



# SAMPLE CONNECTIONS, SAMPLING & INJECTION SYSTEM



## *SAMPLING/INJECTION SYSTEM*

*Company Introduction*

*Sampling Connection Systems*

*Sample Cooler*

*Sample Probe*

- *DBB (Double Block Bleed ) Type*
- *Retrievable Type*
- *Retractable Type*
- *Conventional Type*

**[www.gloazure.com](http://www.gloazure.com)**

## Company Introduction

Gloazure has supplied various kinds of sampling and injection system, various type of sample probes and other related products in the world since 2007

The products ranges are

- Retrievable type sampling and Injection system (quill, nozzle etc.) including retriever tool and service valve
- Retractable type sampling .and Injection system (quill, nozzle etc.) including retractor called side winder
- Convention type Injection and sampling system
- DBB(Double Block Bleed Valve) type sampling or injection system
- Sampling collection unit including closed sampling system and other related products such as cooler, cylinder bottles etc.

Gloazure is one of leading company in Corrosion Monitoring System and Sampling/ Injection system which has been delivered to customers in the world.

The monitored corrosion data is delivered to control room to be analysed and it will be utilized to manage process control in various ways.

All our products ranges are related and applicable to whole system and Gloazure is the only company to supply whole system in this application.

Regarding CMS(Corrosion Monitoring System), the catalogue can be download from the web-site [www.gloazure.com](http://www.gloazure.com)

# Sampling System

## Liquid Sampling Systems

Normally bottle with needle has been used for this service such as toxic, volatile and other dangerous samples.

It should be closed loop and emission free.

Other requirements can be designed on request.

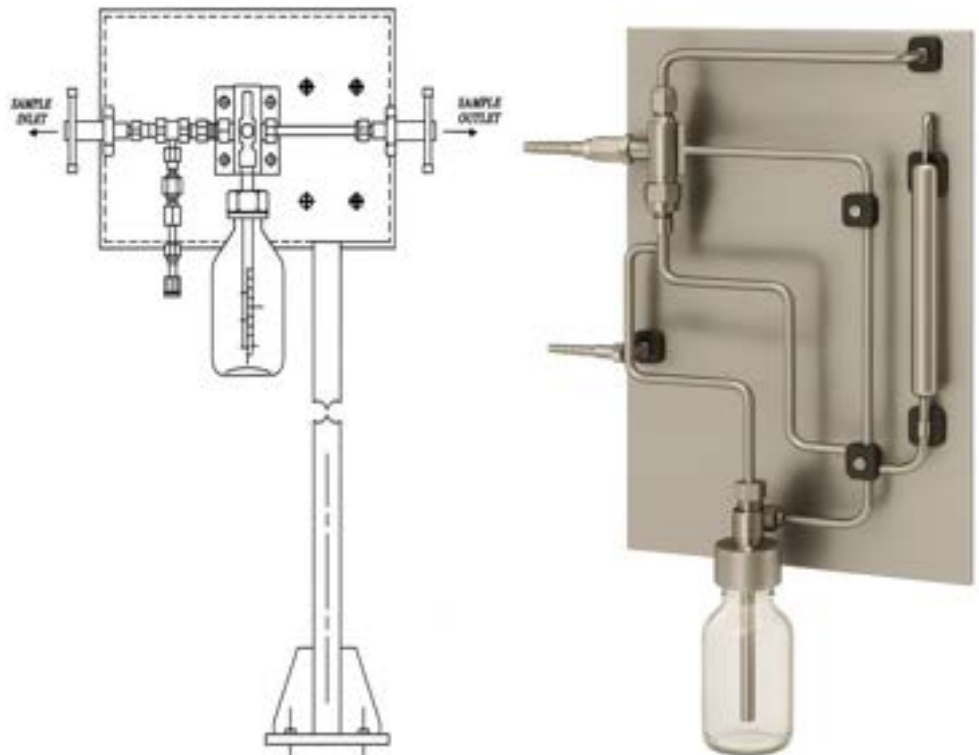
### Features

- Stand volumes are 50, 100, 250, 500 and 1000 ml and others are available on request.
- Max. Process Pressure 8 barg (116 psig) for the bottle. higher process pressure to be discussed with engineer.
- Max. Vapor Pressure 0.7 barg (10 psig)
- Safe (sampling) Process Temperature 60°C (140°F)
- Wetted Part Materials: 316SS as standard and other materials are available on request.
- Non-metal materials are also available depending according to chemical resistance
- Easily replaceable parts and carrying holder is available
- Dedman valve (spring return ball valve) is available as an option
- All samplers can comply with NACE MR0175 / MR0103 standards, for sour service requirements

### Applications

- Single phase liquid samples
- Toxic liquid samples
- Dangerous liquid samples
- Volatile liquid samples
- Refined oil & gas, fuels, etc.
- Water
- Acid samples
- Amine samples
- Alcohols
- Aromatics

- Benzene
- Bio-fuel
- Brine Water
- Chemical mixture
- Cumene
- DCE
- Glycol
- Gasoline
- Hydrocarbons
- Ketone
- Kerosene
- Naphtha
- Paraffins
- Solvents
- Toluene
- Xylene
- etc.



## Gas and Liquefied Gas Sampling Systems

Sample cylinder is widely used for gasses with high process pressures, liquefied, hazardous or toxic gasses.

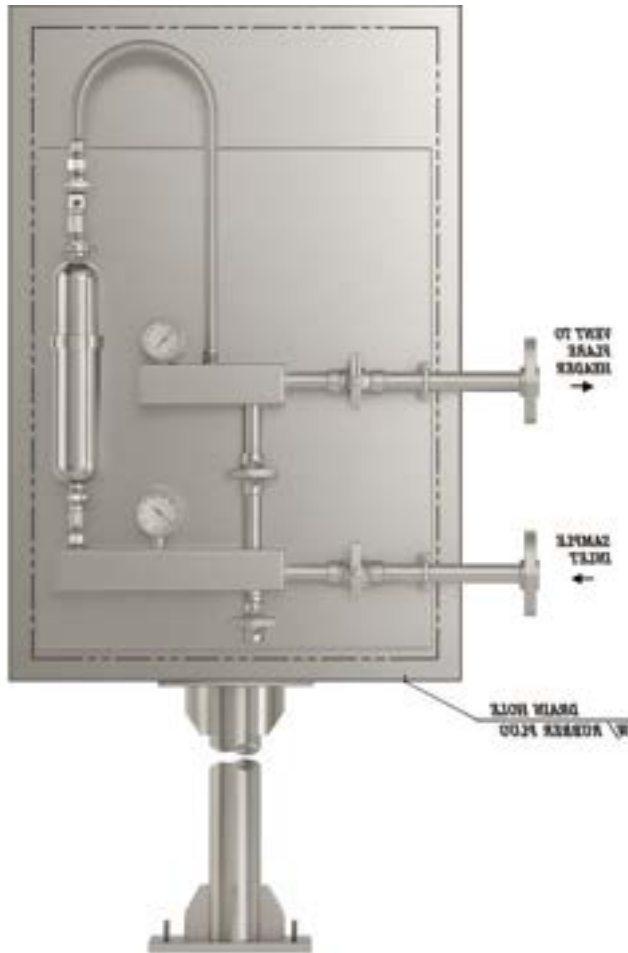
### Features

- Sample volumes cylinders 150, 300, 500, 1000 and 2250 ml (other on request)
- Max. Process Pressure 124 barg (1800 psig), 345 barg (5000 psig) or 689 barg (10000 psig)
- Safe sampling Process Temperature 60°C (140°F) with sample cooler
- Wetted Part Materials: 316SS as standard and other materials are available on request.
- All samplers can comply with NACE MR0175 / MR0103 standards, for sour service requirements

### Applications

- Acetylene
- Butane
- Ethylene
- Flue
- Natural
- LPG
- LNG
- Propylene
- Chemical mixture
- Hydrocarbon
- Nitrogen
- Oxygen
- Carbon dioxide
- Liquid flashing
- etc.





## Water or Steam Sampling System

To control sample temperature, pressure, and flow rate from the sample source to delivery for analysis.

The sampling panels are used for sample conditioning and collection with water analyzer equipment for analysis on chemical parameters like Conductivity, pH, Dissolved Oxygen, Silica and Sodium.

### Features

- Control the Steam Quality
- Actual steam to delivery for analysis in order to plan corrosion action for the boilers, pipelines etc.
- Control of optimize steam chemical composition

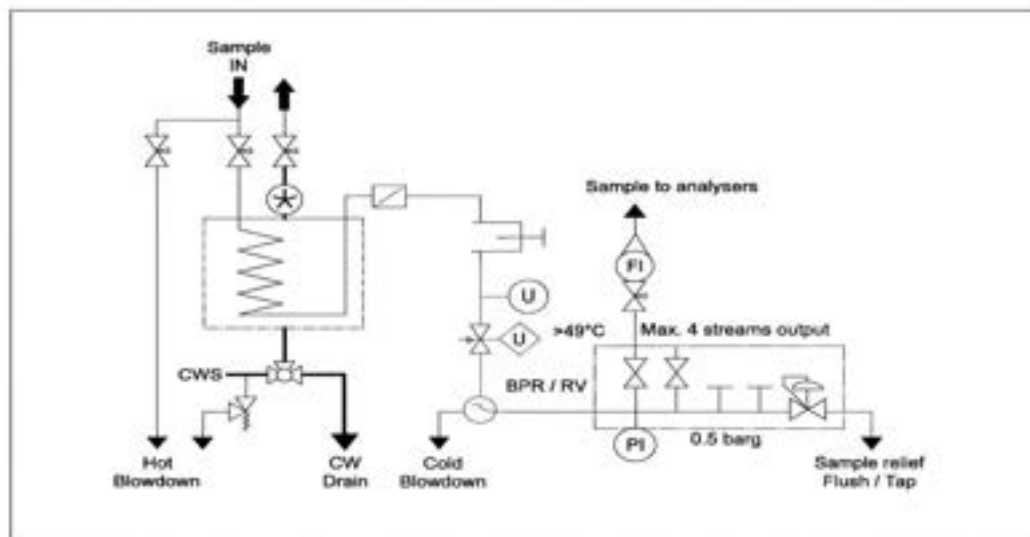
## Applications

- Demi Water
- Feedwater
- Condensate
- Boiler Water
- LP Drum Water
- LP/HP Steam
- Life Steam
- Main Steam Demi Water
- LP Drum Water
- Steam and Water Analysis System
- Objective to Analysis: pH, Conductivity, Silica, Sodium, Dissolved Oxygen, Phosphate, Chlorides, TOC for power stations etc

## Applicable design standard

- ASME PTC 19.11 Steam and Water Sampling, Conditioning, and Analysis in the Power Cycle
- ASTM D1066 Standard practice for Sampling Steam
- ASTM D1192 / D3370 Standard Guide for Equipment and Practices for Sampling Water and Steam
- ISO 5667-7 Water Quality-Sampling – Part 7: Guidance on sampling of water and steam in boiler plants

<Typical Diagram>

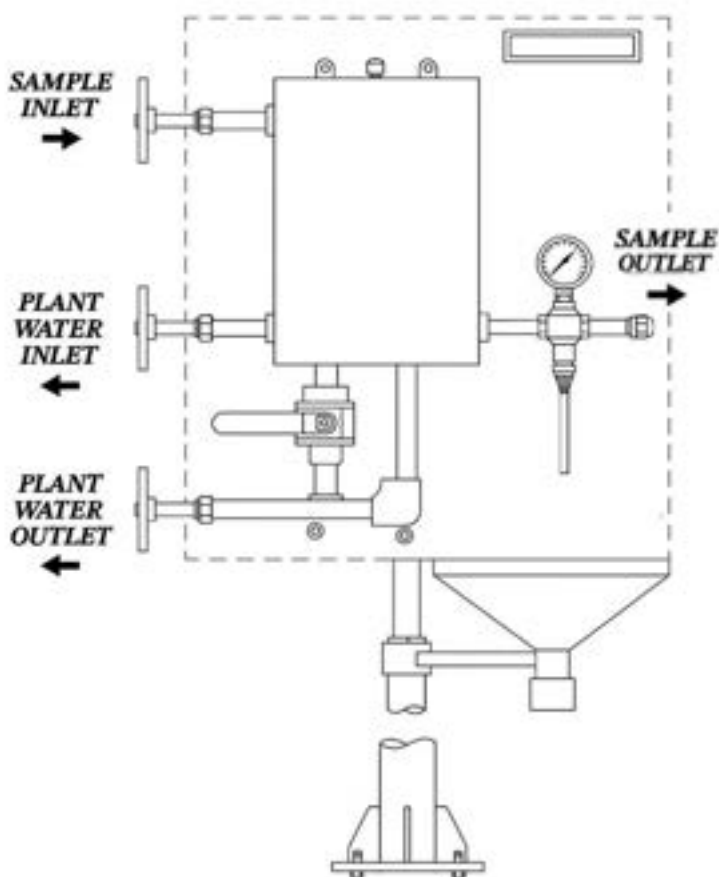


# INTRODUCTION

## SAMPLING and INJECTION SYSTEM

Consists of ;

1. Hot Sample Blowdown (Option)
2. Block Valve-Inlet
3. Filter (Option)
4. Pressure Regulator (Option)
5. Temperature Indicator- gauge 0 - 60 °C (Option)
6. Temperature Shut-Off Valve (Option)
7. Cold Sample Blowdown (Option)
8. Pressure Safety Valve (Option)
9. Sight Glass Indicator (Option)
10. Flow Indicator (Option)



## Sampling Cooler

The sample coolers are used to take samples of hot water or steam from boilers at and pressure. The flow through the shell and coil condenses the steam and cool down hot fluids to achieve safe sample fluids

This spiral coil standard material in the shell is 316 ss and the sell materials is a stainless steel. The tube can be used at up to 540°C and 300 barg.

The sample cooler should prevent 'flashing-off' which can be dangerous while hot pressurized liquids and it may cause an inaccurate sample. The tube material should be corrosion resistant and clean in order to minimize contamination.

Sample cooler has been applied to many industries such as power plants, nuclear power plants, chemical, petroleum refining, cement, mining, pharmaceutical, food and more.

### **Boiler water applications**

Regular sampling from the boiler should be done in order to test required TDS (total dissolved solids) level.

It should be done even though TDS control system is arranged in order to avoid any worst cases and it will cause accidents.

Warning device can be provided if required

The hot sample should be condensed since it is exposed to the air of atmosphere, the TDS level of sample will be higher than actual one.

In order to achieve accurate results from the sample, the cooling down should be done fully and sufficiently to reach around 25°C which is good temperature for analysis.

### **Features**

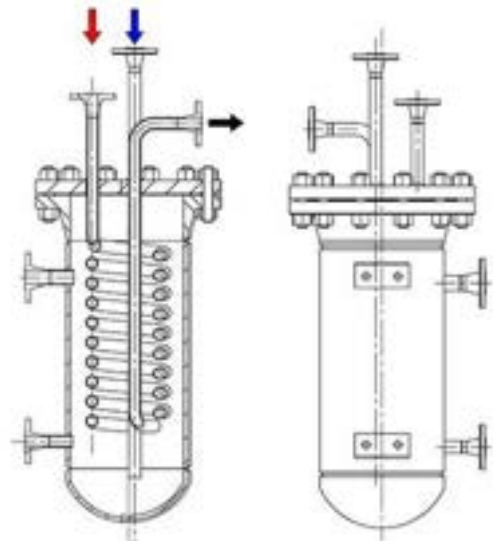
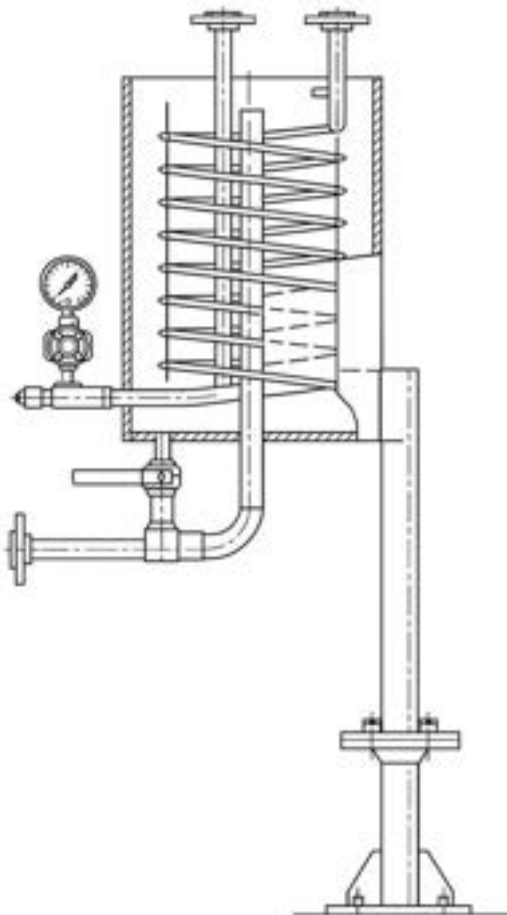
- Standard material for Tube: SS316L
- Standard material for Shell: SS304L
- Including temperature fuse as an option.
- Removable shells easy for maintenance.
- Exotic materials can be used depending on fluids on request

## Applications for samples

- Single phase liquid
- Toxic / Volatile / Dangerous liquid
- Refined oil, gas, fuels others / water etc.
- Material meets NACE requirements - NACE MR0175 / MR0103 standards

## Applicable Design Standards

- ASTM D4057 / ASTM D1265 / NACE MR0175 or MR0103 for sour services



## Sample Probe

### DBB(Double Block Bleed) Type

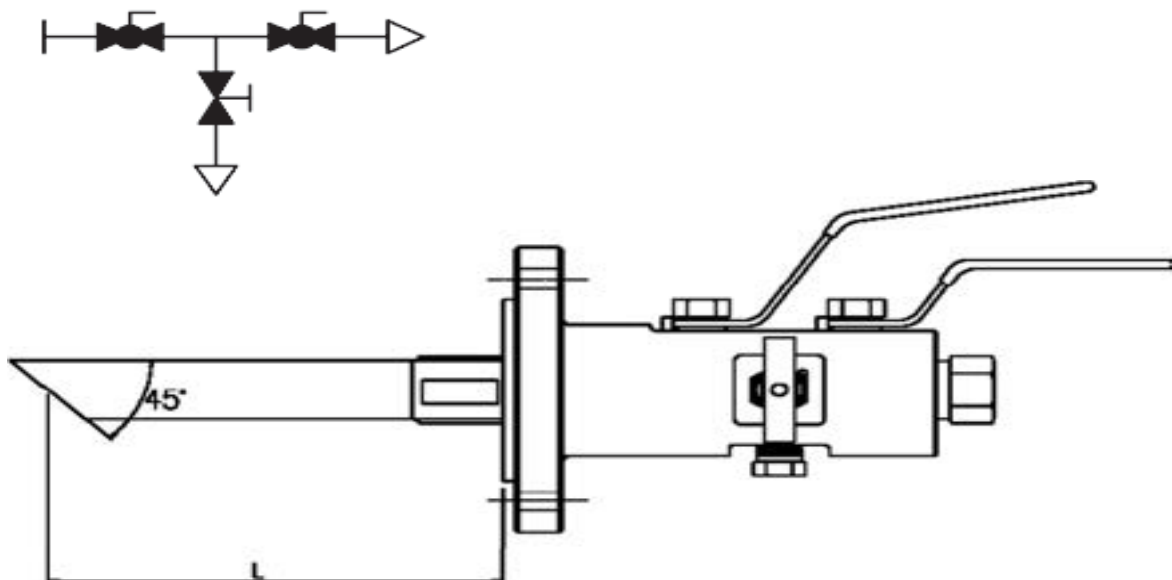
1. Standard connection is Flange and HUB is option
2. Rating :150lb to 2500lb / API 10,000psi
3. Design: Single or Double with optional Bleed (SB-SBB-DB-DBB)
4. Fire Safe design
5. DBB meets ASME B16.5 pressure-temperature ratings for their flange end connection. Rating shall conform to the ASME B16.5.

### **SAMPLING and INJECTION QUILL ASSEMBLY**

Sampling and Injection quill can be added on to DBB valves for 1-1/2 in. and larger flanges or to Root Valves. The standard quill OD is 25mm and the lengths are customer specified. The quill features a length of heavy wall with a screwed connection into the DBB valve body

#### **Sampling Assembly**

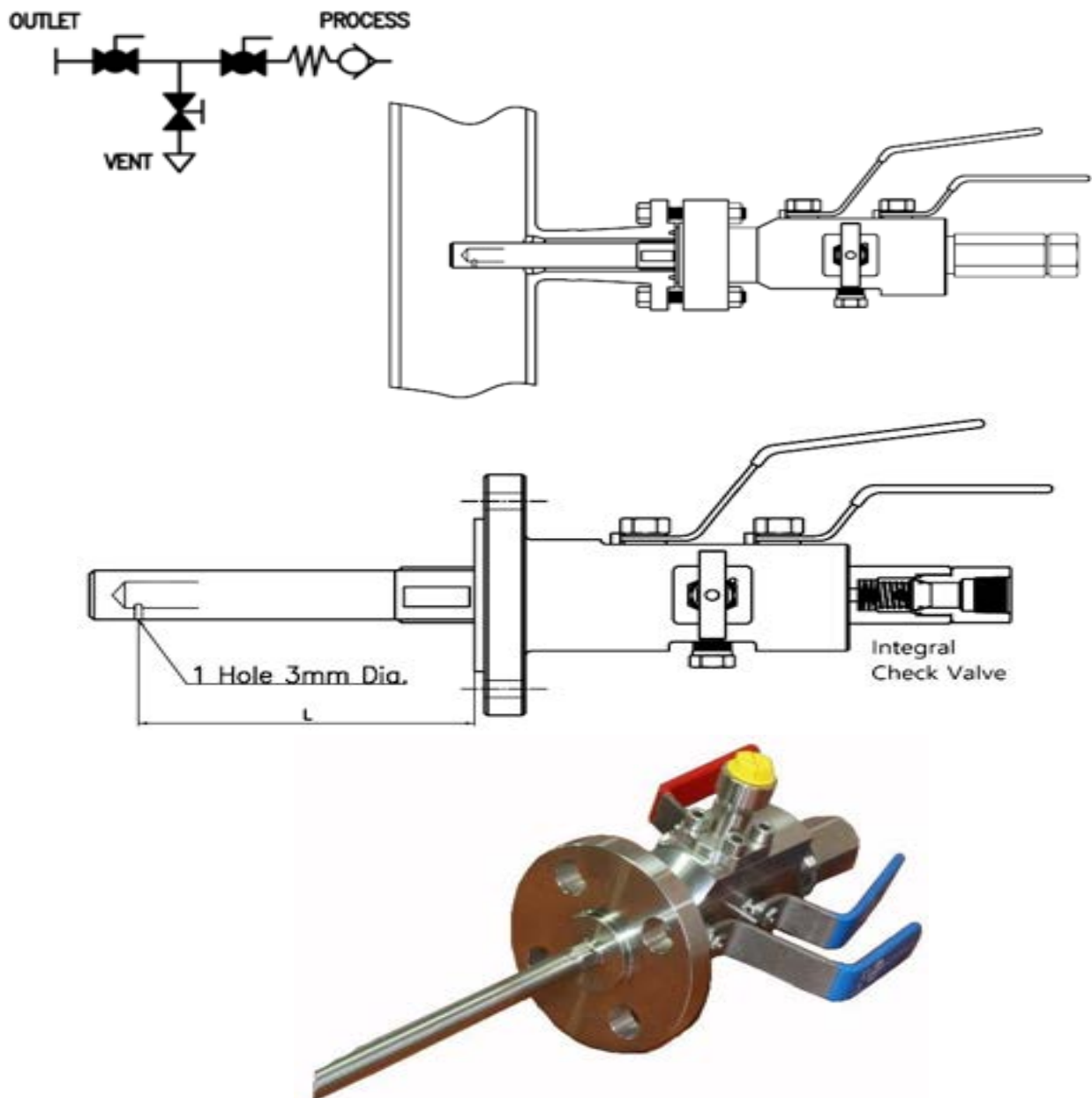
The design has been developed to take a sample from the process stream at full system pressure, providing double block and bleed protection. The sampling valve quill draws process fluid from the flow stream at full pressure. The quill is available in 45degree as standard.



## Injection Assembly

The design has been developed to inject directly liquids or gases into the optimum position of process stream at full system pressure, providing double block and bleed protection.

The integral check valve allows liquids or gases to be injected into the process stream while providing protection against back flow of process fluids. The poppet type spring return check valve is constructed with a standard FKM O-ring seal. The Injection orifice is built with a 3mm (0.125 in.) hole.

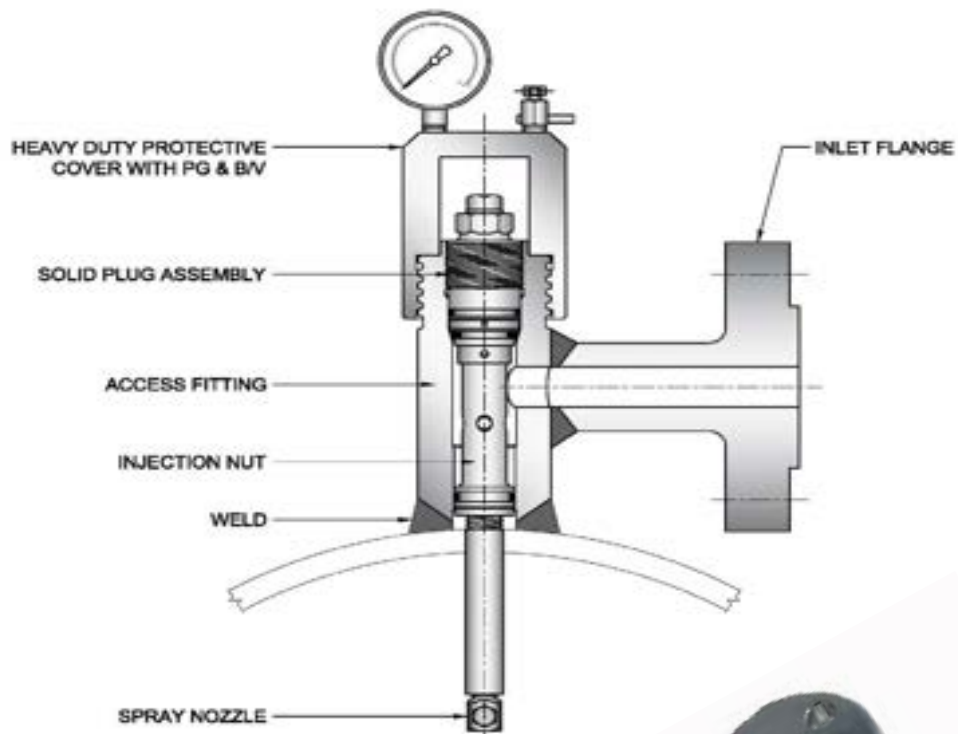


## RETRIEVABLE Type

### Model : HP40 Sampling /Injection Access fitting Assembly Selecting an Appropriate System

The following tables can be used to select the necessary components for most standard Sampling / Injection assemblies:

- Nipple and shut off valve to match the tee of the access fitting body
- Injection nut (Injection: Injection Nut with Integral check valve)
- Injection tube length and style
- Nozzle type: Quill / Flat / Full Cone / Hollow Cone etc



## Retriever Tool Set

Gloazure offer a retriever tool with a service valve that can be used to insert probe/coupon etc or retrieve them from a process system whilst operating under full pressure. It is compatible with our 2inch high pressure access fitting System and to be used up to 3600 psi/6000psi/10,000 psi

It is designed to secure safety and easy in operation at site.

Our retriever tool set are protected by robust case and delivered to the customer.

A retriever stroke can be selected by customer and custom-made stroke is available.

The strokes are based on our wake frequency calculation.

SBB Service    DBB Service Valve



TOOL BOX



Assembled Tool

## RETRACTABLE Type

Model : LP10

### GENERAL

The retractable injection/sampling system consists of a low pressure access fitting assembly through which an injection tube or quill is inserted. Where applicable, a nozzle may be fitted to the tube for injection purposes. Injection/sampling is done through a shut off valve at the end of the tube/quill. An optional check valve is available to ensure that the fluid in the system does not back flow to the injection equipment if for any reason the pressure in the injection system falls below the line pressure.

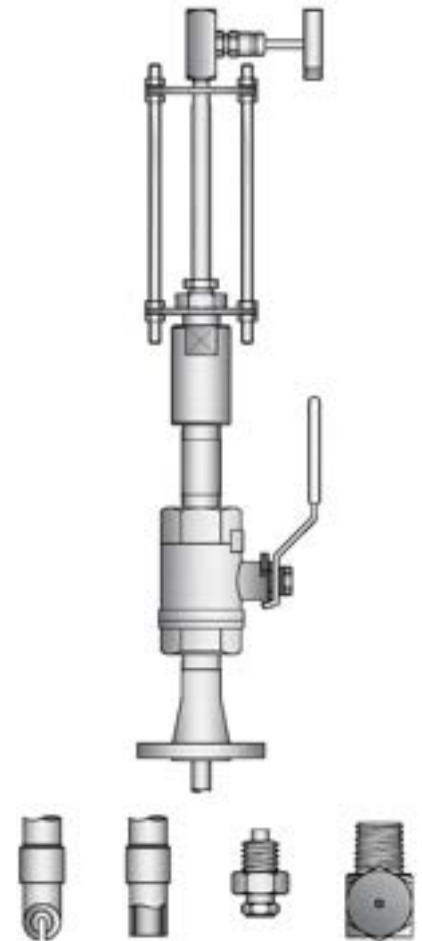
### INJECTION/SAMPLING ASSEMBLY

The standard Gloazure Co., Ltd. retractable injection or sampling assembly is comprised of the following components:

- Low Pressure Access Fitting Assembly
- Injection Tube / Sampling Tube
- Injection Nozzle (if applicable)
- Shut Off Valve
- Check Valve (optional)
- Safety Clamp Assembly
- Feed Pump and an Injection Liquid Tank (usually customer supplied)

### SPECIFICATIONS

Maximum Operating Pressure	1,500 psi (10.3 MPa)
Maximum Operating Temperature	500 °F (260°C)



The access fitting assembly, tube/quill, nozzle and valve are all manufactured from stainless steel. Other materials/designs are available to meet the specifications of virtually any application. The tube/quill is manufactured with an integrated blow-out-preventor as an additional safeguard.

Standard assemblies are designed for mounting through a 1" thread-o-let, weld-o-let or flanged fitting, however other sizes are available upon request.

For safety and ease of operation, the use of a Gloazure Co., Ltd. low pressure retractor "sidewinder" tool is recommended for systems operating above 300 psi (2.1 Mpa).



## RETRACTOR

### GENERAL

Retractor is a tool designed to aid in the retraction of sampling /injection probe equipment mounted in a low pressure access fitting. The retractor permits the operator to retract and insert a variety of equipment, such as: probes, coupon holders, reference cells and injection systems, under pressure and without causing any interruption to the operating system.

The retractors straightforward rugged design provides for safe and easy operation, and is necessary for systems operating between 300 to 1,500 psi.

### APPLICATION

The retractor is attached to the stuffing box on the low pressure access fitting. Once the securing nut on the retractor is tightened onto the top of the injection probe, the safety clamp may be removed.

The locking nut on the stuffing box is then loosened and the handle on the retractor can be cranked, retracting the probe/coupon holder from the line.

When the equipment has cleared the ball valve, the valve is closed, maintaining line pressure. Any pressure in the assembly is purged by slowly opening the union (or through the use of a tee valve), and the equipment is now accessible for inspection and/or replacement.

### SPECIFICATIONS

Maximum Operating Pressure	1,500 psi (10.3 MPa)
Maximum Operating Temperature	500 deg.F (260 deg.C)



The Gloazure Co.,Ltd. Retractor is manufactured with a light-weight cast aluminum body, and carbon steel rods/guides. The standard retractor is designed to operation a 1" access fitting assembly. A retractor that accommodates and 1-1/2" fitting is also available.

## CONVENTIONAL TYPE

### **GENERAL**

The conventional type has various configurations depending piping process conditions and also its materials.

Gloazure had provided them to oil & gas customers in the world.

WFC(Wake Frequency Calculation) is provided before manufacturing and end types are Quill/ Notched Quill / Nozzles (Full Cone/Hollow Cone / Flat Fan / Atomizing / Multi-hole Quill etc.



## Applicable DESIGN STANDARD CODES and Information

- ASME PTC 19.11 Steam and Water Sampling, Conditioning, and Analysis in the Power Cycle
- ASTM D1066 Standard practice for Sampling Steam
- ASTM D1192 / D3370 Standard Guide for Equipment and Practices for Sampling Water and Steam
- ISO 5667-7 Water Quality-Sampling – Part 7: Guidance on sampling of water and steam in boiler plants

### **Sampling Codes& Standards**

#### **ASTM Standardization for Sampling Systems**

- ASTM D1066 Standard practice for **Samping Steam**
- ASTM D1192 / D3370 Standard Guide for Equipment and Practices for **Sampling Water and Steam.**
- ASTM D1265 Standard Practice for Sampling Liquefied Petroleum (LP) Gases, Manual Method Sampling System (closed loop sampler).  
This practice covers the procedures for obtaining representative **samples of liquefied petroleum gases** such as propane, butane, or mixture thereof, in containers other than those used in laboratory testing apparatus
- ASTM D1267 Standard test method for vapour pressure liquefied petroleum gases.
- ASTM D1835 Standard specification for liquefied petroleum (LP) gases.
- ASTM D1837 Standard test method for volatility of liquefied petroleum gases.
- ASTM D1838 Standard test method for copper strip corrosion by liquefied petroleum gases.
- ASTM D2158 Standard test method for residues in liquefied petroleum gases.
- ASTM D2597 Standard Test Method for Analysis of Demethanized Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography
- ASTM D2598 Standard practice method for calculation or certain physical properties of liquefied petroleum gases from compositional analysis.
- ASTM D2713 Standard test method for dryness of propane (Valve freeze method).
- ASTM D3120 Standard test method for trace quantities of sulphur in light liquid petroleum hydrocarbons by oxidative micro coulometry.
- ASTM D3700 Standard practice for obtaining LPG samples using a floating piston cylinder.
- ASTM D4057 Manual Sampling of **Petroleum and Petroleum Products.**
- ASTM D5305 Standard test method for determination of ethyl mercaptan in LP-gas vapor.

- ASTM D5453 Standard test method for determination of total sulphur in light hydrocarbons, spark ignition engine fuel, diesel engine fuel and engine oil by ultraviolet fluorescence.
- ASTM F307 Standard practice for **Sampling Pressurized Gas** for Gas Analysis.
- ASME PTC19.11 The specification requires a "**isokinetic sample nozzle**" representative **sampling of the specific two-phase saturated steam** flow via sample ports drilled in the side of the nozzle facing the steam flow.
- ASME PTC 19.11 **Steam and Water Sampling**, Conditioning, and Analysis in the Power Cycle.
- ISO 5667-7 Water Quality-Sampling – Part 7: Guidance on sampling of water and steam in boiler plants.

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## **International Organization for Standardization of Sampling Systems**

- ISO 3170 Petroleum liquids — Manual Sampling.
- ISO 3993 Liquefied petroleum gas and light hydrocarbons - Determination of density or relative density - Pressure hydrometer method.
- ISO 4256 Liquefied petroleum gases - Determination of vapor pressure - LPG method.
- ISO 4257 Liquefied petroleum gases - Method of sampling.
- ISO 4267-2 Petroleum and liquefied petroleum products - Calculation of oil quantities - Part 2: Dynamic measurement.
- ISO 6251 Liquefied petroleum gases - Corrosiveness to copper - Copper strip test.
- ISO 7941 Commercial propane and butane - Analysis by gas chromatography.
- ISO 8819 Liquefied petroleum gases - Detection of hydrogen sulphide - Lead acetate method.
- ISO 8943 LNG continuous sampling method (Standard for **LNG Probes & Vaporizers**)
- ISO 8943 Draft of sampling with piston cylinder
- ISO 9162 Petroleum products - Fuels (class F) - Liquefied petroleum gases – Specifications.
- ISO 10715 describes a representative sample as "A sample having the same composition as the material sampled, when the latter is considered as a homogenous whole."
- The two most widely known and popular standards being ISO 10715 and GPA 2166.
- GPA 2166 Obtaining Natural Gas Samples for Analysis by Gas Chromatography.

- The American Petroleum Institute (API) Manual of Petroleum Measurement Standards (MPMS), Chapter 14.1 Natural Gas Fluids Measurement: Section 1-Collecting and Handling of Natural Gas Samples for Custody Transfer.
- EN 12838 Installations and equipment for liquefied natural gas. Suitability testing of LNG sampling systems
- GB/T 4756 Method for Manual Sampling Petroleum Liquid

This statement is also quoted in the American Society for Testing and Materials (ASTM) International standard ASTM D5287.

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### **Customers Standardization**

- Gloazure's sampling and Injection system shall be supplied in accordance with client's specification such as ExxonMobil, Total, Shell, etc.