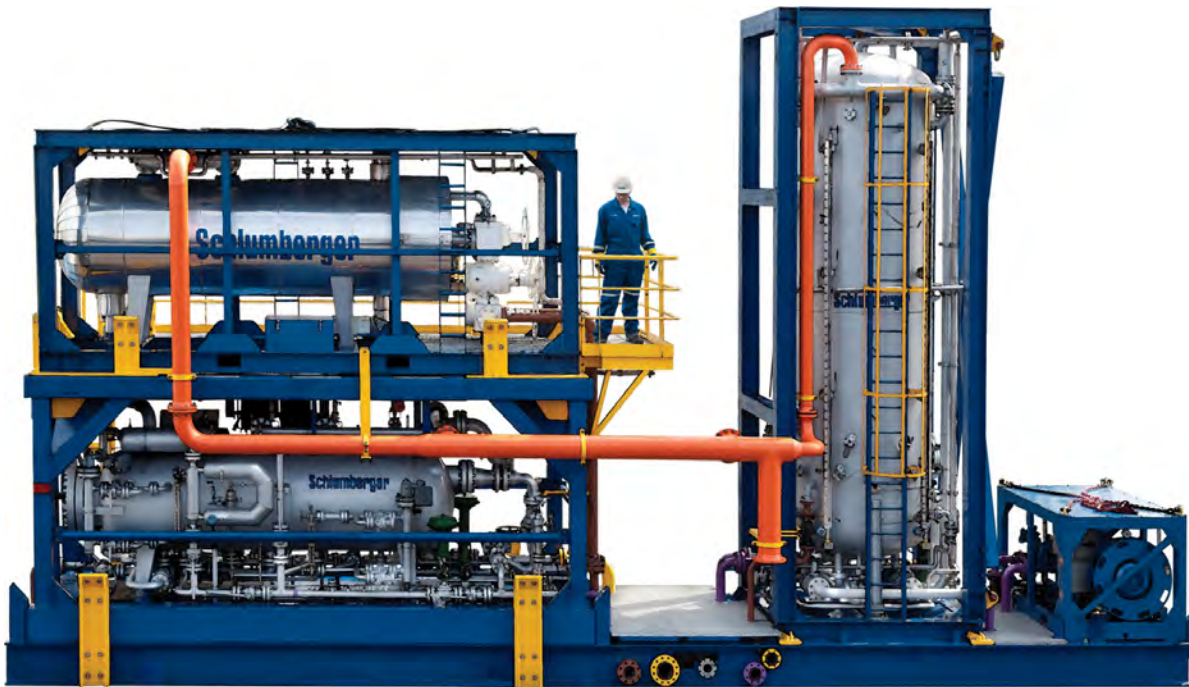


Modular Compact Well Test System

Shorter, simpler rig-up and sea fastening



Modular compact well test system.

Applications

- Exploration, development, and production wells on testing campaigns
- Permanent rigs with limited space
- Offshore operations
- Onshore, offshore, and deepwater testing
- Wells with flow rates up to 52-MMcf/d gas and 15,000-bbl/d oil
- Operations requiring quick positioning and sea fastening

How it improves wells

- Cuts rig-up time by 50% with an HSE-improved process
- Reduces deck space by 40% with a footprint of only 250 m²
- Needs only minimal handling, leading to safer operations
- Features interchangeable skids, which can be placed apart from each other

How it works

The modular compact well test (MCWT) system radically simplifies the sea fastening process with optimized packaging and a state-of-the-art locking system, which improves flexibility and may eliminate welding altogether. The system's design enables quick positioning, using 40% less deck space and saving up to 50% rig-up time with fewer personnel. The system's flowlines and connections are minimized for reduced manual handling and chance spillage. Premade and easy-to-install walkways, coupled with quickly positionable equipment, enable the rig-up process to begin at a later stage, independent of the ongoing

drilling process. On some wells, this could enable the mobilization and rig-up of well test equipment immediately after the decision to perform a test has been made. The flexibility to rig up equipment at any time and the avoidance of hot work eliminates wait times.

The modularity and reduced deck space requirements prevent having to modify the rig layout or backload less-essential equipment. In multiwell testing campaigns, more equipment can remain rigged-up between wells, enabling greater flexibility.

The modular design involves custom flowlines, which also reduces the number of connections and temporary lines, minimizing the number of leak paths for safer operations.

Additional information

In certain instances, it may be desirable to use a multiphase flowmeter in conjunction with the modular compact well test system. The flowmeter can be rigged up on a special platform between the heater and the surge tank.

The takeaways

The modular compact well test system reduces rig-up time and improves safety by using preassembled and quick-fastening technologies to reduce the number of personnel it takes to staff a rig-up operation. Rig-up can take place independently of drilling operations, and the system has reduced-complexity flowlines so it can help minimize hot work. Additionally, the system uses 40% less deck space.

Modular Compact Well Test System

NORSOK MCWT

Specifications						
Description	Model	Working pressure, psi [MPa]	Design temperature, degF [degC]	Applied codes	Dimensions (L x W x H), ft [m]	Wet weight, lbm [kg]
Surface safety valve	SSV-GCD	10,000 [69]	-20 to 350 [-29 to 177]	API-6A (PSL3, PR2), H ₂ S NACE MR0175, DNV 2.7-3, NORSOK	4.27 x 1.97 x 4.95 [1.30 x 0.60 x 1.51]	4,630 [2,100]
Emergency shutdown	ESD-CE	6,000 [41]	-20 to 167 [-29 to 75]	None	3.94 x 3.02 x 3.61 [1.20 x 0.92 x 1.10]	1,100 [500]
Choke manifold	FMF-GP	10,000 [69]	-20 to 350 [-29 to 177]	API-6A (PSL3, PR2), H ₂ S NACE MR0175, DNV 2.7-3, NORSOK	8.83 x 6.89 x 7.09 [2.69 x 2.10 x 2.16]	9,250 [4,196]
PhaseTester* equipment	VXFM-C	5,000 [34]	-4 to 302 [-20 to 150]	H ₂ S NACE MR0175	5.58 x 8.07 x 9.19 [1.70 x 2.46 x 2.80]	3,740 [1,700]
Steam exchanger	STX-MC	10,000 [69]	-4 to 350 [-20 to 177]	API-6A (PSL3, PR2), CE marked, H ₂ S NACE MR0175, NORSOK, ANSI B31.3, ASME VIII Div.1, DNV 2.7-1 skid and frame	21.3 x 8.07 x 9.19 [6.50 x 2.46 x 2.80]	38,053 [17,261]
Separator	SEP-NFC	1,440 [9.93]	-4 to 300 [-20 to 149]	H ₂ S NACE MR0175, NORSOK, ANSI B31.3, ANSI B16.5, ASME VIII Div.2, DNV 2.7-1, CE marked	22.3 x 9.51 x 10.2 [6.80 x 2.90 x 3.10]	49,280 [22,353]
Vertical surge tank (VST)	VST-GB	150 [1.03]	-4 to 212 [-20 to 100]	H ₂ S NACE MR0175, NORSOK, ASME/ANSI B31.3, ASME VIII Div.1, DNV 2.7-1, CE marked	8.53 x 8.53 x 24.3 [2.60 x 2.60 x 7.40]	31,459 [14,270]
Transfer pump	PMP-HBB	250 [1.72]	32 to 212 [0 to 100]	Explosion-proof EExd IIB T4, DNV 2.7-3, CE marked, ASME B31.3	8.37 x 4.92 x 5.18 [2.55 x 1.50 x 1.58]	6,503 [2,950]
Oil manifold	MFD-BEA	1,440 [9.93]	-4 to 300 [-20 to 149]	ASME B31.3, H ₂ S NACE MR0175, CE marked, PED 97/23, DNV 2.7-3	7.09 x 2.40 x 1.80 [2.16 x 0.73 x 0.55]	1,347 [611]
Gas manifold	MFD-AEA	1,440 [9.93]	-4 to 300 [-20 to 149]	ASME B31.3, H ₂ S NACE MR0175, CE marked, PED 97/23, DNV 2.7-3	4.92 x 1.31 x 1.31 [1.50 x 0.40 x 0.40]	481 [220]
Workshop container	-	-	-4 [-20] minimum	DNV 2.7-1, EC 94/9	20.0 x 8.00 x 8.40 [6.10 x 2.44 x 2.56]	14,330 [6,500]

MCWT Module Typical Footprint, Weight, and Deckload

Model	Footprint dimensions (L x W x H), ft [m]	Total dry weight, lbm [kg]	Hydrostatic test weight, lbm [kg]	Max. deckload, lbm/ft ² [kg/m ²]
Compact well test [†]	27.9 x 24.8 x 25.3 [8.50 x 7.55 x 7.70]	214,875 [97,465] [‡]	265,460 [120,410] [‡]	398 [1,940]

[†] Estimated weights

[‡] Compact well test customized to each rig setup. This is an example for information only.

Standard MCWT

Equipment Compliance Codes, Typical Footprint, Weight, and Deckload

Equipment	Quantity	Composition	Notes	Certification (applied codes)	Footprint dimensions, ft [m]	Wet weight, tonUS	Deck load, tonUS/m ²
Separator frame	1	SEP + STX	Steam exchanger mounted on top of the SEPS-A	DNV 2.7-3 (AWS d1.1)	8.04 x 26.90 [2.45 x 8.20]	41	2
VST frame	2	VST x 2	Two VST's mounted in each frame	DNV 2.7-3 (AWS d1.1)	8.04 x 22.97 [2.45 x 7.00]	29	2
VST front frame	2	VST inlet and outlet valves	Main walkways and pipes for oil and gas distribution	DNV 2.7-3 (AWS d1.1)	4.76 x 22.97 [1.45 x 7.00]	-	-
Compact manifold	1	Compact manifold + scrubber	Scrubber mounted on top of the compact manifold	DNV 2.7-1 (AWS d1.1)	8.04 x 19.03 [2.45 x 5.8]	-	-
Surge tanks modules	4	-	-	-	12.80 x 45.93 [3.90 x 14.00]	115	2.1

Flow-Rate Envelope (Coriolis Mass Flow Metering on Oil, Gas, and Water Streams)

Instrumentation	High liquid level (65%)		Low liquid level (35%)		Retention time, s
	Gas, MMcf/d	Oil, bbl/d	Gas, MMcf/d	Oil, bbl/d	
Gas, MMcf/d	52 at 1,150 psi	-	65 at 1,150 psi	-	-
Oil, bbl/d	0	15,000	12,000	15,000	30
Water, bbl/d	6,000	3,000	1,500	0	20

Conventional Equipment Included with MCWT Module

Equipment	Steam exchanger	Separator	Transfer pump	Wilden pump	Surge tank
Quantity	1	1	2	2	4

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