OneSubsea
A Schlumberger Company

# Vx Omni

## Subsea multiphase flowmeter

### APPLICATIONS

- Subsea well testing
- Continuous production monitoring
- Fiscal allocation and custody transfer
- Well performance evaluation
- Production measurement for heavy oil to gas condensate

### BENEFITS

- Short lead time and reduced project costs
- Unaparelled reliability (mean time between failure is 216 years for the nonretrievable pod and 330 years for the retrievable pod), reducing lifetime ownership costs
- Accurate, real-time flow rate measurements under unstable flow conditions to reduce uncertainty, improve decision making, and save costs
- Increased recovery rates through
  - Improved understanding of well dynamics
  - Elimination of major pressure loss in production stream
  - Updated flow rates for reservoir monitoring and production forecasting
- Precise allocation factor to reduce risk of allocation disputes
- Remote metering operations for reduced operating cost from fewer offshore visits

### FEATURES

- Design standardized for the most stringent requirements, including 20,000 psi [137.9 MPa] and 14,750-ft [4,500-m] water depth
- Ability to attain approval from Bureau of Safety and Environmental Enforcement
- Qualification in accordance with API Specs 17D, 17F, and 17TR8
- Fatigue evaluation based on Section VIII-2 fatigue curves and a typical load history
- Redundant electronics as standard
- Retrievable electronic canister option available
- Dual-gamma spectroscopy

When wellheads or trees and production control equipment are located on the seabed, multiphase flow tests are more challenging. Surface measurements of production from subsea wells require the installation of costly subsea test lines, and platform-based facilities with topside test separators do not often have capacity for tying in subsea wells.

The Vx Omni* subsea multiphase flowmeter solves these challenges. This reduced-footprint, highly accurate multiphase flowmeter takes the application of flowmeter technology to 20,000 psi while expanding on capital efficiency, expediting lead times, and achieving unparalleled reliability.

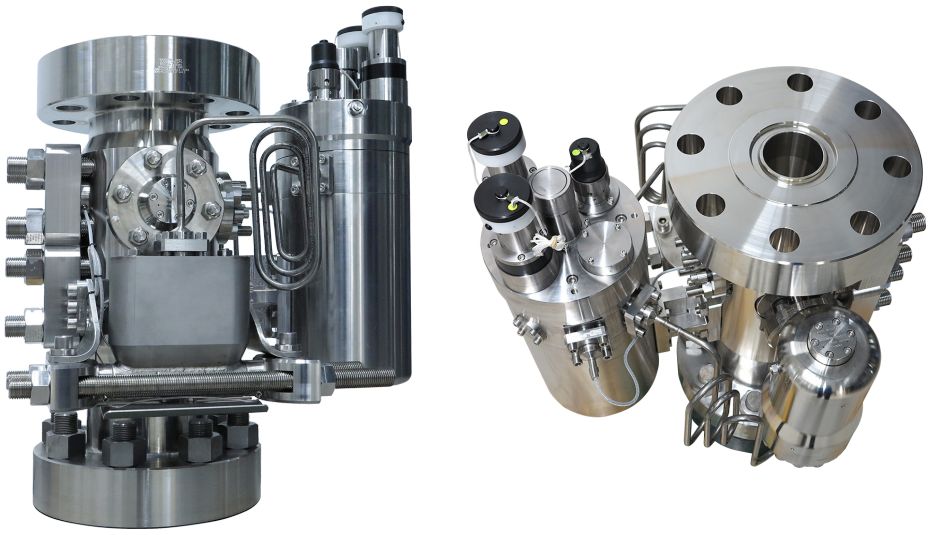
Leveraging the accuracy and precision of Vx* multiphase well testing technology, the flowmeter addresses the need for real-time commingled process stream measurement at the well or manifold for use in well testing, production monitoring, and fiscal allocation.

### Reduced lead time

The number of parts in the Vx Omni flowmeter has been reduced by approximately 66%, compared with previous-generation technologies. More than 90% of these components, including the most advanced instrumentation, are standardized for pressure rating, process fluids compatibility, temperatures, flow rates, and water depth.

### Capital efficiency

The Vx Omni flowmeter offers new possibilities for obtaining data about gas, oil, and water flow from subsea development wells, including those in remote locations. The flowmeter can provide substantial cost savings through downscaling or eliminating surface well testing facilities and subsea test lines. Design simplification equates to fewer parts and less complexity, requiring less material and fewer personnel hours.



*The Vx Omni flowmeter (side view at left, top view at right) takes subsea flowmeter application to 20,000 psi and features a reduced-footprint, simplified design.*

# Vx Omni

## FEATURES, CONT.

- Repeatable, accurate measurements
- Verified metrological performance in reference flow loops
- Single-point measurement
- Exceptional dynamic response
- High-frequency measurements for detailed flow dynamics
- No need for separation and flow calibration
- No moving parts

## Superior reliability

Redundancy, retrievable electronics, and condition monitoring are built into the Vx Omni flowmeter design, resulting in unparalleled dependability and availability. Reliability projection indicates that the flowmeter's mean time between failure is 216 years for the nonretrievable pod and 330 years for the retrievable pod.

## Unparalleled metrological performance

The Vx Omni flowmeter is the only subsea multiphase flowmeter in the industry that measures in high frequency at a single point in the venturi throat, thereby avoiding cross correlation of measurements from multiple locations throughout the system. This technique ensures accurate and repeatable flow rate measurements in any multiphase flow regime and in production fluids ranging from heavy oil to wet gas.

**Vx Omni Flowmeter Specifications**

| | Gas volume fraction (GVF) range, % | Performance specification, % |
|---|---|---|
| Liquid rate | 0–90 | 3 |
| | 90–96 | 6 |
| | 96–98 | 12 |
| | 98–100 | † |
| Gas rate†† | 0–100 | 5 |
| | >90 | 2.5‡ |
| Water liquid ratio | 0–90 | 2 |
| | 90–96 | 5 |
| | 96–98 | 8 |
| Water volume fraction‡‡ | >95 | 0.2 |
| Hydrocarbon mass flow rate | >3 kg/s | 5§ |
| Total mass rate | 0–100 | 2.5 |

For downward flow, gas flow rate uncertainties should be increased by 1%, and liquid flow rate uncertainties should be increased by 2%. Throat pressures greater than 20-bar absolute pressure. Differential pressure greater than 100 mbar. Repeatability and reproducibility of Vx technology is typically better than 1% for most measurements.

† 52-mm venturi size = 1.8 $m^3/h$; 65-mm venturi size = 1.9 $m^3/h$; 88-mm venturi size = 2.3 $m^3/h$. In the GVF range of 90% to 98%, the largest of the absolute and relative uncertainties is applicable.

‡ For throat pressures greater than 35-bar absolute pressure.

§ For throat pressures greater than 25-bar absolute pressure.

†† At low GVF, the uncertainty is limited by an absolute value of 2 $m^3/h$ at line conditions.

‡‡ 0.05% can be achieved with 30-min logging time.

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