



**Fisher Scientific**

**Isotemp**

Fisher Scientific Isotemp  
Economy Water Baths  
Installation and Operation Manual

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**103412 (7002200) Rev. 5**

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<b>Models covered in this manual</b>			
<b>Catalog Number</b>	<b>Model Number</b>	<b>Specific Information</b>	<b>Voltage</b>
15-460-2Q (2228)	102	2L	120V
15-460-3Q (2235)		2L	230V
15-460-2SQ (2230)		2L	120V
15-460-3SQ (2236)		2L	230V
15-460-5Q (2239)	105	5L	120V
15-460-6Q (2240)		5L	230V
15-460-10Q (2223)	110	10L	120V
15-460-11Q (2224)		10L	230V
15-460-15Q (2226)	115	5L/10L, dual chamber	120V
15-460-16Q (2227)		5L/10L, dual chamber	230V
15-460-20Q (2231)	120	20L	120V
15-460-21Q (2232)		20L	230V
15-460-28Q (2233)	128	28L	120V
15-460-29Q (2234)		28L	230V

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5	31076	2/11/15	Added kerosene note	ccs
4	30931	4/9/14	Updated lids and hinges for the 5 liter baths in the Parts List (pg 7-2)	ccs
3	29436	4/7/14	Added Safety Specs to Section 3	ccs
2	30371/BA-816	10/3/13	Removed discontinued models from model lists	ccs
1	29544/29545	2/20/13	Added "Indoor use only" to Specifications	ccs
0	--	4/29/10	Transfer to Marietta (was 103412 11/2/09)	ccs
<b>REV</b>	<b>ECR/ECN</b>	<b>DATE</b>	<b>DESCRIPTION</b>	<b>By</b>



**Important** Read this instruction manual. Failure to read, understand and follow the instructions in this manual may result in damage to the unit, injury to operating personnel, and poor equipment performance. ▲

**Caution** All internal adjustments and maintenance must be performed by qualified service personnel. ▲

Material in this manual is for information purposes only. The contents and the product it describes are subject to change without notice. Fisher Scientific makes no representations or warranties with respect to this manual. In no event shall Fisher Scientific be held liable for any damages, direct or incidental, arising out of or related to the use of this manual.

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Important operating and/or maintenance instructions. Read the accompanying text carefully.



Potential electrical hazards. Only qualified persons should perform procedures associated with this symbol.



Equipment being maintained or serviced must be turned off and locked off to prevent possible injury.



Hot surface(s) present which may cause burns to unprotected skin, or to materials which may be damaged by elevated temperatures.



Marking of electrical and electronic equipment, which applies to electrical and electronic equipment falling under the Directive 2002/96/EC (WEEE) and the equipment that has been put on the market after 13 August 2005.



This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96/EC. It is marked with the WEEE symbol. Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State European Country, and this product should be disposed of or recycled through them. Further information on Fisher Scientific's compliance with this directive, the recyclers in your country and information on these products will be available at [www.fishersci.com](http://www.fishersci.com).

- ✓ Always use the proper protective equipment (clothing, gloves, goggles, etc.)
- ✓ Always dissipate extreme cold or heat and wear protective clothing.
- ✓ Always follow good hygiene practices.
- ✓ Each individual is responsible for his or her own safety.

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When more extensive service is necessary, we will assist you with direct factory trained technicians or a qualified service organization for on-the-spot repair. If your service need is covered by the Fisher Scientific Products warranty, we will arrange for the unit to be repaired at our expense and to your satisfaction.

Regardless of your needs, professional service technicians are available by telephone to assist you concerning our products Monday through Friday from 8:00 a.m. to 6:00 p.m. Eastern Time. Please call or fax us at:

1-800-766-7000  
1-800-926-1166

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International customers, please contact your local Fisher Scientific distributor.

# Table of Contents

<b>Section 1</b>	<b>Introduction</b> .....	<b>1-1</b>
<b>Section 2</b>	<b>Safety Information</b> .....	<b>2-1</b>
<b>Section 3</b>	<b>Specifications</b> .....	<b>3-1</b>
<b>Section 4</b>	<b>Unpacking and Installation</b> .....	<b>4-1</b>
	Assembly and Installation .....	4-2
	Filling the Unit .....	4-3
	Controls and Indicators .....	4-4
<b>Section 5</b>	<b>Operation</b> .....	<b>5-1</b>
	Power Up .....	5-1
	Setting the Temperature Control .....	5-1
	Setting the Limit Control .....	5-2
	Procedure 2 .....	5-2
	Procedure 1 .....	5-2
	Emptying and Cleaning the Unit .....	5-3
<b>Section 6</b>	<b>Troubleshooting</b> .....	<b>6-1</b>
<b>Section 7</b>	<b>Replacement Parts</b> .....	<b>7-1</b>
<b>Section 8</b>	<b>Schematic</b> .....	<b>8-1</b>



# Section 1 Introduction

Congratulations on the purchase of your new Fisher Scientific Isotemp Economy Water Bath.

Isotemp Water Baths offer the versatility needed to handle virtually any clinical laboratory procedure - incubation, inactivation, agglutination - as well as most serological, pharmaceutical, biomedical, and industrial procedures.

These water baths are available with chamber capacities of 2, 5, 10, 20, and 28 liters. The 2 liter unit is available configured with either a standard or shallow chamber. Also, a dual chamber unit is available with 5 and 10 liter chambers, with independent controls for each. All units are available in either 120 or 230 volt models.

The baths work equally well with water or bath oil as the medium. Most models offer the same temperature ranges: ambient to 75°C without the supplied cover, and ambient to 100°C with the cover in place. The temperature range for Model 102 extends from ambient to 85°C without the cover, while the range for Model 102S is from ambient to 70°C.

Bath temperatures are controlled by a hydraulic thermostat for reliable, trouble-free operation. Dual thermostats - one controlling the set point temperature and the other operating as a temperature limiting - reduce the possibility of overheating. Although not designed to operate dry, the bath will not be damaged if it is allowed to run dry.

An energy-saving removable cover helps to reduce evaporation while helping to maintain a uniform, constant temperature. The cover also allows the water bath to reach higher temperatures. The hinged, see-through gable cover features unique “fins” that keep hands away from hot vapors for easier, safer opening. The cover stays open at the 90° position or, because of its quick-attach hinge, can be lifted off completely to accommodate large glassware.

All controls are conveniently located on the front panel for easy access. The water bath features corrosion resistant construction throughout to withstand the rigors of daily lab use. A plastic rim remains cool to the touch even when operating the bath at maximum temperature.





## Section 2 Safety Information



To avoid electrical shock, always:

- Connect the water bath to a properly grounded electrical outlet of the correct voltage and current handling capacity. Check the nameplate on the back of the unit for the voltage and current rating.
- Disconnect the unit from the power outlet prior to maintenance and servicing. **Note** 230V units have double pole, neutral fusing.



To avoid personal injury and property damage:

- Do not use in the presence of flammable or combustible materials; fire or explosion may result. This device contains components which may ignite such materials.
- Do not remove or modify the grounded power plug. Use only properly grounded outlets to avoid a shock hazard. This unit is not rated for use in hazardous atmospheres.
- Do not continue to use the bath if the Temperature Control fails (amber indicator cycling on and off) or if the Limit Control fails (amber indicator will not light even if Limit Control is turned fully counterclockwise).
- Select a fluid that is not corrosive and is not flammable. The following fluids are not recommended and may damage the unit:
  - Chlorides or bleach.
  - Strong concentrations of any acid.
  - Strong concentrations of any salt.
  - Weak concentrations of hydrochloric acid, hydrofluoric acid, hydrobromic acid, hydroiodic acid, sulfuric acid, or chromic acid.
  - Weak salt solutions containing sodium chloride, calcium chloride, chromate or chromium compounds.
  - Most photographic solutions.
  - High Purity water (deionized water >1M ohm)



**To avoid personal injury and property damage (continued):**

- Do not use a flammable liquid. A fire hazard may result. This unit is not explosion proof. Unit contains components which may ignite such materials.
- Use appropriate hand and eye protection when handling hazardous chemicals.
- The interior of the unit can reach temperatures that can cause burns. Avoid contact. The unit can remain hot without visual indication for some time after power is turned off.
- If the water bath is to be used with any liquid that will give off fumes, be sure to operate the water bath in a fume hood or with proper ventilation.
- Use the cover to reduce evaporation and to permit reaching higher temperatures.
- Hot liquids pose a burn hazard. Be careful not to reach into the bath when it contains hot liquids. Also be careful of steam rising from hot liquids.
- The unit is intended to be operated with liquid in the chamber. However, it will not be damaged if it temporarily runs dry.
- Do not use in highly corrosive atmospheres; corrosive fumes and spillage may damage the unit and its internal components, creating a shock hazard.
- Fumes from acidic solutions cause corrosion of the stainless steel reservoir. Care should be taken to maintain a neutral pH at all times.
- Refer servicing to qualified personnel.
- Do not place containers directly on bottom of chamber. The bottom can get extremely hot if no liquid is in the chamber. Always use the diffuser tray.
- The thermometer contains kerosene and is not expected to be a health hazard in the normal intended use of the thermometer.

## Section 3 Specifications

These are nominal specifications. Fisher Scientific reserves the right to change specifications or designs at any time without incurring obligation.

Temperature range .....  
Cover Open: Ambient to 75°C (model 102 to 85°C, model 102S to 70°C)  
Cover closed: ..... Ambient to 100°C  
Uniformity ..... ±0.2°C at 37°C  
..... ±0.5°C at 37°C (shallow pan)  
Stability ..... ±0.2°C at 37°C (with cover)

### Safety Specifications

Indoor use only  
Altitude ..... up to 2000 meters  
Ambient Temperature ..... 0°C to 40°C  
Ambient Humidity ..... 0 - 95% non-condensing  
Voltage Requirements 120VAC or 230VAC nominal  
Voltage Fluctuations ..... ±10% of nominal voltage  
Installation Category II  
Pollution Degree 2

### Certification

Declaration of Conformity is available from the factory

**Section 3**  
Specifications

<b>Catalog Number</b>	<b>Model Number</b>	<b>Specific Information</b>	<b>Voltage</b>
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15-460-28Q (2233)	128	28L	120V
15-460-29Q (2234)		28L	230V

## Section 4 Unpacking and Installation

The water bath is shipped in a single carton. When unpacking the unit, check each loose item against the packing list below. Should a shortage exist, notify your Fisher Scientific distributor, identifying the part by name and catalog number.

**Note** If there is shipping damage, keep entire shipment intact - retaining the carton and all packing material - and file a claim with the final carrier. Usually the firm will send an investigator to ascertain liability. ▲

Packing List	
Qty	Item Supplied
1	Water Bath
1	Cover Assembly
1	Diffuser Tray
1	Thermometer Clip and Grommet
1	Thermometer (120 V only. Not included with 230 V units)
1	Instructions

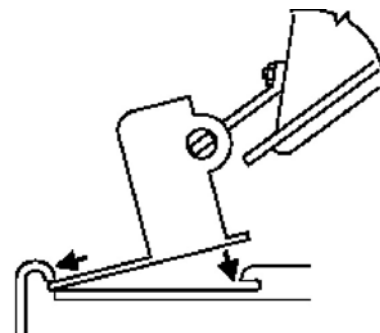
**Note** The thermometer contains kerosene and is not expected to be a health hazard in the normal intended use of the thermometer.

## Assembly and Installation

Follow these steps to assemble and install the water bath before operation:

1. The location must:
  - Be indoors.
  - Provide an adequate source of power. Check the label on the back of the unit for voltage and current requirements.
  - Provide adequate clearance to insert samples.
  - Be level, fixed, and capable of supporting the weight of the unit when filled with liquid and samples.
  - Be free of drafts and wide ambient temperature variations such as near a heater or air conditioning vents.
  - Provide a fume hood if hazardous fumes are anticipated when using the water bath.
  - Be convenient to a sink for filling and draining the water bath.

2. Install the cover by inserting the hinge into the lip at the rear of the bath. Angle the cover up while pushing down to lock the hinge in place under the stainless steel tank lip. Remove the cover by lifting the lid and pushing the hinge towards the back to release it from under the tank lip. Covers on the 2 liter shallow, 5 liter, and 10 liter model baths can also be installed and removed by sliding the hinge into place under the rim and tank lips from either side.



3. Connect the line cord to a suitable grounded electrical outlet.

## Filling the Unit

Follow these steps to fill the unit in preparation for use:

1. Fill the water bath with distilled water or oil so that the liquid level is approximately 1½ inches ( $\frac{3}{4}$  inch with 2 liter shallow model) from the top of the tank when full anticipated load is placed in bath.

For best operation of the equipment, fill the unit with sterilized distilled water or equivalent. The acceptable resistivity range is 50K to 1M ohms (conductivity 1 to 20 micro Siemens).

2. If a thermometer is used, use the clip provided to hold the thermometer to the side of the bath. Slide the O-ring on the thermometer to position the thermometer to the proper depth.
3. When closing the cover, place the thermometer along the front edge. A notch along the front of the cover clears the thermometer and clip with the cover closed.
4. For optimum results, the same fluid level should be maintained throughout the operating period.
5. If using water, algicide may be added to reduce algae formation. Follow the instructions supplied with the algicide.

**Note** If the bath has been used previously, the tank should be thoroughly cleaned before refilling. ▲

**Caution** Using chlorinated tap water or additives that contain chlorine will void the manufacturer warranty. Similarly, high purity (deionized) water that does not fall within a resistivity range of 50K to 1M ohm will void the manufacturer warranty. If you should have any questions, please contact Technical Services. ▲

**Note** Deionized water is not recommended and may cause rusting and pitting in the reservoir. ▲



## **Controls and Indicators**

All controls and indicators are located on the front panel for ease of operation.

### **Power:**

Controls line power to unit. Set to 1 position to turn on power, 0 position to turn off power.

### **Temperature Control:**

Serves as the primary temperature control for the bath. Turns the heater on or off to maintain the bath at the set temperature.

### **Limit Control:**

Sets the backup temperature to the primary setpoint; should be set at a slightly higher temperature than the Temperature Control setpoint to give safety control in the event that the primary control fails.

### **Temperature Control Indicator:**

The green indicator illuminates to show when heat is being supplied to the chamber; cycles on and off as heat is requested by the controller.

### **Limit Control Indicator:**

The amber indicator illuminates to show the the Limit Control is regulating the temperature rather than the primary Temperature Control.

**Note** If the bath has been used previously, the tank should be thoroughly cleaned before refilling. ▲

**Note** The water bath, full of water (within 1-1.5" of top of tank), with lid, is designed to reach 37°C in less than 60 minutes or 90°C in less than 180 minutes. ▲

## Section 5 Operation

Follow these procedures for the operation of the unit.

- Power up and initial indication.
- Setting the temperature control.
- Setting the limit control.
- Emptying and cleaning the unit.

### Power Up

Follow these steps to turn On the unit to prepare it for use:

1. With the unit connected to an appropriate power source, set the power switch to the ON position.
2. The green indicator will illuminate when the unit is applying heat to the bath. This indicator will cycle on and off during normal operation.

### Setting the Temperature Control

Follow these steps to set the Temperature Control so that it maintains the desired temperature.

1. Turn Limit Control knob fully clockwise.
2. Turn the Temperature Control to a setting which approximates the desired temperature. Measure the bath temperature with the supplied thermometer or other temperature measuring device. Allow the bath temperature to stabilize, then readjust the control knob as necessary to achieve the proper temperature.
3. Set the Limit Control according to the procedure below.

**Note** The safety control is not as accurate a control as digital control. ▲

**Note** The thermometer contains kerosene and is not expected to be a health hazard in the normal intended use of the thermometer. ▲

## Setting the Limit Control

Proper setting of the Limit Control is important. **The Limit Control must be set far enough above the control temperature such that it does not operate unless the Temperature Control malfunctions. Wide temperature swings are an indication that the two controls are set too close.**

There are two methods that can be used to set the Limit Control. Follow the steps in **either** Procedure 1 or Procedure 2 to set the bath's Limit Control.

### Procedure 1

(Use either Procedure 1 or 2)

1. After the bath has stabilized at the desired set point temperature, note the cycling of the heater as indicated by the green lamp.
2. Note the length of time that the green lamp is lit. Depending upon set point and ambient temperature, the lamp will cycle on for a few seconds and then off for a period of time.
3. While the green lamp is lit, rotate the Limit Control knob counter-clockwise until the amber lamp illuminates (the green lamp will turn off), then quickly clockwise again until the amber lamp turns off (the green lamp will come back on).
4. Observe a few cycles of the green lamp. If the yellow lamp illuminates, turn the Limit Control knob clockwise until the unit cycles without the yellow lamp lighting.

### Procedure 2

(Use either Procedure 2 or 1)

1. Using the Temperature Control setting instructions above, set the water bath 1 to 5° above desired control temperature.
2. Wait until the bath temperature stabilizes.
3. Turn the Limit Control knob counterclockwise and listen for the click of the control. Turn the knob clockwise and slowly listen for the click. Repeat this step as necessary each adjustment being less than the last one.
4. Once a narrow band is established in Step 3, turn the Temperature Control up to call for a higher temperature (heater on, green lamp on). The amber lamp will turn on when the limit open turning off the heater.
5. Without adjusting the Limit Control, set the Temperature Control to the desired temperature below the limit control.

## Procedure 2 (continued))

6. Check that the amber lamp does not illuminate during the control mode. If it does the Limit Control is set too close to the Temperature Control. Start back at Step 1 to reset the Limit Control.

**Note** The amber limit lamp has no power to illuminate when the temperature control is not calling for heat (green lamp off). The green lamp goes off when the amber lamp is on. ▲

## Emptying and Cleaning the Unit

Please be advised that stainless steel can and will rust if not regularly cleaned and properly maintained. It is recommended that the bath be cleaned at least on a monthly basis for moderate to heavy-use installations. Follow these steps to empty and clean the unit after using it.

**Note** While cleaning the chamber, be careful not to bend the temperature control capillary tube which is located along the bottom of the bath chamber. ▲

1. Turn off power, unplug the unit, and allow to cool completely.
2. If you have a water bath of 2 or 5 liter capacity, pour the liquid from the unit into an appropriate disposal container.
3. If you have a larger size water bath, allow the unit to cool and pump or siphon to empty the unit into an appropriate disposal container.
4. Remove the diffuser tray from the bottom of the bath chamber.
5. Clean the inside of the water bath with mild detergent (such as Joy dishwashing detergent) and warm water. Do not scrub any surface with steel wool. (Steel wool leaves small metal particles behind that will rust, causing the pan to look rusty). In instances where a heavy coating of residue has accumulated inside the tank or where there is evidence that corrosion is beginning, the use of a stainless steel cleaner (such as 3M Stainless Steel Cleaner and Polish) is recommended.
6. Rinse and wipe all tank surfaces with distilled water. The bath is now ready for use.

**Note** If Alarm Light comes on during normal cycling, turn backup controller knob slightly clockwise and monitor. (If backup and digital controls overlap, the bath will have a wider temperature control band.) ▲



## Section 6 Troubleshooting

If you have problems using the unit, follow these general procedures to track down the cause from the symptoms you are experiencing. If an error message appears on the display, refer to the specific error in this chart.

If the problem is not resolved using the table below, contact Technical Services.

Problem	Possible Cause
No power indication	Unit not plugged in; no power at the outlet; incorrect power (make sure outlet matches label on back of unit); defective power cord; defective power switch or fuse(s) (call Technical Services).
No heating	Temperature of Limit Control not set properly; defective heater or control. Check settings.
Always heating;	Check settings. Defective Temperature Control temperature greater than setpoint (call Technical Services)
Very slow heating of samples	Empty tank or extremely low liquid level in tank (add liquid to tank to improve heating).
Unit heating up slower than normal	Defective Temperature Control (call Technical Support).
Amber Limit Control Indicator on constantly	Temperature or Limit Control not set properly; defective Temperature Control. Check settings.
Display not correct	Temperature F or C set in error; temperature not calibrated (perform calibration procedure with thermometer); defective controller (call Technical Services).



## Section 7 Replacement Parts

**Warning** To avoid electrical shock, always disconnect from power supply before maintenance and servicing. Refer servicing to qualified personnel. ▲

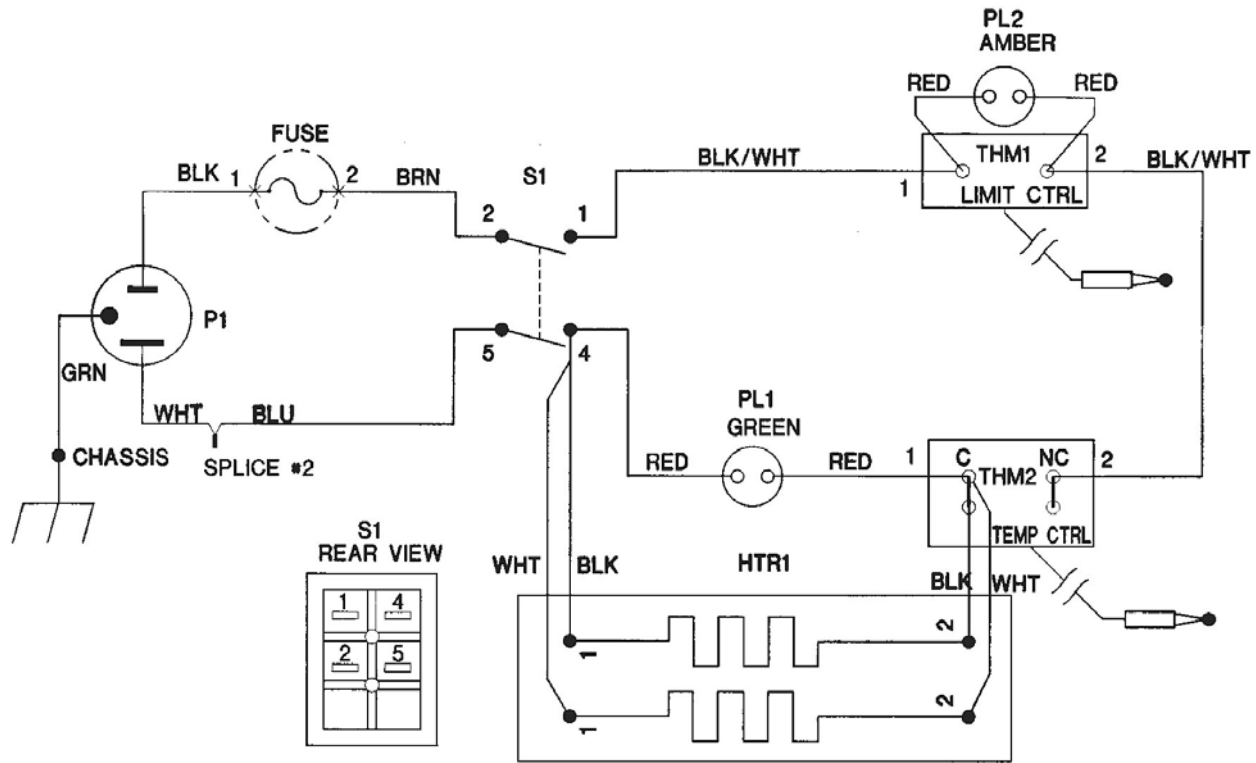
Item		Part No.
Cover, 2 liter	Plastic Lid	102304
	Stainless Steel Lid	1546232Q
Cover, 2 liter shallow	Plastic Lid	107649
	Stainless Steel Lid	1546233Q
Cover, 5 liter	Plastic Lid	107649
	Stainless Steel Lid	CVM1598X1
Cover, 10 liter	Plastic Lid	102306
	Stainless Steel Lid	1546234Q
Cover, 20 and 28 liter	Plastic Lid	102307
	Stainless Steel Lid	1546235Q

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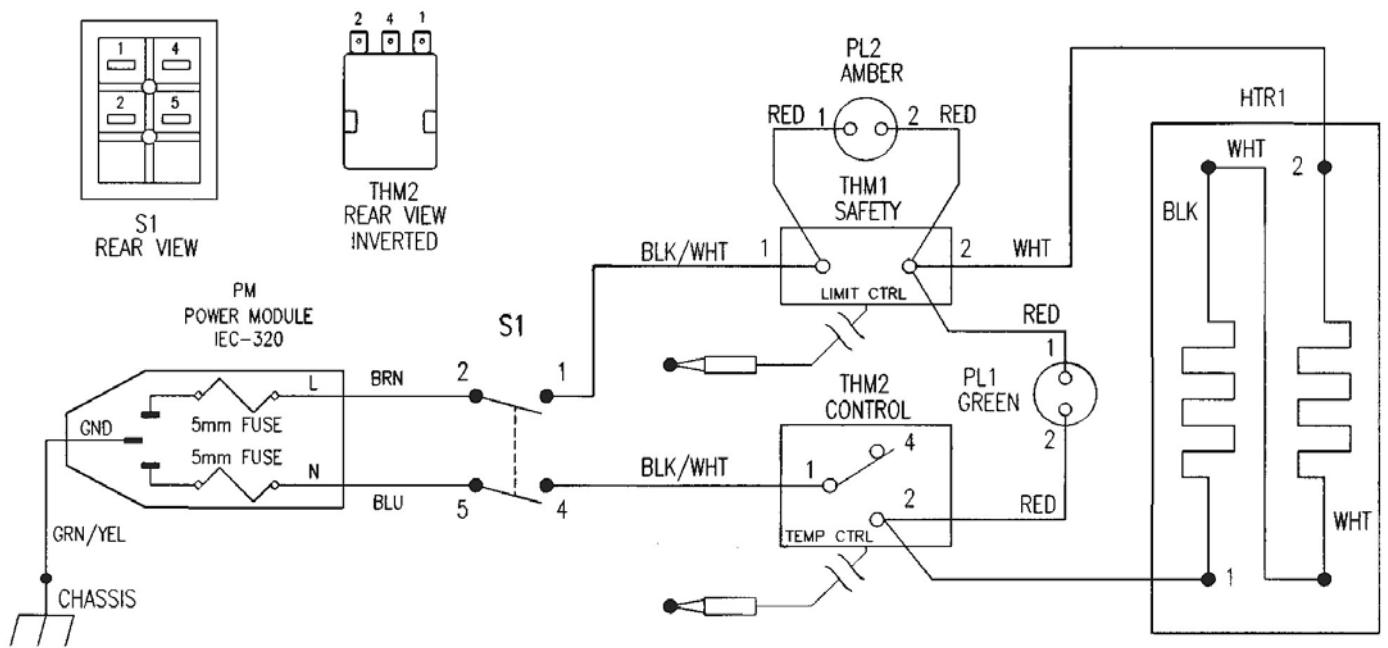


**Section 7**  
Replacement Parts

<b>Item</b>		<b>Part No.</b>
Hinge, lid (for 2 liter)		102383
Hinge, rim (for 2 liter)		102384
Hinge, lid (2 liter shallow & 5 liter)	Plastic Lid	102386
	Stainless Steel Lid	106702
Hinge, lid (for 10, 20, & 28 liter)		102386
Hinge, rim (5L, 28L and Dual Models)		102387
Hinge, rim (for 10 & 20 liter)		102459
Hinge, rim (for 2 liter shallow)		HGMX1
Clip, thermometer (for 2L shallow)		102423
Clip, thermometer (all except 2LS)		102424
Pump, Siphon		102391
Control Thermostat (THM2)	120V	103394
	230V	103521
Safety Thermostat (THM1)		102499
Thermometer		103414FS
Diffuser Tray, 2 liter		103410
Diffuser Tray, 10 liter		102354
Diffuser Tray, 20 or 28 liter		102355
Fuse, Type 3AG 1.25x.25, 10 Amp		45920-DB
Fuse, 5x20mm, F5A, 250V		102487
Power Switch (S1)		102627



**Schematic for 120V Units**



**Schematic for 230V Units**





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