



116 series – Operating and maintenance instructions

116 series – Pressure Reducing Valve

General information:

The type 116 Pressure Regulator will reduce varying inlet pressures to a preset outlet requirement. It is designed for accurate pressure control and features a balanced main valve to maintain a constant outlet pressure, whilst inlet pressure fluctuates.

Installation:

Before installing the regulator, ensure the system operating requirements are matched with the valve specification details printed on the attached data label.

Immediately prior to installing the regulator into a system, check that all protective caps have been removed from various ports. Ensure that no ingress of dirt or debris is allowed to enter any part of the assembly, as this will affect the general working of the regulator.

A check should also be made to establish that the regulator inlet is positioned on the up-stream side and that the ports correspond with the direction of flow within the system.

It is likely, when new installations are assembled, small particles of metal etc will become dislodged. It is therefore recommended that a suitable filter (30 micron or less) be fitted immediately up-stream of the regulator.

As a necessary precaution it is also recommended that a correctly sized pressure relief valve, capable of safely exhausting full flow from the control regulator should be fitted down-stream of the valve. Advice on flow rates at various pressures can be obtained from PRESREG VALVES.

Operation:

When all port connections (including gauge ports, if fitted) have been checked for tightness, and the control knob fully turned anti-clockwise, inlet pressure can be steadily introduced to the regulator. During this time check that no leakage across the valve seat occurs. This will be detected by increasing outlet pressure reading down-stream of the regulator.

Having introduced inlet pressure to the valve, outlet pressure can be controlled by turning the control knob clockwise for increasing pressure and anti-clockwise for decreasing pressure during adjustment. It may be necessary to vent down-stream pressure during adjustment in order to obtain the desired setting.

Finally, check valve operation by venting off (with short steady bursts), the down-stream pressure. Outlet pressure should fall slightly when flow is taken and return to the set pressure when flow ceases.



Spares

A refurbishing facility is offered by PRESREG VALVES and customers are strongly advised to make full use of this service whenever valves need attention. However, from time to time it may not be possible or practical for valves to be returned and therefore it is recommended that customers keep suitable quantities of spare parts in order to carry out their own maintenance.

Spare kits are available from:

Presreg Valves

a trading division of

JRE Precision Limited

18 Bakewell Road
Loughborough
Leicester
LE11 5QY
UNITED KINGDOM
Tel: 44(0) 1509 610580
e-mail: info@jreuk.com

In any correspondence, please quote valve type and serial number.

Maintenance:

Whilst in operation, the various moving components will experience wear. Any elastomer material also has a finite shelf life. It is for these reasons that it is recommended that maintenance be carried out at regular intervals.

Only certain maintenance tasks are recommended, and these are listed below. Work must be restricted to these operations only and no alteration should be made to any component part of the valve, as this may lead to poor performance and even unsafe operation.

Whenever possible, remove the complete valve from the system and carry out servicing at a bench, suitably cleaned to ensure no ingress of dirt or foreign matter into the valve. Anyone wishing to carry out their own maintenance would be well advised to obtain an “O” ring service set of tools as these are specially made to avoid damage to the elastomers during re-assembly.

If, after maintenance has been carried out, the valve is not giving satisfactory performance, the complete unit should be returned, together with a brief outline of faults experienced, to the manufacturer for further investigation.



Recommended maintenance

Before attempting any disassembly of valve, please ensure that a copy of drawing no 116-GA is available for reference, a recommended spares kit is obtained, and a suitable clean area is set aside for working.

****IT IS NOT RECOMMENDED THAT VALVES USED ON MEDICAL/OXYGEN INSTALLATIONS BE SERVICED ON SITE.** Special cleaning procedures and materials are necessary *

*When the valve is to be used for OXYGEN service do not use ordinary grease, ONLY USE FONBLIN RT15. Unsafe conditions may result if this is not observed.

Ensure all pressure is safely vented to zero prior to dismantling. If dangerous medias have been used the system must be purged in accordance with the system service instructions.

1) O ring spares kit:

It is highly recommended that when carrying out any procedure in which the spring housing is removed, that an O ring spares kit is also obtained and fitted before the spring housing is replaced

It is recommended to fit an O ring spares kit whenever the spring housing is removed.

To remove the spring housing (item 2): First remove the dust cap (item 15) and circlip (item 16) retaining the handwheel and place to one side. Pull handwheel (item 10) upwards off the spindle and place to one side.

Use 52 mm spanner to unscrew spring housing using the two flats. The spindle assembly should come away with the spring housing.

Remove the O ring (item 14) from the bottom of the spring housing and discard. Replace with new O ring – apply a small amount of grease to the O ring before fitting.

Push the spindle assembly out of the spring housing and place the spring housing to one side.

Remove the O ring (item 13) from around the spindle and discard. Replace with new O ring – apply a small amount of grease to O ring before fitting.

Using a suitable measuring tool, measure the distance from the top of the spindle to the top of the screw and note this distance (this is important when re-fitting).

Unscrew relief valve screw (item 8) from the top of the spindle. Remove the O ring (item 12) from around the screw and discard. Replace with new O ring – apply a small amount of grease to O ring before fitting.

To refit the spring housing: Screw the relief valve screw back into the spindle, screw down until the screw is the correct distance from the top of the spindle as noted earlier.

Push the spindle assembly back into the spring housing, a small 'pop' should be heard when the spindle seats all the way into the spring housing.

With the load spring still in position, screw the spring housing back into the body, ensure that the O ring in place at the bottom of the spring housing remains in place during this procedure. Tighten using 52mm spanner, no torque is defined for this – tighten to moderate torque.

If no other maintenance is required, the regulator can be brought back into service.

2) Piston spares kit (Venting models)

Follow the procedure above to remove the spring housing and replace the O rings. Place spring housing assembly to one side.

Remove the load spring (item 11) and place to one side.

Refer to drawing no 116-3209 as reference when carrying out the rest of this procedure.

Prise the piston sensing module out from the body using a flat bladed screwdriver.

Hold the bottom spring guide (item 4) in a vice using the flats. Use a suitable flat bladed screwdriver to unscrew the piston (item 2) using the slot in the base of the piston.



Fully unscrew the piston from the bottom spring guide, take the spring (item 6), valve (item 3) and seat (item 5) from inside the piston and discard.

Position new spring into piston, place valve into spring, noting the correct orientation. Gently rest the new seat over the valve. Place the piston to one side.

Remove old O ring and back up ring (item 8,9) from the piston guide (item 1) and discard. Replace with new O ring and back up ring – apply a small amount of grease to O ring before fitting.

Remove O ring (item 7) from the outside of the piston guide and discard. Replace with new O ring – apply a small amount of grease to O ring before fitting.

To rebuild piston assembly – follow the reverse procedure – with the piston resting flat on a surface, push the piston guide over the piston, ensure the spring, valve and seat remain in place. Screw bottom spring guide down until hand tight. Hold in vice to fully tighten, no torque setting is defined for this – tighten to moderate torque.

Position completed piston assembly back into the body, ensuring the O ring (item 7) is seated correctly in the body.

To refit the spring housing assembly – follow the procedure outlined for fitting the O ring spares kit.

To replace handwheel: Place handwheel over the spindle, refit circlip (item 16) and dust cap (item 15).

If no other maintenance is required, the regulator can be brought back into service.

3) Main valve replacement:

The main valve sub assembly should also be replaced as an assembly as supplied.

Unscrew and remove the main valve sub assembly capsule (item 20) from the base of the valve body (item 1). Ensure the O rings and back up ring come out with the capsule.

Screw in replacement main valve sub assembly. Ensure O ring and back up ring are in position around the capsule and that the O ring is in place on the top of the capsule. Secure using 28 mm spanner, torque to 60 Nm. Do not over tighten, there should be approximately 1 mm gap between the capsule and body when fully tightened.

If no other maintenance is required, the regulator can be brought back into service.

4) Panel ring replacement:

First remove the dust cap (item 15) and circlip (item 16) retaining the handwheel and place to one side. Pull handwheel (item 10) upwards off the spindle and place to one side.

Unscrew M4 locking grub screw (item 17) to release the panel ring (Item 3). Unscrew the panel ring and discard.

Replace panel ring with new, replace M4 screw.

To replace handwheel: Place handwheel over the spindle, refit circlip (item 16) and dust cap (item 15).

If no other maintenance is required, the regulator can be brought back into service.

5) Bearing set replacement:

To replace the bearing set, the spring housing must be removed.

To remove the spring housing (item 2): First remove the dust cap (item 15) and circlip (item 16) retaining the handwheel and place to one side. Pull handwheel (item 10) upwards off the spindle and place to one side.

Push the spindle assembly out of the spring housing and place the spring housing to one side.

Remove old bearing set from the top of the piston, a set consists of two washers and a bearing. Ensure that all three components come out. Compressed air can be useful in helping to remove the bearing and washers from the pocket in the spindle.



Discard old bearing components. Refit new bearing set, ensure the correct orientation of components – (*i.e the bearing should be sandwiched by the two washers*).

Liberally grease the bearing with a suitable grease before fitting.

Push the spindle assembly back into the spring housing, a small 'pop' should be heard when the spindle seats all the way into the spring housing.

To refit the spring housing assembly – follow the procedure outlined for fitting the O ring spares kit.

To replace handwheel: Place handwheel over the spindle, refit circlip (item 16) and dust cap (item 15).

If no other maintenance is required, the regulator can be brought back into service.

6) Handwheel replacement

Remove the dust cap (item 15) and circlip (item 16) retaining the handwheel and place to one side. Pull handwheel (item 10) upwards off the spindle and discard.

Place new handwheel over the spindle, refit circlip (item 16) and dust cap (item 15).

If no other maintenance is required, the regulator can be brought back into service.