Assessment of sensory motor and coordination is an important part of behavioral studies. Behaviors result from the integration of environmental sensory stimuli and their conversion within the central nervous system into motor commands.

The notion of brain-body-environment interaction refers to causal effects. Simplistically, sensory inputs causally affect motor outputs, and these motor outputs in turn causally affect sensory inputs. Such “perception-action loops” is crucial to any biological organism or artificial system that possesses the ability to react to the environment. Integration of the sensory perception and motor output occurs in the cerebellum and the basal ganglia. Both structures project by many neural pathways to the motor cortex, which commands movements to the muscles, and to the spinocerebellar tract, which provides feedback on the position of the body in space (proprioception). Consequently, cerebellum and basal ganglia are responsible of smooth, coordinated movements and a disturbance of either system will show up as disorders in fine movements, equilibrium, posture, and motor learning, as observed in Parkinson’s or Huntington’s diseases.

Studying neurobiological mechanisms of these common diseases is therefore essential to find efficient therapeutic strategies. To do so, various behavioral tasks have been developed in laboratory rodent models and are largely validated. Moreover, because behavioral experiments typically measure motor coordinated responses to sensory information, assessment of these abilities is required for the interpretation of results of experiments designed to assess other neurobiological processes.
# Rota Rod Test

The Rota Rod is a standard test of motor coordination, balance and fatigue in rodents. The animals are placed on moving lanes rotating at different speeds or under continuous acceleration, and the time latency to fall from the Rota Rod is recorded.

### Reasons for Choosing This Test
- Easy to perform test
- Allows multi-animals sessions
- Allows evolution curves of performance
- Sensitive for both rats and mice

### Reasons for Not Choosing This Test
- Poor in detecting minor deficits or improvements in coordination
- Needs habituation sessions

### Related Human Disease/Applications
- Motor Phenotyping
- Drug Screening
- Parkinson’s Disease
- Huntington’s Disease
- Alcohol Dependence
- Aging

---

# Grip Strength Test

The purpose of this test is to evaluate the limb motor or muscular functions in rodents. It represents a complementary test to the Rota Rod. Subjects are pulled by the tail while they are allowed to grasp a grid or a bar. The maximum force applied to the grid or the bar just before they lose grip is recorded.

### Reasons for Choosing This Test
- Easy and rapid test
- Sensitive for both rats and mice

### Reasons for Not Choosing This Test
- High variability in the response
- Habitation to the response inducing a loss of motivation when measurements are performed at short interval
- Influenced by user handling (need training)

### Related Human Disease/Applications
- Neuromuscular Diseases
- Phenotyping
- Drug Screening
- Parkinson’s Disease
- Huntington’s Disease
- Aging
### Behavioral Test
#### Startle Response to Acoustic and Tactile Stimulus

The startle response is a brainstem reflex elicited by an unexpected acoustic or tactile stimulus. The evaluation of startle reflex response (and its habituation) to acoustic or tactile stimulus of different intensities is widely used for the detection of sensorimotor gating and hearing deficiencies in phenotyping evaluations.

**Reasons for Choosing This Test**
- Neurological phenotyping for motor and sensory capabilities
- Objective measurement: automated detection of startle reflex
- Sensitive for both rats and mice

**Reasons for Not Choosing This Test**
- Restraint conditions (habituation phase needed)
- Non-specific influence of attention processes

**Related Human Disease/Applications**
- Neurological Phenotyping
- Hyperekplexia
- Auditory Deficits
- Parkinson’s Disease
- Huntington’s Disease
- Schizophrenia

### Behavioral Test
#### Prepulse Inhibition of Startle Reflex

Prepulse Inhibition (PPI) paradigm is commonly used to evaluate sensorimotor gating as well as attentional processes involved in information selection processing. The startle response is a brainstem reflex elicited by an unexpected acoustic or tactile stimulus. In the prepulse inhibition test, sensorimotor gating is assessed by evaluating the characteristics of the innate reduction of the startle reflex induced by a weak prestimulus. This test measures pre-attentive processes that operate outside of conscious awareness and is widely used in animal models of diseases marked by an inability to inhibit, or “gate” irrelevant information in sensory, motor, or cognitive domains.

**Reasons for Choosing This Test**
- Reproduces the same paradigm used in humans to detect attentional and sensorimotor gating disorders
- Objective measurement: automated detection of startle reflex
- Sensitive for both rats and mice

**Reasons for Not Choosing This Test**
- Restraint conditions (habituation phase needed)
- Influenced by non-specific effects on sensorimotor gating

**Related Human Disease/Applications**
- Drug Screening
- Phenotyping
- Attention-Deficit Hyperactivity Disorder (ADHD)
- Schizophrenia
- Autism
- Obsessive Compulsive Disorder
- Huntington’s Disease
- Nocturnal Enuresis
- Tourette’s Syndrome
### Behavioral Test

#### Rotameter Test

Rotational behavior has proved a popular technique for screening the behavioral effects of a wide variety of lesions, drugs, and other experimental manipulations on the brain of rodents. This test is widely carried out in experiments using animal models of Parkinson disease with unilateral lesions in the dopaminergic nigrostriatal system in which the number and direction of animal rotations in quantified after apomorphine treatment.

**Reasons for Choosing This Test**
- Rapid and easy-to-do test
- Can be entirely automated

**Related Human Disease/Applications**
- Drug Screening
- Parkinson’s Disease

**Reasons for Not Choosing This Test**
- Intensity and duration of the exercise cannot be controlled
- Certain lines of transgenic mice may not engage in enough voluntary wheel running exercise to produce training adaptations
- Not suitable for studies that require precise timing to explore acute post exercise adaptations (intermittent running throughout the active cycle)

### Behavioral Test

#### Activity Wheel

The Rodent Activity Wheel represents a very simple and clever way to register animal physical activity in its home cage environment. The use of this high throughput tool is particularly relevant for research involving circadian rhythms, phenotyping and drug testing. The time and distance run on a voluntary running wheel are monitored over several days or weeks to determine whether a particular substance or experimental manipulation has an effect on exercise behavior.

**Reasons for Choosing This Test**
- Rodent voluntary exercise registering: allows animals to exercise when and at the intensity that they choose
- Accessibility to running wheel may reduce the effects of chronic stress on depression-like signs in mice
- Less labor intensive than treadmill running as researchers need not to be present during wheel running
- Relatively inexpensive setup
- Ideal for high throughput experiments; many animals can be trained at the same time
- Sensitive for both mice and rats

**Related Human Disease/Applications**
- Drug Screening
- Phenotyping
- Neuromuscular Disease
- Parkinson’s Disease
- Muscular Dystrophy
The animal is placed on the roller lane of the Rota Rod and the timer is started. When the animal drops safely into its own lane, the time latency to fall (minutes and seconds) and rotation speed are automatically recorded. A removable upper separator for rat models is included to prevent interference between animals running in adjacent lanes.

The Rota Rod is controlled by an advanced microprocessor which provides precise timing control and ultra-accurate speed regulation. Rotation can be electronically set at a constant speed (4-40 rpm) using a dial on the front panel. Alternatively, acceleration rate may be selected at a defined time (30 sec., 1, 2, 5 or 10 min). Acquired data is saved in the form of a table-lanes/trials. The Panlab/Harvard Apparatus Rota Rod is also provided with a computer interface enabling easy exportation of data through RS-232 serial port in a format that is compatible with Excel™.

**Specifications**

<table>
<thead>
<tr>
<th>Unit Dimensions</th>
<th>362 (W) x 240 (D) x 400 (H) mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Hood</td>
<td>100 (H) mm</td>
</tr>
<tr>
<td>Lane and Rod Dimensions-Rats</td>
<td>75 (W); 60 mm rod diameter</td>
</tr>
<tr>
<td>Lane and Rod Dimensions-Mice</td>
<td>50 (W); 30 mm rod diameter</td>
</tr>
<tr>
<td>Material Composition</td>
<td>Methacrylate, arnite (lanes)</td>
</tr>
<tr>
<td>Constant Speeds</td>
<td>4-40 RPM</td>
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<tr>
<td>Acceleration Rate</td>
<td>30 seconds, 1, 2, 5, or 10 minutes</td>
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<tr>
<td>Computer Requirements</td>
<td>PC (Windows® 95, 98, ME, NT, 2000, XP &amp; Vista 32)</td>
</tr>
<tr>
<td>Maximum Number of Stations</td>
<td>1 per computer (multiple set-ups also available under request)</td>
</tr>
<tr>
<td>Certifications</td>
<td>CE compliant</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>110/220 V, 50/60 Hz</td>
</tr>
</tbody>
</table>

**Order # | Model | Product**
--- | --- | ---
BH2 76-0237 | LE 8200 | Accelerating Rota Rod for 5 Mice Including SeDaCom Software
BH2 76-0238 | LE 8300 | Accelerating Rota Rod for 4 rats Including SeDaCom Software
BH2 76-0239 | LE 8500 | Accelerating Rota Rod for 4 Rats or 4 Mice Including SeDaCom Software
BH2 76-0114 | LE 7000 | Thermal Printer

**Options**

- BH2 76-0114: LE 7000 Thermal Printer
- BH2 76-0237: LE 8200 Accelerating Rota Rod for 5 Mice Including SeDaCom Software
- BH2 76-0238: LE 8300 Accelerating Rota Rod for 4 rats Including SeDaCom Software
- BH2 76-0239: LE 8500 Accelerating Rota Rod for 4 Rats or 4 Mice Including SeDaCom Software

**Citations**


Grip Strength Meter

The grip strength meter allows the study of neuromuscular functions in rodents by determining the maximum force displayed by an animal. This test is included in the Functional Observational Battery (FOB) to screen for neurobehavioral toxicity. In this context, changes in grip strength are interpreted as evidence of motor neurotoxicity.

The grip strength meter is positioned horizontally and the subjects are held by the tail and lowered towards the apparatus. The animals are allowed to grasp the metal grid or T-bar and are then pulled backwards in the horizontal plane. The force applied to the grid or to the bar just before it loses grip is recorded as the peak tension. This force can be measured in kilograms, grams, pounds or Newtons.

Data output is carried out through RS-232, printer, or chart recorder. Depending on the grid type used, grip strength can be measured from the front or hind paws.

### Key Features
- Stand alone system, PC optional, not required
- Fits to rats and mice with a simple change of grip accessories
- Multi-units display: kgs, grams, lbs, Newtons
- New and unique internal computations allows direct reading of average value, standard deviation and variability for subjects and up to 100 animals

### Parameters Measured
- Maximum force developed by the front and hind paws

### Components Included
- Display unit with RS-232 connection for PC
- Metal stand
- Grid or bar (one or two grids/bar)
- Instruction manual
- 1 year warranty

### Options
- RS-232 cable
- RSIC software
- Additional grid/bar
- Statistical impact printer with cable

### Specifications

<table>
<thead>
<tr>
<th>Dimensions of 2 Grid System</th>
<th>750 (W) x 180 (D) x 200 (H) mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensor Capacity</td>
<td>0-2 kG (20N)</td>
</tr>
<tr>
<td>Sampling Speed</td>
<td>1000 Hz</td>
</tr>
<tr>
<td>Measurement Range</td>
<td>0 to 2000 grams</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 gram</td>
</tr>
<tr>
<td>Accuracy</td>
<td>0.2 % of full scale</td>
</tr>
<tr>
<td>Material Composition</td>
<td>Stainless steel (Grid)</td>
</tr>
<tr>
<td>Power Supply</td>
<td>110 V/220 V</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions of Single System</th>
<th>400 (W) x 180 (D) x 200 (H) mm</th>
</tr>
</thead>
</table>

### Citations


Kozinska J et al. (2009) Spironolactone potentiates the protective action of some selected antiepileptic drugs against maximal electroshock-induced seizures in mice. Annales UMCS, Pharmacia. 22(1):123-134. (mouse, Poland)


Akhtar M et al. (2008) Effect of thiopental on oxidative stress markers in middle cerebral artery occlusion model of focal cerebral ischemia in rats. Human & Experimental Toxicology. 27(10):761-767. (rat, India)
Grip-Strength Meter

Both the Grip Strength Meter for Rats and the model for Mice are used with this Peak Amplifier. It automatically discriminates whether the grip force is generated by the rat and mouse transducer and expresses them in grams and in decimal of grams respectively.

The data supplied by the peak amplifier is available in digital and analog form. The waveform of the pull can be externally recorded, for example via a channel recorder or the signal may be taken to a data acquisition system.

Grip-Strength Meter is Supplied
Complete with the Following Components

- Peak Amplifier, incorporating a digital display
- Force Transducer suitable for either Rats or Mice
- Trapezes for either Rats or Mice, T-shaped bar for either Rats or Mice
- Perspex Plate with 10 mm diameter upright
- Open-Side Boss Head
- Table Clamp
- Mains Cable
- Set of 2 fuses for either 115 V or 230 V operation
- Instruction Manual

Order #  Model  Product
BH2 72-6713  47105  Grip-Strength Meter for Rats
BH2 72-6715  47106  Grip-Strength Meter for Mice

REPLACEMENT PARTS
BH2 72-6717  47105-002  Force Transducer Assembly for Rat
BH2 72-6718  47105-003  Force Transducer Assembly for Mouse
BH2 72-6719  47105-004  Perspex Plate with 10 mm Diameter Upright
BH2 72-6723  47105-323  Table Clamp
BH2 72-6725  4003  Open-Side Boss Head

Grip-Strength Meter

This system measures the force that is required to make a mouse or rat release its grip. It is ideal to measure the effects of drugs, toxins, muscle relaxants, disease, aging or neural damage on muscle strength.

The rat or mouse is placed over a Perspex plate, in front of a grasping bar, either T-shaped or trapeze-shaped. Rodents instinctively grab anything they can to try to stop this involuntary backward movement. The will continue to grip the trapeze until the pulling force overcomes their grip strength. After the animal loses its grip, the peak preamplifier automatically stores the peak pull force and shows it on a liquid crystal display.

The sensor mechanism is a T-shaped or trapeze-shaped bar whose height is adjustable. The bar is fitted to a force transducer connected to the Peak Amplifier. The Mouse unit is similar to the rat model except the grasping trapeze is proportionately sized for mice and the transducer sensitivity is adjusted to measure the grip strength of mice.

A complete system is comprised of the follow components:

1. A base plate of black sand-blasted Perspex, complete with upright and open-side boss-head
2. A grasping-bar (a grasping trapeze is also supplied)
3. A force transducer of adjustable height, provided with connection cable and connector to the peak amplifier
4. A peak amplifier

Peak Preamplifier
Rodent Activity Wheel

The Rodent Activity Wheel represents a very simple and clever way to register animal voluntary physical activity in its home cage environment.

The use of this high throughput tool is particularly relevant for research involving circadian rhythms, phenotyping and drug testing. The animals are housed individually in the home cages equipped with the running wheel.

The total number of wheel rotation made by the animal is displayed on the external LE907 individual counter or LE3806 multi-counter devices. LE3806 multi-counter allows storing the data in user-defined time intervals and exports them to the SeDaCom PC interface (through RS-232 serial port) in a format compatible with Excel™.

Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Ø Wheel</th>
<th>Lane Width</th>
<th>ACE* Cage Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>LE904</td>
<td>36 cm</td>
<td>10 cm</td>
<td>42 (W) x 26 (D) x 19 (H) cm</td>
</tr>
<tr>
<td>LE905</td>
<td>16 cm</td>
<td>6 cm</td>
<td>36 (W) x 20 (D) x 14 (H) cm</td>
</tr>
</tbody>
</table>

* Other brands are available under request

Order # Model  Product

BH2 76-0412 LE904 Activity Wheel and Cage, Rat
BH2 76-0413 LE905 Activity Wheel and Cage, Mouse

OPTIONS

BH2 76-0414 LE907 Single Wheel Counter
BH2 76-0243 LE3806 Multi-Center (up to 30 wheels) including SeDaCom PC interface
Rodent Activity Wheel and Cage

**Key Features**
- Easy measurement of rodent activity
- For mice, rats and hamsters
- All stainless steel wheel construction
- Clear polycarbonate cage for visibility and strength

**Rodent Activity Wheel**

This Rodent Activity Wheel provides an easy, convenient method for measuring lab rodents’ physical activity in response to chemical or environmental stimuli. It is especially useful for research involving circadian rhythms or pharmaceutical testing. The Rodent Activity Wheel and Cage package comes complete with: stainless steel activity wheel, wheel hub and support, sheet and activity wire lids and polycarbonate cage with cut away bottom and stainless steel floor grid.

The Activity Wheel allows the animal to exercise voluntarily. It has long-lasting, low-friction Teflon TFE bushings for quiet, smooth action. The stainless steel hub and support rod provide strength and durability and the wide wheel allows small to large animals to exercise. A magnetic switch with LCD counter is available as an accessory for recording animal activity on the wheel, counted as wheel revolutions. The magnetic switch can be used with both the rat and mouse wheels.

The clear polycarbonate cage has glass-like clarity and excellent impact strength. The cut-out bottom allows changing of bedding and removal of excreta without disturbing the animal. (Meets NIH floor space requirements for a single rodent). A solid stainless steel lid covers the opening at the edge of the Activity Wheel while a wire lid with exclusive lid locks fasten securely to the cage body. These lids prevent the animal from escaping. The wire lid incorporates a water bottle support with rubber stopper guard and a U-shaped food hopper for pellets.

**Specifications**

**Dimensions:**
- Overall, H x W x D: 36.4 x 26.8 x 50 cm (14.25 x 10.375 x 19.5 in)
- Wheel, OD x W: 34.5 x 9 cm (13.5 x 3.5 in)

**Floor Area:**
- Cage: 929 cm² (144 in²)
- Cage with Wheel: 516 cm² (80 in²)

**Order # | Product**

**FOR RATS**

| BH2 60-1943 | Rat Activity Wheel and Cage |
| BH2 60-1944 | Polycarbonate Waste Tray Collects Excreta, H x W x D: 3.5 x 28 x 45 cm (1.375 x 11.125 x 17.5 in); Requires Use of BH2 60-1945 Support Stand, see below, pkg. of 1 |
| BH2 60-1945 | Support Stand for Cage and Waste Tray for Rat Cage, Stainless Steel, Supports One Activity Cage with Wheel and Waste Tray; Allows Removal of Waste Tray without Disturbing the Cage or Animal |
| BH2 60-0506 | Polycarbonate Water Bottle for Rat Cage, 500 ml Glass Clear and Shatterproof. Extremely Rugged. Permanent, Molded-in Graduations for Easy Measurement. Complete with Chew-Proof Type 316 SS Cap and Sipper tube. Exclusive 1.8 mm Sipper Tube Opening Minimizes Spontaneous Dripping |
| BH2 60-1946 | Magnetic Switch with LCD Counter, the Magnetic Switch Counts Whole Revolutions of the Activity Wheel. Operates on an Extended-Life Battery (Included). A Safety Lock Position on the Reset Button Helps Eliminate Accidental Resettings. Assembly Required to Connect Unit to the Activity Wheel and Cage. Works with Both Rat and Mouse Wheel. |

**FOR MICE**

| BH2 60-2429 | Mouse Activity Wheel and Cage |
| BH2 60-2425 | Polycarbonate Waste Tray for Mouse Cage |
| BH2 60-2423 | Support Stand for Cage and Waste Tray for Mouse Cage |
| BH2 60-2424 | Polycarbonate Water Bottle for Mouse Cage |
| BH2 60-1946 | Magnetic Switch with LCD Counter, see Description Above |
Rotameter for Evaluating Rotation Behavior

Key Features
- Rotation sensor with adjustable TTL output signal
- Configuring experiment duration and time intervals of counting
- Counting the number of partial and complete left and right turns
- Adjustable harness with velcro
- Computer interface included

Parameters Measured
- Number of partial and complete left and right turns

Components Included
- Rotation sensor and support
- Animal harness
- Container (either a bowl or a cylinder)
- SeDaCom software
- Cables and connectors
- Instruction manual
- 2 year warranty

Options
- Double counter (left & right turn)
- Programmable counter with 30 inputs (up to 15 Rotameters) and SeDaCom software

Rotameter
Rotational behavior has proved a popular technique for screening the behavioral effects of a wide variety of lesions, drugs, and other experimental manipulations on the brain of rodents. This test is widely carried out in experiments using animal models of Parkinson’s Disease with unilateral lesions in the dopaminergic nigrostriatal system.

The subject wears an adjustable harness with velcro connected to the rotation sensor by a flexible tie. Wide ranges of harnesses are available to fit different animal sizes. The subject is then placed into a transparent container (cylindrical or oval) with a lateral support for a vertical stand.

A bi-directional rotation sensor provides a double (right and left turns) output with adjustable regulation of pulses/turns (between 3 and 36 pulses per complete turn). Experiment duration and time intervals of measurement can be set. An external multicontroller LE3806 is necessary for data storage; it counts the number of partial and complete left and right turns depending on the adjustments made on the rotation sensors.

The computer interface SeDaCom allows easy exportation of data (through RS-232 serial port) in a format compatible with Excel™.

Specifications
- Fraction of Turn: 4 to 36 fraction of a circumference (selectable)
- Dimensions of the Containers: 400 mm diameter
- Computer Requirements: PC (Windows® 95, 98, ME, NT, 2000, XP & Vista 32)

Order #   Model           Product
BH2 76-0241 LE902       Rotational System Including Rotation Sensor, Rat or Mouse Harness, Bowl or Cylinder Container
BH2 76-0242 LE902-CC     Double Counter (Left & Right Turns)
BH2 76-0243 LE3806       Programmable MultiCounter with 30 Inputs (up to 15 Rotameters) and SeDaCom Software
BH2 76-0244 LE902-SR     Left & Right Rotation Sensor, Adjustible Turn Resolution
BH2 76-0245 LE902-AS     Rat Harness with Velcro and Connecting Wire
BH2 76-0246 LE902-MT     Mouse Harness with Velcro and Connecting Wire
BH2 76-0247 LE902-RP     Cylindrical or Oval Container with Supporting Rod

Citations


Bove J et al. (2006) Reversion of levodopa-induced motor fluctuations by the A2A antagonist CSC is associated with an increase in striatal preprodynorphin mRNA expression in 6-OHDA-lesioned rats. Synapse. 59(7):435-444. (rat, Spain)


Segura-Aguilar J et al. (2002) Inhibition of DT-diaphorase is a requirement for Mn3+ to produce a 6-OH-dopamine-like rotational behavior. Neurotoxicity Research, Volume 4, Number 2, 127 – 131 (rat, Chile)

Sensory & Motor
Small Animal Treadmill

Key Features
- Silent operation, even at high speeds
- Accurate control of shock intensity
- Data acquisition software included (SeDaCom)
- Positive/Negative slope
- High performance motor
- Easy to clean

Parameters Measured
- Total distance covered
- Distance covered at each moment
- Accumulated shock time per animal
- Number of contacts with the shock grid

Components Included
- Treadmill unit with RS-232 port
- Allen key
- SeDaCom software
- Cables and connectors
- Instruction manual
- Set of spare fuses
- 2 year warranty

Options
- LE7000 thermal printer
- LE87XXCO air tight option for calorimetry studies (available only on single lane models)

Treadmills
Panlab/Harvard Apparatus treadmills are rolling belts with an adjustable speed and slope, enabling forced exercise training and accurate testing of fatigue in rodents. Different models are available depending on the user’s needs from one to five lanes.

These treadmills have an adjustable speed (up to 150 cm/s) and slope (from -25 to +25 degrees) and a control unit. The rolling belt is built with specially selected materials to guarantee the best performance under conditions of intensive use and requires minimum maintenance. It is also designed with simplicity for keeping it clean.

The lanes (corridors of activity for the animal) have sufficient width for the subject to correct its errors in coordination, thereby allowing an exact measurement of the fatigue without deficiencies in motor coordination.

The unit controls the speed of the belt, shows measured data in its display, provides current to the shocking grid and allows communication with the PC for data storage, via the RS-232 output and SeDaCom software. Belt velocity can also be controlled by software. Parameters measured in a trial are: belt speed and slope, distance travelled, shock time, and shock intensity.

The electrical shock supplied by the grid is of constant intensity (from 0 to 2 mA), that is, the current which circulates through the animal (and therefore its effect) only depends on the value of the mA chosen and not of the subject (quantity of body mass in contact with the bars, perspiration, etc.)

The apparatus can optionally be provided with an air isolated enclosure for respiratory metabolism studies - single lane versions only. Gas analyzer, air supply and switching units as well as software must be purchased separately for use with air tight option.
## Small Animal Treadmill (continued)

### Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Range</td>
<td>Adjustable from 0 to 2 mA</td>
</tr>
<tr>
<td>Belt Speed</td>
<td>Adjustable from 5 to 150 cm/sec</td>
</tr>
<tr>
<td>Running Surface</td>
<td>450 mm long x 100 mm wide</td>
</tr>
<tr>
<td>Running Lanes</td>
<td>1, 2, or 5, depending upon model selected</td>
</tr>
<tr>
<td>Shock Grid</td>
<td>190 mm long x 100 mm wide</td>
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<tr>
<td>Slope Adjustment</td>
<td>From 0° to 25° (negative slope also available upon request)</td>
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<td>Computer Requirements</td>
<td>PC (Windows® 95, 98, ME, NT, 2000, XP &amp; Vista 32)</td>
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<tr>
<td>Maximum Number</td>
<td>1 per computer with SeDaCom</td>
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<tr>
<td>Certifications</td>
<td>CE compliant</td>
</tr>
<tr>
<td>Power Requirements</td>
<td>110V or 220V, 50/60Hz</td>
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</tbody>
</table>

### Order # | Model | Product |
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>BH2 76-0303</td>
<td>LE8700</td>
<td>Rat Single Lane Treadmill Including Shock Source and SeDaCom Software</td>
</tr>
<tr>
<td>BH2 76-0304</td>
<td>LE8708</td>
<td>Mouse Single Lane Treadmill Including Shock Source and SeDaCom Software</td>
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<td>BH2 76-0305</td>
<td>LE8715</td>
<td>Rabbit Single Lane Treadmill Including Shock Source and SeDaCom Software</td>
</tr>
<tr>
<td>BH2 76-0306</td>
<td>LE8706</td>
<td>Rat Double Lane Treadmill Including Shock Source and SeDaCom Software</td>
</tr>
<tr>
<td>BH2 76-0307</td>
<td>LE8709</td>
<td>Mice Double Lane Treadmill Including Shock Source and SeDaCom Software</td>
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<tr>
<td>BH2 76-0308</td>
<td>LE8710R</td>
<td>5 Lanes Treadmill for Rats, Including Shock Source and SeDaCom Software</td>
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<tr>
<td>BH2 76-0309</td>
<td>LE8710M</td>
<td>5 Lanes Treadmill for Mice, Including Shock Source and SeDaCom Software</td>
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</tbody>
</table>

### OPTIONS

<table>
<thead>
<tr>
<th>Option</th>
<th>Model</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>BH2 76-0310</td>
<td>LE87XCD</td>
<td>CO₂, Air Tight Option (Only Available for LE8700, LE8708 and LE8715)</td>
</tr>
<tr>
<td>BH2 76-0114</td>
<td>LE 7000</td>
<td>Thermal Printer</td>
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<tr>
<td>BH2 76-0312</td>
<td>LE8740R</td>
<td>LE8710 Lead for Rats</td>
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<td>LE8740M</td>
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<td>BH2 76-0314</td>
<td>LE8730R</td>
<td>LE8710 Grid for Rats</td>
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<td>BH2 76-0315</td>
<td>LE8730M</td>
<td>LE8710 Grid for Mice</td>
</tr>
</tbody>
</table>

### Citations

- Macambira SG et al. (2009) Granulocyte colony-stimulating factor treatment in chronic Chagas disease: preservation and improvement of cardiac structure and function. JASEB J. In Press. (LE8700, mouse, Brazil)
- Knauf C et al. (2008) Brain Glucagon-Like Peptide 1 Signaling Controls the Onset of High-Fat Diet-Induced Insulin Resistance and Reduces Energy Expenditure. Endocrinology. 149(1):4768-4777 (mouse, France)
- Serradj N and Jamm M (2007) Age-related changes in the motricity of the inbred mice strains 129/sv and C57BL/6j. Behavioral Brain research 177(1): 80-89. (mouse, France)
- Bollettini V et al. (2005) Inter- and intraspecies variation in mouse critical running speed. J. Appl. Physiol. 98:1258-1263. (mice, France)
HSE-HA Rodent Shocker
Now NEW versions with low current and 0.1mA accuracy available!

Key Features
- For testing anticonvulsant drugs
- For mice and rats
- Two types of electrodes are available: for eyes or ears
- Foot switch operation

Rodent Shocker
Cerebral seizures, preferably in mice, are produced using constant sinusoidal alternating current to determine the effect of anticonvulsant drugs. For the reliable induction of seizures it is necessary to achieve satisfactory current flow. Eye electrodes and (especially in mice) ear electrodes are used for this purpose.

Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulation Frequency</td>
<td>50 Hz or 60 Hz according to supply frequency</td>
</tr>
<tr>
<td>Stimulus Duration</td>
<td>0.1 sec to 9.9 sec in steps of 0.1 sec, selected after pressing a button, the selected time is indicated</td>
</tr>
<tr>
<td>Stimulus Energy</td>
<td>Up to 75 W</td>
</tr>
<tr>
<td>Output</td>
<td>Constant current, fully floating</td>
</tr>
<tr>
<td>Output Current Standard Version</td>
<td>0 to 300 mA, 0 to 150 mA, 0 to 100 mA depending on maximum stimulation voltage selected, the setting is made on a 10-turn potentiometer and the selected value is shown on the digital display</td>
</tr>
<tr>
<td>Output Current LC Version</td>
<td>0 to 30mA and 0 to 20mA depending on selected voltage</td>
</tr>
<tr>
<td>Limitation of Maximum Stimulation Voltage</td>
<td>250 V, 500 V, 750 V in 3 steps, selected by button</td>
</tr>
<tr>
<td>Digital Display</td>
<td>The selected stimulation current is indicated continuously in mA, the actual current applied is shown during application and can be called up later by pushing a button, the selected stimulation time is shown on pressing the TIME button, bargraph indicates the course of the stimulation time.</td>
</tr>
<tr>
<td>Supply</td>
<td>110 V, 60 Hz or 220 V, 50 Hz</td>
</tr>
<tr>
<td>Dimensions, H x W x D</td>
<td>150 x 260 x 380 mm (5.91 x 10.2 x 14.2 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>5 kg (11 lb)</td>
</tr>
</tbody>
</table>

Order # | Product
---|--------------------------------------------------
BH2 73-0105 | Rodent Shocker Sine-Wave Shock Generator with Foot Switch, 115 VAC, 60 Hz
BH2 73-0106 | Rodent Shocker Sine-Wave Shock Generator with Foot Switch, 230 VAC, 50 Hz
BH2 73-3946 | Rodent Shocker RS Type 221/LC Low Current Version, 230 VAC, 50 Hz including foot switch, output power 75 VA, maximum current at 750V is 20 mA, at 500V and 250V 30mA, selectable in steps of 0.1 mA
BH2 73-3047 | Rodent Shocker RS Type 221/LC Low Current Version, 115 VAC, 50 Hz including foot switch, output power 75 VA, maximum current at 750V is 20 mA, at 500V and 250V 30mA, selectable in steps of 0.1 mA
BH2 73-0107 | Ear Shock Electrodes for Mice and Rats, Pair
BH2 73-0108 | Eye Shock Electrode for Mice and Rats