

THREE PHASE TEST SEPARATOR



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TETRA PRODUCTION TESTING SERVICES

The three phase test separator is a mechanical device to separate and measure water, oil and gas rates. Portable test separators accurately gauge fluid production levels, providing our customers with valuable information regarding the well's potential and performance.

The main elements of the test separator, which are the vessel (including internal components, pressure and level regulators and safety devices), the piping necessary for the different phases and metering (fitted with corresponding metering devices), and the skid and its protective frame. Separators are also equipped with a built-in shrinkage tester, barton recorder and sampling points.

The principal internal components of the separator are used to help in the separation.

The coalescing plates prevent droplets larger than 15 mm from being carried into the outlet

gas stream. The mist extractor—which is the last obstacle the gas must pass before leaving the separator vessel—blocks fine liquid droplets still in the gas.

The blocked droplets coalesce back into the oil phase.

Vessel Capacity

The vessel capacity for each phase depends on the conditions of pressure and temperature and the following:

1. **Viscosity and density of the liquid,**
2. **Vessel operating liquid level,**
3. **Vessel internals, such as mist extractors and coalescing plates,**
4. **Required liquid gas separator efficiency in terms of size of liquid droplets to be separated from the gas phase, and**
5. **Size of the vessel itself as shown in the chart below.**

TYPICAL SEPARATOR CAPACITIES

Size	Working Pressure (PSI)	Liquid Capacity (barrels/day)	Gas Capacity MMscfd Liquid at 1/3 of the Vessel						
			400 PSIG	600 PSIG	800 PSIG	1000 PSIG	1200 PSIG	1400 PSIG	2000 PSIG
42" x 10'	1440	10,000	28	35	40	45	50	59	0
42" x 15'	1440	12,000	41	48	53	57	63	72	0
48" x 10'	1440	13,000	42	49	55	60	70	83	0
48" x 15'	1440	19,000	50	58	67	75	82	93	0
48" x 15'	2000	19,000	50	58	67	75	82	93	110

42 INCH X 15 FOOT THREE PHASE TEST SEPARATOR

TECHNICAL SPECIFICATION

Working Pressure:	9.93 MPa (1,440 psi)
Working Temperature:	65°C (150°F)
Capacities:	
Gas:	2.05 MMsm ³ (72.3 MMscf) per day operating pressure with fluid at one-third full
Liquid:	12,000 barrels per day with two (2) minute retention time operating fluid
Metering Equipment:	
Gas:	<ul style="list-style-type: none"> • 8-centimeter (3-inch) Senior ANSI 600 Orifice Fitting (Daniels) • 15-centimeter (6-inch) Senior ANSI 600 Orifice Fitting (Daniels) • Two (2) 10.34 MPa (1,500 psi) Static Barton Recorders • 254 or 508 centimeters (100 or 200 inches) of Water Differential Pressure
Oil:	Two (2) 5-centimeter (2-inch) Turbine Meter Analyzers
Water:	One (1) 5-centimeter (2-inch) Turbine Meter Analyzer
Safety Equipment:	
Over Pressure Safety Devices:	<ul style="list-style-type: none"> • 8- x 8-centimeter (3 x 3 inch)—9.93 MPa (1,440 psi) Relief Valve • 8- x 8-centimeter (3 x 3 inch)—10.41 MPa (1,510 psi) Rupture Disc
Valve Controls:	
Gas Back Pressure:	One (1) 8-centimeter (3-inch)
Oil Level Control:	Two (2) 8-centimeter (3-inch)
Water Control:	One (1) 5-centimeter (2-inch)
Service:	H ₂ S
Standard:	NACE MR0175
Code:	ASME Section VIII, Division 1
Connections:	
Inlet (Female):	10-centimeter (4-inch)—602
Gas Outlet (Male):	8- or 10-centimeter (3- or 4-inch)—602
Oil Line Outlet (Male):	8-centimeter (3-inch)—602
Water Line Outlet (Male):	8-centimeter (3-inch)—602
Dimensions (L x W x H):	7.3 x 2.4 x 2.7 meters (24 x 8 x 9 feet)
Weight:	20,412 kilograms (45,000 pounds)
Special Features:	<ul style="list-style-type: none"> • Separator Bypass Inlet to Gas and Oil Outlets • Recombing Line Oil or Total Liquid to Gas Outlet