200 mAh
Display:	Graphic display (128 x 64 pixel) with 4 different colors

PRECAUTIONS REGARDING SENSOR

Operating with Hydrogen Forming Gases

WARNING!

The temperature of the sensors is heated to approx. 580°C and for this reason the unit cannot be exposed to gas mixtures such as hydrogen gases greater than 10% that explode under these conditions.

Exposure to Water:

If water is introduced to the sensor element, the sudden temperature shock can lead to sensor cracking and failure.

Exposure to Gases:

Gases, which contain halogens such as fluorine (F), chlorine (Cl), bromine (Br), iodine (I) and astatine (At), as well as halogen mixtures, for example CFCs, will damage the sensor even in small quantities.

Gases such SO₂, SO₃, and H₂S in concentrations higher than 50 ppm will cause a reduction in the electrode activity and will dramatically shorten the life span.

Other organic gases from silicone compositions and adhesives can affect the life expectancy of the sensor.

Moisture:

As the sensor has an operating temperature higher than 100°C, moisture present in the measuring gas will not condense inside the unit. Ambient moisture in the measuring gas does not affect the sensor.