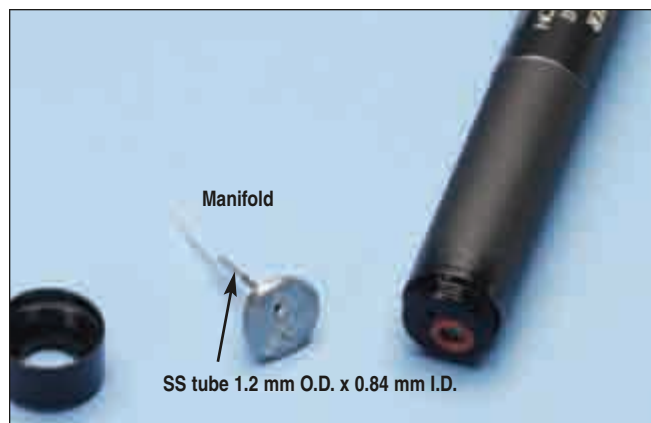
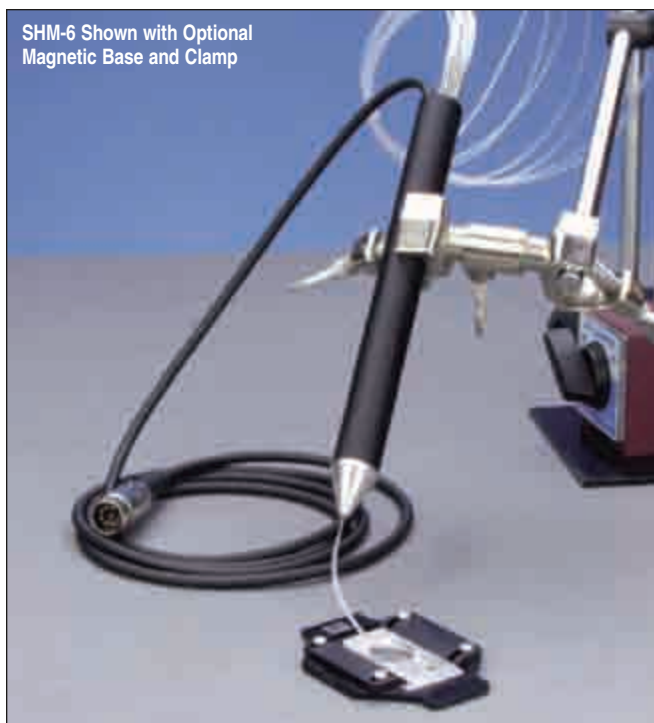


SHM-6 and SHM-8

solution heaters

Multi-Line In-Line Solution Heaters



- Six-line and eight-line models
- Single outflow line
- Plugs into TC-324B and TC-344B Heater Controllers
- Removable manifold for easy cleaning
- Low dead volume

In-line solution heating is the simplest and most effective method of warming perfusion solutions. The minimal dead space manifold (see right image) at the output allows this heater to be used in any application where from 2 to 8 perfusion lines are connected to a chamber or other device. The manifold dead volume is 30 μ l.

The heater is connected to the chamber using a short length of tubing such that the warmed perfusate flows directly into the chamber bath. Connections are made by press fitting (PE-160) tubing onto the 18 gauge stainless steel hypodermic tubes. Cap plugs are supplied to block any unused inputs.

Depending on bath volume and other factors, in-line solution heating itself may be sufficient for many applications. The heaters will accommodate flow rates up to 5 ml/min. Solution reservoir heaters from Warner are recommended if outgassing of solutions is a problem.

These solution heaters require either a single or dual channel temperature controller. See pages 108 to 116.

Each heater is supplied with a TA-29 thermistor cable assembly which allows for monitoring the actual bath temperature (T2 output on heater controllers TC-324B/TC-344B), and 3 meters of PE-160 tubing, a three way valve and replacement O-rings.

Specifications

Heater Resistance	10 Ω
Voltage Requirement	Variable to 12 V max
Maximum Temperature	50°C
Internal Heater Volume	94 μ l/line
Manifold Dead Volume	30 μ l (input of manifold to output tip)
Maximum Flow Rate at 37°C	5 ml/min

Temperature of 37°C can be maintained at $\pm 2^\circ\text{C}$ under following conditions:
a) Solution temperature at input (nominally 21°C) varies no more than $\pm 10\%$;
b) Solution flow rate varies no more than 25% with 3 ml/min max flow rate

Physical Dimensions:

Body (D x L)	16.5 x 165 mm
Weight	104 g
Cable Length	1.9 m
Warranty	One year

Order # Model Product

W4 64-0104	SHM-6	Six-Line Solution Heater
W4 64-0105	SHM-8	Eight-Line Solution Heater

Accessories and Replacement Parts

W4 64-0107	TA-29	Replacement Cable with Bead Thermistor
W4 64-0108	TA-30	Replacement Cable with Glass Thermistor
W4 64-0755	PE-160/10	Polyethylene Tubing, 3 m (10 ft.)
W4 64-0060	MB/B	Magnetic Base
W4 64-0564	U9404	3-Prong Clamp
W4 64-0100	TC-324B	Heater Controller Single
W4 64-0101	TC-344B	Heater Controller Dual