

Unmatched High Accuracy Performance
Sustainable Heavy Duty Sampler
Low installation and Maintenance cost
Fully ISO and API compliant
Prevents Cross Contamination between batches

Auto Sampling

Fast loop

An important part of crude oil transfers is to have a good metering system in place that doesn't just determine the quantity, but also the quality or the oil composition of the stream. Making or verifying a bill of lading using a certified system for the quantity as well as the quality is in the interests of both the buyer and seller. It is an important tool for hydrocarbon accounting and to prevent possible reputation damage, claims, and paying unnecessary taxes. With stronger variations in the oil composition and the worldwide shortage of the product, measuring the quality of the stream is often underestimated and is becoming increasingly important. With this said, do you want to pay \$100 for a barrel of water?

Pipelines upto a 12" diameter can transport high amounts of hydrocarbons representing millions of dollars every year. This makes an accurate and reliable e.g. watercut measurement very important. Online devices for watercut determination are commonly used for process monitoring purposes, but simply are not accurate enough to verify a bill of lading. Especially for low watercut streams, accuracies down to a ppm level are not sufficient and compensation is required for variables such as density, viscosity, salinity and sulfur content, to prevent off readings. Furthermore, there is not an internationally recognized standard available to verify or certify the instrument too. For these reasons automatic sampling systems are used for custody transfer purposes.



Accuracy Performance

Traditional ways of automatic samplers are systems placed directly into the pipeline assuming a homogenous representative flow, and neglecting possible variations in droplet size, density and viscosity. Such inline automatic sampling systems are equipped with a very small inlet, causing the larger water droplets to pass by and making the sample unrepresentative. Furthermore, even with small pipelines there is a potential of saturation in the pipeline making the water travel at the bottom of the pipeline and bypassing the sampler inlet. A solution needs to be found so we are assured that the sample being collected is representative independent of the droplet size.

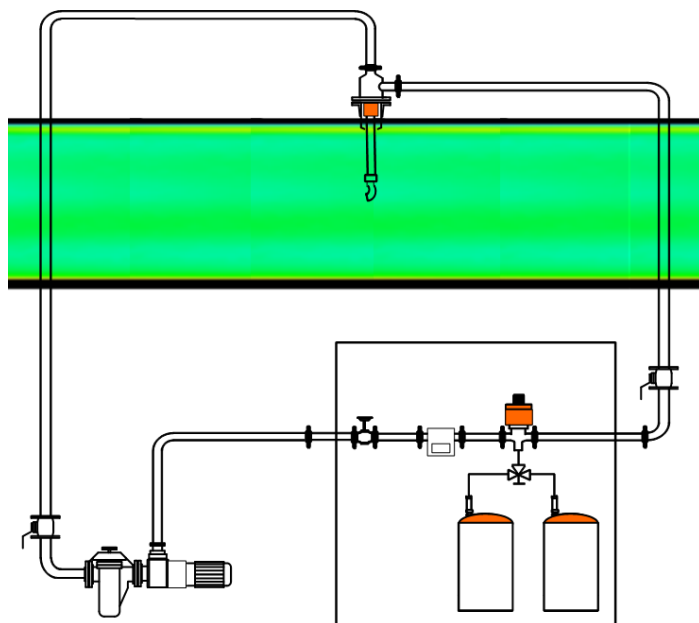
Reliability Performance

With refineries, storage terminals and offshore locations attempting to reduce their operational and maintenance costs, operators are faced with low cost automatic samplers having a high failure rate. Apart of the high maintenance costs and frequent replacements of parts, operators have to pay for the logistics needed to get the sampler up and running again. Furthermore, operators are faced with custody transfers taking place using equipment which is temporarily not available. The bill of lading that needs to be made or verified is considered unreliable. A solution is desired that is easy to use and has a low failure rate.

KPS Fastloop

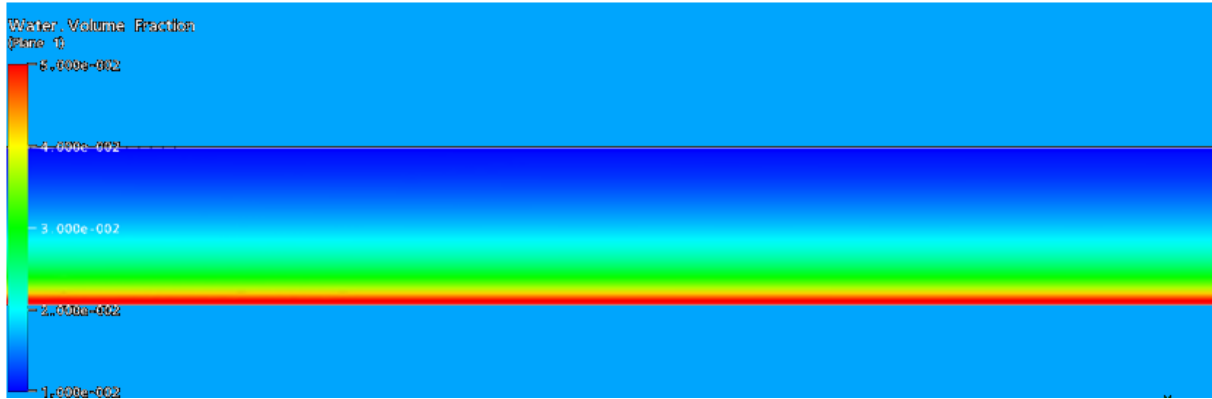
Depending upon the process conditions, inline mixing could be required in order to get a homogeneous representative flow through the KPS Fastloop Sampling System. If an inline mixing device is required, static mixing devices are quite commonly used for smaller pipelines. With this said, operators find this a less attractive solution because it causes a pressure drop which would mean less throughput. For these cases, it could be more interesting to consider a KPS *e-Jetmix*TM system.

The KPS Fastloop Sampling System consists of an external pump and a special designed Take-off/Return probe, as drawn in the picture below. The fastloop is created by pumping around a portion of the main stream using the KPS Take-off/Return probe. In the fastloop, where the innovative and sustainable CS-01 cell sampler is located, accurate and representative 1cc sample grabs are taken and transferred to the receiver cans. Also worth noticing, is the possibility of isolating the sampler or online devices installed for maintenance purposes without having to shutdown the process.



CFD Modeling

Confronted with the complex of variations in densities, viscosities, and flowrate, possible making the flow non-homogeneous; users no longer have to rely on just a rule of thumb or previous experiences. KPS has the capability to verify the installation design using advanced CFD modeling software. This tool can precisely determine the behavior in the pipeline for the entire operating envelope, and makes sure the customer is not faced with possible inaccurate results.



Minimize upon cross contamination

Traditional inline sampler devices, which are located directly on the pipeline, the distance between the automatic sampler and receiver cans are often several meters. This way operations can easily swap the receiver cans. However, the longer the distance between the sampler and receiver cans the more likely cross contamination between batches can occur. Using the KPS Fastloop Sampling Systems or the efficient KPS *e-Jetmix*TM Sampling Systems, the KPS CS-01 cell sampler is located just above the receiver cans, and is designed to minimize the possible contamination between batches. Furthermore, possible water traps in U-bends are prevented.

Sustainable Heavy Duty Sampler

The KPS Fastloop Sampling Systems optimized for low maintenance requirements and sustainability. An integral part of the KPS Fastloop sampler is the innovative KPS CS-01 cell sampler, which is a unique sampler containing several unique features that allow for a unmatched high mean time between failure rate. As a consequence, operators save out a great amount of operational and logistic costs and prevent possible discussions about the reliability and accuracy of the entire sampling system. The KPS CS-01 heavy duty automatic sampler, is capable of handling heavy crude oils containing high solid contents, and highly viscose crudes. The CS-01 uses a three-step technique to assure that the performance stays unaffected by possible variations in the process.



KPS: Your Partner in Sampling

With automatic crude oil sampling it's not just the purchase of the right components; it is the integration of them to form a complete system. Depending upon the crude oil composition and possible contaminants, the proper materials need to be selected. With close to 100 automatic samplers installed within a 20 minute range of the head office, in the Rotterdam harbor area. KPS got the opportunity to develop over time unique low maintenance automatic sampling system designs. The KPS automatic samplers are not just designed to be more sustainable, but also provide a high accuracy based on previous experiences and CFD modeling software.

Specifications

Applications	Crude oil/water mixture, refined hydrocarbons & chemicals
Max line temperature	Designed to suit
Max line pressure	Designed to suit
Line size range (typical)	4" - 12" (other sizes are available on request)
Line tapping size	Typically 3" (application dependent)
Velocity range	Designed to suit
Options	<ul style="list-style-type: none">- Withdrawable Take-off/Return probe- Extractor tool for withdrawable Take-off/Return probe This tool can be used to insert and retract at process conditions without de-pressurising and draining the pipeline.- On-line analysers such as a water-in-oil monitor and a densitometer can be integrated as part of the sampling loop providing a real-time signal of the pipeline contents and a direct comparison of results.

More info:



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OTHER KPS PRODUCTS:

- Automatic Gas Sampling
- Online Analyzer Systems