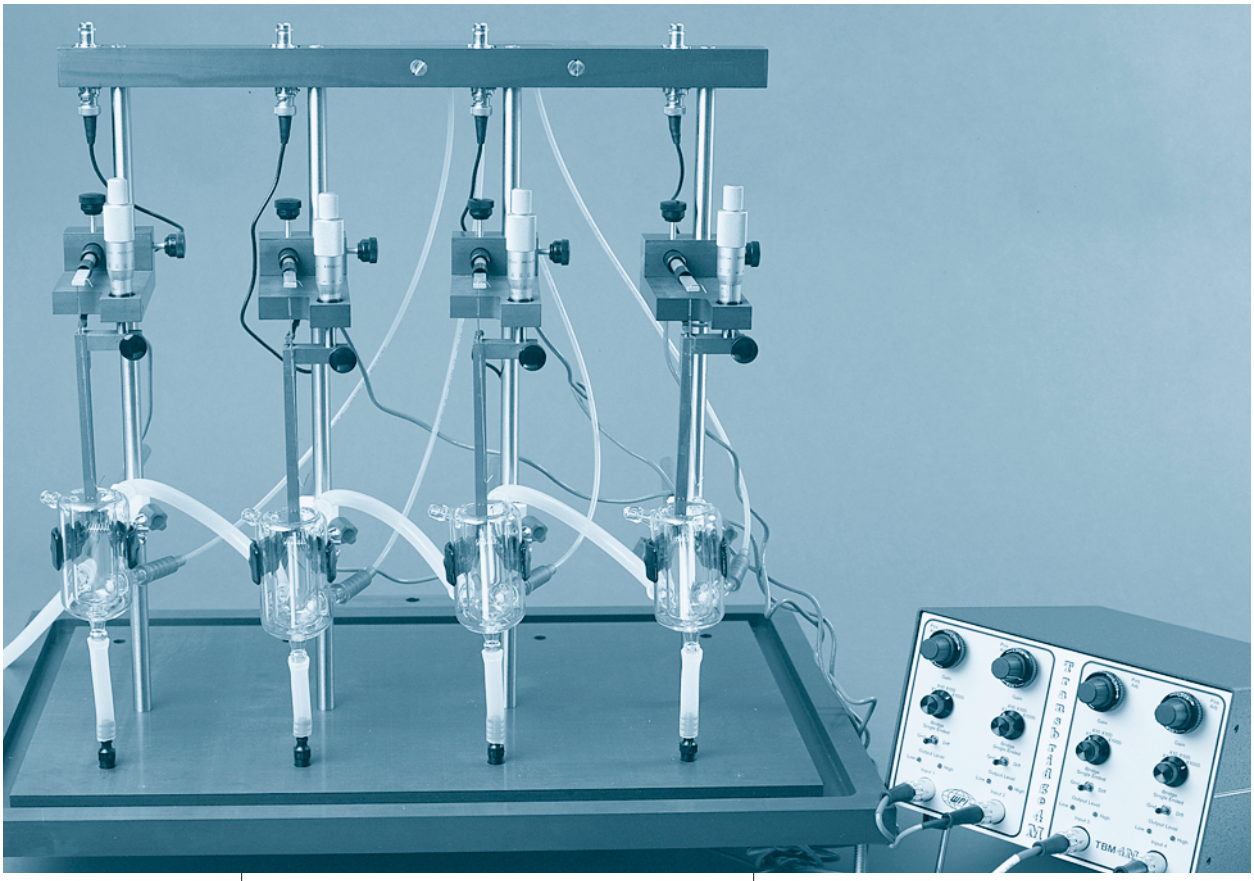
Myobath

Multi-channel tissue bath system



WPI's popular multi-channel isolated tissue bath system (**MYOBATH**) was developed in collaboration with top cardiovascular research scientists over a period of several years. The result is a state-of-the-art easy-to-use, cost-effective system for the *in vitro* study of smooth muscle (vascular and non-vascular), cardiac muscle and other tissue preparations. The Myobath provides the only complete solution to tissue bath studies and is available in 2-, 3- and 4-channel configurations. Each configuration is sold as a complete ready-to-use assembly consisting of: high quality PVC heavy base, stainless steel vertical posts, integrated tissue aeration and stimulation manifold, holding brackets, micrometers, tissue holders and hooks, tissue baths, force transducers, accessories (*i.e.* tubing, clamps, cables and tissue/stimulation adapters) and we even include WPI's famous four-channel **Transbridge** transducer amplifier!

The modular design allows up to four individually mounted organ baths to be studied simultaneously. Multiple systems (*i.e.* more than four) can be linked together if more bath setups are required. The convenient compact bench-top design of Myobath enables the system to be readily located virtually anywhere.

Myobath can also be supplied with an optional water heater/circulator, gravity-fed buffer pre-warming system, transducers, bridge amplifiers, stimulators, PC/Mac-based data-acquisition system and chart recorders.

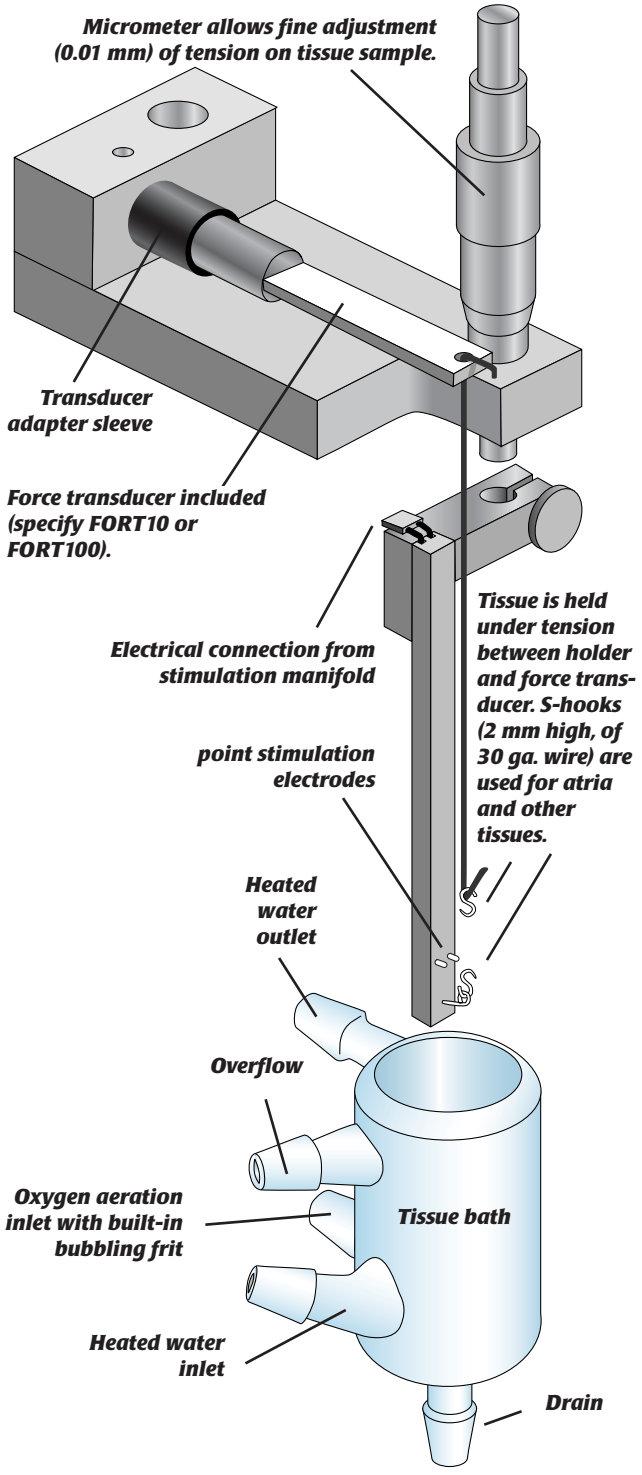
Micrometer Heads

One important key feature of the Myobath are the micrometer heads used for delicate tissue tension adjustment and measurement. Each Myobath channel comes equipped with a high-quality micrometer head which, together with the force transducer, is mounted on to the micrometer head assembly (see figure at right). The tissue preparation is then mounted between the tissue holder (attached to the micrometer) and tissue hook (attached to force transducer). The micrometer provides a convenient way of adjusting and measuring changes in tissue tension and is essential for studying vascular segments where accurate diameter-tension curves need to be constructed for optimizing the passive force placed on the segment (McPherson, '92).

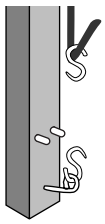
Tissue Holders

There are currently four types of tissue holders available from WPI: atria holder with stimulation feature **(AS)**, vascular holder **(V)**, vascular holder with stimulation feature **(VS)**, and blank holder with stimulation **(B)**. They have been successfully used in the study of cardiac muscle, vascular and non-vascular smooth muscle. In addition to these standard tissue holders, there are five types of optional Micro Tissue Holders available for micro tissue preparations.

Each tissue holder includes a kit containing a complete assembly of stainless steel wire tissue hooks and "S"-hooks. Special "stimulation" tissue holders have a built-in stimulation circuit and external electrodes, which are located in close proximity to the tissue under study. Electrical contact between the tissue holder and stimulator manifold is achieved using screened cables and connectors provided. Stimulus pulses generated using any one of WPI's range of stimulus isolators and be conveniently connected (via a BNC cable) to the Myobath stimulator manifold. Blank tissue holders are also available to enable the user to easily construct custom-made holders for specialized applications.

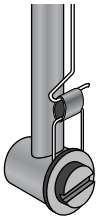


AS Holder (#47030)



The AS holder is designed to be used for mounting muscle and atria preparations. The tissue is mounted onto the two S-shaped hooks (made from 30 1/2 gauge needles), The S-hooks measure 2 mm in diameter on both ends with a sharp tip on one end where tissue is pieced. The two point stimulation platinum (Pt) electrodes on the holder are 2.54 mm (0.1 in.) apart.

V Holder (#47040)

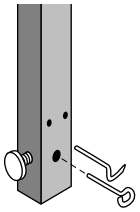


The V holder is desinged to be used for mounting vacular tissue preparations. The bottom hook consists of a U-shaped wire. The top hook is an L-shaped wire. The tissue is mounted as shown. The hooks are made from 0.48 mm (0.019 in.) stainless steel wire. The U-shaped hook measures 6.35 mm (0.25 in.) in base. For V holders which can accommodate U-shaped hooks of different lengths, call WPI for special order.

VS Holder (#47050)

The VS holder uses the same tissue-mounting mechanism as the V holder, but has two 5 mm flexible platinum stimulation electrodes which can be positioned around the tissue. The stimulation connector and electrodes are designed to be replaceable. The VS holder can only be used in the 25 mL or 50 mL baths.

B Holder (#47060)



The B holder is designed to be used with custom-made hooks. The bottom tissue hook is secured with a nylon screw. Stainless steel wire (0.56 mm or 0.022 in.) provided in the MyoBath startup kit, can be used to make the top hook which connects to the strain gauge. Platinum electrodes for point stimulation are identical to those on the AS holder.

Micro Tissue Holders (optional)

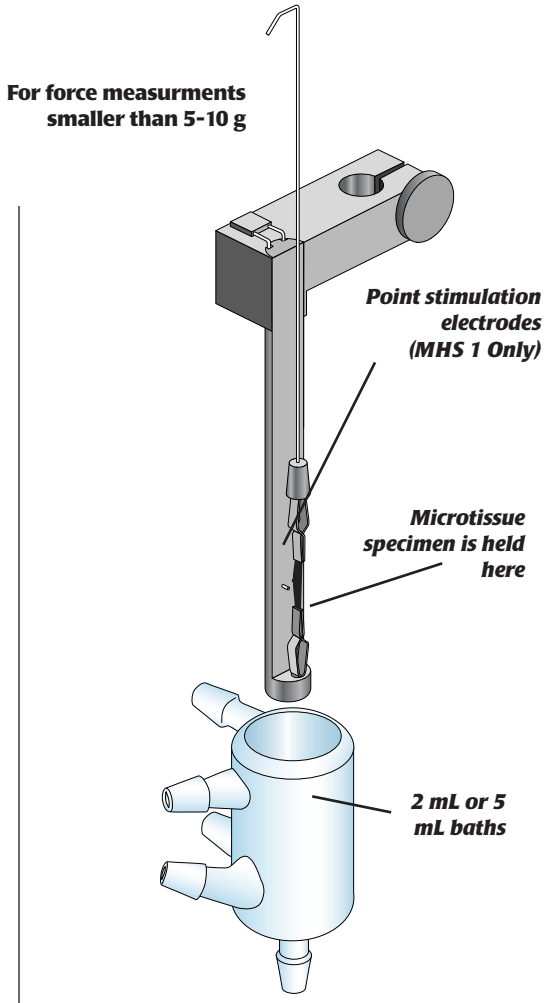
Five unique specially designed micro-tissue holders are available for microtissue strips, microvessel and other similar studies where the force measurements are less than 10 g. Microtissue holders are designed to be used with the microtissue baths (2 mL and 5 mL volume and FORT 10 transducer). Microtissue Holders MH1 and MHS1 are designed for tissue strips as small as 0.5 mm in width and 5 mm in length. The tissue strip is held between two miniature vessel clips with a clamping pressure of 60 grams. These holders are most suitable for measuring isometric force of less than 5-10 grams. MHS1 differs from MH1 only in that it has an in-built stimulation cirrcuit and electrodes.

Microvessel holders MV100, MVS100 and MVS200 (only usable with 5 mL or above baths and FORT 10 transducer) are designed for studying tissue tension and/or contraction and also for measuring the lumen diameter of vessel preparations. The MV100 and MVS100 can be used for microvessl preparations as small as 500-600 microns (ID). MVS200 is designed to be used for larger vessels (> 2 mm ID). MVS100 and MVS200 feature specially designed spiral stimulation electrodes fabricated from 250-micron diameter platinum wire. The two-and-a-half turns of each spiral electrode span appropriately 4-5 mm. The positions of the spiral electrodes can be adjusted with respect to the tissue placement, a feature that is very useful in controlling stimulus intensity.

Microtissue holders (MH1, MHS1, MV100, MVS100 and MVS200) are not supplied with the Myobath system and must be purchased separately.

Miniature Tissue Baths

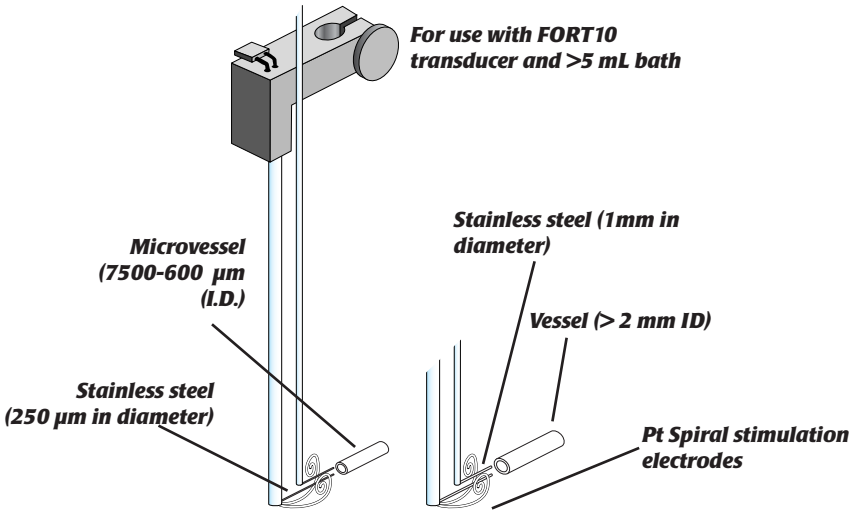
Miniature tissue baths (2 mL and 5 mL volume) are designed to reduce the amount of drugs required in pharmacological studies of tissue preparations. Since many drugs are extremely expensive the use of the miniature tissue bath provides an important cost-saving alternative to larger baths requiring increased volume.The 2 mL miniature tissue bath measures approximately 12 mm (ID) x 25 mm (depth), and the 5 mL bath measures approximately 16 mm (ID) x 30 mm (depth). A nylon clamp (#**14443**) is needed for mounting the microtissue baths.



Micro Tissue Holder MHS1 (#47075)

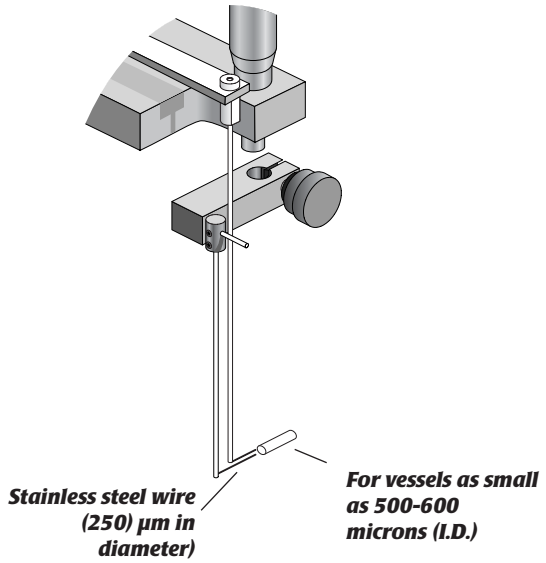
Stimulation/Aeration Manifold

A unique 4-channel stimulation manifold and 6-channel aeration manifold, designed to regulate flow of O_2/CO_2 mixtures, is mounted on top of the vertical stainless steel posts (see cover picture). Four regulators (needle valves) are used to regulate flow of O_2/CO_2 to each individual tissue bath. The remaining two regulators are used to supply O_2/CO_2 to dissecting dishes and/or an optional buffer reservoir (#**47027**). The buffer reservoir holds warm, oxygenated buffer solution to replace that in the organ bath. The tissue baths and buffer reservoir are jacketed and require a heating and recirculating pump to maintain the desired temperature. (eg. WPI **# 500787**)



Micro Tissue Holder
MVS100 (#47120)

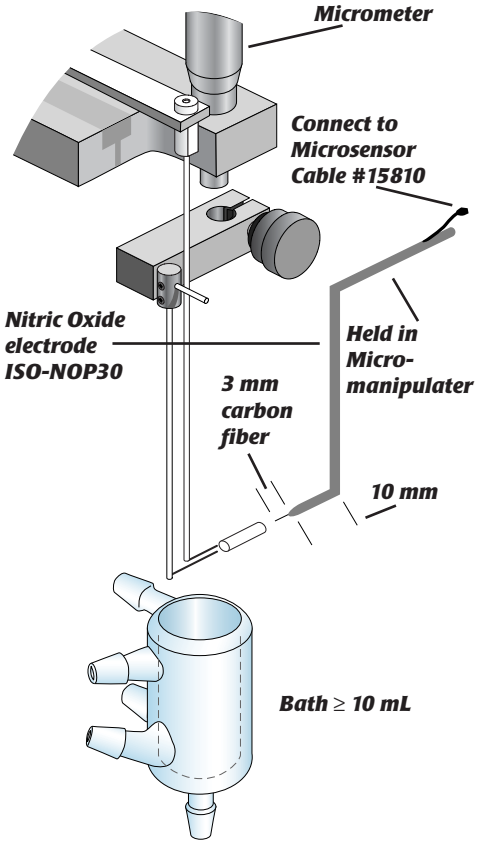
Micro Tissue Holder
MVS200 (#47130)



Micro Tissue Holder
MV100 (#47110)

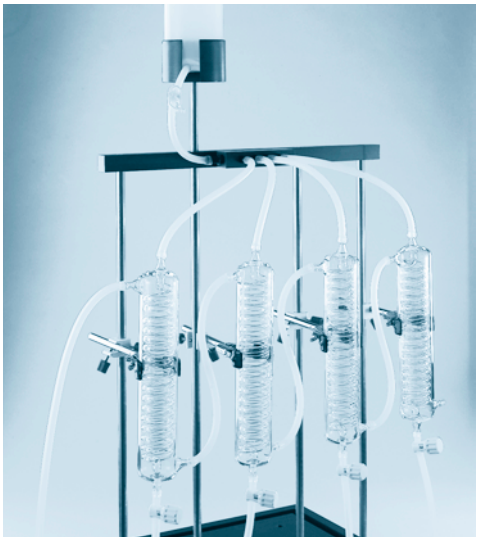
L-Shaped Nitric Oxide Sensor

The **ISO-NOP30-L** is a new L-shaped NO sensor measuring 30 µm (diameter) x 3 mm (length), designed to be used in conjunction with WPI's Myobath or other tissue bath systems. The ISO-NOP30-L is a variant of the **ISO-NOP30** NO sensor and the detection specifications are identical to those of the ISO-NOP30. The design of the sensor facilitates placement of the electrode tip within lumen of the vessel under study.



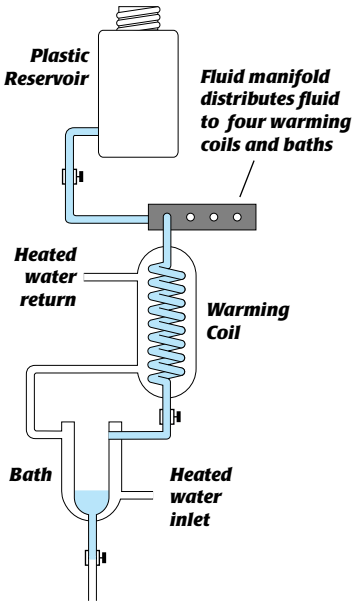
Myobath

Additional Components



Gravity Fed Buffer Pre-Warming System

A popular alternative to transferring heated tissue buffer from the jacketed glass reservoir to the tissue bath (using a syringe), is to use a gravity fed buffer warming system. The buffer can then be more effectively pre-warmed using the heat-exchanging coils and fed directly and gravitationally to the jacketed tissue baths. The gravity feeding provides excellent temperature and flow control of tissue preparations and also keeps both the buffer and heated water within a closed loop, therefore reducing the likelihood of cross-contamination and/or mess creating when transferring buffers manually. The gravity feeding (**GF)** system is designed to be conveniently mounted on the base plate of the Myobath A plastic buffer reservoir is held above the Myobath using a stainless steel rod installed on the back of the base plate. The buffer is pre-warmed in the jacketed glass coils mounted through clamps on the stainless steel rods, before being fed into the tissue baths. Pinch valves and clamps are used to control the flow rate of the buffer. The compact design ensures that buffer transfer is both efficient and convenient. The GF system is available in 2-, 3- and 4-channel configurations. The 2-channel version includes one plastic reservoir (1 liter) and holder, two warming coils (100 mL each), two ringstand clamps, four stainless steel rods, fluid distribution manifold, pinch valves, tubing and clamps. A heated water circulator is required for use with the gravity-fed buffer system



Heating Circulators (#500787)

Ideal for controlling temperatures of external systems. This heating circulator features a polyphenyleneoxide (PPO) construction with a powerful 17 liter per minute flow rate pump for optimum heat exchange with a 12 mm hose. A tap water cooling coil is fitted as a standard feature. The unit comes with a stainless steel cover. The 115 V model is equipped with a 1200-watt heater and the 230 V model comes with a 2000-watt heater.

Transducers/amplifiers: The myobath is designed to be used together with WPI's force transducers, including the **FORT100** (full scale, 100 g, recommended for most work) and **FORT10** (full scale, 10 g). These transducers can be directly connected to either the 4-channel Transbridge™ amplifier or the more advanced 8-channel **Bridge8** amplifiers. (Contact WPI for details)

Stimulators: A number of WPI's stimulators (**A300**, **A310**) and stimulus isolators (**A360**, **A365**, **A385, A395**) are ideally suited for use with the organ bath system.

Data Acquistion: WPI's Myobath can be readily connected to a PC/Mac data acquisition system, such as WPI's MP100 System.

Myobath

Providing the total solution

PMZ 3 Precision Stereo Zoom Dissecting Microscope

A395 Linear Stimulus Isolators

Stainless steel and Titanium Microdissecting Instruments

MYOBATH COMPLETE SYSTEMS

MYOBATH-4 4-Channel Tissue Bath (specify transducer, bath and holder)
MYOBATH-3 3-Channel Tissue Bath (specify transducer, bath and holder)
MYOBATH-2 2-Channel Tissue Bath (specify transducer, bath and holder)
System available without amplifier–call for price

BUFFER PREWARMING SYSTEM

GF4 Gravity Feeder Assembly for MYOBATH-4
GF3 Gravity Feeder Assembly for MYOBATH-3
GF2 Gravity Feeder Assembly for MYOBATH-2

COMPONENTS MAY ALSO BE PURCHASED SEPARATELY

47101 One Additional Tissue Channel (specify transducer, bath, holder)
47025 Tissue Bath (10 mL volume)
47024 Tissue Bath (25 mL volume)
47026 Tissue Bath (50 mL volume)
47030 Tissue Holder AS (Atria, with stimulation)
47040 Tissue Holder V (Vascular)
47050 Tissue Holder VS (Vascular, with stimulation)
47060 Tissue Holder B (Blank, with stimulation)
47027 Jacketed Buffer Reservoir (1 liter), glass
15904 Tissue Bath Surgical Tool Kit (7 pieces)
47099 One Additional Pre-warming and Feeding Channel
Including one warming coil, one coil clamp, pinch valve, tubing, pinch clamp
47091 Jacketed Warming Coil (100 mL)
47600 FORT-10 Transducer and Adapter (10g full scale)
47610 FORT-100 Transducer and Adapter (100g full scale)

MICRO TISSUE HOLDERS AND MINIATURE TISSUE BATHS (For use with FORT10 transducer)

47110 Tissue Holder MV100 (Micro vessel holder for use with ≥ 5 mL bath)
47070 Tissue Holder MH1 (microtissue strips)
47075 Tissue Holder MHS1 (for microtissue strips, with stimulation)
47120 Tissue Holder MVS100 (Micro vessel holder with stimulation for use with ≥ 5 mL bath)
47130 Tissue Holder MVS200 (Micro vessel holder with stimulation for use with ≥ 5 mL bath)
47127 Tissue Bath (2 mL volume)
47128 Tissue Bath (5 mL volume)
14443 Nylon Extension Clamp

MYOBATH NITRIC OXIDE SENSOR

ISO-NOP30-L L-Shaped NO Sensor (3) for use with the ISO-NO Mark II Nitric Oxide Meter (#NOMK2)
15810 Microsensor Cable

HEATING CIRCULATOR

500787 Haake DC10-P5/U Circulating Bath (115 V)
500788 Haake DC10-P5/U Circulating Bath (230 V)
500789 Haake DC10-P5/U Circulating Bath (100 V)

REFERENCES

McPherson, G.A. (1992). *Clin. Exp. Pharm. Physiol.*, 12, 815-825.
McPherson, G.A. and Piekarska, A.E. (1994). *Br. J. Pharmacol.* 112, 1223-1229.
Challinor-Rogers, J.L., *et al.* (1994). *Naunyn-Schmiedeberg's Arch. Pharmacol.*, 350, 158-166.

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