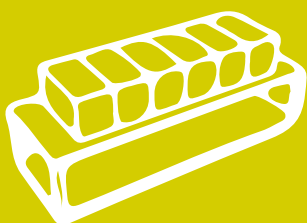


Instruction manual

ANALGESY-METER



ugobasile.com

Cat. No 37215

Pain and Inflammation



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INTO INSTRUMENTS



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25.000 citations

SAFETY CONSIDERATIONS

Although this instrument has been designed with international safety standard, this manual contains information, cautions and warnings which must be followed to ensure safe operation and to retain the instrument in safe conditions.

Service and adjustments should be carried out by qualified personnel, authorized by ugo basile organization.

Any adjustment, maintenance and repair of the opened instrument under voltage should be avoided as much as possible and, when inevitable, should be carried out by a skilled person who is aware of the hazard involved.

Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source of supply.

37215

Instruction Manual

dated June 2019

Revision 4



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PAIN and INFLAMMATION

Analgesy-Meter

Randall-Selitto Paw Pressure Test

Cat. No. 37215

now available with
optional upgrade to

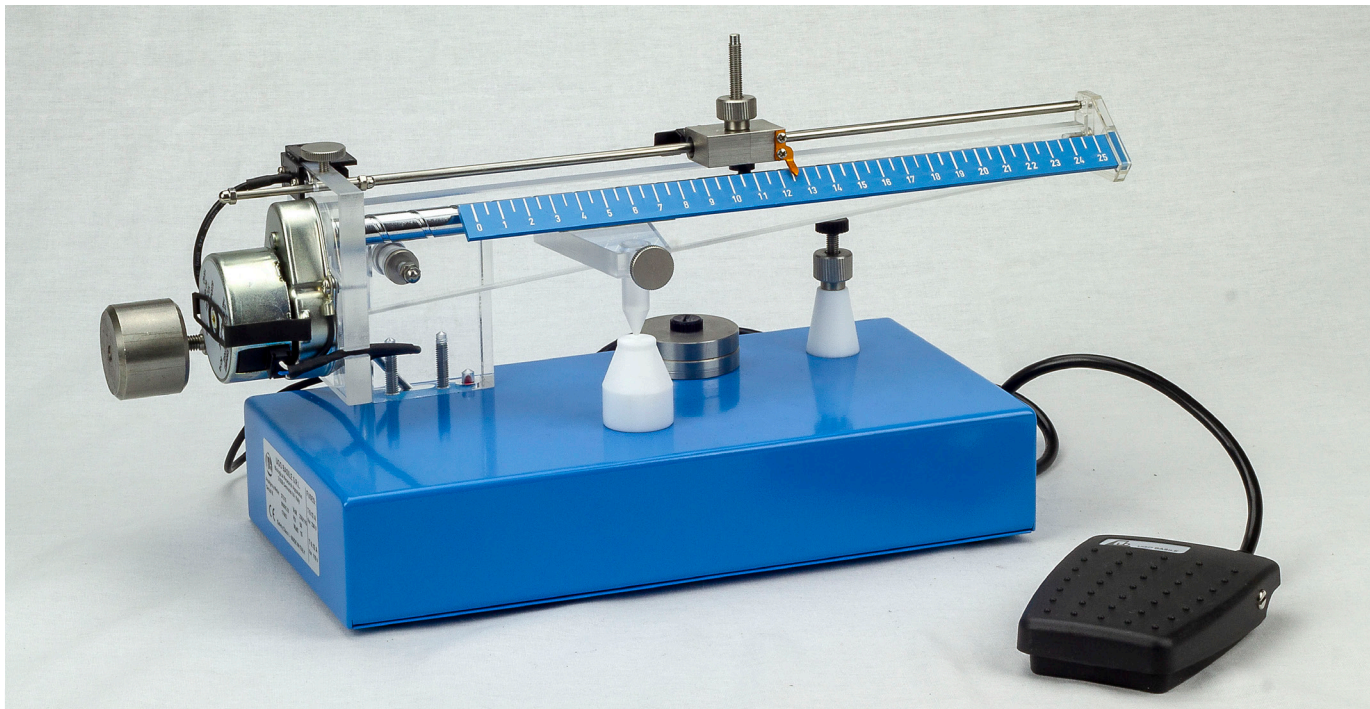
digital reading

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**

Ugo Basile: more than 25,000 citations



ugo basile[®]

TRANSFORMING IDEAS
INTO INSTRUMENTS

CHECK-LIST

- 37215 Analgesy-Meter**
 37216 Analgesy-Meter for Mouse

CLIENTE / CUSTOMER _____

Ordine No. / Order No. _____ Data / Date ____ / ____ / ____

UB code	CAT.No.	✓	Q.ty	DESCRIPTION	DESCRIZIONE
37215					
E-WP 008			1	MAINS CABLE EUROPE	CAVO RETE EUROPA
E-WP 008-1				U.S.A.	
M-CM 458-F-1	37215-303		1	PEDAL SWITCH	PEDALE
E-FT 001-1			2	FUSE T125mA	FUSIBILE T125mA
M-LM 446	37215-323		2	ADDITIONAL DISC (37215)	PESO AGGIUNTIVO (37215)
M-LM 446	37215-322		1	STANDARD PUSHER (cone-shaped)	CONO DI PRESSIONE (a cono)
E-AU 041	37215-302		1	INSTRUCTION MANUAL (on USB drive)	MANUALE DI ISTRUZIONE su chiavetta USB
37216					
E-WP 008			1	MAINS CABLE EUROPE	CAVO RETE EUROPA
E-WP 008-1				U.S.A.	
M-CM 458-F-1	37215-303		1	PEDAL SWITCH	PEDALE
E-FT 001-1			2	FUSE T125mA	FUSIBILE T125mA
M-LM 716-F	37216-323		2	ADDITIONAL DISC (37216)	PESO AGGIUNTIVO (37216)
M-LM 446	37215-322		1	STANDARD PUSHER (cone-shaped)	CONO DI PRESSIONE (a cono)
	37215-326		1	PUSHER (chisel-shaped)	CONO DI PRESSIONE (a scalpello)
E-AU 041	37215-302		1	INSTRUCTION MANUAL (on USB drive)	MANUALE DI ISTRUZIONE su chiavetta USB

DATE / /	Serial No.	IMBALLATO DA / PACKED BY	
Set for			
<input type="checkbox"/> 115V 50 Hz	<input type="checkbox"/> 230V 50 Hz	<input type="checkbox"/> 115V 60 Hz	<input type="checkbox"/> 230V 60 Hz

IMPORTANT/IMPORTANTE:

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

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

FROM: Name	Company/Institution
DATE	REF.

NOTE

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Analgesy-Meter

Cat. 3 7 2 1 5 / 3 7 2 1 6

1 GENERAL

The 37215 is the up to date version of the classical 7200 which, since 1965, is helping to perform a rapid precise screening of analgesic drugs in a number of academic and industrial laboratories, according to the Randall-Selitto test, see paragraph 7.4-BIBLIOGRAPHY.

The 37215 features a weight displacing screw driven by a low voltage geared motor, to increase safety, and an optical switch to measure the start/stop time-lag (hence the force at which the animal struggles).

2 INSTRUMENT DESCRIPTION

2.1 The Method

The Basile Analgesy-Meter has been designed to perform rapid precise screening of analgesic drugs on the normal and inflamed rat paw, according to the Randall-Selitto test.

The instrument is basically a device which exerts a force increasing at a constant rate (a certain number of grams per second). This force is continuously monitored by a pointer moving along a linear scale.

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 plinth is made of TEFLON, which is biologically inert and has a very low friction coefficient. Thus, if the animal suddenly withdraws its paw, it slips out easily without being injured.

The operator depresses a pedal-switch to start the mechanism which exerts the force.

When the rat struggles, the operator releases the pedal and reads off the scale the force at which the animal felt pain.

2.2 The Force Exerting Mechanism

The pusher (1), see figure 1 & 2, is mounted on a bracket (2) fixed to an arm (3), which pivots on a fulcrum.

The paw is placed between plinth (4) and pusher (see the colour picture on the leaflet). When the pedal is depressed, the geared motor (5) starts, thereby rotating the screw (6), which moves the slide (7) along the scale (8).

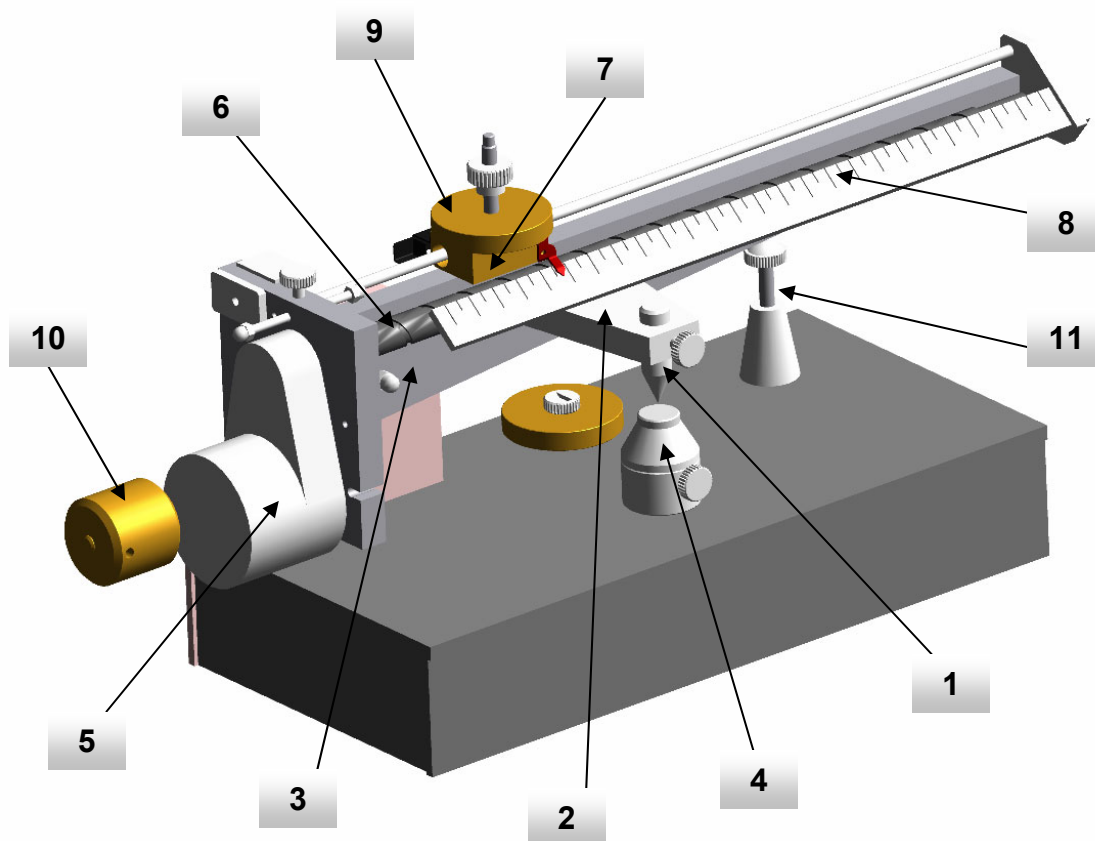


Figure 1, "Front View"

The force applied to the paw by the plinth increases at a constant rate, being the motor synchronous with mains frequency: its speed (60 RPM) is constant, unaffected by friction and wear, thus enabling perfect reproducible measurements to be made.

The motor stops immediately if the pedal is released.

The force is measured on the scale calibrated in 10-gram steps, by a pointer riveted to the slide (7); for example, 11 means 110 grams.

The standard 37215 can be conveniently used with mice. However, a dedicated mouse model 37216 is also available, when lower pressure (50%) is desirable. The 37216 includes a specific slide and 50% reduced additional weights, a standard and a chisel-shaped pusher, which make easier applying pressure to the small mouse paws.

A transformation kit 37215-327 (rat to mouse) is also available, see paragraphs 7.2-Optional and 6.3-Transforming a standard 37215 into a Mouse model.

Consider that model **37216** features a lower pressure (50%) application; hence each reading should be divided by 2. In our example, 11 means 55 grams.

2.2.1 Additional Weights

The scale can be multiplied by 2 or 3, by placing on the slide one or two discs (9) provided with the 37215. For instance, by adding one disc on the slide, the force will be 240 g,

when the pointer indicates 12. With the pointer in the same position, by adding two discs on the slide, the force will be 360 g.

The 37216 special model for mouse is complete with special half-weight discs.

2.2.2 Force Increasing Rate

Since the screw pitch is 16 mm and the geared motor turns at 60 RPM, the slide moves at the speed of 16 mm per second. The instrument is geometrically designed to increase the force on the paw at a rate of 16 grams per second (16x2 with one disc added, 16x3 with two).

The rate at which the force increases has been found to be a satisfactory compromise for normal operation.

Excessively high speed reduces the duration of the test but entails larger error caused by variations in the operator's reaction time when he/she releases the pedal.

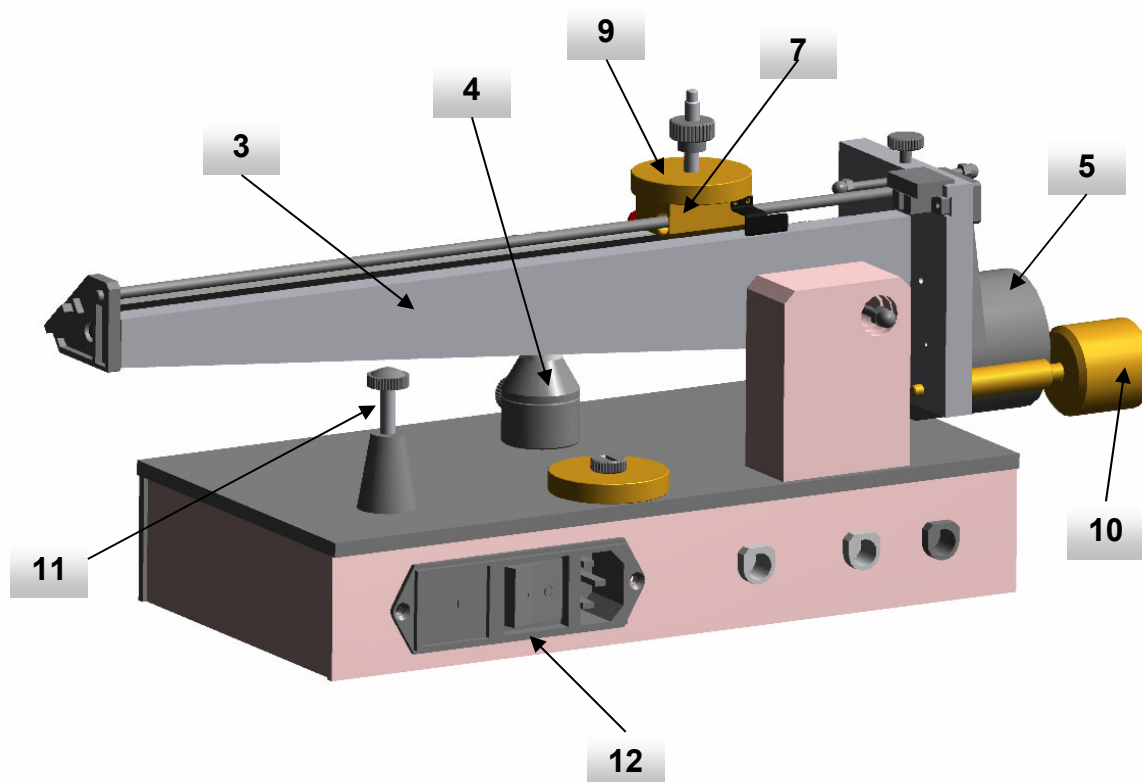


Figure 2, "Back View"

On the other hand, if the speed is too low, the animal is restrained for a longer period, which is inconvenient for the operator and may cause the animal to make spurious movements before it actually feels pain.

2.2.3 Arm Balancing

The arm (3) carries also a calibration weight (10), which can be turned in or out to a limited degree in order to balance the arm.

In practice, however, it is simpler to leave the arm slightly off balance in such a way that a small initial force is exerted on the paw. This helps to retain the paw in the correct position at the beginning of the experiment.

This slight initial force brings about a small error equivalent to an increase in the actual force as compared with that indicated on the scale.

However, this error is constant in every measurement and every multiplication of the scale, i.e., the addition of one or more discs does not affect the measurements and their comparative values.

After each test, the slide should be returned to its starting position by lifting and pushing it back to the left. Do not remove the knurled nut on the slide as, even if there are not additional discs, the calibrated weight of the slide includes the nut.

3 INSTALLATION

3.1 Unpacking & Preliminary Check

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

If the instrument is damaged, inform the carrier immediately, notifying our company. If after having tested it, the Analgesy-Meter fails to meet rated performances, please contact our after sales service, see paragraph 6.5-Customer Support.



Protect the environment!

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

3.2 Notes on the Instruction Manual

The 37215 Instruction Manual included in the package (on the USB pen drive) is necessary for the correct installation and operation of the instrument.

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

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

Our Instruction Manuals are available as free download on our web. For any additional information and/or assistance, you are welcome to contact our Service Department (see paragraph 6.5-Customer Support), specifying the serial number of your instrument.

3.3 Before Applying Power

Consider the Power Module (12, see drawing 2), left on the back panel, which encompasses – from left to right - the fuse holder & the voltage selector, the mains switch and the inlet connection of the mains cord:

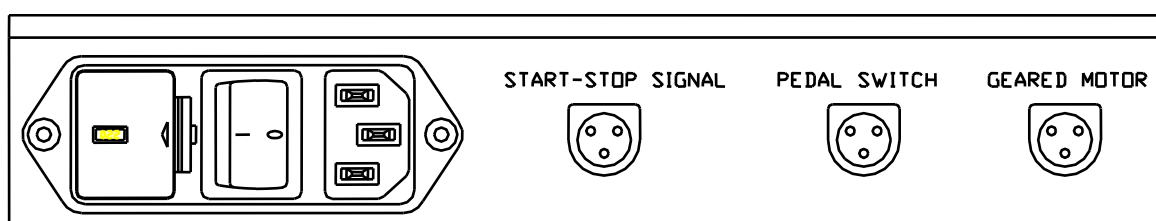


Figure 3, "Back Panel"

3.3.1 Mains Switch

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

- **OFF** when pressed to the right ("O" side)
- **ON** when pressed to the left ("I" side)

3.3.2 Fuse Holder & Voltage Selector

The fuse holder comprises two fuses, one on the live, and the other on the neutral. For both operation at 220-230 Volts and at 115 Volts, we recommend 125 mA timed fuses (type T125). To replace the fuses, see paragraph 6.2.

The fuse holder also embodies the Voltage Selector. Make sure that the flag indicates the correct voltage (i.e., the voltage of your mains). To change the selected voltage, see paragraph 6.2.

3.3.3 Mains Cord

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

3.4 Connections

Three low voltage connectors (for maximum safety of the operator) are located on the right side of the back panel of the instrument, which also lodges the mains module (see drawing 2 in paragraph 3.3), labelled:



START-STOP SIGNAL: the start-stop signal connection enables the operator, to connect the Analgesy-Meter to the optional Analgesy-Meter DAQ 37215-100, see paragraph 5-DATA ACQUISITION and 7.2-Optional (*)

PEDAL SWITCH: insert the male connector of the pedal switch cable until it locks into its socket; a “click” confirms it is locked;

GEARED MOTOR: this connector supplies low voltage power to the geared motor. Insert the male connector of the geared motor until it locks into its socket; a “click” confirms it is locked.

Accidental mismatch does not cause any circuit damage.

(*) For connection to the optional Analgesy-Meter DAQ 37215-100, please refer to the related instruction manual.

3.5 Intended Use

The Analgesy-Meter is intended for investigation use on laboratory animals only.

3.6 General Safety Instructions

The following guidelines must be followed to ensure safe operation.

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



3.7 Additional Safety Consideration

- a. Use original accessories and spare parts only, see also paragraph 7-ORDERING INFORMATION.
- b. immediately disconnect and replace damaged mains cord.
- c. do not operate in hazardous environments or outside prescribed environmental limitations (i.e. +10c° / +40c°, 95% max. relative humidity, non-condensing), see also paragraph 7.2-Optional.
- d. do not spray any liquid on the connectors and on the geared motor, see also paragraph 6-MAINTENANCE.

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

- incorrect electrical supply;
- incorrect installation procedure;
- incorrect or improper use or, in any case, not in accordance with the purpose for which the instrument has been designed and the warnings stated in the instruction manual supplied with the instrument;
- replacement of original components, accessories or parts with others not approved by the manufacturer;
- servicing carried out by unauthorized personnel. place your analgesy-meter on a steady flat surface.
- do not obstruct a comfortable access to the power module.

3.8 Notice for the Customers in Japan

The geared motor turns at 60 RPM if the mains frequency is equal to the one indicated on the instrument plate. See also paragraphs 7 and 2.2.2.

In case a 37215 rated 50 Hz works at 60 Hz, the driving screw will turn at a speed 20% higher; 20% lower in the opposite case.

The force applied to the paw at a different rate may impair the experiment consistency, in particular if you compare the results gathered by two Analgesy-Meters and one of them is fed by the “wrong” mains frequency.

In case of doubt, ask for advice; geared motors rated 50 or 60 Hz are generally available at stock and they are easily interchangeable without special tools.

4 OPERATION

4.1 Preliminary

Make sure the mains cord and the pedal switch cables are properly connected, then switch on the instrument using the switch located on the power module.

The ON position is confirmed by the LED placed at the base of the arm-supporting block; check that the driving screw turns when the pedal switch is pressed.

4.2 Carrying out the Test

Position the slide (7) on the left end of the scale, with the pointer indicating zero, then check the arm balancing (see paragraph 2.2.3). Adjust the position of the pusher to ensure that the arm (3) is horizontal for a given thickness of the paw.

An adjustable travel limit column (11) is provided to prevent the pusher to strike the plinth, when the animal withdraws its paw; separate plinth and pusher by a 1-2 mm gap.

Start the test; release the pedal as soon the animal struggles to a noticeable degree (whether or not this is accompanied by a cry). Read off the force and move the slide back to zero by lifting and pushing it back to the left.

Some experience is required to hold the animal. It should struggle only when the force applied to its paw reaches the threshold of pain and not simply because of the position in which it's held by the operator.

Do not hold the animal with its belly upwards, as it will normally struggle to regain a natural position, which may lead to a faulty reading.

It is advisable to start the experiment with the range of pain response in the lowest third of the scale, if necessary by adding extra weights, so as to enable the activity of the drug to be evaluated, since the drug itself will cause the range of response to shift toward higher values.

4.3 Reading the Results

The following tables provides a correspondence between the figure you read on the ruler (in red) and the corresponding applied force in grams (blue for 37215, green for 37216), respectively with no extra weight, with one and with two weights:

4.3.1 Standard Model 37215

Units →	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	cm
0 weight	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	g
1 extra weight	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	g
2 extra weight	0	30	60	90	120	150	180	210	240	270	300	330	360	390	420	450	480	510	540	470	600	630	660	690	720	750	g

4.3.2 Mouse Model 37216

Units →	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	cm
0 weight	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	g
1 extra weight	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	g
2 extra weight	0	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	g

5 DATA ACQUISITION

The 37215 Analgesy-Meter is provided with a photoelectric switch, which monitors the start of the force exerting motion; the *flag* of the switch is fastened to the slide, the emitter/receiver combination is fastened to the motor supporting plate.

The Analgesy-Meter's connector placed on the instrument's back panel (labelled **START-STOP SIGNAL**, see paragraph 3.4-Connections) connects to the optional Analgesy-Meter DAQ 37215-100 via the USB cable provided with the 37215-100.

The **37215-100** is a new useful tool which makes it possible to upgrade UB Analgesy-Meters to digital.



Figure 4: "Analgesy-Meter 37215 with optional DAQ 37215-100"

A specific pressure sensor and the related controller, transform any UB Analgesy-Meter into a fully digital device.

...and last, but not least, the upgrade kit is designed to fit all existing Ugo Basile Analgesy-Meters (provided with photoelectric switch), for retrofitting old models too!

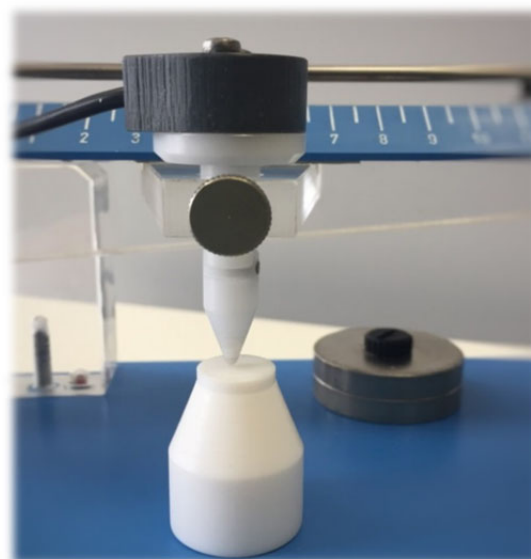


Figure 5: "Optional Pressure transducer"

For operation, please refer to the 37215-100 specific manual.



Keep in mind that the readings obtained on the mechanical scale and those obtained by the electronic sensor may differ slightly.

This is a normal behavior of the instrument due to the fact that the mechanical scale reads the full force applied to the paw, while the electronic reading represents the linear components of the force itself.

It is up to the experimenter's preference to rely on one or the other method; none of them is *right* or *wrong*, but what matters is to consistently refer to one or the other method, because they are not equal, as explained above.

6 MAINTENANCE

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



UNPLUG THE MAINS CORD BEFORE CARRYING OUT ANY MAINTENANCE JOB!

6.1 Mechanical

The Analgesy-Meter requires a minimum of maintenance. Protect it from dust when not in use; dust has in fact an abrasive action on Perspex parts when these are often cleaned.

Organic solvents should not be used for cleaning purposes as they can impair the Perspex surfaces.

Loose dust may be removed with a dry brush or a mild detergent on a soft cloth. **Do not spray any detergent or water on the connectors and on the geared motor.**

All the moving parts, including fulcrum ball bearings, are designed to operate maintenance-free. **DO NOT LUBRICATE!**

6.2 Electrical

To inspect and/or replace the fuses, **disconnect the mains cable first!** Insert a miniature screwdriver in the slot indentation, see drawing 2 in paragraph 3.3, and snap out the slide which houses the fuses.

For operation at both 220-230 Volts and 115 Volts, we recommend 125 mA timed fuses (type T125).

Having extracted the fuse slide, the Voltage selector becomes accessible. The same miniature screwdriver will help you to pry out the cross jumper on which the operation voltage is engraved. Place the jumper upside down if you have to shift from 115 to 230V or viceversa.

Snap in the fuse slide, until the “click” ensures that it is locked. Check the voltage flag before applying electrical power.



When shifting from 115 to 230V or viceversa, **you should also pay attention to frequency:** the Analgesy-Meter employs a different motor for the two frequencies, hence a 37215 meant for 50Hz will not work correctly at 60Hz, and viceversa.

Check the frequency on the silver label attached to the instrument.

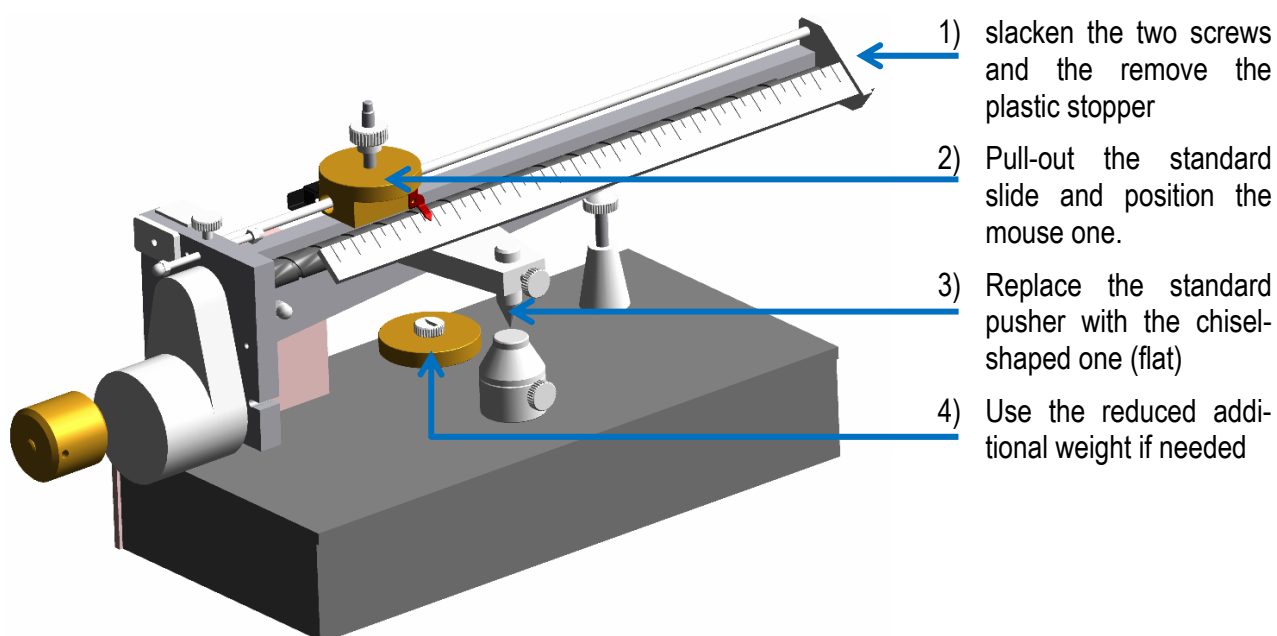
6.3 Transforming a standard 37215 into a Mouse model

The optional kit **37215-327** (see paragraph 7.2) includes the necessary components to transform a standard 37215 into a mouse specific device, with reduced (50%) applied forces, see also paragraph 4.3-Reading the Results.

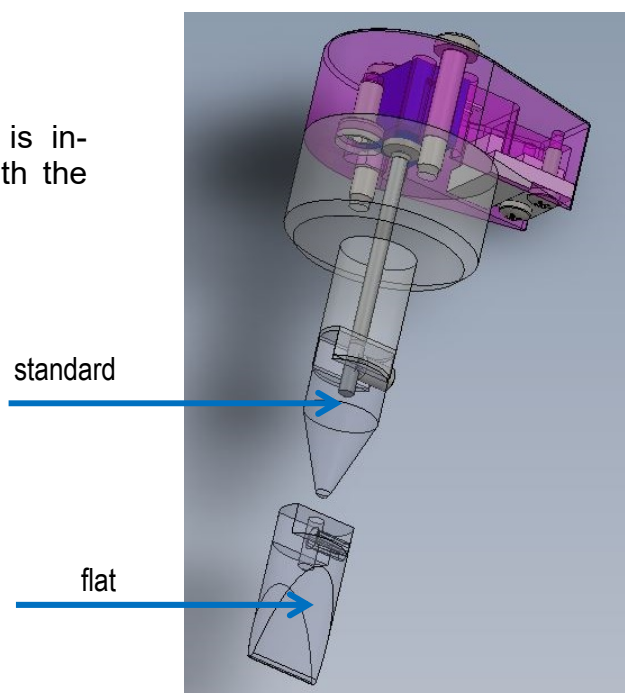
The kit includes:

- A specific slide
- A chisel-shaped pusher
- Two 50% reduced additional weights

The replacement is easily done, following the steps indicated in the drawing below:



If an Analgesy-Meter with digital reading is involved, replace the standard pusher tip with the flat tip



6.4 Long Inactivity

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

6.5 Customer Support

For any further information you may desire concerning the use and/or maintenance of the Analgesy-Meter and accessories, please do not hesitate to contact our **service department** (or our local distributor) either directly or via our [contact page](#):



UGO BASILE s.r.l.

Via G. Di Vittorio 2
21036 GEMONIO – Varese, ITALY



Phone : +39 0332 744574



service@ugobasile.com
logistics@ugobasile.com
sales@ugobasile.com

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

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

7 ORDERING INFORMATION

37215 Analgesy-Meter, standard, complete with following standard accessories:

- 37215-303** Pedal Switch, complete with cable
- 37215-322** Standard Pusher (1)
- 37215-323** 2 Additional discs Disc M-LM 446 (9), see also 2.2.1
- E-WP 008** Mains Cord
- E-FT 001-1** 2 Fuses T125mA
- E-AU 041** USB pen drive, including:
 - 37215-302** Instruction Manual (on USB pen drive)

37216 Analgesy-Meter, low pressure model, suitable for Mouse, with following standard accessories:

- 37215-303 Pedal Switch, complete with cable
- 37215-322 Standard Pusher (1)
- 37215-326 Pusher (special chisel-shaped model)
- 37216-323 2 Additional discs Disc M-LM 716-F (9), see also 2.2.1
- E-WP 008 Mains Cord
- E-FT 001-1 2 Fuses T125mA
- E-AU 041 USB pen drive, including:
 - 37215-302 Instruction Manual (on USB pen drive)

7.1 Other available components

- 37215-320 (50 Hz) Geared Motor (5)
- 37215-330 (60 Hz) Geared Motor
- 37215-321 Plinth (4)
- 37215-324 Counterweight (10), complete with DELRIN set screw
- 37215-325 Slide Plastic Pad (helical tooth which engages the driving screw)



NOTE :

Analgesy-Meter is available for operation at 115 or 230 Volts, 50 or 60 Hz. Please specify mains voltage and frequency when ordering.

7.2 Optional

- 37215-327 Mouse Kit, to transform a 37215 into a 37216 (including slide, 2 additional weight (50%) and 37215-326 pusher)

37215-100 Analgesy-Meter DAQ, including

- 37215-001 Electronic Unit
- 37215-002 Paw-Pressure Transducer
- 38500-323 External trigger switch (foot pedal)

37215-BUNDLE Bundle Analgesy-Meter and DAQ

37216-BUNDLE Bundle Analgesy-Meter and DAQ, mouse

7.3 Specifications

Operation

Start / Stop	by pedal switch
Power Requirement	115/230 Volts, 50/60 Hz
Reading	index position on ruler, see paragraph 4.3-Reading the Results
Force Range	<u>3 force ranges:</u> 37215 from 0 to 250, 500, 750 grams 37216 from 0 to 125, 250, 375 grams
Power Consumption	15 W max.
Connection to PC	via 37215-100 Analgesy-Meter DAQ, see paragraphs 5-DATA ACQUISITION and 7.2-Optional
Operating Temperature	10° to 40° C
Sound Level	negligible
Physical	
Total Weight	3.3 Kg
Shipping Weight	5.4 Kg approx.
Dimensions	46 x 16 x 14 cm
Packing Dimensions	55 x 45 x 36 cm
Warranty	
Warranty	367215 / 37216 are covered by a 24-month warranty.

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