

## Sampling Valves

### Installation Commissioning and Operating Instructions – SD IL 300 & SD IL 400 Inline sampling Valve with pneumatic actuator and control Panel

*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 fitted with pneumatic actuator and control panel.*



#### Overview

The valve is available to mount in either horizontal or vertical flanged piping systems. 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 have serrated grooves or PFA lining and should be protected from damage. It is recommended that the valve should be left in its original packaging until ready for assembling in to 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. The mating flange faces must be free from debris and foreign matter prior to installation. Any remaining gasket material should be removed from the flange faces.

#### Gaskets

Gaskets must be used when bolting up the valve within the pipeline. CRP Flex-Rite 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	
	Ft/Lbs	Newtons
NB		
3/4"	10	14
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.

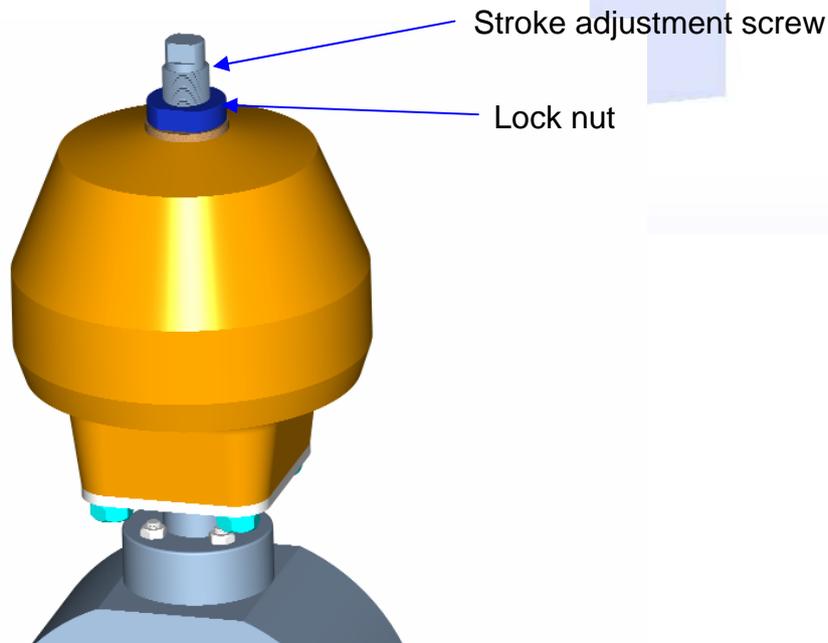
### **Venting**

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. Note if the valve is specifically supplied for use in pipelines under vacuum then there will be no vent as this is not necessary.

### **Commissioning**

The sampling system needs to be properly set up before use in production. Because the sampling valve operation is controlled by a set of controls within the control cabinet these need to be adjusted along with the mechanical stroke adjustment of the valve to give to required sample volume.

The volume of each sample taken is dependant on the pressure within the pipeline, the length of time the actuator / valve is operated for and finally the rate of flow of sample from the sampling valve. The pipeline pressure is governed by on site process conditions. The length of time of sampling valve actuation is set within the control cabinet. Finally the rate of flow from the valve is adjusted by the stroke adjustment screw on top of the actuator.



This must be adjusted to give the correct volume over a set time. Once the final setting has been found the lock nut is tightened to hold the adjustment screw in the correct position. The control panel is set to control the duration of the valve actuation.

Before carrying out any adjustments ensure that a sample bottle is installed.

To adjust the stroke adjustment screw, release the locking nut with a spanner and back off to allow adjustment of the screw. The valve will be supplied with the stroke adjustment screw wound down to its lowest level preventing the valve from being operated. To set the correct flow through the sample valve use the single shot facility on the control panel to take individual samples, adjust the sample duration via the control panel along with sample rate via the stroke adjustment screw on top of the actuator. Generally starting from a very small sample adjust the time / stroke until the correct sample volume is taken for one sample. Next the duration of the

total cycle time is set. Finally the duration between each individual sample, which when divided in to the total cycle time will give you the total amount of samples taken in the cycle run.

### **Operation**

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

The sampling system is designed to take several small samples over a period of time and dispense them in to one bottle, this gives a representative sample of a process over a long period of time.

The quantity of samples taken and the overall cycle time are set at the commissioning stage. To start the cycle firstly ensure a clean bottle is fitted to the sampling valve then press the green start button.

### **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 Flex-rite 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 sampling equipment 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.