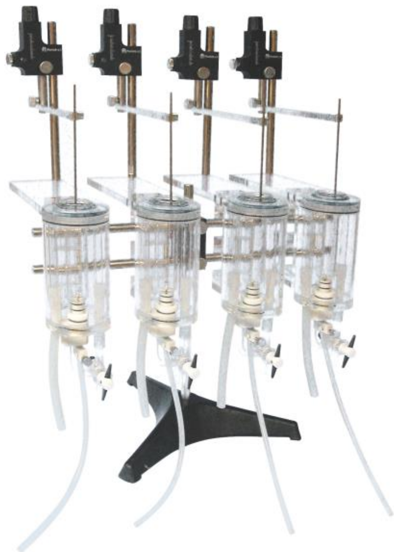
Hardware User's Manual

Modular organ bath

Isolated tissue study



References:

LE11100 (76-0165), LE11200 (76-0166), LE11400 (76-0167)

Version:

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Panlab | Harvard Apparatus

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1. SYMBOLS TABLE

Recognising the symbols used in the manual will help to understand their meaning:

DESCRIPTION	SYMBOL
Warning about operations that must not be done because they can damage the equipment	
Warning about operations that must be done, otherwise the user can be exposed to a hazard.	
Decontamination of equipments prior to disposal at the end of their operative life	

2. GOOD LABORATORY PRACTICE

Check all units periodically and after periods of storage to ensure they are still fit for purpose. Investigate all failures which may indicate a need for service or repair.

Good laboratory practice recommends that the unit be periodically serviced to ensure the unit is suitable for purpose. You must follow preventive maintenance instructions. In case equipment has to be serviced you can arrange this through your distributor. Prior to Inspection, Servicing, Repair or Return of Laboratory Equipment the unit must be cleaned and decontaminated.

Decontamination prior to equipment disposal

In use this product may have been in contact with bio hazardous materials and might therefore carry infectious material. Before disposal the unit and accessories should all be thoroughly decontaminated according to your local environmental safety laws.

3. UNPACKING AND EQUIPMENT INSTALATION

WARNING: Failure to follow the instructions in this section may cause equipment faults or injury to the user.

A. No special equipment is required for lifting but you should consult your local regulations for safe handling and lifting of the equipment.
B. Inspect the instrument for any signs of damage caused during transit. If any damage is discovered, do not use the instrument and report the problem to your supplier.
C. Ensure all transport locks are removed before use. The original packing has been especially designed to protect the instrument during transportation. It is therefore recommended to keep the original carton with its foam parts and accessories box for re-use in case of future shipments. Warranty claims are void if improper packing results in damage during transport.
D. Place the equipment on a flat surface and leave at least 10 cm of free space between the rear panel of the device and the wall. Never place the equipment in zones with vibration or direct sunlight.

The manufacturer accepts no responsibility for improper use of the equipment or the consequences of use other than that for which it has been designed.

PC Control

Some of these instruments are designed to be controlled from a PC. To preserve the integrity of the equipment it is essential that the attached PC itself conforms to basic safety and EMC standards and is set up in accordance with the manufacturers' instructions. If in doubt consult the information that came with your PC. In common with all computer operation the following safety precautions are advised.

WARNING

• To reduce the chance of eye strain, set up the PC display with the correct viewing position, free from glare and with appropriate brightness and contrast settings

• To reduce the chance of physical strain, set up the PC display, keyboard and mouse with correct ergonomic positioning, according to your local safety guidelines.

4. TABLE OF CONTENTS

5. INTRODUCTION

The LE 11100 Modular Organ Baths are highly compact units designed for an easy maintenance of isolated tissues in physiological conditions over long periods, thus making it possible to record responses produced in them by drugs.

Figure 1. Four module LE 11100 Organ Bath assembly.

They consist of a container receptacle for the vessel and a coil heat exchanger. A thermo-regulated pump is necessary to heat the container's water.

The container is made of transparent Perspex; the coil and vessel are made of glass. The vessel can be easily removed from the container.

The baths are shipped by default with 25 ml vessels, but 5 ml, 10 ml and 50 ml vessels are also available.

5.1. ACCESSORIES

- Vessel (1)
- Bar with thread (2)
- Bar with clip (2)
- Bar (2)
- Organ holder (1)
- Bar holder (1)
- Micropositioner (1)
- Gas-valve changer (1)

6. PART IDENTIFICATION

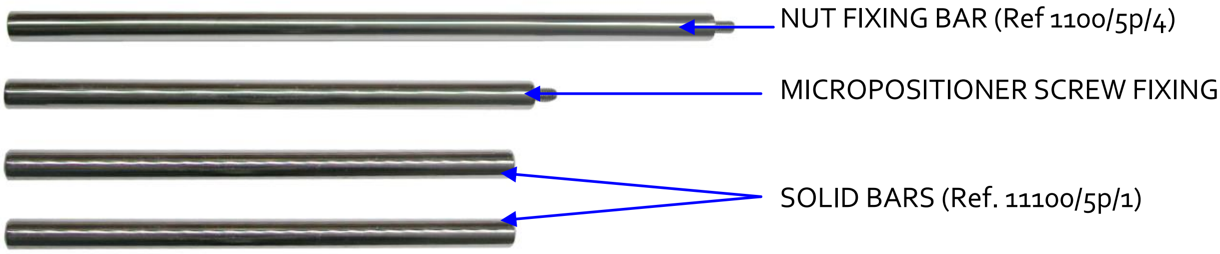

Figure 2. Components 1.

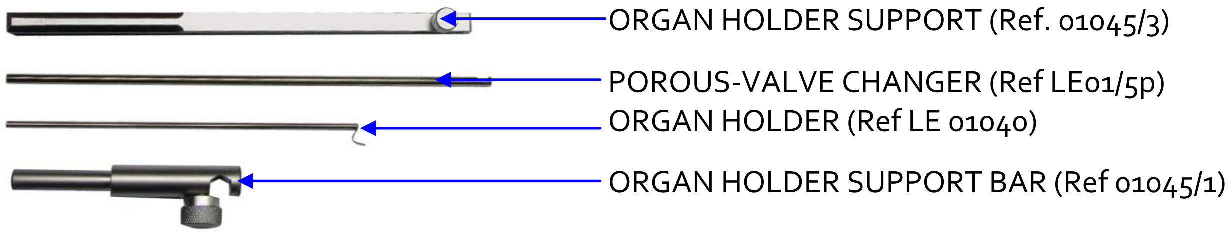

Figure 3. Components 2.

Figure 4. Bath support.

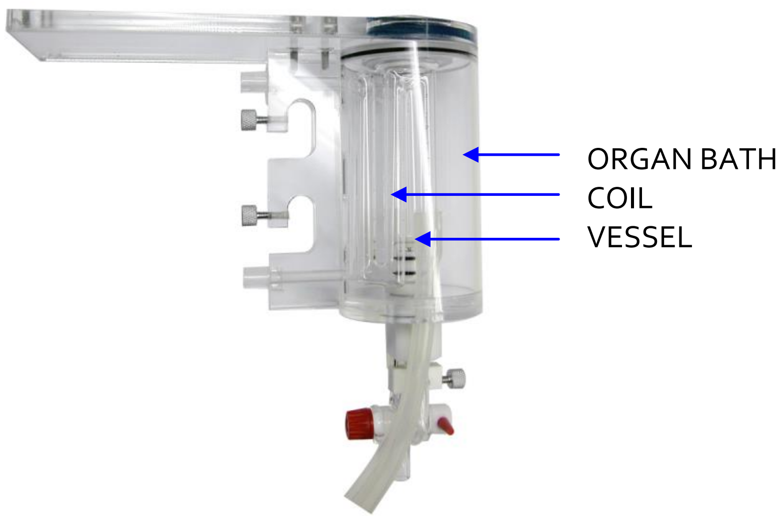

Figure 5. Bath, Vessel and Coil.

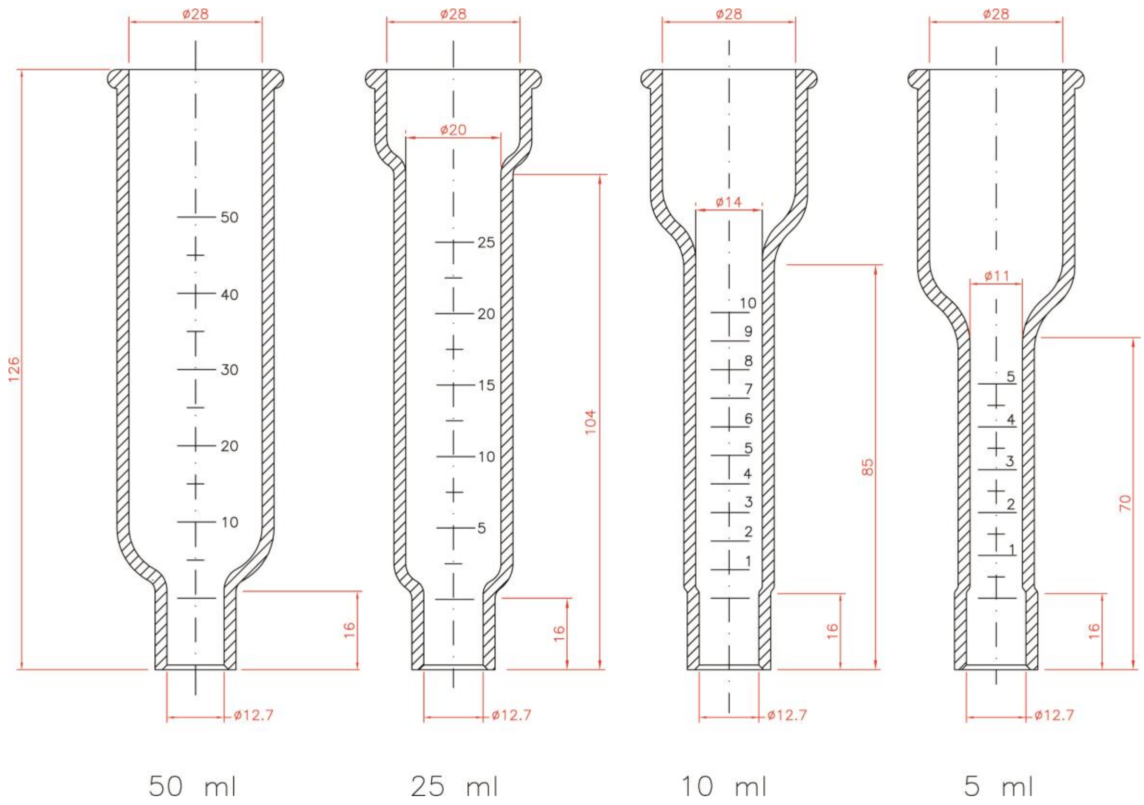

Figure 6. Size of the available vessels.

By default the organ bath is supplied with 25ml vessel, but as option there are available too 5ml, 10ml and 50 ml vessels.

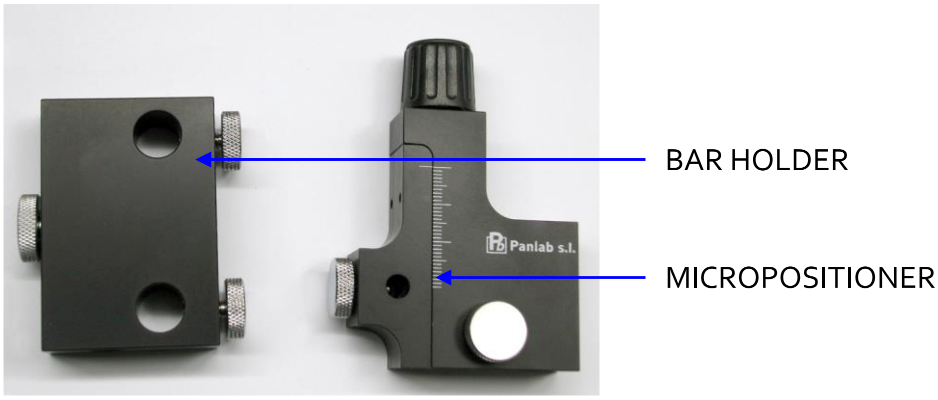

Figure 7. Micropositioner and Bar Holder (Nut).

7. PREPARING THE INSTRUMENT

7.1. PART BY PART

1. Take **the NUT FIXING BAR** and screw it into the hole of the **BATH SUPPORT**.

2. Take the **BARS** and insert them into the **BAR HOLDER**, through the symmetric holes, fixing them with the relevant threads in the **BAR HOLDER**.

3. Take the **NUT FIXING BAR**, and insert it in the **BAR HOLDER** by the hole which will make it perpendicular to the two other bars, and fix it using the remaining thread on the **BAR HOLDER**.

Figure 8. Assembly of the bars.

4. Take the **ORGAN BATH** and insert it by the clefts to the **BARS**, and fix it with the threads.

Figure 9. Affixing the Organ Bath.

5. Take the **MICROPOSITIONER SCREW FIXING BAR** and screw it in the hole in the **ORGAN BATH**.

6. Take the **MICROPOSITIONER** and put it on the **MICROPOSITIONER SCREW FIXING BAR** by the hole, fixing the selected position with the thread on the **MICROPOSITIONER** (it must face the **ORGAN BATH**).

Figure 10. Micropositioner Screw Fixing.

7. Take the **ORGAN HOLDER SUPPORT**, and insert it in the cleft of the **MICROPOSITIONER SCREW FIXING BAR**, and the latter in the relevant hole in the **MICROPOSITIONER**, making sure that the thread on the **MICROPOSITIONER SCREW FIXING BAR** remains on the external part of the assembly.

Figure 11. ORGAN HOLDER SUPPORT fixing.

8. The last step is the instalment of the **TRANSDUCER** (not included). Insert it through the remaining hole on the **MICROPOSITIONER** (facing the **ORGAN BATH**), and fix it with the relevant thread.

Figure 12. Transducer fixing

7.2. THE ORGAN BATH

1. Connect the **ORGAN BATH** to the thermo-regulated pump being used, by **TUBES 1** (hot water in) and **2** (hot water out), in order to fill up the **ORGAN BATH CHAMBER** and, as a consequence, control the temperature of the organ inside the **VESSEL**.

TUBE 2 – HOT WATER OUTPUT

TUBE 1 – HOT WATER INPUT

Figure 13. In and Out Channels for Hot Water in the Bath.

2. Connect the **ORGAN BATH** to the system being used to make the physiological solution reach the **VESSEL**, by **TUBE 3**.

TUBE 3

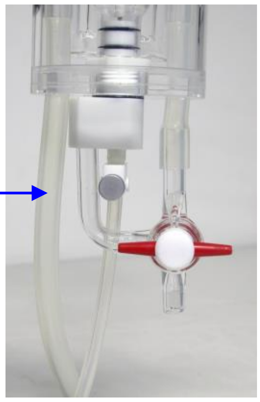

Figure 14. Vessel filling tube.

3. Connect the **ORGAN BATH** to the system being used to oxygenate the organ inside the **VESSEL**, by **TUBE 4**.

TUBE 4

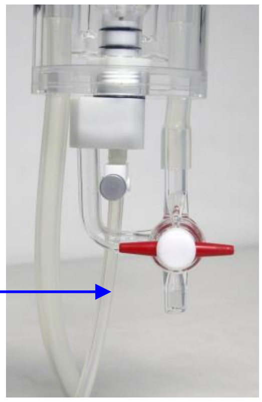

Figure 15. Oxygenator Tube.

7.3. MULTIPLE INSTALLATION

It is also possible to install multiple organ baths at once, simultaneously interconnecting the water circuit and the solution circuit of each organ bath to be fed with the same liquid, and the emptying circuit.

To do so, the only extra components needed are two large **BARS**. These bars must be installed hanging from the two **BAR HOLDERS** (each one in one end of the **BARS**), and the assembly, along with the **NUT FIXING BAR** as shown in Figure 8.

Figure 16. Multiple installations.

– **TO INTERCONNECT THE WATER CIRCUITS.**

- Connect the thermo-regulated water pump being used to the first **ORGAN BATH**, by **TUBE 1** (hot water in).
- Then connect **TUBE 2** (hot water out) of the first **ORGAN BATH** to **TUBE 1** of the second **ORGAN BATH**, and so on until reaching the last **ORGAN BATH**.

– **TO INTERCONNECT THE SOLUTION CIRCUITS.**

- Interconnect all **TUBES 3** by an external shared tube, as shown in Fig. 16 A.
- Connect the shared tube to the system being used to let the solution into the vessels.

– **TO INTERCONNECT THE OXYGENATION CIRCUITS.**

- Interconnect all **TUBES 4** by an external shared tube, as shown in Fig. 16A

- Connect the shared tube to the system being used to oxygenate the organs inside the vessels.

- The independence in the oxygenation level remains intact for each **ORGAN BATH**, as the **OXYGENATION CONTROLLER** is still working.

  – **TO INTERCONNECT THE EMPTYING CIRCUITS.**

- Using an external tube, interconnect all the stopcocks, as shown in Fig. 16 B.

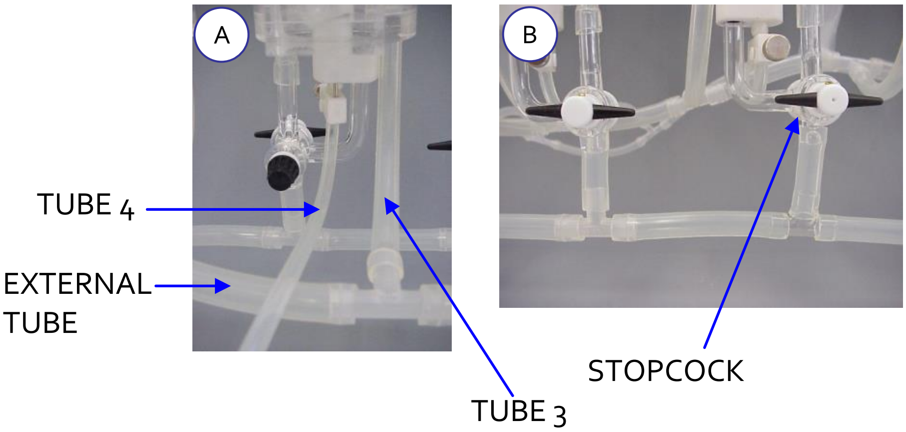

Figure 17. Multiple installation tube connections.

8. USING THE ORGAN BATH

1. First of all, check that the **STOPCOCK** is in the right position (see Figure 18). If not, the physiological solution may flow out of the VESSEL directly.

STOPCOCK POSITIONS AND SOLUTION FLOW

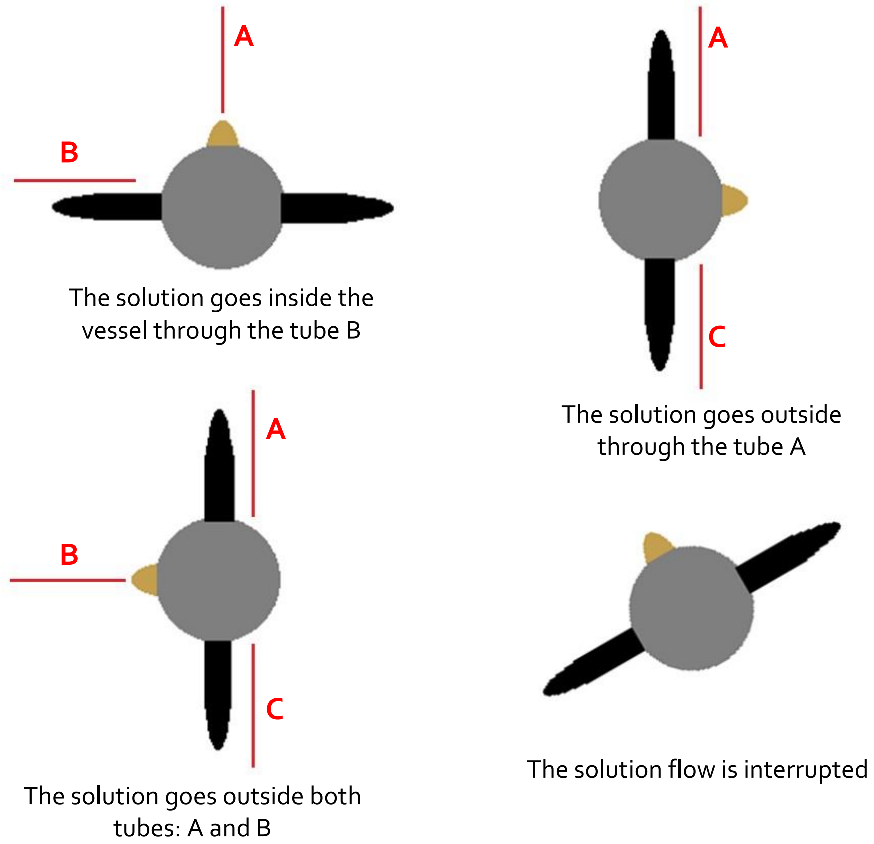

Figure 18. Stopcock Positions.

2. Let the water into the **ORGAN CHAMBER** when the selected temperature is reached. Remember that the water flows continuously, in order to maintain a constant temperature.

3. Once the **ORGAN CHAMBER** is full of water, let the physiological solution in (by the tubes inside the chamber), putting the **STOPCOCK** in **POSITION 4**. In order to allow the solution to reach the desired temperature before the experiment with the organ starts, and before letting the solution into the **VESSEL**.

4. Take the **ORGAN HOLDER** and place it in the clip of the **ORGAN HOLDER SUPPORT**, in a way that allows you to comfortably prepare the selected organ.

Figure 19. Organ Holder Fixing.

5. Let the physiological solution into the **VESSEL**, by positioning the **STOPCOCK** in **POSITION 1**. Do not forget to select **POSITION 3** afterwards, in order to have more solution in the inner tubes.

6. Let the oxygen into the **VESSEL**, controlling the quantity with the **OXYGENATION CONTROLLER**.

OXIGENATOR CONTROLLER

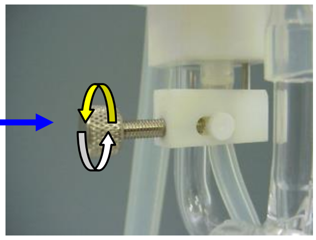

Figure 20. Oxygenator Controller.

7. Take the organ selected to experiment with. Skew one side into the **ORGAN HOLDER**, and the other to the hook tied to a thread.

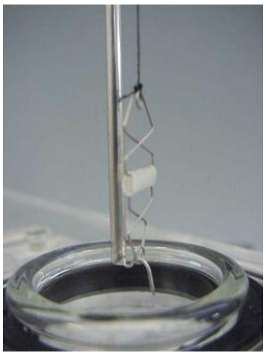

Figure 21. Organ Fixing.

8. Gently slide the holder with the organ through the cleft of the **STEEL BAR WITH CLIP** No.1, until the organ is completely covered by the solution.

WARNING: To change the physiological solution, put the **STOPCOCK** in **POSITION 3** to empty the **VESSEL**, and then in **POSITION 1** to let fresh solution in.

9. Take the thread tied to the organ, and tie it to the transducer, as shown.

Figure 22. Fixing the Tissue to the transducer.

10. Set the desired tension using the **MICROPOSITIONER**.

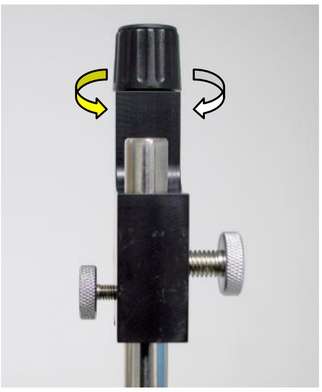

Figure 23. Set Tension with the Micropositioner

The **MICROPOSITIONER / TISSUE HOLDER / TRANSDUCER** assembly can be used separately from the rest of the organ bath.

Removing the assembly from the steel bar fixed to the wall of the organ bath, it is possible to work with the tissue outside the context of the organ bath, with an extra box with physiological solution in it, and using the **EXTRA-OXYGENATOR** to keep oxygenating the tissue, keeping it alive until the experiment starts.

It is possible to take the assembly, work with it and install or uninstall it again on the stand of the organ bath.

Figure 24. Micropositioner/ Tissue Holder/ Transducer Assembly.

9. REMOVING AND CHANGING PARTS

9.1. VESSEL

- The easiest way to remove the **VESSEL** is as shown, placing a finger inside, applying pressure and pulling it out.
- When reinstalling it (or installing a new one), make sure that the **VESSEL** is well fixed to the bottom.

Figure 25. Removing the vessel.

9.2. POROUS-VALVE

- Take the POROUS-VALVE CHANGER, and introduce it inside the vessel. Using the part with a cleft on it, catch the porous-valve and withdraw it by pulling softly.
- To install another one, follow the same instructions in inverse order.

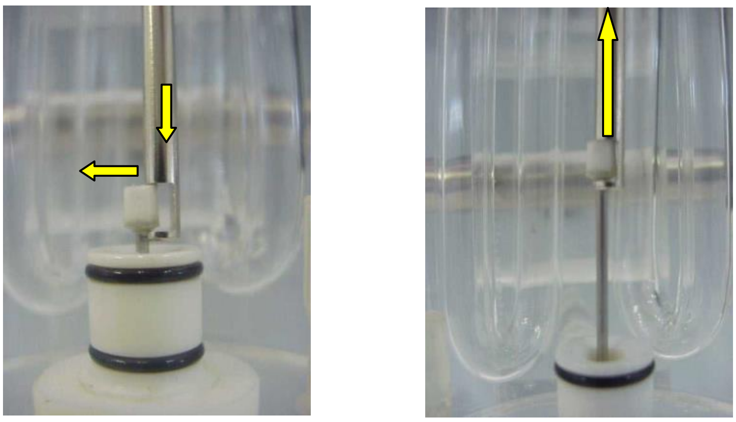

Figure 26. Replacing the Porous Valve.

9.3. SEAL

- In order to extract the seal, press with a regular screwdriver.

Figure 27. Extracting the seal.

10. PART REFERENCES (REPLACEABLE)

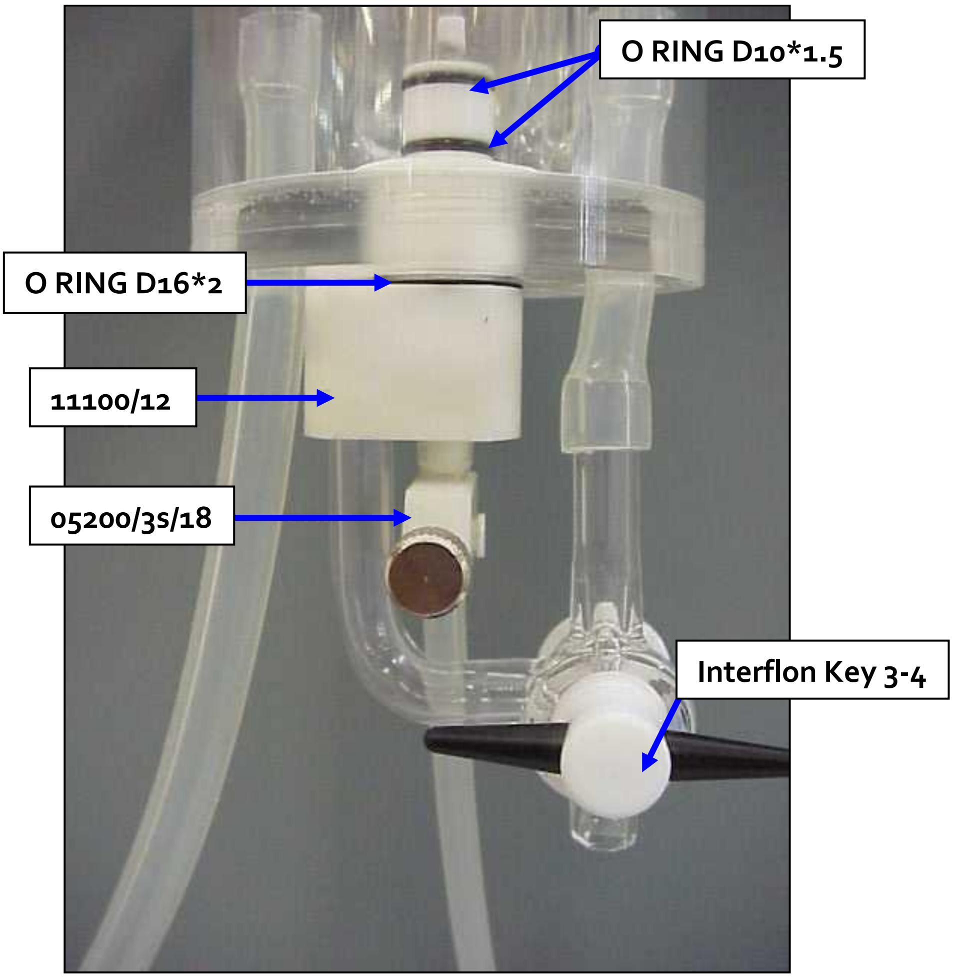

Figure 28. Part References.

11. CLEANING THE BATH

In order to extend the bath life, it is appropriate to fully clean the circuit of the solution on a regular basis. It is also advisable to clean the container when necessary, as indicated.

11.1. CLEANING THE ORGAN BATH GLASS COMPONENTS

Prior to start working with the bath; put 5 litres of distilled water to circulate through the coil and vessel circuit (liquid feed circuit). Clean the vessels with a brush while the distilled water is circulating.

When the experimental session is finished; flush out the circuit using 5 litres more of distilled water, repeating the vessel brushing operation.

If the Organ bath is not going to be used for a lengthy period of time, the preventive steps detailed below should be carried out:

1. The porous meshes of the vessels should be covered with distilled water to keep them from clogging up.

2. Thoroughly clean out the feed circuit (coils and vessels), given that there may be residues that can form saline deposits, which will subsequently impede circulation of the liquids. There are two possible methods to clean coils and vessels:

    a. Remove the vessels and coils and submerge them in a 0.2M solution of hydrochloric acid (HCl) for no longer than 2 minutes. Use caution with the vessels as the acid can attack and remove the paint of the graduated scale. Rinse well with distilled water to eliminate all traces of the acid. If there is any difficulty when disconnecting the silicone tubes from the glass parts, cut them at the joint.

    b. Without dismantling the coils and vessels, circulate a 0.1M solution of hydrochloric acid (HCl) through the internal circuit for a maximum of 2 minutes. Then circulate 5 litres of distilled water through the vessels and coils to remove any traces of acid. It is important to use maximum caution with the acid solution to ensure that it does not come into contact with the plastic parts of the Bath (Perspex).

Other cleaning methods are also available such as the possibility of using solutions of other acids, such as chromic, dichromic or lactic acid. The choice of method is best left up to the user.

11.2. CLEANING THE PLASTIC COMPONENTS OF THE ORGAN BATH

To clean the plastic parts of the bath use a cloth moistened with a soapy solution and rinse with distilled water.

WARNING: Never use alcohol or products containing alcohol derivatives as they will harm the plastic surfaces. Regularly clean the top and fixing bolts using distilled water to avoid the formation of saline deposits.

12. PREVENTIVE MANTEINANCE

	EXPERIMENT	WHEN NECESSARY
CLEANING THE PLASTIC COMPONENTS	☑	
CLEANING THE INTERNAL CIRCUIT OF THE ORGAN BATH	☑	
CHANGE THE VESSEL		☑
CHANGE THE POROUS-VALVE		☑
CHANGE THE SEAL		☑
CHANGE SILICON TUBES		☑

13.SPECIFICATIONS

VESSEL 50 mm	
Capacity:	50 ml
Total height:	126 mm
Height until cup:	126 mm
Neck height:	16 mm
Ø CUP	28 mm
Ø INNER	28 mm
Ø NECK	12.7 mm
VESSEL 25 mm	
Capacity:	25 ml
Total height:	126 mm
Height until cup:	104 mm
Neck height:	16 mm
Ø CUP	28 mm
Ø INNER	20 mm
Ø NECK	12.7 mm
VESSEL 10 mm	
Capacity:	10 ml
Total height:	126 mm
Height until cup:	85 mm
Neck height:	16 mm
Ø CUP	28 mm
Ø INNER	14 mm
Ø NECK	12.7 mm
VESSEL 5 mm	
Capacity:	5 ml
Total height:	126 mm
Height until cup:	70 mm
Neck height:	16 mm
Ø CUP	28 mm
Ø INNER	11 mm
Ø NECK	12.7 mm

DECLARACIÓN DE CONFORMIDAD
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITÉ

Nombre del fabricante: Manufacturer's name: Nom du fabricant:	**Panlab s.l.u.** www.panlab.com info@panlab.com
Dirección del fabricante: Manufacturer's address: Adresse du fabricant:	Energía, 112 08940 Cornellà de Llobregat Barcelona SPAIN
Declara bajo su responsabilidad que el producto: Declares under his responsibility that the product: Déclare sous sa responsabilité que le produit:	**MODULAR ORGAN BATH**
Marca / Brand / Marque:	**PANLAB**
Modelo / Model / Modèle:	**LE 11100**

Cumple los requisitos esenciales establecidos por la Unión Europea en las directivas siguientes:
Fulfils the essential requirements established by The European Union in the following directives:
Remplit les exigences essentielles établies pour l'Union Européenne selon les directives suivantes:

2011/65/EU Restricción de ciertas Sustancias Peligrosas en aparatos eléctricos y electrónicos (ROHS) / Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (ROHS) / Restriction de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques (ROHS)

Analisis de riesgos / Risk assessment / Analyse des risques

Para su evaluación se han aplicado las normas armonizadas siguientes:
For its evaluation, the following harmonized standards were applied:
Pour son évaluation, nous avons appliqué les normes harmonisées suivantes:

En consecuencia, este producto puede incorporar el marcado CE:
Consequently, this product can incorporate the CE marking:
En conséquence, ce produit peut incorporer le marquage CE:

CE

En representación del fabricante:
Manufacturer's representative:
En représentation du fabricant:

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