



Unique HYDRA
A Unique Maritime Group Company

CONTAINERISED DIVE SYSTEM

SL3.4





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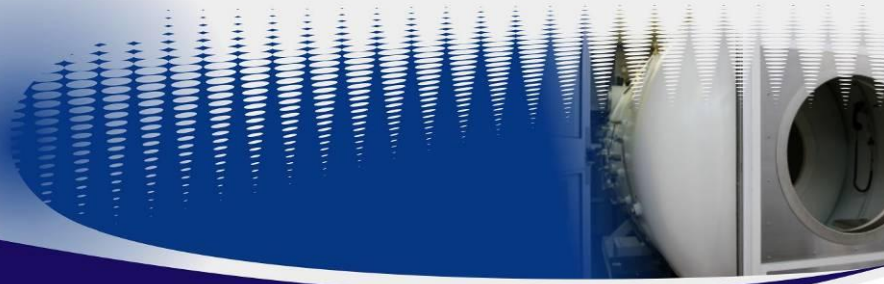


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ABBREVIATIONS AND ACRONYMS

Abbreviation or Acronym	Definition
AC	Alternating Current
A/R	As Required
AMP	Amperage
ASME	American Society of Mechanical Engineers
BA	Breathing Air
BIBS	Built-In Breathing System
BS	British Standards
BTU	British Thermal Unit
C/W	Comes with
DDC	Deck Decompression Chamber
DNV	Det Norske Veritas
EL	Equipment Lock
Ext	External
FSW	Feet of Seawater
HP	High Pressure
IMCA	International Marine Contractors Association
Int	Internal
IP	Ingress Protection Rating
ISO	International Standards Organization
KM	Kirby Morgan
LAN	Local Area Network
LCD	Liquid Crystal Display
LP	Low Pressure
LARS	Launch and Recovery System
ML	Main Lock
MSW	Meters of Seawater
MWP	Max Working Pressure
OEM	Original Equipment Manufacturer
O&M	Operations & Maintenance
par	Paragraph
QC	Quick Connect
QTY	Quantity
RM	Raw Material
ROV	Remotely Operated Vehicle
SP	Standard Product
UHF	Ultra High Frequency
VAC	Voltage Alternating Current
VDC	Voltage Direct Current
VHF	Very High Frequency



1 INTRODUCTION

Unique Hydra is a specialist design and engineering company, situated in the city of Cape Town, South Africa. The company prides itself in developing and consistently providing engineered solutions to its customers throughout the world.

Unique Hydra is a registered ISO 9001:2008 (DNV) compliant company, as well as a member of the International Maritime Contractors Association.

The technical specification relating to the system is outlined below and provides detailed technical information for making a decision to purchase Unique Hydra equipment. We may not be the least expensive solution to your requirement, but we believe in providing the best engineering solution, offering functionality, reliability, support and value for money.

This technical specification outlines the scope of supply for our offer. Any deviation to this must be agreed to in writing and updated within the technical specification. The technical specification is divided into a number of sections.

1.1 SL3 Containerised Dive Systems

The Unique Hydra Containerised Dive Systems are specifically designed to give a compact option to diving systems. We realise the necessity to use the least amount of deck space onboard a vessel and ensure that shipping and mobilisation costs are kept to a minimum. The containers are DNV 2.7-1 modified offshore containers.

A wide variety of standard containerised layouts are available for you to choose from. Please view these in our brochure or on our web page. If none of these suit your needs then we can provide a custom system layout to suit your vessel and diving requirements. The configuration offered in this specification is viewed as being the most practical solution that complies with IMCA's diving standards and general diving requirements.

2 APPLICABLE GUIDANCE CODES & STANDARDS

- IMCA D023: DESIGN - Diving Equipment Systems Inspection Guidance Note for Surface Orientated Diving Systems
- IMCA D050: Minimum Quantities of Gas Required Offshore (May 2012)
- IMCA D012: Stainless steel in oxygen systems
- IMCA D014: International Code of Practice for Offshore Diving
- South African Occupational Health and Safety Act 85/1993
- Lloyds Rules and Regulations for Diving Systems (pressure vessels)
- DNV 2.7-1 - Offshore Containers

3 TECHNICAL SPECIFICATIONS

This section contains the technical specification of the SL3.2 Containerised A1500 Chamber & Dive Control Air System and describes, with illustrations, all the main components and their functions. The technical specification and pricing sheet has been compiled as an initial offer defining available options. The client should review the options required and select with the UNIQUE HYDRA sales person. If the client would like UNIQUE HYDRA to select a comprehensive system, client would need to advise this.

3.1 Scope of Supply

<u>Description / Service</u>	<u>Qty</u>
<u>Container Fit-Out</u>	
Custom DNV 2.7-1 Offshore Container:	
-Mechanical cutouts	1
-Personnel access doors	2
-Sliding window	1
-Marine grade painting specifications	1
-Full steel floor with mechanical mounting arrangements for equipment fastening	1
-Certified Lifting sling (Standard)	1
Container Fit-Out – Insulation:	
- Insulation including walls and roof as per specification (High Spec finish, with Mitre and edged joints, no wood, sealed with SikaFlex bonds)	1
Container Fit-Out – Mechanical Fastening:	
-Chamber mechanical installation	1
-Fastening arrangements	1
-Manway access hatch	1
Container Fit-Out – External Covers and air-conditioning:	
-Stainless steel security covers	1
-Stainless steel penetration plates	1
-Air-conditioning unit and covers	1
Container Fit-Out – Internal Apparatus:	
- Steel work surface/table	1
-Bookshelf	1
-3-drawer pedestal	1
-Labels and decals	Numerous
- Flooring (Grade A Fire retardant rubber tiled flooring)	1
Container Fit-Out – Electrical:	
-220VAC Electrical power cabling	1
- Power Supply	
- 220VAC Plug Points	2
-Galvanised cable trays	1
-Switchboard and fittings	1
- Room Lights	
-Emergency lighting arrangements and smoke detection with internal container audible alarm. (Suitable if 220VAC is supplied separately from the vessel or machinery container)	2
Container Fit-Out - Loose components:	
-Fire extinguishers	2
-Signage	1
-Container Documentation for modifications and fitout of container	1
-16 Cylinder gas bank (air) – split 8/8 and manifolded for DDC support	1
<u>Optional Extras</u>	
-	-

<u>Description / Service</u>	<u>Qty</u>
<u>Chamber Fitout:</u>	
A1800 chamber :	
-IMCA D023 fitout specification with Lloyds Register for the PVHO compliance	1
-HP Management Panel (SP 604)	1
-Hyperbaric Mattress (2 of)	2
-CCTV camera monitoring of Main Lock with an LCD screen fitted above the Chamber Control Panel	1
-Chamber CO₂ scrubber including electrical connectors and integration into chamber	1
-Emergency Breathing Air Supply CABA Mask with comms, 6L Cylinder, Harness and Hose with 2nd connection point for alternative BA source (DDC Operator)	1
<u>Optional Extras</u>	
-Scottmasks VKII c/w Med Mask; w/out 1st stage (5 required for IMCA compliance)	-
-Camera monitoring of the Entry Lock- camera fitted externally with view through the viewport.	-

3.2 Custom DNV 2.7-1 Container - Structure

The container is a DNV2.7-1 certified structure with all round insulation. An internal bulkhead separation is fitted just inside the container double doors and is fitted with a personal access door. An aperture in this internal bulkhead, adjacent the personal access door, provides access to the chamber entry lock manway.

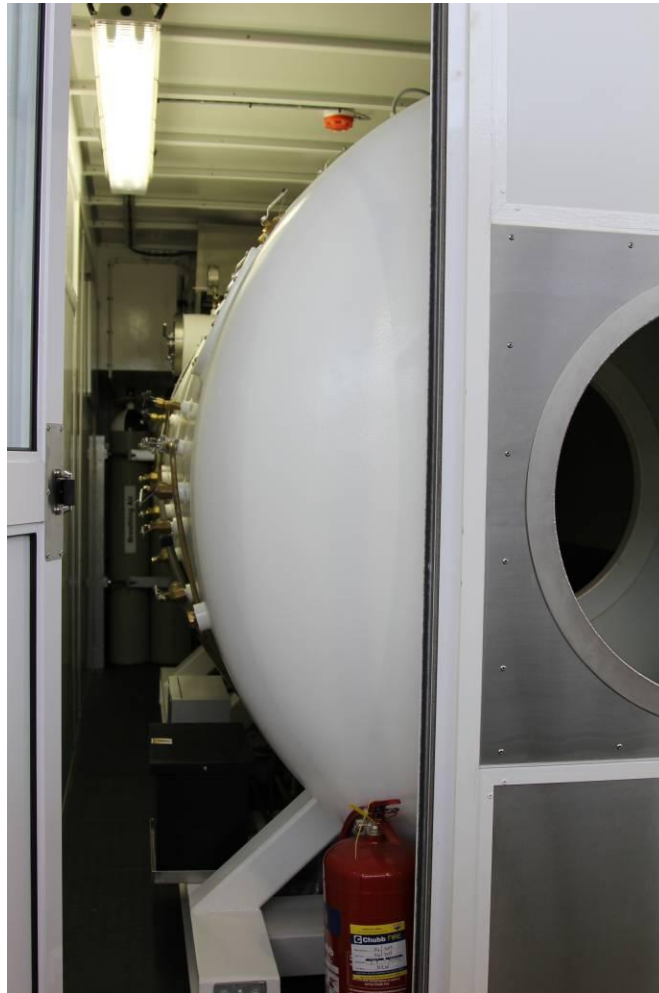


Figure 1: Chamber (view from double door end of container)



Figure 2: Chamber Control Panel and Gas Bank area

3.2.1 Container Physical Data

Certification authority:	DNV (DNV 2.7-1)
Maximum gross weight:	20,000 kg
Paint system:	Marine grade paint system in white (client specified colours is an optional extra).
External Length:	6,058mm
External Height:	2,438mm
External Width	2,438mm
Access to roof top	Ladder/steps provided on the main door locking arms.
Load Test:	Load test certificate in modified state.
MPI Inspection:	Full MPI inspection of container corner casting after load test in modified state.
Documentation:	As per DNV Section 5.5

3.2.2 Mechanical Cut-Outs

The Unique Hydra designed DNV 2.7-1 container has been specifically designed for containerised dive systems. A common container structure was achieved by carefully planning all apertures ("cut-outs") for all the various container layouts. Apertures can fulfil various functions for each layout e.g. door vs. louvre; penetration plate vs window; etc. Each aperture is provided with a stainless steel protective cover that can be secured with a padlock. The certification of the container therefore includes the original DNV 2.7-1 construction certification and the approval for all modifications and openings. CSC certification is maintained throughout.

3.2.3 Personnel Access Doors

The container is fitted with 2 personal access doors complete with windows. One of these doors is an external door and is located on along the short side of the container, on the opposite end to the container double doors. The other personal access door is fitted to the internal bulkhead located just inside the container double doors.

3.2.4 Marine Grade Painting Specifications

Each container is coated with a hard-wearing marine grade paint specification (White Pilot II). As lessons have been learned and as better products have been introduced, Unique Hydra has improved this container coating specification over the years to maximise the protection of the steel structure. The standard coating colour is predominantly white but clients can request custom colour schemes if new-build container orders are placed.

3.2.5 Steel Floor

Each container is fitted with a hard-wearing steel floor. Where applicable, mounting arrangements are fitted to ensure equipment is securely fastened to the container. The steel floor is treated with a bitumen under-layer and a tough paint system above. All joints are sealed with a Sikaflex paintable joint sealer.

3.2.6 Certified Lifting sling (Standard)

A DNV 2.7-1 compliant 4-legged steel wire rope lifting sling is supplied for the Unique Hydra SL3 offshore container.

3.3 Container Fit-Out

3.3.1 Container Fit-Out – Insulation:

The container is insulated on the inner walls and the roof. A high quality finish is achieved with mitred joints. No wood is used within the panels. The panels are a sandwich construction consisting of a white steel skin, bonded to a fully fire resistant board with a thermal insulation mineral wool for high temperature applications in the centre. This arrangement therefore does not have the limitations of the traditional polystyrene insulation panels which give off noxious vapours when burnt. The insulation panels are bounded by anodized aluminium channels and fixed in position using polyurethane adhesive and selected mechanical fasteners. A key feature of the insulation is the strength and mounting arrangement system which allows for equipment to be mounted to the insulation.



Figure 3: Container Insulation

3.3.2 Container Fit-Out – Mechanical Fastening

The decompression chamber is secured to the steel container floor by mechanical fasteners (nuts and bolts). The chamber entry lock manway access is sealed against water ingress and is provided with high wearing stainless steel cladding.

All fixed fit-out items are provided with secure fastening to guard against movement in rough seas and during transportation. All equipment is reverse bolted with nylock nuts to enable the operator and auditor to determine the status of the bolted arrangement at a glance.



Figure 4: Typical Mechanical Fastening

3.3.3 Container Fit-Out – External Covers and Air-Conditioning

All container apertures are provided with stainless steel or corrosion resistant security covers that can be locked with a padlock to prevent tampering or damage during transit and storage.

The penetration backing plates are made from stainless steel and are recessed to reduce damage during transit. The penetration plates are normally provided with 20% spare penetration capacity dependant on the options selected for utilisation. All electrical penetrations/connections are at a high level above deck height to reduce the risk of sea water ingress due to “green seas”.



Figure 5: Quality Enclosures

The air-conditioner will be of the split-unit type with the evaporator situated internally and the condensing coil situated externally of the insulated environment. The air conditioner unit is suitable for heating and cooling and has a variable speed control. The air conditioner is permanently mounted in an enclosure that will protect the external compressor and condensing coil. Refrigerant piping will link the compressor to the internal evaporator.



Figure 6: Internal Split Unit Air-Conditioner Unit

3.3.4 Container Fit-Out – Internal Apparatus

3.3.4.1 Book Shelf

A book shelf is provided to store all relevant dive procedures, job information and system certification. The book shelf is manufactured from stainless steel.



Figure 7: Book shelf

3.3.4.2 Work Surface / Table

A stainless steel work surface is provided for use by the chamber operator.

3.3.4.3 Pedestal Drawer

A 3-drawer pedestal drawer is supplied. The drawer is manufactured from steel and powder coated.

3.3.4.4 Labels & Decals

All items and equipment are labelled with industry recognised identifiers/labels. All labels and decals are provided in English and will be securely fitted to the appropriate item or in an appropriate position.

3.3.4.5 Flooring

The flooring in the Chamber and Dive Control areas of the container are covered with Grade A fire retardant rubber tiling. All edges are sealed and bonded with black sikaflex to ensure water does not become entrapped on the steel floor.



Figure 8: High Quality Rubber Flooring – Grade A

3.3.5 Container Fit-Out - Electrical

3.3.5.1 Electrical Power Cabling

220VAC IEC/Class Compliant Electrical Power Cabling is standard



Figure 9: Typical example of Cable, Connections and labelling

3.3.5.2 Power Supply

The main power supply to the container is via an externally mounted bulkhead appliance inlet (440VAC or 380VAC is standard). A matching power coupler excluding cable is supplied.

3.3.5.3 Incoming Power Transformers to reduce to 440V/380V to 220V/110V

The transformer includes the necessary supply cable and electrical interface connections. (Required if container is to be stand-alone power supply on 380/440VAC supply). Connection cables for the container are not supplied.

- Transformer accommodates 440VAC and 380VAC inputs.
- The transformer can be supplied from either a 380Vac/50Hz or 440Vac/60Hz source, selected via a selector switch.
- Rugged housing with isolating switch and output circuit breakers.
- Circuit breakers rated for spike protection.
- Circulating fan for cooling of transformer.



Figure 10: Incoming Power Transformer

3.3.5.4 Plug Points

The container will be supplied with 2 x UK plug points. Note that client specified plug types can be supplied and are detailed in the Optional Extras section below.



Figure 11: 220VAC Plug Points

3.3.5.5 Galvanised Steel Cable Trays

All cable trays are galvanised.

3.3.5.6 Switchboard and Fittings

The 220VAC electrical distribution board (DB) is supplied from an isolation transformer with the secondary grounded (TN-S distribution system).



Figure 12: Sub- Distribution of 220VAC Consumers

All consumers are fed from double-pole isolating circuit breakers. All multi-purpose appliance outlets (plugs) are protected by 30mA residual current circuit breakers. All cables feed-through are through glands providing strain relief as well suitable sealing. All circuit breakers are labelled with their drawing reference number and the consumer they supply.

3.3.5.7 Room Lights

The light fittings are suspended from rubber mounts to prevent damage caused by shock loads and vibration.

- The room lights are a combination of 2' and 5' double fluorescent light fittings depending on the layout of the room.
- The light fittings are water proof (IP65) and have a clear impact resistant injection moulded lens.
- Typically half of the lights in the room will be fitted with emergency batteries allowing emergency lighting for up to 30min.



Figure 13: Module Light

3.3.5.8 Emergency Lighting and Smoke Detection

Emergency lights are fitted as standard and will provide adequate lighting within the container during a black out situation.

A smoke detector unit is fitted to the ceiling of the container. If activated, the smoke detection unit will trigger an internal container audible alarm in the container.

3.3.6 **Container Fit-Out - Loose Components**

3.3.6.1 Chair

A chair is provided for the Chamber Control Area

3.3.6.2 Fire Extinguishers

Two standard dry powder fire extinguishers are provided inside the container. The fire extinguishers are mounted in the following locations:

- Personnel access door entrance to the Chamber Control area
- Personnel access door entrance adjacent the chamber Entry Lock manway



Figure 14: Typical Fire extinguisher - portable**3.3.6.3 Signage**

All requisite signage is provided in English.

3.3.6.4 Container Documentation

Documentation for the container is provided for modification and fit-out.

3.3.6.5 16 Cylinder Gas Bank

~~A 16 cylinder (16 x 50 litre) 200 Bar gas bank is fitted for pressurisation of the DDC. The Gas bank is split into two independent 8 cylinder supplies ensuring that there is a main and back up supply for the DDC. The cylinder gas bank will comprise of the following:~~

- ~~• Robust galvanized steel brackets~~
- ~~• Manifold fitted with inlet and outlet valve, pressure relief valve and contents gauge~~
- ~~• Cylinders colour coded to IMCA guidelines~~

**Figure 15: 16 Cylinder Gas Bank****3.3.6.6 Ambient control room oxygen analyser**

~~The ambient control room analyser is set to pick up any low oxygen or high oxygen concentrations within the control room. The unit has a long life battery and runs continuously for over 18 months.~~

**Figure 16: Room Analyser****3.3.6.7 Emergency Breathing Air Supply**

The emergency breathing air supply is a single 50litre cylinder mounted externally to the control cabin and provides BA supply to the portable set.

3.3.7 Extras for the Container

3.4 A1800 Decompression Chamber

The Unique Hydra decompression chambers are manufactured using stringent quality control standards. Each component is thoroughly inspected prior to fitting and welding to the pressure vessel. All chambers are designed and manufactured to Category 1 of the pressure vessel code, thereby ensuring that the requirement for pressure vessels for human occupancy is consistently met.



Figure 17: Chamber in a container Module

3.4.1 A1800 chamber Design Data:

Design Pressure Vessel Code:	BS/PD5500/ASME
Certification Authority:	Lloyd's Register or other on request
Maximum Depth Rating:	100 MSW / 334 FSW
Chamber Diameter:	1800mm / 70"
Medical Lock:	10" (250mm) bayonet-type enclosure fitted with safety interlocks
Standard Occupant Capacity:	2 man recumbent / 4 man seated
Paint System:	Marine Coat specification with approved interior coating system

Scope of Supply for A1800 Chamber

Description / Service	ML	EL	Interface
<u>Chamber shell</u>			
Medical lock	1	-	-
View ports	1	1	200mm
Man way doors	1	1	700mm
Deck Plates	1	1	-
Bunks – Lying down	2	-	1,890 x 500
Bunks – Seated	-	1	-
Entry handle grips	1	1	-
Door opening stops	1	1	-
<u>Life Support Piping</u>			
Main Pressurization	1	1	12 JIC
Emergency Pressurization	1	1	12 JIC
Main Exhaust	1	1	Silencer
Gas sample	1	1	-
Bilge Drain	1	1	8 JIC
BIBS Supply	1	1	6 JIC
BIBS Exhaust	1	1	8 JIC
Chamber Relief Valve	1	-	-
Caisson Gauge	1	-	-
Medical lock interlock and piping	1	-	-
<u>Life Support Electrical</u>			
Communication control internal	1	1	-
Sound powered phone – No tone generator	1	1	-
Overhead lights	1	1	-
Video Camera & LCD screen	1	Optional	-
Standby battery supply	1		-
<u>Life Support Components</u>			
Portable Hyperbaric Fire Extinguisher	1		-
<u>External Control Panel</u>			
Depth gauges	1	1	-
Therapeutic Gauge	1	-	-
Electrical switch box		-	-
Oxygen Analyser c/w high and low alarms	1	-	On panel
CO ₂ sample tube analysis kit	1	-	-
Stopwatch	1	1	On panel
<u>Loose Equipment</u>			
Chamber Mattress	2	-	-

[Please refer to optional extras for a wide variety of optional items to include in the chamber]

3.4.2 IMCA D023 fitout specification with Lloyds Register for the PVHO compliance

The chamber complies with the requirements as specified in IMCA D023. The chamber pressure vessel is PVHO compliant with Lloyds Register approvals.



Figure 18: Typical Control Panel

3.4.2.1 Hyperbaric Mattress (2 of)

Mattresses are provided for the 2 bunks in the main lock.

3.4.3 Life Support Piping Systems

The chamber is fitted out for standard diving requirements including the following services:

3.4.3.1 Main chamber blow down

A separate and independent supply is connected to the chamber main and entry lock. Separate penetrators and valves are used as standard for this system. This system is typically connected to the LP air supply system and has pressure gauges with isolation valves and ¼ turn brass ball valves. Tungum tubing is used in the circuit and the vessel is provided with dual shell valves (valves on both side of the chamber shell penetrator). A silencer is fitted on the inside of the chamber to reduce noise and provides a comfortable environment for the diver.

3.4.3.2 Emergency chamber blow down

The emergency blow down for the chamber is identical to the main chamber blow down. The emergency blow down is typically supplied from a 2nd LP compressor or the standby HP air source.

3.4.3.3 Equalization

The piping system interconnecting the two locks is provided such that lock equalization control is achieved externally of the chamber.

3.4.3.4 Exhaust circuit

The exhaust circuit is fitted with ¼ turn brass shell valves on the outside and inside of the chamber. Anti suction devices are fitted to the internal shell valves to prevent suction related injuries to occupants. Silencers are fitted directly to the external valves or interconnect copper pipe-work that leads to an external exhaust.

3.4.3.5 Air Circulation

The air circulation is guaranteed by the strategic placing of the blow down and exhausts valves.

3.4.3.6 Bilge drain

The bilge drain system includes dual shell valves and short flexible hoses for suction of the bilge. The external hoses are provided for draining into suitable bilges or overboard.

3.4.3.7 Depth Monitoring & Gas Analysis

The depth monitoring and gas analysis systems are provided with dual shell valves and ¼ turn plug valves.

3.4.3.8 Shell Valve Frangible Wire

Frangible wire is used to isolate certain valves in the open or closed position. This provides a functional level of safety for the occupants and prevents accidental isolations of safety critical valves. Frangible wire is easily broken when the valve is needed to be operated in an emergency.

Description	Internal ML	External ML	Internal EL	External EL
Main Blow Down	Open	Free	Open	Free
Emergency Blow Down	Open	Free	Open	Free
Exhaust	Open	Free	Open	Free
Depth Monitoring	Open	Open	Open	Open
BIBS Supply	Free	Free	Free	Free
BIBS Exhaust	Free	Free	Free	Free
Medical Lock Piping	Open	Free	Open	Free
Analysis	Open	Open	Open	Open
Bilge Drain	Free	Free	Free	Free
Pressure Relief Valve	Open	Open	-	-
Please note: Open – Wired in the open position Free – Not wired				

3.4.3.9 Chamber Control Panel

The chamber is fitted with a stainless steel control panel mounted on stainless stand-offs. The panel is fitted out with the services as described in the scope of supply table.

3.4.3.10 HP Management Panel (SP 604)

The HP management panel regulates the HP gas supplied from the gas storage banks.

The standard HP management panel will incorporate the following features:

2 x HP supply Inlets through 1 x HP regulator

2 x LP supply inlets

The HP management panel is of modular type and a choice of configuration can be selected. Please refer to the optional extras section.

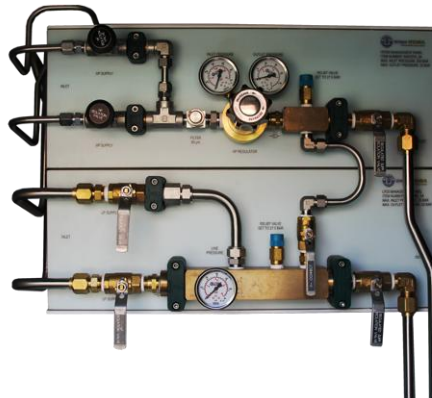


Figure 19: HP Management Panel

3.4.3.11 Primary Communications (SP 86H)

The primary chamber communications system selected is the AMCOM Model 2820-4003 two-way chamber communication system. This provides clear communications between the chamber operator and occupants within the chamber.

This is a two lock systems with independent volume controls for the operator and separate on/off controls for each lock. The system is supplied with a noise cancelling hand-held microphone for use by the operator. The microphone has automatic talk back speaker cut-out which enhances communications quality by reducing the background noise to the chamber occupants.



Figure 20: Typical Chamber Comms unit

Features:

- AC power with battery back-up. Automatic charging
- External 12 VDC connection
- Noise cancelling hand-held push to talk microphone
- Built-In Isolation Transformer
- Separate volume controls for operator and each lock
- Separate on/off controls for each lock
- Simple to operate, with clearly marked controls.

3.4.3.12 Secondary Communications (SP 102H)

A sound powered phone system is provided as the secondary means of communication in the case of complete failure of the primary means. The sound powered phones provided for air diving system do not require the use of a tone generator as the operator is directly outside of the chamber shell. A simple knock on the shell will confirm the requirement to communicate over the sound powered phones.

The chamber is fitted with one sound powered phone in the main and entry lock and one on the control panel for the chamber operator.

3.4.3.13 Oxygen Monitoring (SP 81H)

The chamber is fitted with a chamber analysis piping system as part of the standard fit-out. A Unique Hydra oxygen analyser with high and low alarms is provided. A flow meter with needle valve is fitted to regulate the flow needed to the analyser.

3.4.3.14 BIBS Supply and Exhaust System

As per IMAC DO23, the chamber system must be fitted with a BIBS system to allow occupants of both compartments to breathe a gas other than ambient atmosphere.

Typically, the BIBS systems will comprise of the following:

- The supply system includes the pipe work from the penetration plate to a pressure gauge and connection point on the chamber.
- The supply pipe work is cross connected to the entry and main lock where dual needle valves are provided for shell valves.
- The needle valves are slow rising stem design.
- The regulated supply pressure must be supplied between 8 to 15 bar.

Description	ML	EL
Supply quick connect connections with valve per two outlets	2+1	1+1
Exhaust quick connect connections with valve per two inlets	2+1	1+1
Supply connection	6 JIC	6 JIC

The quick connects supplied are suitable for the standard Scott range of BIBS masks.

As an optional extra, the BIBS system can be up upgraded to incorporate a mixed gas BIBS supply, refer to optional extras for choices available.

3.4.3.15 Safety Systems (SP 71H)

The chamber main lock is fitted with an ASME-approved safety relief valve. The relief valve is fitted externally of the chamber with ¼ turn shell valves fitted to both sides of the chamber. The internal valve is additionally fitted with an anti suction device to protect internal occupants from suction injuries.

The medical/service lock outer door is part of the pressure vessel and is provided with an interlock. The safety interlock ensures that the outer door cannot be opened until all pressure is released from the lock. The safety interlock is provided as an integral part of the door mechanism and is made stainless steel to ensure high reliability.

The internal door of the medical/service lock is also provided with a spring loaded toggle clamp which serves as a safety device to ensure that residual lock pressure is vented to the inside if the chamber pressure is reduced.

3.4.3.16 Lighting (SP 91H)

A 3W LED light is fitted to each of the chamber locks as standard. The lights are fitted with a relief valve to vent any excess internal gas when the chamber pressure is reduced.

3.4.3.17 Fire Fighting (SP 73H)

The standard chamber is fitted with a Unique Hydra 7L hyperbaric fire extinguisher in the main lock. It comprises a portable pressurised cylinder with a foam type fire suppressant. It is operated by removing a pin from the handle and depressing the handle. The unit also incorporates a safety valve to prevent over pressurisation. The unique feature of the design is the ease of refilling, requiring no special recharge systems.

3.4.3.18 DDC Operator Emergency Air & Comms

A CABA set is supplied with full face mask, communications, harness and cylinder. A bailout valve on the harness allows the operator to switch between primary supply and bailout on his back for evacuation of the container. The primary supply is connected via a hose to a quick connect in the bulkhead which is in turn piped to the container gas penetration panel. Clients may connect suitable LP breathing air supply to this penetration point.

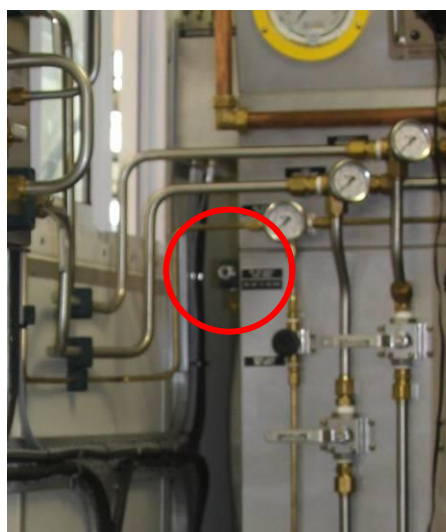


Figure 21: BA set connection



Figure 22: Portable BA set

3.4.3.19 Carbon Dioxide Scrubber (SP 494)

~~The Carbon Dioxide Scrubber is not supplied as part of the standard chamber fit out arrangement.~~

~~Please refer to optional extras for a wide variety of optional items to include in the chamber.~~

~~The Unique Hydra Carbon Dioxide Scrubber is designed and rated for hyperbaric use.~~

~~The simple and efficient construction of the unit provides for ease of assembly and in service maintenance.~~

3.4.4 **A1800 Chamber Optional Extras**

3.4.4.1 Scottmasks VKII c/w Med Mask

~~Without 1st stage (5 required for IMCA compliance).~~

3.4.4.2 Chamber Camera for monitoring the Entry Lock

~~An externally fitted camera will view the Entry Lock through the view port. The images will be displayed on the provided LCD above the Chamber Control Panel.~~

3.5 Interfaces for Client Connection

The following table summarizes the interconnect sizes needed to interface with the container.

3.5.1 Piping Systems

Item	Description	Size	Pressure
1	Cylinder Bank Air Charge 1	4 JIC	Up to 200 Bar
2	Cylinder Bank Air Charge 2	4 JIC	Up to 200 Bar
3	HP Panel - LP Supply 1	12 JIC	Up to 25 Bar
4	HP Panel - LP Supply 2	12 JIC	Up to 25 Bar
5	LP SCBA Supply	6 JIC	Up to 12 Bar
6	BIBS Supply 1 - Oxygen	6 JIC	8 to 15 Bar

4 INTEGRATED LOGISTIC SUPPORT

4.1 Spare Parts Availability

Unique Hydra is committed to supporting its products throughout their life-cycle and all spare parts are readily available from Unique Hydra.

Prices for spare parts will be charged at Unique Hydra's standard list price. Instrumentation, valves and components used in the system are standard industry recognized products which are generally available worldwide from accredited agents and dealers.

Spares are provided as optional extras, please refer to this section or enquire with our sales office.

4.2 Documentation

The equipment is supplied with a comprehensive documentation pack that and will be supplied as per the format specified in the table below.

Documentation Description	Format
Data book containing all certification	1 set hardcopy
Data book containing all certification	2 set CD Rom
OEM O&M Manuals	

5 CERTIFICATION AND WARRANTY

5.1 Warranty

Unique Hydra warrants that all goods supplied are free from defects. Workmanship is guaranteed for 12 months from date of shipment. In addition, all suppliers' guarantees for equipment fitted are passed on to the client, including analysers, communications sets and other electronic items.

Unique Hydra will repair and replace materials and equipment covered by the 12 month warranty or supplier's guarantees for products returned to the Cape Town factory. Shipping and transport costs are however excluded.

5.2 ISO Accreditation

Unique Hydra is an accredited ISO 9001: 2008 company. A copy of the associated certificate can be found at the end of this document.

5.3 Contact Details

Should you require any further information on the product specified above or assistance on our other range of products, please contact us directly.

Contact Person: Dave Couperthwaite
Telephone: +27 21 534 3600
Facsimile: +27 21 534 3610
E Mail: dave.couperthwaite@uniquegroup.com
Website: www.uniquehydra.com

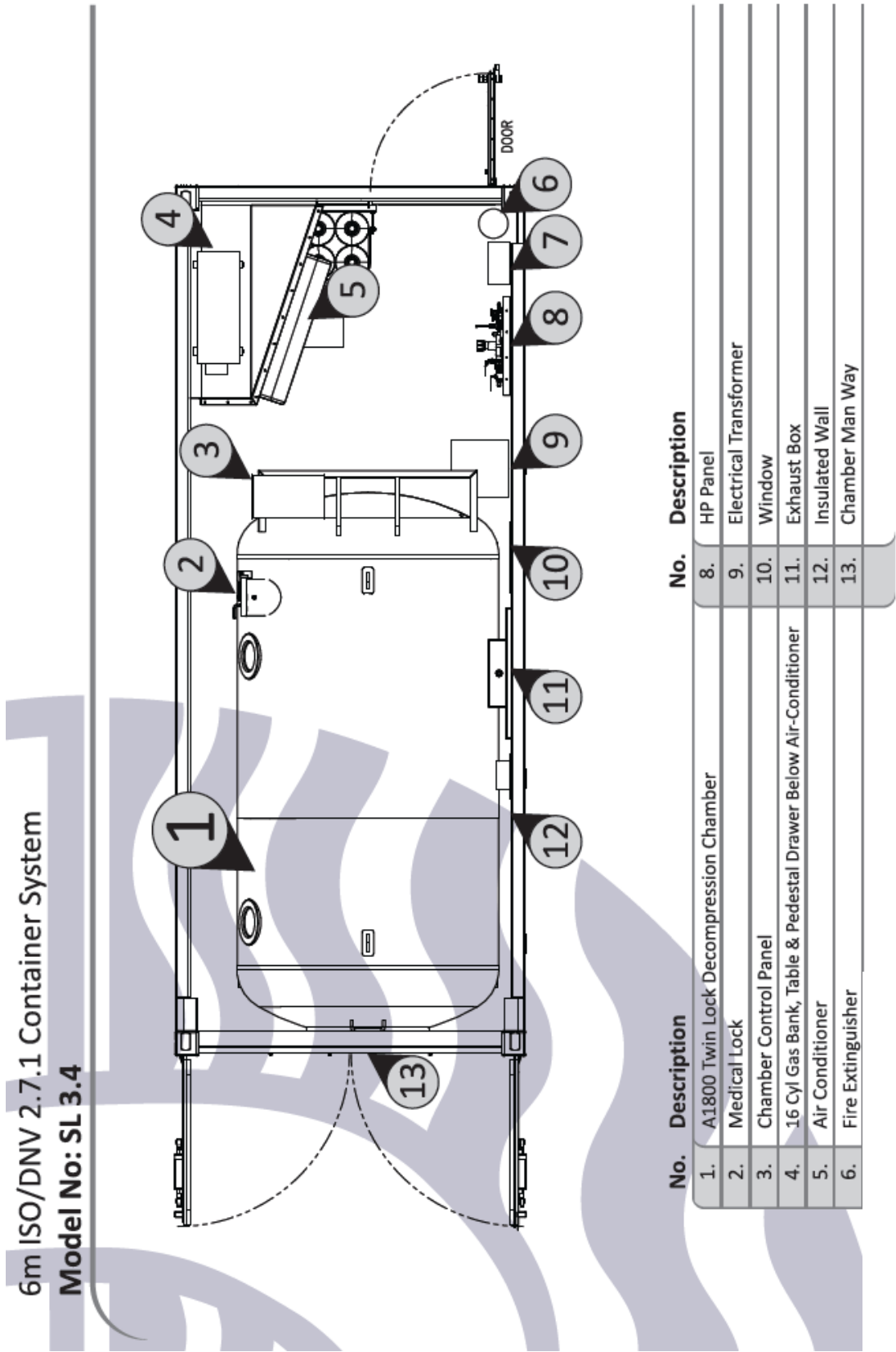


Figure 23: Layout of SL3.4 Containerised Dive System



DNV BUSINESS ASSURANCE MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 136377-2013-AQ-ARE-RvA

This is to certify that

UNIQUE HYDRA (PTY) LTD

at

152 Gunners Circle, Epping Industrial Area, 7460, Cape Town, South Africa

has been found to conform to the Management System Standard:

ISO 9001:2008

This Certificate is valid for the following product or service ranges:

- Design, Manufacture, Repair and Service of Diving Systems, Pressure Vessel for Human Occupancy (PVHO), Associated Life Support, Hyper- Baric, Hypo-Baric & Gas Management Equipment
- Service, Rental, Failure Mode Effect Analysis (FMEA), Repair & Survey of Marine Navigation & Automation Systems, Radio & Dynamic Positioning (DP) Systems
- Operating A Marine Training Centre

Initial Certification date:

28 May 2007

This Certificate is valid until:

27 May 2016

The audit has been performed under the supervision of:

Nirav Shah
Lead Auditor



Place and date:

Dubai, 23 May 2013

for the Accredited Unit:

DET NORSKE VERITAS CERTIFICATION B.V.,
THE NETHERLANDS

Shahram G. Maralani
Shahram G. Maralani
Management Representative

Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

ACCREDITED UNIT: DET NORSKE VERITAS CERTIFICATION B.V., ZWOLSEWEG 1, 2994 EB, BARENDRECHT, THE NETHERLANDS, TEL: +31 (0) 10 2922600, WWW.DNVBA.COM

Figure 24: Unique Hydra DNV Certificate