



Interscan Corporation

Instruction Manual

GasD[®] 8000 Series Portable Gas Analyzer

P.N. 120-00012

Instrument provided with Interscan gas sensor

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Section 1 - Introduction

Congratulations on your purchase of the INTERSCAN GasD® 8000 series portable gas analyzer. The GasD® 8000 series analyzer represents a new chapter in Interscan's longstanding reputation of reliability and accuracy in portable gas monitoring.

Your instrument combines field-proven electrochemical sensing technology with an all-new electronics package, intuitive controls, and a real-time graphics display. Key features include:

- Real time continuous sampling and monitoring.
- Automatic data logging downloadable in a .csv (comma-separated values) file.
- SD Card data storage.
- User adjustable flow rate with auto blockage detection.
- User adjustable Alarm set point with audible and display indications as well as voltage output at rear panel terminals.
- Voltage and current loop analog outputs available at rear panel terminals.
- Rechargeable Li-ion battery providing 5-8 hours of monitoring in the field.
- Instantaneous and accumulated measurement display (Monitor and Graph views).
- Quick connect sampling ports.
- Mini USB charging port.

1.1 PRECAUTIONS

Read this manual fully and carefully before using your instrument. This manual should be read by anyone who will be operating the GasD® 8000 series portable analyzer to ensure accurate measurement and long life.

NOTE 1: *It is **not** necessary to calibrate the analyzer when received from the Interscan or an **authorized distributor**. All Interscan analyzers are calibrated at the factory prior to shipment.*

NOTE 2: *It is a good idea to charge the batteries in your instrument before initial operation. Connect the battery charger and run the instrument for 24 hours in OFF*

MODE to allow the batteries to fully charge and the sensor to fully stabilize. See section 3 for details on battery charging and navigating operation modes.

NOTE 3: *It is recommended that the GasD® 8000 series portable analyzer be connected to the power supply/battery charger during long term storage. See section 3.2 for battery charging information.*

WARNING: *Some gas interferences can adversely affect instrument readings and potentially damage the gas sensor. Be sure to read section 4.3 on Sample Interferences carefully before taking any gas samples.*

1.2 INSTRUMENT PACKING CONTENTS

Carefully remove the analyzer from its packing container along with the accessories. Inspect the instrument for any damage. Check that all accessories are included according to the contents list shown below:

- GasD® 8000 Series Portable Analyzer
- Mini USB Wall Charger/Charging Cable
- Inlet tubing connector
- Sample probe
- User Manual

Contact the Interscan Service Dept. immediately (see section 11) to report any damaged or missing items.

Any items reported damaged or missing after 30 days from delivery will not be covered by INTERSCAN and the customer will be responsible for any replacement or repair expense.

Section 2 – Instrument Description

2.1 CONTROLS & FEATURES

Figure 1 below shows the GasD® 8000 series portable analyzer case and front panel features which are described in the table and sections that follow.

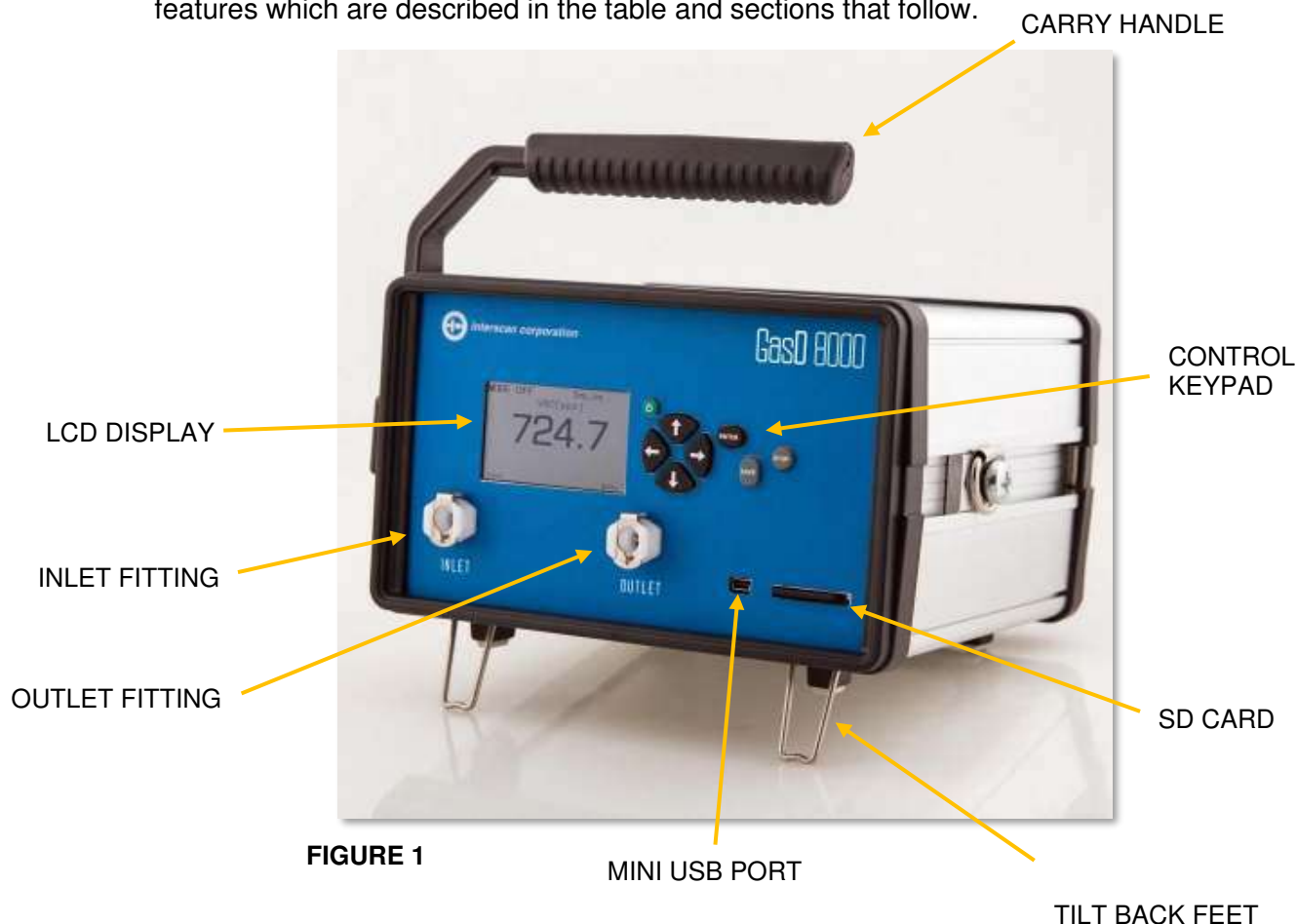


FIGURE 1

MINI USB PORT

TILT BACK FEET

LCD DISPLAY – Displays all relevant numeric and text information related to sampling and menu navigation. Gas values can be displayed numerically or graphically. See section 2.1.1 for display details.

NOTE: Gas labels and units shown in this manual are for example only. Your displayed text may be different.

IN FITTING – Quick connect socket for introduction of sample via sample inlet tubing. See section 2.2 for connection details.

OUT FITTING – Exhaust port for sample stream. No connection is necessary. **DO NOT BLOCK THIS PORT!**

MINI USB PORT – USB connector for battery charging and powered operation. See section 3.5

TILT-BACK FEET – Provides a slight tilt angle for table-top use. Feet are shipped in the collapsed or “flat use” position but can be engaged by simply rotating them forward until they lock in place.

SD CARD – Slot for data storage memory card. See section 6 for details on data storage and accessing data.

CONTROL KEYPAD – Button cluster for unit operation. See section 2.1.2 for control details.

CARRY HANDLE – Enables easy carrying of the instrument between sampling locations. The handle can also be rotated 180° to the underside of instrument case for deeper angled tilt during table-top use as shown in Figure 2. To rotate handle, pull out on the handle mount on the left side of case and rotate handle towards the front of the instrument. It will lock into place when at the 180° position. Be sure to collapse the tilt back feet before rotating the handle.

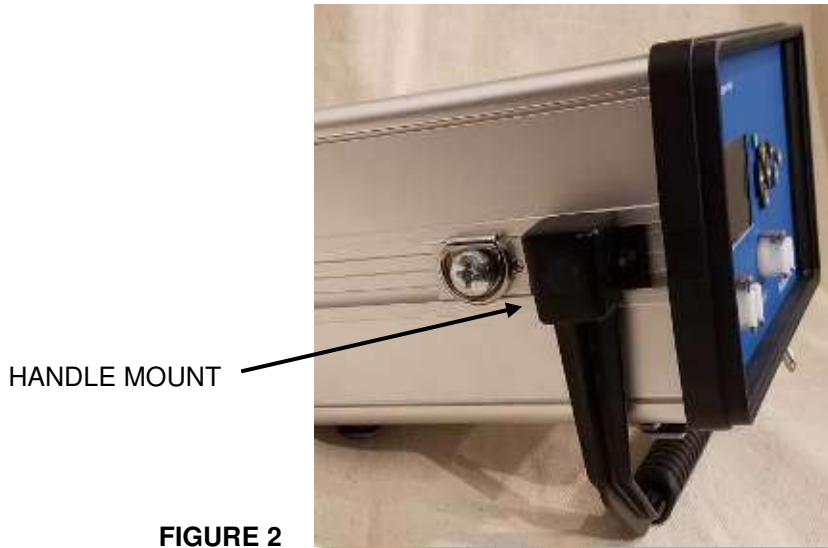


FIGURE 2

2.1.1 DISPLAY FIELDS AND INDICATORS

The GasD® 8000 series portable analyzer display screen offers a variety of information as detailed in Figure 3 below. Some elements may not be visible in some modes of operation. Gas label and units shown may be different on your unit.

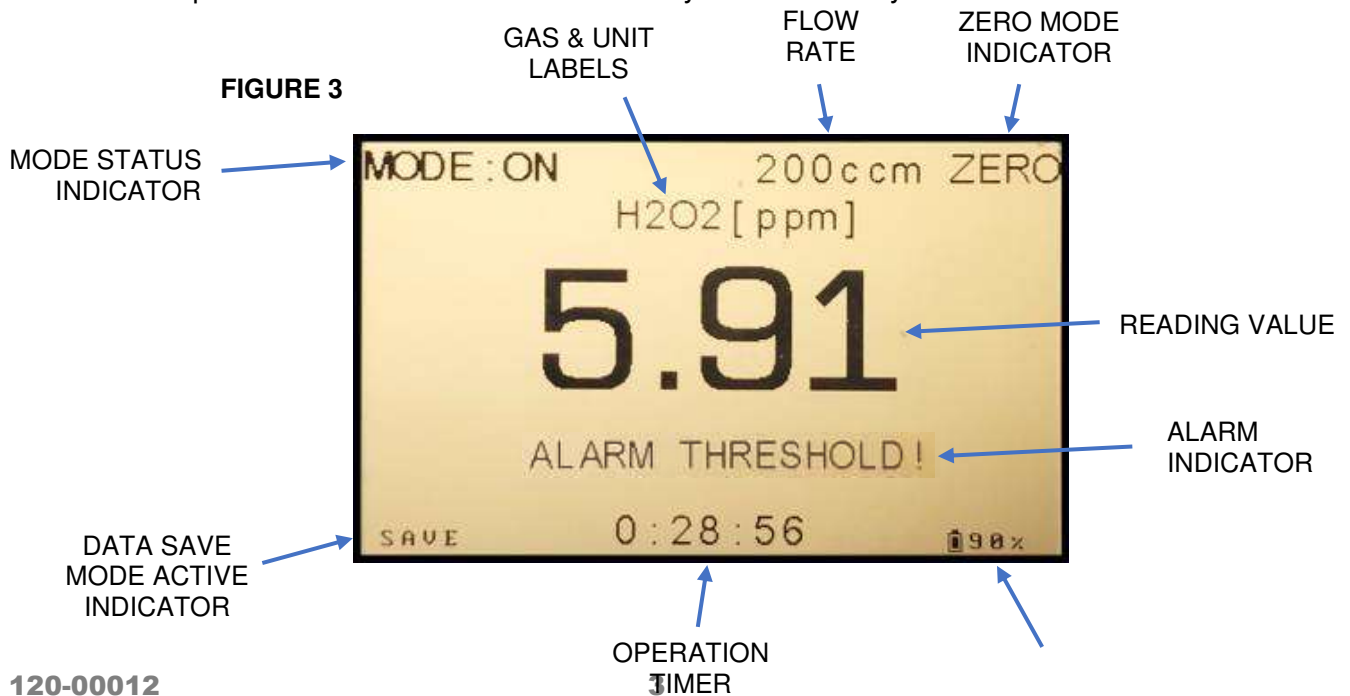


FIGURE 3

2.1.2 CONTROL KEYPAD

The analyzer's control keypad is detailed in Figure 4 below. Each button is described in the table that follows.

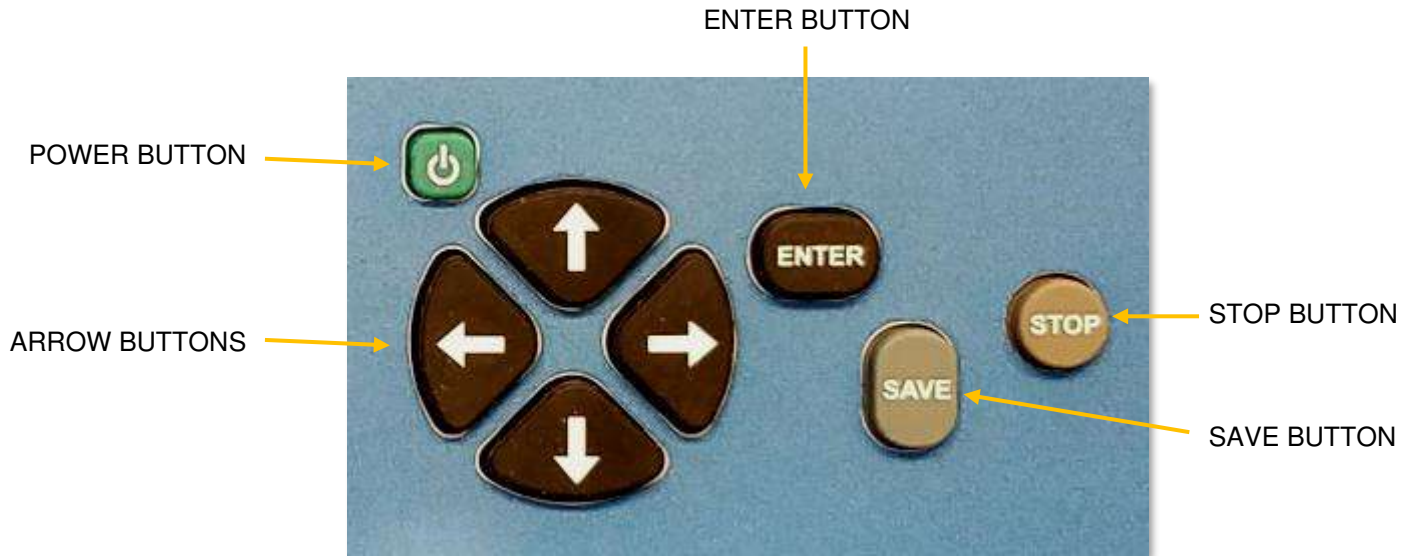


FIGURE 4

POWER BUTTON – Press to turn power to instrument ON. Press from the MAIN MENU to turn power OFF.

ARROW BUTTONS – Used to navigate through the instrument's menus and enter values during numeric and text entry. Proper use is indicated in specific function descriptions.

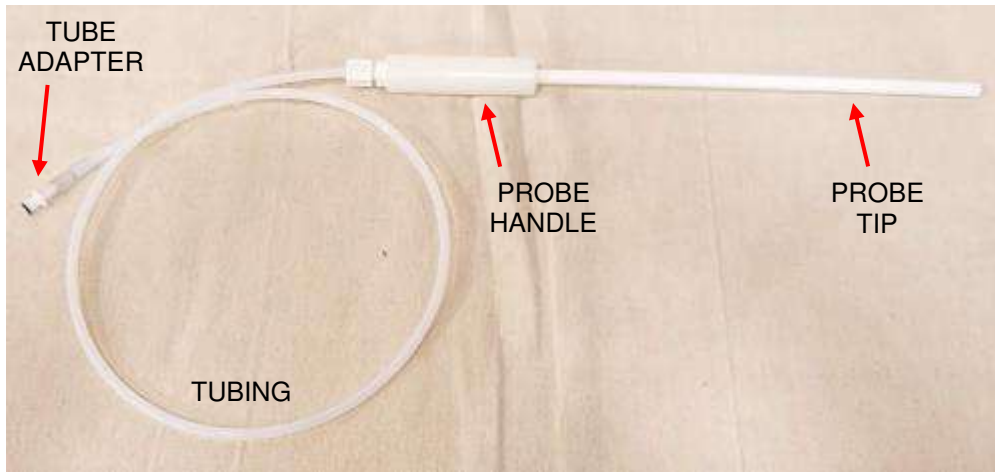
ENTER BUTTON – Used to advance through the sequential menus and finalize certain functions.

STOP BUTTON – Used to back up in sequential menus or end a particular function.

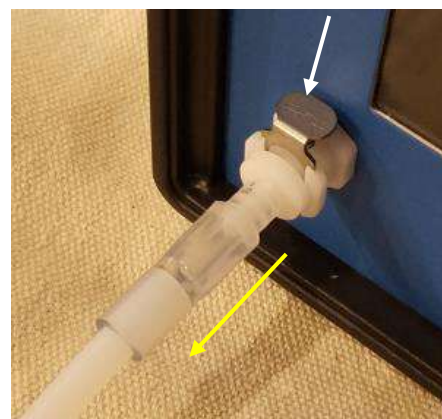
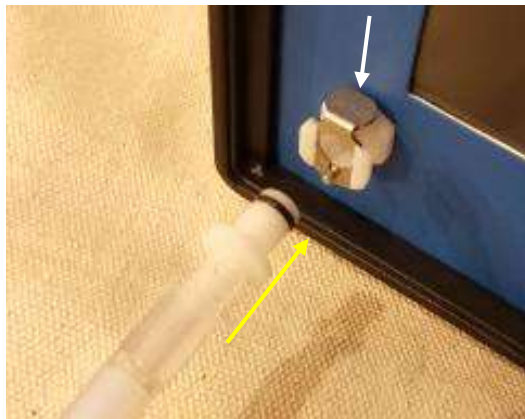
SAVE BUTTON – Press at any point during sampling to save current data to memory card.

2.3 SAMPLE PROBE

In most cases, gas sample will be collected via a provided SAMPLE PROBE which consists of probe handle and tip, a 3 foot length of PTFE (Teflon) or polypropylene tubing and a quick disconnect tube adapter for connection to the INLET of the instrument. This assembly is shown below.



To connect the probe to the instrument INLET first push down on the metal locking tab of the inlet fitting then plug the tube adapter into the “IN” connector until you hear the locking mechanism click into place (below, left). To remove the tube adapter, press down on the metal locking tab on the top of the connector while pulling out on the tubing (below, right).



2.4 ANALOG OUTPUT CONNECTIONS

The GasD® 8000 Series analyzer is equipped with 0-100 mV** and a 4-20 mA analog output signals available at the 10 pin rear panel terminal block as shown in the table below.

For mV output, connect between terminals 1 or 2 (GND) as the negative reference and terminal 7 (AOUT2) as the positive output as shown in blue in the table below. For 4-20 mA output, use terminal 3 (VCC) as the output and terminal 8 (AOUT1) as the return, shown in green in the table below.

Connect to the terminal block by inserting wire conductor into the desired terminal and tightening the terminal's screw. The terminal block can be removed from the rear panel for ease of wiring by gently pulling the block away from the panel. Re-connect the block by gently pressing it back into the receptacle.



PIN	NAME	TYPE	DESCRIPTION
1	GND	Reference	Local Device Ground
2	GND	Reference	Local Device Ground
3	VCC	Reference	+5 Volts
4	-	N/C	-
5	-	N/C	-
6	ALM	Alarm Signal	+5V on alarm actuation
7	AOUT2	Analog Voltage Output	0-100 mV corresponding to gas range
8	AOUT1	Analog Current Output	4-20 mA corresponding to gas range
9	-	N/C	-
10	-	N/C	-

**NOTE – the mV analog output can be adjusted up to 2500 mV at full scale. Contact the INTERSCAN SERVICE DEPT if you wish to modify the voltage output.

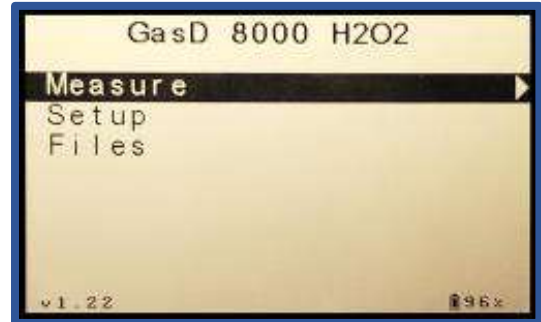
2.5 ALARM OUTPUT CONNECTION

The GasD® 8000 Series analyzer is equipped with an alarm output signal that will activate when gas concentration level exceeds the user set Alarm set point level (see section 3.7). This is a 5V signal available at terminal 6 (Alarm Signal) referenced to terminals 1 or 2 (GND).

Section 3 – Instrument Operation

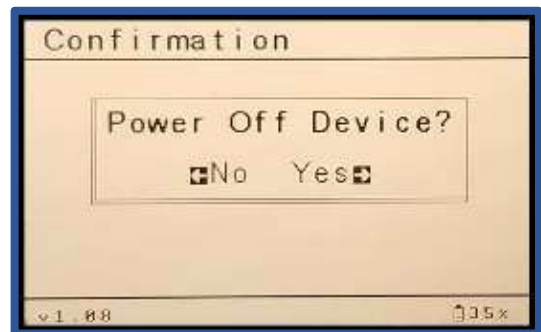
3.1 POWERING THE ANALYZER

To turn the instrument on, press the green power button. The MAIN MENU screen showed on the right will be displayed.



Check the battery life indicator in the lower right corner of the display and confirm that adequate battery life remains for use. Expected battery life is 5-8 hours on a full charge depending on nature of use. See section 3.2 for details on charging the batteries.

To power the unit down, navigate to the MAIN MENU screen shown on the right and press the green power button. The screen will prompt you to confirm power down as shown. Press the **RIGHT ARROW** button to confirm power down.



NOTE: Normal power down only works from the MAIN MENU screen. Access the main menu screen from any of the operating modes or sub-menus by successively pressing the **STOP** button until the MAIN MENU is displayed.

3.2 MAIN MENU NAVIGATION

To navigate through the MAIN MENU, use the **UP** or **DOWN ARROW** buttons to highlight the desired menu selection then use the **RIGHT ARROW** button to open the highlighted sub-menu. This is the procedure for navigating any sub-menu in GasD® 8000 series portable analyzer.

The MAIN MENU offers 3 sub-menu selections that are detailed below:

MEASURE – Sequential sub-menu of primary operating modes as follows:

- STARUP MODE > OFF MODE > ON MODE.

See section 3.3 for details on the MEASURE sub-menu.

SETUP – Sub-menu of user adjustable parameters and functions including:

- FLOW RATE
- SAMPLING MODE
- DATE/TIME
- ALARM
- GAS CALIBRATION
- DIGITAL CALIBRATION
- FACTORY SETTINGS

See section 3.6 for details on the SETUP sub-menu.

FILES – Sub-menu of data storage parameters as follows:

- Create (create and name new data file)
- Delete (delete any existing data file)
- Select (select any existing data file for next sample storage)

See section 6 for details on the FILES menu and accessing data.

3.3 MEASURE MODE

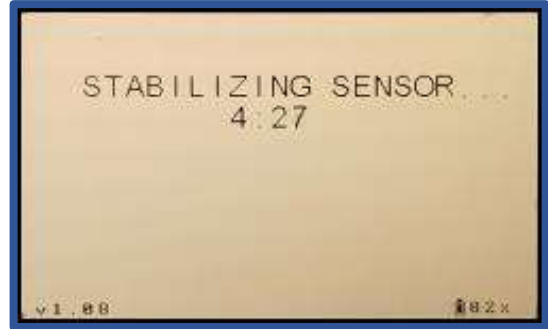
MEASURE MODE is the primary operating mode for GasD® 8000 series portable analyzer.

It is comprised of a sequence of 3 separate modes as detailed below.

SENSOR STABILIZING MODE

Upon selecting MEASURE from the main menu, the unit will automatically advance to SENSOR STABILIZING mode. A 5-minute timer will count down while the sensor is allowed to stabilize following power up. The screen shown to the right will be displayed during SENSOR STABILIZING mode. When

the startup timer elapses, the instrument will automatically enter OFF MODE. To bypass the stabilization period and manually advance to OFF MODE, press the **ENTER** button.



OFF MODE

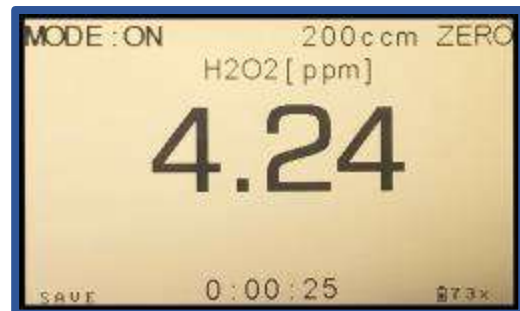
In OFF MODE, the pump is turned off and the screen showed on the right will be displayed. The timer at the bottom of the display indicates how long the unit has been in an operational mode.



This is the mode the instrument should be kept in when powered but not in use. To advance to ON MODE from OFF MODE, press the **ENTER** button. To return to the main menu from OFF MODE, press the **STOP** button.

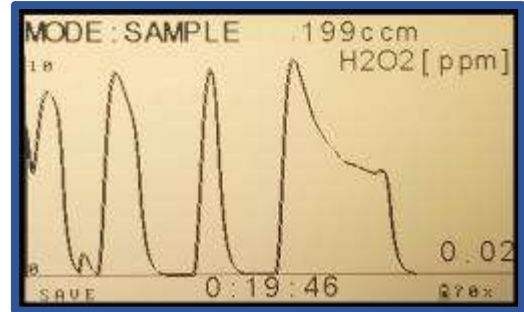
ON MODE

ON MODE is the primary sampling mode for the analyzer. In this mode, the pump is turned on and the screen shown on the right will be displayed. The display will indicate the gas concentration while the active timer continues to display sample duration. Zeroing of the display can be accomplished from this mode as well (See section 5.1 for more on zeroing).



GRAPH DISPLAY

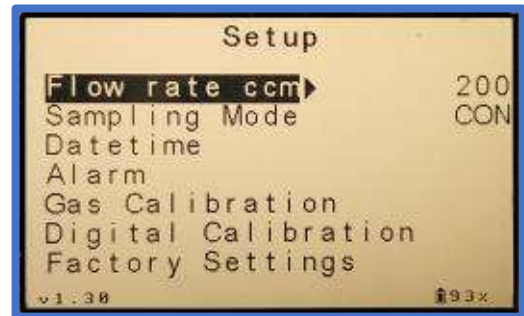
A graphical display of the continuous reading is also accessible in ON MODE by pressing the **RIGHT ARROW** button. The current numeric reading value is displayed in the lower right corner.



Advance forward through the mode sequence by pressing the **ENTER** button as needed. Advance backward through the mode sequence by pressing the **STOP** button as needed. Pressing the **STOP** button successively will return the display to the MAIN MENU where the SETUP and FILE menus can be accessed.

3.4 SETUP MENU

The Setup Menu shown on the right offers access to user adjustable parameters and maintenance functions. This menu is detailed below.



Flow rate – cc / min – Nominal setting = **200 cc / min** unless stated otherwise. Do not change this setting.

Sampling Mode – Nominal setting = **CON**. This setting controls the SAMPLE MODE procedure with 4 options as follows:

- **Continuous** - Sample is drawn continuously. This is the correct mode for use in the GasD® 8000 Series analyzer
- **HAL1** – N/A for 8000 Series analyzers
- **HAL2** - N/A for 8000 Series analyzers
- **HAL3** - N/A for 8000 Series analyzers

Datetime – Set the date and time according to the user's time zone.

Alarm – Allows enabling of Alarm functionality and setting of Alarm set point above which Alarm indications will activate. (See section 3.7).

Gas Calibration – Allows for calibration using a calibration gas standard. See sections 7.1 & 7.2).

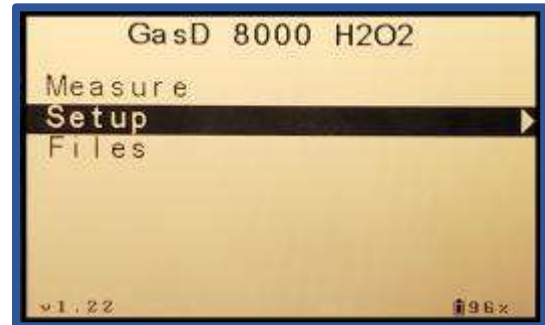
Digital Calibration – Allows for calibration without calibration gas via Interscan's Sensor Express Program. (See sections 7.3 & 7.4)

Factory Setup – A password protected setup sub-menu for factory setup only.

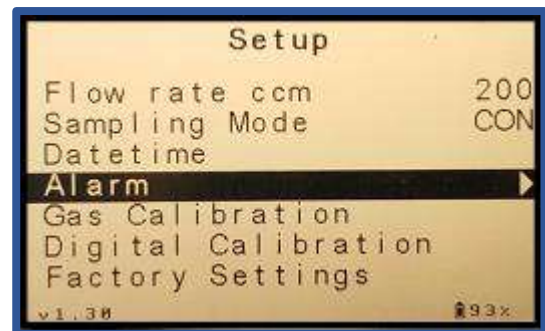
3.5 ALARM SETUP

The GasD® 8000 Series portable analyzer is equipped with an alarm feature that provides visual and audible indication when the gas concentration level exceeds a user set alarm level. This section details alarm setup and functionality.

To access the Alarm settings menu, highlight "**Setup**" on the main menu then press the **RIGHT ARROW** button to select this sub-menu as shown to the right.



Use the **DOWN ARROW** button to highlight "**Alarm**" and press the **RIGHT ARROW** button to select as shown to the right.



The "**GAS HIGH**" value is the alarm set point value above which alarm indication will occur. Highlight this parameter then use the **RIGHT ARROW** button to highlight the numeric field(s) you wish to change. Use the **UP** or **DOWN ARROW** buttons to change the numeric value of the desired fields. Once satisfied with the value, use the **LEFT ARROW** button to exit the parameter value field.



NOTE: Decimal places displayed in the Alarm numeric value field will mirror the decimal place count of the primary gas range.

Use the **DOWN ARROW** button to highlight the "**ENABLE**" parameter, then the **RIGHT ARROW** button to highlight the value. Using the **UP/DOWN ARROW** buttons, select "**YES**" to enable the alarm function or "**NO**" to disable it.



Press the **LEFT ARROW** button to exit the Alarm menu and press again to exit the Setup menu and return to the Main Menu.

3.6 ALARM INDICATIONS

When enabled, the alarm feature will activate any time the displayed gas concentration level exceeds the user set alarm level.

During an alarm condition, “**ALARM THRESHOLD!**” will flash on the main display as shown on the right and a steadily repeating beep tone will sound indicating an active alarm condition. When the concentration value falls below the alarm set point, the alarm indications will deactivate.



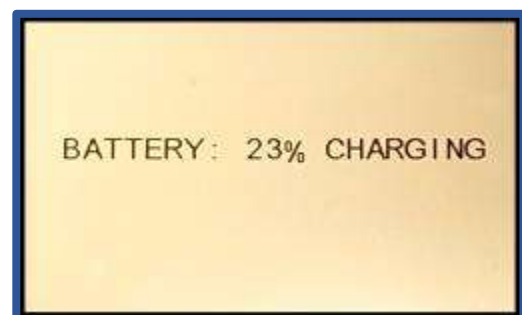
3.7 CHARGING THE BATTERIES

The GasD®8000 series portable analyzer includes a wall charger that can be used to recharge the instrument's batteries, as well as power the instrument during extended use. **The expected battery capacity on a full charge is 5-8 hours depending on nature of use.**

When the battery charge drops below 10%, the display will indicate “**Low Battery!**” at the bottom of the screen. Follow the procedure below to re-charge the batteries:

1. Select the desired plug type on the multi-region charger plug unit.
2. Plug the large USB connector end of the supplied charger cable into one of the charger's USB ports.
3. Connect the mini-USB connector into the mini USB port on the front panel of the instrument.
4. Plug the charger into the wall.
5. Charge until the battery life indicator on the instrument display reads “100%”.

If charged with the power off, the GasD® 8000 series portable analyzer will automatically power up to the MAIN MENU as soon as the charger is connected to the USB port. If the instrument is then powered down the display will show a charging percentage indicator as shown on the right. The instrument can be charged with power on or off.



NOTE: For fastest charging, do not connect any other USB devices to the charger.

NOTE: The internal batteries must have a charge to maintain the sensor bias voltage and minimize sensor warmup time. It is recommended you keep the instrument connected to the power supply for long term storage or extended use.

Section 4 – Sampling

4.1 ZEROING THE ANALYZER

It is always a good idea to zero the analyzer prior to sampling. To accomplish this, ensure the unit is in ON MODE and has been allowed to stabilize in this mode for several minutes. Confirm that the flow rate has settled at the nominal flow rate (200 mL/m) and the display value is not rising or falling significantly. Zero the instrument in an area where clean ambient air is present as follows:

- Press the **UP ARROW** button. The **ZERO** indicator will now be highlighted indicating ZERO MODE is active.
- Press the **ENTER** button. “Set ZERO” will be indicated under the main display for 3 seconds indicating the value is being zeroed. The display value will gradually decrease toward 0. If zero is not attained, repeat the process by pressing **ENTER** again.
- When finished, press the **DOWN ARROW** button to exit ZERO MODE.



The instrument is now ready for sampling.

4.2 TAKING SAMPLES

While in ON MODE, direct the SAMPLE PROBE toward the desired sample location and allow sample to be drawn. The instrument will respond to any target gas in the area within a few seconds.

When finished with sampling, press the **STOP BUTTON** once from ON MODE to return to OFF mode. This stops the automatic data storage saving data space and battery life.

4.4 AUTO BLOCKAGE DETECTION

The GasD® 8000 series portable analyzer is equipped with flow rate detection to protect against unwanted blockages in the inlet line. In the event of a sudden drop in flowrate in ON mode, the screen shown to the right will be displayed. This indicates a blockage of the inlet probe, filter or sample tube that must be addressed before sampling can resume.



Should this message appear, check the probe, filter and sample tube for any blockages or kinks that might restrict flow. Clear this blockage then press the **ENTER** button to proceed.

Section 5 – Data Storage And Access

Sample data can be stored on standard SD card media (a 32 GB card is provided with the instrument). Data is saved to the SD card automatically in ON mode and SAMPLE mode at a rate of one sample per second when AUTO SAVE is enabled (this is the default status on power up).

“SAVE” will be displayed in the lower left corner of the display in ON and SAMPLE modes indicating that the AUTO SAVE feature is active. AUTO SAVE mode can be disabled by pressing the SAVE button in any mode. When disabled, “SAVE” will NOT appear on the display in ON and SAMPLE modes.

Leaving the instrument in AUTO SAVE mode is the surest way to ensure data storage is completed. The trade-off is the potential for storing long strings of unnecessary data every second in ON mode. For this reason the option is provided to disable AUTO SAVE when the instrument is idle and data storage is known to be unnecessary.

5.1 FILES MENU

Data is stored in user created files. The user must create a file for storage and then select the desired file as the data location for future data collection. All file management is executed from the FILES menu as detailed below.

File management is accessed from the MAIN MENU by selecting FILES and then pressing the **RIGHT ARROW** button to open the FILES sub-menu shown on the right. Highlight the desired option using the **DOWN and UP ARROW** buttons and select the desired option using the **RIGHT ARROW** button. FILES options are shown below.



Create file – Shown on the right. Use the **RIGHT ARROW** button to highlight the name field then use the **UP/DOWN** arrow buttons to change the character as desired and the **RIGHT/LEFT** arrow buttons to move the character position as desired. Press the **SAVE** button when finished to save the new file.



Delete file – Shown on the right. Delete existing files and their content. Highlight the desired file using the **UP/DOWN** arrows then press the **RIGHT ARROW** button to delete. You will be prompted to confirm deletion with the **RIGHT ARROW** button.



Select file – Shown on the right. Select the desired file in which to store the data for the next sample cycle(s). Highlight the desired file using the **UP/DOWN** arrows then press the **RIGHT ARROW** button to select. The currently selected file will be shown on the FILES screen.



5.2 ACCESSING AND SAVING DATA

Data can be accessed and exported by removing the SD card and inserting it into an SD card slot on any computer. To remove the SD card, push the edge of the card into the slot until you hear a “click” and the card will eject. To re-insert, press the card all the way into the slot until you hear the “click”.

The data files can be opened in Microsoft Excel or Notepad. Always save data files to a computer and perform any editing of the file to the saved version. **Do not edit files directly on the SD card as this may corrupt the file when read by the instrument!**

NOTE: *It is always a good idea to power the instrument down before removing or re-inserting the SD card from the SD card slot.*

NOTE: *If the SD card is not inserted into the instrument’s SD card slot on power up, “**NO SD Card!**” will be displayed in the lower left corner of the LCD display and AUTO SAVE will be disabled.*

WARNING: **DO NOT CONNECT THE USB CABLE BETWEEN THE INSTRUMENT AND THE COMPUTER WHILE PERFORMING MEASUREMENTS AS THIS CAN LEAD TO DATA ERRORS AND FILE CORRUPTION.**

Section 6 - Calibration

Periodic calibration of the GasD® 8000 series portable analyzer is required to compensate for decreased sensor sensitivity and to maintain accuracy of readings. All instruments are factory calibrated prior to shipment. No calibration is necessary until after considerable use.

The frequency of calibration is a function of instrument use and the concentrations of sample gas to which the sensor is exposed. As such, no exact schedule of calibration can be recommended but a good rule of thumb is to calibrate every 6 months with regular use.

There are 2 calibration methodologies available which are detailed in the following sections.

6.1 GAS CALIBRATION

The factory recommended procedure for calibrating all INTERSCAN analyzers is the introduction of a certified calibration gas standard taken from a gas cylinder or a permeation device. Besides being essential for calibration, having a known certified gas standard on hand allows the user to test the analyzer at any time to confirm proper functionality.

Whatever the source of calibration gas, the recommended delivery method is via a proper sample bag which is attached to the analyzer INLET. The calibration gas is drawn from the proper sample bag through the sensor. **USE AT LEAST A 2 LITER BAG TO ENSURE ADEQUATE CAL GAS SAMPLE VOLUME.**

Teflon® or Tedlar® bags are suitable for H₂S, SO₂, NO and NO₂. Several bag materials are suitable for CO. Gases that are easily chemisorbed (Cl₂, Hydrazine etc.) may require a different method of delivery. Contact the Interscan Factory for recommendations.

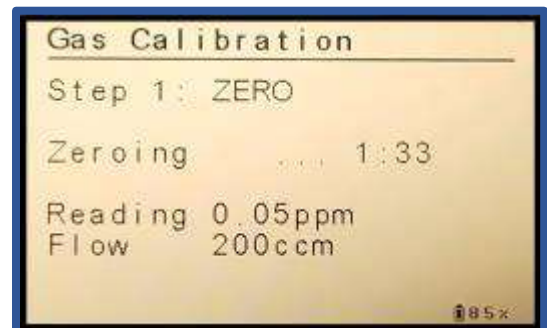
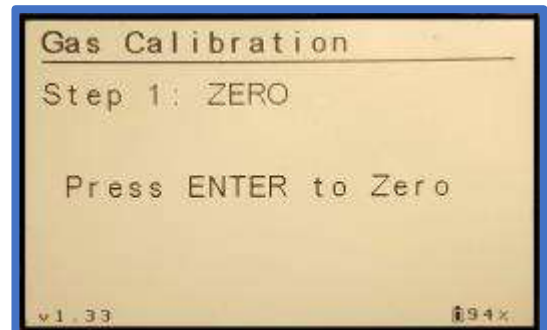
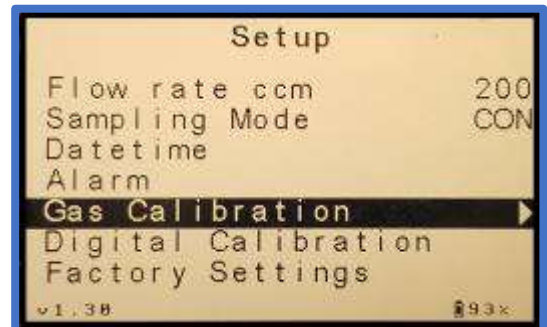
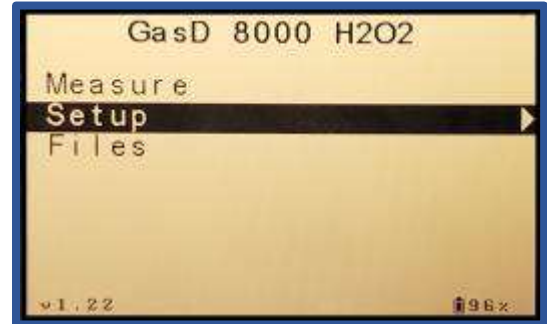
Alternatively, a regulated pressurized certified gas cylinder fitted with a tee-manifold and unrestricted vent is a viable source of calibration gas.

NOTE: PRESSURIZED SAMPLE MUST BE REGULATED TO 4 PSI OR LOWER. OVER-PRESSURIZATION CAN DAMAGE THE SENSOR AND VOID THE WARRANTY!

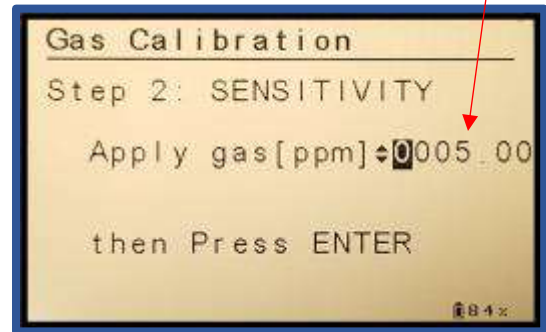
6.2 GAS CALIBRATION PROCEDURE

Once the Calibration Gas delivery method has been determined, follow the procedure below to carry out Gas Calibration:

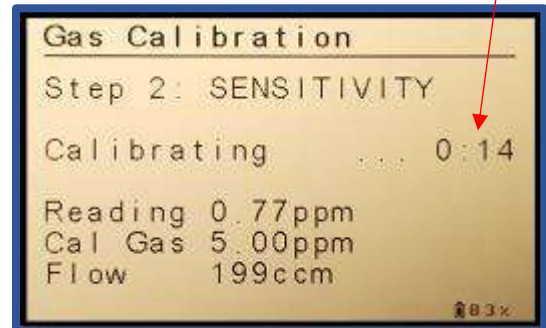
- 1) Navigate to the MAIN MENU by pressing the **STOP** button successively until the MAIN MENU shown to the right is displayed.
- 2) Press the **UP or DOWN ARROW** buttons to move the cursor to highlight "**Setup**" then press the **RIGHT ARROW** button to enter the SETUP MENU.
- 3) Use the **DOWN ARROW** button to move the cursor and highlight "**Gas Calibration**" as shown to the right and press the **RIGHT ARROW** button to enter the Gas Calibration Menu.
- 4) You will now be prompted to carry out zeroing as shown to the right (ignore reference to zero filter). With the analyzer drawing clean ambient air, press the **ENTER** button to initiate zeroing.
- 5) A 2-minute Zero timer will begin counting down as shown on the right after which the unit will automatically zero itself and jump to the Sensitivity input screen.



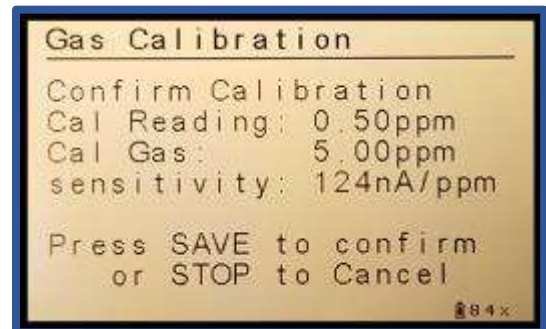
- 6) On the Sensitivity Input screen, enter the value of the Calibration Gas being used in the field indicated on the right. Use the **RIGHT** and **LEFT ARROW** buttons to move the cursor to the desired digit and the **UP** and **DOWN ARROW** buttons to change the value as needed. Double check that the value is accurate then press the **ENTER** button to proceed.



- 7) Connect the inlet to the CAL GAS source. A 2-minute Calibration timer will begin counting down as indicated on the right while Calibration gas is drawn through the sensor. The "Reading" indication shows the real time sensor response which can be compared to the "Cal Gas" value.



- 8) When the Calibration timer fully elapses, the "Confirm Calibration" screen shown on the right will be displayed. The "Cal Reading" field indicates the final reading at the end of the Calibration Timer period. The "Cal Gas" value is shown below the reading value and the final Sensitivity value is shown below that. Press the **SAVE** button to confirm calibration or press the **STOP** button to cancel calibration.



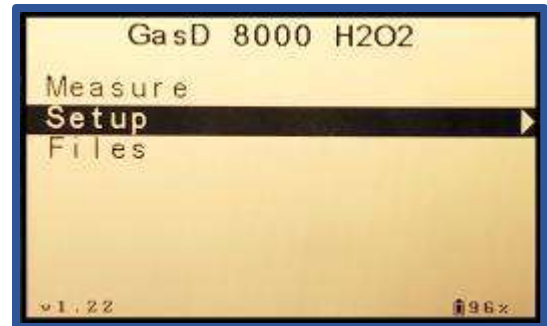
6.3 DIGITAL CALIBRATION

There are circumstances in which calibration using calibration gas or permeation devices is inconvenient and costly. For this reason, INTERSCAN has developed the alternative sensor replacement program, **Sensor Express**[®].

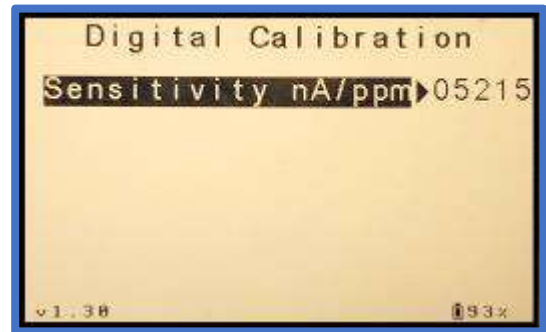
With **Sensor Express**[®], a certified spare sensor is kept at the customer's site to be installed into the analyzer, replacing the older sensor. The sensor being replaced is discarded. The new sensor is accompanied by a certificate detailing its sensitivity data that is entered during the *Digital Calibration* procedure detailed in the section 6.4 below. The sensor replacement procedure is detailed in section 7.

6.4 DIGITAL CALIBRATION PROCEDURE

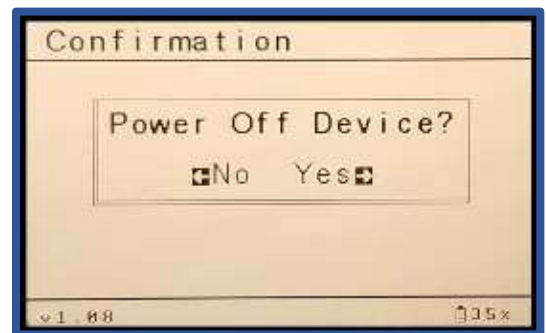
- 1) Navigate to the MAIN MENU by pressing the **STOP** button successively until the MAIN MENU shown to the right is displayed.
- 2) Press the **UP or DOWN ARROW** buttons to move the cursor to highlight **Setup** then press the **RIGHT ARROW** button to enter the SETUP MENU.
- 3) Use the **DOWN ARROW** button to move the cursor and highlight **Digital Calibration** as shown to the right and press the **RIGHT ARROW** button to enter the Digital Calibration Menu.



- 4) The Digital Calibration screen provides a single entry field for sensor sensitivity in nA/ppm. The correct value for this parameter can be found on the **Sensor Express**[®] certificate that is provided with the spare sensor. Use the LEFT/RIGHT ARROW buttons to highlight the desired numeric field then use the **UP/DOWN ARROW** buttons to change the value. Do this for each applicable numeric place until the value shown matches the value on the ECS certification. When satisfied with the entry, press the **LEFT ARROW** button successively until the Main Menu screen is displayed.



- 5) Turn power to the unit OFF by pressing the green power button. A power off confirmation screen will be displayed as shown on the right. Press the RIGHT ARROW button to confirm power down.



- 6) Follow the procedure detailed in **Section 7** for removing and replacing the sensor. When replaced, power the unit back up and allow several hours for the sensor to stabilize. It is a good idea to leave the unit plugged into the AC Charger to re-charge the batteries while the new sensor is warming up.

7.0 Sensor Maintenance/Replacement

The Interscan sensor requires periodic maintenance to address sensor hydration loss due to evaporation. Maintenance is performed by removing and weighing the sensor to determine the amount of weight/hydration loss and then injecting **distilled** or **deionized** water into the sensor to replace the lost water as directed in the following sections. **NOTE: Read each of the following sections completely before performing any maintenance on the sensor.**

NOTE: USE CARE WHEN WORKING INSIDE THE INSTRUMENT TO AVOID CONTACT WITH CIRCUIT BOARDS AND SURFACE MOUNT COMPONENTS! PROPER ESD PROTECTION SHOULD BE USED.



7.1 MAINTENANCE INTERVAL

The degree of hydration loss can vary depending on operating conditions and sensor type. The factory recommended maintenance interval for most sensors in most applications is **once every 6 weeks**. Sensors should be removed and weighed every 6 weeks as detailed in section 7.3 to determine the amount of weight loss and the amount of water to be added. Weight loss should not exceed **25 grams for Hydrazine and Formaldehyde sensors** during maintenance intervals. More frequent maintenance may be indicated if this limit is exceeded in a 6 week period.

Water should be added to the sensor as directed in section 7.3. Always add water to within **5 grams of the original sensor weight** (original weight is noted on the label affixed to the side of the sensor body). It is extremely important to return the weight of the sensor to within **5 grams** of the original weight. **NEVER ADD WATER OVER THE ORIGINAL WEIGHT.**

7.2 SENSOR REMOVAL

NOTE: Some components shown may differ from your unit.

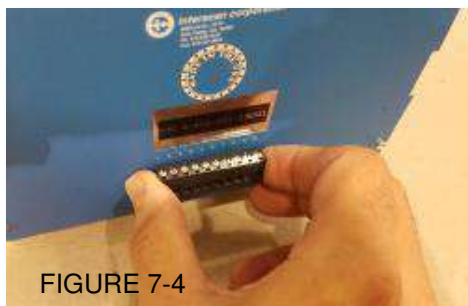
- 1) Power the unit OFF.
- 2) Using your thumb and finger as shown in Figure 7-1, gently pry the right side of the rear bezel away from the side of the instrument case while pulling the bezel toward you. The bezel will pivot away from the case as shown in figure 7-2.



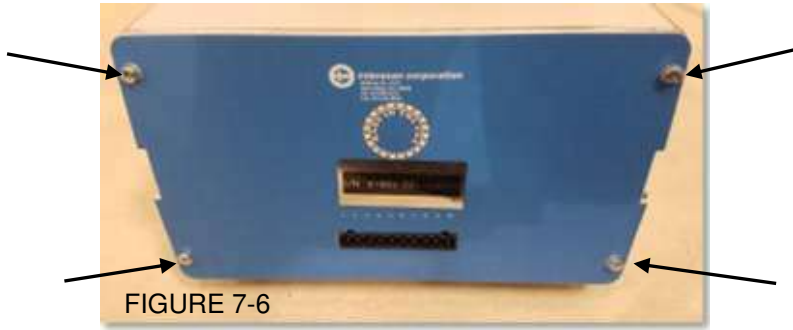
- 3) Slowly continue pivoting the right side of the bezel away from the case until the left side is freed as shown in Figure 7-3. Set the bezel aside. Repeat steps 2 and 3 for the front bezel.



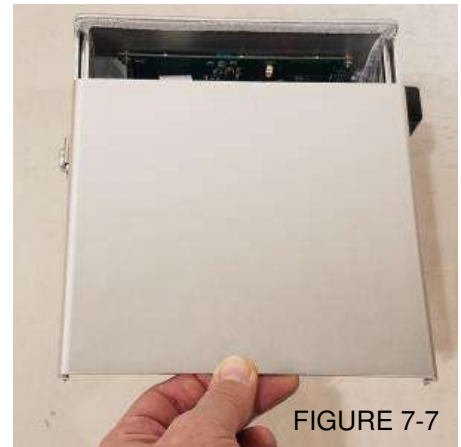
- 4) Firmly grasp the rear terminal block as shown in Figure 7-4 below and gently pull the left side out away from the panel until it is freed from its mating connector as shown in Figure 7-5. Set the terminal block aside.



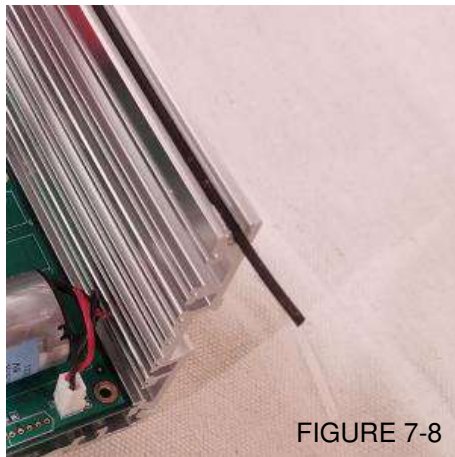
- 5) Remove the 4 screws from the corners of the rear panel as shown in Figure 7-6 below and set aside. Use care not to lose screws or plastic washers! Pull the panel away from the instrument case and set aside. Remove the TOP 2 SCREWS ONLY from the front panel.



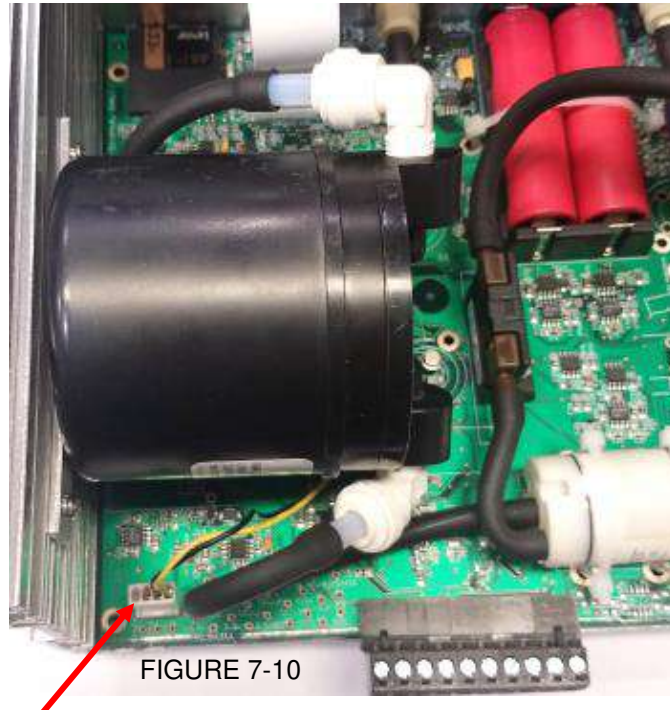
- 6) Remove the top cover by grasping the side of the instrument case with one hand while pulling the cover with the other hand away from the front panel as shown in fig. 7-7. Slide the cover until it is free from the side slots.



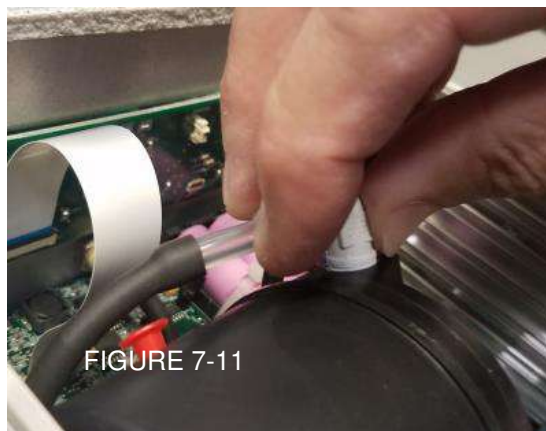
- 7) Check that neither of the black rubber gaskets have been pulled out of the side channels with the cover (fig 7-8). If this is the case, use a small flathead screwdriver to gently work the seal back into the slot as shown in fig 7-9.



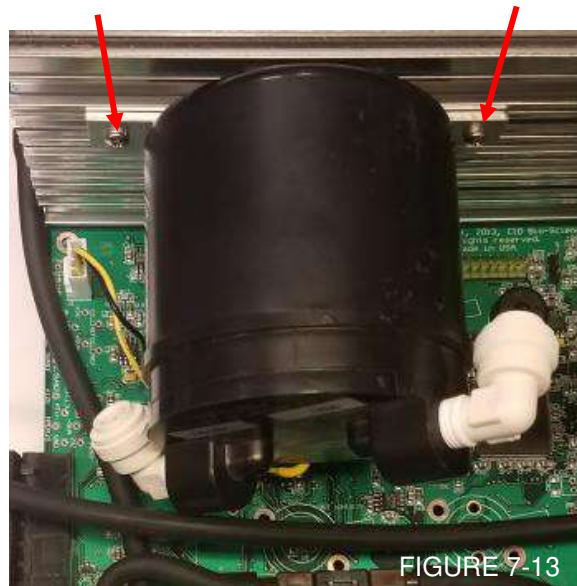
- 8) Carefully remove the sensor board connector (Red arrow below, left) by gently rocking the connector side to side while gently pulling up on the connector body. DO NOT PULL DIRECTLY ON THE WIRES.



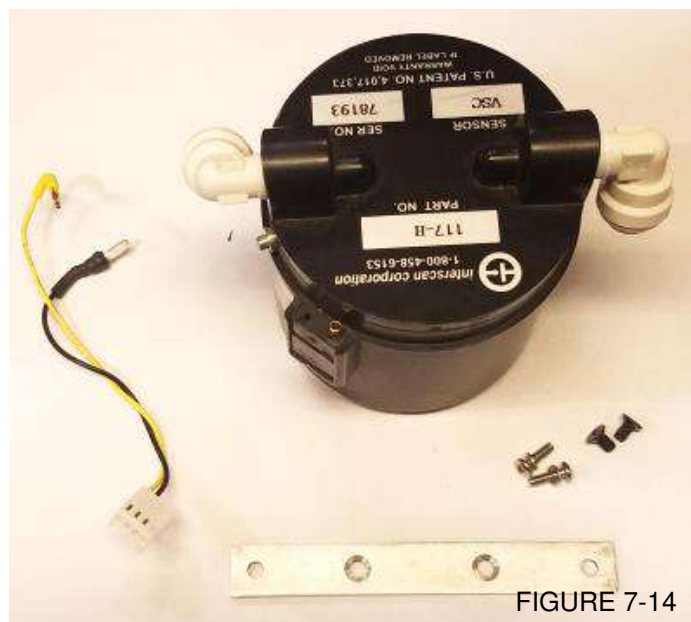
- 9) Grip the front sensor elbow fitting as shown below. Press in on the outer collet ring of the fitting while pulling out on the tubing with the other hand until the tubing is freed as shown below left. Grip the clear plastic tubing when removing and NOT the black tubing. Use caution not to make contact with the display panel ribbon cable. Repeat this step for the rear fitting tubing connection.



- 10) Using a #1 Phillips head screwdriver, loosen the 2 screws holding the sensor to the side of the instrument (arrows below).



- 11) Fully remove the first screw and set aside (use needle nose pliers to keep the screw from falling into the instrument). While holding the sensor with one hand, remove the second screw to free the sensor. Remove the sensor from the instrument and set aside.
- 12) Remove the mounting bar on the bottom of the sensor by removing the 2 securing screws. All sensor parts are shown below.



7.3 SENSOR MAINTENANCE

- 1) Remove the mounting bracket from the bottom of the sensor.
- 2) Weigh the sensor on a gram scale. Be sure to weigh the sensor with both elbow fittings and the red fill plug intact. Subtract the new weight from the sensor's original weight noted on the label affixed to the side of the sensor body. The difference is the weight loss. Weight loss should not be allowed to exceed **25 grams** for Formaldehyde and Hydrazine sensors. If weight *gain* under **5 grams** is observed, no action is required. If weight gain of **5 grams or more** is observed, contact the Interscan Service dept. for further advice.
- 3) Using the 10ml syringe supplied, restore the sensor to its original weight by injecting an amount of **distilled or de-ionized** water in ml. equal to the weight loss in grams. Ex: 10g weight loss requires 10 ml of water.
- 4) Always inject the water *SLOWLY*. Observe the fill hole as you inject the water. If you notice water draining from the fill hole, STOP FILLING as this means **the sensor can take on no additional water without damage**. Weigh the sensor and make note of the weight. Replace the fill plug when finished.
- 5) **NOTE: DO NOT OVERFILL! Overfilling the sensor can cause electrolyte to leak into the sample tubing during sampling, causing significant damage to the instrument.** It is always better to fill to *slightly under* the original weight than to overfill. **Never remove water from the sensor as this will remove the premixed electrolytes as well as damage the sensor.**
- 6) Re-install the sensor mounting bracket to the bottom of the sensor.
- 7) Re-install the short tubing/barbed connector assemblies into the sensor elbow fittings by pressing the tubing into the elbow firmly then pulling back on the tubing to secure the connection.

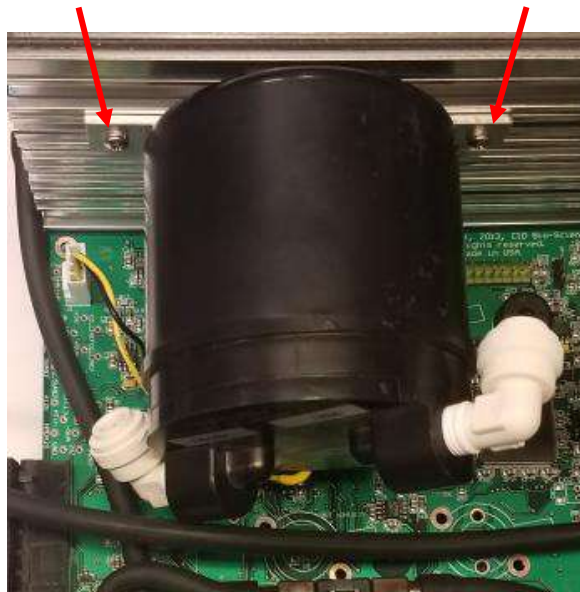
7.4 SENSOR INSTALLATION

- 1) Plug both sensor wiring connectors into the sensor jacks as shown below. Install the mounting bracket to the bottom of the sensor.



FIGURE 7-15

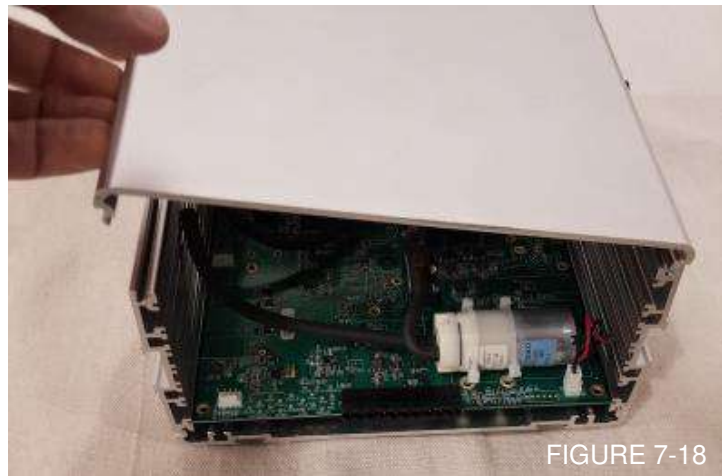
- 2) Hold the sensor sideways with the wiring connections facing down. Insert a mounting screw into the right-side mounting bracket hole. Use a #1 Phillips head screwdriver to hold the screw in place while lining the screw up with the right-side mounting nut on the side rail of the instrument. Thread and tighten the screw loosely. Repeat for the left-side mounting nut. Slide the sensor as needed to line the mounting hole up with the nut. Tighten both screws securely.



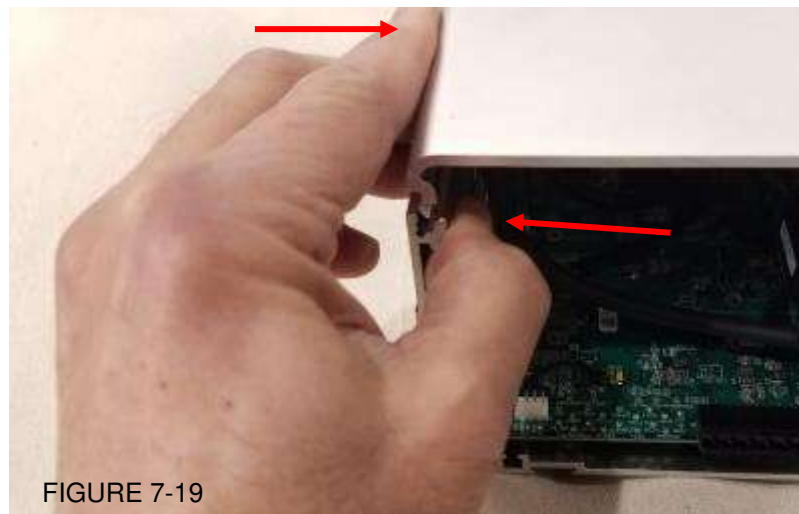
- 3) Connect both tubing lengths (yellow arrows in fig 7-17 below) by pushing each piece of tubing into the fitting until it hits the tube stop then pull back on the tubing to ensure a tight fit. Be sure to pull on the clear tubing and NOT the black tubing.
- 4) Re-connect the sensor harness connector (Black arrow in fig 7-17 below) .



- 5) Replace the instrument cover. The easiest method is to set one side of the cover flange into its mating channel while holding the other side as shown below in fig 7-18. Do this with the cover fully forward against the front panel.



- 6) Lower the remaining side of the cover. With the thumb on the upper inside edge of the case and the index finger on the edge of the cover as shown below in fig 7-19, squeeze with the thumb and index finger while pressing down on the top of the case until the cover flange seats in the mating channel.



- 7) Push on the back of the cover to ensure it is flush with the front panel.
- 8) Replace the 2 upper front panel screws/washers and tighten snugly. Use care not to strip the screw threads - make sure the screws go in straight when tightening. If you feel much resistance the screw may not be seated in the threads. Back the screw out and try again.

- 9) Align the rear panel with the case as shown below in fig. 7-20. Secure with the 4 remaining screws/washers as noted in step 8 above.



FIGURE 7-20

- 10) Re-connect the terminal block to the connector socket (terminal screws on the top). Press firmly into place.
- 11) Align the bezel with the rear of the instrument case and press the bezel back onto the rear of the case as shown in Figure 7-21 below. Confirm that the bezel has fully snapped into place on both sides by pressing firmly with the palm of your hand on each side.



FIGURE 7-21

- 12) Turn power on and allow sensor to stabilize for 24 hours.

Section 8 - Troubleshooting

The chart below addresses common troubleshooting issues and provides probable causes and corrective actions to take. Always consult with the *INTERSCAN service department* for problems not on this list or if suggested corrective actions fail to address the problem.

Symptom	Probably cause / Corrective action
No response to gas	<ul style="list-style-type: none"> • Check all connection points in the probe lead to ensure there are no leaks or blockages. • Unit may require calibration.
Unit will not power up	<ul style="list-style-type: none"> • Batteries may need charging. Use the charger cable to connect the wall charger to the charging port on the unit. The display should indicate charging in progress. • Eject the SD card and/or remove the mini USB cable from the USB port and re-attempt power up. Re-insert the SD card or re-connect the USB cable after successful power up.
Trouble with menu navigation or powering down	<ul style="list-style-type: none"> • Should the instrument “lock up” or if menu navigation functionality is compromised, the user can perform an emergency shutdown by pressing and holding the POWER button for 10 seconds to power the unit down from any screen. <i>This should only be done if normal MAIN MENU screen power down is not possible.</i>

Section 9 - Warranty

INTERSCAN CORPORATION warrants any GasD® 8000 series instrument and gas sensor to be free from defects in material and workmanship for a period of one year from date of shipment.

INTERSCAN CORPORATION's sole obligation under this warranty is limited to repairing or replacing, at its option, any item covered under this warranty, when such item is returned intact, prepaid to the Factory (or designated service center).

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons, or which have been subject to misuse, negligence, or accident, incorrect wiring by others, installation or use not in accordance with instructions furnished by the manufacturer, or which have had the serial numbers altered, effaced, or removed. The sensors are factory-sealed and must not be opened or modified in the field for the warranty to remain in effect. This warranty is in lieu of all other warranties whether expressed or implied.

This warranty does not apply to any of our products, that have had any program and/or software changes incurred, without written authorization from *INTERSCAN CORPORATION*.

Additionally, warranty on any component shall not exceed the manufacturer's warranty given to *INTERSCAN CORPORATION*.

Section 10 - Customer Service

10.1 RETURN AUTHORIZATION

All units being returned for repair or service require a RETURN AUTHORIZATION NUMBER issued by the INTERSCAN Customer Service Department upon request. This is required to ensure the problem truly needs factory service.

In many cases, problems can be resolved in the field by the user. As such, before contacting InterScan with service questions, consult the TROUBLESHOOTING section of this manual (section 7, page 23) as this may help you to resolve any problems without returning the unit.

Should consulting the TROUBLESHOOTING section of the manual not address your problem, contact the INTERSCAN Customer Service Department as noted below to acquire a RETURN AUTHORIZATION NUMBER. The RMA will expedite prompt return of the repaired unit.

The RMA request form can be found at the following link on line...

10.2 SPARE PARTS

Contact the InterScan Customer Service Department for inquiries regarding consumable spare parts for your instrument. Have your instrument's serial number at hand when calling. A list of such parts for your instrument is listed below:

- Gas Sensor – model varies with target gas.