VSRD Multiphase Flowmeter

Delivering accurate and continuous multiphase measurements without separation
MEASURING UP TO YOUR STANDARDS

Achieve continuous multiphase measurements while reducing equipment, installation, and maintenance costs.

Costly and inaccurate test separators are a relic of the past. Rather than infrequent snapshots of cumulative well flow, Weatherford provides continuous individual- and group-well flow-rate measurements for oil, water, and gas without separating production phases.

The VSRD multiphase flowmeter provides accurate and real-time flow-rate measurements that help you to optimize and allocate production. Suited for any environment from heavy oil to gas-condensate wells, the flowmeter enables you to increase well-test frequency and accuracy while reducing both capital expenditures (CAPEX) and operating expenses (OPEX).

Installed simply and with a minimal footprint, the VSRD flowmeter is a cost-effective replacement for any test-separator application. With no moving parts, no need for frequent calibration, and no level-control issues, the system reduces the maintenance costs, personnel requirements, and HSE risks of conventional flow-measurement technology.

THE VSRD ADVANTAGE

- Optimizes and allocates production without the use of a test separator in any environment
- Reduces equipment, installation, and maintenance costs
- Negates the need for frequent calibration
- Eliminates the need for changing salinity corrections
- Provides built-in redundancy for gas and liquid-rate measurements

- Delivers best-in-class non-nuclear high-gas volume fraction (GVF) three-phase measurement
- Provides turndown beyond the 10:1 limit of conventional systems through the use of sonar-based calculations
- Measures any gas-to-liquid ratio and the full range of water cut
SPEND LESS AND SIMPLIFY YOUR PROCESSES

Compared to traditional separation methods, the VSRD flowmeter gives you far more of what you need—accurate flow data—with far less expense and maintenance.

REDUCE CAPEX
Bigger isn’t always better. With a much smaller footprint than test separators, the compact and portable VSRD flowmeter significantly reduces wellsite complexity, lowers your upfront equipment costs, and shrinks your pad-size requirements.

CUT OPEX AND PERSONNEL REQUIREMENTS
Slash your everyday expenses. Installed simply with standard inlet and outlet piping connections, the VSRD flowmeter reduces set-up time and costs. The flowmeter reduces pressure loss, process-fluid amounts, and maintenance requirements when compared to separation-based technologies. Because it has no moving parts, no sand-filling issues, and no controls required to maintain proper fluid levels, you can achieve continuous data flow with minimal personnel and OPEX.

STANDARDIZE ANY WELL
Render difficult wells mundane. The VSRD flowmeter not only replaces any separation system but also also delivers superior performance in wells that are unsuited for conventional three-phase test separators, including remote locations, sites with space constraints, high-pressure wells, corrosive-fluid wells, or wells that require wet-gas measurements. Designed for any location, the flowmeter features low power consumption and broad ambient temperature ratings that make it suitable for solar-panel power, cold weather, and desert applications.
IMPROVE RESERVOIR MANAGEMENT

Timely, accurate flow data helps you to improve well performance and profitability. Our VSRD flowmeter is unaffected by test-separator weak points—including the formation of emulsions that lead to erroneous oil, water, and gas-rate measurements—and delivers real-time flow data in any environment.

INCREASE DATA ACCURACY
Go with any flow. With proprietary multiphase measurement technologies, the VSRD flowmeter delivers pinpoint data accuracy over the full range of flow conditions. It is less sensitive to fluid properties than any other multiphase flowmeter and is unaffected by changes in salinity or transient slug conditions.

ENHANCE UNDERSTANDING AT THE WELLHEAD
Understand each and every well. The VSRD flowmeter improves reservoir-management decisions by delivering continuous, real-time data with one-second resolution at each wellhead.

MANAGE SLUSSING FLOW
Handle GVF ranges from 0 to 100 percent. The VSRD flowmeter provides uninterrupted data in slugging wells that fluctuate between gas-dominant and liquid-dominant flow with no tuning or recalibration necessary.
PROACTIVELY MANAGE YOUR ASSETS

With more than 30 years of experience, Weatherford is one of the world’s largest surface-well-testing providers. Our comprehensive selection of technologies—including the VSRD flowmeter—can help you to optimize field performance, diagnose production problems, and comply with environmental regulations.

Our technologies deliver everything you need to know about your wells. We deliver real-time pressure, flow, temperature, acoustics, seismicity, and water-cut measurements—from downhole to surface facilities—that create an up-to-date window into your wellbore. Our system then instantly harnesses data from every corner of your asset and—using physics-based models and advanced data analytics—helps you to improve well, surface facility, and reservoir performance.

• Monitor downhole production with OmniWell® optical systems
• Automate lift and facility equipment with WellPilot® systems
• Maximize equipment uptime and ultimately extend the life of your asset with the ForSite™ production optimization platform
The VSRD flowmeter is a fully integrated multiphase-measurement technology. Using an integrated flow computer, the flowmeter manages all fluid properties and set-up parameters for multiple well profiles. It reports real-time oil, water, and gas rates in addition to cumulative produced volumes at line or standard conditions via a touch-pad display or MODBUS® protocol.

As the only three-phase surface flowmeter to deliver sonar-based measurements, the VSRD flowmeter combines traditional Venturi and gamma densitometer technologies with our exclusive sonar and Red Eye® water-cut meter technologies.

**SONAR ARRAY**
*Measures turbulent-flow velocity.* Using an array of external strain sensors and processed with a proprietary algorithm, this meter performs in gas, liquid, and mixtures of both and never requires recalibration. Combined with the Venturi and densitometer measurements, the sonar array provides total gas and liquid rates.

**VENTURI NOZZLE**
*Measures flow momentum.* The pressure drop across the Venturi nozzle is directly proportional to the increase in kinetic energy of the flow stream.

**RED EYE WATER-CUT METER**
*Delivers water-cut measurements that are independent from GVF and water chemistry.* These meters measure key wavelengths in the near-infrared (NIR) spectrum to distinguish water, methanol, and liquid hydrocarbon at the molecular level.
GAMMA DENSITOMETER
Measures mixture density. The sensor uses a small gamma source to measure attenuation across the pipe mixtures of both determine gas-liquid ratio.
ACQUIRE REAL-TIME FLOW DATA

The Weatherford VSRD multiphase flowmeter measures oil, water, and gas flow rates in any environment. To learn how our technologies can work for you, please visit weatherford.com/flow