Catalogue

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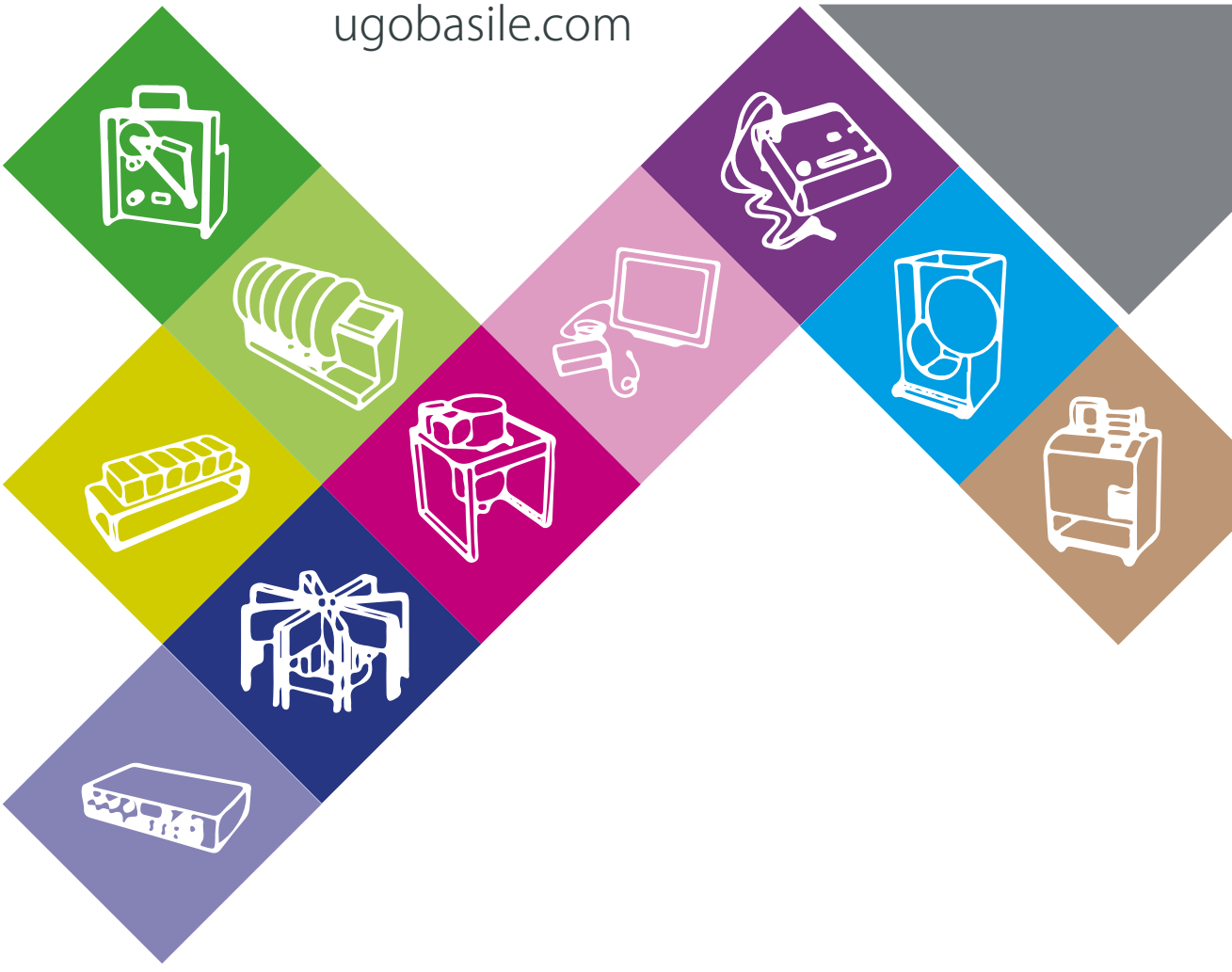

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PAIN AND INFLAMMATION

MOTORY COORDINATION, GRIP STRENGTH, ACTIVITY

VENTILATORS and GAS ANESTHESIA

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BEHAVIOUR, MAZES, TRACKING

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BLOOD PRESSURE, VITAL FUNCTIONS

METABOLISM, FEEDING BEHAVIOUR

MUROMACHI MICROWAVE FIXATION

BROWSE PRODUCTS BY APPLICATION (captions link to the related web page)

NEUROPATHIC PAIN, HYPERALGESIA, INFLAMMATION, JOINT PAIN

- Analgesy-Meter
- Hot/Cold Plate
- TPP Thermal Place Preference
- TGR Thermal Gradient Ring (Zimmermann's method)
- P.A.M. Pressure Application Measurement
- Plantar Test (Hargreaves Apparatus)
- Plethysmometer
- Tail-Flick Unit
- Rodent Treadmill
- Mouse / Rat Rota-Rod
- Orofacial Stimulation Test

ALLODYNIA, HYPERSENSITIVITY, SOMATOSENSATION

- Dynamic Plantar Aesthesiometer
- Von Frey Hairs (with grid)
- Hot/Cold Plate
- TPP Thermal Place Preference
- TGR Thermal Gradient Ring (Zimmermann's method)
- P.A.M. Pressure Application Measurement
- e-VF Electronic Von Frey
- Durham Animal Holders

MOTOR FUNCTION, PARKINSON'S, STRENGTH, EXERCISE

- Mouse / Rat Rota-Rod
- Rotometer
- Rodent Treadmill
- Activity Cage
- Isolated Organ Baths
- Open Field
- Grip-Strength Meter (mice and rats)
- Hole Board

VENTILATION, ANESTHESIA, SURGICAL MONITORING

- Blood Pressure Recorder, non Invasive
- Blood Pressure Transducer, Invasive
- Cat/Rabbit Ventilator
- Mouse Ventilator
- Rodent Ventilator
- Gas Anesthesia System
- Induction Box / Euthanasia Box
- Rodent Warmer, heating pads
- Pulse Oximeter for Mice & Rats

MEMORY, LEARNING, ALZHEIMER

- Fear Conditioning System
- Atlantis Platforms for Water Maze
- Active Avoidance Set-Up (Shuttle-Box)
- Passive Avoidance - Step through
- Passive Avoidance - Step down
- ANYmaze Video-Tracking Software
- Water Maze Pool
- Barnes Maze
- Open Field
- Light/Dark Box
- T-Maze Y-Maze
- Multi-Maze System for Mouse
- Learned Helplessness

ADDICTION AND REWARD, SOCIAL BEHAVIOUR AND AUTISM	Sociability Apparatus (3-chambered social test) Agora Maze for Social Interaction Conditioned Place Preference (CPP) KDS Infusion Pumps ANYmaze Video-Tracking Software Lickometer Vogel Test Open Field
ANXIETY, DEPRESSION, FEAR, STRESS	Startle Response/PPI Learned Helplessness Activity Cage ANYmaze Video-Tracking Software Lickometer Vogel Test Elevated Plus Maze Open Field Elevated Zero-Maze Light/Dark Box Hole Board Forced Swim Test
ELECTROLYTIC LESIONS AND INFUSION	Lesion Making Device Stoelting Stereotaxic Instrument Rodent Warmer, heating pads KDS Infusion Pumps DataCapsule-Evo Digital Recorder
EPILEPSY, SEIZURES, CONVULSIONS	Rotometer Rodent Treadmill ECT Unit
BRAIN CHEMISTRY, PHOSPHORYLATION	Microwave Brain Fixation NEW 5KW

Plethysmometer

Cat. No. 37140

General

In research on rheumatoid arthritis, the central development of oedema, and its modifications by pharmacological processes, it has proved of great value to measure inflammatory processes in the rat paw.

Our **Plethysmometer 37140** displays the exact paw volume on the graphic LCD read-out. Small differences are detected by a transducer of original design.

The 37140 is provided with a pedal holding-command which freezes the reading, enabling the operator to concentrate its attention to the paw dipping.

The paw volume is shown on the multifunction graphic display in four digits, with 0.01 ml resolution. A zero key is provided to zero the meter before each measurement.

Including measuring cell for both RAT & MOUSE paw!!

FOR ACCURATE MEASUREMENT OF:

- RAT paw oedema
- MOUSE paw oedema

MICROPROCESSOR Controlled Instrument. Main Features:

- Computer compatibility : direct connection to PC (via the **52050 Software** <u>included</u>)
- Read-out : multifunction graphic display
- Print-out : by optional thermal MiniPrinters 57145

Volume Measuring Water Cell

The measuring cell consists of two vertical interconnected Perspex tubes; the animal paw is dipped in the larger tube (1.8cm diam) to measure water displacement. A tube of smaller diameter (1.3cm) is also included for measuring the mouse paw.

The smaller diameter side tube contains the transducer which measures the conductance between two vertical wire electrodes.

Conductance is linearly proportional to the water level, hence to the displaced volume.

Data Acquisition

The 37140 Plethysmometer is microprocessor controlled, featuring direct PC output. Internally stored data can be routed to the PC serial (RS232) or USB port (via adaptor).

Communication is managed by the dedicated Software Cat. 52050-02, a Windows® based Data Acquisition Software Package, which enables data storage into individual files (in .csv format) to be easily managed Excel or other statistical analysis packages.

Ordering Information

37140	**PLETHYSMOMETER**, standard package including:-
7141	Electronic Block
7152-S	Standard Water Cell, diam. 1.8cm, including mouse paw tube **7186**, diam. 1.3cm
7153-L	Conductance Transducer
7140-154	Water Reservoir
7155	Calibration Probes (0.1, 0.2 , 0.5, 1, 2, 4ml)
7160	Wetting Compound, 100ml bottle
7165	Connection tube (cell-reservoir & drain vessel)
37215-303	"Hold" Pedal Switch
52050-02	CUB Dedicated Software (on USB drive)
37140-302	Instruction Manual (on USB drive)
52010-320	USB to serial port converter
52010-322	Connecting cable 9 to 9 pin
4210	Three Claw Stand, 10mm diam. upright
4003	Open Side Boss-Head
E-WP 008	Mains Cord

Also Available

37140-25	**Plethysmometer**, complete with water cell **diam. 2.5cm** & standard accessories
37140-35	**Plethysmometer**, complete with water cell **diam. 3.5cm** & standard accessories

Other Available Water Cells

7157	Special Water Cell, diam. 2.5cm, complete with Transducer 7153-L
7159	Special Water Cell, diam. 3.5 cm, complete with Transducer 7153-L

Optional

57145	Thermal Mini-Printer
37400-305	Thermal Paper Roll for 57145

Specifications

Power Requirement	Universal input 85-264 VAC, 50-60Hz, 40 W max.
Data Read-out	multifunction graphic display
Data Format	4 digits (2 integers, 2 decimals)
Resolution	0.01 ml
Commands	via soft-buttons
Connection to PC	direct connection to PC USB port, via serial to USB adaptor
Data Print-Out	via the optional MiniPrinter 57145

Physical

Weight	4.8 Kg
Shipping Weight	8.1 Kg approx.
Shipping Dimension	67x42x53cm

Bibliography

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- T. Keränen et alia: "Anti-Inflammatory Effects of β2-Receptor Agonists Salbutamol and Terbutaline Are Mediated by MKP-1" PLoS ONE, February 5, 2016
- A. Horváth et alia: "Transient Receptor Potential Ankyrin 1 (TRPA1) Re-ceptor is Involved in Chronic Arthritis: in Vivo Study Using TRPA1-Deficient Mice" Arthritis research & therapy 18(6), 2016
- F. Bonezzi et alia: "An Important role for N-Acylethanolamine Acid Ami-dase in the Complete Freund's Adjuvant Rat Model of Arthritis" J Phar-macol. Exp. Ther. jpet.115.230516, 2016
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- T. Bertaim et alia: "**Dose and Administration Schedule Effect of Tiludro-nate on Joint Damage in the Model of Complete Freund Adjuvant Induced Monoarthritis in Rats**" Open Journal of Rheumatology and Autoimmune Diseases 3: 18-25, **2013**

Analgesy-Meter

Randall-Selitto Paw Pressure Test

Cat. No. 37215

now available with optional upgrade to

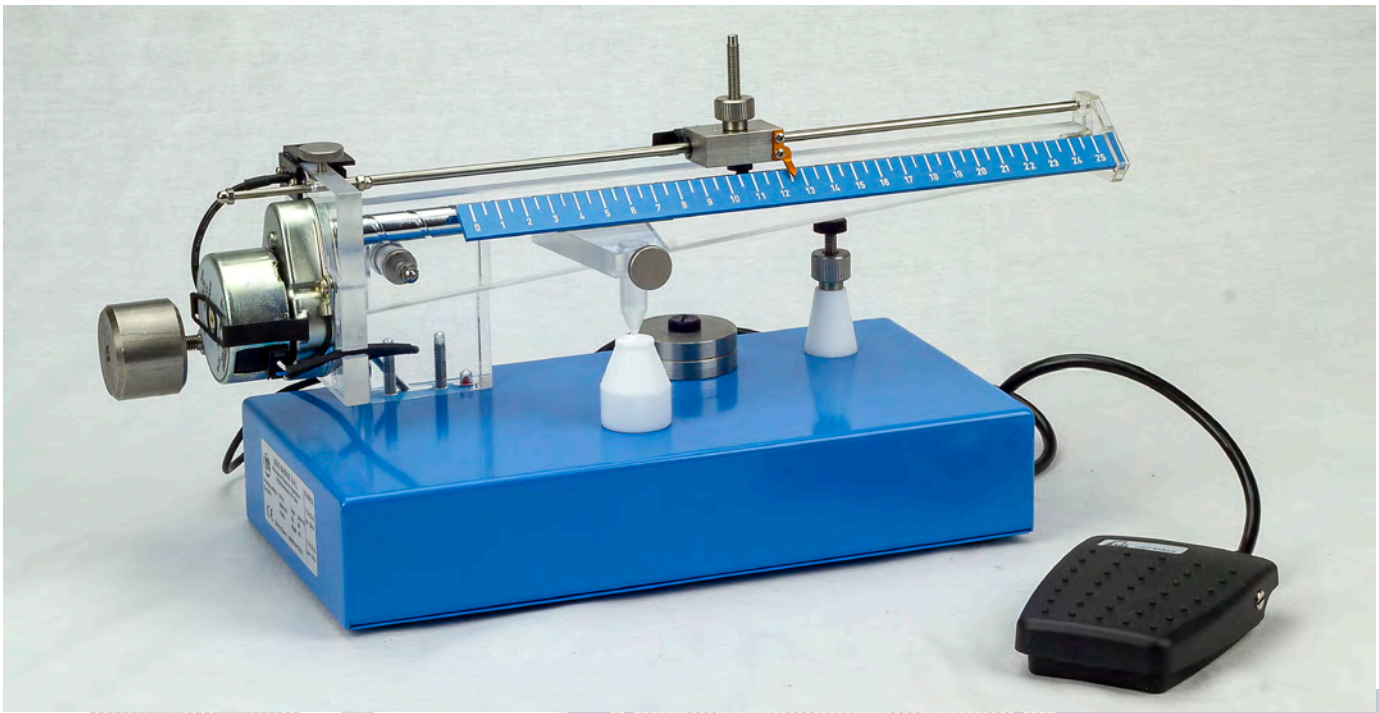
digital reading

General

The 37215 is the up to date version of the classical 7200 paw pressure test which, **since 1965**, is helping to perform a rapid precise screening of analgesic drugs in a number of academic and industrial laboratories.

We are now introducing a **specific pressure sensor and the related controller, available as optional, to transform the Analgesy-Meter in a fully digital device**.

As the basic design is unchanged, results with the digital model are **consistent with published data.** The upgrade kit has been designed to be fitted on existing Ugo Basile Analgesy-Meters as well. Ask for details!



Main Features

- Same instrument, three force ranges (from 0 to 250, 500, 750 g)
- Simple and reliable: no calibration needed!
- **NEW model with digital reading**
- Specific version for Mouse available, with lower (50% pressure range)
- Classic method since the 1960s: hundreds of papers published!
- **Upgrade kit for old Analgesy-Meters available**

Instrument Description

The force is applied to the animal's paw, which is placed on a small plinth under a cone-shaped pusher with a rounded tip. The operator depresses a pedal switch to start the mechanism which exerts the force: the force increases at a constant rate, thus enabling perfect reproducible measurements to be made. The motor stops immediately the pedal is released.

Force is measured on the scale calibrated in 10g steps, The scale can be multiplied by 2 or 3, by placing on the slide one or two discs provided with as standard.

After each test the slide is returned to its starting point by lifting it and pushing it to the left. The 37215 features a low voltage synchronous motor and conforms the CE rules.

The standard 37215 can be conveniently used with mice. However, a dedicated model is also available, when lower pressure (50%) is desirable, model **37216**, which includes a special chisel-shaped pusher (also available separately)

Data Acquisition

The classic Analgesy-Meter can now be integrated with a **specific pressure sensor and the related controller, available as optional, which upgrades the Analgesy-Meter to a fully digital device**.

As the basic design is unchanged, results with the digital model are **consistent with published data.**

The design of the upgrade kit makes it easy to retrofit existing UB Analgesy-Meters as well.

Ask for details!

37215 Specifications

Power Requirements: 115 or 230V, 50/60Hz, 15W max.
Start / Stop : by pedal switch
Force Range 37215 : 0 to 250, 500, 750 grams
37216 : 0 to 125, 250, 375 grams

Physical:

Dimensions : cm 40 x 16 x 14
Packing : cm 55 x 45 x 36
Weight : 2.1Kg
Shipping Weight : 5.0Kg approx

Ordering Information

37215 **ANALGESY-METER,** complete with following standard accessories:-

37215-302 Instruction Manual (on USB key)
37215-303 Pedal Switch, complete with cable
37215-323 Set of discs for additional weight
37215-321 Plinth
37215-322 Standard Pusher *
E-WP008 Mains Cord

* Pushers in special material/shapes, available on request

37216 **ANALGESY-METER,** low-pressure model, suitable for mice, with pusher 37215-326

Optional Upgrade to Digital

37215-100 **ANALGESY DAQ** upgrade kit
37215-BUNDLE Analgesy-Meter & Upgrade Kit

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REFERENCE TO UB ANALGESY-METER (RAT)

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REFERENCE TO UB ANALGESY-METER (MOUSE)

- K. Sugimoto et alia: "**The Impact of Low-Dose Insulin on Peripheral Nerve Insulin Receptor Signaling in Streptozotocin-Induced Diabetic Rats**" PLoS ONE: 8(8): e74247, **2013**
- M.J. Hussey et alia: "**Deletion of the Adenosine A2A Receptor in Mice en-hAnces Spinal Cord Neurochemical Responses to an Inflammatory Noci-ceptive Stimulus**" Neuroscience Letters 506(2): 198-202, **2012**
- M.S. Nash et alia: "**7-tert-Butyl-6-(4-Chloro-Phenyl)-2-Thioxo-2,3-Dihydro-1H-Pyrido[2,3-d]Pyrimidin-4-One, a Classic Polymodal Inhibitor of ...**" J. Pharmaco. Exper. Therap. 342 (2): 389-398, **2012**

Hot / Cold Plate

ng

Cat. No. 35150

General

This new **Hot/Cold Plate NG** offers a wide temperature range, presetable in the range **-5°C to 65°C,** can be used as:

- A **conventional HOT PLATE**, to carry out a rapid precise screening of narcotic type analgesic drugs according to the well known Hot Plate Test devised by N.B. Eddy and D. Leinbach.
- As a **COLD PLATE**; the **Cold Plate Test** is useful in studying cold receptors and cold allodynia, a phenomenon very frequently observed in chronic pain on humans.

  The lid reduces humidity condensation on the plate at low temperatures.

Two working modes allow for testing at fixed temperature or at increasing/decreasing temperature (RAMP).

An optional **auxiliary Plate** (heat only) can be connected to the main unit and will be useful in the habituation phase.

Brand new, user friendly software, to set up the experiment and manage the results.

for Rats

for Mice

- **IT CAN BE USED AS HOT PLATE OR COLD PLATE**
- **NEXT GENERATION INSTRUMENT: SAME RELIABILITY, INNOVATIVE TECHNOLOGY!**

Main Features

- **OPERATING TEMPERATURE:** -5.0°C to 65.0°C in steps of 0.5°C (0.1°C precision)
- **DETECTION:** by pedal switch
- **OPERATING MODES:** fixed or ramping temperature, for dynamic experiments
- ***X-PAD* SOFTWARE:** brand new, user friendly software included as standard, to set up the experiment and manage the results
- **CONTROLS:** 4"3 touch-screen to set and monitor the test
- **DATA PORTABILITY:** via the USB Memory-Key, included as standard

Instrument Description

The Ugo Basile Hot/Cold Plate NG features:

- a cabinet incorporating the **Heating/Cooling Plate** (20cm diam.) and the **4"3 touch-screen**
- a convenient **restrainer** (25cm tall, suitable to restrain either mice or rats), with anti-dew lid.

The plate temperature can be set in the range **-5.0 to 65.0°C**, with **0.5°C** increments (0.1°C precision). The extremes of this ample range can be reached, provided the room temperature remains in the interval 18-24°C.

Operating modes will allow to work with **constant** temperature or **ramp**, defining the initial and final temperature to set an upward or a downward ramp.

What's new

Physically similar to the previous versions, the new model features much quicker temperature changes and greater stability and uniformity.

Totally new is the ***X-PAD*** software included as standard, see below. Remote diagnosis and internet access are provided for.

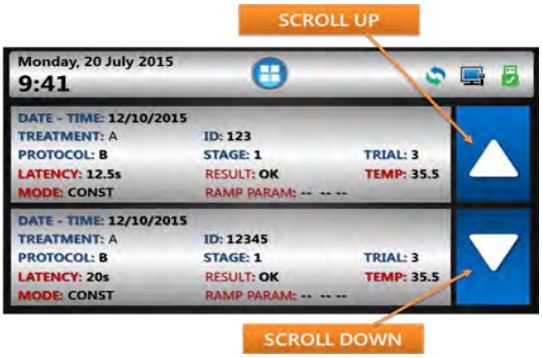
Experimental Configuration

Via the ***X-PAD*** software, the operator can easily **organize** the experiment on her/his PC, and upload it to the Hot/Cold Plate via the USB key.

Treatments, protocols, stages, animals, and various test features (temperature, mode, etc.) can be quickly defined and saved for future use.

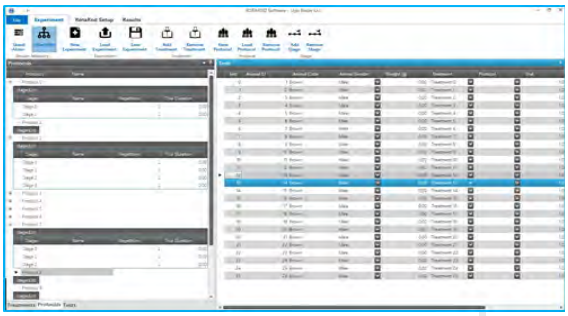
Data Collection and Management

A basic version of the collected data can be viewed on the touch-screen



when transferred to PC via USB drive, test results appear in full version.

The software automatically classifies the data, combining configuration settings with test results; the user can add information, before or after the test. Results appear in a tree-like structure, where columns can be dragged and dropped to customize the layout.



Configurations and data are exported as **Text**, **Excel** or **Pdf** reports and can be saved to cloud via **DropBox**, **OneDrive**, **GoogleDrive**.

Ordering Information

35150	**HOT / COLD PLATE**, standard package:
35150-001	Cabinet (controller/display and Plate assy.)
35100-286	Perspex Animal Restrainer, for Mice and Rats), 25cm height
35150-320	Restrainer Lid
35150-302	Instruction Manual (on USB key)
37215-303	Pedal Switch
X-PAD	Dedicated Software Package (on USB)

Optional

An "auxiliary" Hot Plate 35150-002 is available as optional; a self-standing unit sed in the habituation phase, thus reducing the use of the main unit to the test proper.

35150-002	Auxiliary Hot Plate
35160	Combo Package 35150 & 35150-002

A **Thermal Place Preference** set-up for either Rats or Mice is also available, see the specific datasheet:

35250	TPP Set-Up for Mice
35260	TPP Set-Up for Rats

Physical

Universal input	85-264 VAC, 50-60Hz
Dimensions	25x37x47(h)cm with restrainer
Weight	8.0Kg
Shipping Weight	12Kg approx.
Packing	68x34x28cm

Bibliography

- C.V. Möser: "**TANK-Binding Kinase 1 (TBK1) Modulates Inflammatory Hyperalgesia by Regulating MAP Kinases and NF-κB Dependent Genes**" J. Neuroinflammation 12:100, ***2015***
- W. Kallenborn-Gerhardt et alia: "**Nox2-dependent signaling between macrophages and sensory neurons contributes to neuropathic pain hypersensitivity**" Pain 55(19): 2161-2160, ***2014***
- D. Piomelli et alia: "**Anandamide suppresses pain initiation through a peripheral endocannabinoid mechanism**" Nature NSC, **2010**

TPP Set-Up for Thermal Place Preference

Cat. No. 35250 / 35260

ng

General

Both heat and cold evoke **thermosensation**, which, may elicit feelings of pain. Thermosensation is an essential sensory function which involves a variety of transducer molecules.

The TPP (or **2-choice temperature test**), is a thermal sensitivity assessment tool designed to emphasize integrated learned responses to thermal stimuli applied by the surface on which the animal stands.

It documents escape behaviour in awake, unrestrained animals to innocuous and noxious heating or clooling of the floor; rodents learn to minimize pain by escaping to the opposite side; escape latency can be recorded.

The **Ugo Basile Thermal Place Preference Test** iallows monitoring temperature preferences and nociceptive thresholds in rodents (mice and rats), by assessing the rodent's **temperature preference**.

The TPP Test allows an unrestrained animal (either rat and mouse) to move freely between two 2 compartments set at different temperatures, thus choosing its preferred position (*comfort zone*).

for Rats

for Mice

MONITORING NOCICEPTION THRESHOLDS IN BOTH HOT AND COLD STIMULATION

Main Features

- **OPERATING TEMPERATURE:**
  Hot/Cold Plate: adjustable in the range -5.0 to 65.0°C, with 0.1°C increments
  Hot Plate: from room temperature to 65°C
- **PRECISION:** +/- 0.1°C
- **CONTROLS:** 4"3 touch-screen to set and monitor the test
- **OPERATING MODES:** fixed or ramping temperature, for dynamic experiments
- **DATA PORTABILITY:** via the USB Memory-Key, included as standard

Instrument Description

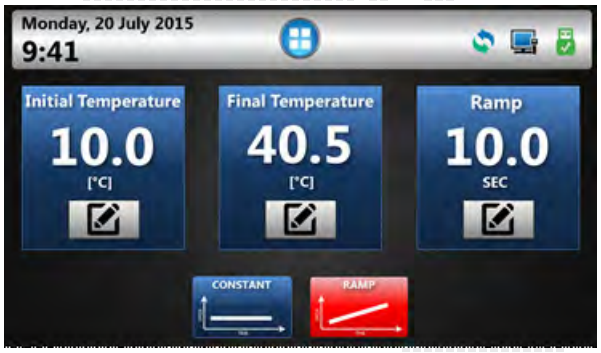
The Ugo Basile Set-UP for TPP consists of:

- a **Hot/Cold Plate 35150**
- an additional **Hot Plate 35150-002**
- a set including **special tubes**, and a **corridor** for either mouse or rat (respectively **35250-003** and **35260-002**), to interconnect the two plates.

Both 35150 and 35150-002 are standard devices, complete with all accessories (see the related datasheet), to be used as independent devices.

The Heating Plate **35150-002** is a basic unit, in which temperature can be preset from the front panel from room temperature to 65°C.

The Hot/Cold Plate NG **35150** is a more sophisticated device, allowing setting the temperature on the 4"3 touch-panel, in the range -5 to 65°C, with 0.5°C increments, with 0.1°C precision.



The extremes of this ample range can be reached, provided room temperature remains in the interval 18-24°C.

Two working modes allow for testing at **fixed** temperature or at increasing/decreasing temperature (**RAMP**).

The set of accessories for mouse **35250-003** consists of two special tubes, with a 45x95(h)mm opening, connected by a metal bridge, whose width was minimized to 4cm.

The enclosures for rat have 87x110(h)mm opening and a 4cm wide bridge.

The tube on the Hot/cold side is provided with a lid to reduces humidity condensation on the plate at low temperatures.

Users interested in t**esting both rats and mice** may order one of the two set-up and the set of tubes for the other species.

Rationale of the Test

The TPP Test allows an unrestrained rodent to move **freely** between two compartments set at different temperatures, via the metal bridge which connects the two areas, thus choosing its preferred position (***comfort zone***). This behavioural protocol provides data about temperature preferences and nociceptive thresholds associated to both hot and cold stimulation.

Unlike ther tests, the TPP Test is operator-independent: using the traditional hot/cold plates, the researcher measures the reaction time of an animal exposed to a certain temperature or ramp, by marking specific stereotypes while in the "2-Temperatures Choice Test" the nociceptive response is given by the animal choice to move to one or the other environment.

The animal response can be **visually observed** by the user, and marked manually or on a **manual scoring** software (as ANYmaze Take Note).

In alternative, more detailed information on the animal behaviour can be obtained and recorded automatically via **ANYmaze** or other **videotracking system**. In the latter case, information will include: time spent in each temperature zone, animal activity, zone trespassing, distance run by the animal (total or by zone), etc.

Ordering Information

35250	**TPP**, Set-Up for Thermal Preference, **Mouse**
35260	**TPP,** Set-Up for Thermal Preference, **Rat**

Individual components:

35150	Hot/Cold Plate NG, complete
35150-002	Additional Heating Plate, complete
35250-003	**Set of Tubes and corridor for Mice**
35260-002	**Set of Tubes and corridor for Rats**

Optional Videotracking:

60000-TN	ANYmaze Take Note (manual scoring)
60000	ANYmaze Full Version
47400-040	USB Camera

Physical

Universal input	85-264 VAC, 50-60Hz
Dimensions	50(w)x37(d)x47(h)cm, with restrainers
Weight	14.4Kg
Shipping Weight	20Kg approx.
Packing	68x34x28cm (2 boxes) + 45x34x26cm

Bibliography

Method Paper:

- Aziz Moqrich et alia: "Impaired Thermosensation in Mice Lacking TRPV3, a Heat and Camphor Sensor in the Skin" Science 04 Mar **2005**: Vol. 307, Issue 5714, pp. 1468-1472 DOI: 10.1126/science.1108609

TGR Thermal Gradient Ring

for Mice

Cat. No. 35550

General

The TGR is a novel device for THERMAL PREFERENCE PHENOTYPING in mice, ac-cording to the method devised by Dr. Katharina Zimmermann.

A NOVEL DEVICE FOR
THERMAL PREFERENCE PHENOTYPING IN MICE
ACCODING TO ZIMMERMANN'S METHOD

Main Features

- New circular design, ID 45cm, OD 57cm: duplicate values, no border effects, no spatial cues
- Two heating devices on opposite sides, to establish a symmetric gradient
- Exact temperature gradient measured in real time by embedded thermocouples
- Thermal Insulated Ring-shaped Aluminum Runway
- 12 zones per side (specular), 40cm^2 ea.
- Test results automatically recorded via dedicated camera (included) & ANYmaze video-tracking soft-ware
- Including a set of 4 dual (visible/I.R.) lights

In recent years the cellular and molecular mechanisms of temperature sensing and thermoregulation are subject of intensive research.

To overcome limitations evidenced in other tests, we have designed a novel circular thermal gradient assay, for thermal preference phenotyping, based on the paper "Comprehensive thermal Preference Phenotyping in Mice using a Novel Automated Circular Gradient Assay", published by University Erlangen-Nuernberg (*see Bibliography, method paper).*

Rationale of the Test

The Thermal Gradient Ring is a novel device, which allows recording and analysis of **Comprehensive Thermal Preference Phenotyping in Mice**, according to **Katharina Zimmermann**'s method.

The new TGR (Thermal Gradient Ring) is suitable to test neuropathic pain, and allows discerning exploratory behavior from thermal selection behavior, providing a high degree of freedom, i.e. thermal choice, and eliminating experimenter bias.

The TGR is more sensitive than previous methods: the gradient setup is superior to 2-plate choice design (it reflects a more complex physiological environment, requires less time, less manpower, less mice). The circular design brings about duplicate values, no border effects and no spatial cues, for bias-free, reproducible data.

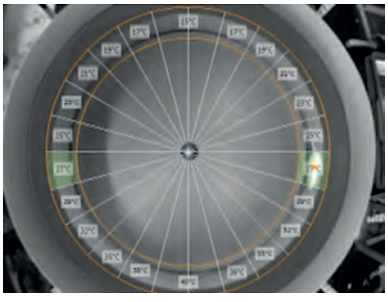
Instrument Description

The TGR consists of a **circular running track**, which provides a thermal gradient between the two extremes of a colder and a hotter zone in which the mouse is free to move. The Thermal Insulated Ring-shaped Aluminium Runway has an ID of 45cm and 57cm OD.

A heating and a heating/cooling device (based on the technology employed in UB Hot/Cold Plate), placed at the opposite sides of the ring, create a **symmetric thermal gradient**, controlled by 4 embedded thermocouples, measuring the temperature gradient in real time.

A stand positioned over the device holds the camera and 4 dual (visible/I.R. lights)

Experimental Configuration



Each side of the ring is divided into 12 zones, in which the temperature Δ is proportionally distributed: in the protocol described in the method paper, in which the two preset temperatures are respectively 15°C and 40°C, each sector represents an increment of 2.27°C.

Data Collection and Management

Recording and analysis of thermal preference behavior is accomplished by ANYmaze. Data output include:

- Preference Temperature time course ± SD
- Time lag to cover zones above a defined temperature (time course)
- Zone histogram

Ordering Information

35550 **TGR THERMAL GRADIENT RING**, complete assembly, including heating and heating/cooling devices, circular runway with circular enclosure, B/W USB camera 35550-035 and related support with dual (visible/I.R.) lights.

Videotracking

60000 **ANY-maze Software (full license is required)**

General

Controls: on the heater/cooler front panel, temperature read-out on LED display

Operating temperature:

Heating Unit : from room temperature to 65°C
Heating/Cooling Unit : from 4°C to 35°C

Temperature feedback : Measured by 4 thermocouples, monitored by ANYmaze in real time

Detection: **:** Via ANYmaze software

Power : : Univ. input 85-264 VAC, 50-60Hz

Physical

Aluminum Runway : ID 45cm, OD 57cm
Circular Enclosures : 24cm high
Dimensions : 87x64x64(h)cm
Weight : 39Kg
Shipping Weight : 57Kg
Packing : 100x80x70cm (wooden pallet)

Bibliography

Method Paper:

- F. Touska Z. Winter, A. Mueller, V. Vlachova, J. Larsen and Katharina Zimmermann: "**Comprehensive thermal preference phenotyping in mice using a novel automated circular gradient assay**" J.Temperature, Vol 3 (1) **2016**
- Z. Winter, P. Gruschwitz, S. Eger, F. Touska and Katharina Zimmermann: "**Cold Temperature Encoding by Cutaneous TRPA1 and TRPM8-Carrying Fibers in the Mouse**" Front. Mol. Neurosci., **2017**

Plantar Test
(Hargreaves Apparatus)

Cat. No. 37370

For Rats

For Mice

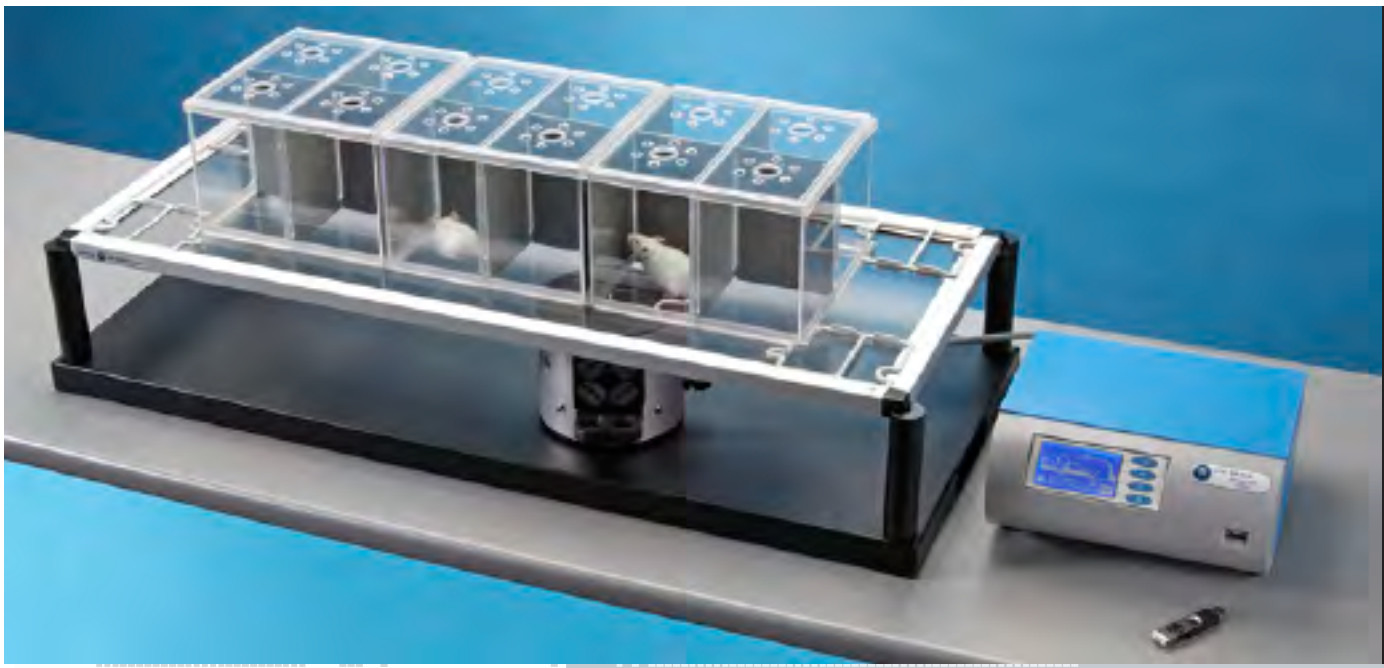
AUTOMATIC MEASUREMENT OF THE ANIMAL RESPONSE

General

Determination of acute nociceptive thermal threshold in laboratory animals has primarily relied upon the tail flick and hot plate methods.

Although both methods are used frequently in pharmacological studies, they are not without limitation. In addition, neither method has been extended to investigating behavioural responses to hyperalgesia.

The Plantar Test represents a remarkable advance in methodology, as it combines the best features of all other methods of measuring pain sensitivity. Unique to the Plantar Test, **the animal is unrestrained and unhandled during experiments.**



Main Features

- Automatic detection of paw withdrawal (no visual score needed!)
- I.R. intensity adjustable in the interval 01-99 (in one digit steps)
- Software included
- Modular animal enclosure, from 3 to 12 spaces, conveniently designed to restrain mice or rats
- Optional 37300 Radiometer for calibration
- Data portability via the included memory key
- NEW: orofacial stimulation by optional holders

Instrument Description

The Instrument basically consists of:-

- a Movable I.R. (infra-red) Source
- a Controller (the picture shows the optional printer 37000-145 mounted on the top panel)

- a framed Glass Pane (86x35cm) supported by columns on a base latform onto which the movable source glides
- a modular enclosure of new design, in which the 3 spaces can be further divided into 2 or 4 by removable partitions, obtaining up to 12 spaces

After the acclimation period, the I.R. source placed under the glass floor (see the picture) is positioned by the operator directly beneath the hind paw. A trial is started by depressing a key on the I.R. source.

When the animal feels pain and withdraws its paw, the I.R. source switches off and the reaction time counter stops. The withdrawal latency to the nearest 0.1s is automatically determined and recorded.

Data Acquisition

The 37370 is a microprocessor controlled unit. The experimental data, stored in its internal memory can be directly exported to the PC USB or serial ports.

Communication is managed by the dedicated CUB Data Acquisition Windows®-based Software Package **52050-10**, included as standard, which enables the user to route the experimental data to the PC and store them into individual files, to be managed by most statistical analysis packages available on the market.

The 37370 is provided with a **memory key**, to record all the experimental data of one or more sessions and to program the experiment parameters from a remote PC.

Calibration Radiometer

Each Plantar Test Unit is accurately calibrated via an **Heat-Flux I.R. Radiometer Cat. 37300.**

The end user should consider this extremely useful optional accessory, which enables the experimenter to:

i) Make sure that two or more units deliver thermal nociceptive stimuli (expressed in mW per square cm) of **exactly the same intensity**.

ii) Measure the I.R. energy (1mW for the duration of 1s corresponds to 1mJ) **in absolute terms**

Ordering Information

37370	**Plantar Test (Hargreaves' test)**, complete with following standard accessories:
37370-001	Plantar Test Controller
37370-002	Emitter/Detector Vessel, with cable
37000-003	Platform
37370-327	Supporting columns
37000-006	Modular Animal Enclosure
37370-005	Framed Glass Pane
37370-302	Instruction manual (on the USB key)
52050-10	CUB Software (USB key) with USB cable
E-WP 008	Mains Cord

Optional Spares & Accessories

37000-145	Panel-Mount Printer
37300	Heat-Flux I.R. Radiometer
E-HR 002	Replacement Bulb
37370-278	Additional stimulation base, complete with glass pane and animal enclosure
37100	Set of two **Durham Holders** for **orofacial** stimulation (see separate datasheet)

Physical

Universal Mains	85-264 VAC - 50-60Hz - 20 W max.
Dimensions	86 x 40 x 35 cm (assembled)
Weight	13.00 Kg
Packing	98 x 49 x 47 cm
Shipping Weight	27.50 Kg approx

Bibliography

Method Paper:

- K.M.Hargreaves, R.Dubner, F.Brown, C.Flores & J.Joris: "**A New and Sensitive Method for Measuring Thermal Nociception in Cutaneous Hyperalgesia**" Pain 32: 77-88, **1988**.
- D.C. Yeomans & H.K. Proudfit: "**Characterization of the Foot Withdrawal Response to Noxious Radiant Heat in the Rat**" Pain 59: 85-97, **1994**.

Papers mentioning UB model:

- D. Piomelli et alia: "**Anandamide suppresses pain initiation through a peripheral endocannabinoid mechanism**" Nature NSC, **2010**
- L. Mannelli et alia: "**Effects of the Neutrophil Elastase Inhibitor EL-17 in Rat Adjuvant-Induced Arthritis**" Rheumatology 10.1093, **2016**
- S. Castany et alia: "**The Antinociceptive Effects of a δ-Opioid Receptor Agonist In mice with Painful Diabetic Neuropathy: Involvement of Heme Oxygenase 1**" Neurosc.Letters 614: 49-54, **2016**
- Z.Z. Huang et alia "**Mir-500-Mediated GAD67 Downregulation Contributes to Neuropathic Pain**" J. Neurosci 36(23): 6321-6331, **2016**
- T.A. Nees et alia: "**Early-Onset Treadmill Training Reduces Mechanical Allodynia and Modulates Calcitonin Gene-Related Peptide Fiber Density in Lamina III/IV in a Mouse Model of Spinal Cord Contusion injury**" Pain 157(3): 687-697, **2016**
- V. Carozzi et alia: "**Chemotherapy-Induced Peripheral Neurotoxicity in Immune-Deficient Mice: New Useful Ready-to-Use Animal Models**" Exp. Neurology 264: 92-102, 2015

Tail-Flick Unit

Cat. No. 37360

Dedicated Software

Memory Key included

RAPID and PRECISE SCREENING OF ANALGESIC DRUGS ON THE RAT TAIL

General

This new style Tail Flick Unit has been designed to perform rapid precise screening of analgesic drugs via heat stimulation on the rat tail, **according to D'Amour & Smith**, see bibliography. It basically consists of an I.R. source, whose radiant energy of adjustable intensity is focused on the rat tail by an embodied parabolic mirror.

The rat is held by the operator on the instrument unobstructed upper panel (see picture) in such a way that its tail, placed over a flush mounted window, receives the I.R. energy.

The operator starts the stimulus and the related solid state second counter. When the rat feels pain and **flicks** its tail, a sensor detects it, stops the second counter and switches off the bulb. The **reaction time** of the animal is thus determinedand automatically recorded.

Main Features

- Automatic detection of the animal response
- Data portable to USB pen-drive stick or to PC (USB)
- Comfortable, unobstructed working surface (no protruding elements)
- Excellent reproducibility thanks to optics lodged in a rigid structure & electronically controlled I.R. flux

Instrument Description

The instrument components are neatly arranged in a box of new design, which contains the I.R. source, the sensor, the microcontroller and the electronic circuit.

When the counter stops, the **display** remains frozen on the indicated time. Latency time is thus automatically recorderd.

An inclined **Mouse Restrainer** is supplied as **optional,** to be used with the mouse to compensate for its tendency to hold its tail at 45 degrees up and therefore away from the heat source.

In fact, the availability of **mice** with specific gene(s) knock-outs is driving a substantial shift from rats to mice as a research animal of first choice.

Data Acquisition

The 37360 is a microprocessor controlled unit. The experimental data, stored in its internal memory can be directly exported to the PC USB or serial ports.

Communication is managed by the dedicated CUB Data Acquisition Software Package, **Cat. 52050-09**, included as standard.

The CUB Windows®-based Software Package enables the user to route the experimental data to the PC and store them into individual files, to be managed by most statistical analysis packages available on the market.

The 37360 is provided with a **memory key**, to record all the experimental data of one or more sessions and to program the experiment layouts from a remote PC.

Calibration Radiometer

Each Tail Flick Unit is accurately calibrated via an **Heat-Flow I.R. Radiometer Cat. 37300.**

The end user should consider this extremely useful accessory, which enables the experimenter to:

i) Make sure that two or more units deliver thermal nociceptive stimuli (expressed in mW per square cm) of **exactly the same intensity.**
ii) Know the I.R. energy (1mW for the duration of 1s corresponds to 1mJ) in **absolute terms**

Ordering Information

37360	**TAIL-FLICK UNIT,** complete with following standard accessories:-
37215-303	Pedal Switch, complete with cable
37360-302	Instruction Manual (on USB key)
52050-09	CUB Software (on USB key)
52010-323	USB cable
E-WP008	Mains Cord

Accessories and Optionals

57145	MiniPrinter
37300	Heat-Flux I.R. Radiometer
E-HR 002	Replacement Bulb
37360-325	Mouse Holder, 25mm diam.
37360-330	Mouse Holder, 30mm diam.

Basic Specifications

I.R. Intensity	adjustable in the interval 01-99 (in one digit steps)
Reaction Time	three digits, 0.1s steps
Calibration	via appropriate I.R. Radiometer

Universal Mains 85-264 VAC - 50-60Hz - 20 W max.

Physical

Dimensions	43x22x10cm
Weight	4.0 Kg
Packing	45x34x26cm
Shipping Weight	5.8 Kg approx.

Bibliography

Method Paper:

- F.E. D'Amour & D.L. Smith: "**A Method for Determining Loss of Pain Sensation**" J. Pharmacol. Exp. Therap. 72: 74-79, **1941**

Papers mentioning UB model:

- T.O. Lilius et alia: "**The Mineralocorticoid Receptor Antagonist Spironolactone Enhances Morphine Antinociception**" Eur. J. of Pain online view, **2013**
- J.W. Little et alia: "**Spinal Mitochondrial-Derived Peroxynitrite Enhances Neuroimmune Activation During Morphine Hyperalgesia and Antinociceptive Tolerance**" Pain 154 (7): 978-986, **2013**
- P.J. McLaughlin et alia: "**The Mineralocorticoid Receptor Antagonist Spironolactone Enhances Morphine Antinociception**" Eur. J. of Pain online, **2013**
- T.A. Kosten et alia: "**A Morphine Conjugate Vaccine Attenuates the Behav-ioral Effects of Morphine in Rats**" Progr. in Neuro-Psychopharmacol. and Biol. Psychiatry 45: 223–229, **2013**
- J. Walsh et alia: "**Disruption of Thermal Nociceptive Behaviour in Mice Mutant for the Schizophrenia-Associated Genes NRG1, COMT and DISC1**" Brain Res. 1348: 114-119, **2012**

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

The 37300 Radiometer enables the experimenter to:

- **Check** (and adjust if necessary) **the actual emission of an I.R. source**
- **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** in absolute terms: 1mW for the duration of 1s corresponds to 1 mJ. A useful datum to compare with any equal or different method/instrument described in the literature.

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
- an Adaptor for Tail-Flick
- an Adaptor for Plantar Test

The Digital Meter is powered by a 9V battery which makes the Radi-ometer 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.

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 (on CD)
37300-320	Probe Front Cover
37300-321	Adaptor for Tail-Flick
37300-322	Adaptor for Plantar Test
I-A 073	Instrument case

Physical

37300 complete standard package, lodged in its case:

Dimensions	37x32x11cm
Weight	2Kg
Packing	46x38x27cm
Shipping Weight	3.2Kg

Bibliography

- M. A. Tejada et alia: "**Sigma-1 Receptor Inhibition Reverses Acute Inflamma-tory Hyperalgesia in Mice: Role of Peripheral Sigma-1 Receptors**" Psycho-pharmacol. 231(19): 3855-3869, ***2014***
- Y. Takasugi et alia: "**The Effect of Sub-MAC Anesthesia and the Radiation Setting on Repeated Tail Flick Testing in Rats**" Experimental Animals 57: 65-72, ***2008***
- M.S. Minett et alia: "**Behavioral Measures of Pain Thresholds**" Current Protocols in Mouse Biology, ***2011***
- K.I.Cheng et alia: "**Intrathecal Lidocaine Pretreatment Attenuates Immedi-ate Neuropathic Pain by Modulating Nav 1.3 Expression and Decreasing Spinal Microglial Activation**" BMC Neurology 11:71, ***2011***
- M.W. Kimpel et alia: "**Pain Thresholds in Alcohol Preferring and Non-preferring Rats: Diurnal and Repeated Trial Line Differences**" Alcoholism Clin. & Exper. Res. 27 (12): 1921-1928, ***2013***

Dynamic Plantar Aesthesiometer

Cat. No. 37450

- Mechanical Stimulation
- With large platform
- Modular animal cage for Mice & Rats

ASSESSMENT OF ANIMAL SENSITIVITY TO LIGHT TOUCH OF THE PAW

General

The Dynamic Plantar Aesthesiometer has been designed to assess "**touch sensitivity**" on the plantar surface of the rodents.

Somaesthetic (mechanical) stimulation has a long history of effective clinical use to diagnose pathologies of hyper- or hypo-aesthesia, brought about by drugs, neural pathology or experimental lesions, etc., in model and experimental systems using laboratory animals.

Main Features

- Automatic detection of animal response (no visual score needed)
- Consistent application of force at an adjustable rate (force ramp)
- Software included as standard
- Data Portability via the Memory-Key provided with the standard package
- Print-out: by optional panel mount or independent thermal MiniPrinter
- NEW: orofacial stimulation by optional holders

The **37450** encompasses:

- a movable **touch-stimulator unit**, complete with filament actuator and adjustable angle mirror
- a microprocessor controlled **electronic unit,** of new design provided with graphic display, internal memory for data storage, memory stick and optional printer.
- a large **testing surface**
- a modular **animal enclosure**, in which the 3 spaces can be further divided into 2 or 4 by removable partition, thus obtaining up to 12 spaces.

Operation

The animal moves freely in one of the enclosure compartments, positioned on the testing surface.
After cessation of exploratory behaviour, the operator places the touch-stimulator below the target area of the animal paw, using the adjustable angled mirror to position the filament.
The **START** key provided at both sides of the touch-stimulator handle, invokes the following automatic sequence:

a. an electrodynamic actuator of proprietary design lifts a straight metal (NiTi alloy) filament
b. the small diameter rod touches the plantar surface and begins to exert an upward force below the threshold of feeling
c. the force increases at the preset application rate, until a stop signal is attained, either when the animal removes its paw or when the preset force is reached.

The filament (0.5mm diameter) transmits force over the entire range of typical aesthesiometers. Paw withdrawal reflex is automatically recorded using two metrics: the latency until withdrawal, in seconds, and the force at which paw was withdrawn, in grams.

Basic Specifications

Starting	via keys on the touch-stimulator vessel
Force range	0.5 to 50 grams, in 0.1g steps (from 0.5 to 5g) and 0.5g steps (from 5 to 50g)
Force increasing rate	adjustable in the interval 1 to 20 seconds, in 1s steps
Filament travel	12mm
Latency time	on graphic display, in 0.1s steps
Connection to PC	through DELTA 9-pin connector

Data Acquisition

The 37450 is a microprocessor controlled unit. The experimental data, stored in its internal memory can be directly exported to the PC USB or serial ports.

Communication is managed by the dedicated CUB Data Acquisition Software Package, **Cat. 52050-12**, included as standard. The CUB Windows®-based Software Package enables the user to route the experimental data to the PC and store them into individual files, to be managed by most statistical analysis packages available on the market.

The 37450 is provided with a **memory key**, to record all the experimental data of one or more sessions and to program the experiment layouts from a remote PC.

Ordering Information

37450	**DYNAMIC PLANTAR AESTHESIOMETER,** complete with following standard accessories:
37450-001	Microprocessor controlled electronic unit, with USB key
37400-002	Touch stimulator
37000-003	Large platform
37400-327	Supporting Columns
37450-005	Framed testing surface (perforated plat-form)
37000-006	Modular animal enclosure (3 to 12 spaces)
37450-302	Instruction manual (on USB key)
37400-321	Set of two 0.5mm diam. NiTi alloy filaments, two calibration weights (5 & 50 g) and accessories, in a plastic case
E-WP 008	Mains Cord
52050-12	CUB Data Acquisition Software Package, with USB Connection Cable

Optional

37000-145	Panel-Mount Thermal Printer
57145	Thermal MiniPrinter
37450-278	Additional stimulation base, with perforated platform and animal enclosure
37100	Set of two **Durham Holders** for **orofacial** stimulation (see separate leaflet)

Physical

Universal Mains	85-264 VAC - 50-60Hz - 20 W max.
Total Weight	Kg 12.5
Packing	98x49x47cm
Shipping Weight	Kg 21 approx.

Bibliography

- R. Lu, A. Schmidtko: "**Direct Intrathecal Drug Delivery in Mice for Detect-ing In Vivo Effects of cGMP on Pain Processing**" Methods in Molecular Biology 1020: 215-221, **2013**
- I.Q. Russe et alia: "**Activation of the AMP-Activated Protein Kinase Reduces Inflammatory Nociception**" Journal of Pain 2, **2013**
- J. Btesh et alia: "**Mapping the Binding Site of TRPV1 on AKAP79: Implications for Inflammatory Hyperalgesia**" J. Neuroscience 33 (21): 9184-9193, **2013**
- V. Brázda et alia: "**Dynamic Response to Peripheral Nerve Injury Detected by In Situ Hybridization of IL-6 and its Receptor mRNAs in the Dorsal Root Ganglia is not Strictly Correlated With Signs of Neuropathic Pain**" Molecular Pain 9(42), **2013**
- D. Piomelli et alia: "**Anandamide Suppresses Pain Initiation Through a Peripheral Endocannabinoid Mechansmsm**" Nature NSC , **2010**
- P.J. Austin et alia: "G. Chronic Constriction of the Sciatic Nerve and Pain Hypersensitivity Testing in Rats" JoVE 61, e3393, doi:10.3791/3393, 2012 http://www.jove.com/video/3393/chronic-constriction-sciatic-nerve-pain-hypersensitivity-testing

PAM

PRESSURE APPLICATION MEASUREMENT

Cat. No. 38500

General

The new P.A.M. (Pressure Application Measurement) from Ugo Basile is a novel, easy-to-use tool for measuring mechanical pain threshold in experimental **joint hypersensitivity models in rodents.**

The PAM device has been designed and validated specifically for the mechanical stimulation and assessment of **joint pain**, and therefore is especially useful in studying **arthritis**.

The PAM applies a quantifiable force for **direct stimulation of the joint** and automatic readout of the animal response.

The operator simply wears on his/her thumb a special force sensor, specially designed to apply force to **rat and mouse joints,** and measures the force which elicits the animal response (normally, limb withdrawal).

Each PAM device comes standard with two force sensors, a **large one** useful for stimulating rat joints, a **smaller sensor** recommended to test mice; an optional **paw transducer/applicator** is also available, to stimulate the animal paw.

Joint Pain

Arthritis

MECHANICAL PAIN THRESHOLD IN:

- Joint Hypersensitivity
- Chronic Joint Inflammation

Main Features

- Rat and Mouse Transducers included
- Maximum Applicable Force: 1500g
- Resolution: 0.1g
- Automatic recording of Limb Withdrawal
- User-controlled application of pressure directly to the joint
- DCA Software included - **NEW 2014 release**

Rationale of the Technique

Arthritis is associated with chronic, debilitating pain in the joints. Current metrics of arthritic pain in animal models are indirect, by scoring the level of motor activity or the animal weight distribution (Barton et al. 2007); while correlating well with the level of joint pain, their metric is a composite picture of complex pain responses, and provides little direct information about local stimulation and locally-evoked responses.

The quantification of localized joint hypersensitivity is not common in animal experiments; in this sense the PAM device represents a step forward toward multifactorial measurement of pain-related behavior in animal research; the **PAM** is the **first instrument designed specifically to apply force to the joint** and automatically detect the animal response.

Instrument Configuration

Pressure transducers: the PAM device comes with 2 transducers, each tested and validated. Both flat and round, the **large transducer** is suitable for rat, the **small one** is ideal for mouse.

Fig. 1: "Joint Transducer"

An optional **paw transducer/applicator** is also available, rapidly transforming the PAM into a Digital Randall-Selitto for pressure application on paws, muscles, tail.

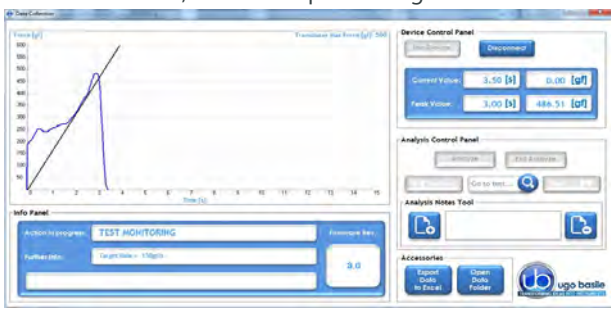
Fig. 2: "Paw Transducer"

Electronic Unit: the compact PAM controller connects to the mains or can be battery-operated. A foot pedal switch is provided for manual score of the peak force.

Fig. 3: "PAM device standard package (38500), shown with pedal switch, small and large joint transducer and Usb cable".

Data Monitoring and Storage

The device includes as standard both a control unit with internal memory and a software for signal monitoring, data transfer and analysis. Saved data can be browsed on the control unit and/or trasferred to a PC in proprietary, .xls or .txt format, for further processing.



Acknowledgements

The PAM was invented and validated in the University of Edinburgh by the team of Prof. Daniel McQueen, Susan Bond and colleagues and Dr. Harry Brash, who built the first prototypes.

Ordering Information

38500	**PAM**, standard package, including:
38500-001	Electronic Unit
38500-002	**Large** Joint Transducer
38500-003	**Small** Joint Transducer
38500-011	DCA Software (on USB Key)
38500-302	Instruction Manual (on USB Key)
38500-303	Pedal Switch

All components lodged in a dedicated plastic case

Options

38500-006	Paw Transducer
38550	PAM, high-pressure model for large animals*

Physical

Weight	1.4 Kg (in the plastic case)
Shipping weight	2.7 Kg
Packing	46x38x27cm
Shipping Weight	27.50 Kg approx

Bibliography

- **Method Paper:** N. J. Barton et al.: "**A novel behavioural technique for measuring hypersensitivity in a rat model of joint pain**". *J. Neurosc. Methods*,*163, 67–75, **2007**.*
- B.Y. Cooper et alia: "Exposure to Gulf War Illness Chemicals Induces Functional M**uscarinic Receptor Maladaptations in Muscle Nociceptors"** NeuroToxicology 54: 99-110, ***2016***
- T.J. Nutter et alia: "**A Delayed Chronic Pain Like Condition with Decreased KV Channel Activity in a Rat Model of Gulf War Illness Pain Syndrome**" NeuroToxicology 51: 67-69, ***2015***
- D. Amorim et alia: "**Amitriptyline reverses hyperalgesia and improves associated mood-like disorders in a model of experimental monoarthritis**" *Behav. Brain Res 265: 12-21, **2014***
- T. Schwagarus et alia: "**A New Method for Measuring CFA-induced Mechanical Hyperalgesia in the Rat**" *Evotec 2012*
- J. Leuchtweis et al.: "**Validation of the Digital Pressure Application Measurement (PAM) Device for Detection of Primary Mechanical Hyperalgesia in Rat and Mouse Antigen-Induced Knee Joint Arthritis**..." *Methods & Findings in Exp. & Clinical Pharmacol., 32(8): 581-589, **2010***
- **38550 (*)**: P. Di Giminiani et alia: "**Capsaicin-induced Neurogenic Inflammation in Pig Skin: A Behavioural Study**" *Res. In Vet Science 96(3): 447-453, **2014***

e-VF

ELECTRONIC VON FREY

Cat. No. 38450

General

Ugo Basile introduces an electronic apparatus for applying light touch to the rodent foot, the **e-VF, Electronic Von Frey**.

A touch stimulator transducer is mounted on a Perspex bar so that routine procedures may be employed to examine and test the animal skin sensitivity. A **prism** of proprietary design is a useful tool to locate and aim the stimulation area.

The completion of each test may be indicated either by the sudden release of the paw or by pressing the external foot-pedal. The display then gives the operator a summary of the results of the test (i.e. force and time corresponding to the animal response).

The operator may choose to reject the results or to accept them, in which case they are recorded in the e-VF internal memory. The results of several hundred tests may be stored in the e-VF for transfer them to a PC when convenient.

The rate of application of the force is set by the operator and the **NEW** e-VF includes software tools that help in consistently applying the force at the desired rate.

Sensitivity

Allodynia

ASSESSMENT OF HYPERSENSITIVITY IN RATS & MICE

Main Features

- DCA Software included - **NEW 2014 release**
- Maximum Applicable Force: 1000g
- Resolution: 0.1g
- Automatic recording of animal response
- User-controlled application of force rate
- Location of the target via the original prism-design

Rationale of the technique

Impaired cutaneous sensation is usually first make evident as a loss of light-touch detection. The Electronic Von Frey was developed to quantify the sensitivity to light touch in the laboratory animal.

The classic instrument for test of touch sensitivity is the **Semmes-Weinstein set of Von Frey Hairs**, i.e., 20 monofilaments in a linear scale of physical force. The Semmes-Weinstein set can be used on rodents, which respond to light touch of the paw, when they feel it, by a paw withdrawal reflex. However, the involved procedure is tedious and time-consuming because several stimulations must be performed for a single test (a different filament for each force level).

Compared to the classic Von Frey Hairs, the **Electronic Von Frey (e-VF)** has the advantage of ensuring a continuous force application along the whole force range of the sensor, by using a single rigid metal tip.

Speaking about force, although the sensor can detect forces from 0 to 1000g, it is reasonable to set the device **lower limit to 5g**, given by difficulty, even for the most skilled user, to apply forces below this threshold.

The metal tip used in the e-VF is the same as the one used in the classic **Ugo Basile Dynamic Plantar Aesthesiometer** 37450, allowing consistent comparison of results among the two instruments.

Fig. 1: "touch stimulator" with prism. Optional grid mesh not included

Data Monitoring and Storage

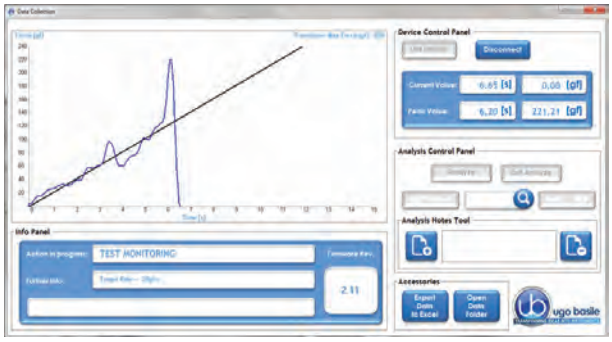
The device comes standard with both a control unit with internal memory and the **new DCA software** for signal monitoring, data transfer and analysis.

Once saved, data can be browsed on the control unit and/or trasferred to a PC in proprietary, Excel (.xls) or text (.txt) format, to be managed by most statistical analysis packages available on the market.

Ease of use

The e-VF device has been designed to make sensitivity experiments easy and consistent, thanks to its:

- Effective **peak detector,** for a reliable and automated detection of the animal response
- **Ratemeter** and **Slope** feature, ensuring the desired force is applied at a consistent rate



- NEW **Software,** acting as a quality control tool, by showing the applied pulling force (red line), the desired target force rate (blue line), and the peak detection in real time, see picture above

Instrument configuration

The e-VF comes as a complete package including **touch stimulator transducer** with **prism**, **electronic unit** with power supply, foot pedal, **software** & **USB** cable**.** The mesh grid with platform, and animal enclosure are optional.

Fig. 2: electronic unit, usb cable and foot pedal

Ordering Information

38450	**e-VF, Electronic Von Frey**, complete with following standard parts
38450-001	Electronic Unit, with power supply
38450-004	Touch-Stimulator Transducer with **38450-310** Prism
38500-011	DCA Software (on USB Key)
38450-302	Instruction Manual (on USB key)

All components lodged in a dedicated plastic case

Options

37450-005	Perforated Metal Sheet for plantar stimulation
37450-278	Base assembly for plantar stimulation, with perforated metal sheet & animal enclosure

Physical

Weight	1.4Kg
Shipping Weight	2.7Kg
Packing	46x38x27cm

Von Frey Hairs

Cat. No. 37450-275

Hypersensitivity

Touch Threshold

Semmes Weinstein Von Frey Filaments for Touch Assessment

General

Von Frey hairs (named after the German physiologist Max von Frey, 1852–1932) were been originally produced from animal and human hairs of different diameter; nowadays they are nylon monofilaments; the diameter determines the resistance of the monofilament to bending. A filament is placed perpendicularly to the skin with slowly increasing force until it bends, thereby determining the amount of force applied.

The **Aesthesio®** set of 20 monofilaments is based on the Semmes Weinstein monofilament set, **but now features retractable filaments** to protect the filament and allow the evaluator to carry a few around in a pocket.

The set of monofilaments provides an approximately logarithmic scale of actual force, and a linear scale of perceived intensity.

They have a long history of effective use in clinical settings, and can be used to diagnose pathologies of hyper- or hypo-aesthesia.

Subsets within the set of 20 probes distinguish pathologies on different parts of the body (foot, hand, lip, cheek, etc.).

Individual filaments are also sold separately individually.

Main Features

- 20 Filament Kit
- Graded Series of Nylon Monofilament, color-coded
- Rotating sleeve protects precision filament while in closed position

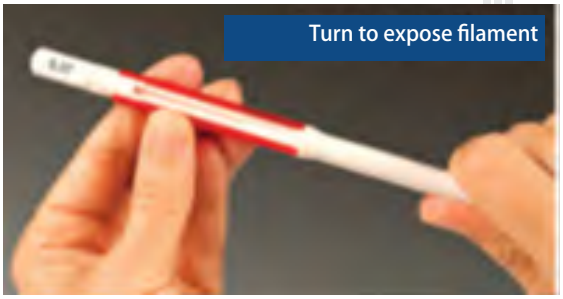
Von Frey Filaments have a long history of effective use in clinical settings, and can be used to diagnose pathologies of hyper- or hypo-aesthesia.

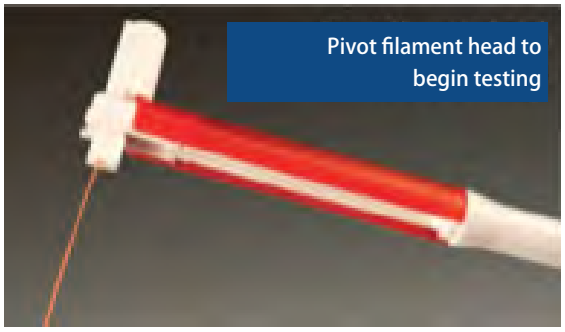
The operating principle remains the same: when the tip of a fiber of given length and diameter is pressed against the skin at right angles, the force of application increases as long as the researcher continues to advance the probe, until the fiber bends. After the fiber bends, continued advance creates more bend, but not more force of application.

This principle makes it possible for the researcher using a hand held probe to apply a reproducible force, within a wide tolerance, to the skin surface.

Rodents exhibit a paw withdrawal reflex when the paw is unexpectedly touched. The Touch Test™ Sensory Evaluator can be used on the Plantar surfaces of the foot of a rat or mouse, and the animal will indicate sensation by pulling back its paw.

Replacement filaments available. Subsets within the set of 20 probes distinguish pathologies on different parts of the body (foot, hand, lip, cheek, etc.). **Rotating sleeve** protects precision filament while in closed position.





Accessories

For easy and quick stimulation of the plantar surface with Von Frey filaments, we offer a 90x38cm **perforated metal platform**, cat. 37450-005. Laser-cut perforations form a mesh-like open grid of square holes ~5X5 mm; intervening metal grid is ~1mm wide, comfortable to the animal and easy to view the target area of the paw.

The shelf is coated with a polymer resin that is easy to clean and which will not be spoiled by fluids or waste materials. Mount the shelf on the wall.

In alternative we offer a **shelf with 40 or 80cm legs**, 37450-045 & 37450-085 respectively, which can be completed with our standard animal enclosure 37000-006; the latter is the **modular enclosure**, used with out Plantar Test & Dynamic Plantar Aesthesiometer, in which the 3 spaces can be further divided by partitions into 2 or 4, , thus lodging up to 12 rats or mice.

You might also consider the **complete stimulation base** 37450-278, including supporting columns, shelf, and animal enclosure.

Ordering Information

37450-275	**Aesthesio®** Sensory Evaluator, Kit of 20 Von Frey filaments in a carrying case

Physical

Weight	0.4 Kg
Shipping Weight	0.9 Kg
Packing	24x22x5cm

Options

37450-005	Large Perforated Metal Platform (testing shelf) for plantar stimulation
37450-045	Platform 37450-005, with 40cm legs
37450-085	Platform 37450-005, with 80cm legs
37000-006	Multiple-configuration animal-enclosure, from 3 to 12 spaces
37450-277	Set of 20 VonFrey Filaments 37450-275 & complete base assembly 37450-278
37450-278	Base Assembly for plantar stimulation, incl. supporting columns, perforated metal sheet and multiple-configuration animal-enclosure, from 3 to 12 spaces

Orofacial Stimulation Test

Fehrenbacher, Henry and Hargreaves Method

Cat. No. 31300

Mechanical Nociception

Thermal Nociception

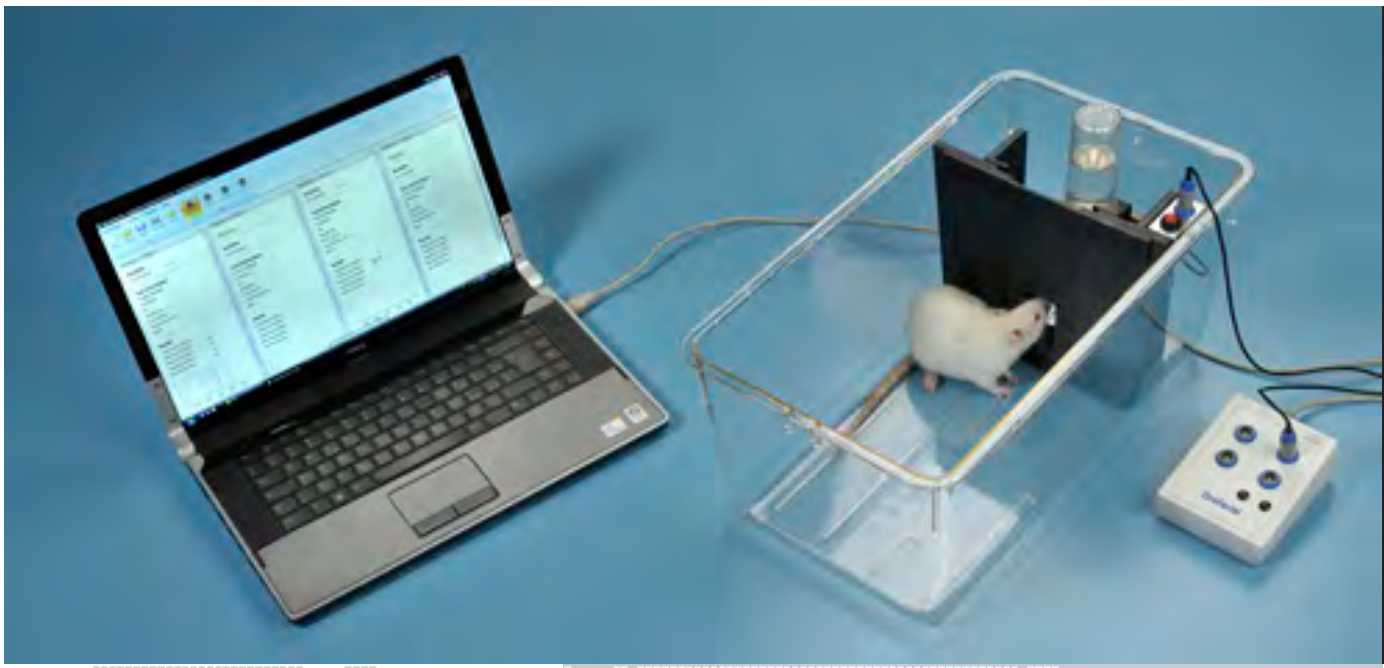
Trigeminal hyperalgesia

General

The **Orofacial Stimulation Test** by **Ugo Basile** measures hypersensitivity to thermal or mechanical stimulation of the trigeminal area.

Rats voluntarily contact a thermal or a mechanical stimulator with their *unshaved vibrissal pad* in order to ac-cess a food reward. Metrics obtained are the **duration** of feeding and the **number of feeding** attempts, measured by interruption of an infrared barrier traversing the opening to the reward.

Feeding duration and number of attempts are strongly dependent on changes in the applied thermal or mechanical stimulus.



Main Features

- Mechanical and thermal nociception assays within the same experiment
- High throughput: up to 16 animals can be tested simultaneously
- Intact vibrissal pad, as the test does not require any shaving
- The ORO-Software, included as standard, manages up to 16 cages

Instrumentation and Methodology

Orofacial pain problems are common and involve structures and mechanisms unique to the trigeminal nerve. Few methods are currently available for orofacial preclinical research, and none incorporates parallel measurement of mechanical or thermal stimulation within the same experiment.

Moreover, while most of the current assays measure unlearned behaviors, such as flinching or withdrawal reflexes, the new **Orofacial Stimulation Test**, developed by Fehrenbacher, Henry and Hargreaves**,** integrates higher-order brain functions into measurements of orofacial nociception.

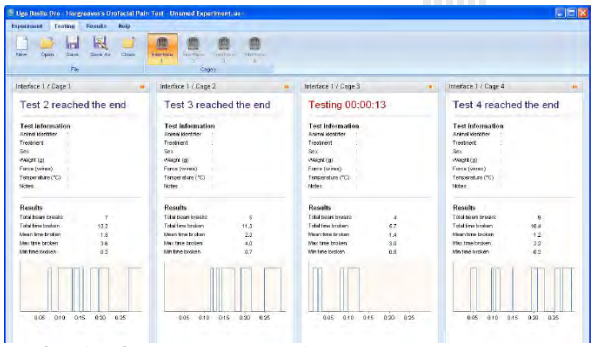
This innovative approach permits highly integrated nociceptive responses to thermal or mechanical stimulation.

Animals are trained & tested in standard home cages.

The snout is inserted through an opening to lick the reward bottle. Tests are performed in the presence of thermal or mechanical stimuli contacting the vibrissal pad.

Following treatment to induce hypersensitivity, (e.g., trigeminal ligation or injection) trials are repeated to determine the effect of treatment on feeding behavior/reward. Assay sensitivity (inflammation-induced decreases in feeding behavior and reversal of hypersensitivity by local and systemic administration of analgesics) has been proven (Hargreaves et alia, ms in prep.); the feeding behavior is strongly correlated to mechanical or thermal orofacial nociception, as the animal must contact the stimulator in order to access the food reward.

The **Ugo Basile Orofacial Stimulation Test** quantifies feeding behavior by measuring and recording the beam-break number and duration (including min, max and mean), via the **ORO-Software** included; the software acquires data from up to 16 cages simultaneously.

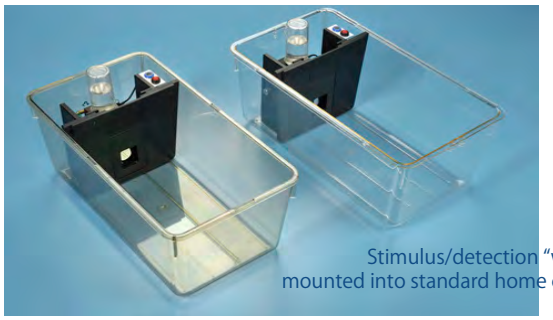


Orofacial Software: testing window

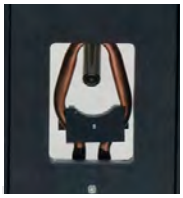
The, Data are shown in real-time both as numeric summary results and in a graphic format. Data are automatically analyzed across time according to an adjustable time window, independently viewable for each of the 16 cages.

The results of all the tests are available in a spreadsheet format which can easily be copied to other programs for further analysis.

Either the thermal or the mechanical stimulator is mounted onto a **stimulation/detection "wall"**, which also incorporates a drinking bottle and fits inside standard rat home cages (e.g. Tecniplast or Allentown).



Stimulus/detection "walls" mounted into standard home cages



The **thermal stimulator** relies on a copper tubing loop and a circulating water bath, whose temperature can be adjusted from ambient to 70°C, to reach hot nociceptive thresholds. Chin inserts are included to test animals of different size.

The **mechanical stimulator** relies on thin wires attached to a mounting plate. The system comes with several plates, each with a different number of wires in order to apply different force levels to the animal vibrissal pad.

A kit of Mouse adaptors for both thermal and mechanical stimulation is available, see ordering information.

*The "System and Method for Assessing Hypersensitivity to Orofacial, Thermal and Mechanical Stimulation" (U.S. Provisional Patent Application 61/235,590) was invented by **J. Fehrenbacher, M. Henry & K. Hargreaves,** in the Lab. of Dr. Hargreaves at **UT San Antonio** and developed commercially by **Ugo Basile R&D**. Dr. Fehrenbacher is now at IUPUI.*

Ordering Information

31300	Complete system for one animal
31320	Complete system for two animals
31340	Complete system for four animals
31300-001	Electronic unit (four channels)
31300-002	Additional cage assembly (includes thermal and mechanical stimulators and feeding detector)
31300-003	Circulating water bath
31300-010	ORO-Software, for data acquisition and analysis from up to 16 cages
31300-323	Optional Kit of Mouse adaptors for thermal and mechanical stimulation (for 1 cage)

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- K. Thibault et alia: "Orofacial Neuropathic Pain Leads to a Hyporesponsive Barrel Cor-tex with Enhanced Structural Synaptic Plasticity" PlosOne 0160786, 2016
- Q. Zhang et alia: "Chemokine CXCL13 Mediates Orofacial Neuropathic Pain via CXCR5/ERK Pathway in the Trigeminal Ganglion of Mice" J. Neuroinflammation 183: 2-13, 2016
- A.A. Abd-Elsayed et alia: "KCNQ channels in nociceptive cold-sensing trigeminal gan-glion neurons as therapeutic targets for treating orofacial cold hyperalgesia" Molecular Pain 45: 2-11, 2015
- M. Prochazkova et alia: "Activation of Cyclin-Dependent Kinase 5 Mediates Orofacial Mechanical Hyperalgesia" Molecular Pain 9:66: 1-12, 2013
- X.Z. Zuo et alia: "Operant Behavioral Responses to Orofacial Cold Stimuli in Rats with Chronic Constrictive Trigeminal Nerve Injury: Effects of Menthol and Capsazepine" Molecular Pain 28: 2-8, 2013
- M. Cha et alia: "Assessment of Chronic Trigeminal Neuro¬pathic Pain by the Orofacial Operant Test in Rats" Behav. Brain Research 234: 82-90, 2012

Durham Animal Holders

New animal holders for trigeminal stimulation

Cat. No. 37100

- Orofacial Pain assessment
- Mechanical and Thermal Nociception

Trigeminal hyperalgesia

General

The **Durham Animal Holders** are the newest accessory for use with the **Plantar Test / Hargreaves Test**, and **Dynamic Plantar Aesthesiometer**, manufactured by Ugo Basile.

These animal holders complete the scope of the infrared (IR) thermal stimulus of the Plantar Test, or the mechanical stimulus of the Dynamic Plantar Aesthesiometer, used for assessing hind paw withdrawal. This new invention allows the application of the same stimulus to the region innervated by the trigeminal nerve.

The 37100 includes two holders, form molded for testing specific size ranges of animals; the two sizes have been optimized for young adult rats as well as for bigger rats.

"Very nicely done - easy to use and it greatly facilitates consistent handling of animals"

Dr. Ken Hargreaves, UT Texas

Main Features

- Correlation thresholds in submandibular (trigeminal) region and hindpaw plantar surface
- Test orofacial nociception using a standard Plantar Test (Hargreaves) device, a Dynamic Plantar Aesthesiometer, or an eVF Electronic Von Frey

Innovative design and material

The Durham Holders are designed to hold an animal comfortably and effectievely. They are made of a proprietary polymer with a deep-red color which appears dark to the animal.

The holders conformation is optimized to two specific animal size ranges; the smaller holder will accommodate rats from 175 grams to 250 grams, and the larger holder will accommodate animals from 225 grams to over 400 grams.

In practice, the rat crawls in happily and becomes snugly nestled within the holder. Normally the rats don't back out, but inserting the vertical back plate ensures that the animal stays in place.

The position of the removable back panel insert can be adjusted from slot to slot, which allows the animal to be securely held in place, without being crowded.

The rat crawling towards the front helps quite a lot and the subject is almost self-positioning for applying the IR stimulus to the submandibular region of the rat face.

Access Panels

There are two different windows through which the stimulus may be presented:

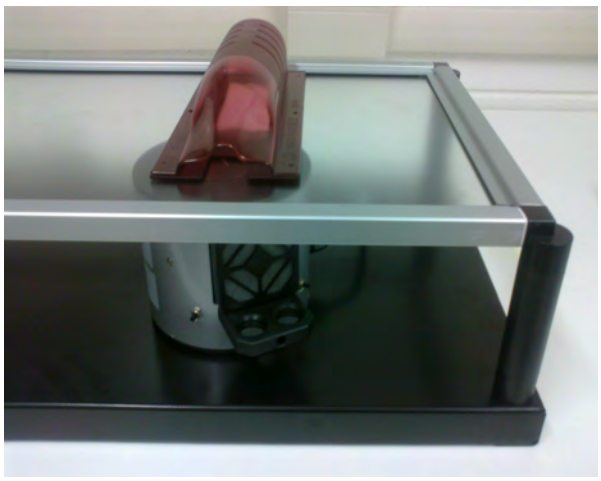
- **Submandibular access panel:**

The opening under the chin is a perfectly sized rectangular aperture just below the animal's chin. It allows the IR or mechanical stimulus to be aimed precisely and to stimulate the area innervated by the mandibular branch of the trigeminal nerve.

The aperture is large enough that both right and/or left side may be individually stimulated!

- **Plantar access panel:**

The holder allows the animal to be positioned in such a way to use the classic Plantar Test instruments for stimulating the hindpaw, as well as the areas innervated by the trigeminal nerve.



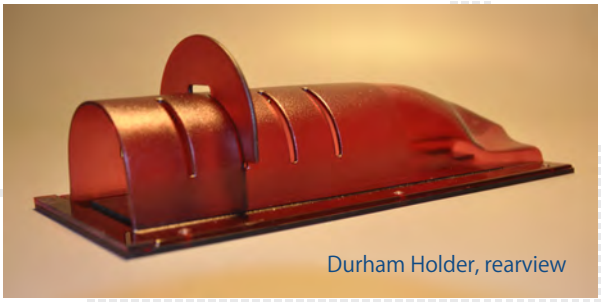
The picture above shows a Durham Holder positioned on a classic Ugo Basile Plantar Test (Hargreaves) device.

Rationale of the technique

The Durham Holders have distinct advantages which make them ideal as accessories to the classical Hargreaves test and they represent a step forward toward a multifactorial measurement of pain-related sensitivity in animal research.

Quantification of localized hypersensitivity is common in the clinic, but not in animal experiments.

The holders may appear similar to the classic Broome style animal holder; however, those restrainers are clunky, made of clear acrylic, and do not have stimulus apertures, so they could never be used for this stimulation.



Durham Holder, rearview

Acknowledgements

The Durham Holders were invented and validated at the Center of Biomedical and Life Sciences at Missouri State University; specifically, in the laboratory of Dr. Paul Durham, director of Biomedical & Life Sciences and Professor of Cell Biology at Missouri State University.
Filip Garrett and Allison Overmyer performed the validations. Prototypes were put together by Larry Vause.

Ordering Information

37100	**Set of two Durham Holders for rats:**	
	37102 medium size	
	37103 large size	
Physical	Weight	0.4 Kg (two holders)
	Gross weight	1.0 Kg
	Packing	39x27x21cm

Bibliography - Method Papers

- F.G. Garrett et alia: "**Validation of a Novel Rat-Holding Device for studying heat- and mechanical-Evoked Trigeminal Nocifensive Behavioral Responses**" *J. Orofacial Pain, 26 No. 4, 336- 344,* ***2012***
- F.G. Garrett, A.E. Overmyer, L.A. Vause, J.L. Hawkins, J.B. Hayden, and P.L. Durham "**Development of a novel device for measuring withdrawal latency by thermal stimulation in rodent facial pain models using the Hargreaves Plantar Apparatus**" *Poster presented at SFN 2010*

Papers mentioning 37100 Orofacial Holders

- R.J. Cady et alia: "**Dual Orexin Receptor Antagonist 12 Inhibits Expression of Proteins in Neurons and Glia Implicated in Peripheral and Central Sensitization**" *Neuroscience 269: 79-92,* ***2014***
- J.L. Hawkins et alia: "**Nicotine Stimulates Expression of Proteins Implicated in Peripheral and Central Sensitization**" *Neuroscience 290: 115-125,* ***2015***

Grip Strength Meter

Cat. No. 47200

Full Optional
including software
3 grasping tools &
2 grasping grids

General

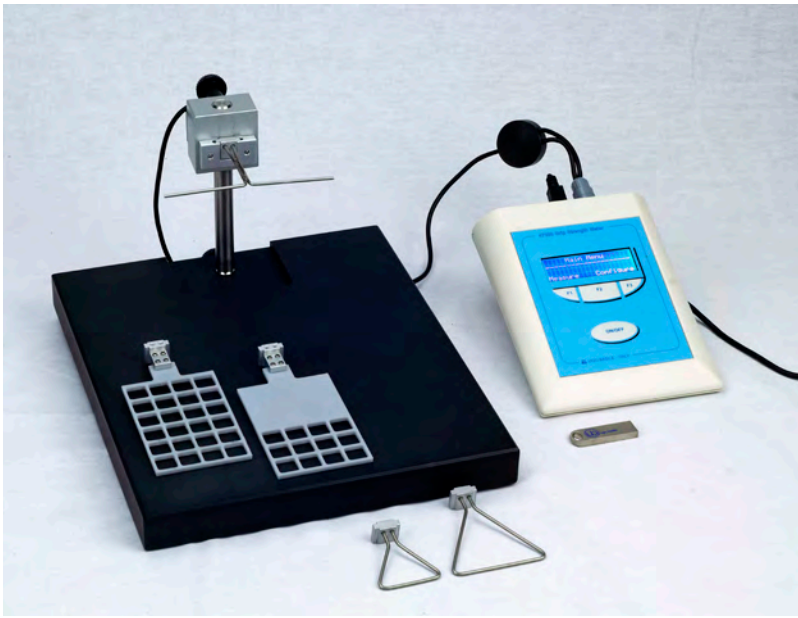
The Ugo Basile Grip Strength Meter automatically measures grip-strength (*i.e.* peak force and time resistance) of forelimb or hindlimb (via the grid) in rats and mice.

The Grip Strength test is a perfect complement to the gold standard Ugo Basile Rota-Rod device for motor coordination and motor function experiments.

The effects of drugs, toxins, muscle relaxants, disease, ageing or neural damage on muscle strength may be assessed.

The animal is placed over a base plate, in front of a grasping tool (either T-shaped, trapeze-shaped or grid), whose height is adjustable.

The bar is fitted to a force sensor connected to the control unit, which can be used as a stand-alone or connected to a PC via the USB port, for monitoring and data recording, via the **NEW** software provided as standard



Consistency facilitated by the force-rate monitoring tool

for Rats
for Mice

Features and Benefits

- Software included - **NEW 2014 Release**
- Grasping tools and grasping-grids included for rats and mice
- No calibration needed
- Force-rate monitoring (via software or LCD display)
- Grasping bar / grasping trapeze positioned at adjustable height. Optional metal grid available
- Maximum applicable force 1500g; resolution 0.1g

Rationale of the Grip Strength test

When pulled by the tail, the animal grasps at the bar. Rodents instinctively grab anything they can, to try to stop this involuntary backward movement, until the pulling force overcomes their grip strength. After the animal loses its grip on the grasping bar, the peak amplifier **automatically stores the peak pull-force achieved by the limbs** and shows it on the display.

The instrument basically consists of a base plate of black sand-blasted Perspex, complete with a force transducer and a grasping device (bar, trapeze or the optional grid), which can be positioned at an adjustable height.

The force transducer has a maximum applicable force of 1500g, with a resolution 0.1g.

The transducer incorporates a proprietary memory chip to store all calibration parameters, so that no further calibration is required for normal use; moreover, the controller will prompt to auto-zeroing routine at every measurement to automatically adjust any offset.

Data Monitoring and Storage

The device comes standard with both a control unit with internal memory and the **new DCA software** for signal monitoring, data transfer and analysis.

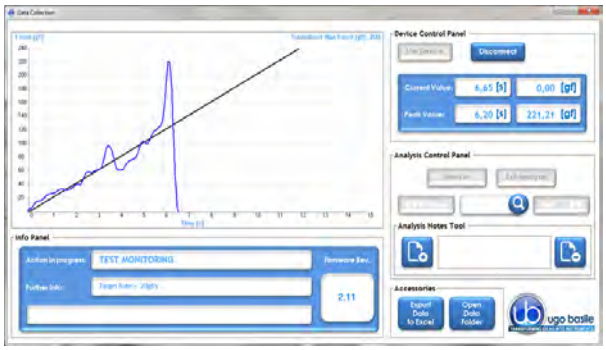
Once saved, data can be browsed on the control unit and/or trasferred to a PC in proprietary, Excel (.xls) or text (.txt) format, to be managed by most statistical analysis packages available on the market.

Ease of use

The GSM device has been designed to make sensitivity experiments easy and consistent, thanks to its:

- Effective **peak detector**, for a reliable and automated detection of the animal response
- **Ratemeter** feature (on control unit), ensuring the desired force is applied at a consistent rate
- NEW **Software,** acting as a quality control tool, by showing the applied pulling force (blue line), the desired target force rate (black line), and the peak detection in real time (**Slope** function**).**

  The experimenter can consistently apply the force (pull the animal) at the desired rate, by making sure that the blue trace lays on the lack line, see figure:



Grasping-Grids

Two basic plastic grasping-grids are included in the standard package, for integrated measurement of the four limbs or hindlimbs (artly blind grid) in mice, see front picture.

A metal grid, Cat. No. **47200-327**, 13x1cm is also available as optional.

Ordering Information

47200	**Grip-Strength Meter,** new model forrats & mice, complete with following standard accessories
47200-001	Control Unit, with Power Supply
47200-002	Force Sensor
47200-004	Baseplate and upright
38500-011	DCA Software (on USB Key)
M-LM 589	T-shaped Grip-Bar
M-LM 590	Grip-Trapeze for Rat
M-LM 588	Grip-Trapeze for Mouse
47200-325	Mouse Grasping Grid
47200-326	Mouse Grasping Grid ("blind" top)
38500-303	Pedal Switch
52010-325	USB Cable

All components lodged in a dedicated plastic case

Physical

Weight	4.8kg
Shipping weight	6.5Kg
Packing	46x38x27cm

Bibliography

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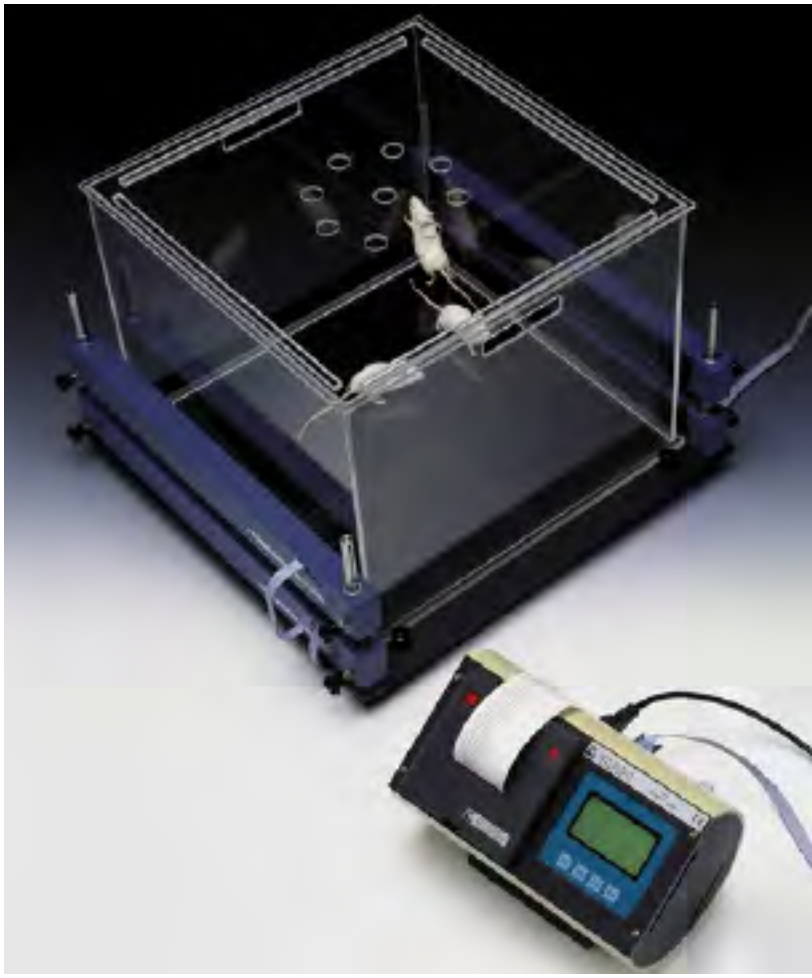
- M. Wiesmann et alia: "**A specific dietary intervention to restore brain structure and function after ischemic stroke**" Theranotics 7 (2): 493-512, **2017**
- A. Lenihan et alia: "**Decreased Anxiety-Related Behaviour but Apparently Unperturbed NUMB Function in Ligand of NUMB Protein-X (LNX) 1/2 Double Knockout Mice**" Molecular Neurobiology: 1-20, **2016**
- G.J. Huang et alia: "**Ectopic Cerebellar Cell Migration Causes Maldevel-opment of Purkinje Cells and Abnormal Motor Behaviour in Cxcr4 Null Mice**". PLoS ONE 9 (2): e86471, **2014** (Mouse)
- R. Barone et alia: "**Endurance Exercise and Conjugated Linoleic Acid (CLA) Supplementation Up-Regulate CYP17A1 and Stimulate Testostero-ne Biosynthesis**" PLoS ONE 8 (11): e79686, **2013** (Mouse)
- N. Lange et alia: "**Behavioural and Pharmacological Examinations in a Transgenic Mouse Model of 2 early-onset torsion dystonia**" Pharmacology, Biochemistry and Behavior 97 (4): 647–655, **2011** (Mouse)
- M. Savic et alia: "**Behavioural Characterization of Four Endemic Stachys Taxa**" Phytother. Res., **2010** (Rat)

Multiple Activity Cage

Cat. No. 47420



General

An animal level of general activity or locomotion is an indicator of drug action, toxic substances, neurological damage, or daily rhythms in activity.

Activity data may be automatically and unobtrusively collected by many methods.

The Ugo Basile Activity Cage has proved to be of great value to record spontaneous co-ordinate activity in rats and mice (individual or groups) and variation of this activity in time.

As the animal moves about a clear acrylic cage, it interrupts one or more infrared beams. The beams are arranged in an array of emitters on one side of the cage, detectors on another.

The lower IR array monitors horizontal movement while the upper IR array monitors vertical or rearing activity.

The number of beam breaks is correlated with the amount of movement about the cage.

With dedicated software included

STAND-ALONE CONTROLLER WITH EMBEDDED PRINTER FOR GLP AND DATA SAFETY

MAIN FEATURES

- Measures **horizontal and vertical activity in rats and mice,** useful in the following types of investigation:-
- **General Toxicology**, ascertaining the action of a drug on the animal's activity
- **Psychopharmacology,** screening drugs which are potentially active on the CNS
- **Behavioural Sciences**, in evaluating the variations of spontaneous activity after changes in environmental conditions

Instrument Description

The **47420 MULTIPLE ACTIVITY CAGE** package comprises:

- an **Electronic Unit,** Cat. 7441
- an **I.R. Beam Cage**

This set-up can accept up to 5 additional cages, for a total of 6.

Electronic Unit

The **7441,** designed to process the data originated by **up to 6 Cages**, incorporates a graphic display, a thermal printer and a serial port RS232 for direct connection to the PC via the software Cat. 52050 included. A serial to USB adaptor is also included.

The graphic display presents all available commands. The operator sets the experiment configuration via the keyboard located below the display.

The activity data are displayed at preset intervals and printed/routed to the computer according to the selected configuration. The data can be customized by adding animal & experiment numbers, gender, etc.

Its internal memory is capable to store the data of several experiments, to be unloaded to the PC later.

Cage

The **7433** Cage consists of a cubicle, entirely made of clear Perspex, dimensioned 41x41x33(h)cm. Upper lid and bottom catch pan detachable for cleaning.

The cubicle rests on a sturdy base, provided with four vertical notched bars of stainless steel to which the horizontal/vertical detecting systems 7435 and/or 7436 can be fastened.

The **7435** consists of two facing blocks containing an I.R. array of emitters and, respectively, sensors, to record the **horizontal activity**. A similar system, Cat. **7436**, whose height can be adjusted, assesses the **vertical activity (rearing)**.

Open-field cages are also available, in different dimensions and colors: ask for additional details

Data Acquisition

The electronic unit is microprocessor controlled and features direct PC output. Internally-stored data can be routed via a 9-pin D-type connector to the PC serial port (RS232).

Data output is managed by **52050-04** Data Acquisition Software Package (Windows® based), which enables the research worker to store the data into individual files, ready to be easily managed by most statistical analysis packages available on the market.

Combination with ANY-maze videotracking software is also possible, to integrate the quantitative measure of general locomotor activity, collected by our Activity cage, with more detailed information about the animal activity.

Moreover, the 47420 will add vertical activity (rearing) to videotracking data. **Ask for additional information!**

Ordering Information

47420	**MULTIPLE ACTIVITY CAGE**, standard package, including following parts:
7441	Electronic Unit
7433	Animal Cage
7435	Set of emitter/receiver sensor arrays for horizontal activity
7436	Set of emitter/receiver sensor arrays for vertical activity
47420-302	Instruction manual (on USB flash drive)
37400-305	Package of 10 Heat Sensitive Paper Rolls
E-WP008	Mains Cord
52050-04	Dedicated Software Package CUB
52010-320	USB to serial port converter
52010-322	Serial cable 9 to 9 pin

Physical

Weight	**7441**	2.7Kg
	7433	11.8Kg (including 7435/7436)
Dimensions		
	7441	27x16x19cm
	7433	54x50x37cm
Shipping weight		26Kg (whole set-up)
Packing		80x60x44cm

Bibliography

- C. Bohotin et alia: "**The effect of one month riboflavin administration on thermo-nociceptive behavior and locomotion in mice**" European Neuropsychopharmacology 26: S293, 2016
- A. Trevlopoulou et al: "**The nitric oxide donor sodium nitroprusside attenuates recognition memory deficits and social withdrawal produced by the NMDA receptor antagonist ketamine and induces anxiolytic-like behaviour in rats**" Psychopharmacol. 333 (6): 1045-1054, 2016
- M. J. Piel: "**Assessment of Knee Joint Pain in Experimental Rodent Models of Osteoarthritis**" Osteoporosis and Osteoarthritis 1226: 175-181, 2015
- B. H. Ali et alia: "**The Antidepressant-like Action of Human and Caprine Amniotic Fluid in Rats: Effect of Gender**" Am. J. Pharmacological Sc. 3 (4): 98-102, 2015
- V. Labrie et alia: "**Genetic loss of D-amino acid oxidase activity reverses schizophrenia-like phenotypes in mice**" Genes, Brain and Behavior, 9: 11–25, 2010
- J. Vlainic, et alia: "**Zolpidem is a potent anticonvulsant in adult and aged mice**" Brain Res.,1310 181–188, 2010
- A. Betourne et alia: "**Central locomotor and cognitive effects of a NPFF receptor agonist in mouse**" Peptides 31, 221–226, 2010

Mouse Rota-Rod

Cat. No. 47650

ng

General

Ugo Basile designed the first industrial Rota-Rod in the 1960s, based on the 1957 paper by N.W Dunham and T.S Miya.

The name we coined soon became so popular, now everybody knows this instrument as RotaRod!

The Rota-Rod is the reference test to screen drugs potentially active, or having side effects, on motor coordination.

The **47650 Rota-Rod NG** (Next Generation), is an evolution of the original model and the result of many years of research in cooperation with the latest development in behavioral and pharmacological research.

The 47650 combines the same functionality of the previous version, now considered the standard, with additional new features: **surprisingly silent operation, much easier experimental organization and data management.**

- UGO BASILE DESIGNED THE ORIGINAL ROTA-ROD IN THE 1960S; SINCE THEN, OUR ROTA-RODS HAVE BEEN CITED IN THOUSANDS OF SCIENTIFIC PAPERS
- NEXT GENERATION ROTA-ROD:
  SAME RELIABILITY, INNOVATIVE TECHNOLOGY!

Main Features

- **SPEED:** adjustable in the range **3-80 RPM**, in steps of 1 RPM
- **MODE:** constant, ramp (accelerating), multi-step ramp and pause (***NEW!***)
- **ROTATION:** forward, reverse and rocking
- **DRIVE:** totally silent motor. Zero noise!
- **CONTROLS:** 4"3 touch-screen to set and monitor the test
- ***X-PAD*** **SOFTWARE:** brand new, user-friendly version, to set the experiment and manage the results
- **DETECTION:** new design: trip-boxes to enclose the animals, stainless-steel to ease sterilization

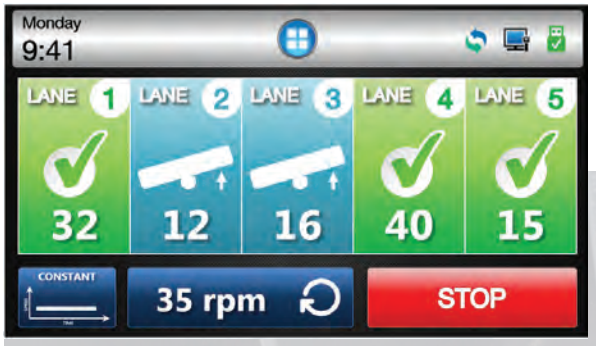
Ugo Basile: more than 25,000 citations

General

The Ugo Basile Rota-Rod NG consists of a 3cm diam. rod, suitably machined to provide grip. Five flanges divide the five 5.7cm lanes, enabling **five mice** to be simultaneously on test.

When a mouse falls off its rod section into the trip-box below, its endurance in RPMs is recorded. Height to fall is 16cm.

A 4"3 touch-screen shows the information for each section, and indicates the actual speed, (RPM):



What's new

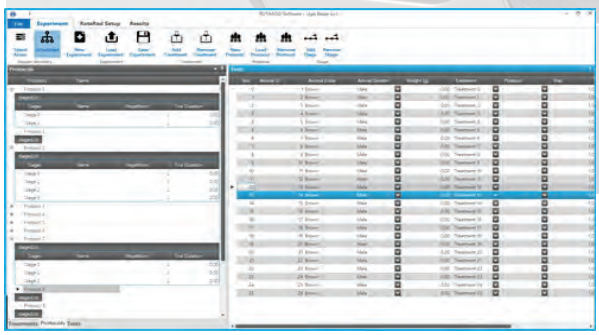
Physically similar to the previous versions, the new model features stainless-steel trip-boxes to facilitate cleaning and confine the animals when they fall off the rod.

Totally new is the software included as standard, see paragraphs below. Remote diagnosis and internet access are provided.

Experimental Configuration

Via the new ***X-PAD*** software, the operator can easily **organize** the experiment on her/his PC, and upload it to the Rota-Rod via the USB key. Custom ramp and pause are managed via the X-PAD only.

Treatments, protocols, stages, animals, and various test features (speed, mode, revolution, etc.) can be quickly defined and saved for future use.



Data Collection and Management

A basic version of the collected data can be viewed on the touch-screen; when transferred to PC via USB drive, test results appear in full version.

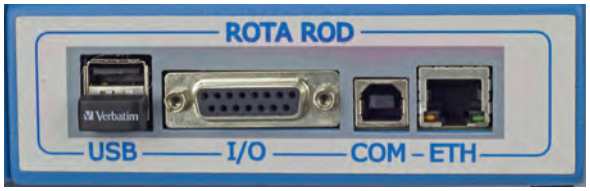
The ***X-PAD*** software automatically classifies the data, combining configuration settings with test results. The user can add information, before or after the test. Results appear in a tree-like structure, where columns can be dragged and dropped to customize the layout.

Configurations and data are exported as **Text**, **Excel** or **Pdf** reports and can be saved to cloud via **DropBox**, **OneDrive**, **GoogleDrive**.

47850 Combo-Package for Mouse & Rat

You work with both rats and mice? You should consider the Combination Package 47850, including both Mouse and Rat Rota-Rods.

Connections



USB1 this USB 2.0 enables data exchange (protocols & results) with the PC, and allows firmware upgrades

USB2 the lower USB port accommodates the USB storage key and should not be removed

I/O D-SUB 15 connector provides TTL outputs for lane status, rotation and speed

COM USB-B 2.0 allows communication to the PC (for factory use only)

ETH Ethernet connector for remote diagnosis & Internet access

Ordering Information

47650	**MOUSE ROTA-ROD**, standard package, including:
47650-320	Stainless-Steel Trip-Box
47650-302	Instruction Manual (on USB key)
X-PAD	Dedicated Software Package (on USB)
Mains Cord	

Optional

47850	Combination Package 47650 Mouse Rota-Rod and 47750 Rat Rota-Rod

Physical

Universal input	85-264 VAC, 50/60 Hz
Dimensions	46(w)x28(d)x33(h)cm
Weight	Kg 11
Shipping Weight	Kg 16 (approx.)
Packing	70x36x46cm

Bibliography

Method Papers

- N.W. Dunham & T.S. Miya: "**A Note on a Simple Apparatus for Detecting Neurological Deficit in Rats & Mice**" J. Am. Pharmaceut. Assoc., Scientific Edit., XLVI: No. 3, 1957
- B.J. Jones & D.J. Roberts: "**The Quantitative Measurement of Motor Incoordination in Naive Mice Using an Accelerating Rotarod**" J. Pharm. Pharmac.: 20: 302-304, 1968

Papers Dealing With Rota-Rod Technique

- L. Micheli et alia: "Acu**te and subchronic antinociceptive effects of nociceptin/orphanin FQ receptor agonists infused by intrathecal route in rats**" Eur. J. Pharmacol. 754 : 73-81, ***2015***
- L. A. Griffiths et alia: "**Knocking Down Metabotropic Glutamate Receptor 1 Improves Survival And Disease Progression in the SOD1G93A Mouse Model of Amyotrophic Lateral Sclerosis**" J. of Pain, accepted manuscript, ***2015***
- JV. Jokinen et alia: "**Pregabalin enhances the antinociceptive effect of oxycodone and morphine in thermal models of nociception in the rat without any pharmacokinetic interactions**" Eur. J. Pain DOI: 10.1002/ejp.728, ***2015***
- JF. Barthel et alia: "Lo**ng-term Application of Glycine Transporter Inhibitors Acts Antineuropathic and Modulates Spinal N-methyl-D-aspartate Receptor Subunit NR-1 Expression in Rats**" Anesthesiology 121.1: 160-169, ***2014***
- C.D. Heldermon et alia: "**Therapeutic Efficacy of Bone Marrow Transplant, Intracranial AAV-mediated Gene Therapy, or Both in the Mouse Model of MPS IIIB**" Molecular Therapy 15(5): 873-880, ***2010*** (*rocking, mouse*)

Rat Rota-Rod

ng

Cat. No. 47750

General

Ugo Basile designed the first industrial Rota-Rod in the 1960s, based on the 1957 paper by N.W Dunham and T.S Miya.

The name we coined soon became so popular, now everybody knows this instrument as RotaRod!

The Rota-Rod is the reference test to screen drugs potentially active, or having side effects, on motor coordination.

The **47750 Rota-Rod NG** (Next Generation), is an evolution of the original model and the result of many years of research in cooperation with the latest development in behavioral and pharmacological research.

The 47750 combines the same functionality of the previous version, now considered the standard, with additional new features: **surprisingly silent operation, much easier experimental organization and data management.**

- UGO BASILE DESIGNED THE ORIGINAL ROTA-ROD IN THE 1960S; SINCE THEN, OUR ROTA-RODS HAVE BEEN CITED IN THOUSANDS OF SCIENTIFIC PAPERS
- NEXT GENERATION ROTA-ROD:
  SAME RELIABILITY, INNOVATIVE TECHNOLOGY!

Main Features

- **SPEED:** adjustable in the range **3-80 RPM**, in steps of 1 RPM
- **MODE:** constant, ramp (accelerating), multi-step ramp and pause (***NEW!***)
- **ROTATION:** forward, reverse and rocking
- **DRIVE:** totally silent motor. Zero noise!
- **CONTROLS:** 4"3 touch-screen to set and monitor the test
- ***X-PAD* SOFTWARE:** brand new, user-friendly version, to set the experiment and manage the results
- **DETECTION:** new design: trip-boxes to enclose the animals, stainless-steel to ease sterilization

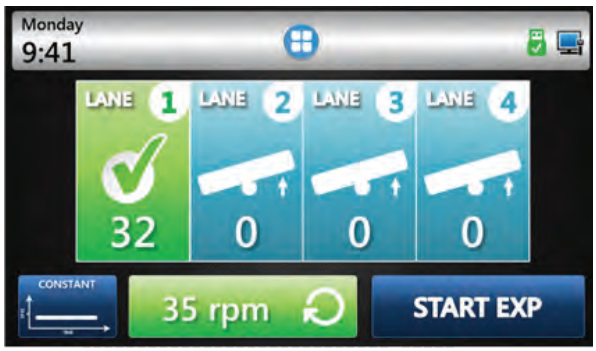
Ugo Basile: more than 25,000 citations

General

The Ugo Basile Rota-Rod NG consists of a 6cm diam. rod, suitably machined to provide grip. Five flanges divide the four 8.7cm lanes, enabling **four** rats to be simultaneously on test.

When a rat falls off its rod section into the trip-box below, its endurance in RPMs is recorded. Height to fall is 30cm.

A 4"3 touch-screen shows the information for each section, and indicates the actual speed, (RPM):



What's new

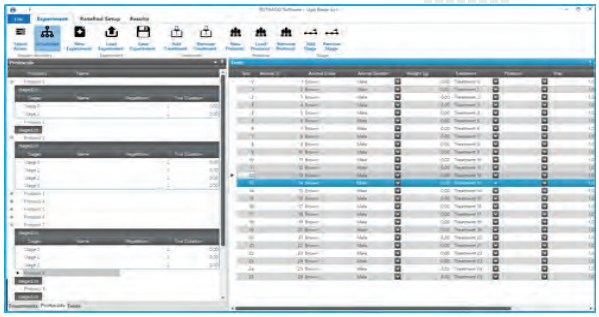
Physically similar to the previous versions, the new model features stainless-steel trip-boxes to facilitate cleaning and confine the animals when they fall off the rod.

Totally new is the software included as standard, see paragraphs below. Remote diagnosis and internet access are provided.

Experimental Configuration

Via the new ***X-PAD*** software, the operator can easily **organize** the experiment on her/his PC, and upload it to the Rota-Rod via the USB key. Custom ramp and pause are managed via the X-PAD only.

Treatments, protocols, stages, animals, and various test features (speed, mode, revolution, etc.) can be quickly defined and saved for future use.



Data Collection and Management

A basic version of the collected data can be viewed on the touch-screen; when transferred to PC via USB drive, test results appear in full version.

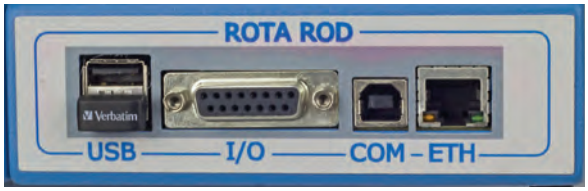
The ***X-PAD*** software automatically classifies the data, combining configuration settings with test results. The user can add information, before or after the test. Results appear in a tree-like structure, where columns can be dragged and dropped to customize the layout.

Configurations and data are exported as **Text**, **Excel** or **Pdf** reports and can be saved to cloud via **DropBox**, **OneDrive**, **GoogleDrive**.

47850 Combo-Package for Mouse & Rat

You work with both rats and mice? You should consider the Combination Package 47850, including both Mouse and Rat Rota-Rods.

Connections



USB1 this USB 2.0 enables data exchange (protocols & results) with the PC, and allows firmware upgrades

USB2 the lower USB port accommodates the USB storage key and should not be removed

I/O D-SUB 15 connector provides TTL outputs for lane status, rotation and speed

COM USB-B 2.0 allows communication to the PC (for factory use only)

ETH Ethernet connector for remote diagnosis & Internet access

Ordering Information

47750	**RAT ROTA-ROD**, standard package, including:
47750-320	Stainless-Steel Trip-Box
47750-302	Instruction Manual (on USB key)
X-PAD	Dedicated Software Package (on USB)
Mains Cord	

Optional

47850	Combination Package 47650 Mouse Rota-Rod and 47750 Rat Rota-Rod

Physical

Universal input	85-264 VAC, 50/60 Hz
Dimensions	55(w)x46(d)x57(h)cm
Weight	Kg 15
Shipping Weight	Kg 21 (approx.)
Packing	76x60x75cm

Bibliography

Method Papers

- N.W. Dunham & T.S. Miya: "**A Note on a Simple Apparatus for Detecting Neurological Deficit in Rats & Mice**" J. Am. Pharmaceut. Assoc., Scientific Edit., XLVI: No. 3, 1957
- B.J. Jones & D.J. Roberts: "**The Quantitative Measurement of Motor Incoordination in Naive Mice Using an Accelerating Rotarod**" J. Pharm. Pharmac.: 20: 302-304, 1968

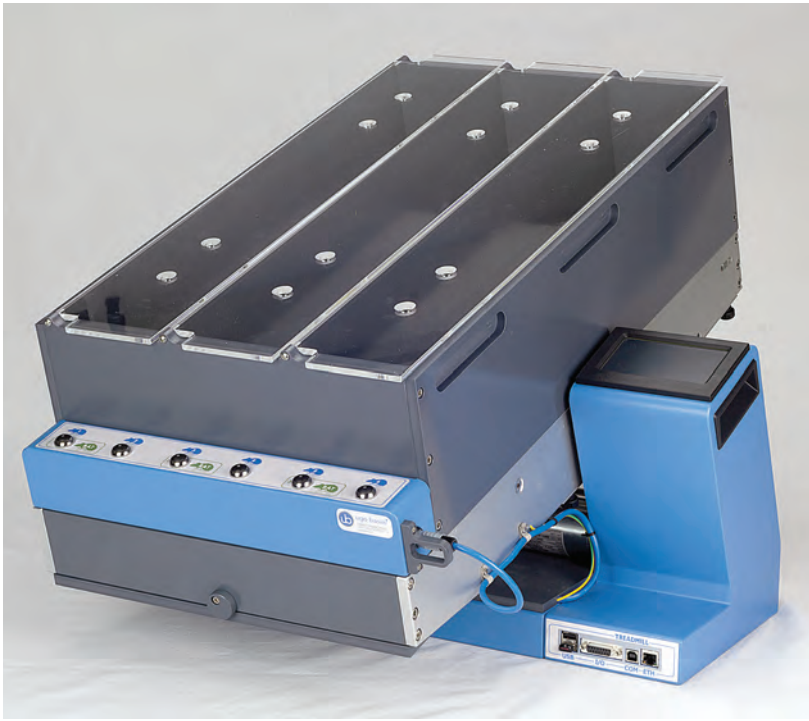
Papers Dealing With UB Rat Rota-Rod

- L. Micheli et alia: "Acu**te and subchronic antinociceptive effects of nociception/orphanin FQ receptor agonists infused by intrathecal route in rats**" Eur. J. Pharmacol. 754 : 73-81, ***2015***
- L. A. Griffiths et alia: "**Knocking Down Metabotropic Glutamate Receptor 1 Improves Survival And Disease Progression in the SOD1G93A Mouse Model of Amyotrophic Lateral Sclerosis**" J. of Pain, accepted manuscript, ***2015***
- JV. Jokinen et alia: "**Pregabalin enhances the antinociceptive effect of oxycodone and morphine in thermal models of nociception in the rat without any pharmacokinetic interactions**" Eur. J. Pain DOI: 10.1002/ejp.728, ***2015***
- JF. Barthel et alia: "Lo**ng-term Application of Glycine Transporter Inhibitors Acts Antineuropathic and Modulates Spinal N-methyl-D-aspartate Receptor Subunit NR-1 Expression in Rats**" Anesthesiology 121.1: 160-169, ***2014***
- C.D. Heldermon et alia: "**Therapeutic Efficacy of Bone Marrow Transplant, Intracranial AAV-mediated Gene Therapy, or Both in the Mouse Model of MPS IIIB**" Molecular Therapy 15(5): 873-880, ***2010*** (*rocking, mouse*)

Rodent Treadmill

Cat. No. 47302 for Rats
Cat. No. 47303 for Mice

ng



General

"*Exercise is a multifactorial activity that affects virtually every organ and tissue in the body. Not only does exercise contribute many health benefits, but lack of exercise is implicated in many chronic health problems.*

As evidence continues to accumulate concerning the impressive range of health benefits that exercise confers, biomedical researchers have increasingly become interested in conducting systematic studies of exercise to further define those benefits"

(from Resource Book for the Design of Animal Exercise Protocols, APS, Feb 2006)

Ugo Basile introduces an original TREADMILL for rats and mice. The same device is suitable for tests on either rats or mice, by simply replacing the lane assembly.

Our model incorporates a shock grid at the back of the treadmill to deliver a mild electric shock, when an aversive stimulus is required.

The running-lane assembly can be manually tilted from -25° to +25°, in steps of 5°.

- MEASURES ENDURANCE , DISTANCE, SPEED
- SAME DEVICE TO TEST RATS & MICE
- COMPACT AND USER-FRIENDLY:
  test settings & monitoring controlled by the attached electronics and managed on the touch-screen.

Main Features

- **SPEED:** from 3 to 100m/min, in steps of 1m/min
- **MODES:** constant, accelerating, custom ramps
- **SLOPE:** positive (uphill) or negative (downhill), from -25° to +25°
- **SHOCK:** from 0 to 2mA (in 0.1mA steps), included
- **CONTROLS:** 4"3 touch-screen to set and monitor the test
- ***X-PAD* SOFTWARE:** brand new, user-friendly version, to set the experiment and manage the results
- **DETECTION:** via incorporated electronic circuit automatically detects speed & absolute and relative distances

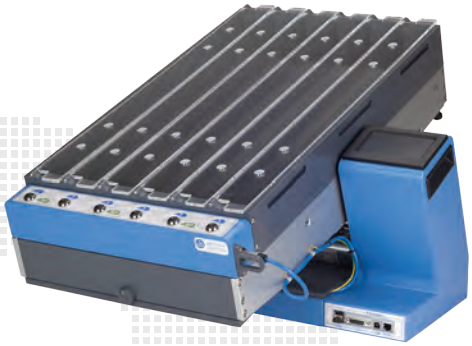
Instrument Description

Our Treadmill consists of a main unit, incorporating drive, shocker, running belt and shock grid, and a control unit with **4"3 touch-screen**.

Two lane assemblies are available, to provide the ideal running tracks for either rats or mice. The running surface consists of an easy-to-clean alimentary-grade white belt, providing suitable grip. The device features an autocleaning tool and a pan to collect droppings.

Mouse Lane-Assembly

The mouse assembly, a structure which is quickly and easily fitted to the main unit, consists of 7cm tall external walls and partitions, to divide the running belt into **6 lanes**, each 45x5.5cm, provided with a transparent lid.



Rat Lane-Assembly (featured in the front page)

The rat assembly has different dimensions: walls and partitions are 15cm high, and the running belt is divided into **3 lanes**, each 45x11cm.

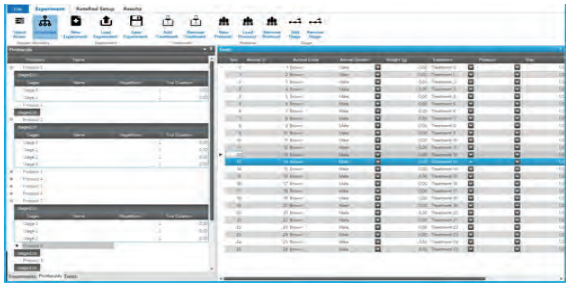
Shock & Detection Circuit

The grid (3mm bars, placed 8mm apart.) attached to either mouse or rat assembly, delivers the light footshock. Shock intensity and frequency can be preset via the controller module, as well as the cut-off number of shocks. The setting is common to all lanes.

The same grid also functions as detection system: distance, both absolute and relative, and speed are detected and recorded.

Experimental Configuration

Via the ***X-PAD*** software, the operator can easily **organize** the experiment on her/his PC, and upload it to the Treadmill via the USB key. Treatments, protocols, stages, animals, and various test features (speed, mode, etc.) can be quickly defined and saved for future use.



Data Collection and Management

A basic version of the collected data can be viewed on the touch-screen; when transferred to the PC via USB drive, test results appear in full version.

The software automatically classifies the data, combining configuration settings with test results. The user can add information, before or after the test. Results appear in a tree-like structure, where columns can be dragged and dropped to customize the layout.

Configurations and data are exported as **Text**, **Excel** or **Pdf** reports.

Connections

USB connectors are provided for data exchange and firmare upgrades; the lower USB port accommodates the USB storage key.

The D-SUB 15 connector provides TTL outputs for shock status for each lane, and speed.

Additional ports are provided for factory use and remote diagnosis.

Ordering Information

47302	**Rat Treadmill NG:** tapis-roulant with touch-screen controller & shocker. 3-lane partition assembly 47300-002 (each lane 45x11x15(h) cm), manual tilting (-25°/+25°), transparent cover. Complete with X-PAD software, USB output, USB flash drive
47303	**Mouse Treadmill NG:** as above, with 6-lane partition assembly 47300-003 (each lane 45x5.5x7(h)cm).
X-PAD	Dedicated SW Package (on USB)

47300 Combo-Package for Mouse & Rat

Working with both rats and mice? Consider the Combination Package 47300, including the main unit and both Mouse & Rat interchangeable lane-assemblies!

Special model for tethered mice:

47300-013 Mouse 6-lane assembly (each lane 45x5.5 x15(h)cm, without lid, for tethered mice)

Specs:

Speed	**3 to 100m/min, in steps of 1m/min**
Shock	0 to 2mA, 1, 2 or 3Hz
Slope	from -25° to +25°, in steps of 5°

Physical

Universal input	85-264 VAC, 50/60Hz
Dimensions	56(w)x67(d)x35(h)cm
Weight	Kg 22-27 (with 1 or 2 lane assy)
Shipping Weight	Kg 35-40 (approx.)
Packing:	wooden crate, 77x65x63 / 82x71x57cm

Bibliography, Method Papers

- American Physiological Society: "Resource Book for the Design of Animal Exercise Protocols" Feb. 2006
- O.J. Kemi et alia: "Intensity-Controlled Treadmill Running in Mice: Cardiacand Skeletal Muscle Hypertrophy" J. Appl. Physiol. 93: 1301-1309, 2002
- X.Q. Wang & G.W. Wang: "Effects of Treadmill Exercise Intensity on Spatial Working Memory and Long-Term Memory in Rats" Life Sc. 149: 96-103, 2016
- M. Shinozaki et alia: "Combined Treatment With Chondroitinase ABC and Treadmillrehabilitation for Chronic Severe Spinal Cord Injury in Adult Rats" Neuroscience Res 113: 37-47, 2016

Rotometer

Cat. No. 43000

General

The Rotometer is widely used in research on motor assessment tests, in traumatic and acquired brain injury research and spinal cord injury research.

There are several well-characterized causes for animals to exhibit rotational behavior:

- Uneven/unilateral higher expression of levels of neurotransmitters (such as GABA or dopamine). Some brain tumors can cause aberrant expression levels to occur. Injury may also interfere with proper neurotransmitter expression and/or cause some localized change in neurotransmitter expression.
- Developmental anomalies can also cause rotational behavior.
- Anxiety/stress may cause this aberrant behavior.
- Exposure to some drugs, or drug abuse, or withdrawal from some drugs; all may cause rotational sequences.
- Physical lesions also can cause rotational behavior in an animal

No Tether !

No Jacket !

TRULY **UNRESTRAINED** MICE

Main Features

- No jacket or tether is necessary: the animal is completely free
- Stand-alone, with internal memory
- **Quick and si**mple to use: no training, turn-key system with software included

Freely Moving Animals

To quantify rotational behavior in a freely moving mouse is a significant development.

This **new Rotometer** accomplishes this task precisely, using new and clever technology to count clockwise (CW) and counterclockwise (CCW) rotations in an open field.

The animal just carries a small magnet (not much larger than a grain of rice) on its nape or on its tail.

The magnet can be surgically implanted or injected subcutaneously; however, a convenient method is to attach it to the base of the mouse tail by using standard laboratory tape. This easy and efficient method, involves minimal stress for the animal, and has the advantage of requiring no anesthesia procedure.

Fig. 1: "2x15mm magnet, attached to the mouse tail"

Our **magnets** are encapsulated within a proven **biocompatible material** (Paryline), to be implanted or injected subcutaneously, and fit within syringes normally used for the injection of identification transponders.

Fig. 2:" four Rotometers set up for high throughput screening, for testing several animals at the same time

Principle of Operation

The animal is placed in the open field (20cm diam. circular arena, enclosed in a 25cm tall acrylic cylinder. Our Rotometer is dimensioned for mice, but small rats can also be tested conveniently.

The design of this detecting system is very advanced, to enable the arena to be quite large whilst the magnet aboard is very small.

When the mouse circles within the open field, or rotates in place, the magnet (carried by the mouse) also rotates.

Sensors below the open field pick up these rotations, and the electronics record their number over time, discriminating Clockwise from Counterclockwise rotation.

As CW and CCW rotations accrue, they are displayed on the front panel and stored in the instrument internal memory; experiments may be qualified with animal data, date, time, and other diagnostic data.

Data Acquisition

The 43000 is a microprocessor controlled unit. The experimental data, stored in its internal memory can be directly exported to the PC USB port, or to a flash drive (included).

Communication is managed by the dedicated CUB Data Acquisition Software Package, **Cat. 52050-13**, included as standard. The CUB Windows®-based Software Package enables the user to route the experimental data to the PC and store them into individual files, to be managed by most statistical analysis packages available on the market.

Ordering Information

43000	**ROTOMETER**, standard package, including:
43000-001	**Main Unit with display**
35100-286	Perspex Animal Restrainer (25cm h)
43000-302	Instruction Manual (on USB key)
E-E 018	Paryline-coated Magnet, 2x12mm (2pcs)
E-E 019	Paryline-coated Magnet, 2x15mm (2pcs)
E-AU 041	Memory Key
52050-13	CUB Data Acquisition Software Package and USB cable

Optional:

57145	Thermal MiniPrinter
43000-321	Syringe Kit, incl. implanter, replacement needle & injectable magnets, 2x12 & 2x15 mm, 10 each
43000-012	Set of 10 Paryline-coated Magnets (2x12mm)
43000-015	Set of 10 Paryline-coated Magnets (2x15mm)
43000-052	Set of 50 Paryline-coated Magnets (2x12mm)
43000-055	Set of 50 Paryline-coated Magnets (2x15mm)

Specifications:

Read-out	multifunction graphic display
Print-out	by optional thermal MiniPrinter
Universal Mains	85-264 VAC - 50-60Hz - 30 W max.
Dimensions	25(w)x37(d)x16(h)cm, plus restrainer
Animal Restrainer	20 (diam.) x 25 (h) cm
Weight	3.5Kg
Shipping Weight	7.0Kg approx.
Packing	68x34x28cm

Hole Board

Cat. No. 6650
Cat. No. 46653 for Videotracking

General

The Hole-Board 6650 has been conceived to study the innate **exploratory behavior** of the mouse confronted with a new environment (head plunging stereotype), according to the classic method devised by Boissier-Simon.

The normal mouse of either gender, when confronted with a new environment, will explore holes in the substrate of its environment by **poking its nose** in and out of the hole a few times, then moving on to the next hole.

The initial exploration activity of the animal and its variations brought about by psychotropic drugs are unmistakably assessed. The nose poke frequency provides an indicator of exploratory behavior.

The test lasts few minutes and does not require any previous training/conditioning of the animal.

A model with no recording unit is also available; the non-reflecting surface makes it particularly suitable or Videotracking. Ask for Cat. No. 46653.

- Quick Test for Exploratory Behavior in Mice
- The classical "Planche à Trous" Test by Boissier & Simon

Main Features

- The recording of the "nose poking" stereotype takes place automatically
- A few minute test is sufficient for most screenings
- No previous training/conditioning required
- A specific model for Videotracking is available

Instrument Descriptions

The "Méthode de la Planche à Trous" devised by Boissier & Simon (see bibliography) can be performed under optimum conditions: the recording of the "head plunging" or "nose poking" stereotype takes place automatically, via miniature I.R. emitters/receivers embodied in the "holes".

The instrument consists of a "Board" and a Control Unit.

Control Unit 6651

The control unit is lodged into a resilient cabinet whose front panel features the ACTIVITY display, the RESET and TEST keys, the LED visual indicators.

At every head plunging, the ACT (activity) LED blinks and the read-out increases by one digit.

A time-constant has been provided to inhibit the circuit to record a rapid up & down nose poking as it were a multiple event.

The figure remains frozen until the operator depresses the reset key again, when placing a fresh mouse on the board.

Board 6652

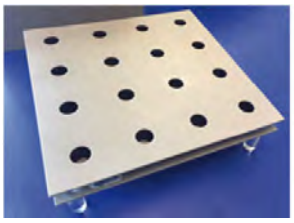
The 40x40 cm board, 2.2cm thick, is made of grey Perspex. The matt finishing avoids reflections which may alter the behaviour of the animal.

The board embodies 16 "head-plunging detectors", each comprising an I.R. emitter and a diametrically opposed receiver, flush mounted 1cm below the upper panel.

The dimensioning of the board and holes has been optimized for mice in the 15-30g range, to provide negligible false recordings.

Special Model for Videotracking

A special model of Mouse Hole-Board is also available, with no electronics, ideal for Videotracking.



The **46653** is a simple open field, dimensioned 40x40cm, with 16 holes diam 3cm, spaced 10cm apart (from center to center), enclosed in transparent (or opaque) walls. The non-reflecting surface makes it particularly suitable for Videotracking.

A similar model, the **46652**, is also available, dimensioned 1mx1m, 35cm high, 16 holes diameter 3.8cm, to test rat exploratory behavior.

Ordering Information

6650	**HOLE BOARD, standard package** including:
6651	Control Unit
6652	Board
6655	Instruction Manual (on USB key)
E-WP008	Mains Cable

Basic Specs.

Power	15 or 230V, 50/60Hz, 15W max.
Dimensions	40x40x2.2(h)cm (board)
	26x15x25(h)cm (controller)
Weight	5.5Kg
Shipping Weight	10Kg approx.
Packing	67x42x53cm

Bibliography

Method Paper

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- P. Santos et alia: "**Anxiolytic Properties of N-acetylcysteine in Mice**" Behav. Brain 317: 461-469, ***2016***
- O.D. Can et alia: "**Anti-depressant-like Effect of Vitexin in BALB/c Mice and Evidence for the Involvement of Monoaminergic Mechanisms**" Eur. J. Pharmacol 699 (1-3): 250-257, ***2013***

Rotating Wheels
for Rodent Activity

Cat. No. 1800 / 1850

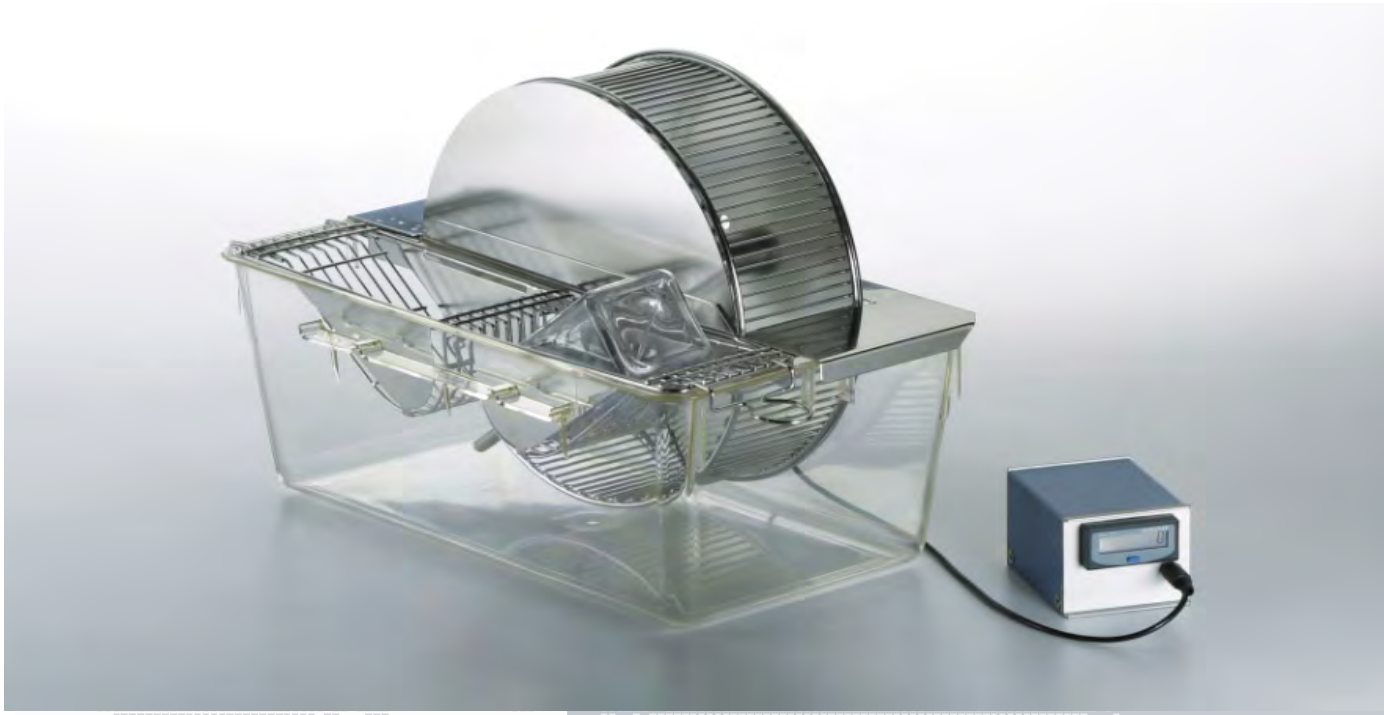
EASY MONITORING OF RODENT MOTOR ACTIVITY

Data Acquisition available as optional (52600 Interface)

General

The Activity Wheels are designed to provide an easy and convenient method for measuring motor activity in laboratory rodents, over long periods of time activity, in response to chemical or environmental stimuli.

Especially useful for research on circadian rhythms or motor function, when connected to the 52600 Interface and software ANYmaze I/O, or to other data acquisition systems.



Main Features

- Flexibility: version for rats or mice
- Easy monitoring (compatible with any Data Acquisition System)
- Clear polycarbonate cage for total visibility
- All stainless-steel wheel construction for easy maintenance

1850 Mouse Cage

The 11850 is the classic **25 cm diameter running-wheel** made of stainless steel, provided with low friction Teflon bushing, for quite smooth action. The mouse runs on 2mm bars, placed 7 mm apart.

The wheel is housed in a clear polycarbonate cage. A stainless steel wire lid with exclusive lid locks incorporates a U-shaped food hopper for pellets; water bottle is not included.

The **Mouse cage is dimensioned 37(h)x26(w)x358d) cm.**

1800 Rat Cage

The Rat Cage is similar to the mouse model; the **running wheel has 35 cm diameter**. The 2 mm bars are placed 8.8 mm apart.

Dimensions of the **Rat Cage are 48(h)x32(w)x47(d) cm**.

Revolution Counter

Each cage is complete with magnetic switch and LCD counter. The switch counts whole revolutions of the activity wheel and operates on an extended-life battery (included).

Cages without counter, models 1800-S and 1850-S, are also available, for data collection via PC, see paragraph below.

Data Acquisition

For data acquisition an interfaceis required.

Our Multifunction Interface NG, Cat. No. 52600 collects data from up to 12 activity wheels.

Data are managed via ANYmaze software (full license or 60000-IO) for further analysis, statistics, etc.

When working with the Multifunction Interface, the counter is not required, so you may consider models 1800-S or 1850-S.

Ordering Information

1800 **Rat Activity Wheel**, complete with polycarbonate cage, magnetic switch and LCD revolution counter

1850 **Mouse Activity Wheel**, complete with polycarbonate cage, magnetic switch and LCD revolution counter

1800-S **Rat Activity Wheel**, complete with polycarbonate cage & magnetic switch, without counter

1850-S **Mouse Activity Wheel**, complete with polycarbonate cage & magnetic switch, without counter

Data Collection and management

52600 **Multifunction Interface NG**, for up to **12** activity wheels (1800-S or 1850-S9. It requires ANYmaze softare (full license or 60000-IO)

60000-IO AnyMaze Software for I/O control

Physical

Dimensions	**1800**	48(h)x32(w)x47(d) cm
	1850	37(h)x26(w)x358d) cm
Weight	**1800**	7Kg
	1850	5Kg
Shipping weight	**1800**	11Kg
	1850	7Kg

Mouse Ventilator

Cat. No. 28025

General

This new Respirator, which completes the well known Ugo Basile line of Ventilators, features:-

- The **tidal volume**, in the range 0.1-1 ml (or 0.05-0.5 with the smaller piston installed), can be selected via its knob either while the pump is running or at a standstill. The stroke volume scale is ample, provided with precise engraved marks.
- The **rate**, selected by a knob, is indicated by a 3-digit solid state display, in the range 60-300 strokes per minute.
- Suitable channels and ports provide the witching of the air flow, with practically **no dead space**.
- A unique **variable stroke linkage** mechanism operates the piston.

The reciprocating motion is adjusted and transmitted to the piston by rods and articulated joints only, which leads to minimal wear, no backlash, silent operation and exact stroke reproducibility.

Unique Design **Reliable**

Compact **Silent**

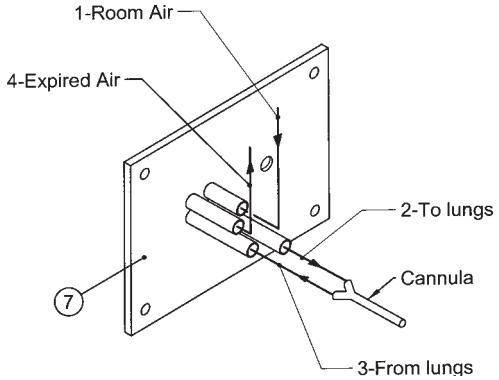
Main Features

- Ideal for use with mice, small birds and perinatal rats
- Optional 0.5 ml cylinder/piston assembly
- Purely mechanical, with impeccable finishing: lifetime lasting
- Quiet operation and negligible electrical noise

Ugo Basile: more than 25,000 citations

The instrument is compact and light, cm 20x13x18.5 and 2.5 Kg, and it is self-contained: in other words, it embodies its power supply which feeds the geared motor, its feedback controller and the rate display.

The Connection Square



As illustrated in the drawing above, and pictured below, a connection square of four ports include:-

1. intake of air or other non-explosive gas mixture
2. delivery of air to the animal lungs
3. return air from animal
4. exhaust, for sampling, partial recycling, testing positive expiration pressure, etc.

so closely packed, that the connection tubes are cut in different lengths, to ease the insertion of the tubing.


28025 Back

Start / Stop Model

A Mouse Ventilator version is available, Cat. **28125**, which embodies a controlled pause feature.

The synchronised START/STOP function gives the operator a means to stop and restart the respirator at "full lungs" point, via an external trigger pulse, when it is beneficial if not essential to minimize any extraneous movement of the anesthetized animal during electrophysiological recording, X-ray and imaging, etc.

Specifications

Rate	**60 to 300** strokes for minute
Rate Read-out	on digital display
Stroke Volume	0.1 to 1ml (with standard 1 ml piston) 0.05 to 0.5ml (optional 0.5ml piston) Reproducibility ±2%
Volume Scale	precision engraved, 0.05ml divisions
Start-Stop	by synchronised command (model 28125 only)

Power Requirements : 115 or 230V, 50/60Hz,10W max.

Physical

Dimensions	20x13x18.5cm
Net weight	2.2Kg
Shipping Weight	4.6Kg approx.
Packing	40x39x30cm

Ordering Information

28025	**MOUSE VENTILATOR**, complete with following standard accessories :-
28025-010	1ml Cylinder/piston assembly
28025-302	Instruction Manual (on CD)
28025-321	Perspex Vertical Lid
28025-323	Cannula/Y-connection assembly (0.7mm & 1mm ID), tube, etc., in a plastic case
E-WP008	Mains Cord

Options

28025-5	**Mouse Ventilator**, with 0.5ml cylinder/piston assy. & standard accessories
28025-005	0.5ml Cylinder/piston assembly
28125	**Mouse Ventilator,** with **synchronised START/STOP** feature, with 1ml cylinder/piston assy. & standard accessories
28125-5	**Mouse Ventilator,** with **synchronised START/STOP** feature, with 0.5ml cylinder/piston assy. & standard accessories

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- M.S.Karbalaei et alia: "**Impaired contractility and detrusor hypertrophy in cavin-1-deficient mice**" Eur.J.Pharmacol, 689 (1-3): 179-185, 2012

Rodent Ventilator

Cat. No. 7025

General

The 7025 Rodent Ventilator is a volume-controlled mechanical ventilator (according to Starling's ventilator method), designed for use with rats, guinea pigs, mice and small birds.

The 7025 drive consists of a variable speed geared motor linked by a novel variable stroke mechanism to easily interchangeable cylinder/piston assemblies.

In particular, the **7025 can be equipped with 5, 10 or 30ml** cylinder/piston assembly.

Its precisely regulated geared-motor speed provides the most accurate and reliable stroke rate control of any respirator available.

The operation of the 7025 may be "paused" by an external TTL logic signal.

The picture features a Rodent Ventilator 7025, together with the 6025 for Cat/Rabbit

Best available Starling Pumps

THE CHOICE OF THE CRITICS!

"We have four of your respirators in our extended lab and they are wonderful - as is your service"

Dr. Nicholas Price, Monash University

Main Features

- Interchangeable cylinder/piston assemblies (5, 10, 30ml)
- Quiet operation, both acustically and electrically (negligible R.F. broadcasting)
- Reliable mechanics and impeccable finishing: lifelong lasting
- Synchronised START/STOP function available as optional

Instrument description

The unique linkage mechanism insures that:

1) The piston almost touches the cylinder end with each stroke, regardless of the pre-set volume, thus insuring all air taken into the pump is expelled with each stroke.
2) The volume, clearly indicated on a **stationary dial**, is adjustable by means of a knob while the pump is either running or at standstill.
3) The reciprocating motion is generated, adjusted and transmitted to the piston by rods and articulated joints only.

The lack of sliding friction leads to:

a) practically no wear
b) no backlash and hence silent operation and exact stroke reproducibility.

Hook-up to animal

Four ports (*Intake, To Animal, From Animal* and *Exhaust*) allow flexibility in air channelling.

The input may be room air or any non-explosive gas mixture. The exhaust air may be partially or totally recycled or collected for analysis.

Ventilator Controls

The speed control knob adjusts the geared motor to the desired speed, which is indicated on the 3-digit LED display labelled STROKES P.M.

The operation of Ugo Basile Ventilators may be "paused" by an external TTL logic signal.

Start / Stop Model

For more demanding electrophysiological-pharmacological investigations, in particular when the operation of the Ventilator is software controlled, a **synchronised command** is available to START-STOP the Ventilator at completed forced inspiration.

Ask for special models 7125.

Specifications

Rate	10 to 180 strokes for minute
Rate Read-out	digital display
Stroke Volume	0.5 to 5; 1 to 10 or 3 to 30 ml, depending on cylinder/piston
Stroke Vol. Scale	1-10 ml
Stroke Vol. Reprod.	±2%

Universal input 85-264 VAC, 50-60Hz, 40 VA max.

Physical

Dimensions	27x26x19cm
Net weight	9.5Kg
Shipping Weight	16Kg approx.
Packing	67x42x53cm

Ordering Information

7025	**RODENT VENTILATOR**, complete with following standard accessories:
7026	10ml Cylinder/piston assembly, complete
7032	Perspex Lid
7033	Lithium-Grease Tube
7044	Y-Canula
7025-302	Instruction Manual (on CD)
E-WP 008	Mains Cord

Other available models and accessories

7025-5	**RODENT VENTILATOR**, as above, 5ml
7025-30	**RODENT VENTILATOR**, as above, 30ml
7128	5ml Cylinder/piston assembly, complete
7027	30ml Cylinder/piston assembly, complete
7025-150	Anesthesia Kit

Models with synchronised START/STOP feature

7125	**Rodent Ventilator**, 10ml
7125-5	**Rodent Ventilator**, 5ml
7125-30	**Rodent Ventilator**, 30ml

See also our Anesthesia Systems, series 21100, the ideal match to our Ventilators!

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- R.H Hassing Frandsen et alia: "**No apparent role for T-type Ca2+ channels in renal autoregulation**" Eur. J. Physiology 468 (4): 541-550, 2016
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- J.K. Marshall et alia: "**Intra-Operative Tissue Oxygen Tension Is Increased by Local Insufflation of Humidified-Warm CO2 during Open Abdominal Surgery in a Rat Model**" PlosOne April 2015

Cat/Rabbit Ventilator

Cat. No. 6025

General

The 6025 Cat/Rabbit Ventilator is a volume-controlled mechanical ventilator (according to Starling's ventilation method), designed for use with cats, rabbits and animals of similar size.

The 6025 drive consists of a variable speed geared motor linked by a novel variable stroke mechanism to easily interchangeable cylinder/piston assemblies.

In particular, **the 6025 can be equipped with 50 or 100ml cylinder/piston assembly**.

Its precisely regulated geared-motor speed provides the most accurate and reliable stroke rate control of any respirator available

The operation of the 6025 may be "paused" by an external TTL logic signal.

The picture features a Rodent Ventilator 7025, together with the 6025 for Cat/Rabbit

Best available Starling Pumps

THE CHOICE OF THE CRITICS!

Main Features

- Interchangeable cylinder/piston assemblies (50 and 100ml)
- Quiet operation, both acustically and electrically (negligible R.F. broadcasting)
- Reliable mechanics and impeccable finishing: lifelong lasting
- Synchronised START/STOP function available as optional

Instrument description

The unique linkage mechanism insures that:

1) The piston almost touches the cylinder end with each stroke, regardless of the pre-set volume, thus insuring all air taken into the pump is expelled with each stroke.
2) The volume, clearly indicated on a **stationary dial**, is adjustable by means of a knob while the pump is either running or at standstill.
3) The reciprocating motion is generated, adjusted and transmitted to the piston by rods and articulated joints only.

The lack of sliding friction leads to:

a) practically no wear
b) no backlash and hence silent operation and exact stroke reproducibility.

Hook-up to animal

Four ports (*Intake, To Animal, From Animal* and *Exhaust*) allow flexibility in air channelling.

The input may be room air or any non-explosive gas mixture. The exhaust air may be partially or totally recycled or collected for analysis.

Ventilator Controls

The speed control knob adjusts the geared motor to the desired speed, which is indicated on the 3-digit LED display labelled STROKES P.M.

The operation of Ugo Basile Ventilators may be "paused" by an external TTL logic signal.

Start / Stop Model

For more demanding electrophysiological-pharmacological investigations, in particular when the operation of the Ventilator is software controlled, a **synchronised command** is available to START-STOP the Ventilator at completed forced inspiration.

Ask for special models 6125.

Specifications

Rate	10 to 100 strokes for minute
Rate Read-out	digital display
Stroke Volume	10 to 50; 20 to 100, depending on cylinder/piston installed
Stroke Vol. Scale	10-50 ml
Stroke Vol. Reprod.	±2%

Universal input 85-264 VAC, 50-60Hz, 40 VA max.

Physical

Dimensions	27x26x19cm
Net weight	10.5Kg
Shipping Weight	16Kg approx.
Packing	67x42x53cm

Ordering Information

6025	**CAT/RABBIT VENTILATOR**, complete with following standard accessories:
6026	50ml Cylinder/piston assembly, complete
6027	Set of 2 Lip-Seal Rings for 50ml piston
7032	Perspex Lid
7033	Lithium-Grease Tube
7034	Set of 3 Hex. Wrenches (2, 2.5, 3 mm)
6044	Y-Canula
6025-302	Instruction Manual (on CD)
E-WP 008	Mains Cord

Other available models and accessories

6025-100	**Cat/Rabbit Ventilator**, as above, 100ml
6029	Set of 2 Lip-Seal Rings for 100ml piston
6025-150	Anesthesia Kit

Models with synchronised START/STOP feature

6125	**Cat/Rabbit Ventilator**, 50ml
6125-100	**Cat/Rabbit Ventilator**, 100ml

See also our Anesthesia Systems, series 21100, featured in the picture together with a 6026 Ventilator.

The ideal match to our Ventilators!

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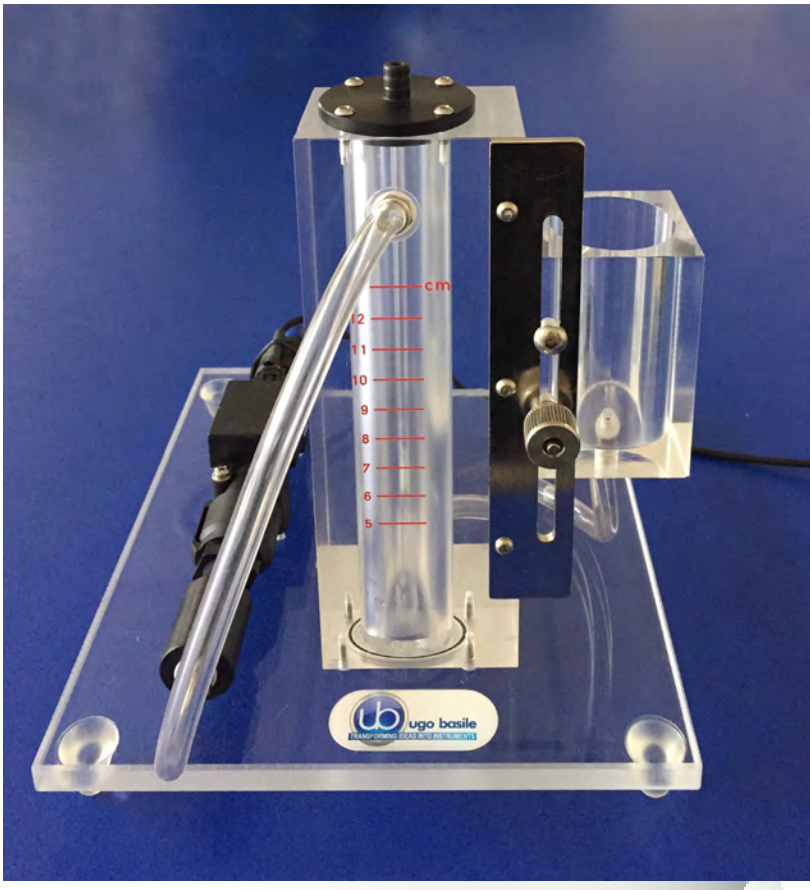
Bronchospasm Transducer

New model for digital recorders

Cat. No. 17020



General

This transducer is designed to perform the bronchospasm test on laboratory animals and is particularly suitable for connection to UGO BASILE DataCapsule-*Evo* Recorder, and to other digital data acquisition systems.

It enables the research worker to evaluate the spasm-inducing effect of drugs having a very wide range of action, not necessarily intended to act on respiratory dynamics.

The Bronchospasm Transducer 17020 is also a useful research tool for screening substances inducing the opposite effect, both those causing active bronchodilation in basal conditions and those which antagonize test drugs such as histamine, bradykinin, etc.

It is basically an air flow meter provided with a water input valve with adjustable pressure threshold.

The measuring device is a compact unit made entirely of Perspex; power supply and controls are located in a separate electronic box.

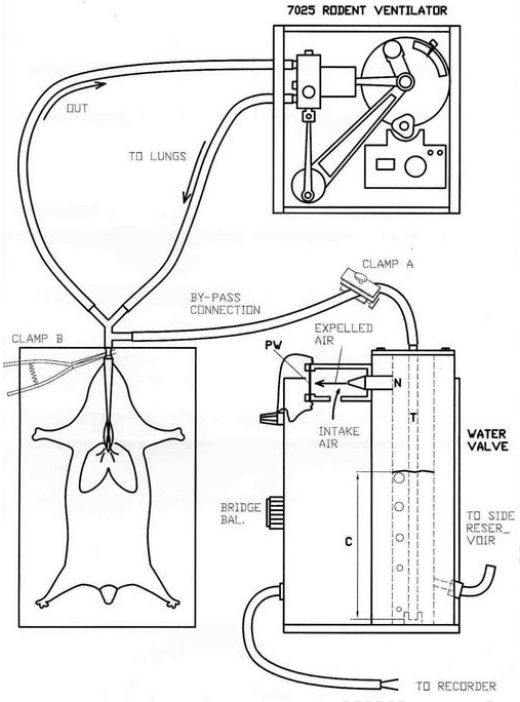
- Evaluates the bronchospasm inducing effect of drugs
- The new model records the volume (with a precision of 0.1ml)

Main Features

- Simple and reliable method to assess airflow resistance
- The effect of bronchodilators agents is quickly assessed
- A complete set-up includes optional animal ventilator and data acquisition system (or chart recorder). Ask for details!

Experimental Layout

The experimental layout follows the well-known Konzett-Roessler arrangement (see BIBLIOGRAPHY) with the anaesthetized subject breathing via a reciprocating pump, according to Starling's mode of operation. See sketch below:



Sensitivity

The sensitivity of the instrument in comparison with conventional Konzett-Roessler apparatus is illustrated in the table below:

Minimum dosage in µg/Kg giving significant readings

	K-R Apparatus	UGO BASILE 17020
Histamine	3 - 6	0.3 - 0.6
Acetylcholine	20 - 40	3 - 10
Serotonin	6 - 15	1 - 3

Air Flow Meter

The recording system monitors respiratory dynamics by providing a tracing appearing as a succession of spikes.

When bronchospasm occurs, overpressure displaces the water column inside the T-tube and air bubbles through the water, escaping through an air flow tranducer thus generating an electrical signal.

When Bronchodilators are administered, overpressure is reduced to below normal breathing values, as the bronchi exert less aerodynamic resistance to forced inspiration.

The tracing will decrease in amplitude to a marked degree, enabling the action of bronchodilators to be assessed.

Compared to the previous model, which simply recorded the number of events, **the new model also provides the volume, with a precision of 0.1ml**.

Controls

The power supply and the controls are located in a separate cabinet of original design.

Ordering Information

17020 **Bronchospasm Transducer**, complete with following parts:
17020-302 Instruction Manual (on CD)

Ask for details about:

7025 Rodent Ventilator
17308 DataCapsule-Evo Digital Recorder

Physical

Weight	2.7Kg
Shipping Weight	5.2Kg
Packing	40x39x30cm

Bibliography

Method Paper

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Gas Anesthesia Systems

Cat. No. 21100

General

The Ugo Basile New Gas Anesthesia is a compact, modular and reasonably-priced system, intended to match the highest technical requirements of animal labs that do not compromise on quality.

A wide range of options and accessories are available, most of which can be added in a scalable manner, making the system modular and with an excellent value for price!

Typical anesthesia procedures involve an induction phase and a maintenance phase, which require at least:

- Flow-meter and anesthetic Vaporizer
- Induction box and/or mask with breathing circuit
- Scavenger or flow hood (for gas anesthetic removal)

The Ugo Basile New Gas Anesthesia system include all of the above! ... and much more!

Portable

Modular

- **THE IDEAL MATCH TO UGO BASILE LINE OF VENTILATORS**

Main Features

- Digital Flowmeter with wide range (up to 16 litres per minute) for multiple animal delivery
- Up to six Animals with one Station
- Manifold for mask/induction-box switch and full range of accessories
- NEW Tec3 Vaporizers (non-refurbished)

Ugo Basile: more than 25,000 citations

Overview

The unique digital flowmeter, coupled to non-refurbished vaporizers for Isoflurane or Sevoflurane, result in an innovative yet sturdy and reliable system to anesthetize animals of virtually any size and up to 6 animals simultaneously.

An ample selection of modular components and accessories enables the user to customize and expand the anesthesia system upgrading from a **basic** (flowmeter & vaporizer) to a **full system** (with induction boxes, breathing circuits with masks of any size, switch valves, multiple delivery systems active or passive scavengers, etc.)

The blue 4mm thick aluminum rack has a highly resistant paint to protect against stains from aggressive anesthetic liquids & solvents.

Two universal attachment blocks are mounted on the back, to connect the device easily to any rail or mobile floor model anesthesia rigs of sizes 25x8mm up to 35x10mm.

Digital Flowmeter

The Ugo Basile Gas Anesthesia System includes a unique digital flowmeter.

Its wide flow range (from 0.3 to 16 l/min.) and fine resolution (0.1 l/min.) guarantees enough gas flow to anesthetize up to 6 animals simultaneously!

Small and large animals could be anesthetized with the same system (virtually, from mouse to horse!)

Nose-cone/Masks with diaphragm

Unlike many rodent masks available on the market, these masks incorporate a latex diaphragm, which holds the rodent nose, keeping the animal in correct position and ensuring a continuous positive flow of fresh oxygen & anesthetic.

The membrane also provides a positive seal reducing the exposure of the user to anesthetic gases.

Available in several sizes:

- Small/Large Mice
- Small/Medium/ Large Rats
- Large Rodents/Feline

The picture shows a mouse nose-cone/ mask, connected to an evacuation tubing.

Induction Box

The **7900** Induction Box is a conveniently dimensioned (25x13x13cm), cost-effective solution to confine one guinea pig, one rat or several mice.

It incorporates a sliding lid and tubing connectors (vaporizer input and scavenger output).

A larger size, **7910** is also available**,** dimensioned 44x22x-21cm, for larger animals such as rabbits.

Dual Diverter Manifold with Humidifier

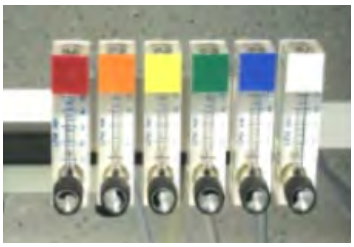
All of the Ugo Basile Gas Anesthesia Systems come with a pre-installed mounting bracket to fit the Dual Diverter Manifold (as shown in the picture).

The anesthetic gas flow can be diverted toward 2 independent devices (i.e., an induction chamber and a breathing mask).

A simple and efficient humidifier is included with the manifold. It is especially recommended for long-term anesthesia, when dehydration may become an issue.

Multiple Delivery System

The Multiple Delivery accessory allows the connection of up to six devices to one anesthesia system for simultaneous operation.



Each device (for 2, 3, 4, 5 or 6 animals) has independent flow regulation.

F/AIR Scavenger

A solution to handling waste anesthetic gases when active evacuation systems are not available, activated charcoal canisters remove approx. 50g of halogenated anesthetic agents from the waste gas stream before being discarded.

Ordering Information

ANESTHESIA SYSTEMS

21050 **Basic Single-Output Anesthesia System** including Digital Flowmeter (for O_2 or Medical Air) and TEC-3 vaporizer for Isoflurane (*)

21100 **Single-Output Anesthesia System**, including 21050 (*), 2 passive scavengers (**), evacuation tubing.

21200 **Double-Output Anesthesia System,** Including 21050 (*), 4 passive scavengers (**), evac. tubing & dual diverter manifold with humidifier

21400 **Multiple-Animal Anesthesia System,** including 21050 (*), 8 passive scavengers (**), evac. tubing and Multiple Delivery System for 4 animals.

21600 **Multiple-Animal Anesthesia System,** including 21050 (*), 12 scavengers (**), evac. tubing and Multiple Delivery System for 6 animals.

Special configurations available on request: ask for details!

ACCESSORIES

Delivery Systems (Masks & Induction Boxes)

PS-0525-A **Nose-Cone/Mask Circuit** for **Small Mice**,

PS-0305-A **Nose-Cone/Mask** for **Large Mice**, 3cm⌀

PS-0306-A **Nose-Cone/Mask** for **Small Rats**, 4.5cm⌀

PS-0307-A **Nose-Cone/Mask, Medium Rats**, 5cm⌀

PS-0308-A **Nose-Cone/Mask** for **Large Rats**, 5.5cm⌀

All masks are complete with diaphragm and inlet connector

7900 **Induction Box** for **small rodents** (rats and mice), dimensioned 25x13x13 (h) cm

7910 **Large Induction Box,** 40x22x21(h)cm

21100-790 **Induction Box** for **small rodents**, airtight model, with latch, 25x13x13 (h) cm

Special Systems with N2O

22100 O_2/N_2O Anesthesia System, with 2 Analog Flowmeters, TEC-3 vaporizer for Isoflurane (*), passive scavenger (**), evac. tubing.

* *Vaporizers for other anesthetic agents available on request*
** *Activated Charcoal Canisters*

Multiple-Output Delivery Systems

PS-0529-02 **Dual Diverter Manifold** with humidifier, *see complete model **21200***

PS 30-459 **Multiple-Animal Delivery System**, 6 Flowmeters, *see complete model **21600***

Multiple delivery systems for 2, 3, 4, and 5 animals available

Anesthetic Scavenger and Evacuation

PS-0581-00 **F/air filter** (activated charcoal canister)

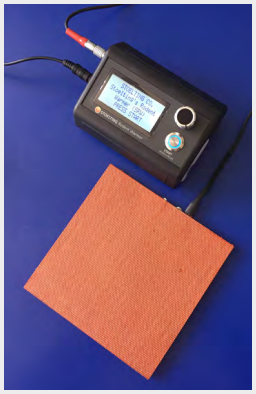
PS-0581-01 **F/air filter**, pkg. of 8

PS-0582 **Evac.Tubing for F/air**, 1.8 m with 19 mm male x 22 mm female adaptor

21100-833 **Active Scavenger System**, to remove the anesthetic agent by negative pressure (to be be connected to an activated charcoal canister)

Heating Pads and Surgical Tables

21100-800 **Rodent Warmer**, to monitor and maintain animal temperature during surgery: available with mouse, rat or home-cage heating pad; the rectal thermal probe is sold separately.
See leaflet!



PS-0811 **Heating Pads** Delta-Phase Isotherm (pkg of 3), 20x20x0.65 cm. Maintains animal body temperature near 37°C up to several hours. Ideal for NMR.

Other Recommended Accessories

Fill Devices

PS-0950 for Isoflurane

PS-0951 for Sevoflurane

PS-0949 for Halothane

Physical (21100)

Weight	8.5Kg
Dimensions	26(w)x18(d)x24(h)cm
Shipping Weight	12Kg
Packing	67x42x53cm

Anesthetizing Box

Cat. No. 7900 (rodents) 7910 (rabbits)

General

Our Induction Boxes are conveniently dimensioned induction boxes, featuring a sliding lid. They are made of Perspex and prove to be particularly useful to confine laboratory animals during anesthetizing.

The **7900**, for small rodents, is **dimensioned 25x13x13**(h)cm; the larger model 7910, for rabbits is **dimensioned 40x22x21**(h)cm;

The transparent acrylics permits the animal to be kept under constant observation.

Two tubing connectors of nickel plated brass are fitted into each end, one located at the top of the box and the other at the bottom.

Any (non-explosive!) gas mixture can be used. In case small quantities of liquid, as ether or chloroform are used, soak a cotton wool flock and place it in a small Becker, in-side the box.

For more demanding application, and higher safety, an airtight model, with latch, is also available, see picture below.

Our Induction chambers are ideal to work with our new Anesthesia Systems

TO CONFINE SMALL LABORATORY ANIMALS DURING ANESTHETIZING

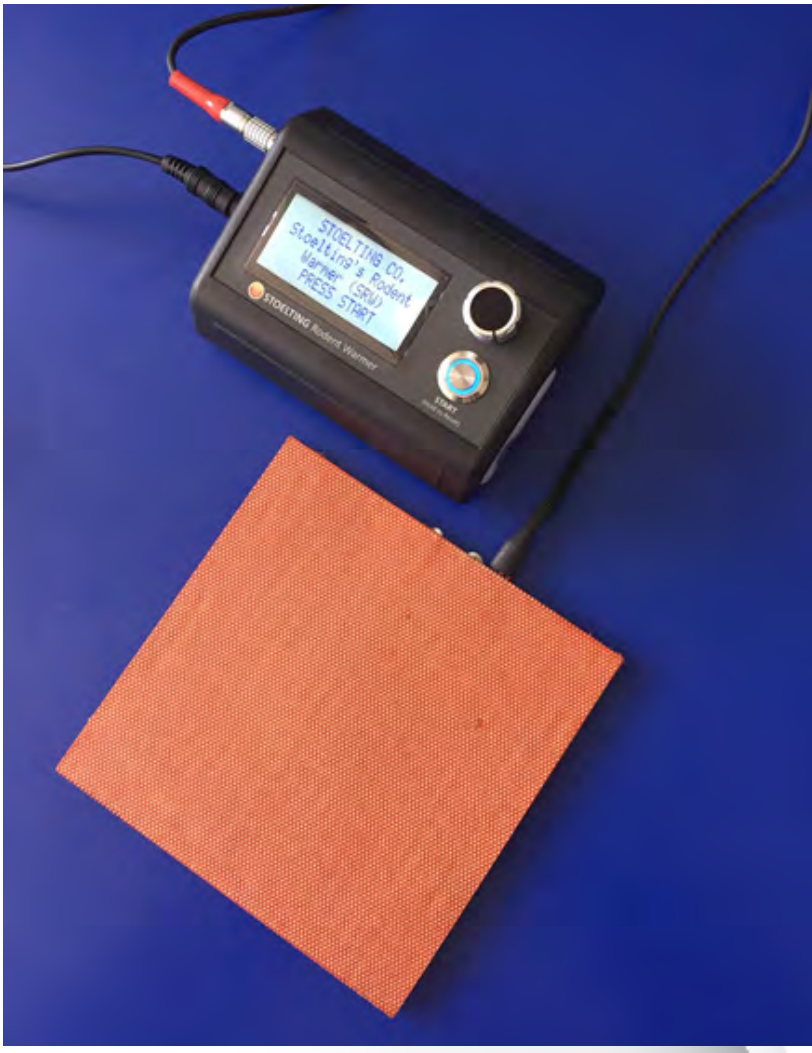
Ordering Information

- **7900** Induction box for small rodents 25x13x13(h)cm, ID 23x12x12(h) cm
- **7910** Induction box for rabbits 40x22x21(h)cm, ID 38x20x19(h) cm
- **2100-790** Airtight model, with latch, see picture 25x13x13 (h) cm, ID 21x11x13(h) cm

Rodent Warmer

by Stoelting

Cat. No. 21100-800



General

Use Rodent Warmer before, during and after surgical procedures to improve surgical outcome and overall longevity.

Monitor and maintain animal temperature with three programmable settings: animal specific, timer or use with thermal probe.

The Rodent Warmer is available with mouse, rat or home-cage heating pad; the rectal thermal probe is sold separately.

The Rodent Warmer is a perfect complement to our line of Ventilators and Anesthesia Systems, as well as our BP Recorder, and Stoelting's Stereotaxic Instruments.

Model X2 is also available, which allows for easy programming and controls 2 independent heating pads simultaneously.

Available with a combination of mouse, rat or home-cage heating pads.

Minimize heat loss and improve surgical outcome with the new rodent warmer!

Compact

for Mice and Rats

Main Features

- Ideal for use with mice and rats
- Easy to use dial control
- Heating Pad Included (for mouse, rat, or home cage)
- Preprogrammed Animal Temperatures
- Lightweight, small footprint
- Use with or without rectal probe (*rectal probe sold separately*)

General

The new Rodent Warmer can be used as a general warming system or with a rectal probe (sold separately) for more accurate, core temperature monitoring during pre- and post-op surgical procedures.

Before: Heating pad can be placed underneath an induction chamber to reduce heat loss during anesthetic administration.

During: Place heating pad on a rodent surgery table or stereotaxic instrument to maintain and monitor temperature during surgical procedures, ventilation and anesthesia.

After: Cage heating pads can be placed in the animal's home cage for faster recovery following surgical procedures.

Instrument Description

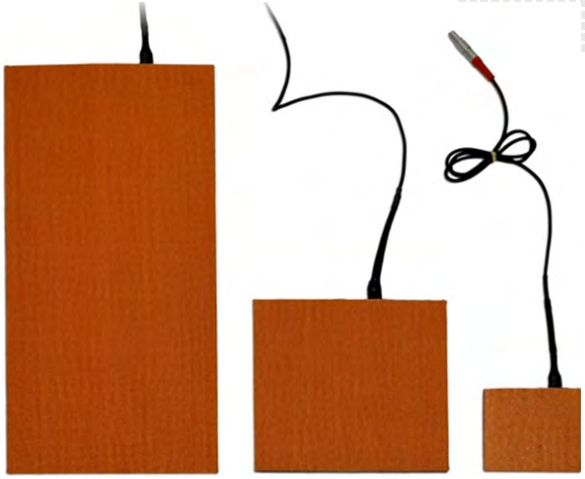
The Rodent Warmer provides three Operating Settings:

1. Select from pre-programmed animal temperatures
2. Countdown Timer
3. Use with Thermal Rectal Probe

All selectable via an easy-to-use dial control.

Heating Pads

Heating pads are available in three different sizes:



Cage
Heating Pad
16x38cm

Rat
Heating Pad
15.25x15.25cm

Mouse
Heating Pad
7x7cm

Optional

Rodent Warmer X2 is also available, to control 2 independent heating pads simultaneously. Available with a combination of mouse, rat or home-cage heating pads.

Physical

Temperature Control Range	:	25-45°C
Temperature Resolution	:	0.1°C
Heater Blanket Connection	:	4-pin locking DIN
Heater Power	:	24VDC@3A
Max Power Requirements	:	120/240VAC (switchable) 50/60Hz, 75VA
Probe Input Connector	:	Phone jack
Probe Dimensions	:	0.62in/1.6mm tip diam.
Control Box Dimensions	:	12.5(l)x9.5(w)x4(h)cm
Control Box Weight	:	200g

Ordering Information

Rodent Warmer X1

21100-800M	Rodent Warmer with Mouse Heating Pad
21100-800R	Rodent Warmer with Rat Heating Pad
21100-800C	Rodent Warmer with Cage Heating Pad

Rodent Warmer X2

21100-850MM	Rodent Warmer with 2 Mouse Heating Pads
21100-850RR	Rodent Warmer with 2 Rat Heating Pads
21100-850CC	Rodent Warmer with 2 Cage Heating Pad

Accessories:

21100-812	Rat Heating Pad
21100-813	Mouse Heating Pad
21100-814	Cage Heating Pad
21100-304	Rectal Thermal Probe (*)

(*) Rectal Thermal probe always sold separately.

Beehive
Conditioning Cage Manager

A SINGLE UNIT TO CONTROL:

- experimental settings (light, sound, etc.)
- shock parameters
- acquisition, management and export of experimental data

Great Versatility

Outstanding Adaptability

Main Features

- The electronic with touch-screen encompasses all controls for **up to 4 animal cages**
- The same controller will function as main unit in a number of **conditioning tests**; just purchase the hardware and the application software for the additional test!
- The new "**launcher**" application, makes it easy to manage other UB behavioral cages

System Description

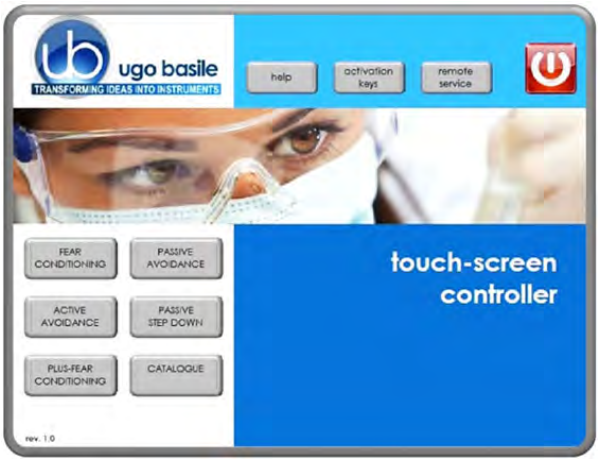
The new **Beehive system**, is an advanced, versatile, modular system for conditioning tests.

Different set-ups, depending on animal (rat or mouse), type of behavioral test and number of cages, can be obtained by combining the following elements:

- **Touch-Screen Controller with Shocker**
- **Behavioral Cage/s** (up to 4 with one controller)
- **Expansion Box**, for multiple cage set-up
- **Isolation Cubicle/s Box**,(if required)

The "*queen bee*" is the **40500-001 Touch-Screen Controller,** a powerful tool incorporating a 12" touch-screen, which will function as main unit in a number of tests, via the dedicated application software:

- **Fear Conditioning**
- **Passive Avoidance (step-through)**
- **Passive Avoidance (step Down)**
- **Active Avoidance**
- **Learned Helplessness**
- Startle Response/PPI for Mice



The **40500-001**, encompasses all controls, incorporates a constant-current high precision 8-pole shocker, and manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.

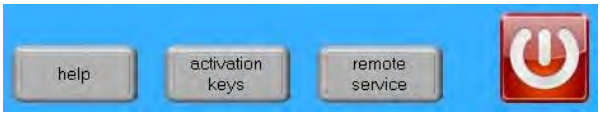
Up to 4 cages of the same type can be connected to the same Controller, via expansion box/es **40500-005**.

For each test, a specific application software is available for installation; each software is sold separately, so it is easy to customize each controller.

Launcher Menu

By the application "Launcher UB" installed on the 12" touch-screen, the user chooses the experimental routine among the ones installed.

In addition, the Launcher features the following options:



- **Help:** pressing the "help" button will display the Launcher user manual online
- **Activation Keys:** software activation keys are entered via a virtual keyboard. Additional software activations may be purchased separately
- **Remote Service:** remote service is manager by a specific software installed on the Touch-Screen.

Ordering Information

40500-001 **Touch-Screen Controller** & Shocker

Available Software Activation Keys

40530-010 Activation SW for **Active Avoidance**
40550-010 Activation SW for **Passive Avoidance**
40570-010 Activation SW for **Passive Avoidance** (step-down)
46000-110 Activation SW for **Fear Conditioning NG**
47500-010 Activation SW for **Helplessness**
48000-010 Activation SW for **Startle/PPI**

See also the following datasheets

40530 **Passive Avoidance** (step-through)
40550 **Passive Avoidance** (step-through)
40570 **Passive Avoidance** (step-down)
46000 **Fear Conditioning**
47500 **Learned Helplessness**
48000 **Startle/PPI for Mice**

System Specifications

Inputs	4
Input voltage	TTL input 0-5Vdc opto-isolated
LCD	12" with resistive touch screen
CPU Module Port	2 USB Port 2.0 1 Ethernet port 10/100Mb 1 DVI port for external monitor
Peripheral Port	4 outputs for Sound, Shock and Light
Power supply	12V-2A
Expansion Bus Connection	2 RJ11 connectors
USB port	type B (only for software connection)
Weight	2.7Kg
Shipping Weight	4Kg
Dimensions	25(d) x 33(w) x 5.5(h) cm
Packing	53x41x13cm

New Fear Conditioning System

Series 46001

Memory

Behavior

TESTING FEAR CONDITIONING HAS NEVER BEEN SO EASY!

- **the new FC-Unit is extremely simple for users to set-up**
- **the communication protocol has been optimized**
- **everything managed by ANY-maze**

General

The **UGO BASILE ANY-maze controlled Fear Conditioning system** automates the two most common fear conditioning paradigms: **Contextual Fear Conditioning** and **Cued Fear Conditioning**. The detection of **Freezing** is automated and based on video analysis.

A typical **FC-System** consists of:

- an FC-Unit, encompassing a Sound-Attenuating Box, with ventilating fan, a dual (visible/I.R.) light, a speaker & a USB-camera. Each FC-Unit has an individual controller on-board
- an FC-cage, for mouse or rat, (see ordering information for available models), with electrified floor & context kit (3 floors and 3 sets of patterned walls)
- ANY-maze software (from version 6.0, FC or full license)

Multiple systems , with virtually no limit, are easily assembled by multiplying the number of FC-Units and FC-cages, with no additional multiplexer or interface required.

ANY-maze controls the shocker, the sound generator and the light (I.R. and visible), and automatically detects the animal *freezing*, reporting information such as: total freezing time, number and duration of freezing episodes, latency times between stimuli and freezing events.

ANY-maze

"I have been using your fear conditioning setup pretty heavily in the last months and I am really happy..."

Dr. Alexandra Klein, Max Planck Institute

Main Features

- **AUTOMATIC** detection of **FREEZING** also in **total darkness**
- Specific versions for rats or mice
- Select the most suitable cage: two sizes, available with optional features, such as specific versions for tethered animals, etc.

NEW to 2.1 version

- Extremely simple to set-up: just plug a USB cable into a single USB port on the FC-Unit
- Multiple Cage Set-up, with virtually no limit in number
- ANY-maze controls all phases of the test, managing the experimental parameters, detecting the animal response and analyzing the experimental data.

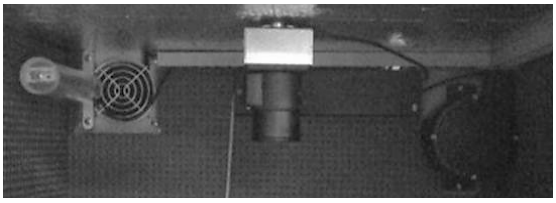
Ugo Basile: more than 25,000 citations

System Components

FC-Unit

The new FC-Unit encompasses all that you need to set-up a Fear Conditioning test:

- a **Sound-Attenuating Chamber** 46000-596
- a noiseless **fan** for ventilation
- a **dual** (**visible** and **I.R.**) LED **light** 46000-325
- a **loudspeaker** 46000-165



- a **controller** on-board 46000-105
- a **USB camera** 47400-035

The 47400-035 USB-camera is sensitive to IR light, which allows for *freezing* detection even in total darkness.

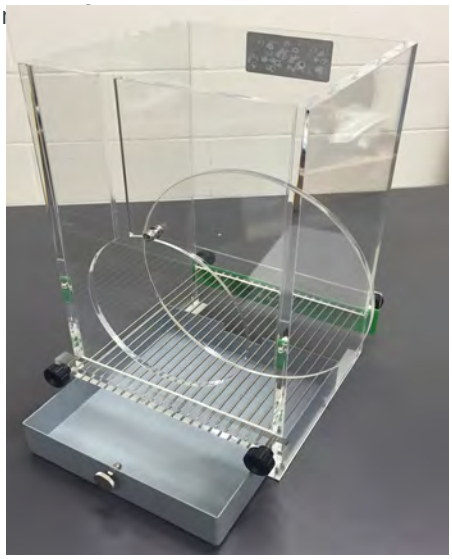
Wide angle lenses and IR filters are included.

Each FC-Unit is individually connected to ANY-maze, with virtually no limit in number: hence setting-up multiple cage systems, just means adding extra FC-Units, and nothing else!

To complete the system, just add the selected cage/s and ANY-maze software (FC-specific or full license), according to your experimental needs.

Animal Cages with Electrified Grid Floor

- **46002** Rat Cage, I.D.: 25.5x25.5x36(h)cm
- **46003** Mouse Cage, I.D.: 17x17x25(h)cm
- **46004** Mouse XL Cage, I.D. 25.5x25.5x36(h)cm, with



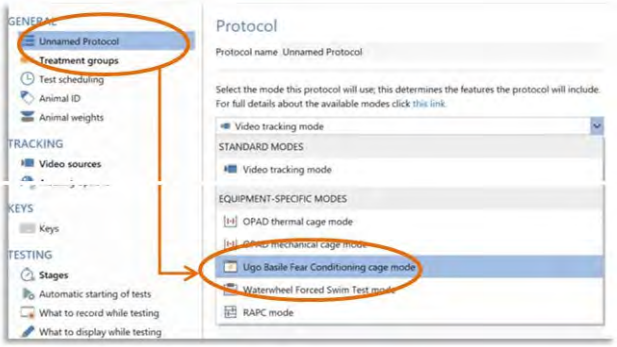
Optional models for tethered animals are available.

A set of removable contexts is provided to alter the cage walls and floor. Each animal box includes a kit with: 3 striped, 3 checkered, 3 grey walls and 3 plastic floors (white, black, grey).

ANYmaze Software

ANY-maze is ther brain of our new FC-system: it controls the experimental setting, such as light, sound (in the range 100Hz-18KHz; 55-100dB or white noise), and shock (constant current presettable from 0.1 to 3.0mA in 0.1mA steps).

An **Ugo Basile Fear Conditioning mode is provided in the Protocol list to facilitate the set-up**: by asking some questions about the way you want to set up the cages, ANY-maze creates lots of the protocol items for you!



During the testing phase, ANY-maze detects freezing, collects experimental data, and analyzes the results.

Ordering Information

46001	**FC-Unit**
46001-2	**Bundle of 2 FC-Units**
46001-3	**Bundle of 3 FC-Units**
46001-4	**Bundle of 4 FC-Units**
46002	Rat Cage
46003	Mouse Cage
46004	Mouse XL Cage
60000-FC	ANYmaze FC-software
60000	ANYmaze Full License

You own a previous version of our FC-System? No worries: you can upgrade it to the new version, and/or add extra units. Ask for details!

Bibliography

- CL Bender et alia: "**Prior Stress Promotes The Generalization Of Contextual Fear Memories: Involvement Of The Gabaergic Signaling Within The Basolateral Amygdala Complex**" Progress in Neuro 83:18-26, **2018**
- SR Blume et alia: "**Sex-And Estrus-Dependent Differences In Rat Basolateral Amygdala**" J. Neurosc., 0758-17 , **2017**
- PL Roubertoux et alia: "**Differential Brain, Cognitive and Motor Profiles Associated with Partial Trisomy. Modeling Down Syndrome in Mice**" Behav. Genetics 47(3), **2017**
- M. Verma & JS Schneider: "**Strain Specific Effects of Low Level Lead Exposure on Associative Learning and Memory in Rats**" NeuroToxicology 62:186-191, **2017**

*We do the job for you: we weekly browse bibliography and add new papers. **Don't forget to check our web page periodically for updated bibliography!***

Set-Up for STARTLE/PPI

Cat. No. 48000

General

In animals, including humans, the startle response is a largely **unconscious defensive response to sudden or threatening stimuli**, such as sudden noise or sharp movement, and is associated with negative effect. Usually the onset of the startle response is a **startle reflex reaction**, a brainstem reflectory reaction (reflex) that serves to protect vulnerable parts, such as the back of the neck (whole-body startle) and the eyes (eyeblink) and facilitates escape from sudden stimuli.

Prepulse Inhibition (**PPI**) is a neurological phenomenon in which a weaker prestimulus (prepulse) inhibits the reaction of an organism to a subsequent strong startling stimulus (pulse). The stimuli are usually acoustic, but tactile stimuli (e.g. via air puffs on the skin) and light stimuli are also used.

The reduction of the amplitude of startle reflects the ability of the nervous system to temporarily adapt to a strong sensory stimulus when a preceding weaker signal is given to warn the organism.

Deficits of prepulse inhibition, manifesting in the inability to filter out the unnecessary information, have been linked to abnormalities of sensorimotor gating, noted in patients suffering from illnesses like **Schizophrenia** and **Alzheimer's Disease**, or under the influence of drugs, surgical manipulations, or mutations. Animal models are widely used to test hypotheses linking genetic components of various diseases with sensorimotor gating.

FOR MICE *

Multiple-Cage Set-up

AUTOMATIC DETECTION OF STARTLE REFLEX

tip! this is part of the beehive cage-manager system; buy a single touch-screen controller, and manage all UB conditioning cages. Ask for details!

Main Features

- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **Maximum flexibility and full event randomization**
- **Specific version for Mice, Rat version available soon (*)**

NEW software NG on board

- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!

Instrument Description

Depending on the number of cages, different set-ups can be obtained by combining the following elements:

- **Controller with Touch-Screen**
- **Dedicated Software on board**
- **Startle Link-Box**
- **Isolation Cubicle**
- **Stimulating/Recording (S/R) Platform**
- **Animal box (NO HOLDER)**

Controller with Touch-Screen

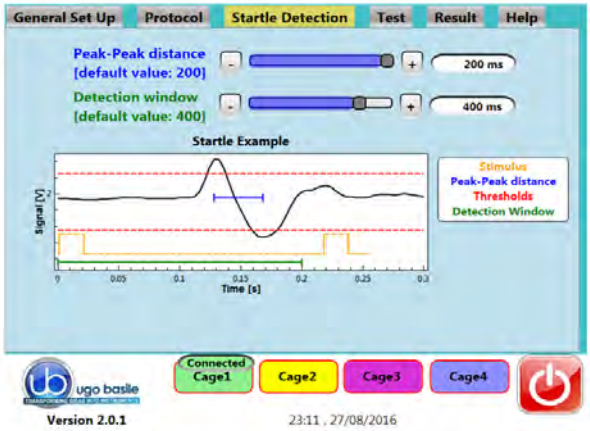
Controller **40500-001**, with the aid of the application software **48000-010**, consolidates all controls in a single compact unit and records data from up to 4 S/R Platforms. On its 12" touch-screen, the operator sets following parameters via the user-friendly interface:

Sound

- Pulse : in the range 100Hz-18KHz; 60-120dB
- Prepulse : 100Hz-18KHz; 60-120dB
- White Noise : 60-80dB

Light

- IR Light : 0-100% (Environment)
- Flash Light : 0–100% (20K Lux) (S/R Platform)



Software

Trials can be configured by entering the setting via the virtual keyboard: trial number, acoustic/visual stimulus and timing of the different experimental sequences:

- **Pulse**
- **Prepulse**
- **Inter-Pulse Interval**
- **Inter-Stimulus Interval**

all fully randomizable.

Startle Link-Box

This unit collects the signals from up to 4 Stimulating/Recording Platforms and sends them to the Controller.

Stimulating/Recording Platform

The S/R Platform is the core of the set-up, encompassing the box where the mouse is placed, the light and the speaker, which deliver the startling stimuli (pulses), and the detection system.

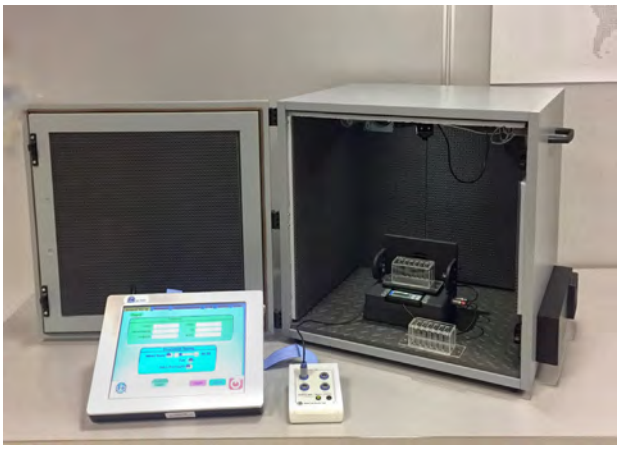
Mouse Box

Two Mouse Boxes are provided as standard:

- **48000-320** Small Mouse Box: ID 84x34x39(h)mm
- **48000-320** Large Mouse Box: ID 84x39x44(h)mm

Isolation Cubicle

The new-design Isolation Cubicle **46000-590** includes an I.R. light, a loudspeaker and a noiseless fan, all conveniently positioned inside the sound attenuating cubicle.



Multiple-cage set-ups include expansion-cubicle/s with slave electronics on board.

Ordering Information

48153	**Startle/PPI System, single cage set-up,** for mouse. Including touch-screen controller, startle link-box, isolation cubicle, stimulating/recording platform with 2 mouse boxes, software.
48253	**Startle/PPI System, two cage set-up**
48453	**Startle/PPI System, four cage set-up**
48003-003	**Additional Mouse Unit,** including isolation cubicle and stimulating/recording platform

Physical:

Shipping Weight : 40Kg
Packing : 82x71x57cm (wooden crate)
for a single cage system, including cubicle

Bibliography

Method Papers

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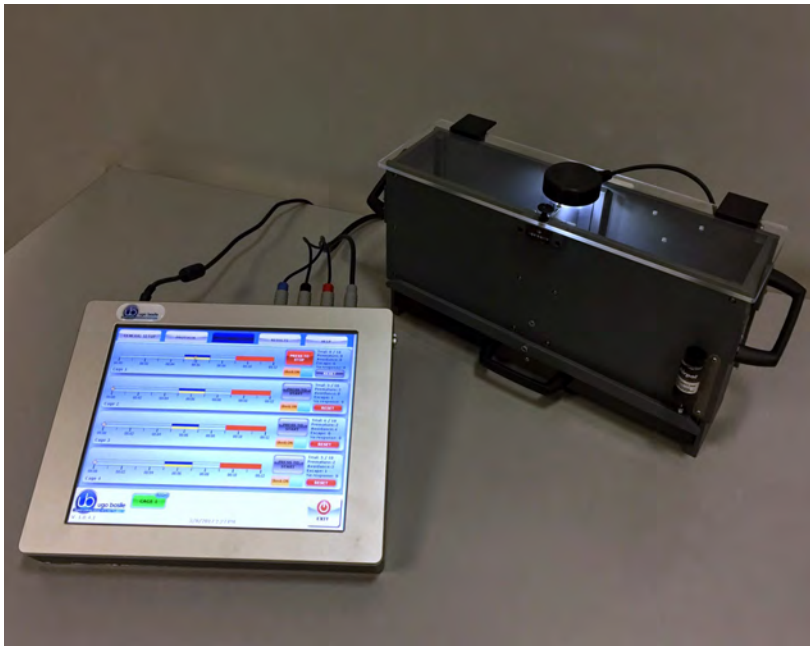
- H.S. Hoffman et al.: "Startle Reaction: Modification By Background Acoustic Stimulation" Science 141: 928-30, 1963
- R.R. Marsh et alia: "The role of small changes in the acoustic environment in modifying the startle reflex" J Exp Psychol Anim Behav Process, 1(3): 1975

Active Avoidance Set-Up
(Automatic Reflex Conditioner)

SPECIFIC CAGES FOR RATS AND FOR MICE

Cat. No. 40530



General

The new model of **Active Avoidance Set-Up** has been designed to enable the researcher to perform a wide range of avoidance experiments, each according to a flexible schedule.

Via the TIMELINE feature, the user will be able to configure a number of different tests, according to the specific experimental needs, namely the classical shuttle-box tests in its various modes.

Ugo Basile Active Avoidance set-up instrument basically consists of a Controller, and a Cage for either rat or mouse.

The tests are conducted in a cage, divided into two sections by a partition with an intercommunicating opening at floor level.

The tilting floor ensures a simple and reliable detection mechanism to score the animal's movement across the two compartments.

The electronic unit encompasses all controls for up to 4 cages, and a scrambling shocker.

NEW VERSION

Multiple-Cage Set-up

EFFICIENT, RELIABLE INSTRUMENT FOR THE CLASSIC ACTIVE AVOIDANCE TEST

tip! this is part of the beehive cage-manager system; buy a single touch-screen controller, and manage all UB conditioning cages. Ask for details!

Main Features

- **Maximum flexibility**: configure your own Avoidance-Experiment Schedules via the **timeline** function
- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **Reliable tilting-floor detection mechanism**

NEW on the 2014 version!

- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!

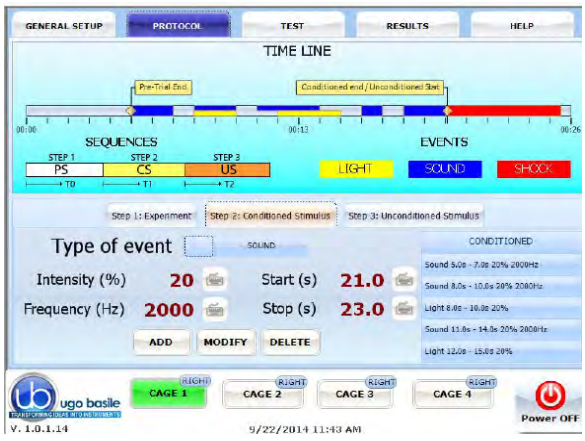
Instrument Description

Different set-ups, depending on animal (rat or mouse) and number of cages, can be obtained by combining the following elements:

- **Programming/Recording Unit with Shocker**
- **Rat Cage** (up to 4 with one controller)
  or
- **Mouse Cage** (up to 4 with one controller)
- **Expansion Box**, for multiple cage set-up

Programming/Recording Unit

The **40500-001** Programming/Recording Unit, encompassing all controls, incorporates a constant-current high precision 8-pole shocker, and manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.



The Unit, incorporating a 12" touch-screen, manages the Passive Avoidance Test via the **40530-010** Software. Up to 4 cages can be connected to the same Controller.

If more than one cage is connected, an expansion box **40500-005** is required for each additional cage.

The trials can be configured via the **TIMELINE** feature, entering the setting via the virtual keyboard: trial number, the acoustic/visual stimulus, delay, shock intensity, and timing of the different experimental sequences:

PS: pre-stimulus interval (randomizable)
CS: conditional stimulus interval
US: unconditional stimulus interval.

Active-Avoidance Cage (shuttle-box)

Two types of cages are available:

- **40532** designed for **Rats**
  dimensioned 57x27x30(h)cm, I.D. 48x20x22(h)cm
- **40533** designed for **Mice**
  dimensioned 47x18x25(h)cm, I.D. 38x9x17(h)cm

Both cages are provided with acoustic and visual conditioning stimulators. The reinforcement consists of an electrical stimulus applied to the floor bars of the cage by an incorporated 8-pole "scrambling" circuit.

The cage is divided into two compartments intercommunicating by an opening at floor level.

When the animal crosses the door, the cage floor tilts, thus operating a reed arrangement, which cuts out all the stimuli or, if the crossing takes place during the pause, records the intertrial crossing.

Ordering Information

40500-001	**Programming/Recording Unit** & Shocker
40530-010	**P.A. Software** and activation
40532	**Rat Cage**, complete with catch pan
40533	**Mouse Cage**, complete with catch pan
40500-005	**Expansion Box**, for multiple cage set-up

Specifications :

Shock Duration	in steps of 0.1s
Shock intensity	0-3mA step 0,1mA
Light intensity	0-100%, in steps of 5
Sound intensity	0-100%, in steps of 5
Sound frequency	100-18.000Hz, in steps of 100Hz
Light, sound, shock start	in seconds, 0,1s precision
Light, sound, shock stop	in seconds, 0,1s precision

Physical:

Weight	2.7Kg	(40500-001)
	5.3Kg	(40532)
	3.4Kg	(40533)
Shipping Weight	4Kg	(40500-001)
	9Kg	(40532)
	5.8Kg	(40533)

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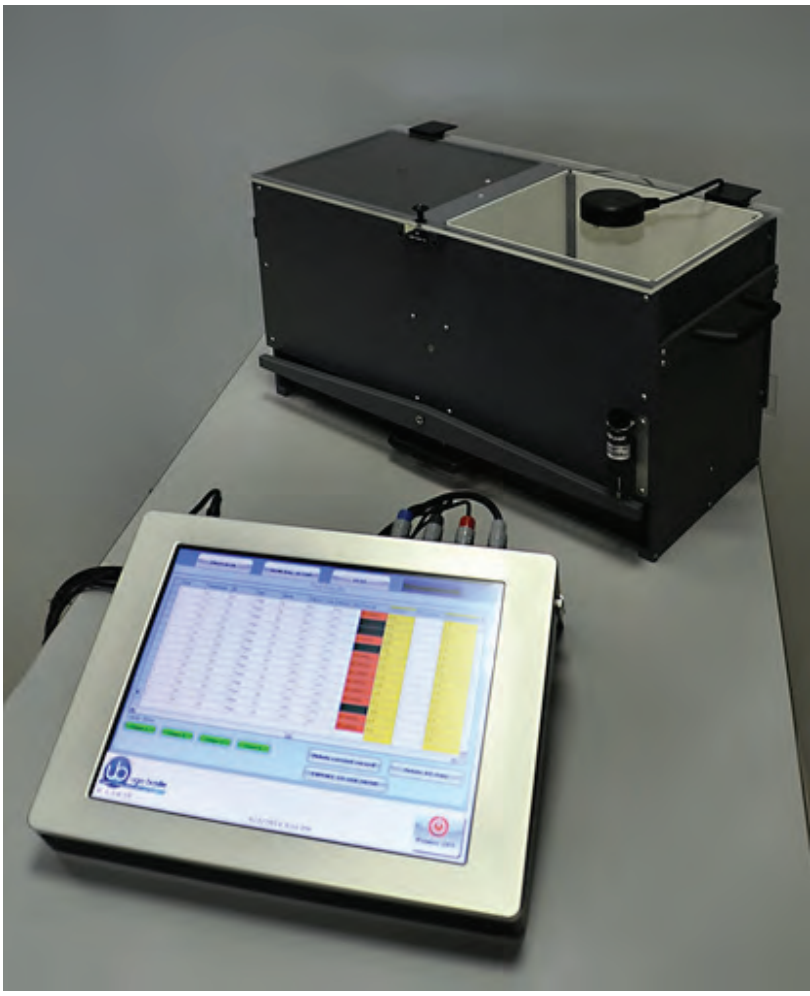
Papers which quote Ugo Basile A.A.Test (previous model)

- D. Dimitrova, D. Getova: "**Effects of Rivastigmine on Learning and Memory Processes in Rats Active Avoidance Test**" Medicine 4.1, **2014**
- G.N. Carmona et alia: "**The Dense Core Vesicle Protein IA-2, but not IA-2 β, is Required for Active Avoidance Learning**" Neuroscience 269 (6): 35-42, **2014**
- O. Ortiz et alia: "**Associative Learning and CA3–CA1 Synaptic Plasticity Are Impaired in D1R Null, Drd1a/ Mice and in Hippocampal siRNA Silenced Drd1a Mice**" J.Neuroscience 30 (37): 12288-12300, **2010**
- J.I. Lemos et alia: "**Involvement of the prelimbic prefrontacortex on cannabidiol-induced attenuation of contextual conditioned fear in rats**" Behav. Brain Res. 207: 05-111, **2010**
- N. Seferos et alia: "**Mandibular bone density and calcium content affected by different kind of stress in mice**" J Musculoskelet Neuronal Interact. 10 (3): 231-236, **2010**

Passive Avoidance
Step-Through *New Model*

Cat. No. 40550



General

Passive Avoidance Test is used to assess memory function based on the association formed between a specific environmental context, which the animal learns to avoid, and an aversive stimulus, represented by a mild foot shock.

The tests are conducted in a two-compartment apparatus, where one is dimly lit and preferable to a rodent, and the other is brightly lit.

After the training period, during the test proper, the animal that learned the task will avoid the location previously paired with the aversive stimulus, and show greater latency to enter it.

Ugo Basile Passive Avoidance set-up instrument basically consists of a Controller, and a Cage divided into two compartments by a partition which embodies a sliding door.

The tilting floor ensures a simple and relaible detection mechanism to score the animal's movement across the two compartments.

Step-Through Cage

Multiple-Cage Set-up

EFFICIENT, RELIABLE INSTRUMENT FOR THE CLASSIC PASSIVE AVOIDANCE TEST

Main Features

- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **Silent and automated sliding door to divide the two compartments (no stepping motor!)**
- **Reliable tilting-floor detection mechanism**

NEW on the 2014 version!

- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!

Ugo Basile: more than 25,000 citations

Instrument Description

Different set-ups, depending on animal (rat or mouse) and number of cages, can be obtained by combining the following elements:

- **Programming/Recording Unit with Shocker**
- **Rat Cage** (up to 4 with one controller)
  or
- **Mouse Cage** (up to 4 with one controller)
- **Expansion Box**, for multiple cage set-up

Programming/Recording Unit

The **40500-001** Programming/Recording Unit, encompassing all controls, incorporates a constant-current high precision 8-pole shocker, and manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.

The Unit, incorporating a 12" touch-screen, manages the Passive Avoidance Test via the **40550-010** Software. Up to 4 cages can be connected to the same Controller.

If more than one cage is connected, an expansion box **40500-005** is required for each additional cage.

Passive-Avoidance Cage (step-through)

Two types of cages are available:

- **40552** designed for **Rats**
  dimensioned 57x27x30(h)cm, I.D. 48x20x22(h)cm
- **40553** designed for **Mice**
  dimensioned 47x18x25(h)cm, I.D. 38x9x17(h)cm

The cage is divided into two sections, the **START** and **ESCAPE** compartments. The start compartment is white and **illuminated** by a light fixture (3LED, white-light); the escape compartment is **dark** and its grid floor is connected to the shocker.

The two compartments are divided by a partition which embodies an automatically operated sliding door at floor level. The **door delay** and the **shock parameters** can be preset on the touch-screen of the controller, according to experience or data suggested by the literature.

With the rodent in the START compartment, the START button activates the timer, providing the **opening of the door** after the preset delay.

The opening of the door enables the **latency timer**, which stops at the animal crossing; latency time is displayed in 0.1s steps. The door shuts one second after the crossing, to prevent the the animal being upset or hurt by a too close door operation.

Ordering Information

40500-001	**Programming/Recording Unit** & Shocker
40550-010	**P.A. Software** and activation
40552	**Rat Cage**, complete with catch pan & sliding door assembly
40553	**Mouse Cage**, complete with catch pan & sliding door assembly
40500-005	**Expansion Box**, for multiple cage set-up

Specifications :

Latency Time	5-digit Read-Out, 0.1s steps
Door Delay	1-300s, in steps of 1s
Shock Duration	0.1-9.9s, in steps of 0.1s
Shock Intensity	0.1-3mA
CutOff Time	0-600s, in steps of 1s
Shock/Pulse Paulse	0-9.9s
Shock/Pulse Train	0-9 trials

Physical:

Weight	2.7Kg	(40500-001)
	5.3Kg	(40552)
	3.4Kg	(40553)
Shipping Weight	4Kg	(40500-001)
	9Kg	(40552)
	5.8Kg	(40553)

Bibliography

Papers which quote Ugo Basile P.A. Test (step-through)

- C.I. Navarro-Francés et alia: "**Influence of trait anxiety on the effects of acute stress on learning and retention of the passive avoidance task in male and female mice**" Behav. Processes 105: 6-14, **2014**
- L. Zvejniece et alia: "**The cognition-enhancing activity of E1R, a novel pos-itive allosteric modulator of sigma-1 receptors**" Br. J. Pharmacol. 171(3): 761-771, **2014**
- R.W. Flint et alia: "**NMDA receptor antagonism with MK-801 impairs consolidation and reconsolidation of passive avoidance conditioning in adolescent rats: Evidence for a state dependent reconsolidation effect**" Neurobiology of Learning and Memory 101: 114-119, **2013**
- G. Telegdy et alia: "**The action of kisspeptin-13 on passive avoidance learning in mice. Involvement of transmitters**" Behav. Brain Res. 243: 300-305, **2013**
- V. Capurro et alia: "**Pharmacological Characterization of Memoquin, a Multi-Target Compound for the Treatment of Alzheimer's Disease**" PLoS ONE 8(2): e56870, **2013**
- J. Michaud et alia: "**Hematopoietic MyD88-adaptor Protein Acts as a Natural Defense Mechanism for Cognitive Deficits in Alzheimer's Disease**" Stem Cell Reviews and Reports 8 (3): 898-904, **2012**

Passive Avoidance
Step-Down *New Model*

Cat. No. 40570

General

The **Passive Avoidance step-down cage**, **for mice or immature rats**, is based on the step-down scheme in which the animal is dropped on an elevated platform which becomes uncomfortable because of vibrations.

The instrument basically consists of an **arena**, shaped as a cage (Cat. No. **47573)** and a control unit with touch-screen

The method is based on the mouse tendency to step-down a small platform, uncomfortable because of vibrations, onto the floor of the testing apparatus., which is electrified.

The animal inhibs its behaviour in order to avoid shock; this is measured by longer latency or refusal to step down. Latency is used to assess memory.

Increase or decrease of the **retention latency** gives an indication of improvement or impairment in memory and learning processes.

Step-Down Cage

Multiple-Cage Set-Up

Measures the increase/decrease of retention latency to study memory & learning processes

tip! this is part of the beehive cage-manager system; buy a single touch-screen controller, and manage all UB conditioning cages. Ask for details!

Main Features

- The electronic unit encompasses all controls for **up to 4 animal cages!**
- **Specifically designed for mice or immature rats**
- **Latency time recorded down to 0.1 seconds**

NEW on the 2014 version!

- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!

Instrument Description

Different set-ups, depending on the number of cages, can be obtained by combining the following elements:

- **Programming/Recording Unit with Shocker**
- **Mouse Cage** (up to 4 with one controller)
- **Expansion Box**, for multiple cage set-up

Programming/Recording Unit

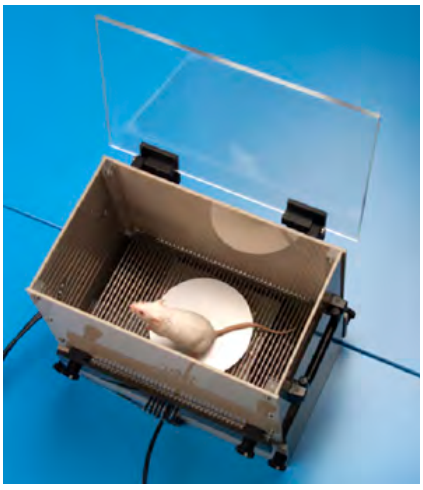
The **40500-001** Programming/Recording Unit, encompassing all controls, incorporates a constant-current high precision 8-pole shocker, and manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.

The Unit, incorporating a 12" touch-screen, manages the Passive Avoidance Test via the **40570-010** Software. Up to 4 cages can be connected to the same Controller.

If more than one cage is connected, an expansion box **40500-005** is required for each additional cage.

Passive Avoidance Cage (step-down)

The cage, dimensioned 28(w)x23(d)x26(h)cm, is provided with a top lid; the cage floor is made of 0.2cm diam. bars, spaced 0.5cm apart, wired to the constant current 8-pole scrambling circuit, located in the control unit.



The detachable circular platform, diam. **7cm**, is positioned at the centre of the cage, on a protruding stud fastened to the actuator, the mechanism which energizes the platform vibration.

A larger platform diam. **11cm**, is also supplied with the standard package.

Principle of Operation

When the elevated platform onto which the animal is dropped becomes uncomfortable because of vibrations, the animal steps down to an electrified grid.

When the mouse confronts the electrified grid and re-turns to the platform, the stop command (or pedal switch) is used to halt platform vibration, and stop the latency counter; the touch-screen controller records the latency time in tenths of seconds.

The latency figure remains frozen until a new "session" is started. experimental data are stored inside the controller memory, for further processing.

The vibration intensity is selected from 10 to 100Hz, in 10 steps (10Hz each). The shock intensity can be preset in the range 0 to 3mA, in steps of 0.1mA.

A delay up to 15 seconds can be set in steps of 1s.

Ordering Information

40500-001	**Programming/Recording Unit** & Shocker
40570-010	**P.A. Software** and activation
47573	**Mouse Cage**, complete 2 platforms
40500-005	**Expansion Box**, for multiple cage set-up

Specifications

Start	from the touch screen, or via pedal switch
Stop	from the touch screen, or via pedal switch
Vibration	10-100Hz, in 10 steps (10Hz each)
Shock	0 to 3mA, in 0.1mA steps
Delay	0-15 seconds, in 1s steps.
Latency Time	0.1s steps

Physical

Dimensions	28(w)x23(d)x26(h)cm (**Cage**)
Dimensions	33(w)x25(d)x5.5(h)cm (**Control Unit**)
Weight	8Kg
Shipping Weight	16Kg (approx.)
Packing	80x60x44cm

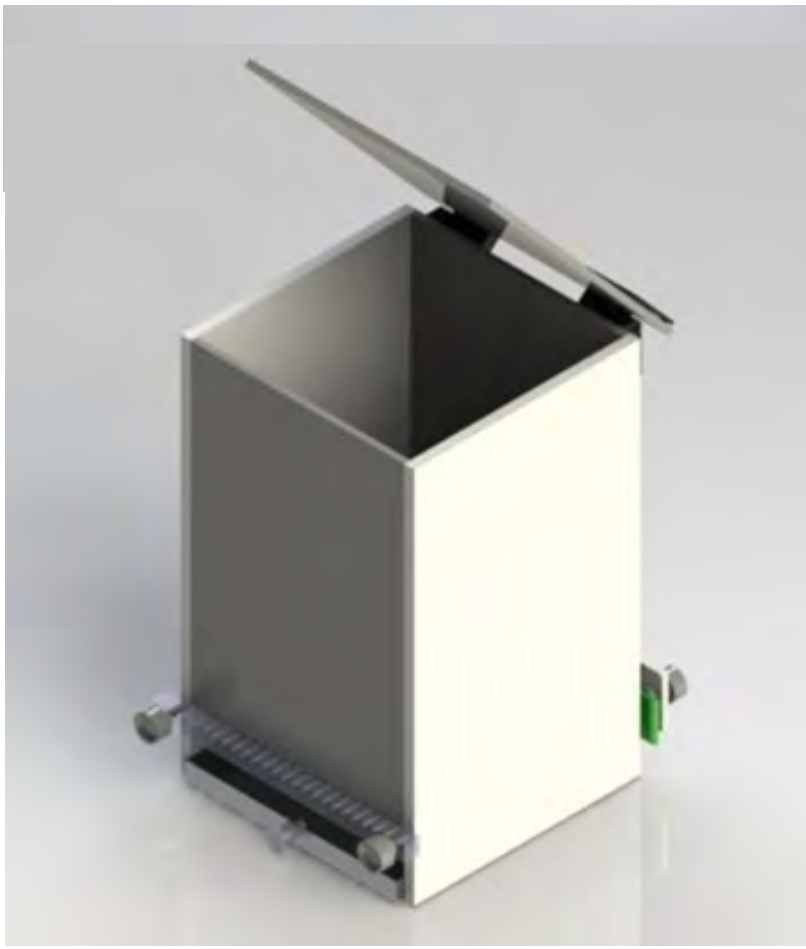
Bibliography

Papers which quote the P.A. Test (step-down)

- A. Mikulecká et alia: "**Consequences of early postnatal benzodiazepines exposure in rats. I. Cognitive-like behavior**" Front. Behav. Neuroscience 8 : 101, **2014**
- I.K. Celikyurt et alia: "**Effect of harmane, an endogenous β-carboline, on learning and memory in rats**" Pharmacol. Biochem. & Behavior 103: 666-671, **2013**
- D.S. Dimitrova & D.P. Getova-Spassova: "**Effects of Galantamine and Donepezil on Active and Passive Avoidance Tests in Rats With Induced Hypoxia**" J. Pharmacol. Sciences 101 : 199-204, **2006**
- M. Sakaguchi et alia: "**Effects of beta-casomorphin-5 on passive avoidance response in mice**" Biosci.Biotechnol. Biochem 67 (11): 2501-2504, **2003**

Learned Helplessness

Cat. No. 47500



General

When rodents are exposed to inescapable and unpredictable stress, such as forced swim or inescapable footshock, they often develop deficits in memory and learning tasks (**e.g. Active Avoidance**), and they often show also analgesic reactions (**S.I.A. Stress-Induced Analgesia**).

The **Ugo Basile Set-Up for Learned Helplessness** is based on a sophisticated generator of unpredictable random shocks delivered to the grid floor of a rodent box where no escape is possible.

Electric shocks can be randomized in terms of shock length and interval.

Complex trains can be programmed.

Up to 4 animals can be treated simultaneously in 4 independent boxes, controlled by the same electronic unit and software.

The set-up for Learned Helpless is part of the new UB Behavioral Cage program, exploiting the potentiality of a modern controller with touch-screen.

IDEAL TO STUDY

- Depression & Stress
- Learning & Memory Impairment
- Stress-Induced Analgesia (S.I.A.)

New Model

tip! this is part of the beehive cage-manager system; buy a single touch-screen controller, and manage all UB conditioning cages. Ask for details!

Main Features

- Ramdomizable shock patterns
- **Maximum flexibility**: configure your own Experimental Schedules on the touch-screen controller
- The electronic unit encompasses all controls for **up to 4 animal cages!**
- The new "launcher" application, makes it possible to manage other UB behavioral cages with the same **Touch-Screen Controller 40500-001**; just purchase the hardware and the application software for the additional test!
- **Remote Control feature** will make remote service and software upgrades extremely simple!

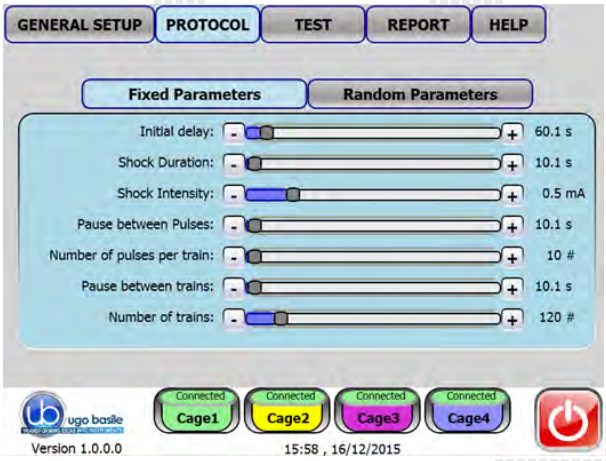
System Description

Different set-ups, depending on animal (rat or mouse) and number of cages, can be obtained by combining the following elements:

- **Touch-Screen Controller with Shocker**
- **Rat Cage** (up to 4 with one controller)
  or
- **Mouse Cage** (up to 4 with one controller)
- **Expansion Box**, for multiple cage set-up

Programming/Recording Unit

The **40500-001** Programming/Recording Unit, encompassing all controls, incorporates a constant-current high precision 8-pole shocker, and manages data acquisition: data are stored inside the unit and can be downloaded via the USB key provided as standard, for further processing via Excel, Access, etc.



The Unit, incorporating a 12" touch-screen, manages the Learned Helplessness Test via the **40530-010** Software. Up to 4 cages can be connected to the same Controller.

If more than one cage is connected, an expansion box **40500-005** is required for each additional cage.

The trials can be configured on the touch-screen controller, entering the setting via the virtual keyboard: train features, shock and timing of the different experimental sequences.

The system includes a user-friendly reporting software, to collect, visualize and manage data related to the delivered shocks; his is especially important to analyze the randomized shocks and have full control on the performed stimulation.

Randomizer

The **Touch-Screen controller** is also a sophisticated generator of unpredictable random shocks delivered to the grid floor of the cage.

Electric shocks can be randomized in terms of shock length, interval and complex trains can be programmed. It connects to up to 4 cages.

Rat and Mouse Cage

The dimensions of **Rat Cage 47502** are 22x22x20(h)cm; **Mouse Cage 47503** is dimensioned 17x17x20 (h) cm.

Both Cages include an electrified floor and a catch pan.

The electrical stimulus is applied to the floor bars of the cage and by an 8-pole "scrambling" circuit incorporated in the touch-screen controller.

All necessary cables and connectors are included to make it a ready-to-use system!

Ordering Information

40500-001	**Touch-Screen Controller** & Shocker
47500-010	**Learned-Helplessness Software** and activation
47502	**Rat Cage**, complete with electrified floor & catch pan
47503	**Mouse Cage**, complete with electrified floor & catch pan
40500-005	**Expansion Box**, for multiple cage set-up

Specifications :

Power Requirement	115/230V, 50/60Hz, 30W max.
Shock Parameters :	constant current, from 0.1 to 2.9mA in 0.1mA steps

Manual or external operation (via 5V TTL signals), with optional I/O box 46000-150

Physical:

Weight	3.9Kg	(40500-001)
	5.3Kg	(47502)
	3.4Kg	(47503)
Shipping Weight	5.7Kg	(40500-001)
	9Kg	(40552)
	6Kg	(40553)
Packing	80x60x44 (control unit & one cage)	

Bibliography

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- K. Szklarczyk et alia: "O**pioid-Dependent Regulation of High and Low Fear Responses in two Inbred Mouse Strains**" Behav. Brain Res 292: 95-101, ***2015***
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- Kademian et alia: "**Biphasic effects of adrenal steroid on learned helplessness behavior by inescapable shock"** Neuropsychopharmacology 30: 58-66, ***2005***
- Borsini & Cesana: "**Mechanisms of action of flibanserin in the learned helplessness in rats**." European Journal of Pharmacology 433: 81-89, ***2001***
- Grau et alia: "**Long-term analgesia and activation of the opiate system"** Science 213:1409-1411, 1981

Conditioned Place Preference Box (CPP)

Cat. No. 42552 for Rat
Cat. No. 42553 for Mouse

General

The **Ugo Basile Conditioned Place Preference (CPP)** is a 2-compartment box to evaluate the abuse potential of substances and the motivational effects of drugs.

The 2 compartments differ for the wall color and patterns and for the floor patterns and texture.

Both floors and contexts floors are interchangeable so that the visual and tactile difference between the 2 compartments can be easily adjusted by the scientist.

In fact, the CPP box includes the contextual cues required by the experimental paradigm; each box includes:

- 4 interchangeble floors with square and circular patterns
- 3 sets of walls.

The new CPP box has been designed and optmized for visual scoring, or for use with any video-tracking software.

IDEAL TO STUDY

Drug Abuse

Addiction

- **Interchangeable floors for tactile stimulation**
- **NEW MODEL with interchangeable CONTEXTS**

Main Features

- Optimized for Video-Tracking
- Specific models for rats or mice
- Designed for multiple-cage systems
- Interchangeable floors provided for different patterns & texture
- Walls in either compartment can be visually altered, by replacing the context kit

Rat and Mouse Box

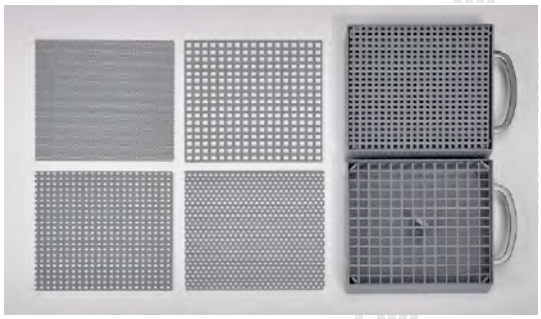
The box **42552** is designed for tests on rats. Its dimensions are 63x32x35(h)cm (handles excl.), and each of the two spaces has an inside dimension of 30x30x30(h)cm. The box **42553** is similar, but its dimensions (35x18x29(h) cm, ID 16x15x25(h)cm) make it suitable for use with mice.

Both boxes have a patterned door in the central wall, 7.5x7.5cm in the rat, 4x6(h)cm in the mouse box.

Tactile Stimulation: Patterned Floors

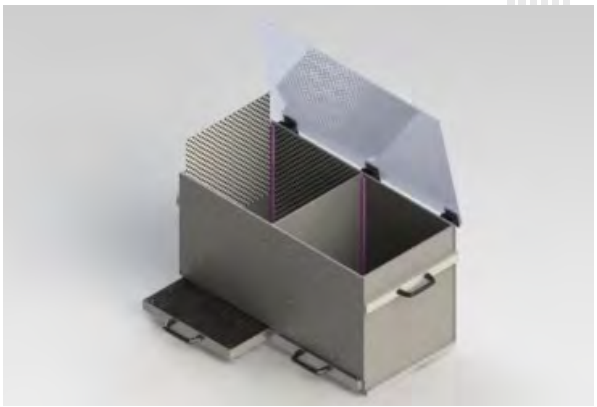
One of the major keys to the success of a **CPP** experiment is due to the design of the visual and tactile differences between the 2 compartments.

Ideally the 2 compartments should have clearly distinct contextual cues but should not determine any preference in unconditioned animals.



Given the importance of **paw tactile sensitivity** in rodents, while the design of commercially available CPP boxes has traditionally focused only on the wall patterns and colors, the Ugo Basile CPP box includes 4 interchangeable floors with different patterns & texture.

4 sets of floor grids, and 2 sets of replaceable wall contexts (striped and checked) are supplied with each box:



Walls with **different texture** can be provided on request: please ask for information!

Rationale and outline of the procedure

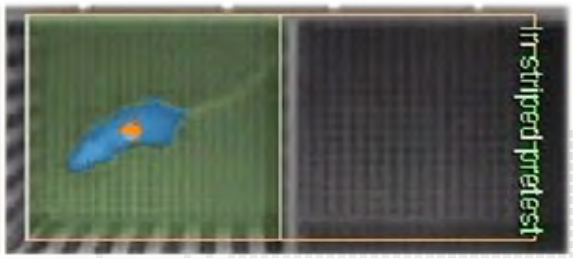
The CPP paradigm provides information on the rewarding or aversive effects of visible and tactile contextual cues associated with drugs.

This technique has acquired great popularity in research studies involving addiction, being much easier, if compared to drug self-administration procedures.

First, the animal is conditioned to identify one of the two compartments with the drug experience. Then the time spent in each compartments is measured; preference or aversion to the drug-paired compartment, hence rewarding/aversive properties of drugs, can be easily deducted.

The CPP test only requires the animal to carry out a simple operation (i.e. move from one compartment to the other) to approach or avoid the drug-paired compartment; the animal is expected to spend more time in the drug-paired compartment, if the drug experience produced a positive effect.

Optimized For Video-Tracking



All floors are grey-colored, to optimize contrast and facilitate tracking of both dark and albino animals.

Ordering Information

42502	**CPP BOX for RAT,** including
M-TR 230-F	Floor Drawer (2 pcs.)
42502-011	Round 2mm holes, 6mm interax. (2 pcs.)
42502-012	Round 12mm holes, 16mm interax. (2 pcs.)
42502-014	Square 6x6mm holes, 9mm interax. (2 pcs.)
42502-013	Square 10x10mm holes, 12mm interax. (2 pcs.)
42552-320	**Wall Context Kit for Rat Cage**
Weight	22Kg net, 25Kg gross; Packing: 80x60x44cm
42503	**CPP BOX for Mouse,** including:
M-TR 238-F	Floor Drawer (2)
42503-012	Round 2mm holes, 3mm interax., 2 pcs.
42503-011	Round 4mm holes, 6mm interax., 2 pcs.
42503-013	Square 4x4 holes, 7mm interax., 2 pcs.
42503-014	Square 6x6 holes, 9mm interax., 2 pcs.
42553-320	**Wall Context Kit for Mouse Cage**
Weight	8Kg net, 10Kg gross; Packing: 36x55x45cm

Acknowledgements & Bibliography

A special thank to Prof. Paola Fadda (Department of Pharmacology, University of Cagliari, Italy) for the initial design of the boxes: her valuable comments and suggestions allowed us to keep the focus on the user needs and opinions.

- L. Fattore et alia: "**Baclofen Prevents Drug-Induced Reinstatement of Extinguished Nicotine-Seeking Behaviour and Nicotine Place Preference in Rodents**" Eur. European Neuropsychopharmacol. 19(7): 487-498, **2009**
- M. Scherma et alia: "**Inhibition of Anandamide Hydrolysis by Cyclohexyl Carbamic Acid 3'-Carbamoyl-3-yl Ester (URB597) Reverses Abuse-Related Behavioral and Neurochemical Effects of Nicotine in Rats**" J. Pharmacol. and Exper. Therap." 327:482–490, **2008**

Lickometer - Vogel Test

Cat. No. 45100 Set-up for Rat
Cat. No. 45150 Set-up for Mouse

General

The **Ugo Basile Lickometer - Vogel Test** is a versatile system that can function as a simple software-based lickometer or as a Drinking-Conflict set-up to assess the anxiolytic effect of drugs.

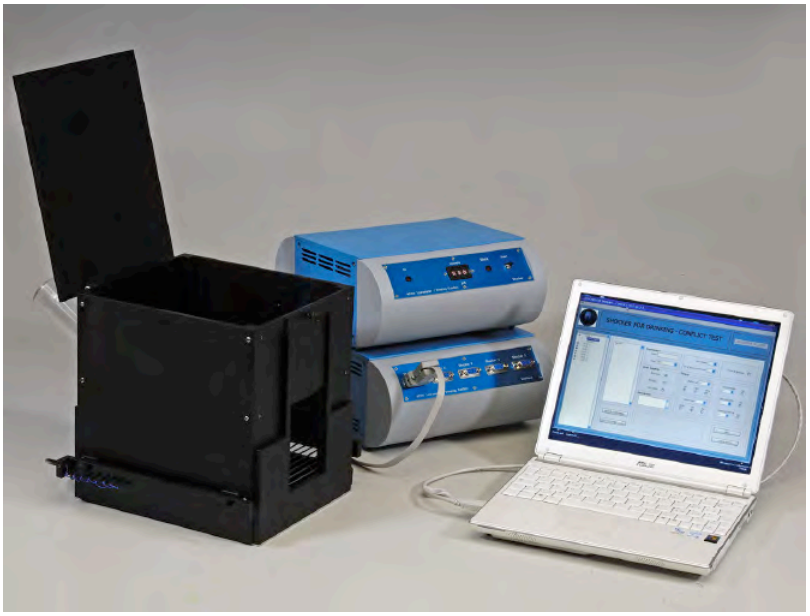
In the Drinking-Conflict Vogel paradigm, a water deprived animal is exposed to a lickometer and the licking events are coupled to electric shocks.

The animal is in a motivationally conflicting situation, hence his licking behavior is affected by anxiety and anxiolytic drugs.

The Lickometer controller and software can manage up to 5 animal cages for either rat or mouse; one shocker is required for each cage.

The friendly-to-user software, provided as standard, manages the system and experimental configuration, collects and saves the experimental data, and provides a detailed report.

Data are saved as .csv file and .rpt file (a proprietary format which can be opened only within the Lickometer software)



Specific Models

for Rat

for Mouse

- **Vogel Conflict Test**
- **Lickometer**
- **Anxiety Testing**
- **Multiple Chambers**

Main Features

- Up to 5 animal chambers with grid floor, lick sensor, water reservoir
- Software for experiment configuration and data collection
- Two-pole shockers with adjustable shock intensity
- Chambers can be used as a general lickometer

Rationale of the Test

The Drinking Conflict Vogel test usually consists of three phases:

- Initial wait (triggered by the first licking event)
- Shock phase (the sipper is electrified)
- No-shock phase (no shock is associated to drinking)

For each phase of the experiment, the number and the timing of licking events is recorded and graphically displayed.

The alternation between shock and no-shock phases can be based on TIME or N° OF LICKS, according to the user experimental paradigm.

When no shock is delivered, the system can be simply used as a software-driven lickometer.

The duration of each phase is user-defined for each cage, based either on time or on the animal behaviour (i.e. the sipper is electrified after a defined number of licking events have occurred).

At the end of the test a report will summarize the results; these results can be automatically printed and exported into a spreadsheet.

System Components

The system is composed of:

- USB-Control Unit for up to 5 cages, including
  - Software
- Drinking Conflict Cage
- 2-Pole Sine-Wave Shocker

Animal Cages

Drinking-conflict cages are provided with grid floor, electrified sipper and lick sensor. Two sizes are available, for rats and mice.

The rat cage inside dimensions are 35(w)x25(d)x30(h)cm.

The mouse cage is dimensioned 20(w)x24(d)x20(h)cm.

Lickometer Software

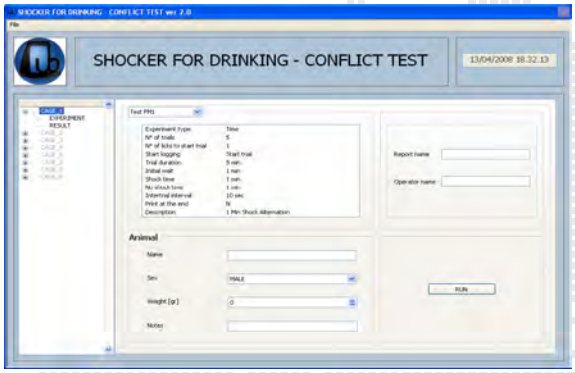
The following parameters, which define the experimental configuration can be set via the software for each cage:

- Trial duration
- Initial Pause
- Time Intervals with and without shock
- Number of licks to deliver a shock

etc.

Experiment configuration

For each cage, it is possible to assign a specific name to report, operator and animals involved in the experiment; sex and weight of the animals can also be specified.



Cage configuration

The software collects the experimental data and saves them as .csv file & .rpt file (the latter a proprietary format which can be opened only within the Lickometer software). A complete report file is provided at the end of the experiment; results can be automatically printed and exported into a datasheet.

Ordering Information

45100	**Lickometer Set-up for RAT, one cage,** including:
45100-002	**Rat Cage**
45100-001	5-channel Electronic Unit
45100-005	Software
45100-004	Shocker
45100-302	Instruction Manual
45150	**Lickometer Set-up for MOUSE, one cage**:
45100-003	**Mouse Cage**
	and other components as for 45100

Physical	**45100**	**45150**
Weight	8.5Kg	7.5Kg
Packing	80x60x44cm	80x60x44cm
Shipping Weight	12Kg	10Kg

Bibliography

- P. Ohara et alia: "**Evidence for a Role of Connexin 43 in Trigeminal Pain Using RNA Interference In Vivo**" J. Neurophysiol 100: 3064-3073, **2008**
- J.P. Vit et alia: "**Silencing the Kir4.1 Potassium Channel Subunit in Satellite Glial Cells of the Rat Trigeminal Ganglion Results in Pain-Like Behavior in the Absence of Nerve Injury** " J. Neurosc. 28(16): 4161-4171, **2008**

Sociability Apparatus

(3-chambered social test)

for MOUSE or RAT

General

Research has shown that, although human social behavior is generally more complex, humans and animals share some aspects of social behavior.

The 3-chambered test is a valuable tool to assess general sociability and interest in social novelty in rodent models of CNS disorders.

Rodents normally prefer to spend time with another rodent (**sociability**) and will investigate a novel intruder more than a familiar one (social novelty).

Based on these inclinations, the Three Chamber Test can help identify rodents with deficits in sociability and/or social novelty.

The **Ugo Basile Sociability Apparatus** consists of a 3-chambered cage, with transparent or grey opaque walls, a special non-reflective grey-colored floor and 2 grid enclosures.

Many authors (e.g. Moy et al. 2004; Nadler et al. 2004) have shown that a 3-chambered box can be used to test:

- Social Novelty Preference
- Sociability
- Dominance
- Autism

FOR STUDIES ON:

- Autism
- Social Memory & Novelty
- Pair-bonding
- Dominance hierarchies

Main Features

- **Works even with the most basic video-tracking software**
- **Grid Enclosures maximize animals interaction**
- The grey floor gives high contrast with both light and dark animals
- The special painting gives a slightly rough surface, pleasant for the animals to walk on.
- **Available with transparent or opaque walls**
- **Sociability Cages for Rat are also available in two sizes: standard 120x40x40(h)cm) and XL 120x80x40(h)cm**

Rationale and Outline of the Procedure

The Ugo Basile 3-Chambered Apparatus can be used with many different procedures.

In their 2004 paper, Moy and co-authors (see bibliography), describe a typical protocol: after a period of habituation a mouse sociability is determined by measuring the time spent by the freely-moving subject in the proximity of the grid enclosures containing the first 'stranger' mouse.

A second 'stranger' mouse is then introduced in the box and the preference for the new 'stranger' mouse can be easily assessed.

3-Chamber Box & Grid Enclosures

The 46553 perimetral walls and internal partitions of grey opaque PVC form a **3 compartment box**, each **20x40x22(h)cm**; two **sliding doors** (5x8(h)cm), opening on the central compartment, can be closed to confine the animal.

Partitions can be easily removed for cleaning (or replaced with transparent ones, if preferred). Transparent lids 46503-320 can be ordered as optional.

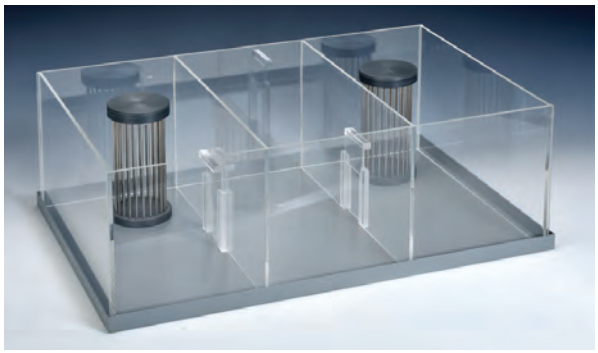
The grey metal floor gives high contrast with both light & dark animals, allowing for automated video-tracking of the animals.

Its special painting also gives a slightly rough surface, pleasant for the animals to walk on.

The grid enclosures allow mice to interact closely; the grid bars have a diameter of 3mm and are spaced 7mm.

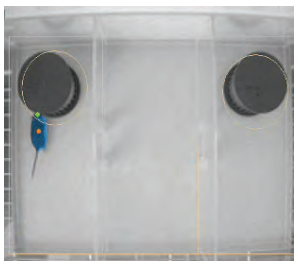
The standard **enclosures** are 15cm tall with an I.D. of 7cm. The top and the bottom are made of grey (**46503-003**) or white (**46503-013**) PVC.

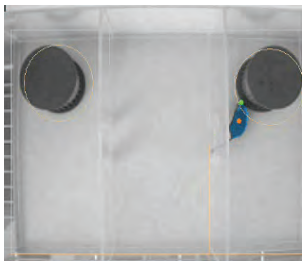
Model 46503 with transparent walls is also available: the clear Perspex is ideal for visual observation of the experiment or for side positioning of the video-camera.



Optimized for Video-Tracking

The grey floor gives best contrast to both light and dark animals, which is the most critical factor for **all video-tracking softwares** to work properly.





Images and videos, courtesy of Dr. Patrizia D'Adamo (San Raffaele Institute, Milan, Italy)

Ordering Information

46553 **Mouse Cage for 3-Chamber Sociability Test, opaque walls & internal partitions (no lids).** With 2 grid cages (grey, I.D. 7cm, height 15cm)

46503 **Mouse Cage for 3-Chamber Sociability Test, transparent walls, internal partitions and lids.** With 2 grid cages (**grey**, I.D. 7cm, h 15cm)

46552 **Rat Cage for 3-Chamber Sociability Test, opaque walls & internal partitions (no lids).** With 2 grid cages (grey, I.D. 15cm, h 25cm)

46562 **Rat Cage XL**, opaque

46502 **Rat Cage for 3-Chamber Sociability Test, transparent walls, internal partitions and lids.** With 2 grid cages (grey, I.D. 15cm, h 25cm)m, 15cm(h)

46512 **Rat Cage XL**, transparent

Physical	Mouse	Rat
Dimensions	60x40x22(h)cm	120x40x40(h)cm 120x80x40(h)cm XL
Weight	9Kg	18Kg
Shipping Weight	12Kg	25Kg
Packing	67x42x53cm	Pallet

Bibliography

- A.J. Mierzwa et alia: "**FGF2 and FGFR1 Signaling Regulate Functional Recovery Following Cuprizone Demyelination**" Neuroscience Letters 548: 280-285, **2013**
- M. J. Kane et alia: "**Mice Genetically Depleted of Brain Serotonin Display Social Impairments, Communication Deficits and Repetitive Behaviors: Possible Relevance to Autism**" PLoS ONE 7(11): e48975, **2012**
- M. Yang et alia: "**UNIT 8.26 Automated Three-Chambered Social Approach Task for Mice**" Current Protocols in Neuroscience Published Online: 1 July **2011**

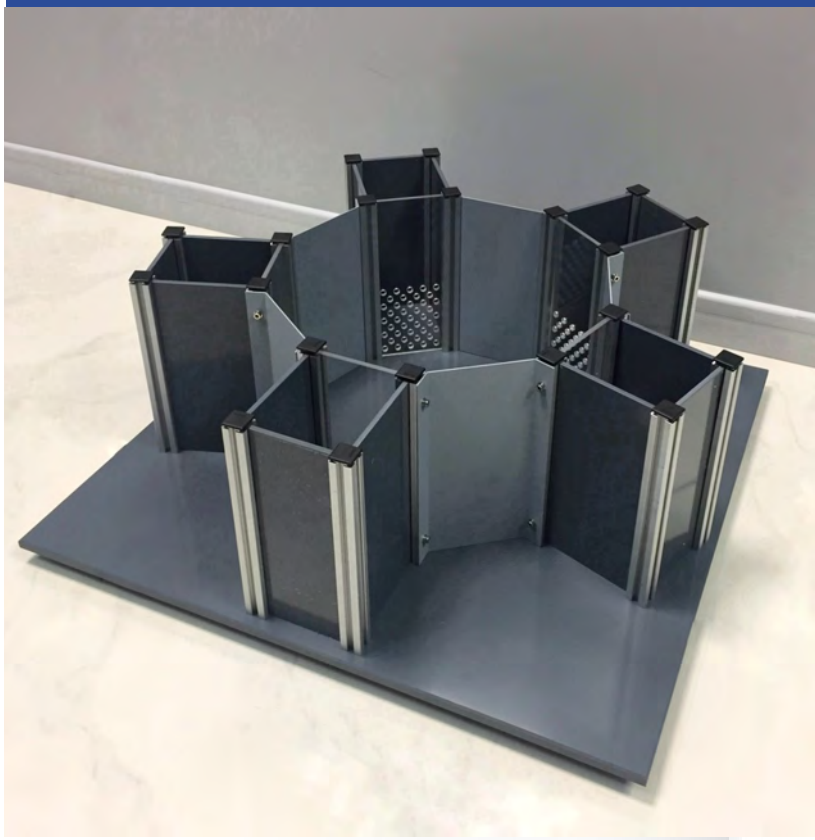
Method Papers

- S.S. Moy et alia: "**Sociability and Preference for Social Novelty in Five Inbred Strains: an Approach to Assess Autistic-Like Behavior in Mice**" Genes, Brain and Behavior 3(5):287-302, 2004
- J.J. Nadler et alia: "**Automated Apparatus for Quantitation of Social Approach Behaviors in Mice**". Genes, Brain and Behavior 3(5): 303–314, 2004.

Agora Maze

(Socio-Box Test for Mice)

Cat. No. 46573



General

"A fundamental prerequisite for living in social communities is a highly complex set of social skills that governs interactions between individual members of a group. In consequence, impairments in these social skills, prominently prevalent in human psychiatric disorders such as autism and schizophrenia, have devastating consequences for individuals and society" (Meyer-Lindenberg and Tost, 2012; Lai et al., 2014; Green et al., 2015).

Research has shown that, although human social behavior is generally more complex, humans and animals share some aspects of social behavior; developing new tools for the assessment of social skills in mouse models is essential to further advance in the understanding of these diseases.

We have designed a **new social interaction cage**, based on the **SocioBox** model (see bibliography).

The experimental design of the new **Agora Maze** allows evaluation of preference for social novelty or the propensity to spend time with a previously un-encountered mouse rather than with a familiar mouse.

The main principle of this test is based on the free choice by a subject mouse to spend time in any part of an open circular arena (*αγορα, the name is reminiscent of the central public space in ancient Greek city-states, literally meaning "gathering place")* attached to 5 cubicles with an animal inside each.

NEW SOCIABILITY TEST

- Social Interaction
- Social Memory & Novelty
- Gender Difference
- Autism
- Parkinson Disease
- Schizophrenia

Main Features

- Optimized for Videotracking
- The grey floor gives high contrast with both light and dark animals
- One central Arena, and 5 external boxes for stimulus mice
- Transparent, perforated dividers to permit social interaction and exchange of odors
- Designed for quick replacement of stimulus mice
- Can be quickly disassembled to facilitate cleaning

Rationale of the Test

The Method (SocioBox) was originally described by D.Krueger-Burg et alia, in their paper "*The SocioBox: a Novel Paradigm to Assess Complex Social Recognition in male Mice*".

The original design, a large central square, and 5 cubicles positioned around its perimeter, enables confronting the subject (a wild--type male mouse) with 5 timulus mice, and subsequently see how readily the subject identifies an unfamiliar mouse among 5 newly acquainted animals.

The SocioBox therefore allows diagnosis of social recognition deficits, prevalent in human psychiatric disorders such as autism and schizophrenia.

In contrast, female mice exhibit lower locomotor activity during social exploration and little or no social recognition in the SocioBox paradigm, likely reflecting inherent differences in gender-specific territorial tasks.

The ***Agora***, the model we designed based on the SocioBox paper, was used at University of Aberdeen with the specific interest in smell related behaviours, with the purpose of understanding mechanisms of PD.

An early phenotype of PD is *anosmia* (loss of the sense of smell) may be translated to animals using a behavioural task that is dependent on smell as well as social interaction (see bibliography).

Outline of the Procedure

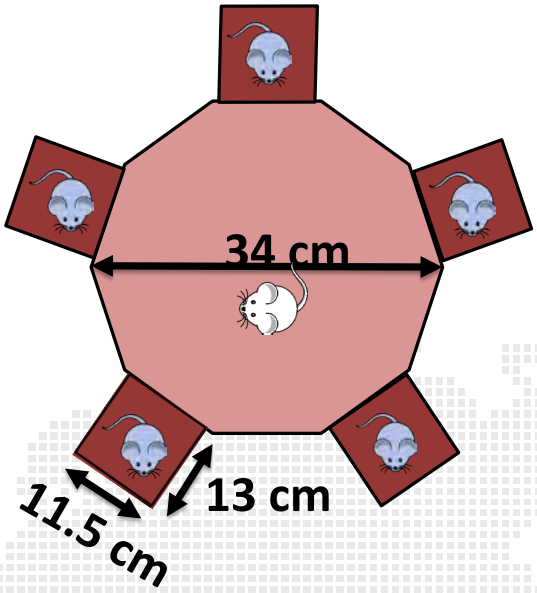
in the habituation session the test animal is exposed to the empty arena for 10 min. in the test session, 5 stranger mice are confined in the cubicles around the perimeter of the arena and the experimental mouse can select between up to 5 partners for social interaction.

In the recognition phase the test animal is conflicted with a novel and 4 familiar interaction partners.

The Agora Maze

The Agora Maze 46573 consists of a 50x50cm grey base, on which 5 cubicles, and 5 blank walls are conveniently positioned to enclose a central square, having a cross diameter of 34 cm.

The 5 cubicles are dimensioned 13x11.5cm, with 25cm height. Social interaction in rodents and especially mice is highly dependent on smell; detachable clear sliders, divide each cubicle from the central square; holes in the clear panels permit exchange of odors.



The whole device can be easily disassembled for cleaning between tests.

Videotracking

The Agora is optimized for videotracking, the ideal tool to automatize the test, allowing the experimenter to record the session without being present in the room.

Additional parameters can be recorderd, such as time spent, as well as distance travelled by the mice in the area closer to the wall of the arena and in the centre.

Images courtesy of Institute of Medical Sciences, University of Aberdeen, UK

Ordering Information

46573 **Agora-Maze**, Sociability Apparatus for Mice, complete

Physical

Dimensions	61x58x27(h)cm
Weight	9Kg
Shipping Weight	14Kg
Packing	80x60x44cm

Bibliography

Method Paper

- D. Krueger-Burg et alia: "**The SocioBox: a Novel paradigm to Assess Complex Social Recognition in Male Mice**" Front. Behav. Neurosci., 11 August 2016 - https://doi.org/10.3389/fnbeh.2016.00151

Papers citing the Agora

- S. Sanchez-Garcia & G. Riedel: "**Agora: a Complex Social Recognition Paradigm**" poster presented at Measuring Behavior 2018

"ATLANTIS" PLATFORMS

for WATER MAZE experiments

Cat. No. 40100-40400

LIFTING CONTROL

LOWERING CONTROL

NO ELECTRICITY

NO HANDS IN THE POOL !

Why Automated Platforms?

Despite being very effective, the **Morris Water Maze** task has some limitations, related to the platforms normally used having fixed height, which cannot be raised during probe tests. Probe tests run with the use of a **lift platform** give more reliable indications on the presence of true **spatial learning**.

The Ugo Basile Atlantis Platforms are made of clear Perspex and are operated by hydraulic pressure. No electricity is present inside the pool; the electrical parts of the mechanism (i.e. the electro-hydraulic actuators) are safely located outside.

Main Features

- 4 Platforms with one Controller
- Remote lifting/lowering control
- Manually or PC-Operated
- Consistency of positioning in the 4 quadrants
- No more hands in the pool!
- No Electricity in the pool

System Description

Up to **4 platform/motor combination** connect to the 4-channel control unit.

Each platform is **driven independently**, so that the Water Maze experiment can be completely automated by positioning a platform in each of the 4 quadrants of the pool.

Once the 4 platforms have been positioned in the pool, each is connected to the related external motor, via the connectors conveniently fitted to the water tank (*ask for information about our models!*); the whole experiment can then be run automatically, via the control unit or external triggers.

Specifications

- 4 independent channels : manual or TTL mode
- Platform vertical range : 25-35cm
- Vertical travel : 10cm, in 9 steps
- Platform Speed : 10mm/s
- Platform diameter : 10cm

Manual or Automated Modes

The platforms go up and down in steps of 1 cm, for a total vertical travel of 10 cm.

Different operation modes are possible using Ugo Basile Atlantis platform system: in the **manual** mode the vertical travel is controlled by simply depressing a key.

In the **automated mode** the platforms can be operated by external triggers (**TTLs**), controlled by any videotracking software.

Each platform can be kept submerged, and raised automatically when the animal swims above it. This protocol allows one to exclude from the test "navigation strategies" in which spatial memory is not involved.

plaftorm up →

↓ platform down

When used as stand-alone tool, without motor/controller, the Atlantis hydraulic **platform 40101-002** can also conveniently replace standard fixed platforms.

Ordering Information

40100 **Complete 1-Platform System**, including standard components as listed below

40400 **Complete 1-Platform System**, including standard components as listed below

		40100	40400
40100-001	4-Channel Controller	1	1
40101-002	Platform	1	4
40101-003	Motor	1	4
40101-320	Connection Cable	1	4
40101-321	100ml Syringe	1	4
40101-322	Stretch of Tube (3m)	1	4
40100-302	Instruction Manual	1	1
E-WP 008	Mains Cable	1	1

Available Accessories

40101 Additional platform and motor assembly

Ask for information about our Water Mazes and ANY-maze videotracking software

Physical		40100	40400
Weight	Kg	11	30
Shipping Weight	Kg	17	39
Packing	cm	80x60x44	(x2)

Bibliography

- D. Ryan et alia: "Spatial Learning Impairments in Plb1triple Knock-In Alzheimer Mice are Task-Specific and Age-Dependent" Cellular and molecular life sciences 70(14): 2603-2619, 2013
- R.I.W. Spooner et al.: "The Atlantis Platform: A New Design and Further Developments of Buresova's On-demand Platform for the Water Maze" Learn. Mem. 1: 203-211, 1994
- G. Riedel et al.: "Reversible Neural Inactivation Re¬veals Hippocampal Participation in Several Memo¬ry processes" Nature Neurosc. 2 (10): 898-905, 1999
- I.Q. Wihshaw et al.: "The Behavior of the Laborato¬ry Rat: A Handbook with Tests" Oxford Univ. Press, USA: 1, 2004

ANY-maze
Behavior Tracking Software

Cat. No. 60000

Why ANY-maze?

ANY-maze is today's most advanced video tracking system. Trusted by thousands of researchers around the world, ANY-maze couples an unrivalled depth of features with a simple, familiar design, to provide automated testing in virtually any behavioural test.

Packed with advanced features ANY-maze is one of the most comprehensive video tracking systems available today

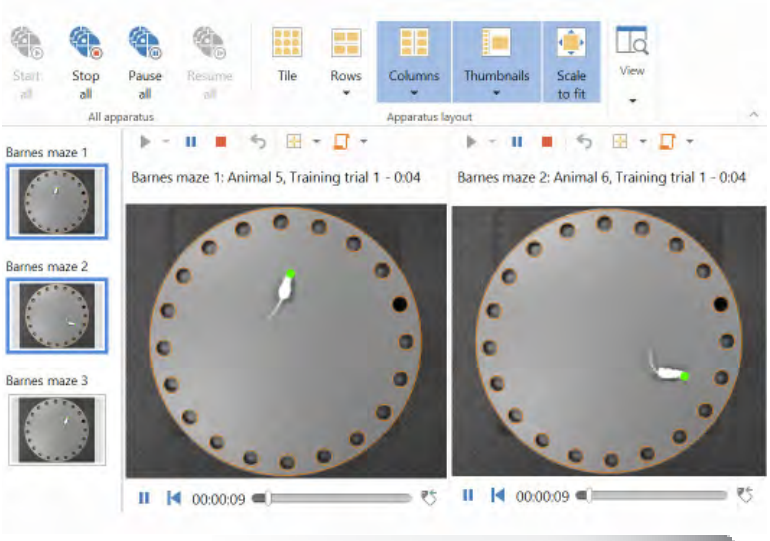
True Flexibility

ANY-maze will happily track a single mouse in a radial arm maze, or simultaneously track sixteen rats in their home cages for a week.

And ANY-maze isn't limited to tracking rodents - users track quails, marmosets, zebra-fish, goats...

All new ANY-maze Version 5

familiar interface
improvements when testing
more flexible animal management
procedures have replaced events and actions
improved reports
smaller files, faster analysis
improved help and support



easy to use
fully featured
value for money

Compatible with most cameras and digitizers

Take a tour and see for yourself

The quickest way to learn more about ANY-maze is to take a brief introductory tour...

Download ANY-maze and try it out

Why not try ANY-maze for yourself downloading the complete system for free! We've even included some videos so you can see the tracking in action.

ANY-maze can be used to automate almost any behavioural test, but it's most often used in 'standard' tests such as

- Morris Water-Mazes
- Elevated Plus Mazes
- O-T- Y-Mazes
- Radial Mazes
- Open Fields
- Home Cages
- Metabolic Cages
- Place Preference Boxes
- Porsolt Forced Swim Tests
- Tail Suspension Tests

Ugo Basile: more than 25,000 citations

Equipment

ANY-maze's flexible design makes it easy to set up experiments in a wide range of different apparatus: plus maze, water-maze, T-maze, activity boxes, forced swim test, open-field cages, Fear Conditioning, etc.

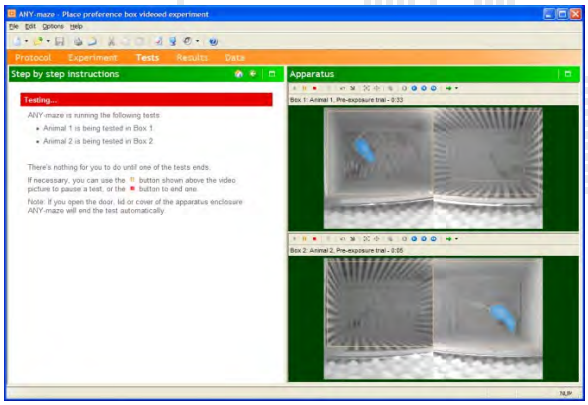
Our extensive range of **high-quality mazes** & test apparatus have been designed in cooperation with experienced behavioural scientists and are optimized for video tracking, include

What's more, all our mazes and test apparatus can be automated using the standard version of ANY-maze; so you only need **a single piece of software to automate any of these tests**; additionally, some devices, such as our **Fear Conditioning system** are available with low-cost versions of ANY-maze specific to the device.

Simultaneous Testing

Using ANY-maze you can perform tests in **up to sixteen pieces of apparatus simultaneously**. This provides a great way to increase throughput and also makes it easier to control for environmental variables.

And ANY-maze's versatile camera management means you can use one camera, or many, to view the apparatus. For example, in these place preference boxes four cameras are being used, one on either side of each box.



Cameras & Computers

With such flexibility, how do you determine the computer, cameras etc., that you'll need?

The answer's provided by the **ANY-maze equipment wizard** which quizzes you about all the apparatus you want to automate and then creates a detailed report of the equipment required.

You can use ANY-maze with inexpensive USB web-cams, high quality 'machine-vision' USB cameras, DV camcorders or almost any analogue CCTV camera.

This breadth of support not only makes it easy to find a compatible device (indeed, you may already own one), but also means that the system can meet a range of differing requirements, such as low cost, notebook connectivity, simultaneous capture from multiple cameras, tracking in darkness, etc.

ANY-maze has been designed to work with modern computers running Windows Vista, Windows XP, Windows 7.

However, that doesn't mean you can't use it with older equipment or other versions of Windows, just check computer compatibility on our web site.

Ordering Information

60000	**ANY-MAZE FULL LICENSE, including updates for 1 year**
60050	ANY-Maze, **1 year support extension (*)**
60000-FC	ANY-Maze, **Freezing detection only**, for Fear Conditioning
60000-FST	ANY-Maze, for FST Test (Nomura)
60000-I/O	ANY-Maze, for I/O control
60000-TN	ANY-Maze TakeNote for Manual Scoring
60000-TNI	ANY-Maze TakeNote fand I/O Control
47400-030	USB Camera, with 2.1 & 4.3 lenses, visible block filter, cables, and ceiling support
47400-040	B/W USB Camera, including 2.8-12mm day&night varifocal lens, 5m USB cable and ceiling support

We also provid pre-installed PCs and training.

Ask for information about **UGO BASILE wide range of mazes, cages and devices**, dedigned and optimized for use in combination with ANY-maze.

ANY-maze License

How ANY-maze licensing works

- You can download ANY-maze from this site for free and install it on any number of computers.
- You only need a license for copies which will be used for tracking - you can use other, free copies to set up experiments, analyse results, transfer data etc.
- To license a copy of ANY-maze, so you can use it for tracking, you supply us with its serial number and pay the purchase price. We then supply you with your license number which will **permanently** enable the tracking system and will permit updates to be installed for a period of 1 year.

What's included in the price

- The ANY-maze software itself.
- All updates to the system for a period of 1 year.*

* Extended Support

- When you purchase ANY-maze, we supply technical support and all upgrades for a period of 1 year.
- When you purchase an extended support contract we will supply you with a new ANY-maze license number, this will permit updates to be installed for a further period of one year.

Animal Mazes
for Video-Tracking

FOR STUDIES OF:

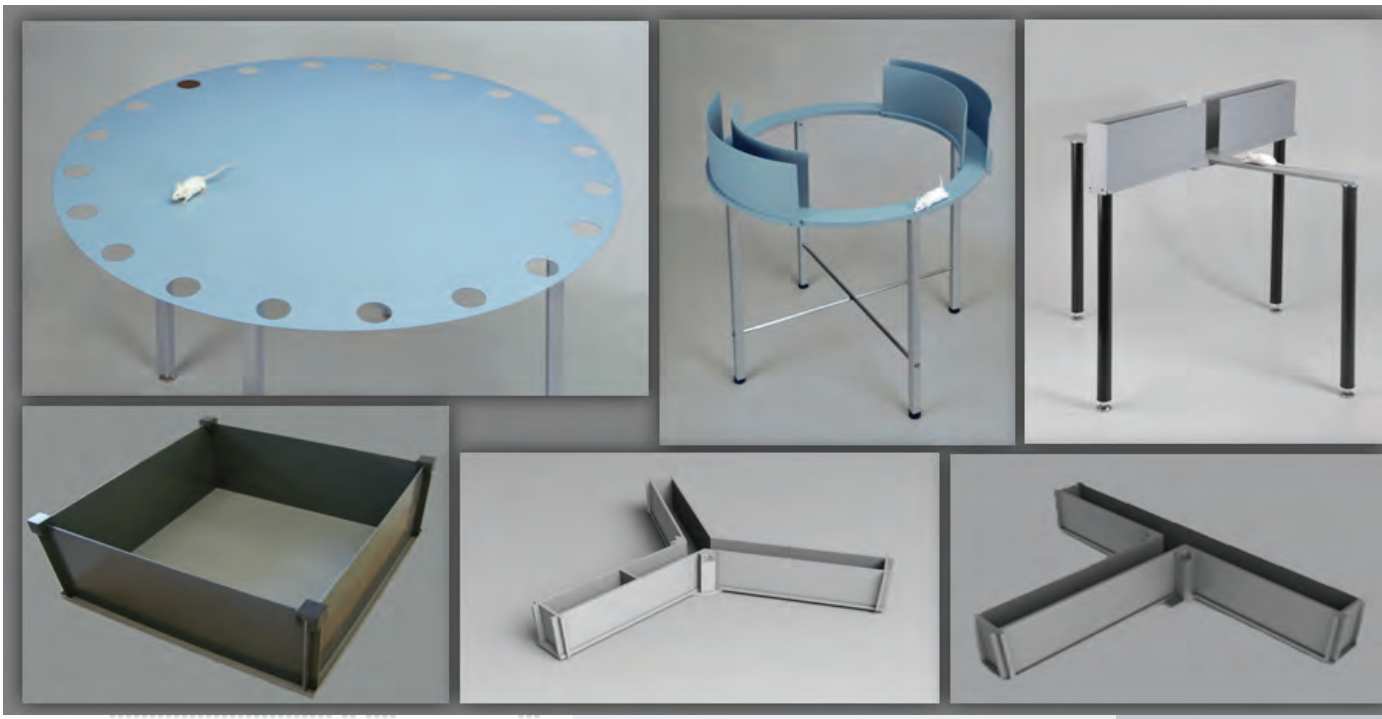
- Anxiety and Stress
- Memory and Learning
- Spatial Memory
- Activity and Exploration

General

The Animal Mazes manufactured by Ugo Basile are designed to give optimal results with any Video-Tracking software. This is achieved by:

- *high-contrast colors*: grey, white, black or the NEW Ugo Basile Light-Blue
- *non-reflective colors*: reflections are a common source of error in animal tracking. Let's avoid them!

All maze materials were selected to be *sturdy and easy to clean*, to construct reliable and durable mazes.



Main Features

- High-contrast, non-reflective colors optimized for Video-Tracking
- Quality materials: light, easy to clean and to store
- Surface texture selected for best rodent's comfort (reasonable rough, "warm" surface)

Water Maze Pool

The Ugo Basile Water Mazes are water pools specifically manufactured for Morris Water Maze experiments (*i.e.,* not a cattle drinking trough) and include:

-wheels and drain hose
-built-in connectors for Hydraulic Atlantis Platforms (not included)
-customizable colors and dimension on request
-animal platform (fixed height, 10 or 12 cm diameter)

Pools are 60 cm high and 120, 150 or 180 cm diameter.

Barnes Maze

- Mouse version: 100 cm diameter, 5 cm hole diameter
- Rat version: 130 cm diameter, 10 cm hole diameter

Both versions are 60 cm high and are painted in non-reflective grey or light-blue (white, black or other custom colors are available on request). The animal shelter is included and is magnetically attached to the maze, for quick and easy experiments.

Elevated Plus-Maze and Zero-Maze

Elevated Plus-Maze

Zero - Maze

These mazes are manufactured from high-tech metal alloy and can be painted in different colors. Dimension (cm):

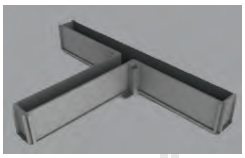
- Elevated Plus-Maze, Mouse: arm lenght 35, arm width 5, closed wall height 15, height from the floor 60
- Elevated Plus-Maze, Rat: arm lenght 50, arm width 10, closed wall height 40, height from the floor 60
- Zero-Maze, Mouse: diameter 55, corridor width 5, wall height 15, height from the floor 60

Y-maze, T-maze

These mazes have a metal base painted in non-reflective grey (more colors on request) and plastic arms that can be disassembled and closed with the included doors. Dimension (cm):

Y-maze, Mouse: arms length 35, width 5, wall height 15
Y-maze, Rat: arms length 50, width 10, wall height 20

T-maze, Mouse: stem length 35, arm length 30, width 5, wall height 15
T-maze, Rat: stem length 50, arm length 40, width 10, wall height 20



Open-Field

Open Fields are avaiable in non-reflective grey color, for mice (44 cm) or for rats (100 cm); both versions have detachable walls for ease of storage.

NEW Mouse Radial Maze

The new Mouse Radial Maze is manufactured from high-tech metal alloy and durable plastics to be as sturdy as possible.

A new automated model, with retractable doors is also available.

Different colors are available, all non-reflective, and arms can be detached, for easy cleaning.
Dimension (cm):
arms length 35, width 5, wall height 10

Ordering Information

40125	**Water Maze, 120 cm, for mice**
40155	**Water Maze, 150 cm, for mice and rats**
40185	**Water Maze, 180 cm, for rats**
40193	**Barnes Maze, for mice**
40192	**Barnes Maze, for rats**
40142	**Elevated Plus-Maze, for rats**
40143	**Elevated Plus-Maze, for mice**
40163	**Elevated Zero-Maze, for mice**
40173	**Y-maze, for mice**
40172	**Y-maze, for rats**
40133	**T-maze, for mice**
40132	**T-maze, for rats**
47432	**Open-field, 44 cm, dark walls**
47433	**Open-field, 44 cm, transparent walls**
47100	**Open-field, 100 cm, dark walls**
47150	**Open-field, 100 cm, with 4 partitions**

Light/Dark Box
(Light/Dark Conflict Test)

Cat. No. 47442/47443

General

The light/dark transition test was originally developed by Crawley and colleagues (Crawley and Goodwin, 1980) and subsequently validated by Costall et al (1989).

It is one of the most widely used tests to measure anxiety-like behavior in mice. The test is based on the innate aversion of rodents to brightly illuminated areas and on their spontaneous exploratory behavior in response to mild stressors, that is, novel environment and light.

Time spent in the lit compartment, and the related exploratory behavior, are reliable parameters for assessing anxiolytic effects that may be useful in identifying and/or screening of anxiolytic and anxiogenic agents.

Our Light/Dark cage allows to carry out the Light/Dark Conflict Test conveniently, recording the time spend in the bright camera and the related exploratory behavior via a video-tracking system.

FOR STUDIES ON

- Anxiolytic Agents
- Anxiogenic Agents

Main Features

- Designed to work with the all video-tracking software
- A model with opaque external walls (white or grey) is available as optional
- External cage can be used as open field
- The grey floor gives high contrast with both light and dark animals
- The special painting gives a slightly rough walking surface, pleasant for the animals

Rationale and Outline of the Procedure

The Light/Dark test is a characteristic tool used in the assessment of anxiety: the apparatus consists of a simple chamber divided into a dark and a light compartment. Rodents prefer darker areas over light areas: however when presented in a novel environment, rodents have a tendency to explore.

These two conflicting emotions lead to observable anxiety-like symptoms.

Mice are allowed to move freely between the two chambers. The number of entries into the bright chamber, the duration of time spent there and the related exploratory behaviors, detected via a videotracking system, are reliable parameters for assessing anxiolytic effects that may be useful in identifying and/or screening of anxiolytic and anxiogenic agents.

Transitions have been reported to be an index of activity-exploration because of habituation over time, and the time spent in each compartment to be a reflection of aversion. Classic anxiolytics as well as the newer anxiolytic-like compounds can be detected using this paradigm. It has the advantages of being quick and easy to use, without requiring the prior training of animals.

The light chamber has no ceiling and the walls are transparent, allowing for the simultaneous detection of bright-space anxiety as well as open-space anxiety in the original version of the test.

Cage Description

The cage is available for Mice or Rats.

The Mouse Cage is made of a Start Box (dark chamber) I.D. 42x20x35(h)cm and a Test Box (light chamber) with the same dimensions.

The Rat Cage is similar, with I.D. 48x48x40(h)cm.

Walls fit solidly onto the drop pan which represents the bottom of the cage, but lift off easily for cleaning.

The special painting of the bottom pan gives a slightly rough walking surface, pleasant for the animals, and easy to clean.

Standard model has transparent walls on the light compartment, but an optional model with opaque white walls is also available. Light is not included.

The lid in the dark compartment can be removed, see picture. The external cage, can be conveniently used as an open field.

Optimized for Video-Tracking

The grey floor gives best contrast to both light and dark animals, which is the most critical factor for **all video-tracking softwares** to work properly.

Ordering Information

47442 **Light/Dark Box for Rats**
47443 **Light/Dark Box for Mice**

Physical	Mouse	Rat
Dimensions	44x44cm	50x100cm
Wall height	35cm	40cm
Dark Box I.D.	42x20x35(h)cm	48x48x40(h)cm
Light Box I.D.	42x20x35(h)cm	48x48x40(h)cm
Weight	10Kg	26Kg
Shipping Weight	14Kg	32Kg
Packing	55x55x27cm	105x105x20cm

Color

Transparent or (optional) opaque (white or grey) external cage (**47444** Rat and **47445** Mouse)

Bibliography

Method Papers

- J. Crawley and F. K. Goodwin: "**Preliminary Report of a Simple Animal Behavior Model for the Anxiolytic Effects of Benzodiazepines**" Pharmacology Biochemistry and Behavior 13(2): 167-170, **1980**
- B. Costall et alia: "**The Effects of ACE Inhibitors Captopril and SQ29, 852 in Rodent Tests of Cognition**" Pharmacology Biochemistry and Behavior 33(3): 573-579, **1989**
- M. Bourin and M. Hascoët: "**The Mouse Light/Dark Box Test**" J Vis Exp. 463(1): 55-65, **2003**
- K. Takao and T. Miyakawa: "**Light/dark Transition Test for Mice**" JoVE 1: e104-e104, **2006**

MULTI-MAZE SYSTEM

Cat. No. 41500

Spatial memory is the ability to create a mental geographical map of the surroundings and to navigate the environment accordingly (Ref). In humans, for example, spatial memory allows one to easily find the way to the right office in a large building.

While the definitions of working and reference memory may be subtle and can be debated among scholars, briefly, working memory is the ability to keep track of which offices we have already visited while looking for someone, while reference memory allows us to remember which of the many rooms is Mary's office.

In rodent studies, spatial memory can be tested by placing animals in mazes composed of 3 or more radially arranged walkways (arms) and observing either spontaneous exploratory behavior or reward-based navigation.

The new **MULTI-MAZE** Cat. No. **41500**, for mouse or rat, will help the researcher to conduct fully automated memory experiments such as:

- Assessing **spatial memory**
- Testing basic **working memory**
- Discriminating working from reference memory
- Evaluating impairments in the working memory

The electronic unit features USB interface, 8 independent TTL inputs and integration with videotracking software.

The proprietary sliding doors retract in the maze floor, ensuring unobstructed animal tracking, while guaranteeing smooth, silent, totally automated up/down movements.

All the animal mazes manufactured by Ugo Basile, feature high-contrast colors and non-reflective coatings, providing optimal results with any videotracking software.

Surface texture was selected for best rodent's comfort.

Our mazes are constructed of sturdy, easy to clean materials, making them the most reliable mazes on the market.

VERSATILE MULTI-MAZE FULLY CONFIGURABLE AS:

- **Y-Maze**
- **T-Maze**
- **8-Arm Radial Maze**

Optimized for Video-Tracking

Ideal for Optogenetics tests

Easily customizable

AVAILABLE FOR MOUSE OR RAT

Main Features

- New proprietary modular system
- Doors slide underneath the floor
- Smooth and silent operation
- Easily cleanable
- Manual or PC-driven operation modes (via TTL or USB connection)
- Interchangeable walls for egocentric or allocentric spatial memory tests (low profile walls are optional)
- Different colors or textures available on request
- Different arm length available on request

System Description

The new **MULTI-MAZE 41500** is a modular system, enabling the user to set-up an electronically controlled maze, by combining one of the different arenas provided, and the required number of arms, in one of the following configurations:

- **Mouse Y-Maze**
- **Mouse T-Maze**
- **Mouse 8-Arm Radial Maze**

This feature is facilitated by the new door-controlling kinematics; the motor for each section is actually an integral part of the arm itself, positioned below the door area, while a control unit, positioned below the central arena, consolidates the motor control board, the interface with the external electronic unit, and the interface with the video-tracking software (ANY-maze, not included).

The corridor side walls, made of plastic material, are easily removable, for cleaning purposes. Moreover, it will be easy to switch from high profile to low profile wall (optional), according to the research needs.

Arm dimensions:

	Mouse	Rat
Length	35cm (**)	60cm (**)
Width	5cm	10cm
Height	12cm	30cm

An automated door is provided on each arm, at the central arena end.

System Configurations

Y-Maze Configurations

	41503 Mouse	41513 Rat	
1	**41500-001**	**41510-001**	Central Control Arena
3	**41500-002**	**41500-012**	Arm with automated door
1	**41153-010**	**41153-010**	Electronic Unit (8 TTL outputs)

T-Maze Configurations

	41504 Mouse	41514 Rat	
1	**41500-001**	**41510-001**	Central Control Arena
3	**41500-002**	**41500-012**	Arm with automated door
1	**41153-010**	**41153-010**	Electronic Unit (8 TTL outputs)
1	**41500-003**	**41500-013**	"Start" compartment

An automated door is provided on each arm, at the central arena end; the "start" compartment with automated door, attached to the end of the stem-arm, completes the T-Maze.

The 41504 /41514 configurations also enable the Y-maze test to be carried out, without any extra accessories.

8-Arm Radial Maze (see front picture)

	41508 Mouse	41518 Rat	
1	**41500-001**	**41510-001**	Central Control Arena
8	**41500-002**	**41500-012**	Arm with automated door
1	**41153-010**	**41153-010**	Electronic Unit (8 TTL outputs)

The 41508/41518 configurations also enable the Y-maze test to be carried out without any extra accessories, and the T-maze with the addition of the Start compartment only.

Ordering Information

Components

Mouse	Rat	
41500-001	**41510-001**	**Central Control Arena,** incorporating motor drive & interface to external unit
41500-002	**41500-012**	**Standard Arm**, provided with automated door, and high profile walls*
41500-003	**41500-013**	**"Start" Compartment** for T-maze, with automated door & high profile walls*
41153-010	**41153-010**	**Electronic Unit** (8 TTL outputs)

Configurations

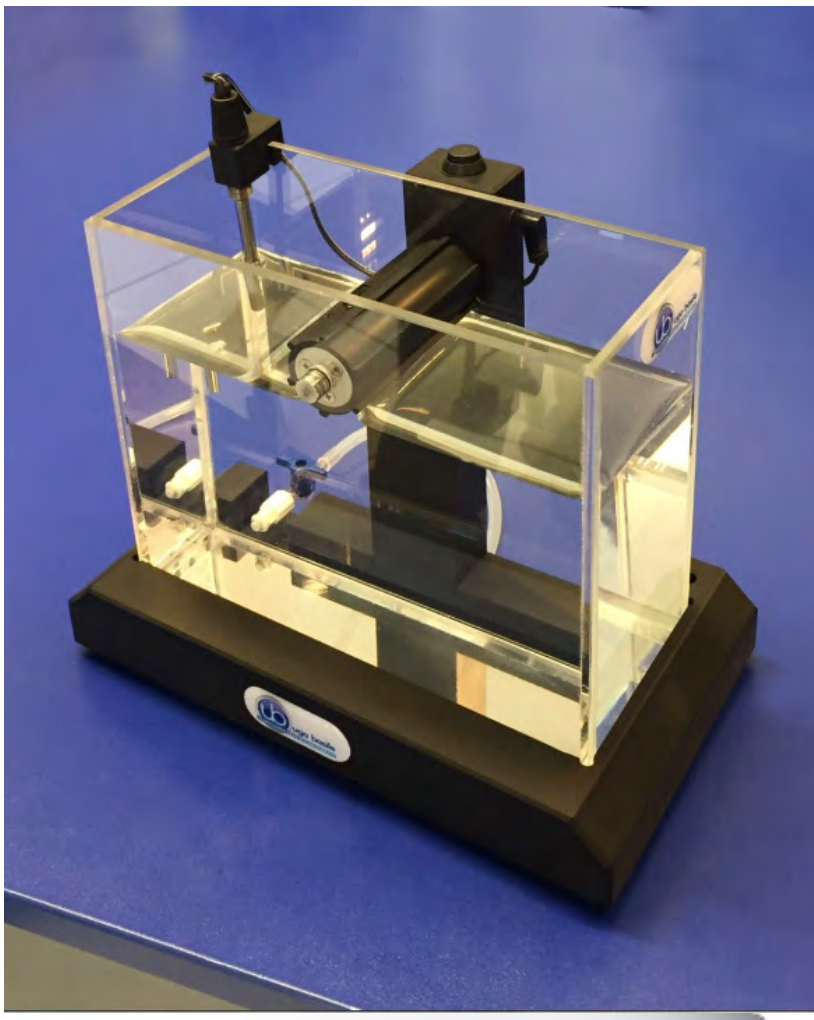
41503 41513	**3-Arm configuration,** for Y-maze test, high profile walls, automated doors, Y & T arenas
41504 41514	**3-Arm configuration**, and "Start" Compartment, for T-maze test, high profile walls, automated doors, Y & T arenas
41508 41518	**8-Arm configuration**, for Radial-Maze, high profile walls, automated doors; 8-arm, Y & T arenas

Custom accessories/configurations are available on request:

- low profile walls (*) for allocentric memory
- longer arms (**)
- custom made set-ups

Forced Swim Test with Water Wheel

Cat. No. 40803



General

The **NEW Forced Swim Test with Water Wheel** automatically scores active escapes and eliminates the subjectivity of immobility measurements. Automatically scored wheel rotations directly correspond to active escape attempts.

In 1977, Porsolt introduced the Forced Swim Test (FST), a behavioral test used for screening antidepressants (see bibliography).

Rodents are placed in an acrylic cylinder filled with water, from which they cannot escape. The animal's natural response is to attempt escape, measured by active swimming. After several unsuccessful attempts, the rodent learns that it cannot escape and becomes immobile. Increased immobility time is associated with behavioral despair and other depression-like behaviors.

Although the Porsolt Forced Swim Test remains one of the most widely used behavioral test for screening antidepressants, significant criticisms of the Porsolt FST interpretation have been made, in particular, maintaining that the method lacks objectivity in evaluating immobility (due to experimenter's subjectivity) and does not successfully screen 'false positive' drugs.

FOR MICE

FOR STUDIES ON

- Depression
- Antidepressants
- Mood
- Behavioral Despair

Main Features

- Compact and user friendly
- Automate up to 40 tests, simultaneously
- Eliminates subjectivity of immobility measurement
- Connects to ANY-maze for automated scoring and completed data analysis
- Continuous water temperature feedback

Rationale and Outline of the Procedure

"*A depressed state can be induced in mice by forcing them to swim in a narrow cylinder from which they cannot escape. After a brief period of vigorous activity the mice adopt a characteristic immobile posture which is readily identifiable" (Porsolt et al.).*

In other words, mice forced to swim in a restricted space rapidly cease moving and become lethargic. Porsolt et al. named this phenomenon '**behavioral despair**', and demonstrated that antidepressants selectively reduced the immobility.

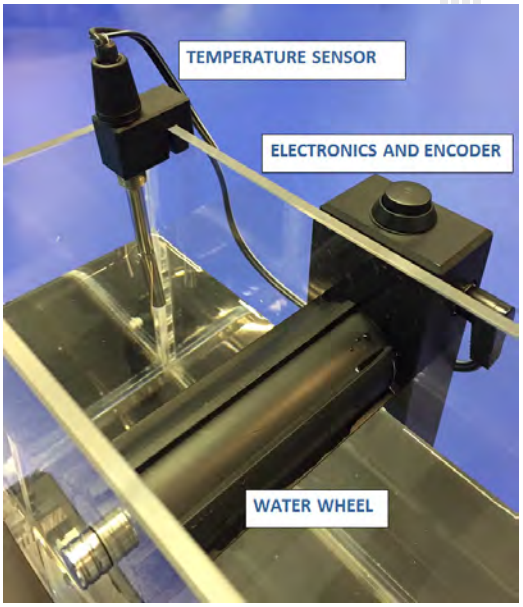
The modification suggested by S. Nomura et alia in their paper of 1982 involves a **small water wheel set in a water tank, to provide an objective measurement (number of rotations)** and overcome the bias intrinsic to Porsolt's method.

In the habituation phase, the rodent is left for 5 minutes to explore the tank, and will identify the wheel as a possible escape way. The wheel rotates freely. During the test proper: mice turn the wheel vigorously and when they give up attempts to escape from the water, the wheel stops revolving and the number of rotations are recorded.

"*... this water wheel test is more appropriate as screening test for antidepressants than Porsolt's test with regard to both objectivity and specificity." (Nomura et al.)*

Instrument Description

The apparatus consists of a transparent water tank dimensioned 20(w)x8(d)x18(h)cm. A water wheel is positioned in the center of the tank.



The water wheel has a diam. of 3.5cm and is 8cm wide; six 0.5cm paddles are evenly positioned on the wheel surface.

The tank should be filled with water at 25°C, with the wheel just resting on the water surface. A temperature sensor, which can be placed on either side of the tank, provides a feedback on the actual temperature.

The number of rotations (Clockwise and Counter Clockwise) are scored by a precision rotation encoder.

A drain is provided on the bottom of the back wall, to adjust water levels and empty the tank without moving the device. The tank can be easily disassembled and conveniently cleaned.

Data Recording and Analysis

The FST device connects to the PC via a USB cable provided as standard. Several 40803s can be connected to the same PC via a USB hub.

A **Forced Swim specific mode of ANY-maze (60000-FST)**, also included in the full license, collects the information from the electronics (encoder & temperature sensor), automatically scores number of rotations and performs statistical analysis.

Ordering Information

40803	**Forced Swim Test,** complete. Including with rotation encoder & temperature sensor
60000-FST	**ANYmaze Module for FST**

Specifications

Power Supply :	USB (connection to PC)
Scoring :	via rotation encoder
Data collection & analysis :	via ANYmaze FST module

Physical

Dimensions	24(w)x12(d)x21(h)cm
Weight	2.4Kg
Shipping Weight	3.5Kg
Packing	29x26x29cm

Bibliography

Method Papers

- S. Nomura et alia: "**A New Behavioral Test for AntiDepressant Drugs"** Eur. J. Pharmacol. 83, 171-175, ***1982***
- R.D. Porsolt et alia: "**Behavioral Despair in Mice: A Primary Screening Test for Antidepressants"** Arch. Intl. Pharmacodyn. 229(2), 327-336, ***1977***
- R.G. Browne: "**Effects of Antidepressants and Anticholinergics in a Mouse "Behavioral Despair" Test**" Eur. J. Pharmacol. 58(3): 331–334, ***1979***

Isolated Organ Baths

Cat. No. 4000 / 4050 / 4400

General

The Isolated Organ Baths have been designed for accurate recording of isometric or isotonic tissue contraction/release.

Research involving effects of electrical stimuli or drugs on isolated organs, uterus, trachea, vessel strips, auricle, can be performed under optimum conditions.

Wash or test solution enters the chamber after passing through the temperature equilibrating coils and the syringe valve. The tissue in the chamber is washed by flushing the chamber through an overflow drain tube, to avoid exposing the tissue to the air.

Water stirring is accomplished by a water jet delivered by a centrifugal pump.

A 200W stainless steel heating element is mounted on the Perspex tank floor. A precise solid state "proportional" thermostat maintains the temperature within the excellent limits of ±0.1°C on all models.

Note : the Isometric and Isotonic Transducers featured in the picture are not included and can be ordered separately.

SAFETY

EFFICIENCY

4000 One Muscle Chamber

4050 Two Muscle Chambers

4400 Four Muscle Chambers

Main Features

- All components visible through the clear Pespex tank: great for teaching!
- Tissue washing without exposure to air
- Water-jet bath stirring provided by a noiseless vibration-free centrifugal pump
- Easy and quick mounting of tissue

Bath 4000

The 4000 water bath consists of a clear Perspex tank, 19x19x17cm which contains one tissue chamber, one temperature equilibrating coil, one adjustable support rod on which transducers can be fastened to the tank via the holder provided.

Bath 4050

This is similar to the one-chamber bath 4000 but the tank is dimensioned (34x19x17cm) to accomodate two muscle chambers and syringe valves, two coils, two adjustable support rods and holders for transducers.

Bath 4400

The bath 4400 lodges up to 4 preparations; they maintain the features of the 4050 but heating power and dimensions are upgraded accordingly, the tank being 47x29x22cm.

Tissue Chamber Configuration

The tissue chambers provided with porous frit, available in 5, 10, 20, 30 or 50 ml are standard. unless otherwise specified, we supply our tissue baths with 10ml muscle chambers.

An accurately positioned glass hook is provided in the chamber to which the thread loop can be easily attached, ensuring the organ being well centered in the chamber.

Tissue chambers are also available provided with an aeration side arm in 20, 30 or 50 ml volume. Tissue chambers without hook are available on request.

Control Box

The control section of the bath lodges the electronics; the temperature regulator, the temperature sensor & the circulation motor are connected to by connectors enabling quick disconnection for servicing purposes.

The upper panel consolidates all commands and the temperature regulator, with keys to preset water temperature in the range 25-45°C, enabling an accurate temperature setting in 0.1°C steps.

Recording & Transducers

Ugo Basile offers a complete line of Transducers (Isometric 7003, 7004, 7005, 7010 or Isotonic 7006) and a versatile 4-channel digital recorder, **DataCapsule-*Evo***. **Ask for details!**

Ordering Information

4000 **Isolated Organ Bath, One Muscle Chamber**, with circulation pump, heater, thermostat, temperature sensor, complete provided with following standard accessories:

4005 Temperature Equilibrating Coil
4100 Muscle Chamber, 10ml, provided with porous frit and hook
14110 Lead-Screw Positioner for 10 & 13mm rods
4004 Supporting Rod (10mm diam.)
4000-302 Instruction Manual
E-WP 008 Mains Cord

4050 **Isolated Organ Bath, 2 Muscle Chambers**, as above but all standard accessories multiplied by two, i.e., 2x4005, 2x4100, etc.

4400 **Isolated Organ Bath, 4 Muscle Chambers**, as above but all standard accessories multiplied by four, i.e., 4x4005, 4x4100, etc.

Physical:

4000	Dimensions	:	32x20x22cm
	Weight	:	4Kg
	Shipping Weight	:	10.5Kg
	Packing	:	67x42x53cm
4050	Dimensions	:	47x20x22cm
	Weight	:	6.5Kg
	Shipping Weight	:	11.5Kg
	Packing	:	80x60x44cm
4400	Dimensions	:	47x29x22cm
	Weight	:	9Kg
	Shipping Weight	:	16.5Kg
	Packing	:	680x60x44cm

Power Requirement:

115 or 230V, 50-60Hz
250VA max. for 4000/4050, 400VA max. for 4400

Bibliography

- N. Bektas et alia: "**Effect of phenolic acids on functions of rat aorta, vas deferens and on metabolic changes in streptozotocin-induced diabetes**" Indian J.Pharmacol. 44 (2): 184-188, 2012
- A. Rizzo et alia: "**In vitro effects of L-arginine on spontaneous and Homocysteine-induced contractility of pregnant canine uteris**" Theriogenology 76 (4): 715-720, 2011
- E. N. Gorbatova et alia: "**In Vitro Effects of Pentifin on Some Neurotransmitter Systems in the Brain**" Bull. Exper. Biology & Medicine136 (2): 174-175, 2003
- G. Re et alia: "**Identification of Functional α-Adrenoceptor Subtypes in the Bovine Female Genital Tract During Different Phases of the Oestrous Cycle**" Vet. es. Communications 26 3): 479-494, 2002

Superfusion System

Cat. No. 14900

General

Neurotransmitter release is the major step of neurotransmission. Abnormalities in neurotransmitter release have been proposed to be involved in many pathological conditions.

Therefore, understanding the physiological mechanisms of transmitter release and how the process can be modified by pathological states is essential to develop therapeutically useful pharmacological agents.

UGO BASILE 14900 Superfusion System has been especially designed to perform release studies from synaptosomes, although brain slices can be employed as well.

On the other hand, presynaptic nerve terminals are the sites where release specifically occurs; therefore superfusion of synaptosomes is best suited to explore presynaptic events.

Superfused synaptosomes are the preparation of choice to study release-regulating presynaptic receptors and to explore the intimate mechanisms of neurotransmitter release.

RAITERI'S METHOD

Synaptosomes Release Studies

Main Features

- Specifically designed to perform release studies from synaptosomes
- Brain slices can be employed as well
- More than 300 full papers using superfused synaptosomes have been published

Introduction

UGO BASILE **14900 Superfusion System is a semi-automated version of that originally developed in Raiteri's laboratory**, where about 300 papers have been published exploiting the technique.

We have developed this Superfusion System in order to make commercially available an instrument in which the original design of the superfusion chambers has remained intact.

The 14900 Superfusion System consists of 12 parallel open superfusion chambers with 12 upper reservoirs, all thermoregulated by a water-jacket. Prewarmed oxygenated media of the desired composition can be concomitantly delivered from the reservoirs to the superfusion chambers.

Synaptosomes are accomodated as very thin layers on microporous filters placed on glass filter supports.

Superfusion is provided by a multi-channel peristaltic pump and superfusate samples are directly collected into scintillation vials.

Ordering Information

14900	**SUPERFUSION SYSTEM (Raiteri's method)**, standard package, including:-
14900-001	Electronic Unit
14900-002	Superfusion Bath Complete Assembly, including upper & lower chambers, valves, set of tubes, etc.
14900-004	Suction Pump
14900-302	Instruction Manual
14900-328	Set of Phials
14900-338	Set of Filters
14900-325	Phial Rack
14900-302	Drain Pan
E-WP008	Mains Cord

Optional:

14900-003-MA12	Water Circulator/Heater (12 litres)
14900-003-MA12	Water Circulator/Heater (26 litres)
14900-015	Masterflex Peristaltic Pump, 12 channels, expandable
14900-024	Masterflex Peristaltic Pump, 24 channels

Physical

Weight	34Kg (complete assembly)
Shipping Weight	48Kg
Dimensions	14900-001: 38(w)x30(d)x13(h)cm 14900-002: 46(w)x28(d)x60(h)cm
Packing	1 box 80x60x44cm 1 box 62x65x84
Power Requirement	115 or 230V, 50/60Hz, 100W max.

Bibliography

Method Paper:

- M. Raiteri, F. Angelini, G. Levi: "**A simple apparatus for studying the release of neurotransmitters from synaptosomes**" Eur. J. Pharmacol. 25: 411-414, 1974

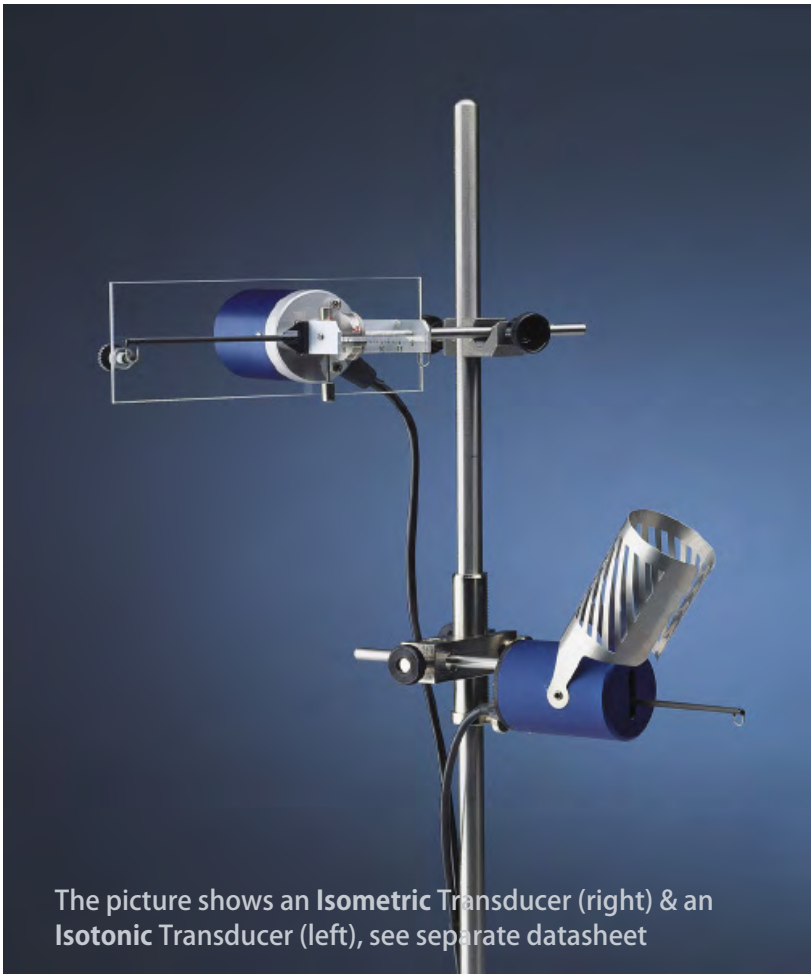
Papers quoting 14900:

- A. Pittaluga et alia: "E**ffects of the neoclerodane Hardwickiic acid on the presynaptic opioid receptors which modulate noradrenaline and dopamine release in mouse central nervous system**" Neurochemistry Intl. 62 (4): 354-359, 2013
- S. Zucchini et alia: "I**ncreased excitability in tat-transgenic mice: Role of tat in HIV-related neurological disorders**" Neurobiology of Disease: available onlyne 2013
- F. Giribaldi et alia: "**Group I metabotropic glutamate autoreceptors induce abnormal glutamate exocytosis in a mouse model of amyotrophic lateral sclerosis**" Neuropharmacology 66: 253-263, 2013
- J. Marrocco et alia: "**Anxiety-Like Behavior of Prenatally Stressed Rats Is Associated with a Selective Reduction of Glutamate Release in the Ventral Hippocampus**" J. neuroscience 32 (48): 17143-17154, 2012
- C. Romei et alia: "**The GABAB receptor antagonists CGP35348 and CGP52432 inhibit glycine exocytosis: Study with GABAB1- and GABAB2-deficient mice**" Pharmacological Res. 61: 547-552, 2010
- M. Grilli et alia: "Specific Inhibitory Effect of Amyloid-β on Presynaptic Muscarinic Receptor Subtypes Modulating Neurotransmitter Release in the Rat Nucleus Accumbens" Neuroscience 167: 482-489, 2010
- G. Bonanno et alia: "**Release of [3H]D-aspartate induced by K+-stimulation is increased in the cervical spinal cord of the wobbler mouse: a model of motor neuron disease**" Neurochemistry Intl. 55: 302-306, 2009
- M. Grilli et alia: " **Release-enhancing pre-synaptic muscarinic and nicotinic receptors co-exist and interact on dopaminergic nerve endings of rat nucleus accumbens**" J. Neurochemistry 105 (6): 2205-2213, 2008

In addition, more than 300 full papers using superfused synaptosomes have been published

Isometric Transducers

Cat. No. 7003 / 7004 / 7005 & 7010



The picture shows an **Isometric** Transducer (right) & an **Isotonic** Transducer (left), see separate datasheet

General

The three models 7003-7004-7005 cover the range from 0 to 50 g (see table on the facing page). The high sensitivity 7010 is designed for the mg range.

The force exerted on a hollow carbon fibre beam is converted into proportional electric signal via strain-gauges, conveniently wired in Wheatstone bridge circuit.

Model Selection

Ugo Basile transducers are of robust construction and can withstand forces of up to 5-10 times the rated value.

It is possible to use 7003 which is generally used for trachea rings or artery strips, where forces of 5-10 grams are involved, by operating at minimum amplifier sensitivity; however, the cantilever will deflect with a load of the mentioned magnitude

Generally speaking, it is advisable to use a stiff transducer, operating at high amplifier sensitivity, and use the most sensitive transducer only when

Also available from Ugo Basile:

- Tissue Baths, 1, 2, 4-chambers
- Digital Recorder DataCapsule-*Evo*
- Electrodes & Stimulators

Main Features

- Ugo Basile transducers have been designed for precise measurement of force in muscular preparations under isometric conditions
- An Isometric Transducer measures changes in force at constant length whereas an Isotonic Transducer is basically a displacement meter under constant load

Isometric Transducer Specifications

Model	7010	7003	7004	7005
Electrical				
Excitation Voltage (max.)	6V	6V	6V	6V
Excitation Voltage (typical)	3V	3V	3V	3V
Sensitivity (μV per g per V)	110	70	25	10
Non linearity & Hysteresis	+/-3%	+/-3%	+/-3%	+/-3%
Mechanical				
Force Range	**0-800 mg**	**0-2g**	**0-10g**	**0-50g**
Overload Rating	5g	20g	50g	200g
Moment of Inertia	7gcm^2	7gcm^2	7gcm^2	7gcm^2
Lever Arm Displacement	0.5 mm/g	0.3 mm/g	0.1 mm/g	0.06 mm/g
Physical				
Weight	270g	270g	270g	270g
Shipping Weight	900g	900g	900g	900g
Packing	29x26x29cm			

Compatibility

Before ordering, check the connection compatibility of your amplifier/recording system.

The Isometric & Isotonic Transducers are normally supplied with a connector (type -F) designed for Ugo Basile DataCapsule-Evo Recorder (see datasheet).

If the customer wishes to make use of other recording apparatus, the transducers can be supplied with appropriate connector on request: we will be glad to provide transducer with different connectors, if available, or to provide wiring information and instruction.

Ordering Information

7003 Isometric Force Transducer , type DY1

7004 Isometric Force Transducer , type DY2

7005 Isometric Force Transducer , type DY3

7010 High-Sensitivity Transducer , type DY0

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Isometric Transducers 7003, 7004, 7005

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High-Sensitivity Transducer 7010

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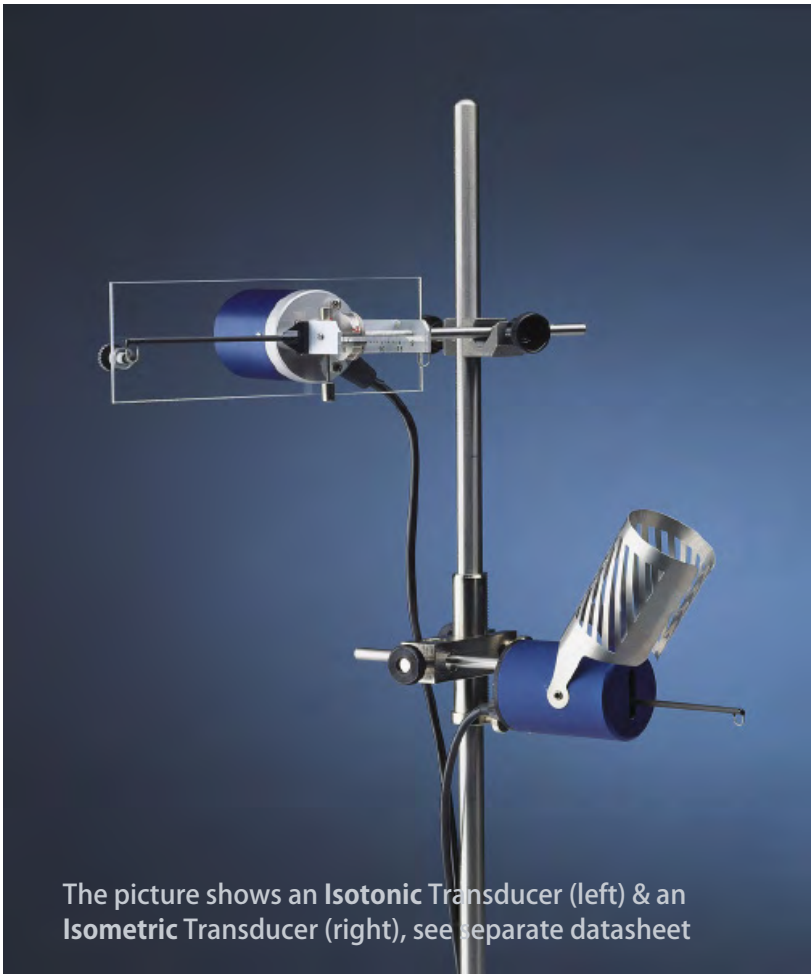
Isotonic Transducer

Cat. No. 7006


The picture shows an **Isotonic** Transducer (left) & an **Isometric** Transducer (right), see separate datasheet

General

The 7006 Isotonic Transducer basically consists of a carbonfibre lever arm which pivots on the shaft of a Hall-effect rotary motion transducer of original design.

The arm is balanced by an adjustable counter-weight of tungsten alloy.

It is possible to carry out experiments on extremely small muscle fibres, which can be held under a tension of as little as 100-200 mg so that minimal force and consequent displacement alterations can be recorded.

The lever arm balancing is provided by a tungsten alloy counterweight which can be shifted by turning its knurled section.

This load is monitored by the counterweight rim moving along a scale calibrated in grams.

Also available from Ugo Basile:

- Tissue Baths, 1, 2, 4-chambers
- Digital Recorder DataCapsule-*Evo*
- Electrodes & Stimulators

Main Features

- Ugo Basile Isotonic Transducer is specially designed for investigating isotonic contractions in isolated organs, particularly smooth muscle, amphibian hearts, etc.
- An Isotonic Transducer is basically a displacement meter under constant load, whereas an Isometric transducer measures changes in force at constant length

Isotonic Transducer Specifications

Voltage Output	300µV per mm displacement of lever arm tip
Linearity	± 2% to ± 15 ° rotation
Excitation Voltage	6 ÷ 15V
Excitation Current	20mA (constant in the range 6 ÷ 15V)
Operating Range	± 15° about the centre
Lever Arm Length	10cm
Lever Arm Travel	6cm
Breakaway Torque	less than 0.1g x cm
Moment of Inertia	35 g x cm^2
Overall Dimensions	16.5x5.5x11cm (excl. removable handle)
Weight	0.35Kg
Shipping Weight	1.60Kg
Packing	29x26x29cm

Compatibility

Before ordering, check the connection compatibility of your amplifier/recording system.

The Isometric & Isotonic Transducers are normally supplied with a connector designed for Ugo Basile Data-Capsule-Evo Recorder (see datasheet).

If the customer wishes to make use of other recording apparatus, the transducers can be supplied with appropriate connectors on request: we will be glad to provide transducer with different connectors, if available, or to provide wiring information and instruction.

Ordering Information

7006 **Isotonic Transducer**

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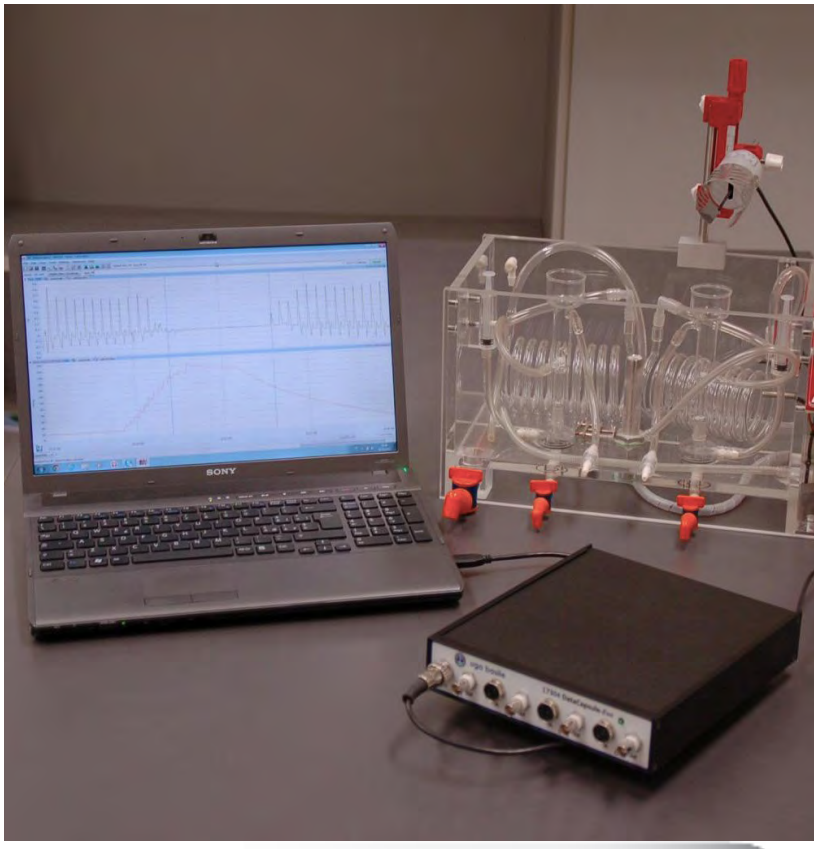
DataCapsule-*Evo* Digital Recorder

Cat. No. 17308

NEW



General

The new DataCapsule-*Evo 17308*, powered by iWorx, is a new general purpose, 8-channel data acquisition system that provides high resolution and sensitivity over conventional recorders.

It is an advanced and feature-rich physiological data acquisition system; it comes standard with eight general purpose input channels, a low voltage and high voltage stimulator, eight digital inputs and outputs, a built-in barometric pressure sensor, and four iWire™ inputs.

The 17308 exhibits the high resolution, low noise, and flexibility required for a variety of research applications.

Set-up is plug-and play easy, with connection to PC or MAC computers via USB interface; incorporating innovative iWire serial interface technology and advanced LabScribe data acquisition and analysis software, the 17308 Recorder accommodates a wide range of sensors, transducers, and other devices.

The 17308 feature a high resolution, 16-bit ADC, with exceptionally low system noise ~ 1mV.

LabScribe3™ software is provided with the instrument, or can be downloaded from our web site.

LabScribe3™ Software on-board

100KHz Sampling Speed

4+4 CHANNEL DATA ACQUISITION SYSTEM

with iWire Interface (4 additional channels)

Main Features

- USB connection to PC and MAC
- Connectors for most transducers
- DIN & BNC inputs and BNC outputs
- Input trigger to start recording
- High resolution and sensitivity
- Dual Programmable stimulator iWire interface

Connections and Specifications

Four Channels are equipped with a BNC connector for single-ended transducers. Four channels are equipped with a transducer amplifier, to allow connection to virtually any physiological transducer via a DIN8 connector.

The Maximum sampling speed is 100k samples per second aggregate.

iWire Connectors accept up to four serial iWire interfaces including the iWire-B3G, iWire-BIO4, iWire-BIO8, and iWire-ECG12. The iWire-B3G interface can record up to four channels of data. Three of the channels are isolated biopotential amplifiers capable of recording ECGs, EMGs, EOGs, EGGs, and EEGs, while the fourth is a dedicated GSR amplifier (used with the C-ISO-GSR sensor). The iWire-BIO4 and iWire-BIO8 include four or eight biopotential amplifiers respectively.

EM1 and EM2 accept the Event Marker (EM-220).

Each channel of the 17308 is equipped with dual, low voltage, independently programmable 16-bit +/- 15V stimulators.

Parameters for the stimulators, such as pulse width, frequency & amplitude, may be changed on the fly, using controls located in the LabScribe software toolbar.

Standard protocols include Pulse, Train, Step, Triangle, Ramp, and Custom. Connected via BNC connectors.

Software and Data Management

The DataCapsule-*Evo* setup is plug-and-play easy with connection to PC or MAC computers via USB interface.

Recorded data are managed by the versatile **LabScribe3 Software**, featuring optimized scaling of displayed data: time base or y-axis scaling can also be zoomed in or out with a single click of the mouse.

Keyboard input from the user may be time locked to the data; annotations may be positioned in the data, just as you would write on chart paper!

Twenty-four off-line calculations are also supported, including Max-Min, Slope at a Point, and Mean.

Any view of the data can be exported to the disk as a text file or graphic.

This capability is ideal for post calculation in programs like Excel™ or MatLab™; data from any window in the program can always be printed.

DataCapsule-*Evo* Specifications

BNC Inputs (A1-A4)

Number of Inputs	4
Input Range	±10 VDC
Resolution	16 bit
Connectors	BNC Cable

DIN8 Transducer Inputs (A5-A8)

Number of Inputs	4
Input Range	±10 VDC
Resolution	16 bit
Isolation	No
Excitation	±5 VDC, 100 mA
Connectors	DIN8
Gain	Programmable with input resistor

High Voltage Stimulator Output

Connectors	HV Safety
Output Range	0-1mA
Compliance	100V
Max ON time	10ms

Low Voltage Stimulator Outputs (S1-and S2)

Resolution	16bit
Connectors	BNC
Output Range	±15 VDC at 35 mA
Modes	Pulse, Train, Constant, Step, Ramp, Triangle, Custom

Digital Inputs and Outputs

Input	8 independent lines, TTL input, 1 Mega Ohm input impedance, 5V maximum
Output	8 independent lines, TTL output level, 24 mA maximum load per line

A/D Converter

Sampling Speed	100KHz aggregate
Interface	USB 1.1, 2.0, full speed

Physical

Power	12VDC, 1.5A
Dimensions	23cm(W) x 15cm(D) x 6.5cm(H)
Shipping Dimensions	45 (D) x 34 x 26 (h) cm
Weight	2.0 Kg
Shipping Weight	4.0 Kg
Software	iWorx LabScribe3™
Warranty	The 17308 hardware is protected with a 24-month warranty

Ordering Information

17308 **DataCapsule-*Evo* Digital Recorder,** standard package, including LabScribe3™ Software

Transducers

The DataCapsule can be connected to a variety of transducers.

Among the ones offered by Ugo Basile:

7003-G	Isometric Force Transducer, type DY1
7004-G	Isometric Force Transducer, type DY2
7005-G	Isometric Force Transducer, type DY3
7010-G	High Sensitivity Transducer, type DY0
7006-G	Isotonic Transducer
17844-G	Pressure Transducer

ECT Unit

Cat. No. 57800

General

The ECT apparatus is specially designed for neurochemical and neuropharmacological research.

A constant current output is used, which ensures reproducible results and accurate determination of the EC threshold while also pinpointing any variations in the threshold, brought about by drugs having a specific action on the cortex and subcortical regions.

The shock parameters have been selected after consulting the most recent literature, to supply the most suitable range when operating with mice and rats.

Consistent reproducible current levels are produced by feedback circuitry that adjust for variance in impedance of the contact from animal to animal.

The Electroconvulsive Device is supplied with auricular (ear lobe) electrodes.

DESIGNED FOR INDUCING CONVULSIONS IN RESEARCH ANIMALS

FOR NEUROCHEMICAL & NEUROPHARMACOLOGICAL RESEARCH

Particularly useful for:-

- General screening of potentially neurotropic substances
- Evaluating the depressant or stimulating action of drugs on the CNS
- Endocrinological investigations on the relationship between the nervous system and the hypophysis

General

Consistent reproducible current levels are produced by feedback circuitry that adjust for variance in impedance of the contact from animal to animal.

The impedance of the animal can be previously measured and displayed, and a warning signal flashes if the impedance is too great to deliver the desired current level.

The special output circuit enables any type of electrode to be used.

The **auricular electrodes 57800-002**, supplied with the standard package, allow a single operator to deliver shock to a number of animals in a short time.

The above picture features **Corneal Electrodes Cat. 57800-003**, which can be provided as **optional**.

Different types of electrodes can be manufactured on request.

Specifications

Rectangular Positive Pulse :	by H.V. transformer
Constant Current :	controlled by a feedback network
Pulse Rise&Fall Time :	20µs
Pulse Width (ms) :	0.1 to 0.9 in 0.1ms steps ±1%
Frequency (pulses/s) :	1-299 in 1 pulse/s steps ±1%
Shock Duration :	0.1 to 9.9 in 0.1s steps ±1%
Pulse Voltage :	2.5KV max.
Current Range :	0-99mA in 1mA steps ±2%
Output Resistance :	min 0Ohm - max. 25KOhm (at max. current)
KOhm Display :	0-199 KOhm - 1KOhm resolution
Power Requirements :	115/230V - 50/60Hz - 70VA

WARNING: due to HIGH VOLTAGE involved, the operator should always wear rubber gloves when handling the electrodes.

Bipolar Inverter 57800-010

An optional Biphasic Unit may be placed between the animal and the Electroconvulsive Device to invert every second pulse. Maximum frequency in this case becomes 100 Hz.

ECT Monitor 57800-015

When connection to an oscilloscope or data acquisition system, this useful accessory is required to guarantee a simple and safe way to monitor the ECT output.

The risk of damage to the ECT Unit due to accidental wrong connections is avoided when using the ECT Monitor.

Ordering Information

57800 **ECT Unit**, standard package including:

57800-001 Pulse Generator
57800-002 Set of Auricular Electrodes
57800-302 Instruction Manual (on USB pen drive)
E-WP 008 **Mains Cord**

Accessories and Spares

57800-003 Set of Corneal Electrodes
57800-320 Set of 4 Felt Pads for Auricular Electrodes

57800-010 Bipolar Inverter
57800-015 ECT Monitor

Physical

Instrument Size	27(W)x37(D)x13(H)cm
Weight	3.4Kg
Packing	45x34x26cm
Shipping Weight	5Kg

Bibliography

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Lesion Making Device

Cat. No. 53500

General

This compact, **solid state DC Lesion Maker** has been designed for the production of localized lesions in small animals, when direct current (DC) is preferred to RF.

If features a regulated power supply combined with a constant DC current generator which operates on either continuous or timed mode.

The Lesion Making Device provides constant DC current in mA from 10 µA to 99 mA. The pulse duration may be timed by the instrument between 1 and 99 seconds, or manually controlled.

The current generator is protected against short circuit, preventing the electronics to get damaged due to the electrodes coming accidentally in contact with each other.

Particular emphasis has been placed in the design of a good circuit output/ground insulation; this feature also minimizes spurious current field lines across the tissue, outside the pattern preset by the operator.

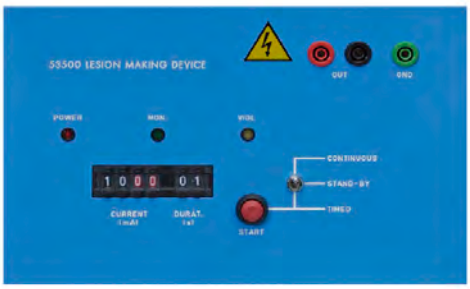
New Model!

A precision instrument, which provides constant DC current in mA

Main Features

- Violation warning circuit
- Current Range : from 10 µA to 99 mA
- 3 modes of Operation
- Digital setting of constant current and time duration
- Pulse Duration : timed between 1 and 99 seconds

Controls



The instrument controls are all placed on the top panel; the parameter are set by two thumb-wheel switches:-

- **Current output adjustment**, in the range 10µA to 99mA
- **Pulse duration** from 0.1 to 99 seconds.

The mode of operation can be selected via a 3-position switch:-

- **Continuous**: the current flows through the preparation in a continuous mode
- **Stand-By**: the instrument is ready to operate but the output stage is not energized
- **Pre-set Duration**: the current flow is timed according to the setting

Three binding posts are located at the upper right of the Lesion Maker: either the red (+) and the black (-) can be connected to the lesion making electrode.

The other binding post is usually connected to a pad electrode with electrolyte on the preparation. Either red (+) or black (-) may be grounded via the green binding post.

Led Indicators

Three LED indicators are embodied on the top panel:-

- **POWER** (green) which lights when the unit is ON
- **MONIT.** (red) which monitors the presence of lesion current
- **VIOL.** (yellow) which indicates when the current does not correspond to the setting

Electrodes

Usual needle electrodes, prepared by the researcher according to his/her experimental needs can be used in conjunction with the 53500 Lesion Making Device.

We have the capability and will to manufacture electrodes based on the customer's request.

Ordering Information

53500	**Lesion Making Device** standard package, including:-
53500-310	Set of 3 output plugs
53500-302	Instruction Manual
E-WP 008	Mains Cord

Technical Specifications

Current Range	from 10 µA to 99 mA
Pulse Duration	timed between 1&99 seconds or manually controlled
Compliance Voltage	200 V DC
Max. Electrode R	20MΩ(10µA) down to 2KΩ (100 mA)
Mains Supply	115 or 230V / 50-60 Hz
Power Consumption	20 W max.

Physical

Dimensions	25x15x11 cm
Weight	1.5Kg
Shipping Weight	2.8Kg approx.
Packing	45x34x26cm

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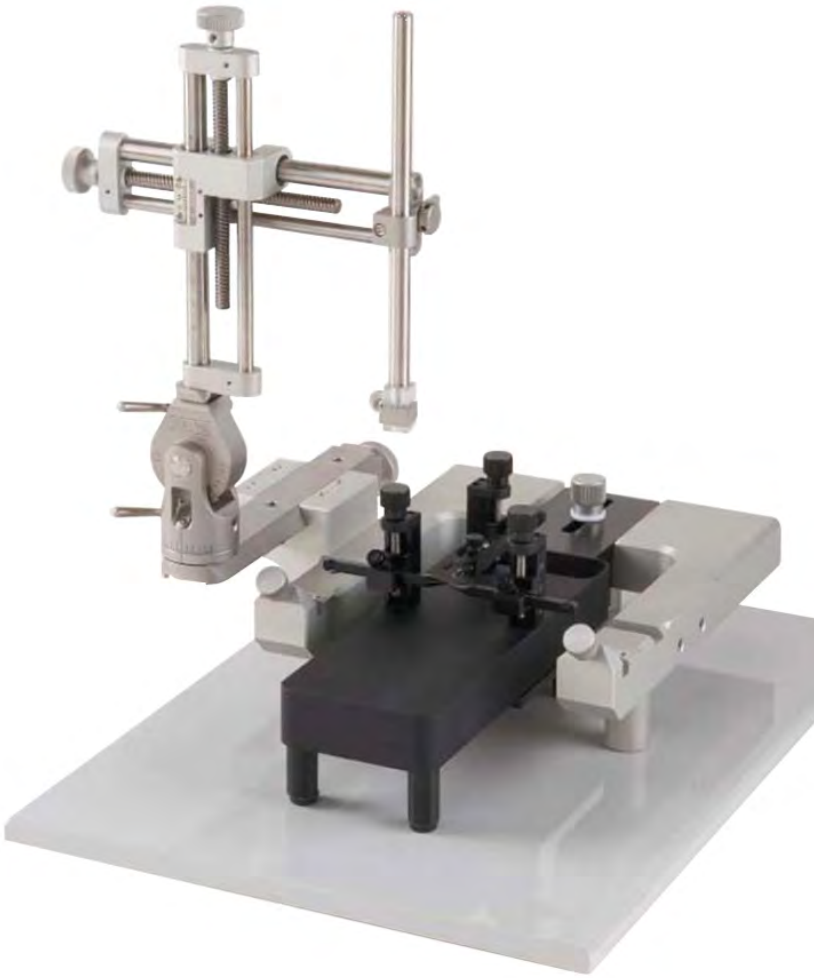
Stereotaxic Instruments
by Stoelting

Cat. No. 51600



General

The Lab Standard™ Stereotaxic Instrument, manufactured by Stoelting, is ideal for researchers in need of a versatile, reliable instrument for stereotaxic procedures with small animals.

Precision alignment when using the Lab Standard™ ensures accurate placement of electrodes, micropipettes, and other devices.

The time-proven 'U'-Frame design concept, sturdy construction, and adaptability to most model species make this the best choice for a stereotaxic instrument.

SLEEK, COMPACT DESIGN

ACCESSORIES AVAILABLE FOR USE WITH A WIDE VARIETY OF SMALL ANIMALS

Classic and Proven U-Frame Design

- Large, easy to read vernier scales. Scales are laser engraved — accurate to 100 microns
- Triple lead screws for fast positioning 80 mm of vertical, lateral and anterior-posterior travel
- Absolute lock at 90 degrees (vertical) Brass bushings in manipulator arm permit electrical grounding

Stoelting's Lab Standard™ offers several advantages over competing instruments:

Easily Read Scales

All scales are oriented to be read easily from the open end of the 'U'. This is the position from which most scientists prefer to work. The numerals on the scales are larger, and therefore more easily read. The scale lines are laser engraved, to allow finest possible permanent marking of scales on all 3 axes. Precise alignment with facing vernier scales gives accurate resolution to 0.1mm.

Smooth Movements

The Lab Standard's™ exclusive, triple lead screws allow the fastest positioning possible, consistent with lining up the scales easily at a given coordinate.

Versatily of Positioning

The manipulator arm controls medio-lateral and vertical positioning via lead screws, and antero-posterior movement via dovetail slide movement, with 80 mm of travel possible in each direction. A Universal Joint allows the investigator to change the angle of the probe up to 90° in either the antero-posterior or medio-lateral planes. The improved locking mechanism on the Lab Standard™ will hold any angle position without slippage. And of course, it also provides an absolute lock at 90° vertical.
In addition, a swing joint allows the investigator to conveniently swing the manipulator arm and probe out of the way for performing a procedure — then reliably return the probe to the same point.

Convenient for Electrophysiology

Integral brass bushings in the manipulator arm allow grounding directly to the closest metal on the manipulator arm — even the probe holder.

Selection of Accessories

Species adaptors are available to fit rat, cat/monkey, dog/monkey, mouse, guinea pig and small bird. Probe holders and species adaptors for 'U' frame stereotaxic instruments from other manufacturers are generally compatible with the Lab Standard™ frame.

Ordering Information

51600	Lab Standard w/18 Degree Earbars
51650	Lab Standard w/45 Earbars
51653	Dual Lab Standard Stereotaxic w/45 deg. Ear Bars
51603	Dual Lab Standard Stereotaxic w/18 deg. Ear Bars
51601	Lab Standard without Manipulator Arms

INFUSION PUMPS
by KDS

SO ADVANCED THEY'RE SIMPLE !!

General

Ugo Basile presents an entirely new generation of micro-processor controlled syringe pumps. They are designed specifically for applications requiring high metering precision at low, pulse free flow rates.
KDS pumps, manufactured by KD Scientific Inc., U.S.A., provide a unique combination of sophisticated features and advanced microstepping motor-drive technology. The result? KDS pumps routinely perform many of the tasks that other pumps make you do manually. So you have more time for what's really important: your research.
KDS pumps are engineered by the designer of the best selling laboratory syringe pump, to ensure you of years of unsurpassed accuracy and reliability. In addition, you'll find they are extremely simple to set-up and use.
And surprisingly affordable.

Setup is as easy as:

- Select syringe from displayed table
- Enter volume to be dispensed
- Enter flow rate, then press "start" button. It's that fast...and that simple!

Common to all models

- A simple menu-driven set up without printed look-up tables **performs rate and volume control and automatic shut-off**. Just set the volume you want dispensed. Volume is tracked continuously on the LC display. Then, when the preset volume has been dispensed, the pump shuts off automatically.
- **An alphanumeric display helps eliminate reading errors**. Their easy-to-read display provides real-time readings using both parameters and values for clearer, mistake-free readings.
- **You can control KDS pumps in many different ways**. Built-in TTL and RS-232C interfaces permit easy external control.

Operation

1. Find the syringe you use from the displayed table. Enter its code number.
2. Enter the volume to be dispensed
3. Enter the flow rate, then press the "start" button. It's that fast and simple! Your settings are permanently stored in memory – there's no need to re-enter them each day

Ordering Information

Cat. No.	Mode	N. of Syringes	Dim. cm	Weight Kg.
KDS 100	Infusion	1	23x15.3x14	2.00
KDS 101	Infusion	2	23x15x14	2.00
KDS 120	Push/pull	1+1	23x15x14	2.00
KDS 200	Infusion	2	28x23x14	4.00
KDS 210	Infusion/ Witdrawal	2	28x23x14	4.00
KDS 220	Infusion	Multiple	28x30.5x14	4.25
KDS 230	Infusion/ Witdrawal	Multiple	28x30.5x14	4.25
KDS 250	Infusion	4 (different size)	28x23x15.3	4.00
KDS 260	Push/pull	2+2	28x23x14	4.25
KDS 310	Nano Pump	1	2 items	2.00

Flow Rates

Models KDS 100 & KDS 120

Syringe	Minimum	Maximum
10 µl	0.1 µl/h	126.5 µl/h
25 µl	0.1 µl/h	318,8 µl/h
50 µl	0.2 µl/h	625 µl/h
100 µ	1.0 µl/h	1274 µl/h
250 µ	2.0 µl/h	3164 µl/h
500 µ	3.0 µl/h	6359 µl/h
1ml	0.01 ml/h	13,2 ml/h
2,5 ml	0.02 ml/h	31,7 ml/h
3 ml	0.02 ml/h	44.9 ml/h
5 ml	0.03 ml/h	87.0 ml/h
10 ml	0.1 ml/h	125.0 ml/h
20 ml	0.1 ml/h	219.0 ml/h
30 ml	0.1 ml/h	282.0 ml/h
60 ml	0.2 ml/h	426.0 ml/h

Model KDS 101

Syringe	Minimum	Maximum
10 µl	0.001 µl/min	0.350 µl/min
25 µl	0.001 µl/min	0.884 µl/min
50 µl	0.001 µl/min	1.759 µl/min
100 µl	0.001 µl/min	3.526 µl/min
250 µl	0.01 µl/min	8.78 µl/min
500 µl	0.01 µl/min	17.65 µl/min
1 ml	0.1 µl/min	35.2 µl/min
3 ml	0.1 µl/min	122.5 µl/min
5 ml	0.1 µl/min	176.2 µl/min
10 ml	0.001 µl/min	0.351 µl/min
20 ml	0.001 µl/min	0.602 µl/min
30 ml	0.001 µl/min	0.773 µl/min
60 ml	0.001 µl/min	1.175 µl/min

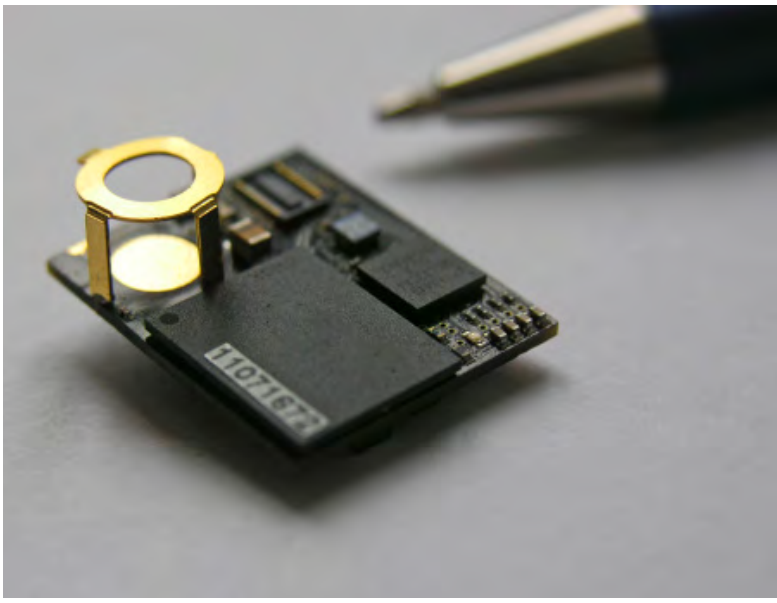
Models KDS 200/220, KDS 210/230, KDS 250/260

Syringe	Minimum	Maximum
10 µl	**0.001 µl/h**	**21.1 µl/min**
25 µl	**0.003µl/h**	**53.15 µl/min**
50 µl	**0.005 µl/h**	**105.8 µl/min**
100 µl	**0.009 µl/h**	**212.6 µl/min**
250 µl	**0.021 µl/h**	**527.6 µl/min**
500µl	**0.042 µl/h**	**1060 µl/min**
1 ml	**0.083 µl/h**	**2119 µl/min**
3 ml	**0.288 µl/h**	**7360 µl/min**
5 ml	**0.414 µl/h**	**634 ml/h**
10 ml	**0.828 µl/h**	**1270 ml/h**
20 ml	**1.414 µl/h**	**2171 ml/h**
30 ml	**1.817 µl/h**	**2789 ml/h**
60 ml	**2.757 µl/h**	**4234 ml/h**
140 ml	**5.746 µl/h**	**8834 ml/h**

NAT Device

Wireless Recordings in Rodents

Cat. No. 55100



General

Biosignal data acquisition & recording is becoming increasingly important in many applications, such as Biomedical and Neuroscience.

The use of devices to record **EEG** (Electroencephalography) is of particular interest. Traditionally, these measurements are taken with tethered devices in the clinic, are short lasting and conducted in artificial settings.

The ability to perform ambulatory monitoring of subjects provides the possibility of long-term data capture of bio-parameters in a normal living-condition or work-place. This has been an aim for many decades. In animals, these are difficult to reproduce and freely moving rodents/mammals are spatially limited to small arenas.

The "**NAT**" (**Neural Activity Tracker**) is a multipurpose data sensing and recording device that is extremely small, lightweight, and enables data acquisition for days to weeks, dependent upon programmable settings.

The NAT is a versatile and very compact device and its use for EEG and sleep studies, local field potential recording and behaviorally relevant event-related brain activity is proven.

Miniaturized & Lightweight

No Wires - No Antennas

Ideal for Mice

WIRELESS EEG & LFP RECORDING

Main Features

- Weight 2.2g , 18mm x 23mm, ideal for small rodents, including mice
- Power delivery: +24 hours on-board battery
- 4 channels, 1kHZ SA/s, 12 bit resolution
- Wireless (flash memory), no antenna
- 3-axis accelerometer & IR time stamping
- Data Download Software included
- Custom features available on request, including 8Gb Memory, higher sample rates and custom add-on boards

General

The NAT (Neural Activity Tracker) is a 4-Channel, wireless, 1KSa/sec Biosignal Data Recorder with 3-D Accelerometer and Infra-red Time/Event stamp Function.

It's **miniaturized size**, **18x22mm**, less than 10mm in height (primarily due to the battery module, as the major part of the device has a profile of less than 4mm), and light weight, less than **2.2grams**, makes it attractive in applications where regulatory constraints apply (mice).

The NAT device comprises of 3 key components – an on board flash memory, a proprietary CPU and a proprietary MEMS (MicroElectroMechanical System) device for accelerometer. An optional infra-red time/event-code recording board can be easily added to the device to allow alignment of behavioral events with the EEG recording.

The NAT's main features are:

Hardware:

- Robustness and reliability
- On-board clock (calibration/synchronisation with ext devices)
- Reliable battery fitting (zinc-air cell)
- Large 4GB memory (optional 8GB)
- Programmable sample frequency
- Advanced accelerometer for 3D movement detection
- Infra-red Time/Eventstamp Function (optional)
- On-board functionality indicator (LED)
- Programmable start function for delayed onset
- Recording of 2x2 channels via independent ground
- Refreshable memory
- Programmable AC input range p to +/-3.75mV; band pass filter 0.3-500Hz

Data handling & analysis:

- Connector compatible with USB2 for download
- Accelerated data download (single/multi-device docking station
- Easy data transfer (to Excel or similar), multiple/flexible data formats (incl. txt and csv format)
- Link to existing data analysis software

Battery

A specially designed gold-plated metal holder houses a single zinc-air cell: such cells are widely used in hearing aids, hence commercially available and easily replaced by the user. These batteries have an active power-delivery life-span up to two weeks allowing for long-duration continuous power.
Battery replacement is easy and can be done by the user!

Optional I.R. Data-Coder

This extremely small add-on allows recording of an infrared pulse code along-side the analogue channels and accelerometer.

Docking Station & Data Handling

The NAT device is provided with a single-channel docking station, including software, for download of data from flash via USB. A multiple docking station will soon be available. Once downloaded, the data are available for further processing in .txt, .csv and edf standard!

Help and Advice

Thanks to the cooperation with the University of Aberdeen, via multidisciplinary expertise we are available to provide user-defined solutions for electrophysiological applications, including:

- Neuroscience / Behaviour / Electrophysiology
- Experimental (disease) models
- Surgical procedures
- Equipment validation
- Data Analysis

Ordering Information

55103	**NAT Device**
55104	**Optional IR Module**
55101	**Docking Station,** including
	55100-010 Data Download Software

Multiple System packs are also available

Accessories

We offer accessories for EEG implantation and recording as additional package of support, including screws, wire, connectors, dummies, batteries.

Specs.

Parameter	*Limits*	*Units*
Analogue inputs	4	channels
Bits per channel recorded	12	bits
Accelerometer	3	Axis
Bits per Accel. Axis	8	bits
Sample rate (max)	1000	Sa/Sec x 4 ch
Data Capacity	4 or 8	Gbits
Recording Time	72 hours at 250Sa/s 48 hours at 500Sa/s 18 hours at 1000Sa/s	
Analogue Resolution	0.5µV	
Select. Analogue mV range	+/- 0.75, +/-1.75, +/-3.75	
Accelerometer range	Selectable 2 or 8	G (G-force)
Accelerometer sensitivity	18 72	mG at 2G range mG at 8G range

Physical

Dimensions	:	18x22x10(h)mm
Weight	:	<2.2grams including battery
Warranty	:	24 months

Bibliography

- "**On the identification of sleep stages in mouse electroencephalography time-series**" J. Neurosc. Methods, Mar **2015** https://doi.org/10.1016/j.jneumeth.2015.03.007
- **"Evaluating a Miniature Multisensor Biosignal Recorder for Unsupervised Parkinson's Disease Monitoring"** Sensors & Transducers, 184:1, Jan **2015**
- "**Detection of time-, frequency- and direction-resolved communication within brain networks**" Nature Scientific Reports, Jan **2018**. https://doi.org/10.1038/s41598-018-19707-1

Blood Pressure Recorder (non-invasive)

Cat. No. 58500 for Rats
Cat. No. 58600 for Mice
Cat. No. 58550 for Rats & Mice

General

The BP RECORDER 58500 combines three main systems

- pressure generation-pressure monitoring system
- a pulse amplifier and
- a thermal-array analog & digital recording unit

with **two auxiliary systems**

- pulse rate measuring and recording
- microprocessor controlled functions to self diagnosis, calibration, signal filtering, signal storage.

Instrument Description

Pressure is transmitted to the tail cuff; as soon the cuff pressure exceeds the diastolic pressure and starts to narrow the tail artery, the amplitude of the recorder pulse wave gradually decreases until the artery is completely constricted (ischemic), the graph becoming a straight line.

This point indicates the maximum internal pressure of the artery (**systolic pressure**) on the paper grid, on which the **actual pressure** of the system is **digitally printed in 10 mm Hg steps.**

At the end of the recording a second pressure measurement can be started, with decreasing pressure. The systolic pressure is indicated, this time, by the return of the pulse tracing.

The animal **pulse rate** can be assessed in real time by a pulse rate counter which picks the signal from the pulse transducer.

INDIRECT MEASURING & RECORDING OF THE SYSTOLIC AND DIASTOLIC PRESSURE IN UNANAESTHETIZED RATS & MICE

Main Features

- graphic printer
- graphic display
- analog output to digital recorders
- pulse transducers of superior performances
- analogue & digital recording of all experiment phases
- reliable pressure generator, providing smooth, stepless pressure build-up

Animal Restrainers

A convenient animal restrainer is provided with the standard package. Our models are particularly suitable, being purposefully designed for this task, as they feature:-

- a conical "muzzle" to confine the animal head
- availability in 4 different diameters for rat and one for mouse, to fit various animal sizes
- telescope-adjustable length
- a quick fit/release back lid with an ample U-shaped tail slot
- convenient ventilation slots and selection of heat conductive materials, to guarantee body heat dissipation.

Optional Rodent Heaters

The **58000-845 Heating Box for Rats** is a compact temperature controlled "cupboard", inside dimension 57(w)x47(d)x20(h) cm, to lodge and prewarm 5 rats, each in its individual holder; **58000-840**, designed **for mice**, has the same dimensions, but it accommodates 6 mouse holders.

Heating Boxes come complete with holders of selectable diameter.

The Air Temperature can be set from room temperature to 39.9°C, in 0.1°C steps, via thumwheel on the front panel

NOTE: The picture features a rat scanner (now discontinued), the scanning feature is not present in heating boxes

Ordering Information

58500 **BP RECORDER**, with accessories for **RAT**: 8mm pulse pick-up, 13mm cuff, 50mm holder
58600 **BP RECORDER**, with accessories for **MOUSE**: 3mm pulse pick-up, 6mm cuff, 30mm holder
58550 **BP RECORDER**, with accessories for **RAT & MOUSE**

Each BP Recorder includes as standard: dedicated software 52050-08, serial cable & USB adaptor, paper roll.

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

Available Tail Cuffs

58000-606 Tail Cuff for Mouse, diam. 6 mm
58000-609 Tail Cuff for Rat, diam. 9 mm
58000-611 Tail Cuff for Rat, diam. 11 mm
58000-613 Tail Cuff for Rat, diam. 13 mm

Available Holders

58000-343 Mouse Holder, 30 mm I.D.
58000-344 Rat Holder, 40 mm I.D.
58000-345 Rat Holder, 50 mm I.D.
58000-346 Rat Holder, 60 mm I.D.
58000-348 Rat Holder, 80 mm I.D.

Optional

58000-840 Mouse Heater, compl. with 6 mouse holders
58000-845 Rat Heater, complete with 5 rat holders of selectable I.D.*

* *if diameter is not specified, the 50mm size will be supplied*

° *pressure cuffs & pulse pick-ups are not included, and should be ordered separately*

Specifications

Pressure Range	50 to 290 mm Hg
Power Requirements	115 or 230 V, 50/60 Hz, 25 W
Weight (net)	Kg 10.6
Shipping Weight	Kg 15.0 approx.
Dimensions	35x35x17(h)cm
Packing dimensions	80x60x44cm

Bibliography

- M. Gerold & H. Tschirky "**Measurement of Blood Pressure in Unanaesthetized Rats**" Arzneimittelforschung 18: 1285-287, **1968**
- M. Gerold & H. Fünfshilling: "**Abhängigkeit der Indirekten Blutdruckmessung an Ratten von der Grösse der Kompressionmanchetten**" Arzneimit-telforschung. 21: 2071-2074, **1971**.

Papers quoting Ugo Basile Model

- L. Testai et alia: "T**he activation of mitochondrial BK potassium channels contributes to the protective effects of naringenin against myocardial ischemia/reperfusion injury**" Biochemical Pharmacol.: 85(11): 1634-1643, **2013**
- A. Kolosov et alia: "I**ntravenous Injection of Leconotide, an Omega Conotoxin: Synergistic Antihyperalgesic Effects with Morphine in a Rat Model of Bone Cancer Pain**" Pain Medicine: 12(6): 923-941, **2011**
- M.A. Gouda et alia: "**Synthesis and anti-hypertensive activity of novel sulphadimidine derivatives**" Med. Chem Res.: 21(11): 3902-3906, **2011**
- J. Tchekalarova et alia: "**Diurnal rhythms of spontaneous recurrent seizures and behavioral alterations of Wistar and spontaneously hypertensive rats in the kainate model of epilepsy**" Epilepsy & Behavior 17: 23-32, **2010**
- C. Bolego et alia: "**Selective estrogen receptor-α agonist provides widespread heart and vascular protection with enhanced endothelial progenitor cell mobilization in the absence of uterotrophic action**" FASEB Journal: fj.09-139220, pub. online **2010**

Blood Pressure Transducer (invasive)

Cat. No. 17844

Easy to fill

High accurancy

Robust, reusable transducer

Typical Applications

- **Arterial or venous blood pressure measurement**
- **Connects to Data Acquisition Systems or Chart Recorders**
- Urodynamic measurement
- Intrauterine Pressure Measurement
- Intracranial Pressure Measurement
- Catheterization
- Intensive Care Unit

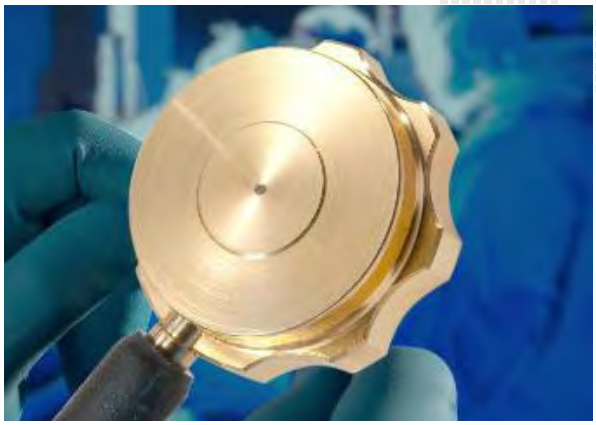
Main Features

- MPG Klasse II b, CE 0470
- Gold plated for easier cleaning
- Only wiping cleaning necessary
- Disinfection/Sterilisation with VIRKON (10 to 30 min) possible
- Short adapter cable with transducer + separate monitor cable
- Dome with "Snap-on" coupling
- Very high frequency response
- High overload protection (10.000 mm/Hg)
- Dome dry-coupled to the transducer

Ugo Basile: more than 25,000 citations

Specifications

Pressure Range	-20...+300mmHg
Overpressure max.	10 000mmHg
Sensitivity	50 µV/V/cmHg
Resonance Frequency	300Hz typical (Transducer and Dome)
Electrical Excitation max.	15V DC or AC
Input Resistance (Input)	700Ohm
Output Resistance (Output)	1000Ohm
Non-Linearity & Hysteresis	max. 0.5% FS
Zero Balance	max. ±30mm/Hg
Thermal Sensitivity Shift	0.15% / °C
Thermal Zero Shift	max. 0.25mm/Hg/°C
Operating Temperature Range	+10...+50°C
Storage Semperature Range	-20... +70°C
Insulation Resistance	min. 103MOhm
Leakage Current	max. 1.5µA at 250V-50Hz
High Voltage Resistance	10KV between Dome and Transducer
Length of Adapter Cable	ca. 30cm
Length of Monitor cable	ca.250cm
Connector	see "compatibility"



Compatibility

Before ordering, check the connection compatibility of your amplifier/recording System.

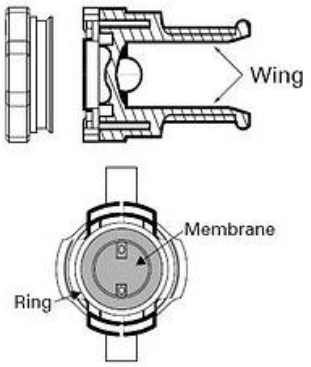
The Pressure Transducers are normally supplied with a connector (type -F) designed for Ugo Basile **DataCapsule-*Evo* Recorder** (see datasheet).

If the customer wishes to make use of other recording apparatus, the transducers can be supplied with appropriate connector on request: we will be glad to provide transducers with different connectors, if available, or to provide witing information and instruction.

Domes

The 17844 is provided with a dome provided with with stop cock. The dome has wings, for easy fitting on the transducer.

The dome should be filled bubbleless at max. pressure of 50mmHg



Ordering Information

17844 **Pressure Transducer "Sensonor", type SP-844,** complete with one dome 17844-001 lodged in its plastic case.

Accessories

17844-001 **Clear Polycarbonate Dome** (with Luer-Lock Fitting), complete with 3-way stopcock

17844-002 **Set of 10 Clear Polycarbonate Dome** (with Luer-Lock Fitting), complete with 3-way stopcock

Physical

Weight	0.024Kg (without cable) 0.2Kg (with cable)
Shipping Weight	0.4Kg
Shipping Dimensions	46x38x27cm

MouseOx *Plus*

Pulse Oximeter for Mice & Rats

General

The MouseOx® is the world's first and only patented **non-invasive** vital signs monitor, for small laboratory animals; specifically designed for mice, it can be used on larger rodents too!

The MouseOx and The MouseOx Plus® are being used by over 1,500 researchers and veterinarians from Universities, Pharmaceutical Companies, and CRO.

It is fully controlled by PC with a **user-friendly interface.**

The new **MouseOx Plus®** uses the same technology as the original MouseOx® but also includes significant improvements:

- the enhanced signal processing ability improves response to the motion of conscious subjects; the pulse signal is maintained and quickly re-acquired following significant movement.
- the modular software design allows the end user to purchase only the functionality that is needed.
- measurement of core body temperature is now available
- the optional Multiplexer makes it possible to monitor up to 16 animals (or 8 animals with temperature), using 1 MouseOx Plus.

Anesthetized Subjects

Conscious Subjects

MRI Compatible

SMALL ANIMAL VITAL SIGNS MONITOR

Main Features

- Simple non-invasive sensor clips for mice and rats
- Monitor data in real time while recording
- USB plug-and-play, user-friendly interface
- High accuracy at heart rates up to 900 BPM
- Works on neonates through adults

General

The **MouseOx Plus Small Animal Vital Signs Monitor** provides the following measurements:

- Arterial Oxygen Saturation
- Heart Rate
- Breath Rate
- Temperature (optional)
- Pulse Distention
- Breath Distention

MouseOx Plus® works with both mice and rats; there are 16 variations of the MouseOx® sensor available to accommodate various sensor placement options on mice and rats, ranging in size from neonatal mice to rats over 500gm. The subject must have a heart rate of at least 90 BPM and no greater than 900 BPM.

The MouseOx® oxygen saturation measurement has only been validated with mice and rats, but the instrument is being used in many research projects on subjects other than mice and rats. Some examples include Guinea pigs, hamsters, rabbits and small primates such as marmosets.

Cardiopulmonary Data Recorder

When used as a Cardiopulmonary Data Recorder, the MouseOx Plus provides:

- Quick Check of Vital Signs
- Real-time Changes in Heart Rate, Breath Rate & O2 Saturation
- Oxygen Saturation During Hypoxemia
- Analog Data Output

Surgery Monitor:

When used as a Surgery MonitorMouseOx Plus:

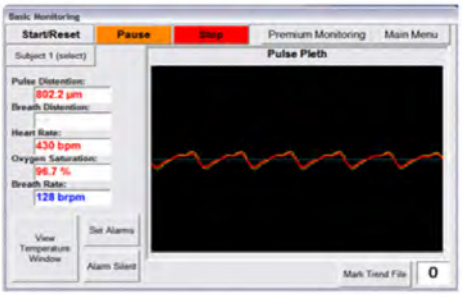
- Prevents Hypoxia During Surgery
- Titrates Mechanical Ventilation
- Ensures Proper Depth of Anesthesia
- Titrates Supplemental Oxygen

Features:

- Immediate responding, beat-by-beat measurements
- High accuracy at heart rates up to 900 BPM and breath rates up to 600 BrPM
- Drawing of blood is not required for any reason
- Simple non-invasive sensor clip enables quick and easy attachment to the subject
- USB plug-and-play technology easily turns your Windows based PC into a low cost physiologic monitor
- Monitor data in real-time, while recording to a file
- Experiment event markers allow the user to mark important events in the data file
- Enhanced signal processing ability improves response to the motion of conscious subjects

Standard Software and Options

The **Standard software** includes basic monitoring and parameter alarms for all of the vital signs provided by the MouseOx Plus; it is included with all MouseOx Plus systems and is intended for basic monitoring applications.



The **Premium Monitoring & Recording Software** includes trending charts, real time recording options, file markers for noting important events, and a quick averaging diagnostic feature for spot-checking

The **Conscious Applications Software** includes enhanced filters and control algorithms to allow the MouseOx® Plus to monitor conscious unrestrained subjects, and provides a subject activity measurement

MRI software allows for the use of the MRI sensor.

Ordering Information

015000	**MouseOxPlus System**, Operation **110V** *
015001	**MouseOxPlus System**, Operation **230V** *
015007	**Premium** Monitoring & Recording Software
015017	**MRI Module**, including Software, 20' Sensor with 15' Copper Wire and 5' Fiber Optic, 2 Mouse Thigh Clips, 2 Rat Foot Clips
015002	**Conscious** Applications Module

Sensors

* Two sensors, selectable when ordering, are included free of charge with each MouseOxPlus System:

CollarClip™ available in XS, S, M, L, XL, 2XL size
ThroatClip™ available in XS, S, M, L, XL, 2XL size
Mouse Thigh sensor, Rat Foot Sensor

Physical

Dimensions	16x12x4(h)cm
Weight	2Kg
Shipping Weight	5Kg approx.
Packing	50x39x17cm

NOTE : Manufacturer's warranty for MouseOx & accessories is limited to 12 months.

Metabolic Cages

Cat. No. 41700-002, -004, -005 for Rats
Cat. No. 4170-003, -033 for Mice

General

These carefully engineered metabolic cages, manufactured by TECNIPLAST, are designed for simplicity of operation and total part interchangeability and feature a unique funnel/cone design which effectively separates faeces and urine and collects them into vials outside the cage.

All components below the cage floor are removable without upsetting the test animal and thus preventing behavioural artifacts.

Four models are available for either rats or mice; their dimensions comply with current USA animal welfare regulations. See Ordering Information for basic metabolic cages.

The Tecniplast Metabolic Cages feature a unique funnel and cone design that effectively separates faeces and urine into tubes outside the cage.

There's **no urine washover** and no potential for urine to enter the faeces tube, so separation is immediate and complete. The results are untainted and the samples reliable.

The cage performs well with either mice (in group) or rats; a single mouse cage of new design is also available. Space saving and great visibility are facilitated by the 12-cage rack.

RELIABLE

DURABLE

- **Practicality of use**
- **Flexibility**
- **Space saving**

NEW
see also 41853, with food/drink and activity analysis

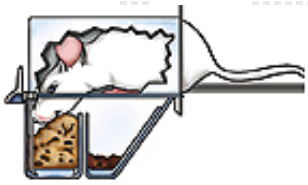
- Unique design and high quality materials, to maximize reliability and endurance.
- Every component is designed to be interchangeable to provide maximum flexibility
- Separation apparatus featuring low-adherence plastic materials: **perfect separation and collection** of faeces and urine
- Easy to remove feeder and collection tubes: feed filling and samples collection without disturbing the animals on test.

Cage Components

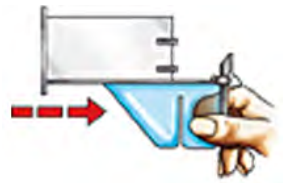
The Metabolic cage components are:

- an **Upper Chamber,** made of smooth, gnaw-proof materials. ● a **Feeder Chamber**, located outside cage. Size discourages rodent from nesting or sleeping inside. The drawer slides out for easy filling without disturbing the animal
- a **Collection funnel** and **separating cone**, unique design and non-wetting PMP ensure immediate, complete separation of faeces and urine
- a **Faeces Collection tube**, made of non-wetting PMP. Pellets roll down side of funnel to be collected in tube. Unlocks with single twist from outside of cage, without disturbing the animal.
- a Support grid of stainless-steel lets excreta pass through the conveniently spaced bars; mouse cage includes mouse-sized grid.

Cage Design

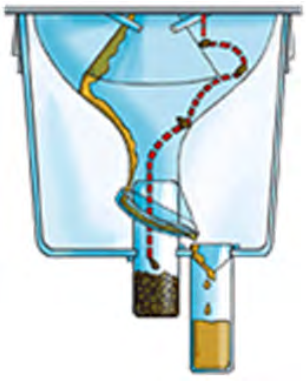


Two-part **feeder chamber l**ocated outside the cage. The front chamber catches spilled food so faeces won't be contaminated. Feeder sizes prevent rodent from nesting or sleeping inside. Available in five sizes.



Drawer slides out of feeder chamber for easy filling, without disturbing animal.

Calibrated to accurately measure intake. Drain diverts overflow into collection tube so **water** can't contaminate urine.



Urine flows along the inside surface of the **collection funnel** and is directed by the urine ring directly into the urine collection tube.

A simple twist unlocks either faeces or urine tube. No need to dismantle cage or disturb animal.

Entire **lower section** of the cage can be easily removed.

Convenient for cleaning during multi-phase investigation.

Standard Cage Dimensions

The cage upper chamber, is available in two sizes:

- for mice and rats up to 300g, with a surface of 320 cm^2 and a height of 14 cm;
- for rats over 300g, with a surface of 450 cm^2 and a height of 18 cm.
- In the single-mouse cage, the usable floor area is 200cm^2 with an internal height of 13cm

Surface and height are comply with current regulations.

Net weight	:	6Kg
Gross weight	:	10Kg
Packing dimensions	:	67x42x53cm

Ordering Information

BASIC METABOLIC CAGES

41700-002	Metabolic Cage for rats up to 150g
41700-003	Metabolic Cage for mice
41700-004	Metabolic Cage for rats 150 to 300g
41700-005	Metabolic Cage for rats over 300g
41700-003	Metabolic Cage for mice (groups)
41700-033	Metabolic Cage for single mouse

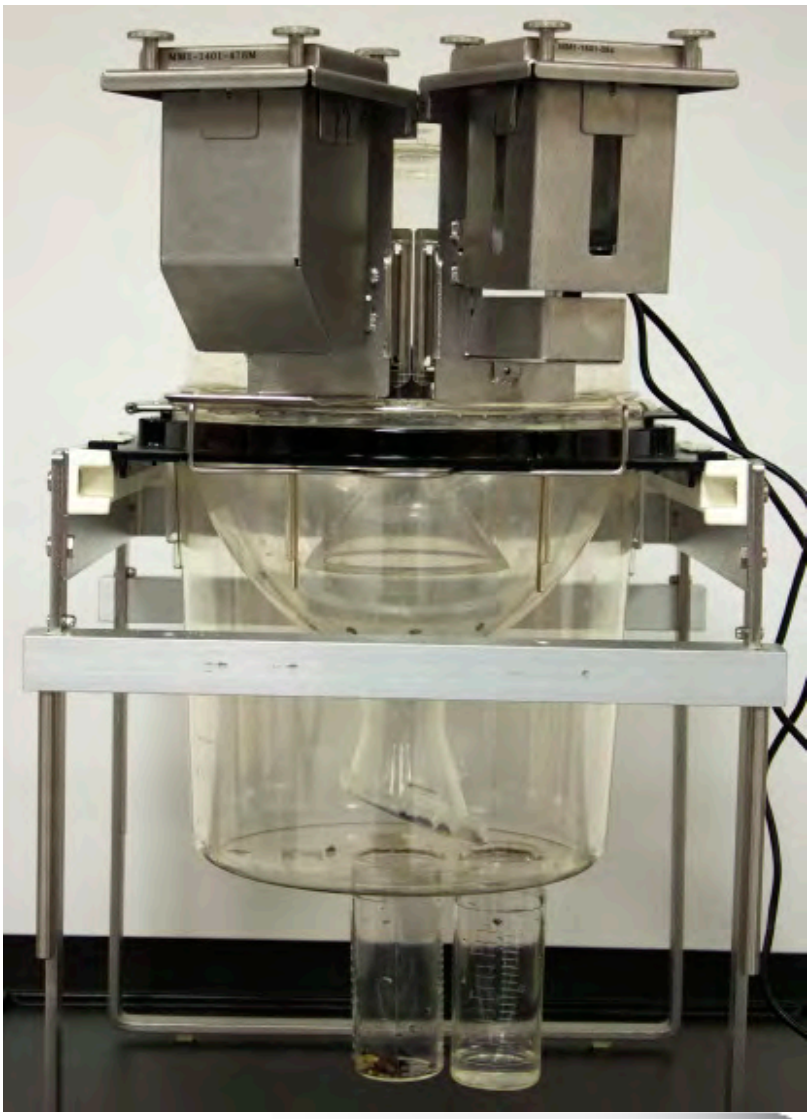
Above models include a single cage stand (except 41700-033 which is self-standing

3M12D100	Vertical Rack for 12 Metabolic Cages, suitable for models 41700-002/005. Dimensions 124x48x190 cm

Metabolic Cages

with Feeding/Drinking Analysis

Cat. No. 41853



General

Ingestive behavior sustains life, but in some forms can lead to serious conditions as obesity, diabetes, and chronic inflammation.

Understanding the signals that initiate ingestion and satiety require synchronized data with high temporal resolution, especially if the pattern of Ingestive events is important.

Animal models (for example, obese and diabetic mice) exhibit symptoms similar to those in humans.

When closely monitored model organisms reveal relevant differences that may correlate with those of human disorders in vital parameters such as feeding/drinking (quantity & frequency of food/drink uptake), activity (with optional I.R. motion detectors) and excretion (the latter assessed by volume or weight).

Ugo Basile introduces a new higher resolution model of feeding analiser, resulting from our cooperation with SABLE SYSTEMS International, worldwide leader in metabolic and intake measurement.

for Mice only

DESIGNED TO MEASURE:
- FEEDING BEHAVIOUR
- EXCRETORY FUNCTIONS
- ACTIVITY (OPTIONAL)

SABLE inside

INNOVATIVE DESIGN

- facilitates retrofitting of Ugo Basile older models of Mouse Feeding Analyser
- makes upgrade from simple Metabolic Cage to Feeding Analyser extremely easy!

For all types of investigations on METABOLISM, including:

- preclinical trials evaluating treatments for anorexia
- addiction/aversion to particular substances
- thirst arousing and quenching mechanism
- feeding habits and their modification brought about by environmental conditions or toxicity

This innovative ingestive behavior system includes:

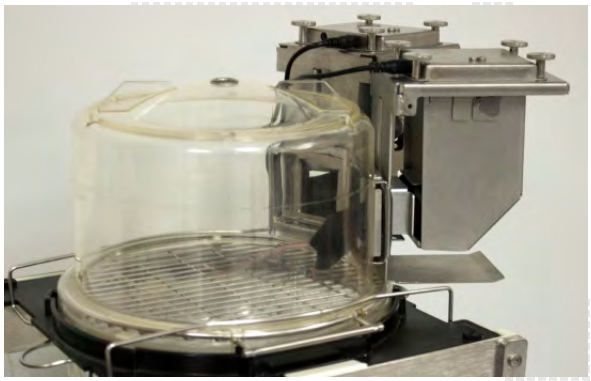
- **a basic Metabolic Cage**
- **a mass measurement system**
- **an interface and software routine**
- **an optional activity sensor**

Basic Cage Design

These carefully engineered metabolic cages are manufactured by TECNIPLAST, see separate datasheet, for separation and quantification of urine and faeces.
All components below the cage floor are removable without upsetting the test animal.

Feeding and Drinking Analysis

Basic Metabolic Cages are upgraded with the addition of the FiWi High-ResolutionFood and Water Systems, for intake quantification and meal patern analysis.



At the heart of the system is the Sable MM1 food and water load sensor, providing high quality results.

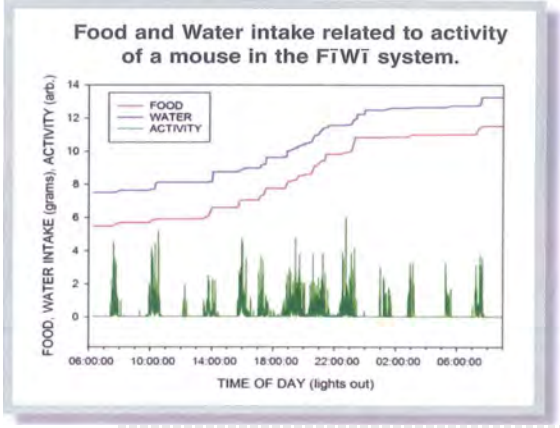
Activity Detection

This versatile option measures the ambulatory activity of the rodent can be measured via the optional Environmental Sensor Array (ESA), monitoring environment and activity.

The ESA Environmental Sensor Array also provides monitoring of light and sound level, barometric pressure, cage temperature, and relative humidity, all relevant data for the animal welfare and test repeatability.

Data Recording

Data are recorded and analysed by software/interface package 41850-010 which includes EXPEDATA (data analysis) and METASCREEN (data acquisition) software and IM-2 Interface Module.



Ordering Information

METABOLIC CAGES WITH FOOD & DRINK RECORDING PROVISION

41853 Feeding/Drinking Monitoring system: one Mouse Metabolic Cage, provided with stainless-steel food and water hoppers, precision mass monitoring unit (0-1000g, 3mg resolution) & cage controller, plus software/interface pckg. 41850-010
41853-X2 Sistem of 2 Metabolic Cages, as above
41853-X3 Sistem of 3 Metabolic Cages, as above
41853-X4 Sistem of 4 Metabolic Cages, as above
41853-X5 Sistem of 5 Metabolic Cages, as above
41853-X6 Sistem of 6 Metabolic Cages, as above
41853-X7 Sistem of 7 Metabolic Cages, as above
41853-X8 Sistem of 8 Metabolic Cages, as above

Product Specifications (MM1 sensor)

Rated Load: up to1Kg
Resolution: 0.002g RMS at 2s digital filtration
Sensor Type: Quad strain gauge
Data Precision: 24bits (better than 1 part in 500,000)
Operating Temperature: **-20 to 60°C**

Optional

41850-005 SSI Environmental Sensor Array (ESA)

Product Specifications (ESA sensor)

Light sensor: 0.05 to 10,000 Lux (auto ranging); resolution: 0.05 Lux-1 Lux
Sound sensor: 20 -100+ dB range
Temperature: range 0-60°C, resolution: 0.01°C
RH Sensor: range 0-100% (non condensing), resolution: 0.01%
Barometric Pressure: range 40-110 kPa, resol. 0.001 kPa

New Microwave Brain Fixation System

Cat. MMW-05 (5kW)

General

In neurochemical studies of the brain, it is of great importance to measure accurately neurochemical events in vivo.

However, it is difficult to perform reproducible measurement of these events because rapid post-mortem changes occur in the brain concentrations of metabolites and neurotransmitters.

With the NEW Microwave Brain Fixation System by Muromachi, a living mouse or rat is positioned inside the applicator and, in less than 1 second, the microwave beam stops all brain chemistry at the level present in the living animal.

Measuring brain chemistry *in-vivo* is possible!

THE FASTEST AND MOST EFFECTIVE KNOWN METHOD OF HALTING BRAIN CHEMICAL ACTIVITY

brain fixation occurs in 1 second

activity of degrading enzymes is blocked

Prior to analysis of:

- Phosphorylated proteins
- Acetylcholine, Serotonin, Endorphins
- Prostaglandins, Catecholamines
- C-AMP, C-GMP, GABA, DOPA

NEW features:

- Improved usability - touch screen
- Air-cooled (no water circulation)
- CE-certified
- Absolute safety - negligible leakage

Ugo Basile: more than 25,000 citations

Various techniques have been developed to **prevent post-mortem changes**. One of the more common method is cooling or freezing by immersion of the decapitated head in liquid Nitrogen or cooled Freon to **inactivate enzymes** involved in the metabolism of these compounds.

Cooling is not fully effective in preventing post-mortem changes as the time required to freeze deep structure of the brain may range from 10 - 90 seconds; post mortem changes will occur during this period.

An alternate method is microwave heating to inactivate enzymes.

The microwave method has several advantages over cooling or freezing:

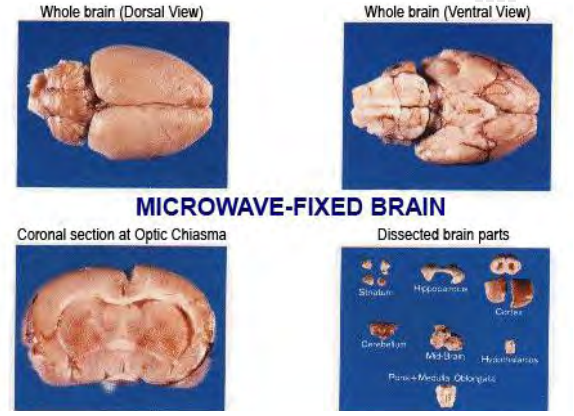
- The enzymes in the whole brain can be completely inactivated in a very short time
- The brain can be dissected easily and reproducibly at room temperature

Microwave fixation system must satisfy the following criteria:

1. elevate the temperature of brain up to 75-90°C as rapidly as possible, by effectively focusing microwave energy on the animal head
2. give the same results from animal to animal
3. be easily and safely used by personnel not experienced in microwave

Instrument Description

Thanks to Patented Microwave Focus Applicators, microwaves are channeled and focused by the wave guide from above the head, rather than in front. The entire animal head is placed in a uniform microwave field. Movements of the head do not change the field strength or microwave distribution.

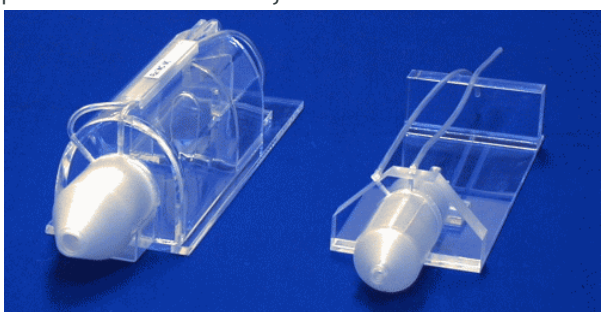


Uniform fixation of the whole brain is thus achieved, without "over cooking" and damage to the hypothalamus.

Muromachi's unique applicators provide protection to the researcher and also compensate for individual differences between animals, giving more reproducible results.

The Muromachi Microwave Fixation Systems are safely designed, so that the microwave leakage will not exceed 1 mW/cm2 (well below the safety standards).

The Microwave Fixation System comes with specific applicator heads and water-jacketed animal holders:



Ordering Information

MMW-05 **Microwave Fixation System 5KW**, including 1 Applicator head and 1 animal holder, to be selected

Applicator heads

TAW-174P	for mouse holder
TAW-424SP	for rat holder WJR-S
TAW-424MP	for rat holder WJR-M & L

Water-Jacketed Animal Holders

WJM-24	for mice 15-20g
WJM-28	for Mice 20-40g
WJR-S	for Rats 150-250g
WJR-M	for Rats 250-400g
WJR-L	for Rats 400-500g

Physical

Power	380-440VAC 20A **3-phase is required**
Dimensions	75(w)x55(d)x128(h)cm
Weight	103Kg
Shipping weight	195Kg
Packing	81x100x132cm

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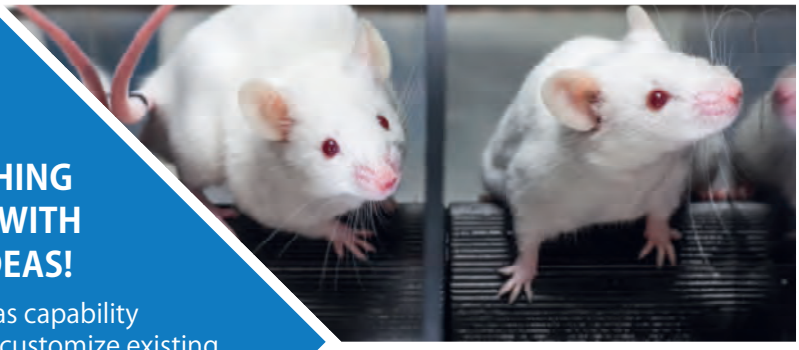
ugo basile®

TRANSFORMING IDEAS INTO INSTRUMENTS



EVERYTHING STARTS WITH YOUR IDEAS!

Our R&D has capability and will to customize existing instruments, or create new instruments from scratch; **researchers trust Ugo Basile to fulfill their need of reliable custom instruments!**

It's true UGO BASILE TRANSFORMS IDEAS INTO INSTRUMENTS.

Just think about the most classical Ugo Basile devices, such as RotaRod and Plantar Test: born of a brilliant idea, designed and industrialized by us in close cooperation with the inventor of the method, they've now become a worldwide standard. **We welcome your ideas!**

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