AirPro® Sentry II

Dual Channel

AirPro® Sentry II Specifications

Size 14" x 14.5" x 9" • 355 mm x 368 mm x 228 mm

Weight 30.8 lb. • 14.0 kg, includes battery, case and magazine

Flow Range 5-200 mL/min constant flow at up to 30" H_2O with digital flow readout

Accuracy

Constant Flow Control: ±5% of sample volume

Volumetric Flow Readout: ±3% at 25°C

Battery System 6V rechargeable, sealed lead acid. Up to 30 days on a single battery charge

AC Battery Charger/Power Adapter Wall-mounted, single station charger. Input: 100 to 120 VAC, 60Hz., output: 12 VDC. Optional input 200-240 VAC, 50 Hz., output 12 VDC. Optional remote battery charger, 110/220V, for external battery charging.

Data Logging Time, date, volumetric flow, tube number and temperature automatically logged into non-volatile memory. Optional meteorological station available for wind speed and directional information.

Input/Output Integrated Parallel Port and RS-232 Port

Case Water Resistant Glass Reinforced Plastic Case.

Sampler Materials 316 stainless steel chassis and hardware, PTFE coated magazine and rotary valve

Temperature Range 0-70°C

Humidity Range 90% Non-condensing

Warranty 1 year

Table of Contents

1.0 Unpacking Checklist

Your Bios AirPro® Sentry II Air Sampler has been packaged with care and includes all components necessary for operation. Please take a moment to check that you have received the following items. If you believe you have not received a full shipment or if you have any questions, please contact Bios immediately.

Your AirPro Sentry II Includes
- AirPro Sentry II Air Sampler
- 6.0 V Battery
- 24 Tube Magazine
- Single Station Wall Mount Charger
- Tubing Connector for Flow Set Calibration
- Instruction Manual
- Warranty Card

Optional Equipment
- Metrological Station – Includes compass, wind monitor, 3 meter tripod and all connecting hardware
- Battery powered miniature thermal printer
- External Battery Charger
- Tube Magazine Cover

2.0 General Description

The AirPro Sentry II is a constant flow sequential sorbent tube sampler designed short or long-term ambient air monitoring for volatile organic compounds. Operating on either AC or battery power the single channel Sentry II is able to take up to 24 sequential sorbent tube samples while the dual channel model can accommodate up to 12 sample pairs in a single sampling regime. During the sampling period the Sentry II automatically logs time, date, volumetric flow, tube number and temperature into non-volatile memory. An optional Meteorological Station is available for collecting and integrating wind speed and directional information.

The Sentry II can be programmed to accept a wide variety of sampling sequences and removable tube magazines are available for most standard sorbent tube sizes. Both the battery and tube magazine are removable for convenient field exchange and the extremely energy efficient patented pumping system allows the Sentry II to operate up to 30 days in the field on a single battery charge. At the end of each sample period, data can be quickly and easily exported via the built-in RS-232 port or by connecting a compatible printer to the integrated parallel port.

3.0 Patented Flow System

The Sentry II utilizes a patented constant flow intermittent pumping system (Figure 1). The Sentry II's highly efficient internal pump draws a vacuum on an internal reservoir. A pressure switch senses the working pressure across the regulator and operates the pump whenever necessary to maintain the set flow rate. This allows the pump to operate intermittently, thereby conserving power by only providing the minimum pneumatic energy necessary to supply the sampling medium's needs.
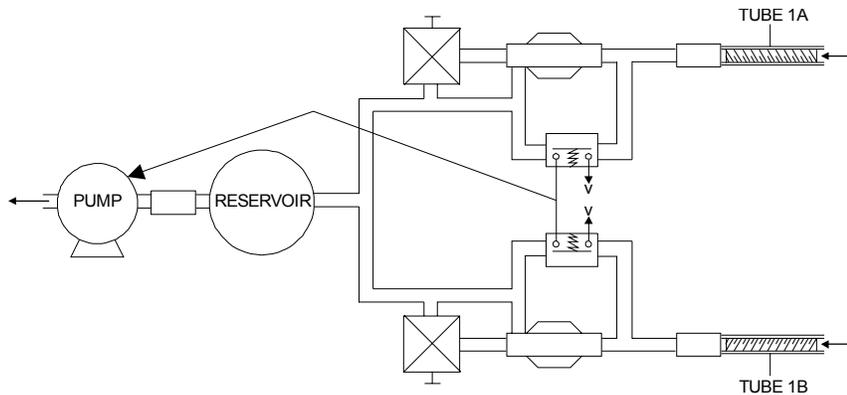
Figure 1 Dual channel intermittent throttling regulator system

4.0 Theory of Operation

The Sentry II 2 x 12 dual tube sampling design allows the user to obtain two simultaneous but independent air samples. The flow through each sorbent tube can be adjusted independently and flow rates for each tube are displayed individually on the LCD display and are also captured in the instrument's internal non-volatile memory. The dual channel sampling system provides for 12 sequential sample pairs for compliance sampling using EPA Compendium Method TO-17 or any method requiring a simultaneous back-up QA sample.

The tube magazine and rotary valve system are PTFE coated aluminum, all fittings are 316 series Stainless Steel and PTFE with Viton o-ring seals. When a sample begins air drawn by the pump passes through the plenum at the top of the magazine and is drawn through the selected sorbent tube pairs, 1A and 1B, 2A and 2B etc. Target compounds are collected on the sorbent tube medium loaded in the removable tube magazine. When the sample program is completed the magazine can be easily removed and replaced. Data can be downloaded or printed and a new program can be set. With practice, total time on-site can be limited to below fifteen minutes. The magazine is self-sealing and a magazine cover is available as an option to seal the outlet end during transport to a lab for analysis.
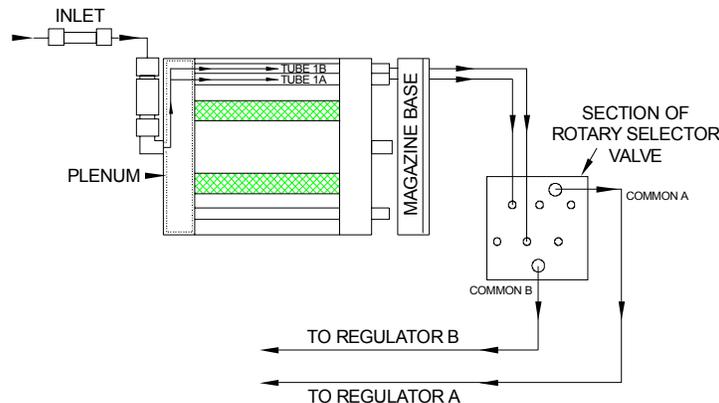
Figure 2. Tube Magazine & Flow Path

5.0 Battery System

Before using your sampler, be sure that the battery system has a full charge to ensure that it will perform to its specifications and maintain operation for the required sampling period. Charging the Sentry II battery requires approximately 16-18 hours. If a low battery condition occurs, "Low Battery!" will be indicated on the display. If the sampler shuts itself off for a low battery during a sample, all prior sampling data will be retained.

5.1 Installing the Battery

The battery is held in place by pressure from the cover plate. Do not allow the exposed battery terminals to touch the faceplate of the Sentry II

1   Loosen the knurled brass thumb-nuts and slide the battery cover plate to the right to remove and expose the battery compartment.

2   Insert the battery pack into the holding pocket on the remote charger placing the battery terminal side down into the pocket. When proper terminal contact is made the red LED will illuminate indicating that the battery is charging.

5.2 Battery Charge & Voltage Status

This feature allows the user to quickly check the battery charging status. A fully charged battery should register anywhere from 6.2 to 6.5 Volts and if the battery is plugged to a charger it should show from 6.8 to 7.2 Volts.

1   From the Test Menu, type **4** and press the **Enter** button to check the Battery Charge Level.
The display may indicate:

```
Bat.  Level  =  6.80
Current  =        .085
Fully   CHARGED
```

Or

```
Bat.  Level  =  7.10
Current  =        .280
CHARGING
```

5.3 Charging with a Standard Single-Station Wall Mount Charger

1   Connect the wall mount charger to an electric outlet.

2   Insert the charger's barrel plug end into the charging jack.

3   When the battery is finished charging, "Fully Charged" will be indicated in the "<4>Charge" section of the Sentry II Test Menu. Charging status will not be displayed if the unit is in standby mode.

5.4 Charging the Battery Pack with an External Battery Charger

Charging the Sentry II with the external battery charger requires approximately 16-18 hours. When the battery is fully charged the red charging LED will turn off. If a fully charged battery is placed into the charger the LED will illuminate briefly and then turn off. After charging is completed the battery is ready to be reinstalled.

1   Loosen the knurled thumb-nuts and slide the battery cover plate to the right to remove and expose the battery.

2   Pull the battery out of its internal compartment.

3   Insert the battery pack into the battery compartment on the remote charger placing the battery terminal side down into the pocket. When proper terminal contact is made the red LED will illuminate indicating that the battery is charging.

6.0 Loading the Tube Magazine

Standard tube magazines are available for most standard sorbent tube sizes. Custom magazines may be manufactured upon request. Please contact the Bios International Customer Service department with specific requirements.

1. Place the tube magazine upside-down on a clean work surface.
2. Insert tubes with the flow directional arrow pointing away from the magazine (Figure 3). Begin inserting tubes at location 1A/1B as indicated on the side of the magazine. Holding the tube with the short piece of rubber tubing included eases installation and removal.
3. Pass the tube through the initial opening.
4. When the tube begins to enter the second opening gently twist to secure a firm air-tight seal.
5. All 24-tube locations must be loaded to prevent flow bypass leakage. Blank stainless steel tubes are provided with each magazine to fill unused tube locations.

Air Flow Direction
As Indicated on Tube

Insert and Twist
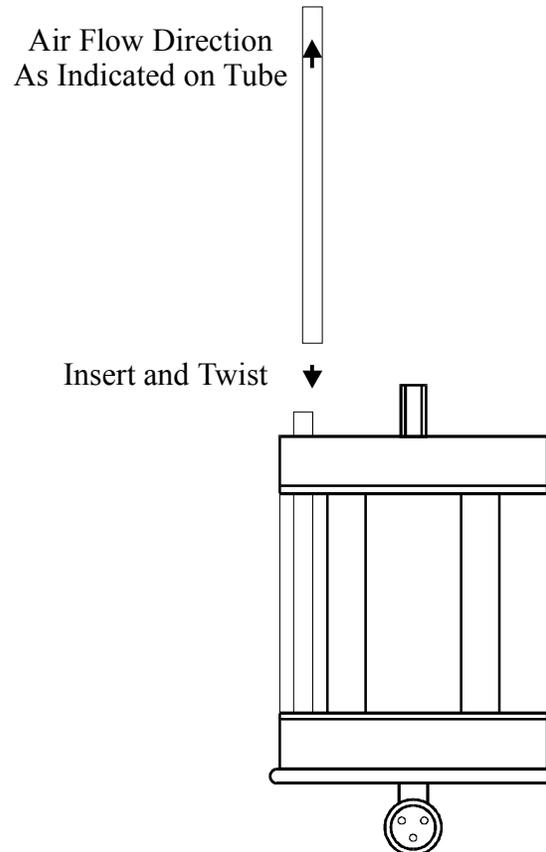
Figure 3. Tube Magazine Diagram

7.0 Operating Instructions

This section teaches the operator how to use the many features of the Sentry II. This section is written for hands-on practice. When a button or LED is called out, it will be bolded.

7.1 Activating the Display Screen for Menu Viewing

When the battery is fully charged and installed correctly the Sentry II can be activated by pressing any button on the keypad. When the unit is initially activated LCD will display the Sentry Main Menu.

```
Sentry Main Menu
<1>Test   <2>Run   <3>Read
    <4>Setup    <5>Review
```

<6>Cal   <7>Standby

7.2 Standby Mode

The Sentry II includes an energy saving standby mode. The unit will not go into the Standby mode when the battery charger is plugged in. If the unit is not plugged in, the display will go blank after 20 minutes during sampling to conserve energy. Pressing any key on the keypad reactivates the instrument.

To manually place the unit into Standby mode:

1   Press **7** and then **Enter** on the keypad.

Sentry Main Menu
<1>Test   <2>Run   <3>Read
<4>Setup   <5>Review
<6>Cal   <7>Standby

2   The display screen will be blank while the unit is in the Standby mode.

7.3 Exploring the Main Menu

<1>Test   Allows the user to quickly verify that key elements of the Sentry sampler are operating properly (i.e. rotary valve, pump and battery).

<2>Run   Allows the user to calibrate the sampling pump (set or adjust the flow rate), set the current time, set the current date and begin the sampling sequence.

Note:
A new start time must be set in the "Setup menu" prior to starting a new sampling sequence. If you attempt to run the sample program without changing the start time and date to a future time and date, in the "Setup menu", (Time entry ERROR !) will be displayed.

<3>Read   Allows the user to access the sample data from the previous sampling sequence either by viewing it manually, printing it via the parallel port or downloading it to a computer via the RS-232 port.

<4>Setup   The user can program the date, start time, sample duration, delay time between samples, if necessary and number of similar samples from this menu. Programming helpers are available as menu selections to simplify the programming task, i.e. Like Samples, Daily Samples and Weekday Samples. In addition there is an Individual Sample Programming mode for customizing every sample period and an easy to use single sample programming selection (OTP).

<5>Review   Allows the user to quickly check the previous sampling sequence program to determine if the same program will be repeated.

<6>Cal   Allows the user to adjust the flow setting, check the current temperature. If the optional meteorological station is present the operator may also, set the compass variation and view wind speed and direction information.

<7>Standby   Places the Sentry II in energy saving standby mode.

7.4 The Run Function

After the sampler battery has been charged, the tube magazine has been put in place and the setup programming has been completed, proceed to the Run mode. In order to enter the run mode the operator must first calibrate the flow rate of the Sentry II pumping system.

If you have previously adjusted flow and temperature select "<2> No" to advance. The pump may also be calibrated prior to entering the Run Menu by first selecting "<6> Cal Menu" from the Main Menu.

1 From the Main Menu type **2** and press **Enter**. The menu will advance to:

```
                    Calibrate

<1> Yes   <2> No
```

2 If you wish to confirm or set flow against a standard, or view the ambient temperature type **1** and press **Enter**. The display will advance to the next screen (below).

```
            Sentry  Cal.  Menu
1  Temperature
<2> Flow   <3> Compass
<4> Wind    <5> Esc
```

Note:
Items "<3> Compass" (Variation) and "<4>Wind" (Speed) can only be accessed and adjusted if your unit is equipped with a Meteorological Station. See "Met Station Addendum" for setup and operation instructions.

3 To verify the current ambient temperature, type **1** and press **Enter**. The temperature sensor reads in °C and is factory calibrated.

```
Temperature  =   21.5


 Push  E  when  set
```

4 Press **Enter** to return to the "Cal. Menu" (see below)

```
            Sentry  Cal.  Menu
<1>  Temperature
<2>  Flow   <3>  Compass
<4> Wind    <5> Esc
```

5 To set flow, type **2** and press **Enter**. The pump will automatically turn on (An intermittent throttling sound is normal) and the following display will appear.

```
Flow   A(1)=   64.3
 Flow   B(2)=   16.2
 Push  E  when  set
```

Note:
1 The internal volumetric flow meters are calibrated at the factory. Please contact Bios for recalibration of the volumetric flow meters and temperature sensors if desired.

2 To check the flow rate with a DryCal primary flow meter, all 24 tubes must be in place to avoid air bypass. For easiest assessment attach a DryCal capable of temperature and pressure standardization to the inlet port. Allow the readings to stabilize before adjusting flow. The volumetric flow meter will read within ±3% of actual flow.

```
Flow   A(1)=   64.3
Flow   B(2)=   16.2
Push  E  when  set
```

6   The flow adjust valves are located on the front of the sampler just below the Tube Magazine. Flow adjustment for channel A is done with Flow Adjust 1 and adjustment for channel B is done with Flow Adjust 2. Set the flow rate using a screwdriver. Turn the flow adjust screw clockwise to decrease flow and counterclockwise to increase flow.

7   When flow is set press **Enter** to return to the Calibration Menu (see below)

```
                Sentry  Cal.  Menu
<1> Temperature
<2> Flow   <3> Compass
<4> Wind   <5> Esc
```

8   Type **5** and press **Enter** to advance to the next screen (see below)

```
                    Set Clock
98/03/24  14:33  Mon
<1>Redo  <2>OK  <3>Esc
```

9   Selecting "<1> Redo" allows you to change the current time, day or date. If these settings are OK and you want to initiate the sampling sequence select "<2> OK" and press **Enter**. The system will return to tubes 1A/1B to prepare for the initiation of a sample sequence and the Run Screen will appear (see below). This may take up to 90 seconds to complete.

```
98/03/24  14:33  Mon
Tube  #  01 A/B


<1>Stop  <2>Last Samp
```

The sampling regime will begin when the clock indicates the selected start time. While sampling, the screen will indicate "Sampling".

10   To stop the sample during the sample regime select from "<1>Stop" (Immediate) or "<2> Last Sample" (unit will stop at the end of the current sample). After either selection the instrument will advance to the Main Menu.

8.0 Data Acquisition

Sample data is accessed and retrieved through selection "<3> Read", from the Main Menu. Information may be displayed for each tube pair from tube pair one to tube pair 12.

1   From the Main Menu type **3** and press **Enter** to advance to the Read Menu (see below).

```
                Read  Menu
<1> Read  <2> Print
<3> RS-232  <4> Esc
```

8.1 Viewing Data

1   To view sample data, type **1** from the Read Menus and press **Enter**. Sample data will be displayed.

```
                Sample  01 of  12
Strt  97/03/25   08:00
Dur.       720  Mns.   tb  02
<1>  Next   <2> Esc
```

2   To view the next data screen, type **1** and press **Enter** (see below).

```
                Sample  01 of  12
Avg.  Flow A          = 64.2
Avg.  Flow B          = 16.5
<1>  Next   <2> Esc
```

3   To view the next data screen of for sample 1 type **1** and press **Enter** (see below).

```
                Sample  01 of  12
Avg.  Temp      = 24.5  (°C)

<1> Next   <2> Esc
```

Note:

 If your Sentry includes a metrological station the next two screens will provide "Wind Speed" and "Wind Direction" information. See the Met Station manual for more detailed information.

4   The data will be displayed for each sample by continuing to type **1** and pressing **Enter**.

5   You can return to the Read Menus at any time by typing **2** and pressing **Enter**.

8.2 Printing Data

To print, first attach a standard 25 Pin Printer Cable between the Sentry II and your printer. The Sentry print program is written to operate with the compact Bios BP-1 portable thermal printer. Be sure to configure your thermal printer to operate properly with the Sentry II by setting the printers internal dip switches according to the Bios product guide included with the BP-1 printer.

1   When the printer is setup and turned on, type **2** at the Read Menus and press **Enter**.

2   The printer will begin to print the data. All sample data from the five sample data screens will be printed. Abort the printing process at any time by pressing **Enter**.

8.3 Downloading Data to a Computer

A separate manual is included with the Sentry II for downloading data to a computer.

9.0 Setting User Preferences

The user must prepare the unit for the type of sampling that will be performed prior to sampling with a Sentry II. The sample start date, start time, sample duration, delay time between samples, and number of similar samples are programmed from the Setup Menu.

9.1 Entering the Setup Menu

1   From the Main Menu, select **4** and press the **Enter** button.

```
              Sentry Main Menu
<1>Test   <2>Run   <3>Read
<4>Setup      <5>Review
<6>Cal    <7>Standby      4
```

A warning message will appear on the screen:

```
              ! ! ! WARNING ! ! !
All   old   data   will   be
erased  -  Is  this  OK ?
<1> Yes    <2> No
```

2   To erase the old data and advance to the Setup Menu, type **1** and press the **Enter** button. The Setup Menu will be displayed (below).

```
              Sentry Setup Menu
<1> Like    <2> Daily
<3> Indiv   <4> OTP
<5> Wkday  <6> Esc
```

3   To return to the Main Menu, from the Setup Menu, after the sampling setup functions are performed, type **6** and press the **Enter** button.

9.2 Exploring the Setup Menu

<1> Like   "Like" samples are samples that start at a specific date and time and repeat at specified intervals of time until the number of samples specified are collected.

<2> Daily   "Daily" samples are samples that start at a specific date and time and repeat daily at that same specified interval until the number of samples specified are collected. The maximum sample length in the "Daily" selection is 1440minutes (24 hrs.) and the default sample length is 480 minutes or (8 hrs).

<3> Indiv   "Indiv" (Individual) samples can be any type sample that you want. Be careful, the samples have to be entered in chronological order without overlapping times or you will get an error message and the sampler will not run the sample sequence.

<4> OTP   The "OTP" is for single sample operation or One Time Programmable samples. You are prompted for sample duration only. The unit will automatically advance to the run mode.

<5> Wkday   "Wkday" samples are similar to "Daily" samples except "Wkday" samples automatically skip weekend days. The only active sampling days are weekdays. The maximum sample length in the "Wkday" selection is 1440 minutes (24 hrs.) and the default sample length is 480 minutes or (8 hrs).

9.3 Programming "Like" Samples

In order to run a new sample sequence a start time must be entered. The new start time must be a future time that will at least allow the operator enough time to complete the setup process. Sentry recognizes 24 hr time only.

1 At the Setup Menu, type **1** and press **Enter**. The following Selection Menu will appear, showing the current date.

```
<1> Year  =  98
<2> Month  =  03
<3> Date  =  24
```

If you intend to sample today, the current date is correct and no change is necessary. If sampling will commence on a future date enter it from this menu.

2 Type **1,2** or **3** and press **Enter**. Then type the appropriate year, month or date.

3 When the correct sampling date is entered, press **Enter** to advance to the next menu (below). This menu will show the current time in military time and the proposed duration of each sample.

```
<4> Hour  =  14
<5> Minutes  =  33
<6> Duration  =  480
```

4 Type **4** or **5** and press **Enter**. Then type the new start time. Again, the unit will not operate in the Run Mode if the start time is not changed from the current time to a future time.

5 To set a sample duration time, type **6** and press **Enter**.

```
<4> Hour  =  08
<5> Minutes  =  00
<6> Duration  =  480
```

6 Enter the new sample duration time (in minutes) in the space and press **Enter**.

```
<4> Hour  =  08
<5> Minutes  =  00
<6> Duration  =  480
Duration  =  720
```

7 The new time will replace the old time.

```
<4> Hour  =  08
<5> Minutes  =  00
<6> Duration  =  720
```

8 Press **Enter** to move to the next selection menu (see below)

```
<7> Number  of
Like Samples  =  12
```

9 Press **Enter** to accept the default value or type in the new number of samples and press **Enter**. On the dual channel Sentry II the total number of sample pairs cannot exceed 12.

10 Press **Enter** to move to the next selection menu (below)

```
<8>  Time  between
Like Samples  =        2
```

13

```
┌────────────────────────┐
│                        │
└────────────────────────┘
```

11 Type a new number of minutes and press **Enter**, or press **Enter** to move to the next selection menu. This is the last Like Sample Setup Screen.

```
┌────────────────────────┐
│ <1> Next   <2> Esc      │
│ <3> Redo  <4> OK        │
│                        │
│                        │
└────────────────────────┘
```

12 If you would like to change something, select "<3> Redo" and press **Enter** to go through the setup sequence again.

13 If you believe that the setup is complete and correct select "<4> OK" and press **Enter** to load the sample program. "Loading..." will flash on the display

14 After the program is loaded you will be forwarded to the Main Menu or an error message will be displayed

15 If the program is successfully loaded the sampler will automatically advance to the Main Menu. If you are ready to start the sampling sequence type **2** and press **Enter**.

9.4 Programming Error Messages

Error Message	Solution
Time Entry Error!	Press **Enter** to return to the Main Menu. Then go to the "Like" setup section and enter a future start time in place of the current time.
Tube Entry Error!	Press **Enter** to return to the Main Menu. Select "TEST" and then "VALVE" to "Set to Tube <01 A/B>". After exiting the unit will then automatically load the sampling program and you can advance to the "RUN" mode to start the sample sequence.

9.5 Programming Other Sample Sequences

The setup menus for "Daily", "Wkday", "Indiv" and "OTP" are similar to the ones displayed in "Like" samples. Select the appropriate type of sampling program by choosing a sample sequence. See section 9.2 Exploring the Setup Menu for more information regarding sample sequence options. Follow on-screen prompts. See Section 9.3 for examples of specific programming steps.

10.0 Maintenance, Quality Assurance

Although the AirPro Sentry ll is a rugged instrument, certain care and maintenance requirements must still be met.

Current service and calibration information and pricing can be found at
www.biosint.com/service/sentry.htm

10.1 Maintenance

When not in use store the Sentry ll in a clean, dry environment. When possible leave the unit on charge. Wipe only with a damp cloth and do not spray with liquid solvents or use abrasive cleaners.

10.2 Test Functions

The Sentry allows the user to access a self-test and diagnostic menu. From this menu the user can quickly verify that the sample selection valve and the pump mechanism are operating properly as well as determining the charging status and voltage level of the battery pack.

1   From the Main Menu, type **1** and press the **Enter** button (see below)

```
                Sentry Main Menu
          <1>Test   <2>Run   <3>Read
              <4>Setup      <5>Review
              <6>Cal    <7>Standby
```

2   The Test Menu will be displayed (see below)

```
                Sentry Test Menu
    <1> Valve    <2> Bat Level
    <3> Pump    OFF
    <4> Charge    <5> Esc
```

3   To return to the Main Menu after component testing is completed, from the Test Menu type **5** and press the **Enter** button.

10.3 Valve Test

1   From the Test Menu, type **1** and press the **Enter** button. The Valve Test Selections will be displayed (see below).

```
                Tube  No.  = 01 A/B
    1 Advance   1   Tube
    <2> Set  to  Tube  01 A/B
    <3> Esc    <4> Burn-in
```

2   To test the tube selection valve, type **1** and press the **Enter** button. The valve should move forward in increments of one as displayed below. Tube selection should be set to <01 A/B> before leaving this menu.

```
                Tube  No.  = 02 A/B
    1 Advance   1   Tube
    <2> Set  to  Tube  01 A/B
    <3> Esc    <4> Burn-in
```

3   To return the valve to Tube 01 A/B, type **2** and press **Enter** to "SET TO TUBE 01 A/B". The tube selection valve will advance to "Tube No. = 01 A/B" at this time. This may take as long as 90 seconds. "<4> Burn-in" is a diagnostic tool that runs the valve for twenty minutes to ensure proper function.

```
                Tube  No.  = 01
    1 Advance   1   step
    <2> Set  to  Tube  01 A/B
    <3> Esc    <4> Burn-in
```

4   Type **3** and press **Enter** button to return to the Test Menu

10.4 Battery Level Test

A fully charged battery should register anywhere from 6.2 to 6.5 Volts and if the battery is plugged to a charger it should show from 6.8 to 7.2 Volts. Be sure that the charge percentage is adequate to operate the sampler for the anticipated sample duration.

1   From the Test Menu, type **2** and press **Enter** to check the battery. The following display will appear:

```
Bat.  Level  =  6.40
Approximate  Charge  =
                          95.5%
```

10.5 Pump Test

The pump test is a quick way to determine that the pump is operational.

1   From the Test Menu, type **3** and press the **Enter** button to check the pump.

```
                Sentry Test Menu
1 Valve    <2> Bat Level
<3> Pump   OFF
<4> Charge    <5> Esc
```

2   The pump will turn on and the display will toggle from off to on. The pump will operate intermittently until the pump is toggled off again. An intermittent throttling sound is normal

```
                Sentry Test Menu
<1> Valve    <2> Bat Level
<3> Pump   ON
<4> Charge    <5> Esc
```

11.0 Limited Warranty

The Bios AirPro Sentry II is warranted to the original end user to be free from defects in materials and workmanship under normal use and service for a period of 1 year from the date of purchase as shown on the purchaser's receipt. The Sentry II's battery is warranted for 6 months from the original purchase date. If the unit was purchased from an authorized reseller a copy of an invoice or packing slip showing the date of purchase may be required to obtain warranty service.

The obligation of Bios International Corporation under this warranty shall be limited to repair or replacement (at our option), during the warranty period, of any part which proves defective in material or workmanship under normal use and service provided the product is returned to Bios International Corporation, transportation charges prepaid.

Notwithstanding the foregoing, Bios International Corporation shall have no liability to repair or replace any Bios International Corporation product:
1   Which has been damaged following sale, including but not limited to damage resulting from improper electrical voltages or currents, defacement, misuse, abuse, neglect, accident, fire, flood, act of God or use in violation of the instructions furnished by Bios International Corporation,
2   Where the serial number has been altered or removed or
3   Which has been repaired, altered or maintained by any person or party other than Bios International Corporation's own service facility or a Bios-authorized service center.

This warranty is in lieu of all other warranties, and all other obligations or liabilities arising as a result of any defect or deficiency of the product, whether in contract or in tort or otherwise. All other warranties, expressed or implied, including any implied warranties of Merchantability and fitness for a particular purpose, are specifically excluded.

In no event shall we be liable for any special, incidental or consequential damages for breach of this or any other warranty, express or implied, whatsoever.