



CRP Ltd

**INSTALLATION, OPERATING AND MAINTENANCE
INFORMATION
FOR INLINE SAMPLING VALVES**

Sampling Valves

Installation Commissioning and Operating Instructions - SD IL 300 & SD IL 400 Inline sampling Valve

This procedure provides detailed information on the field installation, commissioning and operation of the type SD IL 300 & 400 wafer style in-line sampling valve.



Overview

The valve is available to mount in either horizontal or vertical flanged pipework. Ensure that the valve is mounted in the correct orientation so that the bottle hangs vertically down below the valve. The valve is able to sample both hot and hazardous media, so it is very important that suitable protective clothing and eye protection is worn when commissioning and operating the valve.

Storage

The sampling valve should be ideally stored in cool dry conditions in a dust free environment. The flange faces should be protected from damage. It is recommended that the valve should be left in its original packaging until ready for assembly into the pipeline.

Installation

The valve is of a wafer style designed to be mounted in line between flanges. Choose a position within the pipeline that is easily accessible to ensure trouble-free function of the valve by the operator. Prior to installation, the mating flange faces must be free from debris, foreign matter, and any traces of previously used gaskets.

Gaskets

CRP does not recommend the use of gaskets on PFA lined valves (SD IL 400) when being fitted into PTFE/PFA lined pipelines. For unlined valves (SD IL 300), or when a lined valve is being connected to unlined equipment, gaskets must be used when bolting up the valve within the pipeline. CRP recommend Goretex GR expanded PTFE type gaskets or PTFE envelope gaskets.

Bolting Materials

Should be of good quality, clean and well lubricated. The use of washers is recommended to ensure correct even torque. Bolts should be tightened by use of a torque wrench in strict sequence of diagonally opposite pairs.

It is recommended that all bolts are checked at least 24 hours after commissioning or following the initial full process cycle.

The following table gives recommended torque levels for flange to flange connections

Valve Size	Minimum Torque Figure			
	lined Valve (SD IL 400)*		Unlined Valve (SD IL 300)	
NB	Ft Lbs	Nm	Ft Lbs	Nm
3/4"	10	14	Refer to gasket manufacturers recommendations	Refer to gasket manufacturers recommendations
1"	14	19		
1.1/2"	28	38		
2"	55	75		
2.1/2"	65	88		
3"	95	129		
4"	67	91		
6"	127	172		

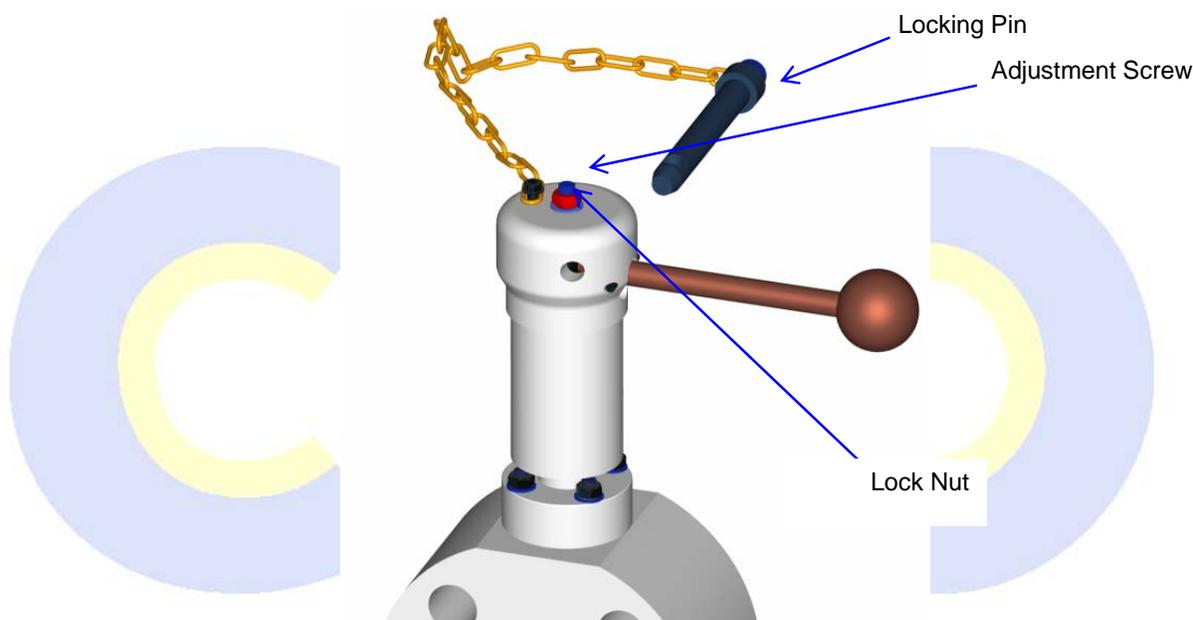
* The Torque figures given are the minimum to effect a seal, they may be exceeded by a value of 50% to effect a seal.

Venting

The sampling valve is supplied with a vent connection which must be plumbed into the site vent line or as a minimum vented away from the operator so that in the case of any fumes or liquid escaping they do not come in contact with the operator.

Commissioning

The valve needs to be properly set up before use in production. The volume flow rate of the sample taken must be adjusted so that the bottle fills at a steady controlled rate. The volume flow rate can be affected by the pressure within the process pipeline and by the stroke of the sampling valve spindle. It is this stroke that must be adjusted to achieve a suitable volume flow rate. The stroke adjustment screw is at the top of the valve as identified below.



Before carrying out any adjustments ensure that a sample bottle is installed and that the locking pin is removed from the body. To adjust the set screw release the locking nut with a spanner and back off to allow adjustment of the set screw. The valve will be supplied with the set screw wound down to its lowest level preventing the valve from being operated. If this is not the case then screw down the set screw till finger tight. To set the correct flow through the sample valve it is necessary to operate the handle by applying downwards force, whilst progressively turning the set screw anticlockwise until the desired flow rate is achieved. Once satisfied with the valve operation tighten the lock nut to maintain the set screw position. Refit the locking pin and replace the sample bottle with a clean one.

Operation

Before attempting to operate the valve make certain that the operator wears adequate personal protection.

To take a representative sample from the pipeline, firstly ensure a clean sample bottle is fitted to the valve, and then remove the locking pin. Pull firmly down on the handle and observe the sample being taken in the sample bottle. When the bottle has been filled to the correct level release the handle and fit the locking pin back in place. Remove the sample bottle and fit the bottle lid. Fit a new clean sample bottle to the sampling valve.

Application and Process / Media Conditions

It is the responsibility of the customer to ensure that the sampling device is suitable for conveying the intended chemical(s) and for the intended operating conditions. Careful consideration must be given to the affects of the process media on the valve, whether from corrosion, erosion temperatures etc.

Important Notes

(a) Whilst the valve is of a strong robust design consideration must be given to the effects of corrosion, erosion/wear, including potential effects from turbulence and vortices etc. For lined valves, it should be noted that while PFA has outstanding corrosion resistance, it has limited erosion resistance, and contained fluid velocities should be kept below 15m/s. For all valves, the valve seats need to be checked regularly for signs of wear. In addition, these products are not approved for conveying unstable fluids.

(b,c) Maximum and Minimum Allowable Operating Pressures (bar(g)) and Temperatures.

In line sampling valves can be split into 3 basic groups as detailed below:

1. Unlined Wafer Pattern: 1" – 6" inclusive, to fit between ASME B16.5 Class 150, BS EN 1092-1 PN10/16, BS10 Table D & E flanges.
2. Unlined Wafer Pattern: 1" – 2" inclusive, to fit between ASME B16.5 Class 300 flanges.
3. PFA lined stainless steel wafer pattern: 1" – 4" inclusive, to fit between ASME B16.5 Class 150, BS EN 1092-1 PN10/16, BS10 Table D & E flanges.

Their allowable operating temperature ranges are:

Valve Type	Temperature	
	Minimum	Maximum
1,2	-20°C	200°C
3	-20°C	180°C

All valves are suitable for operation at full vacuum. Their maximum operating pressures as detailed below (all pressures are in bar(g)):

Valve Type	Max Pressure
1	16
2	30
3	10

- (d) In designing the support structure the user must take into account the following factors in both operating and test conditions, and the possibility of more than one of these loads occurring simultaneously:
- Internal pressure from the contained fluid
 - The mass of the contained fluid
 - Traffic wind and earthquake loading
 - Reaction forces and moments which result from the supports, attachments, other piping etc.
 - Fatigue etc.
 - Vibration
 - The potential to overstress the flanges.
- (e) In earthquake conditions, CRP is unable to guarantee the integrity of its products, and the user must take suitable precautions to guard against potential product failure and its consequences in these circumstances.

- (f) It is the responsibility of the user to ensure that suitable pressure relief and other appropriate safety devices have been included in the design of the entire pressure system, and that discharges from such equipment have been considered.
- (g) If the products are to reach temperatures during operation or test which would be harmful to individuals, should they come in contact with the products in these conditions, it is the users responsibility to overcome this hazard.
- (h) The user is responsible for ensuring that suitable provision is made to allow for any necessary draining and venting of the system.
- (i) The user is responsible for ensuring that suitable provision is made to allow for isolation of take off pipes if these are of a size to present a significant risk. In addition, the risk of inadvertent discharge must be minimised, the take off points must be clearly marked on the permanent side, indicating the fluid contained. Each valve is supplied with a lock out device. It is the users responsibility to ensure that this device is used correctly. Each valve also is supplied with an operating procedure. The user is responsible for ensuring that this procedure is correctly followed every time the valve is used.
- (j) While the valve bodies & handles are manufactured from 316L stainless steel, the user is responsible for the maintenance of the exterior of the products to prevent corrosive attack.
- (k) Where, under reasonably foreseeable conditions, the allowable pressure limits of the products could be exceeded, the user is responsible for the fitting of suitable protective devices, and, if appropriate adequate monitoring devices.
- (l) By their nature, PFA and PTFE are not fire proof (the PFA lining and PTFE seals will melt under extremes of heat), and therefore, if appropriate, the user must consider how to meet any damage limitation requirements in the event of a fire.
- (m) The user is responsible for ensuring that the sampling valve is used in line with the Operational Sequence as supplied with the Sampling Valve, and that the operator is fully protected against the product being sampled.
- (n) Although the sample bottle vent is larger in cross sectional area than the bottle inlet, it is still possible that the sample bottle may become pressurised. Therefore, the user must consider possible pressurisation of the sample bottle by the contained fluid when specifying the bottle.

In cases of uncertainty on the part of the user, please contact the manufacturer for advice on any of the above.