Устройства для мониторинга жизненно важных функций

Описание

Accessories for MouseOx® Plus

Multiplexers, Cables, and Power Supplies

Please see the page for complete systems, system components and modules.

Item No.	Description
72-8080	Universal Cable, 1.8 m (6 ft)
72-8081	Universal Cable, 3.7 m (12 ft)
72-8013	16-Channel Multiplexer for MouseOxPlus, 115 VAC, 60 Hz
72-8014	16-Channel Multiplexer for MouseOxPlus, 230 VAC, 50 Hz
72-8083	8-Channel Multiplexer for MouseOxPlus, 115 VAC, 60 Hz
72-8084	8-Channel Multiplexer for MouseOxPlus, 230 VAC, 50 Hz
72-8008	8-Channel Multiplexer for MouseOxPlus, with Temperature Measurement, 115 VAC, 60 Hz
72-8009	8-Channel Multiplexer for MouseOxPlus, with Temperature Measurement, 230 VAC, 50 Hz

Multiplexers, Cables, and Power Supplies

Please see the page for complete systems, system components and modules.

Venous Pressure Transducers (P75)

Hugo Sachs' rugged low pressure transducer is highly sensitive for research and surgical applications involving liquids or gases.

- For low pressure applications with liquids and gases ±75 mmHg

- Excellent sensitivity and baseline stability

- Applications include:
  - Venous blood pressure
  - Esophageal pressure with fluid filled catheter
  - Perfusion pressure in isolated lung and liver
  - Perfusion pressure on perfused hollow organs, such as the esophagus

- Robust construction with a removable Macrolon® dome, easy to fill, bubble free

- Transducer is a metal housing with ceramic pressure sensor giving the P75 excellent resistance to a variety of media

Item No.	Description
73-0020	P75 Venous Pressure Transducer for PLUGSYS Modules (73-0065, 73-1793) or CTA Compact Transducer Ampllifier (73-4457)
73-3738	P75 Venous Pressure Transducer for ADInstruments Bridge Amp (77-0254, 77-0256)
73-0025	Replacement Dome for Venous Blood Pressure
73-4479	Manual Pressure Calibrator, Range 0-300 mmHg

DETAILS

Hugo Sachs' rugged low pressure transducer is highly sensitive for research and surgical applications involving liquids or gases.

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- Applications include:
    - Venous blood pressure
    - Esophageal pressure with fluid filled catheter
    - Perfusion pressure in isolated lung and liver
    - Perfusion pressure on perfused hollow organs, such as the esophagus

- Robust construction with a removable Macrolon® dome, easy to fill, bubble free

- Transducer is a metal housing with ceramic pressure sensor giving the P75 excellent resistance to a variety of media

The P75 has a removable Macrolon® dome with a pressure connection and a vent connection at the side, so that it can be filled free of air bubbles. The dome connections have a male Luer taper so that suitable stopcocks can be attached. The transducer has a metal housing. The actual pressure sensor inside is made from ceramic and therefore has excellent resistance to different media.

The transducer's rugged construction can withstand pressure overloads up to 4000 mmHg without damage. It works together with any DC bridge amplifier (e.g., PLUGSYS TAM–A).

Compatible Amplifiers & Systems

Transducer Item #	Transducer	Compatible Amplifier
73-0020	P75 for PLUGSYS	(75-0065 or 75-1793) or (73-4457)

73-0021	P75 for Harvard Apparatus Transducer Interface	(50-7970 or 50-7996)
73-0022	P75 for Grass Amplifiers	Please specify in detail type of amplifier to be used
73-0023	P75 for Gould 6600 Series	Please specify in detail type of amplifier to be used
73-3738	P75 for ADInstruments Bridge Amp	(77-0254, 77-0256)

SPECIFICATIONS

Pressure Range	±75 mmHg (±100 cmH$_2$O)
Volume Displacement	0.06 mm^3/10
Linearity	±0.15 mmHg
Long Term Drift	±0.04 mmHg
Overload	-760 (=vacuum) to 4,000 mmHg
Measurement Media	All gases and liquids which are compatible with Macrolon®
Temperature Range	0 to 50ºC
Zero Drift	±0.04 mmHg/10ºC (0 to 50ºC)
Range Drift	±0.04 mV/10ºC (±0.04 mmHg/10ºC) (0 to 50ºC)
Electrical Data:	
Supply Voltage	5 V (4.5 to 5.5 V) DC Only
Current Loading	15 mA max.
Sensitivity	1 mV/mmHg, Nominal
Output Resistance	300 Ω, nominal
Frequency Range	0 to 100 Hz
Connection Cable	Approximately 1.5 m (4.9 ft) long
Suitable Amplifiers	Any Bridge Amp providing 5 VDC excitation voltage
Mechanical Data:	
Pressure Connections	Luer Taper, Male
Weight	0.35 kg (0.8 lb)
Dimensions, H x W x D	40 x 40 x 35 mm (1.57 x 1.57 x 1.38 in)
Mounting Rod	8 x 70 mm (0.31 x 2.76 in)

Sterile Disposable Pressure Transducer (DTXPlus)

Minimize distortion in the pressure waveform and maximize accuracy.

- Individually packaged, sterile, disposable blood pressure transducers
- Five-year shelf life
- Stopcocks must be purchased separately
- Class III according to European Medical Devices Directive 93/42/EEC

Item No.	Description
72-4297	DTXPlus Sterile Disposable Single-Use Transducer, pkg. of 10, with Hugo-Sachs PLUGSYS Interface Cable
72-4292	Replacement DTXPlus Disposable Single-Use BP Transducer, pkg. of 10 (Interface Cable not included)
72-2883	Interface Cable, 12 ft (3.7 m), Universal Connector to Tinned Leads (no connector), For Use with Other Equipment, Mating Connector Required
73-4479	Manual Pressure Calibrator, Range 0-300 mmHg

DTXPlus blood pressure transducers minimize distortion in the pressure waveform and maximize accuracy.

- Individually packaged, sterile, disposable blood pressure transducers
- Five-year shelf life
- Stopcocks must be purchased separately
- Class III according to European Medical Devices Directive 93/42/EEC

Transducer Item #	Interface Cable
72-4293	HAI
72-4297	PUGSYS TAM
72-4294	Grass Amplifiers
72-4295	PROPAQ

SPECIFICATIONS

Pressure Range	–30 to +300 mmHg
Over Pressure Tolerance	–700 to +7,800 mm
Frequency Response	>1,200 Hz, 15 bandwidth shall be >200 Hz
Transducer Excitation	1 to 10 V RMS
Transducer Excitation Input Impedance	1,100 to 3,450 Ω
Transducer Signal Output Impedance	270 to 330 Ω
Nominal Sensitivity (gain)	5 µV/V/mmHg
Unbalance (Zero Balance)	±40 mmHg
Accuracy	2% of the reading or ±1 mmHg, whichever is greater over the operating range
Operating Temperature	15° to 40°C

Sensors and Clips for MouseOx® Plus

All sensors are for MouseOx® Plus.

- CollarClip™ is a non-invasive clip for awake-behaving subjects
- ThroatClip™ is a non-invasive clip for anesthetized subjects
- Several sizes available for mice and rats of various weights

Please see the page for complete systems, system components and modules.

Please see separate listing of if you have the previous generation MouseOx.

Item No.	Description
73-4742	CollarClip™ XS with Blank Clip: Mouse 1 to 15 g, Conscious Mice and Young Rats, pk/1
72-8085	CollarClip™ XS with Blank Clip: Mouse 1 to 15 g, Conscious Mice and Young Rats, pk/5
73-4743	CollarClip™ S with Blank Clip: Mouse >15 g, Rat 5 to 30 g, pk/1
72-8086	CollarClip™ S with Blank Clip: Mouse >15 g, Rag 5 to 30 g, pk/5
73-4744	CollarClip™ M with Blank Clip: Mouse and Rat 30 to 100 g, pk/1
72-8087	CollarClip™ M with Blank Clip: Mouse and Rat 30 to 100 g, pk/5
73-4746	CollarClip™ L with Blank Clip: Rat 101 to 300 g, pk/1
72-8092	CollarClip™ L with Blank Clip: Rat 101 to 300 g, pk/5

Item No.	Description
73-4747	CollarClip™ XL with Blank Clip: Rat 301 to 500 g, pk/1
72-8093	CollarClip™ XL with Blank Clip: Rat 301 to 500 g, pk/5
73-4748	CollarClip™ 2XL with Blank Clip: Rat > 500g, pk/1
72-8094	CollarClip™ 2XL with Blank Clip: Rat > 500g, pk/5
73-4725	ThroatClip™ XS with Blank Clip: Mouse 1 to 15 g, Conscious Mice and Young Rats, pk/1
72-8088	ThroatClip™ XS with Blank Clip: Mouse 1 to 15 g, Conscious Mice and Young Rats, pk/5
73-4724	ThroatClip™ S with Blank Clip: Mouse >15 g, Rat 5 to 30 g, pk/1
72-8089	ThroatClip™ S with Blank Clip: Mouse >15 g, Rat 5 to 30 g, pk/5
73-4745	ThroatClip™ M with Blank Clip: Mouse and Rat 30 to 100 g, pk/1
72-8090	ThroatClip™ M with Blank Clip: Mouse and Rat 30 to 100 g, pk/5
73-4749	ThroatClip™ L with Blank Clip: Rat 101 to 300 g, pk/1
72-8095	ThroatClip™ L with Blank Clip: Rat 101 to 300 g, pk/5
73-4750	ThroatClip™ XL with Blank Clip: Rat 301 to 500 g, pk/1
72-8096	ThroatClip™ XL with Blank Clip: Rat 301 to 500 g, pk/5

Item No.	Description
73-4751	ThroatClip™ 2XL with Blank Clip: Rat >500 g, pk/1
72-8097	ThroatClip™ 2XL with Blank Clip: Rat > 500g, pk/5
72-8098	Rat Foot Sensor, pk/5
73-4752	Rat Foot Sensor, pk/1
72-8100	Mouse Foot Sensor, pk/5
73-4886	Mouse Foot Sensor, pk/1
72-8091	Mouse Thigh Sensor, pk/5
73-4557	Mouse Thigh Sensor, pk/1

DETAILS

All sensors are for MouseOx® Plus.

- CollarClip™ is a non-invasive clip for awake-behaving subjects
- ThroatClip™ is a non-invasive clip for anesthetized subjects
- Several sizes available for mice and rats of various weights

Please see the page for complete systems, system components and modules.

Please see separate listing of if you have the previous generation MouseOx.

Blood Pressure Transducers (APT300)

Inexpensive pressure transducer used to measure arterial blood pressures in all species, even on mice with a high heart rate.

- Inexpensive, reliable and accurate
- Low volume displacement
- Suitable for virtually all arterial pressure applications
- Easy to fill
- Stopcocks included
- Simple holder for rod mounting

Item No.	Description
73-3862	APT300 Pressure Transducer for PLUGSYS Modules (73-0065, 73-1793) or CTA Compact Transducer Ampllifier (73-4457)
73-3866	APT300 Pressure Transducer for ADInstruments Bridge Amp (77-0254, 77-0256)
73-4905	APT300 Pressure Transducer for Small Animal Physiological Monitoring System (75-1500, 75-1501)
73-3860	Replacement Cable with Contact Plate for PLUGSYS TAM Amplifier
73-3861	Replacement Transducer Head for APT300 Transducer
73-3868	Holder for APT300 Transducer, 8 mm Rod, Length 160 mm
73-3869	Holder for APT300 Transducer, 8 mm Rod, Length 75 mm

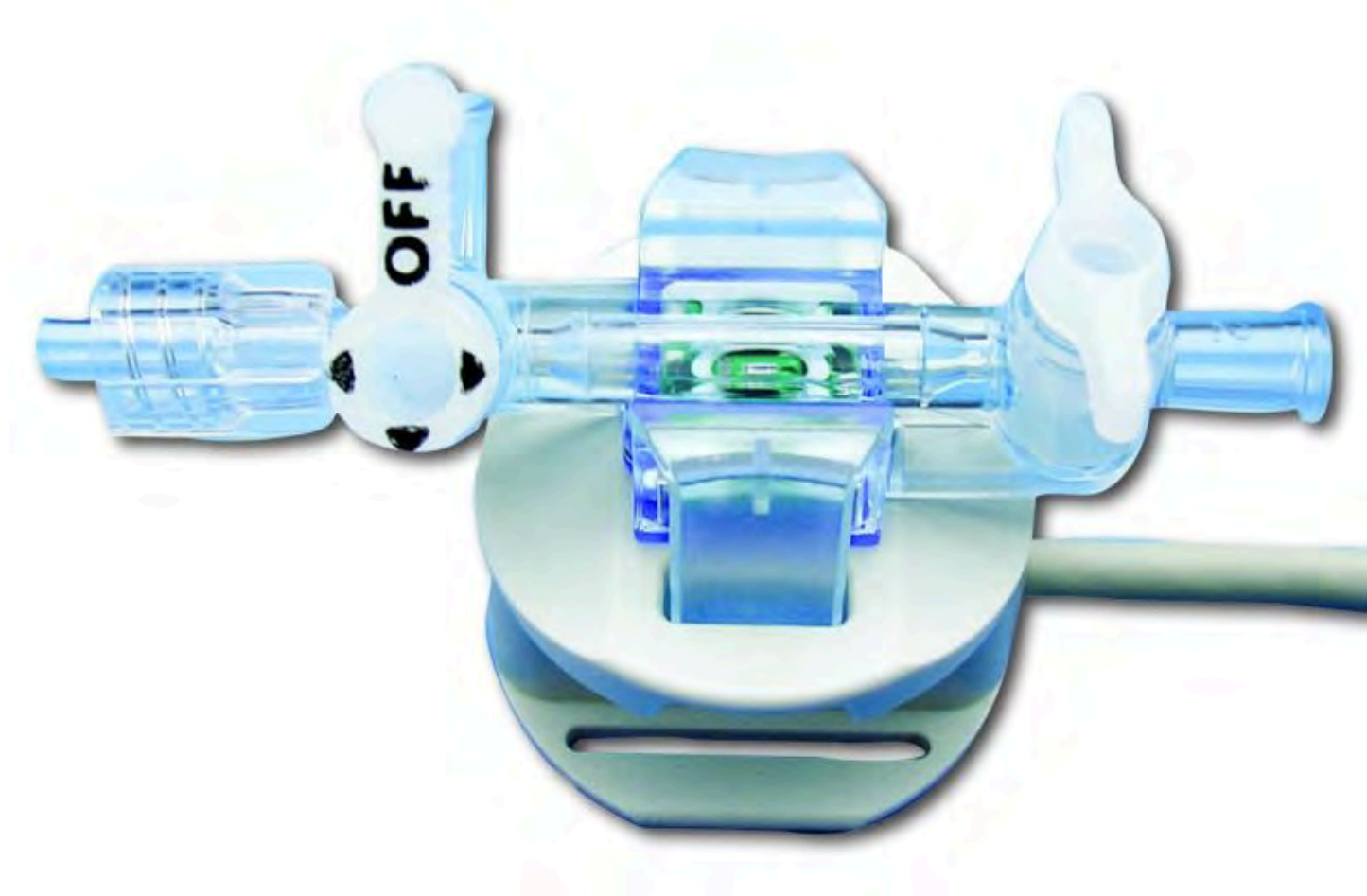| Item No.	Description
73-0566	Plexiglass Block Clamp for mounting 73-0562 Bar onto Lab Stand
73-0500	Lab Stand with Triangular Base Plate, 30 cm Rod Length (one block clamp included)
73-4479	Manual Pressure Calibrator, Range 0-300 mmHg

DETAILS

This APT300 Transducer is an inexpensive pressure transducer which can be used to measure arterial blood pressures in all species, even on mice with a high heart rate. This transducer is typically used for arterial pressure measurement in vivo, perfusion pressures in isolated perfused organs such as heart or kidney, Isovolumetric Left Ventricular (using a balloon) pressures in isolated hearts from mice up to rabbits or pigs.

- Inexpensive, reliable and accurate

- Low volume displacement

- Suitable for virtually all arterial pressure applications

- Easy to fill

- Stopcocks included

- Simple holder for rod mounting

The APT300 Transducer consists of a contact plate with cable and the exchangeable transducer head, which can easily be replaced. Contact plates with cables for different amplifiers are available.

Compatible Amplifiers & Systems

Transducer Item #	Transducer	Compatible Amplifier
73-3862	APT300 for PLUGSYS	(75-0065 or 75-1793) or (73-4457)
73-3863	APT300 for Harvard Apparatus Transducer Interface	(50-7970 or 50-7996)
73-4905	APT300 for Small Animal Physiological Monitoring System	(75-1500 or 75-1501)
73-3864	APT300 for Grass Amplifiers	Please specify in detail type of amplifier to be used
73-3865	APT300 for Gould 6600 Series	Please specify in detail type of amplifier to be used
73-3866	APT300 for ADInstruments Bridge Amp	(77-0254, 77-0256)

SPECIFICATIONS

Operating Pressure	–300 to +300 mmHg
Overpressure	4000 mmHg
Sensitivity	5 µV/V/mmHg (±1%)
Temperature Coefficient	0.1%/°C
Zerodrift	<0.2 mmHg/°C
Zero Offset	<25 mmHg
Excitation Voltage	2 to 15 VDC (or AC up to 5 kHz)
Isolation Against Fluid	>5,000 V
Operating Temperature	15° to 40°C

Storage Temperature	−25° to 70°C
Volume Displacement	<0.04 mm^3 /100 mmHg
Output Impedance	365 Ω ±1%
Frequency Response	>1 kHz
Cable Length	3 m (9.8 ft)
Certifications	CE

Sterile Single Use Wide Range Pressure Sensors

Small-scale in-line sterile pressure sensors suitable for a variety of applications, i.e. in vivo, ex vivo, in situ and regenerative organ and cellular applications.

- Male/Female Luer lock with port cover for female Luer lock end for dead-end applications
- In-line pressure transducers for low flow rates when used with 1/8-in or 1/16-in barbed connectors
- May be paired with adapter Tee-connectors, 1/4-in or 3/8-in barbed connectors, for non-in-line applications

Item No.	Description
73-4479	Manual Pressure Calibrator, Range 0-300 mmHg

These are small-scale in-line sterile pressure sensors suitable for a variety of applications, i.e. in vivo, ex vivo, in situ and regenerative organ and cellular applications.

- Male/Female Luer lock with port cover for female Luer lock end for dead-end applications

- In-line pressure transducers for low flow rates when used with 1/8-in or 1/16-in barbed connectors

- May be paired with adapter Tee-connectors, 1/4-in or 3/8-in barbed connectors, for non-in-line applications

SPECIFICATIONS

Accuracy	Better than ±2% of reading in the range of 0 to 6 psi (0 to 0.41 bar or 0 to 310 mmHg)
	Better than ±3% of reading in the range of 6 to 30 psi (0.41 to 2.07 bar)
	In range of 30 to 60 psi (2.07 to 4.14 bar) typically better than ±5% of reading
Pressure Range	-7 to +75 psi (-0.48 to +5.2 bar)
Biocompatibility	All materials in contact with product fluid path meet USP Class VI requirements
Manufacturing Environment	FDA Registered ISO 13485-certified facility; Class 100,000 clean room
Gamma Irradiation	Up to 50 kGy
Operating Temperature	15 to 40ºC (other ranges with process qualification)
Storage Temperature	-25º to 65ºC
Input/Output Impedence	270 to 4,000 Ω
Excitation Voltage	2.5 to 10 VDC
Sensor Output	0.2584 mV/psi/Volt
Connector	Custom molded water-tight 4 pin connector; signal ± and excitation ±

MouseOx® Plus Pulse Oximeter for Rodents

Non-invasive pulse oximeter providing real–time, continuous measurements of arterial O_2 saturation, heart rate, breath rate, temperature, pulse distention, breath distention and activity in conscious and anesthetized rodents, from neonatal mice through adult rats

Item No.	Description
72–8010	MouseOx®Plus Pulse Oximeter, 115 VAC, 60 Hz (Basic System)
72–8011	MouseOx®Plus Pulse Oximeter, 230 VAC, 50 Hz (Basic System)
72–8019	MouseOx® Plus Pulse Oximeter for Rodents with Software, 230 VAC, 50 Hz (Premium Bundle)
72–8020	MouseOx® Plus Pulse Oximeter with STARR-Link Analog Output Module, 115 VAC, 60 Hz
72–8021	MouseOx® Plus Pulse Oximeter with STARR-Link Analog Output Module, 230 VAC, 50 Hz
72–8022	STARR-Link™ Analog Data Output Module for MouseOx®Plus, 115 VAC, 60 Hz
72–8009	8-Channel Multiplexer for MouseOxPlus, with Temperature Measurement, 230 VAC, 50 Hz
72–8013	16-Channel Multiplexer for MouseOxPlus, 115 VAC, 60 Hz
72–8014	16-Channel Multiplexer for MouseOxPlus, 230 VAC, 50 Hz
72–8083	8-Channel Multiplexer for MouseOxPlus, 115 VAC, 60 Hz

Item No.	Description
72-8008	8-Channel Multiplexer for MouseOxPlus, with Temperature Measurement, 115 VAC, 60 Hz
72-9709	MouseOx® Plus Conscious Monitoring Module
72-8080	Universal Cable, 1.8 m (6 ft)
72-8012	MouseOx® Plus Premium Application Software
75-0550	MouseOx® Plus Mouse Conscious Monitoring Equipment, to mount onto 61-0046
72-8018	MouseOx® Plus Pulse Oximeter for Rodents with Software, 115 VAC, 60 Hz (Premium Bundle)
72-8081	Universal Cable, 3.7 m (12 ft)
72-8084	8-Channel Multiplexer for MouseOxPlus, 230 VAC, 50 Hz

This non-invasive pulse oximeter provides real-time, continuous physiological measurements. It is designed to work with neonatal mice through adult rats. It has a patented design to detect heart rates from 90 to 900 bpm. The MouseOx Plus easily allows researchers to titrate mechanical ventilation and monitor depth of anesthesia.

A complete system for **anesthetized animals** consists of the MouseOx Plus, software, and a sensor. A complete System for **conscious animals** consists of the MouseOx Plus, software with Conscious Monitoring module, conscious monitoring equipment and a collar clip sensor.

- Option for Premium software or DAQ interface box for data collection and analysis
- Option for multiple animal monitoring from one MouseOx Plus system

All MouseOx Plus systems come with two sensors of your choice.

Provides the following measurements:

- Arterial Oxygen Saturation
- Heart Rate– Breath Rate
- Temperature (optional)

- Pulse Distention
- Breath Distention
- Activity (optional)

MouseOx and MouseOx Plus are registered trademarks of Starr Life Sciences. ThroatClip, STARR-link and CollarClip are trademarks of Starr Life Sciences.

SPECIFICATIONS

Oxygen Saturation (SpO$_2$):		
Range	0 to 100% Arterial Blood Oxygen Saturation	
Resolution	<1.5% across entire measurement range	
Response Time	Reported after every heartbeat; screen refreshed every 0.72 seconds	
Pulse Rate (BPM):		
Range	90 to 900 BPM	
	Pulse Rate (BPM)	**Resolution (BPM)**
	210	2.4
	300	4.9
	400	8.7
	500	13.5
	600	19.4
	700	26.2
	800	34
	900	42.9
Response Time	Reported after every heartbeat; screen refreshed every 0.72 seconds	
Breath Rate (BrPM):		
Range	25 to 450 BrPM	
	Breath Rate (BrPM)	Resolution (BrPM)
	25	0.1
	100	0.6
	200	2.2

	300	4.9
	400	8.7
Response Time	Reported every 1.7 seconds as a moving average of the rate of breathing for the previous 10 breath rate measurements.The screen updates every 0.72 seconds, but new breath rate data is presented at the lower rate.	
Pulse Distension:		
Range	0 to 800 mm	
Resolution	<2.4% of measurement	
Response Time	Reported after every heartbeat; screen refreshed every 0.72 seconds	
Breath Distension:		
Range	0 to 800 mm	
Resolution	<2.4% of measurement	
Response Time	Reported every 1.7 seconds	
Temperature Range	15° to 50ºC	
Resolution	±0.1 ºC	
Response Time	Reported every 0.72 seconds	

Fiber Optic Micro-Catheter Pressure Transducers (FISO-LS Series)

Fiber optic blood pressure measurement system for measuring blood pressure in very small vessels, isolated hearts, etc. Pressure measurement occurs at the exact location of interest.

FISO–LS series pressure sensors were designed as semi-disposable for multi-use applications in the life-sciences and small animal research. Unlike its disposable counterpart in clinical applications, this sensor is more robust with a protected tip.

The FISO Series and are required for the use of any of the FISO–LS series fiber optic sensors.

are also available.

Item No.	Description
75-0700	FISO Evolution Series EVO-2 Chassis, 24 VDC, 70 W, for Mounting up to 2 FISO Signal Conditioners
75-0704	FISO FPI-LS Signal Conditioner, Single Channel, 15 kHz Analog Output
75-0706	FISO-LS Fiber Optic Pressure Catheter - Standard, 0.9 F, 1.2 M Length, +/- 300 mmHg
75-0707	FISO-LS Fiber Optic Pressure Catheter - Standard, 2 F, 1.7 M Length, +/- 300 mmHg
75-0715	FISO-LS Fiber Optic Pressure Catheter- MRI, 0.9 F, 10 M Length, +/- 300 mmHg
75-0716	FISO-LS Fiber Optic Pressure Catheter- MRI, 2 F, 10 M Length, +/- 300 mmHg
75-0714	FISO-LS Fiber Optic Pressure Catheter - Standard, 2 F, 1.7 M Length, 0 to 10 Bar
75-0713	FISO-LS Catheter Extension Cable and Remote Connect Adapter, 3 meters

FISO-LS series catheters were designed as semi-disposable for multi-use applications in the life sciences and small animal research. This is a robust sensor with a protected tip. The standard transducers have 1 meter of nylon sheathing to protect the fiber, where the 10 m transducers have 9.3 to 9.8 m of nylon sheath, further protecting the glass fiber. With proper use and care these sensors can be used many times.

All sensors are pre–calibrated at the factory and the transducer's calibration information is stored in a smart chip directly on the optical connector. The information is automatically read into the Evolution Software and downloaded to the FPI signal conditioner. No further recalibration is needed — simply zero the transducer.

- Low noise
- Accurate
- Sensor located at tip of fiber
- Easy to use
- Pre-calibrated sensors

The FISO Series **Signal Conditioners** and **EVO Chassis** are required for the use of any of the FISO–LS series fiber optic sensors.

Applications

- Neuroscience—intracranial pressure; blast wave and impact trauma

- Cardiovascular—left ventricular pressure; arterial or venous blood pressure

- Ocular Tonometry—non-invasive intracoular pressure tonometry

- Urology—bladder/ureter pressure

- Spine—intradiscal pressure

- Bone—intramedullary pressure

- MRI Gating—use the 10 m MRI sensor to measure pressure for gating

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FISO Pressure Sensors

The FISO catheters utilize a Fabry-Pérot etalon which is comprised of two parallel reflecting mirrors on either side of a transparent medium, where the distance between the mirrors is known as the etalon cavity length. The transmission characteristic for the F-P etalon has distinct transmission peaks in wavelength as a function of the cavity length, physically corresponding to resonances of the etalon.

FISO's pressure sensors are a flexible embodiment of the F-Petalon. A deformed membrane is assembled over a vacuumed cavity, thus forming a small drum-like structure. The sensing F-Pcavity is located between the base of the drum and the flexible membrane. When pressure is applied, the membrane is deflected toward the bottom of the drum, thus reducing cavity length. After appropriate sensor calibration, completed at the factory, each etalon cavity length corresponds to a specific pressure value. The signal conditioner is designed to determine the cavity length to the nanometer level, providing the researcher with an extremely accurate and repeatable pressure measurement system.

Modular Evolution Chassis

The EVO Chassis provides the power to the signal conditioner modules as well as the digital interface for data transfer between the signal conditioners and the Evolution Software. The EVO Chassis (2- and 5-channel version) includes the Power/Interface module, Evolution data acquisition and instrument control software, USB cable, power supply, and module removal tool. The Power Supply/Interface module has a USB2.0 output and includes the Evolution software. The 2–Channel chassis can house up to 2 FPI signal conditioning modules, while the 5–channel can house up to 5. Chassis do not need to be filled to capacity for use. Add more signal conditioners at any time up to the capacity of the chassis.

The data sampling rate of up to 15 kHz offers the ability to accurately detect fast–changing pressure signals, such as that from mouse heart. Visualize the dichrotic notch with ease! Data is either transferred into the computer via USB to the Evolution acquisition software (at up to 5 kHz) or via the analog output (up to 15 kHz) to an independent data acquisition system.

FISO Signal Conditioners

RS–232/RS–485 Digital Output onboard as well as a 0 to 5 V analog output. An analog output cable is supplied with a BNC connector to interface with common data acquistion systems. The FPI–HR series conditioners are compatible with the fiber optic temperature catheters. The FPI–LS series conditioners are compatible with the FISO–LS pressure catheters. The technique used internally to transmit and receive the light signal allows for continuous sensing that does not rely on light pulses. Since no light is pulsed there is no need for a minimum catheter length as with previous fiber optic sensors. A built-in fan keeps the signal conditioners from overheating or burning out the unit — no special foot stand required.

Catheter Extension Cable

Allows for the remote connection of the sensor 3 meters from the EVO Chassis/Signal Conditioner.

SPECIFICATIONS

Specifications	75-0706	75-0707	75-0715	75-0716	75-0714
Accuracy	2 mmHg or better	2 mmHg	2 mmHg or better	2 mmHg	2 mmHg
Calibration	Factory Calibration no on site calibration needed	Factory Calibration no on site calibration needed	Factory Calibration no on site calibration needed	Factory Calibration no on site calibration needed	Factory Calibration no on site calibration needed
Coated Fiber Diameter	300 μm	640 μm	300 μm	640 μm	640 μm
Coating	Polyimide, Nylon	Polyimide, Nylon	Polyimide, Nylon	Polyimide, Nylon	Polyimide, Nylon
Length	1.2 meters	1.7 meters	10 meters	10 meters	1.7 meters
Measurement media	Fluid or gas	Fluid or gas	Fluid or gas	Fluid or gas	Fluid or gas
Pressure Range	±300 mmHg	±300 mmHg	±300 mmHg	±300 mmHg	0 to 10 bar
Resolution	< 0.1 mmHg	< 0.3 mmHg	< 0.1 mmHg	< 0.3 mmHg	< 0.3 mmHg
Sensitivity Thermal Effect	< 0.04%/°C	< 0.05%/°C	< 0.04%/°C	< 0.05%/°C	< 0.05%/°C
Sensor Diameter	300 μm	640 μm	300 μm	640 μm	640 μm
Standard bare fiber length	20 cm	70 cm	20 cm	70 cm	70 cm

Specifications	75-0706	75-0707	75-0715	75-0716	75-0714
Storage temperature	−40−+80°C (−40−176°F)	−40−+80°C (−40−176°F)	−40−+80°C (−40−176°F)	−40−+80°C (−40−176°F)	−40−+80°C (−40−176°F)
Tolerated bend radius	10 mm (0.4in)	10 mm (0.4in)	10 mm (0.4in)	10 mm (0.4in)	10 mm (0.4in)
Uncoated Fiber Diameter	260 µm	550 µm	260 µm	550 µm	550 µm
Zero Thermal Effect	0.2 mmHg*°C	0.4 mmHg*°C	0.2 mmHg*°C	0.4 mmHg*°C	0.4 mmHg*°C

Small Animal Physiological Monitoring System

The Small Animal Physiological Monitoring System (HPMS) is an instrument that measures multiple physiological parameters on one single small platform.

Key Features

- Monitors temperature, electrocardiogram (ECG), and respiration, and optionally, oxygen saturation (SpO_2), blood pressure and exhaled CO_2
- Small footprint for mouse or rat
- Minimal setup time at the beginning of procedures
- Heated platform
- Intuitive touchscreen
- Real-time numeric and graphic display
- Recorded data easily exported for further analysis

Item No.	Description
75-1500	Physiological Monitoring System for Mouse (10 g to 100 g) with 8" Tablet
75-1501	Physiological Monitoring System for Rat and Mouse (10 g to 600 g) with 8" Tablet
75-1557	Physiological Monitoring System for Mouse (10 g to 100 g) with 10" Tablet
75-1558	Physiological Monitoring System for Rat and Mouse (10 g to 600 g) with 10" Tablet
75-1502	Blood Pressure Option for Physiological Monitoring System
75-1503	Exhaled CO2 Option for Physiological Monitoring System

Item No.	Description
75-1504	SpO2 Option for Physiological Monitoring System
73-4905	APT300 Pressure Transducer for Small Animal Physiological Monitoring System (75-1500, 75-1501)
73-5019	Needle Electrodes, 29 gauge, shielded, 2 mm pin connector, 30 mm length, red, yellow and black
75-1539	Anesthesia Bain Circuit Holder
75-1540	Head Fixation Device for Mouse with Gas Anesthesia Mask for 75-1500 Platform
75-1541	Head Fixation Device for Mouse with Nose Clamp for 75-1500 Platform
75-1542	Head Fixation Device for Mouse with Gas Anesthesia Mask for 75-1501 Platform
75-1543	Head Fixation Device for Mouse with Nose Clamp for 75-1501 Platform
75-1551	ECG Conductive Gel, 250 g
75-1512	Replacement Rectal Probe for Mice
75-1513	Replacement Rectal Probe for Rats
75-1514	Replacement SpO2 Clip for Physiological Monitoring System

The Small Animal Physiological Monitoring System (HPMS) is an instrument that measures multiple physiological parameters on one single small platform.

The system comes complete with heated monitoring platform, Android tablet with a protective sleeve and stand, wireless communication module, rectal probe, and electrode gel. Adapter and cable for the tablet and wireless connection cable are included. These components are all supplied in a sturdy case for storage and transport.

The platform includes four electrocardiogram (ECG) surface electrodes, a respiration sensor and a heated surface that can be used at a set temperature or in a homeothermic setup using the rectal probe. Additional options to monitor oxygen saturation (SpO_2), blood pressure and exhaled CO_2 can be purchased separately.

Monitoring software is pre-installed on the Android tablet. All data is transferred to the Android tablet by wireless for display and saving. A real-time display provides numeric values as well as waveforms that can be customized by the user. Multiple signals can be displayed on each of three graphs.

At the end of experiments, recorded data can easily be transferred to any computer for analysis. Scripts and utilities are provided to convert data in LabChart or CSV format and to display signals in Excel and MATLAB.

Features & Benefits

- Monitors temperature, electrocardiogram (ECG), and respiration, and optionally, oxygen saturation (SpO$_2$), blood pressure and exhaled CO$_2$

- Small footprint for mouse or rat

- Minimal setup time at the beginning of procedures

- Heated platform

- Intuitive touchscreen

- Reduces the required space and the number of wires around the animal.
    - A single data/power cable connects to a small wireless communication module

- Real-time display provides numeric values as well as waveforms that can be customized by the user.
    - Multiple signals can be displayed on each of the three graphs

- Recorded data can easily be exported for further analysis
    - Scripts and utilities provided to convert data in LabChart or CSV format and to display signals in Excel and Matlab

- Head fixation kit for mouse available for stereotaxic applicatons

Included Components

- Heated monitoring platform (for rat or mouse)

- Android tablet with stand and protective case

- USB adapter and cable for android tablet

- Wireless communication module with power supply and power cord

- 9-pin connection cable to connect communication module and monitoring platform

- Rectal probe

- Electrode gel

- User's manual

Physiological Parameters Measured

- ECG: integrated electrodes under the paws & external electrodes

- Respiration: waveform acquired with a sensor under the animal

- Heart and Breath Rate: real-time display from the ECG and respiration waveform

- Warming and Temperature: heated platform and rectal probe for precise control and monitoring

- Blood Pressure (option): connection for a pressure catheter

- SpO$_2$ (option): pulse oximetry and oxygen saturation with a paw/tail sensor
- Exhaled CO$_2$ (option): gas ports for precise CO$_2$ measurements (with an external ventilator)

System Information

Heated Platform

- Easy to clean surface
- 10 cm x 21 cm x 2.5 cm (mouse)
- 12 cm x 27 cm x 2.5 cm (rat)
- External ports – Rectal temperature, pressure catheter, ECG electrodes, SpO$_2$ sensor
- ECG electrodes
- Respiration sensor
- Warming zone – 0.1°C resolution
- Single data/power cable – Link to a compact wireless module with 4 analog outputs
- Exhaled CO$_2$ ports

Tablet

- 8" Android tablet (10.1" available)
- High resolution touchscreen display: pinch to zoom on waveforms (works with surgical gloves)
- Capacity of over 400 hours of saved data
- 5 to 8 hours battery life
- **Advanced display interface**
  - 1 to 5 second waveforms - Select any signal to display
  - 1 to 30 minute trends - View temperature, heart & breath rate trends, and numeric values
  - Easy data saving - Add notes, save and export data for an easy analysis

Wireless Communication Module

- Wireless and analog outputs are in a separate enclosure to avoid interferences
- 9 cm x 11 cm x 2.5 cm
- 100 to 240 V power supply
- 15 to 25 meters typical range between the communication module and the display unit

Analog Outputs

- 4 configurable outputs
- BNC connectors, ±5 V range
- 1 kHz, 16-bit refresh rate

Data Analysis

- .csv conversion tool
- MATLAB® & Excel® import and display scripts
- Compatible with third-party analysis software (LabChart)

SPECIFICATIONS

Measured Parameters

ECG	Display Leads I, II, III, aVL, aVR & aVF Supine or prone position 1 kHz, 24-bit acquisition 3 external electrodes connections (2 mm)
Respiration	250 Hz acquisition
Heart & Breath Rate	200 to 800 beats/min calculated every second
Breath Rate	25 to 330 breaths/min calculated every second
Warming	Heated surface up to 45ºC with 0.1ºC resolution
Temperature	Closed loop PID controller keeps the animal within ±0.1ºC of set temperature
Blood Pressure	Full waveform display Systolic and diastolic numeric values
Exhaled CO_2	Connect ventilator directly to the platform (1/8" tubing) 1 Hz refresh rate 0.1% accuracy
SpO_2	80 to 100% saturation 250 Hz, 24-bit acquisition Red & infrared channel display

Other

Heated Monitoring Platform **(W x L x D)**	10 cm x 21 cm x 2.9 cm (mouse) 12 cm x 30.4 cm x 2.9 cm (rat & mouse)
8" Android Tablet	High resolution touchscreen display Capacity of over 400 hours of saved data Battery life: 5 to 8 hours
Wireless Communication Module	Wireless and analog outputs are in a separate enclosure to avoid interference 9 cm x 11 cm x 2.5 cm 100 to 240 V power supply

Wireless Range	15 to 25 meters typical range between the communication module and the display unit
Analog Outputs	4 configurable outputs BNC connectors ±5 V range 1 kHz, 16-bit refresh rate
Data Analysis	.csv conversion tool MATLAB® & Excel® import and display scripts Compatible with third-party analysis software (LabChart)

Non-Invasive Blood Pressure System for Rodents

Easy and reliable technique to measure systemic blood pressure and cardiovascular parameters in rodents without invasive catheterization.

- Total reliability to realize consecutive measurements on the same animal

- Analog signal output for recording cuff pressure and pulse signals in a PC

- Automated deflation driven separately for each animal (minimize tail lesions)

- Automated cuff inflation/deflation at a very constant rate

- The same system can be used for mouse/rat/dog

- Real values provided (without any linear regression calculation)

- Easily traceable data (using data acquisition software)

- Parameters evaluated can be visualized on-line on the digital display

Item No.	Description
76-0173	Basic Unit for NIBP with RS-232 Serial Port. Cuff and Transducer must be ordered separately. (LE5001)
76-0174	Standard Unit for NIBP with Memory and RS-232 Serial Port. Cuff and Transducer must be ordered separately. (LE5002)
76-0175	Complete Unit for NIBP with Scheduled Data Acquisition (up to 12 Animals) Memory and RS-232 Serial Port. Cuff and Transducer must be ordered separately. (LE5007)
76-0406	SEDACOM Software V2.0

Item No.	Description
76-0466	Panlab NIBP System Software for the traceability and graphical validation of the 76-0173, 76-0174 or 76-0175 data (NIBPCHART)
76-0177	Electronic Rat Simulator (LE5090)
76-1137	Heater for Single Animal (LE5610A)
76-0179	Automatic Heater and Scanner for Six Rats or Six Mice (LE5650-6)
76-0432	Pulse Transducer & Cuff for Mice (Diameter 6 mm) (LE5160-MM)
76-0012	Pulse Transducer & Cuff for Mice and Rats up to 150 Grams (LE5160M)
76-0183	Holder, Mouse (15 to 25 gr)
76-0184	Holder, Mouse (25 to 40 gr)
76-0185	Holder, Rat (150gr)
76-0186	Holder, Rat (250gr)
76-0187	Holder, Rat (400gr)
76-0188	Holder, Rat (500gr)
76-0013	Pulse Transducer & Cuff for Rat (LE5160R)
76-0014	Dog Pulse Transducer (18 mm Diameter) (LE5015)
76-0015	Pressure Cuff for Dog Options (LE5012)
76-0016	Set of 100 Spare Membranes for Rat Cuff (MB5160R)

Item No.	Description
76-0017	Set of 10 Spare Membranes for Mouse Cuff (MB5160M)
76-0018	Mouse Cuff (LE5180M)
76-0019	Rat Cuff (LE5180R)

DETAILS

The Panlab NIPB system provides an easy and reliable technique to measure systemic blood pressure and cardiovascular parameters in rodents without invasive catheterization.

The pulse signal level (heart rate) is continuously monitored on the LCD display while an internal pressure transducer is constantly measuring the current pressure applied on the cuff. Systolic and diastolic blood pressures are displayed after a series of automatic processes finish.

A warm environment is critical for accurate blood pressure measurement. For optimal conditions the Panlab Warming Chamber (76-1137) or the Automatic Heater & Scanner (76-0179) provides a comfortable heated environment. The requirement of a warm environment for the animals is critical for accurate blood pressure measurements. To provide adequate conditions for NIBP measurement, the system can be used in association with a warming chamber which provides a comfortable and heated environment necessary to produce peripheral vasodilatation and isolate the animal from external noise.

Key Features

- Total reliability to realize consecutive measurements on the same animal
- Analog signal output for recording cuff pressure and pulse signals in a PC
- Automated deflation driven separately for each animal (minimize tail lesions)
- Automated cuff inflation/deflation at a very constant rate
- The same system can be used for mouse/rat/dog
- Real values provided (without any linear regression calculation)
- Easily traceable data (using data acquisition software)
- Parameters evaluated can be visualized on-line on the digital display

Parameters Measured

- Systolic blood pressure
- Diastolic blood pressure
- Mean blood pressure
- Heart rate

Included Components

Basic Unit for NIBP 76-0173 (LE5001)

- Control unit with LCD display
- Pressure and pulse BNC analog signal output
- RS-232 serial port
- Cables
- Spare fuses
- Instruction manual

Standard Unit for NIBP 76-0174 (LE5002)

- Includes all components of 76-0173 plus
- Raw data internal memory (up to 4,000 successive trials)

Complete Unit for NIBP 76-0175 (LE5007)

- Includes all components of 76-0174 plus

- Statistical calculations (average, deviation, number of samples for all animals)
- Connection to the Heater and Scanner device for automatic measurement of up to 12 animals

Accessories

- SEDACOM Software*
- Chart™ Software for monitoring of pressure and pulse wave signals
- Single or multiple animal heating units
- Pulse Transducer & Cuff*
- Specimen holders

*Pulse Transducer & Cuff and SEDACOM software must be ordered separately. Requires 76-0608 RS-232/USB adapter.

SPECIFICATIONS

Dimensions LE5001 Control Unit	360 (W) x 340 (D) x 120 (H) mm
Dimensions LE5002 and LE5007 Control Units	60 (W) x 340 (D) x 170 (H) mm
Computer Requirements (only if SeDaCom is used)	PC with Windows™ XP (SP2 or higher), Vista 32, Windows 7 or Windows 8 compatible operating system
Power Supply	220/110 VAC, 50/60 Hz
Certifications	CE Compliant

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