

INTRODUCTION

The Series 2100 suction demand valve (SDV) is designed to hydraulically isolate a metering pump from its bulky supply tank to prevent variations in suction pressure and hence pump accuracy due to rising and falling tank liquid levels. The valves are capable of accepting inlet pressures up to 15 mtrs. W.C (1.5 BarG) and will provide a pump suction condition of between 1 and 2 mtrs. W.C. irrespective of inlet pressure. The Series 2100 valves are designed for pulsing flow as is normally associated with metering pumps and will not function as a pressure regulating valve under continuous flow conditions. The valves can be used with a wide range of liquids of low to medium viscosity. Whilst they can handle some slurries problems occur when handling particular materials which 'drop out' or settle quickly such as lime slurry. Contact Prochem in these circumstances.



THE MAXIMUM OPERATING PRESSURE FOR STANDARD SERIES 2100 VALVES IS 2 BARG. DO NOT EXCEED THIS PRESSURE UNDER ANY CIRCUMSTANCES

The valves operate on a diaphragm actuated poppet principle with the inlet poppet valve being lifted from its seat when the diaphragm, mounted on the suction side of the valve, senses a demand from the pump in the pipework upstream. The drop in pressure in the diaphragm chamber causes the diaphragm to move upward thus taking the poppet valve clear of its o-ring seat. This allows fresh liquid into the chamber until such time as the pressure is sufficient to deflect the diaphragm back down and so close off the inlet poppet valve once more. This cycle is repeated in line with demands from the pump.

INSTALLATION

THE 2100 VALVE SHOULD NOT BE SUBJECTED TO ANY HYDRO TEST PRESSURE WHATSOEVER AND SHOULD BE ISOLATED FROM ANY PIPEWORK SYSTEM DURING ANY PRESSURE TESTING OF THE PIPEWORK SYSTEM. THE VALVE SHOULD BE SUBSTITUTED WITH AN ELBOW PIECE IF ISOLATION IS NOT POSSIBLE. ELBOW PIECES AVAILABLE FROM PROCHEM.

The 2100 valve can be direct mounted into rigid or flexible pipework. **It is essential that no air pockets exist in the suction line as the build up of air or evolved gases (such as chlorine) will seriously impair the valve operation.** Care should be taken when using flexible pipework so that excessive movement of the hoses does not overstress connections to the valve. The SDV should be mounted as close as is practical to the pump suction and suction lines should be generous in size. Undersize suction lines will produce excessive suction pressure fluctuations which will impair the operation of both the pump and the SDV. The inlet to the valve should be protected by a fine screen strainer as any debris entering the



poppet valve mechanism could prevent it from sealing correctly. The installation position is upright and the valve should be screwed down using the two mounting holes provided. The vent hole in the lower diaphragm chamber should not be obstructed. The lines to and from the valve should be flushed clear of any construction debris prior to installation.

DISASSEMBLY

TAKE EXTREME CARE WHEN REMOVING THE VALVE FROM THE PIPELINE IF THE PRODUCT HANDLED IS HAZARDOUS. THE VALVE BODY AND DIAPHRAGM WILL NORMALLY STILL CONTAIN A QUANTITY OF THE PRODUCT AS THE VALVES DO NOT PUMP DRY. WEARING PROTECTIVE CLOTHING, REMOVE THE VALVE FROM THE LINE AND IMMERSIVE IN WATER OR SUITABLE NEUTRALISER HOLDING THE SUCTION CONNECTION UPPERMOST TO DILUTE THE REMAINING PRODUCT IN THE VALVE BODY.

Release the inlet piece lock screw (13) a few turns to allow unscrewing of the inlet piece (14) with o-ring (15). With this removed the poppet valve chamber is accessible. Using a box spanner and the poppet adjustment tool (page 3) loosen and unscrew the top poppet locking nut & washer (8) along with the poppet valve (6). The poppet valve o-ring (7) can now be removed. Loosen the diaphragm casing screws (12) working diametrically around to reduce component strain. When removed this will allow the lower chamber and diaphragm assembly to drop away. The diaphragm assembly is stripped by unscrewing the flat clamp nut (5). Although not normally required the clamp screw and poppet valve stem can be removed by releasing the stem lock nut and washer and unscrewing the stem. The clamp screw can then be removed.

REASSEMBLY

Replace the diaphragm o-ring seal (10) and refit the diaphragm (11). Replace the lower diaphragm plate (4) and diaphragm clamp nut & washer (5) **DO NOT OVER TIGHTEN**. Locate the diaphragm assembly into the recess in the lower diaphragm chamber. With the upper diaphragm chamber upside down fit the chamber seal o-ring (9). Now invert and locate the upper chamber spigot into the lower chamber recess ensuring that the chamber seal remains in place and that the two mounting bolt holes in the casing halves are in line. When in place refit casing cap screws (12) and re-tighten diametrically. **DO NOT OVER TIGHTEN**. The poppet valve o-ring (7) can now be re-fitted in its recess and the poppet valve replaced onto the valve stem along with the lock nut and washer (do not screw fully down). The inlet piece (14) with o-ring (15) can now be screwed down. The inlet piece lock screw (13) locates into a hole drilled into the inlet piece and correct alignment prior to screwing home will prevent damage to the threads. The poppet valve can now be correctly adjusted by using the adjustment tool (page 3) and a box spanner. With the diaphragm assembly held at the bottom of its stroke the poppet valve is carefully screwed home until it can be felt binding on the o-ring seal. A further quarter turn clockwise should be given and then the lock nut and washer tightened up. Correct seating is confirmed by



either blowing into the suction side port or connecting L.P air to the port. No air leakage should be heard from the inlet port. If leakage is heard then loosen off the locknut, re-adjust and re-test. **Ensure that the poppet valve has not been over adjusted and the diaphragm assembly is always free to move upwards when pushed through the hole in the lower casing.** The valve is now ready for re-installation.

MAINTENANCE

It is recommended that the valves be stripped and checked for wear/ damage once a year and the poppet valve o-ring replaced at least once every 2 years. If the diaphragm should be damaged or has failed during operation, evidence of this would be leakage of the product from the clamp screw hole or vent hole in the bottom chamber.

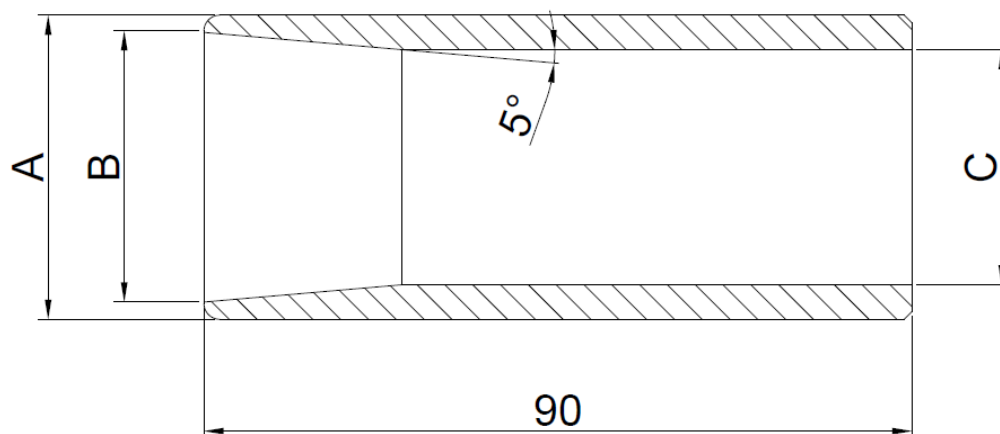
RECOMMENDED SPARES (2 YEARS)

- 1 – Poppet Valve (6)
- 1 – Diaphragm (9)
- 1 – O-Ring Kit (7, 10, 11, & 15)



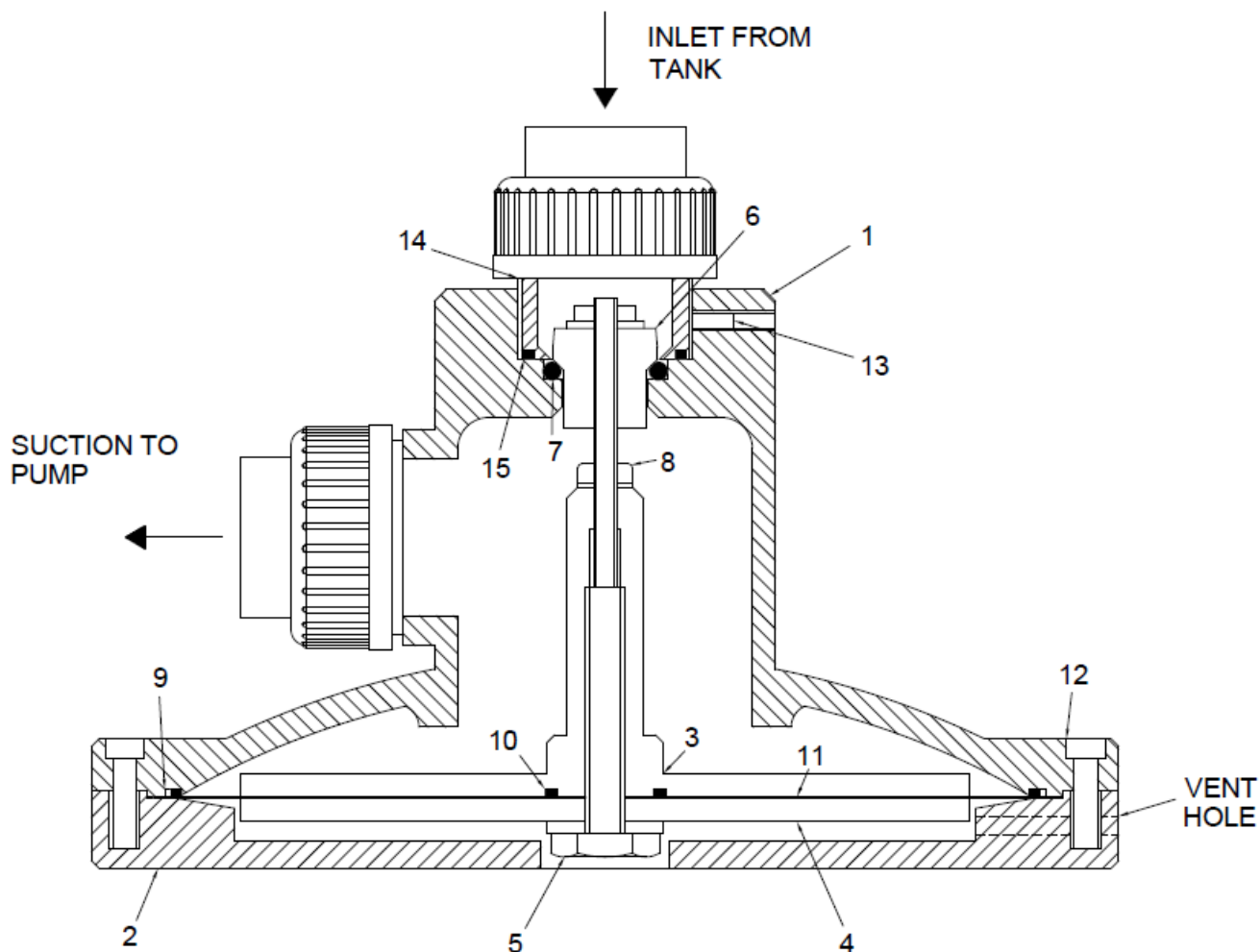
POPPET VALVE ADJUSTMENT TOOL

Made from PVC/ Polypropylene/ Aluminium
(Available from Prochem)



SIZE	1/2"	3/4"	1"	1-1/4"	1-1/2"
A	14.8	20.8	27.8	32.8	38.8
B	12.4	17.2	26.8	29.6	34.4
C	11.5	16.0	24.0	26.0	30.0

SDV SPARES & PARTS LIST



1	UPPER DIAPHRAGM CHAMBER	
2	LOWER DIAPHRAGM CHAMBER	
3	UPPER DIAPHRAGM PLATE	
4	LOWER DIAPHRAGM PLATE	
5	DIAPHRAGM CLAMP SCREW	
6	POPPET VALVE	*
7	POPPET VALVE O-RING	*
8	VALVE STEM NUTS & WASHERS	
9	CHAMBER SEAL O-RING	*
10	DIAPHRAGM SEAL O-RING	*
11	DIAPHRAGM	*
12	CASING CAP SCREWS	
13	INLET PIECE LOCK SCREW	
14	INLET PIECE	
15	INLET PIECE O-RING	*

*** Recommended Spares**