manvia a member of JCT group

JCT Analysentechnik

SAMPLING SYSTEMS

What is a Sampling System?:
(Also know as Grab Sampling)

Grab sampling, is the collecting of a sample of liquid or gas in a pipeline, tank, or system with the intent of transporting the sample to a laboratory for analysis.

Today high-quality standards required in the final product produced. Especially in the chemical and petrochemical industry. This is necessary to have process measures, which are usually done with online analyzers.

However, there is a greater tendency to obtain samples for analysis in the laboratory. This system allows measurements at points where there are no parsers.

Process analyzers do not always cover all points of analysis, due to cost, complexity, and maintenance required, thus the option of installing sampler systems at significant points of analysis is the best guarantee for process control.

These systems have several advantages, in the way of demands of today's modern industry.

- To maximize worker's safety.
- To avoid emissions, commitment environment.
- To obtain a representative sampling.
- Not influence the development process.
- To make the operation easier.
- Low cost, since virtually maintenance.

Manvia, has developed a wide range of samplers for most of the applications in the chemical, petrochemical and refining industry

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TYPE OF CONTAINERS

The first decision is to determinate the type of container to select the appropriate sampler:

BOTTLE CONFIGURATION: Apply for liquids up to 10 psia (0.7 bar(a)) vapor pressure. The sample is drawn into the sample bottle at atmospheric pressure.

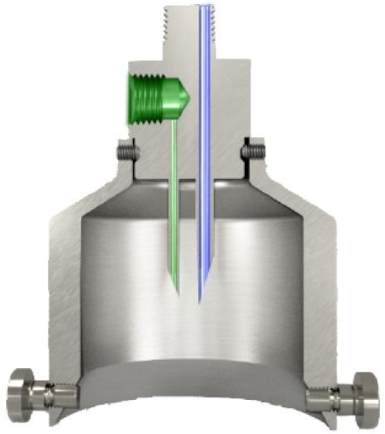
The container consists of bottle, sealed septum and cap.

Our component consist in a block with two different length needles, designed to pierce the septum bottle ensuring sealed and preventing outside emissions.

The sample comes in by the longer needle and vented by the short one, to prevent pressurization on container. Venting may be redirected to the atmosphere or a filter system.

FEATURES:

- No emissions
- Safety for the operator
- Environmental care
- Easy operation and low maintenance
- Seal during filling of the bottle preventing gas or liquid leaks.
- Needles Assembly to sample and vent
- For standard GL45 bottles with septum.



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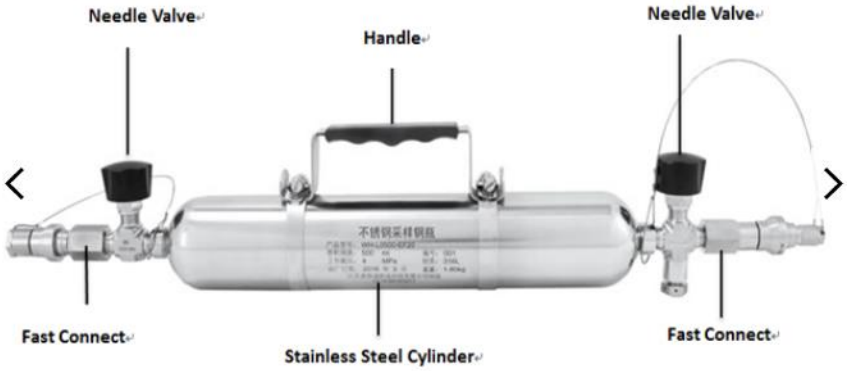
TYPE OF CONTAINERS

CYLINDER CONFIGURATION: Apply FOR:

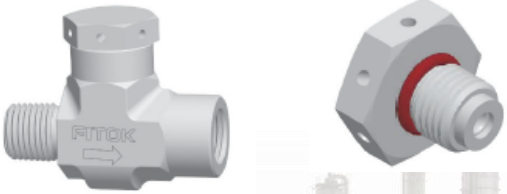
- **Gases**
- **Liquefied gases**
- **Liquids with vapor pressure above 10 psia (0.7 bar(a))**

In this cases the sample is take into the sample cylinder at process pressure

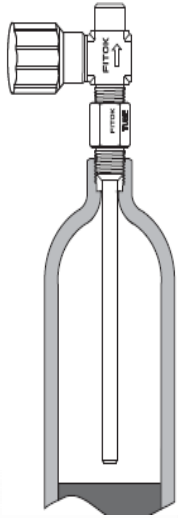
The container consist in a cylinder at both ends equipped whit needle valves and quick connectors. A hose must be installed on the fixed part of panel.



Other components to install in cylinders when is required:



Rupture disc Tees



Outage tube

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Sampling Systems
Manufactured by MANVIA

We can consider two type of products under us manufacture:

- **SAMPLING COMPONENTS:** Components to shell directly to integrations oil&gas companies.

Needles System
Adapter NGL

Fixed Volume
Sampling Cylinders

Sample Bottle
Enclosure

DEAD-MAN System

Block Selector
Two 3-way valves

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Sampling Systems
Manufactured by MANVIA

- **SAMPLING SYSTEMS:** Systems finished and ready to install in process to take the sample.

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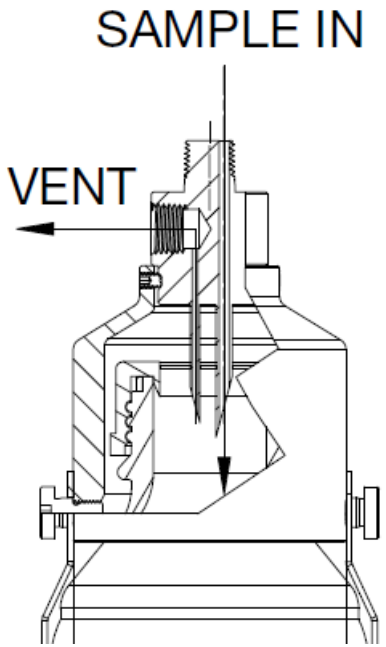
SAMPLING COMPONENTS

NEEDLE SYSTEM ADAPTER FOR STANDARD GL45 BOTTLE (NGL)

NGL systems are used to take a liquid process sample without spillage. Adapted to standard GL45 bottles with septum cap in different sizes (more commons 250, 500 and 1.000 c.c.) .

The needles system ensures the sealing between the process / vent and the sample bottle through the septum.



BENEFITS:

- Safety for the operator
- No emissions.
- Environmental care
- Easy operation and low maintenance.
- Seal during filling of the bottle preventing gas or liquid leaks.
- Needles Assembly to sample and vent
- For standard GL45 bottles with septum.

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SAMPLING COMPONENTS

BLOCK SELECTOR TWO VALVES (BS)

Mechanical system to synchronize two 3-way valves with a single handle.

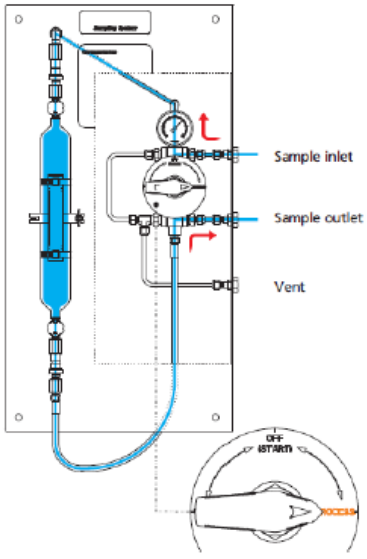
This component simplifies sampling systems providing many advantages:

PROCESS

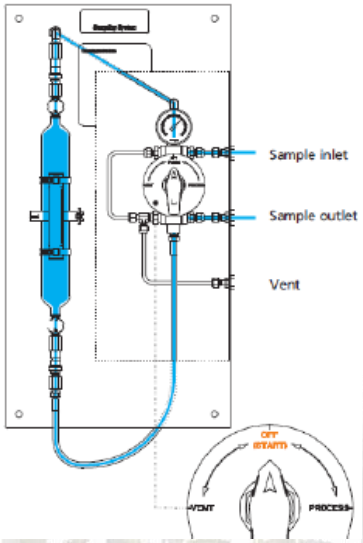
OFF (CLOSED)

VENT

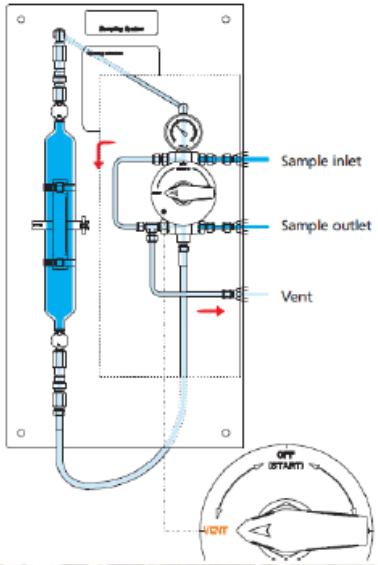
PROCESS: Recirculation through the cylinder.



OFF: We isolate the process again and close the cylinder valves to isolate the sample inside.



VENT: We depressurized the system, except the sample in the cylinder.



BENEFITS:

- With a handle and its three positions we operate the system.
- Operational safety.
- Extremely simple system.
- Avoid handling errors.
- No additional valves are necessary.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- Allows a Dead-man system installation to increase the safety. Leaving the system isolated from the process when anyone work on it.

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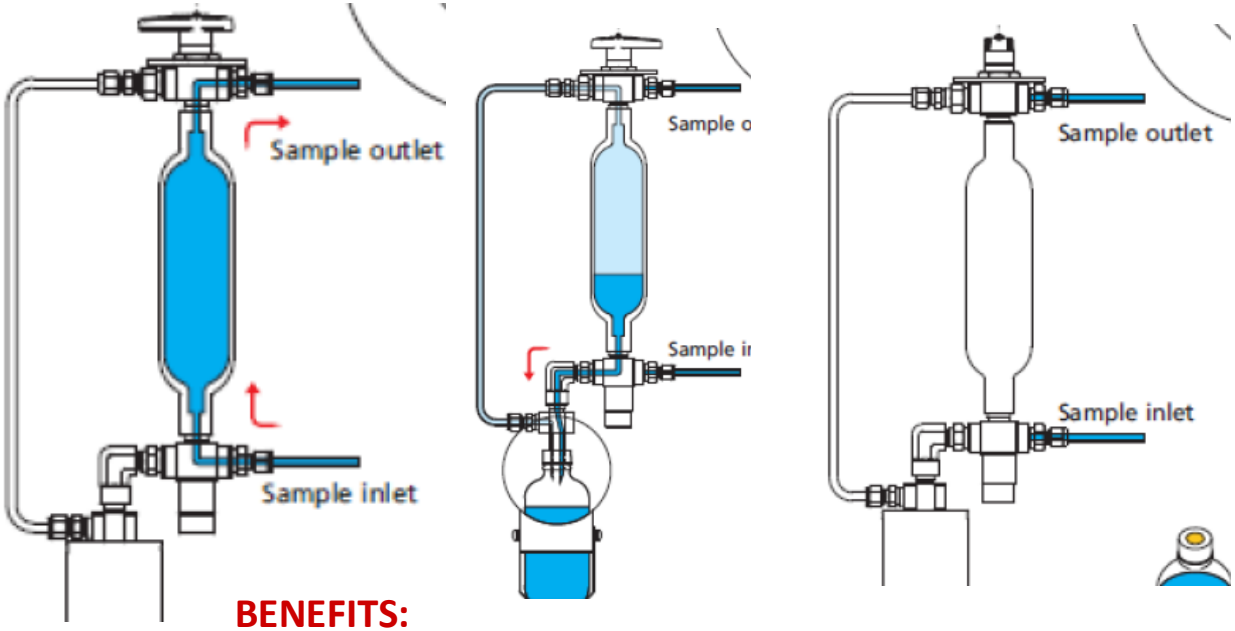
SAMPLING COMPONENTS

FIXED VOLUME SAMPLE CYLINDERS (FV)

Is used to take a process high pressure **LIQUID** sample. They are manufactured with a capacity fixed cylinder and two synchronized three-way valves, which move simultaneously. This system allows us to take a fixed volume of sample isolating it from the process.



BENEFITS:

- With a handle and its three positions we operate the system.
- Application for viscous, corrosive or danger liquids.
- Various capacities available
- Sampling isolation of process conditions
- High temperature and pressure applications
- Representative sampling
- Closed sampling
- Handle operation
- Fixed volume sampling
- Sampler purging

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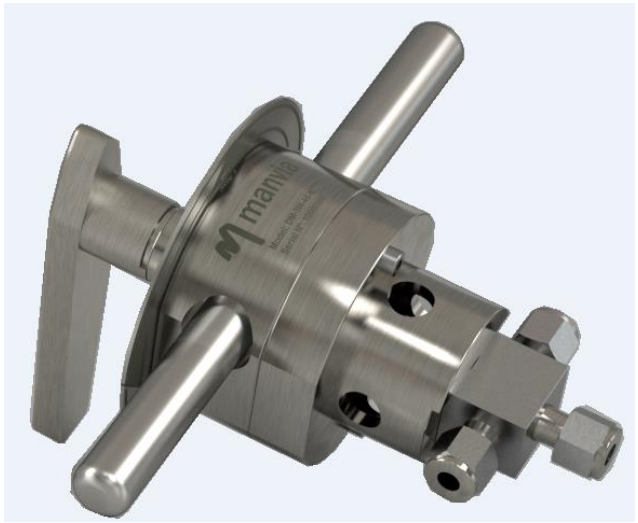
SAMPLING COMPONENTS

DEAD MAN SYSTEMS

Manvia has developed a component to let 2-way and 3-way manual valves, on safe position when the operator release the handle.

This component is designed to be coupled to the sampler systems, so that, in case of confusion, forgetfulness, interruption of the operation for any reason, the sampler go to closed position and remains immediately isolate from process

DEAD MAN Install in Block Selector Two valves.



DEAD MAN Install in 3-way valve.

DEAD MAN Installed in FV System.

BENEFITS:

- We ensure that the system is closed and isolated from the process.

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SAMPLING COMPONENTS

SAMPLE BOTTLE ENCLOSURE

Special enclosure to avoid splatters and spillover during sample collections.

We can manufacture this enclosure with two configurations:

- Direct through tubing **BSE-0**.
- With needle system (**BSE-NGL**)

BSE-0 (TUBING) BSE-NGL (NEEDLE SYSTEM)

By others.

BSE-0 with flange connections

BENEFITS:

- Safety for the operator.
- Avoid splatters. In case of spillover is drive through the bottom connection.
- No emissions.
- Environmental care.
- Easy handling and cleaning

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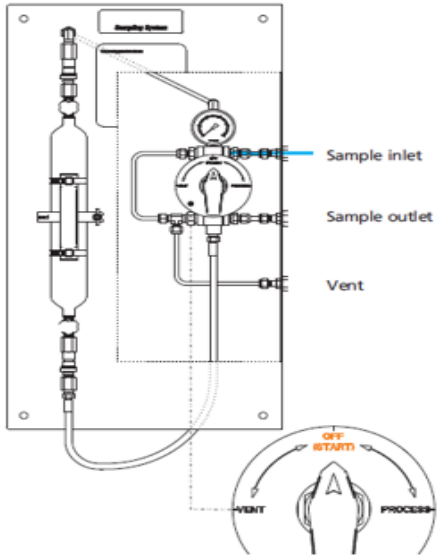
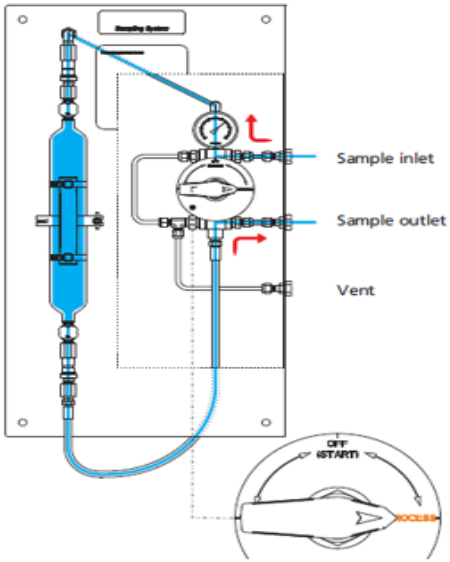
SAMPLING SYSTEMS **SG** FOR GAS

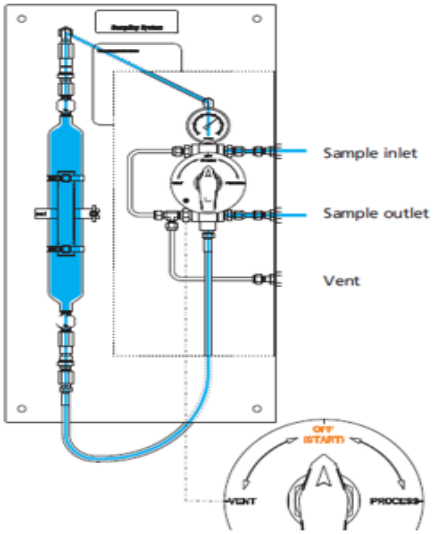
OFF (START): SYSTEM CLOSED, Isolate from process.



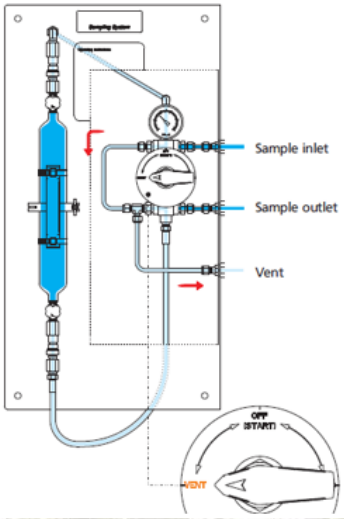
PROCESS: Recirculation through the cylinder.



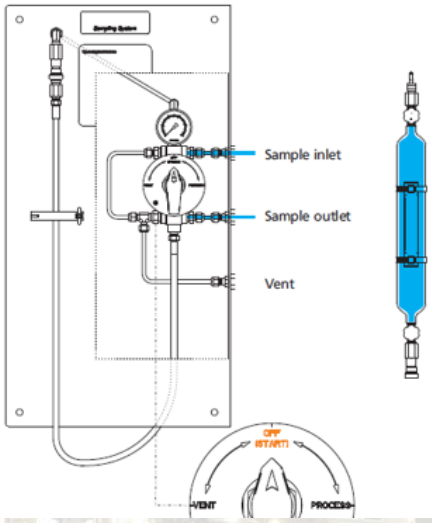
OFF: We isolate the process again and close the cylinder valves to isolate the sample inside.



VENT: We depressurized the system, except the sample in the cylinder.



OFF: We isolate the process again and remove the cylinder.



ADVANTAGES:

- With a handle and its three positions we operate the system.
- Operational safety.
- Extremely simple system.
- Avoid handling errors.
- No additional valves are necessary.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- Allows a Dead-man system installation to increase the safety. Leaving the system isolated from the process when anyone work on it.
- For high temperatures, a cooler can be installed at the inlet of the sampler. (Consult Manvía coolers).
- In addition to the pressure gauge, a thermometer and flow display can be installed.

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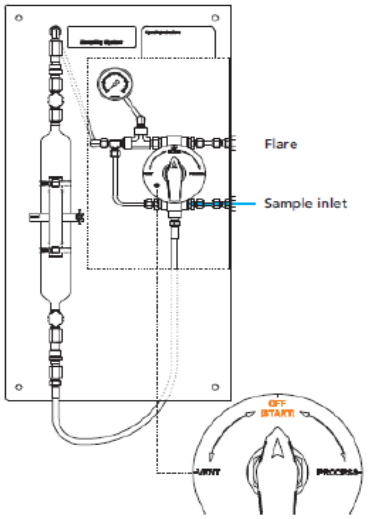
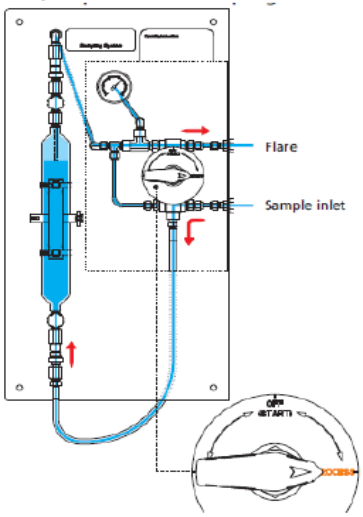
SAMPLING SYSTEMS **SGL** FOR LIQUID pressure vapor > 0,7 bara

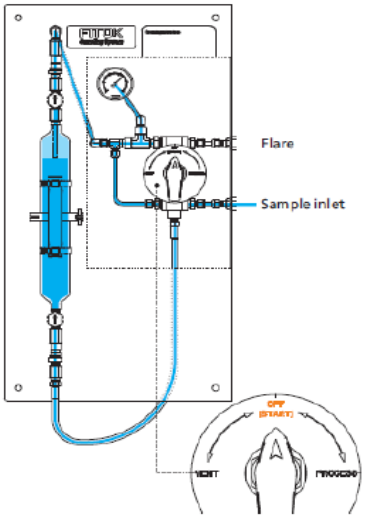
OFF (START): SYSTEM CLOSED, Isolate from process.



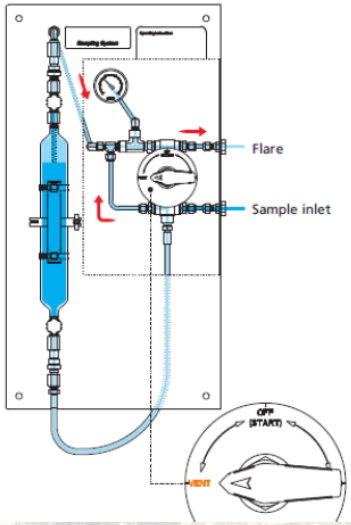
PROCESS: Recirculation through the cylinder.



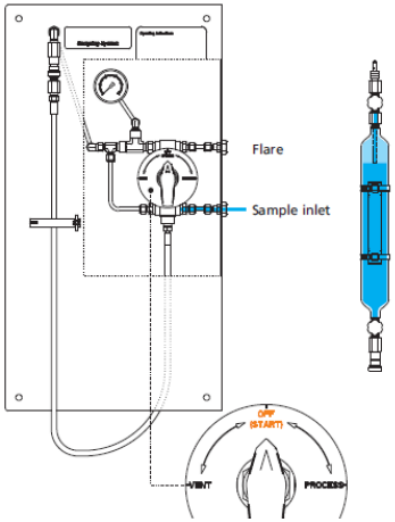
OFF: We isolate the process again and close the cylinder valves to isolate the sample inside.



VENT: We depressurized the system, except the sample in the cylinder.



OFF: We isolate the process again and remove the cylinder.



ADVANTAGES:

- With a handle and its three positions we operate the system.
- Operational safety.
- Extremely simple system.
- Avoid handling errors.
- No additional valves are necessary.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- Allows a Dead-man system installation to increase the safety. Leaving the system isolated from the process when anyone work on it.
- For high temperatures, a cooler can be installed at the inlet of the sampler. (Consult Manvía coolers).
- In addition to the pressure gauge, a thermometer and flow display can be installed.

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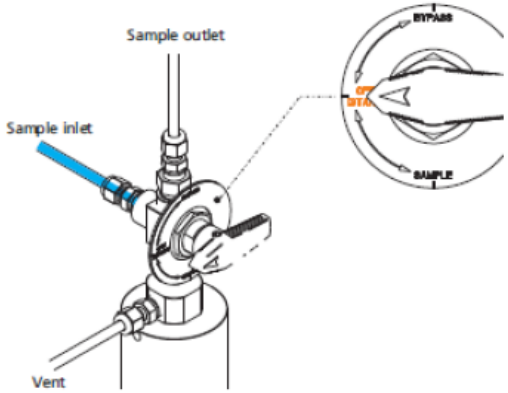
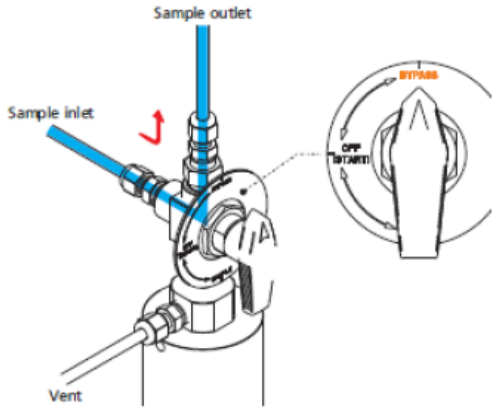
SAMPLING SYSTEMS **ES** FOR LIQUID up to 10 barg P.V. ≤ 0,7 bara

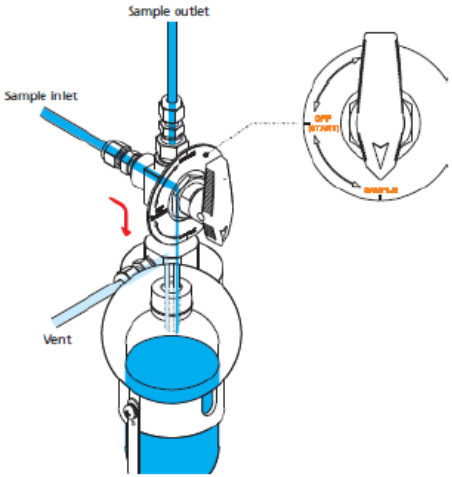
OFF (START): SYSTEM CLOSED, Isolate from process.



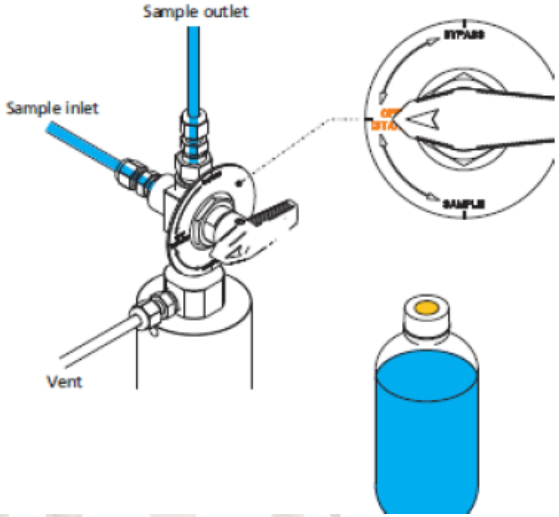
BYPASS: Recirculation to process.



SAMPLE: We take the sample in the bottle.



OFF: We isolate the process again and remove the bottle.



ADVANTAGES:

- With a handle and its three positions we operate the system.
- Operational safety.
- Extremely simple system.
- Avoid handling errors.
- No additional valves are necessary.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- Allows a Dead-man system installation to increase the safety. Leaving the system isolated from the process when anyone work on it.
- For high temperatures, a cooler can be installed at the inlet of the sampler. (Consult Manvía coolers).
- In addition to the pressure gauge, a thermometer and flow display can be installed.

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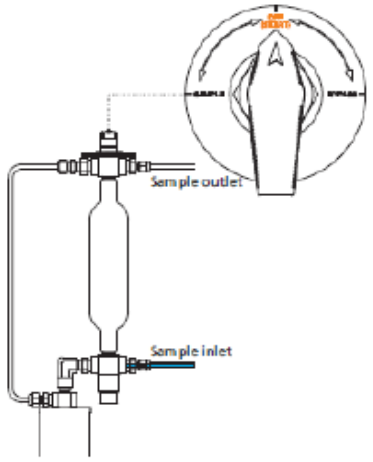
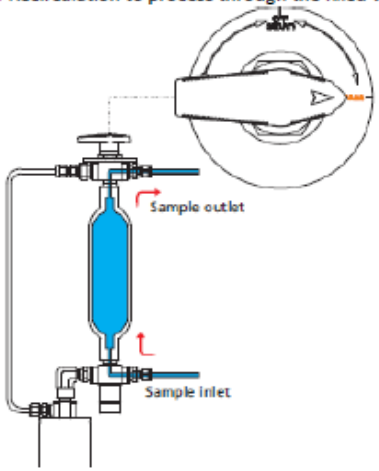
SAMPLING SYSTEMS **FV** FOR LIQUID up to 120 barg P.V. ≤ 0,7 bara

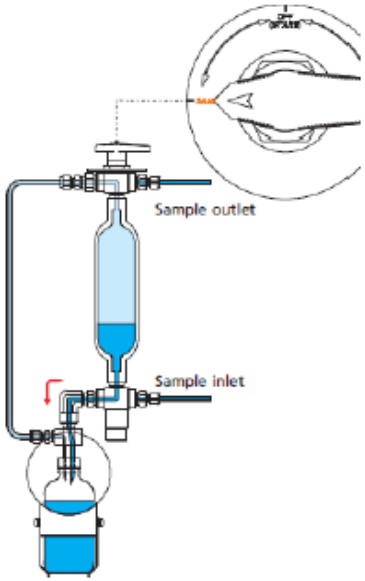
OFF (START): SYSTEM CLOSED, Isolate from process.



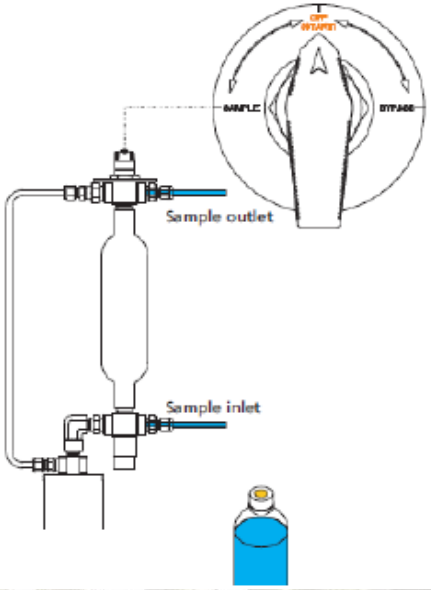
BYPASS: Recirculation to process through the fixed volume.



SAMPLE: We take the sample in the bottle.



OFF: We isolate the process again and remove the bottle.

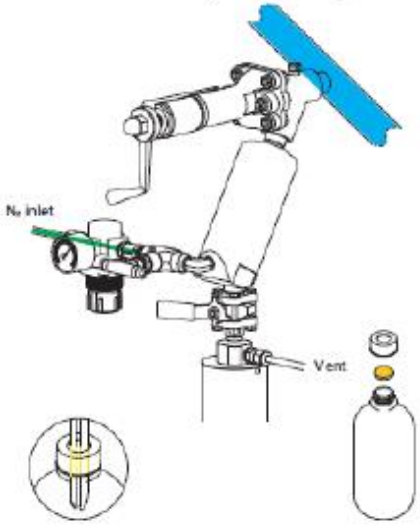


ADVANTAGES:

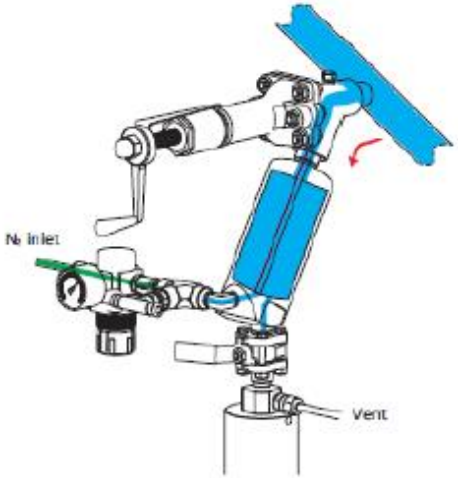
- With a handle and its three positions we operate the system.
- Operational safety.
- Extremely simple system.
- Avoid handling errors.
- No additional valves are necessary.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- Allows a Dead-man system installation to increase the safety. Leaving the system isolated from the process when anyone work on it.
- For high temperatures, a cooler can be installed at the inlet of the sampler. (Consult Manvía coolers).
- In addition to the pressure gauge and thermometer can be installed.

SAMPLING SYSTEMS **VS** FOR LIQUID HIGH VISCOSITY

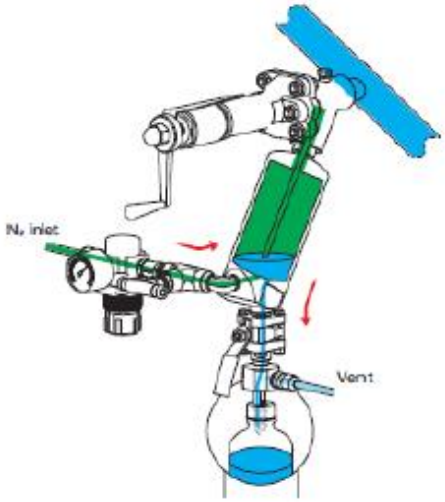
CLOSE: SYSTEM CLOSED, Isolate from process.



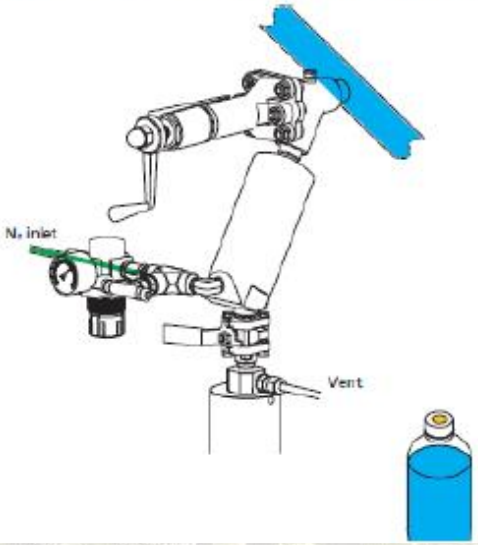
SAMPLING: Open piston valve to put the sample in fixed volume.



TAKING SAMPLE: Close piston valve, open purge to send the sample in the bottle.



CLOSE: Close the rest of valves and remove the bottle.



ADVANTAGES:

- Operational safety.
- Extremely simple system.
- Apply to highly viscous liquids.
- Small capacity in the circuit, which reduces contamination for the next intakes and reduces deadtimes.
- A Shell cooler / heater can be installed around the cylinder.

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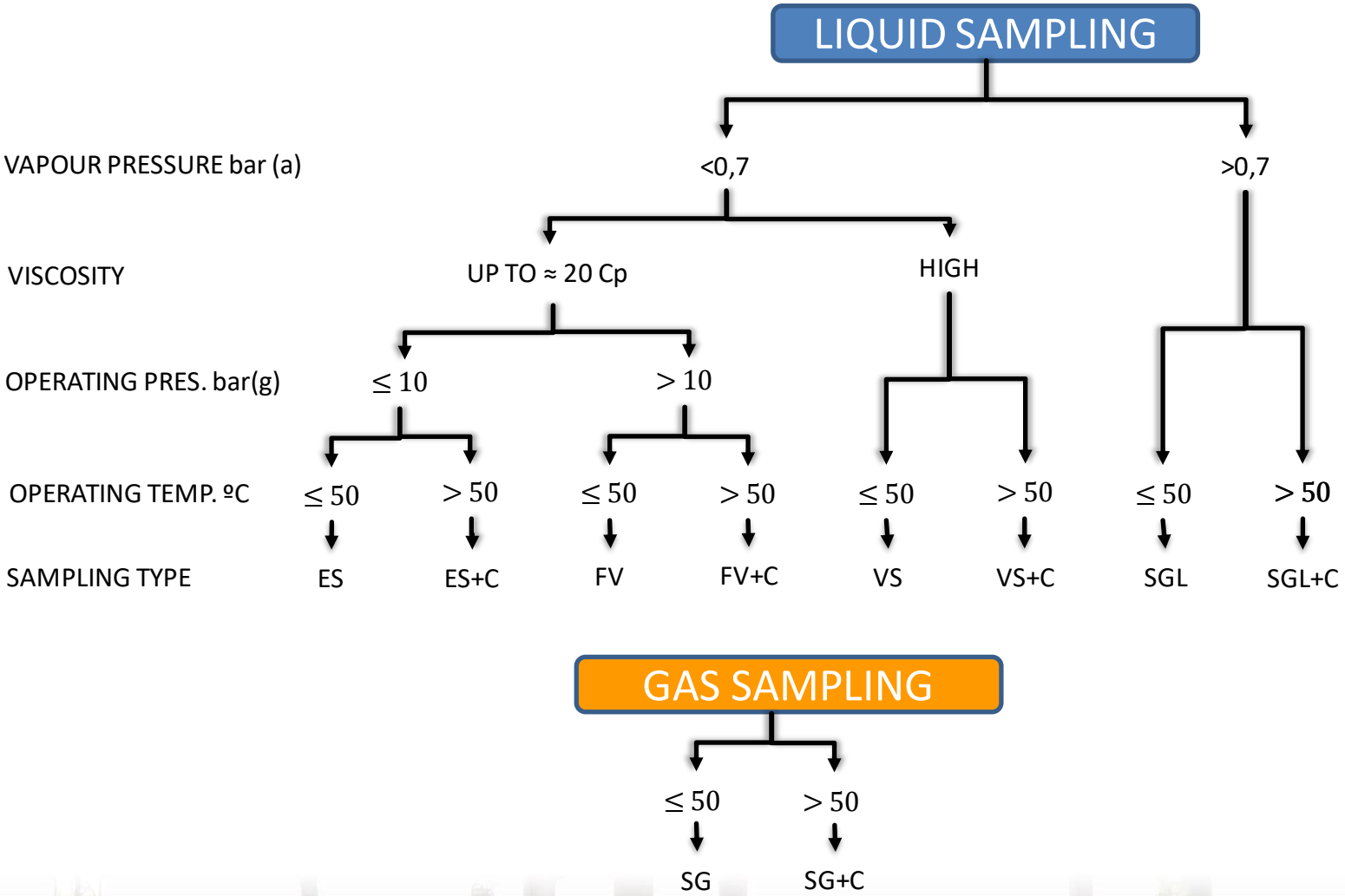
SAMPLING TYPE DECISION TREE



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THINGS TO KNOW About Sampling Systems.

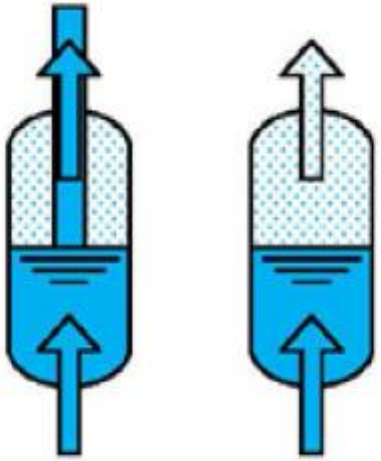
We do not always manufacture samples according to our standards. For this reason, it is necessary to know a series of standards related to the design and manufacture of these systems:

What container to use for sampling?

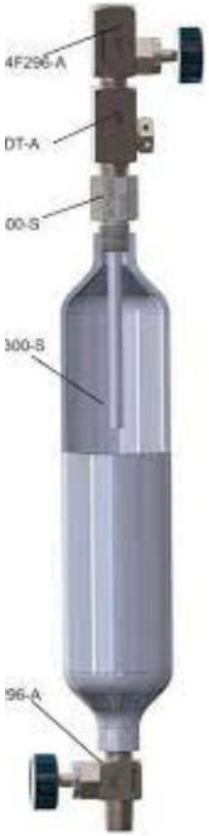
- For liquids with vapor pressure ≤ 0,7 bar(a): BOTTLE.
- For all other fluids: CYLINDER
- For toxic fluids: CYLINDER + N_2 purge

Direction of entry of the sample in a cylinder.

Gas should flow from the top down, pushing out any liquid / condensate from the sample cylinder as it fills .



Liquids should fill from the bottom up. This displaces the vapor space, ensuring the cylinder is full. An outage tube can be added to liquid systems to ensure there is expansion space remaining in the cylinder.



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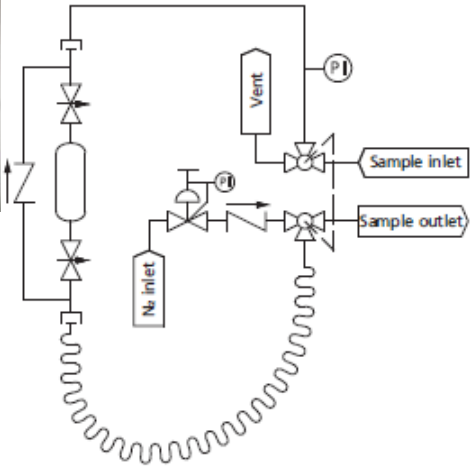
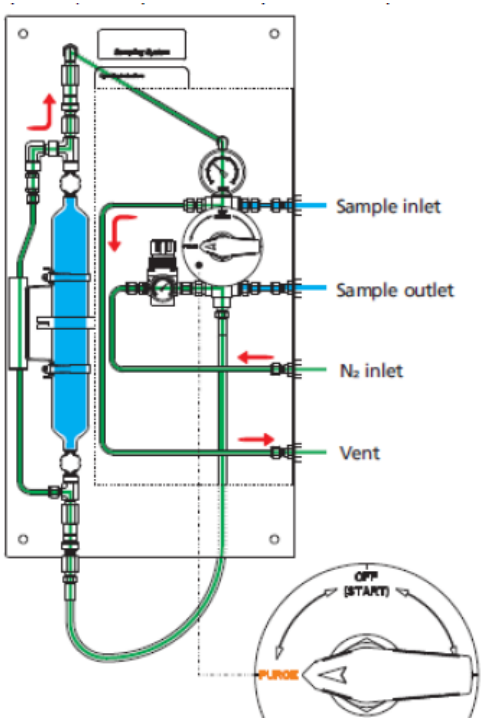
THINGS TO KNOW About Sampling Systems.

Quick connectors flushing when sample is dangerous.

When we disconnect a quick connectors (and we have two per cylinder), there is a liquid spill or a gas leak of a volume of 1 cm^3 in 1/4 connectors and of 6 cm^3 in 1/2" connectors. If the fluid is toxic, cancerous or aggressive to health, we are exposing the operator to a health risk daily. To avoid this, it is necessary to flashing using nitrogen, through the quick connectors to eliminate these residues and remove the cylinder safely.

¼" Quick connector
Out volume to open: 0,6 cm^3





SG sampling system with nitrogen purge

Cylinder with bypass to flushing the quick connectors

IMPORTANT CONSIDERATION ABOUT THE SAFETY !!!!

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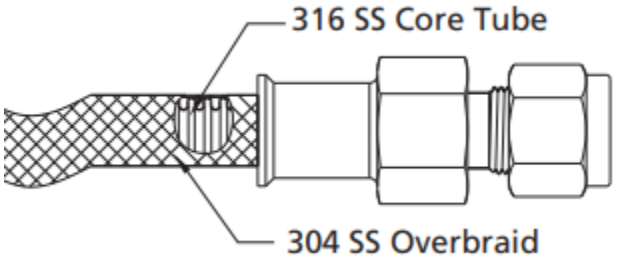
THINGS TO KNOW About Sampling Systems.

Is the hose installed at the inlet or outlet of the cylinder?.

The hose is installed at the output of the cylinder, specially when the hose has the core tube metallic:



The core has an irregular surface to allow for flexibility. This uneven can retain previous samples. By placing it at the outlet of the cylinder we avoid contamination in the sample.

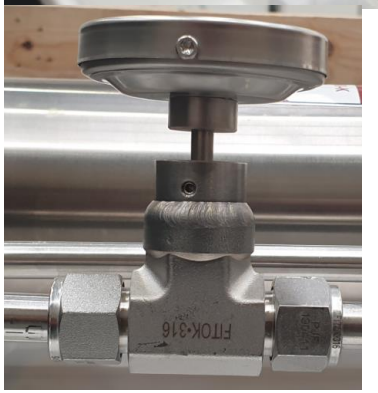
Always look for the minimum capacity.

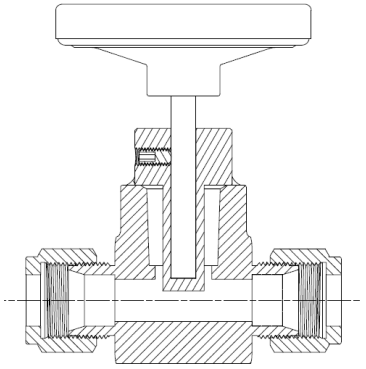
To avoid residue from previous sampling, this systems should be designed with the smallest possible volumes. If possible, instruments where the sample can be retained (bourdon gauges, thermowell cavities, etc.) should be installed at the point after the sampling cylinder or bottle.

Others components manufactured by Manvia to apply on Sampling Systems.

Auxiliary components for Sample Cylinders

IN LINE THERMOWELL





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THANKS FOR YOUR ATTENTION

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