

# 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.



Industrial wire length measurement sensor

### **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

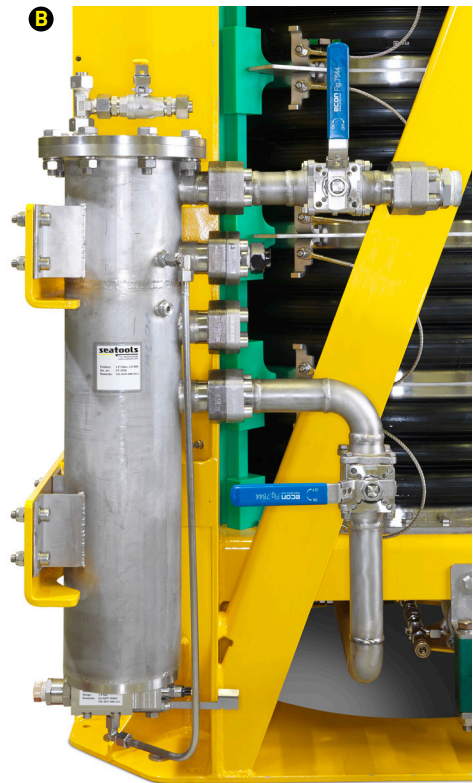
In case the subsea liquid reservoir should be capable of operating in vibration-intensive environments – such as piling templates – vibration dampers can be provided in order to safeguard mechanical integrity in the long run.



Vibration damper

### **D** Hydraulic isolation valves

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



Hydraulic filter

## TYPICAL APPLICATIONS

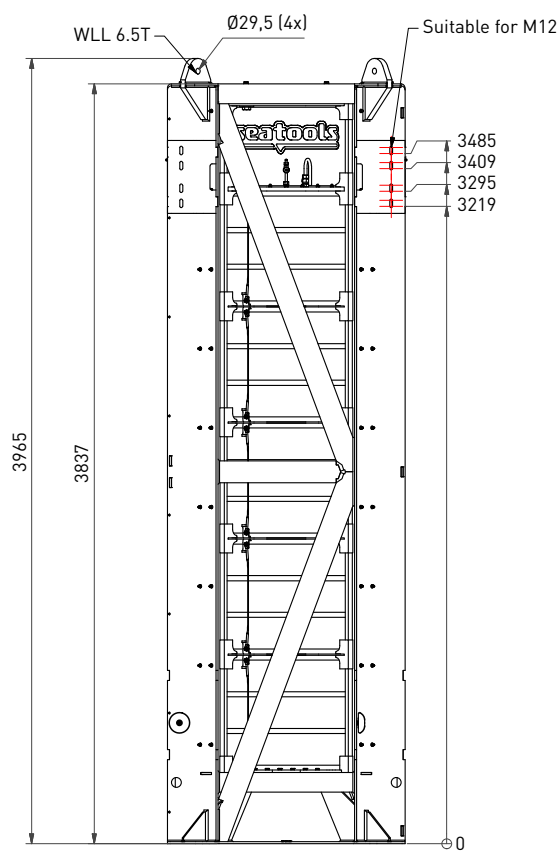
This subsea storage unit is specifically designed for long-term storage of hydraulic fluids and compensation of large-volume subsea hydraulic systems. Example applications:

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

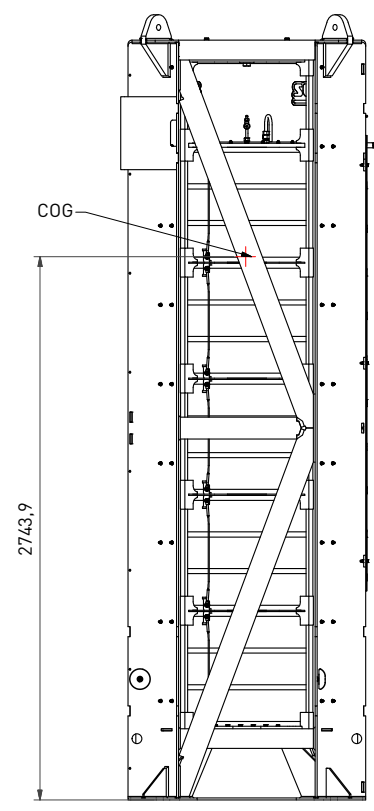


# DIMENSIONS

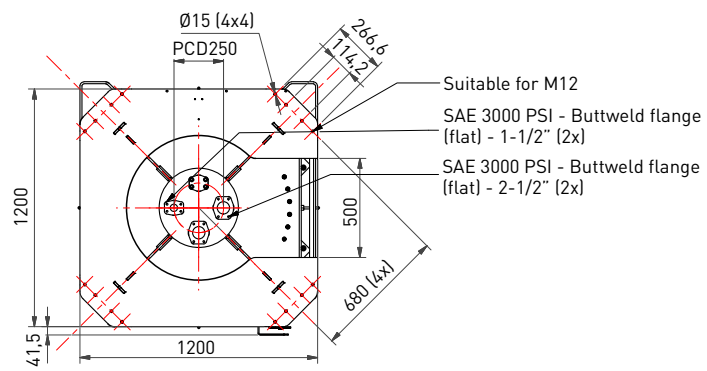
FRONT VIEW



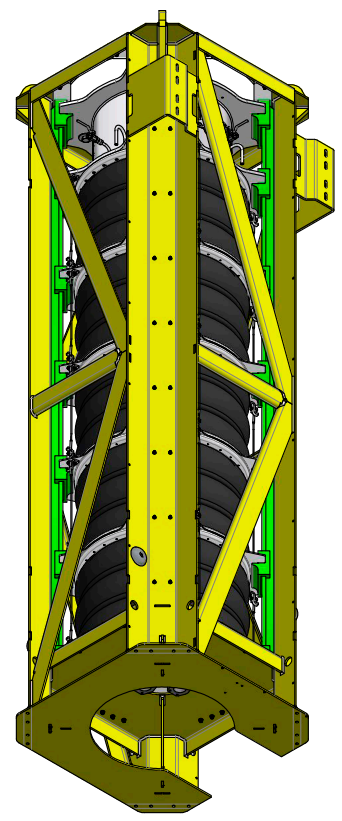
SIDE VIEW



BOTTOM VIEW



3D VIEW



# 1000 LITER SUBSEA LIQUID STORAGE UNIT SPECIFICATIONS

## GENERAL

	METRIC	IMPERIAL
Compensation volume	1070 ± 30 liters	283 ± 8 US gallons
Total oil volume	1300 ± 50 liters	343 ± 13 US gallons
Main dimensions	See detailed drawings	
Weight in air excl. oil <sup>1</sup>	4380 ± 50 kg	9656 ± 110 lbs
Weight in air incl. oil (full) <sup>1</sup>	5630 ± 100 kg	12412 ± 243 lbs
Surface treatment frame	NORSOK M-501, coating system 7	

<sup>1</sup> The indicated weights are excluding oil level measurement and including hydraulic filter

## OPERATIONAL

Maximum operating depth <sup>2</sup>	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 pressure <sup>3</sup> (min. stroke)	0.47 bar (+/- 0.05 bar)	6.82 psi (+/- 0.73 psi)
Full pressure <sup>3</sup> (max. stroke)	1.47 bar (+/- 0.05 bar)	31.32 psi (+/- 0.73 psi)

<sup>2</sup> 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.

<sup>3</sup> The reservoir can be delivered with customized pressure characteristics

## HYDRAULIC

Hydraulic connections to hydraulic system	2 x SEA 1½" 3000 psi 2 x SEA 2½" 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

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

### Industrial grade wire length measurement sensor

	VOLTAGE OUTPUT	CURRENT OUTPUT
Supply voltage	8 - 32 V DC	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	

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# 1000 LITER SUBSEA LIQUID STORAGE UNIT SPECIFICATIONS (CONTINUED)

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

Empty detection	Operating voltage	24 V DC	
	Max. current consumption	30 mA typical	
	Output signal:	NPN Open collector	3 pin Subconn micro
		24 V DC NC	connector or more

## ELECTRICAL - (OPTIONAL) DPS HYDRAULIC FILTER

Supply voltage (Vs)	24 V DC
Switch output	NO or NC
Connector type	Subconn® Micro 6 or 8 pole
Switching current	5A

## 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.



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