



**CRP Ltd**

**INSTALLATION, OPERATING AND MAINTENANCE  
INFORMATION  
FOR INLINE SYRINGE SAMPLING SYSTEMS**

# Sampling Valves

## Installation, Operating & Maintenance Instructions – SD IL 500 & SD IL 600 Inline sampling Valves

This procedure provides detailed information on the field installation, operation & maintenance of the syringe type sampling device.

### Overview

The valve assembly has two parts, a wafer style valve body that is permanently bolted in to the process pipeline and a syringe sampler, which is removable from the valve body.

The syringe sampler is used to remove and transport the sample from the valve body in the pipeline. The valve body can be mounted in either horizontal or vertical flanged pipework. 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

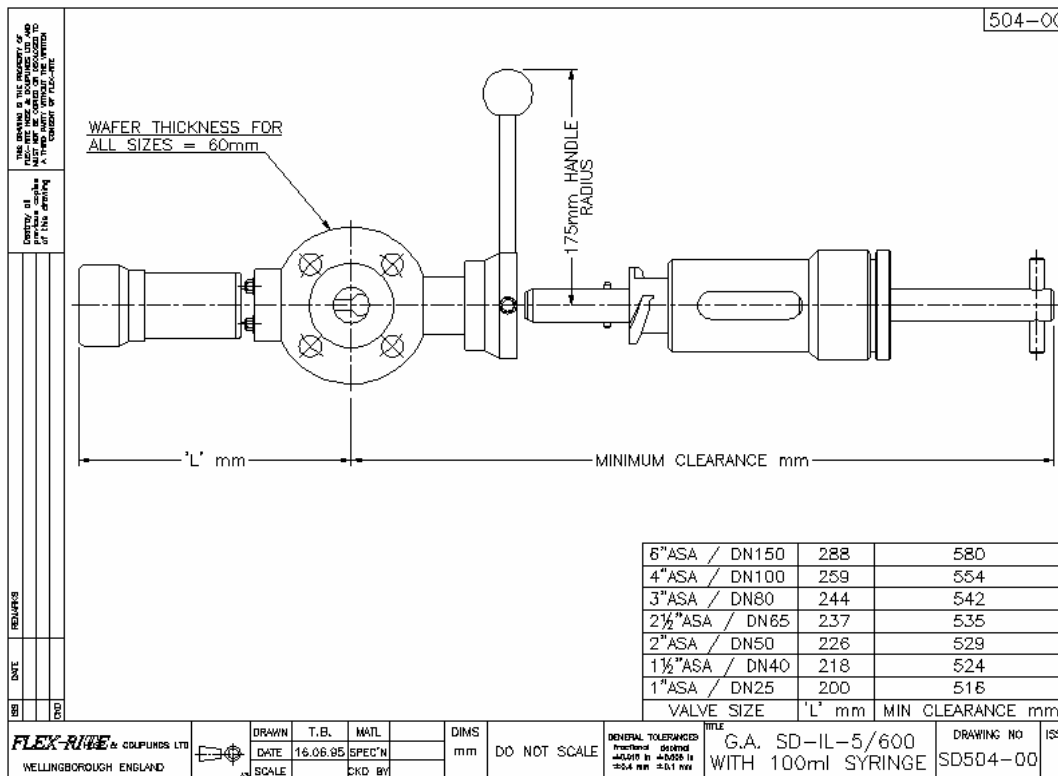
The sampling valve should be ideally stored in cool dry conditions in a dust free environment.

The flange faces on 500 series have serrated grooves and should be protected from damage.

The 600 series have relatively soft PFA flange faces that must 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 mating flanges. Choose a position within the pipeline that is easily accessible to ensure trouble-free function of the valve by the operator. The syringe unit pulls away from body, the syringe plunger extends outwards from the body as the sample is taken, sufficient space must be allowed for this. Please see drawing below for dimensional details.



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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 unlined valves. PFA lined valves can be assembled into a lined pipeline without requiring gaskets, If mounted in unlined pipework gaskets should be used. 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.

### **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 remove the carrying cap from the syringe unit, this is done by rotating the polypropylene cap anticlockwise whilst holding the body of the syringe to release.



Offer the syringe unit carefully up into the sampling connection in the sampling device.



With your free hand rotate the operating lever mounted on the valve connection clock wise by 90 degrees. The syringe has a cam attachment, you will be able to feel the cam mechanism engaging and locking in position. As the cam engages the sample device automatically opens the valve in the sampling body, a representative sample flows from the pipeline into the borosilicate glass cylinder under pressure from the pipeline.

As this happens you will see the cylinder fill with sample liquor and the spindle will extend outwards. Once the syringe is full it can be released from the sample valve. To do this support the syringe with one hand and turn the operating handle 90 degrees anticlockwise.



Fit the carrying cap again to the syringe sampler. The sampler can then be safely transported to the laboratory for example.



To dispense the sample from the syringe sampler, remove the carrying cap and fit the dispensing cap. This is done by rotating the cap on the cam mechanism until it locks.



The sample can be taken from the syringe by pushing the plunger closed, the sample is dispensed through the tube at the end of the carrying cap



### ***Maintenance***

The syringe sampling system has several gaskets and o-ring seals that can be replaced by the customer on site. CRP would recommend that a maintenance schedule be set up and that the seals are routinely replaced as part of the whole plant maintenance system. All these spares can be supplied; some items require the use of special tools, which are also available.

#### **Stem seal**

The valve body has a PTFE / Chemraz oring spindle stem seal. This seals the process from the handle assembly. These can be replaced by the user if required, to replace the stem seal pack a special tool will be required The tool can be used for all our inline sampling valves. Different seal kits are required for the unlined and lined valve bodies.

#### **Tip Seal**

The unlined valve body has a PTFE tip seal. This is the primary seal, sealing the process from the syringe connection. The lined valve does not have a replaceable tip seal.

#### **Syringe mount seal**

When the syringe assembly is introduced in to the valve body, to seal the syringe tip against the valve a chemraz gasket & PTFE gasket support are used. These can be replaced as required. A special tool is required to remove the syringe mount assembly from the body to gain access to the seals.

## Syringe sampler

The syringe sampler has o-ring and inverted lip seals on the body sealing the glass section. The tip seal arrangement of the sampler has several chemraz o-rings. These seal the tip of the sampler.

### **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

The syringe sampler is suitable for use in temperature range –20 to +150° C & for pressures up to 5 barg maximum.

- (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 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.

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