Subsea Solutions
Product Catalogue

POSEIDON
Part of STG

...your subsea partner™
Poseidon Group emerged from the former Saga Petroleum and was established in Stavanger January 2000. Through business development and growth we have achieved a blend of highly skilled employees from the subsea industry.

We have a multidiscipline organisation specialised on subsea technology and know-how, including subsea production equipment, flow lines, umbilicals and topside interfaces.

- Poseidon Group has its main office in Stavanger, Norway.
- A branch office is located in Aberdeen, Scotland.
- Today there are 135 people employed by Poseidon Group

From 2008 Poseidon Group AS became a member of Subsea Technology Group (STG). STG is a supplier of engineered solutions to the oil & gas industry worldwide.

STG can as an industrial group, comprised of Altra Energy, Bennex, Poseidon and Ross Offshore, provide a select suite of services, products and management support to oil and gas companies and EPC contractors in all the phases of an operator’s asset life cycle.

Poseidon Group AS is divided into five different areas described in the following:

- Subsea Engineering
- Field Development
- Solutions & Products
- Operations
- Consulting
Our engineering team has the required resources, knowledge and experience to support all aspects and phases of a subsea development.

Our team has extensive experience from oil companies and suppliers industry, both onshore and offshore. In addition we have extensive competence within subsea template/manifold systems, wellhead/xmas tree systems, riser systems, pipeline, umbilicals and control systems.

The Poseidon engineering team boasts a considerable network within all parts of the oil & gas industry. We apply state of the art engineering tools including Autodesk Inventor (3D CAD), OLGA 2000 (flow assurance), ASAS-NL (FEA), ANSYS, Mathcad and 3D Studio Max (animation).

**Engineering team**

We have the flexibility to perform both small and large projects on short notice and have an excellent track record. Our engineering team can provide the following services:

- Conceptual and FEED studies
- Flow assurance
- Structural analysis (FEA) and design
- Animation/visualisation
- Procurement, construction and testing
- ROV tooling/technology
- Quality surveillance/design verification
- Risk analysis/safety evaluation
- Preparation for installation and operation
- Offshore support

If you require any further information please feel free to contact: Bjørn Ivar Vikør - bjorn.vikor@poseidon-subsea.com
Subsea Systems & Equipment

For further information on these products please contact:
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Emergency Disconnect Panel

OVERVIEW
The purpose of the Emergency disconnect ROV panel is to allow for emergency disconnecting of the PMV- Lock-, Unlock- and secondary unlock function between the TRT and the LRP.

SPECIFICATIONS
- 1 ea Upper Emergency disconnect panels with 4 ea single port receptacles on each panel.
- 1 ea Lower Emergency disconnect panels with 4 ea single port receptacles on each panel, and a ¼" hydraulic interconnect hose between the upper end lower Emergency disconnect panels.
- 4 ea Single port Stab hooked up to 4 ea wires to allow for disconnect capability. The stabbers is hooked up to hydraulic MQC plate on the TRT and interfaced into the umbilical.
- 1 ea Surface PMV Control panel with hydraulic hoses and fittings. The purpose of the panel is to isolate the Oceanic fluid supplied by FMV WOCS from the BRACO fluid to the XT PMV. Additionally a low level audio alarm system is installed to give a low alarm in case the Supply pressure from the accumulator bank in the HPU is falling below 160 bar. The Panel is also fitted with a Pressure reduction panel that reduces the pressure to the PMV to 120 bar.
- Working Pressure: 200bar
OVERVIEW
The purpose of the Choke Bridge Module is to establish connection between the Xmas Tree wing hub and the Manifold Hub. Pressure and temperature sensors are installed upstream and downstream the choke. The choke bridge module also provides the facilities for easy retrieving of sensitive equipment and wear components. In addition a scale inhibitor valve will be ROV retrievable.

FEATURES
The Choke Bridge Module contains the following equipment:

- Process piping
- Service line piping
- Control tubing
- Mechanically operated wing hub connector (Multibore)
- Mechanically operated manifold connector (Multibore)
- Choke (Oil production and gas production)
- Gas lift choke (Oil production)
- Multiphase meter (Oil production)
- Wet gas meter (Gas production)
- Pressure and temperature sensors
- Scale inhibitor valve (ROV retrievable)
- Sand detector
- Protective frame
- Manifold hub connector running tool

SPECIFICATIONS:
- Size: (LxWxH) 2216x1000x1955mm
- Weight in air: 7500kg
Annulus Filter

OVERVIEW

The Annulus filter is installed with a ROV panel, and there are installed isolation valves for the "down hole safety" (SCSSV 1 & 2) valves and an isolation valve (AB) to isolate the Annulus Bleed line from the filter. The ROV panel also includes a dual port hot stab.

The Annulus filter is placed over the panel, and filtrate the Annulus fluid before it gets through the Well Control Module (WCM).

SPECIFICATIONS:

- Size: L 1655mm x Ø140mm
- Weight empty: 82 kg
- Max working pressure: 5000 PSI
- Max test pressure: 7500 PSI
- Filtration: 100 Microns
Light Weight Tree Cap Running Tool

OVERVIEW

The Light Weight Tree Cap Running Tool (LWTC RT) is designed to run the Tree cap and the Support frame (SGF) during Light Weight Intervention from a mono hull vessel.

FEATURES

The LWTC RT is runed on guide wire and is operated by using any WROV. The LWI RT is equipped with ROV panel and ROV operable Latches.

SPECIFICATIONS:

- Size: LxBxH 3446x3180x3792mm
- Weight of LWTCRT: 1.5 ton
- Weight of Tree cap: 6.5 ton
- Weight of Support frame (SGF): 3 ton
- Max. Installation Criteria: Hs 3m
- Max landing speed: 0.5 m/s
- Main Cylinder pull force: 15.5 ton
Light Weight Tree Cap GRP Cover

OVERVIEW

The Light Weight Tree Cap GRP Cover is designed to protect the Xmas tree from dropped objects.

FEATURES

The LWTC Cover is runed on guide wire and is operated by using any WROV. The LWI RT is equiped with ROV panel and ROV operable Latches.

SPECIFICATIONS:

- Size (LxBxW) 5330x3420x1600mm
- Weight in air 2100 kg
- Material Glass fibre
- Impact resistance: According to Norsok U-001 ISO 13628-1
Subsea Structures

For further information on these products please contact:

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GRP Structure

OVERVIEW

The SWIT Pilot Still Room is designed to have optimal flow characteristics to enable maximum solids fallout. The SWIT Pilot has been installed June 2009 at 60 m MSL in Oslo fjord. The structure is fabricated in a Composite material (GRP), and is structural self supported.

FEATURES

The SWIT Pilot is designed to be installed without use of divers or ROV. The SWIT Pilot Stillroom is also going to house all the sensors, Electric Chlorinator, Hydroxyl Radical Generator, Electronic canister, Biocide injection system.

SPECIFICATIONS:

- Size: 8500 X 5500mm
- Weight in air: 12.5 ton
- Water flow: 50m³/hour
OVERVIEW

The integration, assembly and transport structures are designed according to specific requirements and codes.

The saddles supports are made also for sea fastening and transport. During assembly of electrical rack inside enclosures different internal support structures are required (rail units with dampers for impact loads, internal supports, bulkhead support, saddle support, etc).

FEATURES

- The structures are designed to withstand transport and handling impact accelerations and other accidental loads
- Detailed Ansys structural FEM analysis is performed based on customer requirements and our recommendations
OVERVIEW

To accommodate a new umbilical from Snorre A to the subsea template Snorre UPA a new umbilical hangoff frame had to be designed.

Poseidon designed and built this hangoff frame in 2002/2003. The frame was designed to be installed and locked onto one of the UPA structure side skirts.

The frame was installed in March 2003.
4 Slot Production Template Structure

OVERVIEW
This 4 Slot Production Template structure contains the following main components:
- Trawl protection structure including: Main Protection structure with 4 X suction anchors, 2 X umbilical protection hatches, 4 X template protection hatches.
- Manifold unit
- 4 X Choke bridges with multiphase meter.
- Umbilical and flow line Pull in and connection structure

FEATURES
The design of the main overtrawlable protection structure is based on industry standards.
Some main design requirements;
- Overtrawlable structures with integrated foundation system
- Fishing and drilling loads as per Norsok U-001.
- BOP envelope 4.8m x 4.8m with 0.2m running clearance on all sides.
- Retrievable manifold (4-slot template)
- Levelling within +/- 0.3 deg.
- Roof hatches operated by indirect pull, max 50kN force.

SPECIFICATIONS:
- Size: transverse sides (12320 mm) of the upper structural tubulars are continuous, while the longitudinal sides (18122 mm). The overall height is 10872mm
- Max 250mT submerged weight(template including manifold)
- Number of well slot: 4
OVERVIEW
The Subsea Guide Frame (SGF) and the Light Weight Tree Cap Running Tool (LWTC RT) design was conceived in a study performed for Statoil Poseidon early 2005. The SGF is to be installed on the subsea tree (SST) top structure to give the LWI connector guidance onto the Snorre SST. For efficient installation of the SGF and pulling of the newly installed Light Weight Tree Caps, the original LWTC RT was modified so that it could be run on guidewires and used for installation and retrieval of the SGF. The basic design of the SGF structure was taken from the original TRT, but the structure was modified to improve guidance onto the SST when the LWTC is installed. The SGF locked onto the SST with four hydraulic locks. The locks consisted of a hydraulic cylinder which pushed a wedge in under the top profile on the SST structure. The locks were designed so that the SGF was locked firmly down onto the structure. The SGF would not move vertically or horizontally when locked. The wedges were kept in position by the isolated fluid in the cylinders. The locks were pull tested with no hydraulic pressure in the cylinders, to prove a self locking effect if the hydraulic system fails.

SYSTEM DESCRIPTION:
Physical Dimensions: (L x W x H) 2.6 x 3.4 x 4.2 m
Net weight: 3,900 Kg
Control Systems

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Electro-Hydraulic Control Canister

OVERVIEW

Poseidon design and build electro-hydraulic control canisters for various applications (typical SSIV control). The control canister is based on qualified components in accordance with ISO 13628 1-11.

The electro-hydraulic control canister consists of:

Electrical control part, typical containing:

- Controller cards
- Power supplies
- Power line modems

Hydraulic control part, typical containing:

- Hydraulic MQC couplers
- Hydraulic manifold
- Directional Control Valves
- Pressure transmitters
- Flow meters
- Check valves and throttle valves
- Filters

FEATURES

- Redundant functionality/design
- Communication on power line
- Failsafe functionality
- To be used in SIL rated systems
- ROV installable and retrievable

SPECIFICATIONS:

- Size: L 1840mm x Ø490mm
- Depth Rating: 500 m MSL
- Weight in air: 400 kg (incl. frame)
EVA – Electrical Valve Actuator

OVERVIEW

EVA is a subsea Electrical Valve Actuator designed to be retrofitted onto existing subsea field as well as installed on new ones. The system has low power consumption and is therefore ideal for older fields with low available watt budget. Typical applications include:

- Manifold valves /branch valves
- Isolation valves
- Chokes

The system can either be directly connected to a Subsea Control Module (SCM) using the RS 485 protocol or be installed as a stand-alone system utilizing either dedicated electrical circuit or in coexistence with control system supplier using Poseidon’s Backpack solution.

FEATURES

- ROV installable and retrievable
- For permanent or temporary installation
- Adaptable to all ROV API buckets
- Advanced motor control: Torque / Position / Power consumption

SPECIFICATIONS:

- Size: Ø140x500mm
- Mechanical Interface: API 17D
- Max Torque: 2400 Nm
- Communication: RS485/232
- Maximum Consumption: 240W
- Power Supply: 220 VAC or 12-48VDC
OVERVIEW
The SWIT Subsea Control Module (SCM) controls all subsea functionality on the SWIT PILOT.

FEATURES
- For permanent or temporary installation
- Very compact/flexible and service friendly electronic rack design.
- Only one removable lid (Less leak points)
- Lid secured to canister pipe by clamping band (No bolts)

SPECIFICATIONS:
- Size: L 1500mm x Ø305mm
- Depth Rating: 500 m MSL
- Weight in air: 186 kg
Subsea Router Module

OVERVIEW
The Poseidon Subsea Router Module is designed to be a standard compliant communication module with sensor interface enabling easy and transparent communication between topside and subsea.

FEATURES
Allowing third party surface applications to be transparently connected to any device subsea.
Standards compliant based on ISO 13628 and the SIIS draft, as well as industry standards such as Modbus.
Open system, capable of fibre or powerline communication, or a spare 4 pin connection
High power output (96 Watt), for each of three SIIS level 3 connectors (12 pin redundant Ethernet and power), all in a small ROV installable form factor
Modular setup both internal and external ensures flexibility for each customer and project.
Hardware capable of serial communication (rs232/rs485/rs422), CANbus with CANopen protocol, as well as Ethernet/TCP/IP and 4-20mA input/output.
Subsea computer for processing, monitoring or other customer specific applications.
Works independent from current subsea system when used in a retrofit system.
Allowing increased field life by replacing old or non functional sensors or adding new sensor packages (MPFM, camera, sand detection, electrical actuators etc.).
Two modules can be used “back to back” for long subsea connections, enabling a true subsea LAN.

SPECIFICATIONS:
- Size (LxWxH): 640x627x547mm
- Interface: Customer specific
- Communication: SIIS Level 1, 2 and 3, Modbus/RTU
- Transparent Ethernet to topside
- Material: Titanium Grade 5
- ISO 13628
- Depth: 1000 or 3000 meters
Subsea Camera

OVERVIEW

The Subsea Camera is developed for remote surveillance of any subsea equipment. It is designed to be easily integrated into already existing infrastructure and enable ubiquitous presence on all remote locations for easy and inexpensive monitoring. Live or still footage from a remote site can confirm the present state of a subsea system without the need of a costly ROV operation.

Main design goals for the Subsea Camera are:

- Inexpensive remote monitoring from topside (vibration, valve status, etc.).
- Automatic monitoring of leaks/movement
- Automatic recording when an alarm/warning occurs

FEATURES

The subsea camera is capable of motion detection, and can raise alarms, send emails with footage and/or upload footage to a server in the event of a detected alarm.

Footage can be recorded at pre set time intervals for trending and monitoring from topside.

SPECIFICATIONS:

- Size (L x X-section): 236x70 mm
- Interface: 6 pin connector
- Communication: http over TCP/IP
- Resolution: 640 x 480
- Motion detection

RENTAL:

This subsea camera is also available for rental
OVERVIEW

Poseidon designed and built a system for measuring produced sand on the Snorre UPA field. The XMT flowloop had a curvature in the piping to allow for acoustic detection and quantification of sand.

In cooperation with Siemens and ClampOn a system was integrated into the existing control system on Snorre UPA. The concept was designed by Poseidon and tested extensively at IRIS on flowloop dummy. System was approved and built and now installed and running on several Snorre UPA wells.

SYSTEM DESCRIPTION:

- 1 off Poseidon Control canister
  - Siemens electronics
  - Bennex jumpers
  - Tronic subsea connectors

- 2 off ClampOn acoustic detectors

- Interface structure for Control Canister

- ROV installable funnels for sensors

- 2 off ROV tools for removal of piping rubber insulation and polishing of pipe surface
RovNav - A tool for visualisation of ROV operations

OVERVIEW

RovNav is easy to use software for visualisation of subsea operations. It gives an ROV pilot a superb overview of his work-site by visualising the seabed, constructions and pipelines in real-time.

RovNav receives position information on moving objects such as ROV’s and ships from GPS and HPR systems. The objects are visualised on a screen together with fixed objects such as templates, pipelines wellheads and the seabed.

RovNav will be an indispensible supplement to ROV video cameras and navigation controls. The main screen of RovNav is shown below.

RovNav gives the pilot an opportunity to focus on intuitive visual information when navigating.

Todays alternative is instruments for depth and heading, as well ass key-hole information from cameras. Furthermore, cameras are limited by turbid waters or when the target distance exceeds 5-10 metres.

FEATURES

Integration

The application is easily integrated into an existing system. Position data from objects such as ROV’s, rigs and support vessels are received on Ethernet or serial lines (RS232). RovNav will then display these objects in their correct position as they move.

RovNav rely on timely and accurate position estimates from a suitable sensor spread and a “sensor integrator” that does position estimation. The figure below shows a typical system set-up.

Runs on Windows

RovNav runs on a Microsoft PC with a good graphic card. It has a familiar Windows user interface with either a 3D view or a 2D overview (much like a map). Mouse clicks activates frequently used functions. Other functions are placed in a menu.

Simulator

An add-on module to RovNav may be used to simulate and thus plan ROV operations. The simulator is simplified to minimize complexity. It does not simulate tether drag, TMS object collisions etc. Its purpose is simply to enable the operator to familiarize himself with the ROV controls and the worksite as presented by RovNav.
ROV Control Systems

OVERVIEW

Poseidon has a legacy in ROV control systems, where systems have been provided for various ROV’s and even an AUV. The ROV control systems are all electro-hydraulic work class systems. The picture below shows a trenching system based on water jetting, equipped with our control system.

The picture below shows the AUV system which is purely electrical and based on a sophisticated network solution for internal communication between vehicle units. This solution also includes a managed acoustic link to topsides.

FEATURES

These control systems are suitable for any mobile subsea unit, such as intervention tooling.

It offers an atmospheric control canister for operation down to 3000 meters of water depth. The picture below shows the end-lid for the so-called ALIVE system, using standard subsea connectors, here mostly Burton.

The control system operates thrusters, lights, and robotic arms, as well as necessary instrumentation and cameras. In addition, it offers a number of interfaces to sensors and other auxiliary equipment that is mounted on the ROV at any time.

It keeps the power supply and transformers (below) as well as hydraulic control valves in external oil-filled and pressure compensated enclosures.
Biotaguard – Biological real time environment sensors

OVERVIEW

The Biotaguard sensor system is developed for Biotaguard by Poseidon, and is a real time measurement of biological markers. This makes the system capable of measuring actual influence on the environment, and not just indicators such as amount of hydrocarbons etc. A total of 3 monitoring stations was built and deployed.

Main system components delivered by Poseidon was:

- Control canisters with all electronics for monitoring and communication
- Land station with wireless (mobile) link to Biotaguard database for logging and monitoring of system
- Control umbilical between subsea cages and land station
- Complete marine deployment system including anchors, buoyancy and holdback wires
- Planning and execution of deployment and recovery of complete system.

FEATURES

Real time monitoring of actual biomarkers gives a direct measurement of the environment.

Custom designed sensor interface card for accessing data from both biological sensors and traditional sensor packages

16 blue mussels with one heart beat sensor and one valve gap sensor each.

Poseidon designed the system, including cage, canister, interface cards and marine components. Biotaguard had all ownership and patents in the concept of using biomarkers for environmental monitoring, as well as supply of mussels.

Another solution built was a battery powered operation with satellite communication.

FIELD TESTS COMPLETED

The Biotaguard sensor system is a fully working system with three successful field tests completed.
Backpack Control System
for retrofit of instrumentation and electro-hydraulic controls

OVERVIEW
When an operator wants to increase oil recovery from an oil field, there will often be a need for adding subsea control functions. However, the cost of installing new control facilities may outweigh any production benefits.

As an alternative Poseidon offers the Backpack system for upgrading of existing christmas trees. It can be used on all wells where there is a demand for additional instruments and controls.

The Backpack solution is essentially a method of upgrading, repairing or adding functionality to existing subsea systems. It works independently of the original control system so it can be used on systems irrespective of the vendor. As it is a standalone system, it can be configured and installed with minimal modifications. A key feature is that it can be installed by means of a work-class ROV, which importantly means that there is no major break in production.

FEATURES
On new wells, the necessary instruments and controls are often installed as part of the unit, however in older systems, they must be retrofitted. The Backpack enables this retrofit to take place by allowing information from the new instruments to be sent via a power-line modem to production engineers. The resultant signals may optionally be relayed back to built-in subsea solenoid valves that again control various flow valves.

The Backpack system can also provide a variety of other services to inform the operator as to the condition of the subsea well. This includes subsea hydrocarbon leak detection and reading signals from temporary abandoned wells.

It also enable wells to be retrofitted for multiphase metering, while the installation of sand detection system and erosion probes can allow the operator to monitor the well condition. It can also be used to transmit signals from permanent subsea cameras.

SPECIFICATIONS
The Backpack system is qualified for water depths up to 3000m and can be installed by means of an ROV. It is made from duplex steel with a 25 year design life. Electronics are housed in a canister with a typical diameter of 0.3m and a length of 0.6m.

The Backpack control system is based on field-proven technology. Communication is typically enabled by power-line modems giving a range of up to 30km at speeds of 19.2kb per second. These may be employed as standalone systems or coexist with the original facilities. If the existing control umbilical has spare capacity the Backpack can be outfitted with fibre optic or DSL modems, allowing higher data rates.
Acoustic Leak Detection System

OVERVIEW

An Acoustic Leak Detection System creates a four dimensional picture of the environment. A sonar picture is generated from the reflected acoustic waves. The reflection of the propagated waves depends on density, speed of sound in the gas, fluid or material. A large density ratio between seawater and reflected medium gives a strong return signal. Existing fields do not have any hydrocarbon leakage detection system. Future requirement may be impeding. Fields equipped with capacitive sensors often experience:

- False alarms due to shallow gas
- Failure to detect leakage due to very localized monitoring
- Unable to quantify or identify leakage type

SPECIFICATIONS:

- Sensor coverage:
  - 17° Vertical
  - 120m Range
  - 120° Horizontal
- Mechanical Interface: 4 way DigiTron

FEATURES

- System will interface all major system vendors without need to retrieve existing equipment.
- No loss of production during hook-up
- Data processed subsea are updated topside every 1-2 second
- ROV installable and retrievable
- Simple structural interface
- One structure assembly
- Basic ROV handling
- No modifications to existing sub sea structures required
- Independent of manifold size, layout and configuration
OVERVIEW

The UTH is designed to terminate the umbilical into a subsea structure. The umbilical contents are split into electrical, hydraulic and chemical lines for further distribution via dedicated jumpers. The UTH shall further take any stress loads from the umbilical and tie this securely to the subsea structure.

Vigdis Extension UHA was designed to meet installation with no existing tie-in facility, minimal space availability (2.0 x 0.5 x 1.5 m) and no loss of production during installation.

SYSTEM DESCRIPTION:

- Umbilical (ø112mm) contents:
  - 3 off 10mm² electrical quads
  - 3 off 5/8” 517Bar hydraulic lines
  - 2 off 3/4” 345 Bar hydraulic lines
  - 2 off 1/2” 345 Bar hydraulic lines
  - 1 off 25,4mm 345 Bar line
  - 1 off 2” Methanol line “piggybacked”

- Electrical lines pressure compensated and terminated into Tronic connectors

- Hydraulic & Chemical lines terminated into 8 line MQC arrangement
Marinisation

For further information on these products please contact:

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Subsea Cooling Units

OVERVIEW
The cooling units are custom made and are designed according to pressure vessel code EN13445 referring also to EN 13480. It was also considered PED directive guidelines. The cooler can be designed for the required operational water depth.

The cooling units are connected to an internal pump, providing an active cooling that dissipates the excessive heat generated by some of the electrical components located inside enclosure.

FEATURES
- Water tightness is a key aspect
- Manifold machined from a metal block to accommodate 6 pipes with combined length over 800m
- Water with Glycol filled cooler unit
- Internally cleaned pipes with multiple cycle temperature and controlled medium before installation
- Other structures designed to accommodate coolers during lifting, transport & integration
- Protection inserted between cooling pipes and supporting structure in order to avoid damaging the pipes during assembly and handling.
- Highly corrosion resistant material used
- Dissimilar metal welding
- Pipe bending procedure developed in accordance with EN13480

SPECIFICATIONS
Example for delivered cooling units:
- Design life 30 years
- Design pressure about 100 barg
- Weight: cca 1 ton to 8 tons for different cooling units
- Design temperature -20°C to 100°C
Subsea Enclosures – With Cooling Unit

OVERVIEW

The subsea enclosures are mechanically designed according to EN13445 code and DNV-RP-F301. The main load during the operation condition on the seabed at 1000m is the external pressure (maximum internal pressure is 0.5 barg). The selected seal provides an exceptional tightness proved by a helium leak test.

Cooling loop unit is provided in order to dissipate internal heat produced by electrical components.

By locating the enclosure on the seabed it is possible to avoid other top-side facilities.

FEATURES

- Water tightness is a key aspect and it is accomplished by two separate barriers to seawater.
- Number of nozzles/penetrations through the enclosure was kept as low as possible in order to minimize the areas for potential leaks.
- UPS unit has an oil field compartment separated by a bulkhead from the top nitrogen compartment.

A NEW TREND

Lately, the offshore industry has seen a clear trend for production facilities to be installed on the seabed (especially for deepsea and artic environments).

SPECIFICATIONS:

- Design life 30 years
- Design pressure about 100 barg
- Internal Diameter: cca. from 1500 to 3000 mm
- Length: cca. from 8000 mm to 11000 mm
- Weight : cca from 38 ton to 125 ton
OVERVIEW

The circuit breaker enclosure is mechanically designed according to EN13445 code and DNV-RP-F301. The main load during the operation condition on the seabed at 1000m is the external pressure (maximum internal pressure is 0.5 barg). The selected seal provides an exceptional tightness proved by a helium leak test.

By locating the circuit breaker enclosure on the seabed it is possible to avoid other top-side facilities, reducing operation and power lines costs.

FEATURES

- Water tightness is a key aspect and it is accomplished by two separate barriers to seawater.
- Number of nozzles/penetrations through the enclosure was kept as low as possible in order to minimize the areas for potential leaks.
- Nitrogen filled unit

SPECIFICATIONS:

- Design life 30 years
- Design pressure about 100 barg
- Internal Diameter: 2600 mm
- Length: cca. 17600 mm
- Weight: cca 110 ton
Compensated Subsea Biocide Injection System

OVERVIEW
The Self Compensated Subsea Biocide Injection System is design so that no external compensator is needed. The Biocide Injection System is used to inject biocide into a subsea system.

FEATURES
- For permanent or temporary installation
- Very compact/flexible and service friendly electronic rack design.
- Compensator is included in lid design.

SPECIFICATIONS:
- Size: LxWxH 430 x 320 x 173mm
- Depth Rating: Full Ocean Depth
- Weight in air: 42 kg
Subsea Control Canister

OVERVIEW

Numerous subsea control canisters have been designed and built by Poseidongroup to various clients.

Canisters are all based on one design concept; a sealed, nitrogen filled hull consisting of a machined pipe body with two end lids. The top lid contains penetrators, backshells and jumper connections. All seals are testable. Interface to structures and lifting arrangements vary from project to project.

Canisters have been produced in duplex, stainless steel and aluminium.

SPECIFICATIONS:

- Material: Duplex
- Net Weight: Approx 95 Kg
- Physical Dimensions: ø 310 mm x 855 mm
- Internal Dimensions: ø236 mm x 721 mm
- Depth rating: 1000m (100Bar)
- Backshell:
  - 3 off dual hose backshell
  - Expandable to 4 off dual hose
- Penetrations:
  - 3 off 8pin glass to metal penetrators
  - Expandable to 4 off 12pin
- Hose connections:
  - 5 off Anguila jumpers
  - Expandable to 8 off Anguila jumpers
- Other connections:
  - 2 off seal test ports
  - 1 off fill port
Compensated Subsea Junction Box

OVERVIEW

The Self Compensated Subsea junction box is designed so that no external compensator is needed. The junction box is used for electrical connections, and hydraulic actuator enclosure purposes.

FEATURES

- For permanent or temporary installation
- Very compact/flexible and service friendly electronic rack design.
- Compensator is included in lid design.

SPECIFICATIONS:

- Size: LxWxH 430 x 320 x 173mm
- Depth Rating: Full Ocean Depth
- Weight in air: 38 kg
ROV Tooling & Equipment

For further information on these products please contact:
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Hydraulic Hose Sealing Tool

OVERVIEW
The Hydraulic Hose Sealing tool is a hydraulic activated tool. The purpose of the tool is to isolate a faulty hydraulic hose to prevent the fluid from flowing through a hydraulic hose. Typical applications include:

- Isolate faulty hydraulic functions
- Prevent hydraulic oil from leaking from a damaged hydraulic hose.
- Bypassing existing hydraulic components.

FEATURES
- ROV installable
- For permanent or temporary installation
- Suitable for size of Ø 20mm hydraulic hose (other hose dimension available on request)

SPECIFICATIONS:
- Size: 553mm X Ø180mm
- Mechanical Interface: (x-section) 20mm hydraulic hose (Other dimension can be delivered on request)
- Sealing Pressure: 3000 PSI
- Hydraulic function required: 1 function

Method of deployment

Secure Hoses to ROV frame with tynsabs
Tool is carried in 5F manip.
Hydraulic Hose Re-termination Tool

OVERVIEW

HHRT is a subsea re-termination tool designed to be used on defect subsea hydraulic hoses to allow for re-termination of hydraulic hoses. The system is very compact and is therefore ideal for XMAS Trees/BOP/Manifolds interface. Typical applications include:

- Re-termination onto a cut hydraulic hose
- Operation of faulty hydraulic circuits
- Bypassing existing hydraulic components.

The system can either be directly connected to a Subsea Control Module (SCM) using a dedicated hydraulic circuit or in coexistence with control system supplier using Poseidon’s Backpack solution.

FEATURES

- ROV installable
- For permanent or temporary installation
- Suitable for size of 3/8” inch hydraulic hose (other hose dimension available on request)

SPECIFICATIONS:

- Size: (LxWxH) 425x195x435mm
- Mechanical Interface: 3/8” inch hydraulic hose (Other dimension can be delivered on request)
- Sealing Pressure: 5000 PSI (Tested to 8700PSI)
- Working pressure: 5000 PSI
- Hydraulic function required: 5 function
- Interface: API hot stab
Hot tap and Sealing Tool

OVERVIEW

Hot Tap & Sealing tool is designed to be used on subsea hydraulic pipes to allow for isolation and rerouting of hydraulic fluids of faulty hydraulic systems. The system is very compact and is therefore ideal for XMAS Trees/BOP/ Manifolds interface etc. Typical applications include:

- Hot taping into faulty hydraulic circuits
- Isolation of faulty valves
- New hydraulic circuits on existing hydraulic systems.

The system can either be directly connected to a Subsea Control Module (SCM) using a dedicated hydraulic circuit or in coexistence with control system supplier using Poseidon’s Backpack solution.

FEATURES

- ROV installable and retrievable
- For permanent or temporary installation
- Suitable for pipe size of ½” and ¾” inch (other pipe dimension available on request)

SPECIFICATIONS:

- Size: LxWxH: 425x195x435mm
- Mechanical Interface: Ø ½” and ¾” inch pipe (Other dimension can be delivered on request)
- Sealing Pressure: 200 Bar
- Hot tap pressure: 200 Bar
- Hydraulic function required: 5 function
- Interface: API hot stab for hot taping function
Down Hole Fishing Tool

OVERVIEW
The Down Hole Fishing Tool is a remote controlled hydraulic fishing tool designed to fish junk out of the 18 3/8 riser down to the BOP/wellhead elevation. The Fishing tool is equipped with a Camera and a light to enable the operator to see the object while fishing. The Downhole Fishing Tool runes on wireline.

FEATURES
- Hydraulic HPU and valve to open close jaw
- Monitor and light controller.
- Hydraulic twin hose/Camera/light umbilical in a bundle.
- Hydraulic Fishing Tool

SPECIFICATIONS:
- Size LxWxH: 1100x270x155mm
- Colour Camera
- Light
- Monitor
- Light controller
- Umbilical reel
- Umbilical: 500meter
- Working pressure: 800 bar
- Hydraulic function required: 1 function
- Interface: API hot stab
Connector Injection Tool System

OVERVIEW

Connector Injection Tool System enables maintenance of subsea installed connectors. Tordis/Vigdis field has experienced connector failure due to burned pins due to ROV handling, low or falling IR. Retrieved connectors showed that oil missing inside insert bladders may be cause of failing IR. Connector Injection Tool was proposed based on field experience.

Main purpose of the connection injection tool is to:

- Remove old fluid and inject new oil inside female connector
- To improve the overall IR and lifespan of connectors
- Can be configured to all leading connector suppliers

FEATURES

The connection injection tool is a ROV operated tool

Can be used by any WROV

Topside control through ROV interface

SPECIFICATIONS:

- Size: LxWxH: 640x627x547mm
- Mechanical Interface: 4 way DigiTron
Rubber Removal Tool

OVERVIEW

The Rubber removal tool is a tool developed for removal of a 15mm thick tough rubber coating on the flow-line prior to the sand detector installation without compromising (drilling into) the steel pipe integrity. The rubber removal is performed in two stages with two different tools involved. Both tools are hydraulic driven and can be operated by the ROV.

Typical applications include:

- Preparation of rubber coated pipe prior to installation of sand detector
- Preparation of rubber coated pipe prior to installation of ultra sound detector

FEATURES

- ROV installable and retrievable

SPECIFICATIONS:

- Size: LxWxH 135x95x880mm
- Mechanical Interface: Clamp on funnel ID 90mm
- Removal of 35mm x 15mm depth rubber on 5" flow line (Other dimension can be delivered on request)
- Tool Working Pressure: 140 Bar
- Hydraulic function required: 1 function
- Interface: ClampOn funnel
Sealing Surface Polishing Tool

OVERVIEW

- Polishing tool is designed to polish the sealing surface on the 2” UH-550 Male Methanol Connector. The system is hydraulic driven and capable of polishing 3 of sealing profiles simultaneously to max 0.01mm wear on the sealing surfaces. The surface finish is measured to Ra 0.34µm after polishing complete on a test profile for all 3 sealing profiles.

FEATURES

- ROV installable and retrievable
- Citric acid injection capability

SPECIFICATIONS:

- Size: 140x870mm
- Mechanical Interface: UH-550
- Hydraulic function: 1
- Working pressure: 140 bar
- Oil flow: 10 l/min
- Seal surface finish: Ra 0.34µm
- Max. wear on seal surface: 0.01mm
Rental Equipment

For further information on these products please contact:
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OVERVIEW

A complete Intervention WorkOver Control System (IWOCS), custom designed & built was completed for customer in 2008. The equipment has since been rented to clients.

System comprising:

- Redundant pneumatic HPU complete with accumulators, flushing loop system and tank
- Umbilical reel with dual motor drive, on-board operator panel, remote control system and automatic spooling mechanism
- 1300m electro-hydraulic umbilical, containing 1 quad and 7 HP lines
- Umbilical sheaves to support umbilical

- System fully qualified for Norwegian sector, certified to Norsok Z-015, DNV 2.7.1 and approved for Ex-zone operation

SPECIFICATIONS:

HPU:
- Physical Dimensions (lxbxh): 1,8x1,3x2,2m
- Net Weight: 1.470Kg
- Material main frame: Stainless Steel
- Working Pressure: 345Bar (5000psi)
- Accumulator capacity: 3x36litre (max 6x36l)
- Tank Capacity: 240 litre
- Pumps: 2off air driven pumps
- Flushing motor: 3.5KW, Exde IIBt4, 440V, 60Hz
- Certification: EN12079 and Norsok Z-015

Reel:
- Physical Dimensions (lxbxh): 4,1x2,5x2,6m
- Net Weight: 8.800Kg
- Reel inner/outer dim: 1100mm/2060mm
- Reel Width: 2300mm
- Reel speed: 12-40 m/min
- Reel pull force: 750 - 2.500kg
- Hydraulic Working Pressure: 345Bar (5000psi)
- Umbilical exit angles: 30°-40° V, ±5° H
- Coating: Norsok M501, Syst1, RAL 5010

Umbilical:
- Length/X-section: 1.300m, 56mm
- Weight: 2,65 Kg/m (air), 0,35 Kg/m (sea)
- SWL / Min break load: 10KN / 50KN
- Hydraulics: 7 off, ¼", 345 bar (5000 Psi)
- Electrics: 4 off, 2,5mm² conductors
- Min bend radius: 370mm static, 550 dynamic
- Sheath material: Polyurethane (inner&outer)
- Strengthening material: Braided Vectran Fibre

CONTACT

For further technical and sales information please feel free to contact us or visit our website.
Pressure vessel – Hyperbaric test tank

OVERVIEW

Poseidon built and operates a 100Bar pressure vessel for Hyperbaric testing of equipment. The tank is rated to 100Bar and can accommodate objects up to ø700mm, max height 1500mm. The tank is equipped with lifting lugs and forklift pockets.

The test tank can be rented for testing of equipment on Poseidon premises or moved to client facilities for external rental.

SPECIFICATIONS:

- Size (LxWxH): 800x800x1800mm
- Internal Dimensions: 700mm x 1500mm
- Weight: Approx 1000Kg
- Pressure rating: 100Bar
- Penetrations:
  - 7 off 1 1/2 " BSP
  - 4 off 1" BSP
  - 2i off 3" flange connection
Workshop Hydraulic Power Unit

OVERVIEW

Workshop test HPU capable of handling both mineral oil and water based hydraulic fluid. The HPU is designed for both LP and HP operations. The low pressure system contains dual flow regulation and flow measurements.

FEATURES

LP System:
- Operation range 0 – 345 Bar
- Flow measurement
- 3 stage flow regulation system; forward, neutral and reverse

HP System:
- Operation range 0 – 820 Bar

SPECIFICATIONS:
- Size (LxWxH): 950x550x850
- Weight: Approx 70Kg
- Tank Volume: 48 litres
- Flow measurement: 0-15 l/min (LP)
- Fluid: Mineral & water based
- Not EX certified
- External Interface:
  - LP pump: 400V, 3ph, 50Hz
  - HP pump: 7Bar air supply
  - LP connections: 9/16 JIC male
  - HP connections: ¼" MP female