

Blood
Pressure

Analgesia

Restrainers

Behavioral
Activity

Catheters

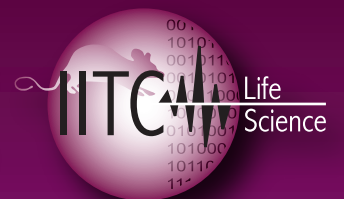
Animal
Respirators

Temperature
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Syringe
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SOURCEBOOK

IITC LIFE SCIENCE



BLOOD PRESSURE

RESTRAINERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

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IITC Life Science Instruments was established in 1973. We are a company that is dedicated to improving the Life Sciences field by supplying the best possible equipment and service to you the researcher. We continue to improve and expand our Non-Invasive Blood Pressure and Analgesia line to assure that you are able to have the most up to date products and features for your research. We at IITC want to hear from you the scientist on our equipment, service and your suggestions.

Thank you to everyone who has supported and allowed us to grow over the years. 35 years and counting.....

Non-Invasive Blood Pressure in rodents (NIBP)

We at IITC Life Science are proud of the fact that we have been supplying the best tail cuff blood pressure equipment since 1973 to researchers globally.

It is known Non-invasive Blood Pressure (NIBP) testing by tail plethysmography needs elevated ambient temperature. The effect of higher ambient temperature on rodents' blood pressure is also well established in literature. Rats and mice regulate their body temperatures by controlling the amount of blood that flows through their tails. When body temperatures are elevated above normal; either by elevated ambient temperatures or exercise; the flow of blood to the tail increases dissipating the extra heat. The higher the body temperature the more blood flow. It has been found; heating rats to 32 degrees Celsius and above or heating mice to 34 degrees Celsius and above causes thermostress, the loss of animals is common due to high temperature. The result of this is a modified blood pressure, (modification can be as much as +/-12-28 mmHg), and a lot of open questions that are still unanswered (for example the effect of elevated ambient temperature on constant vasoconstriction).

The form of pulse detection is critical and sensor selection determines the method. Due to its simplicity the piezoelectric sensors enjoy widespread use over the years. When an external physical force is applied to piezoelectric sensors the drum like action generates electrical signals. Piezoelectric crystals are widely used in inexpensive microphones and touch switches.

There are inherent problems and drawbacks to the use of these crystals for pulse detection: When measuring blood pressure in rodents these crystals need a temperature significantly higher (36 to 40 deg. C) than the thermostress level in order to detect pulses. These facts have been published decades ago. In addition the heating of the tail only is based on the mistaken assumption that the tail pulsation is the result of local heating.

The only forward was when IITC introduced the photoelectric sensor in 1978. IITC's sensors use light and photo sensors for pulse detection. When blood flows throughout the tail, the diameter of the tail changes and in turn the amount of light that reaches the photocell changes. IITC's one piece design (sensing electronics and occluding cuff) does not mechanically load the animal's tail and eliminates exact sensor placement as is needed using other equipment.

The main advantage is:

The photoelectric sensor can detect pulsation at close to room temperature without stressing animals! As a matter of fact, numerous papers have been published with the use of the IITC instruments, stating temperatures as low as 28 Deg. C. for mice and even lower for rats. The high reliability of these sensors and the associated electronic gear allow IITC to back these products with our "Unconditional Lifetime Warranty"; a product backup still unparalleled in the Experimental Biology field worldwide today.

We at IITC are proud to have contributed to the state of the art by our NIBP method and regard the piezoelectric and other type sensors as an inferior non-humane way of testing blood pressure in rodents.

These papers are just a few of the large family of published reports over our 35 years in existence using the NIBP methods. Although we encourage the use of low ambient temperature, it is amazing that published reports with IITC units are using even lower than suggested temperatures. Our method is the only Gold Standard.

Literature References:

Tail Cuff BP Measurement without External Preheating in Awake Rats, R. Bunag et. al., Hypertension Vol.4, No.6, Nov-Dec. 1982, pg. 898-902

Comparison of Simultaneous Measurement of Mouse Systolic Arterial Blood Pressure by Radiotelemetry and Tail-cuff Methods, Steven E. Whitesal, Janet B. Hoff, Alan P. Vollmer, Louis G. D'Alecy, Am. J. Physiol. Heart Circ. Physiol., Feb 2004; 10.1152/ajpheart.01089.2003

Harlan Sprague Dawley rats are quality tested with the IITC Non-invasive Blood Pressure method.

BLOOD PRESSURE	<p>WHY IS THE IITC INDIRECT BLOOD PRESSURE SYSTEM BETTER THAN OTHERS?</p> <p>Comparison is to other high temperature methods out on the market today</p>	<p>lost periodically due to heat shock. This can be a costly mishap. In essays three animals per dosage on average are used. Two of three readings should be usable. If the two animals from the same dosage are lost, the whole essay is not acceptable. To do this twice is quite an expense.</p>
RESTRAINERS	<p>Ambient temperature for testing: (Heating) Rats as do other animals have a built-in regulating mechanism; It is called thermoregulation. Their normal ambient temperature is approximately 26-27 deg. c. It is at 28-30 deg. c. the thermoregulation starts an increased blood-flow; if the normal ambient temperature is exceeded for mice.</p>	<p>Animal Holders and sensors:</p> <p>The IITC animal holders are made with matching sensors to cover an expansive weight range of 25-1000 gr. We also offer large sensors that enable the test of dogs, cats, swine and monkeys.</p>
CATHETERS	<p>As a result, the rodent pumps more blood into its tail, thereby trying to cool itself off, since the tail is the only body part not covered by fur and able to lose heat faster. This mechanism is used in indirect blood pressure testing.</p>	<p>The least sensitive are the piezoelectric sensors. These detectors require the highest temperature 38 deg. C. At high temperatures the animal labors, its parameters change and may even cause death.</p>
ANALGESIA	<p>The big difference is the pulse detection. The tail exhibits small pulses at even 26 deg. c. or less. When the pulse detector is not sensitive enough one must have to go to higher temperatures.</p> <p>Why is this bad?</p>	<p>The piezoelectric detectors require high heat (36-38 Degrees Celsius), which in turn causes high stress on the animal. At this temperature you do not even need equipment to detect a pulse since you can feel it with bare fingers on the low central side of the tail as the pulse occurs.</p>
BEHAVIORAL/ACTIVITY	<p>For rats as well as for mice there is a temperature limit after which the blood pressure is getting modified. Modified is the key word. It may go higher or lower on the same animal daily. Deviations will therefore go either plus or minus. The temperature limit is 32 deg. c. for rats and 34 deg. c. for mice.</p>	<p>The IITC sensors have a specially designed photoelectric detector, which allows the low temperature testing.</p>
ANIMAL RESPIRATORS	<p>If the ambient temperature is kept under these limits the test results will be uniformly close and within five to seven mmHg from the blood pressure values obtained by direct cannulation from arteries.</p> <p>The IITC method tests at 32 deg. c. on rats and at 34 deg. c. on mice. The ambient temperature for other methods is at 38-40 deg. c. this should never be done to a rat. They do not mention this, they simply advise to heat the rat to 34-40 deg. c. and then shut off their heating pads and air heaters so they do not heat.</p>	<p>System Design:</p> <p>A user can buy a single channel system and expand it into a multi-channel system without having to discard any of the existing equipment they purchased previously. When it comes to versatility IITC's line is unsurpassed.</p>
SYRINGE PUMPS	<p>The excessive heating changes the BP reading dramatically by + -12-28 mmHg. This could be a window of 56 mmHg day to day!</p>	<p>All IITC units have an analog output. Starting with the Model 29-SSP single channel system and the Model 229 single channel system with built-in pump. They both can be used with a single or dual channel recorder. This is unique since all other makes can only use a dual channel chart recorder; this means a savings for the end user.</p>
TEMPERATURE PROBES	<p>What does this mean?</p> <p>This means that the high temperature methods also measure BP, but huge deviations and the animals are</p>	<p>Technical Support and Warranty:</p> <p>IITC offers unlimited advice and help before and after the purchase. Users can fax us their recordings, which will enable us to lead them to a perfect recording. It is as if we are in the laboratory with them. We offer an Unlimited Lifetime Warranty on our entire line of NIBP products that we manufacture. The only requirement is that the units have to be returned to us in a non-tampered condition.</p> <p>Literature and Customer Circle: Supplied upon request.</p>

NIBP up to 24 animals

The IITC Life Science blood pressure systems can be configured from 1-24 animals.

All of these systems allow researchers to quickly, and accurately obtain blood pressure measurements at the lowest recommended temperatures.

Systems use a highly sensitive photoelectric sensor for detection of blood pressure pulses.

The only validated method/data when compared to both telemetry and direct blood pressure.

Our method is the only method that allows researchers to measure blood pressure at the lowest ambient temperature which is 32 deg. c. All others require high temperatures (36-40 deg. C) which can cause undue thermostress and inaccurate data.

The only validated method which enables researchers to monitor, record, store and export blood pressure readings automatically with our software.

The software will show you in real time systolic, diastolic, mean and heart rate and allows complete control of system.

Systolic is measured not "calculated/estimated" as with other systems on the market.

A critical part of the process is the placement of the inflation and detection cuff onto the test subject. While others subject the researcher and test subject to two separate cuffs, we have combined both cuffs into our single tail cuff sensor; animal position is not a factor. This technology eliminates the need for restraining the animals tail and creating undue stress.

The comfort of the test subject is most critical in collecting NIBP data. Our warming chambers create a complete environment of controlled temperature as opposed to just radiating heat from a platform or blowers. The result of our method is a reduction in thermostress which can lead to inaccurate data.

MRI systems available upon request.

Details

Analog output
Typical Pulse amplitude 100mV to 1 V
Pressure amplitude adjustable 1-5V at 300 mmHg

120/240V
CE

**"The worlds only
24 channel system available
on the market today"**

BLOOD PRESSURE

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CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

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12 Animal Blood Pressure System



Computer sold separately

Features:

Validated data:
Telemetry
Direct blood pressure

Data supplied:
Systolic
Mean
Diastolic
Heart Rate

Lowest temperature method

Indirect heating

MRI systems available

Animal color not a factor

USB Optional

RS232 Standard

Animals:

Mice
Rats
Cats
Dogs
Rabbits
Swine
Monkeys

Lifetime Warranty

NIBP Multi Channel Blood Pressure Systems



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NIBP Multi Channel Blood Pressure Systems

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Part #	Description
	Mouse
24M22931	24 Mouse Blood Pressure System with software
12M22931	12 Mouse Blood Pressure System with software
6M22931	6 Mouse Blood Pressure System with software
3M22931	3 Mouse Blood Pressure System with software
3M229	3 Mouse Blood Pressure System (no software)
1M22931	1 Mouse Blood Pressure System with software
1M22945L	1 Mouse Blood Pressure System with chart recorder
1M229	1 Mouse Blood Pressure System (no software)

Part #	Description
	Rat
24R22931	24 Rat Blood Pressure System with software
12R22931	12 Rat Blood Pressure System with software
6R22931	6 Rat Blood Pressure System with software
3R22931	3 Rat Blood Pressure System with software
3R229	3 Rat Blood Pressure System (no software)
1R22931	1 Rat Blood Pressure System with software
1R22945L	1 Rat Blood Pressure System with chart recorder
1R229	1 Rat Blood Pressure System (no software)

Economical NIBP Blood Pressure Systems

For small, short studies and student teaching these systems are an ideal economical solution.

Our economical NIBP blood pressure systems are a great entrance into blood pressure research. These systems offer all of the same features as our multi channel systems except for automatic cuff inflation.

All systems allow researchers to accurately obtain blood pressure measurements at the lowest recommended temperatures.

Systems use a highly sensitive photoelectric sensor for detection of blood pressure pulses. The only validated method/data when compared to both telemetry and direct blood pressure.

Features:

Validated data: Telemetry Direct blood pressure	Lowest temperature method Indirect heating	Animals: Mice Rats Cats Dogs Rabbits Swine Monkeys
Data supplied: Systolic Mean Diastolic Heart Rate	MRI systems available Animal color not a factor USB Optional RS232 Standard	Lifetime Warranty

Choose either software or chart recorder for data collection.

Software displays systolic, diastolic, mean and heart rate.

Systolic is measured not “calculated/estimated” as with other systems on the market.

Chart recorders:

1. Single channel chart recorder supplies systolic and heart rate
2. Dual channel chart recorder supplies mean and diastolic.

Our method allows researchers to test blood pressure at the lowest ambient temperature of 32 deg. c. All others require high temperatures (36-40 deg. C) which can cause undue thermostress and inaccurate data.

A critical part of the process is the placement of the inflation and detection cuff onto the test subject. While others subject the researcher and test subject to two separate cuffs, we have combined both cuffs into our single tail cuff sensor. This technology eliminates the need for restraining the animals tail and creating undue stress.

The comfort of the test subject is most critical in collecting NIBP data.

Our warming chambers create a complete environment of controlled temperature as opposed to just radiating heat from a platform or blowers. The result of our method is a reduction in thermostress which can lead to inaccurate data.

Part #	Description
1M29	1 Mouse Blood Pressure System
3M29	3 Mouse Blood Pressure System
1R29	1 Rat Blood Pressure System
3R29	3 Rat Blood Pressure System
	Options
31	Data Acquisition Software
38L	Single Channel Chart Recorder
45L	Dual Channel Chart Recorder
301	Warming Chamber, 1 rat/3 mice

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Economical NIBP Blood Pressure Systems

Manual Inflation Systems (upgradeable to 24 animals)

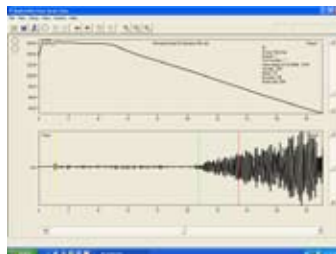


Options

Chart Recorder



Software



Linear Deflation Kit



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NIBP System Component Details

Amplifier with automatic cuff inflation

The IITC amplifier with built in cuff inflation pump is a basic system that allows testing of a single animal at a time. The method is done noninvasive via the tail cuff method.

The IITC method requires minimal warming of rats and mice. The rodents should be warmed to an ambient temperature of 30 deg. c. for rats and 32 deg. c. for mice, which is well below the thermostress level (see NIBP Intro. page). It is suggested to use one of the IITC warming chambers. The artifact filter eliminates the breathing and movement artifacts, enabling the user to pick out endpoints easily. In addition the amplifier has a built in cuff pump which allows for automatic cuff inflation. The built-in cuff pump has adjustable cuff pressure limits with automatic cut off, remote trigger capability, adjustable deflation rate, a manual air release for an immediate pressure drop and a test termination pressure control allows for quick 10 to 15 second test cycles.



Analog output. The instrument has separate outputs for single channel and dual channel (superimposed and split) recording. The typical pulse amplitude is 100 mV to 1 V. The pressure amplitude is adjustable from one to five volts at 300 mmHg. If systolic and heart rate are desired, a single channel chart recorder #38L is sufficient; if the Mean and Diastolic are the desired reading then a dual channel chart recorder is recommended #45L or the IITC software package #31.

The unit can be used in any one of the IITC multi-channel systems.

Lifetime Warranty on amplifier

One year warranty on internal cuff pump.

120/240V

CE

Features:

Validated data:	Lowest temperature method	Animals:
Telemetry	Indirect heating	Mice
Direct blood pressure		Rats
		Cats
Data supplied:	MRI systems available	Dogs
Systolic	Animal color not a factor	Rabbits
Mean		Swine
Diastolic	USB Optional	Monkeys
Heart Rate	RS232 Standard	Lifetime Warranty

Part #	Description
229	Amplifier with built in Automatic Cuff Pump

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ANIMAL RESPIRATORS

SYRINGE PUMPS

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BLOOD PRESSURE

Amplifier, Manual Inflation

The IITC amplifier with manual inflation is a basic system that allows testing of a single animal at a time. This is a noninvasive tail cuff method.

RESTRAINERS

The IITC method requires minimal warming of rats and mice. The rodents should be warmed to an ambient temperature of 30 deg. c. for rats and 32 deg. c. for mice, which is well below the thermostress level (see NIBP Intro. page). It is suggested to use one of the IITC warming chamber.



CATHETERS

A unique feature of IITC's amplifier is the artifact filter, which minimizes the breathing and movement artifacts, enabling the user to pick out the endpoints easily.

Analog output. The instrument has separate outputs for single channel and dual channel (superimposed and split) recording. The typical pulse amplitude is 100 mV to 1 V. The pressure amplitude is adjustable from one to five volts at 300 mmHg. If systolic and heart rate are desired, a single channel chart recorder #38L is sufficient. If the Mean and Diastolic are the desired reading then a dual channel chart recorder is recommended #45L or the IITC software package #31.

ANALGESIA

These units can be used in a manual, automatic, single, or multi-channel system.

Lifetime Warranty
120/240V
CE

BEHAVIORAL/ACTIVITY

Features:

Validated data:
Telemetry
Direct blood pressure

Lowest temperature method
Indirect heating

Animals:
Mice
Rats
Cats
Dogs
Rabbits
Swine
Monkeys

Data supplied:
Systolic
Mean
Diastolic
Heart Rate

MRI systems available
Animal color not a factor
USB Optional
RS232 Standard

Lifetime Warranty

ANIMAL RESPIRATORS

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Part #	Description
29-SSP	Amplifier-Manual Inflation

NIBP System Component Details

Automatic Cuff Pump

The IITC automatic inflation cuff pump is a dedicated cuff pump for small animal noninvasive blood pressure testing. This cuff pump replaces manual inflation and can be used with all of IITC's indirect blood pressure test systems.

The IITC cuff pump has an adjustable cut-off pressure in 50 mmHg increments, adjustable deflation rate calibrated in mmHg and test termination pressure. The maximum pressure is 300 mmHg and higher. The test termination pressure feature allows the tests to be performed in 10-15 seconds. Single or repetitive cycles with extremely linear deflation rates. A manual air release is for immediate pressure drop. A built-in recycle timer can be set to automatically inflate the system in increments of 1 to 999 seconds.



One year warranty
120/240V
CE

Part #	Description
20NW	Automatic Cuff Inflation Pump

Scanner

The IITC manual scanner is used for making sequential measurements on a group of animals during the tail cuff method test. The scanner can be used in systems that are manually inflated, as well as in semi-automatic systems with an automatic cuff pump. In semi-automatic systems the operator has only to advance the test by turning one single switch on the scanner. Both the electrical parameters of the tail cuff sensor as well as the cuff air are selected with this single switch.



Manual Scanner has the capabilities to test up to 12 animals at a time. The rear panel has the terminated Binary Coded Decimal (BCD) parallel output (voltage free contacts) allows on line data handling equipment to recognize the sequential number of the test position. The scanner accepts 12 air tubing ports in the rear, and 12 plugs from the sensors. The front air ports connect to the pump or inflation bulb and the input plug to an amplifier.

One year warranty
120/240V
CE

Part #	Description
65-12	Manual Scanner (12 Position)

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Animal Warming Chambers

The IITC test chambers offer the perfect uniform test environment when measuring blood pressure noninvasive via the tail cuff method on mice and rats. Offering 1, 3, 6, 12 and 24 channels. The chamber temperature is adjustable and stays at a constant temperature within 1 degree c. at all times via the digitally controlled built in temperature controller. Chambers are ideal for testing from 30 to 40 degrees c.

Temperature is displayed and controlled digitally on the right, exterior side of the warming chamber. Temperature can be adjusted in 2 degree increments. Internal temperature is detected by the built in temperature sensor in the interior chamber wall; allowing precise measurements throughout your study.



**312 Warming Chamber
12 animals**



**306 Warming Chamber
6 animals**

All chambers are manufactured of black anodized aluminum and a clear Plexiglas, slide panel door for easy access and viewing of your animals during studies.

A built-in “whisper” fan produces a low level sound that is comforting to the animals. The side panels have been designed with vent holes for air circulation.



**303SC Warming Chamber
3 animals**

A superior method of warming when needed for blood pressure measurements.

Our warming chambers do not supply direct heat in any way as with other methods - heating platforms or blowers that supply heat directly onto animals causing thermotress and the possibility of animal loss are nonexistent with the IITC Life Science method. Supplying a low, consistent, comfortable environment to your animal.



**301 Warming Chamber
1 rat/3 mice**

One year warranty
120/240V
CE

Part #	Description
312	Warming Chamber (12 animals)
306	Warming Chamber (6 animals)
303SC	Warming Chamber (3 animals)
301	Warming Chamber (1 animal)

NIBP System Component Details

Mouse or Rat Tail Cuffs



The IITC sensors have the ability to detect mouse blood pressure or rat blood pressure via the tail photoelectrically. The photoelectric sensor, light source and sensor are built into a one unit which attaches to any one of the IITC restrainers with nylon hand screws. All the sensors are nonmagnetic. They are extremely sensitive in detecting pulses due to IITC's superior design and knowledge of mouse and rat blood pressure measurements. The ambient temperature that a reading can be taken starts at 30 degrees c. The maximum temperature needed for a test is usually 32 degrees c. for rats and 34 degrees c. for mice. The systolic readings are within five mmHg of Cannulation and Telemetry. (Validated)

Part #	Description
B64-1"	Sensor, 650-800 grams
B63-3/4"	Sensor, 500-650 grams
B60-7/16"	Sensor, 150-400 grams
B60-3/8"	Sensor, 70-160 grams
B60-1/4"	Sensor, 20-80 grams

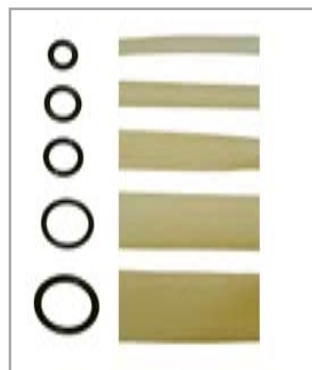


IITC Life Science is the only company capable of measuring blood pressure on all of the above animals.



Lifetime warranty

Part #	Description
5OR	O-Ring 1/4" - 50/pack
5MOR	O-Ring 3/8" - 50/pack
5EOR	O-Ring 7/16" - 50/pack
5FOR	O-Ring 3/4" - 50/pack
5SOR	O-Ring 1" - 50/pack



Part #	Description
2ACL	Cuff liner 1/4" - 100/pack
2CCL	Cuff liner 3/8" - 100/pack
2CL	Cuff liner 7/16" - 100/pack
2BCL	Cuff liner 3/4" - 100/pack
2DCL	Cuff liner 1" - 100/pack

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Blood Pressure Data Acquisition Software

IITC software records, analyzes and reports the data from any of the IITC amplifiers for blood pressure studies. The final data is sent from the amplifier to the software program. The end-point selection is automatic for Systolic, Mean, Heart Rate while the Diastolic values are automatically computed. The user is always in control to override the automatic process by the click of a mouse. Data can be saved, ignored or deleted at the operator's discretion. Any test can be recalled, displayed, printed and modified as needed.

The software supplies ID number, Animal number, test number, date, time, Systolic, Mean, Diastolic and heart rate and Calibration is a breeze. Software can be used with manual, semi-automatic or fully automatic noninvasive blood pressure systems.

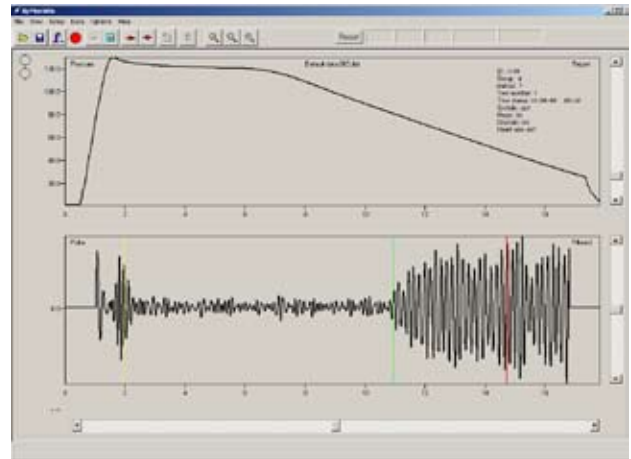
Our software has IITC built-in artifact filter and has user select frequency ranges. A detailed report can be printed or imported into a spreadsheet at the end of a test. Software and analog to digital converter supplied. Software can control the cuff pump #20-NW and recognizes the animals number from the Scanner #65-12.

System Requirements:

Windows 98 or higher, serial port.

Demo disc available upon request.

One year warranty
120/240V
CE



Features

- Record, report and analyze data
- Two channel recording capabilities
- Report data can be imported to Excel
- Test data recorded, displayed in real-time
- Automatic evaluation of captured data
- Optional USB

Part #	Description
31	Noninvasive Blood Pressure Software

NIBP System Component Details

Single and Dual Channel Chart Recorder

The IITC 38L Single Channel chart recorder as well as the 45L dual channel recorder are ideal instruments for use in recording Noninvasive blood pressure in laboratory animals with of these systems. They also have a wide range of uses in the research, development and education departments as well.

The "Plot" and "Home" function can set the pen back to the start for comparative measurements. The pen starts from exactly the same point of the chart in a repetitive form.

One year warranty
120/240V
CE

A cost effective solution for research.

Part #	Description
38L	Single Channel Chart Recorder
45L	Dual Channel Chart Recorder



Specifications:

- 14 calibrated steps imv.
- 20V variable range: 40 to 100 % FS.
- Input impedance 1M Ohm
- Common mode rejection 130 dB
- Zero adjustment: -50 150% FS
- Zero suppression: 6 calibrated steps
- Chart speeds: 0.1/0.2/0.5/1/2/5/10/20 mm/min. & mm/sec
- Paper 25m roll (80 ft.)
- External input: TTL level
- 110/220 switch selectable
- Maximum input signal: 42VDC
- Power Consumption: 30VA on single channel, 50 VA on dual channel
- Matches CSA & VDE.

SP-1 Accessory Kit for NIBP Blood Pressure Equipment

The IITC Accessory Package contains all necessary consumables for replacement in the IITC NIBP line. It is supplied according to the users request for the size of cuff liners and O-rings.

The SP-1 contains:

One pressure gauge with small tubing adapters and manual bulb inflator (this can be used for both calibration and inflation when working with relatively small numbers of animals), 24 small nylon hand screws to mount the sensor to the end plate of the IITC animal restrainers, 50 O-rings that hold cuff liners on the cuff, 100 spare cuff liners (cuff liners and O-rings can be mixed), 50 ft. of Tygon tubing for connecting the cuff air ports to your pressure source.

All items sold individually.

Part #	Description
SP-1	Accessory Package



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Linear Deflation Kit

The IITC Linear Deflation Kit is unique in the fact that the valve allows the user to deflate the cuff at a constant rate. The rate is adjustable by means of the control screw in the valve head using the supplied screwdriver.

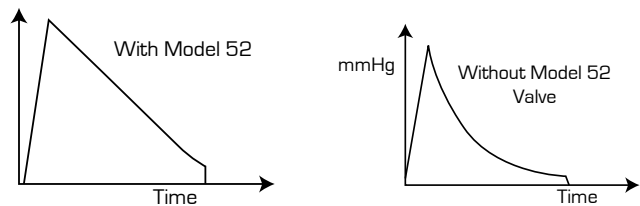
The valve's construction is made so that upon stopping inflation, the deflation starts immediately at the set rate, built in "instant deflation" feature allows to drop the pressure to zero without changing the set rate of the deflation. Although the linearity does not match the electronic solution, it does give a dramatic improvement over manual deflation (see graphs).

Consists of: Manual bulb with special valve, one air ballast, T connectors and one screwdriver.

One year warranty



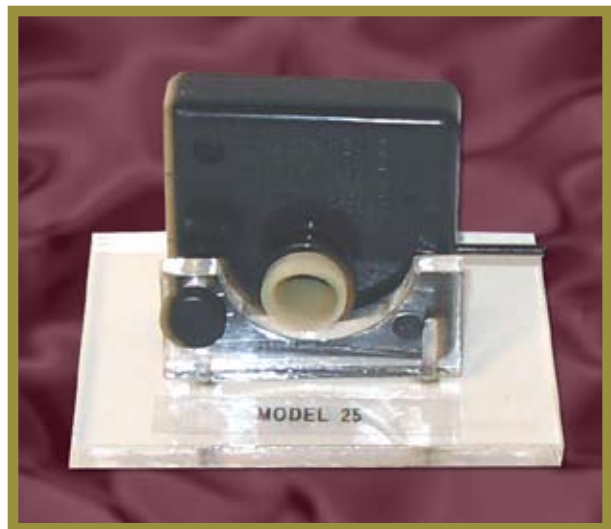
Part #	Description
52	Linear Deflation Kit



Tail Cuff (Sensor) Stand

The IITC sensor cuff stand is used to replace the animal restrainer when studies call for animals to be anesthetized, operated on or during MRI studies. The sensor stand is used to keep the sensor vertical on the tail. The sensor stand accommodates all five IITC sensors (tail cuffs).

One year warranty



Part #	Description
25	Sensor (Tail Cuff) Stand

Restrainers

Restrainers



IITC animal restrainers are used with the noninvasive blood pressure systems for mice and rats they can also be used for tail vein injections or other studies where the animal needs to be restrained.

IITC carries seven different sizes; the weight range is from neonate rats and adult mice up to 1,000 gram rats. They are constructed of sturdy clear, 1/4" wall acrylic. Only a mild soap and water solution is to be used to clean the restrainers no ammonia based products should be used.

They are all supplied with an adjustable head gate and the end plate is removable by snaps. This allows the animal to "walk-in" as opposed to the traditional method of bootstrap holders where the animal is physically forced into the restrainer backwards. The backward forcing of animals may cause severe trauma.

Head gate, end plate, and snaps can be purchased separately.

One year warranty

Part #	Description	Size	Dimensions
84	Restrainer Adult mice and neonate rats	20 to 45 grams	1" ID (25 mm) - 4" Length
83	Restrainer Rodents	70 to 170 grams	1 1/2" ID (38 mm) - 6" Length
82	Restrainer Rodents	180 to 270 grams	2" ID (50 mm) - 8" Length
81	Restrainer Rodents	250 to 400 grams	2 1/2" ID (63 mm) - 9" Length
80	Restrainer Rodents	400 to 600 grams	3" ID (75 mm) - 12" Length
79	Restrainer Rodents	600 to 800 grams	3 1/2" ID (88 mm) - 13" Length
78	Restrainer Rodents	750 to 1000 gram	4" ID (105 mm) - 13" Length

BLOOD PRESSURE

RESTRAINERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Catheters

The technique of using these cannulas is for conscious, relatively unrestrained, rats with indwelling cannulas. Rats prepared with chronically implanted cannulas avoid possible adverse influences of anesthesia, acute effects of surgery, and stress from handling and restraint. Drugs can be administered by many routes: Intravenously into the general circulation, into the portal vein, or internally into the small intestine. Non-irritating drugs can be given subcutaneously or intraperitoneally. Systemic venous blood (inferior or superior vena cava) and portal vein blood can be sampled. If pulmonary metabolism is not a factor, an aortic cannula provides the equivalent of a mixed venous blood sample.

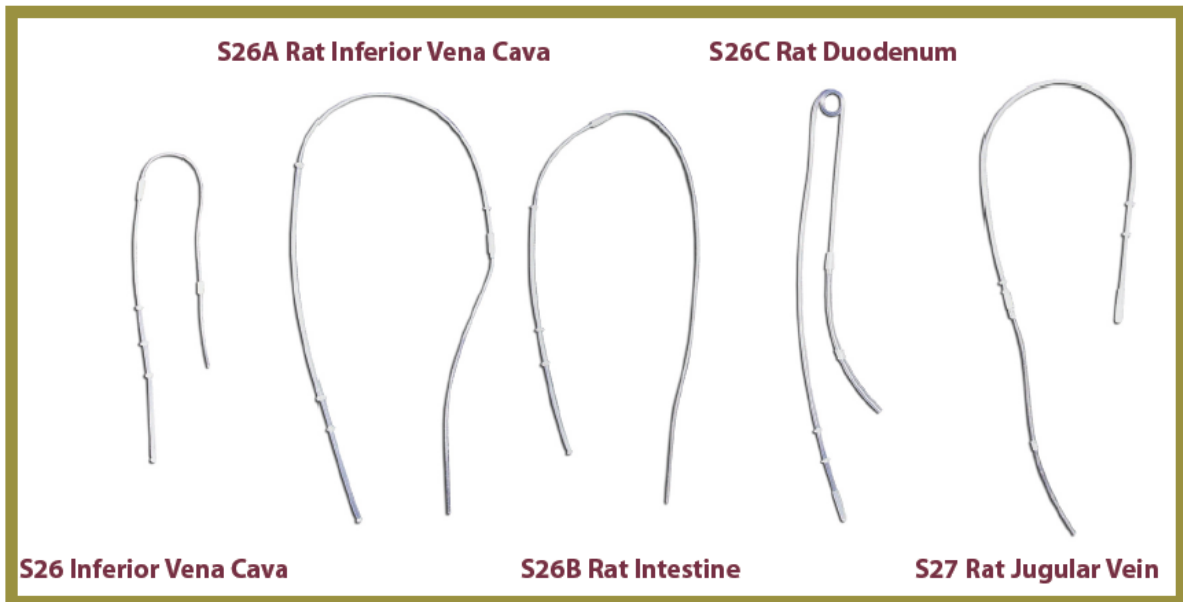
Chronic venous cannulas in rats were developed initially for self-administration of drugs in experimental addiction. Drugs with a short duration of action and powerful acute effect pose a special problem when safety tests must be by the intravenous route.

The IITC catheters come in 10 different types. They are comprised of PE10, PE20 and Silastic. The catheters can be ordered in either a "hybrid end" or "reinforced end". State which ever option when ordering the selected catheters. In addition all IITC catheters have a flared end.

In addition IITC carries a full line of accessories for the IITC catheters. They include plugs, connecting tubing's, U tubes, blunt end needles.

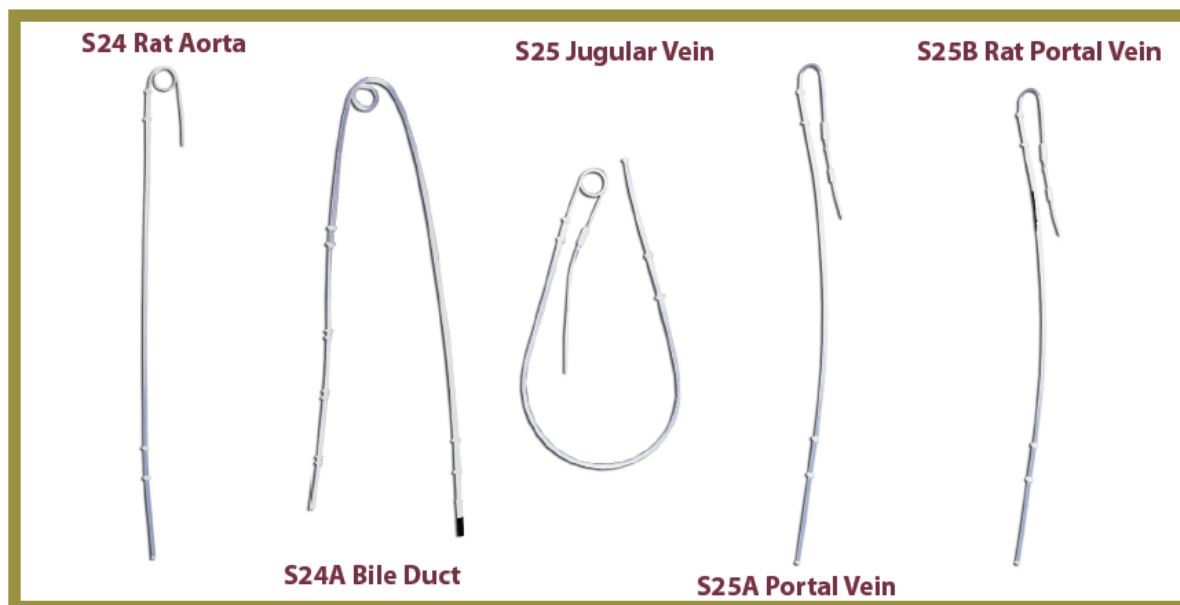
The IITC catheters can also be customized. In order to process a custom order a drawing with exact dimensions must be supplied with the order.

Sold in packs of 10



Rat Catheters

Catheters



Part #	Description
S24	Rat Aorta Catheter-PE20 150mm long, PE10 cut for intravascular portion 12mm
S24A	Bile Duct Catheter to be used with the S26C Duodenal Cannula
S25	Jugular Vein Catheter-PE20 170mm, PE10, 65mm, Silastic 0.025" OD 37mm
S25A	Portal Vein Catheter-tip beveled for injections or infusions, PE20, 140mm PE10, 40mm, Silastic 0.025 OD 25mm
S25B	Rat Portal Vein-tip blunt level for blood sampling, data the same as S25A
S26	Inferior Vena Cava Catheter-via laparotomy, PE20, 50mm, PE10 40mm, Silastic 0.025" OD 80mm
S26A	Rat Inferior Vena Cava Catheter-via femoral and iliac veins, PE20,100mm, PE10 100mm, Silastic 0.025" OD 70mm
S26B	Rat Intestine Catheter-for injections/infusions, PE20, 75mm, PE10, 40mm, Silastic 0.025" OD 125mm
S26C	Rat Duodenum Catheter-Upjohn design for use with S24A Bile Duct Catheter
S27	Rat Jugular Vein Catheter-(modified Harms & Ojeda, for blood sampling, PE20 170mm, Silastic 0.037" OD 70mm

BLOOD PRESSURE

RESTRAINTERS

CATHETERS

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BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

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ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Electronic von Frey Anesthesiometer

The original Electronic von Frey is used to assess mechanical allodynia with rigid tips (threshold) and the "Supertips™" (flexible von Frey hairs) are used for sensory test on all test subjects.

The 2390 series enables researchers to plug up to 3 probes into a single unit. Multiple users have the ability to use one single unit for multiple studies.

Our system is the first system introduced to the market over 9 years ago which finally allows researchers the ability to test and automatically record pain threshold values in a clean, accurate easy to use compact system.

The systems are supplied with either a 90, 800 or 1000 gram probe. Probe type is determined by test subject.

When studies call for pain threshold, rigid tips are used when measuring sensory threshold one of the 15 Supertips™ are used. The IITC hairs are unique in design - each hair has a uniform tip of .8mm in diameter, eliminating the possibility of false readings that may occur due to the varying hair thickness when applied to test subject.

The systems will allow you to measure, store and display your test readings in grams based upon the amount of pressure applied. Manually calculating results is no longer required with the IITC system.

Testing is simple, choose one of the supplied tips place on probe tip; apply pressure probe to test subject, upon reaction the unit will display and store your reading in grams, an easy, quick test system for all pain studies.

An internal load cell is attached to the small tip, this is the central element in the system; which connected to the electronic system allows you digitally record your test results.

All EVF systems are calibrated at the factory and do not require any type of constant calibration, adjustment or separate calibrator to be purchased.

The optional analog output cable supplies a pressure analog output voltage (mV range) exactly proportional to the applied pressure. The signal is free floating and can be used on both chart recorders and/or AD converters.

Our system is an easy, user friendly system which was developed to replace the traditional hairs but at the same time enabling researchers to not only test sensory but pain threshold in one system.



Features

- MRI Probe available
- Plug up to 3 probes into a single unit
- LCD Readout (Floating or last max. & minimum)
- Rigid tips up to 800 Gr.
- "Supertips™" 15 up to 90 Gr.
- 1K probe available
- Microprocessor Electronics 0.1 Gr Plug-in probes
- Independence from Hygroscopy
- Independence from temperature
- Optional analog output cable
- Pipette tips can be customized to any specification
- Hygroscopy is no longer an issue.

Analgesia

Electronic von Frey Anesthesiometer

New Feature - Limit Indicator

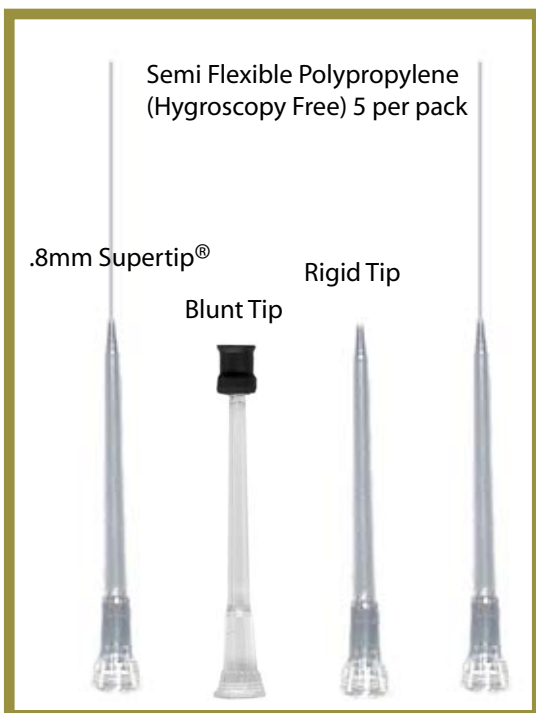
Allows user to preset and select a maximum force limit within 1 gram of accuracy. A warning light informs the user that the preset limit entered has been reached by the system. Users are able to have identical results from two different operators.

What are "Supertips™"

As reported by earlier papers varying probe diameter on von Frey hairs is a serious problem. These patented "Supertips™" have a UNIFORM TIP DIAMETER OF .8mm ON ALL 15 DIFFERENT VON FREY HAIRS! This is a unique feature available only on Electronic von Freys by IITC Inc. Probe size no longer affects pain or pressure thresholds and results are finally comparable!

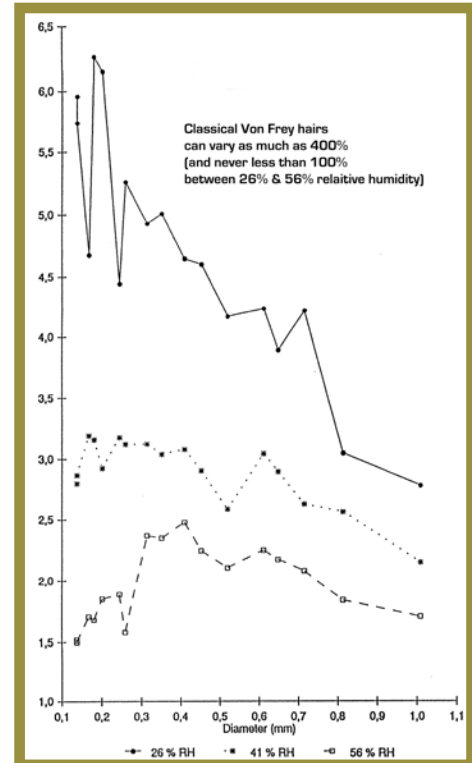


Probe with built in limit indicator shown



This instrument eliminates the poor data collection due to the hygroscopic nature of von Frey hairs (it is proven that relative humidity can change the force by more than 100% between 28-52% relative humidity change!) Only an accurate readout can show the actual force, not a number as on the handle of classic von Frey handles. Bending at various degrees can change the force by 20-30% in every case, this is visible with an electronic readout only. The natural limiting of force with flexible hairs is of great advantage. This instrument makes the up-down method of finding threshold unnecessary. Without using line adapter, Battery life is 50 hours. (Supplied)

All tips can be ordered individually.



Part #	Description
2390	Electronic von Frey rigid tips only, 90 gram range
2391	Electronic von Frey rigid tips only, 800 gram range
2392	Electronic von Frey rigid and 15 Supertips, 90 gram range
2393	Electronic von Frey rigid and 15 Supertips, 800 gram range
2394	Probe only, 90 gram range
2395	Probe only, 800 gram range
2396	Probe only, 1000 gram range
2397	MRI Probe
2398	Limit indicator option for any probe
2399	Cable with limit indicator
2400	Analog output cable

One year warranty
120/240V
CE

Digital Paw Pressure Randall Selitto Instrument Mice and Rats

New Feature - Limit Indicator

Allows user to preset and select a maximum force limit within 1 gram of accuracy. A warning light informs the user that the preset limit entered has been reached by the system. Users are able to have identical results from two different operators.

Once again IITC has designed a first in the pain testing research field, the very first digitally controlled paw pressure meter. The unit allows the user to attain data for analgesic drug testing via the Randall Selitto method.

This hand held instrument applies a force to the extremity of the test subjects. "Live" readings are provided of whatever force is applied at any moment with "Peak and Hold" showing the last maximum force applied during the test. Additional "Pressure Applicators" available.

A footswitch is provided to reset the reading which allows "hands free operation".



An acrylic stand comes standard with the equipment which allows easy viewing of information on the portable electronics. Power 9V battery (with approximately 50 hours of operation

or the power adapter both supplied standard.

Features

- First digitally controlled unit for paw pressure measurements
- Only hand held unit available on the market
- Hands free operation
- "Live" readings in 1 gram increments
- No calibration required
- Footswitch standard
- Analog output cable available

Hand held probe weighs a mere three ounces with an accuracy of 0.5%. A test weight is supplied for accuracy check. No calibration required.

Probe has a spring load for easy opening and closing of pressure applicator. To use the pressure applicator the probe is placed under the paw, close the pressure applicator, upon reaction the electronic unit will capture and store the pressure in grams to view and store. A flat surface is opposite of the probe tip to allow comfort and ease of operation. This test in our new form allows quick testing when the Randall Selitto method is needed.

One year warranty
120/240V
CE



Sold separately

Part #	Description
2500	Digital Paw Pressure Randall Selitto Meter
2600	Pressure Applicator Only
2650	Stand and Sling

Plethysmometer (Paw Volume) Meter

IITC's Paw Volume Meter enables researchers to measure the effectiveness of anti-inflammatory agents and agents to reduce edemic conditions. In use, the paw is inserted into plain water, which contains a special water cell of which the pressure is changed due to the immersion. This pressure change is calibrated in ml and shown on a special electronic monitor. This form of detection eliminates changes due to conductivity alterations at repeated insertions as found on comparable units. The measurements are shown on the units LCD readout in .1ml increments. The unit is stable and can be safely operated either on its own battery or on a line adapter at 9 or 12 V.

An angled acrylic stand serves to keep the instrument in position for easy viewing. The water cell is attached to an acrylic stand of its own. The fact that there is no "wetting solution" required is a first for this type of unit. The unit also allows for obstruction free viewing of the test subject with free access to the cell.



Features

- No wetting solution needed
- One calibration/yr.
- Battery operated

One year warranty
120/240V
CE

Part #	Description
520M	Plethysmometer (Paw Volume) Meter - Mice
520R	Plethysmometer (Paw Volume) Meter - Rat
520MR	Plethysmometer (Paw Volume) Meter - Mice-Rat
520A	Water Cell, Plexi-Glas, Cable Only

Grip Strength Meter for Mice and Rats

To assess muscle hyperalgesia this instrument measures the forelimb grip force using a digital force transducer.

The transducer is connected to a wire mesh grid connected to an anodized base plate. The animal is held by its tail and is gently passed over the mesh until it grasps the grid with its front paws. Three grip force measures are made and the average of these readings represents the animal's forelimb grip force at that particular time.



The last maximum force is held in a "peak & hold" type readout until reset. The unit gives readings in one gram increments. Both rat and mouse grids are supplied and can be easily exchanged. Maximum force range is 2000 Gr (10% over range allowed). Higher ranges available on special order.

The heavy base plate has suction feet to resist even large pulling forces. Both battery and line adapter operation is possible.

One year warranty
120/240V
CE

Part #	Description
2200	Grip Strength Meter for Mice and Rats
2250	Grip Strength Stand and Meshs Only

BLOOD PRESSURE

RESTRAINTERS

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ANALGESIA

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ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Quattro 4 in 1

4 tests in one complete system!

Electronic von Frey (page 22-23)

Randall Selitto (page 24)

Plethysmometer (page 25)

Grip Strength Meter (page 25)

IITC Life Science has developed the first commercially available unit that has the capability of performing three individual tests with one unit.

Our newest addition to our Analgesia line can perform the Electronic von Frey, Digital Randall Selitto, Plethysmometer test and Grip Test Meter with one electronic system.



Sold separately-Randall Selitto test

Order any one of the test systems complete and the only additional item(s) needed are the individual modules to perform each test.

Electronics has up to three inputs allowing users to perform three very different tests with one electronic system when studies call for doing so.

All data is stored and displayed in the electronics supplied.

Example:

Order any one of the 2390 Series Electronic von Frey systems; add on either or both the Digital Paw Pressure Applicator only the glass stand setup only and/or the Grip Strength Meter and you have a system that is complete for all four individual tests.

A wonderful addition to any laboratory facility studying analgesic compounds in research.

Stand and animal sling for Randall Selitto test sold separately.

One year warranty



Sold separately-Randall Selitto test

Part #	Description
2888	Quattro 4 in 1
2650	Stand and Sling

Hot Plate Analgesia Meter

The IITC Hot Plate Analgesia meters is used for latency testing in rats and mice. The animals are placed on a black anodized, aluminum plate (11" X 10.5" X 3/4", 275mm X 263mm X 15mm).

All functions are entered via a keypad on the front panel they are:

- Current temperature
- Animal number
- Current time
- Current date
- Output data to printer
- Set point temperature in Celsius.

The plate's surface temperature can be adjusted from ambient up to 75 degrees Celsius. Plate has consistent temperature throughout providing accurate tests.

All systems are supplied with both a mouse and rat enclosure. If needed IITC allows purchase of each enclosure separately.

- Two year warranty
- 120/240V
- CE



Features

- Temperature is indicated in 0.1 deg c. increments
- Holding accuracy is +/- 0.1 deg c.
- Mice and Rats
- Digitally controlled
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

Part #	Description
39	Hot Plate Analgesia Meter for mice and rats
39RE	Rat Enclosure (Square)
39ME	Mouse Enclosure (Round)
Series 8	Software

Incremental Hot/Cold Plate Analgesia Meter

Only system available with ramping temperature.

IITC Life Science developed the only unit in the world capable of truly assessing pharmacological modulation of thermonociception. Used on latency and threshold based nociception for both conventional and non conventional analgesics a safe and humane way of testing.

As published in the British Journal of Pharmacology-

Almasi et al: Effect of resiniferatoxin on the noxious heat threshold temperature in the rat: A novel heat allodynia model sensitive to analgesics. 139(1):49-58, 2003, British Journal of Pharmacology

IITC's Incremental Hot/Cold Plate is used to measure the nociceptive threshold of analgesic compounds in mice and rats. Conventional constant temperature hot plate tests only measure latencies of stronger narcotic agents.

IITC Incremental Hot/Cold Plate widens the range of analgesia research to new levels. The unit is microprocessor controlled and can be used for both incremental heating and cooling from any starting temperature from 0 deg. c. to 70 deg. c in 0.1 degrees c. increments. The microprocessor monitors and controls the rate of heating/cooling which can be set from 1 to 12 deg c. per minute. The front panel display shows all test results including length of test in .01 sec. increments, starting temperature and stopping temperature. The plate is uniformly heated/cooled at an adjustable rate and has automatic upper/lower cut-off limits. All parameters are entered via front panel keypad. i.e. rate of temperature increase/decrease, maximum/minimum temperature, date/time and animal number.

The unit can also double as a constant temperature hot plate. Temperature stability is .1 deg. c.

Upon reaction of either the hind or forepaw (whichever is chosen) the heating/cooling of the unit is reversed to the standby temperature within minutes. The data includes the date, animal number, temperature and time of day. The readout updates the controlled parameters.

Supplied with a clear animal enclosure. Plate size 4" x 8".

Two year warranty
120/240V
CE



Features

- Cold/Hot 0 - 70 degrees Celsius
- Ramping** temperature for threshold & latency results
- Rapid increase or decrease in temperature
- Precise Programmable digital control
- Print out of data
- Temperature stability is .1 deg. c.
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

Part #	Description
PE34	Incremental Hot/Cold Plate for mice and rats
Series 8	Software
PE34E	Animal Enclosure

Tail Flick Analgesia Meter

The IITC Tail Flick Analgesia Meter measures latency and/or temperature threshold when detecting properties of narcotic and strong non-narcotic drugs on mice and rats. A built-in Timer is automatically stopped when the animals' tail flicks out of the beam of light, test result will be displayed on readout for viewing. An overhead halogen light source is in a constant "ON" (idle state). A pre focused heat source supplies an area of 4X6mm stimulation to the tail. A built-in sensor in the tail groove detects the tail flick of the animal. The tail groove is a non-metallic material to avoid unnecessary conditioning of your animals; unlike other systems. If the animal does not flick their tail within the pre programmed cut-off time; the heat source shuts off automatically; avoiding tissue damage. Built-in timer displays the reaction time in 0.01 second increments. Control of system can be from either the front panel or supplied footswitch: Start, Stop and Reset of tests.



TAIL TEMPERATURE OPTION (T)



Measurement of tail temperature at all times.

Trigger temperature is automatic at start of every test. Warms tail to preset temperature (set by user) and then tests start, allowing all tail temperatures to be identical.

This optional feature allows automatic preheating of the tail up to 75 degrees c., ensuring all experiment protocols to be precisely controlled and repeated. Once a preset temperature is reached, the test and timer start automatically. Once the animal reacts via tail flick the timer and heat source stop and test results are displayed. Readout will now show in repeatable sequence, start, end temperatures and test time. This unique feature stores the set temperature unless otherwise changed; eliminating temperature variations from test to test. We recommend that animals be restrained with one of the IITC restrainers.

Features

- Tail Temperature Optional (T)
- Precise programmable digital control
- Humane cut-off feature
- Adjustable heat intensity in 1% increments room temperature to 250 degrees c.
- Reaction is detected automatically
- Manual override of all timer functions
- Alphanumeric readout
- All Functions and parameters entered via key-pad
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

This unit solves the problem associated with "tail temperature prior to and at the end of testing." See article: KJELL HOLE AND ARNE TJOLSEN: The Tail-Flick Formalin Test in Rodents: Changes in Skin Temperature as a Confounding Factor. Pain 53 (1993) pages. 247-254 Elsevier).

Two year warranty
120/240V
CE

Part #	Description
33	Tail Flick Analgesia Meter
33T	Tail Flick Analgesia Meter/Tail Temperature
18	High Intensity Bulbs, 2 per pack
Series 8	Software

Plantar Test (Hargreaves Method) & Tail Flick Meter in one

The IITC plantar and tail flick combination system is the only commercially available system of its kind. No need to purchase two separate systems, our combinations system enables researchers to perform both tests with this unique design. Testing properties of narcotic and stronger non-narcotic drugs on unrestrained mice and rats in plantar mode.



The IITC Plantar Analgesia Meter for paw stimulation can be used on 12 mice, 6 rats and other animals (cats, rabbits) unrestrained when testing for narcotic drugs. Experiments are easy to perform, simply slide the test head under test subject, align the heat source via our exclusive guide light (idle state) by the attached, adjustable, angled mirror on test head to test subject and perform tests.

Start, stop and reset of tests is done by either the push button on test head, front panel controls or supplied footswitch.

With our exclusive "idle state" of the heat source one is assured of exact placement of the heat source. Tests are performed on the plantar surface by a focused, radiant heat light source. The light beam is focused to the top of the glass and creates a 4X6mm intense spot on the paw.

Our method of visible light is superior to the infrared light method, since a user will not always know exactly where/when the test will start, causing false starts and conditioning of animals. A built-in timer displays reaction time in .01 second increments.

Features

- Tail Temperature optional (T)
- Precise Programmable digital control
- Humane cut-off feature, set by user
- Adjustable beam intensity in 1% increments
- Reaction is detected automatically (Tail Flick set-up)
- Manual override of all timer functions
- All Functions and parameters entered via key-pad
- Heated glass option only from IITC
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)



Animal enclosure

Plantar Test (Hargreaves Method) & Tail Flick Meter in one

The height of the glass is adjustable allowing the focal point of the light to be adjusted to stimulate other body parts if needed. A Humane cutoff timer is standard. The unit can be preset for a cutoff period, at the end of which the heat source shuts off automatically if the animal has not responded, avoiding tissue damage. Our test head does not emit , clicking or whining noises that cause preconditioning of animals prior to test as with other systems on the market.

Our exclusive heated glass option eliminates the glass acting as a heat sink. This feature will eliminate the reaction time of the animals to be altered due to the fact that they are placed on cold glass allowing the possibility of delayed response time to the applied heat source. Built-in heating elements in the glass which are digitally controlled for consistent temperatures. Temperature readout and adjustment from 30-40 degrees c. for the heated base is controlled on the heated base.

Three individual, acrylic animal enclosures are supplied. Each enclosure allows for 2 rats/4 mice allowing testing of up to 6 rats/12mice total. Enclosures have strong magnets to prevent animals from possible escape., individual lids, black dividers inbetween test subjects.

Tail Flick mode - the test head is attached to the electronic gear and the heat source now sits over a tail groove that has a sensor that detects the when the animal flicks it tail. System records and displays time and temperature of test. A humane cutoff timer that can be set by user, preventing tail tissue damage if test subject has not reacted within preset time.



TAIL TEMPERATURE OPTION (T)
Measurement of tail temperature at all times.

Trigger temperature is automatic at the start of every test.

This optional feature allows automatic preheating of the tail. To ensure experiment protocols to be precisely controlled and repeated. This feature allows the user to SET the tail temperature at start of each test is to be started at up to 75 degrees Celsius. Once that preset temperature is reached the test and the timer starts automatically and after the tail flicks the timer and light stop and the result is displayed. Readout will now show in repeatable sequence the start and end temperatures as well as test time.

We recommend animals be restrained with one of the IITC restrainers.

This unit solves the problem associated with “tail temperature prior to and at the end of testing.”
See article: KJELL HOLE AND ARNE TJOLSEN: The Tail-Flick Formalin Test in Rodents: Changes in Skin Temperature as a Confounding Factor.
Pain 53 (1993) pages. 247-254 Elsevier).

Two year warranty
120/240V
CE

Part #	Description
336	Plantar Test (Gargreaves) and Tail Flick Analgesia Meter
336G	Plantar Test (Hargreaves) and Tail Flick Analgesia Meter with heated glass
336T	Plantar Test (Hargreaves) and Tail Flick Analgesia Meter with Tail Temperature
336TG	Plantar Test (Hargreaves) and Tail Flick Analgesia Meter with Heated Glass and Tail Temperature
433	Animal Enclosure (2 rats - 4 mice)
Series 8	Software

Plantar Test (Hargreaves Method)

The IITC Plantar Analgesia Meter for paw stimulation can be used on 12 mice, 6 rats and other animals (cats, rabbits) unrestrained when testing for narcotic drugs. Experiments are easy to perform, simply slide the test head under test subject, align the heat source via our exclusive guide light (idle state) by the attached, adjustable, angled mirror on test head to test subject and perform tests.



Start, stop and reset of tests is done by either the pushbutton on test head, front panel controls or supplied footswitch.

With our exclusive "idle state" of the heat source one is assured of exact placement of the heat source. Tests are performed on the plantar surface by a focused, radiant heat light source. The light beam is focused to the top of the glass and creates a 4X6mm intense spot on the paw.

Our method of visible light is superior to the infrared light method, since a user will not always know exactly where/when the test will start, causing false starts and conditioning of animals. A built-in timer displays reaction time in .01 second increments.

The height of the glass is adjustable allowing the focal point of the light to be adjusted to stimulate other body parts if needed. A Humane cutoff timer is standard. The unit can be preset for a cutoff period, at the end of which the heat source shuts off automatically if the animal has not responded, avoiding tissue damage. Our test head does not emit, clicking or whining noises that cause preconditioning of animals prior to test as with other systems on the market.

Our exclusive heated glass option eliminates the glass acting as a heat sink. This feature will eliminate the reaction time of the animals to be altered due to the fact that they are placed on cold glass allowing the possibility of delayed response time to the applied heat source. Built-in heating elements in the glass which are digitally controlled for consistent temperatures. Temperature readout and adjustment from 30-40 degrees c. for the heated base is controlled on the heated base.

Three individual, acrylic animal enclosures are supplied. Each enclosure allows for 2 rats/4 mice allowing testing of up to 6 rats/12mice total. Enclosures have strong magnets to prevent animals from possible escape., individual lids, black dividers inbetween test subjects.

Features

- Precise programmable digital control
- Humane cut-off feature
- Adjustable beam intensity in 1% increments room temperature to 250 degrees c.
- Manual override of all timer functions
- Alphanumeric readout
- All Functions and parameters entered via key-pad
- Heated glass option only from IITC
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

Part #	Description
390	Plantar Test (Hargreaves method)
390G	Plantar Test (Hargreaves method) with heated glass
433	Animal Enclosure (2 rats - 4 mice)
Series 8	Software

Two year warranty
120/240V
CE



Incapacitance Meter

The IITC Incapacitance Meter is used for test assessment of pain and or inflammation of the hind limbs on mice and rats. It overcomes the drawbacks of other methods that might cause unnecessary stress or subjectivity on the animal. The technique known as dual channel weight averaging enables the test on both limbs allowing a clean stress free correlation to the paw pressure test. Control and testing can be done on the same animal at the same time.

Animals are placed in the supplied holders. Hind limbs rest on the two weight averaging platform pads. As the animal shifts their weight from each pad, the unit records the average weight in grams over a selectable test period of 5 to 999 seconds. Alphanumeric readout displays the weight of both limbs and testing start and stop features. These features are controlled on the front panel: Start, stop, reset.

The standard holder that is supplied is for 180-270 grams. Other sizes are available, the weight of the animal needs to be specified when ordering.

Two year warranty
120/240V
CE



Features

- Mice, Rats, and Birds
- Precise programmable digital control
- Reaction is detected automatically
- Manual override of all timer functions
- Alphanumeric readout
- All Functions and parameters entered via key-pad
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

Part #	Description
600M	Incapacitance Meter for mice
600R	Incapacitance Meter for rat
600MR	Incapacitance Meter for mice /rat
600MH	Mouse holder
600RH	Rat holder
Series 8	Software

BLOOD PRESSURE

RESTRAINERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Mesh Stands for both Rats and Mice

IITC Mesh Stands are ideal for large group studies. When studies call for rapid screening of pain and sensory thresholds the IITC mesh stands are a wonderful addition to any research laboratory. They are used in conjunction with the 2390 Series Electronic von Frey systems.

The two versions available -
6 rats/12 mice
2 rats/4 mice

The standard large mesh stand which houses 6 rats and 12 mice, or when bench top space is limited our smaller size mesh stand can be ordered, the smaller version allows 2 rats and 4 mice.

An optional mirror for either size is available, which enables researchers the ability to view exact placement of EVF probe. Mirror angle has two adjustments that can be adjusted by user. Available for any new or existing IITC Life Science Mesh Stand.

Each IITC Mesh stands are supplied with 5, 16" long, black anodized posts, (16" posts eliminate laboratory technicians from having to strain when trying to view correct placement of EVF probes.), black anodized base. Mesh - black anodized with 1/4" size waffle holes and a clear Plexiglas animal enclosure which is placed on top of mesh; allowing unobstructed view of the animal subjects during testing.



Mesh is interchangeable with glass in any one of the IITC plantar and or combination plantar/tail flick systems. A cost saving feature that allows users to use one stand for two separate tests.

Three individual, acrylic animal enclosures are supplied. Each enclosure allows for 2 rats/4 mice allowing testing of up to 6 rats/12 mice total. Enclosures have strong magnets to prevent animals from possible escape., individual lids, black dividers in between test subjects.



Dimensions
Large base 36" X 16"
Small base 18" X 16"
Mesh 38" X 14"

Two year warranty
120/240V
CE

Part #	Description
408	Mesh Stand for mice and rats (4 mice/2 rats)
410	Mesh Stand for mice and rats (12 mice/6 rats)
EVFL	Mirror for 400 large mesh stand
EVFS	Mirror for 406 small mesh stand
433	Animal Enclosure (4 mice/2 rats)

Glass Stand Only for Plantar Testing

When large group studies, are required IITC offers either version of our glass stands to be purchased individually. Allowing users to quickly and efficiently test large study groups.

The two versions available -
 6 rats/12 mice
 2 rats/4 mice

Both sizes are supplied standard -Black anodized base, 5 black anodized legs. Both sizes are supplied with the standard 8" legs. Tempered glass is placed on top. The clear plexi-glas animal enclosures are placed on top of the glass and allow unobstructed views of animal subjects during testing.

Due to the fact that glass acts as a heat sink; IITC developed the only commercially available heated glass. Warming the glass eliminates the heat sink problem, thus animals are placed onto the slightly warmed glass. Built in temperature controller in the heated base version keeps glass at a constant temperature between 30-40 deg. c which can be adjusted by user as needed.



Three individual, acrylic animal enclosures are supplied. Each enclosure allows for 2 rats/4 mice allowing testing of up to 6 rats/12 mice total. Enclosures have strong magnets to prevent animals from possible escape., individual lids, black dividers in between test subjects.



Dimensions
 Large base 36" X 16"
 Small base 18"X16"

Two year warranty
 120/240V
 CE

Part #	Description
400	Glass Stand for Plantar test (12 mice/6 rats)
400G	Heated Glass Stand for Plantar test (12 mice/6 rats)
402	Glass Stand for Plantar test (4 mice/2 rats)
402G	Glass Stand for Plantar test (12 mice/6 rats)
433	Animal Enclosure (12mice/6rats)

BLOOD PRESSURE

Analgesia and Behavioral Software

The IITC Series 8 software is available for each Series 8 unit. The individual software will capture data in real-time from one of the units and can be exported into Excel or other spreadsheet programs.

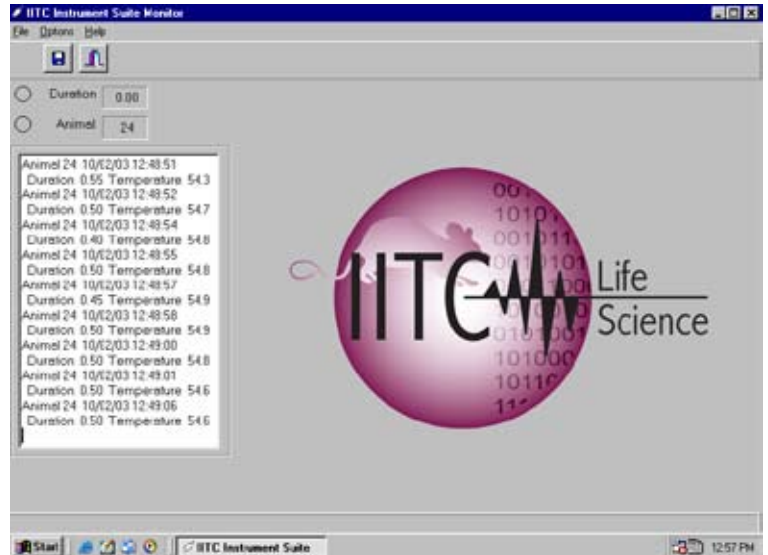
RESTRAINERS

Data supplied:

- Test
- Animal number
- Date
- Time
- Duration
- Temperature
- Starting temperature
- Stop temperature
- Set point temperature
- Active intensity
- Idle intensity
- Cut off time
- Reaction time
- Top end speed
- Distance

CATHETERS

ANALGESIA



The data supplied will depend on which Series 8 equipment is used with the corresponding software.

BEHAVIORAL/ACTIVITY

Part #	Description
Series 8	Series 8 Software for Analgesia Equipment

ANIMAL RESPIRATORS

Printer

This simple to use thermal printer can be ordered for data printout for any of the IITC Series 8 testing equipment. The printer is plugged into the printer output (supplied standard) on the back panel with supplied cable. The printer will supply printout of test data, i.e. animal number, test time. Paper rolls available.



SYRINGE PUMPS

One year warranty
120/240V
CE

TEMPERATURE PROBES

Part #	Description
1000	Thermal Printer for Analgesia Equipment
1000P	Thermal paper 1 each

Rotarod for Rats and Mice

The IITC Rotarod is used to assess the effect of drugs on the motor coordination or fatigue resistance on mice and rats using one unit in a safe and humane way. The animals are placed on textured drums to avoid slipping. When an animal drops onto the individual sensing platforms below, test results are recorded.

IITC's Rotarod has the capabilities of having up to five mice or rats tested at any given time.

The user can select from one to five lanes to be included in an experiment. For mice experiments 1¼ inch diameter drums are supplied and for rat experiments 3¾ inch diameter drums are supplied. All that is needed is a standard phillips screwdriver to change the drums, no other tool required.

The LED display shows all test results for each animal position; they are: Starting and stopping RPM's, length of test and distance traveled.

Animals drop is sensed by accurate magnetic switches that never need adjusting versus other units on the market today which use photoelectric sensing. Vertically sliding acrylic front panels prevent escape of animals.

Literature Reference: Jones & Roberts, F. Pharm., Pharmacol., 1968, 20, 302

The electronic gear is built into the base of the unit. All parameters are digitally controlled and entered via the keypad on the front panel. Start, stop and reset buttons are also on the front of the unit. An LED display allows the user to view all parameters and test results.

Key features of the IITC Rotarod are the following:

Adjustable test length: 1 to 999 seconds.

Adjustable start speed: 0 to 45 RPM's.

Adjustable top end speed: 0 to 45 RPM's.

Adjustable ramp speed: 0 to 999 seconds.

Forward, reverse mode

Distance recorded in Meters

Two year warranty

120/240V

CE

Part #	Description
755	Rotarod Treadmill one unit for mice and rats
Series 8	Software



Features

- No adjustments required on sensing platforms
- Digitally controlled
- Five (5) lanes standard
- Adjustable test length
- Adjustable start speed
- Adjustable top end speed
- Adjustable ramp speed
- Forward and reverse rotation mode
- Distance recorded in Meters
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)
- Thermal printer (optional)



BLOOD PRESSURE

RESTRAINTERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Treadmill for Rats and Mice

The IITC Treadmill is a general purpose exerciser for mice and rats that can be ordered from 1 to 5 lanes. Our unit is designed to enable the operator a more precise reading in conjunction with the amount of exercise given to the animal. This digitally controlled unit has a high degree of repeatability. Test parameters are entered via the front panel keyboard. All the test results are displayed on the front panel display. The test ending results for each position are speed, test time, number of times stimulus was applied as well as distance traveled in meters. The user can select from one to five lanes at a time to be included in the test.

On the IITC Treadmill we have incorporated a shock grid. The shock grid can be turned on and off at will by the user. The shock grid is located at the end of the ramp.

The equipment is supplied with a universal power supply that is built in. On all versions, the ramps can be inclined from 0 to 40 degrees in 5 degree increments. When using multiple lanes each lanes parameters and incline are controlled separately.

Two year warranty
120/240V
CE



Features

- Mice and Rats
- From 1 to 5 lanes
- Textured Belt
- Shock grid for each lane
- Test time adjustable for each lane
- Adjustable ramp speed from 1 to 18 meters per minute
- Adjustable ramp inclination from 0 to 40 degrees in 5 degree increments
- Individual stimulation count for each lane
- Footswitch - RS232 - Printer output (standard)
- Software - USB - Printer (optional)

Part #	Description
801	Treadmill with shocker (1 lane)
802	Treadmill with shocker (2 lane)
803	Treadmill with shocker (3 lane)
804	Treadmill with shocker (4 lane)
805	Treadmill with shocker (5 lane)
Series 8	Software

ANY-Maze behavioral tracking software

Impressively Flexible

As the name implies ANY-maze can be used to track the behavior of literally any animal (planarian to pacaderm) anywhere (Water, Plus, Zero, t-, Y-, Radial Arm, Open field, Locomotor activity, Place Preference boxes, Forced Swim, etc.)

Even power outlets are not required. Using a conventional notebook computer and a USB or FireWire camera you can use ANY-maze to automate most anything. But, ANY-maze can also be used to automate complex systems with multiple cameras and apparatuses.

Incredible price

Deceptively Simple

Intuitive Friendly Design

Comprehensive Technical Support (2007 Life Science Industry Awards Nominee for Most Knowledgeable Technical Support)

Choose to start tests manually or automatically.

With ANY-maze's exclusive adaptive tracking technology there are no values to set – just put the animal in the apparatus and it tracks

Surprisingly Powerful

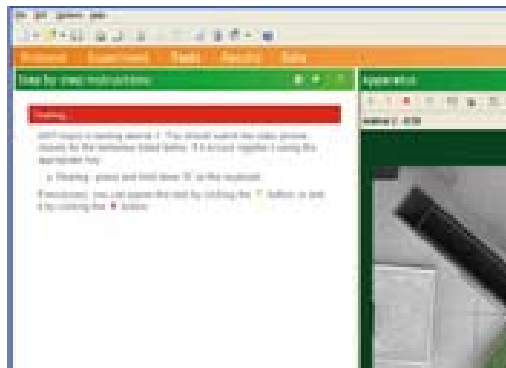
ANY-maze can track within 16 pieces of apparatus simultaneously

ANY-maze includes more than 100 standard measures

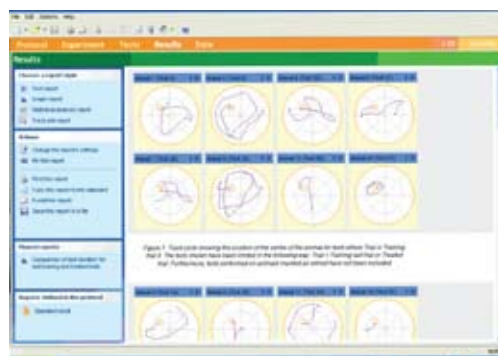
ANY-maze can perform full statistical analysis of results immediately upon completion of your experiment using more than 30 built in parametric and non-parametric tests (and post-hoc analysis)

Features

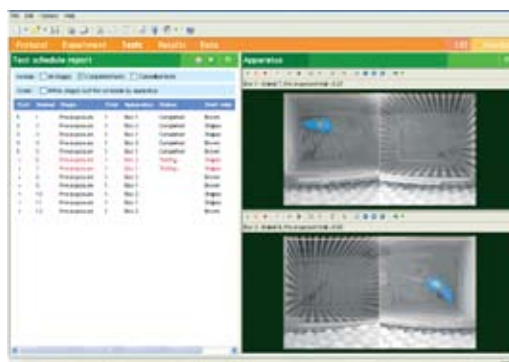
- Tracks up to 16 pieces of apparatus simultaneously
- Includes more than 100 standard measures
- Performs full statistical analysis of results immediately upon completion of your experiment
- Intuitive, friendly design
- Comprehensive technical support



ANY-maze can automate testing in a wide variety of behavioral apparatuses



ANY-maze can perform tests in up to 16 pieces of apparatuses simultaneously



ANY-maze has comprehensive reporting and analysis features including more than 30 built in statistical tests.

BLOOD PRESSURE

RESTRAINTERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

ANY-Maze interface

Light and temperature sensors can automatically record light and temperature levels at the start of tests. They can also be used in 'watch-dog' mode, and alert you by e-mail or cell-phone, if conditions in an experiment go outside preset limits.

Four analog inputs sense and record analog signals providing an interface, for example, with real time electrophysiological data.



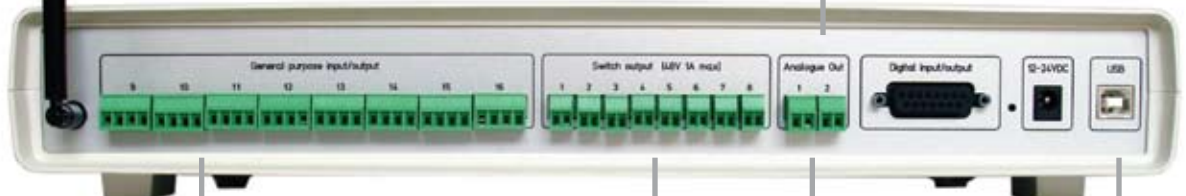
Sixteen general purpose ports can be used to sense switch closures, photo-beam breaks, rotometer revolutions, or to switch devices on and off.

Four independent speakers can play any sound at software controllable volumes.

The ultra-sound input can detect and record vocalizations in the range of 16-66 KHz.

Radio-frequency remote control buttons can be used to control tests at a distance; they even work through walls.

Two analog outputs can generate feedback based on the animal's position or can be used to create stimuli.



Eight solid state relay outputs can be used to control lamps, pumps, motors, lights, etc.

The 8-bit, bidirectional, digital I/O port can be used to interface to existing equipment, for example, to control the shock level generated by a shocker.

USB connection to your PC—in most cases you don't even need a power cord.

- BLOOD PRESSURE
- RESTRAINTERS
- CATHETERS
- ANALGESIA
- BEHAVIORAL/ACTIVITY
- ANIMAL RESPIRATORS
- SYRINGE PUMPS
- TEMPERATURE PROBES

ANY-Maze

Mazes Designed With Video Tracking In mind have been engineered with the goal of optimizing video tracking. These sturdy, non porous pieces are textured and painted a non reflexive gray to optimize the animals contrast with its background. The Plus, Radial Arm, T, Y and Zero mazes have slotted bases so the durable and easy to clean ABS plastic walls of the arms (also textured non reflective gray to eliminate glare) can be removed and the floor of the maze can be thoroughly and easily cleaned between successive animals. These grooves also ensure that the arms are always returned to the same point helping to maintain the footprint of the maze under the camera.

The Radial Arm-Maze has been used extensively in evaluating spatial learning and memory. The apparatus consists of eight (or 12) equidistantly-spaced arms radiating from a small circular central platform. The design ensures that after checking for food at the end of each arm the rat is forced to return to the central platform before making another choice. As a result, the rat always has eight (or 12) possible options.

Part #	Lane Width	Arm Length	Wall Height
60150 Mouse 8 Arm	5cm	35cm	9cm
60250 Rat 8 Arm	10cm	50cm	13cm
60155 Mouse 12 Arm	5cm	35cm	9cm
60255 Rat 12 Arm	10cm	50cm	13cm



The Elevated Plus Maze is used to assess anxiety-like behavior in laboratory animals. The maze exploits the conflict between the innate fear that rodents have of open areas versus their desire to explore novel environments.

Part #	Lane Width	Arm Length	Wall Height	Leg Height
60140 Mouse	5cm	35cm	9cm	40cm
60240 Rat	10cm	50cm	40cm	40cm

The Open Field apparatus is broadly used to assess exploratory behavior and validated for use in the measurement of anxiety related behaviors

Part #	Lane Width	Arm Length	Wall Height
60100 Mouse, clear walls	40cm	40cm	35cm
60101 Mouse gray walls	40cm	40cm	35cm
60200 Rat, clear walls	100cm	100cm	35cm
60201 Rat, gray walls	100cm	100cm	35cm
60210 Quad Divder clear	Divides to 4-50x50cm enclosures		



BLOOD PRESSURE

ANY-Maze

The T-maze is used largely in preference and spatial learning tasks. Animals learn to alternate between arms based on their memory of the previously visited arms or choose an arm based on the reward presented. The simple capital T shape design incorporates a single choice point with only two alternatives.



RESTRAINERS

Part #	Lane Width	Stem Length	Arm Height	Arm Length
60181 Mouse	5cm	35cm	10cm	28cm
60240 Rat	10cm	50cm	20cm	40cm

CATHETERS



The elevated Zero-maze is a modification of the Elevated Plus-Maze which incorporates both traditional and novel ethological measures in the analysis of anxiety. The design comprises an elevated circular platform with two opposite enclosed quadrants and two open, removing any ambiguity in interpretation of time spent on the central square of the traditional "plus" design and allowing uninterrupted exploration.

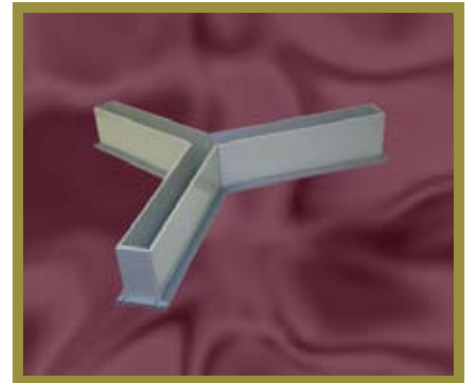
ANALGESIA

Part #	Diameter	Lane Width	Wall Height	Leg Height
60190 Mouse	50cm	5cm	15cm	40cm
60290	100cm	10cm	30cm	40cm

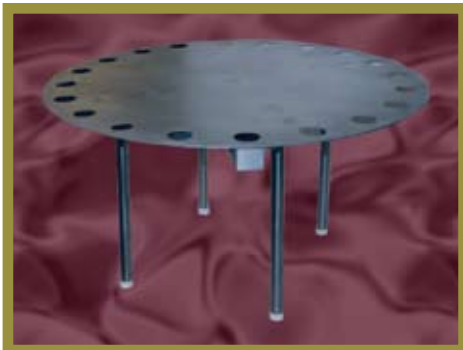
BEHAVIORAL/ACTIVITY

The Y-maze is similar to the T-maze, but has three identical arms. Gradual turns of the Y-maze decrease learning time as compared to the sharp turns of the T-maze

Part #	Lane Width	Arm Length	Wall Height
60180 Mouse	5cm	35cm	10cm
60280 Rat	10cm	50cm	20cm



ANIMAL RESPIRATORS



The Barnes Maze task is similar to the Radial Arm and Morris Water mazes but without dietary restrictions and with less physical stress. The Barnes Maze is designed for testing spatial learning and memory. Within the maze, animals are motivated to escape from the brightly lit, open platform to a small dark recessed chamber (escape box). During testing, the animal learns the spatial location of the escape box. The maze also includes false escape boxes which help to remove visual cues that might be observed from a distance or through an open hole. *The rat model will be available second quarter 2008.

SYRINGE PUMPS

Part #	Table Diameter	Hole Diameter	Height
60170 Mouse	91cm	5cm	90cm
60270 Rat*	122cm	10cm	90cm

TEMPERATURE PROBES

ANY-Maze

The Morris Water Maze is a behavioral procedure designed to test spatial memory. The maze has advantages over conventional mazes such as the elimination of local cues such as trace sense and no fixed escape formula

Both the Deluxe and Economy Mazes have pools nested in customized carts on swivel casters with wheel brakes. They are elevated to make the pool more accessible. Included wheels provide convenience in positioning, adjusting, and storing the maze. Includes side drains for quick emptying and cleanup. Includes islands for use in Morris Maze applications.



Part #	Diameter
DELUXE	1.2 inches
60130	1.5 inches
60131	1.8 inches
60230	100cm
ECONOMY	
60135	1.2 inches
60136	1.5 inches
60235	1.8 inches



The Porsolt or Forced Swimming Test (also known as the Behavioral Despair Test) is the most commonly used test for assessment of depression in animal models. The test is commonly used to measure the effect of antidepressant drugs on behavior. Handles for convenience in carrying, positioning, emptying and cleaning. The Porsolt Arena accommodates top and side camera placement and is well suited for use with both mice and rats. A center drain and valve for water level adjustment and initial emptying.

Part #	Diameter	Depth
60160	20cm	45cm

The Tail-Suspension Test is akin to the forced swim test but avoids the problems of hypothermia and stress associated with forced swimming. Animals are suspended by their tails and the amount of "immobility" is measured. Longer periods of immobility are associated with higher depressive scores and immobility can be reversed with antidepressant treatment.

Part #	Diameter	Station Width	Overall Width
60125 Mouse	54cm	19cm	47cm



BLOOD PRESSURE
RESTRAINTERS
CATHETERS
ANALGESIA
BEHAVIORAL/ACTIVITY
ANIMAL RESPIRATORS
SYRINGE PUMPS
TEMPERATURE PROBES

Part #	Description
CABLES	
60558	4.5M 6 pin to 6 pin Firewire Cable
60559	4.5M 6 pin to 4 pin Firewire Cable
60560	10M 6 pin to 6 pin Firewire Cable
60561	10M 6pin to 4 pin Firewire Cable
60541	15ft. Analog Cable
60542	30ft. Analog Cable
60543	75ft. Analog Cable
FIREWIRE CAMERA AND LENSES	
60515	Firewire Camera
60514	Mini-Firewire Camera Kit
60523	1.9mm 107° Wide Angle Lens for 60514
60524	2.1mm 81° Wide Angle Lens for 60514
60525	4.3mm 45° Wide Angle Lens for 60514
60526	8.0mm 25° Wide Angle Lens for 60514
60527	12mm 17° Wide Angle Lens for 60514
ANALOG CAMERAS	
60510	Panasonic B/W Camera
WEBCAM	
60505	Logitech QuickCam Pro 5000
60506	Creative Webcam NX Ultra
LENSES	
60520	Panasonic
60521	Computar Wide Angle
60522	Computar Narrow Angle
CS MOUNT LENSES	
60528	CS Mount Lens for 60515
60529	CS Mount 6-60mm Varifocal Lens for 60515
60530	CS Mount 3.5-8mm Varifocal Lens for 60515
MOUNTING OPTIONS	
60545	Universal Camera Mounting Bracket
DIGITIZERS	
60501	Digitizer Card
60503	Video to FireWire Converter
ILLUMINATORS	
60549	45' Range Illuminator
60550	60' Range Illuminator

Because ANY-maze supports such a wide range of cameras, you'll be able to customize and configure a system ideal for your research. Configure ANY-maze to fit your needs. Create a simple, inexpensive set up with a web camera, use FireWire Cameras for a camera daisy chain, or use a digitizer with security cameras. We offer an array of camera, lens, cable, mount and connector options to help you out. If you need assistance with your video tracking accessories, just give us a call or send us an e-mail.



Cables



Firewire Cameras and Lenses



Analog Cameras and Lenses



Webcam Mounts

Digitizers



Illuminators

Animal Respirators

SAR-830 Volume-Cycled Ventilator

All ventilators operate on the flow-time principle. This method uses a constant flow of gas, which is gated into the animal for a known time, thus producing a known volume (flow x time = volume). This simple but powerful approach gives great flexibility in setting ventilation parameters such as inspiration time, I/E ratio, and more; something that is difficult or impossible to accomplish with the older mechanical piston-pump technology. In addition, this contributes to the legendary reliability and long service life of our ventilators, since the only moving parts are a pair of long-life solenoid valves.

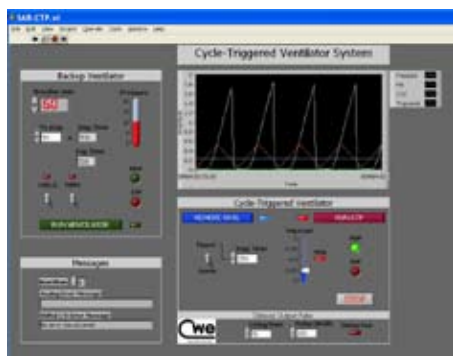
These are our most popular models, and provide reliable and safe ventilation of rodent-size animals. Inhalational anesthesia (Halothane or Isoflurane) is available for all models. Economical multi-animal setups are made easy by adding external valve assemblies. All models feature a built-in computer control interface for remotely-controlled applications. (Model SAR-830/AP shown)



Part #	Description
SAR-830	Rodent ventilator, volume-cycled, without air pump
SAR-830/A	Rodent ventilator, volume-cycled, with internal air pump
SAR-830/P	Rodent ventilator, volume/pressure-cycled, without air pump
SAR-830/AP	Rodent ventilator, volume/pressure-cycled, with internal air pump

One year warranty
120/240V
CE

Part #	Description
CTP-VA-1	External Valve Assembly, mouse-rat size
CTP-VA-3	External Valve Assembly, cat-small dog size
MVA-4	Multivalve electrical adapter for adding up to 4 CTP-VA-1's to an SAR-830
EFM-1	Flowmeter with stand, specify range: 100cc (mouse), 1000cc (rat), 2500cc (cat/rabbit), 5000cc (small dog)
EFM-4	Flowmeter manifold with 4 flowmeters for gas mixing or distribution to multiple valve assemblies, specify range
Mouse Kit	For SAR-830 series: external flowmeter and low-volume tubing set for mouse
LP-REG	Low-pressure in-line regulator for use with SAR-830 series ventilators, allows long, constant lung pressure inflations for imaging applications



Software for SAR 830A or SAR 830AP

- Complete remote control of ventilator
- Synchronize ventilation to neural activity (or other inspiratory nerve or muscle)
- Works with paralyzed or un-paralyzed animals
- Backup ventilator instantly selectable
- Displays airway pressure and CO2 (if available)
- Other custom control functions available
- Runs on any Windows PC with USB port

All that is required is a Moving Average of the nerve activity, which is connected to the USB box. Adjustable trigger levels and a "backup" standard ventilator are included. This system allows complete remote-control of the ventilator.

Flowmeter/Regulators

A regulated flow source is required for each external valve assembly attached to an SAR-830. Rotameter-type flowmeters are available as single units or as four-flowmeter manifolds (seen at right). The flowmeter manifolds can be used to mix anesthetic gasses, or as independent flowmeters for multiple valve assemblies. Digital mass flowmeters are also available where the highest accuracy is required. A metering valve should be ordered with each digital mass flowmeter.



MVA-4 Multi-Valve Adapter

Allows up to four external valve assemblies to be attached to one SAR-830 series ventilator, for a total of five ventilator stations. Up to four CTP-VA-1 valve assemblies can be powered by one SAR-830 ventilator; two CTP-VA-3's, or one CTP-VA-4, due to power supply constraints. Other configurations of the SAR-830 and its associated valve assemblies are available on special order. Complete anesthesia setups, including Halothane or Isoflurane vaporizers, are also available.



CTP-VA-1 External Valve Assembly

External valve assemblies are used to expand the volume range of SAR-830 series ventilators, or to add additional ventilator stations. The valve assembly connects to the ventilator through a supplied 12' cable, and acts as a slave to the SAR-830. The CTP-VA-1 (shown at right) is equivalent to the standard SAR-830 internal valves, and is used to create one or more additional ventilator stations. To connect more than one valve assembly, an MVA-4 electrical adapter is required (see below). A controlled flow source is required for each external valve assembly. Tubing and connectors are supplied.



Animal Respirators

MRI-1 Ventilator

The MRI-1 Ventilator is a small animal ventilator designed for use in MRI and other high magnetic field environments. The system comprises a microprocessor-based control unit and a set of remote, pneumatically operated, non-magnetic valves. The MRI-1 can operate by itself or can be controlled and/or monitored by a computer.

How it works: The MRI-1 operates on the flow-time principle: an inspiratory airflow is established and gated into the animal for a known time, thus producing a known volume. This approach provides extraordinary flexibility — a wide range of volumes, breaths-per-minute, and I/E ratios are possible with no hardware changes, and using just three front-panel controls. For small animals, respiratory airflow is provided by an internal air pump. Alternatively, an external pressurized gas source can be attached (oxygen or anesthetic gases).



The remote pneumatic valves do the actual airflow switching. By locating these valves close to the animal (including inside the magnet bore if necessary), dead-space and tubing compliance are minimized. A range of valves is now available for animals ranging from mice to pigs. Rodent-size valves are supplied standard, and larger valves can be purchased later as required.

Operation: Setting up and operating the MRI-1 is easy. Flexible tubing connect the control unit and the valves, providing respiratory airflow and pneumatic control pressure to the valve. Only three controls are required: respiratory rate is set in breaths/minute; the flow rate is set using the front-panel flowmeter (and measured internally by a mass flowmeter); and the percent inspiration is set to establish the ratio of inspiration to expiration time (I/E ratio). All respiratory parameters are shown on the front-panel LCD display. The tidal volume and minute ventilation reflecting the current settings is also continuously displayed, and can easily be changed by adjusting the flow rate.

Expandable: The MRI-1 can also be used in other than magnetic environments. Because of the non-electrical nature of the ventilation valves, this unit is particularly well suited to sensitive electrophysiology recording situations. Besides the standard miniature pneumatic valves, the MRI-1 also accepts any of the solenoid valve assemblies available for the popular SAR-830 series ventilators. Using the MVA-4 multi-valve expander, it is also possible to ventilate several rodent-sized animals simultaneously using just one MRI-1 as the control unit. The external valves operate synchronously, but tidal volumes are independently set by varying the flow rate to each valve assembly.

Installation requirements: A source of compressed air or helium (approximately 20-50 psi) is required for operating the pneumatic valves. This is attached to the rear panel of the unit, and the pressure is internally switched on or off as required for remote valve operation. Helium is often used as the actuating gas because its lower density and viscosity permits somewhat faster valve switching.

One year warranty
120/240V
CE

Part #	Description
MRI-1	Ventilator system with rodent valve set, all tubing & fittings
Pneumatic Valve XS	Non-magnetic valve set with tubing & fittings, mouse - rat (supplied standard with MRI-1)
Pneumatic Valve S	Non-magnetic valve set with tubing & fittings, rabbit - large rodents
Pneumatic Valve M	Flowmeter with stand, specify range: 100cc (mouse), 1000cc (rat), 2500cc (cat/rabbit), 5000cc (small dog)
Pneumatic Valve L	Non-magnetic valve set with tubing & fittings, dog - goat
Mouse Kit	For SAR-830 series: external flowmeter and low-volume tubing set for mouse
MRI-1 AccPack	Accessory kit of tubing, adapters (supplied standard with MRI-1)

CAPSTAR-100 CO2 Analyzer

The CapStar-100 Carbon Dioxide Analyzer provides continuous measurement of expired CO₂ over the range 0-10 percent. Its rapid response time, small sample flow requirements, and long-term stability make it ideal for respiratory gas measurement of rodents and larger animals.

The heart of the instrument is a miniature infrared analyzer with exceptional stability, low maintenance, and a linear output. The heated measurement cell prevents water condensation. The SensorPod, which contains the infrared measurement cell, attaches to the front panel by a 1.5m cable. This cell can be removed for cleaning, inspection, or replacement in minutes. The digital display shows CO₂ concentration in percent or mmHg, and allows breath-by-breath peak end-tidal reading or continuous rapid response. Calibration is performed with a single calibrated gas and room air.



The reliability and ease of operation of the CapStar-100 make it the perfect instrument for routine respiratory CO₂ monitoring. It is the natural companion to our SAR-830 series Small Animal Ventilators for monitoring respiratory status. With the AVS-1 Advanced Ventilator System, it can control end-tidal CO₂. It can also be used to monitor unassisted animals. Gas sampling rates of less than 30ml/min can be used, making it possible to monitor animals as small as rats. The fast response time of the CapStar-100 allows end-tidal response plateaus with respiratory rates of 100 breaths/min.

A range of accessories is available to ensure easy setup and convenient operation. An accessory pack containing sample tubing, moisture traps, and Nafion® moisture-absorbing sample tubes is included with the instrument.

One year warranty
120/240V
CE

Part #	Description
11-10000	CAPSTAR-100 CO ₂ Analyzer, complete with accessory kit , 120/240V 50/60Hz
11-01100	Replacement CO ₂ sample cell
11-01101	Accessory kit; 2 moisture traps, 2 13mm hydrophobic filters, 1 sample line, 2 Nafion®. sample lines (6" and 2')
11-01102	Sample line, plain, 5', with male Luer-loc connectors
11-01103	Sample line, 2' Nafion® tubing (absorbs and evaporates condensed moisture), with Luer connectors
11-01111	Sample line, 6" Nafion® tubing, with Luer connectors
11-01104	Sample tubing, .040" ID Tygon™, 10' coil
11-01105	Luer-loc adapter, .040" - .062" ID flex tubing to male Luer, pack of 5
11-01106	Luer-loc adapter, .125" ID flex tubing to male Luer, pack of 5
11-01107	Moisture trap, male-female Luer-loc connectors
11-01108	In-line miniature (13mm) hydrophobic filter, Luer male-female fittings
11-01110	Calibration gas, 4 liter aerosol can, 5% CO ₂ , 20% O ₂ , balance N ₂
11-10001	Serial Port, RS232 Serial data port, with cable

Respiratory Gas Analyzers

MicroCapStar Co² Monitor

The MicroCapStar End-Tidal Carbon Dioxide Analyzer provides accurate end-tidal or continuous measurement of expired CO₂ in animals as small as mice. It features very low sample flow requirements, rapid response time, and long-term stability. Respiratory rate (RR) is computed using the excursions of the CO₂ waveform. The CO₂ and RR measurements, as well as a trend plot of the end-tidal values, are displayed on the graphics LCD screen.



The heart of the MicroCapStar is a new temperature-controlled infrared CO₂ sensor with digital output. Low sample flow and rapid response is achieved with a carrier gas system employing digitally-controlled active flow management. This technique precisely and automatically maintains the ratio of carrier flow to sample flow, which is essential for accurate measurements. The heated measurement cell prevents water condensation, even during long-term measurement sessions. The standard sample tubing set is 1m long, but lengths of up to 2.5m are possible.

The front-panel display (see above) shows CO₂ concentration (either instantaneous or ETCO₂) in either percent or mmHg, and a 5-minute trend plot of ETCO₂. Calibration is performed with a single calibration gas and room air. An adjustable ETCO₂ alarm provides a warning when end-tidal values fall out of a user-adjustable preset range. All adjustments are performed digitally using a single knob. Built-in diagnostics monitoring warn of plugged sample tubing or other fault conditions.

The advanced features, reliability, and ease of operation of the MicroCapStar make it the perfect companion to our SAR-830 series Small Animal Ventilators for monitoring respiratory status. With the AVS-1 Advanced Ventilator System, it can be used to control end-tidal CO₂. An accessory pack containing spare low-volume sample tubing and a variety of connectors and fittings is included with the instrument. A range of accessories is available to ensure easy setup and convenient operation. Windows-based monitoring software is included, which allows display of the measurements, and saving the data to a disk file.

CO₂ monitoring is widely recognized as an important measure of the respiratory status of experimental animals. It is useful in setting ventilator parameters, and serves to gauge depth of anesthesia in unassisted, spontaneously breathing animals as well. The microCapStar extends this important technique to the realm of small experimental animals.

One year warranty
120/240V
CE

Part #	Description
15-10000	MicroCapStar End-tidal CO ₂ Analyzer for mice, with accessory pack, 110/220V
15-00100	Sample Tubing Set 1 Sample tubing set for MicroCapStar, 1m, with connector kit
15-00110	Sample Tubing Set 2 Sample tubing set for MicroCapStar, 2m, with connector kit
11-01108	Filter Replacement in-line hydrophobic filter, 13mm dia., pack of 5

BLOOD PRESSURE

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SYRINGE PUMPS

TEMPERATURE PROBES

OXYStar-100 O₂ Monitor

The OxyStar-100 is a fast-response, high accuracy oxygen analyzer for respiratory monitoring, hypoxic gas studies, or general laboratory use.

It features a measurement range of 0 - 100% O₂, with a resolution of 0.1%. Sample flow is adjustable over a 10 - 200ml/min range, making respiratory oxygen measurements possible on small as well as larger animals and human subjects.

The instrument uses an advanced paramagnetic oxygen transducer with fully digital operation. Calibration is accomplished with a simple two-point procedure, typically nitrogen (for 0.0%) and room air (20.9%). The analyzer offers excellent linearity and stability over its entire measurement range.

Standard features of the OxyStar-100 include simple one-knob calibration, analog voltage output signal, and a serial data output for remote monitoring or data collection. A bar-graph display shows rapid changes and trends over three user-selectable ranges. Sample inlet and outlet connections use standard Luer-loc fittings.

The instrument comes complete with sample tubing and an accessory pack of tubing and adapter fittings for constructing custom sample tubing configurations.

One year warranty
120/240V
CE



Part #	Description
OxyStar-100	Oxygen monitor
CapStar-100	Carbon Dioxide monitor
MicroCapStar	Micro-sampling CO ₂ monitor

Respiratory Gas Analyzers

GEMINI Respiratory Monitor

The GEMINI Respiration Monitor measures CO₂, O₂, and respiration rate of spontaneously breathing or ventilated animals. It provides breath-by-breath readings for end-tidal CO₂ and O₂, and instantaneous respiratory rate (breaths/minute). Adjustable alarms are provided to monitor CO₂ and respiratory rate.



This instrument uses the latest sensor technology for accuracy, stability, and fast response. CO₂ is measured with a temperature-controlled miniature infrared analyzer cell; O₂ is measured with a new paramagnetic sensor cell. Respiratory rate is computed using the normal excursion of the CO₂ signal, and is updated on each breath.

Simple set up and operation: The sample inlet tubing is connected to the endotracheal tube as close to the animal as possible. High and low alarms are set using a single knob, and the settings are stored in non-volatile memory so they do not have to be reset the next time the instrument is used. All measurements are displayed on the front panel LCD display, and are available as analog voltages for external recording. In addition, a serial port provides all the measurements in a simple ASCII format for collection by any computer.

Expandable: An open slot is provided for installation of any SYSTEM 1000 instrumentation module. Available modules include a cardiometer (Model CT-1000), blood pressure amplifier (Model PM-1000), plethysmographic respiration monitor for very small animals (Model RR-1000), and many other functions. This expandability allows you to configure a complete physiological monitor for use during surgery or extended experiments.

Applications: The GEMINI monitor provides complete information for respiratory status assessment for animals as small as rats. It comes complete with an accessory pack of inlet tubing, connectors, and moisture filters.

One year warranty
120/240V
CE

Part #	Description
14-10000	GEMINI Respiratory monitor Measure O ₂ , CO ₂ , and resp rate
10-06000 CT-1000	Cardiometer plug-in module Direct connect ECG measurement
10-03000 PM-1000	Transducer amplifier plug-in module Arterial BP measurement
10-04100 DTX-1	Medical-type blood pressure transducer Economical arterial BP transducer
10-04210 TC-GRA	Required adapter cable for TXRR
11-20110	Rat cage Measurement chamber, approx. 2.5 liter For rats and similar size animals
11-01108	Filter Miniature in-line hydrophobic sample filter Prevents water from entering analyzer
11-01103 BCI-1128	Nafion sample line, 2' Membrane tubing dries input sample
11-20211	Dessicant Bulk Drierite dessicant, 12 1 lb packs

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TEMPERATURE PROBES

MM-100 Metabolic Monitor System

The MM-100 Metabolic Monitor is a complete system for measuring oxygen consumption in the small animal. 1 to 16 animals can be measured. Using the latest technology in paramagnetic O₂, infrared CO₂, and thermal mass flowmeter analyzers, it automatically computes O₂ consumption, CO₂ production, and respiratory exchange ratios (RER).



Simple set up and operation: The animal is placed in the provided chamber and allowed to equilibrate for 5 - 10 minutes. All gas and flow measurements, and computed results are shown on the front panel LCD display panel. A serial port connection sends the measurements to any attached computer. Using the included Windows™ software, the readings for O₂ consumption and CO₂ production, along with their moving time averages, are plotted. Data can be logged to simple ASCII files for further analysis. Standardization against room air is automatically performed at intervals, so the accuracy of the system is maintained for long intervals of monitoring.

Multiple chamber systems: Expansion to multiple animals is straightforward. Using the MMX-4 or MMX-16 (for four and sixteen animals, respectively) expansion units, gas sampling and measurement is automatically sequenced between the chambers. This results in an accurate, economical system for screening large numbers of animals for these important physiological parameters.

MM-COMM Monitoring Software: Each MM-100 system includes Windows software for graphically displaying and logging the metabolic data. This software provides a Data Panel showing all the current raw and computed measurements. Data is logged in a simple ASCII format for directly importing it into a spreadsheet or other analysis program. Each record is tagged with the animal number and time of the measurement.

Complete package: The MM-100 comes complete with all necessary components for a single-chamber measurement. This includes the main MM-100 unit, small animal chamber, air pump, drying tubes, and required tubing. The only consumable item is the Drierite material for drying the gas sample.

One year warranty
120/240V
CE

Part #	Description
11-20000 MM-1000	Metabolic Monitor system with mouse chamber Measure O ₂ consumption, CO ₂ production
11-22000 MMX-2	Two-chamber expansion unit w/ 2 chambers Monitor two animals simultaneously
11-23000 MMX-8	Eight-chamber expansion unit w/ 8 chambers Monitor eight animals simultaneously
11-24000 MMX-16	Sixteen-chamber expansion unit w/ 16 chambers Monitor sixteen animals simultaneously
11-20100	Mouse cage Measurement chamber, approx. 1 liter For mice and similar size animals
11-20110	Rat cage Measurement chamber, approx. 2.5 liter For rats and similar size animals
11-20200	Drying tube Spare Drierite tube, pk of 4 Can be regenerated by oven heating
11-20210	Drying column Large dessicant column, 6.7cmD x 29cmH For long-term monitoring
11-20211	Dessicant Bulk Drierite dessicant, 12 1 lb packs Refill for drying tubes or columns

Temperature Controller

TC-1000 Temperature Controller

Model TC-1000 Temperature Controller monitors and controls the body temperature of small animals. This microprocessor-based instrument features a low-voltage DC proportional controller to provide artifact-free heating using a resistive heating blanket. The smooth Proportional-Integral-Derivative (PID) control eliminates the electrical transients common to on/off type controllers. A front-panel LCD panel displays the current body temperature, the targeted set-point temperature, alarm settings, and a heater power bar graph. An analog output provides a linear voltage corresponding to temperature.



The controller uses standard YSI-400 series (or compatible) thermistor probes. These interchangeable probes are available in a variety of sizes to suit the animal being monitored. Resistive heating blankets are available in mouse, rat, or cat size. Other resistive-type heating devices (such as immersion heaters) can be connected, as long as the current draw is less than 3A at 12VDC. Heater currents up to 10A are possible using an external battery or power supply, accessible using binding posts on the rear panel.

Operation: The TC-1000 controller is simple to operate. After plugging in the probe and heating blanket, the animal's temperature is shown on the display. The adjustable set-point temperature and alarm band is also displayed, both being adjustable using a single knob. An over/under temperature alarm with adjustable hysteresis is push button activated. The unit automatically detects fault conditions such as a defective or disconnected probe or heating blanket.

One year warranty
120/240V
CE



Part #	Description
08-13000 TC-1000	Mouse Temperature controller, probe (TH-2K), small heating pad
08-13001 TC-1000	Rat Temperature controller, probe (YSI-402), rat heating pad
08-13002 TC-1000	Cat Temperature controller, probe (YSI-402), medium heating pad
	Individual components
08-13013	Mouse Pad Heating pad, waterproof, mouse, 3 x 6" (7.6 x 15.2cm), MR-compatible
08-13014	Rat Pad Heating pad, waterproof, rat, 5 x 7" (12.7 x 17.8cm), MR-compatible
08-13015	Cat Pad Heating pad, waterproof, cat, 10 x 18" (25.4 x 45.7cm), MR-compatible
08-13011	Blanket-Cat Heating blanket w/ cover, cat, 18 x 27" (45.7 x 68.6cm), not MR-compatible
10-09011 TH-2K	Miniature thermistor probe, mouse, 1mm dia
10-09010 YSI-401	Thermistor probe, cat, 4.75mm dia
10-09020 YSI-402	Thermistor probe, rat, 3mm dia
10-09030 YSI-403	Thermistor probe, stainless steel for immersion, 4mm dia
08-09200 TCA-1	Thermocouple interface for TC-1000
08-09210 THERMO-1	Thermocouple probe Type-T, 0.5mm dia, 10' cable, MR-compatible
08-09211 THERMO-2	Thermocouple probe Type-T, 1.5mm dia, 10' cable, MR-compatible
08-09213 TC-EXT	Type-T Thermocouple extension cable, 6" long

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KDS Syringe Pump

The KD Syringe Pumps are extremely simple to use. They are microprocessor controlled with a high metering position at low, pulse-free flow rates. The dispensed volume is traced on the LCD display. They feature a preset rate, volume control and automatic shut-off. The syringe pumps can be controlled several ways: With a built-in TTL and RS232 interfaces.

The TTL input/output lines are for nine functions including trigger, gate, sync pulse and run indicator. All KS Syringe Pumps can be controlled through their serial ports. The movement of the plungers can be controlled from an outside software (exception: 100). An audible and/or visual alarm can be added as an accessory. The KS Push/Pull Syringe Pumps: These syringe pumps enable the plungers to move simultaneously: Half of the plungers are being moved while the other half are being pulled. Thus enabling to withdraw and fuse at the same rate without volume change.

The 101 Micro-dialysis Syringe Pump: This is a low volume unit holding two micro-syringes; it has only one micro-liter settings. The KD Syringe Pumps operate with both a manual or computer control. The programmable syringe pumps can do multi-step dispensing without the need for a computer control. Any of the 200 series Syringe Pumps can be ordered programmable (P). Simply enter a custom program via the keypad, allowing control of the pump time from seconds to days, permitting the flow rate to change at discreet time period, repeat dispenses, control the TTL signals to coordinate with external devices or to respond to them and perform loops.

The programs also have time periods called "Steps" which can be up to 12 hours long. There can be eight steps in a program. The flow rate can be ramped up and down or stay constant for a set period. After the initial and final flow rate for each period is entered, the pump will automatically makes the changes over the set period. There is no need for entering increments, it automatically is linear. The KD syringe pumps can be restarted or paused by the time delay or the TTL input.

These syringe pumps can respond to switch closures, relays or send the signals to the valves. Two separate loops can be entered so that the steps are repeatable. The number of repeats is controlled by the "loop count", when volume dispensing is required continuously it is triggered by a switch. The two loops can be "nested" so that the program can run for days and complex dispensing can be repeated. When the "Program Mode" is selected, the number of the steps in the program is entered. Each step is automatically numbered.

One year warranty
120/240V
CE



Models

Infusion

- KDS100 Infusion Syringe Pump (single syringe)
- KDS101 Micro-dialysis Syringe Pump
- KDS200 Infusion Syringe Pump (dual syringe)
- KDS220 Multiple Infusion Syringe Pump
- KDS250 Multiple Syringe holder (up to 4)

Infusion/Withdrawal

- KDS210 Infusion/Withdrawal syringe Pump
- KDS230 Multiple Infusion and withdrawal Syringe Pump
- KDS 310 Nano Pump

Push/Pull

- KDS120 Push/Pull Syringe Pump
- KDS260 Holds up to 4 Syrings, 10ml to 60ml
- KDS 270 Holds 4 Syrings, 10ml to 60ml
- KDS330 Microemulsion Making Pump

Syringe Pumps

NE-500 Syringe Pump

Maximum syringe size:

Although a maximum of a 60 cc syringe is specified, the pump can hold up to a 140 cc syringe but can only open up to about 120 cc lengthwise.

High pressure notes:

The NE-500 produces about 15 lbs. of linear force at top speed and about 35 lbs at slow speeds. 10 ml/hr is an example of slow speed. The pressure that can be generated is relative to the syringe size. On a 60 ml syringe, this would roughly produce about 30 psi

The high pressure version, NE-510, will approximately double the pumping force at the same speeds.

Computer controllable: networkable up to 100 pumps.
Stand-alone operation: pre-program the pump with a dispensing program, then operate the pump from an attached Foot Switch, button, or I/O controller
Add the OEM Starter Kit to run as a fully functional, stand-alone pump

Description:

Does not have a built-in user interface
Chassis mountable: 9 1/2"L x 4 1/4"W x 4 1/8"H (23.5 x 10.8 x 10.5 cm)
Operates from a 12V DC 700mA (2.1 mm center-positive barrel) power source
Holds 1 syringe up to 60 cc
Infusion rates from 0.73 μ L/hr (1 cc syringe) to 2100 ml/hr (60 cc syringe)
Includes all the advanced functions and programming features of the NE-1000 family
Download free pump terminal emulator
Custom modifications to the mechanics and firmware available

Features:

Built for Automation
Operates from a computer
Infusion and withdrawal
Set a single pumping rate and/or dispensing volume
Program up to 41 pumping phases that change pumping rates, set dispensing volumes, insert pauses, control and respond to external signals, sound the buzzer
Network, control, and monitor up to 100 pumps with one computer
Motor stall detection available in NE-501 model
Dispensing accuracy of $\pm 1\%$
Unlimited lifetime technical support

Part ID: PUMP-NE500
Part ID: PUMP-NE500-STARTER-U

Two year warranty
120/240V
CE



Syringe Size (cc)	Maximum Rate (mL/hr)	Minimum Rate (μ L/hr)
0.5 μ L	25.49	0.001
1	53.09	0.73
3	192.5	2.646
5	406.1	5.581
10	600	8.244
20	975.8	13.41
30	1282	17.63
60	2120	29.13

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NE-1000 Syringe Pump

Maximum syringe size:

Although a maximum of a 60 cc syringe is specified, the pump can hold up to a 140 cc syringe but can only open up to about 120 cc lengthwise

High pressure notes:

The NE-1000 produces about 15 lbs. of linear force at top speed and about 35 lbs. at slow speeds. 10 ml/hr is an example of slow speed. The pressure that can be generated is relative to the syringe size. On a 60 ml syringe, this would roughly produce about 30 psi.

The high pressure version, NE-1010, will approximately double the pumping force at the same speeds.

Description:

Holds 1 Syringe up to 60 cc*
 Infusion rates from 0.73 $\mu\text{L/hr}$ (1 cc syringe) to 2100 ml/hr (60 cc syringe)
 Easy-to-use keypad interface
 Space Saving Chassis: Foot print size of only 5 3/4" x 8 3/4"
 Includes all the advanced functions and programming features of the NE-1000 family

Special Application: Continuous Infusion (Push-Pull) and Dual Syringe Pump
 Using 2 NE-1000 pumps attached with a cable, one pump will infuse while the other pump refills or have simultaneous infusion.

Features:

Fully programmable; automation capable
 Operates stand-alone or from a computer
 Infusion and withdrawal
 Set a single pumping rate and/or dispensing volume
 Program up to 41 pumping phases that change pumping rates, set dispensing volumes, insert pauses, control and respond to external signals, sound the buzzer
 Network, control, and monitor up to 100 pumps with one computer
 Worldwide power supplies available
 Motor stall detection
 Dispensing accuracy of +/-1%
 Unlimited lifetime technical support

Two year warranty
 120/240V
 CE



Syringe Size (cc)	Maximum Rate (mL/hr)	Minimum Rate ($\mu\text{L/hr}$)
0.5 μL	25.49	0.001
1	53.09	0.73
3	192.5	2.646
5	406.1	5.581
10	600	8.244
20	975.8	13.41
30	1282	17.63
60	2120	29.13

Syringe Pumps

NE-1600 Syringe Pump

Part ID: PUMP-NE1600

Description:

Holds 2, 4, or 6 syringes of up to 60 cc each
Infusion rates from 0.568 μ L/hr
(1 cc syringe) to 1337 ml/hr (60 cc syringe)
Easy-to-use keypad interface
Higher flow rate models available
Includes all the advanced functions and programming features
of the NE-1000 family

Syringe Size (cc)	Maximum Rate (mL/hr)	Minimum Rate (μ L/hr)
0.5 μ L	16.66	0.001
1	34.69	0.73
3	125.7	2.646
5	265.4	5.581
10	392	8.244
20	637.6	13.41
30	838	17.63
60	1385	29.13



NE-1800 Syringe Pump

Holds 2, 4, 6, or 8 syringes of up to 10 cc each
Infusion rates from 0.568 μ L/hr
(1 cc syringe) to 380 ml/hr (10 cc syringe)
Easy-to-use keypad interface
Higher flow rate models available
Includes all the advanced functions and programming features
of the NE-1000 family

Syringe Size (cc)	Maximum Rate (mL/hr)	Minimum Rate (μ L/hr)
0.5 μ L	16.66	0.001
1	34.69	0.73
3	125.7	2.646
5	265.4	5.581
10	392	8.244



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BAT-12 Microprobe Thermometers

We designed the world's first thermocouple thermometer, Model BAT-4, in 1969. It soon found uses in the lab, factory, hospital O.R. and in the field. The new BAT-12 has improvements for all these applications:

In the lab: Readings to 0.1° C; near perfect stability.

In the field: A superior "cold junction reference" which maintains accuracy with ambient temperature changes from 0°C to 50°C; sealed construction, carrying case.

For recording: Analog output for strip chart recording is a standard feature.

BAT-12 is the ideal instrument for use with microprobes. These 5 sensors are among our most popular and there are many more to choose from:

- Flexible Implantable Microprobe, IT-18
- Needle Microprobe, MT-26/2
- Surface Probe, BT-1
- General Purpose Probe, HT-1
- Sensor Six Pack, PT-6

BAT-12 Specifications

Temperature Range: -100°C to +200°C.

Resolution: 0.1°

Accuracy: 0.1°C ± 1 digit between 0-50°C.

0.1% ± 1 digit over full range

Calibration Conformity: Follows NIST thermocouple tables within 1 digit

Ambient Temperature

Compensation: Auto-compensated to 0.1°C from 0°C to 50°C

Readout: 3 1/2 digits, 1/2" liquid crystal numerals

Input Socket: Miniature, quick disconnect, copper-constantan

Analog Output: 10mV per degree c, approx.

Power Supply: Model BAT-12 9V transistor battery, available everywhere

Model BAT-12R AC 115V and Ni-Cad battery with charger

Size, Weight: 5" x 2 1/2" x 6" - 2 lbs., including carrying case



Features

BAT-12 reads to 1/10°C

Super Accuracy and Fast Readings

Auto Corrected for

Ambient Temperature

Heavy duty carrying case

Analog output

BAT-10 Microprobe Thermometers

The new BAT-10 is the most versatile thermometer we have ever designed. Wide temperature range and extensive choice of probes can be used in applications as diverse as cryogenic measurements for blood banking and cryosurgery, skin temperature measurements in exercise experiments, liquid measurements in spectrophotometer cuvettes, melting points of plastics and all types of animal and insect temperature measurements. BAT-10 accuracy is NIST traceable and in each temperature range accuracy is the same as the resolution. For instance, in the 0.1°C range, accuracy is 0.1°C (± 1 least significant digit). Few digital thermometers will do this. In most instruments there is a difference of several tenths between specified accuracy and resolution. At physiological temperatures, where minute changes can be critical, the differential range allows readings to 0.01°C with 0.01°C accuracy.



BAT-10 Specifications

Temperature Range and Resolution: -200 °C to +400 C, 1 °C resolution - 100°C to + 199.9°C, 0.1°C resolution

Differential Temperature Range: - 19.99° to + 19.99°. Linearization centered at 40°C. 0.01°C resolution.

Accuracy, 1° range 0.1° range diff. range - 1°C + 1 least significant digit 0.1°C + 1 least significant digit 0.01°C + 1 least significant digit

Repeatability: + one least significant digit

Calibration: Conforms to National Institute of Standards and Technology tables (Monograph 125)

Sensors: Type T thermocouple

Ambient Operating Range: 15 - 45°C

Readout: Liquid crystal, 3 1/2 digits

Batteries: BAT-10 -- 4 alkaline "C" cells (battery life, 1000 hours) BAT-10R (rechargeable unit) - 4 Ni-Cads

Analog Output: Non-linearized set at 1.6V corresponding to temperature of 401°C

One year warranty
120/240V
CE

Range	Resolution	Accuracy
-100 to +200° C	0.1° C	0.1° C (+ 1 digit)
-200 to +400° C	1° C	1° C (+ 1 digit)
Differential	0.01° C	0.01° C (+ 1 digit)

Features

Multiple inputs
Three ranges
NIST traceable accuracy
Resolution and accuracy as high as 0.01° C

Type T Thermocouple Probes & Wire

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Needle Microprobes

Fast-response needle probes for instant readings in tissue, semisolids, liquids. Also for very small specimens, powders and materials. Needle tip is sealed to ensure only stainless steel contacts specimen. Max. temp. 200°C. 5 ft. lead. Smallest microprobes give fastest reading. Short probes are easier to insert and last longer. Type #'s indicate needle gauge and needle length in cm.

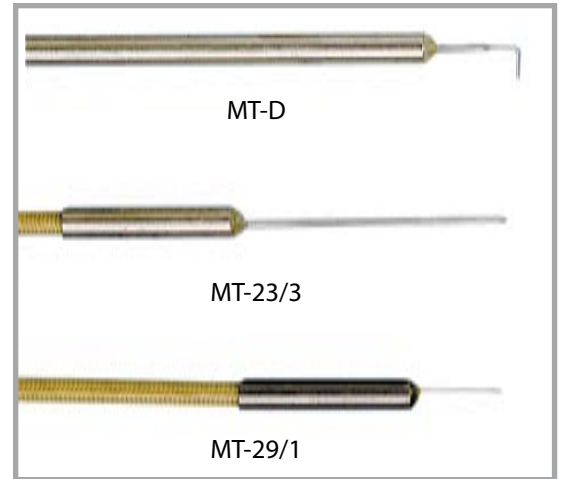
Sizes Available (ga/cm.):

MT-29/1, MT-29/2, MT-29/3, MT-29/5
 MT-26/2, MT-26/4, MT-26/6
 MT-23/3, MT-23/5, MT-23/8

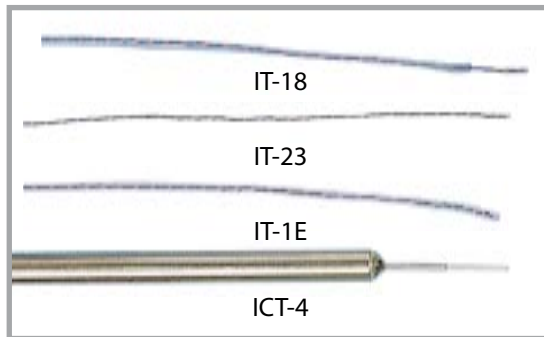
MT-4 - Similar to MT-29/1 but has blunt tip. Good for instant skin and surface temperatures, liquids. Time constant .025 secs. Not isolated.

ICT-4 - For use on integrated circuits and other micro specimens. 0.013" dia. straight stainless steel shaft; slightly protruding sensor bead to facilitate temperature probing. 5" tubular handle fits micro-manipulators. Max. Intermittent Temp. 200°C, continuous use 100°C, Time constant 0.25 secs. 5 ft. lead. Not Isolated.

MT-29/1B - Insect Probe - Similar to MT-29/1 but sensor is welded into tip for max. heat transfer. Designed for high accuracy on extremely small specimens such as insects, seeds, etc. Max. insertion depth 1/8". Time constant 0.015 secs. 5 ft. lead. Max. Temp. 150°C. Other sizes made to special order. Not Isolated.



Type	Dia.	Time Constant
MT-23	23 ga. (.125")	.15 secs.
MT-26	26 ga. (.018")	.1 secs.
MT-29	29 ga. (.013")	.125 secs.



Flexible Implantable Probes

IT Series. Implantable in semi-solids and tissue with needle (supplied). Also for immersion in various solutions and rectal temperatures of small animals. Totally sheathed in chemical resistant Teflon. Quite rugged. Max Temp. 150°C. Isolated. Type # designates needle gauge. (Or one gauge smaller in thin wall).

IT-23 - For ultra fast measurements and for use on micro-size specimens. Sensor lead only 0.009" dia. Tissue implantable with 23ga. needle (supplied). Rather fragile. Max. temp. 150°C. Time constant 0.005 secs. 3 ft. lead. Teflon coated. Isolated.

IT-1E - As IT-18 but sensor bead exposed. Combines the ultra-fast response of IT-23 with the Teflon sheath strength of IT-18. Time constant .005 secs. Isolated.

One year warranty

Type	Dia.	Time Constant	Lead Length
IT-14	.050"	0.3 secs.	3 ft.
IT-18	.025"	0.1 secs.	3 ft.
IT-21	.016"	0.08 secs.	1 ft.

Type T Thermocouple Probes & Wire

Clinical Probes

RET-1 - Rectal probe for humans, neonatal, rabbits, and larger animals. Flexible, vinyl covered, soft tipped. Does not cause discomfort. Max. Temp. 90°C. Time constant 5.0 secs. 5 ft. lead. Isolated.

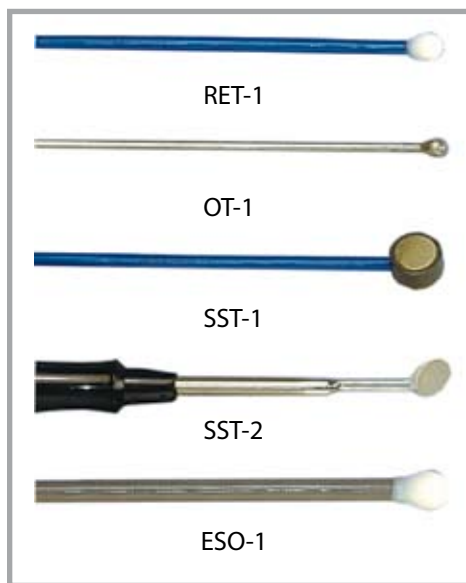
OT-1 - For fast reading oral use. Ball-tipped stainless steel shaft, stainless handle. 5 ft. lead. Max. Temp. 125°C. Time constant 0.8 secs. Not Isolated.

DSP-1 - Disposable sheaths for use with OT-1 and RET-1, per 1000.

SST-1 - Skin surface probe, to be taped on. 1/4" dia. 10 Kt. gold sensor disc, 5 ft. lead. Max. Temp. 90°C. Time constant 0.15 secs. Not Isolated.

SST-2 - as SST-1 with plastic handle. Isolated.

ESO-1 - Esophageal probe. Flexible vinyl covered 1/8" dia. Max. Temp. 90°C. Time constant 5.0 secs. 5 ft. lead. Isolated.



Animal Rectal Probes

RET-2 - Rectal probe for rats. For fast intermittent measurements. Smooth ball tip. Stainless steel shaft - 1" long, 0.59" dia., tip dia. .125". 5 ft. lead. Max Temp. 125°C. Time constant 0.8 secs. Not Isolated.



RET-3 - Rectal probe for mice, etc. As RET-2, with shaft 3/4" long. .028" dia. Tip diameter .065". Time constant 0.5 secs. Not Isolated.

One year warranty

BLOOD PRESSURE

RESTRAINTERS

CATHETERS

ANALGESIA

BEHAVIORAL/ACTIVITY

ANIMAL RESPIRATORS

SYRINGE PUMPS

TEMPERATURE PROBES

Ordering Instructions:

All Purchase orders can be telephoned, faxed, mailed, or e-mailed to:

IITC Inc Life Science
Attn: Order Department
23924 Victory Blvd.
Woodland Hills, CA 91367-1253 USA

All prices are F.O.B. Woodland Hills, California
All orders are shipped UPS ground or specified by customer

Phone: 818-710-8843
Toll Free: 888-414-4482 (IITC) USA
Fax: 818-992-5185
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Visit our web site at: www.iitcinc.com

Minimum order: US\$ 100.00

Government agencies and educational institutes receive a 5% discount. The Discount does not apply to rodent restrainers or consumable parts (accessories).

IITC accepts all major credit cards

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All returns must be authorized by IITC in writing and/or fax. Any unauthorized returns will be returned to sender.

Delinquent accounts: We are sorry but we cannot supply these accounts with technical or written support.

Discounts on selected items, please inquire within.

IITC Exchanges and/or returns policy:

IITC will repair or exchange within the given warranty period any instruments that malfunction. Damage in transit will warrant the same policy after the appropriate parties have examined the goods in question.

IITC maintains the following policy: All IITC instruments are not sold for inspection, trial and/or any other experimentation periods.

Any IITC instrument or part thereof that comes in direct contact with animals in any form cannot be returned to IITC for credit. IITC will not and cannot resell any of these items as used merchandise. For the obvious reason: Liability. (i.e. sensors, restrainers/holders, warming chamber, consumable parts).

Return for repair: IITC will authorize all returns of equipment for repair. The returned equipment is to be returned freight prepaid, packed in the proper protective packing material, carton and insured for the full value of the equipment. Any instruments while in transit under the carrier is under the liability of the shipping company, not IITC, therefore if damage occurs during transit it is under the rules and regulations of the carrier in what manner the repairs are to be conducted. Once the items have been received and signed for by IITC then it is under the liability of IITC.

The IITC non-invasive Blood Pressure equipment is covered by the IITC "Unconditional Lifetime Warranty". If a return is authorized and the instrument is returned for repair, IITC will examine the equipment and upon making a decision will either repair or replace the equipment at a "no charge" to the customer. All items shipped within the United States will be returned UPS ground. If the return of the equipment is to be other than UPS ground shipping then the shipping expense will be incurred by end user.

If a return is coming from outside the United States: A minimum charge for shipping will be applied and billed in every case. On overseas returns the customer should follow IITC's written shipping instructions, i.e. shipping instructions, carrier and form of shipping. Any deviation that may cause extra expense on IITC's part will be billed back to customer. If an error in product shipping occurs, IITC will either request the incorrect item to be returned or the customer may keep the item at no charge (this applies to low value items).

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