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HEATING BOX

Cat. 58000-840 FOR MOUSE

Cat. 58000-845 FOR RAT

RAT SCANNER

Cat. 58000-850

1 GENERAL

These compact hot-air temperature controlled chambers are useful complements to our BP Recorder series 58000, to warm up the animals on test at about 29-30°C, in order to cause a sufficient vasodilation of the caudal artery (see also paragraph 6-APPENDIX). A rapid and consistent bloodless pressure measurement is made possible by vasodilation.

Models **58000-845** and **-850** for rats house five rat holders; model **58000-840** lodges up to 6 mouse holders.

Tail cuffs and pulse pick-ups (to be ordered separately, see paragraph 5-ORDERING INFORMATION, can be positioned on the tail of each animal on test, which protrudes from its holder, see also Figure 3 “Rat Holder”.

In the Rat Scanner, a double function electrical-pneumatic switch enables the operator to connect the animal holders in sequence to the BP Recorder, to “scan” (hence the name, Rat Scanner) the blood pressure in five animals.

1.1 Instrument Description

The frame of the Heater/Scanner is built from square section tubes which are fitted together with die-cast angles. Both angles and tubes are of aluminium alloy. The tubes are anodized whilst the angles have a stove-enamelled black finish.

Double wall panels of aluminium with a rubber sponge core provide good thermal and acoustic insulation. The stove enamelled orange-peel finish is scratch-resistant and gives the whole instrument an impeccable look.

The top and bottom panels, as well as the front and back lower panels are removable for inspection and servicing, see paragraph 4.1.

The front lid is hinged at the top (see picture) and rotates slightly over 180 degrees to retain the open position without any latch.



When the lid is open, the wide and deep unobstructed warming chamber enables the rat holders to be comfortably placed/removed and the electric/pneumatic connections of the pulse pick-up and cuff to be easily made/taken apart.

The back panel of the warming chamber conceals a compartment which houses a sophisticated hot-air heating system. This includes, besides the circulation fan, the heating coils and the temperature probe, also a wedge shaped vent and a Venturi duct to provide uniform air flow and partial recirculation.

1.2 Heater Controls

The front panel of both Mouse and Rat Heater feature a Temperature Regulator, see following paragraph.

1.2.1 *Temperature Regulator*

The 3-digit thumb-wheel temperature regulator fitted to the front panel enables the experimenter to preset the air-temperature in the range from room temperature up to 39.9°C in 0.1°C steps, adequate for vasodilation purposes. The temperature regulator monitors the chamber temperature via a reliable probe fitted to the back panel of the chamber.

A lock has been installed to prevent accidental setting over 39.9°C, which could be dangerous for the animals. Do not force the ratchet push buttons of the left wheel to display a digit larger than three!

This regulator does not trip a relay according to the conventional ON-OFF mode, but rather modulates power into pulses of convenient width when the air temperature reaches the preset value minus 20%, to reduce temperature hunting to less than +/- 0.1°C.

1.2.2 *Power LED*

This LED, placed near the left edge of the front panel, lights when power is ON, see also paragraph 2.3.

1.3 Rat Scanner Controls

The front panel of the Rat Scanner features the same Temperature Regulator we have seen in paragraph 1.2.1 and power LED described in paragraph 2.3. An animal selector is placed to the right of the temperature regulator, see following paragraph.

1.3.1 *Animal Selector*

The 5-position Animal Selector on the control panel of the Rat Scanner 58000-850, see picture and Figure 1 "Rat-Scanner Front Panel", enables the operator to connect sequentially the cuff and the pulse pick-up of each individual rat to the BP Recorder.



Each position, clearly monitored by a green LED, corresponds to a rat holder. By rotating the knob CW, the scansion proceeds unmistakably from left to right.

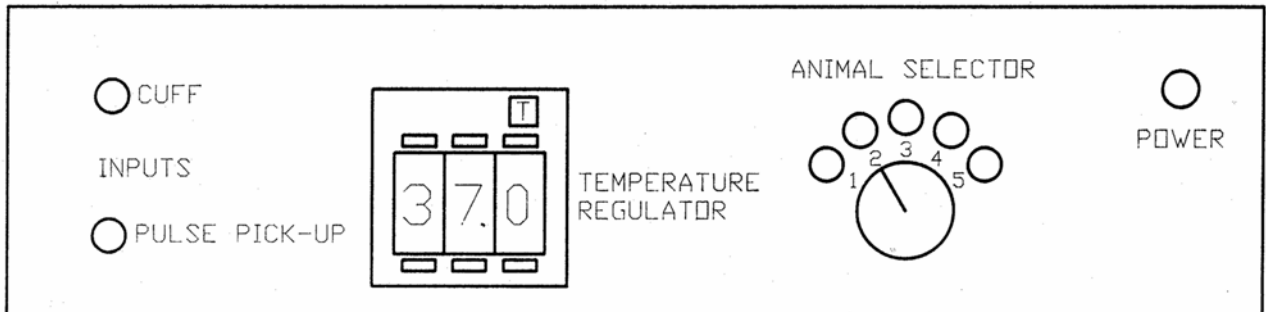


Figure 1 "Rat-Scanner Front Panel"

1.3.2 Electrical / Pneumatic Connections

The pneumatic and electrical connectors are clearly marked:

- O CUFF**
- INPUTS**
- O PULSE PICK-UP**

They are placed near the left edge of the panel, see also Figure 1 "Rat-Scanner Front Panel".

A stretch of clear plastic tube fitted with the pneumatic plug at the BP Recorder end and a stretch of mini-coaxial cable fitted with identical RCA connectors at both ends are provided.

2 INSTALLATION

2.1 Unpacking & Preliminary Check

Check the contents of the shipment for completeness, packing list to hand, and visually inspect the instrument as soon you take it out of the packaging. Use the **Check List** supplied.



Protect the environment!

Dispose of packaging properly, according to existing and applicable waste management rules and regulations.



Maximum care is paid when packing the equipment, if however the instrument is damaged or, after having tested it, fails to meet rated performances, notify the carrier and our company immediately.

2.2 Notes on the Instruction Manual

The Instruction Manual included in the package is necessary for the correct installation and operation of the instrument.

We recommend keeping the manual in good conditions, ready to be consulted by the qualified personnel who operate the instrument.

Free copies of the instruction manual are available upon request: please contact our service department (see paragraph 4.5-Customer Support) specifying the series number of your instrument.

2.3 Before Applying Power

Position the instrument on a stable bench or table surface.

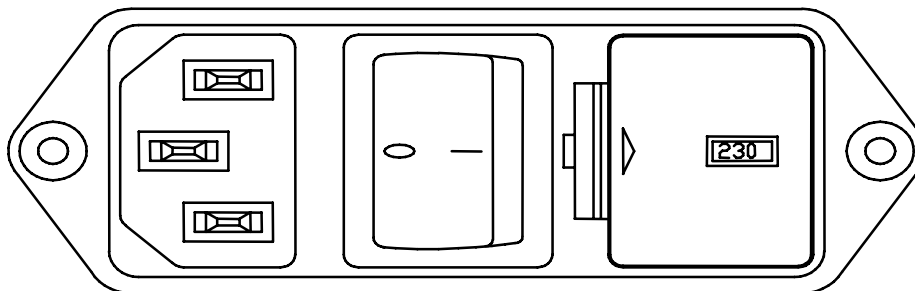


Figure 2 "Power Module"

Take a look at the Power Module, on the back panel of the Heater / Scanner, which encompasses the inlet connection of the mains cord, the mains switch, the fuse holder and the voltage selector.

2.3.1 Mains Switch

This two-pole toggle switch, which complies with international safety standards, provides a visual cue, meaning:-

- **OFF** when pressed to the "O" side
- **ON** when pressed to the "I" side

2.3.2 Fuse Holder & Voltage Selector

The fuse holder comprises two fuses, one on the live, and the other on the neutral. For operation at 230 Volts, we recommend 2.5A timed fuses (type T2.5A). Use 5A fuses (type T5A) for operation at 115 Volts.



The power module also embodies the Voltage Selector. Make sure that the flag indicates the correct voltage (i.e., the voltage of your mains).

To replace the fuses, see paragraph 4.3-Fuses & Voltage Selector.

2.3.3 Mains Cord

It is a standard cable, Cat. # E-WP008. Make sure your power outtake is provided with a reliable ground connection, see also 2.4 & 2.5.

2.4 Connections

Connect the mains cord to a power outtake, **provided with a reliable earth connection.** The mains cord is a standard cable, Cat. E-WP 008.

For electrical/pneumatic connections of Rat Scanner, see paragraph 0

2.5 Additional Safety Consideration



UGO BASILE DOES NOT ACCEPT ANY RESPONSIBILITY FOR PROBLEMS OR HARM CAUSED TO THINGS OR PERSONS ARISING FROM:

- ◆ **INCORRECT ELECTRICAL SUPPLY;**
- ◆ **INCORRECT INSTALLATION PROCEDURE;**
- ◆ **INCORRECT OR IMPROPER OPERATION OR, IN ANY CASE, NOT IN ACCORDANCE WITH THE PURPOSE FOR WHICH THE INSTRUMENT HAS BEEN DESIGNED AND THE WARNINGS STATED IN THE INSTRUCTION MANUAL SUPPLIED WITH THE INSTRUMENT;**
- ◆ **REPLACEMENT OF ORIGINAL COMPONENTS, ACCESSORIES OR PARTS WITH OTHERS NOT APPROVED BY THE MANUFACTURER;**
- ◆ **SERVICING CARRIED OUT BY UNAUTHORIZED PERSONNEL.**

- a. Place your instrument on a steady flat surface.
- b. Do not obstruct free and comfortable access to the power module.
- c. Use original accessories and spare parts only, see also paragraph 5-ORDERING INFORMATION.
- d. Immediately disconnect and replace a damaged mains cord.
- e. Do not operate in hazardous environments or outside prescribed environmental limitations (i.e., 10°C / +40°C, 95% relative humidity, non-condensing); see also paragraph 5.5-Specifications.
- f. Do not spray any liquid on the connectors; see also paragraph 4-MAINTENANCE.



3 OPERATION

3.1 Switching On

Switch on the Heater/Scanner by acting on the Mains Switch placed on the back panel of the instrument; see paragraph 2.3.1-Mains Switch. The power LED located on the front panel will light, denoting that the instrument is on.

Get familiar with the temperature regulator and, in case you have a rat scanner to hand, with the animal selector.

We suggest the operator to make a “dry-run”, to realize how the whole works, without the presence of the animals, which will inevitably catch all available attention, in particular before the operator masters how to handle the interface animal/machine. See paragraph 6-APPENDIX .

When the instrument is ON, its fan operates; its intake grid is visible on the left wall. The hum of the motor and the whisper of the circulating air are barely audible unless you work in a super-quiet environment, but you will feel the air blow by applying your hand over the back panel slot, inside the chamber.

3.2 Setting the Temperature

Select the desired temperature in the range from room temperature up to 39.9°C in 0.1 steps, by acting on the thumb-wheel fitted on the front panel; see paragraph 1.2.1-Temperature Regulator.

If the temperature pre-set on the **THERMAL REGULATOR** happens to be over the room temperature, its LED indicator lights and the heating coils are energized until the chamber air reaches that temperature.

A lock has been installed to limit maximum presettable temperature, to prevent accidental setting over 39.9°C, which could be dangerous for the animals.



IMPORTANT :

Do not force the ratchet push buttons of the left wheel to display a digit larger than three!

3.3 Rat Scanner

If you are operating a Rat Scanner, as soon as the power is ON, you will also notice that one of the green LEDs of the **ANIMAL SELECTOR** lights. The corresponding electro-valve is energized and the pulse pick-up connected to that position is connected to the **input jack**.

After having connected the Scanner to the BP Recorder (both electrically and pneumatically), test that all the cuffs and pulse pick-ups are alive, by rotating the animal selector.



By tapping gently the pick-ups, you will notice a spike in the BP recording.

You will also notice that the cuffs will inflate. Prevent the membranes from bursting by scanning rapidly or, better, by inserting in the cuffs a suitable cylindrical piece, as for example a pencil; see also the BP Recorder manual.

4 MAINTENANCE

While any service of the instrument is to be carried out by Ugo Basile personnel or by qualified technical personnel, authorized by UGO BASILE organization, this section of the instruction manuals describes normal maintenance procedures which can be carried out at the customer's facility.



UNPLUG THE MAINS CORD BEFORE CARRYING OUT ANY MAINTENANCE JOB!

4.1 Access to the Instrument Inside

The access to temperature regulator, power supply and electro-valves (scanner only) is made easy by the detachable bottom panel. Put the instrument upside down and remove the self threading Screws. The layout of the component is not cramped, thanks to the ample space available.

Great accessibility (even the front panel is removable, if it is necessary) and simple straightforward wiring makes inspection and servicing easy.

4.2 Hot Air Heating System

The heating system is housed behind the back panel of the warming chambers. Outside air is sucked in by the fan fastened to the inner end of the Venturi manifold. The air expands in the heating coil section and further expands at the lower level of the heating compartment before entering the chamber via appropriate slots.

Part of the air is recycled via a port cut in the back wall of the chamber.

Both the fan and the heating coils, the latter working at one third of the rated voltage are very reliable components and hardly require attention. In case it becomes necessary to inspect the compartment, the access requires the removal of the top panel of the box. Remove its self-threading screws and take it out.

Take out the insulation rubber sponge sheet and then slide out the ceiling plate of the chamber, after having freed it. This requires removing the four screws which keep the ceiling in place, from inside of the chamber. It does not require a contortionist but only a screw-driver (not too long!) and a modicum of dexterity.



Once the ceiling is out, the components of the system are all in sight. A 5MA box-wrench will help in the case the heating resistor package requires a close inspection or replacement.

The fan is clamped into place by 4MA screws.

To reassemble, follow the same steps in reverse order.

4.3 Fuses & Voltage Selector

To inspect and/or replace the fuses, **disconnect the mains cable first!** Insert a miniature screwdriver in the slot indentation, see Figure 2 "Power Module", and snap out the slide which houses the fuses.

For operation at 230 Volts, we recommend 2.5 A timed fuses (type T2.5A). Use 5A fuses (type T5A) for operation at 115 Volts.

Snap in the fuse slide: the "*click*" ensures that it is locked. Check the voltage flag before applying electrical power.

4.4 Long Inactivity

The instrument does not require any particular maintenance after long inactivity, except cleaning.

We recommended that the instrument is duly protected from dust during storage.

4.5 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Plantar Test, please do not hesitate to get in touch with our local distributor or with our **service department** at:-



UGO BASILE S.r.l.
Via Guido Borghi 43
21025 COMERIO – Varese, ITALY



Phone : +39 0332 744574



Fax : +39 0332 745488



e-mail : service@ugobasile.com

Before sending any instrument to our factory for repair, we recommend you to get in touch with our service department to obtain a return authorization number (R.A.N.) and shipping/packing instructions.



We may not be held responsible for damages during transport due to poor packing. Whenever possible, please use the original packing.

5 ORDERING INFORMATION

58000-840 Mouse Heater, complete with 6 mouse holders.

58000-845 Rat Heater, complete with 5 rat holders of selectable I.D. ¹

58000-850 Rat Scanner, complete with 5 rat holders of selectable I.D. ¹

Each Heater and Scanner is complete with following standard accessories:-

E-WP008 Mains Cord – Europe (or *E-WP008-1* U.S.A. / *E-WP008-2* U.K.)

Set of 2 fuses for either 115 VAC or 230 VAC mains

NOTE: Pressure cuffs & pulse pick-ups are not included and are to be purchased separately, see paragraphs 5.1 & 5.2.

5.1 Available Pulse Pick-ups

- 58000-503 Pulse Pick-up for Mouse, diam. 3 mm
- 58000-504 Pulse Pick-up for Mouse, diam. 4 mm
- 58000-505 Pulse Pick-up for Rat, diam. 5 mm
- 58000-506 Pulse Pick-up for Rat, diam. 6 mm
- 58000-507 Pulse Pick-up for Rat, diam. 7 mm
- 58000-508 Pulse Pick-up for Rat, diam. 8 mm
- 58000-509 Pulse Pick-up for Rat, diam. 9 mm
- 58000-518 Pulse Pick-up for Dog, diam. 18 mm

5.2 Available Tail Cuffs

- 58000-606 Tail Cuff for Mouse, diam. 6 mm
- 58000-609 Tail Cuff for Rat, diam. 9 mm
- 58000-613 Tail Cuff for Rat, diam. 13 mm
- 58000-620 Tail Cuff for Dog, diam. 20 mm
- 58000-624 Tail Cuff for Dog, diam. 24 mm

¹ If no other diameter is specified, we will supply the 50mm size, see paragraph 5.3



5.3 Available Holders

- 58000-343 Mouse Holder
- 58000-344 Rat Holder, 40 mm I.D.
- 58000-345 Rat Holder, 50 mm I.D.
- 58000-346 Rat Holder, 60 mm I.D.

5.4 Consumables

- 58000-706 Set of 5 Membranes for 6 mm Cuff
- 58000-709 Set of 5 Membranes for 9 mm Cuff
- 58000-713 Set of 5 Membranes for 13 mm Cuff
- 58000-720 Set of 5 Membranes for 20 mm Cuff
- 58000-724 Set of 5 Membranes for 24 mm Cuff
- 58000-806 Set of 2 O-Rings for 6 mm Cuff
- 58000-809 Set of 2 O-Rings for 9 mm Cuff
- 58000-813 Set of 2 O-Rings for 13 mm Cuff
- 58000-820 Set of 2 O-Rings for 20 mm Cuff
- 58000-824 Set of 2 O-Rings for 24 mm Cuff
- 58000-320 Foam Ring for all pulse Pick-ups (set of 3)

5.5 Specifications

- Air Temperature : from room temperature to 39.9°C, in 0.1°C steps
- Temperature Setting : via thumb-wheel on the front panel
- Animal Scanning (Scanner only) : via 5-position selector on the front panel
- Power Requirements : 115 or 230 V, 50/60 Hz, 250 VA max.
- Operating Temperature : 10° to 40° C
- Sound Level : <45dB
- Outside Dimensions : 60 (width) x 50 (depth) x 32 (height) cm
- Outside Dimensions : 57 (width) x 37 (depth) x 20 (height) cm
- Chamber volume : 38 litres
- Weight (net) : Kg 19.5
- Shipping Weight : Kg 28.0 approx.
- Shipping dimensions : 80 x 60 x 44 cm



6 APPENDIX

6.1 Prewarming the Animals

Place the animal in the warming cupboard, at about 29-30°C for at least 30 minutes, in order to cause a sufficient vasodilation in the caudal artery.

Some researchers feel that in this way the vasodilation of the whole vascular system will inevitably cause a “pressure drop”. This pressure drop takes place in all animals and consequently the reliability of a pressure screening should not be severely affected. Admittedly, this reasoning may leave some scientists uncomfortable about the artefact he/she feels it may impair the experiment.

As alternative, it is suggested to prewarm at lower temperature, say, 26-27°C which, after all, is not worse than a hot Summer day, and then apply local heating.

Once the animal is restrained in its harness, apply on the protruding tail the heat source, which can be an infrared bulb, a heating blanket or both.

Care should be taken to avoid overheating which may cause the animal a severe discomfort and consequent struggling, etc. A warm jacket-tube in which the tail is inserted has proven to be good.

Bear in mind that the vasodilation which makes the pulse “audible” to the transducer is a threshold process. In particular, when the local heating method is followed, the pulse may be totally missing at the “TEST interrogation” and pops out loud and clear twenty seconds later.

Once a satisfactory vasodilation is achieved, the heat source can be removed or reduced. A minimum of practice (and persistence!) will overcome all problems.

According to our knowledge, every researcher using the BP Recorder has perfected the technique, adding each his/her personal touch to optimize technique for lab or application. See also BP Recorder manual.

6.2 Restraining the Animals

Basically, the animal is placed in a holder from which the tail protrudes. Convenient animal restrainers are provided with the standard package. Our models are particularly suitable, see paragraph 5.3-Available Holders, being purposefully designed for this task, as they feature:-

- a) a conical “muzzle” to confine the animal head
- b) availability in 3 different diameters for rat and one for mouse, to fit various animal sizes (see 5.3-Available Holders).

- c) telescope-adjustable length
- d) a quick fit/release back lid provided with an ample U-shaped tail slot
- e) capability of dissipating the rat body heat by a suitable combination of ventilation slots, selection of heat conductive materials, etc.



Figure 3 "Rat Holder"

6.3 Conditioning the Animals

Some research workers think advisable to carry out some kind of "conditioning", before starting the blood pressure measurement.

In other words, the animals should be kept 3-4 minutes in the restrained conditions, their tails fitted with cuff and transducer, better if the exercise is repeated 2-3 times a day. It is obvious they will behave in a more relaxed way, in particular from the cardio-vascular perspective, when the "real thing" will eventually take place!

Operate with patience and remember that more patience and longer familiarization time are required when handling mice. These small creatures seem to be constantly in motion, twisting and turning, particularly when you confront them with a fresh mouse holder.



WIRING DIAGRAMS

8450-001ES01	Wiring Diagram
8500/01	Wiring Diagram
58000-845EX01	External Components
58000-850EX01 (sh 1 of 2)	External Components
58000-850EX01 (sh 2 of 2)	External Components

checked on 08/06/04 by