

Hardware User's Manual

Hot plate

Hot-plate



References:

LE7406 (76-0113)

Publication:

PB-MF-MAN-046-REV1.0

Limitation of Liability








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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 65°C	
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 INSTALLATION



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.
- 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 selected in the equipment. **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.

Class A equipment is intended for use in an industrial environment.



- WARNING**
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with these instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.
- The user is only authorised to replace fuses with the specified type when necessary.

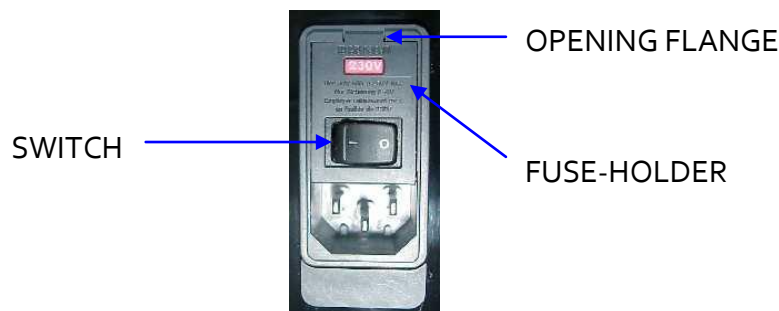


Figure 1. Power inlet, main switch and fuse holder.

FUSE REPLACEMENT OR VOLTAGE SETTING CHANGE

In case of an over-voltage or other incident in the AC net making it impossible to turn on the equipment, or if the equipment voltage setting is incorrect, check fuses according to the following procedure.

- 1 Remove power cord from the power inlet.

- 2 Open fuse-holder by pulling the flange with a regular screwdriver.

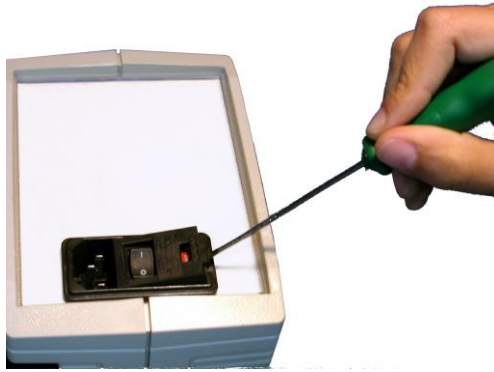


Figure 2. Open fuse-holder door.

- 3 Extract fuse holder using the screwdriver.

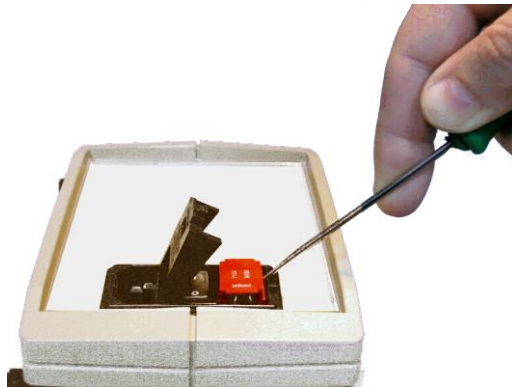
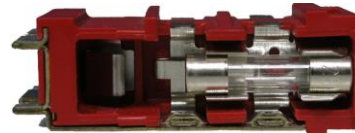


Figure 3. Extract fuse-holder.

- 4 Replace fuses if necessary. Insert fuses in the fuse-holder in the correct position.



CORRECT



INCORRECT

Figure 4. Fuses position.

- 5 Insert the fuse-holder again, positioning it according to the voltage in the AC net.



115V POSITON



230V POSITION

Figure 5 Fuse holder position.

- 6 If the fuses blow again, unplug the equipment and contact technical service.



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

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6. INTRODUCTION

The LE 7406 is a device used to assess a rodent's response to pain induced by heating the rodent's legs. The nociceptive stimulus comes from a metallic surface which is electrically heated in its entirety. The animal is placed on the metallic surface and the latency of the motor response induced by the pain is measured.



Figure 6. LE7406 Hot Plate.

The stimulation surface can be heated to a temperature (between 45°C and 62°C) which is user-selectable, and which the device will maintain constant ($\pm 0.1^\circ\text{C}$) throughout the test. The user starts a timer (by pressing a PEDAL) when the animal is placed on the metal surface. Following a period of latency, the animal licks its leg. This reaction is the usual evaluation criterion for the test. The user presses the PEDAL again to cut off the time once the animal's response is visually detected.

The response time (determined with a precision of 0.01 sec.) is displayed on an LCD screen until the next test. The information can be transmitted to a serial printer or a PC via an RS 232 communications port and the SEDACOM software (not included, should be purchased separately).



WARNING: The temperature of the Hot Plate hot plate is adjustable between 45 °C and 62 °C. In case of broke down a resettable thermal protection system prevents the temperature exceeds 70 ° C. Take caution when touching the hot surface.

6.1. ACCESSORIES SUPPLIED

- LE 7406 HOT PLATE (1).
- PEDAL (1).
- Power supply cable (1).
- RS-232 connection cable (1).

7. EQUIPMENT DESCRIPTION

7.1. FRONT PANEL

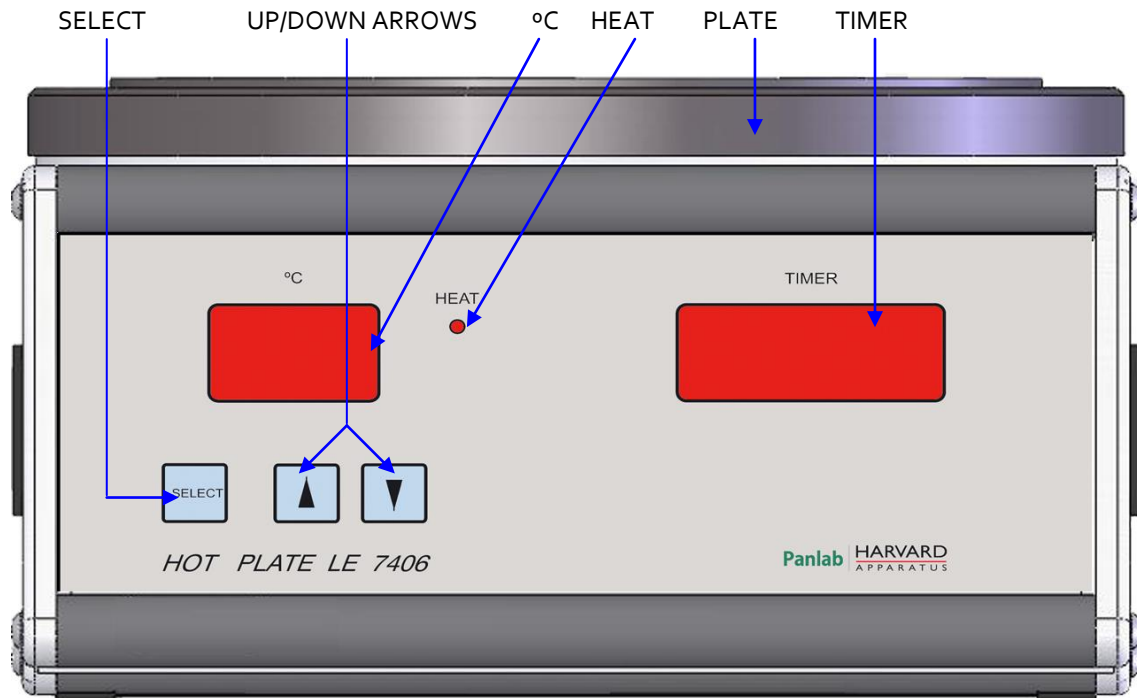


Figure 7. Front Panel.

- **HEAT:** LED that comes on while the unit is in the process of reaching the temperature selected.
- **° C:** This screen indicates the present plate temperature. When the SELECT button is pressed the required temperature is displayed.
- **SELECT:** Press this button to set the required temperature using the ARROWS. The Up arrow increases the setting temperature and the Down arrow lowers it. The temperature can be set from 45°C to 62°C in increments of 0.1°C.
- **ARROWS:** These buttons are used to select the target temperature once the SELECT button has been pressed (with the decimal dot flashing). To validate the selection press the SELECT button again (the decimal dot will not flash and the display will show the present plate temperature).
- **TIMER:** The screen indicates the time elapsed from the moment the pedal is pressed (start) until it is pressed again (stop).

7.2. REAR PANEL

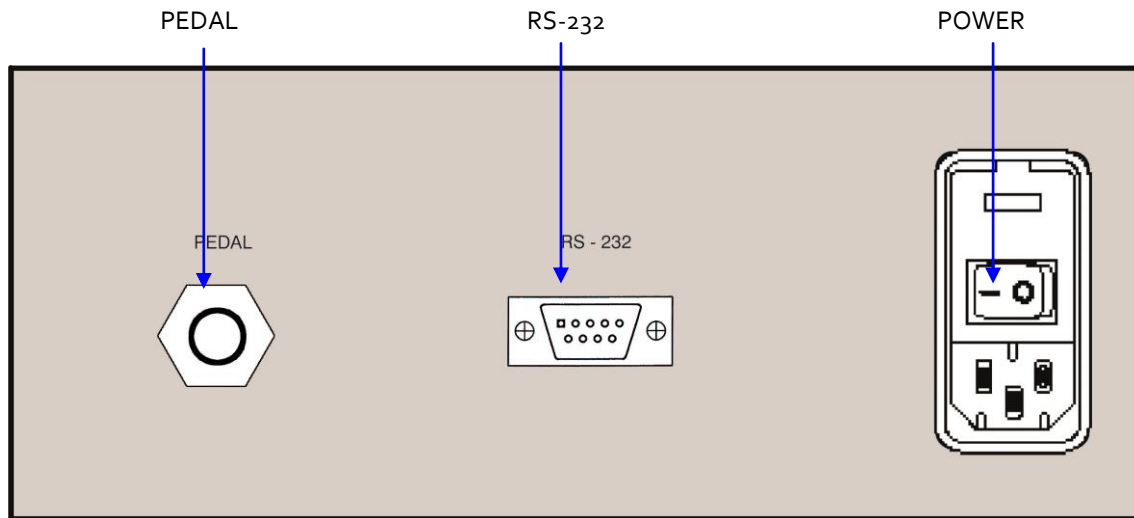


Figure 8. Rear Panel.

- **PEDAL:** 6,35mm female jack. The foot switch is connected to this connector.
- **RS-232:** DB9 female connector to connect the control unit to the computer serial port.
- **POWER:** Power inlet, main switch and fuse holder.

8. OPERATING THE LE 7406

8.1. EQUIPMENT CONNECTION

This illustration features a sample system connection.

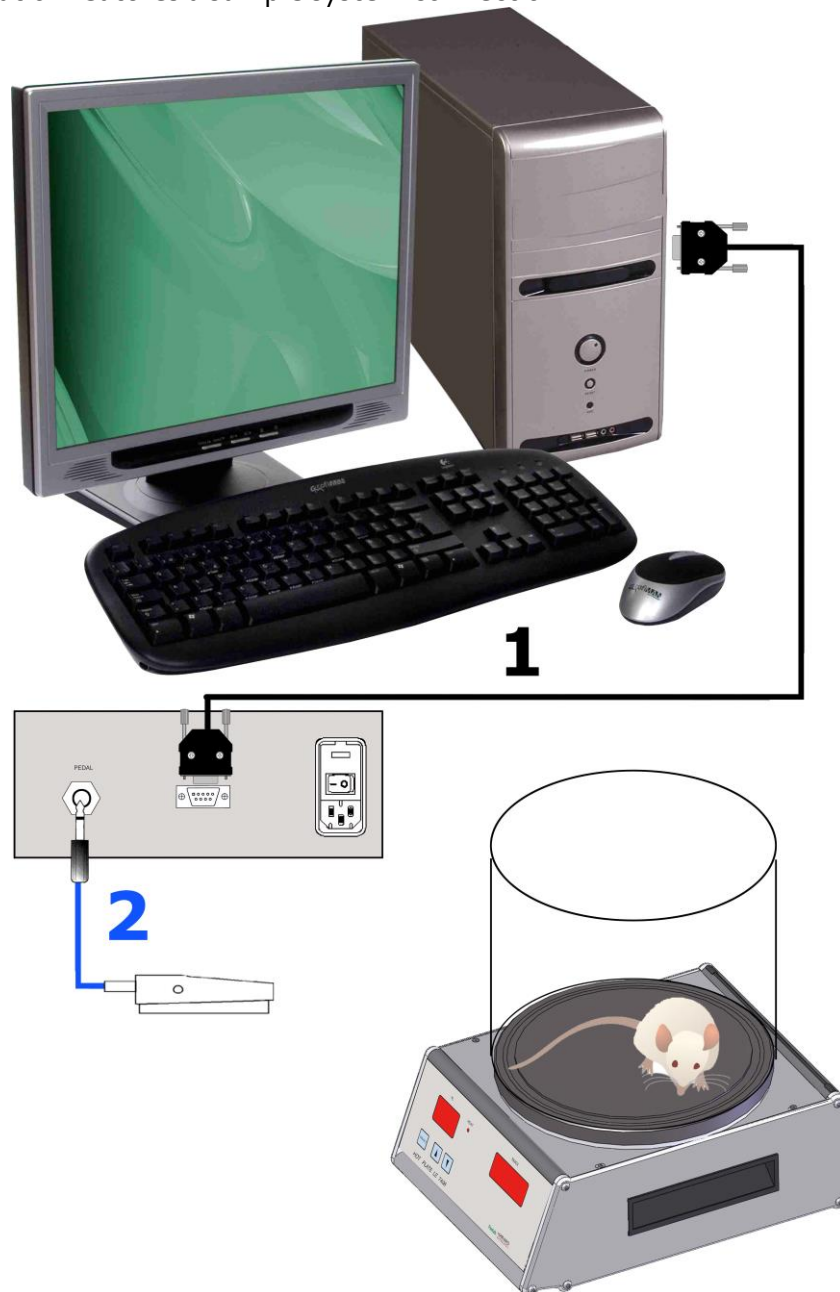





Figure 9. Equipment connection.




The connections and necessary cables are listed in the following table.



	FROM	TO	CABLE
1	LE7406 RS-232	PC Com Port	RS-232 cable
2	LE7406 Pedal	Foot switch	6,35mm jack

8.2. START-UP

When the instrument is switched on (switch to ON), the  screen displays the present temperature of the hot plate (between 20°C and 70°C). If the temperature is above/below this, the screen will display: “—”.

When the  button is pressed, the required temperature appears on  screen with a flashing decimal dot.

Press the   ARROWS to modify (increase or reduce) the required temperature. Press the  button again to select the required temperature, which will be stored in the device's memory, eliminating the need to adjust it every day.

While the required temperature is being modified the plate heating system remains active at the previously set temperature. The LED  remains on while the heating system is active. The amount of electrical power applied to the plate is proportional to the difference between the actual and the target plate temperature. Once the required temperature is reached, the led  will go off, and the plate will stop heating.

When the plate temperature falls below the required temperature due to the heat released into the environment, the heating system switches on automatically until the required temperature is reached again.





WARNING: the stability of the plate's temperature does not only depend on the heating control system, but also on environmental conditions. Stability is lower if the unit is in a place where ambient temperature is variable (near an open window, air-conditioning unit, etc.) or if there is a substantial difference between the required temperature and the ambient temperature.

Following a brief pre-heating period (between 5 and 10 minutes, depending on the difference between required and present plate temperature), the required temperature should be reached. The unit is now ready to begin testing with animals.

The test consists of visually detecting a characteristic motor response in mice when they are placed on a hot plate, that is following a very brief period of exploration the mouse licks its leg.

The user measures the time elapsed from when the animal is placed on the plate (start point: the timer is started by pressing the PEDAL once) until it licks its leg (end point: the timer is stopped by pressing the PEDAL again).

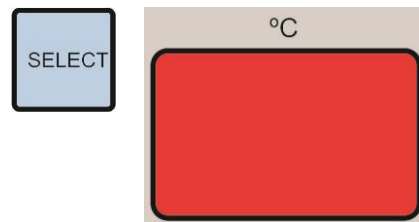
The latency of the response is shown on the  screen to a precision of 0.01 seconds. The latency time remains on  screen until the pedal is pressed again to run another test.

The procedure to be followed is described as follows:

8.2.1. SETTING TO THE REQUIRED TEMPERATURE

1 Switch on the Hot Plate.

2 Press the SELECT button once. The present required temperature will be displayed on screen.



3 The decimal dot flashes, indicating that the value of the required temperature can be modified.

4 Press the UP/DOWN ARROWS to modify the required temperature.



5 Once the new required temperature has been reached, press the SELECT button again.



6 This value will be stored permanently in the unit's memory and will prevail throughout the work session.

7 There is no need to input the required temperature every day, as the value is stored permanently in memory.

8 The led HEAT will remain on while the equipment is heating.



9 Following 5 minutes of pre-heating, the unit is ready for use.

8.2.2. TESTS WITH ANIMALS

- 1 Place the experimental animal on the plate, pressing the PEDAL once at the same time.



- 2 As soon as the animal responds by licking its leg, press the PEDAL once to stop the timer.
- 3 The screen displays the latency of the response, which will remain until the next test.
- 4 If the device is not connected to the RS 232 port, write down the latency value. Otherwise the peripheral device (serial printer or PC) will record the value displayed on screen.
- 5 Remove the animal from the plate and go back to step 1 to repeat the procedure.

8.3. EQUIPMENT CLEANING

8.3.1. CLEANING THE HOT PLATE

To clean the hot plate you can use a cloth dampen with water and then dry it with a dry cloth. In case that there would be traces of faeces and urine, you can impregnate the cloth with a soapy solution, then remove the soap residues with a dampen cloth and finally dry it with a dry cloth.



WARNING: Before cleaning the Hot Plate unplug it from mains.

8.3.2. CLEANING THE TRANSPARENT CYLINDER



WARNING: To clean the transparent cylinder never use alcohol or alcohol derived products, otherwise streaks will appear in clear plastic.

To clean the transparent cylinder you can use a slightly dampen cloth and then dry it with a dry cloth. If it is too dirty the cloth can be dampen with a soap solution, then remove the foam with a damp cloth and finally dry it with a dry cloth.

9. WORKING WITH THE SEDACOM SOFTWARE

The purchase of the **Sedacom** software is needed for transferring the data to a computer (please contact your local sales delegate for more information). The **Sedacom** software reference is composed by a USB Flash key containing the software Installer, a License for use and **Sedacom** User's Manual. Follow next instructions:

- Please refer to the **Sedacom** User's Manual for instructions on how to install and use the software with the present device.
- A serial port (RS232) communication cable (provided with the present device) is needed for the connection of the present device to the computer in which the **Sedacom** software is installed. Please refer to the present User's Manual chapter 8.1 for instructions on how to connect this cable to the device.
- If the computer does not have any serial port, the RS232/USB adapter is needed (ref. CONRS232USB, contact your local sales delegate for more information)

WARNING: the RS232 communication cable provided with the device is used for any connection of the device with associated software (**Sedacom**, etc.). Even when the device is used without software in first instance this cable is to be preserved and kept in a secure place in case the need of using the system with a software arises in the future. In this last case, if the user lost the cable, a new one should be purchased to his local sales delegate (ref. CONRS232). The warranty duration of this cable is the same than the warranty duration of the device.

9.1. TRANSMISSION PARAMETERS

The transmission parameters are as follows:

Parameter	Value
Rate	9600 bauds
Start bit	1
Data bits	8
Stop bit	1
Control signals	CTS and RTS

10. TROUBLESHOOTING

This table features instructions to solve the most frequent problems.

PROBLEM	SOLUTION
The equipment does not start up.	<ul style="list-style-type: none"> • Ensure that the voltage of mains is the same as that selected in the fuse holder. • Check the condition of the fuses.
The equipment does not send data to the program Sedacom .	<ul style="list-style-type: none"> • Check that the cable is connected between the RS-232 device and the PC serial port (see Figure 9). • Make sure that both the serial port as the device selected in the Sedacom program are correct. • The equipment will send data only when you press the pedal and the stopwatch is running, then the time is stopped and is necessary to press the pedal again to start a new measurement.
The LE7406 display shows "---" instead of a numeric value.	<ul style="list-style-type: none"> • If the temperature is below 20.0 ° C or above 70 ° C the display will not show the temperature but will show "---". • If the internal temperature probe does not work, the display will show "---"; in this case contact the technical service.
The Hot Plate heats always	<ul style="list-style-type: none"> • If the internal triac is shorted, the Hot Plate has a protective thermal switch that opens the circuit when the temperature reaches 70 ° C. This can be seen when the equipment continues warming despite the HEAT LED is off.


11. PREVENTIVE MAINTENANCE

	EXPERIMENT
HOT PLATE CLEANING	<input checked="" type="checkbox"/>
TRANSPARENT CYLINDER CLEANING	<input checked="" type="checkbox"/>
CHECK TRANSPARENT CYLINDER PLACING	<input checked="" type="checkbox"/>

12. SPECIFICATIONS

POWER SUPPLY Input voltage: Frequency: Fuse: Maximum power: Conducted noise: Equipment start-up time:	115/230V~ 50/60 Hz 2 fuses 5mm*20mm 2A 250V Fast 190W EN55022 /CISPR22/CISPR16 class B <10 min
WARMING SPECIFICATIONS Temperature range: Display resolution: Accuracy: Highest temperature: Security switch:	45°C–62 °C 0.1 °C +/-0.3 °C 70 °C (without probe feedback) 70°C
TEMPERATURE PROBE Technology: Measurement range showed: Linearity: Accuracy:	Active probe 20°C-70 °C +/-0.1 °C +/- 0.1 °C
ENVIRONMENTAL CONDITIONS Operating temperature: Operating relative humidity: Storage temperature:	10°C to +40°C 0% to 85% RH, non-condensing 0°C to +50°C, non-condensing
COMUNICATIONS OUTPUT Standard interface: Connector:	RS232C Delta 9 contacts female connector
TIMER Range Resolution	0.00s to 999.99s 0.01s
DIMENSIONS Width x Height x Depth: Weight:	232 mm*124 mm*297 mm 5.31 kg

**DECLARACIÓN DE CONFORMIDAD
DECLARATION OF CONFORMITY
DECLARATION DE CONFORMITÉ**

Nombre del fabricante:	Panlab s.l.u.
Manufacturer's name:	www.panlab.com
Nom du fabricant:	info@panlab.com
Dirección del fabricante:	Energía, 112
Manufacturer's address:	08940 Cornellà de Llobregat
Adresse du fabricant:	Barcelona SPAIN
Declara bajo su responsabilidad que el producto:	HOT PLATE
Declares under his responsibility that the product:	
Déclare sous sa responsabilité que le produit:	
Marca / Brand / Marque:	PANLAB
Modelo / Model / Modèle:	LE 7406
Cumple los requisitos esenciales establecidos por la Unión Europea en las directivas siguientes: Fulfil 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 tension
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/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)
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 A¹
FCC:	FCC47CFR 15B Class A¹
Safety of machinery:	EN ISO 12100:2010
¹ This equipment complies with the limits for class A equipment in accordance with CISPR 11 definition and is classed as a Class A digital device, pursuant to CFR Title 47 part 15 of the FCC Rules and is intended to be used in an industrial environment.	
En consecuencia, este producto puede incorporar el marcado CE y FCC: Consequently, this product can incorporate the CE and FCC marking: En conséquence, ce produit peut incorporer le marquage CE et FCC:	
	
En representación del fabricante:	
Manufacturer's representative:	Carme Canalís
En représentation du fabricant:	General Manager
	Panlab s.l.u., a division of Harvard BioScience
Cornellà de Llobregat, Spain	
26/06/2014	

(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 Verkaufsstelle 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 específicos 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.