

Specifications

The Controller is specifically designed to slowly heat the objective over a fifteen minute warm-up period then hold the objective at the set point value within 0.2 degrees C. The Controller operates from ambient to 50 degrees C and has special safety circuitry which utilizes a 0.9 degrees C error window to shut down the controller and sound an alarm if, for any reason, the temperature of the objective deviates after it has reached set point. A user calibration test is also built in to the controller.

Objective diameters:

17mm to 38mm

Sensor:

Thermistor

Temperature range:

Ambient to 43°C 1.3 Watt

Temperature stability

±0.2°C Typically

A patented solution for immersion objectives.



Objective Heating and Cooling System

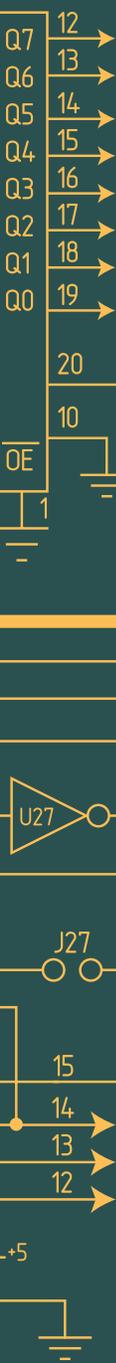
The Problem

When high numeric aperture objectives are used to observe temperature sensitive specimens, heat from the specimen is transferred through the optical coupling medium (oil, glycerine, or water) to the colder objective. Therefore, it is necessary to control the temperature of the objective. It is important to understand that when the system is set up properly, the objective heater is only used to prevent heat loss from the specimen. It should not be used to provide heat to the specimen.

The Solution

To eliminate the heat loss from the specimen, Bioprotechs developed a patented Objective Heater System[®], which includes a heater/sensor and an electronic controller specifically designed for this purpose. The heater/sensor is comprised of an adjustable thin-film heating band which surrounds 3/4 of the diameter of the upper region of the central retracting tube of the objective. A temperature probe positioned in the gap formed between the ends of the heating band provides accurate feedback to a closed loop controller. A metal cube shaped frame supports a thermal sensor and contains a mechanism to adjust the size of the heater-band.

The Objective Controller[®] is specifically designed to slowly heat the objective over a fifteen minute warm-up period, then hold the objective at the setpoint



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Special note:

1. When using warmed objectives it is recommended to use Type 37 Immersion Oil, available from Biotech's. This oil is specially formulated to have a refractive index of 1.518 at 37°C.
2. The Biotech's Objective Heater® can be adapted to fit all objectives. Due to the size, geometry and thermal characteristics of some objectives, it may be necessary to use a thermal spacer to eliminate the influence of the nosepiece.

Objective Cooling Collar

The Objective Cooling Collar is an attachment to an objective that provides an isolated pathway through which a refrigerated fluid can flow. This provides an efficient means of cooling the objective. The source of the chilled fluid can be as simple as a dewar of ice water or as sophisticated as an AC powered chiller bath. The removal of heat from the objective is more difficult than heating because you are limited by the thermal transfer efficiency of both the objective and the contact surface of the cooling ring. Therefore, the cooling ring needs to be of sufficient size to work. It is advisable to make sure you have enough room under the stage for the additional diameter required for the cooling collar and tubing. Cooling collars are precision machined to fit specific objectives.

Objective Heating and Cooling Ordering Information

Part No.	Product Description	
Bi-150803	Objective Heater Controller	
Bi-150819	Objective Heater, Standard (16-28mm)	
Bi-150815	Objective Heater, Medium (24-32mm)	
Bi-150812	Objective Heater, Large (26-35mm)	
Bi-150303	Objective Cooling Collar	
	Complete Biotech's product line available.	

Email or visit web store for latest prices.

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