TIS Manufacturing

WELL INTERVENTION

Wellhead Control Panel (API 16D & SIL2)

TIS Manufacturing | Wellhead Control Panel (API 16D & SIL2)

TIS Manufacturing recently delivered a **HP/HT 18-Function Wellhead Control Panel (API 16D & SIL2)** for the operator on the Culzean Field, offshore UK.

The WHIP is capable of operating a wireline BOP, coil tubing BOP, tree valve functions, and downhole functions, all from local and remote PLC control stations.

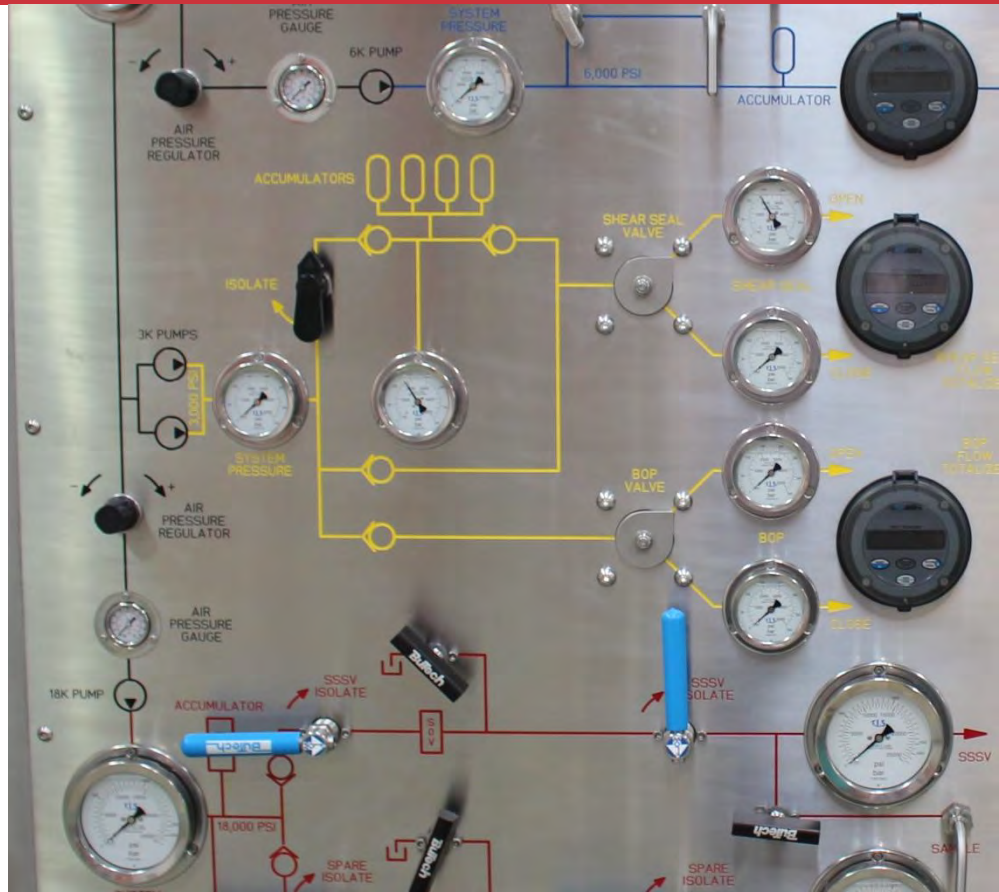
Features:

- SIL2 & API 16D compliant design
- PLC system
- Local & remote control via touchscreen HMIs
- Remote ESD functionality
- Colour engraved stainless main panel
- Auto-wind hosereels
- DNV complaint stainless steel construction
- Fluid filtration system - AS4059 compliant
- Enclosed Accumulator Bank
- Roof access hatches to all primary components

Maersk Culzean WHIP | Operating Functions

The WHIP provides control for the following functions:

- Shear/Seal Valve Open – 3,000psi
- Shear/Seal Valve Close – 3,000psi
- BOP Valve Open – 3,000psi
- BOP Valve Close – 3,000psi
- Safety Valve (SV) Open – 6,000psi
- Auxiliary Swab Valve (ASV) Open – 6,000psi
- Production Wing Valve (PWV) Open – 6,000psi
- Upper Master Valve (UMV) Open – 6,000psi
- Lower Master Valve (LMV) Open – 6,000psi
- Annulus 1 – 6,000psi
- Annulus 2 – 6,000psi
- Spare Line 1 – 6,000psi
- Spare line 2 – 6,000psi
- DHLVA Open – 10,000psi
- DHLVA Close – 10,000psi
- Subsea Safety Valve (SSSV) – 18,000psi
- Spare Downhole Line – 18,000psi

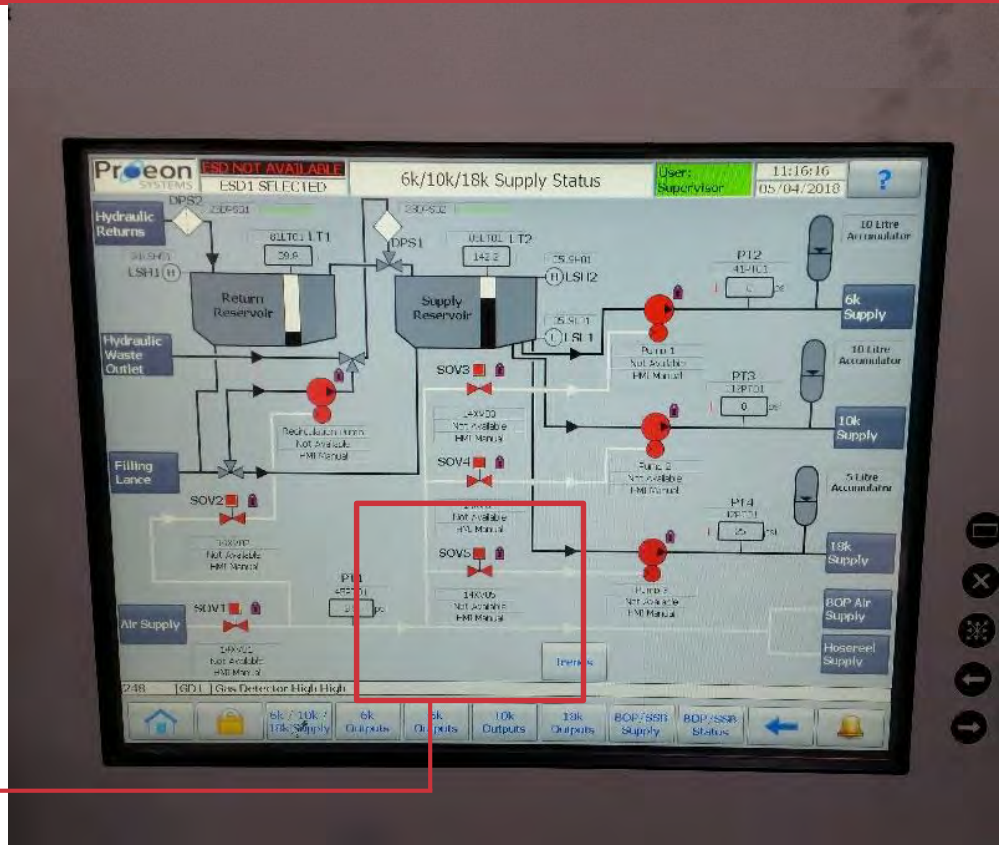


Maersk Culzean WHIP | PLC System

The **Programmable Logic Controller System** is designed for integration with all components of the WHIP to provide control from a multiple touchscreen **Human Machine Interfaces** during operation.

One local and two remote HMIs provide operator control via a bespoke programmed software package, with access password protected to various levels of admission.

The local HMI is mounted to the exterior control panel of the WHIP, while the two remote HMIs are protected by suitable stainless steel constructions, the first of which is wall mountable while the second is a portable station.



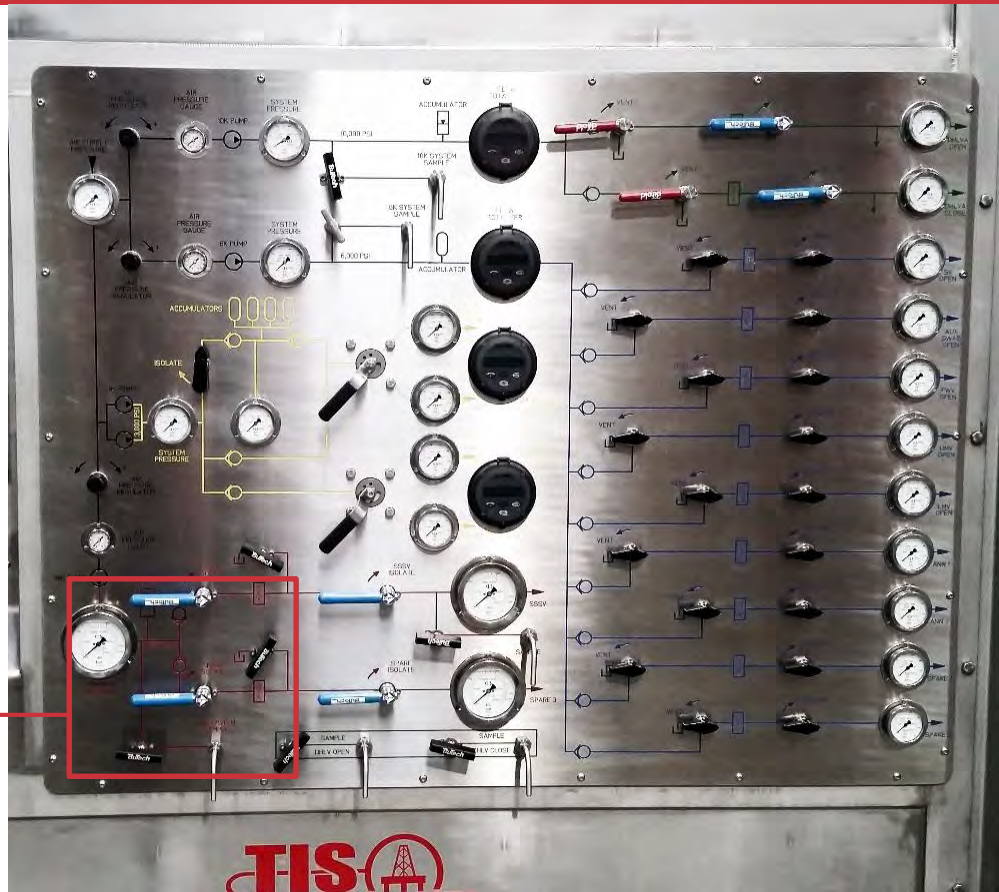
HMI CONTROLLED PLC SYSTEM

Maersk Culzean WHIP | Control Panel

The WHIP main **Control Panel** is installed on the exterior of the unit, adjacent to the local HMI, and acts as a physical redundancy control option should there be any issue with the PLC System or HMIs.

The fully engraved stainless steel panel shows a mimic of all major hydraulic circuits, and is colour coded for easy identification of switches, valves and gauges, and their relevant systems.

EXTERNAL CONTROL PANEL

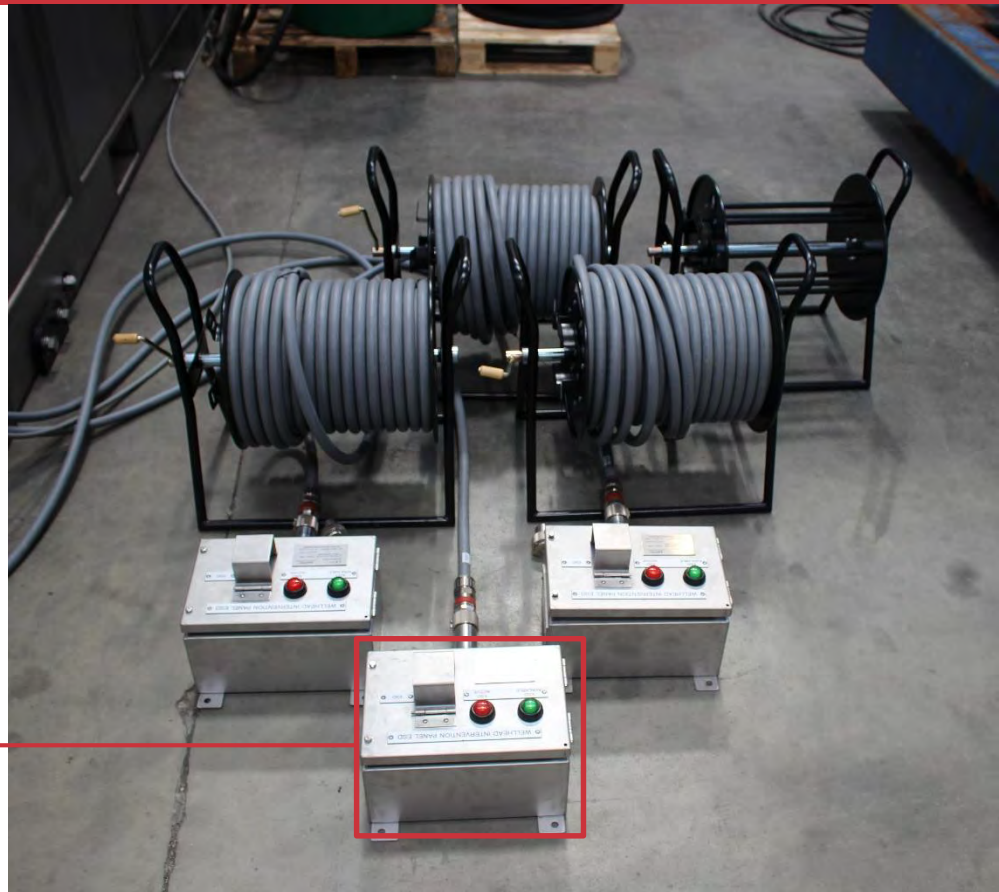


Maersk Culzean WHIP | Remote ESDs

The WHIP has been built with three **Remote ESD** boxes, with capacity to install a fourth should it be required at a later date.

The ESD logic has been programmed via the PLC system and is password protected to prevent against any changes.

Each ESD is fitted with a **100ft Cable Reel** to allow strategic location, typically intended to be one local to the work site, one in the intervention office, and one across the adjoining platform bridge.

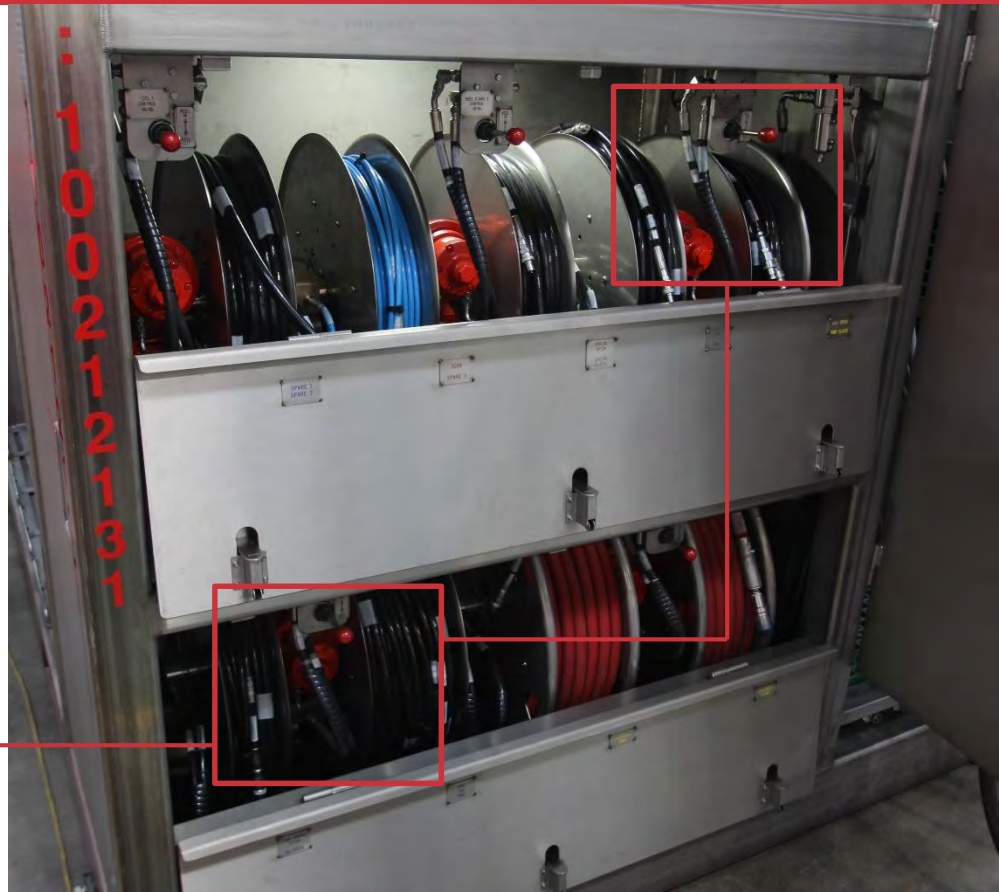


REMOTE ESDs

Maersk Culzean WHIP | Auto-wind Hosereels

Two banks containing a total of nine **Auto-wind Hosereels** are located behind hinged stainless steel doors at one end of the WHIP.

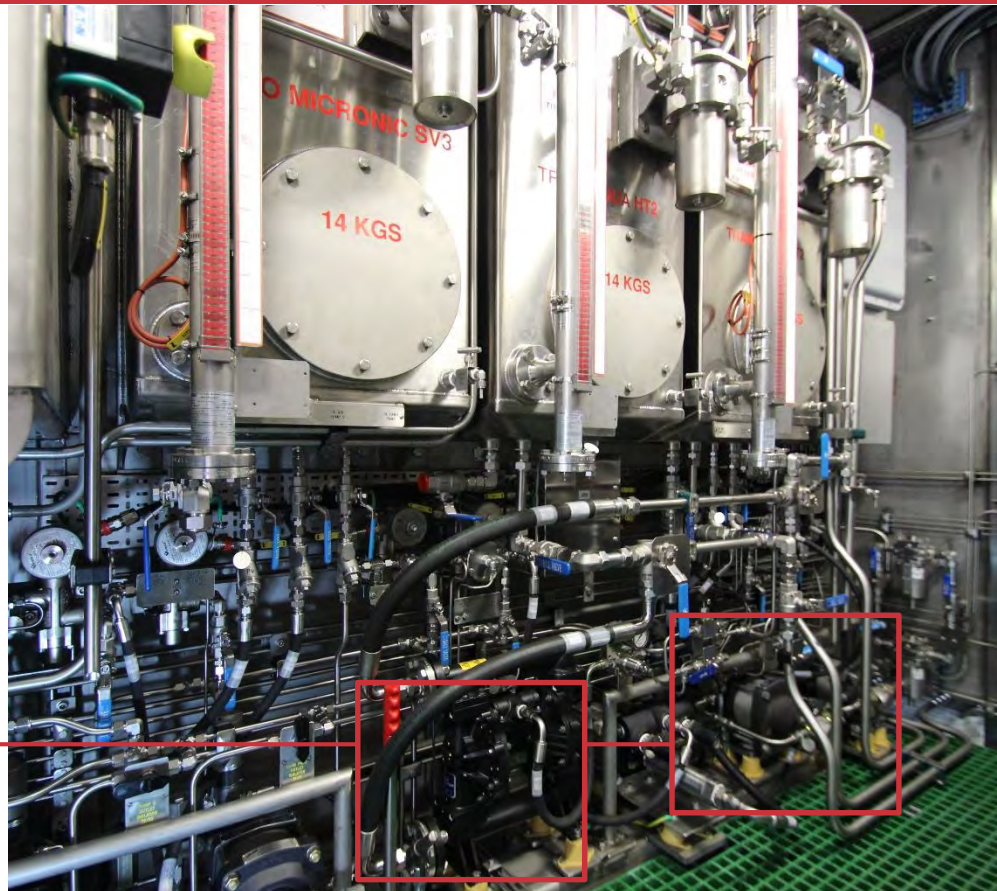
The auto-wind function provides easy retrieval of hook-up hoses onto the reels for storage or transportation of the unit.



Maersk Culzean WHIP | Pumps

Air Driven Pumps are installed in a dual redundancy philosophy on each of the hydraulic circuits to provide a back-up pressure supply in the event of a failure, and are controlled via the PLC.

An **Electrically Driven Pump**, also operated by the PLC, continuously filters hydraulic control fluid to ensure cleanliness in accordance with SAE 4059 12B-F standard, resulting in reduced overall maintenance.



AIR DRIVEN PUMPS

Maersk Culzean WHIP | Accumulators

High Pressure Piston Accumulators are pre-charged with nitrogen gas and fitted with rupture discs to prevent over pressurisation, with vents piped externally to the unit.

Pressure Gauges show accumulated pressure in the system while **Pressure Relief Valves** are fitted to the fluid end of the accumulator as a back-up safety function.

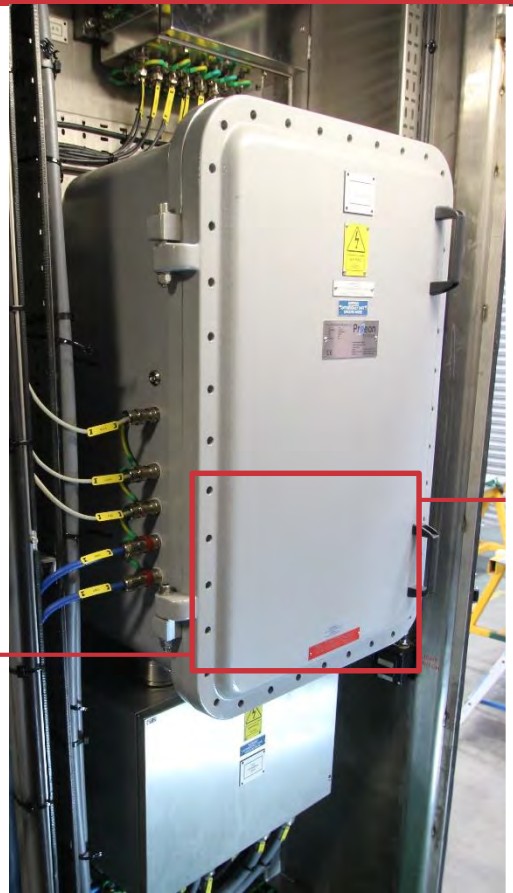
ACCUMULATOR BANK

Maersk Culzean WHIP | EXD & EXE Enclosures

EXD & EXE Certified Enclosures are used to house junction boxes and control systems, ensuring the build meets ATEX regulations.

Both enclosure types are built as a safety measure with **EXD Enclosures** typically housing motor controls and power distribution, while **EXE Enclosures** house junction boxes.

EXE ENCLOSED JUNCTION BOX

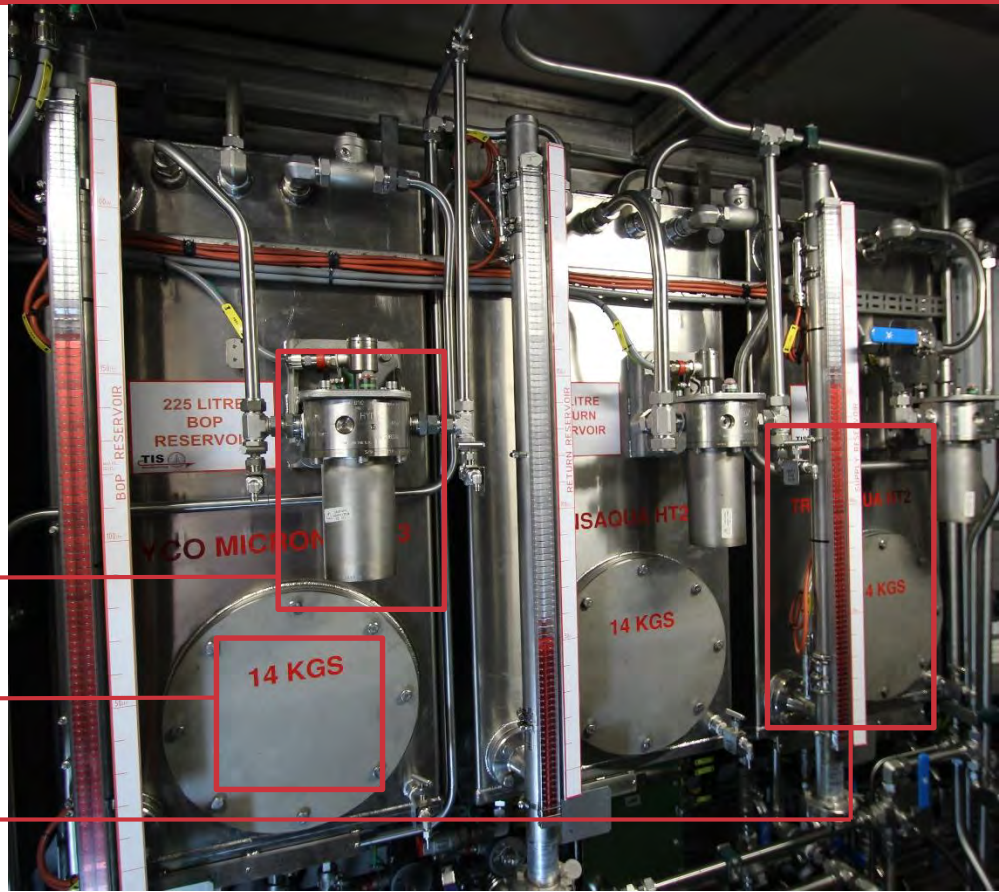


Maersk Culzean WHIP | Fluid Reservoirs

A **Dual Return Filtration System** allows continuous cleaning of fluid to minimise abrasive impact on equipment being controlled.

Fluid Level Indicators provide a visual reference of reservoir levels while transmitters deliver digital readouts and allow for an automatic switch-off feature.

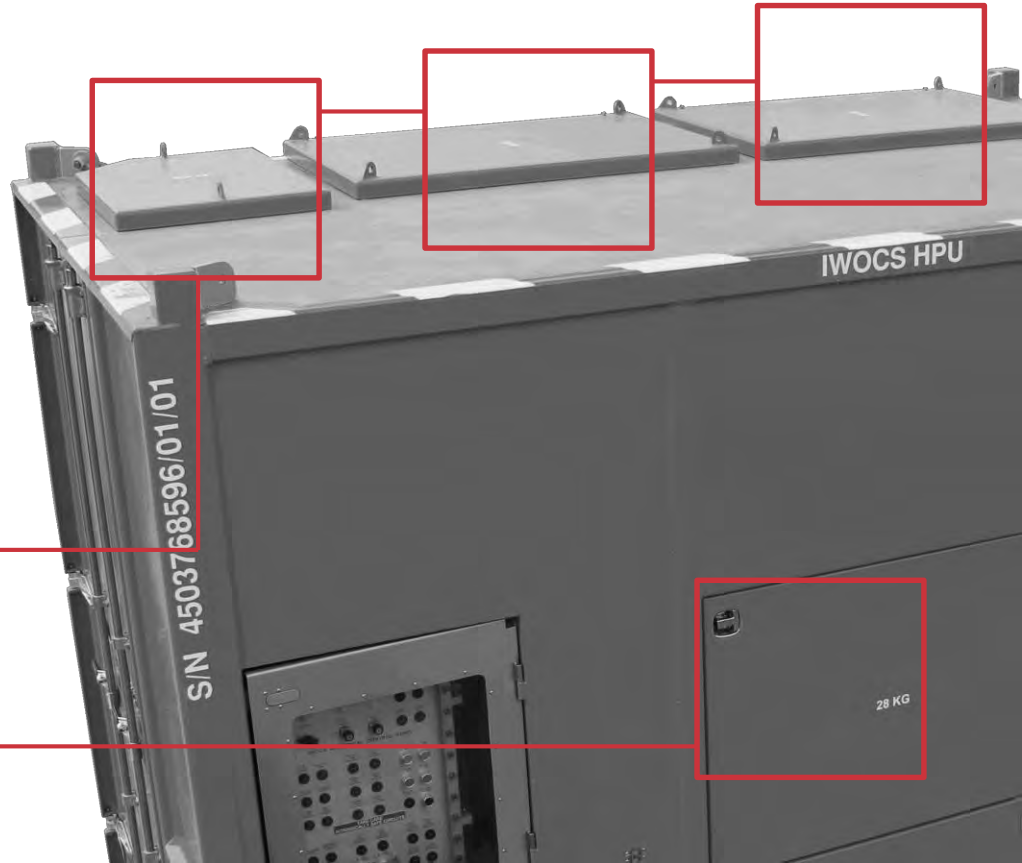
Reservoir Access Hatches allow for visual inspection and manual cleaning of tanks.



Maersk Culzean WHIP | Maintenance Access

Access Hatches on the roof and walls provide the facility to reach key components for maintenance requirements.

Larger components including the **Fluid Reservoirs**, **Pumps** and **Accumulators** are provided with lifting points and can be removed from the unit through the **Roof Access Hatches**.



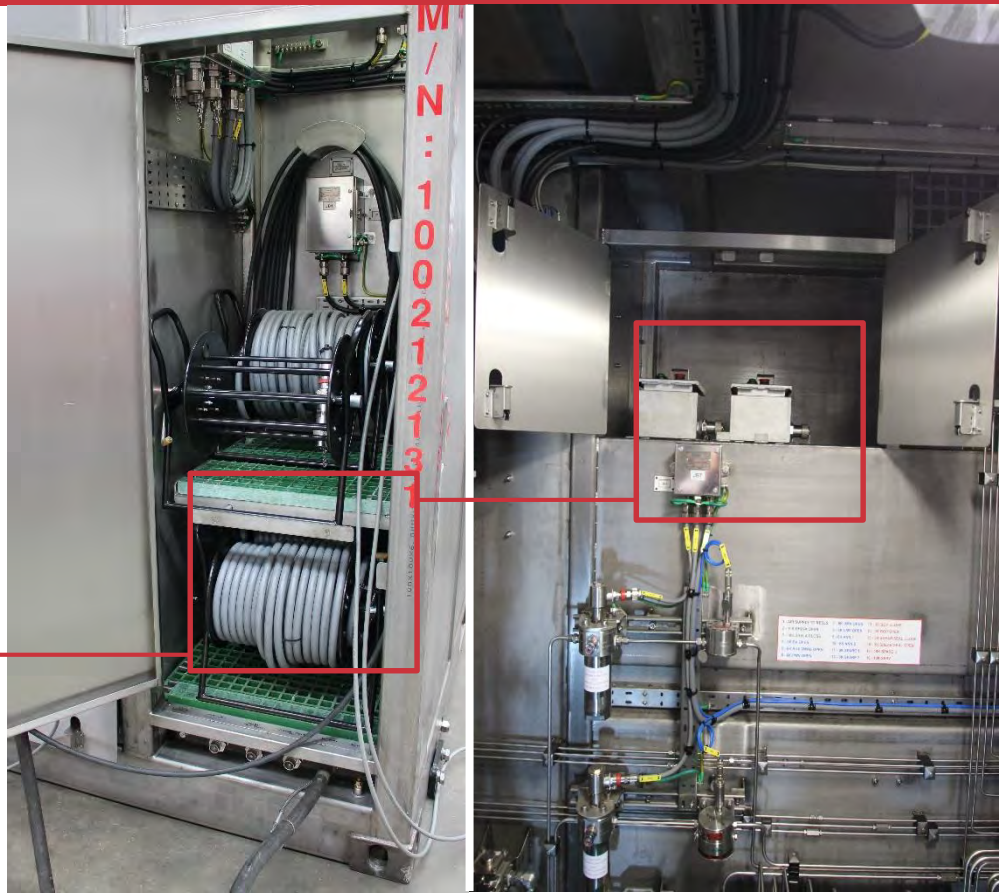
ROOF ACCESS HATCHES

WALL ACCESS HATCH

Maersk Culzean WHIP | Storage Lockers

Multiple **Storage lockers** are accessible externally and internally, and are designed to house portable components such as the ESD boxes, cable reels and other ancillaries.

STORAGE LOCKERS



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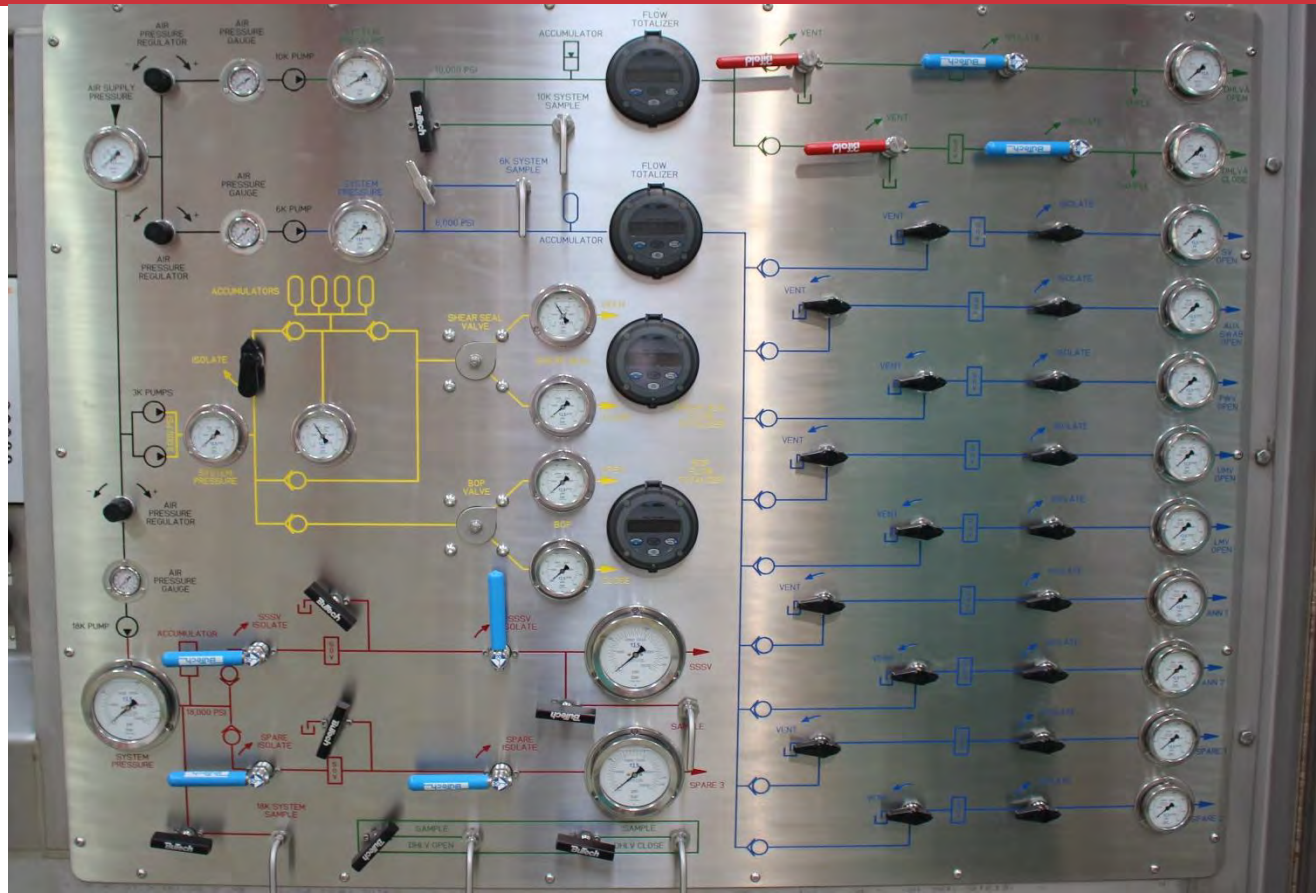

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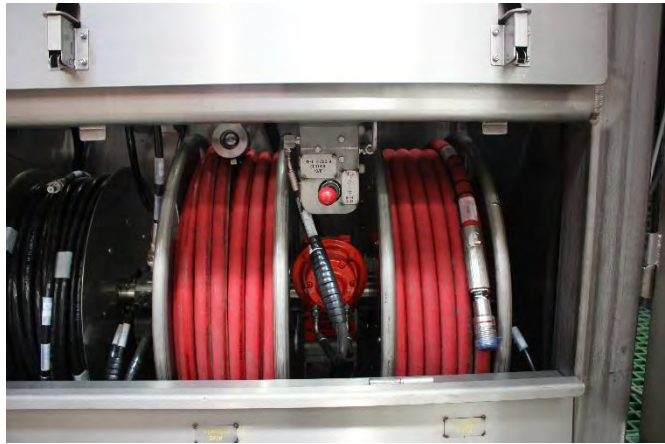

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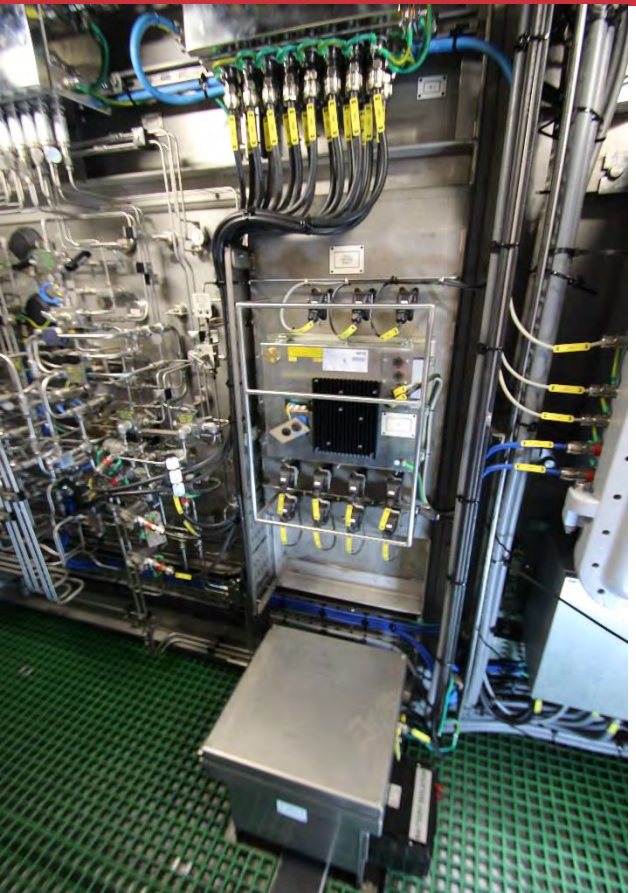

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