Warner Instruments
SWS Series Syringe Heater
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The **SWS Syringe Warmer** System from Warner Instruments is comprised of a SWS syringe warmer and a TC-124 temperature controller. This capable system is designed to conveniently warm solutions in a syringe for use in a variety of applications. The compact design of the warmer allows it to be used either with a syringe pump or mounted on a support stand. The model number of the specific syringe warmer (SW-10, SW-60) indicates the size syringe to which it fits.

In general, reservoir heating is an important technique used to deliver warmed solution of a bath or to eliminate outgassing in heated solutions. Since solution gas loading has a dependence on pressure and temperature, preheating a solution at atmospheric pressure prior to delivery to a warmed environment can minimize the occurrence of bubbles in the bath, even if the solution is allowed to cool enroute.

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**THIS EQUIPMENT IS NOT DESIGNED NOR INTENDED FOR USE ON HUMAN SUBJECTS**

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[Warner Instruments logo]
NOMENCLATURE

Text conventions

This manual refers to instrument controls at two functional levels; specific controls and settings of these controls. To minimize the potential for confusion, we have employed the following text conventions. Since our goal is to provide clarity rather than complexity, we welcome any feedback you may wish to provide.

- Warner Instrument product numbers are presented using **bold type**.
- References to controls are specified using **SMALL CAPS**.
- References to control settings are specified using *italic type*.
- Special comments and warnings are presented in **highlighted text**.

Any other formatting should be apparent from context.
SYSTEM DESCRIPTION

A syringe heating system is comprised of one or more syringe heaters and a temperature controller. These devices work in concert to provide temperature control of bulk solutions prior to delivery to a warmed environment. The SWS Syringe Heater is one component of such a syringe heating system.

The SWS Syringe Heater is designed to be mounted directly onto a syringe body. The heater-mounted syringe can the be mounted onto a syringe pump, support stand, or hand manipulated.

Temperature regulation is maintained via Warner’s TC-124 mini temperature controller. Instructions for the function and use of the TC-124 is provided in a separate user’s manual.

The SWS Syringe Heater have two o-rings mounted into grooves in the top of the unit which serve to provide a gripping mechanism for inserted syringes. As a result, a syringe can be partly or completely inserted into the heater body.

SETUP

1. Place the TC-124 temperature controller in a convenient location. Do not plug the device in yet.

2. Place an appropriately sized syringe into the syringe heater. Mount the syringe to a support stand or perfusion pump.

   **NOTE:** If placing the syringe/syringe heater assembly into a syringe pump, be sure to remove the two o-rings from the heater body as they may interfere with proper alignment of the syringe with pump.

3. Attach a stopcock to the Luer fitting on the syringe and run perfusion lines from the syringe to your setup.

4. Connect the power cord from the syringe heater to the input channel on the temperature controller.

5. Plug the TC-124 in and adjust the unit to the solution temperature. (See the TC-124 User’s Manual.)
OPERATION

The main use of a heater control device such as the **TC-124** is to maintain a constant solution temperature with a minimum deviation from the set temperature.

Settling Times

A feedback sensor for the temperature controller resides within the aluminum block of the **SWS Series** heater. Consequently, the *Read Temperature* reported by the device is actually that of the heater block. Therefore, it is important to allow enough time for the system to reach equilibrium so that the reported temperature is also that of the solution being warmed.
APPENDIX

Specifications

<table>
<thead>
<tr>
<th>SWS Series Syringe Warmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe sizes</td>
</tr>
<tr>
<td>Heater resistance</td>
</tr>
<tr>
<td>Temperature range</td>
</tr>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>Model</td>
</tr>
<tr>
<td>Weight (gm)</td>
</tr>
<tr>
<td>Length (mm)</td>
</tr>
<tr>
<td>O.D. (mm)</td>
</tr>
<tr>
<td>I.D. (mm)</td>
</tr>
<tr>
<td>Syringe Type</td>
</tr>
</tbody>
</table>
| Operating conditions        | Equipment is intended to be operated in a controlled laboratory environment.  
Temperature: 0-40 °C  
Altitude: sea level to 2000 m  
Relative humidity: 0-95% |

Accessories and replacement parts

<table>
<thead>
<tr>
<th>Description</th>
<th>Model No.</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringe Warmer for 10 cc syringes</td>
<td>SWS-10</td>
<td>64-1584</td>
</tr>
<tr>
<td>Syringe Warmer for 60 cc syringes</td>
<td>SWS-60</td>
<td>64-1560</td>
</tr>
<tr>
<td>Syringe Warmer for 140 cc syringes</td>
<td>SWS-140</td>
<td>64-1585</td>
</tr>
<tr>
<td>Temperature Controller (US)</td>
<td>TC-124</td>
<td>64-1545</td>
</tr>
<tr>
<td>Temperature Controller (EU)</td>
<td>TC-124E</td>
<td>64-1545E</td>
</tr>
</tbody>
</table>
Warranty and service

**Warranty**

The **SWS Series Syringe Warmer** is covered by our Warranty to be free from defects in materials and workmanship from the date of shipment for a period of one year. If a failure occurs within this period, we will either repair or replace the faulty component(s). This warranty does not cover instrument failure or damage caused by physical abuse or electrical stress (inputs exceeding specified limits).

In the event that instrument repairs are necessary, shipping charges to the factory are the customer’s responsibility. Return charges will be paid by Warner Instruments. Our offices are located at 1125 Dixwell Avenue, Hamden, CT 06514.

Normal business hours are 8:30 AM to 5:00 PM (EST), Monday through Friday and we can be reached by phone at (800) 599-4203 or (203) 776-0664. Our fax number is (203) 776-1278.

We can also be reached by e-mail at support@warneronline.com or through our Web site at [http://www.warneronline.com](http://www.warneronline.com).

**Service notes**

Please refer all questions regarding service to our Engineering Department.

A) Should service be required, please contact the factory. The problem may often be corrected by us shipping a replacement part. Factory service, if required, will be expedited to minimize the customer’s inconvenience. Instruments are inspected immediately upon receipt and the customer is notified if the repair is not covered by our warranty. Repairs can often be completed in 1-2 days from our receipt of the instrument.

B) If factory service is required, please observe the following instructions:

1) Obtain an RMA from Warner Instruments.

2) Package the instrument with at least 3 inches of cushioning on all sides. Use the original shipping carton if it is available.

3) Insure the shipment for its full value.

4) Include an explanation of the problem with the shipment.

**IMPORTANT: CUSTOMERS OUTSIDE THE U.S.**

Please contact us before return shipping any goods. We will provide instructions so that the shipment will not be delayed or subject to unnecessary expense in clearing U.S. Customs.
Certifications

Declaration of Conformity
CE MARKING (EMC)


Standards To Which Conformity Is Declared:
EN55022 Class A
EN61000-3-2
EN61000-3-3
EN50082-1:1992
EN61000-4-2
EN61000-4-3
ENV50204
EN610000-4-4
EN610000-4-8
EN610000-4-11

Manufacturer’s Name: Warner Instruments, LLC
Manufacturer’s Address: 1125 Dixwell Avenue
Hamden, CT 06514
Tel: (203) 776-0664

Equipment Description: Power Controller
Equipment Class: ITE-Class A
Model Numbers: TC-124

I the undersigned, hereby declare that the equipment specified above, conforms to the above Directive(s) and Standard(s).

Place: Hamden, Connecticut USA

Signature: 
Full Name: Burton J. Warner
Position: President
# Declaration of Conformity

**CE MARKING (LVD)**


<table>
<thead>
<tr>
<th>Standards To Which Conformity Is Declared:</th>
<th>EN61010-1:1993</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer’s Name:</td>
<td>Warner Instruments, LLC</td>
</tr>
<tr>
<td>Manufacturer’s Address:</td>
<td>1125 Dixwell Avenue</td>
</tr>
<tr>
<td></td>
<td>Hamden, CT 06514</td>
</tr>
<tr>
<td></td>
<td>Tel: (203) 776-0664</td>
</tr>
<tr>
<td>Equipment Description:</td>
<td>Power Controller</td>
</tr>
<tr>
<td></td>
<td>Safety requirements for electrical equipment for measurement and laboratory use</td>
</tr>
<tr>
<td>Equipment Class:</td>
<td>Class I</td>
</tr>
<tr>
<td>Model Numbers:</td>
<td>TC-124</td>
</tr>
</tbody>
</table>

I the undersigned, hereby declare that the equipment specified above, conforms to the above Directive(s) and Standard(s).

Place: Hamden, Connecticut USA

Signature:

[Signature]

Full Name: Burton J. Warner

Position: President
WEEE/RoHS Compliance Statement

To Our Valued Customers:

Harvard Apparatus is committed to being a good corporate citizen. As part of that commitment, we strive to maintain an environmentally conscious manufacturing operation. The European Union (EU) has enacted two Directives, the first on product recycling (Waste Electrical and Electronic Equipment, WEEE) and the second limiting the use of certain substances (Restriction on the use of Hazardous Substances, RoHS). Over time, these Directives will be implemented in the national laws of each EU Member State.

Once the final national regulations have been put into place, recycling will be offered for those Harvard Apparatus products which are within the scope of the WEEE Directive. Products falling under the scope of the WEEE Directive available for sale after August 13, 2005 will be identified with a “wheelie bin” symbol.

Two Categories of products covered by the WEEE Directive are currently exempt from the RoHS Directive - Category 8, medical devices (with the exception of implanted or inflected products) and Category 9, monitoring and control instruments. Most of Harvard Apparatus’ products fall into either Category 8 or 9 and are currently exempt from the RoHS Directive. Harvard Apparatus will continue to monitor the application of the RoHS Directive to its products and will comply with any changes as they apply.

- Do Not Dispose Product with Municipal Waste.
- Special Collection/Disposal Required.