



HIFISC Modular Sampling System for on-line process analysers

The innovative Hobré HIFISC gas and LPG sample conditioning system is a big step forward in performance, safety and environmental impact.

The HIFISC system is an advanced combination of components and provides safety by full double block and bleed process isolation, superior response time, accuracy, low emissions, close to zero maintenance and high availability and reliability. On trace levels of moisture and H₂S the system will give stable readings within minutes. The net result is a faster return of an analyser package investment and a reduced failure risk in safety critical applications.

KEY FEATURES

- **Significantly faster response time when compared to traditional sampling systems; applications with 5 minutes response time instead of several hours**
- **Lower emission; 90% or greater reduction in gas flaring and venting**
- **High safety level**
- **Low maintenance**
- **Protection of analyser and sampling system against liquid and particle carry-over**
- **Vast improvement on availability of analyser**
- **Cost saving**

The patented HIFISC is a proprietary system of Hobré Instruments BV.

The HIFISC combines proven elements such as the Hobré HPFF multi phobic membrane filter and the Hobré Flow Impact Probe for a unique and outstanding performance.

The HIFISC greatly improves the response time of the analyser system, protects the analyser against liquid carry-over and particles, reduces gas flaring and venting by 90% and results in considerable cost savings by higher availability, lower maintenance, safety and an optimized design.



ENVIRONMENTAL

The Hobré Flow Impact probe with preconditioning system has a built-in fast loop driven by process velocity. Return of this fast loop to the process keeps the valuable process fluids in the process and simultaneously prevents pollution of the environment by flaring or atmospheric venting.

The innovative heated pressure reduction has no dead volumes and can be operated at a low sample flow volume, without compromising the performance. It is possible to achieve a 90% or greater reduction in flaring and venting, in comparison to traditional systems.

SAFETY

The probe and double block and bleed valves used in the system are manufactured in accordance with applicable piping specifications.

The heated pressure reduction system has no dead volume, seals or moving parts. The flow to the analyser is limited by design. The flow will be limited even when full tube rupture occurs in the analyser system. The heated pressure reduction system does not carry the risk of failure of a heated pressure regulator; the only possible malfunction (plugging) leads to a detectable and safe situation. The principal design eliminates the risk of excessive flaring or venting that might occur with a conventional set up.

ANALYTICAL PERFORMANCE

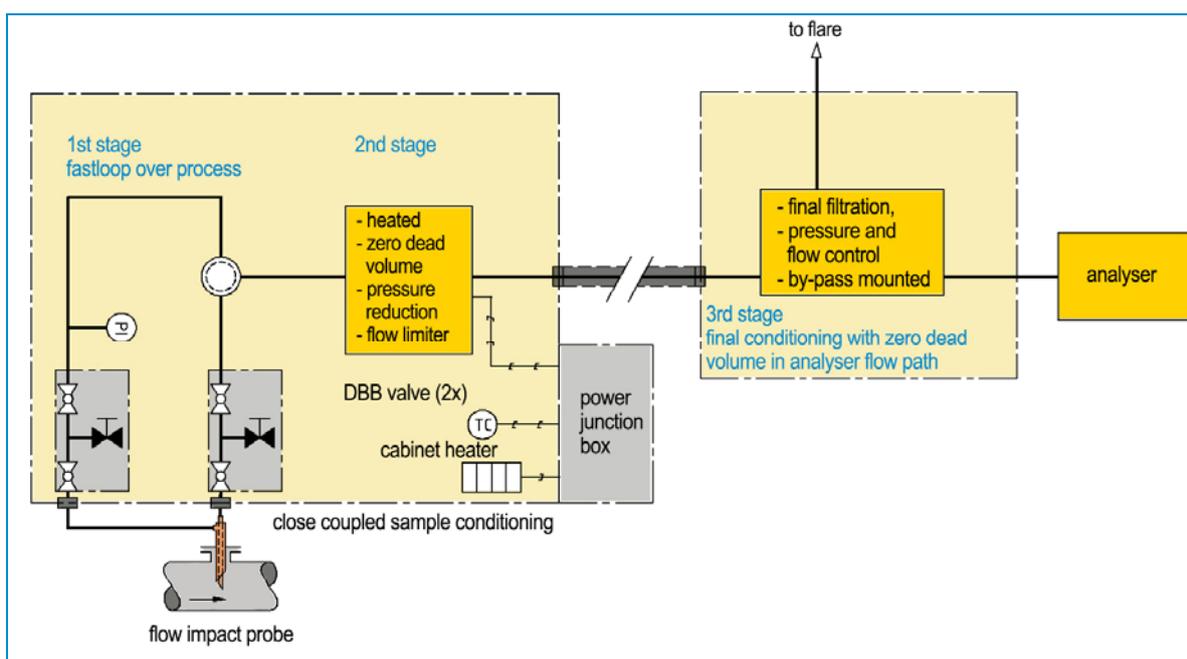
By using the patented Hobré HPFF Multi-Phobic membrane filter in the Flow Impact-based fast loop, the remaining part of the sampling system is protected against carry over of polar and non-polar liquids and solid particles above 0,2 or 0,4 micron.

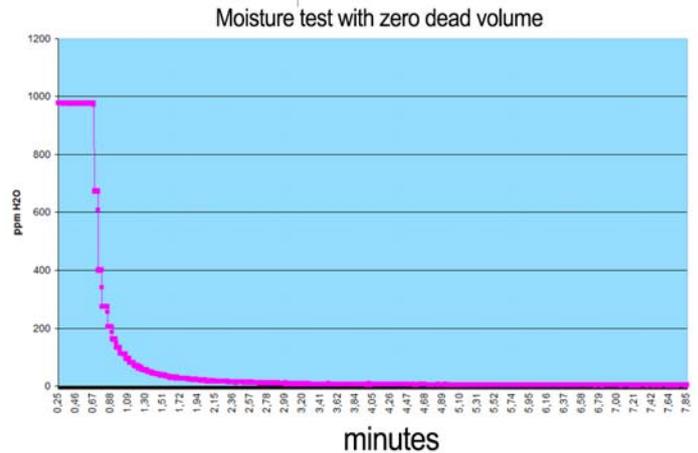
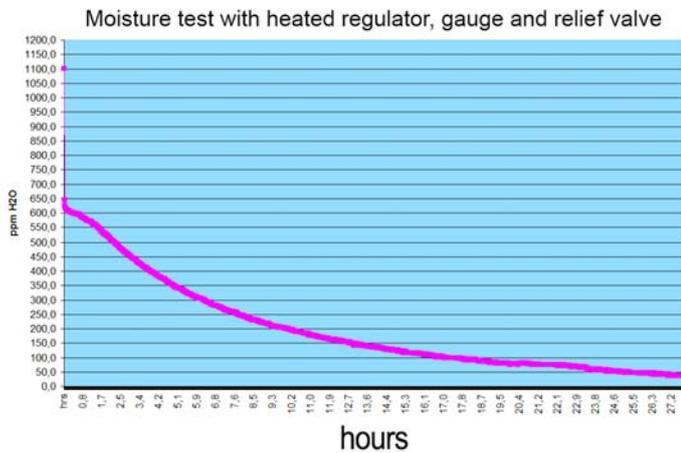
The HPFF multi-phobic membrane filter prevents contamination of sample lines, and as such avoids excessive memory effects during the analysis of reactive molecules, such as NH_3 , H_2S and water.

By eliminating dead volumes of pressure regulators, gauges, relief valve connections etc. first order response time can be close to time lag. Diffusion problems are avoided by eliminating any dead volume in the flow path between the Hobré Flow Impact fast loop and the analyser.

For moisture analyser systems at ppb and low ppm levels the availability of the analyser is greatly improved, as time to stabilise after a shutdown or process upset can be limited to 15-30 minutes (depending on analyser type), instead of hours or even days with conventional systems.

By minimising the compression type fittings in the flow path to the analyser, risk of leakages and consequential errors in the moisture measurement is reduced to a minimum.





The test graphs show the difference in response time between the use of a regular pressure reduction system and the HIFISC system. Pure N₂ with 5 ppm H₂O was tested with both systems at 10 barg.

The difference in response time is significant. The HIFISC with zero dead volume reaches 5 ppm H₂O within minutes. The traditional pressure reduction system needs > 24 hours to reach 5 ppm H₂O.

MAINTENANCE

By combining a multi-phobic membrane with the fast loop, the filter element will typically last more than a year. The self-draining fast loop is a 10 mm ID full-bore flow path, and drains to the probe. This loop requires no maintenance. The system has been proven on saturated gas streams with liquid droplets.

By placing the first membrane filter at the probe, the system's downstream side is kept clean.

A second level of protection of the analyser is provided with the installation of a second membrane filter with a small fast loop at the analyser inlet. This dual level protection reduces the contamination risk of sensitive process analysers.

For process streams with excessive liquid carry-over, the fast loop surface is treated to avoid liquid carry-over from sticking to the probe and fast loop tubing.

ASPECTS AND COST SAVINGS FOR INSTALLATION IN ANALYSER HOUSES

In those applications where analysers are installed indoors, it is a common practice to install the sample conditioning system in a cabinet on the outer wall. The HIFISC design, however, limits the sample flow and pressure into the analyser shelter and eliminates the need for a secondary sample conditioning system outside the shelter.

The final filtration stage can be installed close to the analyser. By installing the secondary filter under the same ambient conditions as the analyser and close to the analyser, it reduces the contamination risk of the analyser, and results in easier (indoors) maintenance.

For those applications where calibration gases are required, the entry flow of calibration gas into the shelter is limited.



FLEXIBILITY

The gas sampling system is a modular concept. Modules can be selected to the relevant application requirements. Most types of extractive gas analysers can be connected to the system. Parallel installation of multiple analysers is possible. Sample wetted parts are available in the materials typically used in upstream, midstream and downstream gas industries.

The selection of the operating temperature of the system depends on the process conditions, phase diagram of the process fluid and environmental conditions. Accurate temperature control of sample lines and conditioning cabinet is a standard feature.

Remote monitoring of all essential functions of the system is optionally available for critical applications and/or normally unmanned locations in the oil and gas production.

REFERENCES

- The Hobré Flow Impact Probe and HPFF combination has been successfully proven in multiple upstream projects. Over 200 systems have been installed.
- A German natural gas storage plant has been using this system for moisture and HC dew point analysis since 2013.

- The 2nd and 3rd stage of the HIFISC system has been operational since 2012 on molecular sieve absorption beds in a Norwegian gas plant for the regeneration cycle on moisture content, to increase mol sieve bed life with 20%.

CONCLUSION

The HIFISC sampling is a completely new and innovative high pressure gas sampling concept, suitable for highly contaminated gas streams.

It provides the ultimate mix of safety, performance, environmental protection, ready availability, and low maintenance in on-line gas analyser systems.

The benefits are application dependent: mol sieve bed life extensions, faster detection of off-spec products and less downtime after a process upset.

Hobre Instruments uses this technology both as a standalone solution for their clients and as a basis for the supply of complete high pressure process analyser systems.

HOBRE INSTRUMENTS BV is a leading provider of online analyzers, sample systems and complete turnkey systems and solutions to the oil & gas and process industries.

Hobre Instruments designs, manufactures and sells highly specialized analyzers and client specific solutions and has entrenched customer relationships that have been built over many years. Hobré Instruments' products represent mission critical, must have solutions and are designed and certified to meet client specific demands. Hobré Instruments has an established reputation for operational excellence, superior quality and reliability among its customers.

HOBRE INSTRUMENTS BV was founded in 1978, is headquartered in the Netherlands and currently employs 90 people in both the Netherlands and Hungary.

W: www.hobre.com

E: info@hobre.com

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