Hardware User's Manual

Rat paw pressure meter

Randall-Selitto test

References:

LE7306 (76-0234)

Version:

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Panlab | Harvard Apparatus

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Some symbols may have more than one interpretation by professionals unaccustomed to their usage.
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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 equipment 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. 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.

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.
- Equipment does 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.

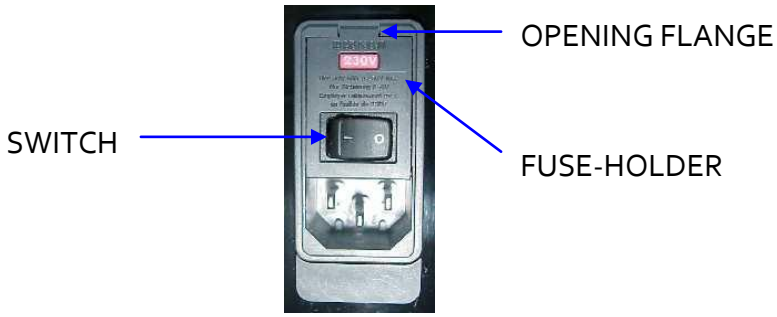


Figure 1. Power inlet, main switch and fuse holder.

FUSE REPLACEMENT

In case of an over-voltage or other incident in the AC net making it impossible to turn on the equipment, 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

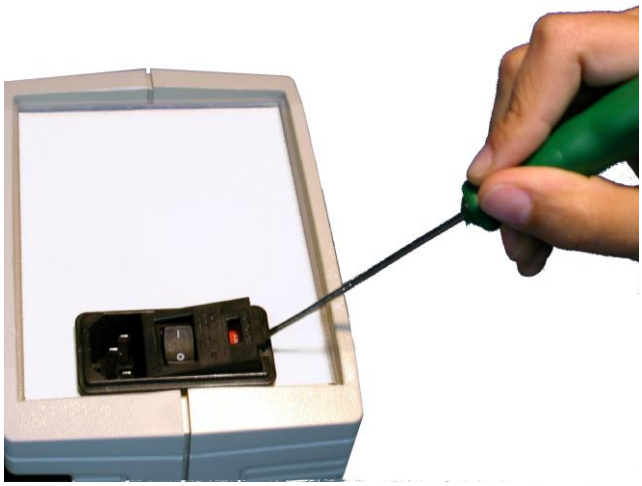


Figure 2. Open fuse-holder door.

3 Extract fuse holder using the screwdriver.

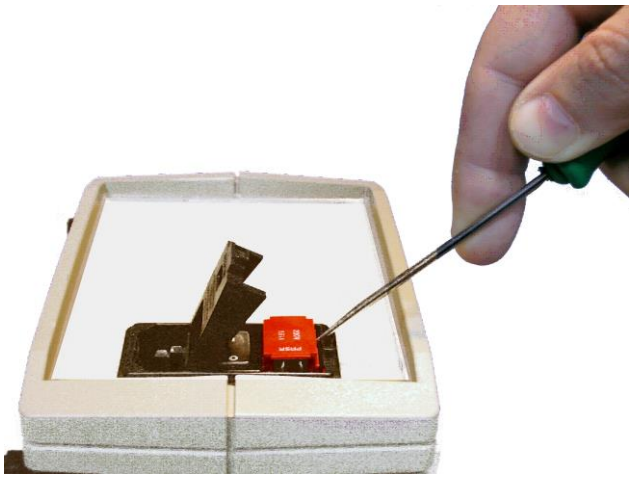
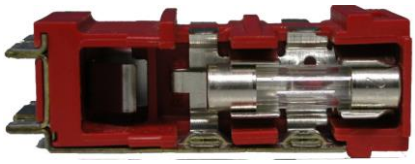


Figure 3. Extract fuse-holder.

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

CORRECT



INCORRECT

Figure 4. Fuses position.

5 Insert again fuse-holder, both possible positions are correct because power supply is universal.

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

WARNING

For electrical safety, never open the equipment. The power supply has dangerous voltages.

5. TABLE OF CONTENTS

6. INTRODUCTION

The quantification of an animal reaction to a painful stimulus is one of the most recurrent problems in pharmacological research. Multiple techniques have been proposed to manage this problem, with the so-called Randall & Selitto[1] test being one of the most widely-used in routine determinations of animal nociceptive responses.

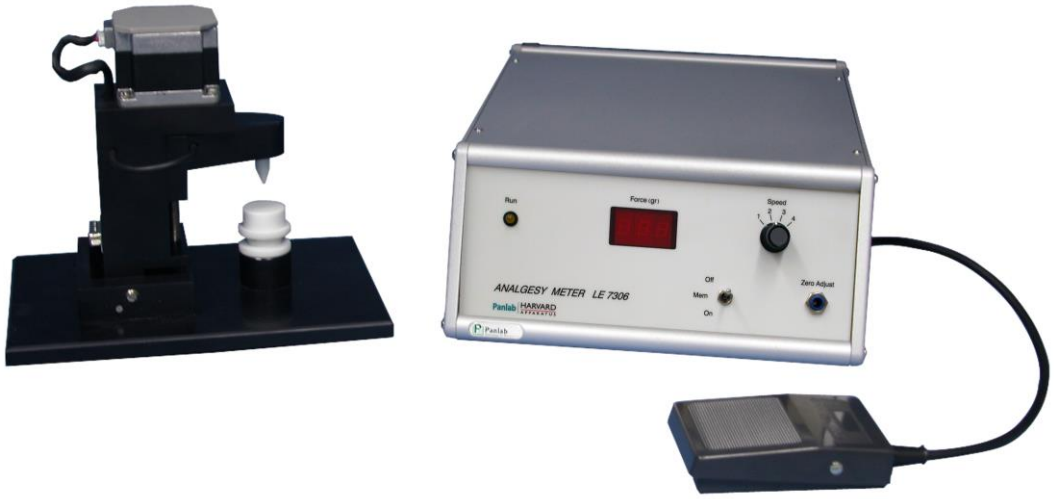


Figure 5. LE 7306 Analgesy meter.

In general terms, the Randall & Selitto test is based on the determination of the response threshold to painful stimulation through pressure on the rodent's paw. Normal animals as well as animals with inflammation induced by any of the available methods can be tested this way.

The LE 7306 Analgesy Meter is an instrument conceived to allow a rapid and accurate study of the analgesic activity using the Randall & Selitto test[1].

[1] Randall, L.O. & Selitto, J.J.; Arch. Int. Pharmacodyn. Ther. 111: 409, (1957)

7. EQUIPMENT DESCRIPTION

7.1. LE 7306 FRONT PANEL

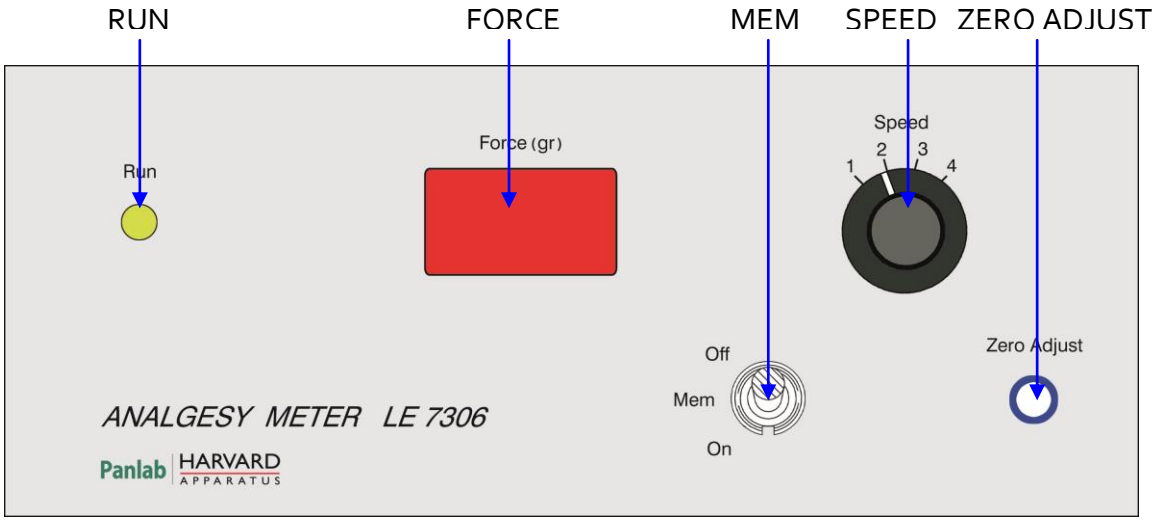


Figure 6. LE 7306 Front Panel.

- **RUN:** This is a yellow led that remains on while the stimulation unit is activated.

- **FORCE (gr):** This is a digital display showing the force (in grams) marked by the strain gauge over which the stimulation point has been mounted. This value is recorded. The way the force value is expressed depends on the position of the MEMORY switch (see paragraph **MEMORY**).

- **SPEED:** This is a switch that allows the stimulation point motor's speed selection, and consequently the increase rate of the stimulation force used on the limb being studied. Said speed can be increased from 1 to 4. The value selected only affects the speed at which the point moves when lowering. The speed at which the point is raised is always at maximum speed.

- **MEMORY:** This switch makes it possible to select the mode in which the force values are expressed on the FORCE display. When the switch is in the OFF position, the value shown on the display is the current value of the force being recorded by the transducer. In this position, changes in force are NOT memorised. When this switch is in the ON position, the value shown on the display is under the control of the starting pedal, in such a way that its initial value is 0 (zero). When the start pedal is pressed, its value will be progressively modified according to the tension being recorded. When the pedal is released, the display maintains the last value reached, and the motor moves at its maximum speed in counter-clockwise direction, raising the conic point and thus releasing the stimulus over the paw. This cycle is reinitiated when the pedal is pressed again.

- **ZERO ADJUST:** This makes it possible to adjust the display value to zero, when the transducer is free of charge. To operate this control, it is recommended that the MEMORY switch be in its OFF position.

7.2. LE 7306 REAR PANEL

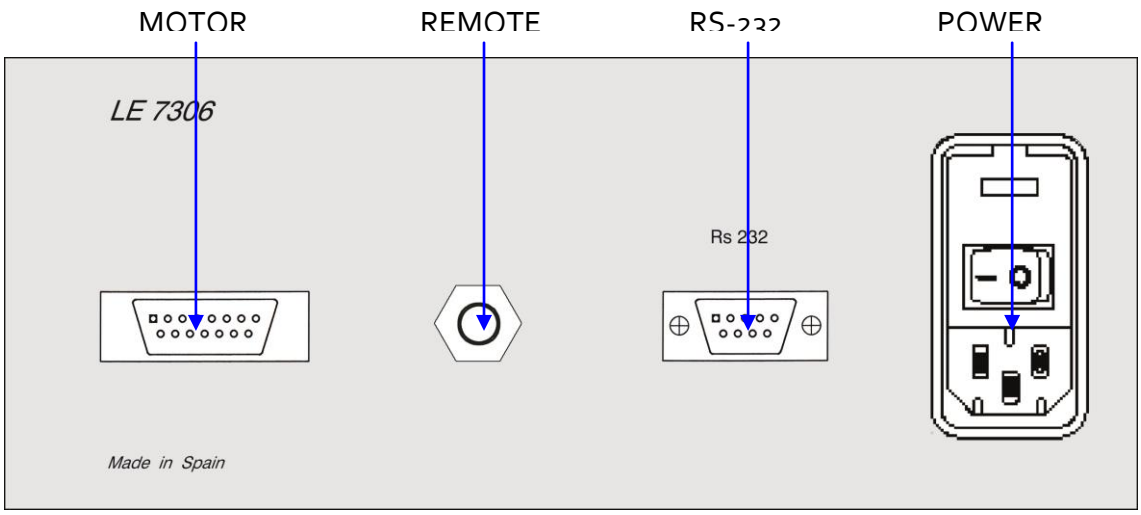


Figure 7. LE 7306 Rear Panel.

- **POWER:** Main switch, power inlet and fuse holder.

- **MOTOR:** Connection between the control unit and the stimulation unit.

- **REMOTE:** Consists of the foot switch, while pressed it activates the experiment. Once there is an animal response the foot switch must be released, and the rounded point will return at its maximum speed and to the original position.

- **RS-232:** For communicating between the computer serial port and the control unit. Data is sent to the computer and recorded with the **Sedacom** software (not included, should be purchased separately). Data is sent to the computer each time the foot switch is released.

7.3. STIMULATION UNIT

The stimulation unit allows a gradual increase (at a selectable rate) of the force applied to the member being studied. This force is applied through a conic point that presses the animal's limb lying on a platform underneath the point. This point is moved down (increasing force) and up (releasing stimulus) by a motor controlled with a pedal.

Figure 8. Stimulation Unit.

This conic point is mounted over an extensiometric cell (a strain gauge), that makes possible the determination of the real force (expressed in grams) that is actually being exerted by the stimulation point.

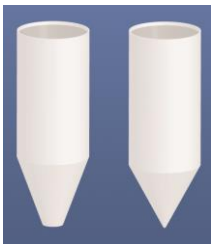


Figure 9. Two kinds of points.

WARNING: The point can cause damage if too much pressure is applied, be careful when handling the device

8. EQUIPMENT CONNECTION

The following schematic shows a sample equipment connection:

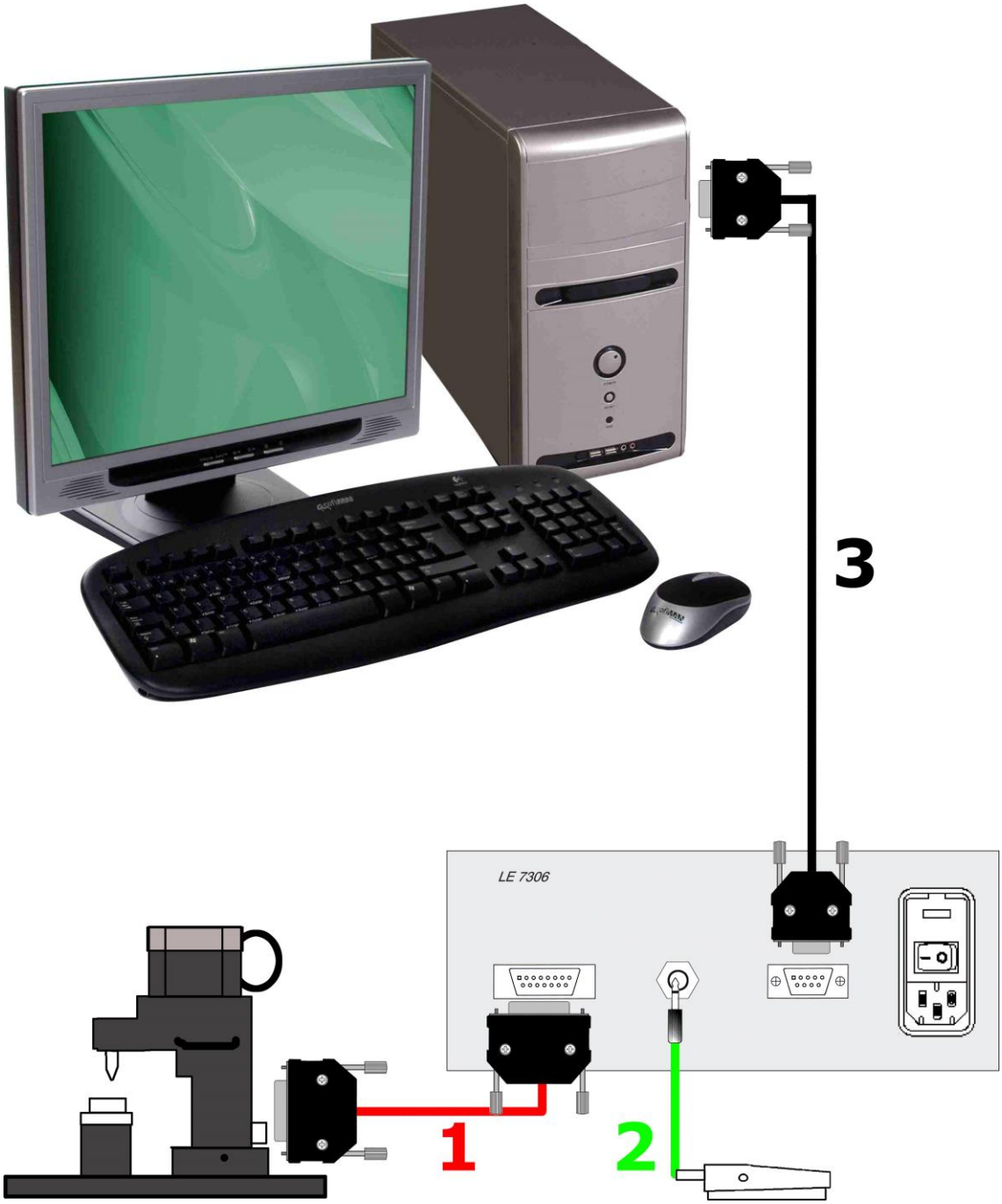


Figure 10. Equipment Connection.

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

	FROM	TO	CABLE
1	LE 7306 Motor	Motor	DB15 cable
2	LE 7306 Remote	Foot switch	Jack mono 6,35mm
3	LE 7306 RS-232	PC Com Port	RS-232 cable

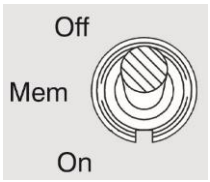
9. WORKING WITH THE EQUIPMENT

9.1. CONDUCTING AN EXPERIMENT

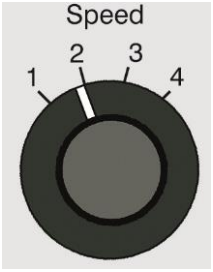
1 Connect the cables as explained in Chapter 8.

2 Activate the start control.

3 If necessary, set the display to zero. To do so, switch MEMORY to OFF and adjust the display value by using the ZERO ADJUST control until zero is reached. Return the MEMORY switch to the ON position.



4 Select the speed of the tip with the SPEED knob, 1 is the lowest and 4 the highest.



5 Situate the animal limb to be studied on the platform under the stimulation point, so that this is at a distance of 5 mm.

6 Once the animal is prepared, activate the start pedal. The values on the display will progressively increase. Once the selected analgesic response has been reached (shaking of the stimulated limb, vocalisation etc.), release the start pedal.

7 The RUN led remains on while the motor is on, while the point is moving down by keeping pressed the pedal, and when the point returns to the rest position when you release the pedal.

8 The force (g) being exerted at the moment the start pedal is released is considered the endpoint of the test. Once the pedal is released, the motor will turn counter-clockwise, raising the point at its maximum speed.

9 The value of the tension reached will remain on the display until a new trial is initiated by pressing the start pedal again.

WARNING: the endpoint of the test is established by the experimenter, and **NOT** detected automatically by the instrument

9.2. CLEANING THE EXPERIMENTATION UNIT

To clean the surface of experimentation unit you can use a lightly wet cloth and then dry it with a dry cloth. If it's too dirty you can wet the cloth with a soapy solution, then remove foam with a wet cloth and finally dry it with a dry cloth.

WARNING: In order to clean the Perspex parts never use neither alcohol nor alcoholic derived products, otherwise stripes will appear in the plastic.

10. WORKING WITH THE SEDACOM SOFTWARE

The purchase of the **Sedacom** software option 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, License for use and **Sedacom** User's Manual. Follow next instructions:

- Please refer to the **Sedacom** User's Manuel for the instruction about 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 devices to the computer in which the **Sedacom** software is installed. Please refer to the present User's Manual for the instruction about how to connect this cable to the device.
- If the computer doesn't 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.). When the device is used without software in first instance, this cable needs 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 time of this cable is the same than the warranty time of the device.

11. TROUBLESHOOTING

This table features instructions to solve the most frequent problems.

PROBLEM	SOLUTION
The equipment does not start up.	• Check the condition of the fuses.
The equipment does not send data to the program **Sedacom**.	• Check that the cable is connected between the RS-232 device and the PC serial port (see Figure 10). • Check that MEM switch is in the ON position. If it is in the OFF position will not send data. • 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 release the pedal, then the tip is removed to the maximum speed.
The LE7306 screen shows a value different to 000 when the **MEM** switch is **OFF** position.	• This is because the transducer is slightly unbalanced. You can balance it using the ZERO ADJUST adjustment with the help of a small screwdriver (see point 3 of Chapter 9).

12. PREVENTIVE MAINTENANCE

	EXPERIMENT
CLEAN EXPERIMENTATION UNIT SURFACE	☑
CHECK CABLES CONNECTION	☑

13. TECHNICAL SPECIFICATIONS

POWER SUPPLY	
Input voltage:	Universal 100-240VAC
Frequency:	50/60 Hz
Fuse:	2 fuses 5mmx20mm 2A 250V fast
Maximum Power:	18W
Conducted Noise:	EN55022 /CISPR22/CISPR16 class B
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
FORCE	
Range:	0 gr to 999 gr
Resolution:	1gr
COMUNICATIONS OUTPUT	
Standard Interface:	RS232C
Connector:	Delta 9 contacts female connector
DIMENSIONS	
Width x Height x Depth:	232 mm x 111 mm x 297 mm
Weight:	3.65kg

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:	**ANALGESY METER**
Marca / Brand / Marque:	**PANLAB**
Modelo / Model / Modèle:	**LE 7306**

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/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:	**EN61326-1:2012 Class B**
FCC	**FCC47CFR 15B Class B**
Safety of machinery:	**EN ISO 12100:2010**

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

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
25/06/2014

(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 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.