

HCMIS, Cooling / Heating MicroIncubator Stage

Investigators who perform electrophysiology or imaging experiments in-vitro often choose to perform experiments at non-ambient temperatures in order to elucidate mechanisms or to enhance physiological relevance. This capability can be added to almost any setup with the **ALA HCMIS** and an npi bipolar temperature controller.

HCMIS Features:



HCMIS shown with gas ports and magnetic mounting plate installed at top and **MS-502** chamber in middle

- * Dual Peltiers and anodized Al construction ensure uniform heat exchange
- * Base fits most major manufacturers' stages & platforms
- * Chamber well accommodates MS recording chambers or 35 mm Petri dishes
- * Chamber design compatible with immersion objectives
- * Chamber wall cut outs ease electrode access
- * In line temperature control of perfusate included
- * Shielded flexible cable minimizes electrical noise
- * Low-profile & built-in water ports minimize vibration during cooling
- * Gas ports enable oxygenation of slice preparations
- * Built-in thermistor for monitoring block temperature

The **ALA HCMIS** simplifies temperature control for demanding electrophysiology and imaging applications. The grooved bottom of the instrument allows it to fit snugly on Nikon, Olympus and Zeiss microscope stages as well as Gibraltar, Narishige and Scientifica platforms. For cooling applications, the sideports enable water circulation to cool preparation to near freezing temperatures. The gas ports allow gas to flow over the bath when necessary, for improved oxygenation and pH control with bicarbonate based buffers. A flexible, shielded, multiconductor cable attaches the **HCMIS** to the npi electronic heating/cooling controllers that feature PI controllers and automated shut-off features for unparalleled control and protection.

Specifications

HCMIS - Dimension & Weight	127x116x16 mm LWH - 375g
Max Volts/Amps	14.4V/3.7A
Perfusion Tubing	PTFE - 2.4mm ID x 3.8mm OD
Min./Max. Temperature	0°C to 55°C
Perfusion tubing recommended flow rates	0 to 2ml/min
Recommended heat sink water flow	>300ml/min
Typical temperature ramp speeds using PTC-20 , block control	25°C to 13°C - 2:30 min. / 25°C to 37°C - 1:45 min. gain/limiter = 75%, integral = 0%
Typical temperature ramp speed w/ PTC-20 , block control, MS502SW chamber, 1ml fluid, heat sink water flow, bath probe monitoring	22°C to 10°C - 2:30 min. / 22°C to 37°C - 1:45 min. gain/limiter = 75%, integral = 0%
Microscopes and platforms supported w/o adapter plates	Nikon TESR stage, Olympus IX stages w/110mm opening, Zeiss frame K, Exfo Gibraltar, Narishige ITS, Scientifica - other stages available
Cable information	8 conductor; 2 for Peltiers, 2 for built-in thermistor, 4 unused, with DIN connector

Heating/Cooling Perfusion Cube

ALA's **Heating/Cooling Perfusion Cube (HCPC)** features compact size, small internal volume, efficient power demand, inert material, and light weight. The **HCPC** is ideal for use on a microscope stage. The **HCPC** is an essential component for heating and cooling flowing liquids during electrophysiology & imaging studies.

HCPC Features:

- *small footprint
- *polyamide output tip
- *flow rates up to 5ml/min
- *low adjustable internal volume
- *flexible cable with DIN connector
- *built-in temperature sensor in flow path
- *compatible w/npi temperature controllers
- *internal wetted surface is ceramic coated
- *low dead volume adjustable from 100-200ul
- *fast temperature change at 1°C/sec



HCPC, Heating/Cooling Perfusion Cube shown with MHOLD-HCPC magnetic ball joint holder

Specifications

Weight	90g with cable	Thermistor	2252Ω @ 25°C
Cable length	1.2m	Max Power	7Volts, 3 Amps; Peltier element
Connector	8 pin DIN	Max output	21 Watts
Dimensions	16x20x67 mm	Volume	~200ul, adjustable to 100ul
Min/Max Temperature	0°C to 75°C	Flow Rate	~5ml/min @ 1m height gravity feed, adjustable down to 0.5ml/min



ALA Koolance liquid heat remover for HCPC & HCMIS

Performing patch clamp and imaging experiments at non ambient temperatures requires instruments that maintain these temperatures consistently and accurately without compromising sensitive electrical or optical measurements. npi electronics' **PTC-10** and **PTC-20**, bipolar controllers include all of the essential features that make these experiments possible.



PTC-10 & PTC-20 Features:

- * Digital or manual controlled temperature commands (3°C - 45°C)
- * Flexible sensor placement; third-party sensors OK
- * Display temperatures from two sensors simultaneously (e.g. block and bath)
- * Tune proportional and integral controller for optimizing response speed and accuracy
- * Select unipolar output to configure for heat only applications (resistive element heating)
- * Adjust maximal output voltage limit to protect sensitive heating elements
- * High-current DC power supply minimizes electrical noise
- * Short circuit shutoff protects heating elements and electronics from sensor malfunction

Ordering information

ALA HCMIS	Heating/Cooling MicroIncubator Stage
ALA HCMIS-MAGP	Magnetic top plate for HCMIS
ALA HCPC	Heat/Cool Perfusion Cube
ALA TS-1	Additional thermistor standard size
ALA TS-2	Additional thermistor sensor miniature size
ALA THERDIN	Thermistor cable
npi PTC-10	Single channel bipolar temperature controller
npi PTC-20	Dual channel bipolar temperature controller

Specifications

PTC-10 / PTC-20	19" rack mount - 483 mm x 360 mm x 88 mm LWH
Dimension & Weight	8 kg (PTC-10) 10 kg (PTC-20)
Power Requirements	115 / 230 VAC (160 VA - PTC-10) (225 VA - PTC-20)
Power Output	+/- 15 V / (5A - PTC-10) (3A - PTC-20) each channel
Accuracy	+/- 0.2°C typically
Standard output and input calibration	10 mV / °C
Measuring accuracy	+/-0.1 °C @ 25 °C typically
Alarm and auto shut-off	Below 1-2 °C or above 45 °C