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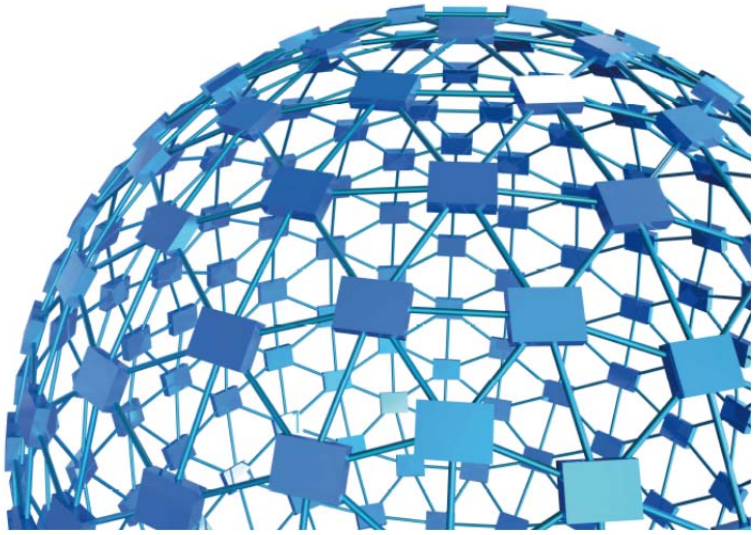
TRANSFORMING IDEAS INTO INSTRUMENTS

instruction manual

Heat-Flux I.R. Radiometer
Cat. No. 37300



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instruction manual

Heat-Flux I.R. Radiometer
Cat. No. 37300

Serial No.

SAFETY CONSIDERATIONS

ALTHOUGH THIS INSTRUMENT HAS BEEN DESIGNED WITH INTERNATIONAL SAFETY STANDARD, THIS MANUAL CONTAINS INFORMATION, CAUTIONS AND WARNINGS WHICH MUST BE FOLLOWED TO ENSURE SAFE OPERATION AND TO RETAIN THE INSTRUMENT IN SAFE CONDITIONS.

SERVICE AND ADJUSTMENTS SHOULD BE CARRIED OUT BY QUALIFIED PERSONNEL, AUTHORIZED BY UGO BASILE ORGANIZATION.

ANY ADJUSTMENT, MAINTENANCE AND REPAIR OF THE OPENED INSTRUMENT UNDER VOLTAGE SHOULD BE AVOIDED AS MUCH AS POSSIBLE AND, WHEN INEVITABLE, SHOULD BE CARRIED OUT BY A SKILLED PERSON WHO IS AWARE OF THE HAZARD INVOLVED.

CAPACITORS INSIDE THE INSTRUMENT MAY STILL BE CHARGED EVEN IF THE INSTRUMENT HAS BEEN DISCONNECTED FROM ITS SOURCE OF SUPPLY.

Instruction Manual dated October 2016
Revision 1

CE

www.ugobasile.com

I.R. Heat-Flux Radiometer

Cat. No. 37300

General

The Heat-Flux I.R. Radiometer Cat. 37300 has been designed to **calibrate** I.R. sources, in particular the classic Tail-Flick 37360 and Plantar Test 37370 of our make.

The purpose of this extremely useful accessory is to make sure different I.R. sources deliver the same **power flux** (expressed in mW per square cm), hence a nociceptive stimulus of the **same intensity.**

The I.R. output of a I.R. Tail-Flick or Plantar Test may, over the course of one-two years, undergo to 2-3% reduction, due to dust gathered on the optics, darkening of the I.R. bulb, accidental knocks, aging of components due to thermal cycles, etc.

Moreover, if the bulb is replaced or the electronics serviced, output alteration of more significant magnitude, say, 8-10%, may take place.

The design of a simple and reliable I.R. Radiometer has been made possible by the availability of miniature flat "temperature gradient sensors", whose out-put signal is proportional to the temperature difference between their top and bottom surface.

- For Precise Calibration of Infrared Analgesia Meters
- To calibrate the I.R. emission of Ugo Basile Plantar Test & Tail Flick

Main Features

- Provides a measure of stimulus intensity in mW/cm^2
- Assures that all infrared instruments are emitting the same level of stimulus intensity

Ugo Basile: more than 10,000 citations

CHECK-LIST

Cat. No. 37300 HEAT-FLUX I.R. RADIOMETER

CLIENTE / CUSTOMER_____

Ordine No. / Order No. _____ Data / Date___/_____/_____

UB code	*CAT.No.*	*√*	*Q.ty*	*DESCRIPTION*	*DESCRIZIONE*
	37300-001		1	HEAT-FLUX METER	UNITA ELETTRONICA
	37300-002		1	HEAT-FLUX PROBE	SONDA
	37300-320		1	PROBE FRONT COVER	COPERCHIO DI PROTEZIONE
	37300-321		1	ADAPTOR FOR TAIL-FLICK	ADATTATORE TAIL-FLICK
	37300-322		1	ADAPTOR FOR PLANTAR TEST	ADATTATORE PLANTAR TEST
	37300-323		1	INSTRUMENT CASE	VALIGETTA
E-AU 041 USB pen-drive	37300-302			INSTRUCTION MANUAL	MANUALE D'ISTRUZIONE

DATE / /	Serial No.	IMBALLATO DA / PACKED BY

IMPORTANT/IMPORTANTE:

Check the shipment for completeness immediately after receipt: should you find any discrepancy, please fill in the following part and transmit it to our fax no. +39 0332 745488

Al ricevimento della merce controllate che la spedizione sia completa: in caso di discrepanza, completate il formulario di seguito riportato ed inviatelo al nostro fax no. 0332 745488

FROM: Name	Company/Institution
DATE	REF.

NOTE

CONTENTS

Heat-Flux I.R. Radiometer

Cat. 37300

1 GENERAL

The Heat-Flux Radiometer cat. 37300 has been designed to **calibrate** I.R. sources, in particular the classic Tail-Flick Cat. 7360 & Plantar Test Cat. 7370 of our make, i.e., to make sure they deliver the same **power flux** and hence a nociceptive stimulus of the **same intensity**.

The power FLUX is expressed in mW per square cm.

The 37300 Radiometer enables the experimenter to:-

a) Check (and adjust if necessary) the I.R. emission. In fact, the I.R. output of the Tail-Flick and Plantar Test Units may, in the course of one-two years, undergo 2-3% reduction, due to dust gathered on the optics, blackening of the I.R. bulb, accidental knocks, ageing of components due to thermal cycles, etc.

b) Moreover, in case the bulb is replaced or the electronics serviced, output alteration of more significant magnitude, say, 8-10%, may take place.

c) Make sure that two or more Tail-Flick/Plantar Test Units deliver thermal nociceptive stimuli of exactly the same intensity and balance them, if necessary.

d) Know the I.R. energy (1 mW for the duration of 1s corresponds to 1 mJ) in absolute terms, a useful datum to compare with any equal or different method/instrument described in the literature.

The design of a simple and reliable I.R. Radiometer has been made possible by the availability of miniature flat “temperature gradient sensors”, whose output signal is proportional to the temperature difference between their top and bottom surface.

2 INSTRUMENT DESCRIPTION

The standard package of this extremely useful accessory includes:

- the **Heat-Flux Meter**
- the **Heat-Flux Probe**, embodying the heat sink and the temperature gradient sensor, the latter provided with a Guard Cover

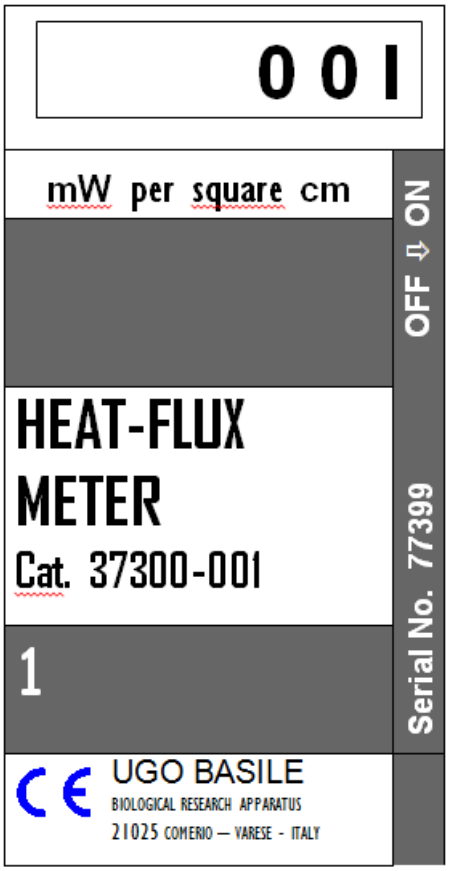
- the **Adaptor** for **Tail-Flick**
- the **Adaptor** for **Plantar Test**

see picture and Ordering Information.

The Digital Meter is powered by a 9V battery which makes the Radiometer entirely self-sufficient.

All parts of this portable instrument are neatly lodged in a sturdy plastic case with punched foam lining, which should be retained for the safe storage of the Radiometer and its accessories.

2.1 Heat-Flux Meter



The Meter upper panel features a 3-digit display which indicates the heat-flux, whose measuring unit (mW per square cm) is indicated below the display window.

The panel outlines also the instrument name, catalogue & serial number and indicates the ON-OFF position of the slide-switch placed on the right side.

The probe is provided with a cable whose end connector (low voltage) matches the plug located on the top of the Meter, see picture.

3 INSTALLATION

3.1 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 supplied ***Check List***.

If the instrument is damaged or, after having tested it, fails to meet rated performances, notify the carrier and our company immediately, see paragraph 6.3-Customer Support.

Always stock the instruments in its plastic case after use.

Protect the environment!

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

3.2 Notes on the Instruction Manual

The 37300 Instruction Manual included in the package (on the USB drive) is necessary for the correct installation and operation of the instrument.

We recommend reading the manual with attention, as it is essential for the correct installation and operation of the instrument.

Please save the manual, ready to be consulted by the qualified personnel who use the instrument. Print it, only if necessary.

Our Instruction Manuals are available as free download on our web. For any additional information and/or assistance, you are welcome to contact our Service Department (see paragraph 6.3-Customer Support), specifying the serial number of your instrument.

3.3 Assembling the Device

Remove the guard cover of the Probe from the threaded head of its heat-sink, and place it in the case. Exert caution, as the Temperature Gradient Sensor is now unprotected.

Assemble the suitable adaptor selected between the two provided, **without unnecessary final tightening**.

3.4 Connections

Insert the male connector of the Heat-Flux Probe until it locks into its socket located on the top of the meter; a “click” confirms it is locked.

3.5 Intended Use

The Radiometer is a measuring tool intended for devices to be used on laboratory animals only.

3.6 General Safety Instructions

The following guidelines must be followed to ensure safe operation.

- ! **DO NOT** attempt to open or perform any service work
- ! **DO NOT** connect up human subjects

3.7 Additional Safety Consideration

a. Use original accessories and spare parts only, see also paragraph 7-ORDERING INFORMATION.

b. Do not operate the instrument in hazardous environments or outside prescribed environmental limitations (i.e. +18C°/+24C°, 60% relative humidity, non-condensing);

c. Do not spray any liquid on the connectors;

d. Keep inflammables far from the instruments.

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 use 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.

4 OPERATION

4.1 Measurement

Fit the adaptor on the I.R. Window of the instrument to be checked; the substantial weight of the probe eases the job.

- **Switch on the Meter**, by the slide-switch located on its right side.
- **Switch on the instrument** to be checked (Plantar or Tail-Flick), set at the desired I.R. intensity value.

- At this point the Meter will indicate the "**stand-by" power level**, about 20 mW/cm^2. In fact the I.R. source is energized at reduced power, well below the stimulation threshold, as soon the Plantar (or Tail-Flick) Unit is switched on.

  This arrangement reduces the latency time when the selected radiation power is eventually delivered via the START key.

- **Depress the START key**. The steady state, see also last paragraph of **2.2,** is reached in few seconds.

- When the displayed figure settles on an unchanging value (last digit oscillation is normal), **record the indicated power flux value.**

Remove the probe and put it on the table, ADAPTOR DOWN. In this way, **the** probe rests on a wider base[1] and the sensor is more protected against accidental damage.

When the measures are over, we recommend to reposition the aluminium guard cover on the probe. Store all Radiometer components when not in use.

4.2 Calibration

As outlined in paragraphs c) & d) of the general description, the Radiometer assures the researcher, that two or more Tail-Flick or Plantar Test units deliver the same I.R. power flux and hence nociceptive stimuli of the same intensity, while supplying the I.R. power flux in absolute terms, a very useful datum to be compared with any equal or different method/instrument described in the literature.

To equalize two or more I.R. sources (two or more Plantar or, respectively, Tail-Flick units) proceed as follows:-

- Fit the Radiometer Probe, complete with the Adaptor ad hoc (see paragraph 2 and picture) to the instrument on test.

- Set the I.R. INTENSITY thumb-wheel selector of the instrument on test at **50** (mid-scale 0-99).

- Switch on the Radiometer Meter.

- Switch on the instrument on test. Depress its START KEY.

After 3-4 seconds, the read-out settles to a stable value. Adjust the CALIBRATION trimmer of the instrument on test (front panel of the Plantar, side panel of the Tail-Flick), until the digital METER shows:

- **190** mW/square cm for the **Plantar Test**

- **260** mW/square cm for the **Tail-Flick**

[1] in the case of Plantar adaptor

This adjusting may shift the trimmer setting mentioned in the Plantar Test manual (see 5.3) whose purpose is to make a preliminary “centering” on the bulb power range.

In the Plantar & Tail-Flick units of previous generations, the range of the calibration trimmer may not be sufficient to bring the I.R. emission to the factory set value. If this is the case, the operator can obtain the identical power flux, hence identical meter reading, by adjusting the intensity selectors (of the two or more instrument on test) to different values.

Example: the Plantar (A) delivers 190 mW/cm^2 at INTENSITY 50

the Plantar (B) delivers 205 mW/cm2 at same intensity but cannot be “derated” to 190. By setting the intensity to somewhat lower values, say 43-45, you bring even the instrument (B) to the desired power flux (190 mW/cm2).

The same procedure can be repeated at, say, INTENSITY 30, etc. according to the range of I.R. intensity involved in the investigation.

5 PRACTICAL CLUES

5.1 Interchangeability

Each supplied set Heat-Flux Probe / Heat-Flux Meter cannot be divided. In other words, each Probe has to match its Meter.

In fact, each temperature gradient sensor has its own “*mV per mW signature*”, which should match its individually adjusted amplifier.

The **series number**, clearly indicated on both Probe & Meter helps to avoid a possible mismatch which could take place in case two or more Radiometers are in operation in your laboratory.

Such accidental exchange will not damage the Radiometers but will sensibly degrade the measurement precision.

It follows that in the event of Radiometer malfunction, it is advisable to send to the factory both components for servicing. First, without appropriate instrumentation it is difficult to ascertain on the spot whether the fault took place in the meter or in the probe.

Second, each set is, as mentioned, an indivisible unit and has to be serviced and recalibrated accordingly.

5.2 Background Radiation

The background radiation has no effect on the precision of the measures. Only in case a strong table lamp is over the probe placed upside down, i.e., adaptor up a radiation flux energizes the sensor and the display may show a one digit figure in the range 1-5.

By placing the probe in the **correct position** over the table, thermal balance and consequent zero indication will follow in a matter of 1-2 minutes.

The probe is then ready to the measuring/calibration operation.

6 MAINTENANCE

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

The final servicing of the **complete** instrument at the factory is highly recommended, **even in case of minor problems**, for an accurate check-out & recalibration: in fact, repair/recalibrate the Radiometer shall be done at our factory where a standard I.R. source and other appropriate measuring instruments are available.

6.1 Battery Replacement

The Heat-Flux Meter 37300-001 is energized by a 9V battery (not rechargeable), commercially available everywhere. Their energy capacity is of the order of 150-200 mA/h, which assures several months of operation, as the power drain of the Meter is 0.6 mA.

When the battery is near exhaustion the caption **BAT** appears on the upper left corner of the display: it is time to replace the battery, located under the battery lid, on the back panel.

6.2 Long Inactivity

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

6.3 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Radiometer, please do not hesitate to contact our **service department** (or our local distributor) either directly of via our support page http://www.ugobasile.com/support.html :

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sales@ugobasile.com

Before sending any instrument to our factory for repair, please contact our logistics department to obtain a return authorization number (RMA) 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.

7 ORDERING INFORMATION

37300	**I.R. HEAT-FLUX RADIOMETER, standard package, including:-**
37300-001	**Heat-Flux Meter**, complete with 9V battery
37300-002	**Heat-Flux Probe**, complete with cable/connector
37300-302	Instruction Manual
37300-320	Probe Guard Cover
37300-321	Adaptor for Tail-Flick
37300-322	Adaptor for Plantar Test
37300-323	Instrument Case

8 INSTRUMENT SPECIFICATIONS

Operation	
Switching ON/OFF	via slide-switch located on the meter
Read-out	3-digit display
Power Requirement	9V battery
Operating Temperature	10° to 40° C
Sound Level	none
Pollution Degree	≤ 2
Physical	
Total Weight	2Kg (of the complete set plus the containing case)
Shipping Weight	3.2Kg approx.
Dimensions	37x32x11(h)cm (dimensions of the case)
Packing Dimensions	46x38x27cm
Warranty	

38450 is covered by a 24-month warranty

9 BIBLIOGRAPHY

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Notes

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CE CONFORMITY STATEMENT

Manufacturer	**UGO BASILE srl**
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We hereby declare that

Instrument.	**HEAT-FLUX I.R. RADIOMETER**
Catalog number	**37300**

It is manufactured in compliance with the following European Union Directives and relevant harmonized standards

- *2004/108/CE relating to electromagnetic compatibility*
- *2011/65/UE on the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Account *Manager* — Adriano Basile

Nome / *Name*

April 2014

Date — Firma / *Signature*