



WATER BATHS

MODELS: W2M, W6M, W14M, W20M, and W614M

115v/220v and PC Models

MICROPROCESSOR CONTROLLED

INSTALLATION AND OPERATION MANUAL

08/08
4861626

These units are general purpose water baths for professional, industrial, or educational use where the preparation or testing of materials is done at approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated. These units are not intended for hazardous or household location use.

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INTRODUCTION

Thank you for choosing a general purpose water bath. These units are not intended for use at hazardous or household locations.

Before you use the unit, read this entire manual carefully to understand how to install, operate, and maintain the unit in a safe manner. Your satisfaction with the unit will be maximized as you read about its safety and operational features.

Keep this manual on-hand so it can be used by all operators of the unit. Be sure all operators of the unit are given appropriate training before you put the unit in service.

Note: Use the unit only in the way described in this manual. Failure to follow the guidelines and instructions in this manual may be dangerous and illegal.

General Safety Considerations

Your water bath and its recommended accessories have been designed and tested to meet strict safety requirements.

For continued safe operation of your water bath, always follow basic safety precautions including:

- Read this entire manual before using the water bath.
- Be sure you follow any city, county, or other ordinances in your area regarding the use of this unit.
- Use only approved accessories. Do not modify system components. Any alterations or modifications to your water bath may be dangerous and will void your warranty.
- Always plug the unit's power cord into a grounded electrical outlet that conforms to national and local electrical codes. If the unit is not grounded, parts such as knobs and controls may conduct electricity and cause serious injury.
- Do not connect the unit to a power source of any other voltage or frequency beyond the range stated on the power rating overlay at the rear of the unit.
- Do not modify the power cord provided with the unit. If the plug does not fit an outlet, have a proper outlet installed by a qualified electrician.
- Avoid damaging the power cord. Do not bend it excessively, step on it, place heavy objects on it. A damaged cord can easily become a shock or fire hazard. Never use a power cord after it has become damaged.
- Do not position equipment in a manner that prohibits access to power cord.
- Do not attempt to move the unit during operation or before the unit has been allowed to cool.

RECEIVING YOUR UNIT

Before leaving our factory, all units are packaged in high quality shipping materials designed to provide protection from transportation related damage.

Once a unit leaves our factory, safe delivery becomes the responsibility of the carrier who is liable for loss or damage to your unit. Damage sustained during transit is not covered under your unit warranty.

When you receive your unit, inspect it for concealed loss or damage to its interior and exterior. Should you find any damage to the unit, follow the carrier's procedure for claiming damage or loss.

Inspection Guidelines

Carefully inspect the shipping carton for damage. If the carton is damaged, report the damage to the carrier service that delivered the unit.

If the carton is not damaged, open the carton and remove its contents. Verify that all of the following equipment is included in the crate:

- One (1) Bath cover, two (2) for W614M
- One (1) Magnetic thermometer clip

Carefully check all packaging before discarding. Save the shipping carton until you are sure everything is in order.

Returning Shipment

If you must return the unit for any reason, first contact your service representative for authorization. You will be asked to provide the data plate information. See Recording Data Plate Information.

Recording Data Plate Information

Once you have determined the unit is free from damage, locate the data plate at the back of the unit. The data plate indicates your unit's model number and serial number. Record this information below for future reference.

Table 1. Data Plate Information

Model Number	
Serial Number	
Part Number	
Voltage	

GRAPHIC SYMBOLS

Your unit is provided with a display of graphic symbols that should help in identifying user adjustable components.

Table 2. Symbols

Symbol	Identification
	Indicates that you should consult your operator's manual for further instructions.
	Indicates "Temperature"
	Indicates "Over Temperature Protection"
	Indicates "AC Power"
	Indicates the power is "ON"
	Indicates the power is "OFF"
	Indicates "Protective Earthground"
	Indicates "Up" and "Down" respectively
	Indicates "Manually Adjustable"
	Indicates "Potential Shock Hazard" behind partition
	Indicates "Hot Surface"
	Indicates " Unit should be recycled " (Not disposed of in land-fill)

INSTALLATION

Your satisfaction and safety require a complete understanding of this unit. Read the instructions thoroughly and be sure all operators are given adequate training before attempting to put the unit in service.

This equipment must be used only for its intended application; any alterations or modifications will void your warranty. Local city, county, or other ordinances may govern the use of this equipment. If you have any questions about local requirements, please contact the appropriate local agency. The end user may perform installation.

Environmental Conditions

Under normal circumstances these units are intended for use indoors, at room temperatures between 18° and 40°C, at no greater than 80% relative Humidity (at 25°C) and with a supply voltage that does not vary by more than 10% from the data plate rating. This equipment should not be operated at an altitude exceeding 2000 meters. Installation category is **II**, pollution degree 2. Customer service should be contacted for operating conditions outside of these limits.

Power Source

Check the data plate for voltage, cycle, and ampere requirements. If matched to your power source, plug the power cord into a grounded outlet.

Voltage should not vary more than $\pm 10\%$ from the data plate rating.

These units are intended for 50/60-HZ application. A separate circuit is recommended to prevent damage to the unit due to overloading or circuit failure.

Location

In selecting a location, consider all conditions that might affect performance, such as heat from radiators, ovens, autoclaves, etc. Avoid direct sun, fast-moving air currents, heating and cooling ducts, and high traffic areas. Allow a minimum of 10 cm between the unit and any walls or partitions that might obstruct free airflow.

Lifting and Handling

These units are heavy and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. The unit should be completely restrained from tipping during lifting or transport. All moving parts such as trays or covers should be removed during transfer to prevent shifting and damage. The bottom of the unit is hot during operation as is the water in the tank. Always allow the unit to cool before attempting to move it.

Cleaning and Decontamination

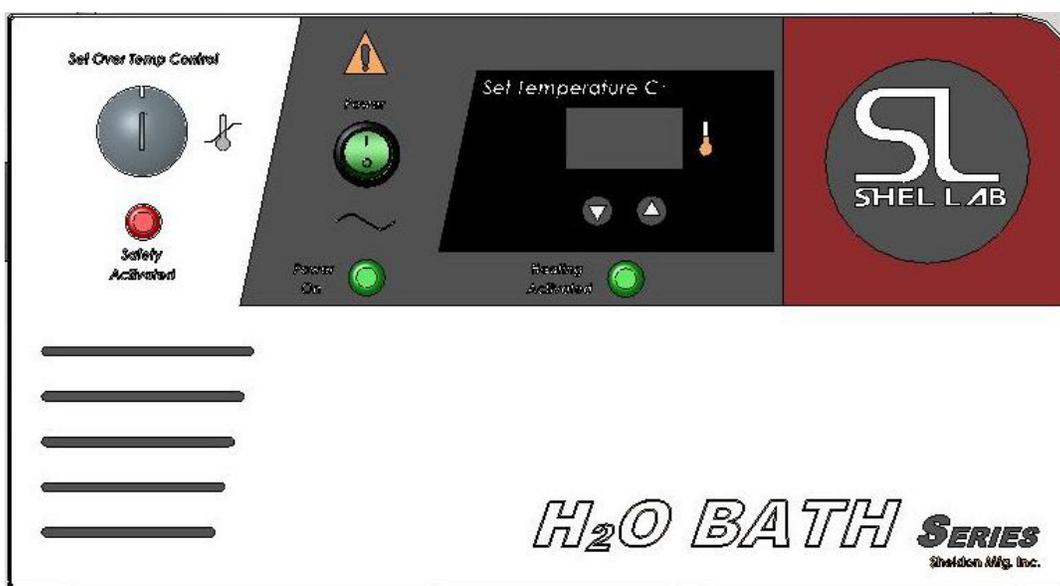
In the event hazardous material is spilled onto or into the equipment appropriate decontamination must be carried out. If there is any doubt about the compatibility of decontamination or cleaning agents with parts of the equipment or with material contained, please contact the manufacturer.

Units are cleaned at the factory, but not sterilized. Remove any racks if assembled and clean the bath with a disinfectant that is suitable for your application. See MAINTENANCE for cleaning instructions and precautions.

CONTROLS OVERVIEW

This section provides an overview of the panel controls. See Figure 1 for an illustration of the panel controls.

Figure 1. Control Panel



Power Switch

The Green I/O (On/Off) power switch controls all power to the unit. It must be in the I position to be ON and the green power on light illuminated before any systems are operational. The on/off switch must remain easily accessible at all times. The W614M is equipped with separate switches for each tank.

Main Temperature Controller

This control is marked SET TEMPERATURE and consists of the digital display and UP and DOWN arrow pads for inputting set point temperatures and calibration. Separate controls are used on the W614M to control temperature in the respective tanks.

Fuses

The fuses are located at the back of the unit within the power inlet plug and 220v units also have a fuse holder located next to the inlet. The fuses act as a circuit breaker and will cut off power to the unit if there is an electrical surge or malfunction. The fuses must be in place for the unit to operate. Please contact customer service for more information.

Over Temperature Safety Thermostat (OTP)

This controller is marked “Set Over Temp Control” and is completely independent of the Temperature Controller. The Safety guards against any failure of the Temperature Controller that would allow the temperature to rise past set point. If the temperature rises to the safety set point, the Safety takes control of the heating element and allows continued use of the water bath until the problem can be resolved or service can be arranged. The Safety is manually adjusted with a screwdriver or coin so accidental adjustment cannot occur. The W614M has separate controls for each of the tanks.

Heating Activated

This light is ON when the Temperature Controller has activated the heating element to reach and maintain set point.

Over Temperature Activated Light

This light is ON when the Over Temperature Safety Thermostat has been activated. Under normal operating conditions this light should never be on.

OPERATION

Warning:  These baths are not intended for use as acid baths. Use as an acid bath will cause severe damage to bath components and void your warranty. Do not use deionized water, tap water, or chemicals. USE DISTILLED WATER ONLY.

Turning On the Unit

To turn on the unit, perform the following steps:

1. Check power supply against unit serial plate; they must match.
2. Plug service cord into the electrical outlet. If supplied with a detachable cordset, plug the female end into the unit inlet and the male plug into the power supply. Verify that units requiring a fuse have the fuse installed in the power inlet.
3. Fill bath to your required depth with DISTILLED WATER. DO NOT USE TAP WATER, DEIONIZED WATER, OR CHEMICALS. For singer or larger tank, normal depth is 5 ½ inches (14 cm), but depth must be at least 2 inches (5 cm) over the bottom of the rack. For shallow tank, normal depth is 2/3 full, but depth must beat least 2 inches (5 cm). Check water level frequently, add water to appropriate levels if needed. At higher operating temperatures, or under circumstances where a cover cannot be used, it will be necessary to check the water level more frequently.
4. Push the Main power switch to the ON position and turn the Over Temperature Safety Thermostat to its maximum position, clockwise.

Setting Main Temperature Control

To enter set point mode on the control, push and release either the Up or Down arrow pad one time and the digital display will start to blink from bright to dim. While blinking, the digital display shows the set point that can be changed using the UP or DOWN arrow pads. If the arrow pads are not pressed for five (5) seconds, the display will stop blinking and will revert to reading the actual temperature in the bath. Allow at least two (2) hours for the temperature to stabilize.

Warning:  If the tank boils dry while containing plastic ware, the plastic will melt. If you intend to use test tube racks, remember that plastic coated wire racks may wear and expose metal that can cause damage. Preferably, use all plastic racks.

Calibrating the Main Temperature Control

We recommend that you calibrate your unit once it has been installed in its working environment and the chamber temperature has been stable at the set point for several hours.

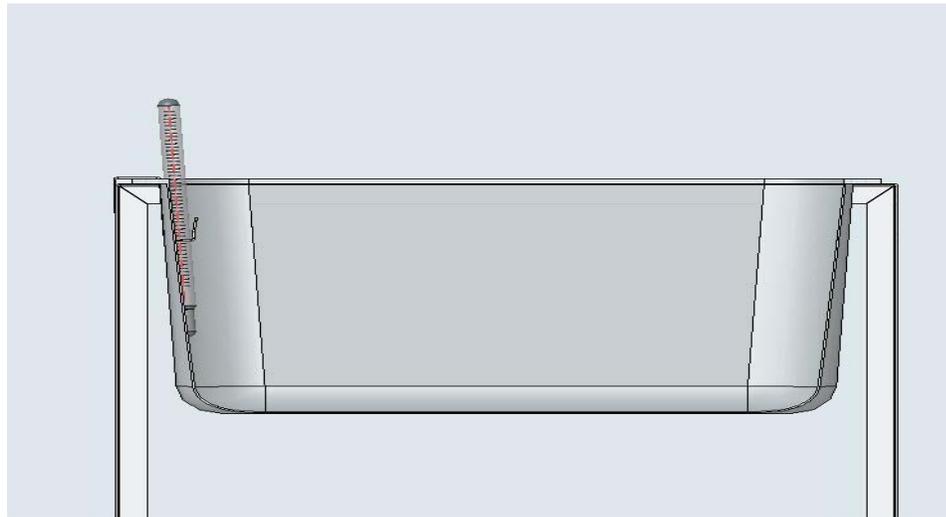
1. Place a calibrated reference thermometer in the bath (a thermometer clip is provided with the accessories package). (See Figure 2 for placement.) Allow the thermometer to reach temperature and remain stable for one (1) hour.
2. Compare the reading on the reference thermometer with the temperature control display. If there is a difference, put the display into calibrate mode by pressing both the Up and Down arrow pads at the same time until the two (2) outside decimal points begin to blink.
3. When the decimal points are blinking, press the Up or Down arrow pad to adjust the display to match the reference thermometer. If the arrow pads are not pressed within five (5) seconds the display will revert to showing the temperature within the bath.
4. Allow the unit to stabilize again, and repeat calibration if necessary.
5. On the W614M, both tanks will need to be calibrated individually.

Setting the Overtemperature Safety Thermostat

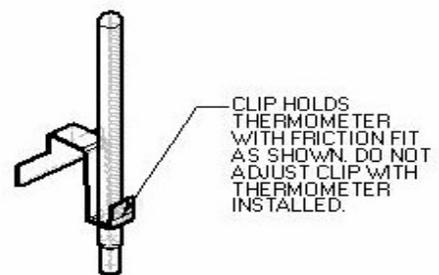
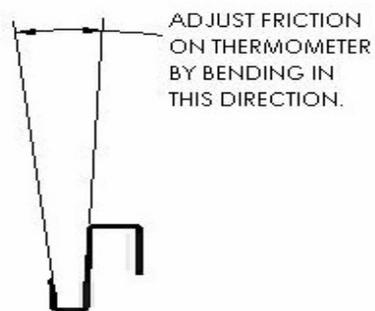
To set the Over Temperature Safety Thermostat, perform the following steps:

1. Verify that the Safety Thermostat was set to its maximum position to allow the water bath to stabilize.
2. Turn the Safety Thermostat counterclockwise until the Safety indicator light turns on.
3. Turn the Safety Thermostat clockwise until the Safety indicator light turns off.
4. Turn the thermostat clockwise again, two (2) of the smallest divisions on its scale past the point where the indicator light went out. This will set the Safety Thermostat at approximately 1°C above the Main Temperature set point..

Figure 2. Thermometer Placement



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Note: Water bath thermometer must be placed so that the bulb is always fully immersed. The thermometer must not touch the sides or the bottom of the bath tank.

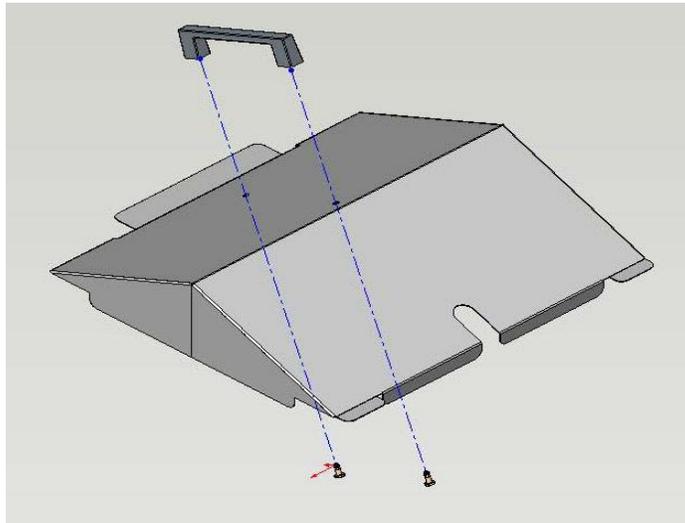
Bath Cover Assembly

To assemble the bath cover, perform the following steps:

1. Insert 2 self-tapping screws through the respective cover holes and into the holes in the handle, leaving the first self-tapping screw loose to assure proper alignment. See Figure 3. Firmly fasten both screws into place. Do not over-tighten.

Figure 3. Bath Cover Assembly Step 1.

Handle Part#300110



MAINTENANCE

Warning:  Prior to any maintenance or service on this unit, disconnect the power cord from the power supply and the drain water from the tank. Before reattaching the unit to its power supply, be sure all volatile and flammable cleaners are evaporated and dry.

Cleaning

To clean the water bath, perform the following steps:

1. Clean the water bath with mild soap and water solution. DO NOT USE chlorine-based bleaches, as they will damage the tank interior. DO NOT USE spray cleaners that may contain solvents, which could leak through openings and cracks and harm electrical part coatings. Failure to do this may permanently damage the unit.
2. Rinse the water bath with clean water and wipe dry with a soft cloth. Stainless steel does not rust, but foreign materials in the tank may rust or leave rust spots. If corrosion is seen, scrub out the stains with a mild abrasive, never steel wool.

Heating and Water Level

The heating element of this bath does not contact the tank bottom, thus will not burn out if the tank is allowed to run dry. However, a tank going dry during operation can strain interior surfaces so this should not be allowed to occur. During operation a minimum of 5cm (two inches) of distilled water should be in the tank. Check water bath water level frequently, add water as needed. Please note that at higher operating temperatures, or in applications where a cover is not used, more frequent water level checking is required.

Test-tube Racks

If the water bath tank boils dry while containing plastic-ware, the plastic will melt. If you intend to use test-tube racks that are wire or plastic-coated wire that may wear and expose metal, damage may occur to the tank. It is recommended that all-plastic racks be used, and that the tank never be allowed to boil dry.

TROUBLESHOOTING

Should the unit malfunction, use this section to determine the problem and resolution. Troubleshooting topics include:

- Temperature
- Mechanical
- Miscellaneous

Warning:  Troubleshooting procedures involve working with high voltages that can cause injury or death. Troubleshooting should be performed only by trained personnel.

Table 3. Temperature Troubleshooting

Problem	Possible Cause	Solution
Temperature too high	Main controller set too high	See Setting Main Temperature Control
	Main controller failed on	Call customer service.
	Wiring error	Call customer service.
Display reads "HI" or "400"+	Probe is unplugged	Call customer service.
	Probe is broken or wire to the sensor is broken.	Call customer service.
Temperature spikes over set point, then settles to set point.	Calibration issue	Recalibrate.
Temperature is too low	Over Temperature Safety is set too low.	See Setting the Overtemperature Safety Thermostat. See Setting Main Temperature Control.
	Bath temperature not recovered from water being added.	Wait for display to stop changing.
	Unit not recovered from power failure or being turned off.	Bath will need a minimum of 2 hours to warm up and stabilize.
	Element failure	Compare current draw to data plate.
	Main controller failure	Confirm with front panel lights that controller is calling for heat.
	Wiring problem	Check all functions and compare wiring to the wiring schematic, especially around any areas recently worked on.
	Loose connection	Call customer service.

Problem	Possible Cause	Solution
Display reads "LO" but heating all the time	Control failure	Call customer service.
Display reads "LO" and not heating	Sensor plugged in backwards	Call customer service.
Unit will not heat over a temperature that is below set point	N/A	Confirm that amperage and voltage match data plate.
	N/A	Confirm that set point is set high enough and that the Over Temperature Safety is not activated.
	N/	Check calibration. Using independent thermometer, follow instructions in Calibration..
	N/A	Put the cover on.
Unit will not heat up at all	N/A	Check amperage. Amperage should be virtually at maximum rated (data plate) amperage.
	N/A	Do all controller functions work? Amperage should be virtually at maximum rated (data plate) amperage.
	N/A	Set the Over Temperature Safety higher.
	N/A	Has the fuse or circuit breaker blown?
Indicated bath temperature unstable	Fluctuating by ± 0.1 ?	May be normal, especially without the use of bath cover.
	Ambient room temperature is radically changing	Temperature fluctuation due to door opening or room airflow from heaters or air conditioning. Stabilize ambient conditions.
	Calibration sensitivity	Recalibrate. Call customer service if recalibration does not resolve fluctuation.
	Bath not full	Assure that the bath is at least 1/3 full.
	Electrical noise	Remove nearby sources of RFI including motors, arcing relays or radio transmitters
	Bad connection on temperature sensor or faulty sensor	Call customer service.
Will not maintain set point	N/A	Assure that set point is at least 5 degrees over ambient room temperature.
	N/A	See if ambient is fluctuating.
Display and Reference thermometer do not match	Temperature sensor failure	Call customer service.
	Controller failure	Call customer service.
	N/A	Allow at least two hours to stabilize.
	N/A	Verify the reference thermometer is calibrated.
Can not adjust set points or calibration	N/A	Turn entire unit off and on to reset.
	N/A	If repeatedly happens, call Customer Service.

Problem	Possible Cause	Solution
Calibrated at one temperature, but not at another	N/A	This can be a normal condition when operating temperature varies widely. For maximum accuracy, calibration should be done as close to the set point temperature as possible.

Note: N/A is not available.

Table 4. Mechanical Troubleshooting

Problem	Possible Cause	Solution
Water leaking	Leak	Dry bath and check the tank with flashlight to see if leak is noticeable. Fill tank again and see if leak repeats and find source of leak. Sources may include: fittings that need tightening, crack in outlet tube, or crack in tank. Call customer service if these things are noted.
Holes or rust in water bath tank	N/A	Assure that clean, distilled water is used. Deionized water, tap water, and chemicals should never be used in the tank. USE DISTILLED WATER ONLY.
	N/A	Assure that no test sample has leaked into bath water.
	N/A	No metallic products should be in the tank with exception of the oscillation rack.

Note: N/A is not available.

Table 5. Miscellaneous Troubleshooting

Problem	Possible Cause	Solution
Controller on at all times - "locked-up"	N/A	Turn unit off and on to reset.
	N/A	If you cannot change any condition on the front panel, call customer service.
Front panel displays are all off	Unit or wall fuse/circuit breaker is blown.	Check for wire damage.
	N/A	Check wall power source.
	N/A	Compare current draw and compare to specifications on data plate.
	N/A	See what other loads are on the wall circuit.
Unit will not turn on	N/A	Check wall power source.
	N/A	Check fuse/circuit breaker on unit or in wall.
	N/A	Check all wiring connections, especially around the on/off switch.
Unit is smoking out of the box	N/A	This is not an uncommon occurrence for new units. The elements will burn off protective coatings. Run the bath in a well ventilated area at high temperature for one hour until smoke dissipates.

Note: N/A is not available.

Service

If this product should require service, contact your customer service representative.

PARTS LIST

Table 6. Parts

Description	115v.	220v.
Element – W2M/W6M (W614M-SMALL)	9570704	9570575
Element – W14M (W614M-LARGE)	9570695	9570696
Element – W20M	9570578	9570698
Fuse, 10.0 AMP	3300516	3300516
Fuse, 6.3 AMP	3300515	3300515
Gable Covers –W2M/W6M	9571183	9571183
Gable Covers – W14M	9571184	9571184
Gable Covers – W20M	9571185	9571185
Cable Covers – W614M	9571191 9571184	9571191 9571184
Microprocessor Main Temp Control	1750776	1750776
Over Temperature Safety Control	1750747	1750747
Pilot Lamp, Green	200021	200021
Pilot Lamp, Red	200020	200020
Power Cord	1800510	1800500
Power Switch	7850532	7850532
Rubber Feet w/ Screws	300091	300091
Tank Gasket	103554	103554
Tanks – W2M	104052	104052
Tanks – W6M & W614M	890058	890058
Tanks – W14M & W614M	890062	890062
Tanks – W20M	890060	890060
Tanks – W2M PC Models	7930515	7930515
Tanks – W6M PC & W614 PC Models	7930503	7930503
Tanks – W14M PC & W614 PC Models	7930501	7930501
Tanks – W20M PC Models	7930502	7930502

UNIT SPECIFICATIONS

Table 7. Weight

Model	Shipping	Net
W2M	21 lbs.	14 lbs
W6M	21 lbs.	14 lbs
W14M	26.5 lbs.	18 lbs.
W20M	29 lbs.	25 lbs.
W614M	42 lbs.	39 lbs.

Table 8. Dimensions

Model	Exterior WxDxH	Interior WxDxH
W2M	14.75x12.25x12.1	11.8 x 5.8 x 2.5
W6M	14.75x12.25x12.1	11.8 x 5.8 x 6
W14M	14.75x19x12.1	11.8 x 12.8 x 6
W20M	14.75x25x12.1	11.5 x 19.5 x 6
W614M	14.75x12.25x12.1 (small) 14.75x19x12.1 (large)	11.8x5.8x6 (small) 11.8x12.8x6 (large)

Table 9. Capacity

Model	Liters/Fill Line	Liters/Flush
W2M	1.6	2.4
W6M	4.7	5.75
W14M	11.225	14.75
W20M	14	17
W614M	4.7 (small tank) 11.225 (large tank)	5.75 (small tank) 14.75 (large tank)

Table 10. Temperature

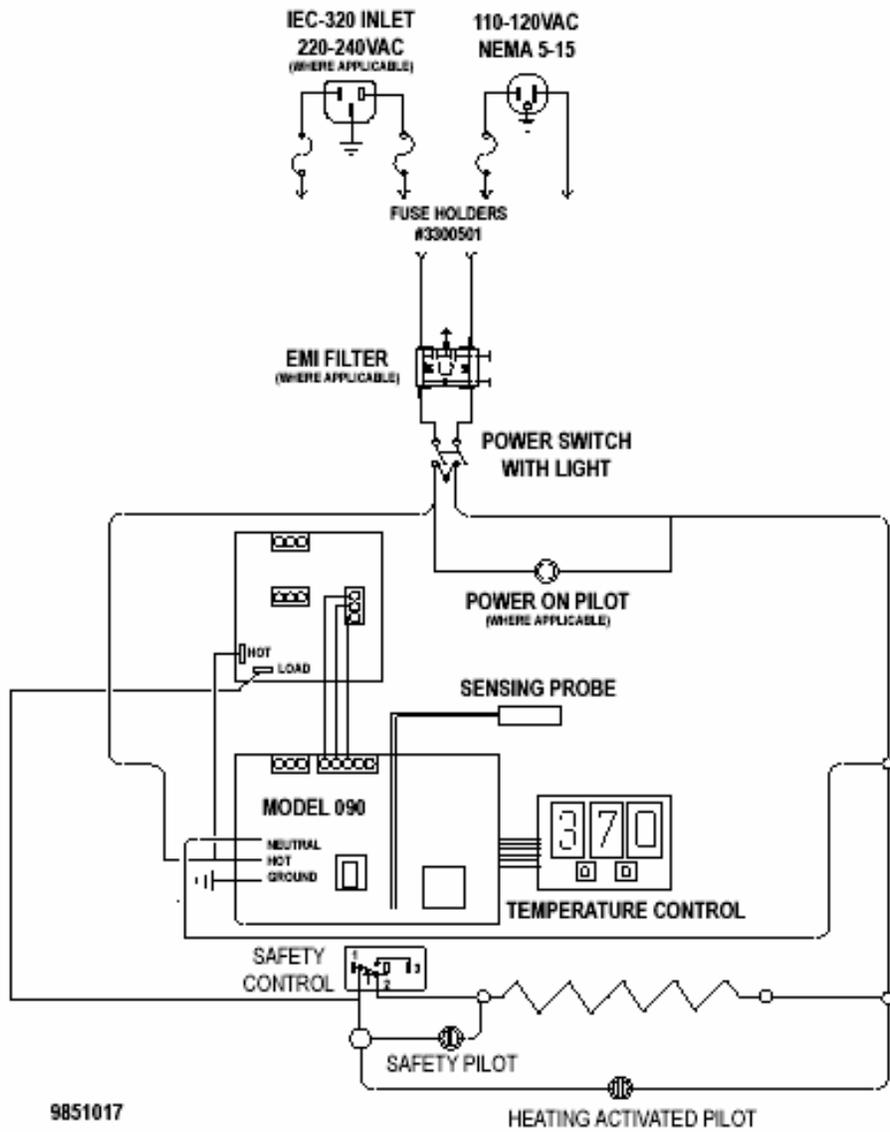
Model	Range	Uniformity	Sensitivity
W2M	Amb. +5°C to 80.0	+2°C @ 37°C	+ .07°C
W6M	Amb. +5°C to 80.0	+2°C @ 37°C	+ .07°C
W14M	Amb. +5°C to 80.0	+2°C @ 37°C	+ .07°C
W20M	Amb. +5°C to 80.0	+2°C @ 37°C	+ .07°C
W614M	Amb. +5°C to 80.0	+2°C @ 37°C	+ .07°C

Table 11. Power Requirements

Model	Voltage	Voltage -2 Models
W2M	Volts 110-120 V~ 3 A 50/60 Hz	Volts 208-240 V~ 2 A 50/60 Hz
W6M	Volts 110-120 V~ 3 A 50/60 Hz	Volts 208-240 V~ 2 A 50/60 Hz
W14M	Volts 110-120 V~ 5 A 50/60 Hz	Volts 208-240 V~ 3 A 50/60 Hz
W20M	Volts 110-120 V~ 5 A 50/60 Hz	Volts 208-240 V~ 3.5 A 50/60 Hz
W614M	Volts 110-120 V~ 8 A 50/60 Hz	Volts 208-240 V~ 4.5 A 50/60 Hz

SCHEMATICS

WIRE DIAGRAM
W2M, W6M, W14M, W20M



WIRING DIAGRAM

W614M

