STEALTH CLEARANCE DIVER’S LIFE SUPPORT EQUIPMENT (CDLSE) is the latest development of the highly successful and operationally proven range of Stealth Closed Circuit Mixed Gas Underwater Breathing Apparatus (UBA). Through the incorporation of modern materials, micro processing power and the very latest thinking in UBA design, Divex has again set new standards in military UBA design and performance. Stealth CDLSE represents the “state of the art” in Mine Countermeasures Explosive Ordnance Disposal (MCM EOD) underwater life support technology offering increased levels of diver safety, equipment reliability, maintainability, operational capability and mission versatility.

Proven Design
Following competitive evaluations by independent government defence evaluation research agencies and user organisations over extended periods, the predecessors of Stealth CDLSE, Stealth EOD and Stealth EOD-M are now in service with various countries worldwide that include Germany, Italy, India and the UK. In addition the UK and French Navies have announced significant contracts for Stealth CDLSE for MCM diving operations.

CE Approval
Further to these military / government evaluations, against the latest European Rebreather standard (CE 14143 Sept 03), Stealth has been independently certified in Germany by Germanisher Lloyd and is the only MCM EOD underwater life support system with CE approval for use to 60msw using Air as the Diluent gas and to 120msw using Heliox as the Diluent gas.

Non Magnetic Design
Other generations of electronically controlled UBA have historically been unable to meet the stringent low magnetic signature requirements of NATO STANAG 2897 Class A in all attitudes. Magnetically sensitive ordnance is becoming increasingly sophisticated; as a result the requirement to meet NATO STANAG 2897 Class A without compromise is an operational necessity. Stealth CDLSE fully meets the requirements of STANAG 2897 Class A under both static and dynamic test conditions in all attitudes and for all components that may come into contact with magnetically sensitive ordnance.

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Principle of Operation
The fundamental principle of electronically controlled Closed Circuit Mixed Gas Underwater Breathing Apparatus (CC MG UBA) is well established, however Stealth CDLSE incorporates an advanced Oxygen control system that rapidly and accurately responds to changes in life control system status. Using three independent Oxygen sensors (micro fuel cells), Stealth CDLSE functions by analyzing the breathing gas and through the automatic addition of 100% Oxygen, the Partial Pressure of Oxygen (PO2) is accurately maintained at a pre set level dependent upon the depth. A Diluent gas (Air, Heliox or Trimix) provides gas volume within the closed circuit system, whilst Carbon Dioxide (CO2) from exhaled gas is absorbed by the long endurance scrubber unit.

Operational Versatility
Stealth CDLSE is a true multi-role under water life support system that provides a common platform to meet the complete range of operational roles throughout the water column. As a result of this unique mission flexibility, Stealth is presently the only single CCMG UBA operationally employed in the following military diving disciplines:

- Mine Counter Measures Explosive Ordnance Disposal to a depth of 54msw using Nitrox
- Deep Mine Counter Measure Explosive Ordnance Disposal to a depth of 100msw + using Heliox/Trimix
- Mine Investigation and Exploitation (MIE)
- Very Shallow Water Mine Countermeasures Explosive Ordnance Disposal (VSW MCM EOD)
- Underwater Force Protection (UW FP)
- Special Operations Forces (SOF)

Performance
- 120msw using Heliox or Trimix as a diluent gas
- 60msw using Air as a diluent gas
- 18msw “no decompression depth” (using Air as the Diluent gas)
- 4-6 hr duration
- Breathing performance that surpasses international standards
- Operating temperature −20ºC to + 50ºC
- Sea temperature operation −1ºC to + 37ºC
- Fresh water temperature operation 1ºC to 37ºC
- Low magnetic to NATO STANAG 2897 Class A in all attitudes under static and dynamic test conditions
- Low noise to NATO STANAG 1158 / AMP 15
- Shock and vibration tested to UK and German defence standards
- Environmentally tested to UK and German defence standards

Configuration Options
Stealth CDLSE is a modular underwater life support system that can be tailored to suit mission requirements by using a combination of the following accessories:

- Simple harness
- Bite mouthpiece and half mask
- Full Face Mask
- Buoyancy compensation device with integral weight pockets
- Open circuit bailout options for both bite mouthpiece and full face mask
- Full Face Dual Mode Mask, permitting breathing from closed and open circuit gas supplies
Manufacturers of Quality Diving Equipment

Modular Bailout system
The open circuit secondary breathing system serves to provide a supply of open circuit breathing gas - Air or Heliox to the Diver in the unlikely event of a catastrophic closed circuit primary breathing system failure. The open circuit secondary breathing system is a modular system that may be configured to meet various dive profiles using Air or Heliox.

The Bailout Cylinders are constructed from a unique non-magnetic composite design that provides a 300 bar Safe Working Pressure and fitted with a 300 bar forged Shut-Off Valves. The Bailout Regulator reduces the high pressure gas to medium pressure, which is supplied to the Dual Mode Mask.

Alternatively, if using a Half Mask / Bite Mouthpiece Assembly configuration, medium pressure gas is supplied to the Bailout Emergency Demand Valve.

External Breathing System
The eXternal Breathing System (XBS) has been designed for use with Stealth CDLSE to provide an alternative source of breathing gas in event of an emergency situation during deep diving operations. The XBS is used in a similar manner as a “lazy shot” and provides a diver station during decompression. Should the diver require the use of the SBS, he connects into the system using the integrated quick connection hose and rotates the Stealth CDLSE full-face Dual Mode Mask (DMM) Change Over Valve to the open circuit position, or alternatively uses the XBS emergency demand valve.

Construction
The XBS is housed in a lightweight moulded plastic case containing two 9 litre 300bar composite cylinders. Each cylinder has an independent shut off valve, contents gauge, first stage reducer and safety relief valve. Both first stage reducers supply medium-pressure gas to a switch over block enabling the diver to switch between cylinders.

The SBS is available in two variants; a two cylinder Heliox or Trimix system for deep diving open circuit emergency bailout and a two cylinder Oxygen system for extended decompression. Alternatively a combined Heliox / Oxygen unit can be provided. Due to its low magnetic design, the SBS may be placed in the vicinity of the diver during MCM EOD operations.
Surface Supplied Gas System
The Surface Supplied Gas System (SSGS) is an optional system for deep diving applications serving to provide the diver with emergency open circuit gas supplies. A micro Composite Umbilical (CU) is terminated with the various electrical and gas fittings necessary to interface between Stealth CDLSE with the SSGS. The CU overall diameter is 15mm with a minimum "no damage" strain of 300kg enabling it to be used as a diver life line.

The Surface Supplied Gas System (SSGS) is located in the surface support craft. Gas from the SSGS is supplied to the diver via a Composite Umbilical. The SSGS comprises the following main systems:

1) Heliox Supplementary System (HSS)
2) Oxygen Supplementary System (OSS)
3) Composite Umbilical System (CUS)

Composite Umbilical
The Composite Umbilical comprises the following:

1) 1 x small bore Intermediate Pressure (IP) hose (300 bar SWP)
2) 2 x four (4) twisted screened electrical pairs

The Composite Umbilical System (CU) serves to provide the diver with an emergency supply of open circuit Heliox gas by supplementing the autonomous open circuit bailout system with Intermediate Pressure (IP) gas at approximately 70 bar. The Composite Umbilical is terminated with the various electrical and gas fittings necessary to interface Stealth CDLSE with the SSGS. The CU overall diameter is 15mm with a minimum ‘no damage’ strain of 300kg enabling it to be used as a diver life line.

Dual Mode Mask
The Dual Mode Mask (DMM) is based on the Divator full face mask and incorporates the Divex Changeover Valve and open circuit Demand Valve enabling the diver to alternate between closed circuit and open circuit gas supplies such as the autonomous “on-board” bailout system, XBS or the Surface Supplied Gas System (SSGS). The mask is fitted with a bite mouthpiece, water dump valve and a pressure equaliser. Provision is made for the fitment of a communications system and the face port has also been modified to accept the Stealth status LED that is held in a receptacle on the diver’s left side.
Stealth CDLSE System Features

- Fully closed circuit electronically controlled constant Oxygen partial pressure
- Extremely low breathing resistance in all body positions
- The duration of Stealth CDLSE is independent of depth
- 20 hr re-chargeable external waterproof battery
- 10 hr re-chargeable emergency internal reserve battery
- Vacuum sealed electronics unit
- Water tolerant breathing circuit design reducing the likelihood of a ‘caustic cocktail’
- Multiple open-circuit bale-out options available
- Oxygen sensors and electronic circuitry protected from moisture ingress
- Standard cylinder charging pressures 300 bar
- A discreet head mounted light sensitive LED indicating equipment status
- Advanced back-light LCD display module presenting detailed information on the life control system
- Automatic Diluent gas addition allowing hands free operation on descent
- Dual bag counterlung design
- DIN fittings for high pressure ‘O’ ring seal security.
- Three independent high performance Oxygen sensors.
- True Oxygen sensor vote out logic to eliminate the input of a faulty Oxygen sensor.
- Data acquisition ‘black box’ facility.
- Diver configurable alarm level settings for cylinder pressures, dive time, maximum depth, altitude, ascent rate, language
- Real time link between the life support system and the surface (Supervisor’s Monitoring Outfit)
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Statistics

Weight: 25kgs (basic unit–dependent upon customer configuration)
Dimensions: 155 x 370 x 640mm (basic unit–dependent upon customer configuration)
Scrubber capacity: 2.8 kgs (Molecular Products Sofnalime 797 Grade 812 Mesh)
Working pressure: 200 bar (optional 300 bar)
Stealth NATO stock number: 4220-99-663-8036 (UK Royal Marine Commandos)
4220-99-225-7176 (UK Royal Navy)
4240-12-351-3291 (Federal German Navy)

Accessories

- Non magnetic hardwire communications system (with Helium speech un-scrambler)
- Non magnetic hand held / mask mounted torch
- Non Magnetic Fins
- Non Magnetic Mask
- Non Magnetic Drysuit
- Non Magnetic Drysuit inflation System
- Non Magnetic Undersuit

Stealth Dual Mode Mask
Data Acquisition

The Stealth data acquisition facility enables a “real time” information relay to the surface via a non magnetic hardwire diving tender safety cable/rope. This may be interfaced with a suitable “ruggedised” Personal Computer to provide the surface safety / diving supervisor with the “real time” status of the diver’s life support system. Alternatively data can be downloaded to a Personal Computer providing a detailed record of the dive in graphical or data formats.