1000 LITER SUBSEA LIQUID STORAGE UNIT
PRODUCT SHEETS

Reliable subsea storage of liquids and pressurization of large-volume hydraulic systems
OPTION LIST

The following features are optional:

A  Oil level measurement
For oil level measurement three different options exist:
- Precise oil level measurement executed with ISO-13628 compliant sensor and connector including full ISO 13628-6:2006 Environmental Stress Screening (ESS).
- Precise oil level measurement executed with industrial wire length measurement sensor.
- Empty detection. Signals that the reservoir is (close to) empty. Cost effective alternative for the precise oil level measurement options.

B  Hydraulic filter
In order to safeguard a clean state of the subsea hydraulic system, the subsea storage unit can be supplied with a low-pressure hydraulic filter. This hydraulic filter includes a differential pressure switch (DPS) that measures the differential pressure over the filter and generates an alarm signal in case pressure exceeds a pre-set value.

C  Vibration dampers
In case the subsea liquid reservoir should be capable of operating in vibration-intensive environments – such as piling templates – vibration dampers can be provided in order to safeguard mechanical integrity in the long run.

D  Hydraulic isolation valves
The reservoir can be supplied along with hydraulic isolation valves, which allow for effective (de-)coupling of the hydraulic system.

TYPICAL APPLICATIONS

This subsea storage unit is specifically designed for long-term storage of hydraulic fluids and compensation of large-volume subsea hydraulic systems. Example applications:

- Control fluid storage open-loop PCS
- Subsea transformer pressure compensation
- Subsea VSD pressure compensation
- Volume compensation large volume actuators
DIMENSIONS

FRONT VIEW

SIDE VIEW

BOTTOM VIEW

3D VIEW

WLL 6.5T

Suitable for M12

3485
3409
3295
3219

COG

PCD250

Suitable for M12
SAE 3000 PSI - Butt weld flange (flat) - 1-1/2" [2x]
SAE 3000 PSI - Butt weld flange (flat) - 2-1/2" [2x]
# 1000 Liter Subsea Liquid Storage Unit Specifications

## General

<table>
<thead>
<tr>
<th>Metric</th>
<th>Imperial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensation volume</td>
<td>1070 ± 30 liters</td>
</tr>
<tr>
<td>Total oil volume</td>
<td>1300 ± 50 liters</td>
</tr>
<tr>
<td>Main dimensions</td>
<td>See detailed drawings</td>
</tr>
<tr>
<td>Weight in air excl. oil¹</td>
<td>4380 ± 50 kg</td>
</tr>
<tr>
<td>Weight in air incl. oil (full)¹</td>
<td>5630 ± 100 kg</td>
</tr>
<tr>
<td>Surface treatment frame</td>
<td>NORSOK M-501, coating system 7</td>
</tr>
</tbody>
</table>

¹ The indicated weights are excluding oil level measurement and including hydraulic filter.

## Operational

| Metric                          | Metric                          |
|------|------|--------------------------------|
| Maximum operating depth²        | 5000 m                         | 16404 feet                     |
| Operating temperature range (water) | -18°C – +50°C  | -0.4°F – 122°F               |
| Storage temperature range (air)  | -25°C – +50°C                  | -13°F – 122°F                  |
| Allowed operational inclination  | 10°… +10°                      |                                |
| Pre pressure³ (min. stroke)     | 0.47 bar (+/- 0.05 bar)         | 6.82 psi (+/- 0.73 psi)        |
| Full pressure³ (max. stroke)    | 1.47 bar (+/- 0.05 bar)         | 31.32 psi (+/- 0.73 psi)       |

² The indicated maximum operating depth is valid for a reservoir without level measurement. Depending on the selected level measurement sensor the depth rating might be limited.

³ The reservoir can be delivered with customized pressure characteristics.

## Hydraulic

| Metric                          | Metric                          |
|------|------|--------------------------------|
| Hydraulic connections to hydraulic system | 2 x SEA 1½" 3000 psi         |                                |
| Hydraulic supply connection (when optional hydraulic filter is applied) | 2 x SEA 1½" 3000 psi         |                                |
| Maximum flow capacity hydraulic filter | 500 l/min                        | 132 gpm                         |
| Filtration size (relates to optional hydraulic filter) | 10 micron                      |                                |
| Maximum operating pressure      | 2.6 bar                         | 37.7 psi                        |

## Electrical - (Optional) Oil Level Sensors

| Metric                          | Metric                          |
|------|------|--------------------------------|
| ISO-13628 compliant level sensor | Supply voltage               | 24 V DC                        |
| Output signal                   | 4 – 20 mA                      |                                |
| Interface                       | SIIS 2                         |                                |

| Metric                          | Metric                          |
|------|------|--------------------------------|
| Industrial grade wire length measurement sensor | Supply voltage | 8 – 32 V DC |
| Current consumption             | 15 mA (without load)            | 20 mA (without load)           |
| Output signal                   | 0.5 – 9.5 V                     | 4 – 20 mA                      |
| Load on output                  | >5 kΩ at 12 V DC                | <500 Ω                         |
| Resolution                      | 13 Bit (over entire measurement range) |                                |
| Linearity                       | 0.15 %                          |                                |
| Settling time                   | 80 ms                           |                                |
1000 LITER SUBSEA LIQUID STORAGE UNIT SPECIFICATIONS
(CONTINUED)

**ELECTRICAL - (OPTIONAL) OIL LEVEL SENSORS (CONTINUED)**

<table>
<thead>
<tr>
<th>Empty detection</th>
<th>Operating voltage</th>
<th>Max. current consumption</th>
<th>Output signal:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24 V DC</td>
<td>30 mA typical</td>
<td>NPN Open collector</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>24 V DC NC</td>
</tr>
</tbody>
</table>

**ELECTRICAL - (OPTIONAL) DPS HYDRAULIC FILTER**

<table>
<thead>
<tr>
<th>Supply voltage (Vs)</th>
<th>Switch output</th>
<th>Connector type</th>
<th>Switching current</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
<td>NO or NC</td>
<td>Subconn® Micro 6 or 8 pole</td>
<td>5A</td>
</tr>
</tbody>
</table>

**RELATED SERVICES**

**Client advisory**
To ensure that the right size and type of subsea liquid reservoir is selected, we advise our clients during the selection process. We do so, taking temperature ranges, pressure ranges, filling levels, entrapped air, fluid behaviors, and other factors into account. In addition, we provide advice regarding the installation and use of a reservoir in a subsea hydraulic system.

**Advanced testing programs**
Normal factory testing procedures include internal pressure testing, leakage testing, and functional testing. In addition, we also offer more extensive factory testing and qualification programs including external pressure testing, cycle testing, temperature range testing, and contamination testing.

In addition, the reservoir can be delivered flushed to a pre-defined cleanliness level class.

**Custom-made versions**
Next to our standardized series, Seatools offers custom-made subsea liquid reservoir and compensators that are tailored to your specifications. Please contact our sales department to request a customized solution.

**Subsea hydraulic systems**
Because of our subsea hydraulic engineering capabilities we are able to fully unburden our customers by delivering complete tailor-engineered subsea hydraulic systems. This includes all related systems such as mechanics, software, electronics, and controls.