

# Other coolers/warmers

## OW Series Objective Warmers

*Reduces the thermal gradient between objective and specimen*



Systems include heated collar and temperature controller

- Reduces thermal gradient between objective and sample
- No direct contact between warmer and objective
- Heated collar warms the surrounding air which then gently warms the objective
- Fits microscope objectives from most manufactures
- Can be powered from Warner's low noise TC-324B/TC344B temperature controller or a 12 volt battery for sensitive electrophysiology applications

A common problem with immersion optics is the loss of thermal control of the solution directly adjacent to the microscope objective. The need to keep a sample at a temperature different from ambient during observation is directly compromised by the heat-sink character of the microscope objective.

The OWS Series Objective Warmer from Warner Instruments provides a simple and effective method for maintaining a stable temperature within a microscope objective. This in turn reduces the thermal gradient between the lens and sample.

A thermally controlled collar attaches to the microscope objective via soft silicone rings. The collar incorporates a resistive heater and thermistor which allows the included electronic controls to maintain the objective warmer at a constant and well maintained temperature.

Heat generated by the isolated collar is not directly communicated to the objective but is instead distributed around the objective via a conducting sleeve.

The conducting sleeve warms the surrounding air, which in turn gently warms the objective. This approach allows the apparatus to take full advantage of the thermal characteristics of the surrounding air. The warmer achieves its task without directly contacting or exposing the objective to significant stresses associated with temperature gradients.

Collars are available to fit objectives from most microscope manufacturers and custom designs are available.

Order #	Model	Product
W4 64-1664	OWS-1	Objective Warmer System for 23-30 mm Lens Includes TC-124A Controller
W4 64-1676	OWS-2	Objective Warmer System for 30-35 mm Lens Includes TC-124A Controller
W4 64-1664E	OWS-1E	Objective Warmer System for 23-30 mm Lens Includes TC-124A Controller (240VAC)
W4 64-1676E	OWS-2E	Objective Warmer System for 30-35 mm Lens Includes TC-124A Controller (240VAC)
Accessories / Replacement Parts		
W4 64-1665	OW-1	Objective Warmer Collar for 23-30 mm Lens; Requires a TC-124A Controller
W4 64-1674	OW-2	Objective Warmer Collar for 30-35 mm Lens; Requires a TC-124A Controller
W4 64-1665D	OW-1D	Objective Warmer Collar for 23-30 mm Lens; Requires a TC-324B/344B Controller
W4 64-1674D	OW-2D	Objective Warmer Collar for 30-35 mm Lens; Requires a TC-324B/344B Controller
Temperature Controllers		
W4 64-1545	TC-124A	Temperature Controller 100-120 VAC
W4 64-1545E	TC-124AE	Temperature Controller 240 VAC
W4 64-1655	TC-144	Temperature Controller Dual Channel Universal Input Voltage