FLOTRONIC®
ONE-NUT™ PUMPS

A UNIBLOC® BRAND

# Flotronic ‘One-Nut’ Pumps – 7” Slimline Stainless Steel

## Installation, Operation and Maintenance Manual

UNIBLOC®
Hygienic Technologies

## AMENDMENT RECORD

| Issue No. | Date | Signature | Issue No. | Date | Signature |
|---|---|---|---|---|---|
| 1 | 10-03-2021 | D.GILES | | | |
| 2 | 26-05-2021 | D.GILES | | | |
| 3 | 27-05-2021 | D.GILES | | | |

# Contents

# Contents

# 0. General

## 0.1. Introduction

The Flotronic Pumps ‘One-Nut’ Slimline Stainless Steel Pump is used in a wide range of industries including chemical, cosmetic, paints, pharmaceutical, adhesive and hygienic applications.

The pumps are designed to be safe, simple, easy to use and maintain due to the ‘One-Nut’ design.

With proper attention to maintenance, Flotronic Pumps ‘One-Nut’ Stainless Steel Pumps will give efficient trouble free operation.

This manual will familiarise operators with detailed information on installing, operating and maintenance procedures.

## 0.2. Safety Notice

The following safety notices are included throughout this manual but are listed here for clarity:

1. Operation of this equipment must be carried out in accordance with the instructions provided within this manual.
2. Personnel involved in the installation, operation and/or maintenance of this equipment must be competent to carry out the procedures detailed within this manual.
3. Do not operate this equipment if it has a known fault.
4. Only original Flotronic Pumps spare parts should be used in the repair and maintenance of this equipment.
5. Do not exceed 7.2 Barg (105PSI) air supply pressure and ensure the compressed air supply is filtered, dry and oil free to the specifications detailed in section 1.3.5.
6. Do not modify this equipment from manufacturers original specifications.
7. Regular maintenance schedules must be followed to ensure safe and reliable pump operation. See ‘Section 3. Maintenance’ for more details.
8. Before maintenance ensure the air supply, delivery and suction pipelines have been isolated and that any residual pressure within the pump has been relieved.
9. Always wear safety glasses when operating this equipment. In the unlikely event of a diaphragm failure product may be ejected through the air silencers
10. Never operate the pump without the suction and delivery pipe work connected.
11. Work area must be kept clear to avoid potential hazards.

## 0.3. Declaration of conformity

As defined by the Machinery Directive 2006/42/EC, and complies with the essential Health & Safety requirements, Annex 1, and the technical construction file requirements of the Directive.

Where necessary, this pump can comply with ATEX Directive 2014/34/EU.

A declaration of conformity accompanies all pumps, and all pumps carry the UKCA Mark as required by UK Law and the CE Mark as required by European Law.

## 0.4. Training

Personnel involved in the installation, operation and/or maintenance of equipment supplied by Flotronic Pumps must be competent to carry out the procedures detailed within this manual. As a minimum we recommend that personnel be trained in:

1. The safe use of compressed air.
2. Manual handling.
3. Use of lifting equipment, (should it be required).

## 0.5. Limitations of use

All performance figures are based on tests carried out by Flotronic Pumps using water at ambient temperature.

Operating temperatures are governed by the materials of construction and it is the installer's responsibility to ensure that these maximum temperatures are not exceeded under any circumstances.

Performance figures provided by Flotronic Pumps against individual enquiries are estimates only, and are subject to variations depending upon air pressure and volumes of air provided by the client, head losses due to pipework, valves and any other installation factors which may be unknown to Flotronic Pumps.

All performance figures, temperatures, flow rates, dimensions and other details are subject to change without notice.

Due to the wide variety of media handled by Flotronic pumps, it is impossible for Flotronic Pumps to give a firm recommendation regarding materials of construction for pump components. It is the users or specifiers responsibility to determine the effect of corrosion, abrasion and the general suitability of any pump supplied for any individual application. Flotronic Pumps will, however, give advice regarding such material selection as it may be able to do so in good faith.

**WARNING** - WHEN HANDLING FLOTRONIC PUMPS PRODUCTS, PLEASE OBSERVE WEIGHTS GIVEN WITHIN FLOTRONIC PUMPS LITERATURE, LIFTING EQUIPMENT MAY BE REQUIRED IN CERTAIN CASES.

# General

All pumps despatched from our works are tested with water and during storage, packing and installation, some water will have remained in the pump body. This water may cause spillage during handling. Water could react with the media you wish to pump, and it is your responsibility to check this before putting the pump into operation. Water may also freeze if the pump is exposed to sub-zero temperatures. Do not operate the pump under these conditions as ice inside the pump may cause damage to working parts of the pump.

At all times the installer must wear suitable clothing, footwear, goggles, etc. for personal protection. This particularly applies when the pump is being operated or maintained.

In the case of diaphragm failure leakage of media can occur from the exhaust silencers unless a guardian protection system is fitted.

If the media being processed is hazardous, then provision must be made by the user to deal with this problem. This can be achieved by specifying a guardian protection system as part of the original pump specification or as a retrofit from Flotronic Pumps, or the silencers must be removed and replaced by pipework which can carry the leakage to a safe place. Please note that wherever the media is piped, pulses of mixed air and media will occur at the end of the pipework when diaphragm failure has occurred. Provision must be made to accept the volumes of air/media mixture that may be present.

**WARNING** - MEDIA MAY REMAIN INSIDE THE PUMP AFTER USE AND MAY BE UNDER PRESSURE.

## HEALTH HAZARD WARNING

Flotronic Pumps products may contain PTFE depending upon specification.

At temperatures up to 250 °C polytetrafluoroethylene (PTFE) is completely inert.

At higher temperatures however, small quantities of toxic fumes can be produced and the direct inhalation of these can cause an influenza type of illness, which may not appear for some hours, but which subsides without after effects in 24 to 48 hours. Such fumes can arise from PTFE particles picked up on the end of a cigarette, or in the presence of any open flame or similar i.e. electric fire, therefore smoking should be prohibited when pumps are being serviced or PTFE components are being handled.

The disposal of PTFE components such as diaphragms etc. must be carefully controlled and under no circumstances should be burned.

# 0.6. ATEX Safety Information

## 0.6.1. General

These instructions must be kept close to the product's operating location or directly with the product.

These instructions are to be followed to comply with ATEX safety requirements. Any further local regulations must also be adhered to. Always coordinate repair activity with operations personnel, follow all plant safety requirements and applicable safety and health/law regulations.

These instructions should be read prior to installing, operating, using and maintaining the equipment in conjunction with the main user instructions provided. The equipment must not be put into service until all the conditions relating to safety instructions have been satisfied.

## 0.6.2. ATEX Directive 2014/34/EU (Equipment for Explosive Atmospheres)

Where applicable the equipment is in conformance with the Directive. To establish if the equipment is CE marked for ATEX, observe the equipment nameplate and the certification provided.

It is the responsibility of the user to ensure that the equipment is correctly rated for the environment in which it is to be used.

A technical file is lodged with Intertek Italia S.P.A, notified body 2575 under document number 3010075.

## 0.6.3. Personnel qualifications and training

All personnel involved in the operation, installation, inspection and maintenance of ATEX compliant products must be qualified to carry out the work involved.

## 0.6.4. Products used in potentially explosive atmospheres

Measures are required to:

4. Avoid excess temperature.
5. Prevent build-up of explosive mixtures.
6. Prevent the generation of sparks.
7. Prevent leakages.
8. Maintain the equipment to avoid potential hazard.

The following instructions for pumps and ancillary equipment, when installed in potentially explosive atmospheres, must be followed to help ensure explosion protection. All equipment must meet the requirements of European Directive 2014/34/EU.

## 0.6.5. Scope of compliance

Use equipment only in the zone for which it is appropriate and suitably rated.

## 0.6.6. Marking

An example of ATEX equipment marking is shown below. The classification of the pump will be engraved on the nameplate (Fig 1).

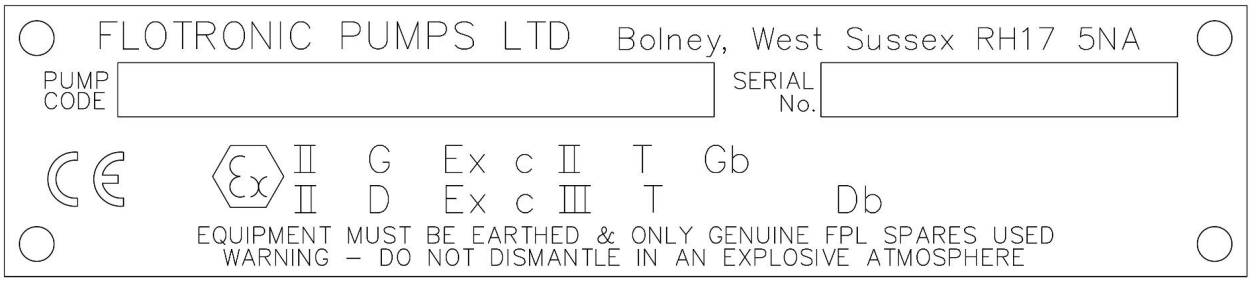



Fig 1 Example ATEX Nameplate

Special attention must be paid to the marking on the ATEX nameplate.

It is essential to comply with the instruction prohibiting dismantling of the equipment in a flammable atmosphere where applicable.

## 0.6.7. Avoiding excessive surface temperatures

**WARNING** - ENSURE THE EQUIPMENT TEMPERATURE CLASS IS SUITABLE FOR THE HAZARD ZONE

## 0.6.8. Pump media temperature

Pumps have a temperature class as stated on the nameplate. These are based on a maximum ambient of 40 ºC (104 ºF). Refer to Flotronic Pumps if higher ambient temperatures are to be considered.

Where there is any risk of the pump being run for prolonged periods against a closed or partially closed valve generating high media and casing external surface temperatures, it recommended that users fit an external surface temperature protection device.

## 0.6.9. Preventing the build-up of explosive mixtures

**WARNING** - ENSURE PUMP IS PROPERLY FILLED WHENEVER POSSIBLE AND DOES NOT RUN DRY FOR LONGER THAN 5 MINUTES CONTINUOUSLY.

Ensure the pump and relevant suction and delivery pipeline system is totally filled with media during the pumping operation, so that an explosive atmosphere is prevented.

If the operation of the system cannot avoid this condition, ensure that the pump does not run dry for more than 5 minutes continuously.

## 0.6.10. Preventing sparks

To avoid the potential hazard from an electrostatic charge generating a spark, the earth stud on the pump casing or foot must be connected to ground.

Do not rub non-metallic surfaces with a dry cloth for cleaning.

## 0.6.11. Preventing leakage

The pump must only be used to handle media for which it has been approved to have the correct corrosion resistance.

Avoid entrapment of media in the pump and associated piping due to closing of suction and delivery valves, which could cause dangerous excessive pressures to occur if there is heat input to the media.

## 0.6.12. Maintenance to the double diaphragm pump to avoid potential hazards

**WARNING** - CORRECT MAINTENANCE IS REQUIRED TO AVOID POTENTIAL HAZARDS WHICH GIVE A RISK OF EXPLOSION.

The responsibility for compliance with maintenance instructions is with the plant operator.

To avoid potential explosive hazards during maintenance the tools used must not give rise to sparking or adversely affect the ambient conditions. Where there is a risk from such tools or materials, maintenance must be conducted in a safe area.

It is recommended that a maintenance plan and schedule is adopted, in line with the user instructions provided, to include the following:

1. Check for any leaks from gaskets and seals. The condition of the divider seal must be checked regularly to ensure correct functioning.

2. Check that the duty condition is in the safe operating range for the pump.

3. Check that dirt and dust is removed from operational areas of the pump and any surfaces liable to experience high temperatures.

4. Check the operation of the air valve.

5. Check the condition of the thrust tube bearings and renew the complete thrust tube if any sign of excess wear or damage is apparent.

6. Inspect the diaphragms and renew if any sign of damage is apparent.

## 0.6.13. Additional safety instructions

When installing a pump either for the first time or after maintenance, a check must be made to ensure that the earth connection terminal on the pump and any external metalwork is at ground potential.

Ensure that all metallic pump shrouds and casings are correctly fitted after maintenance, and that earth continuity between them is at ground potential.

Only genuine Flotronic Pumps spare parts should be used to ensure ATEX compliance.

# 1. Installation

## 1.1. Packaging and Shipping Inspection

Although precaution is taken when packaging and shipping, we urge you to carefully check the shipment on receipt. Make sure that all parts and accessories listed on the packaging list are accounted for. Immediately report any damage or shortage to the Transport Company and Flotronic Pumps.

## 1.2. Storage

If the equipment is to be stored prior to installation, place in a clean location. The pump should be stored in an ambient temperature of 15◦C (59◦F) to 25◦C (77◦F) and relative humidity below 65%. Do not remove the protective covers from the suction, delivery and air connections which have been fastened to keep pump internals free of debris.

## 1.3. Installing the Slimline Pump

### 1.3.1. Foundation

The pump will operate properly without being fixed to a foundation, however if the pump is required to be fixed in position, all Flotronic Pumps are provided with mounting plates and suitable holes for bolting.

1. Mount the pump to a suitable base plate or foundation.
2. Make sure the foundation is able to absorb vibrations.
3. Ensure fixings used are suitable for the duty.
4. Fixing hole size can be found in section 5.3

## 1.3.2. Connection of suction and delivery pipes

**WARNING** - ANY ASSOCIATED PIPEWORK (FLEXIBLE OR RIGID) SHOULD BE FITTED TO CORRECT STANDARDS TO MINIMISE STRESS CAUSED BY PIPE VIBRATION/MOVEMENT. PIPE STRESS CAN CREATE A HAZARD TO PERSONNEL.

Flotronic Pump connections are designed of adequate thickness to absorb normal pipe loads/connections. Do not over tighten or force pipes into threads (particularly female plastic threads).

Connecting the suction and delivery pipework properly is critical to performance sustainability.

**When connecting the suction pipework, observe the following:**

1. Flexible piping should be used between the suction connections and any rigid pipework.
2. The internal diameter of the pipe should be the same or larger than that of the suction connection to maintain efficient suction capability.
3. Ensure connections to the pump are flanged, screwed or clamped to appropriate standards.
4. Ensure connections are completely tight and that bends and/or restrictions to the pipework are kept to a minimum.
5. Any leakage in the suction pipework will dramatically reduce the suction capability of the pump.

**When connecting the delivery pipework, observe the following:**

1. Flexible piping should be used between the delivery connections and any rigid pipework.
2. The internal diameter of the pipe should be the same or larger than that of the delivery connection to maintain efficient delivery capability.
3. Ensure connections to the pump are flanged, screwed or clamped to appropriate standards.
4. Ensure connections are completely tight, that bends and/or restrictions to the pipework are kept to a minimum.

### 1.3.3. Connection of Air Pipes

Air pipework and connections must be suitable for the purpose.

Air supply pipework and fittings must correspond to the air connections on the pump.

It is recommended that air connections must include a short length of flexible pipework to avoid side or end loads being applied to the tie rod assembly.

Any remote isolation valve in the air supply line should be installed within 1 metre of the pump.

Do not over tighten or force pipes into threads.

### 1.3.4. Air Pressure

**WARNING** - OPERATING THE PUMP AT A HIGHER PRESSURE THAN INSTRUCTED BELOW CAN DAMAGE THE PUMP AND MAY CAUSE INJURY TO PERSONNEL.

Maximum air pressure must not exceed 7.2 bar (105 psi) and the pump should be operated at the lowest pressure to achieve adequate performance from the pump.

### 1.3.5. Air condition

A clean supply of compressed air is required (maximum particle size after filtration of 25 microns). The pump will run most efficiently on dry non-lubricated air.

## 1.4. Example of Installation

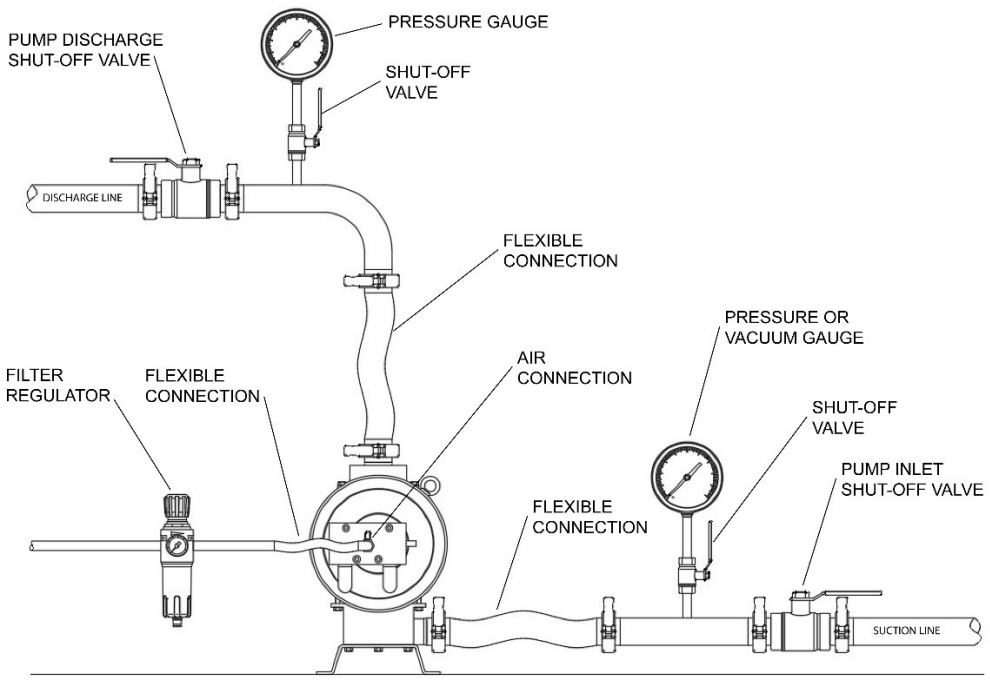



Fig 2 Example of Installed Pump

# 2. Operation

**WARNING** - DO NOT OPERATE THIS EQUIPMENT IF IT HAS A KNOWN FAULT.

## 2.1. Before starting the pump

1. Make sure the pump is correctly installed in accordance with the installation instruction detailed in chapter 1.

2. When a pump is newly installed, check all fastenings are tightened to the correct torque value. Torque figures are detailed in chapter 5.2 Table 3.

## 2.2. Operation of pump

1. Ensure any valves located in the suction and delivery pipework are open.

2. Open the air inlet valve and apply air pressure.

3. If a valve is fitted adjacent to the pump on the delivery side of the fluid pipework, this can be used to control flow. Alternatively the pump may be controlled by adjusting the air supply.

## 2.3. Noise levels

Noise levels from the Flotronic Pumps pump will generally not exceed 85 decibels at one metre distance.

Hearing protection may be required.

## 2.4. Recommendations for Best Pump Performance

The following points should be observed to achieve the best results from all Flotronic pumps:

1. Operate the pump at the minimum speed and pressure to achieve the required duty point.

2. Ensure suction pipework is free from restrictions and as short as possible.

3. Suction pipework diameter should be at least the same as the pump inlet

4. Dry running should be kept to a minimum.

5. Air connection to have a minimum ID of 10mm.

# 3. Maintenance

The unique ‘One-Nut’ construction enables the user to carry out all maintenance quickly and efficiently.

**WARNING** - AIR SUPPLY TO THE PUMP MUST BE ISOLATED BEFORE ANY MAINTENANCE IS CARRIED OUT.

**WARNING** - MEDIA COULD REMAIN INSIDE THE PUMP AND MAY BE UNDER PRESSURE. PERSONNEL MUST WEAR APPROPRIATE PPE AT ALL TIMES.

**WARNING** - ONLY ORIGINAL FLOTRONIC PUMPS SPARE PARTS SHOULD BE USED IN THE REPAIR AND MAINTENANCE OF THIS EQUIPMENT.

## 3.1. Routine inspection

Frequent observation of the pump operation is recommended to optimise performance.

## 3.2. Complete inspection

The intervals for a complete inspection depend upon the operating conditions of the pump, the characteristics of the media, temperature and running time.

It’s recommended that a complete inspection is carried out at least once per year.

If a problem has occurred or if the pump is in need of a complete inspection, refer to procedures below.

## 3.3. Disassembly of the pump

Disassembly of the Flotronic Pumps Slimline pump can be easily achieved by competent personnel.

Spares required: Service kit.

To disassemble the Flotronic pump perform the following procedure:

Fig 3

1. Loosen and remove main nut.

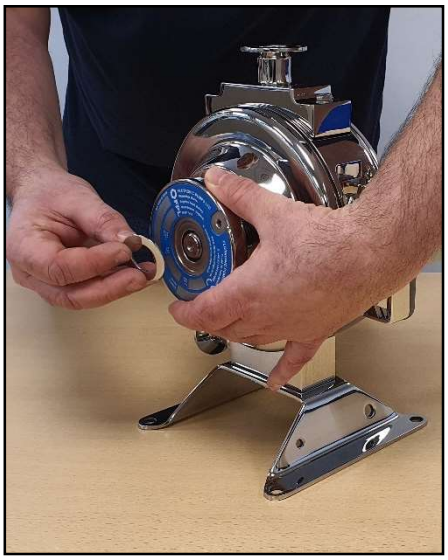
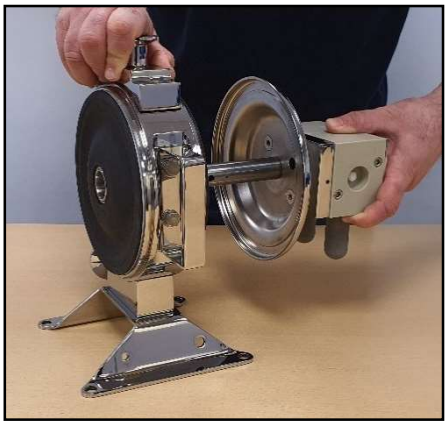


Fig 4

2. Remove the dome washer assembly.

Fig 5

3. Remove the secondary air dome.



4. Slide out the air system complete with the air valve and the primary air dome.

Fig 6

Fig 7

5. Gripping both diaphragms, unscrew and remove either diaphragm from the thrust tube.

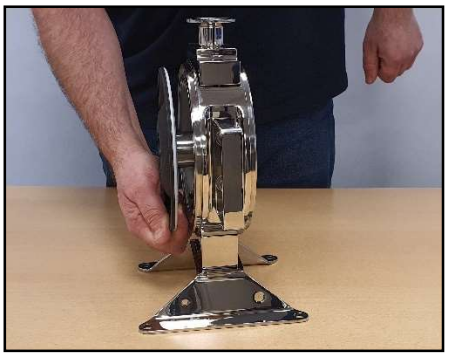


Fig 8

6. Withdraw the other diaphragm with the thrust tube attached.

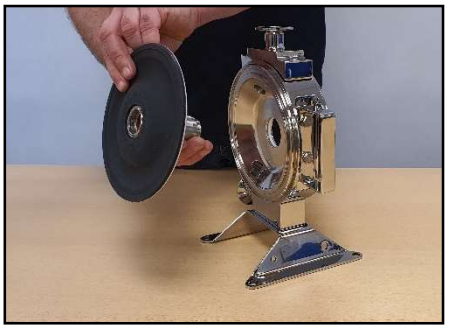


Fig 9

7. Unscrew the second diaphragm from the thrust tube.

It is recommended that the thrust tube is held in a vice using soft jaws to aid diaphragm removal and prevent damage to the thrust tube surface.

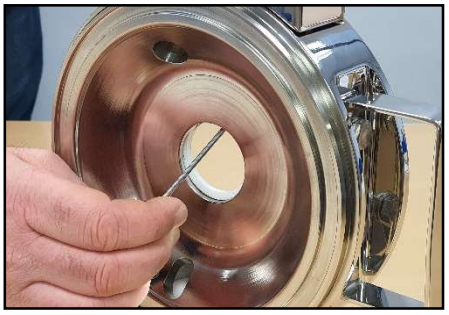


Fig 10

**8. Standard Divider Seal**

Using a suitable tool, push the divider seal up into the groove until the bottom can be pulled or pushed out and removed.

The groove in the body is machined so that it is deeper towards the top of the pump.

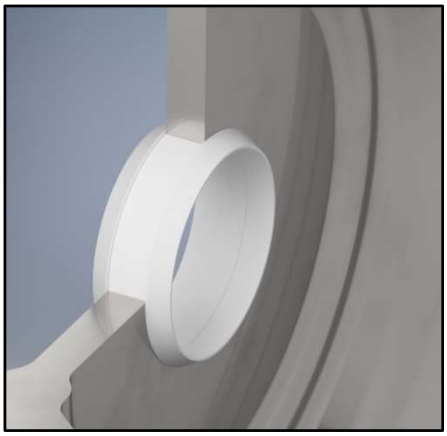


Fig 11

**9. Snap Fit Divider Seal**

The divider seal may be pushed out with a suitable blunt tool whilst taking care not to damage the face of the body.

Fig 12

10. Unscrew the two bolts and remove the delivery manifold.

Fig 13

11. Remove the two delivery balls.

Fig 14

12. Use a suitable tool to remove the two delivery manifold ‘O' rings.

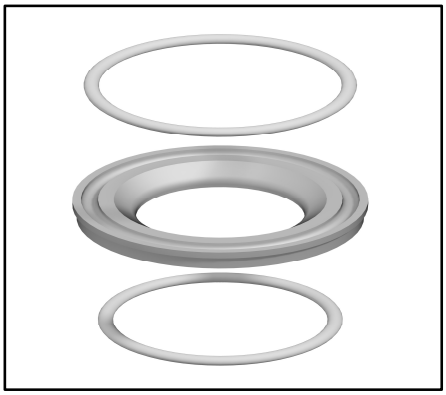


Fig 15

13. Pumps fitted with optional replaceable seats will have 2 ‘O’ rings per seat.

Fig 16

14. Unscrew and remove the bolts securing the suction manifold to the main body.

Fig 17

15. Lift the main body off the suction manifold and remove the two suction balls.

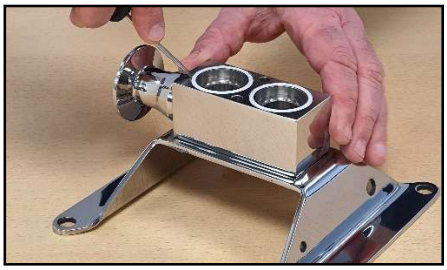


Fig 18

16. Use a suitable tool to remove the two suction manifold ‘O’ rings.

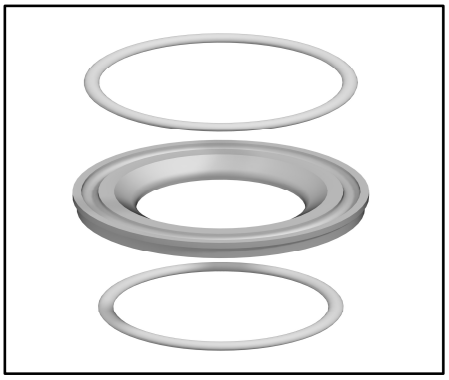


Fig 19

17. Pumps fitted with optional replaceable seats will have 2 ‘O’ rings per seat.

Fig 20

18. The Flotronic Slimline pump is now disassembled with the exception of the air valve. Please see section 3.5 for air valve removal.

Check all components for wear or damage and replace if necessary.

## 3.4. Assembly of the pump

Assembly of the Flotronic Slimline pump can be easily achieved by competent personnel.

Spares required: As identified during inspection.

Supplies required: Suitable lubricant (as per site protocol)

To assemble the Flotronic Slimline pump, perform the following procedure:

Fig 21

1. Ensure all component parts are present and check for wear or damage, replace if necessary. Clean parts prior to assembly using appropriate cleaning agents.

Special attention should be paid to the diaphragm sealing faces on body and thrust tube.

Fig 22

2. Install the two suction manifold ‘O’ rings, ensuring sufficient care is taken not to damage the ‘O’ rings.

Pumps fitted with optional replaceable seats will have 2 ‘O’ rings per seat (Fig 19)

Fig 23

3. Install the two suction balls in the suction manifolds.

4. Position the main body on the suction manifold.

Fig 24

5. Install the suction manifold and tighten the retaining bolts to the torque value specified in section 5.2 Table 3.

Fig 25

6. Install the two delivery manifold ‘O’ rings, ensuring sufficient care is taken not to damage the ‘O’ rings.

Pumps fitted with optional replaceable seats will have 2 ‘O’ rings per seat (Fig 19)

Fig 26

7. Install the two delivery balls.

Fig 27

8. Install the delivery manifold and tighten the two retaining bolts to the torque value specified in section 5.2 Table 3.

Fig 28

**9. Standard Divider Seal**

Form the divider seal into an oval shape.

Fig 29

10. Bend as shown

Fig 30

11. Install the divider seal by pushing the seal up into the groove.

The groove in the body is machined so that it is deeper towards the top of the pump.

Fig 31

12. Push the bottom of the seal into place and reshape the divider seal by pressing the sides into the groove.

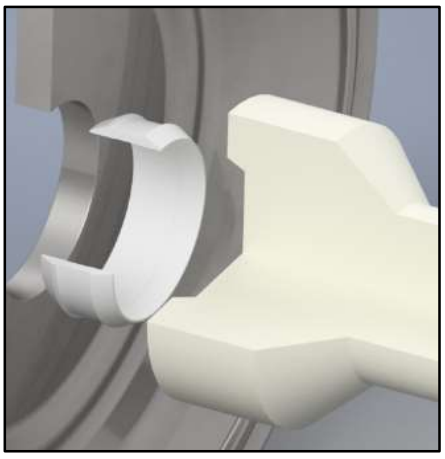


Fig 32

**13. Snap Fit Divider Seal**

Align the divider seal and insertion tool as shown.

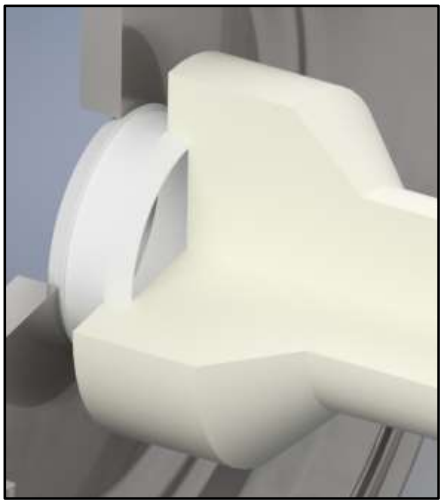


Fig 33

14. Position the new seal into the bore and using the insertion tool T-025, apply a sharp tap with a light mallet or similar, ensuring that the seal is held central and square to the body.

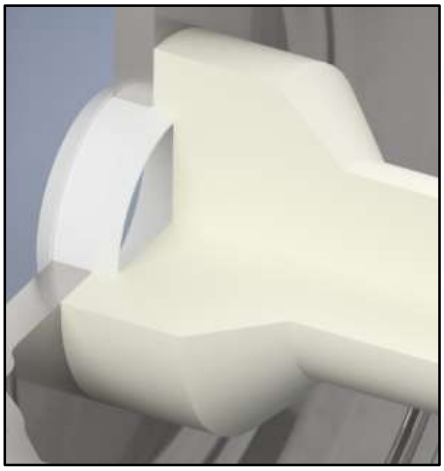


Fig 34

15. Divider seal should ‘snap’ into position. The raised edges of the seal must be checked to ensure that they have engaged fully and correctly on the body faces. Insertion tool is designed to stop the seal being pushed too far.

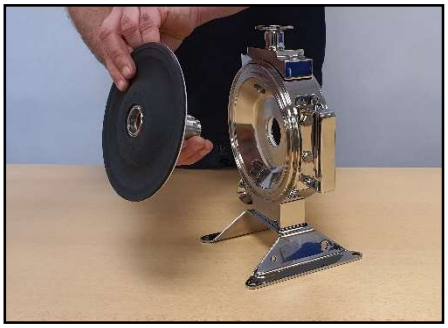


Fig 35

16. Screw the first diaphragm onto the thrust tube, ensure thread is lubricated.

It is recommended that the thrust tube is held in a vice using soft jaws to aid diaphragm fitting and prevent damage to the thrust tube surface.

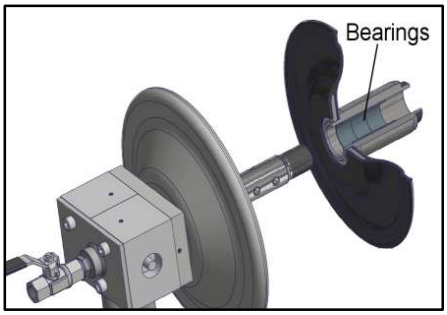



Fig 36

17. Before installing the thrust tube take note of the bearing position within the tube.

Bearing stack should be closest to Air Valve

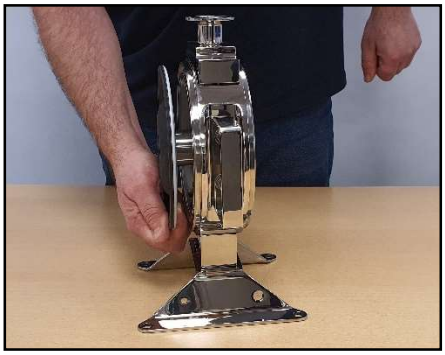


Fig 37

18. Install the diaphragm and thrust tube into the main body of the pump.

Ensure that the thrust tube is inserted with the bearings nearest to the air valve side of the pump as shown in Fig 36.

Fig 38

19. Screw the second diaphragm onto the thrust tube, ensure thread is lubricated.

20. Grip both diaphragms and tighten by hand.

21. Allow 5 minutes and re-tighten.

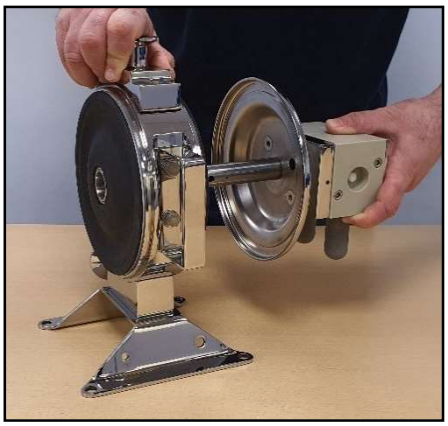


Fig 39

22. Install the air system complete with the air valve and main dome.

Ensure that the air system is inserted with the bearings nearest to the air valve side of the pump as shown in Fig 36.

Fig 40

23. Fit the secondary air dome.

Take care not to damage the ‘O’ ring located in the centre of the air dome.

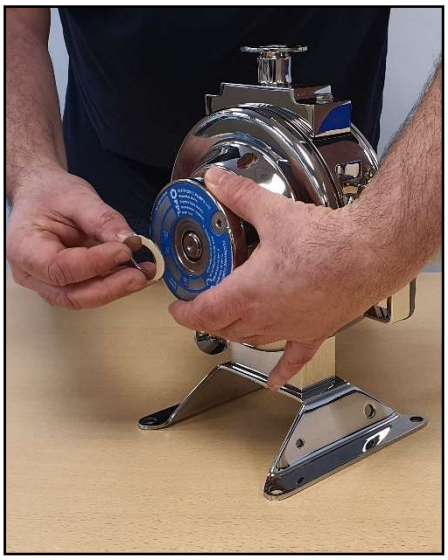


Fig 41

24. Fit the dome washer and rod washer.

Fig 42

25. Fit and hand tighten the main nut.


Fig 43

26. Using a torque wrench, tighten the main nut to the torque specified in Section 5.2 Table 3.

It is recommended that the air valve is positioned with the silencers pointing down before final tightening of main nut.

## 3.5. Air valves

### 3.5.1. Air valve unit inspection and replacement.

**WARNING** - AIR SUPPLY TO THE PUMP MUST BE ISOLATED BEFORE ANY MAINTENANCE IS CARRIED OUT.

TYPICAL AIR VALVE SHOWN, VARIATIONS WILL APPLY DEPENDING ON PUMP SPECIFICATION BUT DESIGN IS FUNDAMENTALLY THE SAME.

The air valve is a non-serviceable item and as such if an issue occurs it is recommended that the complete air valve unit be changed. Please see below for replacement procedure.

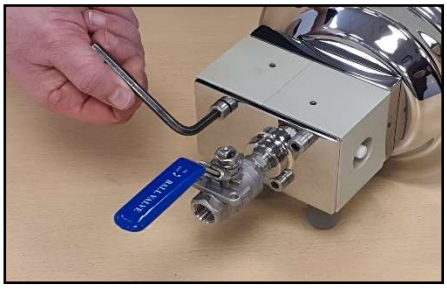


Fig 44

1. Remove the 4 fixing bolts holding the valve unit to the air assembly and main dome.

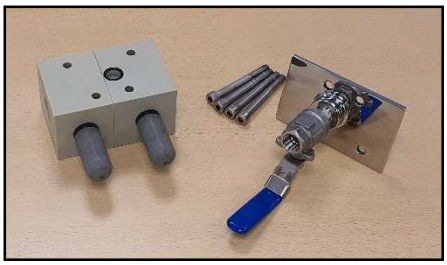


Fig 45

2. Remove the air valve unit and separate from cover plate.

The whole air valve unit can now be replaced.

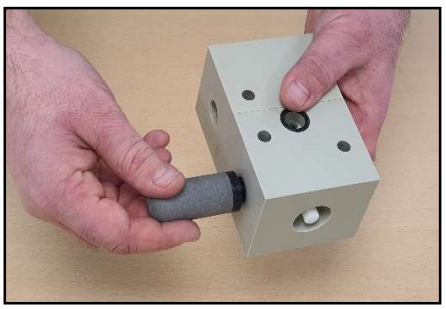


Fig 46

3. Install the two new silencers, that were supplied as part of the repair kit, into the new air valve.

Fig 47

Fig 48

Fig 49

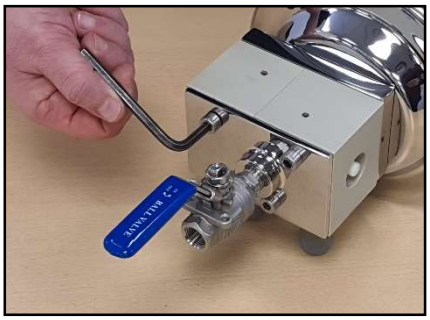


Fig 50

4. Check the two signal holes, (shown in Fig 57), for contamination by blowing compressed air through each hole. Air should flow from the corresponding small hole in the tie rod. One of these holes is shown in Fig 58.

   If a blockage is suspected, clean using a suitable cleaning product.

5. Check the larger air passages for contamination and clean if required.

6. Air valve can now be reattached to the Air Assembly, by means of four bolts, ready for use. Tighten to 8Nm / 6lb/ft

Upon reassembly, please ensure that the air valve face with the single ‘o’ ring seal, as shown in Fig 46, mates to the cover plate and not the pump.

# 4. Spare parts

## 4.1. F Series Slimline metallic pump

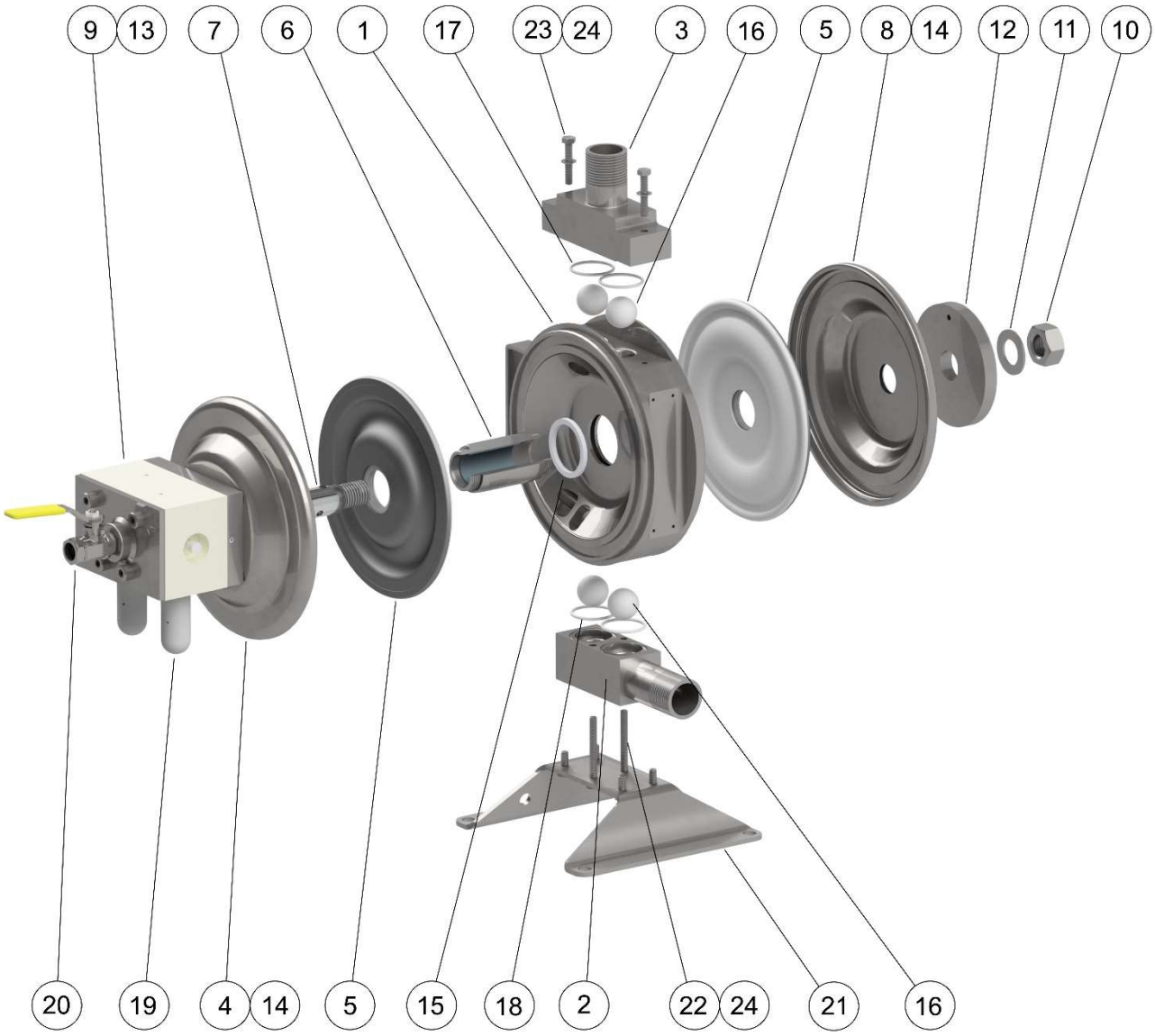



Fig 55 F Series Slimline Pump

**TABLE 1 SLIMLINE FLOTRONIC PUMP PARTS LIST**

| Item No. | Description | Quantity |
|---|---|---|
| 1 | Pump Body | 1 |
| 2 | Suction Manifold | 1 |
| 3 | Delivery Manifold | 1 |
| 4 | Primary Air Dome | 1 |
| 5 | Diaphragm | 2 |
| 6 | Thrust Tube | 1 |
| 7 | Tie Rod | 1 |
| 8 | Secondary Air Dome | 1 |
| 9 | Air Valve | 1 |
| 10 | Tie Rod Nut | 1 |
| 11 | Rod Washer | 1 |
| 12 | Dome Washer | 1 |
| 13 | Air Valve Cover Plate | 1 |
| 14 | Dome ‘O’ Ring | 2 |
| 15 | Divider Seal | 1 |
| 16 | Balls | 4 |
| 17 | Manifold ‘O’ Rings (delivery) | 2 |
| 18 | Manifold ‘O’ Rings (suction) | 2 |
| 19 | Silencers (exhaust) | 2 |
| 20 | Ball Valve (Pump On/Off) | 1 |
| 21 | Footplate | 1 |
| 22 | Suction Manifold Bolts | 2 or 4 depending on version |
| 23 | Delivery Manifold Bolts | 2 |
| 24 | Washer | 4 |

## 4.2. Ordering spares

When ordering spare parts contact Flotronic Pumps with the model number, serial number and the item number from the spare parts list (Table 2) where possible.

# 5. Data

## 5.1. Technical data

| | |
|---|---|
| Maximum Air Pressure | 7.2 Barg |
| Maximum Delivery Pressure | 7.2 Barg |
| Maximum Suction Pressure | 7.2 Barg with optional reinforced diaphragms fitted.<br>0.5 Barg with standard diaphragms. |
| Maximum Media Temperature | 135°C (275°F) depending on diaphragm material |
| Minimum Media Temperature | -15°C (5°F) depending on diaphragm material |
| Suction Lift | Dry 3.6m (12ft)<br>Wet 8m (26ft) |
| Average Volume per Stroke | 0.37 litres |

## 5.2. Tightening torques

Before the pump is put into service and after any maintenance, tighten the fastenings to the torque figures given in Table 3 ensuring fasteners are suitably lubricated.

**TABLE 3 – TORQUE FIGURES**

| | Diaphragm Material | LB/FT | Nm | KGM |
|---|---|---|---|---|
| **Tie Rod Nut:** Stainless Steel / Mild Steel | PTFE/Nitrile | 100 | 135 | 13.5 |
| **Tie Rod Nut:** Silver Plated | PTFE/Nitrile | 75 | 100 | 10 |
| **Manifold M6 Bolts** | Stainless Steel | 7 | 10 | 1 |
| **Manifold M5 Bolts** | Stainless Steel | 3 | 4 | 0.4 |

## 5.3. Dimensions

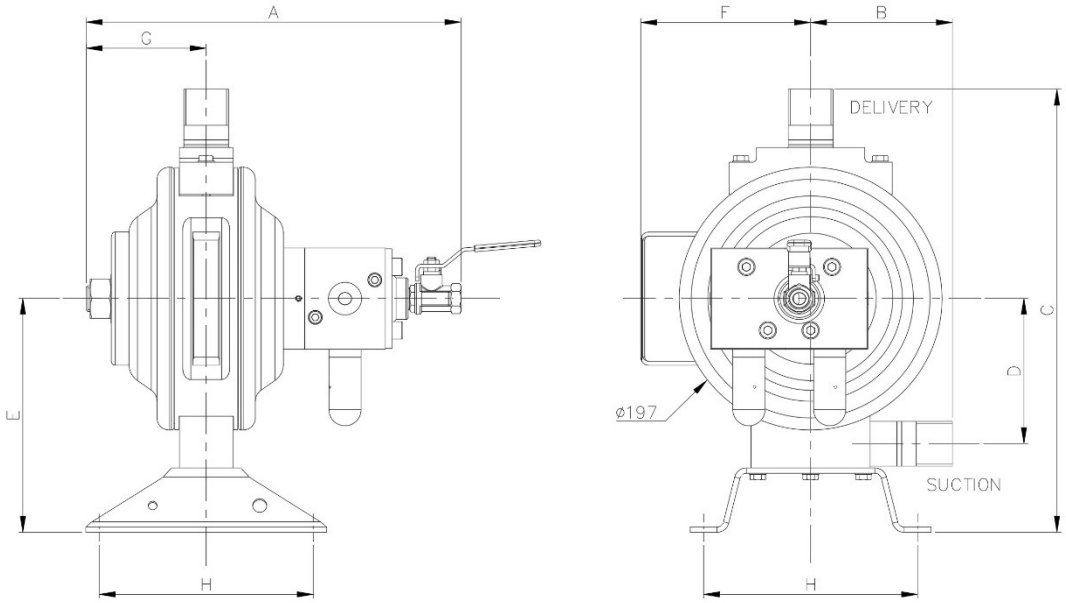



Fig 56 F Series Stainless Steel Slimline pump shown with BSP connections

**TABLE 4 DIMENSIONS WITH BSP CONNECTIONS**

| Size | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) | G (mm) | H (mm) | Wt (Kg) | Diam. |
|---|---|---|---|---|---|---|---|---|---|---|
| ½” | 240 | 101 | 331 | 109 | 175 | 127 | 90 | 160 | 17 | 7” |
| 1” | 280 | 106 | 331 | 109 | 175 | 127 | 90 | 160 | 17 | 7” |

**Pump footplate securing holes for all connection sizes = Diameter 11.0 mm**

All dimensions quoted are for guidance only and will be dependent upon specification chosen.

General arrangement drawings available on request.

# 6. Warranty

## 6.1. Warranty

We warrant that all new equipment sold by us is free from defects in material or workmanship. Our liability under this warranty is limited to making good any part or parts which shall within one year from the date when the equipment was delivered new to the customer be returned to us and which we are satisfied on our examination to have been defective material or workmanship. Included in this warranty are the costs of labour incurred by us in making good such part or parts.

This warranty is given on condition that:-

a) We are notified in writing within 21 days after such defects appear and the equipment or defective parts are returned to us as soon as reasonably practical or where this is not practical made available for inspection by us.

b) The equipment has in our judgement been correctly installed and normally used in accordance with the instructions provided for its installation, operation and maintenance.

c) Unless performance figures and performance tolerances have been stipulated by the purchaser and agreed by us at the time of ordering the equipment, we shall be under no liability in the absence of any defect in material or workmanship for failure to obtain any particular performance.

d) If the equipment has in our judgement been altered, taken apart, repaired, tampered with, neglected, damaged or used in any way so as to adversely affect its performance or condition we shall not be liable for any fault arising from its use.

e) We shall not be liable for faults arising from the use of any spare or replacement parts not authorised or recommended by us.

f) Any equipment or defective part replaced by us shall become our property.

g) The decision whether to repair or replace a defective part under a warranty claim shall be at our discretion.

h) Excluded from this warranty are any parts which need replacement due to wear and tear.

i) Carriage to our works of any equipment or parts returned to us under a warranty claim shall be the responsibility of and at the expense of the claimant.

j) We accept no responsibility for loss or damage howsoever occasioned to customers' goods whilst such goods are in transit to or from ourselves or in the possession of or in transit to or from our agents.

k) We give no warranty in respect of equipment supplied by us except the foregoing warranty and without prejudice to the generality of the foregoing we shall be under no liability whether in contract or otherwise in respect of any defects in the goods or from any injury, loss or damage resulting from such defects or from any work done in connection therewith and we shall not in any circumstances be liable for any consequential loss or damage suffered including any loss of use, loss of contract or loss of profits. Our liability shall in no case exceed the value of goods in relation to which the claim is made.

l) The purchaser acknowledges that the equipment is sold to him in consideration of payment of the price and of the undertaking of the part of the purchaser to:-

- observe all prudent trade practices in relation to installation and user so that the equipment is not used when it is in an unsafe condition for whatsoever reason.

- ensure in so far as the equipment is incorporated into other equipment that such other equipment is in good working order and that such incorporation is in accordance with what the manufacturer would require.

- ensure that users of the equipment are adequately informed of their duties in relation to use of the equipment.

- observe the Health and Safety at work legislation as amended from time to time in relation to the equipment supplied.

So that we shall not be liable in any respect as a result of the purchaser's failure to observe the conditions a) to d) set out above.

## 6.2. Returning parts

When returning parts to Flotronic Pumps the following procedure should be adhered to:

1. Consult Flotronic Pumps for shipping information and a returns form and decontamination declaration.

2. Make sure the part/pump is safe for handling and transport.

3. Pack the return articles carefully to prevent any damage during transport.

Goods will not be accepted unless the above procedure has been complied with.

### 6.2.1. Disclaimer

Information in these User Instructions is given in good faith and is believed to be reliable but due to constant product improvement.

The information in this manual is given in good faith and is accurate at the time of going to press. Flotronic Pumps reserve the right to modify and change any of our products, without notice, in accordance with our policy for continued product improvement through research and development.