

## LNG Sampling Systems

# LNG Probe & Vaporiser System (> 0.7 barg)

360<sup>®</sup>  
KAS

*Our high innovative LNG sampling probe-vaporiser system able to take verifiably accurate and representative LNG samples from a cryogenic flow at pipeline pressures above 0.7 barg.*

LNG Sampling Systems are used for collecting samples during the custody transfer of LNG cargo. By offline (lab) analysis of these retained samples, principal proof of the transferred LNG quality can be obtained. Together with the density and quantity transferred, the commercial value of the cargo can be determined.

360°KAS has a long track record in the development and design of Continuous and Intermittent LNG Sampling Systems since 1994. The systems are in compliance with the ISO 8943, the ISO 10715 and the guidelines stipulated in the GIIGNL.

A LNG Sampling System is typically supplied in combination with:

- A sample take-off assembly.
- A LNG probe & vaporiser system.
- Sample transport lines.
- An online Process Gas Chromatograph in combination with an Intelligent Quality Reporting Module (iQRM).

LNG Probe & Vaporiser Systems are the critical elements in obtaining representative samples from the cryogenic flow in the main LNG transfer pipeline.

### Functionality

Typically the vaporiser probe of the LNG Probe-Vaporiser System is inserted in the cryogenic sample take-off assembly, also called bypass loop. In this way the LNG Sampling System can be isolated from the process. This ensures safe working and easy maintenance as there is no need to drain and warm up the complete LNG loading line.

The one-piece design of the CryoSamp combines probe and vaporiser with a cold and hot section in a single body, thus avoiding a sample line from probe to vaporiser. This design maintains the sample integrity without any premature vaporisation before the sample enters the hot section.



*CryoSamp in vertical position, horizontal alignment is also possible.*

The two-step hot section design ensures complete vaporisation resulting in a gas mixture with exactly the same composition as the liquid sample.

The sampling system is controlled by PT100 sensors both in the cold and hot section to start the sampling automatically when the proper conditions are reached and stop in case of operation outside of required parameters.

## CryoSamp

|                     |   |
|---------------------|---|
| Pressure Rating     | Max. 16 barg  |
| Sample Connection   | Upon request (minimum 2") for process, 6 mm OD or 1/4" OD for sample and sub-cooling outlet |
| Ambient Temperature | -30 °C to + 40 °C   |
| Sample Temperature  | -170 °C at inlet<br>+ 50 °C at outlet   |
| Capacity            | 2-5 NI/min of gas<br>(ca. 3-10 ml/min of LNG)   |
| Power               | 230/110VAC, 50/60 Hz, max 200W  |
| Protection          | Explosion Proof IECEx Zone 1 IIC T4   |
| Materials           | Stainless Steel 304/316   |
| Dimensions          | 1085 mm in height (above the flange) x<br>radius of 256 mm                                  |
| Weight              | 50 kg   |

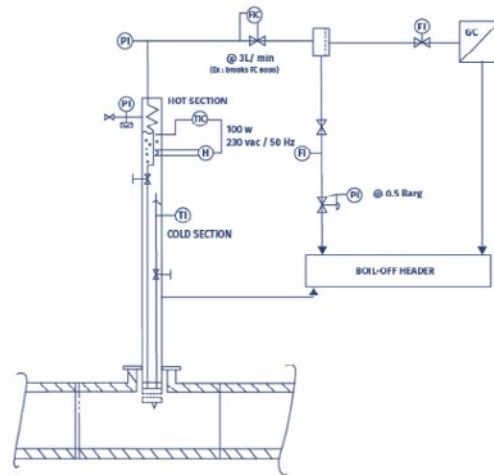
The boil-off flow can be controlled such that sufficient sub-cooling is maintained but that at the same time spillage of LNG is avoided.

The CryoSamp has the following features:

- Compact and "all-in-one" system.
- No fractionation or premature-vaporisation between probe and vaporiser.
- Homogeneous vaporisation by means of static mixing.
- No bubble forming thanks to an integrated debubbler at the sample intake.
- Easy maintenance, no wearing parts.
- Can be installed in vertical and horizontal position;
- Complies with ISO 8943:2007 standard.



Example of a take-off assembly excluding impact probes.



Typical flow schematic of a vertical aligned CryoSamp.

### The following LNG Sampling product sheets are available:

- LNG Probe & Vaporiser System >2.5 barg
- LNG Probe & Vaporiser System (CryoSamp) > 0.7 barg
- Intermittent (CP/FP) Sampling System
- Continuous Water Seal (Dome) Sampling System
- Continuous Waterless (Membrane) Sampling System
- Intelligent Quality Reporting Module (iQRM)



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