Инструменты для сердечно-сосудистых исследований

Описание

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Rat/Guinea Pig Universal Left Ventricular Pressure (LVP) Kits with Mini Ball Joint Holders

This kit includes a ball-joint holder, LL2-IHSR, 10 balloons No. 5 (0.1 ml), blunt Luer cannula, plexiglass block clamp and bar with ball, spindle syringe with LECTROCATH catheter for sensitive filling of balloons to adjust end diastolic preload (balloon pressure), including holder with ball joints for spindle syringe.

ltem No.	Description

73-3560

Universal Balloon Kit V.2 for Rat/Guinea Pig Hearts



DETAILS

This kit includes a ball-joint holder, LL2-IHSR, 10 balloons No. 5 (0.1 ml), blunt Luer cannula, plexiglass block clamp and bar with ball, spindle syringe with LECTROCATH catheter for sensitive filling of balloons to adjust end diastolic preload (balloon pressure), including holder with ball joints for spindle syringe.

Rabbit Universal Left Ventricular Pressure (LVP) Kits

This kit includes a steel catheter 1464 LL4, 5 balloons No. 12 and 5 balloons No. 13, spindle syringe for sensitive filling of balloons to adjust preload (balloon pressure), including holder with ball joints.

tem No.	Description
73-0323	Universal Balloon Kit for Rabbit Hearts

DETAILS

This kit includes a steel catheter 1464 LL4, 5 balloons No. 12 and 5 balloons No. 13, spindle syringe for sensitive filling of balloons to adjust preload (balloon pressure), including holder with ball joints.

Disposable Foam Electrode

Ag/AgCI high chloride wet gel disposable foam electrode for fast, clear traces

Item No.	Description
72-7095	Disposable Foam Electrode, 38 mm (1 1/2 in) di- ameter, pkg of 60 (5 electrodes per strip)



DETAILS

Ag/AgCI high chloride wet gel for fast, clear traces

• For active subjects, no movement artifact

- Latex free/hypoallergenic
- Package of 60 (5 per strip)

SPECIFICATIONS

Specifications

72-7095

Diameter (English)	1 1/2 in
Diameter (Metric)	38 mm

Mouse Universal Left Ventricular Pressure (LVP) Kits

This kit includes a PE catheter for connecting the balloon to the pressure transducer, cannula, T-piece, holder for balloon catheter with 2 mini ball joint holders, plexiglass block clamp and bar with ball, and spindle syringe.

Item No.

Description

73-0331

Universal Mini Balloon Kit for Left Ventricular Pressure (LVP) on Isolated Mice Hearts



This kit includes a PE catheter for connecting the balloon to the pressure transducer, cannula, T-piece, holder for balloon catheter with 2 mini ball joint holders, plexiglass block clamp and bar with ball, and spindle syringe.

Standard Flow Probes (R-Series - J Reflector)

Limited available quantities. Please contact us for further information.

For direct measurement of volume flow for vessels from 1 to 1.5 mm diameter using the PLUGSYS transit time flow meter module (. These probes have the transducers positioned at an 45° angle to the vessel. The probes are available with the cable exit in the back or on the side.

Item No.	Description
73-4669	MAIPRS Flow probe for HSE TTFM-2 or TS420 module
73-4670	MA1.5 PRB Flow probe for TTFM-2 or TS420 Module



DETAILS

For direct measurement of volume flow for vessels from 1 to 1.5 mm diameter using the PLUGSYS transit time flow meter module (. These probes have the transducers positioned at an 45° angle to the vessel. The probes are available with the cable exit in the back or on the side.

Coding:

- RB: R-probe with cable exit in the Back
- RS: R-probe with cable exit on the Side

All R Probes do have a J reflector with slide cover.

For information on flow probes to interface with the earlier versions of the TTFM (73-0146) please contact Technical Services.

SPECIFICATIONS

Item Number	73-4668	73-4669	73-4670
Diameter	1 mm	1 mm	1.5 mm
OD Vessel Acute	0.7 - 1.2	0.7 - 1.2	1.2 - 1.8
Resolution ml/min	0.05	0.05	0.075
Range ml/min			
Sc. Low	5	5	10
Sc. Norm	20	20	40
Мах	100	100	200
Probe Length	6.5 mm	6.5 mm	7.6 mm
Probe Width	4 mm	4 mm	3.5 mm
Cable Length	60 cm	60 cm	60 cm
Cable Exit	Back	Side	Back

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 or- dered 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

PLUGSYS Transit Time Flowmeter Module (TTFM-2)

Limited available quantities. Please contact us for further information.

Used to measure blood flow in-vivo or flow rates of any perfusion solution in isolated organ systems.

Item No.

Description

73-4617

Transit Time Flowmeter Module (TTFM-2)



DETAILS

The **Transit Time Flowmeter Module** (TTFM-2) is an ultrasonic transit time flowmeter module used to measure blood flow in-vivo or flow rates of any perfusion solution in isolated organ systems. It incorporates a complete 1-channel Transonic[®] ultrasonic transit time flowmeter which must be connected to a PLUGSYS housing. It can be used either with in-line flow probes or perivascular probes from Transonic.

The module features a built-in digital display for direct reading of the mean flow and an analog instrument to show flow, signal quality and scale factors. This module requires a PLUGSYS housing or with five PLUGSYS slots. The module includes a 1.25 M extension cable (73-4706).

The TTFM-2 module should be added to a PLUGSYS amplifier that also includes modules to measure pressure, ECG, temperature and other physiological parameters.

Click this link for recommended .

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Click this link for more information about .

Extension Cables

73-4706 Extension Cable for TTFM-2, CRA10-S-CRA10

73-4707 Extension Cable for TTFM-2, CRA10-M2-CRA10 (Cannot be used with 0.5 and 0.7 mm nanoprobes) 73-4708 Extensiion Cable for TTFM-2, CRA10-M3-CRA10 (Cannot be used with 0.5 and 0.7 mm nanoprobes

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-inline applications

Item No.

Description

73-4479

Manual Pressure Calibrator, Range 0-300 mmHg



DETAILS

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 40°C (other ranges with process qualification)
Storage Temperature	-25° to 65°C
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 ±

Standard Flow Probes (S-Series - L Reflector)

Limited available quantities. Please contact us for further information.

For direct measurement of volume flow for vessels from 2 to 20 mm diameter using the PLUGSYS transit time flow meter module ().

These probes have the transducers positioned at an 60° angle to the vessel. This reduces the flow probe body size and reflector width for placement of the probe in applications where space is limited. These probes are available with the cable exit in the back or on the side.

Item No.	Description
73-4643	MA1.5 PSL Flow probe for HSE TTFM-2 or TS420 module
73-4646	MA2PSS Flow probe for HSE TTFM-2 or TS420 module
73-4648	MA2.5PSS Flow probe for HSE TTFM-2 or TS420 module
73-4649	MA2.5PSL Flow probe for HSE TTFM-2 or TS420 module
73-4651	MA3PSS Flow probe for HSE TTFM-2 or TS420 module
73-4653	MA4 PSS Flow probe for HSE TTFM-2 or TS420 module
73-4655	MA6 PSS Flow probe for HSE TTFM-2 or TS420 module
73-4657	MA8PSS Flow probe for HSE TTFM-2 or TS420 module
73-4658	MA10PSB Flow probe for HSE TTFM-2 or TS420 module

Item No.	Description
73-4659	MA10PSS Flow probe for HSE TTFM-2 or TS420 module
73-4661	MA12PSS Flow probe for HSE TTFM-2 or TS420 module
73-4662	MA14PSB Flow probe for HSE TTFM-2 or TS420 module
73-4663	MA14PSS Flow probe for HSE TTFM-2 or TS420 module
73-4664	MA16PSB Flow probe for HSE TTFM-2 or TS420 module
73-4665	MA16PSS Flow probe for HSE TTFM-2 or TS420 module
73-4666	MA20PSB Flow probe for HSE TTFM-2 or TS420 module
73-4667	MA20PSS Flow probe for HSE TTFM-2 or TS420 module



DETAILS

For direct measurement of volume flow for vessels from 2 to 20 mm diameter using the PLUGSYS transit time flow meter module ().

These probes have the transducers positioned at an 60° angle to the vessel. This reduces the flow probe body size and reflector width for placement of the probe in applications where space is limited. These probes are available with the cable exit in the back or on the side. (Photo shows side exit.)

Coding:

- SB: S-probe with cable exit in the Back
- SS: S-probe with cable exit on the Side

Probe diameters between 2 and 2.5 mm do have a J reflector with slide cover Probe diameters between 3 and 20 mm do have a L reflector with slide cover

For information on flow probes to interface with the earlier versions of the TTFM (73-0146) please contact Technical Services.

SPECIFICATIONS

<u>Diameters 3 mm - 6 mm</u>

Item Number	73-4650	73-4651	73-4652	73-4653	73-4654	73-4655
Diameter	3 mm	3 mm	4 mm	4 mm	6 mm	6 mm
OD Vessel Acute	2.5 - 3.7	2.5 - 3.7	3.3 - 4.4	3.3 - 4.4	4.4 - 6.6	.4.4 - 6.6
Resolution ml/min	0.4	0.4	0.8	0.8	2.2	2.2
Range ml/min						
Sc. Low	50	50	100	100	50	50
Sc. Norm	200	200	400	400	1L	1L
Мах	1 L	1 L	2 L	2 L	5 L	5 L
Probe Length	9 mm	9 mm	13.3 mm	13.3 mm	13.5 mm	13.5 mm
Probe Width	5 mm	5 mm	6 mm	6 mm	6.7 mm	6.7 mm
Cable Length	100 cm					
Cable Exit	Back	Side	Back	Side	Back	Side

<u>Diameters 8 mm - 12 mm</u>

Item Number	73-4656	73-4657	73-4658	73-4659	73-4660	73-4661
Diameter	8 mm	8 mm	10 mm	10 mm	12 mm	12 mm
OD Vessel Acute	6.6 - 8.8	6.6 - 8.8	8.3 - 11.0	8.3 - 11.0	9.8 - 13	9.8 - 13
Resolution ml/min	4	4	8	8	8	8
Range ml/min						
Sc. Low	500	500	500	500	1L	1L
Sc. Norm	2 L	2 L	2 L	2 L	4 L	4 L
Мах	10 L	10 L	10 L	10 L	20 L	20 L
Probe Length	18.8 mm	18.8 mm	18.7 mm	18.7 mm	22.5 mm	22.5 mm
Probe Width	7.5 mm	7.5 mm	8.5 mm	8.5 mm	8.5 mm	8.5 mm
Cable Length	100 cm	100 cm	100 cm	100 cm	100 cm	100 cm
Cable Exit	Back	Side	Back	Side	Back	Side

<u> Diameter 14 mm - 20 mm</u>

Item Number	73-4662	73-4663	73-4664	73-4665	734666	73-4667
Diameter	14 mm	14 mm	16 mm	16 mm	20 mm	20 mm
OD Vessel Acute	11.3 - 15.0	11.3 - 15.0	13.3 - 17.7	13.3 - 17.7	16.0 - 21.0	16.0 - 21.0
Resolution ml/min	16	16	20	20	40	40
Range ml/min						
Sc. Low	1L	1L	2.5 L	2.5 L	2.5 L	2.5 L
Sc. Norm	4 L	4 L	10 L	10 L	10 L	10 L
Мах	20 L	20 L	50 L	50 L	50 L	50 L
Probe Length	26.2 mm	26.2 mm	36 mm	36 mm	31 mm	31 mm
Probe Width	8.5 mm	8.5 mm	10 mm	10 mm	9 mm	9 mm
Cable Length	100 cm					
Cable Exit	Back	Side	Back	Side	Back	Side

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



DETAILS

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

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.

- 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

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 50°C
Zero Drift	±0.04 mmHg/10°C (0 to 50°C)
Range Drift	±0.04 mV/10°C (±0.04 mmHg/10°C) (0 to 50°C)
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)

Small Disposable Electrodes, Gentle or Aggressive Adhesive

For use in EMG, NCS and EP studies; also suitable for use with EKG monitors. Latex-free; meet or exceed AAMI specifications

Item No.

Description

72-7091

Gentle Adhesive Small Disposable Electrode, 2.2cm² (0.88 in²), pkg of 60 (3 electrodes per strip)



DETAILS

These Small Disposable Cloth Electrodes are for use in EMG, NCS and EP studies and are latex-free. They meet or exceed AAMI specifications and are also suitable for use with EKG monitors.

- Small size for easy placement on difficult locations
- Gentle or aggressive adhesive
- Solid gel is repositionable and easy clean-up
- Hypoallergenic for long term use with no irritation
- Cloth base is comfortable and conforming
- Silver/Silver Chloride sensor gives a clear signal
- Multipurpose use for EMG or EKG

The Small Disposable Agressive Adhesive Electrodes are supplied as 3 electrodes per strip in a package of 30 electrodes. This Small Disposable 2.5 cm² (1.0 in²), aggressive adhesive electrode is designed for easy placement and superior adhesion. A specially formulated adhesive solid gel ensures full sensor contact and excellent readings.

The Gentle Adhesive Small Disposable Electrodes are supplied as 3 electrodes per strip in a package of 60 electrodes. They attach with an alligator clip or standard connector lead wire. These Small Disposable 2.2 cm² (0.88 in²) gentle adhesive electrodes are designed with a gentle adhesive for use in sensitive areas.

SPECIFICATIONS

Specifications	72-7090	72-7091
Adhesive Material	Solid Gel	Solid Gel
Diameter (English)	1.0 in ²	0.88 in ²
Diameter (Metric)	2.5 cm ²	2.2 cm ²

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, lsovolumetric 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

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 lifesciences 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



DETAILS

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

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				
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				
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

Specifications	75-0706	75-0707	75-0715	75-0716	75-0714
Standard bare fiber length	20 cm	70 cm	20 cm	70 cm	70 cm
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)				
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

Cardiovascular Waveform Pump

The Cardiovascular Waveform Pump (former name Pulsatile Blood Pump) simulates the ventricular hemodynamic waveform of the heart. It features silicone rubber-covered heart-type ball valves and smooth flow. Only inert materials like silicone rubber, acrylate, and PTFE contact the fluid. The pumping head is easy to take apart and reassemble and can be sterilized. It can be used for circulating emulsions, suspensions, and non-Newtonian fluids such as blood. Actuation of the ball check valves will result in some hemolysis over time when using blood or blood cell doped solutions but acute use with these solutions in mock circulatory loops can be performed. Four different models are available with minute volumes of 1 – 200 ml, 10 ml – 2 L, 80 ml – 6 L, 150 ml – 10 L. It is ideal for testing flow circuits and medical devices that require ventricular hemodynamic flow morphology.

Tubing listed in the table below for connection to inlet and outlet pump ports. Other formulations and sizes as well as are available.

Item No.	Description
52-9552	Cardiovascular Waveform Pump Model 1407
55-1838	Cardiovascular Waveform Pump Model 1405
72-1027	Tygon® E-3603 Tubing, 15.2 m (50 ft) Length, 7.9 mm (5/16 in) ID, 11.1 mm (7/16 in) OD; for Models 1405 & 1407
55-3321	Cardiovascular Waveform Pump Model 1421
72-1032	Tygon® E-3603 Tubing, 15.2 m (50 ft) Length, 11.1 mm (7/16 in) ID, 17.5 mm (11/16 in) OD; for Model 1421
55-3305	Cardiovascular Waveform Pump Model 1423

Item No.

72-1033

Description

Tygon® E-3603 Tubing, 15.2 m (50 ft) Length, 12.7 mm (1/2 in) ID, 17.5 mm (11/16 in) OD; for Model 1423



DETAILS

The Cardiovascular Waveform Pump (former name Pulsatile Blood Pump) simulates the ventricular hemodynamic waveform of the heart. It features silicone rubber-covered heart-type ball valves and smooth flow. Only inert materials like silicone rubber, acrylate, and PTFE contact the fluid. The pumping head is easy to take apart and reassemble and can be sterilized. It can be used for circulating emulsions, suspensions, and non-Newtonian fluids such as blood. Actuation of the ball check valves will result in some hemolysis over time when using blood or blood cell doped solutions but acute use with these solutions in mock circulatory loops can be performed. Four different models are available with minute volumes of 1 - 200 ml, 10 ml - 2 L, 80 ml - 6 L, 150 ml - 10 L. It is ideal for testing flow circuits and medical devices that require ventricular hemodynamic flow morphology.

Features

- Reproduction of the ventricular hemodynamic waveform including temporal phasing of systole (dispensing) and diastole (refilling).
- Durable construction for hours of continuous operation.
- 4 flow rate range models, Minute volumes:
 - 1 200 ml, 10 ml 2 L, 80 ml 6 L, 150 ml 10 L
 - Variable phasing for Models 1421 and 1423 (see specifications table)
- Suitable for acute studies with bloodA, ideal for simulated blood solutions, other non-Newtonian solutions as well as aqueous solutions.

A. When using blood or blood cell doped solutions hemolysis will occur over time and is affected by the mechanical closing of valves, stroke rate and potentially the fluid pathway. The user is advised to determine change in hematocrit and/or free hemoglobin at various time points during the pumping of these solutions.

Pump Mechanism

A positive piston actuator and ball check valves provide the proportioning action. The product of stroke rate times stroke volume is an accurate indicator of the flow rate. Positive piston action prevents changes in flow rates, regardless of variations in resistance or back pressure. The piston always travels to the end of the ejection stroke, independent of the volume pumped.

We offer turnkey solutions including tubing, connectors, pressure transducers, flowmeters and data acquisition platforms to complete your experimental setup.

Test Setup with Pressure and Flow Values

A simple setup is presented in the figure below with a small compliance device (Penrose tubing).



Pressure Curves

The shape of the output pressure curve is a function of both the pump action and the characteristics of the external system on the output fluid circuit. The following set of curves were obtained with Model 1421, using water as the pumped medium. In the tests, pressure transducers were inserted in three locations and continuous records obtained under varying conditions.

Varying the peripheral resistance, stroke rate, stroke volume and phase ratio allows for creation of a wide range of output flow and pressure characteristics.

- Curve A Pressure just beyond the output valve
- Curve B Pressure within the pump chamber
- Curve C Pressure just before the intake valve



Ex Vivo Organ Perfusion

An example of ex vivo organ perfusion pressure and flow values obtained from a dog lung lobe perfusion.



SPECIFICATIONS

Item #	52-9552	55-1838	55-3321	55-3305
Model No.	1407	1405	1421	1423
Stroke Volume Adjustable	0.05 to 1.0 ml	0.5 to 10 ml	4 to 30 ml	15 to 100 ml
Rate Stroke/Minute	20 to 200	20 to 200	20 to 200	10 to 100
Minute Volume Stroke Volume x Rate	1 to 200 ml	10 to 2,000 ml	80 to 6,000 ml	150 to 10,000 ml
Phasing*	Fixed Phase	Fixed Phase	Adjustable Phase	Adjustable Phase
	35% systole	35% systole	35 to 50% systole	35 to 50% systole
	65% diastole	65% diastole	65 to 50% diastole	65 to 50% diastole
Port ID	0.25″ (6.35mm)	0.25" (6.35mm)	0.375″ (9.52mm)	0.5" (12.7mm)
Port OD	0.325″ (8.26mm)	0.325″ (8.26mm)	0.44″ (11.18 mm)	0.56" (14.22mm)
Tube ID	8 mm (0.31 in)	8 mm (0.31 in)	11 mm (0.437 in)	14 mm (0.551 in)
Dimensions H x W x D	312 x 156 x 250 mm (12.3 x 6.1 x 9.9 in)	312 x 156 x 250 mm (12.3 x 6.1 x 9.9 in)	500 x 212 x 337 mm (19.7 x 8.4 x 13.4 in)	500 x 212 x 337 mm (19.7 x 8.4 x 13.4 in)
Weight	7.3 kg (16 lb)	7.3 kg (16 lb)	13.6 kg (30 lb)	14.5 kg (32 lb)
Voltage	115 VAC, 50/60 Hz or 230 VAC, 50/60 Hz UK and EU Models	115 VAC, 50/60 Hz or 230 VAC, 50/60 Hz UK and EU Models	115 VAC, 50/60 Hz or 230 VAC, 50/60 Hz UK and EU Models	115 VAC, 50/60 Hz or 230 VAC, 50/60 Hz UK and EU Models

* Phasing = percentage of one cycle dispensing (systole) or refilling (diastole) pump piston

Solid Gel General Purpose Disposable ECG Electrodes

Ideal choice for cardiac monitoring and diagnostic applications such as stress test, long term monitoring, short term monitoring or resting EKG

Item No.

Description

72-7093

Solid Gel Adhesive General Purpose Electrodes, 48 mm (17/8 in), pkg of 60 (5 electrodes per strip)



DETAILS

These Solid Gel General Purpose Disposable ECG Electrodes are the ideal choice for cardiac monitoring and diagnostic applications. Each Electrode is designed to work in all procedures: Stress Test, Long Term Monitoring, Short Term Monitoring or Resting EKG.

- Suitable for all types of studies
- Solid gel for improved adhesion and applications

The adhesive has a specially formulated solid gel that improves adhesion and ease of application, while reducing the need for clean-up. Electrodes are available in a 48 mm (17/8 in) diameter breathable tape with a stainless steel snap and are Latex-Free. They are supplied as 5 electrodes per strip in a package of 60. They attach to an alligator clip or a standard connector lead wire.

SPECIFICATIONS

Specifications

72-7093

Adhesive Material	Solid Gel
Diameter (English)	17/8 in
Diameter (Metric)	48 mm

Coaxial Stimulation Electrode for the Isolated Heart (Rat, Guinea-pig, Rabbit)

For electrical stimulation of the isolated perfused heart. Ensures constant heart rate.

Item No.	Description
73-3322	Link for Higher Loading Capacity, for Two Arms with 9 or 9.5 mm Maxi Balls, pkg of 1



Electrical stimulation of the isolated heart ensures constant heart rate. The tissue is being stimulated between the inner wire and the outer cylinder. Through the coaxial construction, the outer electrode at zero potential acts as a screen so that stray fields are reduced and interference to ECG (EG) recordings is limited. A special holder for easy positioning of the electrode on the heart surface is available as an accessory.

- For electrical stimulation of the isolated perfused heart
- Reduced stray fields for more accurate recordings

Holder with Maxi-Ball Joints for Large Stimulation Electrode includes 9 mm Ball with 130 mm length and 8 mm diameter Rod (73-3323), Maxi-Ball High Load Link (73-3322), and special bar with ball and thumbscrew.

SPECIFICATIONS

Specifications	73-0219	73- 3322	73- 3323
Cable Length (English)	4.7 in ending on 4 mm MC Banana Plugs, 2-core screened cable		
Cable Length (Metric)	120 mm ending on 4 mm MC Banana Plugs, 2-core screened cable		
Length of Cylinder	75 mm		
Outside Diameter (OD)	4.3 mm		
Weight (Metric)	40 g, without holder]	

Centrifugal Pump

The centrifugal pump is specifically designed for pumping blood and/or erythrocyte suspension solutions in the physiological or pharmacological laboratory.

A complete setup consists of the digital pump drive with centrifugal head mounting plate (73–5157) and a centrifugal pump head (73–5173). The pump head is hermetically sealed. Flow rates are up to 10 L/min. The perfusion circuit resistance will limit the flow rate that can be achieved. See the pressure flow graph for more details. A priming circuit is supplied with the pump along with an instruction manual for care and use. The pump can be coupled with an Pressure Transducer, Transducer Amplifier, Pump Controller, housing and Controller Connection Cable to perform constant pressure perfusion.refer to the details section for the list of parts required. Please contact us for assistance configuring your perfusion setup.

Item No.	Description
73-5157	Centrifugal PUMP DRIVE, 110V – 240 VAC
73-5173	CENTRIFUGAL PUMP HEAD AP40
72-4621	Tygon [®] E-3603 Tubing, 15.2 m (50 ft) Length, 9.5 mm (3/8 in) ID, 12.7 mm (1/2 in) OD
73-4759	CONNECTION CABLE SCP to 25 PIN D-SUB (DB-25) FOR MFLX L/S, L/S DIGITAL, REGLO and HSE CENTRIFUGAL PUMP DRIVES



DETAILS

The centrifugal pump is specifically designed for pumping blood and/or erythrocyte suspension solutions in the physiological or pharmacological laboratory.

A complete setup consists of the digital pump drive with centrifugal head mounting plate (73–5157) and a centrifugal pump head (73–5173). The pump head is hermetically sealed. Flow rates are up to 10 L/min. The perfusion circuit resistance will limit the flow rate that can be achieved. See the pressure flow graph for more details. A priming circuit is supplied with the pump along with an instruction manual for care and use. The pump can be coupled with an Pressure Transducer, Transducer Amplifier, Pump Controller, housing and Controller Connection Cable to perform constant pressure perfusion. Please contact us for assistance configuring your perfusion setup.

The drive is very robust and suitable for continuous speed selection operation.

The HSE/HA Large Centrifugal Pump can be outfitted to perform constant pressure perfusion using the following items. Please contact us for assistance.

Constant Perfusion Pressure Option

73-3862	APT300 Pressure Transducer for PLUGSYS Modules (73-0065, 73-1793) or CTA Compact Transducer Ampllifier (73-4457)	
73-3869	Holder for APT300 Transducer, 8 mm Rod, Length 75 mm	
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	
73-1793	Transducer Amplifier Module (TAM-D)	
73-2806	PLUGSYS Servo Controller for Perfusion (SCP)	
Plus one of three amplifier cases below		
73-1523	PLUGSYS Case, Type 609	
73-1521	PLUGSYS Case, Type 601	
73-0045	PLUGSYS Case, Type 603	

SPECIFICATIONS

Technical data

- Speed range: 36 3600 rpm
- Flow rate and pressure: depending on pump head (see diagram chapter 6.1)
- External control: via analogue interface 0...10V or 0...5V
- Supply: wide range power supply 115 V 230 V (50/60 Hz)
- Fuses: 1 x 3.15 A T (slow blow)
- Operating conditions: normal laboratory environment temperature +5 to +40°C rel. humidity 80% max.
- Dimensions (drive): 10.5 in × 8 in × 8 in (267 × 203 × 203 mm)
- Weight: 15.5 lb (7.0 kg)
- Enclosure Rating: IP 33 per IEC 60529
- CE conformity:
 - Conforms to ANSI/UL Std 61010-1

Certified to CAN/CSA Std C22.2 No. 61010-1.

This product has been tested to the requirements of CAN/CSA-C22.2 No. 61010-1, second edition, including Amendment 1, or a later version of the same standard incorporating the same level of testing requirements.

(For CE Mark): EN61010-1 (EU Low Voltage Directive) and EN61326 (EU EMC Directive)

Digital Pressure Calibrators

A calibration certificate is provided with the purchase of any of these instruments. A recalibration (with certificate) is available; requires return of instrument.

The calibrator KAL 84 is used for calibrating pressure sensors. It represents a combination of a pressure generator (hand pump) and a pressure meter with digital display. The instrument provides a simple means for testing and calibrating both pressure sensors and complete pressure measuring equipment. High accuracy and excellent reproducibility, together with a specially rugged construction, provide the unit with all the properties required for laboratory applications.

- Maintenance free
- Four units available:
 - 0 to 200 mmHg
 - 0 to 300 mmHg
 - 0 to 20 mmH₂O
 - 0 to 200 mmH₂O

A calibration certificate is provided with the purchase of any of these instruments. A recalibration (with certificate) is available; requires return of instrument.

Item No.	Description
73-2918	Recalibration of KAL84 with certificate (Requires Return of Unit)
73-0012	Electronic Pressure Calibrators, Model KAL 84 H, Mercury, Range 1: 0 to 199.9 mmHg, Range 2: 0 to 26.66 kPa, 115 VAC, 60 Hz, For Use with Blood Pressure Transducers
73-0014	Electronic Pressure Calibrators, Model KAL 84 SH, Mercury, Range 1: 0 to 300.0 mmHg, Range 2: 0 to 39.99 kPa, 115 VAC, 60 Hz, For Use with Blood Pressure Transducers

Item No.

73-0018

Description

Electronic Pressure Calibrators, Model KAL 84 M, Water, Range 1: 0 to 199.9 mmH2O, Range 2: 0 to 1960 Pa, 115 VAC, 60 Hz, For Use with Low-Range Differential Pressure Transducers

Electronic Pressure Calibrators, Model KAL 84 M, Water, Range 1: 0 to 199.9 mmH2O, Range 2: 0 to 1960 Pa, 230 VAC, 50 Hz, For Use with Low-Range Differential Pressure Transducers



DETAILS

A calibration certificate is provided with the purchase of any of these instruments. A recalibration (with certificate) is available; requires return of instrument.

The calibrator KAL 84 is used for calibrating pressure sensors. It represents a combination of a pressure generator (hand pump) and a pressure meter with digital display. The instrument provides a simple means for testing and calibrating both pressure sensors and complete pressure measuring

73-0019

equipment. High accuracy and excellent reproducibility, together with a specially rugged construction, provide the unit with all the properties required for laboratory applications.

- Maintenance free
- Four units available:
 - 0 to 200 mmHg
 - 0 to 300 mmHg
 - 0 to 20 mmH₂O
 - 0 to 200 mmH₂O

After the unit has been switched on and connected to the pressure sensor to be calibrated (test object), the required pressure is set with the small hand-wheel. The built-in pressure meter measures the set pressure accurately and indicates it in digital form. Since the generated pressure is identical at the built-in pressure meter and at the test object, the pressure measured by the test object corresponds exactly to the pressure indicated by the KAL 84. Models with different pressure ranges are available. Each model has an application-specific range (range 1) and can be switched to a corresponding SI range (range 2) in Pascal (Pa) or Kilopascal (kPA).

A calibration certificate is provided with the purchase of any of these instruments. A recalibration (with certificate) is available; requires return of instrument.

SPECIFICATIONS

Specifications	73-0012	73-0014	73-0013	73-0015
Analog Output	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ
Certifications	CE	CE	CE	CE
Depth English	7.1 in	7.1 in	7.1 in	7.1 in
Depth Metric	180 mm	180 mm	180 mm	180 mm
Height English	3.9 in	3.9 in	3.9 in	3.9 in
Height Metric	100 mm	100 mm	100 mm	100 mm
Hysteresis	0.1% FS	0.1% FS	0.1% FS	0.1% FS
Linearity	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models
Liquid	Mercury	Mercury	Mercury	Mercury

Specifications	73-0012	73-0014	73-0013	73-0015
Model	KAL 84 H	KAL 84 SH	KAL 84 H	KAL 84 SH
Nominal Temperature Range Metric	10 to 50 °C			
Operating Temperature Range Metric	0 to 60 °C			
Optional Certificate	Linearity test certificate, DKD (German calibration service, see below)			
Overpressure Limit	200% FS for mercury models 500% FS for water models			
Power	115 VAC, 60 Hz, 9 V rechargeable battery, mains adapter	115 VAC, 60 Hz, 9 V rechargeable battery, mains adapter	230 VAC, 50 Hz, 9 V rechargeable battery, mains adapter	230 VAC, 50 Hz, 9 V rechargeable battery, mains adapter
Pressure Connections	6.5 mm OD for 5 mm ID tubing			
Range	Measurement and calibration range for appropriate model (see table below)			
Range 1	0 to 199.9	0 to 300.0	0 to 199.9	0 to 300.0
Range 1 UOM	mmHg	mmHg	mmHg	mmHg
Range 2	0 to 26.66	0 to 39.99	0 to 26.66	0 to 39.99
Range 2 UOM	kPa	kPa	kPa	kPa
Response Time	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec
Used for Calibrations of	Blood Pressure Transducer like APT300, TRA Series, P75, Millar or Others	Blood Pressure Transducer like APT300, TRA Series, P75, Millar or Others	Blood Pressure Transducer like APT300, TRA Series, P75, Millar or Others	Blood Pressure Transducer like APT300, TRA Series, P75, Millar or Others

Specifications	73-0012	73-0014	73-0013	73-0015
Weight English	6.6 lb	6.6 lb	6.6 lb	6.6 lb
Weight Metric	3 kg	3 kg	3 kg	3 kg
Width English	10.2 in	10.2 in	10.2 in	10.2 in
Width Metric	260 mm	260 mm	260 mm	260 mm

Specifications	73-0016
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73-

73-0018 73-0017

73-0019

Analog Output	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ	0 to 1 V for 100% nominal range, load resistance at least 2 kΩ
Certifications	CE	CE	CE	CE
Depth English	7.1 in	7.1 in	7.1 in	7.1 in
Depth Metric	180 mm	180 mm	180 mm	180 mm
Height English	3.9 in	3.9 in	3.9 in	3.9 in
Height Metric	100 mm	100 mm	100 mm	100 mm
Hysteresis	0.1% FS	0.1% FS	0.1% FS	0.1% FS
Linearity	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models	±0.5% FS ±1 digit for mercury models, ±1% FS ±1 digit for water models
Liquid	Water	Water	Water	Water
Model	KAL 84 L	KAL 84 M	KAL 84 L	KAL 84 M
Nominal Temperature Range Metric	10 to 50 °C	10 to 50 °C	10 to 50 °C	10 to 50 °C
Operating Temperature Range Metric	0 to 60 °C	0 to 60 °C	0 to 60 °C	0 to 60 °C
Optional Certificate	Linearity test certificate, DKD (German calibration service, see below)	Linearity test certificate, DKD (German calibration service, see below)	Linearity test certificate, DKD (German calibration service, see below)	Linearity test certificate, DKD (German calibration service, see below)

Specifications	73-0016	73-0018	73-0017	73-0019
Overpressure Limit	200% FS for mercury models 500% FS for water models	200% FS for mercury models 500% FS for water models	200% FS for mercury models 500% FS for water models	200% FS for mercury models 500% FS for water models
Power	115 VAC, 60 Hz, 9 V rechargeable battery, mains adapter	115 VAC, 60 Hz, 9 V rechargeable battery, mains adapter	230 VAC, 50 Hz, 9 V rechargeable battery, mains adapter	230 VAC, 50 Hz, 9 V rechargeable battery, mains adapter
Pressure Connections	6.5 mm OD for 5 mm ID tubing	6.5 mm OD for 5 mm ID tubing	6.5 mm OD for 5 mm ID tubing	6.5 mm OD for 5 mm ID tubing
Range	Measurement and calibration range for appropriate model (see table below)	Measurement and calibration range for appropriate model (see table below)	Measurement and calibration range for appropriate model (see table below)	Measurement and calibration range for appropriate model (see table below)
Range 1	0 to 19.99	0 to 199.9	0 to 19.99	0 to 199.9
Range 1 UOM	mmH2O	mmH2O	mmH2O	mmH2O
Range 2	0 to 196.0	0 to 1960	0 to 196.0	0 to 1960
Range 2 UOM	Pa	Ра	Ра	Ра
Response Time	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec	TE = 20 ms, time constant can be switched to 0.1 sec or 1 sec
Used for Calibrations of	Low-Range Differential Pressure Transducer like DLP2.5 at 10 mmH2O as Nominal Value for PTM (Pneumotachometer)	Low-Range Differential Pressure Transducer like DLP2.5 or MPX, Type 399	Low-Range Differential Pressure Transducer like DLP2.5 at 10 mmH2O as Nominal Value for PTM (Pneumotachometer)	Low-Range Differential Pressure Transducer like DLP2.5 or MPX, Type 399
Weight English	6.6 lb	6.6 lb	6.6 lb	6.6 lb
Weight Metric	3 kg	3 kg	3 kg	3 kg
Width English	10.2 in	10.2 in	10.2 in	10.2 in
Width Metric	260 mm	260 mm	260 mm	260 mm

Small Stimulation Electrode Set (Mice)

This stimulation electrode set is used for electrical stimulation of small heart or tissues. Through the coaxial construction, the other electrode at zero potential acts as a screen so that stray fields are reduced and interference to recordings is limited (ECG, MAP). In combination with the mini ball joint holders a precise fixation on the myocard is possible.

Item No.	Description
73-0160	Small Stimulation Electrode Set, Includes 73-0181 and 73-0182
73-0181	Mini Coaxial Stimulation Electrode with modified Lemosa connector
73-0182	Adapter Cable - modified Lemosa connector to 4 mm Banana Plugs, 1.5 mm cable length



DETAILS

This stimulation electrode set is used for electrical stimulation of small heart or tissues. Through the coaxial construction, the other electrode at zero potential acts as a screen so that stray fields are reduced and interference to recordings is limited (ECG, MAP). In combination with the mini ball joint holders a precise fixation on the myocard is possible.

SPECIFICATIONS

Specifications	73-0160	73-0181
Cable Length (Metric)	35 cm	35 cm
Connector	Modified Lemo	Modified Lemo
Outside Diameter (OD)	1.3 mm	1.3 mm
Tip Length	20 mm	20 mm

Manual Pressure Calibrator

Manual Pressure Calibrator, Range 0 to 300 mmHg

Item No.

Description

73-4479

Manual Pressure Calibrator, Range 0-300 mmHg



DETAILS

The Manual Pressure Calibration kit makes use of a one-way valve in bulb and is appropriate for blood pressure calibration for both arterial and venous pressure ranges.

По вопросам продаж и поддержки обращайтесь:

Магнитогорск (3519)55-03-13

Москва (495)268-04-70

Алматы (727)345-47-04 Ангарск (3955)60-70-56 Архангельск (8182)63-90-72 Астрахань (8512)99-46-04 Барнаул (3852)73-04-60 Белгород (4722)40-23-64 Благовещенск (4162)22-76-07 Брянск (4832)59-03-52 Владивосток (423)249-28-31 Владикавказ (8672)28-90-48 Владимир (4922)49-43-18 Волгоград (844)278-03-48 Волоград (844)278-03-48 Вологда (8172)26-41-59 Воронеж (473)204-51-73 Екатеринбург (343)384-55-89 Иваново (4932)77-34-06 Ижевск (3412)26-03-58 Иркутск (395)279-98-46 Казань (843)206-01-48 Калининград (4012)72-03-81 Калига (4842)92-23-67 Кемерово (3842)65-04-62 Киров (8332)68-02-04 Коломна (4966)23-41-49 Кострома (4942)77-07-48 Краснодар (861)203-40-90 Красноярск (391)204-63-61 Курск (4712)77-13-04 Курган (3522)50-90-47 Липецк (4742)52-20-81

Мурманск (8152)59-64-93 Набережные Челны (8552)20-53-41 Нижний Новгород (831)429-08-12 Новокузнецк (3843)20-46-81 Ноябрьск (3496)41-32-12 Новосибирск (383)227-86-73 Омск (3812)21-46-40 Орел (4862)44-53-42 Оренбург (3532)37-68-04 Пенза (8412)22-31-16 Петрозаводск (8142)55-98-37 Псков (8112)59-10-37 Пермь (342)205-81-47 Ростов-на-Дону (863)308-18-15 Рязань (4912)46-61-64 Самара (846)206-03-16 Санкт-Петербург (812)309-46-40 Саратов (845)249-38-78 Севастополь (8692)22-31-93 Саранск (8342)22-96-24 Симферополь (3652)67-13-56 Смоленск (4812)29-41-54 Сочи (862)225-72-31 Ставрополь (8652)20-65-13 Сургут (3462)77-98-35 Сыктывкар (8212)25-95-17 Тамбов (4752)50-40-97 Тверь (4822)63-31-35 Тольятти (8482)63-91-07 Томск (3822)98-41-53 Тула (4872)33-79-87 Тюмень (3452)66-21-18 Ульяновск (8422)24-23-59 Улан-Удэ (3012)59-97-51 Уфа (347)229-48-12 Хабаровск (4212)92-98-04 Чебоксары (8352)28-53-07 Челябинск (351)202-03-61 Череповец (8202)49-02-64 Чита (3022)38-34-83 Якутск (4112)23-90-97 <u>Яросп</u>авль (4852)69-52-93

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