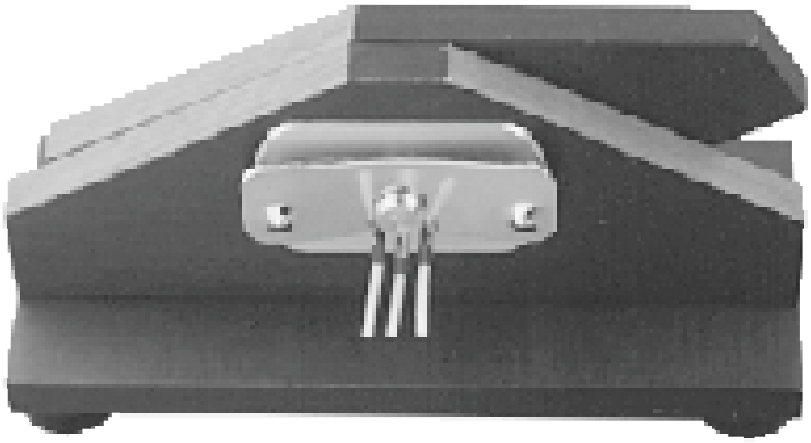
THE UNIVENTOR LIQUID SWITCH



Univentor
HIGH PRECISION INSTRUMENTS

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EDITION 2

Section 1 - WARRANTY & SERVICE

1.1. WARRANTY

Univentor Ltd guarantees all components of the Univentor Liquid Switch to be free from defects of material and workmanship for a period of two years after initial purchase. Univentor will repair or replace, at its discretion, all defective components during the aforementioned warranty period.

For warranty service or repair, all Univentor's products must be returned to Univentor or to an authorised Univentor representative. The client is responsible for shipping charges to Univentor.

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the client, unauthorised modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

For any product expressly covered under this warranty, Univentor is liable only to the extent of replacement or repair of the defective items. Univentor shall not be liable for any personal injury, property damage, or consequential damages of any kind whatsoever. The foregoing warranty is in lieu of all other warranties of merchant ability and fitness for a particular purpose.

1.2. DAMAGED SHIPMENTS

Damage to any part of this instrument during shipping should be reported immediately to Univentor or an authorised representative. You must retain the original packing box and contents for inspection by the freight handler. Univentor will replace any new instrument damaged in shipping with an identical product as soon as possible after the claim filing date. Claims not filed within 30 days after the shipping date will be invalid. Do not return damaged goods to Univentor without first contacting Customer Service for a Return Authorisation Number (RA#). When a defective part is returned to Univentor, the RA# immediately identifies you as the sender, and describes the item being returned. Univentor refuses all unauthorised return shipments.

1.3. SERVICE

Univentor has a skilled service staff available to solve any technical problem. For further details contact Univentor or Univentor's representative. Following discussion of your specific difficulties, an appropriate course of action will be described and the problem resolved accordingly. Do not return any products for service until a RETURN AUTHORISATION NUMBER (RA#) has been obtained. The RA# identifies you as the sender and describes in full detail the problems you have. Turnaround time for service can be quoted to you at the time your RA# is issued, although we can not determine the actual amount of service required until we have received your unit and diagnosed the problem. All correspondence and shipments should be sent to Univentor Ltd. or your Univentor representative.

Section 2 - INTRODUCTION

2.1. INTRODUCTION

The Univentor Liquid Switch is designed to simply and effectively switch between two inlets and one common outlet.

The design guarantees that the unit is completely inert and protected from air entering the system and ensures that there is no dead volume to take into consideration.

Although the Liquid Switch has been designed to be easily handled we recommend that you read this manual to ensure that the unit is maintained at its optimum performance.

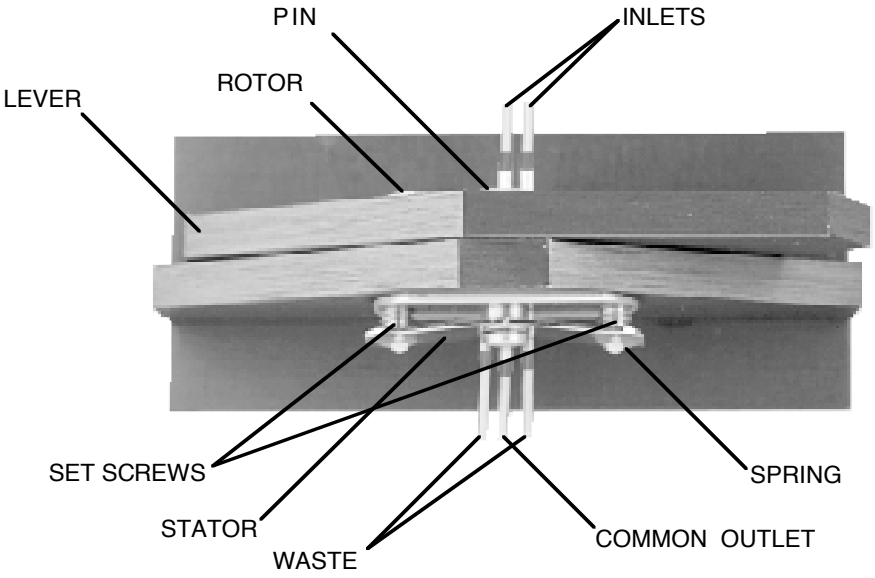

FIGURE 2.1. - The Univentor Liquid Switch

Section 3 - GENERAL

3.1. UNPACKING AND INSTALLATION

Remove the instrument from the shipping container and inspect both the instrument and the package for any signs of damage. If any damage is noted, contact the freight handler immediately, see section 1.2.

Missing Items?

Carefully check the packing list against the contents of the shipping package. If anything appears to be missing, check the packing material very carefully for any overlooked items. If any items are missing, contact your Univentor representative immediately.

3.2. CHANNELS

The side with two channels is the inlet and the side with three channels is the outlet.

Liquid is delivered through the centre channel, the common outlet, and the other two are waste. Note that the inlet not in use is always drained through the same channel so that the two sources never mix.

The channels are controlled by the position of the lever so that the inlet that corresponds with the pressed down side is delivering to the common outlet, centre channel, and the inlet that corresponds with the raised side is drained.

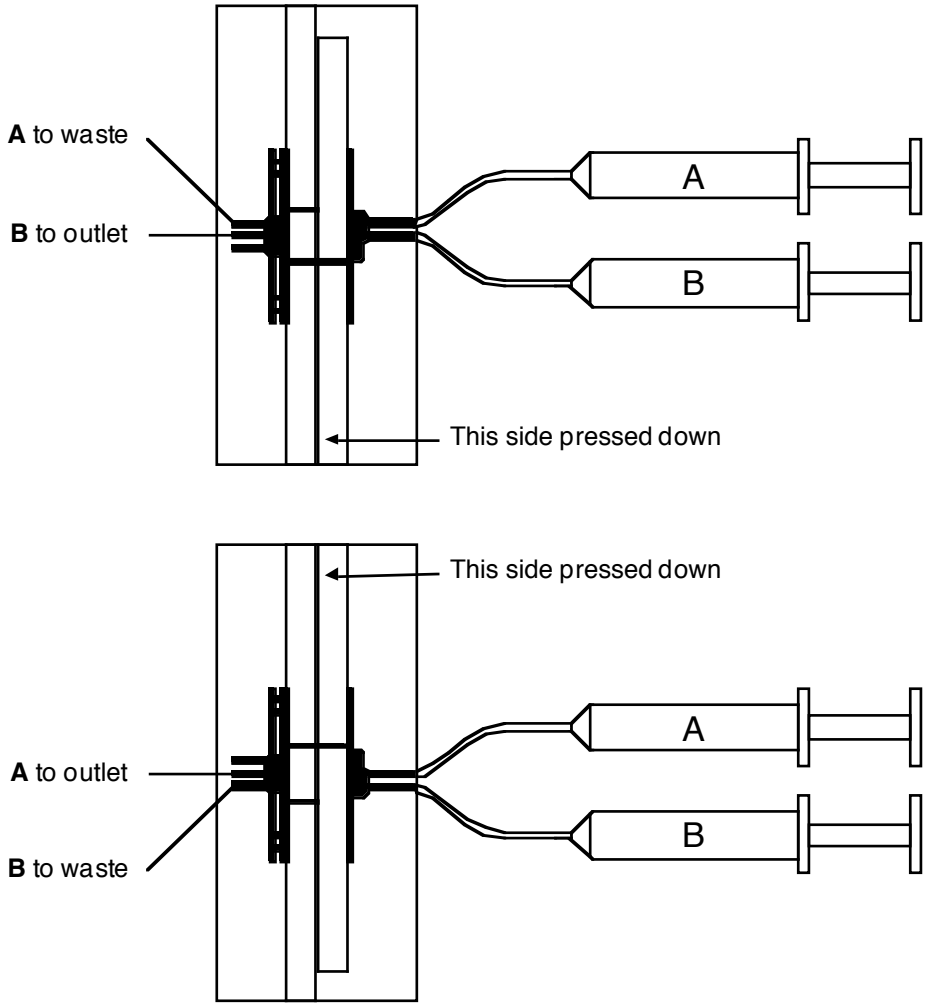

FIGURE 3.2. - The Univentor Liquid Switch with syringes

3.3. TUBING

The outside diameter of the peek tubing is 0.65 mm and any fittings that fit may be used. The Univentor tubing kit consists of 2 PUR tubing lengths of 20 cm each (flanged one end only), 1 meter transparent FEP tubing and 5 adaptors, Cat. No. 7401405.

The tubing length should be kept as short as possible to avoid unnecessary pressure (max. 10,000 mm H_2O/channel).

Section 4 - OPERATION

4.1. INSTRUCTIONS

1) Connect adaptors and tubing using the PUR tubes for the waste.

2) Remove any air from all channels to be used by flushing the system and switching repeatedly.

3) To avoid blockages and consequent leakages it is very important that after each experiment the Liquid Switch is cleaned:

a) Flush all used channels by manually injecting distilled water while switching.

b) Dry all used channels by manually injecting air while switching.

c) Wipe all external surfaces with a soft cloth.

Do NOT use any alcohol containing solvents.

Section 5 - MAINTENANCE

5.1. DISMANTLING

1) Position the lever so that the two internal setscrews are accessible through the holes of the inlet side.

2) Gradually release the two setscrews until the spring is lose enough to remove.

3) Remove spring.

4) Gently push the pin from the outlet side until it protrudes 3-4mm on the other side and the rotor and stator assemblies are released.

5) Remove the rotor assembly (2 channels).

6) Remove the stator assembly (3 channels).

7) Clean:

a) the channels by injecting distilled water. Make sure that there is no blockage and dry the channels by injecting air.

b) all surfaces with distilled water and dry with a soft cloth.

c) the ceramic surfaces by wiping with an antistatic cloth or similar to ensure that there are no dust particles.

8) Assemble unit as per Assembly Instructions.

Do NOT use any alcohol containing solvents.

5.2. ASSEMBLING & SETTING

1) Making sure that ceramic surfaces are completely clean reassemble the unit fitting the rotor (inlet)assembly into the lever and the stator assembly into the other side. Cannulas are to be positioned facing down.

2) Holding the rotor and the stator in position press the pin, from the inlet side, all the way through.

3) Position the spring, horizontally and with indentations facing the set screws, into the slot of the pin. Holding the spring in this position tighten the two set screws alternatively until the spring bends slightly. Do NOT over tighten.

Should pressing of the lever be hard/tight release both set screws gradually and equally.

4) To test that the pressure is adequate and that the channels are open fill a 1ml syringe with a 10mm air bubble followed by distilled water so that the bubble is at the back of the syringe and:

a) connect the syringe to one of the inlet cannulas and set the lever so that the connected inlet is routed to the outlet.

b) press the plunger and make sure that the channel is not blocked. ie: liquid passes freely.

c) block the outlet and press plunger until the air bubble has been compressed to one third of its original size and maintain this position for at least 15 seconds.

d) block the corresponding waste channel, switch and repeat above step 4 c.

e) repeat for the other inlet.

Should the air bubble expand, the channel is leaking. Dismantle and dry all parts following the dismantling instructions. Assemble and tighten the set screws slightly more.

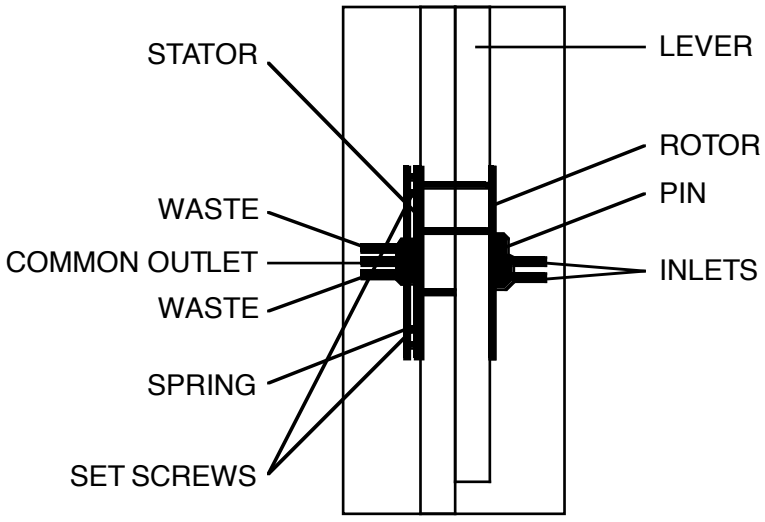

FIGURE 5.2. - The Univentor Liquid Switch

Section 6 - SPECIFICATIONS

Dimensions	30(H) x 25(W) x 60(L) mm
Weight	42 g
Peek Tubing	Internal diameter 0.25 mm
Volume	Outlet Cannulas: 0.72 μl
Dead Volumes	Zero
Pressure	10,000 mm H_2O/channel
Materials	Housing: Anodised aluminium
	Cannulas: Peek tubing supported by stainless steel tubing
	Rotor and Stator: Produced in ceramic

Section 7 - ACCESSORIES

8401405	Univentor Liquid Switch
7401405	Tubing kit for Liquid Switch