DIVE TALK GO MANUAL

Dive Talk Gear
www.DiveTalkGo.com
info@divetalkgear.com

MSL 1.00 Dive Talk Go R.4

Gus Gonzalez

Woody Alpern

Gus Gonzalez

Woody Alpern

READ THE MANUAL!!!!

IN ORDER TO FULLY UNDERSTAND YOUR NEW REBREATHER, THE COMPONENTS, HOW THEY WORK, HOW TO HANDLE AND TREAT THEM, YOU MUST READ THE MANUAL IN FULL, FOR YOUR REBREATHER.

THIS SHOULD BE DONE PRIOR TO DIVING OR SERVICING THIS UNIT!!! SPECIAL ATTENTION SHOULD BE PAID TO ALL NOTES &/OR WARNINGS; THEY MUST BE READ AND UNDERSTOOD!!!! FAILURE TO DO SO, MAY CAUSE SERIOUS INJURY OR DEATH!!!!

DO NOT MODIFY THE DIVE TALK GO REBREATHER. UNAUTHORIZED MODIFICATIONS COULD CAUSE SERIOUS INJURY OR DEATH!!!

YOU MUST BE A LEGAL ADULT IN THE AREA IN WHICH YOU LIVE IN ORDER TO PURCHASE AND DIVE A DIVE TALK GO REBREATHER.

- ***DO NOT USE THE REBREATHER WITHOUT FIRST SUCESSFULLY COMPLETING A UNIT SPECIFIC TRAINING COURSE APPROVED BY DIVETALK.***

- ***REBREATHER DIVING IS PHYSICALLY AND MENTALLY DEMANDING. DO NOT USE THE REBREATHER UNLESS YOU ARE PHYSICIALLY, MEDICALLY AND MENTALLY FIT TO UNDERTAKE THIS ACTIVITY PRIOR TO DIVING.***

As with all scuba diving equipment, your Dive Talk rebreather components should be serviced annually by a trained technician. For those diving frequently, servicing may be required more often.

ALL INFORMATION IN THIS MANUAL IS SUBJECT TO CHANGE.
Please visit our website, www.DiveTalkGO.com
for updated manuals.

THIS IS NOT A JOKE!!

Participation in rebreather diving can result in serious injury or death to you, the diver!

The warning on the Dive Talk Go rebreather is not a joke. Before beginning your dive, you must consider the risks involved. The DT Go consists of many parts. All of these components will eventually fail. Careful maintenance, assembly, and testing will not prevent this from happening. At best, it will delay the failure. The DT Go is not automatic in any way. It requires constant monitoring, a complete awareness of the potential problems likely to be encountered, and full knowledge of how to deal with whatever problems may occur. If you do not have adequate training, equipment, physical conditioning, and a proper mind-set, do not get in the water.

The diver, YOU, has the final responsibility for his or her own safety and actions while using this rebreather. All components of the DT Go must be in good working order and be properly assembled and tested to reduce the risk of failure. Regardless of the training and experience of the diver and the reliability of the rebreather the risk of serious injury and/or death can never be reduced to zero.

This manual is not a complete text on the maintenance and operation of the DT Go. The diver must complete a proper training course covering the maintenance, testing and operation of the rebreather before diving this equipment. The rebreather can malfunction while diving even when properly assembled and having passed all pre-dive tests. Only carrying adequate bailout gas and having the training and skills necessary to utilize the bailout system can reduce, but never eliminate, the risk of equipment failure.

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Thanks to the folks that helped with all the images. Photographers: Doug Ebersole, Carol Ebersole, Josh Cantou, Woody Alpern, and Gus Gonzalez. Divers: Woody Alpern, Gus Gonzalez, Doug Ebersole, Jorge Burgueno, Malisha Small Holland, Yukon Sean Holland, Terri Broome, Ken Joyce.

Introducing, The Dive Talk GO
Operations Manual

The Dive Talk GO MCCR exemplifies unmatched convenience and performance, weighing just 10 lb/ 4.5 kg without the absorbent or cylinder, and approximately 18.2 lb/8.3 kg with absorbent. Its versatile chest mount design allows for seamless attachment to any BCD, catering to both recreational and technical divers.

From effortless packing in a carry-on suitcase to minimal space requirements on boat dives, the Dive Talk GO MCCR ensures unparalleled portability. With exceptional work of breathing and straightforward assembly, divers can relish extended 3-hour dives, making it their preferred choice. Its straightforward design and versatility make it stand out, offering comparable benefits to heavier and pricier units. Embrace the Dive Talk GO MCCR as the effortless, adaptable solution for both back mount and side mount preferences, fitting seamlessly onto any recreational BCD.

Specifications: DIVE TALK GO

- Weight of the unit completely assembled with a full scrubber canister is, 18.2lb/ 8.3kg.
- The weight of the unit without the cylinder and no absorbent is 10lb/4.5kg. This would be the weight of the system for flying without the cylinder.
- The length of the unit ready to dive is 14.5 inches/36.83 cm.
- The widest part of the unit is 12.5 inches/31.75 cm.
- PLEASE SEE OUR PARTS LIST ON THE NEXT PAGE FOR A FULL LIST OF WHAT IS INCLUDED AND WHAT IS NOT.
- It is a mechanical rebreather which adds O2 continuously by a feed orifice and manually as needed.
- Compatible with Trimix.
- Work of breathing: 132 feet/ 40 meters is 1.07 J/L.
- Scrubber holds approximately 3.5 lb/1.59 kg of absorbent, depending on the brand. Divers must use 8-12 granule size.

***WARNING: The use of larger granules can cause channeling. This can cause serious injury or death!**

- The Dive Talk Go is a closed circuit rebreather designed for recreational diving to the depth of 132 feet (40 meters). Proper training, outside the basic DT Go rebreather course is required for any deep or technical diving. For some types of diving, extra gear must be carried or alternate gear configurations will be required. Ensure you have the proper training, gases and gear to conduct your planned dive.
- A bailout system is required for all dives. The bailout system should be appropriate for the dive that is planned. Dive Talk strongly recommends that a second stage regulator is attached to the bailout first stages, using a LP hose. Dive Talk does not recommend using quick connects on regulator hoses, which have a regulator attached.

Parts List

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The Dive Talk Go body includes:

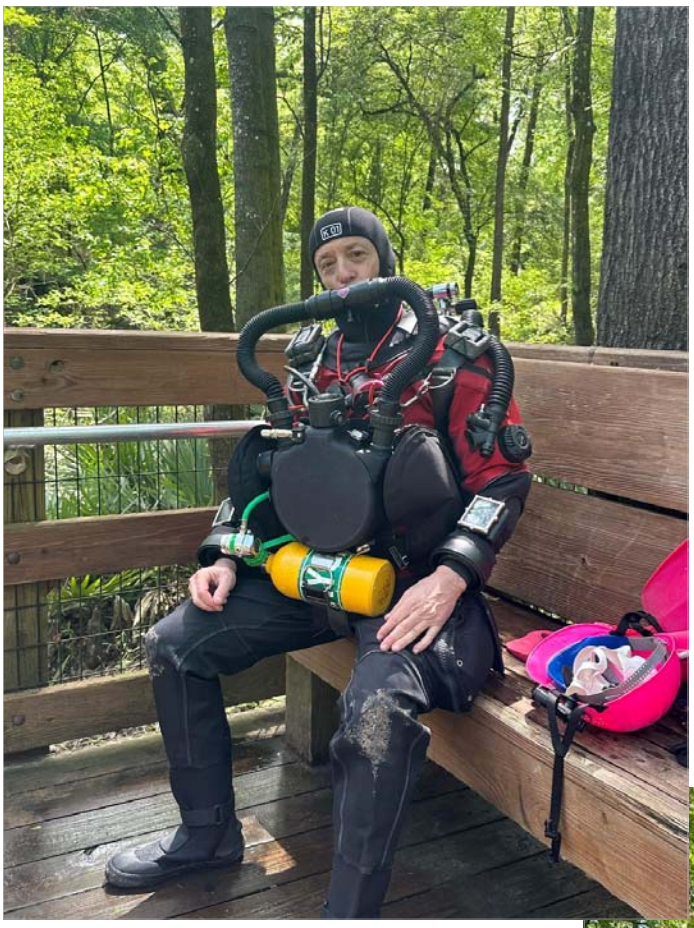
- Removable screen
- 6 scrubber tension springs
- Attached ADV with low pressure hose
- Attached oxygen MAV
- Left and right counterlungs
- Loop hoses
- DSV
- Blocked oxygen first stage, includes OPV and pressure gauge
- Attached back plate with quick connect
- Oxygen cylinder bracket

Display Options are priced extra:

- Shearwater Petrel decompression computer
- Shearwater NERD, 4 pin system

Not included:

- Diluent low pressure inflator hose
- Diluent bail out regulator
- Diluent bail out cylinder
- BCD
- 3 DT-SMB sensors



Unpacking & Disassembly

Congratulations! You have just received your Dive Talk Go! The first thing to do is ensure that all the parts you ordered, are included in the box. As you know, the DT Go can be shipped either as the BASIC unit or with various components added. Please see the previous parts page for a list of what is included with the BASIC kit, and what the optional extras are. Go through the box and ensure that everything that you ordered has arrived. Small items can be lost in bubble wrap so ensure that you look carefully in the packing material also. The package will also include a thumb drive which contains your manual.

The DT Go ships with all the O-rings installed and the unit is assembled. The following instructions are for disassembling the Go.

- The counterlungs will be in the box, but not attached to the unit. Take them out.
- The mouthpiece/DSV will be wrapped separately. Take it out of the box, and unwrap it.
- Lay the unit face-down, and undo the 3 stainless steel latches by pushing the lock lever, then lifting the latch.

- Open the unit by pushing down on the ADV, and then pulling up on the inhale tower.

- Pull the top screen out.

The unit is now disassembled. Further sections of this manual will discuss assembly, scrubber packing, sensor installation & displays, and trouble shooting.

Four Pin Cable - Installation & Care

How to install a 4 pin cable:
The 4 pin cable can be installed or removed with a 15mm wrench. To ensure that the inner wires do not get twisted, after each turn (installing or removing) stop and straighten out the wires.

Having a 4 pin cable on a rebreather display system is a convenience that many divers enjoy. While a lot of maintenance is not required, some care is important in order to ensure that they operate properly.

The 4 pin port is watertight and any water that gets in to the port cannot harm your head, computer, or NERD. However, should sea water get inside the port or the ends of your linking cable, flush them with fresh water as soon as possible afterwards then leave them to dry completely BEFORE refitting the cap.

Regular maintenance should include:

1. Inspect the connectors and look for any signs of corrosion; parts will start to turn green.

2. If you see green/corrosion, rinse the connectors briefly with white vinegar and use a fine toothbrush to remove the build-up. Rinse well and let dry completely. Coat with a protective product such as Deoxit Gold.

3. Keep the 4 pins lubricated by applying a SMALL amount of Dielectric grease such as Dow Corning 111 on the metal end of the cable end that slides into the 4 pin connector. This will serve to improve the seal and make the connection more reliable. Always use a strain relief to keep the cables connected, while in use.

Remember, the cleanliness of the contacts is essential to the integrity of the link. Following these simple steps will ensure that your system works properly. Look after your cable and connectors and they will look after you.

***WARNING: The DT Go 4 pin cable/wiring, and sensor wiring system is considered a KEY COMPONENT. This is an important item. Misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

Oxygen Sensors

The DT Go uses 3 oxygen sensors. The part number is, DT-SMB.

The sensors are simple to install, and use the SMB connection system. First, secure each SMB connector to the back of each sensor.

Next, put each sensor on the cradle and stretch the 028 O-ring over it. This will hold the sensor in place.

***WARNING: The DT Go uses the Shearwater computers. As with all electronics, these components must be treated with care and respect. This includes taking care to not drop, bang, or roughly handle them. Also, do not leave these components in a hot environment, such as a car or direct sunlight. The heat &/or sun, can and will damage any electronic components.**

***WARNING: Do not mix sensor brands in your rebreather! There are various sensor brands available in the market place. If you mix brand "A" with brand "B", they will not work properly. As the response times are different for each brand, most electronics will not calibrate properly. If they do calibrate, they may not work correctly while diving as the different response times could cause an error reading.**

The DT Go uses the rebreather sensor, DT-SMB. The DT Go does not include the sensors. Many of our dealers stock the DT-SMB sensor and they are available directly from them. Should you wish to order them with your unit, please let us know your wish to add this product.

Prior to installing them, it is best to open the bags and let them sit for at least 24 hours prior to calibration as they need to go through a "wake up" period. Ideally, open the bags about a week prior to use, if possible. New sensors will read low when first installed and will creep up slightly over the course of a week or so. After that, they seem to be stable for months on end.

Don't waste time calibrating the sensors if they are reading within a 1/2 percent. These sensors should be changed annually, sooner if they are damaged or abused. Oxygen sensors work on the same basis as a battery. The more that they are used, the more often they will need to be replaced.

An easy way to remember your sensors anniversary date is to write the date on the top of the sensor. The DT-SMB sensors are safe to dive if the millivolt reading is between 9 and 13 in air, AND they must be calibrated in oxygen. The Shearwater computers will read the millivolts of the sensors or a volt meter can be purchased at your local hardware or electronics store.

***WARNING: It is extremely important that the sensors millivolt readings are in the correct range, and that they can be calibrated in oxygen, and verified with air. If even just one of these 3 items doesn't comply, DO NOT DIVE!!!! Failure to ensure that the sensors are working properly, can result in serious injury or death!!!**

***WARNING: On the following pages are the calibration instructions for the displays systems. It is essential that the calibration procedures are followed properly. Also, DT Go divers must take the time to thoroughly read the Shearwater manuals. Divers must read and understand them, especially the sections on calibration. Failure to do so can cause injury or death!!**

***WARNING: It is important that the display cables are properly wired. Failure to do so, may cause serious injury or death! Ensure that the O-rings are in good condition, that the area is clean and the components are not damaged. Lastly, if the wires are pinched under the plate, the scrubber head will not be water tight. Water damage in this area will ruin the sensors and/or the electronics. If the wires do get pinched, inspect them for damage!!**

***WARNING: The DT Go sensors are a KEY COMPONENT. This is an important item. Misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

When you open up your new DT-SMB sensors, they will have a millivolt reading between 9 and 13 millivolts, in air. As long as they are in that range, they are safe to use. In 100% oxygen, at sea level the sensors should be between 42.85 and 61.88 millivolts.

***WARNING: You also need to ensure that they can be calibrated in Oxygen, and that they read correctly in air. This is very important. Even if a sensor is reading in the proper range, as it ages you may no longer be able to calibrate it properly. Sensors should not be used for more than 1 year.**

*****IF THIS HAPPENS, THE SENSOR MUST BE DISCARDED. FAILURE TO USE A PROPER SENSOR WILL CAUSE SERIOUS INJURY OR DEATH!!!!!!!!!!**

***Warning: Oxygen sensors are a fuel cell. As they age, they run lower on fuel, and will become voltage limited. They will read correctly in air, and calibrate in 100% oxygen, BUT as the partial pressure gets higher, they will no longer have the fuel to produce higher millivolts. Thus, they are VOLTAGE LIMITED, and will read incorrectly. THIS COULD CAUSE SERIOUS INJURY OR DEATH!!**

In diving applications the sensor will last 1 year, depending on how often you dive and how they are stored. Sensors should be allowed to dry out after your day of diving, especially if you are diving in a humid environment. This means that you need to leave the loop hoses or scrubber canister off overnight to allow air to circulate through the scrubber head. Leaving the unit sealed up will not allow the condensation to evaporate.

*****If the DT Go has moisture in the head from diving or from being in a humid environment, and it is then sealed up tight, the wires from the end of the display will start to corrode!!!! If this happens, whatever display or computer you are using, will not work properly!!!! It is extremely important that the head is allowed to dry out if the unit is to be sealed up. This means that after a dive trip, don't just drop the unit on your work bench and walk away from it!!! At the very least, drop the canister's off and let the head's dry. This will help keep your wires in good working order.**

Sea water on the sensors will probably cause them to fail.

As your sensors start to age you will notice that they are harder to calibrate, slower to react and will drift more after calibration.

Electrolyte, which is a gel like substance is inside the sensors. If you notice this substance leaking out of the sensors, do not touch it as it is caustic. Do not dive with a leaking sensor. The readings will be high!!!!

Automatic Diluent Valve (ADV)

AUTOMATIC DILUENT VALVE (ADV):

The ADV is located on the top of the gas addition scrubber head. The ADV will add diluent gas to your breathing loop after the loop volume has been reduced by either descending or "breathing down" the volume of oxygen. The diver will get the feeling that there is no more air in the loop to breath. All the diver needs to do is suck hard to trigger the ADV and it will feed him more gas. This is how a second stage regulator works.

The ADV has been setup "tight" enough so that it doesn't add diluent without the diver being aware. But it adds enough gas so that a reasonable descent rate can be maintained. As you can see, there is an adjustment knob on the ADV regulator. It is very important that this knob is always tight and turned all the way in. As such, the diver's must be aware of body position at all times and understand that a trim position will cause the ADV to activate more rapidly then other positions.

***WARNING: THE ADJUSTMENT KNOB ON THE ADV REGULATOR MUST ALWAYS BE TIGHT AND TURNED ALL THE WAY IN. ALSO, THE DIVER SHOULD BE AWARE THAT IN A HEAD-DOWN POSITION THE ADV MAY TRIGGER MORE RAPIDLY, CAUSING A RAPID ADDITION OF GAS. THIS WILL CAUSE BUOYANCY ISSUES WHICH MAY CAUSE THE DIVER TO HAVE AN UN-CONTROLLED ASCENT, WHICH MAY LEAD TO INJURY OR DEATH!**

Anytime the ADV triggers you need to check your PPO2. you have either descended and compressed the gas in the loop or you have consumed enough oxygen to reduce the PPO2 significantly . This may also have caused you to lose buoyancy and descend.

The position of the diver will effect the ADV. If the diver is horizontal or face down, the ADV will trigger easily. If the diver is vertical, then it is more difficult to trigger. (A well fitting harness is important; this will greatly reduce the difficulties of being vertical in the water).

Adjustable ADV

Non-Adjustable ADV

***WARNING: As the DT Go ADV system is considered an important item, misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

Oxygen Manual Add Valve/Metering Orifice

The oxygen MAV, which is mounted to the unit, is the component that will add oxygen to your unit continuously and will also allow you to push a button to add gas as required.

The DT Go rebreather is mechanically controlled. The oxygen manual add valve houses a orifice which allows oxygen to flow into the loop at all times. In the event that more oxygen is required, the button on the O2 valve will need to be pushed. The difference between diving a DT Go rebreather manually and other rebreather's is that the constant flow of oxygen keeps our divers from getting too busy underwater. Diving other rebreather's manually means that the only way oxygen gets into the loop is by pushing the button.

What does this mean to the diver? It means that when you get to your maximum depth, you will adjust your PPO2 and then unless you are working hard or going up and down in the water column, you will only be pushing the button every 10 to 20 minutes. This depends also on where the constant flow has been set. If you find yourself pushing the button all the time, then you need to increase the flow. If you find that your oxygen is creeping up during normal diving activities, then you will want to decrease the flow.

***WARNING: WHEN YOU DO YOUR TRAINING COURSE, WITH THE HELP OF YOUR INSTRUCTOR, YOU WILL MONITOR THE FLOW RATE. IF YOU ARE CONSTANTLY PUSHING THE BUTTON, YOU WILL NEED TO INCREASE THE FLOW. IF YOUR OXYGEN IS CREEPING UP DURING NORMAL DIVING ACTIVITIES, YOU WILL NEED TO DECREASE THE FLOW. YOU MUST BE AWARE OF YOUR FLOW RATE AND UNDERSTAND HOW IT WORKS. FAILURE TO DO THIS, MAY CAUSE SERIOUS INJURY OR DEATH!**

The oxygen manual add valve on the DT Go should be serviced by a qualified technician annually.

***WARNING: THE OXYGEN MANUAL ADD VALVE MUST BE SERVICED BY A QUALIFED TECHNICIAN ANNUALLY. FAILURE TO DO THIS, MAY CAUSE INJURY OR DEATH!**

***WARNING: The DT Go manual add valve and gas addition system is considered a KEY COMPONENT. This is an important item. Misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

Getting started and understanding the oxygen flow rate:

When you first receive your DT Go, a flow rate time test should be conducted. This is the best way to determine if your flow rate changes over time.

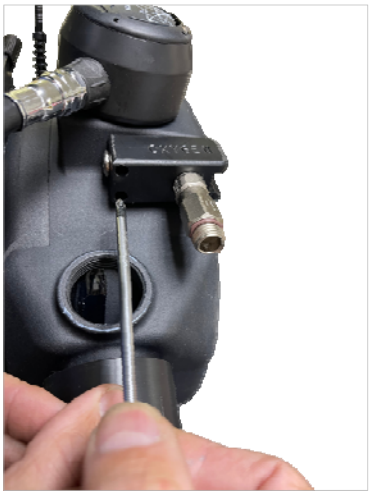
- With the DT Go fully assembled, secure a cylinder with more than 2000 psi of gas.
- Open the valve to pressurize the system.
- Close the valve, and watch the pressure gauge. The gauge should start bleeding down.
- Once the gauge is at 2000 psi/137.9 bar start a timer and note how long it takes for the system to bleed down to 1000 psi/68.9 bar. It should take approximately 50 to 60 seconds, depending on the configuration of the system, and other variables.

Once you have this information, write it down and keep it safe. It will be your reference later on when you double check your flow rate.

It should be noted that the rate of pressure drop during the flow rate test will vary (largely) depending on the length of the high-pressure hose and gauge that is installed on the first stage regulator. Changing the length of this hose, or removing it all together, will alter the flow rate time test.

Oxygen Add Valve Inner Components:

The oxygen manual add valve is for adding oxygen to the loop. The O-rings should be changed annually or if the flow rate changes. The inlet of the valve is protected by a 20 micron filter. This filter will NOT stop seawater from contaminating the orifice. All components in the oxygen add valve must be clean, oil free, with the O-rings lightly lubricated with oxygen compatible grease. The oxygen MAV is attached with 3 Phillips head screws. It can be removed to send in for service.



***WARNING: When reassembling the O2 valve, ensure that you do not over-tighten the nut. Remember, when screwing any metal screws into plastic use only two fingers on the wrench. If you over-tighten the nut, it will strip the threads and the valve will leak.**

When attaching the O2 valve to the filter and the hoses, it is very important that you use a second wrench to hold the nut next to the O2 valve body in place. Do not allow this nut to spin as it will over-tighten and strip the plastic. This will cause the O2 valve to leak. The O2 valve body is not a substitute for a wrench.

All low pressure hoses on the DT Go should be inspected periodically to ensure that they are not damaged and in good working order. This includes the oxygen hose and diluent hose.

***WARNING: ALL SERVICE WORK MUST BE DONE BY A QUALIFED TECHNICIAN ANNUALLY. FAILURE TO DO THIS, MAY CAUSE INJURY OR DEATH!**

Oxygen First Stage Regulator & Flow Rates

The oxygen first stage regulator is located on the bottom of the rebreather and is secured to the on-board cylinder.

The DT Go oxygen first stage is shipped with a delrin block in place. This is different from a standard scuba first stage as the oxygen delivery system on the rebreather must be at a constant pressure, and not variable. The block will prevent the pressure from increasing with depth and increasing the oxygen flow rate.

It is important that both the delrin block and the Over Pressure Valve (OPV) be properly installed on the oxygen first stage. If the delrin block is not installed the oxygen delivery system on the DT Go will not work properly!

The oxygen first stage must only be serviced by a qualified technician annually, that is trained in servicing oxygen clean components.

***WARNING: THE DELRIN PLUG MUST BE PROPERLY INSERTED INTO THE OXYGEN FIRST STAGE FOR THE SYSTEM TO WORK PROPERLY.**

***WARNING: DO NOT EVER USE AN OXYGEN FIRST STAGE WITHOUT AN OVER PRESSURE VALVE! TO DO SO MAY CAUSE SERIOUS INJURY OR DEATH!**

THE OXYGEN FIRST STAGE MUST BE SERVICED BY A QUALIFED TECHNICIAN ANNUALLY. FAILURE TO DO THIS, MAY CAUSE INJURY OR DEATH!

***WARNING: LIKE ALL PRESSURIZED SYSTEMS, WHEN OPENING THE VALVE'S ON YOUR CYLINDERS, BE CERTAIN TO DO IT SLOWLY!! ALL GAUGES SHOULD BE FACING AWAY FROM YOU. WHEN WORKING WITH PURE OXYGEN, THIS IS EVEN MORE IMPORTANT. FAILURE TO DO THIS, MAY CAUSE INJURY OR DEATH!**

IGNORING ANY OF THE ABOVE WARNINGS, COULD CAUSE SERIOUS INJURY OR DEATH.

Adjusting the oxygen flow rate:

The oxygen injection rate can be adjusted to suit each individual diver. The required flow rate depends on the physical size of the diver and the degree of exertion used during the dive. If the flow rate is too high the PP02 will climb to dangerous levels and the breathing loop will have to be purged to reduce the oxygen partial pressure to a safe level. If the flow rate is set too low oxygen will have to be manually added more often during the dive. If you need your flow rate adjusted, seek out a qualified technician or instructor.

***WARNING: TOO LOW IS BETTER AS IT IS QUICKER TO ADD OXYGEN TO THE LOOP, THEN TO FLUSH IT!!**

NOTE: IT IS VERY IMPORTANT THAT TWO WRENCH'S ARE USED WHEN REMOVING HOSES OR FITTINGS FROM THE MANUAL ADD VALVE!!! ONE MUST BE USED TO ENSURE THAT THE FITTING ON THE VALVE DOES NOT SPIN!! SEE THE PHOTOS AT THE TOP OF THE PREVIOUS PAGE WHICH SHOW HOW TO DO THIS PROPERLY.

Flow rate:
What should your flow rate be set at? 0.75 LPM is a good starting point, this is where the DT Go will be factory set. The PPO2 should remain constant when you are hanging motionless in the water. Try this in a pool for 5 minutes to determine if you need to increase or decrease the flow rate. You should have to add O2 at regular intervals during the dive due to workload.

WARNING!

The oxygen injector is a convenience. It is not a controller in any way. The only device regulating the oxygen partial pressure is your brain. The automatic oxygen add does not reduce the need to monitor the computer display. It only reduces the number of times you have to press the oxygen add button. The displays should be checked constantly during the dive. The oxygen regulator can fail and stop delivering 02 or it can fail and increase the flow drastically. The orifice can become plugged and stop delivering oxygen. The add valve O-rings can fail and increase the amount of 02 being added to the breathing loop. Any of these things can kill you but any of these problems can be overcome if you are aware of the conditions in the breathing loop.

The manual oxygen addition valve is a key component of the DT Go diving system; care should be taken to ensure that it is not damaged, serviced as required and is functioning properly.

DIVER SHOULD BE CHECKING THEIR PPO2 DISPLAYS EVERY MINUTE.
KNOW YOUR PPO2 AT ALL TIMES...*OR YOU WILL DIE!!*

Oxygen Manual Add Valve Troubleshooting

If the flow rate is lower than it should be in relation to the pressure, one of the following things has happened:

- The filter has become clogged and should be replaced.
- The orifice has become partially plugged and must be replaced.

DO NOT TRY TO CORRECT A LOW FLOW RATE BY INCREASING THE REGULATOR PRESSURE!

If the flow rate is higher than it should be in relation to the pressure one of the following things has happened:

- The orifice has become loose where it screws onto the valve.
- The valve O-ring is worn or damaged.
- The spring is broken or weakened and is not holding the valve closed.

The oxygen first stage will have a delrin block installed to prevent the pressure from increasing with depth and increasing the oxygen flow rate. If the pressure is inconsistent the high pressure seat or diaphragm may be damaged. The regulator should be serviced regularly and maintained in an oxygen clean condition.

***WARNING: It is very important that this valve is in good working order, with proper flow rates and good O-rings. Ensure that you rinse your gear after diving in salt water, and if you flood your rebreather, and you think water has gotten into the valve, service it!! If you pay attention to how often you usually add oxygen to your rebreather during a typical dive, it will be easier for you to notice a problem.**

Mouthpiece/DSV Maintenance

The following are the steps to service your mouthpiece.

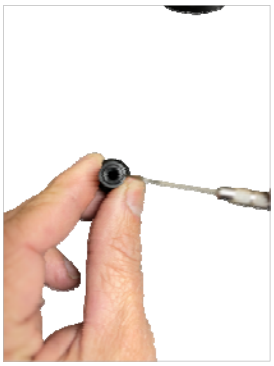
Using an 1/8 inch Allen wrench, reach through the breathing port and remove the screw that holds the lever in place.

Once the lever has been removed, push the inner barrel out. It can be pushed out at either end.

Inspect the inner barrel, and after cleaning it the O-rings can now be replaced. 1 x #121 50 durometer, and 2 x # 127 70 durometer. Next, clean and lubricate the inside of DSV body. Finally, lubricate the outside of the barrel.

The barrel is now ready to be inserted into the DSV body. When inserting the barrel, be certain to align the notch in the barrel with the side of the body that has the small hole.

Inspect the lever, and be certain that the #008 O-ring is in place. Reinstall the lever, being certain to not over tighten.



Inspect the mushroom valves, make certain that they are laying flat and will seal properly.

When installing the mushroom valves, the left hand side must allow the gas to flow inwards, from the breathing loop. This is the gas you will be inhaling, and is the scrubbed gas.

The right hand side must allow the gas to flow outwards. This is the gas that you have exhaled, and will be going into the unit to be scrubbed.

WARNING: IF YOU CHOOSE TO CHANGE TO A BOV, IT MUST BE SELECTED FROM A REPUTABLE COMPANY WHICH HAS AN INTEGRATED 2ND STAGE FOR BAIL OUT. AS WELL, THE APPROPRIATE AMOUNT OF BALLAST FOR THE LOOP HOSES MUST BE SECURED. DIVERS WHO CHOOSE TO DO THIS, MUST ENSURE THAT THEY ARE PROPERLY TRAINED TO USE THE BOV.

Mouthpiece Test

Once the mouthpiece has been assembled, it is important to ensure that it is working properly. The following steps will show you how to stereo check your mouthpiece.

1. With the DSV open, cover the right (exhale) side, and blow (gently!!) into the mouthpiece. The mushroom valve should seal and no gas should exit out of the left side.

   Problems:

   - Mushroom valve on the left could leak. Remove the carrier and inspect it again.

2. With the DSV open, cover the left (inhale) side, and suck (gently!!) into the mouthpiece. No gas should come in.

   Problems:

   - Mushroom valve on the right could leak. Remove the carrier and inspect it again.

3. Other leaks. Cover both the inhale and exhale sides of the mouthpiece, while gently blowing into the mouthpiece. Also do this test while gently sucking from the mouthpiece. These tests will determine if the rubber mouthpiece has a leak.

4. Attach the loop hoses to the mouthpiece, and with the mouthpiece open, put the open hose ends by your ears. The rubber mouth-bite should be in your mouth. While breathing in and out, you should notice that your exhalation should blow by your right ear, and your inhalation should blow by your left ear. This is called a Stereo Check.

NOTE: CLEAN AND INSPECT THE MOUTHPIECE AS REQUIRED. SERVICING SHOULD BE DONE BY A QUALIFIED TECHNICIAN.

IT SHOULD BE NOTED THAT A LEAK ON THE MOUTHPIECE, INCLUDING THE RUBBER MOUTH BIT, WILL NOT BE DETECTED ON THE POSITIVE AND NEGATIVE TESTS!! THIS IS WHY IT IS VERY IMPORTANT TO KEEP YOUR MOUTHPIECE PROPERLY SERVICED AND CLEANED. ALSO, ALWAYS CARRY A SPARE RUBBER MOUTH-BITE. MOST MOUTHPIECE LEAKS ARE FROM THIS!!

Mouthpiece Servicing & Troubleshooting

***Warning: Your DT Go mouthpiece is an important part of the DT diving system and should be serviced yearly or more often if required. When to service depends on how often you dive, the environment you dive in and also how well it is cleaned after every dive. It is important that it is kept clean and the knob should always turn smoothly. Keeping your DSV clean is important as grit inside the moving parts can score the plastic. Your local DT dealer can assist you with servicing the DSV if you prefer not to do it. Care should be taken to ensure that it is in good working order and not damaged. Failure to maintain your DSV could result in serious injury or death.**

Also, be aware that if you wash your DSV with a powerful hose, the valve disks may be blown off!! After cleaning, be certain to inspect your gear and follow all the pre-dive check's!!!

IF THE MUSHROOM VALVES ARE DISTORTED OR DAMAGED THEY MUST BE REPLACED!!!
To remove the old mushroom valve, pull the valve out. To install a new mushroom valve, be certain that you are inserting it onto the flat side of the carrier. Slide the centre stem through the hole. Gently pull it through until it clicks into place.

WATER INTRUSION

First determine if the water is sea water (from diving) or fresh water (if you are not fresh water diving, this could be condensation).

If it is sea water, service your DSV and ensure that the O-rings are all in good shape. Also clean and lubricate at this time.

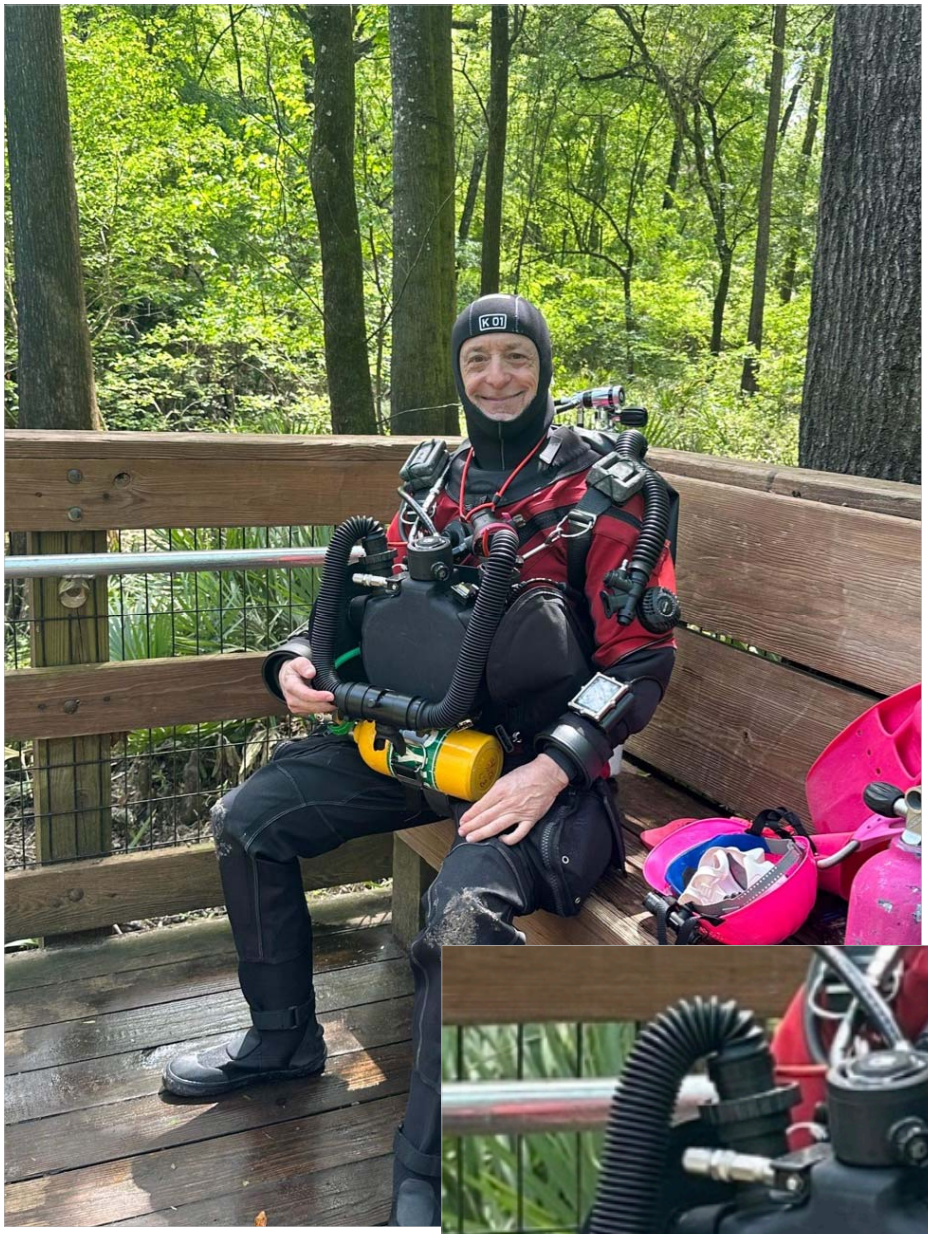
Check your rubber mouth bite for damage and for a proper fit onto the mouthpiece. They generally come in a variety of attachment sizes. Ensure that the one you choose fits properly. There are some specialized rubber mouth bites which while a pleasure to dive, just do not fit properly on our mouthpiece. Seacure is one of them and after time it will always leak.

Also check for a tear underneath the zip tie which holds the rubber mouth bit in place. Damage here will also cause water to leak into the system.

Many cases of water into the loop come from torn or damaged rubber mouth pieces.

Loose lips.

Your loop hoses should be inspected around the hard connections for a pinch or tear.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Loop Hoses & Hose Stubs

The DT Go is shipped with a quick connect system for the scrubber side of the loop hoses. You will see that the towers on the scrubber head have a lip in which the quick disconnect hose stubs are secured. The unit is shipped standard with 2 hose stubs which will be fitted to your loop hoses with hose clamps, prior to shipping.

***NOTE: THE TOWERS ARE THREADED INTO THE SCRUBBER HEAD AND SEAL WITH AN O-RING. WHILE THE TOWERS ARE DESIGNED TO BE DIFFICULT TO TURN, IT IS STILL IMPORTANT THAT THEY ARE NOT ACCIDENTLY UNSCREWED WHILE REMOVING OR INSTALLING THE BREATHING HOSE. A LOOSE TOWER WILL LEAK!!! CHECK THE TOWERS PRIOR TO DIVING TO ENSURE THEY ARE TIGHT.**

The procedure to install the hose stubs to the towers are as follows:

- Ensure that the sealing areas on the towers are clean.
- Ensure that the O-ring areas on the hose stubs are clean and then apply lubricant.
- Push the hose stub on to the tower, lining up the lip on the tower with the space on the hose stub.
- Turn the ring to secure.
- Inspect the area to ensure that all the O-rings are properly seated and not pinched.
- To remove the hose stub, push in on the stub, and then turn the ring. This is a similar method to opening and closing a child proof medication bottle.

***SERVICE: THE O-RINGS ON THE HOSE STUBS AND THE CORRESPONDING SURFACES ON THE DSV ADAPTERS AND HOSE ATTACHMENTS SHOULD BE LUBRICATED ON A REGULAR BASIS. PRIOR TO DIVING, ENSURE THAT HOSES HAVE BEEN PROPERLY ATTACHED TO THE TOWERS AND TO THE DSV!!! FAILURE TO DO SO COULD CAUSE INJURY OR DEATH!!!**

***WARNING: As the DT Go loop hose and connection system is considered an important item, misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

Diluent Cylinder & Quick Connect System

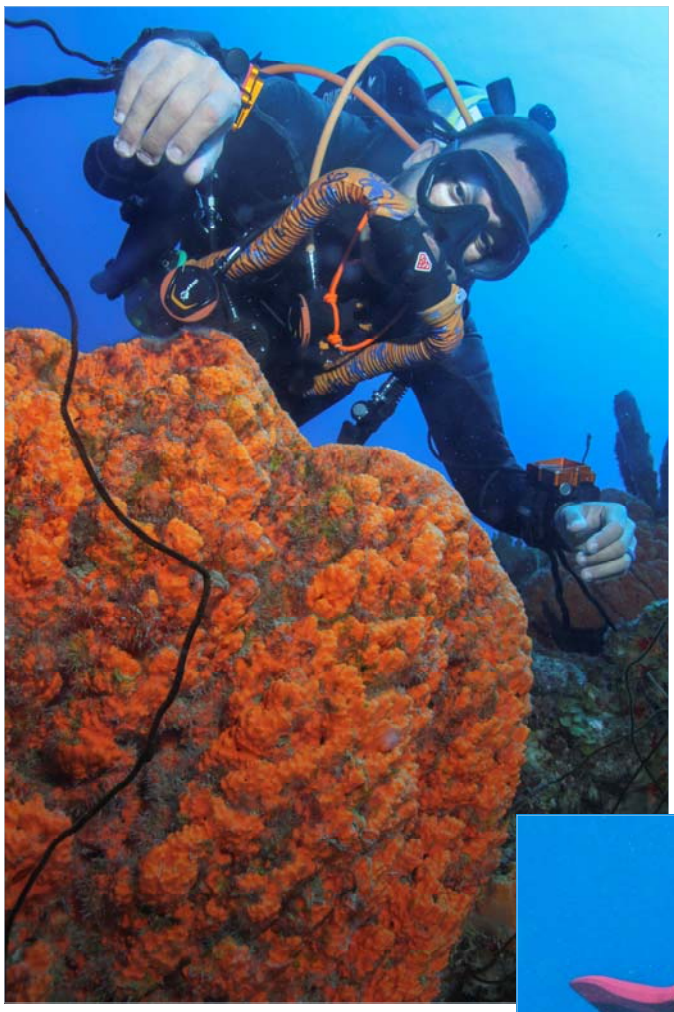
The diluent cylinder on the DT Go is back-mounted similar to a standard diving system, and doubles as the diver's bail out system. In this configuration the diluent cylinder is referred to as off board diluent gas as the cylinder is not secured to the main rebreather. The advantages of this are that diver's may customize the system to suit their diving needs. It also keeps the main rebreather small, light, flexible, and easy to travel with.

DT recommends that a minimum of 40 cuft should be used as the diluent/bailout cylinder when diving recreationally. Diver's must be certain that the cylinder they choose has the proper amount of gas for diluent, wing & drysuit inflation, and also for bailout. Those doing any sort of technical and/or decompression diving must carry a larger cylinder(s) and ensure that it is appropriate for the dive that they are planning.

The DT Go includes a low pressure quick connect. This accessory is used to plumb the diluent/bailout gas into the rebreather via a low pressure inflator hose.

The low pressure inflator hose should be secured to the diver's first stage on the diluent/bailout cylinder.

***WARNING: AS WITH ANY NEW DIVING EQUIPMENT, USING THIS ACCESSORY WILL REQUIRE THE DIVER TO LEARN NEW SKILLS AND CREATE NEW MUSCLE MEMORY.**



Filling the Scrubber Canister

The DT Go has an axial scrubber design, which is resistant to channelling. It holds approximately 3.5 lb/1.59 kg of absorbent. The actual weight will depend on the brand that is used. (Divers must use 8-12 granule size)

***WARNING: The use of larger granules can cause channeling. This can cause serious injury or death!**

The Go has a unique design with a large face, which has a lot of surface area. It also has a short bed length. This spreads out the exhaled gas, which lowers the breathing resistance. (breathing resistance is also known as Work of Breathing, or WOB).

The procedure to fill the scrubber canister is as follows:

- Remove the top screen.
- Fill the canister with absorbent, about half way up.
- Tap all the sides of the canister to help settle the absorbent.
- Add more absorbent, as needed, until the level is 1/8 inch below the absorbent fill line.
- Put the top screen in place, over the absorbent.
- The top screen will need to be wiggled back and forth to settle the absorbent.
- While putting light pressure on the top screen, tap the edges again. The fill line should be slightly visible above the screen.

- Using a lint free cloth or paper towel, clean the O-ring surface area of any debris or grit.
- Using clean fingers, apply a light amount of lubricant to the O-ring surface area.

- Place the lid in position, being certain to align the clamps.
- Gently press the lid straight down to push it into position. It should easily be pushed down, moving smoothly and evenly.
- Visually inspect the scrubber canister, and make certain that there are no gaps between the canister and the lid.

***WARNING: IF THERE IS A GAP BETWEEN THE SCRUBBER CANISTER HE LID, IT IS LIKELY DUE TO A PINCHED O-RING!! IF THIS HAPPENS WATER WILL LEAK INTO THE SCRUBBER CANISTER & UNIT, WHICH WILL RESULT IN A CATASTROPHICH FAILURE!!!!**

Duration:

Cold water, below 12.7°C/55 °F : 1.5 hours
Moderate water, 12.7°C/55 °F to 21.1°C/70°F , 2 hours
Warm water, above 21.1°C/70°F: 2.5 hours

***WARNING: Diver's have been known to travel great distances with their rebreather's assembled and the scrubber canister packed. A word of warning; the great the distance traveled the more likely the absorbent can settle with the large and small granules separating. This could cause channeling, which in turn could cause a problem with Carbon dioxide, which could cause serious injury or death. How to avoid this? Travel shorter distances only. Also it is far less likely to happen if you travel with the rebreather in a flat position rather then having it vertical, as laying it flat will decrease the chances of the absorbent settling to one side. If you have concerns about this, it is better to pour out the absorbent once you reach your destination, and repack it. Remember, this can happen on any rebreather!**

***WARNING: As the DT Go scrubber canister is considered an important item, misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

***WARNING: IF CANISTER O-RING IS PINCHED AND THERE IS A LEAK, YOU WILL HAVE A SERIOUS FLOOD!!! THIS COULD CAUSE SERIOUS INJURY OR DEATH!!**

Counterlung Installation

The counterlung system on the DT Go consists of 2 equal sized lungs, which are approximately 2.3 litres each.

- Visually inspect the O-rings on each counterlung. Ensure that they are in place, and in good condition. They should be wiped clean with a lint free cloth or paper towel, ensuring no debris or grit is present.

- The right side counterlung has an over pressure valve (OPV) installed. Inspect the OPV to ensure that it is clean, with no debris or grit present, and then ensure it is tightened all the way in.

- Ensure that the inside of the counterlung adapter is clean, and free of any debris or grit. To the inside of the counterlung adapter, apply a light amount of lubricant.

- Press the counterlung release, and insert the counterlung. Use smooth and even pressure.

- Once the lung is in place and properly secured, ensure that it is properly angled. It should be similar to the photo.

- Once the lung is properly installed, secured and properly angled, the counterlung retaining quick-link should be installed.

- The quick-link should be screwed down tightly.

- Follow the same installation procedures to install the left side counterlung.

***WARNING: As the DT Go counterlung/connection system, and exhaust valve are considered important item's, misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**

Loop Hose & DSV Assembly

Lubricate the inside of the hose end.

Inspect the O-rings. Then, gently slide the hose attachment onto the DSV, being careful not pinch the O-rings, or cause them to extrude.

To insert the retaining clip, squeeze it gently, and push it into the grove. Repeat with the other side.

Our DSV has a larger bore and has an excellent work of breathing. In order to get that good work of breathing, the valves are more flexible. This means that with this, we need to ensure that we have good testing habits. Those divers who learned the testing procedures years ago, have to understand that the equipment has now changed, and that our habits must also change.

Also ensure that the area where the Mushroom valve seal's is clean. build up in this area will cause the diaphragm to leak.

Positive/Negative Testing

Once the DT Go has been completely assembled you are ready to do the positive and negative pressure tests. While these tests will give you the best indication of any leaks in the system, it is still a good idea to do a quick bubble check when you enter the water. That's where buddies come in handy.

***WARNING: IT IS VERY IMPORTANT THAT THE POSITIVE/NEGATIVE PRESSURE TESTS ARE COMPLETED AND THAT THEY ARE DONE PROPERLY. ANY LEAKS THAT ARE PRESENT ARE MOST LIKELY TO BE CAUGHT WHILE DOING THESE TESTS!! WHEN DOING YOUR TESTS, YOU SHOULD BE VERY CERTAIN THAT THEY PASS. IF YOU HAVE ANY DOUBT AND ARE UNSURE THAT THE TEST PASSED, YOU PROBABLY HAVE A SMALL LEAK. FIND IT!! THE UNITS HOLD VERY GOOD POSITIVE AND NEGATIVE TESTS.**

To do the negative test, first ensure that the male end of the off board accessory is plugged. All gases should be off, the unit fully assembled, exhaust valve closed. Then put the DSV into your mouth, turn the knob and inhale the gas from the loop into your lungs and exhale it out of your nose until it is impossible to inhale any further. When the loop is empty, there should be no leakage into the rebreather and you shouldn't feel any extra gas sneaking into your mouth. If you don't feel any extra gas, close the loop while inhaling. The breathing hoses should be tighter as there is a vacuum in the loop. This will cause the DSV to sit higher than usual and the ridges on the hoses to be close together. If you watch the hoses while you are drawing the gas out of the loop, you will see how they constrict. Also, look at the counterlung's. They should be completely flat. Once you close the mouthpiece, watch the hoses and lungs closely. Don't look away. You need to notice if anything changes, such as a slight droop in the hoses and/or the mouthpiece dropping or the lungs shift slightly showing that gas might be going back into them. Leave the loop closed for a few moments, 60 seconds is adequate, to see if the vacuum holds and then open the loop to let air back in. (Longer is not necessary and will damage the diaphragm.)

The next most important part of doing your negative test (watching the lungs and hoses is the first) is when you release the pressure and open the mouthpiece. You should hear a “whoosh” as pressure is released. If you don’t hear this sound, you have a leak! Or if the “whoosh” isn’t as strong as it usually is, you have a leak. After diving the unit for a while, you will learn what sound to expect when releasing the pressure. When you hear that sound, you will feel confident that you did a good test. If you have any uncertain feeling, then you may have a small leak.

***WARNING - It is important to not leave the vacuum in the loop for more than a few moments as this will cause damage to the diaphragm. If this happens, the ADV will not work properly. It will either stop working altogether or will continuously feed the diver diluent. It will certainly allow water to leak into the ADV.**

***NOTE: When doing your test, it is VERY important to not suck so hard that you are damaging the diaphragms. When you do the negative test, suck until you get a good seal, and then immediately close off the DSV. if you suck so hard that you feel the pressure building in the back of your throat/neck area, your ears pop, or you feel your face turning red for exertion, this is way too hard. There is no need for this and it will damage the valves and diaphragms. Suck just until you feel that pressure, then close the valve.**

To do the positive test, put the DSV into your mouth, turn the knob and exhale into the loop until you hear the exhaust valve release and then quickly close the DSV without letting any air escape the loop. The counterlung's should be expanded to their maximum size. Listen carefully for any air leaks and ensure that the counterlung's remain firm for several minutes. The oxygen tank valve and mouthpiece should be closed during these tests. After the test is complete and you open the DSV again you will hear the sound of the pressure being released. This is important!


DIVE TALK
GO


SUBE RAVTIY

Dive Computer & Calibration

The DT Go uses the Shearwater display and monitoring system, which utilizes the 4 pin connection system. Options are:

- Shearwater Petrel wrist computer with the 4 pin connection system.
- Shearwater NERD with the 4 pin connection system.
- 4 pin connection system only.

Adjusting the oxygen flow rate:

The oxygen injection rate can be adjusted to suit each individual diver. The required flow rate depends on the physical size of the diver and the degree of exertion used during the dive. If the flow rate is too high the PP02 will climb to dangerous levels and the breathing loop will have to be purged to reduce the oxygen partial pressure to a safe level. If the flow rate is set too low oxygen will have to be manually added more often during the dive. If you need your flow rate adjusted, seek out a qualified technician or instructor.

All computer instructions may be found in the Shearwater manuals.

***WARNING: IT IS CRITICAL THAT ALL DT GO DIVERS READ AND FULLY UNDERSTAND THE SHEARWATER MANUALS AND ALSO FULLY UNDERSTAND THE CALIBRATION INSTRUCTIONS. FAILURE TO DO SO COULD CAUSE SERIOUS INJURY OR DEATH!!!**

***WARNING: Never risk your life on only one source of information. Use a second computer or tables. If you choose to make riskier dives, obtain the proper training and work up to them slowly to gain experience.**

***WARNING: All display system's will fail. It is not whether it will fail but when it will fail. Do not depend on it. Always have a plan on how to handle failures. Automatic systems are no substitute for knowledge and training. No technology will keep you alive. Knowledge, skill, and practiced procedures are your best defense. (Except for not doing the dive, of course.)**

***WARNING: DIVERS THAT CHOOSE TO PURCHASE THE DT GO, WITHOUT THE COMPUTER OR NERD, MUST ENSURE THAT THEY ARE USING AN APPROVED SYSTEM. FAILURE TO DO SO MAY CAUSE SERIOUS INJURY OR DEATH.**

Calibration:

Attach an oxygen cylinder to the first stage. Most divers will use a separate larger cylinder, so the cylinder that is actually used on the dive is not depleted.

Once attached, open the cylinder valve.

Open the DSV.

Turn on the computer, and set to calibrate.

Press the oxygen MAV button and watch the PPO2 rise.

When the millivolts level out, press calibrate. (right button)

The Millivolt reading will be between 9 and 13 millivolts, in air. As long as they are in that range, they are safe to use. In 100% oxygen, at sea level the sensors should be between 42.85 and 61.88 millivolts.

It will give you report with altitude. Confirm by pushing the right button.

This completes the calibration process, and shows the PPO2 value on the screen. If you are at sea level this will be 0.98. The higher the elevation, the lower the equivalent will be.

***WARNING: The DT Go display system is considered a KEY COMPONENT. This is an important item. Misuse of this system can result in serious injury or death. This is life support equipment, treat it with the respect it deserves.**


VE TALK

Pre-dive Checklist's

The first part of our check list, are items that must be addressed and/or confirmed prior to suiting up for the dive. Those that are using this tool, usually keep several blank copies in a small binder with their dive gear.

The second part of the check list are items that are usually checked shortly before a dive. This list can also be printed out, but other options are to copy it onto a dive slate or wet-notes in a permanent ink marker.

A point worth noting is that all pilots have a check list which they go through every time they fly. Diving a rebreather should be no different. While rebreather diving doesn't necessarily take more preparation or clean up time than open circuit diving, there are very specific things that need to be checked and confirmed prior to getting into the water.

Using this check list will only add a few seconds more time to your preparation, but could make all the difference in having a pleasurable time in the underwater environment. It certainly assists in creating competent, happy divers.

DIVERS SHOULD FOLLOW THE PRE-DIVE CHECKLISTS BEFORE EVERY DIVE AND KEEP A COPY OF THE CHECKLIST WITH THE DT GO AT ALL TIMES.

Dive Talk GO Build Checklist

- □ Check and lubricate scrubber O-ring
- □ Fill scrubber to 1/8” below fill line and place screen
- □ Do not overfill the scrubber
- □ Secure lid in place
- □ Attach counterlungs
- □ Stereo check DSV
- □ Attach breathing hoses
- □ Attach oxygen cylinder
- □ Attach Shearwater Petrel or NERD
- □ Check PPO2 and millivolts in air (sensors should be 9 – 13 millivolts in air)
- □ Check battery life
- □ Verify gases for CCR and bailout - gas mixtures & cylinder pressure
- □ Reset stack timer
- □ Turn on oxygen, check pressure, and verify function of oxygen manual add valve
- □ Turn off oxygen and watch pressure fall to verify leaky valve is functioning
- □ Positive pressure check
- □ Negative pressure check
- □ Calibrate oxygen sensors using 100% oxygen (on 100% oxygen, each sensor should read 4.76 times the millivolts they read in air)
- □ Attach to regulator via low pressure hose, and verify ADV and MAV function of the regulator

Post Dive Checklist - DT GO Disassembly

After diving the DT Go, your diving system will need to be disassembled and cleaned. Follow the disassembly procedures at the front of the manual; follow with the cleaning instructions below.

- Rinse the rebreather, wing & harness fully with fresh water. Be certain to rinse the first stages, valves and any regulators very well.
- The loop components should be rinsed and sanitized after diving. In order to disinfect the components, a product such as Virkon must be used. Virkon is a product that comes in powder form which must be mixed with water. Follow the package directions for use.
- After sanitizing, rinse all components in fresh water. Set out to dry. Counterlung's can easily be dried by turning them partially, inside out.

Once your components are dry, the unit may be stored for future use. Keep in mind that it is best to not store the unit assembled. The O-rings will get a memory and not seal as well.

Troubleshooting - Exhaust Valve, ADV & Work of Breathing

In this section, you will find information about the exhaust valve, ADV and work of breathing. We have helpful hints and trouble shooting. The exhaust valve and the ADV work in harmony. If you are having difficulties with either one, it makes sense to check both.

BUBBLING OVER PRESSURE VALVE

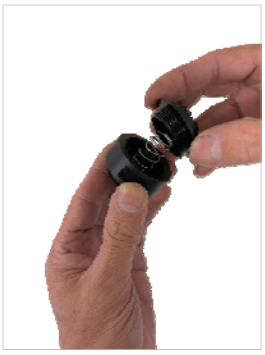
There are several things that can cause this problem. Over the next few pages, situations are listed and described.

1. ***There is debris in the valve.*** See below for instructions on how to take the valve part, should you need to.

It should be noted that if the lungs on the unit are full, and you then open the mouthpiece and start breathing while on the surface, you will find that the air is difficult to exhaust through the exhaust valve. If this happens, it will feel like you can't properly inhale or exhale fully. This generally happens after a diver does his pre-dive testing and pre-breathe and the unit's lungs are inflated. To solve this problem, simply exhale gas out of the loop through your nose. Under-water, the exhaust valve will dump the gas for you.

OVER PRESSURE VALVE MAINTENANCE

1. Unscrew from the counterlung.



2. Unscrew the top.

3. Remove the spring and piston

4. Flush water through from the backside.

3. ***ADV problem.*** If your counterlung volume is correct and the exhaust valve is in good working order, and you still have a leaking exhaust with the feeling of too much gas in the loop, you could have a problem with your ADV adding too much gas into the system. If this is happening you will also notice that your PPO2 is reading lower than usual and that your buoyancy is off. This could be caused by a stretched, damaged or torn ADV diaphragm, or a problem with the other components of the ADV. Inspect the diaphragm for damage or fault. If you have an adjustable ADV, have it serviced by a qualified technician.

   To determine if this is the problem, shut off the diluent gas. First you will notice your PPO2 stabilize and stop dropping. Also, the lungs will stop filling up all the way and the exhaust valve should stop purging.

   The diaphragm is simple to check. Open the cover and pull the assembly out. It should be fairly flat, and not damaged. You may need to look quite closely for small tears or holes. Sometimes holding it up to the light and gently pulling the rubber will help. When you reinstall the cover, tighten the bolts to inch pounds.

4. ***Check the IP on the diluent first stage.*** It should be between 8 (117.6 psi) and 10 bar (147 psi).

5. ***First stage needs to be serviced.*** If the first stage is not functioning properly, it could have a leak, which could cause excess diluent gas to flow into the rebreather's loop.

***NOTE: A damaged ADV assembly will either deliver too much diluent gas, or none at all.**

***NOTE: It is important that the proper installation procedures are followed for the ADV assembly and diaphragm. Only qualified technician's should service the regulator. Those with no experience should take it to their local DT Go dealer or send it to the DT Go head office for servicing. The exhaust valve is a key component of the DT Go diving system; care should be taken that it is not damaged and properly maintained.**

ADV IS DIFFICULT TO TRIGGER

The position of the diver will effect the ADV. If the diver is horizontal or face down, the ADV will trigger easily. If the diver is vertical, then it will be a bit harder. Also, rolling to your right side, while horizontal, will assist in triggering the ADV.

Lastly, check the IP on the diluent first stage. Ensure that it is in the correct range. Remember, the ADV is not meant to be easy to trigger. It was designed this way so that the diver would know when they were triggering it. If it was too easy, then diluent gas could be fed into the breathing loop without the diver being aware of what was happening.

WORK OF BREATHING

There are several things that can cause a high work of breathing.

1. ***Too much gas in the loop.*** This can happen if the loop has gas in it, the mouthpiece is closed and then the diver puts the mouthpiece in his mouth and blows more gas into the loop. The exhaust valve will probably not release any gas if the diver is on the surface. It will feel like you can not get a full breath and the breathing will be difficult. Dump part of the loop (exhale out of your nose). If this is the cause, you will notice the difference immediately. Also, if this happens, it won't be possible to trigger the ADV. This can also happen if the ADV is faulty and it is leaking diluent gas into the loop.

2. ***Twisted counterlung's.*** If the counterlung's are twisted, or bunched up, they will not be able to expand properly and breathing will be restricted.

3. ***Counterlung's not attached to the frame properly.*** If the counterlung's are not properly routed, it is likely that they could be restricted in some manner. This will cause the breathing to be restricted.

Warranty

The Dive Talk Gear, LLC. rebreather and DSV are warranted for the period of 1 year. All warranty and service work should be returned to our warehouse.

- The warranty applies to the original owner only.
- Mistreatment or neglect of the products will void the warranty.
- Parts not covered by the warranty are batteries and sensors.
- Completed liability waivers must be on file for the rebreather warranty to be valid.
- Modifications to the DT Go will void the warranty. Only approved modifications are allowed.
- We are unable to determine if the parts are covered by the warranty until they have been inspected.

PROCEDURES FOR WARRANTY & SERVICE WORK

Prior to shipping, please email info@divetalkgo.com to inform us of your shipment. You will need to print out the warranty/service form, fill it in and ship it with your item. This form can be obtained from the DT website at www.divetalkgo.com

Your product should be returned to us with the warranty/service form, in the box.

Carefully box up the items being returned. Dive Talk Gear, LLC. is not responsible for any damage incurred during shipping. Ensure that the items are properly padded and shipped in a strong box, and also that it is well sealed. (Don't forget to insert the above mentioned paperwork!) Please write in large clear letters, WARRANTY RETURN, MADE IN USA on the outside of the parcel and on any paperwork. This is important as otherwise USA Customs will charge us a brokerage fee and duties, which we pass on to you.

The parcel may be shipped via the post office or a courier. All shipments must be prepaid and insured. Any fees that Dive Talk Gear LLC. incurs must be paid for by the shipper. This includes duties and brokerage fees for the item re-entering the USA. Note that if you ship via a courier such as UPS or Federal Express, there will be a brokerage fee, even if there are no duties. While there may be no charges for the warranty work, this brokerage fee must be paid for by the shipper.

Dive Talk Go - Information Sheet for New Divers

What is Dive Talk Gear, LLC. doing to ensure that divers understand how to safely use their products?

It is the duty of all rebreather manufacturers to ensure that when a diving system is sold, our clients are able to confidently choose a Training Agency and Instructor that will fulfill the training requirement.

In our goal to help divers become the best rebreather diver's possible, Dive Talk Gear, LLC. has a Training Quality Assurance program (TQA), which outlines our standards and expectations.

As a Dive Talk Go rebreather owner, there are some things we would like you to know:

1. Dive Talk Gear, LLC has 2 private Facebook groups, Dive Talk Go Divers, and Dive Talk Go Instructors. We strongly recommend that all DT Go owner's join the DT Go divers' group, and all instructors join the DT Go instructor group. While these lists may not be terribly active, it is where we release important information such as manual updates, issues, recalls, etc.

   Dive Talk Go rebreather owners should search Facebook for, Dive Talk Go – Official Page. Dive Talk Go rebreather instructors should search for, Dive Talk Go Rebreather Instructors – Official Page. If anyone is having difficulty finding these pages, please email us at, info@divetalkgo.com for help.

   Upon asking to join, you will be asked a few questions. Upon receipt of your request and answers, your member ship will be granted.

2. You will find a copy of the Dive Talk Go minimum training standards in the back of your manual. We have published it here as we feel it is important for all DT Go divers to understand what the minimum training requirements are for each level of training. DT Go approved training agencies are able to add to these standards, but not take away from them.

3. Also, in the back of your manual are copies of the Dive Talk Go rebreather course evaluation form. As you can see the form lists all the required skills, and your score. At the completion of the program, all students and instructors are required to sign off/date this form. Your instructor will email the final copy of the form to Dive Talk.

   Again, we have published these forms so that all DT Go owners know what to expect in their training program. As a DT Go diver, you have made an investment in a specialized piece of diving equipment, and in a specific training pro gram. As such, you deserve to receive the equipment as promised, and all the training that you have paid for. If at any time you feel that this hasn't happened, please contact us directly at, info@divetalkgo.com.

4. Anyone that purchases a DT Go rebreather, must have the appropriate training.

5. The Dive Talk Go Training Quality Assurance (TQA) information is listed on our website, www.divetalkgo.com. Here you will find copies of the minimum training standards, course evaluation forms, Instructor Registration forms, and other information.

6. As a number of our sales go through our dealers, we don't have contact information for all our divers. We ask that all Dive Talk Go divers ensure that they are registered with us, so we are able to reach you should the need arise. As mentioned, we do publish information on our private Facebook groups, and in other places, but having your name and email address (at a minimum) on file with us would help insure that we can reach you in the event that we have important information. Ideally please email us your: full name, address, phone number, email address, the name of the unit you are diving, and your serial number. This information can be sent directly to, info@divetalkgo.com.

Dive Talk Gear, LLC has a duty to their clients to ensure that Dive Talk Go divers understand how to safely use their products. We take this very seriously. If anyone ever has a concern, comment, observation, we would love to hear from you. Our goal is to be the best that we can, and feedback from our clients will help us achieve that. Any feedback may be emailed directly to us at, info@divetalkgo.com.

INFORMATION

Welcome to the Dive Talk Go information page. With so much information and misinformation available, Dive Talk Gear want to ensure that divers are familiar with the DT Go facts. Purchasing a rebreather is a big decision for most divers, and we want to be certain that divers are choosing a unit that suits their diving needs. We also wanted to have an easy section where many of the DT Go questions can be answered.

There are many questions you should ask yourself, prior to purchasing a rebreather. We have tried to cover them here. These are questions that will assist you in choosing a rebreather, how to configure it, and how to move through social media and assess the facts from the fiction.

Woody and Gus,
Dive Talk Gear

Information vs Misinformation - Dealing with the GOSSIP

1. Misinformation: Lack of experience - Gossip says the DTG team doesn't have the knowledge or background.

That is not true. The team behind the DT Go has decades of experience.

2. Why did Woody and Gus step up?

Starting a rebreather company, a training agency, and everything that goes with it is not for the faint of heart. Why would Gus and Woody, both successful business people, and dedicated family men do this?

Being active in the scuba industry, rebreather divers, and the Dive Talk hosts, educated Gus and Woody on important aspects of the diving industry as a whole, and also gave them critical insight to the world of rebreather diving. After diving the Go daily for a week, they felt strongly that this was such an amazing rebreather, they approached the designer to private label it.

They knew that they had the drive and energy to do it properly, safely and help create a system that would be exciting for many divers. Knowing Mike for so long, and understanding his dedication to building safe and reliable gear made the decision to get involved easy. For Mike, he was excited to work with the DT team as it was clear that their values for education, safety, and testing matched his own.

3. Misinformation: Gossip says it is not a real rebreather, but costs the same.

This is not true. Many of the rebreathers on the market, are built for exploration, and extreme diving conditions. For explorers, these are great units. As they are heavy, expensive and complex, they are not a great tool for most divers.

The vast majority of technical trained divers usually stay above the 200 foot mark, with most of their diving between 100 and 150 feet. Invest in a rebreather that is suited for the type of diving you usually do.

The DT Go is a well-priced rebreather that will be rated for 200 feet. This makes it accessible for many divers that want to take their diving to the next level.

4. Misinformation: Gossip says the DT Go won't follow standard CCR training.

This is not true. After decades in the rebreather industry, the DT team members are still baffled by this statement. This statement is not usually followed up with why they are saying this.

Here is the truth: The training on the DT Go will follow the same standards as other units, following RESA minimum training standards. DT Academy will be set up with excellent quality control for instruction. The DT Go has been third party tested, and has proven to have excellent WOB and duration. Dangerous situations happen with lack of education (poor training), or rule breaking.

It is important to understand that a rebreather is a tool that can be used for different types of diving. Recreational, technical, or exploration. A diver could take a rig set up for deep exploration dives, and dive it within recreational limits. The best way to look at this is to understand that both open circuit and closed circuit diving can be with decompression or without. Dive within your certification limits and stay in your comfort zone.

5. Misinformation: Third party testing - Gossip says DT Go doesn't have any.

That is not true. The DT Go has third party testing. The Work of Breathing (WOB) and the scrubber duration tests were both outstanding! Computer systems are from Shearwater Research who clearly build our industries best electronics.

6. Misinformation: Minimum Training Standards - Gossip says DTG doesn't follow them.

That is not true. Minimum training standards outlined by RESA are strictly followed. While Dive Talk Gear is not yet a RESA member, their standards are strictly followed. DTG team members have been working with RESA since inception, and helped create RESA. The training program that DT Go divers must complete follows the same minimum training standards as all RESA rebreathers.

7. Misinformation: It is dangerous - Gossip says it is so dangerous that only divers with hundreds of dives, and that are certified to dive to extreme depths, are safe to dive a closed circuit system.

This is not true. Since the start of rebreather diving decades ago, there has always been a select group that would prefer to keep the "mystery" about rebreather diving, to keep it complicated, and keep it exclusive.

Rebreather manufacturers have been fighting these bad attitudes from the beginning. It was one of the reasons that RESA was created. Manufacturers decided to fight for the betterment of our industry and through education, create a better understanding for all rebreather divers.

When is the right time for an individual to start rebreather diving? That is a personal decision. No different from choices that open water divers make: am I ready to do a rescue class; am I ready to dive off shore?

RESA minimum training standards state that a person must have 20 open water dives, and have completed a Nitrox certification. Some divers will be ready at this point, and some won't.

8. Misinformation: Gossip says you need hundreds of dives before taking a rebreather course.

This is not true. See above note on the RESA minimum training standards. These standards were written by the RESA members who are some of the worlds top rebreather manufacturers.

It is worth stating again, this is a personal choice. Like any diving, ALL divers need to be properly trained, dive within their limits, and follow the rules. This is what makes a safe rebreather diver. It is not a number in a log book.

Some divers may wish to invest in purchasing training and gear and move through the open circuit curriculum first. That is a personal choice and not necessary. If this is your choice, just be aware that you will need to invest in further training once you start rebreather diving. If a charter operator wants clients to have a deep, or wreck certification, then you will have to do those courses again on a rebreather. This is industry rules/liability. Not a cash grab.

9. Misinformation: Gossip says a rebreather should not be used for recreational diving and saying so is dangerous.

This is not true. As mentioned before, these are general words that are often thrown out on social media, that sadly are not followed up and don't have a real meaning. A rebreather can certainly be enjoyed on recreational dives. The advantages of rebreather diving with the perfect nitrox mix at every point of your dive and not just MOD, warm moist air, less post dive fatigue, getting extremely close to the wild life. These are all great reasons to dive a CCR.

Many people have assumed that all rebreathers are complex and this is what makes them dangerous. Remember, a rebreather is a tool. Use it within the parameters it was built for, and within your certification and experience levels. The DT Go is a very straight forward unit, easy to set up, easy to dive and easy to clean. Watch our video, and you will see!

Things you are CURIOUS about - QUESTIONS you should ask

10. Is the manufacturer of the unit you are looking at approachable? Do they have a record of excellent customer service? Will they be honest and clear with the information that they provide?

The DT team has extensive experience in designing and building closed circuit diving systems.

11. When you look at the manufacturer's material, is there clear information on what the rig comes with and what is extra? Do I have a choice on configuration?

The DT Go manual states clearing what is included and what is not. There are some choices for configuration.

12. Is the unit simple? Is the unit complex? The more complex that a rebreather diving system is, the more that can go wrong, and the harder it is to fix. Do you have the option to service the unit yourself, should you wish or need to?

The DT Go is very simple, and some divers will be able to service most parts themselves.

13. Is there a service plan available that is affordable, and good value for the dollar?

For those that would prefer DTG to do the annual servicing, there will be a service plan that covers both service work, and parts.

14. Are you looking to purchase a rebreather that you can travel with, that can be easily transported, and are confident that it will work properly? Is your spare parts kit small and light?

The travel weight of the DT Go is 10lbs. This is the unit without the cylinder or absorbent. Spare parts kits are available and they are small and light.

15. What computer system comes with your rebreather?

The DT team feels that the computer system should be the best on the market. This is why we offer the Shearwater Research products.

16. How difficult is it to assemble and test the unit? Is it quick and easy? If the positive or negative test fails, is it easy to diagnose and fix?

Due to the simple design of the unit, the DT Go is very quick to assemble, test and trouble shoot. See our video!

17. You are deciding between a Mechanical CCR and an Electronic CCR. How do you know what is right for you?

This is personal choice. Some divers choose an electronic CCR as they want it to be easier. Keep in mind when diving either an electronic or mechanical CCR, you MUST monitor the oxygen display the same. On a mechanical system, you need to push the O2 add button a few times. If you choose to dive an electronic CCR manually, the only way the oxygen goes into the system is when the button is pushed. So those divers are much more busy.

18. What Is a mechanical CCR?

A mechanically controlled CCR is a system where the design of the unit constantly bleeds a small amount of pure oxygen into the system at all times. It has a push-button override where the diver can manually add oxygen when needed.

19. How often do I have to push the oxygen add valve button?

If the constant flow is set up for the diving that you usually do, (this happens in training), then not very often. It is reported from experienced divers that they may only push the button a few times during a typical dive.

20. Does the team behind the rebreather you choose have a proven track record? Do they have a Quality Assurance program in place, and follow set rules for building, testing, training?

The Dive Talk Gear team has decades of experience behind them, they have a QA program in place, do third party testing, and will follow strict protocol's for training.

21. There are a number of used units on the market, would investing in one be a good idea?

You must fully understand the cost involved to get that unit up and running to suit you. Be certain to fully understand the condition of the gear you are purchasing, and contact the manufacturer to determine the cost of repairs or upgrades. Remember, buying a new rebreather is like buying a bunch of rebreather parts at a really good discount!

22. Why are the counterlungs are on the side, do they get in the way or are uncomfortable?

The lungs are situated very close to the divers own lungs, and this is one of the reasons the WOB is excellent. When diving the Go, the lungs are comfortable, and not bulky.

23. What sort of scrubber canister does the DT Go have? And, is it easy to prepare for diving, and to open and close the canister.

The DT Go has a circular axial scrubber design with a large surface area and a relatively thin scrubber bed. This design spreads out the exhaled gas, which lowers the breathing resistance (WOB). The simplicity of design allows for easy filling and prepping for dives, and the clamp system while sturdy, means that the unit can easily be opened and closed for either filling, cleaning or inspection.

24. Is this unit right for me?

It depends, are you interested in having the perfect nitrox mix during your entire dive? Warm and moist air to breathe? Would you like to get close to the wild life? Do you want a diving system that is EASY to use, EASY to set up, EASY to maintain, and EASY to learn? Are you ready to take your diving to the next level? If this sounds great, maybe the next step should be a discussion with an instructor to understand the system better, or a try dive.

25. How deep are most divers going who dive rebreathers?

While many divers talk about going deep, to 300 feet or further, very few actually do it. Most divers do not go deeper than 200 feet, and those trained technically usually spend much of their time above 180 feet, in the 100 to 150 foot range. Think hard before you invest in a rebreather that is heavy and complex if in reality you may never be using or needing a unit that complicated. That complexity comes with a price…expensive electronics that are not user serviceable; the units are likely heavy so not that easy to dive, or to get in and out of the water, and a challenge to fly with; added complexity usually means more failure points.

26. Is the unit CE approved?

CE is a legal requirement in Europe and manufacturers must go through this process. With DTG being an American company, there is no legal requirement for this. Third party testing and setting up a good Quality Assurance Program can be done without going through the process of CE. As an American company, the designation is not important. The testing and QA systems are, which is why DTG does them.

27. How does the DT Go compare with other units in the market place?

The DT Go will be a fantastic unit for many divers. It fills a specific niche, which makes it unique. It was designed as a light weight mechanical rebreather which has outstanding work of breathing, can be set up with multiple configurations (single back mount cylinder, back mount doubles, or side mount), and the goal of DT Gear is to offer a product that would get more divers interested in rebreathers in general.

It was not designed to compete with any other rebreathers. DT Gear feels that there is a place for a variety of different units, and we celebrate them all!

28. Can I do a try dive or take the full class, prior to doing a purchase?

Yes! A number of the DT Go instructors have multiple rental units. Divers can choose to do either an introduction or the full class without purchasing a unit.

29. Do I need a special type of buoyancy compensator?

No! One of the best features of the DT Go is that it will work with almost any jacket style BCD, backmount wing system, or a sidemount system. As the comfort and fit of a divers BCD is one of the most critical components for comfortable diving, we are very excited to let divers know that they can keep using their favorite

Dive Talk Academy - Why is this happening?

After much discussion amongst the DT team members and legal counsel, it was decided that best way to move forward with training is to keep it fully in-house. The counsel for DTG is an individual who is very involved in the rebreather industry, and is an advocate for safety and doing things properly. It was on his advice that the DT team keep the training in-house. From that advice, Dive Talk Academy was born.

Why is training so important? Rebreather diving, like open circuit diving, can be very safe and a fun experience. Training is important as it is critical for all divers, open circuit or rebreather, to fully understand the rules. It would be no surprise to most divers that not all instructors are awesome.

Let's Get Into More Detail…

The Dive Talk Academy academic programs will be fully online. An online system has many advantages:

- Ensures the manual has been downloaded.
- Ensures all paperwork is complete.
- Ensures that the student reads and passes each module before being allowed to start the next one.
- All modules must be passed, before the exam may be written.
- Both instructors and students will need to digitally sign off on all required skills.
- Has checks and balances where the student must review and evaluate the instructor. (10 questions with a 1 to 5 rating system)

- The instructor must also review and evaluate the student, with the same 1 to 5 rating system.
- The instructors on-going review scores will be made public. This will be similar to how an Uber shows a driver review.

Thoughts from Woody…

After careful consideration on how to develop and teach a RESA based course for the Dive Talk Go, we sought advice from David Concannon, our counsel, on the best approach. He recommended starting our own dive agency using top technology to ensure students receive a proper education. It will be a comprehensive CCR course tailored for the new mCCR invented by Mike Young.

As a user of multiple learning platforms for various business ventures, I discussed with our team various features and functions that I believe are essential for the Dive Talk Academy's system, including:

- All required paperwork will be completed digitally and saved in a student profile automatically, with progress quizzes on paperwork before accessing other learning modules.
- The manual will be integrated into the learning system, with quizzes to be passed before unlocking other modules.
- Standards and rebreather operation will be explained through dynamic animations and videos, with quizzes to be passed before progressing to the next module.
- Skill requirements will be demonstrated through videos with progress quizzes, leading to a final online exam.
- A digital sign-off sheet must be completed by the instructor and student before a digital certificate is issued.
- The platform will require student and instructor reviews before issuing the digital certificate.
- All skills and standards will meet the RESA minimums, with bios of available instructors, for student selection.
- Steve Luchon is developing the online system with modern technology for efficient learning.
- Instructors will be notified when students have completed online content to begin practical training.
- The system will record unit serial numbers for students who purchase units for the course.
- The Dive Talk Academy will expand to offer courses from open water diver to advanced technical levels, with a focus on RSTC compliance.
- The technology used will provide a realistic learning platform with practical application videos and progress tracking.
- Courses will be tested by experienced dive professionals before release to set a new standard in scuba diving education.
- The Dive Talk Go class will be the first course released in the system soon, followed by Nitrox courses and advanced classes.

RESA recommends: Dive Rebreathers safely by following this 10 point plan

1. Be wary of "internet advice". Check the manufacturers and training agencies for best practise/configuration information and if you can't find the information you need, contact them.

2. Take time to learn your rebreather and practise using all the controls regularly.

3. Use a checklist before every dive, for assembly and pre-dive checks, ensuring that when you get in the water you haven't forgotten something stupid:
    a. Ensuring everything is okay BEFORE you get in the water increases the chances exponentially of it being a successful, trouble free dive.
    b. We're all human, we all forget things, but you're entering an environment where even trivial issues on the surface can be fatal underwater.
    c. No matter what your experience level, it is stupid not to use a checklist system, whether it be electronic or paper – use a checklist.
4. Unless the manufacturer of your unit advises differently, change your oxygen sensors every 12 months — O2 sensors/cells are a consumable. Their useful life is much less in a rebreather than in a surface O2 analyser:
    a. Several diving professionals have lost their lives over the past few years because they didn't change their cells in a timely fashion.
    b. Understanding what current limiting is and what to do about it are important skills. Test for it on every dive by adding a little bit of oxygen to see whether the cell rises by 0.1 bar or not, and if not start reducing your setpoint down below 1.0 bar or more or bailout to open circuit.
5. Dive with a buddy. Be a buddy. Most rebreather divers are capable of diving alone but it is always useful to have a friend to help identify that your dry suit hose isn't connected yet or is on hand to help reach components. A good buddy is a good diver. A good diver is a good buddy.
6. Take your time. Take time to sit and think about the dive, about your equipment. Is everything connected? Is everything working properly?
7. Plan your bailout requirements:
    a. Ensure you have enough bailout gas for the planned dive.
    b. Ensure you can reach bailout.
    c. Test your bail-out pre-dive and early in the dive.
    d. If your "emergency plan" is your open circuit bailout, make sure you use it. Too many divers die carrying bailout.
8. Use only the CO2 absorbent and grade recommended by the manufacturer, that is the grade tested in their machine and has known performance:
    a. Some absorbents are totally unsuitable for diving, they just don't absorb CO2 quickly enough.
    b. If you do use a different diving grade absorbent to that recommended, you MUST reduce the usage time. If the absorbent has a larger granule size than that in the recommended absorbent, reduce the usage time by at least one third.
    c. Changing it early is much better than changing it late. Push the scrubber to it's limits and one day you will be caught out.

9. Don’t be afraid to cancel a dive. You are part of the pre –dive analysis. If you don’t feel right or have misgivings about the dive, just cancel it, walk away. The dive will be there tomorrow and the next day and the day after that:
    a. Be a good buddy, respect your buddy’s wishes – if s/he wants to cancel then so be it, they’re safer on the boat.
10. Do pre-jump tests & re-check with appropriate safety drills when you jump in:
    a. Check PO2 on HUD and handset and continue to do so regularly during the dive.
    b. Check both tanks are on.
    c. Check buddy.
    d. Leak check prior to dive and always bubble check in the water.

Dive Talk Go – CCR Diver Course Evaluation Form

As per the DT Go minimum required training standards, the course must be completed with the minimum required dives and minutes, along with discussion on required academic topics, and all required skills. The student must achieve a minimum score of 8 out of 10 points in all the following skill areas.

DT Go minimum training standards may differ from approved training agency standards. As DT Go minimum training standards are the minimum required standard, the approved training agencies may add to them. Instructors should check with the appropriate training agency to ensure that all standards have been met.

Student: _____ Instructor: _____
Course start date: _____ Course completion date: _____
Dive Talk Go model & serial number: _____

Skills:

1. Pre-dive checks: Average score: ____
   - ____ Specific unit checklist
   - ____ Verify diluent and oxygen (O2) cylinder contents using gas analyzers
   - ____ Unit built up
   - ____ Scrubber canister filling
   - ____ Breathing loop check including mouthpiece one way valves and positive and negative check
   - ____ Sensor calibration in oxygen, with verification in air
   - ____ 5 minute pre-breathe
   - ____ Bailout bottle/stage cylinder rigging

2. Demonstrate correct pre-dive planning procedures: Average score: ____
   - ____ Limits based on system performance
   - ____ Limits based on oxygen exposures at chosen PO2 levels
   - ____ Limits based on nitrogen absorption at planned depth and PO2 set point
   - ____ Appropriate selection of decompression conservatism/gradient factors for the planned dive
   - ____ Thermal constraints

3. Underwater verification: Average score: ____
   - ____ Stop at 3-6 meters/9-19 feet on descent for leak bubble check
   - ____ Counterlung and Over Pressure Valve adjustment, if necessary

4. Mouthpiece familiarity skills: Average score: ____
   - ____ BOV: switch between open and closed circuit
   - ____ DSV: switch to bailout system

5. Adding diluent gas/ADV familiarity skills: Average score: ____
   - ____ ADV: Adding diluent gas and understand how it works
   - ____ BOV: Use BOV to add diluent gas to the loop – 2 ways
   - ____ Bail out second stage: Use to add diluent gas to the loop
   - ____ Dual button MAV: Adding diluent gas (if unit is shipped with this item)

6. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2, "diver emergencies" that the student must react to: Average score: ____
   ____ Practical bailout skills: including 2 open circuit ascent's from approximately 18 meters/59 feet
   ____ Gas shut downs and loss of gas
   ____ Broken hoses
   ____ Flooded absorbent canister
   ____ Carbon dioxide (CO_2) breakthrough
   ____ Low oxygen drills
   ____ High oxygen drills
   ____ Flooding loop
   ____ Electronics, sensor, and battery failure

7. Practice transferring to open circuit bailout: Score: ____

8. Rescue skill session as outlined by Training Agency: Score: ____

9. Use of buoyancy control system: Average score: ____
   ____ Buoyancy and trim control at safety stop
   ____ Buoyancy and trim control during dive

10. Controlling and monitoring for PPO_2 levels: Average score: ____
    ____ Raising/lowering PPO_2
    ____ Starting PPO_2
    ____ PPO_2 monitoring every minute
    ____ Manual Add Valve verification: static at constant depth, monitor change over several minutes
    ____ Electronics systems monitoring for PPO_2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)

11. Electronic systems use: Average score: ____
    ____ Use and adjustment of Heads Up Display, position, brightness, colour
    ____ Use and adjustment of PPO_2/depth/time display, position, brightness, colour
    ____ Use and adjustment of decompression computer, set up/gas switching, battery verification, etc

12. Use of lift bag/DSMB and reel (where relevant and applicable): Score: ____

13. Mask removal and replacement: Score: ____

14. Proper execution of the dive within all pre-determined dive limits: Score: ____

15. Demonstration of safety stops at pre-determined depths (on all dives): Score: ____

16. Constant loop volume management: Score: ____

17. Cell validation checks with appropriate use of diluent and oxygen: Average score: ____
    ____ Oxygen sensor verification at depth
    ____ Voltage limited test on sensors at approximately 5 meter/16 feet on pure oxygen

18. Post dive cleaning of unit: Average score: ____
    ____ Mouthpiece and hoses
    ____ Clean and disinfect unit

____ Inspect components of unit

19. Diver maintenance of unit: Average score: ____
    ____ Cell removal and replacement
    ____ Mouthpiece care
    ____ Replacing or re-charging of batteries

20. Demonstrate an adequate level of fitness by completing a minimum of a 50 meter/164 feet surface diver tow with both rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program: Score: ____

21. Complete all academic sessions and unit specific assessments as specified in the training material of the training agency and the manufacturer: Completed: ____

22. Complete a minimum of seven (7) training dives, including confided water skill development of at least one (1) hour, and six (6) core open water training dives with a minimum run time of 30 minutes each: Completed: ____

23. Complete a minimum of 420 minutes of total in-water time (including confined water) on the applicable unit: Completed: ____

24. Be able to independently complete a dive plan: Completed: ____

25. Complete the final course exam as set out by the training agency with a required minimum pass rate of 80% with 100% remediation: Completed: ____

Student Signature: _____ Date: _____
Instructor signature: _____Date: _____

In order to complete the students Dive Talk Go certification, this document must be completed in full, and emailed to: info@divetalkgo.com.

PLEASE PRINT CLEARLY - IF WE CAN'T READ YOUR WRITING, WE CAN NOT PROCESS THIS FORM. THANK YOU!

Dive Talk Go – CCR Decompression Diver Course Evaluation Form

As per the DT Go minimum required training standards, the course must be completed with the minimum required dives and minutes, along with discussion on required academic topics, and all required skills. The student must achieve a minimum score of 8 out of 10 points in all the following skill areas.

DT Go minimum training standards may differ from approved training agency standards. As DT minimum training standards are the minimum required standard, the approved training agencies may add to them. Instructors should check with the appropriate training agency to ensure that all standards have been met.

Student: _____ Instructor: _____
Course start date: _____ Course completion date: _____
Dive Talk Go rebreather name & serial number: _____

Skills:

1. Pre-dive checks: Average score: ____
   - ____ Specific unit checklist
   - ____ Verify diluent and oxygen (O2) cylinder contents using gas analyzers
   - ____ Unit built up
   - ____ Scrubber canister filling
   - ____ Breathing loop check including mouthpiece one way valves and positive and negative check
   - ____ Sensor calibration in oxygen, with verification in air
   - ____ 5 minute pre-breathe
   - ____ Stage cylinder rigging

2. Demonstrate correct pre-dive planning procedures: Average score: ____
   - ____ Limits based on system performance
   - ____ Limits based on oxygen exposures at chosen PO2 levels
   - ____ Limits based on nitrogen absorption at planned depth and PO2 set point
   - ____ Appropriate selection of decompression conservatism/gradient factors for the planned dive
   - ____ Thermal constraints

3. Underwater verification: Average score: ____
   - ____ Stop at 3-6 meters/9-19 feet on descent for leak bubble check
   - ____ Counterlung and Over Pressure Valve adjustment, if necessary

4. Mouthpiece familiarity skills: Average score: ____
   - ____ BOV: switch between open and closed circuit
   - ____ DSV: switch to bailout system

5. Adding diluent gas/ADV familiarity skills: Average score: ____
   - ____ ADV: Adding diluent gas and understand how it works
   - ____ BOV: Use BOV to add diluent gas to the loop – 2 ways
   - ____ Bail out second stage: Use to add diluent gas to the loop
   - ____ Dual button MAV: Adding diluent gas (if unit is shipped with this item)

6. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2, "diver emergencies" that the student must react to: Average score: ____
   ____ Practical bailout skills: including 2 open circuit ascent's from approximately 18 meters/59 feet
   ____ Gas shut downs and loss of gas
   ____ Broken hoses
   ____ Flooded absorbent canister
   ____ Carbon dioxide (CO_2) breakthrough
   ____ Low oxygen drills
   ____ High oxygen drills
   ____ Flooding loop
   ____ Electronics, sensor, and battery failure

7. Practice transferring to open circuit bailout: Score: ____

8. Rescue skill session as outlined by Training Agency: Score: ____

9. Use of buoyancy control system: Average score: ____
   ____ Buoyancy and trim control at safety stop
   ____ Buoyancy and trim control during dive

10. Controlling and monitoring for PPO_2 levels: Average score: ____
    ____ Raising/lowering PPO_2
    ____ Starting PPO_2
    ____ PPO_2 monitoring every minute
    ____ Manual Add Valve verification: static at constant depth, monitor change over several minutes
    ____ Electronics systems monitoring for PPO_2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)

11. Electronic systems use: Average score: ____
    ____ Use and adjustment of Heads Up Display, position, brightness, colour
    ____ Use and adjustment of PPO_2/depth/time display, position, brightness, colour
    ____ Use and adjustment of decompression computer, set up/gas switching, battery verification, etc

12. Use of lift bag/DSMB and reel (where relevant and applicable): Score: ____

13. Mask removal and replacement: Score: ____

14. Proper execution of the dive within all pre-determined dive limits: Score: ____

15. Demonstration of safety stops at pre-determined depths (on all dives): Score: ____

16. Constant loop volume management: Score: ____

17. Cell validation checks with appropriate use of diluent and oxygen: Average score: ____
    ____ Oxygen sensor verification at depth
    ____ Voltage limited test on sensors at approximately 5 meter/16 feet on pure oxygen

18. Post dive cleaning of unit: Average score: ____
    ____ Mouthpiece and hoses

____ Clean and disinfect unit
____ Inspect components of unit

19. Diver maintenance of unit: Average score: ____
    ____ Cell removal and replacement
    ____ Mouthpiece care
    ____ Replacing or re-charging of batteries

20. Decompression related in-water skills: Average score: ____
    ____ Demonstrate the ability to drop and retrieve one (1) bailout cylinder while maintaining position in the water column
    ____ Demonstrate appropriate reaction to gas hemorrhage from bailout valve, first stage, second stage or SPG
    ____ Demonstrate appropriate reaction to simulated free-flowing deco regulator
    ____ Demonstrate the ability to Buddy Breathe from a decompression gas
    ____ Oxygen rebreather mode at less than six (6) meter/19 foot stop
    ____ Complete two (2) bailout scenario at depth to include decompression obligation on open circuit

21. Demonstrate an adequate level of fitness by completing a minimum of a 50 meter/164 feet surface diver tow with both rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program: Score: ____

22. Complete all academic sessions and unit specific assessments as specified in the training material of the training agency and the manufacturer: Completed: ____

23. Complete a minimum of seven (7) training dives, including confided water skill development of at least one (1) hour, and six (6) core open water training dives with a minimum run time of 30 minutes each: Completed: ____

24. Complete a minimum of 420 minutes of total in-water time (including confined water) on the applicable unit: Completed: ____

25. Be able to independently complete a dive plan: Completed: ____

26. Complete the final course exam as set out by the training agency with a required minimum pass rate of 80% with 100% remediation: Completed: ____

Student Signature: _____ Date: _____
Instructor signature: _____Date: _____

In order to complete the students Dive Talk Go certification, this document must be completed in full, and emailed to: info@divetalkgo.com.

PLEASE PRINT CLEARLY - IF WE CAN'T READ YOUR WRITING, WE CAN NOT PROCESS THIS FORM. THANK YOU!

Dive Talk Gear, LLC. – Trimix CCR Diver 60m – Diver Course Evaluation Form

As per the Dive Talk Gear minimum required training standards, the course must be completed with the minimum required dives and minutes, along with discussion on required academic topics, and all required skills. The student must achieve a minimum score of 8 out of 10 points in all the following skill areas.

DTG minimum training standards may differ from approved training agency standards. As DTG minimum training standards are the minimum required standard, the approved training agencies may add to them. Instructors should check with the appropriate training agency to ensure that all standards have been met.

Student: _____ Instructor: _____
Course start date: _____ Course completion date: _____
DTG rebreather name & serial number: _____

Skills:

1. Pre-dive checks: Average score: ____
   - ____ Specific unit checklist
   - ____ Verify diluent and oxygen (O2) cylinder contents using gas analyzers
   - ____ Unit built up
   - ____ Scrubber canister filling
   - ____ Breathing loop check including mouthpiece one way valves and positive and negative check
   - ____ Sensor calibration in oxygen, with verification in air
   - ____ 5 minute pre-breathe
   - ____ Stage cylinder rigging

2. Demonstrate correct pre-dive planning procedures: Average score: ____
   - ____ Limits based on system performance
   - ____ Limits based on oxygen exposures at chosen PO2 levels
   - ____ Limits based on nitrogen absorption at planned depth and PO2 set point
   - ____ Appropriate selection of decompression conservatism/gradient factors for the planned dive
   - ____ Thermal constraints

3. Underwater verification: Average score: ____
   - ____ Stop at 3-6 meters/9-19 feet on descent for leak bubble check
   - ____ Counterlung and Over Pressure Valve adjustment, if necessary

4. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2, ”diver emergencies” that the student must react to: Average score: ____
   - ____ Properly execute a recovery from a system failure and conclude the dive and decompression on open circuit gases carried
   - ____ Gas shutdowns and loss of gas, correct choice and switching to off board gases.
   - ____ Broken hoses, catastrophic failure scenarios
   - ____ Flooded absorbent canister
   - ____ Cell errors

5. Demonstrate competence managing two (2) bailout cylinders, including drop and recovery while maintaining position in the water column: Score: ____

6. Rescue skill session as outlined by Training Agency: Score: ____

7. Use of buoyancy control system: Average score: ____
   ____ Buoyancy and trim control at safety stop
   ____ Buoyancy and trim control during dive
   ____ Buoyancy and trim control hover at fixed position in water column without moving hands or feet

8. Controlling and monitoring for PPO2 levels: Average score: ____
   ____ Raising/lowering PPO2
   ____ Starting PPO2
   ____ PPO2 monitoring every minute
   ____ Manual Add Valve verification: static at constant depth, monitor change over several minutes
   ____ Electronics systems monitoring for PPO2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)

9. Electronic systems use: Average score: ____
   ____ Use and adjustment of Heads Up Display, position, brightness, colour
   ____ Use and adjustment of PPO2/depth/time display, position, brightness, colour
   ____ Use and adjustment of decompression computer, set up/gas switching, battery verification, etc

10. Use of lift bag/DSMB and reel: Average score: ____
    ____ Use of lift bag/DSMB and reel at depth, and mid water
    ____ Simulate failed lift bag/DSMB deployment
    ____ On two (2) of the dives, demonstrate an ascent with ascent reel and lift bag and perform staged decompression

11. Mask removal and replacement: Score: ____

12. Proper execution of the dive within all pre-determined dive limits: Score: ____

13. Demonstration of decompression stops at pre-determined depths (on all dives): Score: ____

14. Cell validation checks with appropriate use of diluent and oxygen: Average score: ____
    ____ Oxygen sensor verification at depth
    ____ Linearity check of sensors at approximately 5 meter/16 feet on pure oxygen

15. Decompression related in-water skills: Average score: ____
    ____ Demonstrate proper understanding and implementation of team diving procedures to conduct bailout from a depth greater than 30 meters/98 feet
    ____ Demonstrate ability to plug in and share off-board gas, including sharing/swapping of off-board bailouts
    ____ Oxygen rebreather mode at less than six (6) meter/19 foot stop

16. Show awareness of buddy and other team members through communications, proximity and team oriented dive practices: Score: ____

17. Demonstrate an adequate level of fitness by completing a minimum of a 50 meter/164 feet surface diver tow with both rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program: Score: ____

18. Complete all academic sessions and unit specific assessments as specified in the training material of the training agency and the manufacturer: Completed: ____

19. Complete a minimum of six (6) training dives, including confided water skill development of at least one (1) hour, and five (5) core open water training dives with a minimum run time of 30 minutes each: Completed: ____

20. Complete a minimum of 360 minutes of total in-water time (including confined water) on the applicable unit: Completed: ____

21. Be able to independently complete a dive plan: Completed: ____

22. Complete the final course exam as set out by the training agency with a required minimum pass rate of 80% with 100% remediation: Completed: ____

Student Signature: _____ Date: _____
Instructor signature: _____Date: _____

In order to complete the students DTG certification, this document must be completed in full, and emailed to: info@divetalkgo.com

PLEASE PRINT CLEARLY - IF WE CAN'T READ YOUR WRITING, WE CAN NOT PROCESS THIS FORM. THANK YOU!

CCR DIVER

INTENT

The CCR Diver program provides divers with the knowledge and training necessary to independently plan and conduct unit specific no decompression closed-circuit rebreather (CCR) dives to a maximum depth of 30 meters/98 feet, using a manufacturer approved CCR unit with air as diluent utilizing CCR Diving procedures with a dive buddy diving on a rebreather or diving open circuit.

REQUIRED INSTRUCTOR RATING

An active status unit-specific CCR Instructor or higher may conduct the unit-specific CCR Diver program.

TEACHING RATIOS

- The maximum number of students for CCR training is 3:1
- The maximum number of students for no-decompression CCR training where one (1) student is making a crossover or doing a refresher is 4:1

These ratios should be reduced as required if the situation and/or environmental conditions call for it.

STUDENT PREREQUISITES

- Nitrox certification
- Have logged 20 open water dives
- Minimum age: 18

DURATION

- Recommended hours for course completion: 40
- Minimum number of days: 4
- Minimum number of hours for Academics and Dry practical: 8

MATERIALS AND EQUIPMENT

The minimum required student and Instructor equipment for this program includes:

A complete DT Go CCR Unit that:

- Is compliant to local laws, is approved by the training agency and is properly functioning
- Has no non-manufacturer approved modifications
- Depth gauge & bottom timer, or dive computer
- A single off-board bailout gas suitable for a safe return to the surface from the planned maximum depth including all safety and decompression stops in the event of an emergency
- For Open water and lake environments with the exception of cave/overhead environments a Delayed Surface Marker Buoy (DSMB) and a spool / reel appropriate for the planned dive depth.
- cutting device
- Access to an appropriate gas analyzer

The minimum required student and instructor materials for this program includes:

- DT Go Rebreather unit specific user manual
- Agency student training manual or online training course
- Agency instructor manual (electronic instructor manuals meet this requirement)
- Course liability release and assumption of risk (in accordance with local laws)
- Training agency approved medical document
- Unit specific checklist (units equipped with a built-in electronic checklist, meet this requirement)
- Manufacturer's sign off sheet/course completion document

All skills must be demonstrated by the instructor on the specific unit being trained

REQUIREMENTS FOR COMPLETION

Academics

Students shall have sufficient understanding and knowledge in the following subject areas listed. They should be capable of planning dives in the typical local conditions and environment and be able to plan for typical emergency situations.

1. Practical mechanics of a CCR
   - Assembly and disassembly specific to DT Go rebreather being used. Use unit specific manual as a guide
   - Unit Specific Check list
   - Design and overview of the DT Go unit
   - Insert O-rings where required
   - O-ring location and condition
   - Absorbent canister
   - Breathing loop
   - Automatic Diluent Valve: automatic and manual use
   - Manufacturer's supported add-ons: BOV, etc

2. Loop volume - minimum / optimum
   - Determine the correct counterlung size, & understand how to attain and maintain proper loop volume

3. Gas Physiology
   - Oxygen risks, Hypoxia, Hyperoxia
   - Carbon dioxide (CO_2) toxicity, Hypercapnia
   - Nitrogen absorption

4. Proper scrubber filling; in accordance with DT Go recommendations
   - Manufacturer's recommended scrubber medium, & procedures according to DT Go user manual

5. Electronic or Manual or Mechanical Systems Design and Maintenance
   - Oxygen (O_2) metabolizing calculations
   - Oxygen Sensors, limitations, care and replacement regime
   - System electronics functionality and calibration procedures
   - DT Go manual gas addition valve design and function. (raising and lowering of constant flow; determining correct flow rate for each individual)

6. Dive Tables
   - Constant partial pressure of oxygen (PPO_2) theory
   - Central nervous system (CNS) and Oxygen Tolerance Unit (OTU) tracking and awareness

7. Dive Computers
   - Mix adjustable
   - Constant PO_2
   - Decompression conservatism / Gradient factor selection
   - Oxygen (O_2) integrated

8. Dive Planning
   - Operational planning

- Gas consumption
- Scrubber duration
- Gas requirements including bailout scenarios
- Oxygen limitations
- Nitrogen limitations

9. Emergency Procedures
   - Flooded loop
   - Cell warnings
   - Battery warnings
   - Electronic failures

Skills

1. Pre-dive checks
   - Specific Unit Checklist
   - Verify diluent and oxygen (O_2) cylinder contents using gas analyzers
   - Unit build-up
   - Scrubber canister filling
   - Breathing loop check including mouthpiece one-way valves and positive and negative check
   - Sensor calibration in oxygen, with verification in air
   - 5 minute pre-breathe
   - Bailout bottle/stage cylinder rigging
2. Demonstrate correct pre-dive planning procedures including
   - Limits based on system performance
   - Limits based on oxygen exposures at chosen PO_2 levels
   - Limits based on nitrogen absorption at planned depth and PO_2 set point
   - Appropriate selection of decompression conservatism / gradient factors for the planned dive
   - Thermal constraints
3. Underwater verification
   - Stop at 3-6 meters/9-19 feet on descent for leak bubble check
   - Counterlung & Over Pressure Valve adjustment, if necessary
4. Mouthpiece familiarity skills
   - BOV: switch between open and closed circuit
   - DSV: switch to bailout system
5. Adding diluent gas/ADV familiarity skills
   - ADV: Adding diluent gas and understand how it works
   - BOV: Use BOV to add diluent gas to the loop – 2 ways
   - Bail out second stage: Use to add diluent gas to the loop
   - Dual button MAV: Adding diluent gas (if unit is shipped with this item)
6. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2 “diver emergencies” that the student must react to.
   - Practical bailout skills: including 2 open circuit ascents from approximately 18 meter/59 feet.
   - Gas shutdowns and loss of gas

- Broken hoses
- Flooded absorbent canister
- Carbon dioxide (CO_2) breakthrough
- Low oxygen drills
- High oxygen drills
- Flooding loop
- Electronics, sensor, and battery failure

7. Practice transferring to open circuit bailout
8. Rescue skill session as outlined by the training agency
9. Use of a buoyancy control system
   - Buoyancy/trim control during dive
   - Buoyancy/trim control at safety stop
10. Controlling and monitoring for PPO2 levels:
    - Raising/lowering PPO2
    - Starting PPO2
    - PPO2 monitoring every minute
    - Manual Add Valve verification: static at constant depth, monitor change over several minutes
    - Electronics systems monitoring for PPO2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)
11. Electronic systems use:
    - Use and adjustment of Heads Up Display, position, brightness, colour
    - Use and adjustment of PPO2/depth/time display, position, brightness, colour
    - Use and adjustment of decompression computer, set up/gas switching, battery verification, etc
12. Use of lift bag / DSMB and reel (where relevant and applicable)
13. Mask removal and replacement
14. Proper execution of the dive within all pre-determined dive limits
15. Demonstration of safety stops at pre-determined depths (on all dives)
16. Constant loop volume management
17. Cell validation checks with appropriate use of diluent and oxygen
    - Oxygen sensor verification at depth
    - Do voltage limited test on sensors at approximately 5 meter/16 feet on pure oxygen
18. Post dive clean of unit
    - Mouth piece and hoses
    - Clean and disinfect unit
    - Inspect components of unit
19. Diver maintenance of unit
    - Cell removal and replacement
    - Mouthpiece care
    - Replacing or re-charging of batteries

EXTRA REQUIREMENTS FOR COMPLETION

- Demonstrate an adequate level of fitness by completing a minimum of a 50m/164 feet surface diver tow with both the rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program.
- Complete all academic sessions and unit specific assessments as specified in the training material of the Training Agency and the Manufacturer.
- Complete a minimum of seven (7) training dives, including confined water skill development of at least one (1) hour, and six (6) core open water training dives with a minimum run time of 30 minutes each.
- Complete at least a minimum of 420 minutes of total in-water time on the applicable CCR unit.
- Be able to independently complete a full dive plan
- Complete a final course exam as set out by the training agency and / or manufacturer with a required minimum pass rate of 80% with 100% remediation.
- When the feature is available on a rebreather, download the student's dive logs of all training dives and retain for a minimum of seven years.
- If the feature is not available on a rebreather, download the dive logs from the students dive computer and retain for a minimum of seven years
- Fill in and sign a course completion form confirming all academics and practical sessions have been completed

Dive logs and student-signed course completion form are to submitted to the manufacturer of the specific unit on request

DEPTH LIMITATIONS

- Open Water Training Dives shall be initially shallow, progressively increasing in depth.
- Two (2) dives must be deeper than 20 meters/65 feet for certification
- All dives must be conducted at a depth shallower than 30 meters/98 feet.

NOTES

- All training dives must be planned within the no-decompression limits of the Combined Air/EAN Tables or the student's personal dive computer or computer-generated decompression profiles.
- Bailout cylinder gas is to be based on a maximum PPO_2 of 1.6 at the maximum depth of the dive.
- Divers should not carry an on-board diluent gas with a PPO_2 higher than 1.1 bar at the bottom.
- The maximum loop set point is 1.3 bar.
- It is recommended that the student finish the training course within 6 weeks of the starting date.
- It is recommended that the student have access to, or purchase a unit within 3 months of completing the training program.
- Only approved training agencies and instructors may teach a DT Go rebreather course.

Diving in an overhead environment

This course shall not be conducted in an overhead environment. Subject to training agency approval certain dive sites can be deemed suitable for the CCR Diver course under the following conditions:

- The student must remain in the daylight zone where there is no need for the use of a dive light
- The student must never be a distance of more than 132 linear feet / 40 linear meters from the surface

SEQUENCE

Open Water Training Dives 1 and 2 may only be conducted after completing the equipment configuration section, the surface diver tow and all confined water sessions.

CERTIFICATION

The unit specific CCR Diver certification entitles the holder to dive with a buddy, diving on a rebreather or diving open circuit, utilizing CCR diving procedures to make non decompression dives to depths of up to 30 meters/98 feet, providing that dives are conducted in environments similar to those of the diver's training and experience.

CCR DECOMPRESSION DIVER

INTENT

The intent of the Decompression CCR Diver program is to provide divers with the training necessary to independently plan and conduct unit specific decompression dives using air diluent, to a maximum depth of 40 meters/131 feet, and utilizing CCR diving procedures with a dive buddy diving on a rebreather or diving open circuit.

REQUIRED INSTRUCTOR RATING

An active status unit-specific Decompression CCR Instructor or higher may conduct the unit-specific Decompression CCR Diver program. The instructor must be qualified as a unit-specific CCR Decompression diver 40 m/131 ft Instructor or higher to conduct the Decompression CCR Diver program.

TEACHING RATIOS

- The maximum number of students for CCR training is 3:1
- The maximum number of students for where one (1) student is making a crossover or doing a refresher is 4:1

These ratios should be reduced as required if the situation and/or environmental conditions call for it.

STUDENT PREREQUISITES

- An advanced level of Nitrox understanding. This is to include but not limited to the use of gases up to 100% Oxygen for decompression, tracking of CNS and OTU's, gas planning and accelerated decompression.
- Have logged 40 open water dives
- Minimum Age: 18

OR

- CCR diver with minimum 20 dives / 20 hours on the specific unit
- Minimum age: 18

DURATION

- Recommended hours for course completion: 40
- Minimum number of days: 4
- Minimum number of hours for Academics and Dry practical: 8

MATERIALS AND EQUIPMENT

The minimum required student and Instructor equipment for this program includes:

A complete CCR Unit that:

- Is compliant to local laws, is approved by the training agency, is properly functioning and is appropriate for bailout and accelerated decompression diving
- Has no non-manufacturer approved modifications
- Depth gauge & bottom timer, or dive computer
- A single off-board bailout gas suitable for a safe return to the surface from the planned maximum depth including all safety and Decompression stops in the event of an emergency
- Backup OC/CCR computer for bailout in the event of a system failure
- For Open water and lake environments with the exception of cave/overhead environments a Delayed Surface Marker Buoy (DSMB) and spool / reel appropriate for the planned dive depth
- A back up Delayed Surface Marker Buoy (DSMB) and spool / reel appropriate for the planned dive depth
- cutting device
- Access to appropriate gas analyzers

The minimum required student and instructor materials for this program includes:

- DT Go Rebreather unit specific user manual
- Agency student training manual or online training course
- Agency instructor manual (electronic instructor manuals meet this requirement)
- Course liability release and assumption of risk (in accordance with local laws)
- Training agency approved medical document
- Unit specific checklist (units equipped with a built in electronic checklist, meet this requirement)
- Manufacturer's sign off sheet/course completion document

All skills must be demonstrated by the instructor on the specific unit being trained.

REQUIREMENTS FOR COMPLETION

Academics

Students shall have sufficient understanding and knowledge in the following subject areas listed. They should be capable of planning dives in the typical local conditions and environment and be able to plan for typical emergency situations.

1. Practical mechanics of a CCR
   - Assembly and disassembly specific to DT Go rebreather being used. Use unit specific manual as a guide
   - Unit Specific Check list
   - Design and overview of the DT Go unit
   - Insert O-rings where required
   - O-ring location and condition
   - Absorbent canister
   - Breathing loop
   - Automatic Diluent Valve: automatic and manual use
   - Manufacturer's supported add-ons: BOV, ADV, etc

2. Loop volume - minimum / optimum
   - Determine the correct counterlung size, & understand how to attain and maintain proper loop volume

3. Gas Physiology
   - Oxygen risks, Hypoxia, Hyperoxia
   - Carbon dioxide (CO_2) toxicity, Hypercapnia
   - Nitrogen absorption

4. Proper scrubber filling; in accordance with DT Go recommendations
   - Manufacturer's recommended scrubber medium, & procedures according to DT Go user manual

5. Electronic or Manual or Mechanical Systems Design and Maintenance
   - Oxygen (O_2) metabolizing calculations
   - Oxygen Sensors, limitations, care and replacement regime
   - System electronics functionality and calibration procedures
   - DT Go manual gas addition valve design and function. (raising and lowering of constant flow; determining correct flow rate for each individual)

6. Dive Tables
   - Constant partial pressure of oxygen (PPO_2) theory
   - Central nervous system (CNS) and Oxygen Tolerance Unit (OTU) tracking and awareness
7. Dive Computers

- Mix adjustable
- Constant PO_2
- Decompression conservatism / Gradient factor selection
- Oxygen (O_2) integrated

8. Dive Planning
   - Operational planning
   - Gas consumption
   - Scrubber duration
   - Gas requirements including bailout scenarios
   - Oxygen limitations
   - Nitrogen limitations

9. Emergency Procedures
   - Flooded loop
   - Cell warnings
   - Battery warnings
   - Electronic failures

Skills

1. Pre-dive checks
   - Specific Unit Checklist
   - Verify diluent and oxygen (O_2) cylinder contents using appropriate gas analyzers
   - Unit build-up
   - Scrubber canister filling
   - Breathing loop check including mouthpiece one way valves and positive and negative check
   - Sensor calibration in oxygen, with verification in air
   - 5 minute pre-breathe
   - Stage cylinder rigging

2. Demonstrate correct pre-dive planning procedures including
   - Limits based on system performance
   - Limits based on oxygen exposures at chosen PO_2 levels
   - Limits based on nitrogen absorption at planned depth and PO_2 set point
   - Appropriate selection of decompression conservatism / gradient factors for the planned dive
   - Thermal constraints

3. Underwater verification
   - Stop at 3-6 meters/9-19 feet on descent for leak bubble check
   - Counterlung & Over Pressure Valve adjustment, if necessary

4. Mouthpiece familiarity skills
   - BOV: switch between open and closed circuit
   - DSV: switch to bailout system

5. Adding diluent gas/ADV familiarity skills
   - ADV: Adding diluent gas and understand how it works
   - BOV: Use BOV to add diluent gas to the loop – 2 ways
   - Bail out second stage: Use to add diluent gas to the loop

- Dual button MAV: Adding diluent gas (if unit is shipped with this item)

6. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2 “diver emergencies” that the student must react to.
   - Practical bailout skills: including 2 open circuit ascents from approximately 18 meter/59 feet.
   - Gas shutdowns and loss of gas
   - Broken hoses
   - Flooded absorbent canister
   - Carbon dioxide (CO_2) breakthrough
   - Low oxygen drills
   - High oxygen drills
   - Flooding loop
   - Electronics, sensor, and battery failure
7. Practice transferring to open circuit bailout
8. Rescue skill session as outlined by the training agency
9. Use of a buoyancy control system
   - Buoyancy and trim control at safety stop
   - Buoyancy and trim control during dive
10. Controlling and monitoring for PPO2 levels:
    - Raising/lowering PPO2
    - Starting PPO2
    - PPO2 monitoring every minute
    - Manual Add Valve verification: static at constant depth, monitor change over several minutes
    - Electronics systems monitoring for PPO2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)
11. Electronic systems use:
    - Use and adjustment of Heads Up Display, position, brightness, colour
    - Use and adjustment of PPO2/depth/time display, position, brightness, colour
    - Use and adjustment of decompression computer, set up/gas switching, battery verification, etc
12. Use of lift bag / DSMB and reel (where relevant and applicable)
13. Mask removal and replacement
14. Proper execution of the dive within all pre-determined dive limits
15. Demonstration of safety stops at pre-determined depths
16. Constant loop volume management
17. Cell validation checks with appropriate use of diluent and oxygen
    - Oxygen sensor verification at depth
    - Voltage limited test on sensors at approximately 5 meter/16 feet on pure oxygen
18. Post dive clean of unit
    - Mouth piece and hoses
    - Clean and disinfect unit
    - Inspect components of unit

19. Diver maintenance of unit
    - Cell removal and replacement
    - Mouthpiece care
    - Replacing or re-charging of batteries

20. Decompression related in water skills
    - Demonstrate the ability to drop and retrieve one (1) bailout cylinder while maintaining position in the water column
    - Demonstrate appropriate reaction to gas hemorrhage from bailout valve, first stage, second stage or SPG
    - Demonstrate appropriate reaction to simulated free-flowing deco regulator
    - Demonstrate the ability to Buddy breathe from a decompression gas
    - Oxygen rebreather mode at less than six (6) meter/19 foot stop
    - Complete two (2) bailout scenario at depth to include decompression obligation on open circuit

EXTRA REQUIREMENTS FOR COMPLETION

- Demonstrate an adequate level of fitness by completing a minimum of a 50m/164 ft surface diver tow with both the rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program
- Complete all academic sessions and unit specific assessments as specified in the training material of the Training Agency and the Manufacturer.
- Complete a minimum of seven (7) training dives, including confined water skill development of at least one (1) hour, and six (6) core open water training dives with a minimum run time of 30 minutes each.
- Complete at least a minimum of 420 minutes of total in-water time on the applicable CCR unit.
- Be able to independently complete a full dive plan
- Complete a final course exam as set out by the training agency and / or manufacturer with a required minimum pass rate of 80% with 100% remediation.
- When the feature is available on a rebreather, download the student's dive logs of all training dives and retain for a minimum of seven years.
- If the feature is not available on a rebreather, download the dive logs from the students dive computer and retain for a minimum of seven years
- Fill in and sign a course completion form confirming all academics and practical sessions have been completed

Dive logs and student-signed course completion forms are to submitted to the manufacturer of the specific unit on request

DEPTH LIMITATIONS

- Open Water Training Dives shall be initially shallow, progressively increasing in depth.
- Two (2) dives must be deeper than 30 meters/98 feet for certification
- All dives must be conducted at a depth shallower than 40 meters/131 feet.

CREDIT

- Students upgrading from CCR Diver to CCR Decompression Diver need to perform an evaluation dive, plus a minimum of four (4) open water divers with two (2) dives greater than 30m/98 feet.

NOTES

- Bailout cylinder gas is to be based on a maximum PPO_2 of 1.6 at the maximum depth of the dive.
- Divers should not carry an on-board diluent gas with a ppO_2 higher than 1.1 bar at the bottom.
- The maximum loop set point is 1.3 bar.
- It is recommended that the student finish the training course within 6 weeks of the starting date.
- It is recommended that the student have access to, or purchase a unit within 3 months of completing the training program.
- Only approved training agencies and instructors may teach a DT Go rebreather course.

Diving in an overhead environment

This course shall not be conducted in an overhead environment. Subject to training agency approval certain dive sites can be deemed suitable for the CCR Diver course under the following conditions:

- The student must remain in the daylight zone where there is no need for the use of a dive light.

- The student must never be a distance of more than 132 linear feet / 40 linear meters from the surface

SEQUENCE

Open Water Training Dives 1 and 2 may only be conducted after completing the equipment configuration section, the Surface Diver tow and all confined water sessions.

CERTIFICATION

The unit-specific Decompression CCR Diver certification entitles the holder to dive with a buddy, diving on a rebreather or diving open circuit, on dives utilizing CCR diving procedures to depths of up to 40m /131 feet with air diluent, and requiring staged decompression stops providing that dives are conducted in environments similar to those of the diver's training and experience.

TRIMIX CCR DIVER 60m

INTENT

The intent of the CCR Trimix 60m Diving program is to provide divers with the training necessary to independently plan and conduct unit specific multiple-stop decompression dives to depths of up to 60m/196 feet using trimix with a minimum of 16% oxygen and utilizing CCR diving procedures with a buddy diving on a rebreather or diving open circuit.

REQUIRED INSTRUCTOR RATING

An active status unit specific CCR Trimix 60m Diving Instructor or higher may conduct the unit specific CCR Trimix 60m Diving program.

TEACHING RATIOS

- The maximum number of students for CCR training is 3:1

This ratio should be reduced as required if the situation and/or environmental conditions call for it.

STUDENT PREREQUISITES

- Decompression CCR Diver
- Have logged a minimum of 50 CCR dives over a minimum of 50 hours, including at least 20 dives deeper than 30m/98 feet and at least ten (10) dives requiring staged decompression.
- At least 25 dives / 25 hours are required on the specific unit.
- Minimum Age: 18

DURATION

- Minimum hours for course completion: 40
- Minimum number of days: 4

MATERIALS AND EQUIPMENT

The minimum required student and Instructor equipment for this program includes:

A complete CCR Unit that:

- Is compliant to local laws, is approved by the training agency, is properly functioning and is appropriate for bailout and accelerated decompression diving
- Has no non-manufacturer approved modifications
- Depth gauge & bottom timer, or dive computer
- Two off-board stage cylinders, one for bottom bailout, one for decompression suitable for a safe return to the surface including all safety and decompression stops in the event of an emergency
- Backup OC/CCR computer for bailout in the event of a system failure
- For Open water and lake environments with the exception of cave, a Delayed Surface Marker Buoy (DSMB) and spool / reel appropriate for the planned dive depth
- A back up Delayed Surface Marker Buoy (DSMB) and spool / reel appropriate for the planned dive depth
- Backup mask
- Cutting device
- Access to appropriate gas analyzers

All skills must be demonstrated by the instructor on the specific unit being trained.

The minimum required student and instructor materials for this program includes:

- DT Go Rebreather unit specific user manual
- Agency student training manual or online training course

- Agency instructor manual (electronic instructor manuals meet this requirement)
- Course liability release and assumption of risk (in accordance with local laws)
- Training agency approved medical document
- Unit specific checklist (units equipped with a built in electronic checklist, meet this requirement)
- Manufacturer's sign off sheet/course completion document

REQUIREMENTS FOR COMPLETION

Academics

Students shall have sufficient understanding and knowledge in the following subject areas listed. They should be capable of planning dives in the typical local conditions and environment and be able to plan for typical emergency situations.

1. Gas Physiology
   - Oxygen (O_2) toxicity, Hypoxia, Hyperoxia
   - Central nervous system (CNS) tracking
   - Oxygen tracking units (OTU)
   - Oxygen (O_2) metabolizing calculations
   - Carbon dioxide (CO_2) Toxicity, Hypercapnia
   - Nitrogen absorption
   - Equivalent narcosis depth theory
   - Helium absorption
   - HPNS
2. Gas mixing
3. Formula Work
4. Manually controlled closed circuit rebreathers
5. Dive Tables.
   - Creation of custom dive tables appropriate to dive depths
   - Creation of lower percentage of oxygen (PO_2) diluent to support loop flushing and bailout at depth
6. Dive Computers.
   - Mix adjustable
   - Constant PO_2
   - Decompression Conservatism / Gradient Factor selection
   - Oxygen (O_2) integrated
7. Dive Planning
   - Operational planning
   - Scrubber Duration
   - Gas requirements including bailout scenarios
   - Gas consumption
   - Gas management
8. Decompression on a CCR
   - Oxygen limitations
   - Nitrogen limitations
   - Helium limitations

9. Unit Assembly
    - Loop configurations
10. Unit Specific Check list
11. Equipment Maintenance
    - Fuel cell management
    - Date stamps
    - Replacement
12. Additional fitted equipment and modifications
    - Auto diluent addition
    - Dual mode mouthpieces
    - Heads up display
    - Additional manual injectors
    - Integrating oxygen monitors for dive computers

Skills

1. Pre-dive checks
    - Specific Unit Checklist
    - Verify diluent and oxygen (O_2) cylinder contents using appropriate gas analyzers
    - Unit build-up
    - Scrubber canister filling
    - Breathing loop check including mouthpiece one way valves and positive and negative check
    - Sensor calibration in oxygen, with verification in air
    - 5 minute pre-breathe
    - Stage cylinder rigging
2. Demonstrate correct pre-dive planning procedures including
    - Limits based on system performance
    - Limits based on oxygen exposures at chosen PO_2 levels
    - Limits based on nitrogen absorption at planned depth and PO_2 set point
    - Appropriate selection of decompression conservatism / gradient factors for the planned dive
    - Thermal constraints
3. Underwater verification
    - Stop at 3-6 meters/9-19 feet on descent for leak bubble check
    - Counterlung & Over Pressure Valve adjustment, if necessary
4. Emergency procedures: demonstrate appropriate response to the following; each dive should have a minimum of 2 “diver emergencies” that the student must react to.
    - Properly execute a recovery from a system failure and conclude the dive and decompression on open circuit gases carried
    - Gas shutdowns and loss of gas, correct choice and switching to off board gases
    - Broken hoses, catastrophic failure scenarios
    - Flooded absorbent canister
    - Cell errors
5. Demonstrate competence managing two (2) bailout cylinders, including drop and recovery while maintaining position in the water column

6. Rescue skill session as outlined by the training agency

7. Use of Buoyancy control system
   - Buoyancy and trim control at safety stop
   - Buoyancy and trim control during dive
   - Demonstrate buoyancy control; ability to hover at fixed position in water column without moving hands or feet

8. Controlling and monitoring for PPO2 levels:
   - Raising/lowering PPO2
   - Starting PPO2
   - PPO2 monitoring every minute
   - Manual Add Valve verification: static at constant depth, monitor change over several minutes
   - Electronics systems monitoring for PPO2 levels (SETPOINT) and setpoint switching using manual and pre-programmed methods when available (when the unit is equipped with an on board decompression computer that monitors sensors)

9. Electronic systems use:
   - Use and adjustment of Heads Up Display, position, brightness, colour
   - Use and adjustment of PPO2/depth/time display, position, brightness, colour
   - Use and adjustment of decompression computer, set up/gas switching, battery verification, etc

10. Use of lift bag/DSMB and reel
    - Use of lift bag/DSMB and reel at depth, and mid water
    - Simulate failed lift bag/DSMB deployment
    - On two (2) of the dives, demonstrate an ascent with ascent reel and lift bag and perform staged decompression

11. Mask removal and replacement

12. Proper execution of the dive within all pre-determined dive limits

13. Demonstration of decompression stops at pre-determined depths

14. Cell validation checks with appropriate use of diluent and oxygen
    - Oxygen sensor verification at depth
    - Linearity check of sensors at approximately 5 meters/16 feet on pure oxygen

15. Decompression related in water skills
    - Demonstrate proper understanding and implementation of team diving procedures to conduct bailout from a depth greater than 30 meters/98 feet.
    - Demonstrate ability to plug in and share off-board gas, including sharing/swapping of off-board bailouts
    - Oxygen rebreather mode in depths less than six (6) meters/19 feet

16. Show good awareness of buddy and other team members through communications, proximity and team oriented dive practices

EXTRA REQUIREMENTS FOR COMPLETION

- Demonstrate an adequate level of fitness by completing a minimum of a 50m/164 feet surface diver tow with both the rescuer and the victim wearing a complete CCR diving system and bailout cylinder(s) applicable to their specific program
- Complete all academic sessions and unit specific assessments as specified in the training material of the Training Agency and the Manufacturer.
- Complete at least six (6) training dives, including one open water skill development session of at least one (1) hour, and a minimum of five (5) open water training dives, with a minimum runtime of at least 30 minutes each.
- Complete a minimum of 360 minutes of total in-water time on the applicable CCR unit.

- Be able to independently complete a full dive plan
- Complete a final course exam as set out by the training agency and / or manufacturer with a required minimum pass rate of 80% with 100% remediation.
- When the feature is available on a rebreather, download the student's dive logs of all training dives and retain for a minimum of seven years.
- If the feature is not available on a rebreather, download the dive logs from the students dive computer and retain for a minimum of seven years
- Fill in and sign a course completion form confirming all academics and practical sessions have been completed

Dive logs and student signed course completion forms are to be submitted to the manufacturer of the specific unit on request

DEPTH LIMITATIONS

- Open Water Training Dives shall be initially shallow, progressively increasing in depth.
- Two (2) dives should be deeper than 30 meters/98 feet
- And an additional two (2) dives should be deeper than 50 meters/164 feet for certification
- All dives must be conducted at a depth shallower than 60 meters/196 feet.

NOTES

- Dives 1 and 2 must be planned within the no-decompression limits of the Combined Air/EAN Tables or the student's personal dive computer or computer-generated decompression profiles.
- The planned decompression obligation (total ascent time including all decompression stops) for training dives must not exceed 30 minutes for dives 3 and 4, and must not exceed 60 minutes for dives 5 and 6.
- At least one (1) dive must have a total run time in excess of 60 minutes.
- If environmental or water conditions make it unsafe or impractical to meet the cumulative time requirement in six (6) dives, additional training dives should be scheduled.
- Bailout cylinder gas to be based on a maximum PPO_2 of 1.6 at the maximum depth of the dive.
- Divers should not carry an on-board diluent gas with a PPO_2 higher than 1.2 bar at the bottom.
- The maximum loop set point is 1.3 bar.
- The maximum END for the Diluent for the bottom part of the dive, cannot be greater than 30m/98 feet

Diving in an overhead environment

- All skills must be demonstrated in an open water environment prior to entering the overhead environment
- The Instructor must be an active status overhead instructor for the particular environment
- The Diver must hold the user level overhead certification for the particular environment

SEQUENCE

Open Water Training Dive 2 may only be conducted after completing the surface diver tow and all the open water skill development session.

CERTIFICATION

The unit-specific CCR Trimix 60m Diving certification entitles the holder to dive autonomously with a buddy, diving on a rebreather or diving open circuit, on dives using Trimix with a minimum of 16% oxygen, utilizing CCR procedures to depths of 60m/196 feet, and requiring unlimited staged decompression
stops with a maximum of two bail out gas mixtures, providing that dives are conducted in environments similar to those of the diver's training and experience.

CCR DIVER CROSSOVER

INTENT

The intent of the program is to provide divers already certified on a unit with additional unit specific training to get certified on an additional unit, following RESA minimum training standards.

REQUIRED INSTRUCTOR RATING

An active status unit specific CCR instructor at the level the candidate is crossing over for

ADMINISTRATIVE REQUIREMENTS

- Course liability release and assumption of risk (in accordance with local laws)
- Health screening document
- Anything else as required by the Training Agency or manufacturer

STUDENT PREREQUISITES

- Be certified as a CCR Diver from a RESA recognized training agency
- Show proof of 10 logged CCR dives in the last 12 months
- Minimum age 18 years

NOTE

- Crossover is not allowed for certifications on SCR or PSCR, or for CCR certifications that only allow a lesser dive depth: in all these cases a full course is mandatory
- Crossover applies to rebreathers of different brand/manufacturers
- Crossovers between similar units of the same brand/manufacturer may require an upgrade course as specified by the manufacturer

MATERIALS AND EQUIPMENT

- As specified in the specific diver level course standard

DURATION

- Recommended hours for course completion: 16 to 24
- The number of classes, hours and sessions per day are set by the training agency.

REQUIREMENTS FOR COMPLETION

The crossover course will include:

- CCR assembly workshop.
- A 60 minute water skills evaluation in a confined skill session. All skills from the level the candidate is crossing over at must be demonstrated successfully prior to open water dives.
- Complete a minimum of 4 open water dives and a total accumulated dive time of minimum 240 minutes, demonstrating proficiency in all skills from the level the diver is crossing over at
- Complete a final exam with a passing score as specified by the Training Agency and the Manufacturer.