# SPECIFICATION
# DPII VESSEL RS SENTINEL

## DPII Vessel RS SENTINEL

This unique vessel has especially been reconstructed and equipped for multi purposes such as surveys, light constructions, ROV inspections and work, diving operations and maintenance services.

In 2009 the vessel was extensively upgraded and fitted, to include new accommodation, new main engines, new Kongsberg DP2 system and new aft deck.

The diesel electric propulsion system is designed for low fuel consumption which leads to lower emissions and less environmental impact.

The vessel is equipped with a complete and certified Air Diving Spread for diving work in DP mode and a working class ROV with TMS system.

# SPECIFICATION
# DPII VESSEL RS SENTINEL

| Flag and Classification | |
|---|---|
| Flag | Malta |
| Port of Registry | Valletta |
| Register Number | SSR5181 |
| IMO Number | 7106877 |
| Call Sign | 9HA3754 |
| Classification | RINA 100 A 1.1, AP; ST<br>Unrestricted Nav.<br>Dyna pos. AM/AT R |

| Main Particulars | |
|---|---|
| Builder | Ferguson Brothers Ltd. (UK) |
| Year of Construction | 1971 |
| Vessel Conversion | 1999, 2009 |
| LOA | 68,25m |
| LBP | 60,96m |
| Breadth | 13,41m |
| Depth | 7,16m |
| Draft Summer | 4,58m |
| Air Draft | 21,5m |

| Capacities | |
|---|---|
| Deadweight | 580 DWT |
| Gross Tonnage | 1722 |
| Net Tonnage | 516 |
| Free Deck Area | Approx. 220 + approx. 80m² |
| Gasoil | Approx. 400m³ |
| Potable Water | Approx. 100m³ |

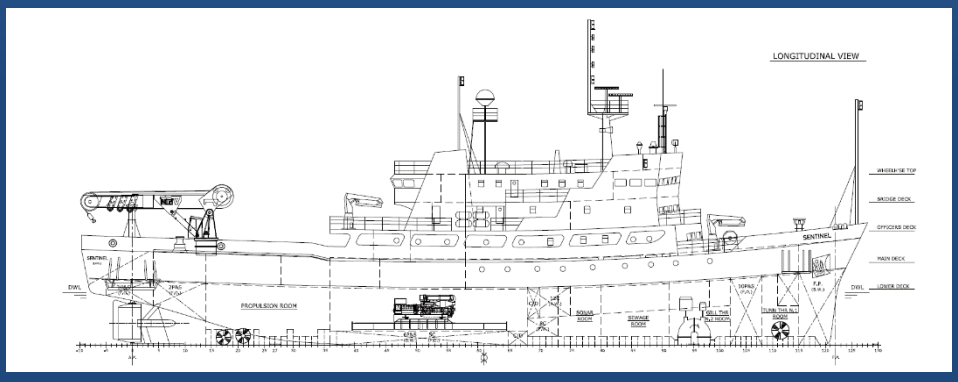
| Accommodation | |
|---|---|
| Total Berths | 48 |
| Hospital | 1 |
| Recreation Rooms: | 1 x 32m² / 75“ TV & 60“TV |
| Gym | 1 x 22m² |
| Mess Room | 1 x 42m² |
| Office 1 / Office 2 | On-/Off Line room 32m² / 9m² |

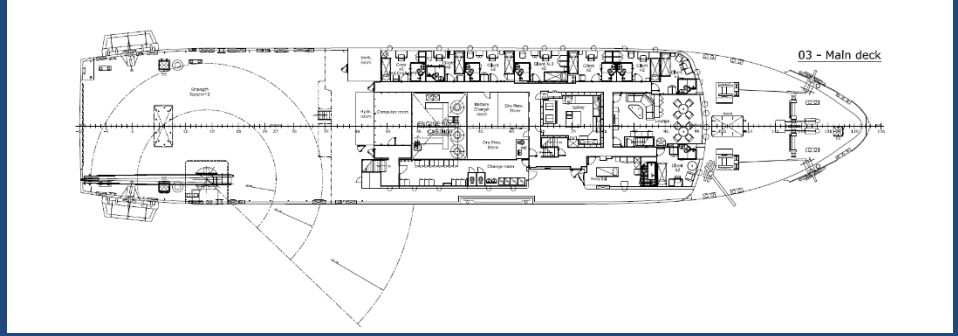
| Machinery | |
|---|---|
| Main Engines<br>(installed in 2009) | 1 x 1100kW CAT3512<br>2 x 1100kW W6L20 |
| Main Propeller | 1470kW electric driven<br>fixed propeller in kort nozzle rudder |
| Bow Thruster | 1 x 420kW Gill Jet Azimuth<br>1 x 600kW ABB Tunnel Thruster |
| Aft Thruster | 2 x 360kW Brunvoll Tunnel Thruster |
| Aux. Generators | 1 x 370kW CAT3408 |

| Deck Machinery | |
|---|---|
| Cranes | 1 x COVIS Crane: 15,5 tons at 6m (aft)<br>9,4 tons at 18m (aft)<br>1 x 2 tons Crane (on boardside)<br>1 x Palfinger Crane: 450kg at 16,8m (aft)<br>1,9 tons max. load on the winch (aft) |
| Mooring Equipment | 4-Point-Mooring |

| Dynamic Positioning | |
|---|---|
| DP II | Kongsberg K-POS DP21 |
| Reference System | Simrad HiPAP 500<br>CyScan Mk 4<br>2 x DGPS |

| Navigational Equipment | |
|---|---|
| ECDIS | TRANSAS NAVI-SAILOR 4000 |
| 2 x Radar | JRC – JMA 9922 – 6XA, Sperry Marine Vision Master FT |
| Autopilot | Simrad AutoPilot 50 |
| GMDSS | A1 / A2 / A3 |



# SPECIFICATION
# DPII VESSEL RS SENTINEL


[1]


[2]

The Vessel

[1] Aft View

[2] Crane Deck


[3]


[4]

[3] Taut Wire System

[4] Palfinger Crane


[5]


[6]

Offices

[5] Office 1
- Conference Table
- Phone
- LED Screen
- 5 Work Desks

[6] Office 2
- Small Conference Table
- Conference Phone
- Work Desk & Printer


[7]


[8]

Catering

[7] Serving Area

[8] Mess Room

# SPECIFICATION
# DPII VESSEL RS SENTINEL


[9]


[10]

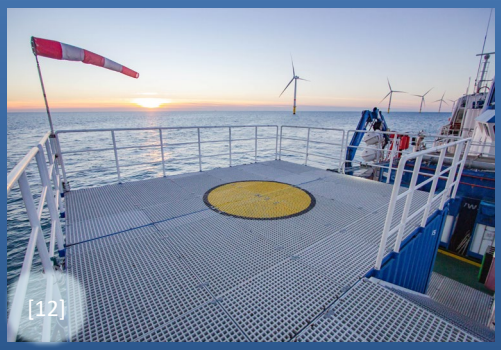
Cabins

[9] Single Room

[10] Double Room

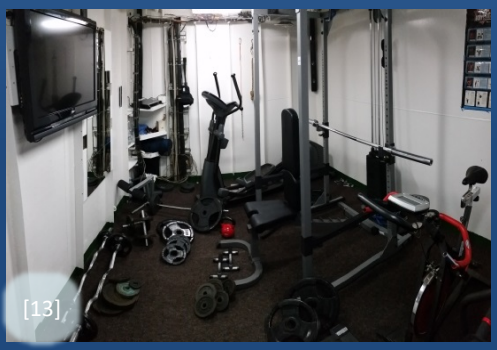
- Cabins with Shower & WC


[11]


[12]

[11] Hospital
- ECG & Defibrillator

[12] Hoist Platform


[13]


[14]

Leisure

[11] Gym

[12] Lounge
- 75” & 60” LED TV Screens


[15]


[16]

[15] Whirlpool

[16] Sauna and Infrared Cabin

# SPECIFICATION
# DPII VESSEL RS SENTINEL


**The DP II Vessel RS SENTINEL stands out due to the following equipment:**

| | | | |
|---|---|---|---|
| Seaeye Panther XT Plus | Appendix 1 | Multibeam (MBES) | Appendix 13 |
| Seaeye Falcon | Appendix 2 | Hydrins iXblue | Appendix 14 |
| Dive Control Container I | Appendix 3 | Septentrio AsteRx-U Marine | Appendix 15 |
| Deck Decompression Chamber | Appendix 4 | NDT | Appendix 16 |
| LARS (Launch and Recovery System) | Appendix 5 | Rapid Torc | Appendix 17 |
| Nitrox Container | Appendix 6 | SUPRA MECA Suprafix SUB150 | Appendix 18 |
| Palfinger Crane | Appendix 7 | Davit Arm System | Appendix 19 |
| Light Weight Taut Wire System | Appendix 8 | Magnetometer | Appendix 20 |
| QINSy | Appendix 9 | Diver UXO Survey Unit | Appendix 21 |
| Zodiac (Rigid Inflatable Boat) | Appendix 10 | Temporary UXO Storage | Appendix 22 |
| ESVAGT Safe Personnel Transfer Basket | Appendix 11 | 8ft Subsea Basket | Appendix 23 |
| Survey Pole | Appendix 12 | | |

Upon request, the DP II Vessel RS SENTINEL can be additionally equipped with an A-Frame.

Specifications subject to change at owner's discretion

# SPECIFICATION
# ROV SEAEYE PANTHER XT PLUS

## Seaeye Panther XT Plus
## 1000m Depth Rated

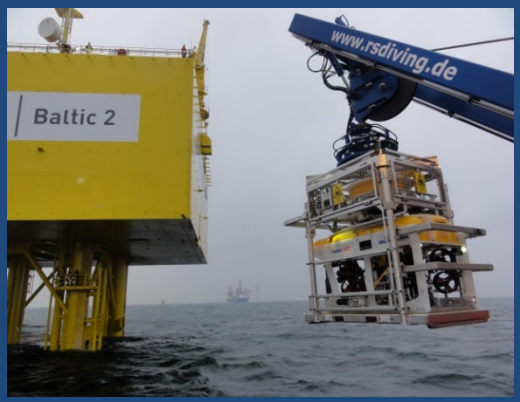

The customizable Seaeye Panther-XT Plus is designed as the benchmark for electric work ROVs and challenges heavier and more costly hydraulic vehicles, particularly where deck space is at a premium.

Thanks to its 500V eight horizontal thrusters and dual power supplies, the Seaeye Panther-XT Plus benefits from exceptional handling and boasts a high power to weight ratio while maintaining an observation class deck footprint.


The RS DIVING Panther-XT Plus ROV brings with it the state of the art fully articulating proportional Schilling Orion 7-functions manipulator for delicate intervention operations, as well as the muscle and brute force of the Schilling Orion 4-functions manipulator for when you need power that makes a difference subsea.

The RS Diving Panther-XT Plus accommodates a wide range of sensors and interchangeable tooling packages to answer the demands of challenging tasks and ever changing conditions, without the high costs associated with larger and more expensive systems.

When the ROV system is large, then everything else must be as well, launch & recovery system, deck space, vessel, and the day rates involved in all of the associated pieces required for such larger ROV systems. But with the RS Diving Panther-XT Plus, it's large on capability and versatility while being the right size for your needs, desires and budget. Smaller deck footprint means smaller vessel, and the savings only get better from there.




The RS Diving Panther-XT Plus is highly suited for work tasks including drill support, pipeline survey, salvage, cleaning, dredging and light IRM to depths of 700 meters.

With its stainless steel TMS, the RS Diving Panther-XT Plus has over 150 meters of tether and 700 meters of umbilical to take it to the depths where your assets and valuable investments await. You know you're in good hands with RS Diving.

# SPECIFICATION
# ROV SEAEYE PANTHER XT PLUS

| ROV Control Cabin / Workshop Container | |
|---|---|
| Dimensions | 20ft Split A60 Safe Area Container<br>20ft x 8ft wide x 9ft high, 4mm |
| Isolation | Walls, floor and ceilings insulated and lined to SOLAS A60 fire rating |
| Electrics | Electrical power distribution system for cabin, ROV system and LARS |
| Interior | Semi high back pilot seat<br>2 x 42" & 7 x 17" LCD monitors |

| Launch and Recovery System (LARS) | |
|---|---|
| LARS | - Hydraulic winch unit (700m capacity) 2,2t load rating<br>- Hydraulic power unit & controls Lloyds witnessed load testing<br>- Snubber rotator unit for safe transfer of the TMS smoothly through the LARS<br>- Certified according to EN12079 for offshore lifting<br>- Technical manual & certification<br>- High folding platform in front of the LARS for additional work space |

| Tether Management System (TMS) | |
|---|---|
| Description | For work at greater depths, in higher currents and for faster travel to and from the working zone, as well as greater protection of the vehicle through the splash zone, the Panther-XT Plus comes with a TMS. |
| Construction | - Stainless steel TMS frame<br>- Bailing arm style TMS with 200m of 20,6mm tether |

| Transport Dimension | |
|---|---|
| Container | 1 x 20" container à 10.500kg (6,06 x 2,45 x 2,75m) (L x B x H) |
| ROV LARS | 17.200kg (6,06 x 2,45 x 3,58m) |

| Main Details | |
|---|---|
| ROV | Remotely Operated Vehicle |
| Serial No. | (977) |
| Product | Seaeye Panther-XT Plus 1000m rated |
| Producer | Saab Seaeye Ltd. |

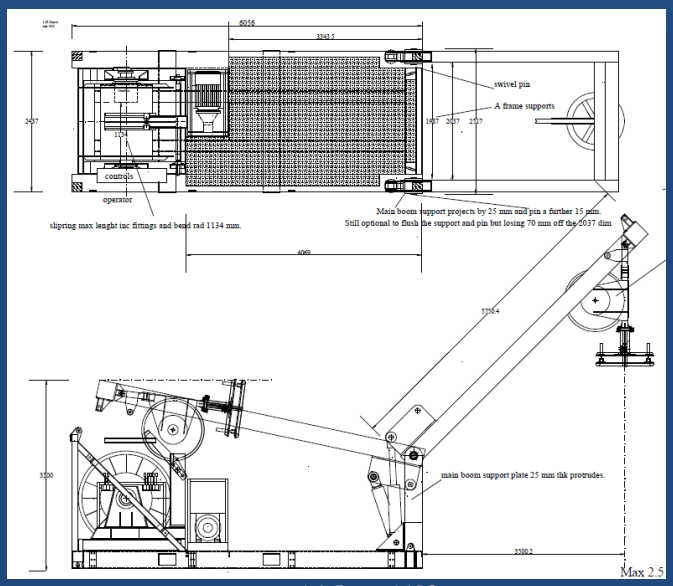
| Technical Details | |
|---|---|
| Depth Rating | 1000msw |
| Length | 2140mm |
| Height | 1217mm |
| Width | 1060mm |
| Launch weight | 800kg |
| Thrust forward | 353kgf |
| Thrust lateral | 248kgf |
| Thrust vertical | 105kgf (std) |
| Depth rating | 1000msw |
| Length | 2140mm |

| ROV Sensors | |
|---|---|
| Sonars | - Tritech Super SeaKing scanning sonar<br>- Blueview M900-130 2D imaging sonar<br>- Tritech Altimeter PA 200 |
| INS | - iXBlue ROVINS NANO Inertial Navigation System (inertial position & velocity, DVL can be integrated) |

| ROV Tool | |
|---|---|
| Manipulators | - Schilling Orion 7P Work Class Arm (proportional control) with 7.8" PA gripper<br>- Schilling Orion 4R Work Class Arm (rate control) with 7.8" gripper |
| Camera | - 4 x Colour Camera (Manipulator Camera)<br>- 1 x Low Light Camera<br>- Recorder with geo referenced overlay |
| Further Tools | - Rotary Disc Cutter<br>- Cleaning Brush |

TMS

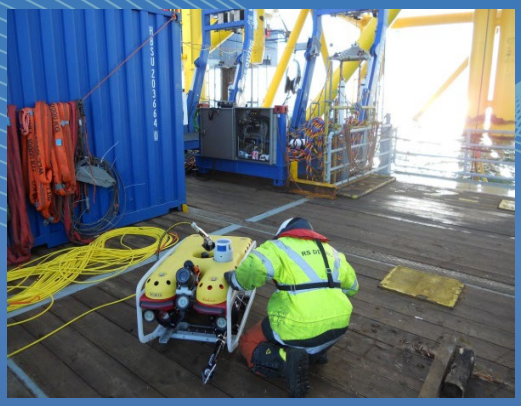
ROV Control Cabin




1 A-Frame LARS

Specifications subject to change at owner's discretion

# SPECIFICATION
# ROV SEAEYE FALCON



## Falcon ROV
## 300m Depth Rated

The Falcon ROV system is configured to be a free swimming ROV platform. It is adaptable, reliable and can perform varied subsea tasks from GVI's, CVI's and Diver Support to CP surveys and light cleaning duties.

Various tooling packages can be integrated with the Falcon (listed below). The Seaeye Falcon is the choice of many leading operators for capability, versatility and the ability to get the job done. Lightweight and portable, they go where they're needed - inshore, offshore, down tunnels or for remote location operations where portability and durability mean success.

Available with a choice of options, tools and accessories, such as rotary cleaning brushes, CP probes, pipe & cable trackers and ultra-sonic thickness gauge to extended tether hand winches and manipulator skids, Seaeye Falcons make an ideal platform for achieving numerous intricate and demanding subsea applications.

# SPECIFICATION
# ROV SEAEYE FALCON

| Main Details | |
|---|---|
| ROV | Remotely Operated Vehicle |
| Serial No. | 12238 |
| Product | ROV SEAEYE FALCON – 300m rated |
| Producer | Saab Seaeye Ltd<br>20 Brunel Way, Segensworth East,<br>Fareham,<br>Hampshire, PO15 5SD, United Kingdom<br>Phone: +44 (0) 1489 898000<br>Fax: +44 (0) 1489 898001<br>E-Mail: rovs@seaeye.com |
| Supervising Authorities | D_TÜV, Germanischer Lloyd |

| Technical Details | |
|---|---|
| Length | 1000mm |
| Length of Ante Chamber | 1000mm |
| Height | 545mm |
| Width | 600mm l |
| Thrust Forward | 48kg |
| Thrust Lateral | 28kg |
| Thrust Vertical | 12kg |
| Weight | 65kg |
| | Payload 10-15kg |

| Video Overlay includes as Standard |
|---|
| Compass heading |
| Depth in meters or feet |
| Camera tilt platform position |
| Auto function status |
| Date and time |
| Turn counter |
| Free designable user screens |
| Facility to export data to survey |
| CP reading (optional) |
| Odometer count (optional) |

| Power Requirements |
|---|
| 220-240Vac single phase 16amp |

| Standard Falcon supplied with | |
|---|---|
| 5 x | MCT1 thrusters |
| 1 x | Colour camera |
| 1 x | Monochrome camera |
| 1 x | Super Sea King sonar |
| 1 x 300m<br>1 x 200m<br>1 x 100m | Low drag tether |
| 1 x | Full LED light, incl. 3rd LED lamp |
| 1 x | Grip stick, incl. rope cutter |

| Standard Surface Equipment | |
|---|---|
| 1 x | Power supply unit, incl. pilot monitor and hand control unit |
| 1 x | Desktop system for video backup, including video editing, survey and additional tasks |
| 2 x | LCD monitors |
| 1 x | Touchscreen |
| 1 x | Trackball |
| 1 x | USB video grabbers |
| 1 x | Wireless router |
| 1 x | Various software |
| 1 x | Digital video recorder |
| 1 x | Fully network capable, e.g. wireless streaming of ROV pictures in real-time, complete network access |
| 1 x | Laptop as complete backup system |
| 1 x | Remote spares package and tool set |

| Special Features for RS Diving | |
|---|---|
| 1 x | 300m 11mm cable / 20m decks lead |
| 1 x | Extended tether hand winch |
| 1 x | Lock latch system |
| 1 x | Rear camera |
| 1 x | Five function manipulator skid |
| 1 x | ROV cage for subsea deployment |
| 1 x | CP probe |

*LED Lights*


*Five Function Manipulator Skid*

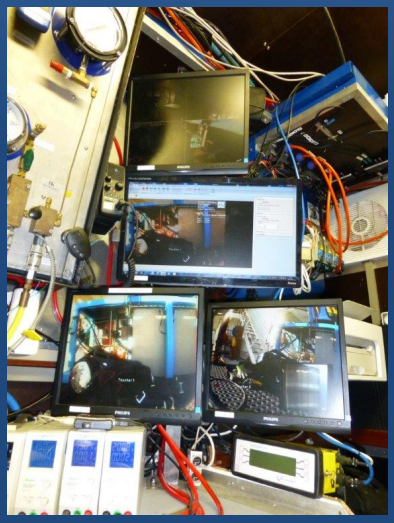

*Surface Control*

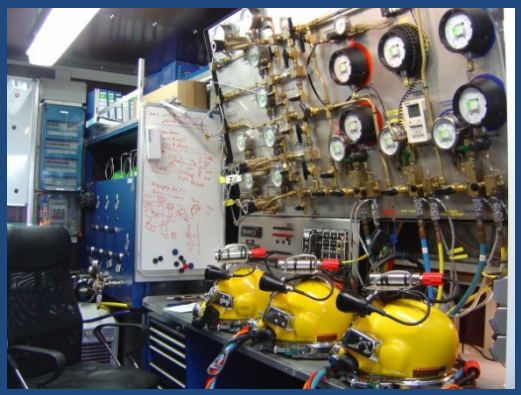
Specifications subject to change at owner's discretion

# SPECIFICATION
# DIVE CONTROL CONTAINER I


## Dive Control Container I

- Size: 20” x 8” x 8,6” (LxWxH)
- Certified by Germanischer Lloyd
- Insulation of walls
- Ventilation system for in- and outlet of the container
- Certified tools





# SPECIFICATION
# DIVE CONTROL CONTAINER I

| Main Details | |
|---|---|
| DCC I | Dive Control Container I |
| Serial No. | D-HH-4529/GL6271 |
| Product | 20" CSC |
| Producer | Hytech bv. and RS DIVING CONTRACTOR GmbH |
| Certification | DNV GL |

| Dive Equipment certified by GL, Germanischer Lloyd | |
|---|---|
| 3 x Diver Umbilical | - Fibron umbilical (140m)<br>- Pneumo hose<br>- 3 Wire light cable<br>- 3/8 Air supply hose<br>- Video cable<br>- 4 Wire coms cable |
| 3 x Diver Helmet | 27b Kirby Morgan |
| 1 x Diver Helmet | 17b Kirby Morgan double outlet valve |
| 3 x Jackets | Diver jackets MK 5 and MK 3 |
| 3 x Bail Out | Steel bail out bottles (10l) |
| Diver Gas Panel | 3 Diver gas panel<br>O2 Analyser |
| Distribution Panel | 3 Inlet and outlet distribution panels with filling station |
| Air Cylinder | 6 x 50l Bottles, 200 bar air cylinder connected to the distribution panel |
| HP Compressor | 240l/min Bauer HP Verticus Compressor super silence |
| Diver Lights | Diver helmet lights (24V) |
| Underwater Camera System | - 3 Diver underwater camera systems<br>- Voice recording - Black box DVD continuously recording diver 1, 2 and 3<br>- Client DVD recording with video (overlay system) |
| 2 x Decks Camera | Decks camera system<br>1 Black & white camera, 1 Colour decks recording on DVD and VHS tape |
| Communication System | - 2 x Three diver Amcom coms. box complete round robin system for 2 extra tender (crane driver)<br>- Loudspeaker |

| UW Burning and Welding Equipment | |
|---|---|
| 1 x Welding Unit | Welding unit Esab 630 LHF |
| 1 x Cable | Burning cable (100m) with O2 hose<br>Welding cable (100m) |
| | Broco torches with spare parts |
| | Welding torches |
| | Surface welding equipment |
| | O2 Reducer for subsea burning |
| | Different sized rods |

| Contents Workshop Equipment | |
|---|---|
| Equipment | Workbenches in different sizes |
| | Spare parts for dive equipment |
| | Tools (driller, grinder, etc.) |
| | Measuring tools |
| | Dräger smoke dive equipment |
| Medical | Eye wash station<br>First aid box<br>(according to offshore standard) |

# SPECIFICATION
# DIVE CONTROL CONTAINER I

## Additional Equipment on Board

Atlas Air Compressor

Hydraulic Power Supply HATZ with bio-degradable oil

Hydraulic Subsea Tools:

Stanley Chop Saw

Stanley Grinder

Stanley Jackhammer

Stanley Impact Driver

Nemo Cordless underwater Grinder and Driller

Specifications subject to change at owner's discretion

# SPECIFICATION
# DECK DECOMPRESSION CHAMBER I

## Deck Decompression Chamber I

The RS Diving DCC I is a fully equipped, state of the art hyperbaric chamber system for up to 6 persons. It can work to up to 5,0 bar overpressure and contains all necessary medical and life saving appliances needed for a mobile treatment system in accordance with IMCA standards.

Main features are a rectangular door for easy and direct access to the main chamber, oxygen breathing system for main and entry chamber, internal air bank for backup and a complete monitoring system as well as all necessary supervision and safety devices.

# SPECIFICATION
# DECK DECOMPRESSION CHAMBER I

| Main Details | |
|---|---|
| Chamber | Containerized Diver Decompression Chamber (DDC) |
| Serial No. | 200516 |
| Product | Starcom 2000/5,5 |
| Producer | Haux Life Support GmbH |
| Certification | D_TÜV, DNV GL |

| Technical Details | |
|---|---|
| Max. Working Pressure | 5,0 bar gauge = 6,0 bar absolute = 6 ATA |
| Design Pressure | 5,5 bar gauge = 6,5 bar absolute |
| Test Pressure | 8,25 bar gauge = 9,25 bar absolute |
| Main Chamber Capacity | 4 Sitting persons or<br>2 Persons lying on stretchers or<br>Mixed other arrangements |
| Ante Chamber Capacity | 2 Sitting persons |
| Inner Diameter of Chamber | 2000mm |
| Length of Main Chamber | 2200mm |
| Length of Ante Chamber | 1000mm |
| Main Chamber Volume | 6.700l |
| Ante Chamber Volume | 3.100l |
| Length overall (incl. control stat.) | 4385mm |
| Width overall | 2020mm |
| Height overall (incl. lamps) | 2050mm |
| Circular Door (AC-direct, AC/MC) | Ø 700mm |
| Rectangular Door (MC-direct) | 1500 x 600mm |
| Supply Lock MC | Ø 200mm / 300mm free length |
| NATO-/STANAG/Din-Bayonet | For connection of transportable chambers (arranged at AC access) |
| Material | P265 GH |
| Weight of Chamber | 9.500kg (approx.), fully equipped |

| Safety Equipment | |
|---|---|
| Firefighting | - "Haux Spray Fog" high pressure fog fire extinguishing system in both chambers with additional manual trigger<br>- Hyperbaric fire extinguishers in both chambers as well as in the control area<br>- Special hardly inflammable upholstery of the interior<br>- Additional fire blankets in the chambers<br>- Dräger Smoke dive equipment for the operator with built-in connections at the control panel |
| Medical | - Complete medical treatment backpack<br>- Wenoll system: Emergency oxygen case for artificial oxygen supply<br>- AED (Automated External Defibrillator)<br>- Spine board with fixation straps and neck support<br>- First Aid boxes<br>- Eye wash station |

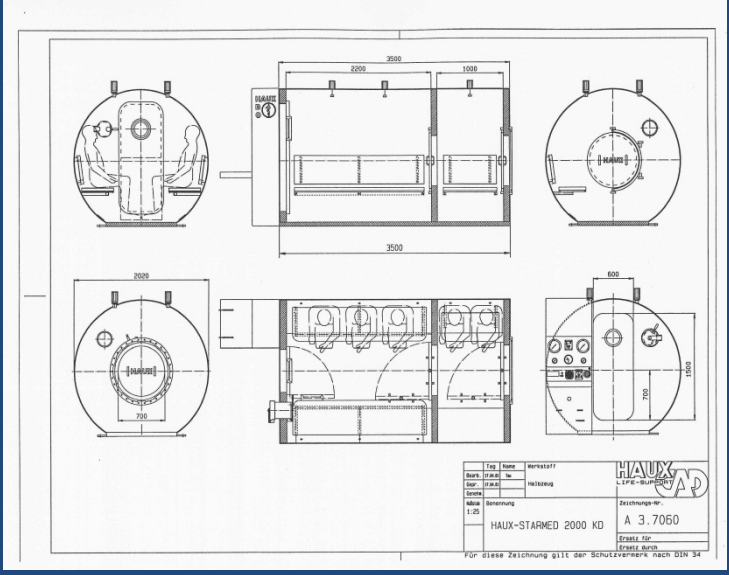

# SPECIFICATION
# DECK DECOMPRESSION CHAMBER I

| Communication Monitoring | |
|---|---|
| Communication | - Chamber intercom system "Haux Star Com" for both chambers<br>- Permanent-dynamic telephone with howler<br>- TV Monitoring system for both chambers<br>- Black Box recording of chamber cameras and communication<br>- Independent monitoring of the oxygen concentration of both chambers with adjustable minimum and maximum alarms<br>- Digital monitoring system "Jumo Logo screen" for continuous registration of time-pressure profile as well as oxygen concentration of both chambers, including backup function on MMC-Card for archiving<br>- All electronic systems, including illumination, are buffered by a UPS unit which ensures operation without external power for at least 30min |

| General Features | |
|---|---|
| General Features | - All valves are fitted from in- and outside to ensure safe operation under all circumstances<br>- Oxygen system switchable<br>- Semi-automatic ventilation valve ("Haux Ventmaster") to ensure fresh air according to the number of persons in the chamber<br>- Internal air bank with 6x50l air tanks as emergency backup<br>- SPS controlled alarm system for phase fault, low level fire<br>- Control room with one frontal and one sideway door to ensure freedom of positioning |

| Connections | |
|---|---|
| Breathing Gases | - 2 Low pressure air inlets<br>- 1 High pressure air inlet<br>- 2 Low pressure oxygen inlets<br>- Outlet manifold for external discharge of breathing gases |
| Electrical | 32A Power connection |
| Container | - Equipped with standard 20” container twist locks |

| Documentation | |
|---|---|
| Documentation | - Operation manuals<br>- Emergency procedures<br>- Maintenance manuals<br>- Spare part lists<br>- Integrated in the RS Diving Contractor’s planned maintenance system ( PMS), including test certificates and maintenance schedules |




Specifications subject to change at owner’s discretion

# SPECIFICATION
# LAUNCH & RECOVERY SYSTEM

## LARS with Top Winch

This Launch and Recovery System is specifically designed to provide an extreme compact option to the standard launch and recovery systems offered by our competitors.

This system is very easily transportable. It is designed to fit 2 complete systems in a high cube 20” container.

We realize the necessity to use the least amount of deck space onboard a vessel and ensure that shipping & mobilization costs are kept to a minimum.

The configuration offered in this specification is viewed as being the most practical solution for a mobile launch & recovery system that complies with IMCA diving standards and your specification requirements.



# SPECIFICATION
# LAUNCH & RECOVERY SYSTEM

| Main Details | |
|---|---|
| LARS | Launch and Recovery System |
| Serial Nos. | 130218-01-01 |
| Product | Launch and Recovery System |
| Producer | Pommec BV |
| Certification | Class approved |

| Technical Details | |
|---|---|
| Dimensions stored | 4000 x 2200 x 1300mm (LxWxH) |
| Dimensions operational | 5300 x 2200 x 4270mm (LxWxH) |
| Weight | 3250kg<br>(including clump weight and basket) |
| Power Hydraulic Supply | 180 bar, 42l/min |
| Power Electric Supply | 2 motors 3 phase 11kw (2 control panels)<br>* 380-420V - 50Hz<br>* 440-480V - 60Hz<br>Hydraulic power 210bar – 42l/min, each machine |

| Work Area | |
|---|---|
| Offshore | Open sea environment (Lloyd's Register) |
| Fixation | 4 Mounting plates |
| Work Temperature | - 10°C + 50°C |

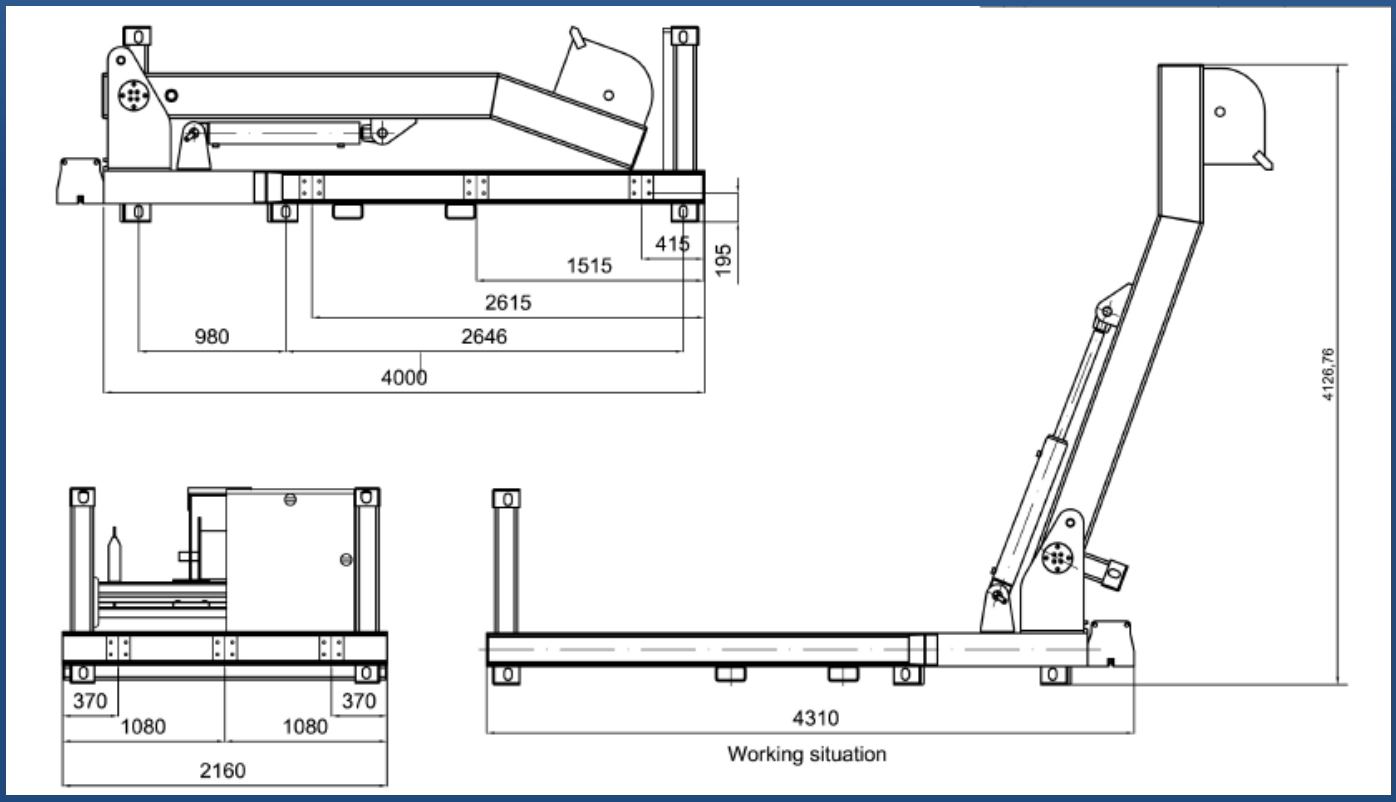
| Control | |
|---|---|
| Control | Control box mounted on platform |

| Material and Preservation | |
|---|---|
| Platform | Offshore coated steel S 355 J2 |
| A-Frame | Offshore coated steel S 355 J2 |
| Control Box | Stainless steel AISI 316L |
| Hydraulic Cylinders | Offshore coated steel FE 510 D<br>(hard chrome rods) |

| Diving Cage | |
|---|---|
| Material | Stainless Steel AISI 316L |
| Inner Dimensions | 1250 x 900 x 2300mm (LxWxH) |
| Weight | 0-300kg |
| Payload | 500kg |

| Clump Weight | |
|---|---|
| Material | Stainless steel AISI 316L<br>(synthetic top plate) |
| Dimensions | 1280 x 300 x 255mm (LxWxH) |
| Weight | 0-300kg |

| Winches | |
|---|---|
| Material | Stainless steel (AISI 316L) |
| Break | Double break hydraulic driven man-riding winches |
| Wires | 80m diam. 10mm wire for cage<br>106m diam. 8mm wire for clump weight |




Specifications subject to change at owner's discretion

# SPECIFICATION NITROX CONTAINER

## Nitrox Container

Mixed gas container with autonomous Nitrox gas production and emergency breathing gas storage.

The container is divided into two compartments in order to isolate noise-producing equipment, and to provide a noise protected control room.

Room 1: Control room for storing and regulating the breathing gas for each respective dive.

Room 2: Nitrox breathing gas production, high- and low-pressure compressors, and climate control.


# SPECIFICATION NITROX CONTAINER

| Container Size | |
|---|---|
| Length | 20ft (610cm) |
| Width | 8ft (244cm) |
| Height | 8ft, 6in. (259cm) |
| Non-combustible insulation | 50mm |

| Low-Pressure Compressor | |
|---|---|
| Model | Renner RSDK-15 |
| Operating Pressure | 15bar |
| Delivery Rate | 1240l/min. |
| Electrical Requirements | 400V / 50Hz |
| Storage Tank | 500l |

| High-Pressure Compressor | |
|---|---|
| Make/Model | Bauer V 12.14-7,5-5 |
| Operating Pressure | 225bar |
| Delivery Rate | 260 l/min. |
| Electrical Requirements | 400V /50Hz |
| Power Consumption | 5,3kW |
| Dimensions | 148 x 83 x 152cm |
| Weight | Approx. 305kg |

| Breathing Air Bottle | |
|---|---|
| Volume | 50l |
| Pressure Rating | 200bar |
| Number | 14 |


Specifications subject to change at owner's discretion

# SPECIFICATION
# PALFINGER CRANE

## Palfinger Crane
## PK 14002-EH

The Palfinger crane is a remotely operated hydraulic crane.

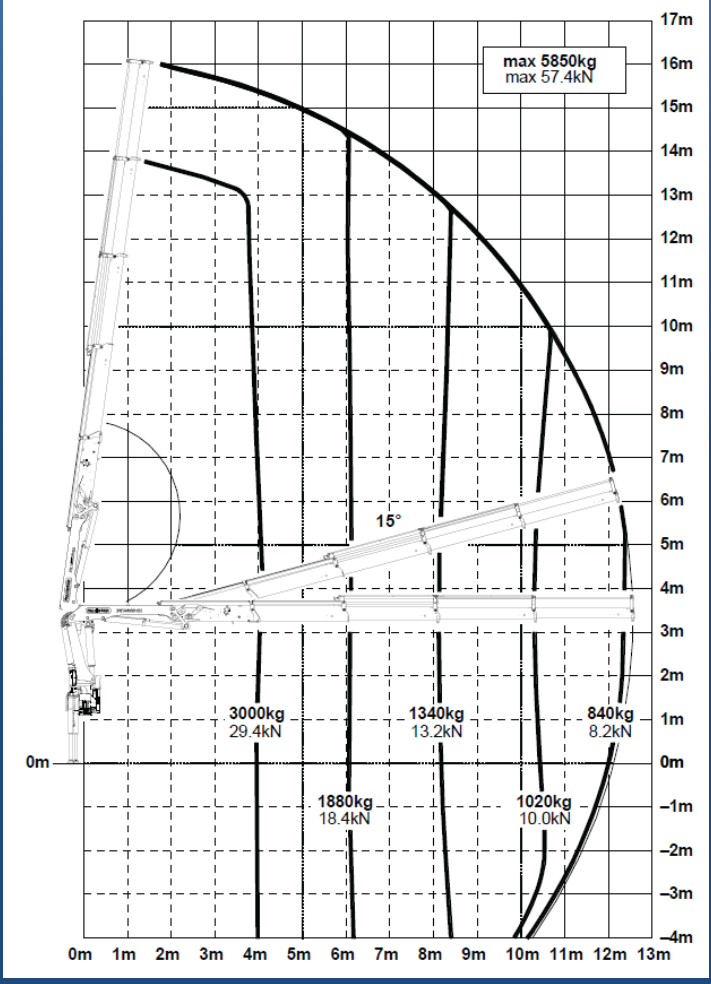
It is installed next to the dive deck and is used for crane operations during diving.

It can also extend the range of the divers by using a “Golden Gate” on the crane, where the divers attach their umbilicals.

# SPECIFICATION PALFINGER CRANE

| Main Details | |
|---|---|
| Palfinger PK14002-EH | Hydraulic Crane |
| Serial No. | 1001833243 |
| Product | Palfinger crane with winch<br>Powered by Rexroth Hydraulic<br>Power Pack |

| Features |
|---|
| - Operation via remote control or levels on the crane |
| - Integrated Load and Geometry Monitoring System to avoid that the maximum load is exceeded |
| - Max. boom length: 17m (approx. 15m overboard) |
| - Max. safe working load: 450kg |
| - Max. load on the winch: 1900kg |
| - Max. load on the crane: 5650kg |
| - 72m cable on the winch to reach a water depth of approx. 45m during full reach of the crane |



# SPECIFICATION
# TAUT WIRE SYSTEM

## Light Weight Taut Wire Mk 15B Position Reference System

The Light Weight Taut Wire Mk 15B is a position reference system designed for use in deck-mounted port or starboard position on surface vessels. Its purpose is to provide accurate data of a surface vessel's movements with respect to the position of a depressor weight on the sea floor.

A wire is maintained at a constant tension by means of a depressor weight on the sea bed and a pneumatic and electric servo-assisted "mooring" system. Any movement of the vessel will cause the tensioned wire to deviate from its initial inclination. This movement activates potentiometers mounted in the gimbal (sensor) head and produces changes of analogue signals directly proportional to the deviation in inclination.

# SPECIFICATION
# TAUT WIRE SYSTEM

| Manufacturer's Info | |
|---|---|
| Model | LTW Mk 15B |
| Article Number | 702788 |
| Manufacturer | KONGSBERG MARITIME AS<br>Norway |

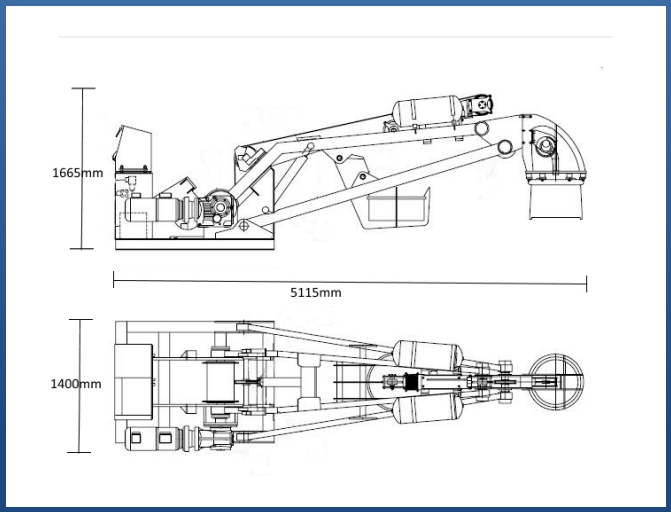
| Dimensions, Deck Equipment | |
|---|---|
| Height (parked) | 3550mm |
| Height (operational) | 1665mm |
| Width | 1400mm |
| Length (parked) | 1700mm |
| Length (operational) | 5115mm |
| Weight | 2530kg, incl. depressor (360kg) |
| Support Frame | 1700mm x 1300mm |

| Dimensions, Electronics Cabinet | |
|---|---|
| Height | 1900mm |
| Width | 800mm |
| Depth | 510mm |
| Weight | 250kg |
| *Note: Distance between deck equipment and electrical cabinet shall not exceed 50m.* | |

| Electrical | |
|---|---|
| Input Voltages | 440 VAC +20%/-30%<br>3-phase, 50 - 60Hz<br>220 VAC, single phase<br>50 - 60 Hz, (from UPS) |
| Power Consumption | |
| - 440VAC Input | 22kW (continuous load) |
| | 36 kW (peak load, max 30min) |
| - 220VAC input | 500W |

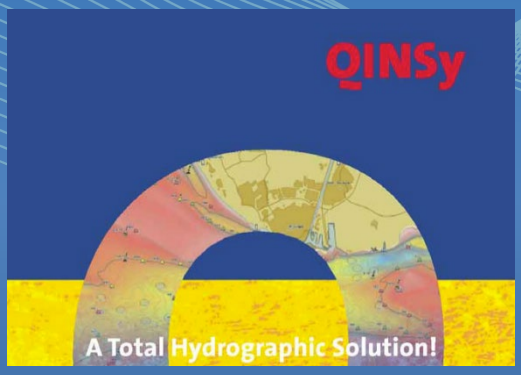
| Pressurized Air | |
|---|---|
| Maximum pressure | 10 bar |
| Minimum pressure | 6 bar |
| Minimum flow | 5Nm3/h |
| Purity (in accordance with ISO 8573-1) | |
| - Solid Contamination | Class 5 |
| - Water | Class 3 |
| - Oil | Class 5 |

| Environmental | |
|---|---|
| Ambient Temperature (Operational) | |
| - Cabinet | 0 to +55°C |
| - Deck Equipment | -15 to +65°C (no ice) |
| Ambient Temperature (Storage) | 25 to +70°C |
| Ambient Relative Humidity (Operational) | 20% to 100% |
| Ambient Relative Humidity (Storage) | 0% to 100% (sealed in aluminium foil) |
| Operating Wind Strength | 0 to 80 knots |
| Ice Thickness | |
| - Operational | NONE |
| - Parked | Up to 100mm |
| Acoustic Protection | |
| - Cabinet | IP22 |
| - Deck Equipment | IP56 |




Specifications subject to change at owner's discretion

# SPECIFICATION
# QINSy

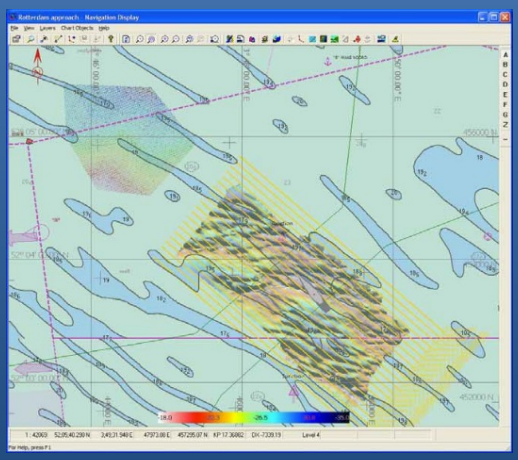


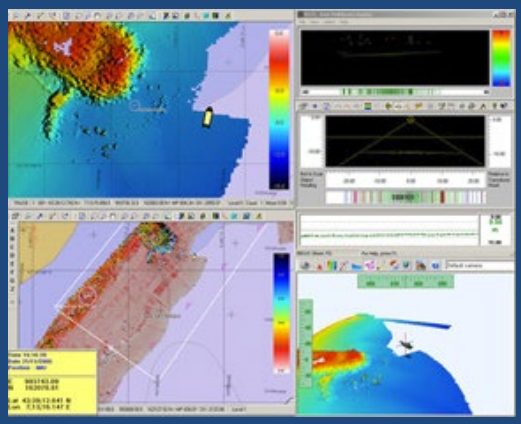

## QINSy

(Quality Integrated Navigation System)

QINSy is a hydrographic data acquisition, navigation and processing software package.

The suite of applications can be used for various types of surveys, ranging from simple single beam surveys up to complex offshore construction works.

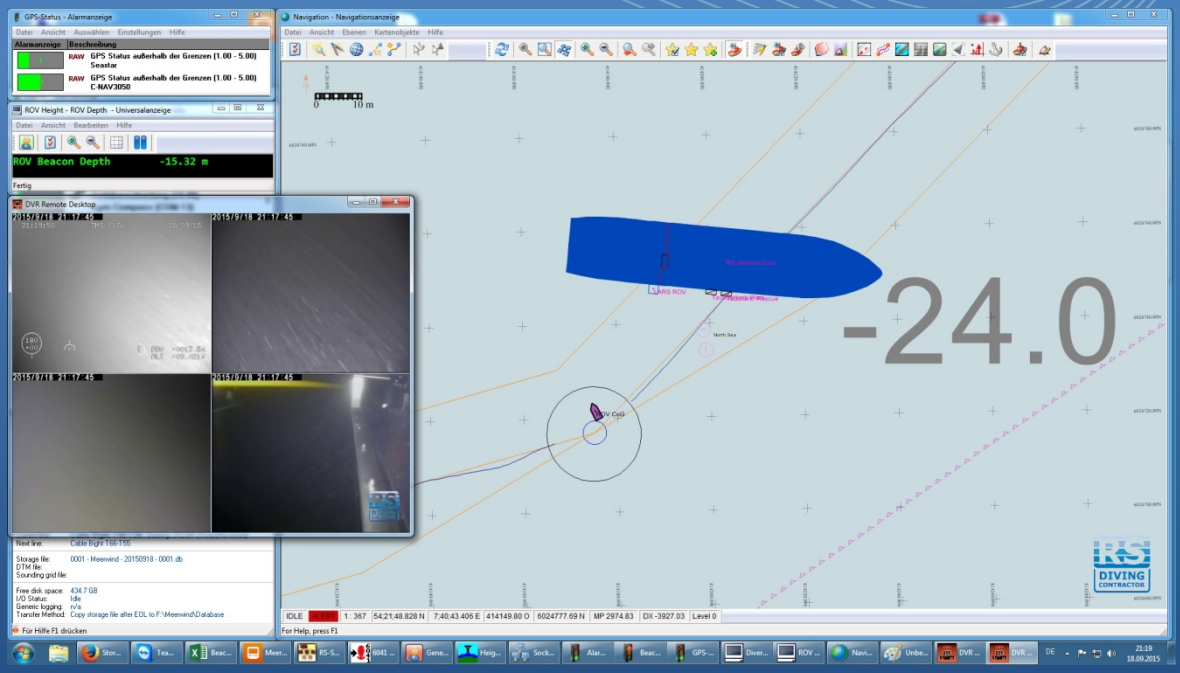




# SPECIFICATION QINSy

| Main Details | |
|---|---|
| QINSy | Quality Integrated Navigation System |
| Serial No. | CZC5173CT2 (Desktop) |
| Product | Software, incl. PC and LED screens |
| Producer | QPS (Member of Saab Group) |
| License | Survey |

| Features |
|---|
| - Hydrographic & Oceanographic Survey |
| - Offshore Inspection Survey |
| - Marine / Offshore Construction Support |
| - ROV & Diver tracking and position data collection |



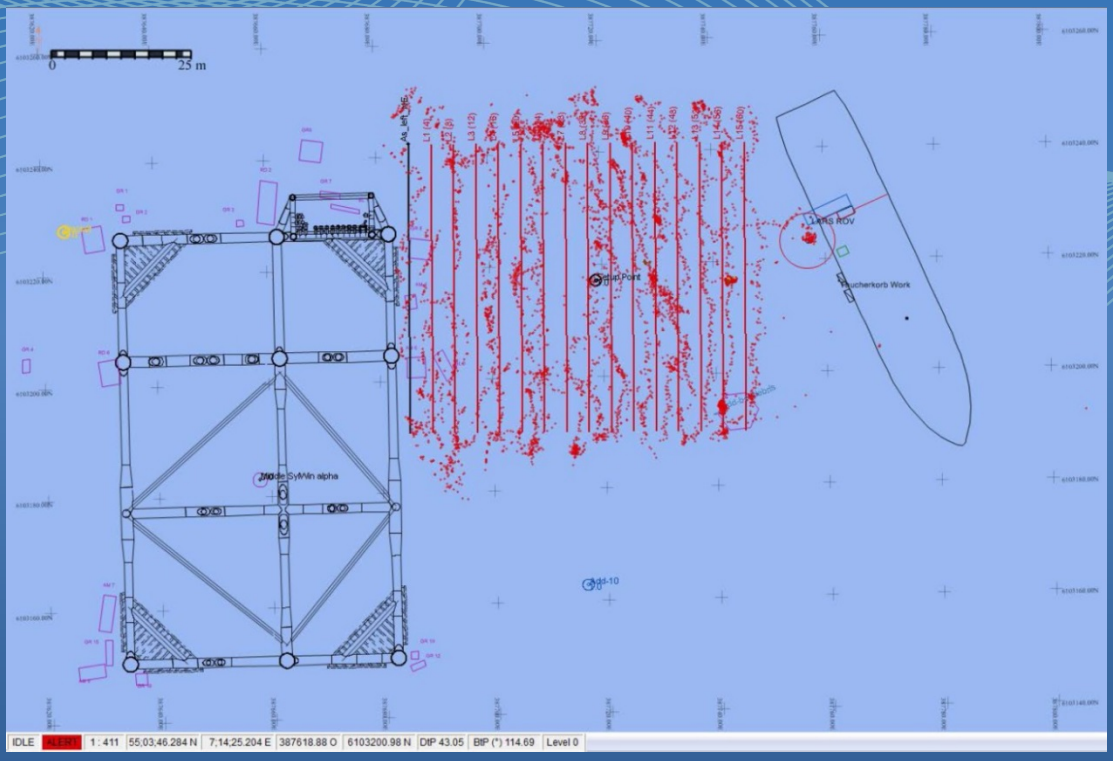

ROV Inspection tracked by QINSy showing the ROVs depth and position to navigate the ROV as close and as fast as possible to the job task.


USBL beacons are mounted on the diving equipment, ROV and crane hook.

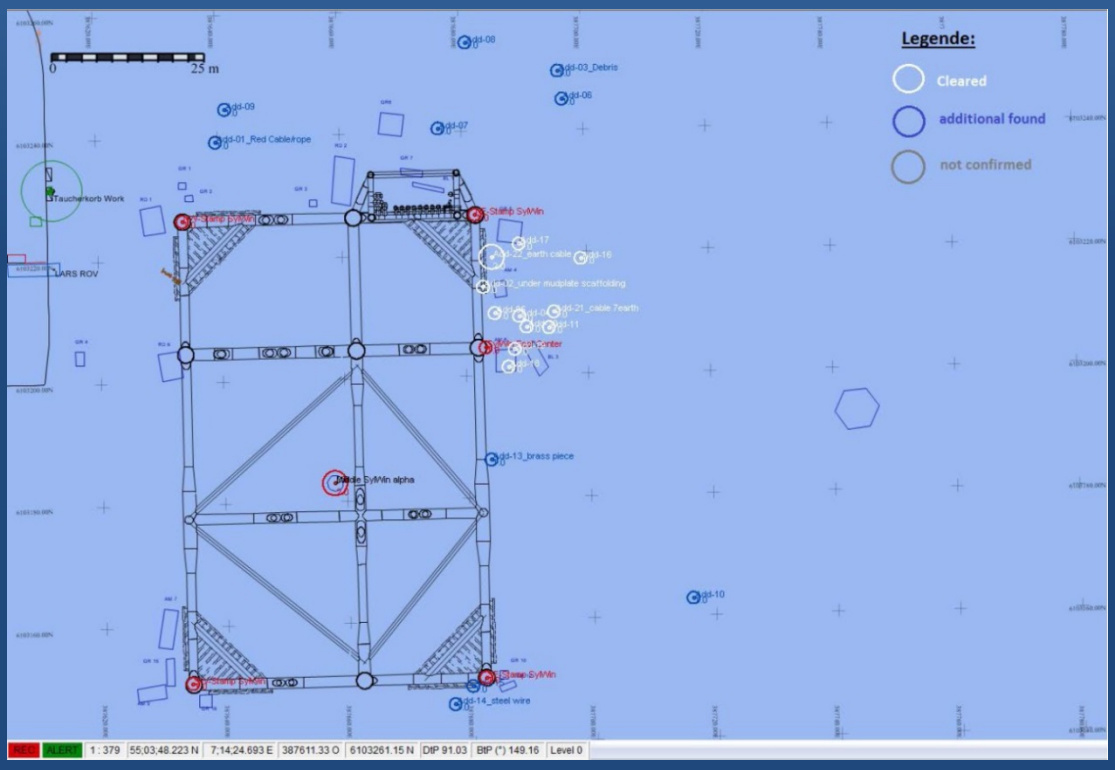
QINSy tracks divers' depths and positions to assist in diving procedures and during under water crane operations.

Each department on board of the RS SENTINEL is equipped with a client computer running QINSy to assist with their job tasks.
Clients are controlled by the host QINSy computer located in the survey office to support ROV and dive control and the DP Bridge. (See picture)

# SPECIFICATION QINSy




Logged positions of an ROV video inspection across survey lines to ensure a 100% coverage along the required survey area.




*Logged target positions to support the divers and ROV´s clearance tasks. After an initial survey additional targets identified can be added. The work progress can be monitored and documented. An as left survey of located targets is more simply and faster.*

# SPECIFICATION ZODIAC

## Zodiac

### Rigid Inflatable Boat

Lightweight but high-performance and high-capacity boat constructed with a solid, shaped hull and flexible tubes at the gunwale.

Designed for offshore voyages in conditions up to and including wind force 8 and significant wave height up to and including 4 meters.

# SPECIFICATION ZODIAC

| Main Details | |
|---|---|
| Vessel | Zodiac |
| Number Plate | EMD-RS 3 |
| Construction Number | NL-EoW10001E212 |
| Product | BUE SPRINT 100 OP |
| Producer | Euro Offshore Service BV |
| Material | GFK |
| Length | 5,70m |
| Beam | 2,30m |
| Draught | 0,10-0,80m |
| Weight (tanks empty) | 0,285t |
| Water displacement | < 10m³ |
| Year of Construction | 2012 |

| Engine | |
|---|---|
| Engine Product | Yamaha F70 Four-Stroke |
| Engine Number | 6C J00YM-1 |
| Displacement | 996cc |
| Horse Power | 70hp at 5800 RPM |

| Capacity | |
|---|---|
| Max. Number of Persons | 8 |
| Max. Load | 850kg |
| Max. Power | 168hp (125kW) |
| Fuel Tank | 2 x 25l |

| Equipment | |
|---|---|
| Life Buoy 2,5 kg | 1 x |
| Floating Rescue Line | 1 x |
| Commet Red Hand Flare | 2 x |
| Commet Smoke Signal | 1 x |
| Comet Red Parachute Signal Rocket | 3 x |

| Trailer | |
|---|---|
| Trailer Type | V 1500-20-6014 R (x=145cm) |
| Trailer ID | XNYG1150012000151 |
| Number Plate | 52-WJ-HN |

Specifications subject to change at owner's discretion

# SPECIFICATION
# PERSONNEL TRANSFER BASKET

## ESVAGT
## Safe Personnel Transfer Basket

The ESVAGT Safe Personnel Transfer Basket enables safe, quick and effective transfer between offshore installations, drilling rigs and vessels.

The basket is constructed to considerably enhance safety and confidence levels for personnel during transfers.

# SPECIFICATION
# PERSONNEL TRANSFER BASKET

| Dimensions | |
|---|---|
| Diameter | 2600mm |
| Height | 3222mm |
| Weight | 450kg |
| Weight of Transfer Cable | 30kg |
| Weight, loose gear, incl. sling | 50kg |

| Capacity | |
|---|---|
| Personnel Capacity | 4 PAX |
| Transfer Weight Capacity | 500kg |

## Key Features

***Closing Straps***

*Rope webbings are fitted with fast click- buckle straps ensuring fast and easy exit.*

***Nets***

*Four rope webbings made of spliced rope are attached to the upper and lower stainless steel structure. These rope webbings function primarily to secure personnel inside the basket.*

***Strap Tighteners***

*Strap tighteners are used for securing stretcher to the basket.*

***Bottom Deck***

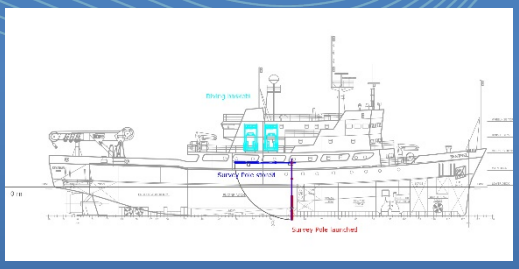
*A heavy aluminum plate as bottom deck with anti-slip pattern.*

***Shock Absorbing Function***

*Large floats and bottom ring are fitted underneath the basket deck to provide shock-absorbing function for softer landing.*

Specifications subject to change at owner's discretion

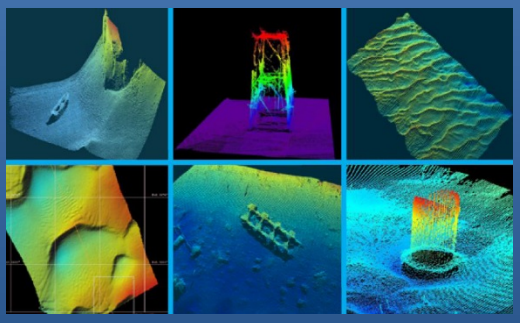
# SPECIFICATION
# SURVEY POLE INSTALLATION

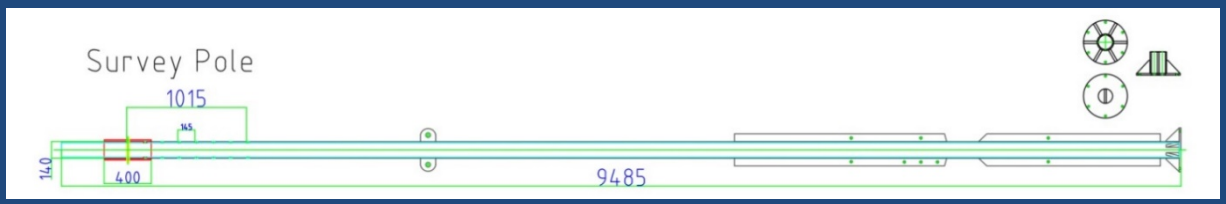


## Survey Pole Installation

The DSV RS SENTINEL is equipped with a survey pole.

It is installed at starboard side to attach a variety of survey equipment enabling different survey tasks.





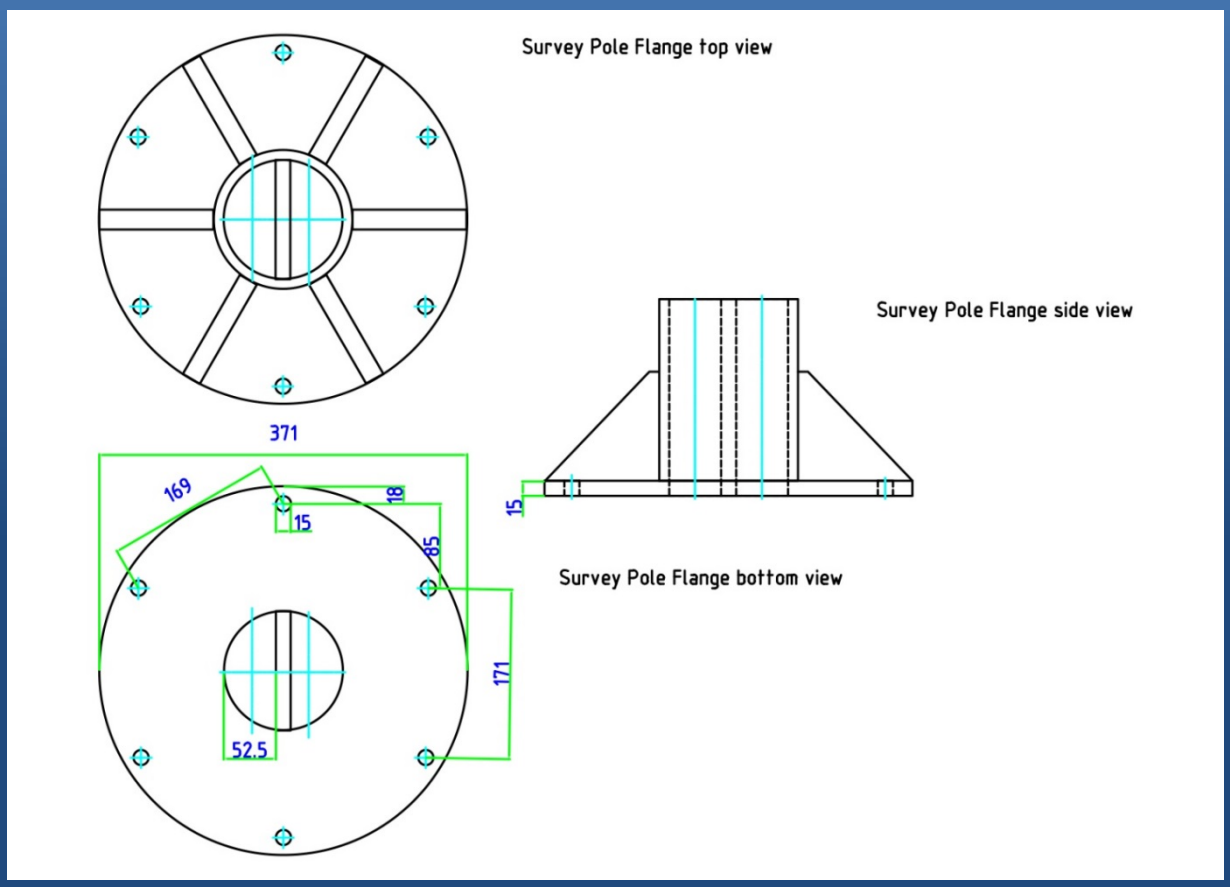
# SPECIFICATION
# SURVEY POLE INSTALLATION

| Main Details | |
|---|---|
| Survey Pole | Installed mid ships at starboard |
| Vessel | DSV RS Sentinel, DP 2 |
| Length | ~ 9,5m |
| Draught | ~ 5m (~0,5m under keel) |
| Flange | Flange for various attachments |

**Features**

- Survey Pole with calibrated offsets
- Flange for various attachments of survey equipment, e.g. Multibeam, Scanning Sonar, Echoscope, Sub Bottom Profiler
- Survey jobs such as seabed surveys, scour monitoring, construction support etc.
- Easy installation on surface, support from own divers to fix the pole on ships keel blade with a screwed on bracket

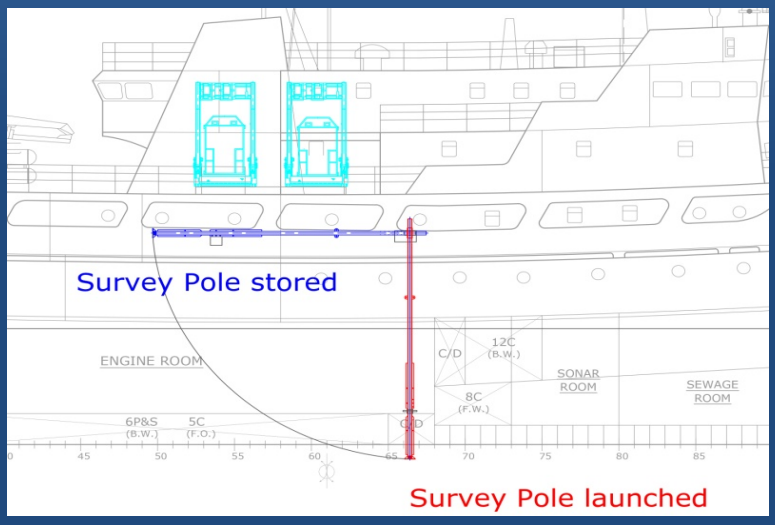
The installed and offset calibrated survey pole on the DSV RS Sentinel offers a wide variety of survey tasks from seabed surveys, scour monitoring to structure scans or construction support. Different sonar equipment can be attached to the pole's flange, such as multi beam systems, sub bottom profilers or other devices. The equipment can easily be installed on surface and kept aside or recovered for longer travels. When lowered under water, it can be fixed with a bracket on the ships keel blade, which can be processed by our own team.



# SPECIFICATION
# SURVEY POLE INSTALLATION

Bracket mounted at the DSV RS Sentinel's keel blade to prevent vibrations. The bracket can be installed by our diving team in port or at sea.

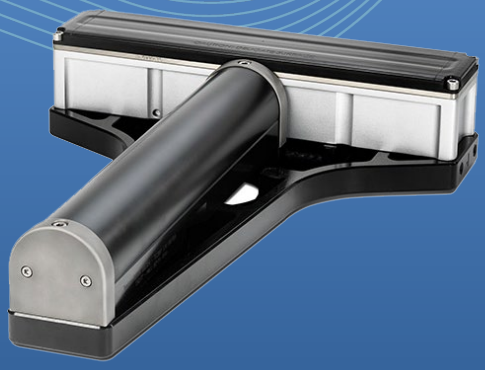
Topside view of the pole being recovered to the travel position.




In lowered position, the flange of the pole is located approx. 0,5m under the keel of the vessel. Draught of the vessel is approx. 4,6m.

Specifications subject to change at owner's discretion

# SPECIFICATION
# Multibeam SeaBat® T50-R



SeaBat T50 sonar head

## Multibeam
## Teledyne RESON
## SeaBat® T50-R

- All-in-one, fully flexible and fully integrated survey system.
- The compact system allows for fast mobilization, minimal interfacing and extremely low space requirements.
- The new compressed water column data significantly reduces data volume while maintaining the required information.
- Normalized backscatter designed for accurate, reliable and repeatable sea bed classification.


Rack-mounted Sonar Processor (RSP)

RS DIVING CONTRACTOR

# SPECIFICATION
# Multibeam SeaBat® T50-R

| | | | | | |
|---|---|---|---|---|---|
| Input voltage | 100-230VAC 50/60Hz | | | | |
| Transducer cable length | 25m (standard) Optional: 10m, 50m or 100m | | | | |
| Temperature (operational / storage) | Rack-mounted Sonar Processor: -5°C to +45°C / -20°C to +65°C | | | | |
| | **height [mm]** | **width [mm]** | **depth [mm]** | **weight [kg/air]** | **weight [kg/water]** |
| T50 Rx (EM7218) | 102.0 | 460.0 | 90.7 | 8.2 | 3.9 |
| T50 Tx (TC2181) | 86.6 | 93.1 | 280 | 5.4 | 3.4 |
| Rack-mounted Sonar Processor<br>* Standard 19" rack-mount | 88 (2U) | 478* | 462 | 12.3-13.8 | N/A |
| Teledyne Type 20/30 IMU | 123 | 118 | 95.6 | 3.0 | 1.6 |

| T50 Acoustic performance | **400kHz** | **200kHz** |
|---|---|---|
| Across-track receiver beam width[1] | 0.5° | 1° |
| Along-track beam width[1] | 1° | 2° |
| Number of beams | 10 - 512 | |
| Swath coverage (up to) | 10°-150° Equi distance, 10°- 165° Equi Angle | |
| Typical Depth (CW[2]) | 0.5-150 meters | 0.5-375 meters |
| Max Depth (CW[3]) | 250 meters | 550 meters |
| Typical Depth (FM[2]) | 0.5-180 meters | 0.5-450 meters |
| Max Depth (FM[3]) | 300 meters | 575 meters |
| Ping rate (range dependent) | Up to 50 pings/s | |
| Pulse length (CW) | 15 – 300µs | |
| Pulse length (FM) | 300µs – 10ms | |
| Depth resolution | 6mm | |
| Depth rating (sonar head) | 50 meters | |

| | | | | | |
|---|---|---|---|---|---|
| Teledyne INS Type -20 | Roll/Pitch<br>0.02° | Heading[4]<br>0.015° | Heave[4]<br>5cm/5% | TrueHeave<br>2cm/2% | Optional postprocessing with POSPac MMS.<br>Optional Fugro MarineStar®. |
| Teledyne INS Type -30 | Roll/Pitch<br>0.01° | Heading[4]<br>0.010° | Heave[4]<br>5cm/5% | TrueHeave<br>2cm/2% | |

For relevant tolerances for dimensions above and detailed outlined drawings see Product Description
1 Nominal values
2 This is a depth range within which the system is normally operated, from the minimum depth to a depth value corresponding to the max. swath-50%.
3 This is the single value corresponding to the depth at which the swath is reduced to 10% of its max. value. For actual swath performance refer to Product Description.
4 With 4m GPS base line. Heave 5cm/5% whichever is greater for periods +/- 20sec

# SPECIFICATION
# iXblue Hydrins

## iXblue
## High-grade INS for hydrographic and multibeam surveys

- High-accuracy 3D positioning with heading, roll and pitch.
- Simplified Integration with a single GNSS antenna setup
- Automatic GNSS drop-out / multipath management


### With GNSS[2]

| Correction type | SPS Natural | SBAS | DGNSS | PPP* | RTK** | PPK*** |
|---|---|---|---|---|---|---|
| Position Horizontal (X,Y) (m) | 1.20 | 0.60 | 0.30 | 0.06 | 0.006 + 0.5 ppm | 0.006 + 0.5 ppm |
| Position Vertical (Z) (m) | 1.90 | 0.80 | 0.50 | 0.09 | 0.01 + 1 ppm | 0.01 + 1 ppm |
| Heading[3] (deg) | 0.01 | | | | | |
| Roll & Pitch (deg) | 0.01 | | | | | |
| Heave / Smart Heave[4] | 5 cm or 5% / 2 cm or 2 % | | | | | |

### During GNSS outage[2]

| Outage duration | RTK** 60 sec | PPK*** 60 sec |
|---|---|---|
| Horizontal (X,Y) (m) | 0.30 | 0.20 |
| Vertical (Z) (m) | 0.30 | 0.20 |
| Heading[3] (deg) | 0.01 | |
| Roll & Pitch (deg) | 0.01 | |
| Heave / Smart Heave[4] | 5 cm or 5% / 2 cm or 2% | |

### PERFORMANCE | IMU[1]

| | |
|---|---|
| Bias stability (deg/hr) | 0.0065 |
| ARW (deg/sqrt(hr)) | 0.003 |

### Characteristics

| | |
|---|---|
| Weight | 4.5 kg |
| Material | Aluminium |
| Size | 180 mm x 180 mm x 160 mm |
| Power | 24 VDC (20 - 32 V) / < 20 W |
| Operating temperature | -20°C to 55°C |
| Storage temperature | -40°C to 80°C |
| MTBF | Environmental 100,000 hours |
| IP Rating | IP 66 |

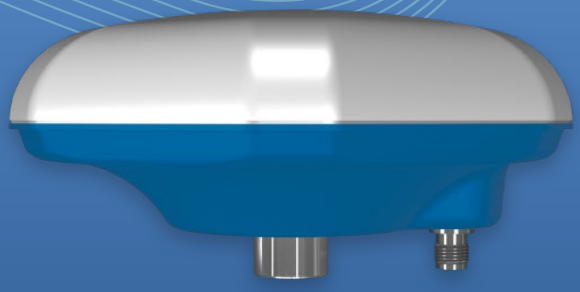
### INTERFACES

| | |
|---|---|
| Output refreshing rate | Up to 200 Hz |
| Latency | < 3 ms |
| Time tagging | PPS output |
| Ethernet | UDP / TCP Client / TCP server |
| Serial RS232 or RS422 | 5 inputs / 5 outputs / 1 configuration port |
| Input / Output formats | Industry standards: NMEA0183, ASCII, BINARY |
| Pulses | 4 inputs and 2 outputs |
| Options & accessories | APPS (Post Processing Software)<br>External GNSS Septentrio Receiver |

(1) Typical RMS performance.
(2) Actual results depending on the quality of the GNSS system used, satellite configuration, atmospheric conditions and other environmental effects.
(3) Secant latitude = 1 / cosine latitude.
(4) Whichever is greater for wave periods up to 30 seconds. Smart Heave is delayed by 100 s fixed value. Real-time heave accuracy is 5 cm or 5% whichever is greater for period up to 25s.

# SPECIFICATION

# Septentrio© AsteRx-U MARINE & navXperience 3G+C maritime

## Septentrio GNSS receiver AsteRx-U MARINE

- 544 channels for tracking all known and future signals from GPS, GLONASS, GALILEO, BEIDOU, NavIC, QZSS & SBAS on both antennas (model dependent)
- Precise and solid heading calculation
- cm-level (RTK) and dm-level (PPP) position accuracy
- Compatible with PPP, SSR, RTK and SBAS corrections
- Septentrio GNSS+ algorithms for solid performance
- Integrated cellular modem, Bluetooth and WiFi with optional UHF radio

## navXperience 3G+C maritime GNSS antenna

- The 3G+C maritime is designed for use an all types of maritime vehicles. A gain of 42 dB enables the customer to use (low lass) RF cables with a length of up to 60 m, and still have excellent quality RF signals at the GNSS receiver. Neither storms, cold, heat or salt water will have an effect an this antenna.

# SPECIFICATION
# Septentrio© AsteRx-U MARINE

## FEATURES

### GNSS Technology

544 Hardware channels for simultaneous tracking of all visible satellite signals

Supported signals:

- GPS: L1, L2, L5
- GLONASS: L1, L2, L3
- Galileo: E1, E5ab, AltBoc, E61
- BeiDou: B1, B2, B31
- SBAS: EGNOS, WAAS, GAGAN, MSAS, SDCM (L1, L5)
- IRNSS: L5[1, 15]
- QZSS: L1, L2, L5, L6[15]

Septentrio's patented GNSS+ technologies:

- **AIM+** unique anti-jamming and monitoring system against narrow and wideband interference
- **APME+** a posteriori multipath estimator for code and phase multipath mitigation.
- **LOCK+** superior tracking robustness under heavy mechanical shocks or vibrations
- **IONO+** advanced scintillation mitigation
- **RAIM** (Receiver Autonomous Integrity Monitoring) RTK (base and rover)[1]

Integrated dual-channel L-band receiver

Support for VERIPOS and FUGRO Marinestar services[1,2]

Support for PPP (SECORX-60)[1,2]

Moving base[1,3]

Heading GNSS attitude[1]

8 GB internal memory

### Formats

Septentrio Binary Format (SBF), fully documented with sample parsing tools

RTCM v2x and 3x (MSM included)

CMR 2.0 and CMR+ (CMR+ input only)

NMEA 0183, v2.3, v3.01, v4.0 (output only) UHF[1]: Satel, Trimtalk (450S_P, 450S_T) Pacific Crest (GMSK, 4FSK, FST)

### Connectivity

3 Hi-speed serial ports (RS232)

Ethernet port (TCP/IP and UDP)

Full-speed USB

2 Event markers

xPPS output (max. 100 Hz)

Integrated Bluetooth (2.1 + EDR/4.0)

Integrated Quadband Cellular Modem (EDGE, 2G, 3G, 3.5G)

Integrated WiFi (802.11 b/g/n)

Integrated UHF (406-470 MHz)[1]

## PERFORMANCE

### Position Accuracy [4,5]

| | Horizontal | Vertical |
|---|---|---|
| Standalone | 1.2 m | 1.9 m |
| SBAS | 0.6 m | 0.8 m |
| DGNSS | 0.4 m | 0.7 m |
| SECORX-60 (PPP) [2,6] | 6 cm | 9 cm |

### RTK Performance [4,5]

| | |
|---|---|
| Horizontal accuracy | 0.6 cm + 0.5 ppm |
| Vertical accuracy | 1 cm + 1 ppm 7 s |
| Initialisation | |

### GNSS attitude accuracy [4,5]

| Antenna separation | Heading | Pitch/Roll |
|---|---|---|
| 1 m | 0.15° | 0.25° |
| 5 m | 0.03° | 0.05° |

### Velocity accuracy [4,5]

0.03 m/s

### Maximum Update Rate [13]

| | |
|---|---|
| Position | 50 Hz |
| Position and attitude | 20 Hz |
| Measurements | 100 Hz |

### Latency[9,15]

<20 ms

### Time accuracy

| | |
|---|---|
| xPPS Out[10] | 10 ns |
| Event accuracy | < 20 ns |

### Time to first fix

| | |
|---|---|
| Cold Start[11] | < 45 s |
| Warm Start[12] | < 20 s |
| Re-acquisition | avg. 1 s |

### Tracking performance (C/N0 threshold)[14]

| | |
|---|---|
| Tracking | 20 dB-Hz |
| Acquisition | 33 dB-Hz |

## MODELS

**AsteRx-U MARINE:** Enabled for PPP using SECORX-60 or VERIPOS correction data

**AsteRx-U MARINE (Fg):** Enabled for PPP using FUGRO Marinestar correction data

## PHYSICAL AND ENVIRONMENTAL

| | |
|---|---|
| **Size** | 174 x 166 x 53 mm |
| | 6.85 x 6.54 x 2.09 in |
| **Weight** | 1.5 kg / 3.30 lb |
| **Input Voltage** | 9-36 VDC |
| **Power Consumption** | 7 W typical |
| **Operating temperature** | -30° C to +65° C |
| | -22° F to 149° F |
| **Storage temperature** | -40° C to +75° C |
| | -40° F to 167° F |
| **Humidity** | MIL-STD810G, Method 507.5, Procedure I |
| **Dust** | MIL-STD-810G, Method 510.5, Procedure I |
| **Shock** | MIL-STD-810G, Method 516.6, Procedure I/ II |
| **Vibration** | MIL-STD-810G, Method 514.6, Procedure |

### Connectors

| | |
|---|---|
| Antennas | TNC female |
| Power | LEMO 4 pins female |
| USB/ETH | LEMO 16 pins female |
| PPS OUT | LEMO 5 pins female |
| Serial 2 | LEMO 9 pins female |
| Serial 1 & 3 USB Host | LEMO 14 pins female |
| Events/GPIO | LEMO 7 pins female |

### Antenna LNA Power Output

Output voltage 5 VDC

Maximum current 200 mA

### Certification

IP67, RoHS, WEEE, CE

FCC Class B Part 15

IEC 60945

[1] Optional feature
[2] Service subscription required
[3] Maximum output rate is 20 Hz
[4] Open sky conditions
[5] RMS levels
[6] After convergence
[7] RTK fixed ambiguities
[8] Baseline < 40 Km
[9] 99.9%
[10] Including software compensation of sawtooth effect
[11] No information available (no almanac, no approximate position)
[12] Ephemeris and approximate position known
[13] (Fg) model 10 Hz
[14] Max. 600 m/s
[15] Not applicable to (Fg) Model

# SPECIFICATION
# navXperience 3G+C maritime

| | |
|---|---|
| Bandwidth | 1525 - 1610 MHz<br>1150 - 1300 MHz |
| Galileo Frequences | all |
| GPS Frequences | all |
| GLONASS Frequences | all |
| BeiDou Frequences | all |
| L-Band Correction Data Signals | all |
| Active Gain | 42dB |
| Passive Gain | 4,2dbic |
| Polarisation | RHCP |
| VSWR(max) | 1,5:1 |
| VRV | > 13dB |
| XPD | > 15dB |
| 10dB Beamwidth | 170° to 180° |
| Axial Ratio | 3dB (max) |
| LNA Nolse factor | <2dB |
| Power | 3,3- 20 Volt |
| Current draw | <50mA |
| Operatin g temperature Connector | -45° to 85° C |
| type | TNC |
| Dimensions (mm) | Durchmesser: 172<br>Höhe: 72 |
| Weight | 380 g |
| 100% Water- and Dustproof | IP69K<br>MIL-STD 810g |

# SPECIFICATION
# NDT Equipment


## NDT Equipment
## (Non-Destructive Testing Equipment)

Through the years of experience RS DIVING has collected a rage of non-destructive testing equipment and the necessary knowledge to work and receive precise data.

The service with NDT Equipment is especially considered if it comes to recurrent inspection works at offshore constructions such as weld inspections on monopiles or platforms.

The following equipment has become part of our high standard inspection methods.

- **ACFM U31** (for divers use only)
  Alternating Current Field Measurement may be applied to detect cracks and other linear discontinuities on or near the surfaces of welds.

- **Bathycorrometer H1** (ROV & Divers use)
  This CP Meter is used for polarisation, corrosion and interaction surveys / CP measurements.

- **Cygnus DIVE M1** (for divers use only)
  Ultrasonic Thickness Gauge will measure metal thickness through paint and other coatings, even light marine growth. The Multiple Echo Technique ensures only genuine, verified thickness measurements are displayed.

- **Cygnus M5-ROV-2K** (for ROV use only) is an Ultrasonic Thickness Gauge designed for and mounted on an ROV.

- **HCM 25 DC YOKE**
  **MPI Equipment** (for divers use)
  The Magnetic Particle Inspection process is for detecting surface and slightly subsurface discontinuities.

- **Pressure Tank K100 (DANA-TANK A/S)**
  Pressure tanks are closed containers where the internal pressure is above the ambient pressure.

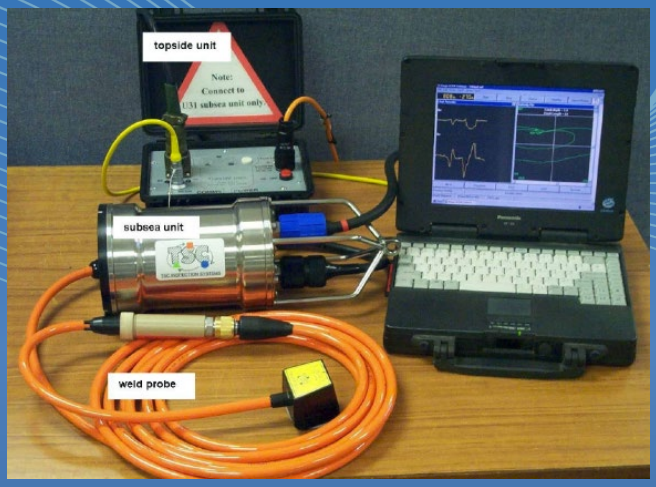
# SPECIFICATION
# NDT Equipment

## ACFM U31
(Alternating Current Field Measurement)

ACFM uses an input current that is locally uniform in strength and direction. This simplifies the modelling of the interaction between current and planar defect for ACFM, allowing depth sizing of cracks without calibration. The direction of magnetic field in ACFM is parallel to the defect, so the current is perpendicular to the defect. ACFM uses (as a minimum) one tangential field inducer and two separate orthogonal magnetic field sensors. ACFM measures absolute magnetic field strength.

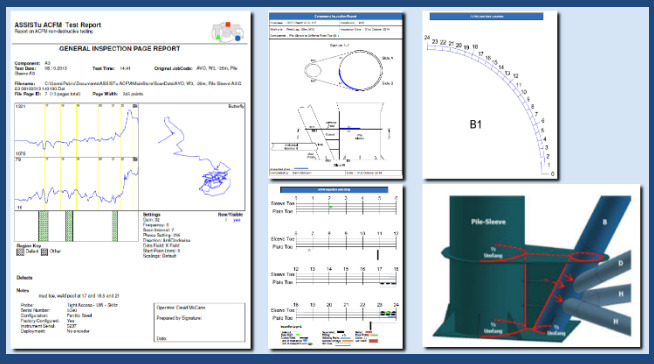
Apart from the ability to depth size defects from analytical models, the use of a tangential, uniform input field provides other advantages for ACFM:

- There is less effect from changing probe lift-off, so ACFM can inspect through thicker coatings (10mm or more), and on rough surfaces.
- Currents are forced to flow further down the defect face (so deeper cracks can be depth sized – 25 to 30mm).
- The current is perpendicular to a weld, and the scan direction is parallel, so there is no effect from the permeability change across a weld.
- Separating inducer and sensors means one large inducer can be used with a large number of sensors in an array, with no need to multiplex the energizing current, and no cross-talk between elements.
- The simpler scanning pattern used makes it possible to separate probe deployment from signal interpretation.



*U31D Crack Micro Gauge System (with short test umbilical)*


*Diver uses the U31D Crack Micro Gauge System*



*ACFM Weld Inspection Reports*

| Main Details | |
|---|---|
| ACFM | Alternating Current Field Measurement |
| Serial No. | 5237 / 5372 / 5562 / 5307 / 5070 |
| Product | ACFM U31D System |
| Producer | TSC Inspections |
| Certification | Annual calibration and certification by Producer |

# SPECIFICATION
# NDT Equipment

## Bathycorrometer H1
## (CP Meter)

The Bathycorrometer is a robust, dependable and well-proven inspection tool for measuring the levels of corrosion on sub-sea structures.
This hand-held unit enables divers to obtain accurate readings of the corrosion potential levels of structures at the point of contact.

It can be connected to a Surface Display Unit (SDU), which provides a top-side verification of readings.


| Main Details | |
|---|---|
| Bathycorrometer H1: | CP Meter |
| Serial No. | B6612H & D10573D |
| Product | H1 |
| Producer | Buckleys |
| Certified | Annual calibration and certification by Producer |
| **Technical Specification** | |
| Display | 0.001 to 1.999v 3½ digit backlit LCD |
| Accuracy | 0.05% typical |
| instrument calibration accuracy | +/- 1mV +/- 1 count |
| Battery charger | 14hr standard 110-230V AC |
| Input impedance | 10M Ohms |
| Operating temperature | Range 0 to 30°C |
| Temperature stability | 100 ppm/°C |
| Operating time on full charge | 50hr + |
| Reference electrode | silver/silver chloride |
| Weight (unit only) | in air 2.5Kg, in water 0.85Kg |
| Dimensions (unit only) | 10cm x 27.5cm |
| Dimensions (carrying case) | 38cm x 49cm x 19cm |


| Features |
|---|
| - Accurate 3½ digit LCD display |
| - Backlit LCD display |
| - Depth of operation – up to 350m |
| - Facility for adding remote monitoring via Surface Display Unit |
| - Single handed and light |
| - Robust and inert housing |
| - Contact with structure by hardened stainless steel probe |

# SPECIFICATION
# NDT Equipment

## Cygnus DIVE M1

The Cygnus Dive M1 is a wrist-mounted Underwater Thickness Measuring Gauge.

It has been specifically designed for the professional diver undertaking metal thickness surveys in both shallow and deep water sites. It has been designed to withstand the extreme environments encountered while providing quick, clear and accurate metal thickness measurements using the Cygnus multiple echo technique.
The Cygnus DIVE Underwater Thickness Gauge is pressure rated to a maximum depth of 300m sea water (984ft).
The Gauge can be worn on the divers forearm allowing one hand to remain free while carrying out the thickness survey.
A bright colour LCD display shows the thickness measurement in large numbers and in a choice of colour to suit the environment.
Thickness measurements are further backed-up by an A-scan display. Measurement data can be sent to surface via a RS-485 serial data link where they can be data logged and used to produce a survey report using Cygnus DIVE Link software.
Measurements can be displayed in metric (mm) or imperial (inch) units and measurement resolution can be selected for either 0.1mm or 0.05mm, (0.005 or 0.002 inch). Thickness measurements can easily be calibrated to a known thickness or to a known velocity of sound.


| Main Details | |
|---|---|
| Cygnus Dive M1: | Ultrasonic Thickness Gauge |
| Serial No. | 10085 |
| Product | M1 (wrist mounted) |
| Producer | Cygnus |
| Certified | Annual calibration and certification by manufacturer |
| **Technical Specification** | |
| Display | 320 x 240 Pixels 2.4” with LED Backlight |
| Accuracy | ±0.05mm (±0.002”) |
| Size | 105mm x 110mm x 35mm (WxHxD) |
| Power Supply | Rechargeable Lithium-Ion Battery |
| Probe Sockets | Fischer 105 Series |
| Operating temperature | Range -10°C to +50°C (14°F to 122°F) |
| Operating time on full charge | 10hr + |
| Battery Voltage Range | Min 3.2V dc, Max 4.5 Vdc |
| Measurement Range (steel) | 2.25MHz probe<br>3mm to 250mm [0.120 in. to 10.00 in.]<br>3.5MHz probe<br>2mm to 150mm [0.080 in. to 6.000 in.]<br>5MHz probe<br>1mm to 50mm [0.040 in. to 2.000 in.] |


Specifications subject to change at owner’s discretion

# SPECIFICATION
# NDT Equipment

## Cygnus M5-ROV-2K
### (ROV Mountable Thickness Gauge)


The Cygnus M5-ROV-2K is specifically designed for underwater remote operated vehicles. The ROV mountable thickness gauge M50ROV02K is depth rated - 2,000m. This mountable measurement gauge benefits from the multiple-echo technology.

It is versatile and designed to measure metal thickness through coatings in the harshest operating conditions.

Dedicated software reveals the date, time and thickness readings on the surface which may be logged or stored.
In addition, a Topside Repeater (TSR) provides the ability to present the thickness measurements remotely and overlay them on to a video signal. This permits the measurements to be superimposed on the ROV camera's monitor screen.


| Main Details | |
|---|---|
| Cygnus M5-ROV-2K | ROV Mountable Thickness Gauge |
| Serial No. | ROV596 |
| Product | M50ROV02K |
| Producer | Cygnus |
| Certified | Annual calibration and certification by Producer |

| Features |
|---|
| - M5-ROV-2K 2000m (6,526ft) depth rated |
| - Selectable deep coat mode for measuring through coatings up to 3/4" (20mm) thick |
| - Supplied with CygLink software to display and log thickness measurements from the ROV on a computer at the surface which can be saved to a file and printed out. |
| - CygLink has two data logging facilities: Quick Log for simple recording of thickness measurements and structured mode with four templates available - Single Point, Multi Point, Grid Point and Key Point. |
| - The ROV Gauge sends thickness measurement data to the surface via an RS-422 serial link, Cygnus can supply the RS-422 umbilical cable up to 4,000ft (1,200m) in length. For longer distances the ROV Gauge can output data in RS-232 mode. |
| - Fitted with a safety pressure relief valve and securing eye. |
| - Removable end plate for full serviceability with access to the Option Switches, Fuse and Status LED. |

# SPECIFICATION
# NDT Equipment

## HCM 25 DC YOKE
### (Portable MPI System)

The HCM MPI was designed in response to the need for a rapidly deployable and reliable system. It has six main components, namely an electromagnetic yoke, a UV lamp, a battery pack, an interface to run the yoke from a conventional MPI transformer, a hand operated ink pump and a combined battery charger and topside PSU.

The yoke and the lamp are world 'firsts' in that HCL have designed them for sub-sea or 'in-air' use. Both operate from 24V DC, are rated for continuous use, and in both cases, can operate from batteries or umbilicals. Thus, for the first time, sub-sea MPI can be entirely independent of the surface.

| Main Details | |
|---|---|
| HCM 25 DC YOKE | MPI Equipment |
| Producer | HCM |
| **Technical Specifications** | |
| Lifting Pull | 25kg min. at 24V DC |
| Pole Spacing | 230mm Max, 85mm Min. |
| Leg Articulation Axial | 90ø |
| Leg Articulation Radial | 360ø |
| Weights | -3.2kg - in air<br>-2.4kg - in water |
| Depth Rating | Infinite-limited by connector rating |
| Hull Construction | Oil-filled, Pressure-Compensated |
| Power Requirement | 24VDC, 400mA (-10W) |
| Duty Cycle | 100% in water or air |
| Connector | 2-way single pin male b/head EO style |

# SPECIFICATION
# NDT Equipment

## Pressure Tank K100 (DANA-TANK A/S)

| Main Details | |
|---|---|
| Pressure Tank K100 | Grit Blasting Equipment |
| Manufacturer | DANA-Tank A/S |
| **Technical Specifications** | |
| Max. allowable working pressure (MAWP) | 10bar |
| Max. operating temperature | <= 50° |
| Welding factor | 0,85 |

# SPECIFICATION
# Hydraulic Torque Wrench

## Rapid-Torc RTX Series Low Profile Hydraulic Torque Wrench System

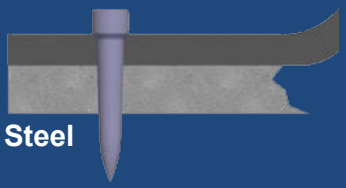
- The RTX direct-fit, low profile torque wrenches combine high power-to-weight ratio, durability and hands-free operation. The result is a tool that is perfectly suited for low clearance applications that require high torque.
- Most of the exterior is made up of aircraft-quality aluminum alloy, which provides amazing strength while keeping weight to a minimum
- Greater range of movement on multiple axis allows the hose to move easier compared to one axis swivels.
- The powerhead engages the direct fit ratchet link automatically.
- Using just one high strength pin to connect allows operators to quickly change out link sizes.

# SPECIFICATION
# SUPRAFIX SUB150

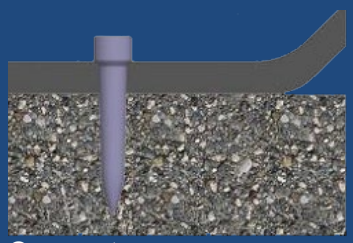
## SUPRA MECA
## Suprafix SUB150
## Underwater Fixing Tool

- Total length: 390mm
- Weight: 3.2kg
- Usable with bolts and threats
- Maximum operation depth: 150m
- Rate of shooting: 60 shots/hour
- Usable in steel and concrete
- Made of corrosion proof material

## Bolts



Steel



Concrete

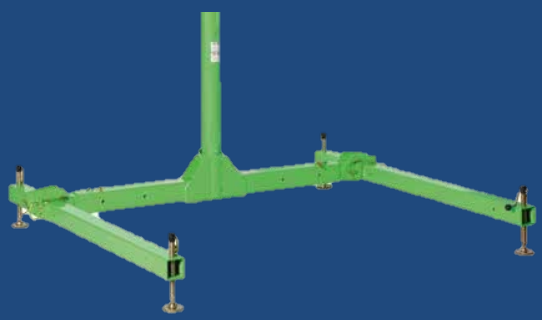
## Threads

Specifications subject to change at owner's discretion

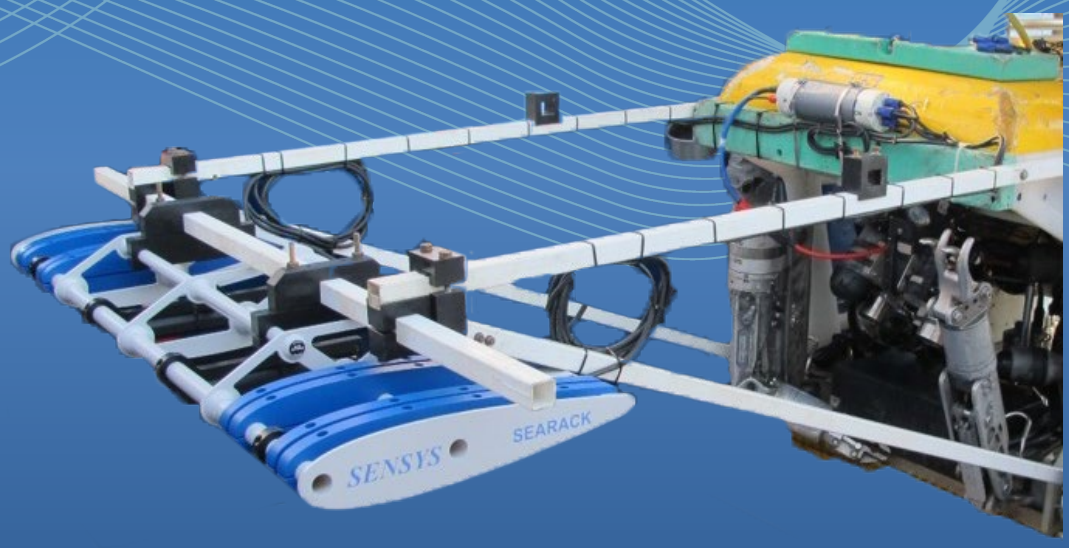
# SPECIFICATION
# Davit Arm System

## 3M DBI-SALA®
## Davit Arm System

- Man rated for raising, lowering and supporting personnel
- 205kg working load
- Certified for fall arrest for two users at the same time
- 113cm boom
- Digital Winch with two cranking speeds: 4 m/min (13 ft/min) to 9 m/min (30 ft/min)
- Stainless steel lifeline with 27m working length
- Multiple mounting solutions for maximum flexibility

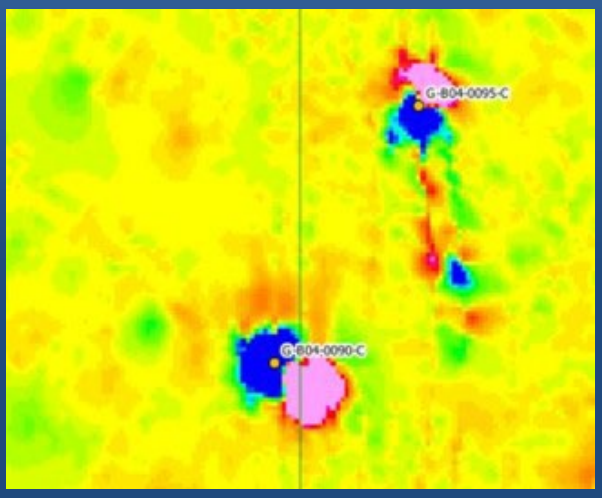


# SPECIFICATION
# Magnetometer MX3D UW




## Sensys Magnetometer MX35 UW 5

- Perfect for UXO detection, Cartography, Pin pointing, Pipeline detection/tracking.
- Including Magneto® Software
- Depth rating 300 m
- 5x Fluxgate magnetometer FGM3D UW series
- Up to 10,000 Hz sampling rate
- Up to 4,000 Hz bandwidth



# SPECIFICATION
# Magnetometer MX3D UW

| | |
|---|---|
| **Sensors** | **FGM3D/100 UW II** |
| Measurement Range | ±100,000 nT (others available upon request) |
| Noise | <15 $pT_{rms}/\sqrt{}$ Hz @ f = 1 Hz |
| Bandwidth | 2,000 Hz standard, 4,000 Hz upon request |
| Length | 263 mm |
| Diameter | 45 mm |
| Power Supply | ±12….±15 V |
| Current Consumption | ± 26 mA |
| Cable Length to MX3D UW | 0.5 to 100 m |
| Weight (Air/Water/Salt Water) | 444 g/188 g/182 g |
| | |
| **Data Acquisition** | **MX3D UW DAU** |
| Number of Sensors | 1 to 5 units per digitizer, cascadable |
| Number AUX Sensors | 2 (serial, GPS, altimeter, AHRS, etc.) |
| Sampling Range | 200 Hz to 10,000 Hz (others available upon request) |
| Resolution (ADC) | 24 bit |
| Input | 15x analogue channel, 1x RS232 |
| Output | 10/100 mBits/s, full duplex |
| Start-up current | 2.5 A (restricted) |
| Power Supply | 10…32 VDC |
| Current consumption (at 200 Hz sampling rate) | max. 10 W (including 5 sensors) |
| Ethernet Cable Length | max. 100 m (min. Cat6), extendible via DSL modem |
| Bandwidth requirements | approx. 750 kbit/s (5 sensors, 1,000 Hz sampling rate) |
| Connectors | Sensors: Subconn MCBH8F, Voltage/LAN: DBH13M |
| Dimensions | Diameter: 98 mm, Length (w/o connector): 324 mm, Volume: 1,694 Liters |
| Weight (Air/Water/Salt Water) | 2,949.4 g /1,250 g/1,210 g |

# SPECIFICATION
# DBL15 Diver survey unit

## Sensys
## DBL 15
## Diver survey unit

- The DBL15 is a robust but very compact survey unit in an IP67 case to connect and operate an FGM400/38 probe for diver's underwater UXO search
- total measurement range of the DBL15 is ±30,000 nT.
- Sensor cable of up to 150 meter
- Autarkic operation from vessel due to internal battery with 40 hours operation time.

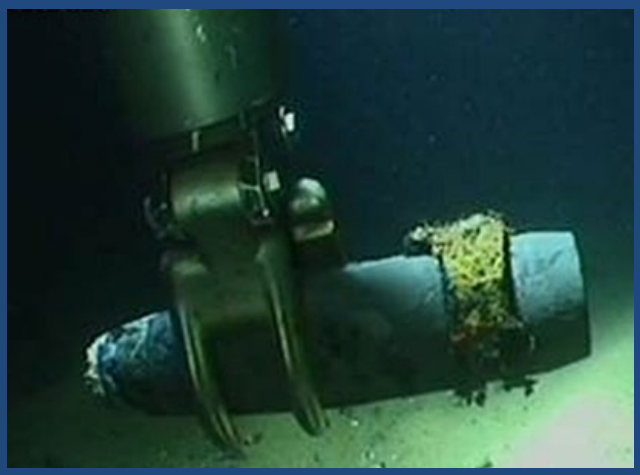
# SPECIFICATION
# DBL15 Diver survey unit

| | |
|---|---|
| **General Technical Data** | |
| Power Supply (internal) | Li-Ion battery[1] with approx. 40 h operating time |
| Operating Temperature | -20°C to +50°C |
| Operating Weight (without casing) | 1.7 kg |
| Dimensions (L x W x H) when folded | 215 x 275 x 110 mm |
| **Measurement Configuration** | |
| Maximum measurement range | ±30,000 nT |
| Sensitivity levels | 9 |
| Display | Analogue pointer with ±10 scale division |
| Resolution | 0.075 nT at 3 nT measurement range |
| **FGM400/38[2]** | |
| Maximum ambient field | ±75,000 nT |
| Specified measurement range | ±38,460 nT |
| Sensor Element Spacing | 400 mm |
| Point of reference | 378 mm[3]/4 mm[4] |
| Declination | ±3 nT |
| Resolution | 0.2 nT |
| Noise | <40 pT/√Hz @ 1Hz |
| Cut off frequency (Bandwidth) | 20 Hz |
| Temperature drift | <0.3 nT/K |
| Drift over time | t.b.d. |
| Uncertainty of measurement | 1%[5] |
| Stability | <1 nT |
| Linearity | ±4 nT / <0.01% |
| Compensation range | |
| Probe Diameter | 35 mm |
| IP code | IP68 100m available |
| **Standard accessories** | |
| Rugged case (L x W x H, empty weight) | 1,150 x 335 x 155 mm, 8.5 kg |
| Probe connector cable | 100 m length (others on request) |
| Peripherals | Audio cable (chinch), power plug |
| Documentation | Certificate, manual, quick guide |
| **Optional accessories** | |
| External battery | 12V led gel battery |
| Audio cable (jack plug) | Optional with increased audio level |
| Rugged PDA (optional with Bluetooth dongle) | For borehole and single channel measurements |
| Head phone | Customizable cable length |
| MAGNETO® Software | For data processing |

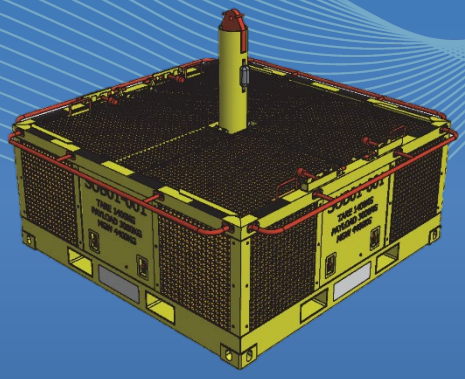
# SPECIFICATION
# TEMPORARY UXO STORAGE

## Temporary UXO Storage »Richterschatulle«

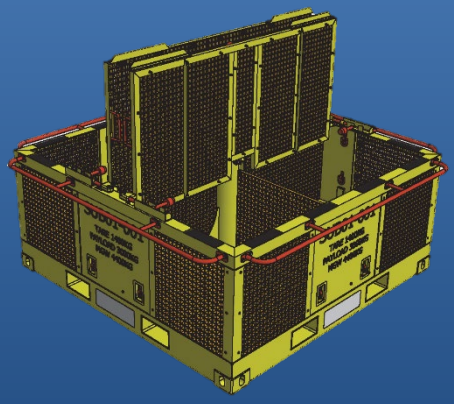
- Size: 100cm x 60cm x 61cm (L x W x H)
- For temporary storage of small and mid UXO
- Type approval according to the release of the Ministry of the Interior of the State of North Rhine-Westphalia (Innenministerium des Landes Nordrhein-Westfalen) from 1990
- Made of hot-dip galvanized S235JR steel
- Modular plug-in system
- 2 Special locks integrated
- Intermediate cover with extra lock for more safety



# SPECIFICATION SUBSEA BASKET



## Subsea Basket



- Size in ft: 8ft x 8ft x 6ft (L x W x H)
- Size in m:  2,4m x 2,4m x 1,8m (L x W x H)
- Tare: 1.400kg
- Payload: 3000kg
- Designed and manufactured to DNV 2.7-3
- Including internal and external lashing rings
- Integrated anodes preventing corrosion
- Grabtails included
- Lockable flaps for save transport


Specifications subject to change at owner's discretion