

# LNG Sampling Solutions



*“360°KAS serves the LNG Value Chain from production through liquefaction, shipping and storage/regasification with high-end analyzing and sampling”*



360<sup>®</sup>  
KAS



# LNG Sampling Systems

*360°KAS serves the LNG Value Chain with accurate, reliable and durable solutions to sample LNG from the main transfer line.*

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 the quantity transferred, the commercial value of the cargo can be determined.

360°KAS is serving the LNG value chain with a number of solutions to sample LNG from the main transfer line:

- Sample Take-Off Assembly
- Probe & Vaporizer System
- Sample Transport Lines
- LNG Sampling System:
  - Intermittent (CP/FP) Sampling System
  - Continuous Waterless (Membrane) Sampling System
  - Continuous Water Seal (Dome) Sampling System
  - On-line Gas Chromatograph System

## Sample Take-Off Assembly

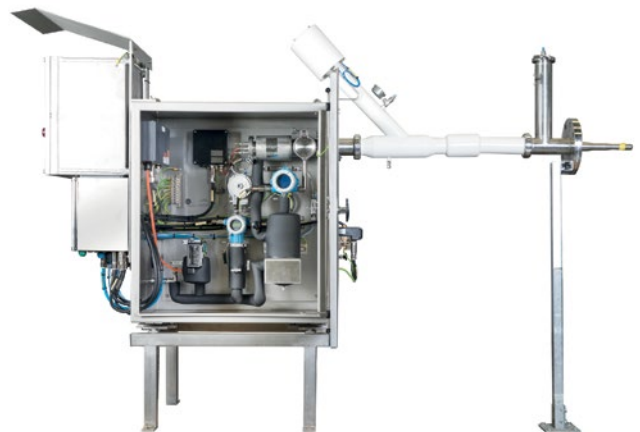
LNG Probe & Vaporizer Systems are the critical elements in obtaining representative samples from the cryogenic flow in the main LNG transfer pipeline.

Typically the Sample Take-off Probe of the LNG Probe & Vaporizer 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 transfer line.



## Probe and Vaporizer System

In order to meet the ISO 8943 requirement 360°KAS developed a standalone operating LNG probe and vaporizer system combination. By use of integrated controls and premium materials this solution has proven to be one of the most reliable in the market.



The LNG probe and vaporizer system consists of three main elements:

- 1 SS316 vacuum insulated sampling probe**  
Preferably inserted in the bypass loop to assure that easy maintenance can be performed without having to drain and warm up the complete LNG transfer pipeline.
- 2 Electrical vaporizer system with ISO 8943 sample conditioning system**  
As per ISO 8943 an accumulator and sample conditioning system shall be positioned after the LNG vaporizer, also temperature and pressure transmitters are included to monitor the performance of the vaporizer.

### 3 Integrated controller for client connections

The vaporizer heater is controlled by a dedicated temperature controller that is installed inside the local EEx d control box. As standard the EEx d control box is mounted on the side of the vaporizer cabinet as integrated part of the stand-alone solution.

The GIIGNL advises to install the vaporizer system and/or custody transfer point as close as possible to the sampling point.

## Sample Transport Lines

For the transport of the vaporized LNG from the vaporizer and accumulator to the LNG sampling system, it is recommended to use heat traced tubing as sample transport line. 360°KAS is able to supply these sample transport lines as per client requirements and specifications.

## LNG Sampling System

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

We can offer the following sampling Systems:

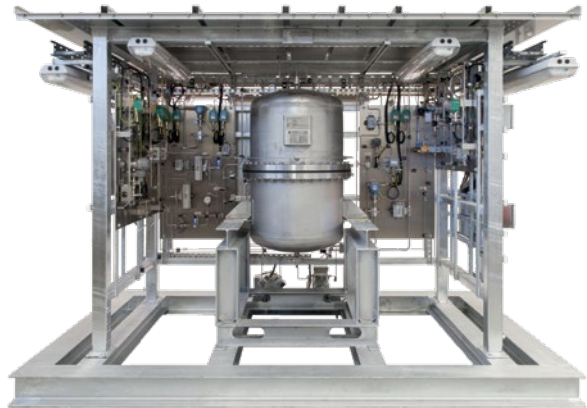
### 1 Continuous Water Seal (Dome) Sampler

The continuous water seal (dome) LNG sampler system stores the sample in a water sealed tank eliminating sample contamination from ambient air. After completion of the sample sequence, the sample is collected in transportable cylinders in accordance with the ISO 8943 paragraph 4.2 Continuous sampling.



### 2 Continuous Waterless (Membrane) Sampler

The key feature of our continuous waterless (membrane) LNG sampling system is the collection of a high integrity sample with extremely low traces of contamination. This outstanding performance is ensured by the unique design of the waterless sample holder and its internal elastomer membrane. The sample is collected in transportable cylinders in accordance with the ISO 8943 paragraph 4.2 Continuous sampling.



### 3 Intermittent (CP/FP) Sampler

The Intermittent (CP/FP) LNG Sampling System does this by collecting a sample in transportable Constant Pressure, Floating Piston (CP/FP) cylinders in accordance with the ISO 8943 paragraph 4.3 Intermittent sampling.



## Other solutions for the LNG market

### Analyzer & Sampling Solutions

All necessary equipment to measure specified process variables in pipelines and process units within the LNG plant can be offered, such as:

- Total analyzer package solutions for composition, H<sub>2</sub>S, hydrocarbons and Water Dew point analysis during LNG production
- Total analyzer package solutions for composition and H<sub>2</sub>S analysis on transferred LNG
- Sampling System for Mercury Analysis on produced or transferred LNG

### Lifecycle Service Management

360°KAS offers spares, services and maintenance as part of its Life Cycle Service Management program. This program covers all the services necessary to maintain and operate your systems safely and accurate from initial start-up till controlled end of life cycle. It enables clients to realize maximum availability of their systems with minimum downtime at the most economical operational costs.

As part of this program the following services can be coordinated by our dedicated in-house Customer Service department:

- Site Construction & Supervision
- (Pre-) Commissioning & Start up
- Site Acceptance Test (SAT)
- Training
- Service Level Agreements (SLA)
- Analyser Maintenance Support
- Spare parts & consumables
- Life Cycle assessment
- Upgrades & retrofits
- End of life services & replacement



The following specific LNG related product sheets are available:

- LNG Probe and Vaporizer System
- Continuous Water Seal (Dome) Sampler
- Continuous Waterless (Membrane) Sampler
- Intermittent (CP/FP) Sampler



**360°KAS is an independent system integrator serving the global Oil & Gas, Petrochemical, LNG and Research & Development markets with high-end analyzing, sampling and pilot testing solutions. We take care of the whole process from basic and detailed design, through procurement, assembly and final system integration on site.**

We believe trust is the most valuable asset in any relationship. You should be able to rely on our systems; 360°KAS is driven to be the quality leader in our field of expertise. Our solutions are more than accurate. They are durable, reliable and keep going. That's what we call Engineering Trust. Our portfolio encompasses:

#### • Analyzer & Sampling Systems

From sample take-off, sample preparation, sample storage up to actual analyser measurement we are able to provide you with a fit for purpose and trustworthy solution.

#### • Pilot Plants

R&D Test Units for continuous, semi-continuous and batch, dedicated and multi-purpose, fixed/ fluidized bed, liquid, gas and multi-phase reactor applications.

#### • LNG Sampling Systems

Serving the Liquid Natural Gas (LNG) value chain with a variety of smart solutions to sample LNG from the main transfer line.

#### • Spares, Service & Maintenance

All services necessary to maintain and operate your systems safely and accurate from initial start-up till controlled end of life cycle.

#### • Instrument Sales

Our portfolio of distributed products.

360°KAS is part of the Industry International Group. Industry International Group currently employs around 300 people across five autonomous businesses, each delivering specific technical engineered products and services in their respective fields and markets from different locations in The Netherlands, France, Africa, Middle East and the Far East.



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