

AQUA LUNG 'S NEW CLOSED CIRCUIT DIVING APPARATUS FOR SHALLOW WATER OPERATIONS F.R.O.G.S. (Full Range Oxygen Gas System)

Introduction

F.R.O.G.S, a new underwater apparatus from Aqua Lung, has been created to meet the French Navy technical specifications to equip the Combat Swimmers from the Commando Hubert (French Navy Special Forces).

F.R.O.G.S was chosen by the French Navy to replace their current rig. The testing was performed during a 6 month period and according to the NATO standards comparing 3 different apparatus (LARV VI, S10 and FROGS).

The technical specifications were issued by the French Navy in close collaborations between users, the Defense technical department and the rebreather's manufacturers.

As background for these specifications, a complete study was performed that linked the operational knowledge of the French frogmen with the operational characteristics from the existing diving apparatus available in the market.



Description

The F.R.O.G.S. is a self-contained chest mounted closed circuit apparatus, using 100% Oxygen. It was created for intensive work using a high performance, simple and sturdy mechanism. Daily maintenance is simple with no tools required.

The soda-lime canister, the counter lung and the high-pressure cylinder are housed in a hydrodynamic casing. The diver breathes through a mouthpiece fitted with two non return-valves connected to the corrugated hoses (inhalation and exhalation). The exhaled CO₂ is 100% absorbed by the soda lime in the canister. The second stage regulator is fitted with a demand valve, which automatically injects fresh oxygen to replace the gas consumed by the diver. The high pressure gauge is stowed in a recess of the case for low profile and safety, and can be deployed quickly for viewing. A special kit is available to convert the set from front-worn to back-worn.

Technical Specifications

- Dimensions : 480x300x190MM - 19.2" x12"x7.6"
- Weight in air : 14.2kg - 31.3 Lb. filled with soda lime
- Weight (in water) : 0.5 kg. negative in saltwater (counter lung empty)
- Soda-lime canister volume : 2.6kg - 5.73 Lb.
- Counterlung Volume : 5 liters - 305.1 cu. in.
- Oxygen supply : Capacity 2.1 liters -15 cu. ft.
- Service pressure : 200 bar (2950 psi)
- Gas duration : 4 hours+
- Soda-lime duration : 7 hours @ 22.5 RMV and 21.1° C (70°F)
- Non Magnetic Characteristics : In accordance with STANAG OTAN 2897 EOD 1158W
- Accoustic Characteristics : In accordance with STANAG OTAN 1158W

Main Features and Benefits

Safety

Multiple water traps are located in the exhalation circuit to prevent accidental entry of seawater and in the inhalation circuit and counterlung to trap condensation.

In case of a second stage failure, counterlung or exhalation hose rupture, a by-pass system allows the diver to inject oxygen directly from the first stage into the inhaling hose, letting the diver breathe in the flooded apparatus.



Maintenance

The modular design makes the pre-dive, post-dive, and routine maintenance easy and low cost. No tools are needed for post-dive maintenance and cleaning. The counterlung is very easy to assemble.

Performance

The optimal breathing loop of 1.07 J/liter at a depth of 7 meters and a respiratory minute volume (RMV) of 62.5-l/min. performance translated to increased respiratory comfort for the diver.

Technical Features

- The canister is designed to provide an excellent thermal insulation when diving in cold water.
- The removable soda-lime canister uses large surface grids and a specific design to increase the apparatus' duration.
- The counterlung is constructed of a robust material resistant to abrasion and tearing.
- The second stage is externally adjustable from a free flow position to a completely closed position.
- The second stage is located in a position near the lung reference pressure. This location minimizes the pressure variations during diver position changes and delivers increased respiratory comfort.
- Low acoustic level achieved by a sintered filter that reduces the noise of the gas flow.
- Breathing hose connections that cannot be reversed during installation.
- Non-return valves are located in the mouthpiece in order to significantly limit the volume of any residual CO₂ in the corrugated breathing hoses.
- Non-magnetic signature is created by the use of materials chosen for their special characteristics.



F.R.O.G.S. supplied with a robust carry and storage case