



AP Rebreather Mouthpiece

("DSV, dive/surface valve") ("open/closed mouthpiece valve")
("standard mouthpiece")

User Instruction Manual

March 2023

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Quick Look:**Installation note:**

When fitting your own convoluted hoses to the new mouthpiece, ensure the hose locking nuts are securely hand-tightened to the mouthpiece, the self-tapping pozidrive screws are no longer required.

Warning:

The operating lever is designed for use in two positions, fully open or fully closed; do not use with the lever between the two positions, as you will inhale water!



The photograph above shows the underside of the mouthpiece valve showing the operating lever and the two moulded-in flanges which allow one handed operation. The rotational inner and outer body are injection moulded in a PTFE filled, self-lubricating, acetal polymer. The slotted lock screw, top left, prevents accidental unscrewing of the blue inhale-valve-holder (not visible). The operating lever, made in nickel-plated-brass, screws into a moulded-in brass-threaded-insert for added strength.

General Precautions and Warnings

Please read the instructions in this manual carefully before using the Rebreather Mouthpiece.

Before using this product, you must receive instruction and certification in diving rebreathers from a recognised training agency. Use of this Mouthpiece by uncertified or untrained persons is dangerous and can result in injury or death. It is very easy to configure the Mouthpiece and/or use it in an unsafe manner. Even if specific training is undertaken in its configuration and use, it is still possible to injure yourself through carelessness.

Factory / Dealer prescribed service for this Mouthpiece is recommended at least once annually by a factory trained AP Diving service technician. Disassembly or repair must not be attempted by persons who are not factory trained and authorised by AP Diving.

Introduction

Thank you for choosing an AP Diving product. This Mouthpiece has been designed and manufactured with pride under a SGS Quality Assured BS EN ISO 9001 Quality management system.

Before you dive with your new Mouthpiece, it is important to read this manual in its entirety to become familiar with its features, as well as the correct procedures for setup, pre-dive inspection and post-dive maintenance.

Risks against which the PPE is intended to protect

The RB160 AP Rebreather Mouthpiece is a respiratory protective device intended for diving purposes only. It must be used in conjunction with an AP Diving closed circuit rebreather, the Inspiration XPD, EVP or EVO. The whole rebreather assembly including the Mouthpiece, makes it possible to supply the user with a breathable gaseous mixture under foreseeable conditions of use, whilst taking account to the maximum depth of immersion.

Limitations

CE Maximum certified depth: Closed Circuit = 100m.

This product is only available to trained divers with an appropriate level, AP Diving rebreather specific qualification from a recognised rebreather training agency.

Further information regarding use and limitations can be found in the Inspiration (XPD, EVP & EVO) Rebreather User manual.

Functional description

The RB160 is designed to allow one handed operation when opening and closing. The Mouthpiece utilises a lever and two ergonomically designed moulded fins to rotate the inner core between each position. The Mouthpiece houses the one-way valves and is retrofittable to all existing AP hoses.

Features

- Robust, injection-moulded, construction with strengthening ribs, moulded in acetal (Delrin is one brand name for acetal) with PTFE compounded in to add a degree of self-lubrication.
- An offset mouthpiece lowers the mouthpiece body relative to the mouth, increasing the diver's field of view while also allowing the diver to access a camera's viewport more easily.
- True single-handed operation with either hand; simply squeeze the lever towards the moulded-in fin(s) eliminating the need to grip tightly in the mouth or hold with your other hand.
- Tactile feedback when switching.
- The position of the operating lever is visible to the buddy diver/instructor/dive supervisor.
- 15% improvement in work of breathing, compared to previous version.
- Inbuilt one-way silicone valves reduce CO₂ dead space.
- Optimum sized water channel allows easy clearing, before opening the valve.
- Deep ty-rap channel for secure mouthpiece attachment
- Completely compatible with the RBSM (rebreather-safety-mouthpiece with head strap), fitted in picture below, which gives greater security and eliminates jaw fatigue on long duration dives.

Product Operation



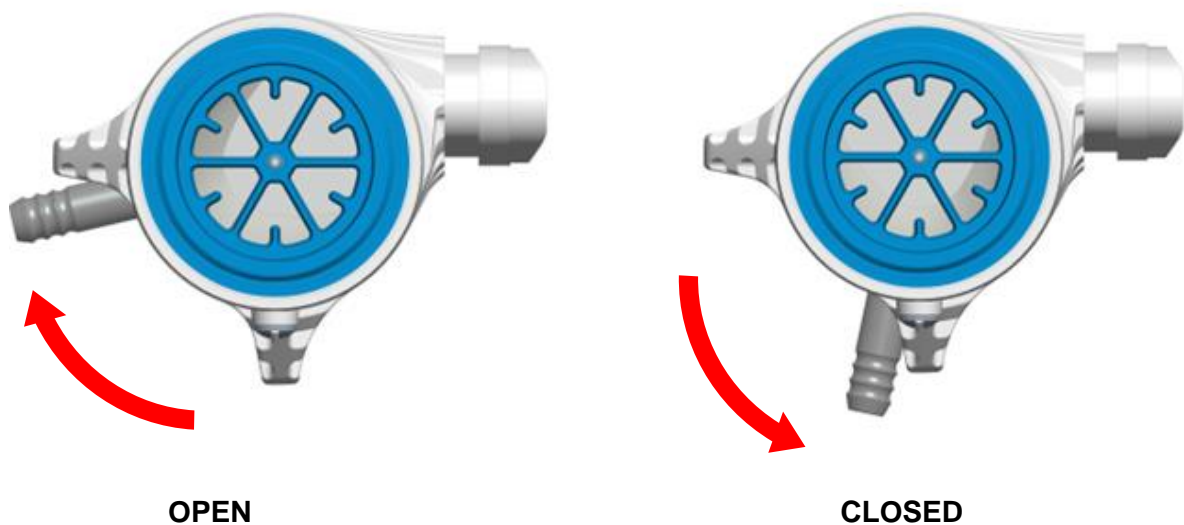
The mouthpiece is designed specifically for the AP Diving range of rebreathers which have a left to right (of the user) gas direction.

Warning:

The R160 rebreather mouthpiece is **only** suitable for left to right (of the user) gas direction. If inserted the wrong way, the non-return valves will leak as the upstream surfaces are designed for improved flow, they are not designed to seal.

The valve has a simple lever to open and close the valve. As per your basic rebreather training, it is essential to close the mouthpiece before removing it from your mouth. Failure to do so will result in an instant loss of buoyancy and you are likely to allow water into the rebreather.

The two modes (open and closed) are selected by rotating the lever upwards or downwards, which in turn rotates the internal components within the main body. The valve is opened by rotating the lever upwards, away from your chin, to where the lever is opposite the mouthpiece opening, pointing forwards. The closed position is activated when the lever is pulled towards you where the lever is pointing downwards, approximately perpendicular to the mouthpiece.



Initial Configuration

Your mouthpiece is retrofittable to all AP Diving Rebreathers. When purchased with new convoluted hoses, it will come ready assembled for connection to the counterlung T pieces.

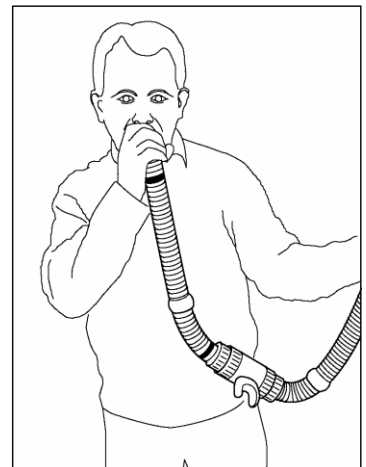
If fitting to your existing convoluted hoses:

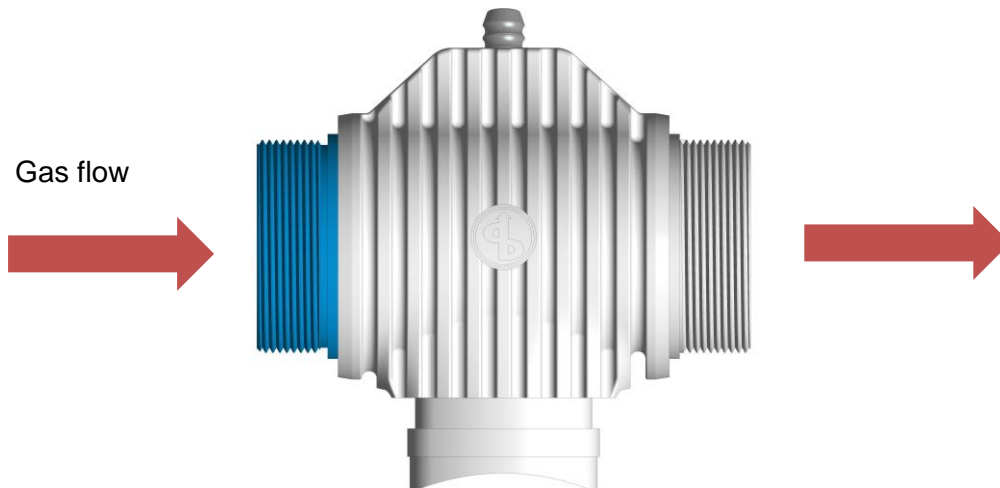
1. Remove the two pozidrive screws which lock your inhale (RB07/03) and exhale hoses (RB07/04) to your existing Mouthpiece or OCB and unscrew both hose nuts, anti-clockwise.
2. Either lubricate, with silicone grease, the existing hose O rings in the swivel stems - the moulding inside the nose nuts or replace the O rings with the ones provided with the mouthpiece, O ring size:BS029 N70 (dimensions: 41.38mm OD, 37.82mm ID), taking the opportunity to clean the O ring groove in the stem and lubricate with silicone grease. Be careful not to scratch any surfaces.
3. Now screw your convoluted hoses onto your new RB160 AP Rebreather Mouthpiece, ensuring the blue insert end of the mouthpiece is connected to your inhale hose (RB07/03), i.e. the hose fitted with the blue ident rings. Tighten securely; hand-tight is sufficient.
4. Do **NOT** refit the pozidrive screws; they are no longer required as the rotational inner is separated from the male-threaded hose connections, so there is no longer any rotational force on the hose connection when opening and closing the mouthpiece. The opening and closing of the valve is one handed and there is no need to hold the mouthpiece or hose nuts with the other hand, as both opening and closing involves nothing more than a squeezing motion between thumb and forefinger.
5. Conduct a thorough positive pressure test while immersing the closed mouthpiece and follow with a thorough negative pressure check.

PRE-DIVE INSPECTION check list

It is essential to perform a complete pre-dive inspection of your mouthpiece valve before every dive. NEVER dive with any diving equipment that shows signs of damage, debris, loose connections or unsatisfactory performance.

1. Carefully inspect all hose fittings to ensure they are securely connected at both ends. Inspect along the length of each hose to ensure that the hoses are not blistered, cut, or otherwise damaged.
2. Visually inspect the mouthpiece for any signs of external damage or debris.
3. Visually inspect the mouthpiece bite for damage or cuts and ensure it is securely fastened to the Mouthpiece.
4. Check the rebreather's one-way valves for back leaks. Located within each end of the mouthpiece valve are the one-way valves which are assembled to ensure they pass gas the correct way around the rebreather. **It is essential to check the direction of gas flow and check the proper operation of the one-way valves prior to each dive.** The valves could leak due to debris left over from cleaning, due to faulty assembly, worn components or due to being frozen open (in freezing conditions). They are the only moving parts within the rebreather's breathing circuit, they deserve proper testing. This check can be easily carried out by disconnecting the hose connectors from the T piece and gently blowing and sucking against the connectors. The direction of gas flow for the AP Diving rebreathers is clockwise when looking down on the unit. i.e. you exhale over your right shoulder.





5. When blowing into the right-hand side or exhale hose connector the one-way valve will close and then open when air is sucked from the connector. The opposite will happen with the left hand, inhale hose, when blowing the valve will open but should close when air is sucked from the connector.
6. After reassembling the hose to the unit check for correct operation by alternately squeezing the inhale and exhale tubes as you inhale and exhale. Gas must come from the left and go out to the right. You must not be able to inhale gas from the exhale hose or be able to exhale into the inhale hose.
7. Check for a smooth and positive switching operation between OPEN and CLOSED modes, checking to ensure the mouthpiece orifice O ring slides smoothly past the orifice without distortion. If it distorts, the dive **MUST** be postponed until a remedial service and O ring replacement can be done.
8. In the CLOSED position, carry out a positive and negative pressure test of the breathing loop.
9. Ensure you can see the Head Up Display if you cannot, you can slide it across in its holder towards the centre as well as rotate the holder on the breathing hose. The HUD clip comes in three sizes which are supplied with every rebreather and replacements (RB/HUDHOLDER/SK) are readily available from the AP Diving website.

Post Dive

Proper preventative-maintenance is essential to ensure the best possible performance and maximum life of your Mouthpiece valve as any sand or salt crystals can scratch the internal sealing surfaces. However, please bear in mind the principle that everything you take apart has to be re-assembled properly and thoroughly tested prior to use, so it is preferable wherever possible to conduct daily maintenance on the assembled product. While it is conceivable that leaks can manifest themselves, a product is far less likely to leak if it hasn't been disturbed between dives... if it sealed on the morning dive it is most likely to seal for the afternoon dive. The following maintenance procedures should be performed routinely after each use to ensure that the Mouthpiece is cleaned, inspected, and prepared for the next use or for storage:

1. After diving, the Mouthpiece should be rinsed thoroughly with fresh water before it dries.
2. If it is allowed to dry, rinsing alone may not sufficiently clean the Mouthpiece. To clean the Mouthpiece as thoroughly as possible, it is necessary to soak it in warm fresh-water for at least one hour.
3. After rinsing be sure to check the one-way valves are not back-leaking. (Refer to steps 4 & 5 on the pre-dive inspection check list above).

4. Wipe the Mouthpiece as dry as possible and hang in the OPEN mode to ensure all remaining moisture drains from the mouthpiece.
5. Store the Mouthpiece in a clean, dry place. Do not store the Mouthpiece where it may be exposed to extreme heat, ozone (electric motor), chlorine or ultraviolet rays.
6. Do not use any type of solvent or petroleum-based substance (i.e. do not use Vaseline or oil) to clean or lubricate any part of the Mouthpiece. Do not expose any part to aerosol spray.
7. **Do not use silicone lubricant on the one-way valves.**
8. Periodically, usually weekly, disinfect the mouthpiece and convoluted hoses using an appropriate disinfectant such as Chemgene from AP Diving, following the instructions for dilution. Thoroughly rinse in clean fresh-water and dry before use.

Warning: do not disinfect with mouthwash products or baby feeding disinfectants such as Milton. These can adversely affect the non-return valves and seals.

Maintenance Schedule

To keep the Rebreather Mouthpiece running smoothly and efficiently it is imperative to thoroughly wash and dry the unit after each dive as described in the 'Post Dive' section. The Mouthpiece also requires periodic disassembly and re-greasing of O rings using silicone grease. The servicing interval will vary depending on usage. It is best to clean the components in fresh water and re-grease the O rings whenever any excessive stiffness or stickiness is felt, when rotating between the two modes.

Warning: When servicing this valve, it is imperative to dis-assemble following the instructions. Just pulling it apart, lubricating and pushing it back together will most likely result in the O rings stretching and can result in an O ring jamming the valve between the open and closed positions which will flood the rebreather and prevent you breathing.

Warning: The mouthpiece must always be in the closed position when removing and inserting the core.

The RB160 maintenance manual can be found here:

<https://www.apdiving.com/en/rebreathers/resources/manuals/>

Service and Repair

1. It cannot be assumed that any diving equipment is in good working order on the basis that it has received little use since it was last serviced. Remember that prolonged or improper storage can still result in deterioration of O-ring seals.
2. We recommend you obtain factory prescribed service for your Mouthpiece at least once a year from an authorised dealer, regardless of the amount of use it has received. Your Mouthpiece may require this service more frequently, depending on the amount of use it receives and the environmental conditions in which it is used.
3. If the Mouthpiece is used for rental or training purposes, it will require complete overhaul and factory prescribed service every three to six months or 50 hours use. Chlorinated swimming pool water is an especially damaging environment for diving equipment due to the high levels of chlorine and pH balancing chemicals which cause certain components to rapidly deteriorate.

Factory Service and Repair

When your Mouthpiece requires annual service take it or send it, postage paid, to the factory or an authorised AP Diving dealer. For help in finding a dealer in your area, please contact your local distributor. Your distributor details can be found on our website www.apdiving.com or by contacting the factory.

Warranty

This RB160 Mouthpiece is covered by AP's 1 year warranty against defects in materials or workmanship. This warranty is only extended to the original purchaser and is not transferable. A copy of the receipt must be presented whenever obtaining warranty service.

Applicable Law:

All products are sold on the strict understanding that only English Law applies in cases of warranty claims and product liability, regardless of where the equipment is purchased or used. Should a claim be made then the venue for this would be in Truro, England.

Manufacturer:

Manufactured in the UK by Ambient Pressure Diving Ltd, Unit 2C, Water-Ma-Trout Industrial Estate, Helston, Cornwall, TR13 0LW, Telephone +44(0)1326 563834.

EC Type Approval & Conformity Assessment:

EC Type certification, module B & D of PPE regulation (EU) 2016/425, by SGS FIMKO OY, Takomotie 8, FI-00380 Helsinki, Finland. Notified Body Number 0598.



UK Type Approval & Conformity Assessment:

UKCA certification. Module B & D of PPE Regulation EU 2016/425 as amended and adopted in UK law, by SGS UK Approval Body 0120; SGS UK Ltd, Rossmore Business Park, Ellesmere Port, Cheshire CH65 3EN.



EC & UK Declaration of Conformity:

The latest manufacturers Declaration of Conformity can be found on Ambient Pressure Diving website:

<https://www.apdiving.com/en/rebreathers/resources/useful-info/>

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