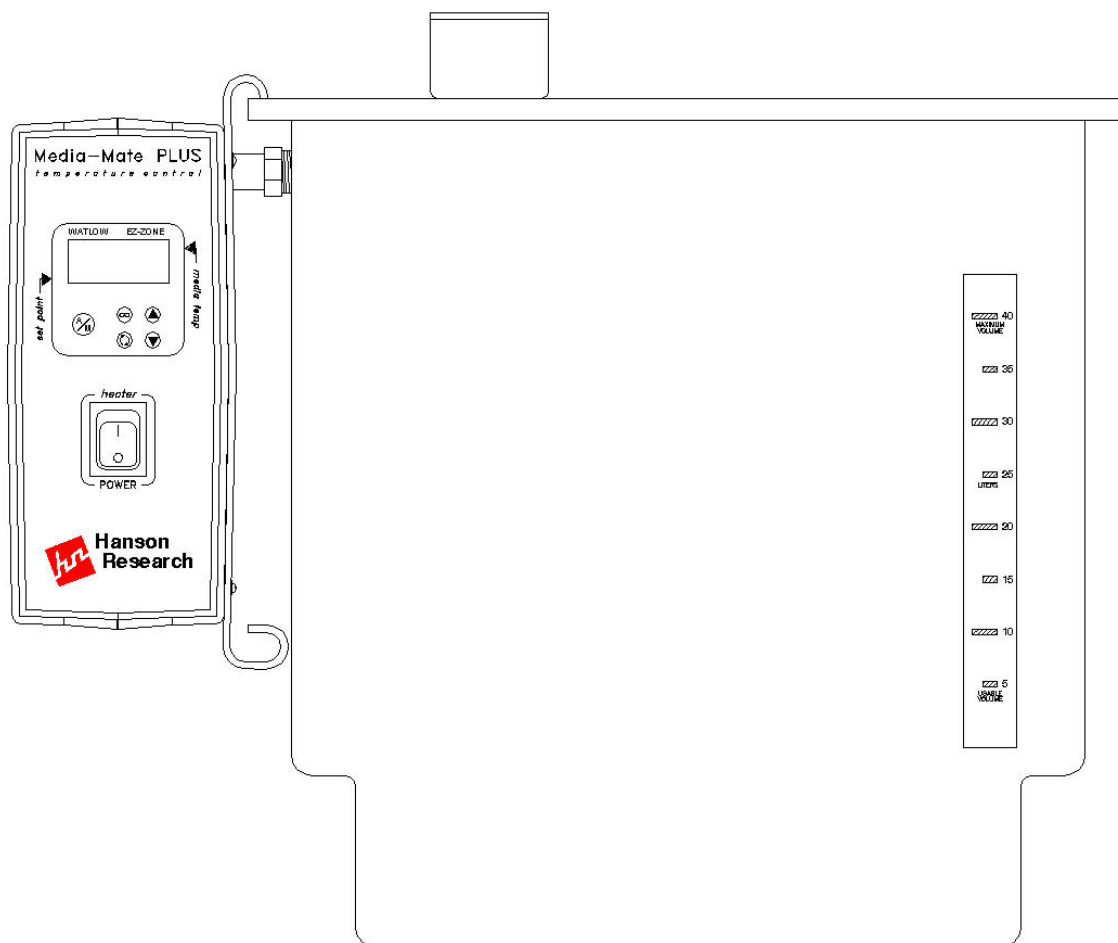


Tank, Heater, and Control Operation Manual

25-710-804

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Hanson Research Corporation
9810 Variel Avenue • Chatsworth, CA 91311 USA
(800) 821-8165 • (818) 882-7266 • FAX (818) 882-9470
www.hansonresearch.com

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Section One - Safety Considerations

1.1 General

1. The Instrument should be on its own circuit to prevent instrument problems and circuit overload, see section 2 specifications.
2. Never work on the electrical components in the system while there is power to the unit. **Disconnect power: Do not run instrument with protective cover removed from the electrical control cabinet.**
3. Do not fill the Tank through the filter port on the Tank, as the system may not handle the back pressure.
4. Review all safety and environmental precautions pertaining to any chemicals which are to be used in conjunction with this equipment.

1.2 Warning signs

For your own safety, you must observe the following safety warning signs. The safety warning signs indicate a possible source of danger. They also provide information on what to do to avoid danger.

Sign	Location	Safety Warning
	<ul style="list-style-type: none"> Rear Control Panel 	<p>Danger! Supply voltage and supply frequency must be of the value specified for the control unit in the serial number tag located on the side of the control unit. All electrical outlets must be properly grounded.</p>
 	<ul style="list-style-type: none"> Control Heater 	<p>Caution: No operator accessible parts inside. Refer servicing to qualified personnel only. Risk of electrical shock. Do not open.</p> <p>Achtung: Es gibt keine vorn Benutzer zu wanenden Teile. Oberlassen Sie Reparaturen dem qualifizierten Service-fachmann. Hochspannung. Nicht öffnen.</p> <p>Attention: Aucune pièce remplaçable par l'utilisateur. Toute réparation doit être effectuée par un technicien qualifié. Risque d' electrocution. Ne pas ouvrir.</p>
	<ul style="list-style-type: none"> Control 	<p>Caution! Turn unit off and remove power cord before replacing fuses. Fuses must be replaced with the same current rating and type described next to the fuse holder.</p>
	<ul style="list-style-type: none"> Heater 	<p>Caution! Heater is hot, do not touch.</p>
	<ul style="list-style-type: none"> Control 	<p>Note! Line and Neutral fused separately.</p>
	<ul style="list-style-type: none"> Inside Control 	<p>Note! Protective conductor terminal.</p>

Section Two - Introduction

The Hanson Research Tank, Heater and Control is a media pre-heat station, designed to work with the Hanson Media-Mate Plus. The unit will preheat media and then the media and Tank can be placed on the Media-Mate Plus.

2.1 Design Features

1. Quick change to Media-Mate Plus.
2. Control - The electronics are enclosed within the control for protection and may be easily removed for service. The control panel is a user friendly design with digital readout of actual media temperature and temperature set point.
3. Heater - The Heater is an integral design comprised of the heater element, temperature sensor, overload sensor and level sensor. The heater is easily removed for cleaning or for placement in spare media tanks. The heater has a Teflon coating for chemical resistance.
4. Tank - The Tank is chemically inert and is equipped with a 5 micron filter and standard hose bib for quick and easy connection to the Media-Mate Plus. A chemically inert cover retards evaporation and provides a docking location for the Dispense Head from the Media-Mate Plus.

2.2 How it Works

The Hanson Tank, Heater and Control is a media pre-heat station. The control will tell the Heater what temperature to go to, the sensor (mounted on Heater) will feed back to the control how warm the media is.

Note: if the liquid level becomes too low (approximately at the 18 liter mark), the low water level sensor will not allow the Heater to operate.

Section Three - Specifications

Weight:

Without media: 9 kg (20 lbs)
 With 40 liters of media: 49 kg (108 lbs)

Size:

Width: 63.5 cm (25.0 in)
 Depth: 38.1 cm (15.0 in)
 Height: 55.9 cm (22.0 in)

Electrical:

Voltage: 115 VAC or 230 VAC \pm 10%
 Frequency: 50/60 Hz
 Current: 8 amps (115 VAC) or 5 amps (230 VAC)
 Phase: single

4 Fuses (TT Type)

115 VAC Units	230 VAC Units
One 15 Amp.	One 8 Amp, 250 VAC
One 15 Amp.	One 8 Amp, 250 VAC
One 1 Amp, 250 VAC	One 1 Amp, 250 VAC
One 1/2Amp, 250 VAC	One 1/2Amp, 250 VAC

Environment:

Maximum ambient temperature: 5°C below temperature set point
 Maximum humidity: < 85%

Performance:

Pre-heat temperature range: 30°C to 50°C
 Pre-heat temperature control accuracy: \pm 0.5°C
 Pre-heat temperature readout accuracy: \pm 0.2°C
 Pre-heat time (21 to 37 deg C): 60 min. max.
 Filtration: 5 micron nominal

Tank Capacity

Tank volume (usable): 40 liters (10.5 gal)
 Tank volume (unusable): 2 liters (2.1 gal)
 Volume to top of Filter 8 liters (2.1 gal)
 Volume when low water level sensor turns
 Heater off: about 18 liters

Materials, Wet

Tank: High Density Polyethylene
 Heater: Teflon Coated
 Filter: Polyethylene
 Fittings and Hose: PVC

Section Four - Installation

4.1 Unpacking

The Tank, Heater and Control are shipped in one box. The shipping box was specifically designed to provide maximum shipping protection and to facilitate unpacking.

To Unpack

1. Move package close to final destination.
2. Cut and remove any straps.
3. Open box, taking care not to damage box.
4. Remove instrument from box.
5. Reassemble empty box and store for possible future use.

4.2 Parts Identification

Throughout this manual, reference is made to various components by name. Figures are provided to assist in the visual identification of these components (see Figure 4-1).

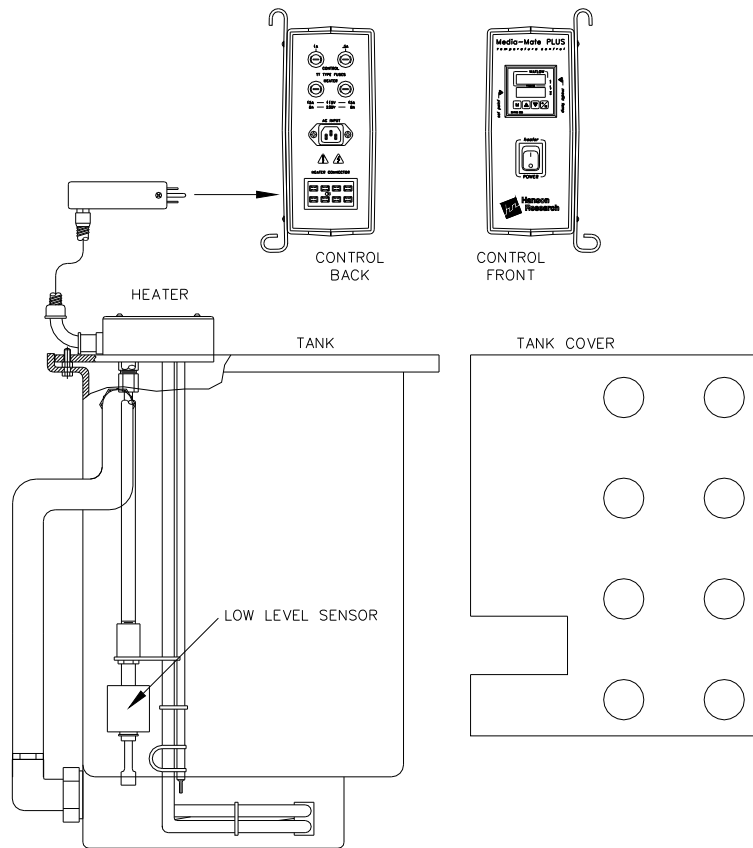


Figure 4-1

4.3 System Check-out

1. After removing the instrument from the box, remove all other shipping materials.
2. Visually inspect the instrument for damage or missing parts. Make note of any discrepancies and contact Hanson Research Corporation, Customer Support immediately.
3. Remove Heater from shipping position within Tank.
4. Clean inside of Tank, Heater and hose as necessary to removing any packing debris.
5. Visually inspect all electrical and liquid connections for shipping damage.
6. Review Operating Instructions (see Section 5).

4.4 Installation



CAUTION

The unit should not be plugged in until installed per instructions below.

1. Control installation is done by hanging the control over the left side top lip of the Tank. Connect the power cord into the connector labeled "AC INPUT"
2. Heater installation is done by setting the heater plate over the two screw pegs on the lip of the tank. This is the only position for the heater. Connect the Heater plug into the connector labeled "HEATER" on the back panel of the control (see Figure 4-1).
3. Place about 10 liters of desired solution into Tank and check for leaks. After 5 minutes fill Tank to desired level.
4. Tank Cover installation is done by placing the Cover into the lip of the Tank, while aligning the cut out for the Heater.

4.5 Start Up



CAUTION

The voltage indicated on the control unit must be the same as the power source. If the incorrect voltage is indicated, do not plug in the instrument and contact Hanson Research.

1. Verify that the voltage indicated on the bottom of the Control is the same as the power source.
2. Connect the other end of the power cord into a grounded outlet.
3. Turn on the power switch, located on the front panel of the Control.
4. The Temperature Control display should come on, showing the temperature, and temperature set point.
5. Turn the power off.

Section Five - Operating Instructions

5.1 Temperature Setting (see Figure 6-1)

The Temperature Controller is located in the center, top of the front control panel. The Temperature Controller has two digital displays which display in degree C. The upper display shows actual media temperature while the lower display shows set point temperature.

To set Temperature

1. Verify that the Tank has been filled to at least the 18 liter mark.
2. Verify that the Heater is installed in the Tank and is plugged into the back control panel.
3. Plug the power cord into appropriate AC power receptacle and into rear control panel.
4. Turn on power at the front control panel.
5. Increase or decrease set point temperature using up / down arrow keys located just below the set point display on the Temperature Controller.
6. It is recommended to set the temperature 2 to 3°C above the final required temperature because there will be a few degrees loss when liquid is being transferred by the Media-Mate Plus.

5.2 Installing Tank on Media-Mate Plus



CAUTION

Caution should be taken when installing a Tank with liquid in it. The Tank is heavy and solution may spill. This procedure requires at least 2 people. The person holding and pushing the Tank onto cart legs should be capable of supporting the weight of the Tank, basically get a strong person to hold and push the Tank on.

1. Unplug heater and remove control. Always leave Tank Cover on Tank.
2. Align Media-Mate Plus cart legs with steps on Tank from the back. Tip Tank so that cart legs can be pushed under Tank. Support Tank as you slide cart legs under and push Tank onto legs.

Note: it is not necessary to lift the full weight of the Tank, just tip and push. Practice with an empty Tank to get the feel of how the Tank goes on.

Hint: keep the Media-Mate Plus front wheels straight.

5.3 Removing Tank from the Media-Mate Plus



CAUTION

Caution should be taken when removing a Tank with liquid in it. The Tank is heavy and solution may spill. This procedure requires at least 2 people. The person holding and pulling the Tank off of the cart legs should be capable of supporting the weight of the Tank, basically get a strong person to hold and pull the Tank off.

1. Unplug heater and disconnect fill hose. Return hose to its holding position on side of Tank.
2. Back up Media-Mate Plus until front wheels turn around.
3. Pull Tank outwards until Tank tips off the end and touches the floor. Then push Media-Mate Plus back away from Tank, easing the tank down to the floor.

Note: it is not necessary to lift the full weight of the Tank, just tip and push. Practice with an empty Tank to get the feel of how the Tank comes off.

Section Six - Validation and Calibration

6.1 Pre-Heat Temperature Calibration

Calibration check of the Temperature Control system is recommended every six months. A Temperature Calibration Log is provided (see Section 6) and may be copied for entry of temperature calibration data.

1. Place calibrated thermometer in 3/8 inch hole provided in Tank Cover (hole located furthest from Heater).
2. Set temperature set point to 32°C (see Section 7) and allow to stabilize.
3. Record set point temperature and sensor display temperature from control panel digital display. Record actual temperature from calibrated thermometer.
4. Set temperature set point to 37°C (see Section 7) and allow to stabilize.
5. Record set point temperature and sensor display temperature from control panel digital display. Record actual temperature from calibrated thermometer.

6.2 Adjustment of Sensor Display Temperature (see Figure 6-1)

The sensor display temperature has been adjusted at the factory and should not require any additional adjustment. Adjustment may be made only when Calibration per Section 6 indicates more than 0.2°C. difference between display temperature and actual temperature.

1. Press both the Up (↑) and Down (↓) keys simultaneously until you see “LOC” equal to “5” (if “2”, change number using Up key to “5”).
2. Press the (∞) key, then press the (↻) key repeatedly until you see “i.CA”.
3. Add or subtract to the number in order to equal the standard temperature.
4. After calibrating, press the (∞) key, then press both the Up (↑) and Down (↓) keys simultaneously until you see “LOC”, which needs to be changed to “2”. Press the (∞) key to finish.
5. Recalibrate per *Section 6 – Pre-Heat Temperature Calibration*.

6.3 Temperature Controller (PID) Setup

The Temperature Controller has been programmed at the factory to obtain optimum temperature control and quick heat up time. The program set points are locked and should not require changing or resetting. If the factory program has been altered for any reason, it may be restored in accordance with Hanson Research Corporation Procedure Number 25-710-807, Programming Procedures for Temperature Controller. This procedure is available on request from Hanson Research Corporation, (see Section 11).



Figure 6-1

6.4 Temperature Calibration Record

Instrument Model Number: _____

Instrument Serial Number _____

Set point temperature (degrees C)	Displayed temperature (degrees C)	Actual temperature (degrees C)	Date	Tested By

Section Seven - Troubleshooting

7.1 Temperature Control problems

1. Does not heat media (media remains at ambient temperature)

Cause	Solution
Power source connection	Check and correct all electrical connections
Low Water Level	Fill tank to at least the 18 liter mark
Blown Fuse	Replace fuse (see Section 8.5). Contact service if fuse blows again.
Set Point too low	Adjust set point higher
Defective Heater Assembly	Check and replace if necessary
Defective Temperature controller	Check and replace if necessary

2. Temperature fluctuates more than + or - 0.5°C. with the tank filled to at least the 18 liter mark. Note that lower liquid levels may cause readings to fluctuate more than 0.5°C.

Cause	Solution
Defective Heater Assembly	Check and replace if necessary
Defective Temperature controller	Check and replace if necessary
Temp control program changed	Check program and fix.

3. Temperature reading does not match calibrated thermometer.

Cause	Solution
Unit not calibrated	Do calibration procedure, (see Section 6)

Section Eight - Maintenance

The Tank, Heater and Control has been designed to be a low maintenance instrument. In general, the instrument is maintained by proper cleaning after use, and periodic replacement of the Filter.

8.1 General Cleaning

The exterior of the instrument should be periodically wiped down with a damp cloth. Frequency of cleaning depends on instrument usage and operating environment.

8.2 Cleaning the Tank (Always Unplug the Heater)

The Tank should always be cleaned prior to filling the Tank with a media that is different than the media previously used. Also, whenever the instrument will not be used within 36 hours it should be cleaned.

Cleaning Method

1. Disconnect the Fill Tube near the top of the Tank, to drain the Tank. Replace Fill Tube when finish draining.
2. Remove the Tank and pour out any remaining media and wipe dry.
3. Rinse the Tank with clean DI water.
4. If the instrument is not going to be used within 15 days, it should be covered and moved to an appropriate storage location.

8.3 Replacement of Filter

A clogged Filter will restrict media flow and impair instrument performance. The Filter should be replaced every 90 days or whenever the fill level is reduced by 25 ml (this may be observed during a Media-Mate Plus filling cycle). Also, since the Filter will retain a small volume of media, it must be replaced whenever the Tank is to be filled with a different media.

Replacing the Filter

1. Unscrew the Filter Core and remove from Tank along with the Filter and Washers (see fig. 8.1), save washers.
2. Discard Filter and replace with new Filter, p/n 91-500-099.
3. Place washers into Filter, put Filter core through washers and screw into fitting until all parts come together, this is not very tight. Only use hand to tighten.

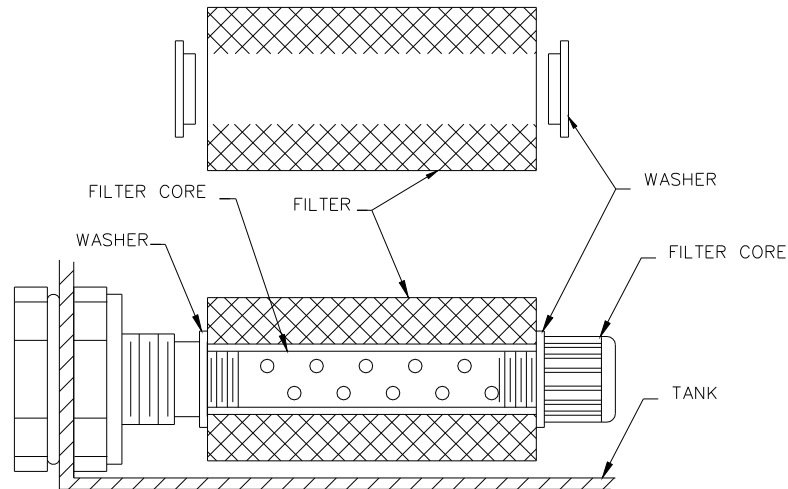


Figure 8.1

For systems with a filter housing used to reduce dead volume in the Media-Mate Plus tank, follow the procedure below.

8.5 Replacing the Element for Units with a Filter Housing:

1. Unscrew the Filter Core Assembly and remove it from the Tank along with the filter, filter element, and filter housing end caps (see *Figure 9-2*).
2. Remove the filter housing end caps and slide the filter off the filter core.
3. Discard the old element and replace with a new element (P/N 91-500-099)
4. Slide the new element into the housing and secure with the end caps.
5. Slide the filter core through the assembly.
6. Reinstall the assembly into the Media-Mate Plus tank.

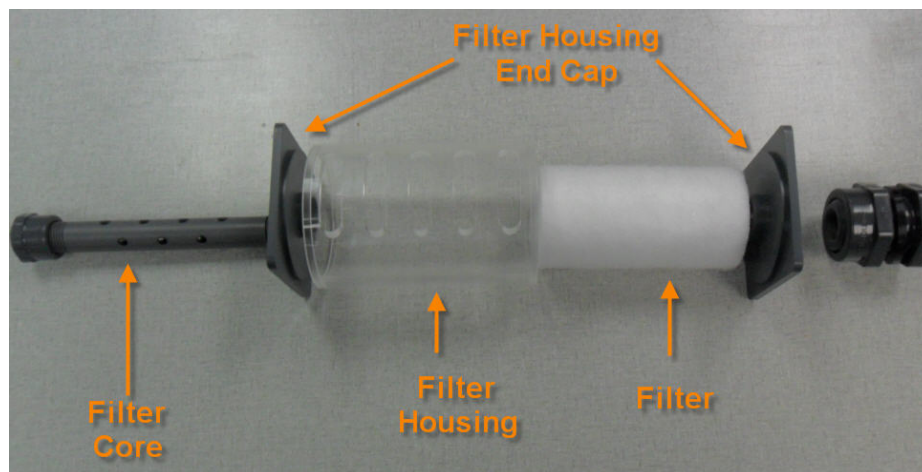


Figure: 9-2

Note: Removed from tank to provide clear view. Clear Filter housing shown only to provide clarification on function.

8.6 Fuse Replacement

The fuses are located on the back of the control. Each system has four fuses. The amperage is labeled next to the fuse. Notice that the amperage of the two of the four fuses is dependent upon the voltage of the system.

To check the fuses and replace a defective fuse

1. Insert the end of a standard (flat) screwdriver into the slot on the end of the fuse holder and turn counter-clockwise to remove the holder.
2. Visually inspect the fuse to see if it is defective.
3. If it is defective, remove the fuse from the holder by pulling and replace with a fuse of the same type and rating.



CAUTION

For continued protection against risk of fire, replace the fuse(s) with same type and current rating. Do not over-tighten fuse holder.

4. Push the fuse back into the control. Secure the fuse holder by pressing in and turning clockwise with the screwdriver.

Section Nine - Moving and Storage

Storage

If the unit will not be used for an extended period of time (15 days or more), the power should be turned off and disconnected from the power source. The instrument should be cleaned (see Section 8), covered and moved to an appropriate storage location.

Moving

The unit, when empty, is a light system, and therefore does not require special consideration when being moved within the same laboratory or building. If shipping or transporting a long distance, pack into original packing material or equivalent.

Section Ten - Parts, Supplies and Accessories

Spare Parts and Kits

25-710-400	Extra 40 liter Tank Assembly with Heater 115 VAC
25-710-401	Extra 40 liter Tank Assembly with Heater 230 VAC
91-500-099	Filter Element (5 Micron)
25-710-404	Fill Hose Assembly
91-212-003	Fuse 15 Amp. (115 VAC units, 2 needed)
91-212-006	Fuse 8 Amp. (230 VAC units, 2 needed)
91-212-045	Fuse 1 Amp.
91-212-049	Fuse 1/2 Amp.
25-710-402	Tank Assembly 40 liter
25-710-130	Heater Assembly 115 VAC
25-710-131	Heater Assembly 230 VAC
25-710-125	Stand Alone Temperature Control, 115 VAC
25-710-126	Stand Alone Temperature Control, 230 VAC
25-710-545	Tank Cover

Tools and Accessories

91-902-020	Electro-Mechanical Tool Kit
65-233-401	Certified Calibrated Thermometer

Section Eleven - Sales and Service Offices

The Tank, Heater and Control System is sold and serviced by a worldwide network of dealers and distributors. If you need additional accessories, replacement parts, or require service information, you can either contact your local agent, or you can contact Hanson Research Corporation at their worldwide headquarters:

Hanson Research Corporation
9810 Variel Avenue
Chatsworth, CA 91311 USA

Phone: (818) 882-7266

Toll free in USA, Canada and Puerto Rico: (800) 821-8165

FAX: (818) 882-9470

Website: <http://www.hansonresearch.com>

Section Twelve - Warranty

The Tank, Heater and Control are covered under the Terms, Conditions, and Warranty document 99-100-003.