



Model # HC-MIS INSTRUCTION MANUAL

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Introduction

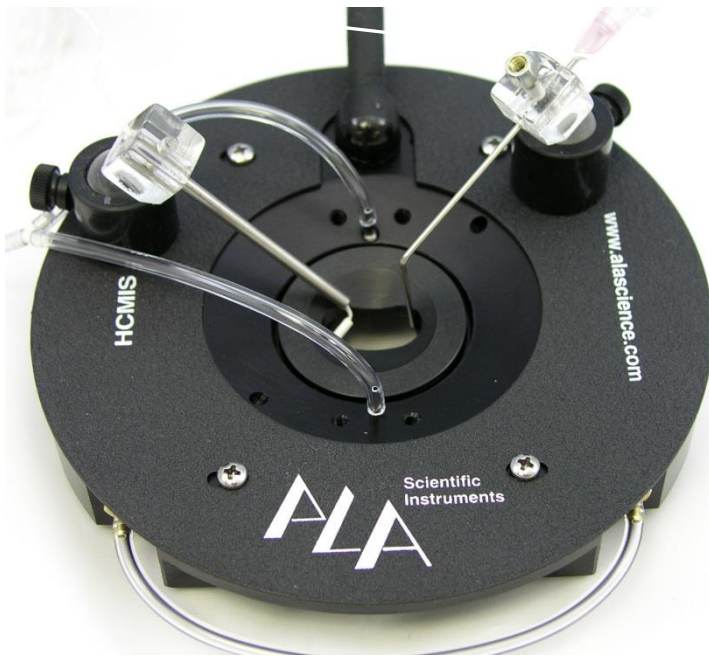
The Micro-Incubator stage you have purchased is designed to provide you with very accurate temperature control through a broad temperature range (0-45°C). The assembly is equipped with two Peltier elements, one on each side. Peltiers are thermoelectric devices. They use current passed through a field of dissimilar metals to drive heat to one side of the element. Consequently, the other side gets cool. It is possible for the cold side to be 67°C cooler than the warm side, provided that adequate cooling is provided. As a micro incubator, the HC-MIS is designed to provide a “micro-environment” for live cells and tissue. In addition to heating and cooling the chamber in which the tissue is situated, the HC-MIS can provide a carbogen environment in the prep area. The HC-MIS is an open type chamber making it ideal for imaging and electrophysiology.

The HCMIS system uses water flow-through cooling to remove the heat generated by the Peltier elements. This heat removal is essential. When the unit is in cooling mode, a substantial amount of heat will be generated. The user must insure sufficient water flow to cool the Peltiers. The water flow must be no less than 300ml/min.! By keeping the temperature of the upper part of the chamber assembly (the heat exchange part) at room temperature by flowing water through it, will give excellent stability and cold temperature range. Do not worry if your flow of water is temporarily disrupted, the mass of the upper part of the HCMIS can absorb significant heat. In fact, for cooling of up to 5°C below room temperature, no water cooling is necessary unless you see inadequate performance, or unless the system feels very hot. It is not necessary to flow cooling water when the system is in the heating mode.

It is important to insure that the flow of water is constant and bubble free so that no vibrations are induced into the chamber system. Also, periodically check the water pathway for leaks; tighten any fitting as necessary. As you may be aware, Peltier heating/cooling devices pump heat according to the voltage orientation. Thus, a Peltier driven temperature control system is switched from heating to cooling and visa versa, by a polarity switch, (+ to -, or - to +). When you install the HCMIS, you must be sure that it is connected to the temperature controller correctly. This is easily done by plugging in the stage to your controller, turning the controller on heating or cooling, while holding your hand on the bottom section of the chamber. Make sure that the bottom section responds the way it is supposed to for the setting of the controller. If it does not, reverse the polarity on the plugs to your controller's power output and the unit should function properly.

Additionally, you must be sure that your controller can provide adequate power for the HCMIS. This means at least 10VDC and 3 amp. output. If the voltage is too low the system will not work properly. Also, if your controller cannot supply enough amperage, the controller may burn out.

Product Overview and Instructions



HC-MIS: shown at left with optional magnetic plate and magnetic swivel tools from ALA (MU-TOOL holding a thermistor sensor, and stainless steel perfusion canula). Also shown are gas input ports and tubing. At lower end part of the cooling fluid loop tubing is visible.

The HCMIS is placed on a microscope stage. It can be secured as necessary, but it will fit directly into most round stage openings (or any other stage with a 110mm opening for Olympus or 108 mm opening for Nikon and that includes Gibraltar® from Exfo and platforms from Scientifica and Narishige) Also, it fits the Zeiss K stage using two screw extensions, and there is a mounting available for the M stage as well.

When cooling, a steady flow of water of not less than 300ml/min. must be maintained through the cooling water tubes. Simply connect a flow of clean water to one of the brass fittings on the back of the HC-MIS near where the cable is located. Either side can be the input or the output. The water source can be the tap, though pressure should be down-regulated, or use a pump and reserve tank of adequate capacity so it does not warm up too much in a day's worth of use. When heating, no water is necessary.

A thermistor (2250 ohms @ 25°C) is permanently installed in the chamber block for temperature feedback for control. The HC-MIS cable is specially shielded and designed to fit directly to all npi temperature controllers and uses a DIN style connector. The pin-out diagram can be obtained from ALA.

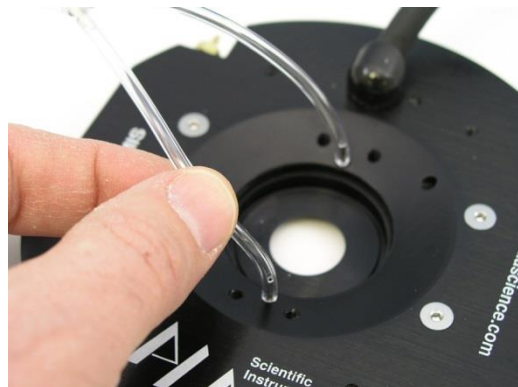
HCMIS with Gas Ports

The HC-MIS has a built-in vent system for applying carbogen gas to the prep. Two gas inputs duct the CO₂/O₂ mixture into a vent that projects it to the prep area. (Please remember that this is an open system so the carbogen creates an atmosphere around the prep, and may not saturate it.)

Gas input tubes are carefully threaded into the inner-most screw ports around the prep area.



1.5mm tubing can be slipped over the stainless steel tubes, and a 'Y' connector makes an easy hook-up to a gas supply.



Gas pressure will need to be determined empirically for each set up. Generally, we recommend about 10PSI (68kPa) as a guide. Certainly you may need more or less pressure. Remember that the gas is to form a curtain over the prep and you may or may not want it to create turbulence in the chamber. Also remember that when cooling, humidified gasses will cause condensation. Generally, the temperature of the gas should not cause a problem for the temperature control, but if you notice a problem, please consult your dealer or ALA directly for a solution.

Magnetic Plate Mounting



The HC-MIS can be fitted with an optional plate to allow the use of magnetic tools which cannot adhere to the aluminum frame of the HC-MIS.

The Magnetic plate comes with four screws of the 4-40 thread size.

To install it:

First pass the cable through the ring.



Then align the plate on the surface of the HC-MIS so that the four screws can be inserted.

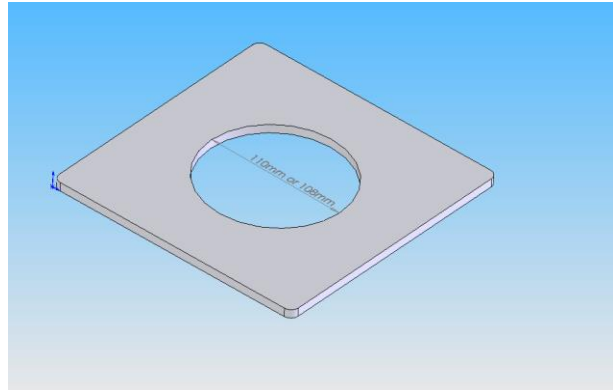


Then tighten them down for a secure fit.



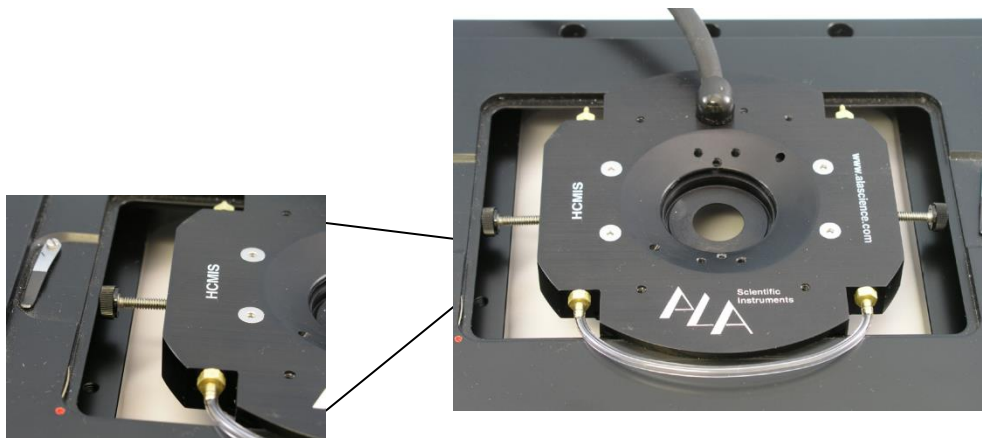
Microscope Mounting

For microscopes and other stages that have a round mounting hole, the HC-MIS will “drop-in” if the hole is 108mm or 110mm in diameter.



Zeiss K stage

For the Zeiss K stage, the HC-MIS can just drop in as well, but two screws are provided as brackets to center and stabilize it:



The HC-MIS is simply dropped in and the two screws with cap heads are backed out until it fits snugly in the center of the square hole.

Zeiss M stage

Other custom mountings are available, such as this one for the Zeiss M stage:



The above bracket is used in place of the clip bracket shown to the right.

This will allow for the HC-MIS to be mounted on the X-Y stage positioner.



Please ask your distributor or ALA directly about other mounting options.

Care and Maintenance

The HCMIS should be kept clean and dry. During extended cooling in warm weather, condensation will accumulate on the lower block. Try to wipe this up periodically during operation to prevent dripping. Wipe off all salt solutions that get on the block with a damp cloth or towel. Do not immerse the block fully in water. If it should become immersed, allow it to dry for a day before attempting to re-use it. Contact your representative or the factory if there are any irregularities in performance.

When using the PTC-10 or 20 controller from npf, the HCMIS can be tested for functionality by setting the controller to Direct COOL and a setting of 500 on the pin dial to see that the HCMIS gets cold by seeing the temperature drop on the temperature display, and the reverse, set the Direct HEAT to 500 and observe that the unit gets warm as shown on the temperature display. Contact your representative or ALA Scientific if there are any irregularities.

Specifications

Weight: 400g with cable

Power: 10V maximum, 3Amps

LWH: 126mm x 115mm x 12.3(nominal height in 110mm hole, maximum height from inner flange (108mm to top of cable grommet: 26mm.

Thermistor: 2252ohms at 25°C

Microscope stages supported: Zeiss, Nikon, Olympus, Exfo, Scientifica.

Limited Warranty

ALA Scientific Instruments Inc. agrees to warranty this product for one year from the date of shipment. Said warranty covers all parts and labor necessary to remedy defects in workmanship and/or materials. Coverage is limited to repair or replacement of parts.

All units returned to ALA Scientific Instruments Inc. for repair, whether under warranty or not, must be returned freight prepaid. Freight collect will be refused and will result in longer repair times.

ALA Scientific Instruments Inc. assumes no liability for damage to or resulting from the use of this product including damage to other equipment, personal property and persons using this instrument. The user is responsible for using this instrument in accordance with this manual for the intended purpose of monitoring biological signals. Usage that is inconsistent with this intent may result in forfeiture of warranty. Please consult ALA Scientific Instruments if considering alternative applications.

THIS EQUIPMENT IS NEITHER INTENDED NOR APPROVED FOR CLINICAL USE IN ANY WAY AT ALL.

No other warranties are expressed or implied, your rights as a consumer may vary from state to state.

Please note: It is the buyer's responsibility to inspect this instrument upon receipt for possible damage that has resulted from shipping and to report any claim to the carrier within three business days.

If the unit is damaged in shipment, it is the buyer's responsibility to file a claim with the carrier. ALA Scientific Instruments will assist as much as possible.

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