



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 Cat. 7360 & Plantar Test Cat 7370 of our make, i.e., to make sure they deliver the same **power flux** (expressed in mW per square cm) and hence a nociceptive stimulus of the **same intensity**.

The standard package of this extremely useful accessory is complete with I.R. Probe, Digital Meter, Adaptors for Tail-Flick and Plantar Test (see picture), all parts of this portable self-sufficient instrument neatly lodged in a sturdy plastic case with punched foam lining.



- For Precise Calibration of Infrared Analgesia Meters

- To calibrate the I.R. emission of Plantar Test & Tail Flick

Main Features

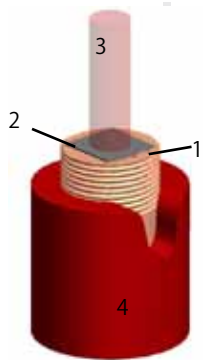
- Provides a measure of stimulus intensity in mW/cm²
- Assures that all infrared instruments are emitting the same level of stimulus intensity

The 37300 Radiometer enables the experimenter to:

- **Check** (and adjust if necessary) **the I.R. emission.** In fact the I.R. output of the Tail-Flick/Plantar Test may, over the course of one-two years, undergo to 2-3% re-duction, 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.
- **Ensure** that two or more Tail-Flick/Plantar Test Units deliver thermal nociceptive stimuli of exactly the **same intensity.** Balance them, if necessary.
- **Know the I.R. energy** (1 mW for the duration of 1s cor-responds to 1 mJ) in absolute terms, a useful datum to compare with any equal or different method/instrument described in the literature.

Principle of Operation

This simple and reliable I.R. Radiometer uses miniature flat "temperature gradient sensors", whose output signal is pro-portional to the temperature difference between their top and bottom surface.



1 Heat-Sink
2 Temperature Gradient Sensor
3 I.R. Beam
4 Guard Plastic

In fact, the temperature reached by the top surface of the sensor attains few degrees Celsius over the heat-sink tem-perature and hence involves negligible con-vection and radia-tion losses.

At the equilibrium, the I.R. power flux p (mW per square cm) is given by the formula:

$$p = \Delta T / \rho d$$

Where ΔT is the temperature difference between top and bottom surfaces of the sensor, ρ is its thermal resistivity and d its thickness.

It is notable that the determination of p is not affected by the heat-sink temperature. ΔT only comes into play.

The time constant of the system ζ , i.e., the time to reach the equilibrium is given by the formula:

$$\zeta = \rho d C$$

where C is the thermal capacity * of the sensor.

ρd and C are very small, which leads to the equilibrium and hence to the exact determination of the I.R. power flux in a matter of 3-4 seconds.

Note : * thermal capacity = mass by specific heat

** the heat propagates by radiation - conduction - convection

Practical Clues

The measure, as previously mentioned, requires only a few seconds. The I.R. probe is positioned on the Tail-Flick/Plantar Test, after the suitable adaptor is fitted on the threaded head of its heat-sink.

The reading on the digital display gives the I.R. power output in mW per square centimetre.

The calibration (if necessary) of the I.R. radiation source is carried out by adjusting the supply current of the I.R. bulb, see the instruction manuals of the Tail Flick and, respectively, the Plantar Test.

Ordering Information

37300 I.R. HEAT-FLUX RADIOMETER, standard package, including:-

37300-001	Heat-Flux Meter (complete with cable/connector & 9V battery)
37300-002	Heat-Flux Probe
37300-302	Instruction Manual
37300-320	Probe Front Cover
37300-321	Adaptor for Tail-Flick
37300-322	Adaptor for Plantar Test
37300-323	Instrument case

PHYSICAL

37300, complete standard package, lodged in its case:

Dimensions	cm 37 x 32 x 11(h)
Weight	Kg. 2.00
Shipping Weight	Kg. 3.20