

# VR2 and VR3 manual updates

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# 1 AIR BREAK

## 1.1 FAQ #1: What do I do when the Air break notice appears?

The air break notice will appear when your CNS % reaches the level that you have chosen in your Set Up menu.

When it appears, if you then switch to a low PO<sub>2</sub> gas for five minutes as recommended, you should select that gas on your VR3 for the period you are breathing it, so that the VR3 can accurately calculate your decompression. If you do not tell the VR3 that you have switched to a low PO<sub>2</sub> gas, it will assume that you have not switched.

Do not forget to tell the VR3 when you switch back to your decompression gas.

See also the CNS section under SETUP functions in your VR3 manual.

# 2 ALTITUDE

## 2.1 FAQ#1 Please explain aspects of the Altitude Screen?

Altitude

What do the numbers on the altitude screen mean?

See page in your VR3 User Manual for a list of graphics, a description of what they mean and how to use the screen.

The current pressure and altitude (calculated with reference to standard atmospheric pressure) are also shown on the start up screen, ( the first one you see when you power up your VR3.)

## 2.2 FAQ #2 Why do the numbers move?

The pressure sensor is very sensitive. The absolute pressure accuracy is +/- 30Mb; the gain is 1% to 2%. This means that underwater, where 10m (33 ft) of depth exerts a pressure of 1 bar, the pressure reading is very accurate in depth terms, it also means that on the surface, where the whole height of the atmosphere exerts a pressure of 1 Bar, altitude readings can vary between VR computers as much as several hundred metres, (the equivalent of +/- 30 Mb). Your VR is not a barometer.

As the entire atmosphere exerts the same pressure as 10 metres of water, a difference in pressure equivalent to a depth change of several cms underwater is equivalent to a change of several 100 metres of altitude.

## 2.3 FAQ #3 Why do the readings disagree with my barometer or the local weather report?

This is a dive computer, not a barometer. The readings in pressure terms will not disagree drastically. But barometers do have variation in accuracy too. +/- 30mbar is equivalent to approximately +/- 300m of altitude.

#### **2.4 FAQ #4 What is the significance of altitude fluctuation on my decompression profile?**

Nothing you change in the altitude screen will have any effect on your decompression obligation, whether at sea level or if diving at altitude.

#### **2.5 FAQ #5 What is the purpose of the altitude screen then?**

If you are diving at altitude, then an altitude reading will help you choose which back up tables to use. The ambient pressure reading will also assist you in calibrating your rebreather before the dive, (see your rebreather operating manual for information on calibration.)

#### **FAQ #6 Do I have to do anything special with the computer when I am diving at altitude?**

If you are diving at altitude, then you should switch the VR on at the surface before diving so that it can read the ambient atmospheric pressure.

### **3 Batteries**

#### **3.1 FAQ #1 Which batteries should I use?**

Use AA batteries with 1.5 to 3.6V. Do not use AA batteries below 1.2V. Lithium batteries last much longer but have a very fast discharge curve.

#### **3.2 FAQ #2 When should I change the battery?**

Never remove the battery with the screen on. Always change the battery when there is still life in the unit. As a general guideline change the battery when the voltage gets down to 1.2V, (you will find the voltage reading on line 6 of your VR3's start up screen.) Some lithium batteries need to be changed at even higher voltages.

#### **3.3 FAQ #3 How do I change the battery?**

Turn the VR3 on then let it turn itself off. (If it will not turn on see FAQ#4). Insert the battery positive end first into the compartment. (If you insert the battery negative end first, it will not damage the VR3 but it will not function.) Screw down the battery cap until no O ring is visible and the thread bottoms out. (Always keep the thread clean as the thread is the earth for the battery.)

#### **3.4 FAQ #4 Too late; my battery went flat. What do I do now?**

Remove the battery. Wait at least 10 minutes. Insert a new battery and screw the battery cap in slowly until you see the screen flash once. Stop and let the VR3 turn itself on (,you will see the time change screen,) then allow the VR3 to turn itself off again. **NOW FINISH SCREWING THE CAP TIGHTLY.** You will now be able to switch the VR3 on normally.

If the VR3 appears to freeze with data showing on the screen, leave it for 2 minutes and it will reset itself. If the VR3 appears to hang, repeat the procedure outlined in this FAQ.

### **3.5 FAQ #5 How should I care for my battery cap O-Rings?**

Treat them like O rings on an underwater camera housing. Keep them lightly greased, change them if they become damaged or worn and as a basic rule of thumb, change them after 10 battery changes even if they do not look damaged or worn.

### **3.6 FAQ#7 My VR3 resets underwater and loses gases and defaults to air**

When using some 3.6v lithium batteries they are too tight in the battery cap, the negative end of the battery needs the outer plastic skin removed. This allows a better contact with the battery.  
Also check the battery cap is fully screwed in.

### **3.7 FAQ#6 When I changed my battery I lost all my logged dives?**

Before changing the battery allow the VR3 to power down (switch off). Then change the battery as FAQ#3

## **4 Calibration**

### **4.1 FAQ #1 4th cell won't calibrate or reads differently while diving**

To test this, follow the manufacturers calibration procedures of the rebreather. As an example, assuming you are at sea level (1000mb), if not adjust for altitude. Now flush the rebreather with oxygen totally and then evacuate the loop, allowing no air in at any time. Repeat this 3 times in total. After the last fill make sure the loop is at ambient pressure by momentarily opening and closing the mouthpiece or pulling the counter lung dump cord. Now read the rebreather displays. If they are at 1 bar PO<sub>2</sub> then it is calibrated correctly. If not re-calibrate it. Some units may require a breath of air to be put into the loop to allow auto calibration to take place if counter lungs are full of oxygen.. Now flush and evacuate the rebreather one more time with oxygen and the displays should read 1 bar. Now you can go through the calibration routine for the VR3 as described in the manual.

## 5 Closed Circuit Rebreather Mode

### 5.1 FAQ #1 I am in CCR mode using the direct link to my rebreather with the external sensor ON. I wish to bailout to Open Circuit. What do I do with my VR3 settings?

- First use a short push on the left switch to cycle to the gas bottle icon.
- Use a long push on the left switch to enter the screen.
- A long push on both switches will switch from closed circuit to open circuit,
- then a short push on the right switch will confirm the change and return you to the dive screen.

NOTE: As your external sensor is still switched on, you are now getting a semi-closed decompression based on the external cell readings, so you now need to switch off the external sensor.

- Next use a short push on the left switch to cycle to DVo.
- A long push on the left switch enters the screen.
- Then use a short push on either switch to switch XO2 off and
- a long push on both switches together will confirm the change and return you to the dive screen.

NOTE: your decompression is now based upon the open circuit gas shown on the dive screen. MAKE SURE THAT IS WHAT YOU ARE ACTUALLY BREATHING.

### 5.2 FAQ #2 What is the difference in the PO2 display when I have the external sensor switched on?

When diving with the VR3 in closed circuit mode with a link and the external sensor on, (XO2 ON),

- the reading on the bottom line of your VR3's dive screen is the actual PO2 for the gas you are breathing.
- On the second line up you will see the diluent gas.
- A short push of the left switch on the VR3 will show your internal PO2 set point on the second line up.
- This will revert to the diluent gas display after 10 seconds.

When diving with the VR3 in closed circuit mode with a link and the external sensor off, (XO2 OFF),

- the bottom line of the VR3's dive screen shows the internal set point,
- NOTE: unless the diluent PO2 is greater than set point, in which case the diluent PO2 is shown\* (see example below).
- The second line up shows the diluent gas.

NOTE: This is the same as the display on non-link VR3s in CCR mode.

Example:

- you have your VR3 and Rebreather setpoint at a PO2 of 1.2.
- You are diving with an air diluent at 55m
- At 55m (6.5 ATA) with air as your diluent the PO2 of the gas you are breathing is  $6.5 \times .209 = 1.36$ .
- The bottom line of your VR3's dive screen will therefore show 1.36.

### **5.3 FAQ #3 Why do the PO2 reading and the internal set point not match sometimes?**

The PO2 of the gas you are breathing will rise beyond set point if you exceed the depth at which your diluent gas reaches set point PO2. You will also see temporary variations while descending and ascending.

### **5.4 FAQ #4 How do I calibrate my VR3 with the external oxygen sensor and cable link connected to my closed circuit rebreather?**

- Connect the sensor cable to the VR3's I/O port.
  - Ensure the correct oxygen sensor cell is installed in the sensor holder, (see Oxygen Sensor Cell FAQs)
  - Install the sensor cell in your rebreather.
  - Switch on your VR3
  - Select Dive Now (short push of both switches) to keep the VR3 active for 5 minutes
  - A long push on the right switch will take you into your Gas Select screen
  - Make sure you are in Closed Circuit Mode and you see CLOSED CCT at the top of your screen
  - If not go to Closed Circuit mode by a long push on both switches
  - A short push of both switches takes you into the ADJUST screen
  - Move the cursor to select NX 99 in your gas list and switch it ON
- NOTE: use NX 99 unless you are at altitude in which case see FAQ#6.

- A long push of both switches will save NX 99 as your diluent
- Save it as the calibration gas (CAL) by a further long push on both switches.
- CAL GAS will appear on the screen
- Then a short push on the right-hand switch will confirm and
- a further short push on the right-hand switch will take you back to the Dive Now screen.

#### **IMPORTANT NOTE:**

Remember, AFTER calibrating, to set the diluent setting back to the actual dive diluent!)

- In the Dive Now screen, cycle to the O2 option by a short push on the right-hand switch
- Then a long push on the right-hand switch takes you in to the SENSOR screen, where you will see the current oxygen reading expressed as a decimal ( for example .209 = 20.9%) and a bar graph.
- A long push on both switches takes you into CAL (cal ibration) mode.
- You will see the instruction FLUSH CAL GAS
- Completely flood the rebreather loop with oxygen, (usually achieved by flushing and emptying the loop with pure oxygen three times), then equalize the counterlung to ambient pressure.)
- A short push on the right switch takes you into the EQUALISE screen
- Once the reading is again stable a short push on the right switch accepts it and takes you into a SENSOR screen where you will see the reading and a measurement of the oxygen sensor cell output (measured in millivolts mV).
- A short push of both switches will begin the calibration process. When the reading on the screen is stable, a short push of both switches will save it
- Your VR3 is now calibrated

### **5.5 FAQ #5 Why can I not calibrate the external cell linked to my VR3 or why does it show a different reading to my rebreather cells?**

It is likely that the rebreather has not been properly calibrated. To test this, follow the manufacturers' recommended calibration procedure. For example: -

- If you are at sea level set the atmospheric pressure at 1000mb; if not adjust for altitude
- Fill the rebreather completely with oxygen with the loop closed
- Then evacuate the loop, allowing no air in at any time
- Repeat this three times
- After the last fill make sure the loop is at ambient pressure by momentarily opening and closing the mouth piece or pulling the counter-lung dump cord
- Read the rebreather displays
- If they are at 1.0 Bar PO<sub>2</sub>, the rebreather is correctly calibrated
- If not, repeat the calibration process

NOTE: you may get a cell stuck message while calibrating with the counterlungs full of oxygen. If so, you may need to add a breath of air to the loop to allow auto calibration to take place.

- Fill and evacuate the rebreather one more time with oxygen and the displays should read 1.0 Bar
- Now calibrate the VR3 as per FAQ#4

### **5.6 FAQ #6 How do I calibrate the VR3 for my rebreather at altitude?**

Because your rebreather works on absolute pressure, the calibration gas in the VR3 must be adjusted for the ambient pressure when diving at altitude. For example:

You are at an altitude pressure of 850mb.

Therefore instead of setting the calibration gas as NX 99 ( as you would at sea level) you would set it as

$$99 \times 850/1000 = \text{NX } 84$$

Then calibrate as per FAQ#4.

IMPORTANT NOTE; Remember, AFTER calibrating, to set the diluent setting back to the actual dive diluent!)

### **5.7 FAQ#7 How will my VR3 track my closed circuit decompression if I exceed the setpoint PO<sub>2</sub> of my diluent?**

A: Normal diving practice is you do not dive deeper than the diluent PO<sub>2</sub> vs setpoint number. I.E. the diluent at the target depth should always have a lower PO<sub>2</sub> than the setpoint.

Because;

1. You can then do a flush with Dil and do a cell check
2. You have a constant confirmation that the sensors/ solenoid are working If we allow the setpoint PO<sub>2</sub> drive decompression then when you dive deeper were the diluent PO<sub>2</sub> is higher than setpoint you will have excessive decompression. Decompression should track the diluent PO<sub>2</sub> to be optimised. However if you maintain a deep depth where the diluent PO<sub>2</sub> is greater than the setpoint and you metabolise the oxygen down in the loop without adding any, then the decompression will start to become inaccurate. This is again why you should never use rich diluents at depth .

If you are using a linked system (loop PO2 monitoring) then the VR will use the as read PO2 until the diluent PO2 again exceeds it and then an alarm will appear, again warning of unsafe diving practices.

### **5.8 FAQ#8 Diving beyond the MOD of the diluent in closed circuit mode / or beyond the PO2 of the unit is less than the diluent PO2 at depth**

Dive computers calculate decompression based on the inert gas partial pressures. This is the only accurate way to estimate decompression requirements. Decompression computers are an aid to decompression and backup tables and depth/time instrumentation should always be carried. When diving beyond the MOD in closed circuit mode and if the setpoint PO2 of the unit is less than the diluent PO2 at depth, then the diluent PO2 will be used to drive the decompression. This is a correct assumption as it is the partial pressures of the inert gas in the diluent that drives decompression. Alarms on the VR showing the actual diluent PO2 will display once the diluent/setpoint PO2 level has been exceeded. As the main concern at this stage is oxygen toxicity then the increased PO2 will display and the CNS % calculation will be updated until it in turn warns of dangerous levels. Additional alarms are displayed on our Rebreather product.

If you remain at depth with no additional gas injection, then the PO2 in the loop will drop (due to metabolism) and the inert gas partial pressures may rise (dependant on the bodies gas absorption rates) a small amount dependant on the gas volume (and hence total partial pressure within the loop). At some point the resultant volume drop will make the loop volume become unbreathable until diluent is added. At this point the decompression may vary slightly from the decompression displayed on the VR. However due to gas volumes being absorbed by the body and other factors any variations that may occur will be minimal. If diluent were added during this static phase of the dive (as it should be) then the decompression will be as accurate as possible. The rise in PO2 (drop in inert gas pressures) will reduce the total time to surface calculation on the assumption that the PO2 (hence PN2/PHe) will remain constant to the surface as it is only being predictive based on current facts. Once the depth is decreased and the PO2 reduces then the calculation and prediction will update.

In the above example, If the decompression is being driven via a sensor linked system as in a rebreather then the PO2 is always monitored and providing a breathable volume is maintained, then the decompression will be accurate. However, if the PO2 falls below that of the equivalent for the diluent at that depth, then a warning will appear. The VR will assume the O2 cell has not been calibrated correctly. Again this is the most likely result as training agencies and normal dive practice do not allow for turning of the diluent in a rebreather. Exceeding the MOD/setpoint number will generate an alarm, warning of this unsafe practice.

Having a diluent that has a sufficiently low PO2 at the MOD to allow the rebreather to be flushed to confirm sensor operation or reduce the PO2 in the loop is a safe practice.

Decompression computers calculate decompression requirement based on the inert gas partial pressures. Whether you are above the MOD of a gas or below it this calculation is the same. In both scenarios additional safety factors

are applied to the decompression calculations to allow for variations in diving practice.

Diving beyond the maximum operating depth of any gas is dangerous and should be avoided and is not endorsed by any training agency. Emergency plans and gas should always be carried to cater for temporary excursions in the event of an emergency.

## **6 Dead VR3**

### **6.1 FAQ #1 My unit froze at depth or turned off while diving. What can I do?**

It is likely that you have allowed the battery to run out before replacing it. Go to Battery FAQ#4. Following this procedure will usually solve the problem. If the unit appears to freeze at a depth this could also be due to a low battery. Please read FAQ#4 on battery changing. It is appears to switch off and sometimes switch on again while diving, there may be corrosion in the battery cap due to a leaking battery. If a faulty battery has leaked, clean in side the battery cap and the battery compartment. Wire wool or Em ery paper may be required. Remove the battery cap spring and clean around it. Spare battery caps are available through Delta P. If this is does not solve the problem, send your VR3 back to us at Delta P together with a recent history.

### **6.2 FAQ#2 My Vr3 switches off at depth and switches on again when shallow**

When using some 3.6v lithium batteries they are too tight in the battery cap, the negitive end of the battery needs the outer plastic skin removed. This allows a better contact with the battery.

Also check the battery cap is fully screwed in.

### **6.3 FAQ#3 VR won't turn on past start up screen**

Unit turns on showing date name and personal information screen but no other screens are available. Switches do not function.

This is an indication that one of the switch bu ttons has cracked and needs replacement. To check, pop both the out switches, (instructions on Maintenance page in manual), and check them. If one or both are broken, contact your dealer for a replacement set, (you might also like to buy a set to keep in your spares kit, especially if planning a long trip.)

## 7 High PPO2 warnings

### 7.1 FAQ#1 I am diving on a gas and have no "deeper" gas to switch to the high PPO2 warning does not appear until I reach a PPO2 of 1.8?

This is not a flaw or bug in the computer. This is how the computer works and has always worked.

The high PPO2 warning is just that, it warns as soon as a diver's PPO2 reaches a dangerous level and there is no deeper gas in the gas list to switch to. It is not an "MOD exceeded" warning, the VR3 has no such thing. The diver presets an MOD for each gas and it is the diver's responsibility to remain above this MOD. An indication that a diver has exceeded an MOD of 1.6 would be a rapidly climbing CNS% reading and shortly after that, depending on what level the diver has set as his warning %, an air break warning would appear. The philosophy behind the design of VR computers is that they tell a diver what he is doing and inform him of the consequences of his action; their task is not to teach or punish.

## 8 Light Modes

### 8.1 FAQ #1 What do the abbreviations for the five different backlight modes in the DVo screen mean?

Tm .....Light on for 10 seconds at the surface or underwater  
DTm.....Light on for 10 seconds underwater  
On.....Light always on at the surface and underwater  
DOn.....Light off at the surface, light on underwater  
OFF.....Light always off.

### 8.2 FAQ #2 What do the abbreviations for the five different backlight modes in the Setup screen mean?

T ..... Light on for 10 seconds at the surface or underwater  
Y..... Light always on at the surface and underwater  
D..... Light off at the surface, light on underwater  
N..... Light always off.  
d..... Light on for 10 seconds underwater

### 8.3 FAQ #3 Do the DVo backlight settings over-ride those in the Setup?

They are separate. Whichever light option you choose in either menu will over-ride any previous settings in either menu. Practically, you will find that you use the DVo menu more as the screen is much more easily accessible during a dive.

## 9 Oxygen Analyser Mode

### 9.1 FAQ #1 How do I calibrate my analyser?

- Connect the sensor cable to the VR3's I/O port.
- Ensure the correct oxygen sensor cell is installed on the pin connector. (See FAQs on Oxygen Sensor Cell)
- You can calibrate the analyzer either in ambient air or by inserting the cell in a cylinder connection kit and attaching the connection kit to an air cylinder.  
NOTE: If you choose the latter method remember that excessive flow will increase the partial pressure and give you a false reading. This also applies when you are analyzing a gas, (see below). To ascertain the correct flow rate to use, attach the connection kit to an air cylinder and increase the flow gradually until the sensor reading changes, then decrease the flow until the reading comes back down and becomes stable. That is the correct flow rate to use in future.
- Switch on your VR3
- Select Dive Now (short push on both switches) to keep the VR3 active for 5 minutes
- Analyser calibration is normally carried out in air and on Open Circuit VR3s air is automatically set as the only CAL gas.  
(NOTE: On Closed Circuit capable VR3s you can select other calibration gases. See Closed Circuit Mode FAQs for guidance.)
- Cycle to the O2 option in the bottom right hand corner of the screen by a short push on the right-hand switch
- Then a long push on the right-hand switch takes you in to the SENSOR screen, where you will see the current oxygen reading expressed as a decimal (for example .209 = 20.9%) and the PO2 bar graph.  
(NOTE: The PO2 bar graph has no digits but the bottom of the bar is zero and the top 2.0. The small arrow to the left of the bar represents the VR3's internal PO2 set point. This graph is also available in DIVE and SIM modes.)
- A long push on both switches takes you into CAL (calibration) mode.
- You will see the instruction FLUSH CAL GAS
- Ignore this if you are calibrating in ambient air
- If calibrating using the cylinder connection kit, open the cylinder valve until you hear a gentle hiss, (see caveat concerning flow rate, above)
- Once the reading is stable a short push on the right switch accepts it and takes you into the EQUALISE screen which, again, if calibrating in ambient air you ignore. If using the cylinder connection kit, stop the flow of air from the cylinder and allow the reading to stabilize.
- Once the reading is again stable a short push on the right switch accepts it and takes you into a SENSOR screen where you will see the reading and a measurement of the oxygen sensor cell output (measured in millivolts mV). A short push of both switches will begin the calibration process.  
When the reading on this screen is stable (at .209 if using AIR as the CAL gas), a short push of both switches will save it
- Your VR3 is now calibrated.

NOTE: when saving the reading you may be shown a WARNING CELL LOW or a WARNING CELL HIGH message. This does not refer to the PO2 but to the mV output of your Oxygen Sensor Cell and may indicate that you have the

wrong type of cell connected or else that your cell needs replacing. ( See FAQs on Oxygen Sensor Cell.)

## **9.2 FAQ #2 How do I analyse a gas using the analyser?**

- Connect the sensor cable with oxygen sensor cell attached to the VR3's I/O port,
  - place the cell in the cylinder connection kit and
  - attach the connection kit to the cylinder to be analysed.
  - Switch on your VR3
  - Select Dive Now (short push on both switches) to keep the Vr3 active for 5 minutes
  - Cycle to the O2 option by a short push on the right -hand switch
  - When you see O2 in the bottom right hand corner of the screen, a long push on the right-hand switch will take you into the SENSOR screen, where you will see the current oxygen reading expressed as a decimal (for example .209 = 20.9%) and the PO2 bar graph.
  - A long push on both switches takes you into CAL (calibration) mode.
  - You will see the instruction FLUSH CAL GAS
  - Open the cylinder valve until you hear a gentle hiss, (see caveat concerning flow rate, in FAQ#3 above).
  - Once the reading is stable a short push on the right switch accepts it and takes you into the EQUALISE screen whereupon you stop the flow of gas from the cylinder.
  - Once the reading is again stable a short push on the right switch accepts it and takes you into a screen where you will see the reading and a measurement of the oxygen sensor cell output (measured in millivolts mV).
  - A further short push of both switches saves the analysis and the GAS icon will appear in the bottom right-hand corner of the screen.
  - A short push on the right-hand switch will take you into the Gas Adjust screen
  - The gas number will be highlighted and you can change that number to place your analysed gas into any position in the gas list you wish.
  - Short pushes of both switches will move the cursor on the screen until the analysis ( 2nd line up) is highlighted.
  - You will then see a TRANSFER O2 icon in the bottom right hand corner of the screen.
  - A short push of the right-hand switch will transfer your analysed gas to the designated position in the gas list.
  - Then a long push of both switches saves it.
  - You will need to make the gas active to use it.
- NOTE: if the analysed gas is the same as the gas already occupying the designated position in the gas list then the transfer icon and Save O2 icon will not appear. (There is no need to transfer what is already there!)

## **9.3 FAQ #3 How do I use the analyzer at altitude ?**

Once you are at the altitude where you will dive, use the procedure set out in FAQ #3 calibrating the VR3 to a reading of between .208 and .210 in ambient

air at the altitude at which you will dive. Then analyse your diving gas as per FAQ #4.

Or before ascending to altitude calibrate the VR3 to air at atmospheric pressure at sea-level and analyse the gas there and then.

## **10 Oxygen Sensor Cell**

### **10.1 FAQ #1 Which oxygen sensor cell is recommended for use with the VR3?**

The standard Teledyne cell recommended for use with the VR3 and a rebreather linking cable is the R22 with a 3.5 mini jack connection system. With the oxygen analyzer cable, the recommended cell is the Teledyne R17. The output of the cell should be between 7 and 12 millivolts DC in ambient air

### **10.2 FAQ #2 How do I test the oxygen sensor cell output?**

Use a DC voltmeter. Test the voltmeter on a known voltage first such as a AA battery. Now test the cell.

To test a cell with the molex (rebreather) style connection you touch the voltmeter probes to the two outside pins.

To test an analyser cell you fit it to the cable and touch the voltmeter to the two pins on the VR3 end of the cable, taking care not to short the probes to the cable end casing.

## **11 SC/CC mode and decompression look ahead**

### **11.1 FAQ#1 SC/CC mode and decompression look ahead**

In semi-closed mode the VR3 and VR2 use the diluent(s) the user sets into the system as the gas which estimates the total time to surface. The actual decompression which takes place is based on the readings taken from the external cell (assuming it is turned on). Hence a longer TTS may be shown then the actual decompression which takes place.

In normal semi-closed use the user should calculate the inspired FO<sub>2</sub> (the FO<sub>2</sub> the rebreather is expected to maintain) and set this as the diluent. This will mean that the predicted decompression and the actual decompression (based on the external cell readings) will be similar. If a bailout to open circuit is required then the user can easily either change the inspired FO<sub>2</sub> to be the bailout FO<sub>2</sub> or turn on another gas which is representative of the bailout FO<sub>2</sub>. In closed circuit mode, the look ahead decompression is based on the diluent(s) set and the PO<sub>2</sub> setpoint, while the actual decompression is again based on the external cell readings. Again the user should set the VR3/VR2 setpoint close to the expected setpoint the rebreather will maintain to obtain a good prediction of decompression.

When dives are downloaded (whether the cell is turned on or off) the external cell reading will be logged on the graph.

## **12 Switches**

### **12.1 FAQ #1 The switches are not operating smoothly. What can I do?**

The switch pockets are sealed and separate from the main unit. Occasionally sand or dirt may become lodged in the pocket and impede their operation. To remove this slightly depress the switch and clean the pocket out with a jet of fresh water. A SMALL amount of light engineering oil, (NOT grease) may help improve switch action in extreme cases.

### **12.2 FAQ #2 One or both of the switches does not seem to be working. Is there anything I can do?**

If the apparent switch malfunction has taken place after a battery change and your VR3 will not power up at all, see FAQ #4 in the Battery section for a possible solution.

In other circumstances, if the switch seems to be moving correctly but the VR3 still does not respond return your VR3 to us at Delta P for maintenance and repair, including a note on the problem and recent history of use. The switches are not user-repairable.

### **12.3 FAQ#3 The switch in my VR3 is sticking. Is there anything I can do?**

In rare cases the last two coils of the switch spring are a little too tight and cling on to the body of the switch causing the switch to stick.

Hold the switch in and, with a small flat head screwdriver, carefully ease out the silver circlips holding it in from the small groove on the back of the VR3. The spring and switch will then come out easily.

The reason the switches are sticking is that the spring is too tight on the switch.

Holding the spring onto the middle of the switch, use a small pair of pliers and open the free end of the spring out half a turn. Then hold the spring at the end of the switch and open the free end out a further quarter turn. Look at the spring end on. The last coil should still be in line with the other coils. If it stands proud, you have opened it out too much; bend it back in a little.

Put the spring and switch back in, push it in and out a few times and it should now move freely. If so, replace the circlips while holding the switch completely in. Push the circlips down firmly making sure you put it in as flat to the body as possible.

Should do the trick.

### **12.4 FAQ#4 VR won't turn on past start up screen**

Unit turns on showing date name and personal information screen but no other screens are available. Switches do not function.

This is an indication that one of the switch buttons has cracked and needs replacement. To check, pop both the out switches, (instructions on Maintenance page in manual), and check them. If one or both are broken, contact your dealer for a replacement set, (you might also like to buy a set to keep in your spares kit, especially if planning a long trip.)

## **13 Use Tables**

### **13.1 FAQ #1 “USE TABLES”. On a recent dive “USE TABLES” appeared on the screen while I was ascending. What does that mean?**

If you ascend past a required micro-bubble deep stop or a decompression stop ceiling you will see a DESCEND message and a sixty second timer starts counting down. If you return to below the ceiling before sixty seconds have elapsed then the timer will start to count back up to 60 again and when it reaches 60, the VR3 will resume its calculation of your decompression profile. Depending on the extent of your excursion you should build in safety factors for the remainder of your decompression.

If you ignore or do not notice the DESCEND warning, after 60 seconds the “USE TABLES” message will appear. After this, the VR3 will continue to display decompression data but this will be “Best Guess” and cannot be relied upon. You should switch to manual back-up tables for the remainder of the dive.

## **14 VR3 Inspiration Link**

### **14.1 FAQ#1: How do I connect my VR3 to my Inspiration?**

Connection of the VR3 to your Inspiration is via the fourth cell holder linking cable and the Y-shaped Inspiration O2 interface.

1. The screw fitting with the O-rings on the Y-shaped Interface goes onto the top of the stack where the rebreather inhalation hose is currently connected, so remove the inhalation hose from the stack and attach the Y-shaped Interface.
2. The fourth oxygen cell holder goes into the wider of the two remaining ports on the interface, the one with the internal thread that matches the cell holder's threads.
3. To attach the Inspiration's inhalation hose to the remaining port, pull the hose's screw fitting up and along the hose and remove the two half circle plastic fittings. Fit the hose to the interface port, replace the two half circle fittings and then bring the screw fitting back down to secure the hose onto the port.