

Vx Spectra

surface multiphase flowmeter



Highly accurate flow measurement that cuts vented methane emissions and enables zero-flaring operations



Aligns with United Nations Sustainable Development Goals 12 and 13



Emissions reduction:
Reduces CO₂e emissions up to 99.8% when replacing high- or low-bleed separators for well production metering.

Applications

- Surface well testing (onshore or offshore)
- Continuous production monitoring
- Fiscal allocation and custody transfer
- Well performance evaluation
- Artificial lift system surveillance and optimization

Features

- Full-gamma spectroscopy
- Single-point measurement
- Range of sizes covering a broad operating envelope
- High-frequency measurements for detailed flow dynamics
- Compact, robust design
- Modular and versatile configuration
- Remote operation and data acquisition

How it enhances metering

- Repeatable, accurate flow rate measurements over long durations
- Highly accurate phase measurements unaffected by foam or emulsion
- Real-time 24/7 monitoring for rapid production optimization
- Broader view of well dynamics
- Simplified wellsite architecture and maintenance
- Reduced footprint versus bulk tanks or separator
- Reduced field development costs
- No separation required (reduces flaring)
- No moving parts (reduces maintenance costs)
- Elimination of major pressure loss in the production stream
- Enablement of unmanned metering operations

How it works

The Vx Spectra* surface multiphase flowmeter (MPFM) is SLB's flagship MPFM product based on rugged Vx* multiphase well testing technology, which helps you determine flow rates without the need for separation and provides full visibility on your well performance. By measuring flow rate and phase fractions at high frequency and at a single point in the venturi throat, the Vx Spectra flowmeter delivers continuous, accurate, and repeatable measurements in any multiphase flow regime, regardless of composition, emulsions, or foaming and in fluid types from heavy oil to wet gas.

The Vx Spectra flowmeter underwent extensive flow loop testing at various metering reference facilities, including TÜV SÜD National Engineering Laboratory and DNV. The flowmeter has acquired more than thousands of flow loop points since its inception, incorporating varying pressures, flow regimes, and fluids while exhibiting excellent metrological accuracy and repeatability.

How it improves measurement

The Vx Spectra flowmeter has five venturi throat sizes that expand the operating envelope to deliver precise measurements at lower flow rates in a wide range of production environments, all the way to high-rate oil and wet gas wells. Real-time continuous measurement enables on-the-spot, rapid decision making to optimize production, identify and rectify

challenges with artificial lift equipment, and ensure maximum production uptime.

With its smaller footprint, reduced maintenance, and ability to operate without additional fluid conditioning, the Vx Spectra flowmeter can measure production across multiple wells, monitoring individual well performance while also delivering comprehensive field production data. With the Vx Spectra flowmeter, changes in well behavior, waxing, water production, solids, or composition can be seen immediately and used to determine an optimal intervention response.

Lightweight and compact, the Vx Spectra flowmeter has no moving parts; significantly reduces footprint, connections, and valves; and requires little maintenance. When used to replace separators, it simplifies well pad architecture and reduces operating expenses.

How it reduces emissions

For separators that use methane bleeding to actuate control valves, replacement by a Vx Spectra flowmeter can reduce emissions up to 99.8%. The Vx Spectra flowmeter is a key component of Production ExPRESS* rapid production response solutions that enable zero flaring. The flowmeter provides real-time rate information that can be used to optimize fluid processing and provide assurance that only fluid meeting production requirements is sent to the facilities.



The Vx Spectra flowmeter contains a venturi section with multivariable transmitter for measuring total flow rate; a nuclear source and detector that obtain oil, gas, and water holdups; and a compact flow computer that performs all calculations and converts flow measurements from line to standard conditions.

Specifications

Venturi size	19 mm	29 mm	40 mm	65 mm	88 mm
Service	Sour, as per NACE MR0175 and ISO 15156	Sour, as per NACE MR0175/ ISO 15156	Sour, as per NACE MR0175/ ISO 15156	Sour, as per NACE MR0175/ ISO 15156	Sour, as per NACE MR0175/ ISO 15156
Max. working pressure, psi [MPa]	5,000 [34.5]	5,000 [34.5]	5,000 [34.5]	5,000 [34.5]	5,000 [34.5]
Design temperature, degF [degC]	-50 to 250 [-46 to 121]	-50 to 250 [-46 to 121]	-50 to 250 [-46 to 121]	-50 to 250 [-46 to 121]	-50 to 250 [-46 to 121]
Electronics temperature, degF [degC]	-40 to 185 [-40 to 85]	-40 to 185 [-40 to 85]	-40 to 185 [-40 to 85]	-40 to 185 [-40 to 85]	-40 to 185 [-40 to 85]
Water/liquid ratio, %	0 to 100	0 to 100	0 to 100	0 to 100	0 to 100
Gas volume fraction, %	0 to 100	0 to 100	0 to 100	0 to 100	0 to 100
Liquid viscosity at line conditions, cP [Pa.s]	0.1 to 2,000 [0.0001 to 2]	0.1 to 2,000 [0.0001 to 2]	0.1 to 2,000 [0.0001 to 2]	0.1 to 2,000 [0.0001 to 2]	0.1 to 2,000 [0.0001 to 2]
Max. flow capacity					
Liquid flow rate, bbl/d [m ³ /d]	4,000 [635]	11,000 [1,749]	21,000 [3,340]	55,000 [8,745]	100,000 [15,898]
Gas flow rate at 10 MPa, MMscf/d [MMm ³ /d]	11 [0.31]	26 [0.74]	50 [1.42]	130 [3.68]	250 [7.08]
Repeatability (total mass rate at line conditions)	Better than 1%	Better than 1%	Better than 1%	Better than 1%	Better than 1%
Resolution (total mass rate at line conditions)	Better than 0.1%	Better than 0.1%	Better than 0.1%	Better than 0.1%	Better than 0.1%
Dimensions (L x H x W), in [mm]	28.4 x 20.1 x 19.7 [720 x 510 x 500]	28.4 x 20.1 x 19.7 [720 x 510 x 500]	28.4 x 20.1 x 19.7 [720 x 510 x 500]	31.3 x 27.6 x 22.3 [795 x 700 x 565]	34 x 30.86 x 21.1 [885 x 783 x 537]
Weight, [†] lbm [kg]	550 [250]	550 [250]	550 [250]	990 [450]	1,170 [530]
Power consumption, W	20	20	20	20	20

All specifications are subject to change without notice.

[†] Typical configuration; may vary depending on selected options

Configurable Options

Venturi body	UNS S31803 (duplex stainless steel) or UNS N06625 (INCONEL® 625)
Ingress protection	IP [†] 67 or NEMA 4X
Pressure sensor connections	Remote seals combined with isolation blocks
Electrical power	100–240 V AC or 24 V DC
Data connectivity	RS-485 or Ethernet TCP/IP (Modbus®)
Typical process connections [‡]	ANSI flange, API flange, Grayloc®, weld neck, compact NORSOK [§]
Hazardous area classification	ATEX, IECEx, CSA, UL
Pressure certifications	PED 2014/68/EU, ASME B31.3 2018 ^{††} , CRN ^{††}

All specifications are subject to change without notice.

[†] Ingress Protection

[‡] Example of typical process connections available; additional options may be applicable depending on requirements to Standards Relating to Equipment for Use in Explosive Atmospheres

[§] Norsk Søkkelkonkurranseposisjon

^{††} Selected configurations