



Objective Lens Heating Mantle

Model # ALA OBJHEATER

**Ver. 2.0
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Objective Lens Heater



The Objective lens heater pad is a resistive element that can be used with any temperature controller or power supply. The heater operates with a maximum of 12V DC.

It is recommended that you place the **OBJHEATER** on the objective lens prior to power it so the heat can dissipate to the lens.

Note: operating the heater on its own at maximum voltage (12v DC) may burn out the element.

A NOTE OF WARNING: Do not overheat your objective lens, heat can damage some lenses and/or distort focus. Check with the manufacturer to be sure your objective can be heated. Know its limits, and set up your system so as not to exceed them.

Setup

The **OBJHEATER** is wrapped around the objective lens at the part of the shaft of the lens where the foil has the best surface contact with the metal of the lens. The plastic surface of the foil should contact the metal of the objective as much as possible. Use the Velcro® fastener to secure the **OBJHEATER** in the wrapped position. Try to keep the wrap as tight as possible. The wire should be run so as not to interfere with the rotation of the microscope nose piece. Secure the power wire from the heater carefully as to not get it pinched by any moving parts.



The Heater comes with a mate connector and pins to connect it to any temperature controller or power supply used. Optional cable is available to connect to npi electronics temperature controllers.

Cable Pin-Out:

Power - 2 red wires (no polarity)

Sensor - 2 white wires (no polarity). Sensor is 2225Ω @ 25°C

Power Supply:

The **OBJHEATER** can be powered by a 12V DC power supply. After setting up the **OBJHEATER** on the objective lens slowly increase the voltage output until the desired temperature is reached. In most cases no more than 6V DC will be needed.

Temperature Controller

For active temperature control, the Objective heater comes with a built-in sensor that can be connected to your temperature controller. If using an ALA Scientific or npi temperature controller, an optional cable (TC4-ABLE) is available to connect the objective heater to the circular DIN connector on the front panel. Measure the temperature and adjust the controller as necessary.



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With ALA-HCT-10/30 Temperature Controllers

The **OBJHEATER** is designed to work directly with ALA temperature controllers. The user should refer to the manual for the ALA HCT-10 or HCT-30 (Tri Temp) for specifics on how to operate the temperature controller with this device.

Connect the **OBJHEATER** using the TC4-CABLE(optional) to the input on the front panel of the temperature controller. Sensor A in the case of the HCT-10 or A or B in the case of the HCT-30. The internal sensor and the power are contained in the plug so no other connection is necessary. Once the **OBJHEATER** is connected, then the temperature controller can



A CTRL	22.0°C	HEAT
CH B	X.X°C	SPEED ■ ■ ■
SET	20.0°C	OUT 2 V

be switched on.

When the HCT-10 is switched on, the menu will come up and the user can set the temperature and the power in volts. The power should be set between 5 and

12 volts, but higher voltage, over 9V, should be reserved for high flow rates. The feedback sensor of the **OBJHEATER** is internal so it will quickly register the temperature and give tight control. With the speed set at the third bar (as in the illustration at left) the **OBJHEATER** will respond in a few seconds. Further information about settings and operation can be found in the HCT-10 manual.

With npi electronic controllers

The **OBJHEATER** connects directly with npi electronics temperature controllers using the optional TC4-CABLE. The **OBJHEATER** will plug into a DIN connector on the front panel of these instruments.



The instrument allows a mode of operation to be selected. In control mode, the controller monitors the internal temperature of the **OBJHEATER** and displays it. A set-point is selected and the unit works to control to that set-point. All npi electronic controllers have the three controls shown at the right. We recommend these settings for the **OBJHEATER**. The integrator sets the time phase of the PID control loop. The gain adjusts the sensitivity to temperature change and the limiter limits the amount of power that the controller can output. Full power is 12V, so if the **LIMITER** is set for 100% there is 12V output, if it is set for 50%, then 6V. Power output can be measured with a meter across the blue and red banana terminals shown above. More information about the npi controllers can be found in their manuals.



Oil immersion Lens

If you are using an oil immersion lens with a small chamber and you want to use the **OBJHEATER** to heat the chamber when the lens is in contact, you have two choices:

You can place a sensor in the dish with the cells, and measure the temperature there as you slowly adjust the controller in Direct mode, or when the temperature of the bath gets close to what you need, you can switch over to control mode and go from there. This is fine; so long as the system does not need so much heating that the **OBJHEATER** is driven at full power for several minutes.

Another option is to use one sensor in the bath, another attached to the lens. If the one attached to the lens is in contact with the **OBJHEATER**, it can be used as the feedback sensor as the unit is run in the control mode. The **OBJHEATER** should not be damaged in this arrangement. Simply turn up the temperature on the objective lens until the desired temperature in the cell bath is seen.

Limited Warranty

ALA Scientific Instruments, Inc. agrees to warranty this product against defects in material and workmanship for one year from date of shipment. Remedy shall be limited to replacement or repair of the item(s) at ALA's discretion. Neither ALA nor any of its affiliates makes any guaranty of performance for this product. The usage of this product by the user will indicate the users understanding of the use of this product as set forth in this manual. The user also affirms the he or she is aware that this product is not a guaranty against spillage, leakage or overflow of a cell bath. Neither ALA Scientific Instruments, Inc., nor any of its affiliates will be held responsible for damage to laboratory equipment, including microscopes, resulting from the use or misuse of this product, including malfunction, whether preventable or otherwise. Your rights under this warranty may vary from state to state and country to county.

