

Miniature Holders

User's Guide



Miniature Accessories to position Probes, Sensors & Fluidics tubing around your sample

- From Single to Multi-Channel Units
- Screw-Type Adapters for use with any surface
- Magnetic Adapters for any microscope
- Compatible with Temperature Control & Perfusion Systems
- Flexible Configuration & Easy to Use



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Introduction

The miniature holders allow you to position inflow and outflow tubing, perfusion manifolds, aspiration/suction tubing, temperature probes and reference electrodes around your sample. The strong magnet of these holders will keep micro-accessories firmly in place around your experimental setup. Adjustable extensions can change length, tilt, and angles to allow access to your sample from any point. Can be used with micro-perfusion and controlled flow systems.

The magnetic clamps are used to fix bath chambers/petri dishes or other accessories firmly to microscope adapters. The surface of the clamps can be also used to attach custom accessories, including miniature holders MH-1 and MH-2.

MTH Holder Overview

1 The miniature holders include mounting base and a set of extensions, tubing clamps and ball-joints for flexible positioning of miniature accessories in 3-D space around your sample. MTH holder includes MTH1 magnetic base, which can be used as a holder by itself to fix different accessories - electrodes and tubing. The height of the electrode or tubing can be adjusted by releasing the thumb screws. Adjust the angle and length of the holder and tighten the screws back. The screws are also used to fix tubing at a required length or rotation angle.



2 MTH holder can be attached to a MA type microscope adapter. MTH1 base fits to Teflon manifold TPM, which comes with perfusion systems, and any rods and tubing with less than 4mm O.D. The magnetic bottom is covered with Teflon film to move the holder easily along metal surfaces. The base dimensions are 0.75D x 0.75H in. The holder comes with adhesive magnetic strip to attach the holders to non magnetic and plastic surfaces. It can be also used with MTH-SCR screw-type adapter to attach to plates with holes.

3 MM manifold fits inside MTH1 base to form perfusion setup for bath chambers.



4 Below are sample configurations made using parts included with MTH holder set:



MTH-S Holder with Suction Tubing

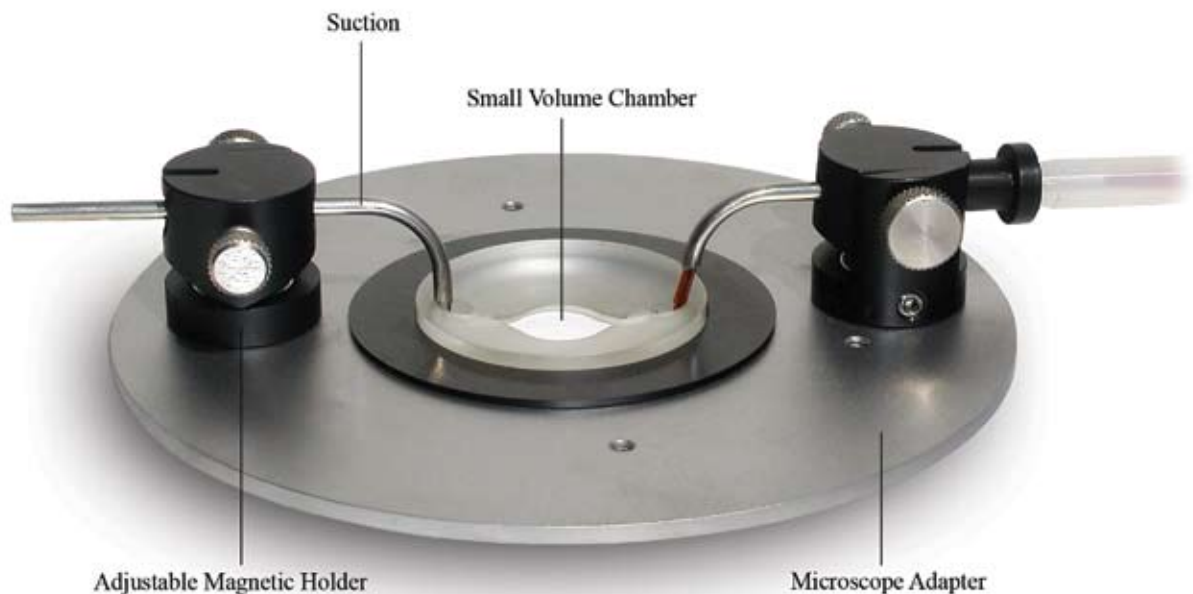
This miniature magnetic holder is only 20mm high and 19mm diameter. It comes with stainless steel suction tubing to provide smooth solution removal from perfusion chambers, if connected to an outflow unit CFPS-1U66 for example. Two thumb screws adjust tubing height (tilt) and length. No extra tools are needed. Simply put the holder on any iron surface (MA adapter) and the strong magnet will keep the tubing firmly in place anywhere around your sample. If you do not have suitable surface available, use a magnetic adhesive strip provided or screw-type adapter MTH-SCR. The suction tubing can be replaced with any custom tubing up to 4mm diameter. Can be used with any

perfusion systems. The stainless aspiration/suction tubing will fit inside 1/16 in. I.D. soft tubing Tygon-16, which is included with perfusion systems.



ZMM Zero-Dead Volume Manifold

Zero-dead volume facilitates solution exchange inside small volume perfusion chambers. The output channels can be adjusted at a different height to prevent contamination of solutions. The outputs for lower concentration solutions, for example, can be positioned higher so that they never mix with other solutions. Incorporated magnetic holder allows you to position the manifold anywhere around your sample. Two thumb screws fix the manifold in required



W-HLD Holder-Clamps

These two clamps can be positioned anywhere on the stainless steel microscope adapter MA to fix the chambers and dishes firmly in place. Can be used to prevent chamber elevation while working with oil immersion objectives. The surface of the clamp can be also used to attach optional custom accessories, including miniature holders MH-1 and MH-2. It can be also attached to an adhesive magnetic strip (included), or any other metal magnetic surfaces. If the magnetic strip is used, the Teflon coating from the bottom of the holder/clamp needs to be removed to provide better grip. Use MTH-SCR kit to attach magnetic holders to non-magnetic surfaces.



The flat spring of the clamp can be bent down to fix recessed chambers, or it can be elevated by using additional washers.

MTH-SCR Mounting Kit

If you do not have magnetic surfaces, MTH type holders can be mounted on a head of the bolt from MTH-SCR kit after removing the magnet.

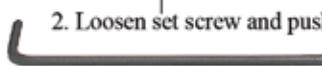
1. Remove the top part after unscrewing the thumb screw.



3. Position the holder over the head of provided bolt instead.



2. Loosen set screw and push the magnet out.



You can use MTH-SCR adapter on any surface with threaded or through holes. This kit includes 1/4-20 threaded bolt and nut. The magnet from the MTH type holders can be removed using the included Allen wrench, and the holder can be fixed on the head of the bolt instead. Specify length of the bolt when ordering. Any other thread sizes, including metric, are available.

MA Microscope Adapters

Since most microscope stages are not magnetic, a specially treated stainless adapter is recommended when using magnetic holders. The middle opening will fit perfusion chambers, standard 35 mm Corning petri dishes, glass bottom dishes (both 35 and 50mm), and TC heated stages. Can be also used to position miniature manipulators. Choose the option appropriate for your microscope.

IMA Microscope Adapters

Miniature screw-type holders, MH-1 & MH-2, can be attached directly to the surface of IMA type adapters to fix perfusion tubing, electrodes and sensors. Includes fixing clamps and thumb screws. Specify microscope model when ordering.

Specifications:

Inside opening: 50mm, & 75x25mm

Reducing Ring and Clamp: to fit all brands of 35mm dishes (including glass bottom dishes)

Height: 3 mm

Use with: 35mm dishes, chambers, 50mm dishes, glass slides, and heating stages



MA-110 for OLYMPUS, NARISHIGE,
APPLIED PRECISION (110 MM),
MA-108 for NIKON, SISKIYOU,
Burleigh Gibraltar (108 MM)



LEICA (150x150mm)



150x120mm STAINLESS STEEL PLATE



LEICA & ZEISS TYPE M ADAPTER



MA-motor MTORIZED X-Y stages
(160x110mm) leveling x4 set screws in corners



ZEISS TYPE K (160x110mm)
leveling x4 set screws in corners



MA-180x180 STAINLESS STEEL PLATE
leveling x4 set screws in corners



MA-CUSTOM



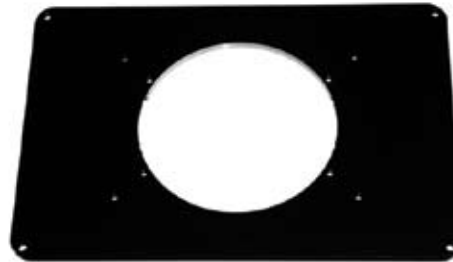
IMA-110 for OLYMPUS, NARISHIGE,
APPLIED PRECISION (110 MM),
IMA-108 for NIKON, SISKIYOU,
Burleigh Gibraltar (108mm)



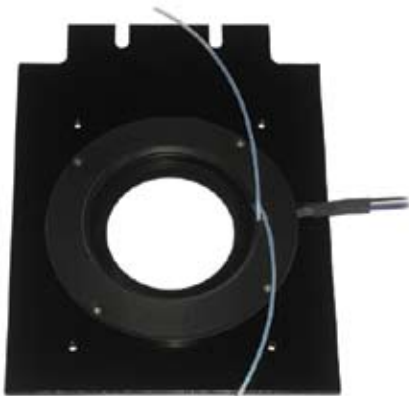
IMA-128x86 128x86mm PLATE
the same size as multi-well plates



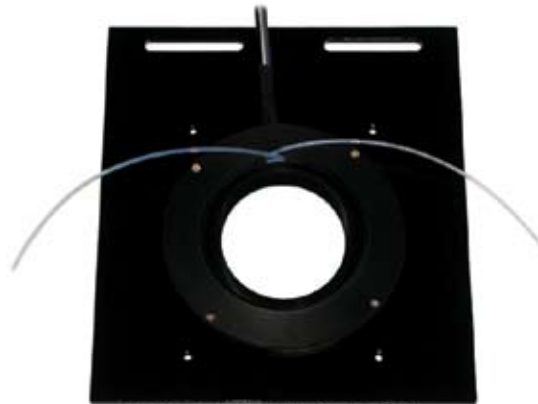
IMA-LM Leica & ZEISS TYPE M



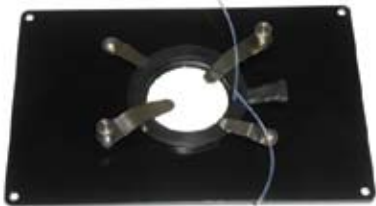
IMA-160x110 ZEISS TYPE K (160x110mm),
levelling x4 set screws in corners



IMA-OLY-UP for OLYMPUS
UPRIGHT microscopes

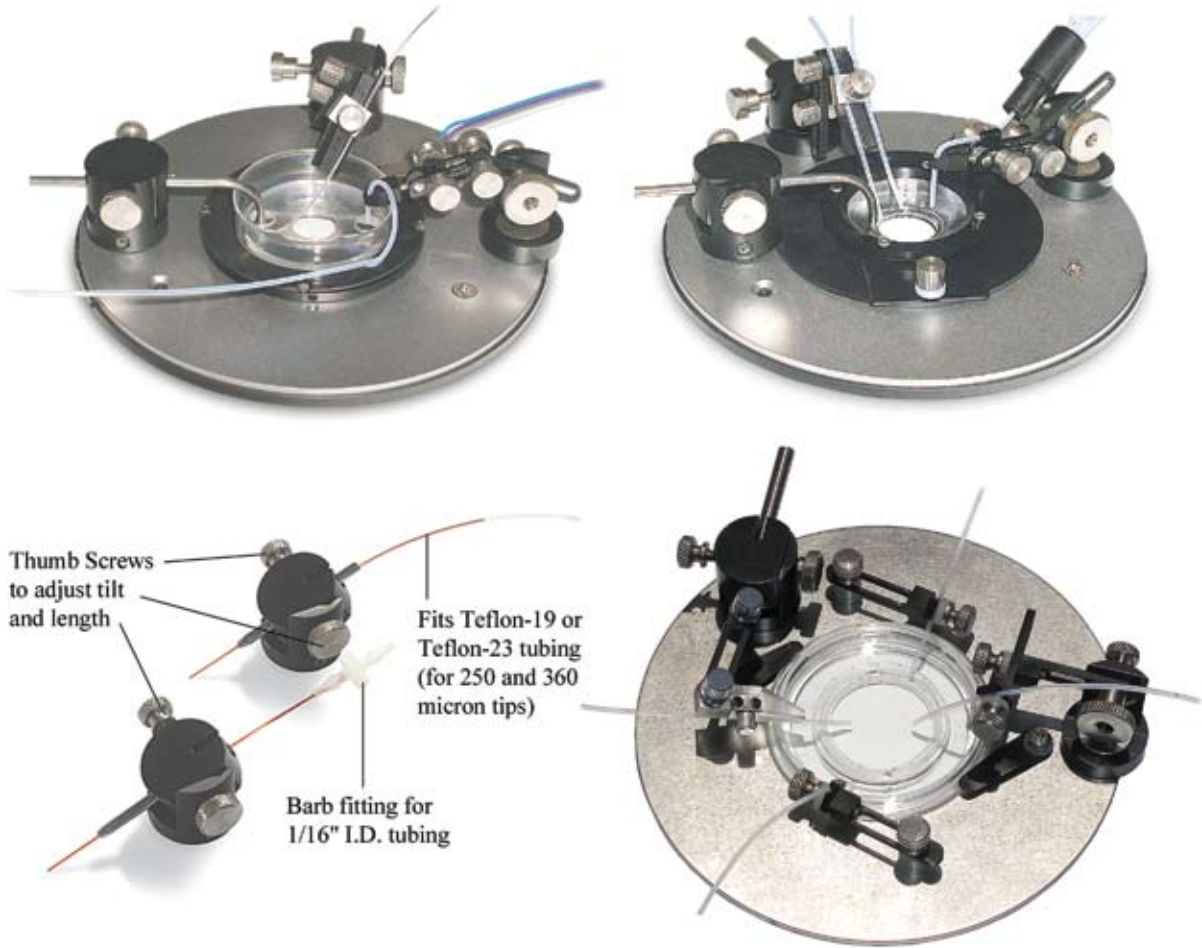


IMA-UP for UPRIGHT
MICROSCOPES



IMA-SUT for SUTTER STAGES

Using MTH Holders



MH-1, the Smallest Holder



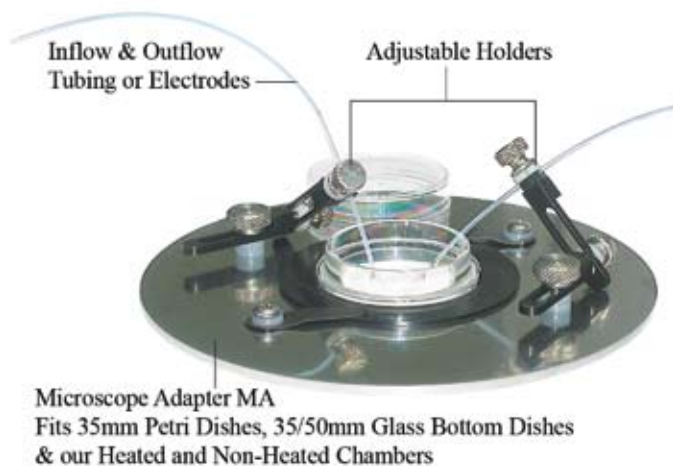
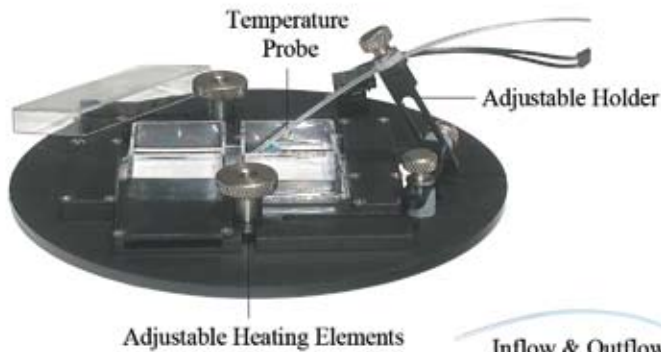
MH-2 Multi-Holder

Miniature Magnetic Multi-Holder positions multiple tubings, electrodes, sensors or pipettes around your sample. This miniature holder can be attached to MA microscope adapters or any magnetic surface. It can be also attached to any threaded surface. The holder includes eight extensions, 1 in. long. Two of these extensions can attach at a right angle, and four are straight extensions. Two double tubing/pipette clamps, two simple clamps and two ball-joints are used to fix your accessories. The extensions are attached using thumb screws, and allow easy configuration and adjustment of tilt, swing, and rotation angles in multiple axes. Below are sample configurations of MH-2 holder.



Mounting MH-2 and MH-1 Holders on Threaded Surfaces

Use provided stand-off or screws to mount Miniature Holders on any threaded surface with M3 or #4-40 threads. Optional adapters will let you to use other thread sizes as well. Regular screws or stand-offs can be also used. Use included thumb screws to fix the holder on top of the stand-off. Below are some sample examples of using the holders on both MA and IMA type microscope adapters. Multiple holders can be used on the same microscope adapter to fix tubing and electrodes.





Extensions: accessories for custom configurations

The items listed in Accessories section allow you to build adjustable holders for any purpose. The mounting options include #4-40, M2.5, M3, M3.5 and M4 threaded holes and self-adhesive strips for any other surface. The example below is an adjustable magnetic stand-holders for an in vivo heated plate constructed using x4 MTH1 magnetic bases, x4 1in. extensions, x4 right-angle clamps MH-RA, and a threaded rods set, MH-TRDS. The stands can be elevated to the required heights to accommodate different size animals.



Extensions set, 1in.long, and Right-Angle extension, MH-E

This set of two 1in. long extensions includes thumb screws and nuts to extend your accessories to the required length. The right-angle extension provides extra flexibility for adjustment in 3-D space. These 1 in. long extensions can be used with any miniature holder. Use the straight extension to elongate your holders, or right angle extension, which also includes built-in tubing clamp. The right-angle extension arm has a threaded hole to attach the included tubing/pipette clamps.



Extension with Double Tubing/Electrode Clamp, MH-T

This extension fits inside MTH1 base to provide means to fix your electrodes, tubing and sensors around your sample. Extends up to 3in. This is a part of MTH system. Can fix tubing up to 4mm O.D.



Miniature Right-angle clamps, MH-RA

Creates flexible joint at a right-angle. Includes a tubing clamp. Ultra-miniature size allows you to fix accessories inside small compartments.

Miniature Ball-Joint with Right-Angle Extension, MH-RB

This adjustable extension can be used to position your miniature accessories in any direction and angle. The right angle attachment provides extra freedom to adjust height and length. Ideal to fix tubing above your sample. Incorporates tubing clamp. Can be used to attach double tubing/electrode holder/clamp of MTH-T as well. Extends up to 2in. Does not obstruct optical field. This is a part of MTH, MH-1 and MH-2 systems.



Set of 4-40 threaded rods MH-TRDS, assorted length, x5, and a set of plastic washers/spacers.

Set of threaded stand-off MH-MS, and self-adhesive strip and mounting nut to attach miniature holders to any surface with M2.5, M3.5 or M4 threaded holes, or on any surface using the self-adhesive strip.

List of microscope adapters

MA-110, stainless steel, for Olympus microscopes, 110mm

MA-108, stainless steel, for Nikon microscopes, 108mm

MA-160x110, stainless steel, for Zeiss type K stages, 160x110mm

MA-LM, stainless steel, for Leica microscopes and Zeiss type M stages

MA-motor, stainless steel, for motorized stages

MA-150x150, stainless steel, for Leica, 150x150mm

MA-SIS, stainless steel, for SISKIYOU stages, 108mm

MA-GIB-108, stainless steel, for Burleigh Gibraltar stages, 108mm

MA-GIB-110, stainless steel, for Burleigh Gibraltar stages, 110mm

MA-NAR, stainless steel, for Narishige stages, 110mm

MA-AP, stainless steel, for Applied Precision stages, 110mm

non-Magnetic:

IMA-110, Adapter for Olympus microscopes, 110mm

IMA-108, Adapter for Nikon microscopes, 108mm

IMA-160x110, Microscope Adapter for Zeiss type K stages, 160x110mm

IMA-LM, Adapter for Leica microscopes and Zeiss type M stages

IMA-motor, Microscope Adapter for motorized stages

IMA-150x150, for Leica microscopes, 150x150mm

IMA-128x86, Adapter, 128x86mm

IMA-piezo, Adapter for PI piezo stages

IMA-galvo, Adapter for GALVO Leica stages

IMA-SUT, Adapter for SUTTER stages

IMA-UP, Adapter for upright microscopes

IMA-SIS, Adapter for SISKIYOU stages, 108mm

IMA-GIB-110, Adapter for Burleigh Gibraltar stages, 110mm

IMA-GIB-108, Adapter for Burleigh Gibraltar stages, 108mm

IMA-NAR-110, Adapter for Narishige stages, 110mm

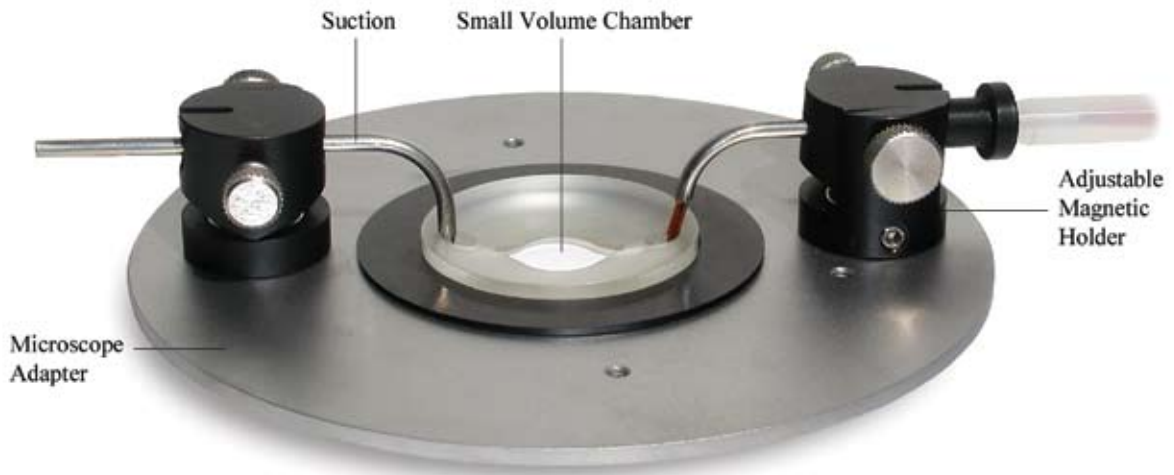
IMA-AP-110, Adapter for Applied Precision stages, 110mm

Warranty Service and Repair Information

The Flow Control system is warranted to be free from defects in construction caused by materials and workmanship for a period of one year from the date of purchase. During this period, the manufacturer will service your instrument at no charge.

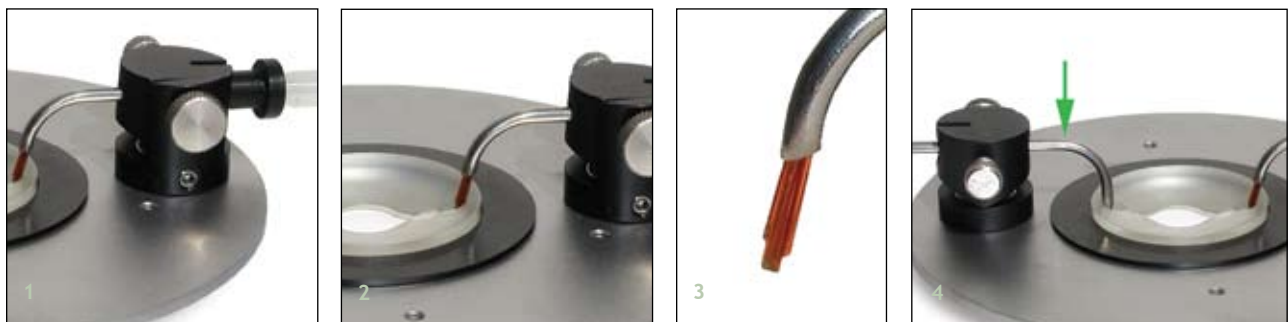
A phone call to us can usually provide enough data to confirm the problem. We will immediately ship to you the replacement parts that are necessary to fix the instrument. If your problem is more serious, or if you prefer that we replace any faulty cards, please call us first. We will issue you a return authorization number. You must put this return number on the outside of the box and on the packing slip or instruction sheet accompanying the instrument. We will immediately repair all instruments that are accompanied by an authorization number and return them to you.

Appendix: Instructions for using Zero-Dead Volume Manifolds, ZMM



In case when even a slight contamination of different solutions is undesirable, a zero-dead volume manifold can be used instead of regular Teflon manifolds. The zero-dead volume manifolds offer the additional advantage of facilitating perfusion and accelerating solution exchange rate around your samples. This manifold can be also used for solution outflow/suction, by connecting one of the channels to CFPS-1U unit.

ZMM manifolds come with 2 feet Teflon tubing, to connect to a computerized perfusion systems, PS15-8. Use fitting from PS-KIT to attach Teflon tubing to either 1/16" soft tubing or polyethylene tubing, included with perfusion systems. Teflon tubing also fits Small Volume Delivery System SVDS1, which require a pressure switch if used with the manifolds directly.



1. Position the manifold on a microscope adapter.
2. Place the tip of the manifold inside a chamber. The stainless tubing can be moved inside black holder to obtain desired configuration and to fit inside perfusion chambers.
3. The inside polyimide tubing can be adjusted to provide non-contaminating flow of different solutions by positioning the outputs at different heights. The polyimide tubing can be cut to required length using a surgical grade sharp blade or a scalpel. Polyimide tubing is washable.

Note: Selected channels of the manifold can be also used to provide suction or outflow of solution from the chamber to keep the volume inside the chamber constant. The height of the suction tubing will determine the level of solution (volume) inside the chamber.

Note: The "oocyte" manifold ZMO comes with a plastic holder, which fits inside small volume oocyte chambers – OPC3/4. Polyimide tubing inside ZMO manifold, and heated manifolds ZMMT is not adjustable/removable.

4. Position outflow or suction tubing inside the chamber before using the perfusion system.

Note: The polyimide 360/250 micron I.D. tubing inside the manifolds will provide adequate solution flow with regular gravity driven perfusion system PS15-8. If higher solution flow rate through the manifold are required, the solutions can be pressurized or elevated. SVDS1 system, for example, requires external pressure application to drive the solutions from the reservoirs. Controlled flow systems CFPS can also provide enough pressure to drive the solutions through the manifold.

Note: Always wash the manifold with DISTILLED water after use.

