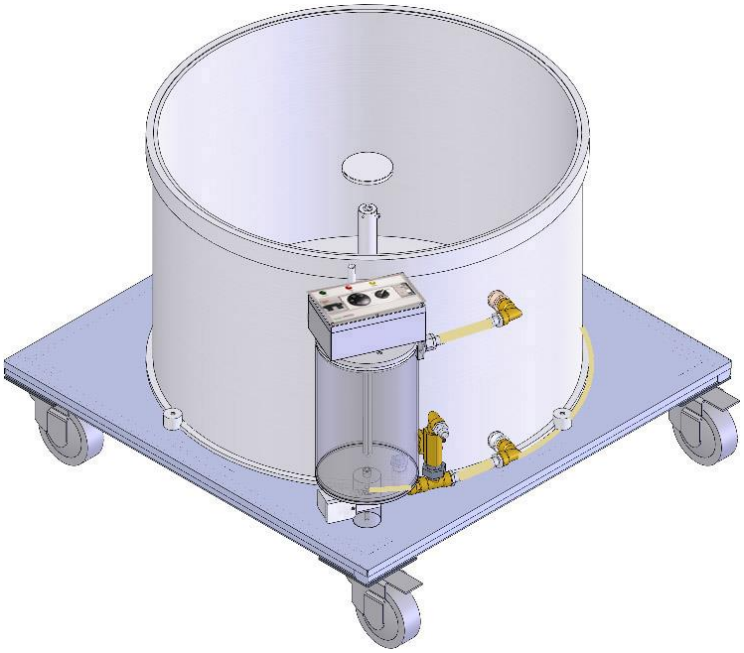
Hardware User's Manual

Circular pool

Water maze



Referencias:

LE82090 (76-0020), LE820120 (76-0021), LE820140 (76-0022), LE820170 (76-0023), LE820200 (76-0024)

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Panlab | Harvard Apparatus

Panlab, s.l.u
C/Energía, 112
08940 Cornellà de Ll.(Barcelona)
Spain
www.panlab.com

International Calls: +34 934 750 697
Domestic Call: 934 190 709
Fax: +34 934 750 699
Info@panlab.com

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Algunos símbolos pueden interpretarse de diversas maneras por profesionales que no estén acostumbrados a su uso.
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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.	
Protection terminal ground connection.	
Warning about a hot surface which temperature may exceed 65ºC	
Warning about a metal surface that can supply electrical shock when it's touched.	
Decontamination of equipments prior to disposal at the end of their operative life	
Waste Electrical and Electronic Equipment Directive (WEEE)	

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. The swimming pool is bulky and heavy equipment. To unpack and lift the equipment you must use the right tools and machinery, you should check your local regulations to avoid injury unpacking and lifting 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.
E. Once the equipment is installed in the final place, the main power switch must be easily accessible.
F. Only use power cords that have been supplied with the equipment. In case that you have to replace them, the spare ones must have the same specs that the original ones.
G.  Make sure that the AC voltage in the electrical network is the same as the voltage the equipment is made for (110V AC or 230V AC not selectable). **Never connect the equipment to a power outlet with voltage outside these limits.**

WARNING

For electrical safety reasons you only can connect equipment to power outlets provided with earth connections  .
This equipment can be used in installations with category II over-voltage according to the General Safety Rules.

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. MAINTENANCE

WARNING: Failure to follow the instructions in this section may cause equipment fault.

- PRESS KEYS SOFTLY – Lightly pressing the keys is sufficient to activate them.
- Equipments do not require being disinfected, but cleaned for removing urine, faeces and odour. To do so, we recommend using a wet cloth or paper with soap (which has no strong odour). NEVER USE ABRASIVE PRODUCTS OR DISSOLVENTS.
- NEVER pour water or liquids on the equipment.
- Once you have finished using the equipment turn it off with the main switch. Clean and check the equipment so that it is in optimal condition for its next use.

WARNING

For electrical safety reasons, never open the equipment. The power supply has dangerous voltage levels.

5. TABLE OF CONTENTS

6. INTRODUCTION

The LE 820 Automatic Swimming Pool is designed as an ideal component for swimming tests that can be performed with rats and mice. These experiments were described by Dr. Morris (Morris R.G.M. Learning and Motivation, 12:239, 1981).

Figure 1. LE 820 Swimming pool.

There are several sizes of swimming pools:

Reference	Diam. (cm)	Height (cm)	Volume (L)	Weight Filled (Kg)
LE 82090	90	60	350	420
LE 820120	120	60	620	705
LE 820140	140	60	850	960
LE 820170	170	60	1250	1387
LE 820200	200	60	1725	1893

WARNING: For anxiety experiments, the water is normally dyed white so that the animal cannot see the bottom of the pool. Never use latex for this purpose as it will damage the pump, level switch and resistor.

7. EQUIPMENT DESCRIPTION

7.1. CONTROL UNIT

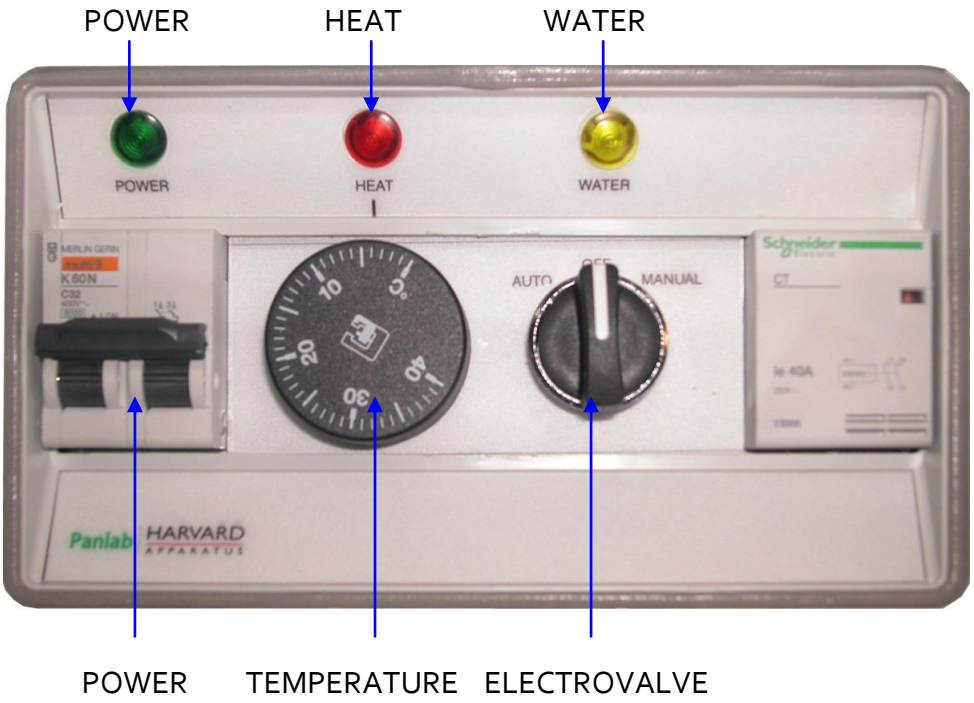


Figure 2. Control unit.

- **POWER LIGHT:** Green light that remains on when POWER switch is in the ON position.

- **HEAT LIGHT:** Red light that remains on when the heater resistor is heating. Four conditions must be met for the heater resistor to heat the water:
    - The POWER switch must be in the ON position.
    - The water must be above the minimum heating level.
    - The protection temperature (50ºC) must not be exceeded.
    - The temperature regulation thermostat must have a temperature higher than the actual water temperature.

- **WATER LIGHT:** Yellow light that remains on when electro valve allows water to enter the swimming pool.

- **POWER SWITCH:** This is the main POWER SWITCH that turns the equipment on. As it is a magneto-thermal switch, it acts as protection in case of over current or short circuit in the heating resistor.

- **TEMPERATURE**: Selects water temperature. When water reaches the selected temperature it opens the circuit and the resistor will not work until the temperature falls below the selected value.

- **ELECTROVALVE:** Control of electro valve, this rotary switch has three positions:
    - MANUAL: The user allows as much water as desired to enter.
    - AUTO: The swimming pool is filled with water up to the level of the level detector. Then the electro valve is closed and no more water can enter the swimming pool.
    - OFF: The electro valve is closed and the water cannot enter the swimming pool.

- **PUMP:** There is a push switch button at one side of control unit. This button activates the pump while pressed. This manual activation of the pump helps when the heating tank is being cleaned.

7.2. HEATING TANK

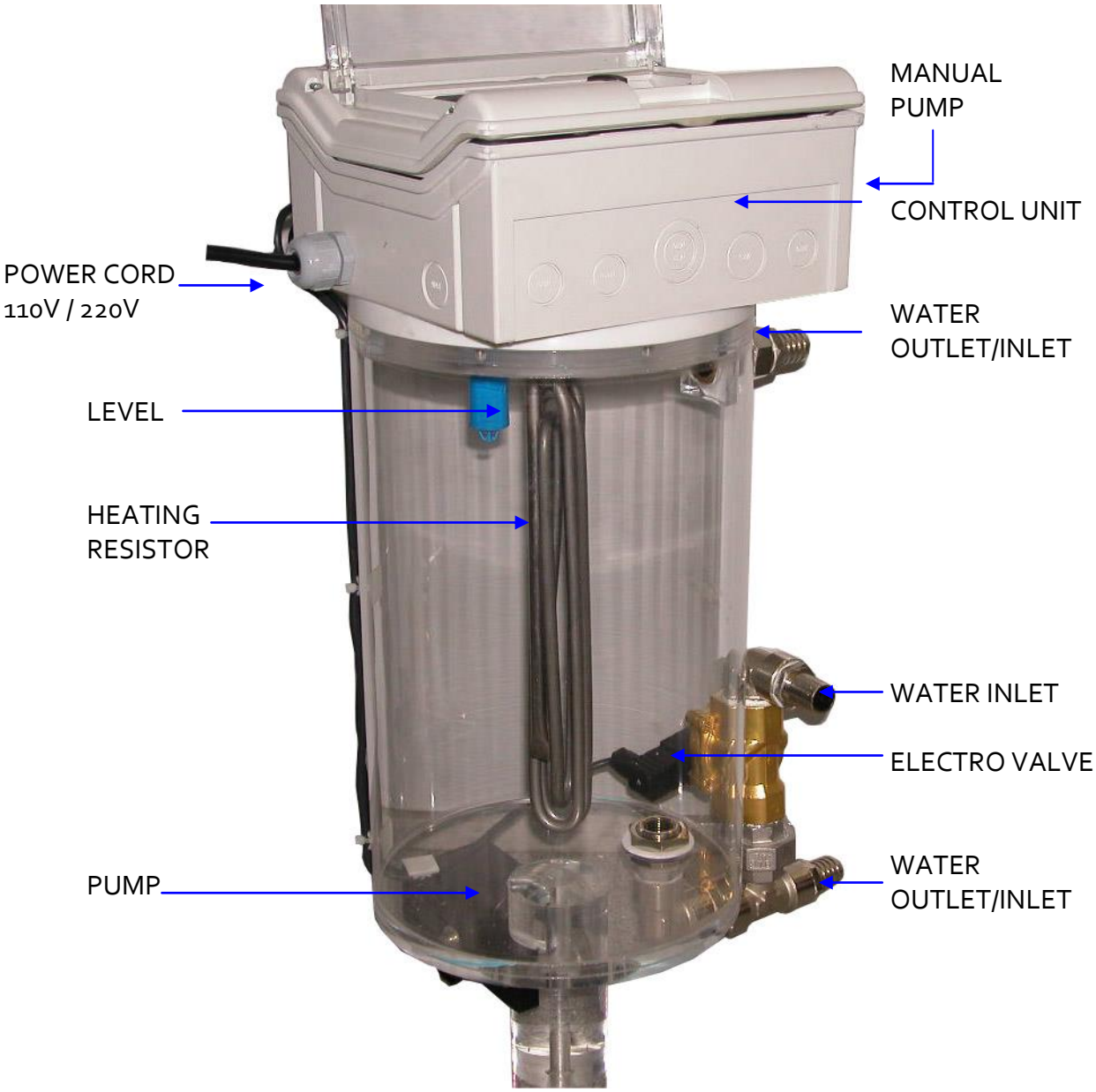


Figure 3. Heating tank.

- **LEVEL:** Floating switch that detects when water reaches the minimum level necessary to heat.
- **RESISTOR:** The heating element that heats water. It has a power of 3 kW.
- **PUMP:** The pump moves water from the heating tank to the swimming pool to make temperature uniform.

- **WATER OULET/INLET:** Water flows between the heating tank and the swimming pool through the 2 water outlets/inlets.

- **WATER INLET:** Water enters the heating tank by flowing from the lab's water supply system, passing through the electro valve.

- **ELECTRO VALVE:** The electro valve allows water into the swimming pool when it is activated in the AUTO or MANUAL control positions.

- **MANUAL PUMP:** There is a push button labelled MANUAL PUMP in left side of control unit box. It is used to test the pump and during the heater tank cleaning (see chapter 10).

7.3. SWIMMING POOL

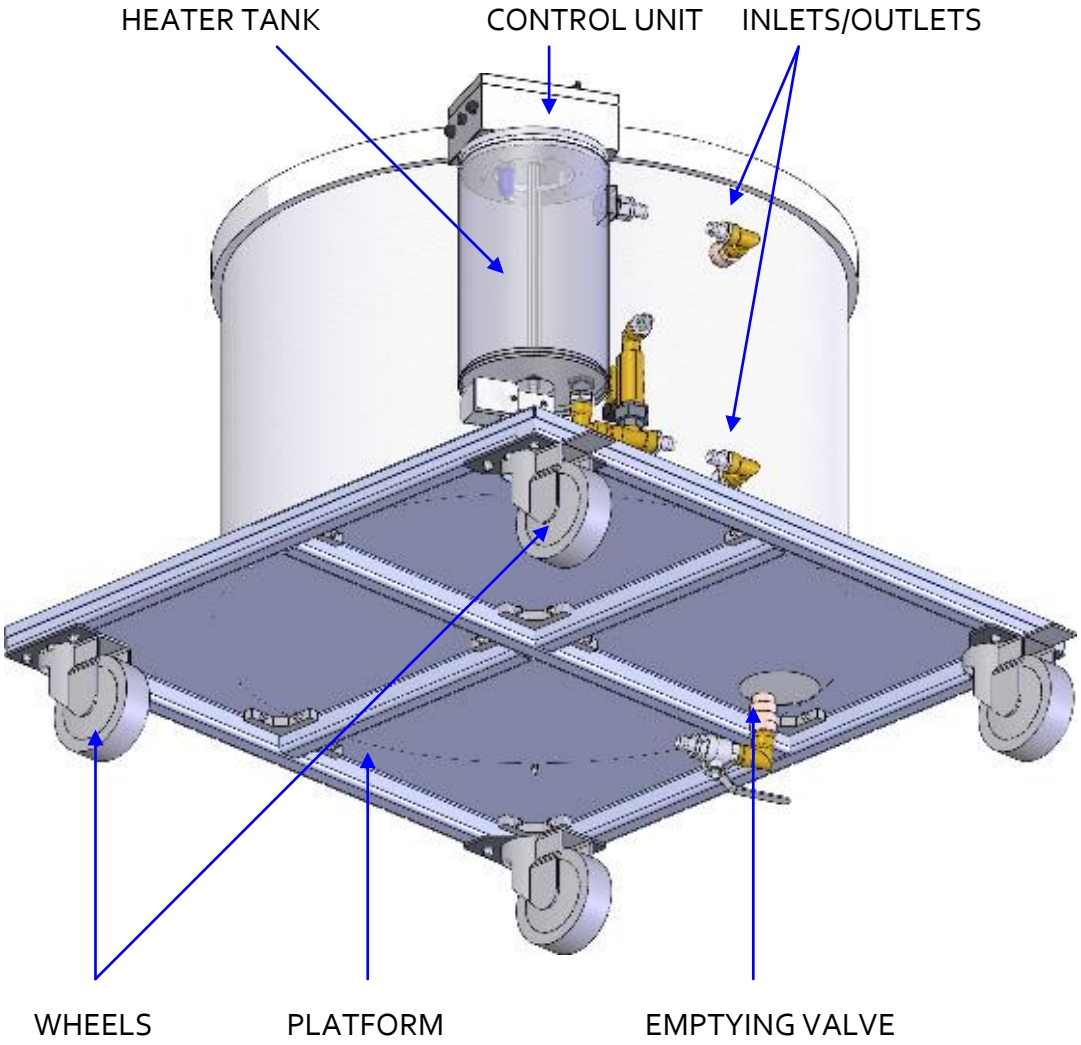
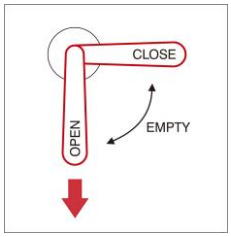


Figure 4. Swimming pool.

The swimming pool is mounted on a platform with wheels to make it easier to move. Two of the wheels have brakes to block the swimming pool once it is in its place. There is an emptying valve at the lower side of the platform. This valve must only be opened to empty the swimming pool. The valve stays closed in normal operation.

The laboratory drain must be lower than the swimming pool emptying valve to correctly empty the swimming pool. For faster emptying, Panlab offers an optional pump with a flow of 900 l/h.



There is a label over the platform close to the emptying valve that shows the position of the key.

Circular pool

8. EQUIPMENT CONNECTION

The electrical connections are simply connected to the mains AC power net by the power cord. The following schematic illustrates the hydraulic connections.

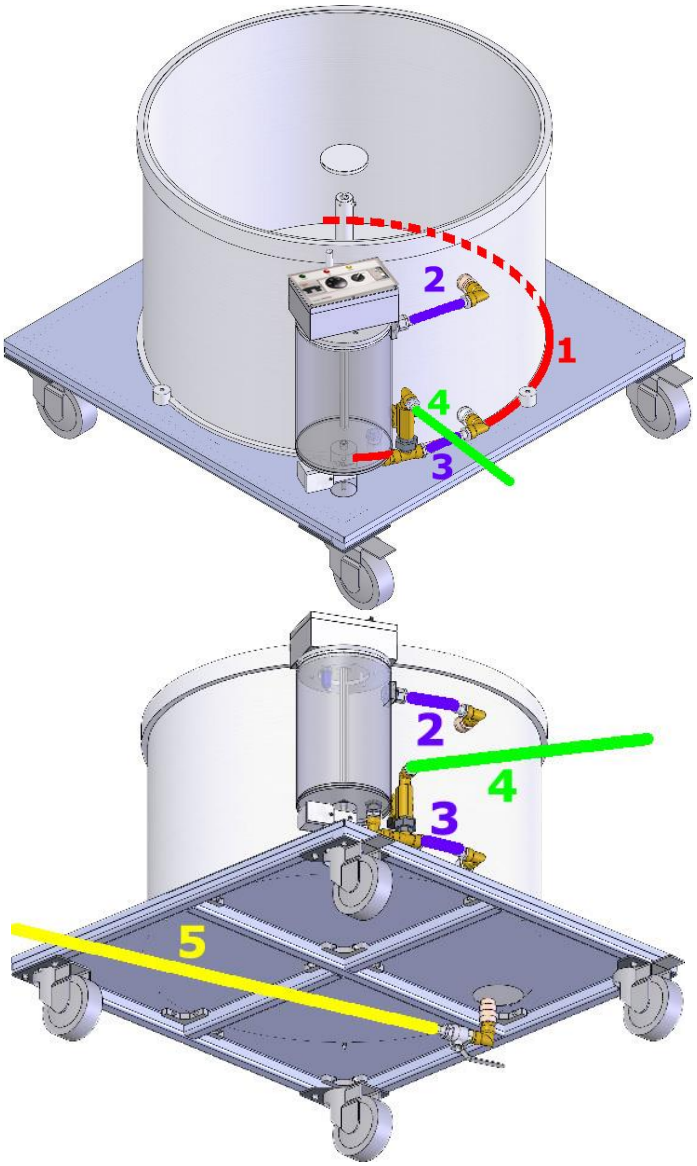


Figure 5. Hydraulic connections.

The necessary connections are listed in the following table:

	FROM	TO	HOSE
1	Swimming Pool inlet	Pump outlet	∅18 mm x ∅12 mm
2	Heater inlet/outlet	Swimming Pool inlet/outlet	∅26 mm x ∅20 mm
3	Heater inlet/outlet	Swimming Pool inlet/outlet	∅26 mm x ∅20 mm
4	Water supply system	Heater inlet	∅26 mm x ∅20 mm
5	Swimming Pool emptying valve	Room water drain	∅26 mm x ∅20 mm

9. EQUIPMENT SET-UP

WARNING

The pool is made specifically for 230V or 110V and the operating voltage is not selectable.
The water pressure should not exceed 3bars for filling the pool. If installation pressure is higher, partially close the stopcock to reduce this pressure.

9.1. SWIMMING POOL FILLING

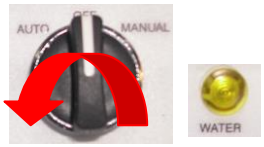
1) Before making the connection to the pool has to be noted that the drain valve is fully closed and that the entrance to the electro valve is connected to the water supply network.

2) It is advised that the laboratory has a water inlet with a stainless steel valve and hose barb with an inner diameter of 20 mm.

3) Connect the silicone tube in the heater transparent tube that acts as a vent.

4) Set the temperature selector to the minimum (0 °C) to not start heating. To do this, turn the dial counter-clockwise.

5) After checking all this and making the connection to the mains (220V or 110V AC) set the **POWER** switch to the (ON) position then the green light labelled **POWER** will turn on.



6) Set the valve control in the **AUTO** position and the pool will begin to fill up to the minimum level of the heater. While the pool is filling place the silicone breather tube into the pool. While the electro valve is allowing the ingress of water the yellow light labelled **WATER** will be on. If the inlet water pressure is high, you will see how the heater tank fills quickly and the swimming pool is filled through the water inlets. If at any time the level switch comes up you will hear a clicking sound and the yellow light labelled **WATER** turns off momentarily, do not worry the system will automatically reset.

7) Once the minimum water level is reached the electro valve will be closed and the yellow light turns off. The water recirculation pump will start running.

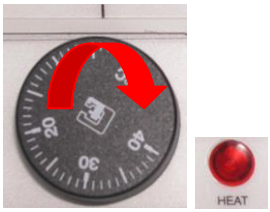
8) Now move the valve control to **MANUAL** to finish filling the swimming pool (heater tank must be completely filled with water). While valve control is in the manual position **WATER** light stays on.

9) Once the swimming pool is filled remove the silicone breather from the pool and leave it hanging at the side of the heater tank.

10) Set the valve control to the centre position labelled **OFF** to close the electro valve.

9.2. WATER HEATING

1) After filling the pool (see section 9.1) and with the **POWER** switch set to **ON** and the valve selector set in the **OFF** position, turn the temperature selector clockwise to maximum (40°C), then the light labelled **HEAT** will turn on indicating that the swimming pool is heating.



2) Water in the tank will be warmed up; the recirculation pump takes water from the heater tank and leads it to the opposite end of the pool via a diffuser. The flow is around 8L/min to prevent the animal to note movement of the water.

3) Depending on the water temperature and the volume of water the pool will be heated to a maximum rate of 2-3 ° C/hour. During this time the **HEAT** light stays on all the time (it may turn off at a transitional moment but most of the time remain lit).

4) After one or two hours you should place the temperature selector to the temperature you want to keep the water, and the system will stabilize the temperature.

5) When necessary the light **HEAT** will turn on again. The system will maintain the temperature within 1°C of the target for the duration of the experiment.

6) If you want to know the current water temperature turn the temperature dial until you hear the shutter click of the thermostat, this is the current water temperature.

WARNING: Due to the heat exchange with the environment, do not try to reach temperatures above 30 °C since in the end the system comes to equilibrium with the atmosphere and the water heating process would be too long.

10. LE820900 HEATER TANK CLEANING PROCEDURE

10.1. ITEMS SUPPLIED

- 1 Cleaner lance 007267
- 2 Stainless clamps. 12/20 002246
- 3 Meters glass reinforced hose 002255

10.2. CLEANING PROCEDURE

WARNING: The incoming water pressure must not exceed 3.5 bar.

1) Empty the pool.

2) Connect the end of the hose to a water valve (B) posting this with the provided steel clamp.

3) Remove the silicone tube/exhaust pipe elbow from the heater (A)

4) Enter the lance by the exhaust pipe.

5) Open the water valve and proceed to clean the tank heater. Effected cleaning must be done always up to down.

6) To prevent water from accumulating in the tank you should start recirculating water pump by pressing the button (D) while cleaning is being done.

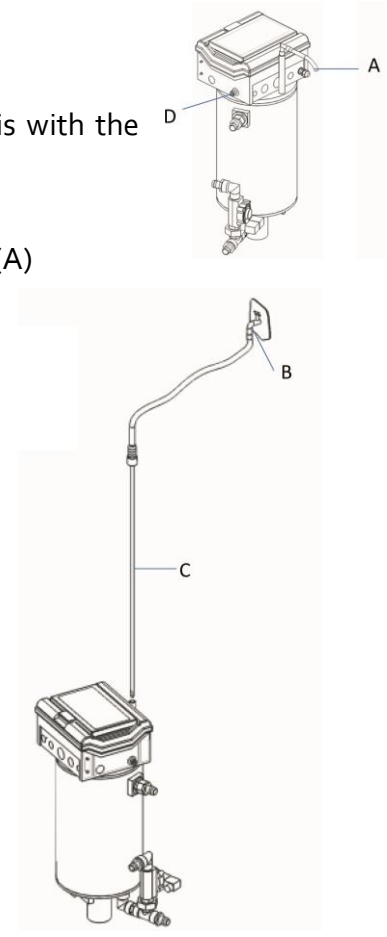


Figure 6. Procedure to clean the heater tank.

NOTE: Do not use products that may contain alcohol to clean the tank heater.

11. TROUBLESHOOTING

This table features instructions to solve the most frequent problems.

PROBLEM	SOLUTION
The equipment does not turn on.	• Check that the mains voltage is the same for which the pool is designed. • Check that the mains cable is connected.
Recirculation pump does not work.	• The water recirculation pump only works if the level switch is up, or if you press the black button on the right side of the control box. If the pool is not filled up completely follow the instructions in chapter 9.1 to fill it. • Touch the body of the pump located under the heater tank to notice if it vibrates or not. Press the black button on the side of the control box and touch the pump to see if it vibrates. • Reach into the pool in front of where the hose comes out of the pump, and playing on the sides because there is a diffuser feel if the water is moving or not. The pump flow is about 8l/min to prevent the animal be guided by the movement of water. • If the pump vibrates but no water comes out of the pool diffuser, the tube is probably clogged. • Do not use latex or products that may damage the water pump for white colouring of water.
How can you check if water level is enough?	• Set the valve control in the **AUTO** position. If the water level is correct **WATER** light remains off and the electro valve is closed. If, however, the water level is low, when you set the valve control to **AUTO** the **WATER** light will turn on and you will hear a clicking sound when opening the valve.

The resistor does not heat	• The resistor only will heat if the following condition are accomplished:
	  ○ The heater control is on (**POWER** light is on).
	  ○ The water level is correct.
	  ○ The selected temperature is higher than the current water temperature.
	• If you select a temperature close to the current

	water temperature, the **HEAT** light and the resistor will be turned on and turned off alone due to the temperature control system.
When the swimming pool is being filled water level in the heater tank rises rapidly and this causes in **AUTO** mode that the electro valve will open and close.	• The water inlet pressure is high, this causes the heater tank level up faster because enters more water than it can exit to the pool. Whenever there is a rebound of level float switch, electro valve and **WATER** light will close and then will open again. At the end to finish the filling of the pool set the valve control to **MANUAL** until the heater tank is completely filled.
How can the swimming pool be emptied?	• Turn off the control or set the valve control in the **OFF** position and open the drain valve. When water level is low, press the black button on the side of the control unit so that the pump helps emptying the heater tank.
How to know the water temperature of the pool if you do not have a thermometer?	• Turn the temperature selector until it clicks and the light **HEAT** turns on, the temperature marked by the temperature selector when you hear the click is the current water temperature.
Can I cool the pool water?	• The device only can heat the pool water. If the temperature selector selects a lower temperature than the current one it simply will not heat the water. • The only way for water cooling is to wait for it to cool, or partially drain the pool and refill it with cold water.

12. PREVENTIVE MAINTENANCE

	EXPERIMENT	MONTHLY
HEAT WATER	☑	
EMPTY SWIMING POOL		☑[1]
CLEANING HEATER TANK		☑[2]
CLEAN WALLS AND FLOOR		☑[3]

[1] Depending on the state of water, emptying frequency of the pool will be more or less frequent.
[2] Follow instructions in chapter 10.
[3] While the pool is emptied you should clean walls and floor brushing thoroughly with a hard haired broom.

13. SPECIFICATIONS

POWER SUPPLY	
Input voltage:	110 /230 VAC (not selectable)
Frequency:	50/60 Hz
Maximum Power:	3100 W
WARMING SPECIFICATIONS	
Temperature range of the selector:	0ºC-40 ºC
Swimming poll max. temp.:	~32ºC[4]
Accuracy:	+/-3 ºC
Thermal protection switch:	50ºC
Heating Power:	3100 W
Resistance:	
230 v:	17,5Ω
110V:	4,4Ω
Heating rate:	<3ºC/hour
ELECTRICAL SPECIFICATIONS	
Main switch:	
230V:	16A 400V
110V:	32A 400V
Nominal current:	
230V:	13A
110V:	27A
ENVIRONMENTAL CONDITIONS	
Operating temperature:	10°C to +40°C
Operating relative humidity:	0% to 85% RH, non-condensing
Storage temperature:	0°C to +50°C, non-condensing

DIMENSIONS:

Reference	Diam. (cm)	Height (cm)	Volume (L)	Weight Filled (Kg)
LE 82090	90	60	350	420
LE 820120	120	60	620	705
LE 820140	140	60	850	960
LE 820170	170	60	1250	1387
LE 820200	200	60	1725	1893

[4] Depending on environment temperature and pool size.

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:	**SWIMMING POOL**
Marca / Brand / Marque:	**PANLAB**
Modelo / Model / Modèle:	**LE820120, LE820140, LE820170, LE820200, LE82090, LE820900**

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:

2006/95/EC	Directiva de baja tensión / Low Voltage / Basse tensión
2004/108/EC	Directiva EMC / EMC Directive / Directive CEM
2012/19/EU	La Directiva de Residuos de Aparatos Eléctricos y Electrónicos (WEEE) / The Waste Electrical and Electronic Equipment Directive (WEEE) / Les déchets d'équipements électriques et électroniques (WEEE)
2011/65/EC	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)
2006/42/EC	Directiva mecánica / Machinery directive / Directive mécanique

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:

Seguridad / Safety / Sécurité:	**EN61010-1:2011**
EMC:	**EN61326-1:2013 Class B**
Safety of machinery:	**EN ISO 12100:2010**

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:

Carme Canalís
General Manager
Panlab s.l.u., a division of Harvard BioScience

Cornellà de Llobregat, Spain
27/05/2014

(GB) *Note on environmental protection:*

After the implementation of the European Directive 2002/96/EU in the national legal system, the following applies:
Electrical and electronic devices may not be disposed of with domestic waste.Consumers are obliged by law to return electrical and electronic devices at the end of their service lives to the public collecting points set up for this purpose or point of sale. Details to this are defined by the national law of the respective country. This symbol on the product, the instruction manual or the package indicates that a product is subject to these regulations. By recycling, reusing the materials or other forms of utilising old devices, you are making an important contribution to protecting our environment.

(E) *Nota sobre la protección medioambiental:*

Después de la puesta en marcha de la directiva Europea 2002/96/EU en el sistema legislativo nacional, Se aplicara lo siguiente:
Los aparatos eléctricos y electrónicos, así como pilas y baterías, no se deben tirar a la basura doméstica. El usuario está legalmente obligado a llevar los aparatos eléctricos y electrónicos, así como pilas y baterías, al final de su vida útil a los puntos de recogida municipales o devolverlos al lugar donde los adquirió. Los detalles quedaran definidos por la ley de cada país. El símbolo en el producto, en las instrucciones de uso o en el embalaje hace referencia a ello. Gracias al reciclaje, a la reutilización de materiales i a otras formas de reciclaje de aparatos usados, usted contribuirá de forma importante a la protección de nuestro medio ambiente.

(F) *Remarques concernant la protection de l'environnement :*

Conformément à la directive européenne 2002/96/CE, et afin d'atteindre un certain nombre d'objectifs en matière de protection de l'environnement, les règles suivantes doivent être appliquées.
Elles concernent les déchets d'équipement électriques et électroniques. Le pictogramme "picto" présent sur le produit, son manuel d'utilisation ou son emballage indique que le produit est soumis à cette réglementation. Le consommateur doit retourner le produit usager aux points de collecte prévus à cet effet. Il peut aussi le remettre à un revendeur.En permettant enfin le recyclage des produits, le consommateur contribuera à la protection de notre environnement. C'est un acte écologique.

(D) *Hinweis zum Umweltschutz:*

Ab dem Zeitpunkt der Umsetzung der europäischen Richtlinie 2002/96/EU in nationales Recht gilt folgendes:
Elektrische und elektronische Geräte dürfen nicht mit dem Hausmüll entsorgt werden. Der Verbraucher ist gesetzlich verpflichtet, elektrische und elektronische Geräte am Ende ihrer Lebensdauer an den dafür eingerichteten, öffentlichen Sammelstellen oder an die Verkaufstelle zurückzugeben. Einzelheiten dazu regelt das jeweilige Landesrecht. Das Symbol auf dem Produkt, der Gebrauchsanleitung oder der Verpackung weist auf diese Bestimmungen hin. Mit der Wiederverwertung, der stofflichen Verwertung oder anderer Formen der Verwertung von Altgeräten leisten Sie einen wichtigen Beitrag zum Schutz unserer Umwelt.

(I) *Informazioni per protezione ambientale:*

Dopo l'implementazione della Direttiva Europea 2002/96/EU nel sistema legale nazionale, ci sono le seguenti applicazioni:
I dispositivi elettrici ed elettronici non devono essere considerati rifiuti domestici. I consumatori sono obbligati dalla legge a restituire I dispositivi elettrici ed elettronici alla fine della loro vita utile ai punti di raccolta collerici preposti per questo scopo o nei punti vendita. Dettagli di quanto riportato sono definiti dalle leggi nazionali di ogni stato. Questo simbolo sul prodotto, sul manuale d'istruzioni o sull'imballo indicano che questo prodotto è soggetto a queste regole. Dal riciclo, e re-utilizzo del material o altre forme di utilizzo di dispositivi obsoleti, voi renderete un importante contributo alla protezione dell'ambiente.

(P) *Nota em Protecção Ambiental:*

Após a implementação da directiva comunitária 2002/96/EU no sistema legal nacional, o seguinte aplica-se:
Todos os aparelhos eléctricos e electrónicos não podem ser despejados juntamente com o lixo doméstico Consumidores estão obrigados por lei a colocar os aparelhos eléctricos e electrónicos sem uso em locais públicos especficos para este efeito ou no ponto de venda. Os detalhes para este processo são definidos por lei pelos respectivos países. Este símbolo no produto, o manual de instruções ou a embalagem indicam que o produto está sujeito a estes regulamentos. Reciclando, reutilizando os materiais dos seus velhos aparelhos, esta a fazer uma enorme contribuição para a protecção do ambiente.