Panlab
Technology for Bioresearch

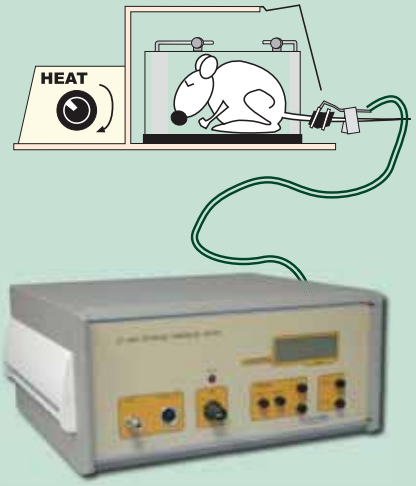
Certified Quality System
ISO 9001: 2000
TÜV CERT
Certificate: 01 100 028154

Non-Invasive Blood Pressure System

N.I.B.P

Using an entirely automatised procedure…

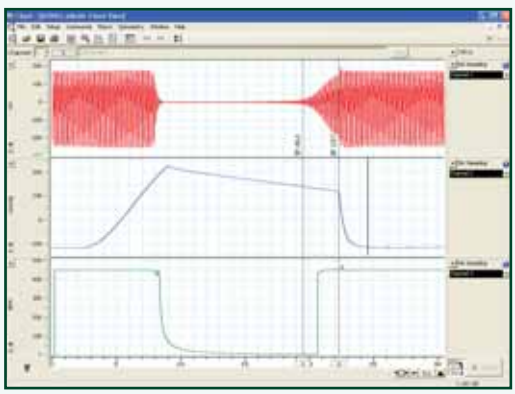
PRESSURE METERS, HEATER & SCANNER…



- Avoid acute or chronic invasive catheterization.
- Suitable for measurements in mice, rats and dogs.
- Based on the same mechanism for measuring blood pressure in humans, sphygmomanometry.
- The value of Systolic Pressure is that which exists in the cuff when the pulse restarts after occlusion. It is possible to associate the SP with the level of occlusion pressure (the moment when the blood flow is interrupted).
- One single Transducer/Cuff for all sizes of animal.
- A built-in air pump ensures AUTOMATED cuff inflation/deflation at a very constant rate.
- The pressure in the Cuff decreases automatically when occlusion of the blood flow is obtained. It is therefore not necessary to set a prior maximum pressure level (slightly above the anticipated occlusion level) to be reached in every measurement. In this way, we avoid subjecting the tail to counterproductive effort that may seriously damage it and complicate the attainment of reliable measurements.
- Quick and easy Transducer/Cuff positioning. Its fastening mechanism allows it to be used with the animal free (not immobilised).
- Allow SEQUENTIAL measurement of to 12 animals without having to change the pulse transducers and tail cuffs.

… AND A SYSTEM FOR **VALIDATION**

- ONLY 4 measures are needed to obtain fiable values.
- REAL VALUES (without linear regression calculation) are done and easily TRACEABLE: visualization of the signal through a Data Acquisition Software;



- SYSTOLIC BLOOD PRESSURE (SP): cuff pressure when the pulse signal level reappears, NOT BY EXTRAPOLATION.
- DIASTOLIC BLOOD PRESSURE (DP): cuff pressure when the pulse signal level recovers its initial level, NOT CALCULATED!
- MEAN BLOOD PRESSURE (MP), computed as:
  MP = DP + 0.33 (SP-DP).
- HEART RATE: evaluated permanently from the blood pulses.
- A Calibration Certificate is supplied with the apparatus.

LE 5001 BASIC SYSTEM

The measured values are not stored in a memory. Each time a new measuring process is begun, the previous measurements are lost.

Data transfer using a RS 232 (USB) built-in port to Serial Printer or PC Computer with SEDACOM software (included).

LE 5002 STANDARD SYSTEM

Data are stored as a single array of successive trials (up to 4.000) and can be shown subsequently. They are not cleared when the LE 5002 is switched off.

Data transfer using a RS 232 (USB) built-in port to Serial Printer or PC Computer with SEDACOM software (included).

LE 5007 PROGRAMMABLE SYSTEM

In addition to the characteristics of the LE 5002, it is equipped with the following:

Calculates the average value, deviation and the number of samples for all animals.

Using PANLAB HEATERS & SCANNER up to 12 animals can be measured completely automatically, programming the number of tests, the number of measurements and the interval between each. (See Automatic NIBP catalogue)

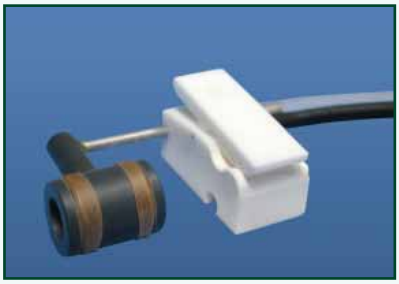
TRANSDUCERS/CUFF

Equipment assembled axially with solidarity, but it can be used separately for the convenience of the user.

Transducer: Its purpose is to detect the pulsations produced in the periphery of the tail by the pressure of the heart beat. It is OMNIDIRECTIONAL, therefore it may be applied at any point of the tail, without further restrictions. Its clamp system guarantees that it can be used for any size of tail of the animal.

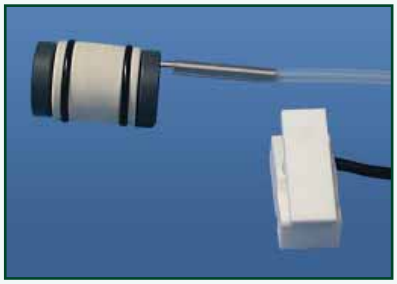
Cuff: By means of the pneumatic pressure which is applied on the membrane, this provokes the occlusion of the blood flow, with the aim of being able to reference the points of the SP and DP (indirect method).

LE 5160-M



For Mice
For Rats up to 150 gr

LE 5160-R



For Rats

LE 5015/LE 5012

For Dogs

CHARACTERISTICS COMMON TO ALL MODELS

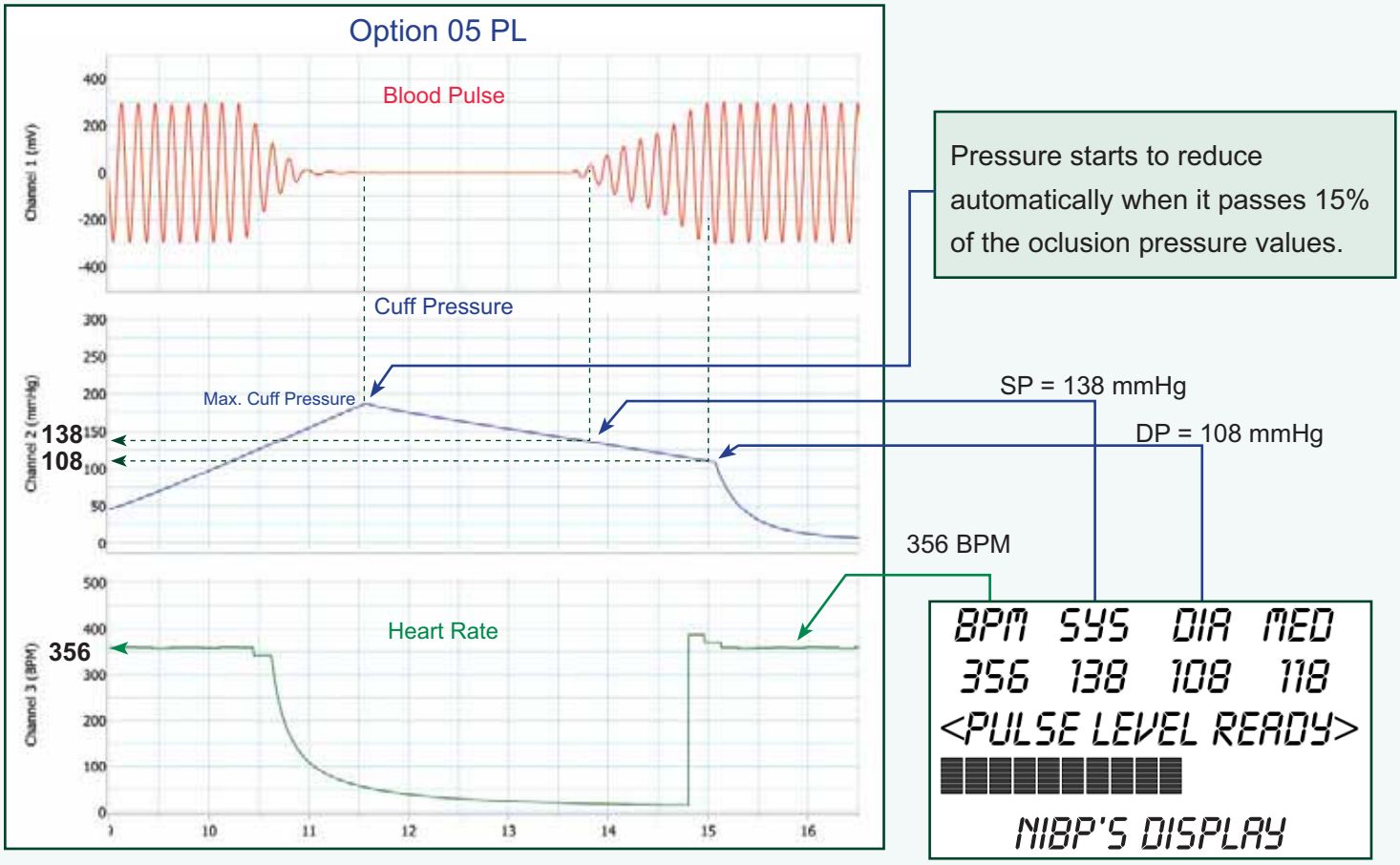
•The trial process begins with the inflation of the Cuff and ends with its complete disinflation. The Start may be operated manually or automatically. At the end of the process (25 to 35 secs.) the digital value of Systolic, Diastolic and Mean Pressure are displayed. Heartbeat and Cuff Pressure levels are shown permanently on the Display.

• All models can be supplied with OPTION 05 PL (see diagram), for monitoring and analysing the data (Pulse, Pressure and Frequency) via a USB port. Software included.

• Standard equipment includes a Transducer/Cuff for rats and 250 gr. restrainer. These may be substituted for others of different sizes.

• Two back BNC data outputs:
PULSE :0.5 Vpp
CUFF PRESSURE: 1 mmHg = 1.43 mV // 350 mmHg= 0.5 V

This information may be sent to a Logger, an Oscilloscope or a Data Acquisition system for analog checking of the values measured by the equipment (TRACEABILITY), as shown in the following diagram:



SEDACOM SOFTWARE

Software supplied free with models LE 5002 and LE 5007. Allows viewing of data and stored values on a PC.

The ASCII format allows easy exporting of data to statistical programmes.

Suitable for Windows 95, 98, ME, NT, 2000 and XP.

AUTOMATIC DATA

ID	TRIAL	RAT	MEAS	BPM	SYS	DIAS	MED
7	1	1	1	396	108	80	89
8	1	1	2	396	104	76	85
9	1	2	1	396	103	75	84
10	1	2	2	396	102	74	83
11	1	3	1	396	102	74	83
12	1	3	2	395	102	74	83
13	1	4	1	396	102	75	84
14	1	4	2	396	102	74	83
15	1	5	1	396	102	74	83
16	1	5	2	396	102	73	82
17	1	6	1	396	101	73	82
18	1	6	2	396	103	73	83

STATISTIC RAT 1

ID	TRIAL	RAT	MEAS	BPM	SYS	DIAS	MED
1	MAN	1		405	109	83	91
7	1	1	1	396	108	80	89
8	1	1	2	396	104	76	85
			X =	399	107	80	88
			S =	5	3	3	3
			n =	3	3	3	3

HEATERS & SCANNER

In order to take reliable blood pressure measurements in rodents, the rodents must be in a state of relaxation. If not, it is generally a very difficult process and the values measured are erratic and slightly higher than the base measurements, corresponding perfectly with the agitated state of the subject.

The best and quickest way of putting the rodent into a state of relaxation, therefore, is to provoke a moderate dilation of the blood vessels by subjecting it to a slight rise in temperature, generated in an enclosure which also retains an external view and environmental noises, uncontrolled and significant sources of anxiety (stress) in the animal.

With Panlab NIBP's, in contrast to other equipment, blood vessel dilation is recommendable not so as to increase the level of the heartbeat signal (Panlab tail Transducers are sufficiently sensitive for this), but to calm the animal and also avoid the anxious movements of its breathing being transmitted to the tail, interfering with the cuff function (occlusion).

Under strict environmental conditions and controlled manipulation it would clearly not be necessary to raise the animal's temperature, or possibly, have to keep it in a restrainer.

LE 5610

Heater for one animal. Temperature adjustable from room temperature to 38ºC.

LE 5650-6 (rats and mice) LE 5660-6 (mice)

Heaters with switches for up to 6 animals.

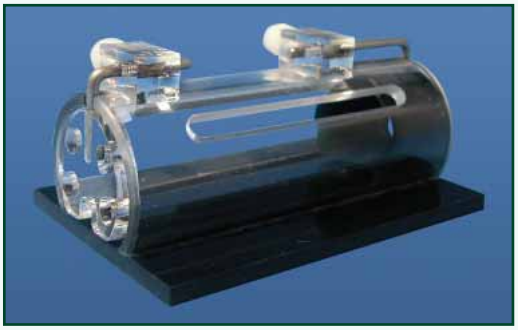
Equipped with a switch for selecting which animal is to be measured. This function can be performed automatically or programmed, using the LE 5007 (up to 2 units = 12 animals).

A fan ensures appropriate air flow and correct dispersion of the heat produced by a system of electronically controlled resistances.

Temperature adjustable from room temperature to 38ºC.

RESTRAINERS

Reference	Description
LE 5016	Restrainer for mice of 35 g (90 x 30 mm)
LE 5018	Restrainer for mice of 50 g (100 x 34 mm)
LE 5020	Restrainer for rats of 150 g (150 x 44 mm)
LE 5022	Restrainer for rats of 250 g (180 x 54 mm)
LE 5024	Restrainer for rats of 400 g (200 x 64 mm)
LE 5025	Restrainer for rats of 500 g (225 x 74 mm)



Panlab, S.L.
C/ Energia,112
08940 Cornellá (Barcelona)
Spain

Phone: + 34 934 750 697 (International)
Phone: 934 190 709 (Domestic)
Fax: + 34 934 750 699
www.panlab-sl.com
info@panlab-sl.com

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