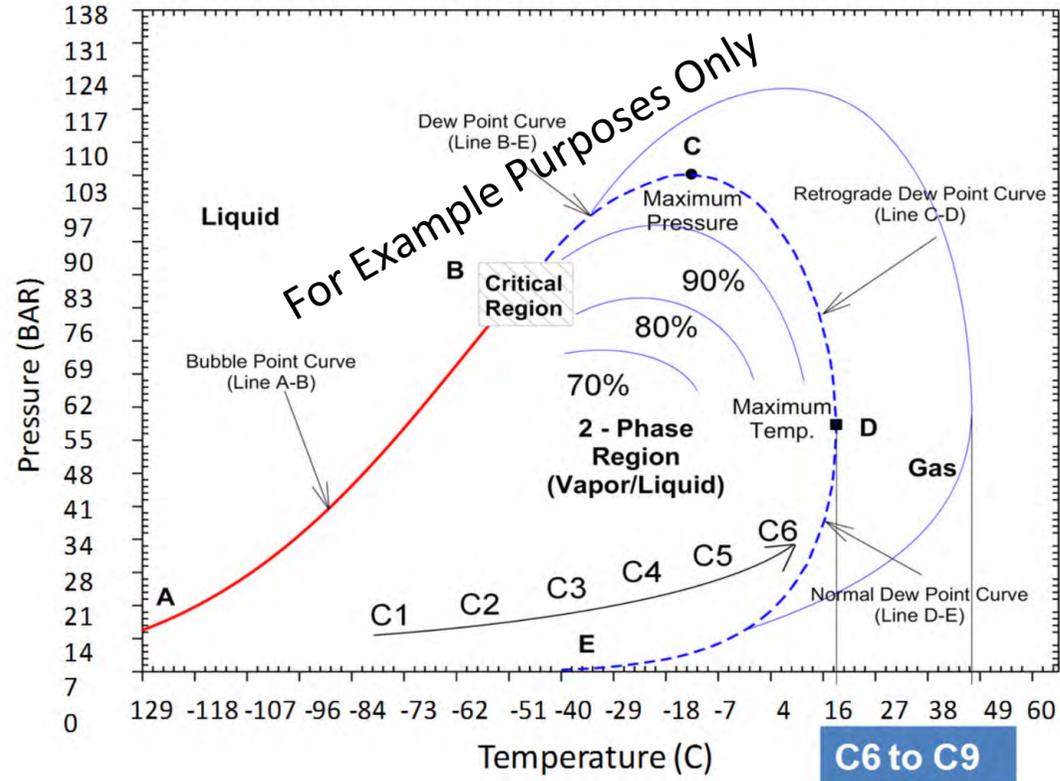


Liquid drop outs:



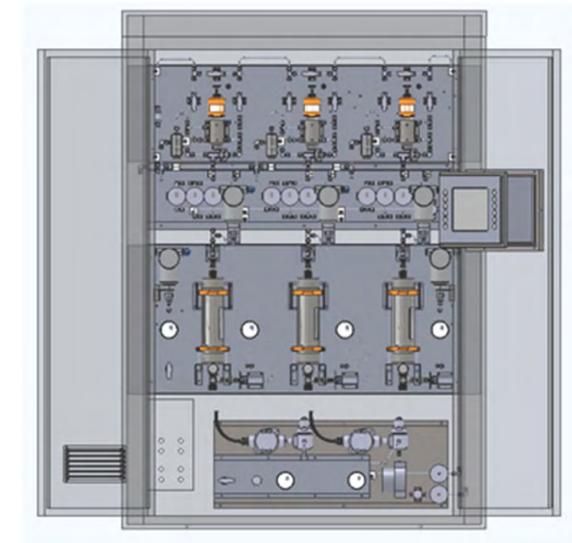
Traditional Gas sampling (pressure volume) and Drop outs:

1. Pressure reduction causes possible liquid drop outs
2. Low pressure samples collected have to remain around 10 C above dewpoint to prevent dropouts
3. Low pressure samples collected require **heating during transport** to lab to prevent dropouts

KPS: Your Partner for Automatic Sampling



Gas Sampling Systems



KPS: Your Partner for Automatic Sampling

- OTHER KPS PRODUCTS:
- Automatic Liquid Sampling
 - Online Analyzer Systems



Dienstenstraat 25
3161GN Rhoon
The Netherlands

Tel. +31 (0)10-5030077
Fax. +31 (0)10-5030079

Web: www.kpsnl.com

ISO 9001

SCC* (VCA*)

Introduction

KPS is a leading original equipment manufacturer of automatic sampling systems for custody transfer purposes. KPS distinguishes itself through superior designs in terms of reliability, accuracy and low maintenance. KPS automatic sampling systems are also fully ISO and API compliant and rest upon over 15 years of field experience in automatic sampling.

Generally, pipeline gas compositions will vary over time. Compositional variations will also occur as a result of reservoir changes and the gas treatment equipment used. Traditional methods for auto sampling or online GCs make use of pressure reduction stations in order to collect a sample or perform an online analysis. Due to the required pressure reduction, there is a potential for condensation as described by the gas specific pressure/temperature phase boundary diagram. As soon as condensation occurs, the sample cylinders collect two-phase flow and the sample can be considered unrepresentative. Moreover, it is not just the bulk of the gas stream that should be considered, but also the individual C6+ components in order to prevent a degrading of the sample being analysed.

Furthermore, with offshore platforms and FPSO's attempting to reduce the maintenance and skill level required, operators are faced with complicated online GCs. Apart from the amount of training and expertise required to operate an online GC, they tend to have a high failure rate and require frequent re-calibrations on a daily or weekly basis in order to remain accurate within the desired operational levels.

The KPS Gas Sampling Systems provide a solution for this which is easy to use and has a low failure rate.



Gas Sampling System

Depending upon your needs, KPS provides customised and certified turnkey systems.

The low maintenance, user-friendly KPS automatic sampling systems are designed to prevent retrograde condensation, hence degrading of the sample. As soon as the sample receivers are filled, they are disconnected and transported to the laboratory. In the laboratory, a detailed analysis can then be conducted under ideal environmental conditions. Using the KPS CPR sample receivers, you no longer need to worry about temperature drops that can occur during transport to the lab or during storage. The KPS CPR prevents possible condensation due to temperature drops by storing the samples at high pressure. The KPS CPR makes use of the floating-piston cylinder principle. A moving piston separates the sample from a buffer gas, equalising the pressure on both sides of the piston. During sampling, the floating piston is then displaced by the grabs taken using the KPS GS-01 Gas Sampler. KPS automatic sampling systems provide a truly representative composite sample, reassuring both the user and his clients.

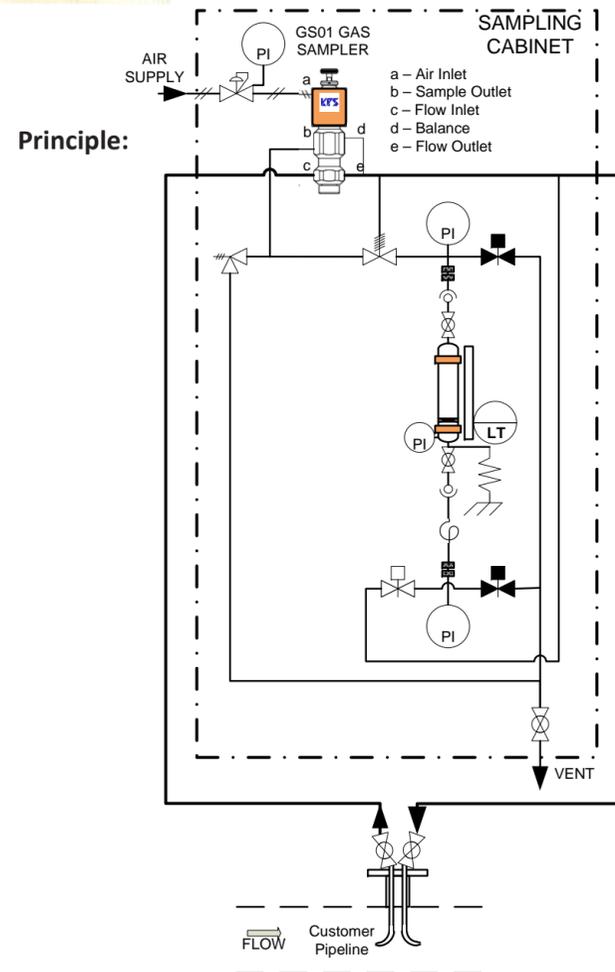


Gas Sampler

The KPS GS-01 Gas Sampler provides a heavy-duty reliable and very accurate means of extracting gas samples from either high or low pressure pipelines. The GS-01 is an integral part of the KPS Gas Sampling Systems. The size of the sample is fully adjustable from 0 to 0.5ml and has a maximum operating pressure in excess of 2900psi (200bar). The KPS GS-01 uses pressure balanced self-lubricating seals to maximise service intervals and all construction materials are selected to eliminate corrosion by contaminants.

Since KPS already has an installed base on many offshore platforms, and since most gas produced today is "wet", the design of the KPS GS-01 has been further developed to optimize for such applications. As a result, BTU losses are prevented by eliminating concerns about the reliability and accuracy of the entire metering system. The KPS GS-01 heavy duty automatic sampler provides long-term and stable performance.

The KPS GS-01 can be completely overhauled in less than 15 minutes. The KPS GS-01 operates at all pipeline pressures and will provide repeatable sample sizes regardless of pressure fluctuations. It operates as a pressure balanced pump and samples are discharged at pipeline pressure. This minimises evaporation or condensation and guarantees that each grab remains representative.



Sampler Monitor and Controller

The KPS sampler monitor and controller allows for a completely automated solution to assure sampling quality and to prevent mistakes due to wrong manual handling. Apart from the functional control, this monitor allows for traceability from the pipe to the lab. Furthermore, the integrity of the sample is assured by the integrated sampler validation program.

The KPS sampler monitor and controller involve a remote I/O functionality with HMI, PLC and web interface. The collected data can be logged, providing an overview of the well(s) development over time. Another consideration worth noticing is the possibility of generating a KPI report, this way onshore teams can schedule their maintenance visit.

Constant Pressure Sample Receiver

The KPS CPR constant pressure sample receiver provides a heavy-duty reliable and very accurate means of storing gasses, crude oils, condensates and refined hydrocarbons for either high or low pressure pipelines. The KPS CPR's can be pre-charged with inert gas or line pressure to maintain the collected sample at process pressure conditions. This is done to minimise upon evaporation or condensation and to make sure that downgrading of the grabs are prevented.

For practical reasons (e.g. carrying weight) and storage, the CPR's tend to be smaller in size than the low pressure KPS Receiver Cans and are available in 500ml and 1000ml standard Sizes. Other sizes are available upon request. Furthermore, it has a robust and rugged design that complies with the highest internationally recognized health and safety requirements.

The CPR has a maximum operating pressure in excess of 150bar @ 100 C, are equipped with a pressure gauge and an integral magnet and external level indicator. As an option, this can be combined with an electronic high/low or level sensors and a rugged carrying case.

Since KPS already has an installed base on many offshore platforms, the design of the KPS GS-01 has been further developed to minimise maintenance requirements.

