

VE Fixed Probe (FVE) Technical Data Sheet



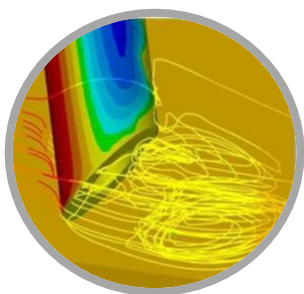
VE Technology® Fixed Sample Probe

The VE fixed sample probe is revolutionary within the gas industry. The unique, patented design ensures that it is not only the safest sample probe on the market, but the only option for fast, accurate and most importantly, representative sampling.

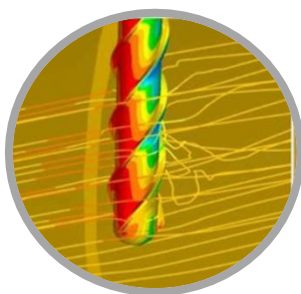
The primary function of a sample probe is to extract a representative sample from a source stream for your chosen analysis. The structure must be strong enough to withstand process conditions, typically involving high pressure and fast flowing fluid, containing particulates and other contaminants, but also be able to extract and transport the sample in a way that does not alter its chemical identity or state. Several products are available that can accommodate some of the industrial conditions anticipated, but none have purpose-built solutions that are able to excel in both respects, without compromise. The VE sample probe is a product that fulfils all these needs, using novel and patented methods to excel where others are forced to compromise.

The VE Technology sample probe is the first module of a complete kit of innovative sampling products, designed and developed in-house to bring customers new levels of safety and performance – without any compromise on either. The probe shown has an integrated isolation valve and is designed to integrate with a number of the VE integrated sampling systems. The probe is also available with Double Block and Bleed (DBB) functionality (see TDS 004 Annex 1&2).

Below: Computational Fluid Dynamics (CFD) image showing the comparison of gas flow around the probe tip of a conventional probe and the VE Technology probe.

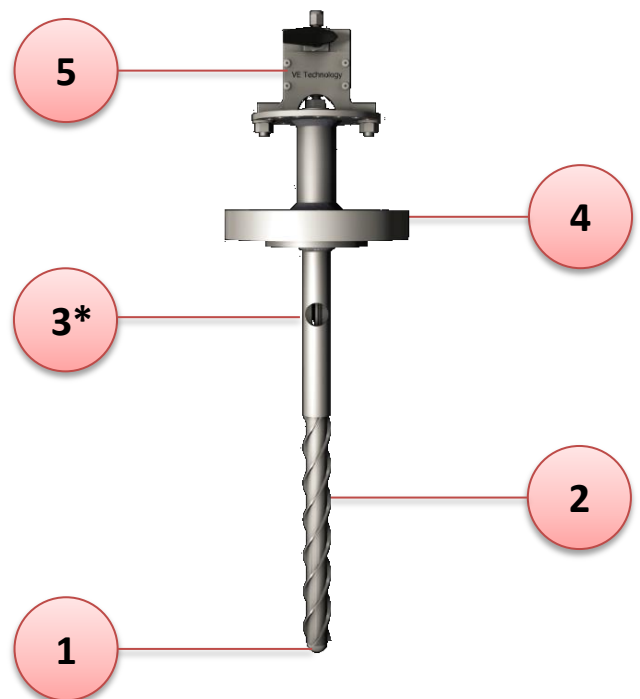


Conventional Probe



VE Technology Probe

Eliminate Uncertainty In Natural Gas Sampling



Above: VE Technology® Fixed Sample Probe with single isolation valve. *The shaft cut-out shows internal sample pathway (for illustration only)

Benefits

- 1) Patented aerodynamic, electropolished probe tip** actively rejects particulates, droplets and other contaminants in the sample stream, acting as a primary filter. The tip profile also prevents pressure drop (and associated aerosol formation) and recirculation around the tip, which causes a loss of sample integrity and representativeness in other sample probes.
- 2) No wake calculations are required. Patented helical strakes** eliminate the vortex shedding effect which generates a von Karman Street downstream of the probe and induces vibrations and associated cyclic stresses on the probe and surrounding (pipeline) structure and ancillary equipment.
- 3) Electropolished 2mm sample pathway with no dead legs or dead spaces from probe tip to outlet** ensures the sample of interest is delivered quickly and uncompromised to the sample system. Memory effects and 'hang-ups' are eliminated with this design, ensuring the sample remains truly representative.
- 4) FVE is built to any standard pipeline connection** - flanged or screwed. By eliminating vortex shedding, practically any probe length is possible allowing central 1/3 or pipeline centre sampling
- 5) FVE Integrated isolation valve** allows advanced installation & commissioning of probe ahead of connecting systems.

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Operating Conditions	<p>Pipeline pressure – 172 barg (2500 Psig) as standard, extended ranges available Pipeline velocity – 40 m/s (130 fps) as standard, extended ranges available *A reduction in any of the above limits would allow an increase in other factors All probes are built specifically to the customer specifications</p>
Climatic Conditions	<p>Permissible ambient temperature – - 50°C to 150°C (- 58°F to 302°F) at fully rated conditions, extended ranges available</p>
Welding	<p>Weld procedures – ASME IX Welders qualification – ASME IX *As standard, additional approvals available Welding inspection – ASME V</p>
Connections	<p>Process connection – Flanged (to ANSI B16.5, others available) or threaded connections Outlet connection – 1/8" O.D. Tube fitting</p>
Materials	<p>Wetted by the sample – 1/8" O.D. (2mm I.D.) Stainless steel tube ASTM A269 316L, electropolished as standard – others by request. Housing – 316L Stainless Steel, Duplex, Super Duplex, Inconel 625/825, Monel 400 and others by request SilcoNert™ coated and NACE approved available on request</p>
Conformity	<p>The combination of volumes and pressures fall outside the requirements of the European "Pressure Equipment Directive" (PED 97/23/EC) and therefore the standard VE probe cannot bear the CE marking. The pressure multiplied by the volume lies within the SEP envelope The VE probe is designed using Sound Engineering Practice (SEP) and is based upon AME B31.2 Certification - Material certificates for the pressure retaining parts are available to BS EN 10204.31B as standard, others available by request Bending stress calculations available on request</p>
Testing	<p>Assembly pressure tested - 1.5 x design pressure (minimum of 150 barg/2,200 Psi) Assembly leak tested - 1.5 x design pressure (minimum of 150 barg/2,200 Psi)</p>
Standard Options	<p>Valves - SilcoNert™ coated for ultra-fast response & ultra-accurate measurements Special materials – All sample wetted parts/housing available with special materials Instrument Double Block and Bleed Valve arrangement – Fully integrated DBB, validation and back flush valve arrangement integrated on to the head of the probe. Please see TDS 004 Annex 1. Process Grade Double Block and Bleed Valve Arrangement – Fully integrated forged process DBB on head of probe (full fire safe and pressure rating approval to ASME/NORSOK standards). Please see TDS 004 Annex 2. Security – Primary isolation valve and DBB handle locking arrangement Custom probe tip and housing specifically designed for gas processing such as inside mol-sieve beds Integrated temperature measurement in the probe tip (single or multi-point)</p>
Installation	<p>User instructions - Please see IOM 004 for installation, operation, maintenance and removal instructions</p>

The following Patent Numbers apply to the VE Fixed Probe (FVE):
 UK Patent No: GB2433122
 US Patent No: US8424396
 Others pending

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