

MICROLAB ELETTRONICA s.a.s. di Bergamo Giorgio & C. PicoPress Technical manual Rev. 6

# **MICROLAB**



Technical manual for users

## WARNING

Please note that the instructions listed in this technical manual are for the benefit of operators who have been appropriately trained. This manual should be read in its entirety before the instrument is utilized. Should there be any doubts or problems please contact Microlab's Technical service at E-MAIL info@microlabitalia.it In order to improve the quality of this product, Microlab Elettronica reserves the right to modify this manual without prior notice

Rev.	Description	Date	Appr.	Code: M-1207
0	First issue	01-09-2014		
1	New Battery Charger	18-07-2016		
2	Battery revamping, app. regulations	22-05-2018		
3	Regulations updates	22-04-2021		

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## 1. RESPONSIBILITY

1. The mark guarantees the safety of the PicoPress device when it is placed on the market; Microlab Elettronica is responsible for the safety and correct functioning of the PicoPress device if the indications provided for by the regulations in force and the instructions for use contained in this manual are respected.

## **Customer responsibility**

This manual is to be considered an integral part of the instrument and it should, thus, be carefully stored in place where it will not deteriorate or be tampered with. It must be available at all times to the user and to authorized personnel from Microlab Electronica sas.

CEI EN 60601-1:2007 III edition

UNI CEI EN ISO 14971:2012 CEI EN 60601-1-4: 2003 CEI EN 60601-1-6:2011

UNI CEI EN ISO 15223-1:2016

CEI EN 62304:2006

CEI EN 60529, 1997 CEI EN 60529/A1, 2000

ISO 10993 :2010

CEI EN 60601-1-2:2016 IV edition

#### **CE Mark**

The appliance is a CLASS I device **CE** marked compliant to **UE 2017/745** regulations.

#### **Applied regulations**

Safety Electro magnetic compatibility Risk Analisys

Medical Device Software Labelling Enclosure

Biocompatibility

#### **Product lifetime**

The lifetime of the instrument (with the exception of the batteries) is 5 years. The battery duration depends upon their use and is quantifiable in about 300 complete charge-discharge cycles. This duration is valid only if the instrument has been utilized following the manufacturer's instructions and if the maintenance has been carried out according to the instructions outlined in this manual. The production date can be inferred by the last four digits of the series numbers indicating, respectively, the month and year of production (for example, in the series numbers PP0010907 the last four digits are 0907 indicating September (09) 2007 (07).

#### Guarantee

General Conditions relating to the guarantee

Microlab Elettronica guarantees the product for all production defects and that the instrument conforms to all of the characteristics specified here.

Should the product malfunction during the guarantee period the instrument will be repaired at the expense of the Microlab Elettronica Company by its laboratory in Padua Italy. The instrument will travel at the buyer's expense.

#### Limits relative to the guarantee

The guarantee does not cover damage caused by improper use, negligence, defective maintenance, maintenance not carried out within the time limits indicated in the manual, modifications carried out by non authorized personnel or by its use in inappropriate environmental conditions.

Duration of the Guarantee: the duration of the guarantee is <u>12 (twelve)</u> months from the installation date, with the exclusion of the batteries whose guarantee is for 6 (six) months' time.



### 2. CHARACTERISTICS

The PicoPress instrument is a portable digital gauge to be utilized, for medical purposes, to measure the pressure exerted by a bandage. PicoPress does not administer energy to the patient while it is measuring pressure.

The instrument utilizes a circular transducer made out of an ultra thin biocompatible material in which a known quantity of air is inserted. The transducer is placed between the limb and the bandage.

The pressure detected by the transducer is measured by a microprocessor digital gauge and visualized by means of an alphanumeric display which also provides the essential operative instructions.

The instrument incorporates a micro pump which is manually activated by introducing a known volume of air. The micro pump is furnished with a detection sensor.

The instrument is furnished with firmware (software resident in the microprocessor) which memorizes a maximum of 100 readings and which can be connected by a USB to a personal computer.

The transducers are not sterile as they are made out of disposable, biocompatible material.

The instrument is furnished with rechargeable batteries permitting at least 5 hours of use and including a battery charger. The firmware checks the charging process with opportune algorithms and messages to optimise battery use. The batteries are completely charged in about 6 hours time.

The instrument consists in the following modules:

Cod. M-1200	compact digital gauge complete with a manual micro pump
Cod. T3916ST	battery charger
Cod M-668	carrying case
Cod M-669	package of 5 disposable circular transducers
Cod M-688	User manual (English Version)

#### 3. TECHNICAL DATA

Producer Microlab Elettronica s.a.s. di Bergamo Giorgio & C. via G. Rossa, 35 35020 Ponte S. N (PD) – ITALY	
Electrical Characteristics	
Supply voltage	7.2 V furnished by 6 internal batteries NI-MH at 1.2 V 600 mAh
Maximum current consumption	$50 \text{ mA} \pm 5 \text{ mA}$
Protection fuse	500mA internal, self restoring
Display	Negative alphanumeric, 16 columns, 2 lines, blue illuminated background
Power Absorbed at 230 V	10W (while the batteries recharge)
Dimensions	160 mm x 90 mm x 32 mm
Weight (only the gauge model)	320 grams
Allowed Environmental conditions	
Use	Temperature: from 10°C to 30°C (vedi nota) Humidity: maximum70% Rh at +30°C
	General: ambulatory environment setting
Storage	Temperature: from –5 °C to 40°C Humidity: maximum. 70% Rh at +30°C
Electromedical Characteristics	
Type of Instrument	Risk class: I as 93/42/CE
Applied part	Type BF as IEC EN 60601-1
Insulation	Class II (during recharging) Internal supply (during use)
Grade of protection from liquids	IPX0
Use in the presence of inflammable gases	No
Usage	Continuous use
General characteristics	
Measurement range	from 0 to 189 mmHg
Precision	± 3 mmHg (see note)
Maximum allowable pressure	300 mmHg

The instrument may be less precise if the temperature is not within the limits prescribed here. If it has been kept in a room whose temperature is not within these limits it is advisable to wait at least an hour before utilizing it. Accuracy is guaranteed if the pneumatic sensor is applied to a curved surface (patient's limb) with a diameter greater than 6 cm)



# 4. ELECTROMAGNETIC COMPATIBILITY AND SAFETY

Emissions				
Emission test	Conformity	Electromagnetic Environment - guidance		
RF Emissions Cispr 11	Group 1	The appliance must emit electromagnetic energy in order to perform its intended function. Nearby electronic equipment may be affected.		
RF Emissions Cispr 11	Class B	The appliance is suitable for use in all establishments, included domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.		
Harmonic emissions IEC 61000-3-2	Class A Conforms	It is possible to use the device in all establishments, including domestic establishments and those directly connected to		
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Conforms with limit on network impedance	the public low-voltage power supply network that supplies buildings used for domestic purposes. According to user manual a limit on network impedance in installation point shall be respected		

Immunity aspects					
The device is intended for use	in the electromagnetic envir	onment specified below. Th	e customer or the		
user of the device should assur-	e that it is used in such an e	environment.			
Immunity test	Test level	Compliance Level	Electromagnetic environement -		
	EN 60601-1-2		guide		
Electrostatic discharge	± 6kV contact	± 6kV contact	Floors should be wood, concrete or		
(ESD)	± 8kV air	± 8kV air	synthetic material, the relative		
EN 61000-4-2			humidity should be at least 30 %.		
Burst/Fast Transient	±2kV power supply	±2kV power supply	Mains power quality should be that of		
EN 61000-4-4	lines	lines	a typical commercial or hospital		
			environment.		
Surge	±1kV differential	±1kV differential	Mains power quality should be that of		
EN 61000-4-5	mode	mode	a typical commercial or hospital		
	±2kV common	±2kV common	environment.		
	mode	mode			
Γ	1	1			
Voltage dips, short	< 5% UT	< 5% UT	Mains power quality should be that of		
interruptions and	(>95% dip in UT)	(>95% dip in UT)	environment. If the user of the device requires continued operation during		
voltage variations on	fo 0,5 cycles	fo 0,5 cycles			
FN 61000-4-11	40% UT	40% UT	power mains interruptions, it is		
	(60% din in LIT)	(60% dip in LIT)	recommended that the device be powered from an uninterruptible power		
	for 5 cycles	for 5 cycles			
	70% UT	70% UT			
	(30% dip in UT)	(30% dip in UT)			
	for 25 cycles	for 25 cycles			
	< 5% UT	< 5% UT			
	(>95% dip in UT)	(>95% dip in UT)			
	for 5 seconds	for 5 seconds			
Power frequency	3 A/m	3 A/m	Magnetic power frequency fields		
magnetic field			snould be that of a typical commercial		
EN 61000-4-8					



Immunity aspects at r.f.						
The devices is intended the user of the device sho	The devices is intended for use in the electromagnetic environment specified below. The customer or the user of the device should assure that it is used in such an electromagnetic environment.					
Immunity test	est Test level Compliance EN 60601-1-2 Level		Electromagnetic environement - guide			
RF conducted EN 61000-4-6	3 Veff 150kHz 80MHz	from to	3 Veff 150kHz 80MHz	from to	Portable and mobile RF communications equipment should be used no closer to any part of the device, including cables, than the	
RF radiated EN 61000-4-3	3 Veff 80MHz 2,5GHz	from to	3 Veff 80MHz 2,5GHz	from to	of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. Recommended separation distance $d = 1, 2 \cdot \sqrt{P}$ from 150kHz to 80MHz $d = 1, 2 \cdot \sqrt{P}$ from 80 MHz to 800 MHz $d = 2, 3 \cdot \sqrt{P}$ from 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m)	
Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment marked with the following symbol:						

## Recommended separation distances between portable and mobile RF communications equipment and the Device

The device is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the device can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the device as recommended below, according to the maximum output power of the communications equipment.

Rated maximum	Separation distance accordino to frequency of the transmitter (m)			
transmitter (W)	From 150kHz to 80MHz d = 1,2 · √P	From 80MHz to 800MHz d = 1,2 · √P	From 800MHz to 2GHz d = 2,3 $\cdot \sqrt{P}$	
0,01	0,12	0,12	0,23	
0,1	0,38	0,38	0,73	
1	1,2	1,2	2,3	
10	3,8	3,8	7,3	
100	12	12	23	

For transmitters rated at a maximum output power not listed above, the recommended separation distance d in metres (m) can be determined using the equation applicable to the frequency of the transmitter, where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

## Notes:

(1) At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies. (2) These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

The instrument may turn itself off following an electrostatic discharge. Turn it on and take the measurement again.



## 5. SYMBOLS

<b>\$</b>	Read the instruction Manual
	Please note, the enclosed documents must be read
<u>П</u>	On and Off button
Μ	Menu button
€ €	USB connection to a personal computer
	Transducer connection (tubing)
œ <b>f</b> ⊒	Battery charger connection
<b>†</b>	Applied Part: BF
	Class II
REF	Catalogue number
SN	Serial number
	Producer's name and address
2011-04	Date of manufacture (yyyy-mm)

#### 6. LABELING









▲ 🚱

- Leggere attentamente il manuale prima dell'uso
  Non usare in presenza di gas infiammabili
  Lo strumento può essere riparato solo
  da personale qualificato
  Maneggiare con cura ed evitare qualsiasi urto
  Caricare le batterie quando richiesto sul display
  esolo con il caricabatterie originale
  Non porzare il pistone
  Usare solo con accessori originali
  Non pulire con solventi
  Leggere il manuale per il corretto smaltimento





## 7. INTENDED USE

The PicoPress instrument is to be used exclusively to evaluate the pressure exerted on elastocompression bandages on the limb of a patient using a circular disposable transducer furnished by Microlab Elettronica s.a.s. PicoPress must be used exclusively by appropriately trained medical or paramedical personnel.

## 8. WARNINGS AND SIDE EFFECTS

- Read this technical manual before using the instrument
- Use the instrument in conformity with the instructions outlined in this manual
- Allow only authorized and properly trained personnel to use this instrument
- Use only if the environmental conditions are those delineated in this manual. In particular using the instrument at a temperature higher or lower than the range described here may affect the instrument's precision
- Do not use high frequency instruments (electrical scalpels, mobile phones, X rays, transmitters, etc) in the immediate vicinity of the instrument as it might be negatively influenced
- The instrument may turn itself off following an electrostatic discharge. Turn it on and take the measurement again
- Measurements cannot be made while the batteries are being recharged
- Utilize only the appropriate battery charger to recharge the battery
- · Operators should be careful while handling the instrument and the transducer and all types of blows are to be avoided
- Be sure that the transducer is stretched out completely when it is applied to the patient
- Do not inject liquids or other gases other than the air in the transducer or in the connector of the manometer
- There are no parts that can be repaired by the user on the inside of the instrument. Do not attempt to gain access to the internal parts
- Do not apply the transducer if the patient's skin is injured
- We advise that gauze be placed between the patient's skin and the transducer
- The transducers are disposable. Do not utilize the same transducer on more than one patient
- Do not use solvents to clean the instrument
- Do not force the plunger of the micro pump
- Use only original Microlab transducers and accessories
- Do not use on patient's limbs with a diameter less than 6 cm.
- The instrument must be used exclusively for the purpose expressed here. It should not used in the operating room. Do not apply it to injured skin. The instrument cannot be used as a sphygmomanometer.
- The liquid contained in the batteries is highly corrosive and can cause burns or skin injuries. In case of contact wash the part abundantly with water and contact a physician. Do not for any reason whatsoever touch your eyes with your hands or the part of the body that had contact with the battery liquid.

#### 9. TRANSPORTATION AND STORAGE

The instrument should be stored in a dry, clean, ventilated place at a temperature between -5 and 40°C. Exposition to direct sunlight, to temperature extremes and excessive humidity should be avoided.

Storing the instrument at a temperature above or below the temperature range listed here may cause damage to the instrument Do not bend, tighten or excessively rotate the wires and or tubing of the measuring transducer.

Use the bag that is furnished whenever the instrument is being transported or stored making sure to remove the transducer connected to the manometer from the connector

The instrument and its accessories must be stored in a dry place protected from dust in the environmental conditions described in chapter 3 of this manual.

### **10. INSTALLATION**

The instrument is normally tested and the batteries are charged before shipment. We recommend, in any case, recharging the instrument before putting it into use.

To guarantee the system's safety utilize only the furnished battery charger.

#### 11. DISPOSAL

When the product can no longer be utilized it must be appropriately disposed of .

Non toxic materials for human beings and for the environment have been used and most of the instrument has been made of recyclable substances such as plastic, copper, etc.

Operators should be careful to dispose of the batteries which, though they do not contain lead, should be treated as special refuse. In those areas where there are no specific disposal norms the instrument and its accessories can be returned to Microlab which will see to its disposal.

## **12. MAINTENANCE AND CLEANING**

Attention: the system should be turned off and the wire of the battery charger and USB connection should be disconnected before cleaning is begun

Clean and dry all of the parts that seem dirty using a slightly humid soft cloth (use water with tensioactive detergent). Be sure not to get the transducer wet while you are cleaning the instrument. Do not use any abrasive materials. We recommend having the instrument calibrated once a year at the Microlab.

#### Charging and servicing the batteries:

The batteries cannot be substituted by the user. Do not attempt to open the module and to substitute the batteries.

Read the warnings in case of battery breakdown.

Refer to the chapter on Troubleshooting (chapter 16)

The PicoPress is equipped with 6 nickel-metal hydride (NI-MH) batteries without memory effect (1.2 Volt, 600 mAh each), which guarantees a continuous functioning autonomy of at least 5 hours.

Do not leave uncharged for long periods of time and recharge them only when the message on the display indicates that the charge is insufficient. If the charge level is insufficient PicoPress shuts off automatically to prevent the batteries from exhausting themselves.

The instrument can remain indefinitely connected to the battery charger without becoming overcharged or damaged as the microprocessor will oversee the charging process interrupting it automatically. Complete recharging of totally uncharged batteries takes place in approximately 6-7 hours during which time the word "recharging"

Complete recharging of totally uncharged batteries takes place in approximately 6-7 hours during which time the word "recharging" is seen on the display. When it has finished recharging the instrument turns itself off automatically. If the batteries seem unable to guarantee a sufficient working autonomy contact Microlab's Technical Assistance to have them substituted.

It is advisable to wait for the instrument to indicate that the batteries are uncharged before you charge them.

If the device is not used for a long time, perform a complete charge cycle before storing it and recharge the batteries once a month or, even better, carry out a discharge/charge cycle once a month. Otherwise, it may be impossible to recharge the batteries due to the degradation of internal electrolytes. In this situation, starting from the firmware rev.8, the possibility of forcing a start-up (see chapter 18) of a series of slow charge cycles has been added, which must be followed from as many discharge cycles, until the normal operation of the batteries is restored. However, it is strongly recommended to prevent the use of this procedure by performing the correct maintenance through the periodic charge/discharge cycles.

The battery duration is about 300 complete charge - discharge cycles.

## **13. WORKING INSTRUCTIONS**

<u>Turning on PicoPress</u>: turn the instrument on by pressing the button 0 for a few seconds. An acoustic signal will confirm that the instrument is on and the display will light up.

<u>Placing the transducer</u>: place the sensor on the part of the limb to be examined placing it between a thin piece of gauze and the patient's skin. Make sure that the transducer is stretched out completely when it is applied to the patient and while the bandage is being applied.





<u>Making measurements</u>: connect the sensor to PicoPress but do not force the Luer connector. "PULL PLUNGER OUT" will appear on the display: pull out the plunger of the micro pump as much as possible. An acoustic signal will confirm that the plunger has been pulled out to the fullest extent possible . Wait a few seconds while the instrument goes to zero (indicated on the display by the words "WAIT FOR ZERO PRESSURE").

Push in the plunger without forcing when "PUSH PLUNGER IN" appears on the display. That means that you have reached the end because there is a perceptible click.

You can then read the pressure measurement on the lower line of the display indicating "P = XXX mmHg"

The words "M: MENU :NEW" will appear on the first line of the display

- By pushing  $\bigoplus$  you can begin to take a new measurement (the zeroing , inflating and measuring phases will be repeated)
- By pressing M you enter into the menu where the following choices are available (by rotation pressing M) "STORE MEMORY", "VIEW MEMORY", "CLEAR MEMORY", "LANGUAGE", "EXIT"

By pushing  $\emptyset$  when one of these choices appears you are selecting the corresponding function.



<u>Store Memory</u>: the pressure value displayed during measurement will be recorded into the PicoPress internal memory. A maximum of 100 measurements can be recorded.

<u>*View Memory*</u> : the stored measurements are shown in chronological order. You can scroll measurements pushing the M button. By pushing  $\psi$  you will exit the View Memory function.

<u>Clear Memory</u> : Erases all of the measurements stored into PicoPress internal memory. Press both keys 0 and M at the same time.

Language : allow you to select one of the following languages: Italian, English, German and French

*Exit* : exit from the menu options.

<u>*Turning PicoPress Off:*</u> press the button 0 for at least 2 seconds.

#### 14. CONNECTION TO A PC

The connector of a PicoPress to a PC is possible using the USB port available on PicoPress itself. Use a USB cable with USB A plug and a USB B plug on each side.

PC connection is useful when you want to collect real time pressure measurements (in mmHg) from PicoPress. Using a standard terminal emulation programs (such as Hyperteminal) it is possible to send commands to PicoPress and receive replies. Plug in the USB cable in a USB 2.0 port available on your PC, switch on your PicoPress and the COM driver will be installed. Please wait for the warn message from the Operating System before using the terminal emulation program. At the end of the driver installation, check the COM port number (Es: COM11). Configure the terminal emulation program COM port as follow:

•	Comunication speed	:115200
•	Stop Bit	:1
•	Char lenght	:8 bit
•	Parity	:none
•	Handshake	:none

Follow the instruction on <u>Chapter 13</u> to set up the PicoPress for the pressure readings. On the terminal emulation program, type the command VER (capitol letters, always) and the CR button. If the connection is ok, PicoPress will reply the message: Microlab PicoPress Ver. X (X=actual PicoPress Firmware version)

OK

If so, the connection is running; then to get the real time pressure readings from PicoPress use the command (capitol letters): **REMOTE1 (CR)** PicoPress will reply: **REMOTE ON** OK now type the command: START (CR) PicoPress will reply with the following: P=93.9,0 P=93.8,0 P=93.7,0 P=93.5.0 P=54.8,0 . . . . . Where: P=XX,Y Pressure in mmHg ,0 pressure is OK or Overflow: read pressure is grater than 200 mmHg. ,1 The readings frequency is 4 readings per second (a sample every 250mS). To stop the readings streaming type the command: STOP (CR) PicoPress will reply: οκ

To close the PicoPress connection, type the command: **REMOTE0 (CR)** PicoPress will reply: **REMOTE OFF OK** 

Attention: during the PC connection, PicoPress DO NOT display the pressure readings on its own display.

Attention: if you don't give the **REMOTEO** command to close the connection, PicoPress will remain inactive. To resume to normal operation, switch it off and then on using the  $\dot{U}$  button.

## 15. SPARE PARTS AND ACCESSORIES

PicoPress con provide for the following spare parts:			
CODE	DESCRIPTION		
T3916ST / T5889ST	Battery charger		
M-668	Carrying case		
M-669	Package containing 5 circular disposable transducers		

#### **16. TROUBLESHOOTING**

DISPLAY	DESCRIPTION			
CALIBRATION NEEDED	The instrument needs to be calibrated. Contact Microlab.			
ZERO ERROR!	Plunger pushed in before ZERO	routine termination. Repeat measurement.		
ZERO ERROR!	The instrument is unable to carry	out calibration of zero pressure. It is not possible to make measurements.		
call service	Contact Microlab.			
MEMORY FULL!	The limit of the number of measu	rements that can be memorized has been reached. Erase the		
	measurements			
BATTERY LOW	The batteries voltage is low: charge the batteries.			
RECHARGE!				
OVERFLOW!	The transducer's pressure has exceeded the limit of 189 mmHg			
PROBLEM	POSSIBLE CAUSE SOLUTION			
The instrument does not	The batteries could be	Recharge the batteries. If the instrument does not turn on after the		
turn On	uncharged	batteries have been charged, contact Microlab		
Pressure Measurement is	Leak in the transducer	Check the Luer connector or change the transducer		
not stable				
The pressure stays at zero Leak in the transducer Check the Luer connector or change the transducer		Check the Luer connector or change the transducer		
It is difficult to utilize the	The micro pump has been	Do not force the plunger! Contact Microlab		
plunger of the micro pump	damaged			

#### **17. RECURSIVE CHECKS**

Microlab Electronica recommends checking with a frequency at least annually on the functioning of PicoPress, doing some checks that can be performed by the User. Checks are:

## **17.1 PNEUMATIC CIRCUIT CHECK**

Plug in the PicoPress pneumatic sensor M-676. <u>Be sure to tighten the Luer-Lock plug</u>. Switch on the PicoPress and push the plunger as described in chapter 13. Place the sensor on the flat surface of your desk. Be sure that no acuminated objects may punch the sensor. Put a weight over the sensor (I.E. a book) to get a read pressure of about 100 mmHg. Let the pressure stabilize for about 10 Sec. and then observe the pressure readings: pressure loss must be less than 5 mmHg after 3 minutes. If the pressure is grater, change the sensor M-676 and repeat the procedure. If you have a loss grater than 5 mmHg in 3 minutes again, contact Microlab Elettronica via E-Mail info@microlabitalia.it.

## **17.2 CALIBRATION CHECK**

To perform this test is necessary to have a sphygmomanometer with air cuff for the measurement of blood pressure. Wear the cuff on a arm, the same position as to perform the blood pressure measurement. Insert the M-676 PicoPress sensor between the cuff and the arm skin, and place it in the <u>CENTER</u> of the cuff. Use a glue strip to fix the tube to the arm. Switch on the PicoPress and perform a pressure reading. Now looking the PicoPress display, tighten the cuff straps until you read a pressure between 5 and 10 mmHg. Inflate the cuff using the sphygmomanometer until you read a pressure of 100 mmHg <u>on the sphygmomanometer</u>; the PicoPress display must show the same pressure of 100 mmHg +/- 5%.

If the pressure read by PicoPress is much different, repeat the whole procedure by checking the M-676 sensor is in the <u>CENTER</u> of the cuff and there are no folds or bottlenecks nearby the insertion of the tube into the plastic blister of the sensor itself.

If even after these checks the pressure is found outside the limits specified, contact Microlab Elettronica (E-Mail: info@Microlabitalia.it)

## **18.BATTERY REVAMPING**

Use this function only when the PicoPress autonomy is less than one hour. The function activates 5 slow charge and discharge cycles to partially restore the degraded electrolyte of the batteries and increase the working autonomy of the PicoPress.

When the PicoPress is off, hold down the power button  $\oplus$  and at the same time insert the battery charger connector.

The display will show the message: "Battery Revamping". Leave the battery charger inserted until the first battery charge cycle is complete. At the end of the cycle, the message "Detach charger live device on" will appear (disconnect the battery charger and leave the device on). The Picopress will automatically turn off at the end of the discharge cycle. When the PicoPress is turned off, connect the charger connector to start a new slow charge cycle. The described process will be repeated five times. If the procedure has been successful, the autonomy of the PicoPress will be more than 4 continuous working hours. If, on the other hand, the autonomy is still less than one hour (about), the batteries must be replaced at the Microlab Elettronica sas laboratory.



If the battery regeneration cycle has been started inadvertently, to end it prematurely turn off the PicoPress using the power button U during the slow discharge phase, after disconnecting the battery charger.