

Special Operations

Underwater Life Support Systems







INTRODUCTION TO JFD

JFD is the world leading underwater capability provider facilitating the commercial and defence diving industries by offering innovative diving, submarine rescue and subsea technical solutions.

JFD has a well-established history in the development of advanced and innovative diving and submarine rescue systems spanning over 30 years. Our systems continue to set the president in terms of capability and performance and JFD is relied upon by divers worldwide across both the defence and commercial sectors.

Our products and services have been delivered to a large number of countries across all continents. With in-service support established in many of these locations and tailored Integrated Logistics Support (ILS) packages, JFD is able to provide high customer equipment availability, rapid technical support and tailored training packages.

JFD offers two highly capable underwater life support systems to meet the full mission profile of today's Special Operations diver.

A modular approach enables customisation of the life support system in response to demands across the full operational spectrum.



SHADOW

The solution for extended duration and deeper diving mission profiles.



ENFORCER

The lightweight solution for short duration mission profiles.

A common life support platform facilitates a multi-mission capability offering numerous operational and logistic benefits that include:

ENHANCED MISSION EFFECTIVENESS

- Front and back mount options
- Oxygen or combined oxygen / nitrox
- Simple pre and post dive procedures
- Ballistic protection vest interface
- Long duration capability
- Superior work of breathing performance
- Simple and rugged design
- Operationally proven worldwide
- Readily field maintained
- Low magnetic and acoustic signatures

OPTIMISED LOGISTIC EFFICIENCY

- Configuration flexibility
- Fully user serviceable
- Minimised maintenance
- Through life cost reduction
- Comprehensive maintenance training packages
- Reduced user and maintainer training
- Reduced documentation
- Common spares across the rebreather range
- Standardised operating procedures
- Enhanced safety



Shadow

INTRODUCTION

Offering unparalleled levels of mission flexibility, Shadow has established itself as the industry leader in operational capability and performance.

Latest developments include a systems approach to integrating life support and combat equipment. This includes a rapid clip-on / clip-off interface with ballistic protection vest, use of nitrox for diving below the safe depth of oxygen and a back mount option optimised for use with manned free flooding submersible vehicles.

PRINCIPLE OF OPERATION

When configured for oxygen use, via a first stage pressure reducer, oxygen is supplied from the pressure vessel (cylinder) to a demand valve that automatically adds oxygen to the re-circulation sub-system.

One-way check valves in the breathing hose mouthpiece assembly ensures exhaled breathing gas is re-circulated through a long endurance scrubber canister that removes exhaled CO₂ prior to re-inhalation. A readily accessible submersible pressure gauge enables continual monitoring of oxygen pressure vessel.

When configured with the nitrox kit, Shadow may be used in either oxygen or nitrox mode. To access the nitrox gas supply stored in a separate pressure vessel (cylinder), the diver rotates a multi-turn gas switch-over valve that enables a constant mass flow of nitrox gas (60% oxygen / 40% nitrogen) into the re-circulation sub-system at 6 litres per minute. Following a gas switch from oxygen to nitrox, the diver may descend to a recommended maximum depth of 24msw.

PERFORMANCE AND CAPABILITY

- Oxygen or combined oxygen / nitrox configurations
- Maximum depth:
 - 15msw (oxygen configuration)*
 - 24msw (nitrox configuration)*
- 4 hour canister duration at a metabolic CO₂ production rate of 1.6 l/min (40RMV) in 4°C water**
- Optimised counter lung position to minimise hydrostatic imbalance
- Reduced breathing gas flow restrictions to minimise resistive effort (low work of breathing)
- Operationally proven worldwide from arctic to tropical climates
- 300 bar pressure vessel (cylinder)
- Automatic demand valve that serves as a manual bypass valve
- Harness options:
 - Stand-alone rebreather for training / operations
 - Ballistic protection vest clip-on / off interface
- User configurable to suit mission profiles
- MOLLE webbing system to facilitate the interface of ancillary equipment
- Reinforced double layer counter lung
- Low magnetic and acoustic signatures
- Low weight to performance ratio

* In accordance with local oxygen partial pressure depth / time exposure regulations.

** Canister duration in excess of 5hrs at lower breathing rates and / or in warm water.



15msw* with oxygen



24msw* with nitrox



Multi-mission profiles



Clip-on / clip-off options



Low work of breathing

PROVEN CAPABILITY

Since its launch in 2003, the unique features and advanced design of Shadow has played an instrumental role in the development of Special Operations underwater mission capability.

Continual design evolution in response to customer specific requirements ensures Shadow continues to offer unparalleled levels of safety, performance and capability across a broad mission spectrum and remains the underwater life support system choice for Special Operations around the world.



Shadow

MISSION SPECIFIC OPTIONS

+ NITROX KIT



The nitrox kit facilitates greater depth capability for a range of mission profiles that may include:

- Submarine exit / entry
- Very Shallow Water (VSW) Mine Countermeasures (MCM)
- Amphibious beach reconnaissance
- Direct action below safe depth of oxygen
- Free flooding submersible operations

FEATURES

Nitrox reconfiguration is readily undertaken by the user in the field in a matter of minutes without the use of tools.



+ BACK MOUNT KIT



The back mount kit enables the standard front mount Shadow to be back worn providing ready access to mission equipment and is suitable for a range of mission profiles that include:

- Over the beach operations
- Diver propulsion vehicles
- Swimmer delivery vehicles

FEATURES

The reconfiguration to back mount is readily undertaken by the user in the field in a matter of minutes without the use of tools. The back mount variant may be worn as a stand-alone rebreather or interfaced with a ballistic protection vest.



+ BALLISTIC PROTECTION VEST KIT



The ballistic protection vest and clip-on / clip-off kit provided in collaboration with SnigelDesign offers a systems approach to the carriage of the underwater life support system and mission critical equipment.

FEATURES

- Easy rebreather clip-on / clip-off
- Hard plate protection up to 7.62mm NATO round
- Optional neck, shoulder, upper arm and groin protection modules
- MOLLE webbing system
- Wide range of pockets, pouches and ancillary equipment holders
- Optional life preserver emergency inflation collar module



+ ACCESSORIES



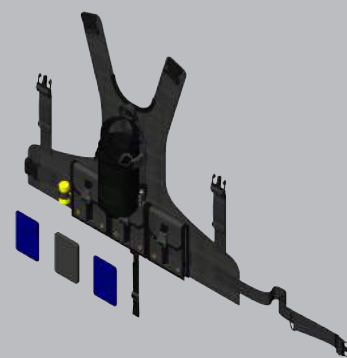
BUOYANCY JACKET

- Collar-style adjustable buoyancy
- Intermediate pressure inflation
- Oral inflation
- Rugged single skin design



BAILOUT SYSTEM

- Independent system for emergency ascent
- 300 bar cylinder
- Low work of breathing
- Readily accessible submersible pressure gauge



WEIGHT VEST

- Emergency quick release
- Comfortable waistcoat design
- Use in training or operational dives
- Various tactical colour options

Enforcer

INTRODUCTION

The compact, lightweight design of Enforcer lends itself to rapid deployment shallow water, short duration mission profiles.

Designed to meet the evolving operational roles of maritime law enforcement and special operations, its unique design offers unparalleled performance and mission flexibility whilst minimising size and weight.

The use of pre-packaged ExtendAir® cartridges ensures consistent CO₂ scrubbing performance and simplifies scrubber canister filling, whilst providing low work of breathing, thereby reducing diver fatigue.

PRINCIPLE OF OPERATION

Via a first stage pressure reducer, oxygen is supplied from the pressure vessel (cylinder) to a demand valve that automatically adds oxygen to the re-circulation sub-system.

One-way check valves in the breathing hose mouthpiece assembly ensures exhaled breathing gas is re-circulated through the ExtendAir® cartridge that removes exhaled CO₂ prior to re-inhalation. A readily accessible submersible pressure gauge enables continual monitoring of oxygen pressure vessel.

PERFORMANCE AND CAPABILITY

- Lightweight compact design
- Simplified pre / post dive procedures
- Maximum depth:
 - 15msw (oxygen)*
- 2 hour canister duration at a metabolic CO₂ production rate of 1.6 l/min (40RMV) in 4°C water**
- Optimised counter lung position to minimise hydrostatic imbalance
- Reduced breathing gas flow restrictions to minimise resistive effort (low work of breathing)
- Operationally proven worldwide from arctic to tropical climates
- 300 bar pressure vessel (cylinder)
- Automatic demand valve that serves as a manual bypass valve
- Harness options:
 - Stand-alone rebreather for training / operations
 - Ballistic protection vest clip-on / off interface
- MOLLE webbing system to facilitate the interface of ancillary equipment
- Reinforced double layer counter lung
- Low magnetic and acoustic signatures

* In accordance with local oxygen partial pressure depth / time exposure regulations.

** Canister duration in excess of 2hrs at lower breathing rates and / or in warm water.



15msw* depth



2-3 hours duration



Clip-on / clip-off options



Lightweight



Low work of breathing

EXTENDAIR® BENEFITS

- Extremely low work of breathing
- Consistent CO₂ scrubbing performance
- No requirement to pack granules manually
- No user packing variability and greater duration consistency
- No CO₂ absorbent material channelling and early CO₂ break through from settling
- Water tolerant; the hazard of a caustic cocktail is significantly reduced
- Flooded breathing loop is recoverable allowing a mission to be safely aborted
- Lack of dust compared to granules (allows canister packing aboard submarines)
- Excellent shock and vibration resistance





Related equipment

DIVER THROUGH WATER COMMUNICATIONS

All JFD special operations life support systems have been designed to be interfaced with the JFD Digicom Diver Through Water Communications (DTWC) system that enables a diver to diver and / or diver to surface communications up to a maximum range of 3000m. The JFD Digicom DTWC system has been designed and built to UK Ministry of Defence requirements and is fully NATO codified.

ANCILLARIES

Shadow and Enforcer capability can be further enhanced to suit customer specific requirements via the use of the following equipment:

- Shadow NAV
- Full face dual mode mask
- Dual mode bite mouthpiece assembly
- Dry suit inflation system
- Low pressure cylinder alarm system
- Diver and maintainer tool and test equipment
- Transport case
- Spares package

SWIMMER DELIVERY VEHICLES

Our underwater life support systems can be seamlessly integrated with JFD Swimmer Delivery Vehicles (SDVs).

The primary function of these vehicles is to facilitate the insertion and extraction of Special Operations Forces and their equipment.

The vehicles have further application in the maritime littoral space. These include specialist maritime operations, mine countermeasures, counter-terrorism, counter-narcotics, counter-piracy and maritime protection operations. SEAL Pod vehicles are surface or sub-sea craft, each optimised for a particular deployment method or mission profile.

- SEAL Carrier
- Torpedo SEAL
- Sub SEAL





Services



Documentation



Training



Equipment
safety



Spares and
repairs

LOGISTICS SUPPORT

As a result of the sustained engagement with militaries worldwide, JFD has identified numerous effective and sustainable in-service support models specific to customer requirements. This service is managed and delivered by a dedicated defence Integrated Logistics Support (ILS) department, comprised of subject matter experts.

The ILS department has project managers, technical authors, training officers, commodities management and engineering support. To meet the additional challenges of supporting more complex equipment types, JFD has embedded first line maintenance facilities within defence establishments, with the primary objective of providing immediate technical support to the equipment. JFD offers through-life support for all equipment up to, and including, full safety case management and associated activities.

JFD is currently under contract with a number of government defence departments worldwide providing a full ILS capability resulting in exceptionally high rates of equipment availability.



TAILORED TRAINING

JFD provides tailored training packages to Special Operations Forces, Law Enforcement and Security Agencies. Training packages include:

- Equipment use
- Operational use and planning
- Equipment maintenance

PRODUCT DEMONSTRATIONS

JFD can arrange product demonstrations, please contact us for more information.





Aberdeen | Bremen | Cape Town | China | Glasgow | Newcastle
Perth | Portsmouth | Singapore | Stirling | Sydney | Vaxholm | Virginia



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