

CleanSep

More efficient cleanup with adjustable flow rate control and fluid volume monitoring

APPLICATIONS

- Onshore and offshore oil and gas well testing and cleanup
- Operations with strict environmental requirements on water and hydrocarbon disposal

BENEFITS

- Accommodate fluctuating water flow rates during well test cleanup
- Eliminate disposal of unseparated fluids, minimizing risks to the environment
- Improve safety by flowing initial cleanup into a separator instead of low-pressure tanks
- Provide reliable flow rate data, including oil-line water cut
- Reduce cleanup time by allowing higher flow rates and monitoring cumulative volumes of nonhydrocarbon fluids

FEATURES

- Adjustable SmartWeir* phase separation technology to optimize water retention time during cleanup
- Enhanced mist extractor to reduce liquid carryover
- Adjustable liquid level and adjustable oil-water interface level
- Total liquid level and oil/water interface measurements using time domain reflectometry technology (radar)
- Compartment to capture solids during cleanup
- Coriolis meters and a water-cut analyzer for quality check or operations when no PhaseTester* portable multiphase well testing equipment is available or conditions fall outside the operating envelope



CleanSep adjustable well test separator.

The CleanSep* adjustable well test separator is a new-generation horizontal separator that can operate as a stand-alone unit or in combination with the PhaseTester portable multiphase well testing equipment with Vx* multiphase well testing technology. In the latter configuration, high-quality flow measurements are unaffected by separation issues such as foaming oil (carryover), emulsions, and gas carryunder (gas in the oil line).

The CleanSep separator is fitted with the SmartWeir technology for separation that accommodates fluctuating water flow rates and high water cuts. The oil/water interface level is adjustable from 10 to 55% and the total liquid level from 35 to 65% of the vessel ID. The adjustable weir enables the separator to be online during the cleanup phase.

This well test separator can also handle limited amounts of solids, so it eliminates the need to flow fluids through a low-pressure surge tank or gauge tank during cleanup while reducing HSE hazards. Faster cleanup operations are possible because the effluents can still be processed when the well is cleaned up on large chokes. Environmental risks are reduced dramatically because there is no need to dispose of unseparated fluids during cleanup periods. The optimized liquid-liquid separation results in less water in the oil line (optimizing the burning process) and less oil in the water line (conditioning the water to be treated for disposal).

The CleanSep separator uses Coriolis meters and a water-cut analyzer on the oil line to enable flow metering of each phase at the separator outlets. Its operating parameters, such as level, interface, pressure, and weir system adjustments, are remotely set from the data acquisition and control console.

All CleanSep separators are manufactured under a Type Approval and are provided with a Certificate of Conformity and a full quality file.

Specifications

Model	SEPS-A and SEPS-AB
Vessel size, horizontal, in × ft [cm × m]	42 × 10 [107 × 3.05]
Working pressure, psi [kPa] at degF [degC]	1,440 [9,930] at 100 [38] or 1,345 [9,275] at 212 [100] or 1,330 [9,171] at 257 [125]
Min. operating temperature, degF [degC]	-4 [-20]
Max. operating temperature, degF [degC]	257 [125]
Safety valve set pressure, psi [kPa]	1,315 [9,070]
Skid and frame rating	DNV [†] 2.7-1
Max. gas flow rate	
Low liquid level, MMscf/d [MM m ³ /d] at psi [kPa]	61.5 [1.74] at 1,440 [9,930]
High liquid level, MMscf/d [MM m ³ /d] at psi [kPa]	43.0 [1.22] at 1,440 [9,930]
Max. oil flow rate	
Low liquid level, bbl/d [m ³ /d]	7,900 [1,255]
High liquid level, bbl/d [m ³ /d]	14,500 [2,304]
Max. water flow rate	
Low interface level, bbl/d [m ³ /d]	4,150 [659]
High interface level, bbl/d [m ³ /d]	10,550 [1,676]
Hazardous area certification	Zone 1, gas, T4 (T _{ambient} = 140 degF [60 degC]), ATEX [‡] 94/9/CE [§] compliant
Overall dimensions (L × W × H), ft [m]	20 × 8 × 8.7 [6.10 × 2.44 × 2.65]
Weight, lbm [kg]	30,865 [14,000]
Connections	
Inlet	3-in, Fig 602, female
Gas outlet	4-in, Fig 602, male
Oil outlet	3-in, Fig 602, male
Water outlet	3-in, Fig 602, male
Sand jet	3-in, Fig 602, female
Pressure safety valve outlet	4-in, Fig 602, male
Solids disposal	3-in, Fig 602, male
Codes and standards	ASME ^{††} VIII Div. 1, ANSI/ASME B31.3, API RP 520/521, NACE ^{††} MR0175, DNV 2.7-1 SEPS-AB only is PED ^{§§} compliant and CE marked.
Certifications	Third-party certifications for vessel, frame, and explosive atmospheres

[†] Det Norske Veritas

[‡] Complies with ATmospheres EXplosives directive

[§] Conformité Européene

^{††} American Society of Mechanical Engineers

^{††} National Association of Corrosion Engineers International

^{§§} Pressure equipment directive (EU)

Meter Specifications

Fluid	Meter Type	Flow Range	Accuracy
Gas	Coriolis	0 to 65 MMscf/d	Better than 1.5% from 0.5 to 2 MMscf/d Better than 0.36% from 2 to 65 MMscf/d
Oil	Coriolis	0 to 20,000 bbl/d [0 to 3,178 m ³ /d]	Better than 1.3% from 100 to 1,000 bbl/d [15.9 to 158.9 m ³ /d] Better than 0.15% from 1,000 to 15,000 bbl/d [158.9 to 2,384 m ³ /d]
	Water-cut analyzer	0 to inversion	0.5%
Water	Coriolis	15 to 6,000 bbl/d [2.4 to 954 m ³ /d]	Better than 1% from 100 to 500 bbl/d [15.9 to 79.5 m ³ /d] Better than 0.2% from 500 to 6,000 bbl/d [79.5 to 954 m ³ /d]

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