

CleanPhase well test separator

Reduce cleanup time, improve safety, and minimize environmental risk



CleanPhase well test separator.

Applications

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

Features

- Optimizes water retention time during cleanup with SmartWeir* phase separation technology
- Provides an enhanced mist extractor to reduce liquid carryover
- Accommodates fluctuating water flow rates during well test cleanup
- Enables an adjustable liquid level and adjustable oil-layer thickness
- Measures oil-layer thickness using time domain reflectometry technology (radar)

- Compartmentalizes to capture solids during cleanup
- Provides the option of Coriolis meters and electromagnetic meters for quality checking

How it improves wells

- Improves safety by flowing the initial cleanup fluid into a separator instead of low-pressure tanks
- Reduces cleanup time by enabling higher flow rates and monitoring cumulative volumes of nonhydrocarbon fluids
- Minimizes environmental risk by eliminating disposal of unseparated fluids
- Enhances decision making with reliable flow rate data, even for foaming or low-API oils

How it works

The CleanPhase* well test separator is a new-generation horizontal separator that can operate as a stand-alone unit or in a combination configuration that includes Vx* multiphase well testing technology. With this setup, high-quality flow measurements are unaffected by separation issues such as foaming oil (carryover), emulsions, and gas carryunder (gas in the oil line).

The CleanPhase separator uses SmartWeir technology that accommodates fluctuating water flow rates and high water cuts. SmartWeir technology enables the separator to be on line during the cleanup phase. The liquid level is adjustable from 40% to 65% and an oil-layer thickness from 0% to 65% of the vessel ID.

CleanPhase

The CleanPhase separator can be equipped with an optional single-phase flowmetering (SPFM) system using Coriolis meters for all three phases or Coriolis meters for oil and gas and an electromagnetic meter for water. This option enables flowmetering of each phase at the separator outlets. It is useful in operations where no Vx technology is available or when the Vx Advisor* multiphase metering advisory software indicates that well conditions fall outside the operating envelope. As an alternative to the SPFM, acquisition can be done through the Bullet™ WirelessHART® adapter for increased operational efficiency and safety.

Reliability is built into CleanPhase separators, which are manufactured under appropriate type approval and provided with a certificate of conformity and a full quality file.

Reduced HSE risks and greater efficiency

The CleanPhase well test separator can also handle limited amounts of solids, so it eliminates the need to flow through a low-pressure surge tank or gauge tank during cleanup to reduce HSE risk. 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 significantly 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).

Options

- Pressure and level switches installed on the vessel to trigger the emergency shutdown system when set limits are reached
- Blowdown valve installed on the vessel to bypass the pressure relief valves and release the separator pressure when an emergency is triggered
- Isolation pneumatic-actuated ball valve on the gas outlet line to open automatically at 65 psi [448 kPa] or remotely controlled during separator setup
- Water-cut analyzer to measure the water content in the oil stream

Specifications

Model	Vessel Size, in × ft [cm × m]	Working Pressure, psi [kPa], at 100 degF [38 degC]	Temperature Range, degF [degC]	Safety Valve Set Pressure, psi [kPa]	Max. Oil Flow Rate, bbl/d [m ³ /d]		Max. Gas Flow Rate, MMcf/d [million m ³ /d]		Max. Water Flow Rate, bbl/d [m ³ /d]		Hazardous Area Certification
					High Level	Low Level	High Level	Low Level	Low Interface	High Interface	
SEPL-A [†]	42 × 10 [107 × 3.05]	1,440 [9,930]	32 to 257 [0 to 125]	1,315 [9,066]	14,500 [2,304]	7,900 [1,255]	43 [1.16]	61.5 [1.66]	4,150 [659]	10,550 [1,676]	Zone 1, gas IIB, T3 (T _{ambient} = 131 degF [55 degC]), ATEX [‡] 94/9 from serial number 710 and above T4 (T _{ambient} = 131 degF [55 degC]), from serial numbers 701 to 709
SEPL-B/BW [†] (winterized)	42 × 10 [107 × 3.05]	1,440 [9,930]	-4 to 300 [-20 to 149]	1,315 [9,066]	14,500 [2,304]	7,900 [1,255]	43 [1.16]	61.5 [1.66]	4,150 [659]	10,550 [1,676]	Zone 1, gas IIB, T3 (T _{ambient} = 131 degF [55 degC]), ATEX 94/9, CE [§] marked
SEPL-E/EW [†] (winterized)	48 × 18 [122 × 5.5]	1,440 [9,930]	-4 to 300 [-20 to 149]	1,310 [9,032]	30,000 [4,770]	10,000 [1,590]	75 [2.12]	105 [2.97]	3,000 [477]	6,000 [954]	Zone 1, gas IIB, T3 (T _{ambient} = SEPL-E: 131 degF [55 degC]), SEPL-EW: 104 degF [40 degC]), ATEX 94/9, CE marked
SEPL-FW [†] (winterized)	48 × 18 [122 × 5.5]	1,440 [9,930]	-4 to 300 [-20 to 149]	1,310 [9,032]	30,000 [4,770]	10,000 [1,590]	75 [2.12]	105 [2.97]	3,000 [477]	6,000 [954]	Zone 1, gas IIB, T3 (T _{ambient} = 131 degF [55 degC]), ATEX: 2014/34/UE, CE marked
SEPS-A [†]	42 × 10 [107 × 3.05]	1,440 [9,930]	-4 to 257 [-20 to 125]	1,315 [9,066]	14,500 [2,304]	7,900 [1,255]	43 [1.16]	61.5 [1.66]	4,150 [659]	10,550 [1,676]	Zone 1, gas IIB, T4 (T _{ambient} = 140 degF [60 degC]), ATEX 94/9, CE compliant

[†] Includes third-party certifications for vessel, skid, frame, and electrical parts.

[‡] Complies with ATmosphere EXplosible directive

[§] Conformité Européene

Specifications and Codes

Model	Connections							Dimensions, (L × W × H), ft [m]	Weight, lbm [kg]	Codes and Standards
	Inlet	Gas Outlet	Oil Outlet	Water Outlet	Sand-Jet Line	Pressure Safety Valve Outlet	Solids Disposal			
SEPL-A [†]	3-in, Fig 602, female	3-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, female	4-in, Fig 602, male	3-in, Fig 602, male	19.7 × 8.1 × 8.9 [6.00 × 2.46 × 2.70]	33,069 [15,000]	ASME [‡] VIII Div. 1, ANSI/ASME B31.3, API RP 520/521, NACE MR0175, DNV [§] 2.7-1
SEPL-B/BW [†] (winterized)	3-in, Fig 602, female	3-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, female	4-in, Fig 602, male	3-in, Fig 602, male	SEPL-B: 19.7 × 8.1 × 8.9 [6.00 × 2.46 × 2.70] SEPL-BW: 20 × 8 × 9.6 [6.1 × 2.44 × 2.9]	33,069 [15,000] 55,998 [25,400]	ASME VIII Div. 1, ANSI/ASME B31.3, API RP 520/521, NACE MR0175, DNV 2.7-1
SEPL-E/EW [†] (winterized)	6-in 600RF ANSI B16.5	6-in 600RF ANSI B16.5	4-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, female	6-in 600RF ANSI B16.5	3-in, Fig 602, male	SEPL-E: 30 × 8 × 9.6 [9.13 × 2.44 × 2.9] SEPL-EW: 30.3 × 8.3 × 9.9 [9.23 × 2.54 × 3.03]	54,013 [24,500] 62,611 [28,400]	ASME VIII Div. 2, ANSI B31.3, API RP 520/521, NACE MR0175, DNV 2.7-1, CE
SEPL-FW [†] (winterized)	6-in 600RF ANSI B16.5	6-in 600RF ANSI B16.5	4-in 600RF ANSI B16.5	3-in 600RF ANSI B16.5	3-in, Fig 602, female	6-in 600RF ANSI B16.5	3-in 600RF ANSI B16.5	30.3 × 8.3 × 9.9 [9.23 × 2.54 × 3.03]	74,957 [34,000]	ASME VIII Div. 2, ANSI B31.3, API RP 520/521, NACE MR0175, DNV 2.7-3, CE
SEPS-A [†]	3-in, Fig 602, female	4-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, male	3-in, Fig 602, female	4-in, Fig 602, male	3-in, Fig 602, male	20 × 8 × 8.7 [6.10 × 2.44 × 2.65]	30,865 [14,000]	ASME VIII Div. 1, ANSI/ASME B31.3, API RP 520/521, NACE MR0175, DNV 2.7-1

[†] Includes third-party certifications for vessel, skid, frame, and electrical parts.

[‡] American Society of Mechanical Engineers

[§] Det Norske Veritas