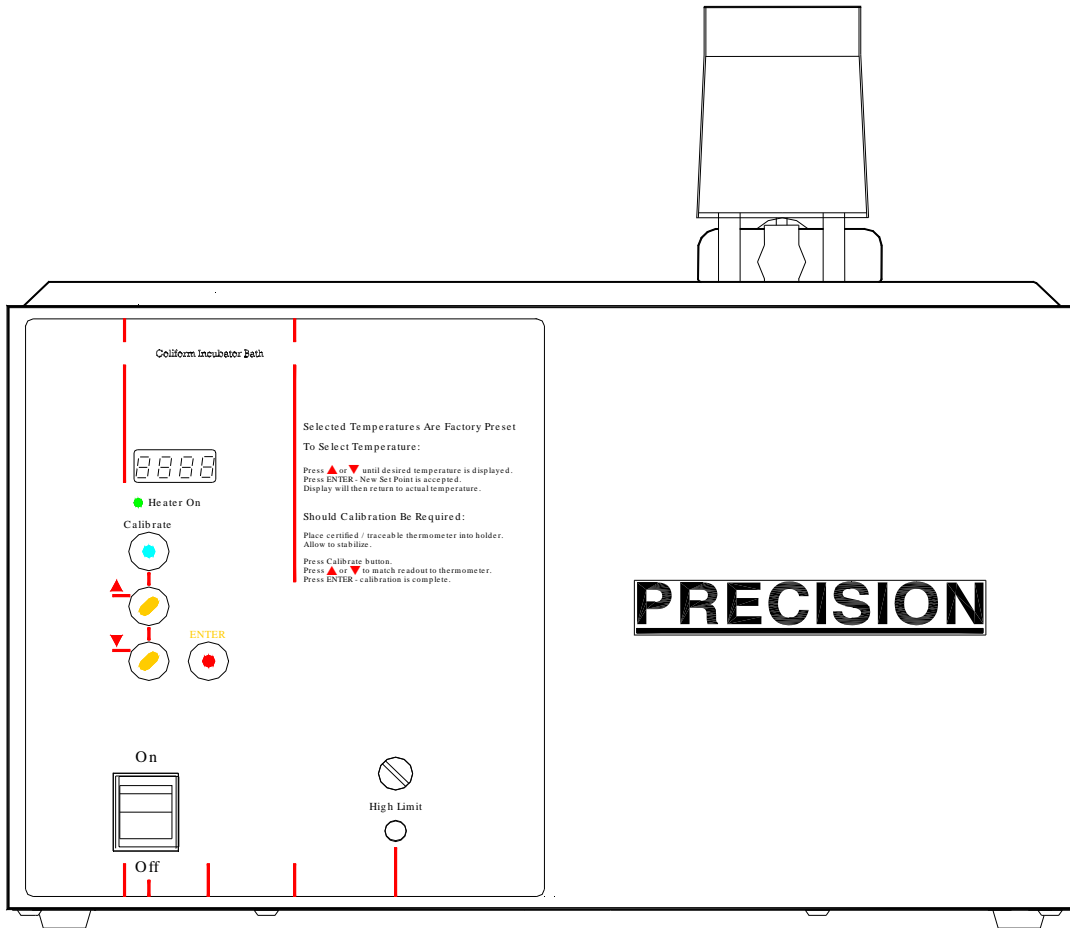


Installation/Service Manual Coliform Incubator Bath Model 2860/2861 (251)



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Manual P/N 3177875
Rev. F Dated 06APR09

Thermo
SCIENTIFIC

NOTE:

THE 230V UNITS DESCRIBED IN THIS MANUAL WERE DESIGNED SPECIFICALLY FOR THE EUROPEAN MARKET AND ARE SUPPLIED WITH A EUROPEAN STYLE POWER CORD. FOR DOMESTIC USE, A U.S. STYLE POWER CORD (P/N: 3176836) MUST BE ORDERED SEPARATELY.

NOTICE

THE MATERIAL IN THIS MANUAL IS FOR INFORMATION PURPOSES ONLY. THE CONTENTS AND THE PRODUCT IT DESCRIBES ARE SUBJECT TO CHANGE WITHOUT NOTICE. THERMO SCIENTIFIC MAKES NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THIS MANUAL. IN NO EVENT SHALL THERMO BE LIABLE FOR ANY DAMAGES, DIRECT OR INCIDENTAL, ARISING OUT OF OR RELATED TO THE USE OF THIS MANUAL.

For repair information or replacement parts assistance from the manufacturer, call Technical Services using our toll free telephone number.

800-438-4851
(FAX) 740-373-4189

REVISION STATUS

INDEX	DATE	AMENDED PAGES	NOTES
A	6/99		Initial release
B	NOV01	5	Add caution "acidic & caustic substance"
C	APR05	36100110 (34001605)	new manuals #, manufacture location
D	JUN06	ECR23443 & 23496	consolidated with 3177691 230V, removed CE symbol and declaration
E	SEPT08	ECR24808	Revised water specifications
F	APR09	ECR25448/BA-670	Added UL required info

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1. INTRODUCTION

1.01 Your satisfaction and safety are important to Thermo and a complete understanding of this unit is necessary to attain these objectives.

1.02 As the user of this apparatus, you have the responsibility to understand the proper function and operational characteristics of your bath. This instruction manual should be thoroughly read and all operators given adequate training before attempting to place this unit in service. Awareness of the stated cautions and warnings, and compliance with recommended operating parameters -- together with maintenance requirements -- are important for safe and satisfactory operation. The unit should be used for its intended application; alterations or modifications will **VOID THE WARRANTY.**

WARNING

As a routine laboratory precaution, always wear safety glasses when working with this apparatus.

CAUTION

The benchtop must be rigid and strong enough to comfortably support the weight of the unit when filled with water.

1.03 This product is not intended, nor can it be used, as a sterile or patient connected device. In addition, this apparatus is not designed for use in Class I, II or III locations as defined by the National Electrical Code.

2. UNPACKING AND DAMAGE

2.01 Save all packing material until unit is put into service. This merchandise was carefully packed and thoroughly inspected before leaving our factory.

2.02 Responsibility for safe delivery was assumed by the carrier upon acceptance of the shipment; therefore, claims for loss or damage sustained in transit must be made upon the carrier by the recipient as follows:

1. **Visible Loss or Damage:** Note any external evidence of loss or damage on the freight bill, or express receipt, and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusing to honor your damage claim. The form required to file such claim will be supplied by the carrier.

2. **Concealed Loss or Damage:** Concealed loss or damage means loss or damage which does not become apparent until the merchandise has been unpacked and inspected. Should either occur, make a written request for inspection by carrier's agent within fifteen (15) days of the delivery date; then file a claim with the carrier since the damage is the carrier's responsibility.

2.03 If you follow the above instructions carefully, we will guarantee our full support of your claim to be compensated for loss or concealed damage.

DO NOT — FOR ANY REASON — RETURN THIS UNIT WITHOUT FIRST OBTAINING AUTHORIZATION. In any correspondence to Thermo, please supply the nameplate data, including catalog number and serial number.

3. GENERAL INFORMATION

3.01 The Precision Coliform Incubator Bath is a special purpose bath designed for two specific tests.

1. Determination of fecal coliform content of water or sewage samples by incubation at 35.0°, 41.5°, or 44.5°C with uniformity of ±0.2°C, as specified by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Pollution Control Federation (WPCF) in "Standard Methods for the Examination of Water and Wastewater", 13th edition (1971), by either the membrane filter methods, MPN method, or defined substrate technology (DST).
2. Determination of E. coli content of food samples by incubation at 45.5°C, with uniformity of ± 0.2°C, as specified by the AOAC in "Official Methods of Analysis of the AOAC", 11th edition (1970)

3.02 The four user-selectable operating temperatures have been factory preset and are precisely maintained by the microprocessor controller. The centrifugal circulating pump runs at a constant speed as soon as the bath is turned on. A safety hydraulic thermostat is included as an over-temperature protection device.

CAUTION

TO AVOID BUILD-UP OF MINERAL DEPOSITS AND TO PREVENT CORROSION, USE ONLY DISTILLED WATER IN THE BATH.

WARNING

USING CHLORINATED TAP WATER OR ADDITIVES THAT CONTAIN CHLORINE WILL VOID THE MANUFACTURER'S WARRANTY. SIMILARLY, HIGH PURITY (DEIONIZED) WATER THAT DOES NOT FALL WITH IN RESISTIVITY RANGE OF 50K TO 1M OHM AND PH RANGE OF 7 TO 9 WILL ALSO VOID THE WARRANTY. CONTACT TECHNICAL SERVICES WITH ANY QUESTIONS.

3.03 The proportional integral temperature control coupled with circulation provided by the centrifugal pump allows precise temperature control, (factory precalibrated) when used in conjunction with the supplied gable cover. The gable cover helps the bath hold maximum stability and reduces water loss by evaporation.

CAUTION

AS WATER BATHS ARE OPERATED, ESPECIALLY AT HIGHER TEMPERATURES, CONDENSATION FORMS ON THE UNDERSIDE OF THE GABLE COVER. THE AMOUNT OF CONDENSATION CAN BE CONSIDERABLE. CARE SHOULD BE EXERCISED WHEN REMOVING THE COVER SO THAT WATER WILL FALL BACK INTO THE BATH CHAMBER, AND NOT ON THE BATH SURFACE. THE COVER SHOULD BE PLACED UPSIDE DOWN WHEN REMOVED TO MAINTAIN A DRY WORK AREA.

Table 1. Listing of Models included in this Manual

Cat. No.	Volts	Watts	Amps	Hertz	Max. BTU/Hr	Power Supply Board Fuse	Mains Fuse
3166676	120	665	5.8	50/60	2268	N/A	N/A
3166677	240	665	2.9	50/60	2268	FST6.3x32-63mA	FST5x20-3.15A

3.04 The interior of the bath is constructed of stainless steel and is designed for operation with distilled water or water solutions, such as water/ethylene glycol with a corrosion inhibitor added. The body is made from galvanized steel and is painted for added protection. A stainless steel gable cover is also provided with the bath.

3.05 The 230-volt units are identical in appearance to the 120 volt units.

4. PERFORMANCE DATA

4.01 The following table identifies the specifications for the Coliform Incubator Bath.

Technical Specifications

Temperature Settings (factory preset)

35 °C

41.5 °C

44.5 °C

45.5 °C

Sensitivity (cover on)

0.1°C

Uniformity (cover on)

± 0.2°C

Chamber Size

Length 14 inches (35 cm.)

Width 12 inches (30 cm.)

Height 8 inches (20 cm.)

Capacity (1.5" from top) -
4.8 gallons (19.3L.)

5. INSTALLATION

WARNING

INSTALLATION SHOULD BE COMPLETED ONLY BY QUALIFIED PERSONNEL.

5.01 Location - The most uniform operating conditions will be obtained by placing the bath on a level surface in an area remote from drafts, ventilating outlets, radiators, and other rapidly changing ambient conditions.

Environmental Conditions-

This instrument is designed to operate safely under the following conditions:

- Indoor Use Only
- Temperature: 5° to 40° C
- Maximum Relative Humidity: 80% for temperatures to 22°C
- Maximum Altitude 2000 meters

Maximum performance is assured across the following temperature range:

- 15°C to 45°C

5.02 Electrical Connections -

IMPORTANT

FOR PERSONAL SAFETY, THIS APPARATUS MUST BE PROPERLY GROUNDED.

1. The power cord provided on this unit is equipped with a three-prong (grounding) plug which mates with standard three-prong grounding wall receptacle to minimize the possibility of electric shock hazard from this apparatus. If in doubt the user should have the wall receptacle and circuit checked by a qualified electrician to make sure the receptacle can provide adequate current and is properly grounded.

2. Where a standard two-prong wall receptacle is encountered, it is the personal responsibility and obligation of the user to have it replaced with a properly grounded three-prong wall receptacle. ***Do not, under any circumstances, cut or remove the third (ground) prong from the power cord. Do not use a two-prong adapter plug.***

5.03 Determine the total amount of current being used by other apparatus connected to the circuit that will be used for this apparatus. It is critical that the added current demand (see nameplate) of this and other equipment used on the same circuit does not exceed the rating of the fuse or circuit breaker.

CAUTION

-BE SURE THAT THE POWER SUPPLY IS OF THE SAME VOLTAGE AS THAT SPECIFIED ON THE NAMEPLATE.

-BE SURE THAT THE WALL RECEPTACLE (MAINS DISCONNECT) IS READILY IDENTIFIABLE AND EASILY REACHED TO DISCONNECT THE UNIT FROM THE POWER SOURCE.

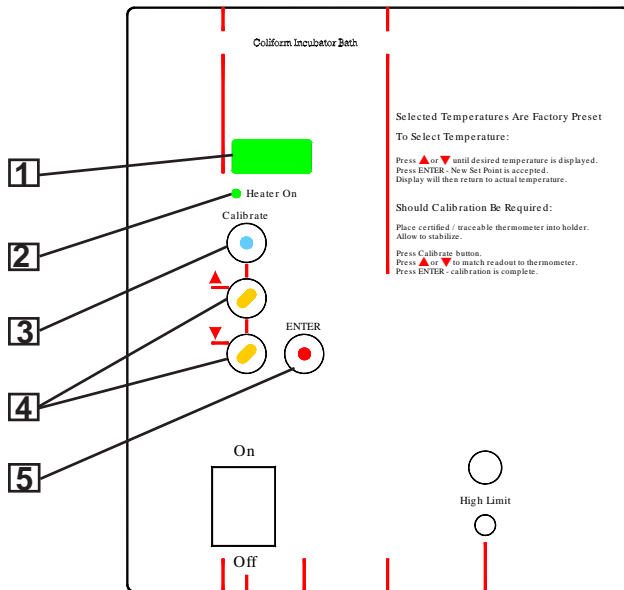


Figure 6.1 - Front Panel Controls

6. EXPLANATION OF CONTROLS

6.01 Power Switch - The power switch located on the lower left-hand side of the control panel provides power for the entire unit. The power switch controls all electric power to the temperature control and the pump. The pump starts when the power is turned on and runs at a fixed speed.

6.02 Hi-Limit Thermostat - The high limit thermostat is located immediately to the right of the power switch on the lower right hand corner of the control panel. The high limit is an adjustable control used to prevent thermal runaway in the event that the primary control fails.

6.03 Control Panel - The Control Panel provides a digital readout of temperature readings, heater "ON" indicator, and provides keys for user to make their desired selections.

- LED Display** - Four digits are used to display the actual, set, and calibrated values for temperature.
- Heater On Lamp** - The "HEATER ON" lamp is illuminated when power is applied to the heater.
- Calibrate Key** - This key puts the unit in calibrate mode to match a traceable thermometer to the actual temperature display.
- Temperature Selection Keys** - These keys are used to increase or decrease the setpoint and/or calibrate temperature selections.
- Enter Key** - The enter key is used to store a new setpoint or calibration value.

7. OPERATION

CAUTION

EXERCISE CARE WHEN USING ACIDIC OR CAUSTIC SOLUTIONS AS THEY WILL ATTACK THE GALVANIZED STEEL BATH BODY IF SPILLED INTO THE BATH. IF SPILLS DO OCCUR, THE BATH LIQUID SHOULD BE IMMEDIATELY DRAINED AND THE UNIT THOROUGHLY FLUSHED. SPILLS AND CONDENSATION SHOULD BE CLEANED/REMOVED FROM ALL METAL SURFACES AFTER EACH USE.

WARNING

EXPLOSION, IMPLOSION OR THE RELEASE OF TOXIC OR FLAMMABLE GASES ARISING FROM MATERIAL BEING HEATED IS THE SOLE RESPONSIBILITY OF THE USER.

7.01 When filling the bath with water, allowance must be made for the displacement of water upon immersion of samples. The maximum liquid level should be 1 inch below the top of the pan. **Do not use deionized water.**

7.02 To conserve energy, reduce evaporation and increase temperature control accuracy, use the gable cover provided. Do not use aluminum foil as a cover; as it may cause corrosion due to an electrochemical reaction.

1. Add distilled water to bath. Position the temperature probe tip 4 1/2" from the top edge of pan. Adjust O-ring if necessary. Probe must always be immersed in the pan during operation. Water level should be at least 1-1/2 inches above the top pump outlet for adequate water circulation. The water level should be approximately 1 to 1 1/2 inches from the top of the bath when the bath is fully loaded.
2. Power up: Depress the power switch located at the lower left hand corner of the bath. The unit is fully operational upon application of power and the display will read actual bath temperature.

3. To Select the Operating Temperature:
Model 2860 has four user selectable temperature setpoints of 35.0, 41.5, 44.5 and 45.5°C. To select the desired operating temperature, press the ▲ or down ▼ button until the desired temperature is displayed. Press Enter button to accept the new setpoint. The display will flash, indicating that the new setting has been entered. When the flashing stops, the display returns to actual bath temperature.
4. To Calibrate:
 - a. Calibration should be performed to match a stable bath's actual temp display to a calibrated thermometer.
 - b. Press CALIBRATE button once. Display flashes to indicate Calibrate mode.
 - c. Press ▲ or ▼ button until the display matches the readout on a certified thermometer. Press ENTER to set new value.
 - d. If ENTER is not pressed, the new value will not be set and display will return to the previously displayed temperature.
 - e. Display should now match your calibrated thermometer. The unit will stabilize automatically to the set temperature.

Periodic Safety Check

Test the operation of the Hi-Limit thermostat, as follows, every three months.

1. Locate the Hi-Limit thermostat adjustment to the right of the power switch.
2. When delivered, the thermostat adjustment is turned fully clockwise. In this position, the Hi-limit light is OFF.
3. After the bath temperature has stabilized, use a standard, flatblade screwdriver to adjust the thermostat.
4. Turn the thermostat adjustment counter-clockwise until the Hi-limit light is ON.
5. Then turn the thermostat adjustment clockwise 1/8 of a turn at a time, until the Hi-limit light goes OFF.

At this setting, if the bath temp increases above the selected setting, the Hi-limit activates.

8. MAINTENANCE

8.01 **Cleaning and care of stainless steel:**

Stainless steel will resist corrosion; however, it is not impervious to it. For maximum life, stainless steel must receive a certain amount of care.

CAUTION

AVOID SPILLING HARSH CHEMICALS ONTO THE BATH, AS CORROSION OF THE STAINLESS STEEL MAY RESULT.

IMPORTANT

THE USER HAS THE RESPONSIBILITY FOR CARRYING OUT APPROPRIATE DECONTAMINATION IF HAZARDOUS MATERIAL IS SPILLED ON OR INSIDE THE BATH.

IMPORTANT

BEFORE USING ANY CLEANING OR DECONTAMINATION METHOD OTHER THAN THOSE RECOMMENDED BY THE MANUFACTURER, USERS SHOULD CHECK WITH THE MANUFACTURER THAT THE PROPOSED METHOD WILL NOT DAMAGE THE EQUIPMENT.

1. There are many chemical cleaners, but usually just changing the water and periodic cleaning with a non-scratching scouring powder, such as Bon Ami will suffice.

Should algae or any other undesirable microorganisms form on top of the bath media, remove the diffuser pan, drain the water and clean the bath.

CAUTION

ELECTROLYSIS CAN DAMAGE STAINLESS STEEL. THIS CAN OCCUR IF AN OBJECT IS ALLOWED TO REST DIRECTLY ON THE SURFACE, TRAPPING MOISTURE THAT BECOMES OXYGEN STARVED BUT IS SURROUNDED BY WATER CONTAINING OXYGEN. RESULTING ELECTROLYTIC ACTION WILL PIT OR ERODE THE STAINLESS STEEL.

2. Should it be necessary to use a media other than water such as those listed below, limit the time to a maximum of four hours. Clean surfaces immediately after use.

Aluminum Chloride	Barium Chloride
Bichloride of Mercury	Calcium Chloride
Carbolic Acid	Chlorinated Lime
Citric Acid (boiling)	Dakin's Solution
Ferrous Chloride	Mercury Salts
Lysol Mercuric Chloride	Phenol
Potassium Permanganate	Stannous Chloride
Sodium Hypochlorite	Tartaric Acid
Potassium Thiocyanate	

CAUTION

Never use the following chemicals:

Aqua Regia	Ferric Chloride	Iodine
Sodium Azide	Sulfuric Acid	

3. Should the stainless steel ever become discolored by iron rust, use the following procedure to remove all traces of the rust and restore the stainless steel.

WARNING

OBSERVE THE FOLLOWING SAFETY PRECAUTIONS! USE HEAVY GLOVES OR OTHER ADEQUATE HAND PROTECTION. WEAR GOGGLES OR OTHER ADEQUATE EYE PROTECTION. ONLY WORK IN AREAS WITH ADEQUATE VENTILATION.

Prepare a solution of 20% nitric and 1.5% hydrochloric acid (if preferred, a 2% to 5% solution of warm oxalic acid may be used). Swab solution over surface, allowing it to remain until all rust is loosened. This will usually take 1 to 2 minutes.

As soon as rust is loosened, immediately flush with clean water until all acid is removed. Dry thoroughly.

4. During operation, condensation forms on the inside of the gable cover. When removing the gable cover, have one of its corners centered above the water bath, so that water runoff goes into the bath. Shaking the cover aids the water runoff. Be sure to wipe up any water spillage on or around the bath.

9. TROUBLESHOOTING

WARNING

SERVICE SHOULD BE PERFORMED BY A QUALIFIED TECHNICIAN. BEFORE REPLACING ANY ELECTRICAL OR MECHANICAL COMPONENTS, UNPLUG THE LINE CORD. IF ELECTRICAL POWER IS REQUIRED FOR SERVICE, USE EXTREME CARE.

9.01 Refer to Troubleshooting Procedures Table (9.03 through 9.06) for troubleshooting information on the baths. This table provides the basic information required to repair the bath.

9.02 The following is a list of the tools and instruments required to perform the procedures outlined in the Troubleshooting Procedures table.

Tools Needed:

- Phillips or Flat Head Screwdriver
- Ohmmeter
- DC Voltmeter
- AC Voltmeter
- 5Vdc Power Supply

Trouble Shooting Procedures																													
Problem	Procedure																												
9.03 No Heat	<ol style="list-style-type: none"> 1. Verify that setpoint temp is greater than the actual water temp. 2. Verify that Hi Limit lamp is off. If light is on, turn High Limit control fully clockwise. 3. Check temperature probe. <ol style="list-style-type: none"> A. Disconnect unit from electrical supply. B. Disconnect temperature probe connector J302 from CPU board. C. Apply a +5VDC to the temperature probe, +5 to pin 1 of blue connector. Ground to pin 3 of blue connector. The connector has these numbers embedded on it. D. Place a voltmeter between pins 2 & 3 on temperature probe connector. Place the temperature probe in a bath of known temperature. Verify that the output voltage of the temperature probe approximately corresponds to the values in the table below. <p style="text-align: center;">Degrees Centigrade vs. Output Voltage of Temperature Probe</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Temp °C</th> <th style="text-align: left;">Volt</th> <th style="text-align: left;">Temp °C</th> <th style="text-align: left;">Volt</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>320mV</td> <td>60</td> <td>1.400V</td> </tr> <tr> <td>10</td> <td>500mV</td> <td>70</td> <td>1.580V</td> </tr> <tr> <td>20</td> <td>680mV</td> <td>80</td> <td>1.760V</td> </tr> <tr> <td>30</td> <td>860mV</td> <td>90</td> <td>1.940V</td> </tr> <tr> <td>40</td> <td>1.040V</td> <td>99.9</td> <td>2.218V</td> </tr> <tr> <td>50</td> <td>1.220V</td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> E. If a 5V DC power supply is not available, leave J302 connected to the CPU board, turn power on and repeat step <p style="text-align: center;">D by placing the voltmeter probes on the backside of J302.</p>	Temp °C	Volt	Temp °C	Volt	0	320mV	60	1.400V	10	500mV	70	1.580V	20	680mV	80	1.760V	30	860mV	90	1.940V	40	1.040V	99.9	2.218V	50	1.220V		
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50	1.220V																												

9.03 No Heat (Cont'd)	4. Check Heater A. Disconnect unit from electrical supply. B. Disconnect heater from circuit and check resistance between heater leads (red and white wires) with an ohmmeter. Approximate heater resistance values are shown below. 120V 230V 24 ohms 47 ohms If resistance reads 0 or infinite, replace heater. C. Check resistance between heater leads and ground (green wire). If resistance reads 0 ohms, replace heater. D. Check resistance between heater leads and outside case of heater. If resistance reads less than 250K, replace heater.
	5. Check TRIAC (Q2 on power supply board) A. Turn power on. B. Let bath stabilize to desired setpoint value. C. Place an AC voltmeter between pins 1 & 5 on wire side of connector J105 on power supply board. Voltmeter should fluctuate between 0 volts and anything less than 5 volts. D. If voltmeter does not show specified values in Step C, replace power supply board.
	6. Check CPU board A. Disconnect temperature probe connector from J302 on CPU board. B. Turn power on. C. Verify that potential across pins 1 & 3 of J302 reads 5 volts with a voltmeter. If voltmeter does not read 5 volts, replace CPU board.
9.04 Unstable temperature control	1. Use gable cover provided to improve temperature control. 2. Verify that temperature setpoint is set at desired value. 3. If control is stable, but not at desired temperature, check temperature calibration. Readjust if necessary. 4. Check temperature probe (See Paragraph 9.03, Step 3). 5. Check CPU board (See Paragraph 9.03, Step 6).
9.05 Too much heat.	1. Check temperature probe (see Paragraph 9.03, Step 3). 2. Check TRIAC (See Paragraph 9.03, step 5). 3. Check CPU Board (See Paragraph 9.03, Step 6).

<p>9.06 Pump does not circulate water.</p>	<ol style="list-style-type: none"> 1. Verify that the water level is above both the pump inlet and outlet. 2. If pump is not running, verify that power is applied to the bath. If power is present, check wiring of pump to power switch. If wiring is correct, replace the pump.
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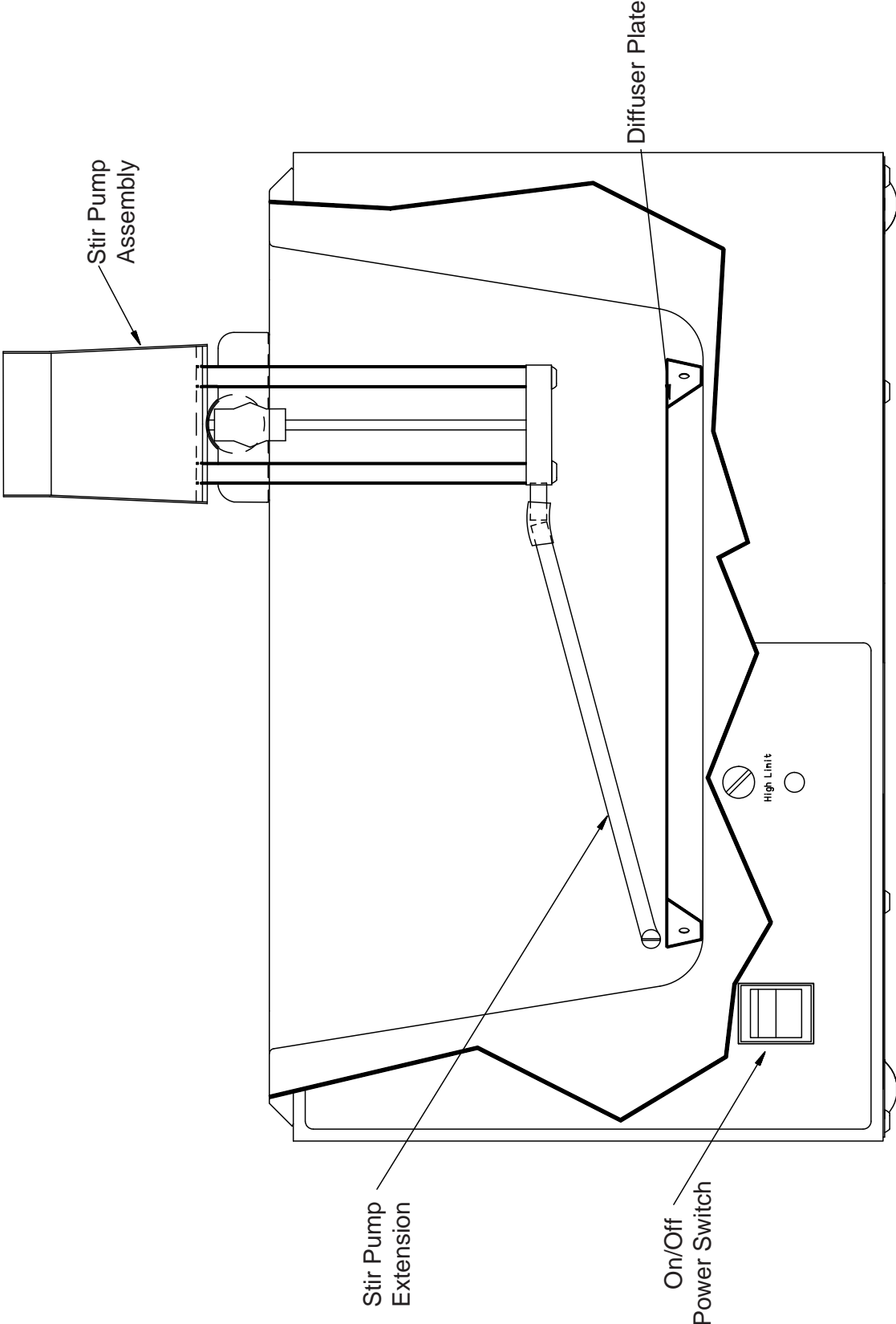
<p>9.07 Replace CPU or Display/Keyboard board</p>	<ol style="list-style-type: none"> 1. The software must be configured to match the Bath model. To enter configuration mode, press the upper left push-button switch while applying power. The upper left switch is labeled "Calibrate." This switch is used to enter configuration codes and steps through the different levels of configurations. <p>Immediately following power up with the switch depressed, the readout will display a 3-digit number. This is the software revision. The readout will then begin to do a self-test of digits. Press the "Calibrate" switch once. The readout will display 0000. Follow the listing below to complete the configuration.</p> <table border="1" data-bbox="321 982 1437 1533"> <thead> <tr> <th><u>DISPLAY</u></th> <th><u>ACTION</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>A. 0000</td> <td>Enter 37 using up/down arrows.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>B. U 51</td> <td>Enter 51 using up/down arrows.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>C. P 2.0</td> <td>Enter 2.0 using up/down arrows.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>D. i400</td> <td>Enter 400 using up/down arrows.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>E. t 8</td> <td>Enter 8 using up/down arrows.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>F. 2668#</td> <td>None. Diagnostic Display.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>G. "Water Temp"</td> <td>*LOWTEMP CALIBRATION LITTLE "c" Factory Setting.</td> <td>Press "Calibrate"</td> </tr> <tr> <td>H. "Water Temp"</td> <td>*HITEMP CALIBRATION BIG "C" Factory Setting.</td> <td>Press "Calibrate"</td> </tr> </tbody> </table> <p># This number corresponds to the temperature of the sensor. It will not necessarily be "2668", but a four digit number.</p>	<u>DISPLAY</u>	<u>ACTION</u>		A. 0000	Enter 37 using up/down arrows.	Press "Calibrate"	B. U 51	Enter 51 using up/down arrows.	Press "Calibrate"	C. P 2.0	Enter 2.0 using up/down arrows.	Press "Calibrate"	D. i400	Enter 400 using up/down arrows.	Press "Calibrate"	E. t 8	Enter 8 using up/down arrows.	Press "Calibrate"	F. 2668#	None. Diagnostic Display.	Press "Calibrate"	G. "Water Temp"	*LOWTEMP CALIBRATION LITTLE "c" Factory Setting.	Press "Calibrate"	H. "Water Temp"	*HITEMP CALIBRATION BIG "C" Factory Setting.	Press "Calibrate"
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* Calibration of the low and high end of the sensor input is done at the factory. Field calibration of the sensor may be performed using the following technique: Enter the configuration routine and press the top left switch until a little "c" (Item G) is displayed. Add water that is around 10°C to the bath completely covering the sensor. Insert a calibrated thermometer. After the thermometer stabilizes, match the display setting to the thermometer reading by pressing the up or down push-button switch. Press the top left switch. The readout will now display a big "C" (Item H). Remove water from the bath and add hot water of about 70-80°C. After the unit stabilizes, match readout display to temperature on thermometer. Press the top left switch. Calibration is now complete.

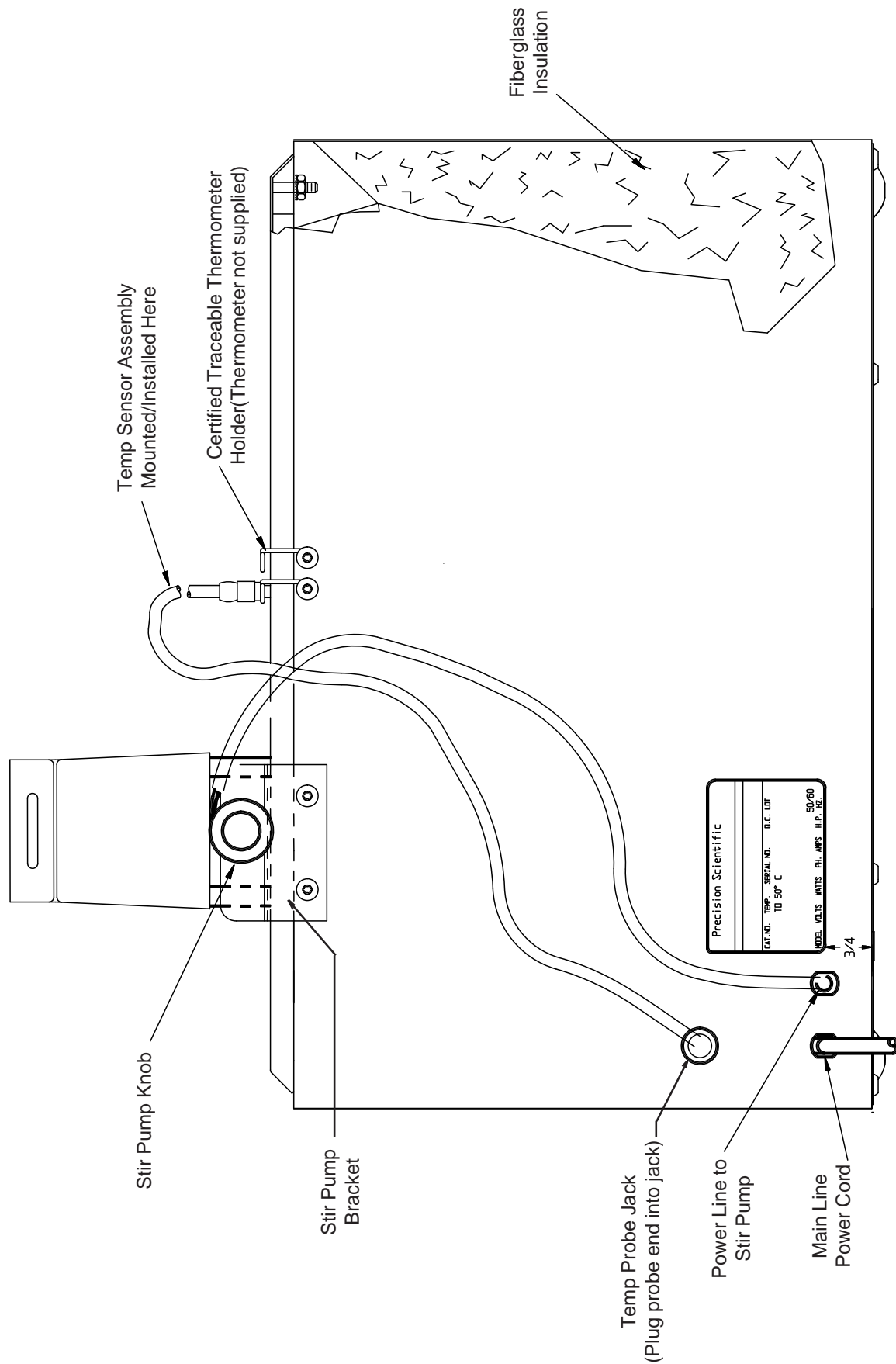
10. REPLACEMENT PARTS LIST

SMALL COLIFORM BATH		
	3166676	3166677
Voltage	115V	230V
Stirrer Pump Assembly	3167049	3162149
Stirrer Pump Extension	3177458	
Stirrer Pump Mounting Bracket	3164460	
Bath Pan Kit	3167149	
PCB Assembly, Power Supply	3166924	
PCB Assembly, CPU	3167119	
PCB Assembly, Display	3176679	
Wire Harness	3177620	3173909
Temp. Probe Assembly (Plug w/Jack)	3167038	
Probe/Thermometer Holder	3177444	
Bath "O" Ring Kit	3167129	
Heater Kit	3167160	3175478
Heater/Thermostat Bracket	N/A	3174465
High Limit Thermostat	3175458	
Hi Limit Light, Amber	3177575	3173907
On/Off Switch	3175318	
Line Cord	3178034	319481
Diffuser Plate	3163799	
Gable Cover	3166219	
Power Supply Fuse (Mains)	N/A	3172442
Power Cord Receptacle	N/A	3179502
Power Supply Board Fuse	N/A	3175930

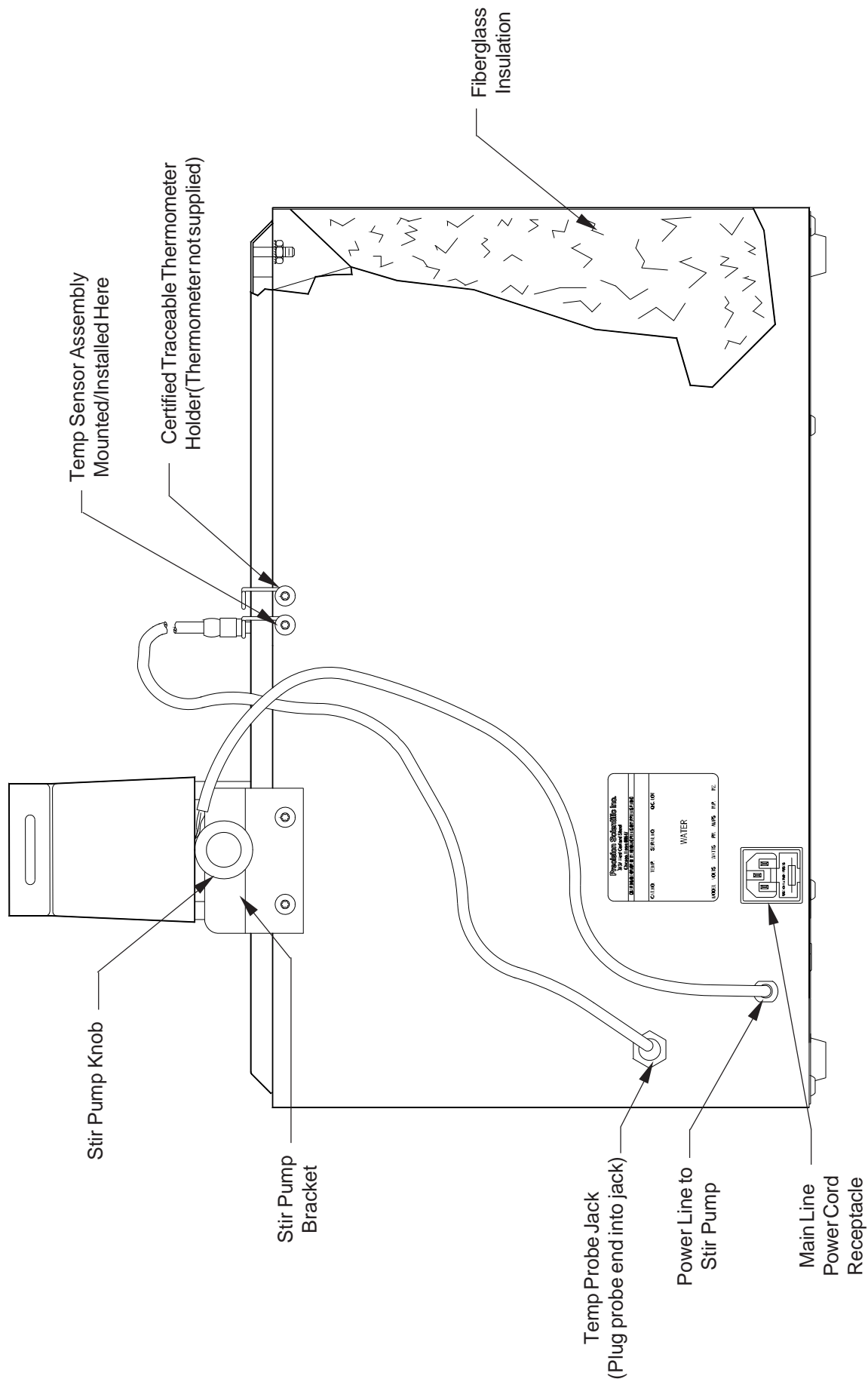
11. ASSEMBLY AND SCHEMATIC DRAWINGS



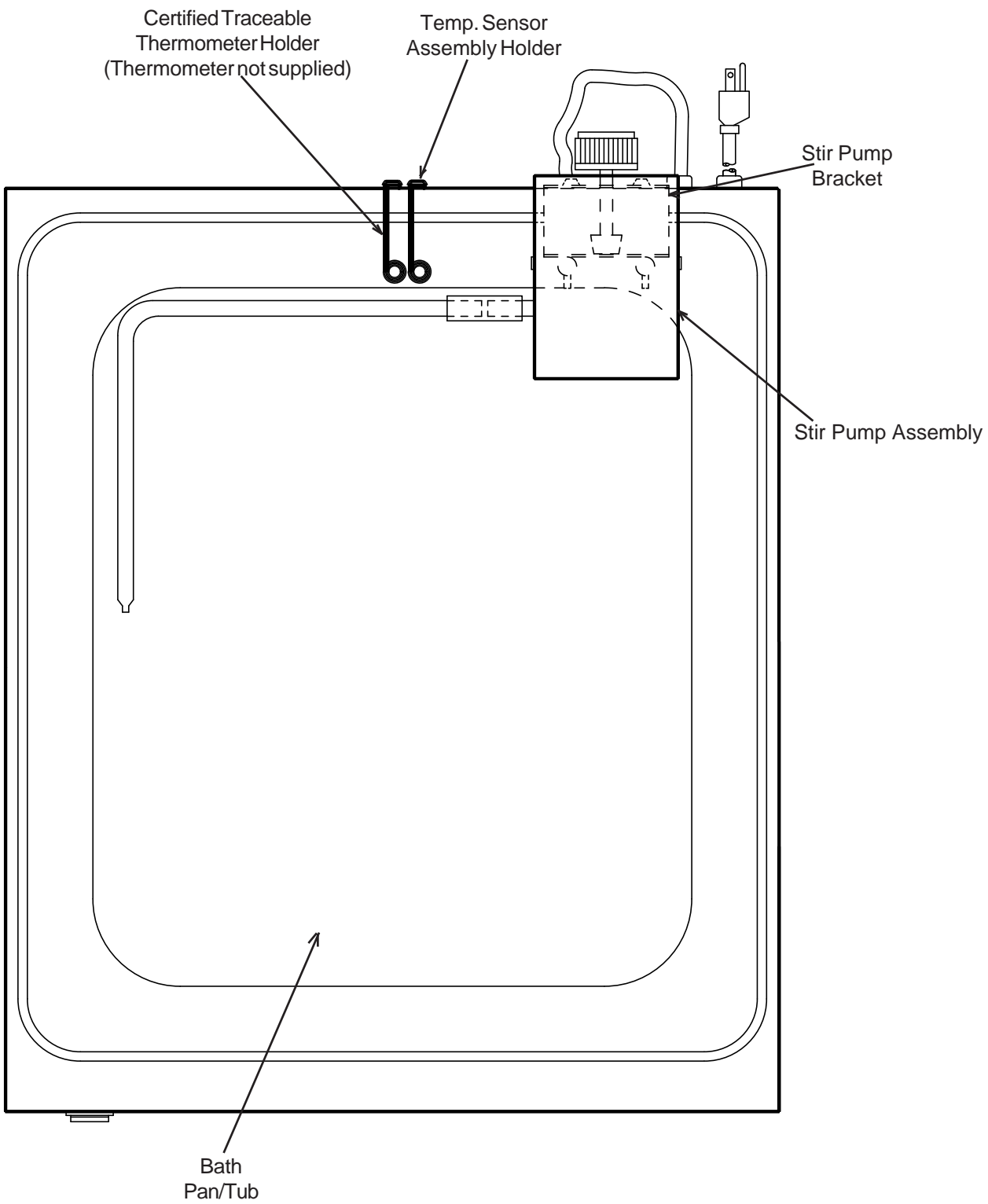
FRONT SECTION VIEW



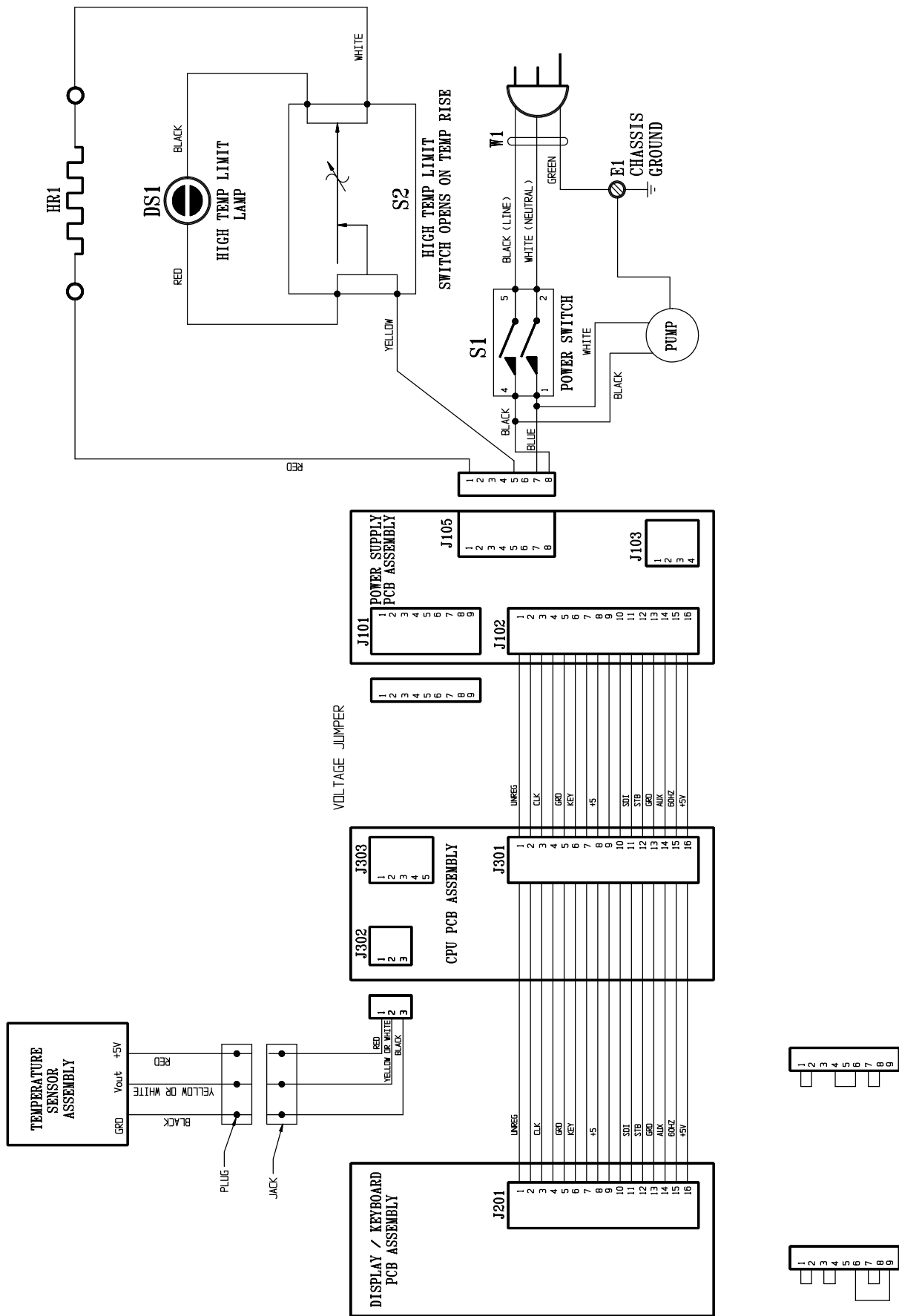
120V UNIT BACK VIEW



230V UNIT BACK VIEW



TOP VIEW



ELECTRICAL DIAGRAM

115V
230V
JUMPER PLUG CONFIGURATIONS

THERMO FISHER SCIENTIFIC STANDARD PRODUCT WARRANTY

The Warranty Period starts two weeks from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor included. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo Electron Corporation postage paid and replacement parts are shipped FOB destination.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.
Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

If equipment service is required, please call your Technical Services Department at 1-888-213-1790 (USA and Canada) or 1-740-373-4763. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application. Outside the USA, contact your local distributor for warranty information.



Rev. 3 2/07

THERMO FISHER SCIENTIFIC INTERNATIONAL DEALER WARRANTY

The Warranty Period starts two months from the date your equipment is shipped from our facility. This allows for shipping time so the warranty will go into effect at approximately the same time your equipment is delivered. The warranty protection extends to any subsequent owner during the first year warranty period. Dealers who stock our equipment are allowed an additional six months for delivery and installation, provided the warranty card is completed and returned to the Technical Services Department.

During the first year, component parts proven to be non-conforming in materials or workmanship will be repaired or replaced at Thermo's expense, labor excluded. Installation and calibration are not covered by this warranty agreement. The Technical Services Department must be contacted for warranty determination and direction prior to performance of any repairs. Expendable items, glass, filters, reagents, tubing, and gaskets are excluded from this warranty.

Replacement or repair of components parts or equipment under this warranty shall not extend the warranty to either the equipment or to the component part beyond the original warranty period. The Technical Services Department must give prior approval for return of any components or equipment. At Thermo's option, all non-conforming parts must be returned to Thermo postage paid and replacement parts are shipped FOB destination.

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL OR IMPLIED. NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL APPLY.

Thermo shall not be liable for any indirect or consequential damages including, without limitation, damages relating to lost profits or loss of products.

Your local Thermo Sales Office is ready to help with comprehensive site preparation information before your equipment arrives. Printed instruction manuals carefully detail equipment installation, operation and preventive maintenance.

Contact your local distributor for warranty information. We're ready to answer your questions on equipment warranty, operation, maintenance, service and special application.



Rev. 4 2/09

