PROCHEM SERVICES LTD.

SERIES 1100 P.R./P.L. VALVES.

INSTALLATION AND MAINTENANCE INSTRUCTIONS.

The 1100 series valves are designed to provide pressure relief over the range of 1 to 10 BarG when using the HP inlet (this is identified as the port having the central vent visible inside), or pressure loading/sustaining duty over the range 0.5 to 3.0 BarG. when using the opposite inlet port. Normally these ports are clearly identified by external labelling but this may be damaged or removed during use. Back pressure at the discharge port in the pressure relief mode will affect the valve performance and set point - check with PROCHEM in these circumstances.

THE MAXIMUM OPERATING PRESSURE FOR STANDARD SERIES 1100 VALVES IS 12 BARG. DO NOT EXCEED THIS PRESSURE UNDER ANY CIRCUMSTANCES.

The valves operate on the spring loaded diaphragm principle with the load on the diaphragm being varied by means of a screw adjuster. The adjusting screw is accessed by removing the bonnet cap on standard valves. On valves equipped with manual override, security locks, or electric contacts then these must be removed first - see the relevant section of these instructions. All adjustments should be made using as broad a bladed driver as possible to avoid damage to the adjuster screw - suitable adjuster tools are available from PROCHEM. As a safety precaution, when fully adjusted to its lower stop the adjusting screw will not block off the valve.

INSTALLATION.

The 1100 series valves are designed for direct mounting in the pipeline via a choice of S.W., screwed, union, or flanged connections. The valves can be mounted in any position although totally inverted mounting is least recommended due to the possibility of air or gas pockets forming in the pipework above the valve and causing erratic operation. If the valves need to be mounted WITH THE PIPELINE AXIS VERTICAL **on lime** or **slurry duties** where settling out will occur then the LP inlet port should always be arranged at the bottom.
The lines to the valves should be flushed clear of construction debris prior to installation as particles of swarf or grit could damage the valve diaphragm if allowed to become trapped between it and the seat. This is especially true in the case of valves fitted with PTFE coated diaphragms. If debris is anticipated during normal operation then a strainer should be installed upstream.

DISASSEMBLY.

Remove bonnet cap and unscrew adjuster to remove spring. Release bonnet locking grub screw by a few turns. The bonnet can now be unscrewed anti-clockwise and removed. The diaphragm can now be removed by pushing on the pressure pad from the spring side. Note: the diaphragm and integral ‘O’ ring seal are a single item.

RE-ASSEMBLY.

Replace pressure pad in recess of bonnet and carefully ease the diaphragm into the threaded area pinching it so as to place the majority of it well into the locating recess of the bonnet. Using a small blunt pointed instrument carefully ease the diaphragm fully into the recess. The diaphragm should feel snug but not tight and all edges should be seated into the recess. Thread the bonnet back onto the body after ensuring that no debris remains in the body or bonnet. The bonnet can be tightened up fully (there may still be a small gap between body nand bonnet). Some resistance

will be felt toward the end as the integral diaphragm 'O' ring is compressed. The bonnet locking screw should now be screwed home to prevent bonnet rotation (this should not be over tightened). The spring can now be inserted (after lightly lubricating with thin mineral or silicone oil) into the bonnet and the adjuster screw turned home to the desired pressure setting. After setting the bonnet cap should be replaced.

MAINTENANCE.

It is recommended that the valves be stripped and checked for wear or damage once a year and the diaphragms replaced at least once every two years along with the springs.

RECOMMENDED SPARES (PER VALVE).

2 Years operation	Commissioning
2 - DIAPHRAGMS.	1 - DIAPHRAGM
1 - LOADING SPRING.	
1 - ADJUSTER SCREW.	
1 - PRESSURE PAD	

It is also considered good practice to have at least one spare diaphragm on stock for emergency replacement.

O & M INSTRUCTIONS FOR OPTIONAL FEATURES.

SECURITY LOCK
MANUAL OVERRIDE
ELECTRIC ALARM CONTACTS

SECURITY LOCK.

With this option a mechanical locking bar is fitted to prevent unauthorised adjustment of the valve setting pressure. The locking bar passes through a slot in the top of the bonnet and is secured with a small padlock. Adjustment of the valve setting pressure can only be achieved by unlocking the bar, sliding it out, and removing the bonnet cap. On larger valves a plastic blanking disc may be fitted and this also has to be removed.

MANUAL OVERRIDE.

This option allows operators to override the valve setting pressure for line flushing or during maintenance or commissioning. The diaphragm pressure pad is lifted by means of a connecting rod passing through the bonnet cap and adjuster screw and actuated by an over-centre toggle lever. To operate, the toggle is lifted to the vertical position where it will remain until lowered thus clearly indicating that override is in operation. Note that the lever only lifts the pressure pad and not the diaphragm so the natural stiffness of the diaphragm will still produce a slight back pressure. To adjust the valve the toggle lever should be unscrewed to withdraw the complete connecting rod assembly. (Normally the thread in the toggle lever is secured with Loctite to facilitate removal.) The bonnet cap can now be unscrewed to reveal the adjuster screw. Reverse the procedure for re-assembly.

MANUAL OVERRIDE WITH SECURITY LOCK.

In this option the connecting rod assembly passes right through the locking bar and the connecting rod must be removed before the locking bar can be withdrawn for adjustment purposes.

ELECTRIC ALARM CONTACTS.

This feature provides a remote means of indicating over-pressure venting of the valve in pressure relief mode. The contact mechanism is via a micro switch mounted on the top of the valve bonnet and which monitors the movement of the diaphragm and pressure pad through an actuating rod and lost motion mechanism. The switching action is no-volt as follows:-

SWITCH RATING.....100VA AT 48 VOLTS.
CONTACTS... NORMALLY OPEN/NORMALLY CLOSED (AS SPECIFIED).
ENCLOSURE PROTECTION.... IP 65 (WITH BOOT FITTED)

To adjust valve set pressure.

If the valve is already installed then remove the rubber protective boot and disconnect and make safe the two spade type terminals. Gripping the red plastic switch mounting pad unscrew this from the valve bonnet anti-clockwise. This will expose the connecting rod and lost motion plunger.**(Be sure not to lose the plunger and the small spring inside the connecting rod).** The connecting rod can now be unscrewed from the pressure pad allowing adjustment of the valve setting spring. If required the switch itself can now be unscrewed from the mounting pad exposing the switch 'O' ring seal. To re-assemble reverse the procedure **ensuring that the lost motion spring and plunger are located correctly within both the connecting rod and the micro switch .** It is recommended that a liquid sealant be smeared around the top of the bonnet to produce a seal between the mounting pad and bonnet.

To adjust the switch sensitivity.

Re-assemble the valve and switch as above ensuring that the switch is fully screwed home into the mounting pad and the pad screwed down onto the valve bonnet. With the protective boot removed and a test meter across the switch terminals unscrew the central switch adjuster screw until the switch contacts make or break (depending upon N.O. or N.C. contacts). Once the contacts have operated then carefully screw in the switch adjuster screw until they just make or break once more. At this point the switch is at its most sensitive - screwing in the adjuster screw further will de-sensitise the setting. Replace the connections and protective boot.

Note:- The minimum recommended operation for the alarm option is a flow rate equal to 30% of the valve steady flow capacity. If lower flows than this are envisaged then the pressure switch alarm option should be considered (see Appendix 1 of these O&M instructions).

ELECTRIC ALARM CONTACTS WITH MANUAL OVERRIDE.

This option is only available when the valve is fitted with the pressure switch alarm option (see Appendix 1). the two features are independent of each other and are dealt with as per their separate instructions.