

## INTRODUCTION

The 'Protector' pressure gauge and pressure switch diaphragm seals are designed to provide an isolation barrier between aggressive/ corrosive fluids and the pressure switch or gauges monitoring them. By using the 'protector' relatively low cost standard gauges and switches can be used instead of those made from corrosive resistant exotic metals. The majority of 'protectors' are manufactured from engineering plastics such as PVC, Polypropylene and PVDF. Other materials are available as required.



**THE HYDRO TEST PRESSURE OF THE 'PROTECTOR' IS 20 BARG AND THE OPERATING PRESSURE SHOULD BE CONSISTENT WITH THIS PRESSURE WITH AN ACCEPTABLE SAFETY FACTOR. PROCHEM NORMALLY LIMITS THE OPERATING PRESSURE TO 10 BARG AT AMBIENT TEMPERATURE.**

The seals operate on the isolation of the diaphragm principle which allows full hydraulic pressure to pass from one side of the seal to the other without passage or mixing of the fluids on either side. The general construction can be seen on DRG. PS/02/767/1 as shown below.

## INSTALLATION

The 'protector' can be fitted in any axis although for practical reasons vertically up is the normal position. If handling a fluid which 'drops out' such as lime slurry then the only position is vertically up with the process port at the bottom. Fixing is by means of 1/2" BSP screw thread onto the main pipeline and the pressure gauge/ switch are normally 1/4", 3/8" or 1/2" BSPF depending on order details. Sealing the connections is normally achieved by using PTFE tape or sealant. **THE PROTECTOR IS NOT DESIGNED TO TAKE HIGH EQUIPMENT LOADS OR TO BE USED AS A PIPE CONNECTOR. CARE SHOULD BE TAKEN WHEN SCREWING INTO PLACE AS NOT TO STRESS THE THREADED PORTS.** If the diaphragm seals are not factory fitted with pressure gauges or switches then extreme care should be taken to ensure their correct filling before installation, see instructions under re-assembly.

## DISASSEMBLY

**ENSURE THE PROCESS LINE IS DRAINED AND NO CORROSIVE FLUID REMAINS IN THE DIAPHRAGM SEAL BEFORE STRIPPING.**

Remove from the process line by unscrewing by hand or using the pin spanner holes until loose enough to continue by hand. If pressure gauge or switch removal is required remove both grub lock screws from before unscrewing. Top grub screw will have a section of O-ring to seal if bonded washer is used. Using a pin spanner and light strap wrench unscrew the two halves of the body assembly. The diaphragm can now be removed along with the chamber filling security screw and O-ring. 3mm Pin Hex Allen key required. Inspect for wear and replace items as required.

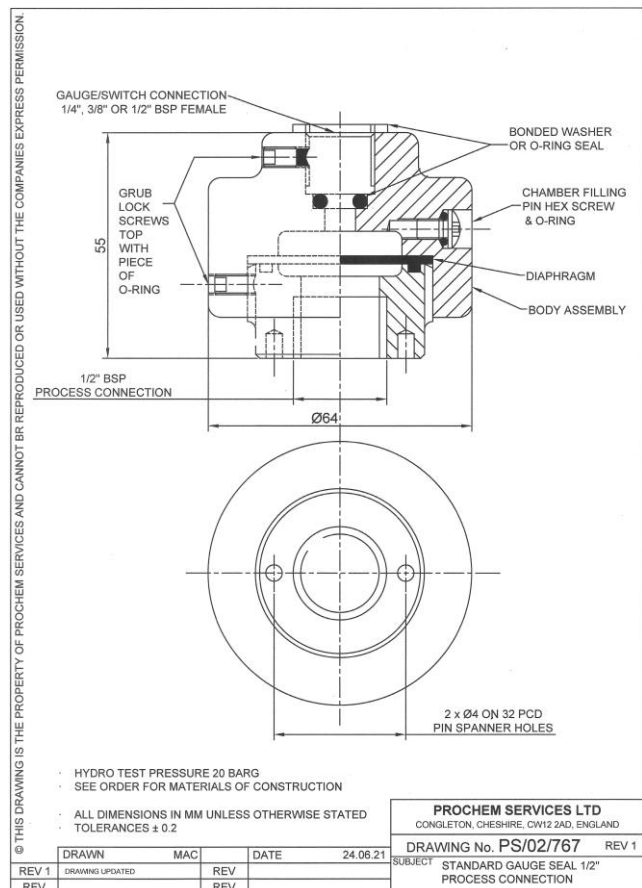


## RE-ASSEMBLY

Locate the diaphragm in place and screw together the two body halves. Note that the grub lock screw locates in a drilled hole in the inner half so the holes should be aligned accurately before locking together. If the diaphragm is coated then ensure this side is to the process port. It is essential that the complete diaphragm chamber and pressure gauge/switch are solidly filled with water or silicone oil for the seal to operate correctly. This is achieved as follows. With the pressure gauge/switch separate from the chamber carefully fill the sensing port with water or silicone oil using a fine syringe ensuring that no air bubbles are trapped in the gauge or switch body. Holding the 'protector' so that the process port is uppermost, carefully screw into place the gauge or switch with its O-ring or bonded washer. Hold vertically to prevent losing the liquid (do not over tighten in vice) fill the diaphragm chamber with water or silicone oil through the filling port with the syringe eliminating any air pockets until the liquid level reaches the filling screw hole. Gradually rotate the assembly whilst filling until the filling port is upmost and full. A light pumping action on the syringe will help draw out any air when in this position. Tap the assembly to release any air bubbles still left on the internal surfaces and top up as required. Slowly screw home the filling screw and O-ring, a slight waggle as you do this will displace the surplus seal liquid to escape past the screw. **The filling screw should not be over tightened.** If possible check the gauge pressure, if not matching then repeat the above.

## MAINTENANCE

It is recommended that the 'protector' be stripped and checked for wear/damage every 18-24 months and the diaphragms and O-rings be replaced. It is good practice to keep a spare diaphragm kit in stock in case of unforeseen damage or failure.



Syringe and Pin Hex allen key to assist bleeding gauge seals and switched 1100 series valves available from Prochem. Part number 'SYRINGE-BLEED-KIT'

