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WATER BATHS

Model 1200 Series

Microprocessor Control

Models: 1225, 1225PC, 1235, 1235PC,1245, 1245PC, 1255,1255PC, 1295PC

Installation And Operation Manual

Sheldon Manufacturing Inc. P.O. Box 627 Cornelius, Oregon 97113
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REV 3/03
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These units are general purpose water baths for professional, industrial or educational use where the preparation or testing of materials is done approximately atmospheric pressure and no flammable, volatile or combustible materials are being heated. These units are not intended for hazardous or household locations or use.

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Section 1

RECEIVING AND INSPECTION

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 use. Note that this equipment must be used only for its intended application; any alterations or modifications will void your warranty.

1.1 **Inspection:** The carrier, when accepting shipment, also accepts responsibility for safe delivery and is liable for loss or damage. On delivery, inspect for visible exterior damage, note and describe on the freight bill any damage found, and enter your claim on the form supplied by the carrier.

1.2 Inspect for concealed loss or damage on the unit itself, both interior and exterior. If any, the carrier will arrange for official inspection to substantiate your claim.

1.3 **Return Shipment:** If for any reason you must return the unit, contact your service representative for authorization and supply nameplate data. Please see the manual cover for information on where to contact Customer Service.

1.4 **Accessories:** Verify that all of the equipment indicated on the packing slip is included with the unit. Carefully check all before discarding. All units (except 1295PC) are equipped with 1 bath cover and 1 thermometer clip, except for the 1255 which is equipped with 2 bath covers and 2 thermometer clips.

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Section 2

INSTALLATION

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. Installation may be performed by the end user.

Under normal circumstances this unit is intended for use indoors, at room temperatures between 5° 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%. Customer service should be contacted for operating conditions outside of these limits.

2.1 Power Source: Check the data plate for voltage, cycle, phase and ampere requirements. If matched to your power source, plug the power cord into a grounded outlet. VOLTAGE SHOULD NOT VARY MORE THAN 10% FROM THE DATA PLATE RATING. These units are intended for 50/60 Hz application. A separate circuit is recommended to preclude loss of product due to overloading or circuit failure. Note: Electrical supply to the unit must conform to all national and local electrical codes.

2.2 Location: In selecting a location, consider all conditions which might affect performance, such as heat from radiators, ovens, autoclaves, etc. Avoid direct sun, fast-moving air currents, heating/cooling ducts and high-traffic areas. Allow a minimum of 5cm between the unit and walls or partitions which might obstruct free airflow.

2.3 Lifting / Handling: These units may be heavy for some people and care should be taken to use appropriate lifting devices that are sufficiently rated for these loads. Units should only be lifted from their bottom surfaces. Handles and knobs are not adequate for lifting or stabilization. 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.

2.4 Cleaning: These units were 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. Rinse clean with water and wipe dry. DO NOT USE chlorine-based bleaches or abrasives as this will damage the tank, regardless if it is stainless steel or polymer coated. DO NOT USE spray cleaners that might leak through openings

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and cracks and get on electrical parts or that may contain solvents that will harm coatings. A similar periodic cleaning is recommended.

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

2.5 Bath Cover: using the bath cover will accelerate heat-up time and reduce evaporation. The cover must be used to reach set points above 60°C. Note that the cover is not designed to be air tight and create a pressurized environment.

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Section 3

CONTROLS OVERVIEW (See Figure 1)

3.1 **Power Switch:** The main I/O (On/Off) power switch, located at the back of the unit, controls all power to the unit. It must be in the ON position before any systems are operational.

3.2 **Main Temperature Controller:** This control is marked TEMPERATURE and consists of the digital display and Up/Down arrow pads for inputting set point temperature and calibration.

3.3 **Over Temperature Safety Thermostat:** This controller is marked OTP and is completely independent of the Main Temperature Controller. The Safety guards against any failure of the Main Controller which would allow temperature to rise past set point. If 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.

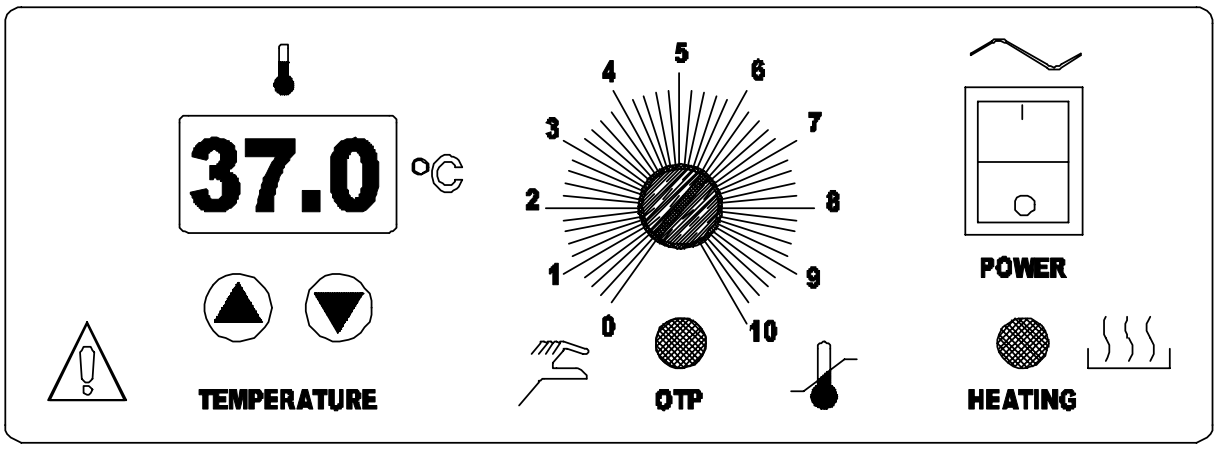
3.4 **Heating Light:** This light is ON when the Main Controller has activated the heating element to reach and maintain set point.

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

3.6 **Fuse / Circuit Breaker:** Your unit will either be equipped with a fuse or a circuit breaker. Fuses will be installed in the power inlet on 220 volt CE units. Circuit breakers will be adjacent to the power cord on all others. The fuse/circuit breaker is an added measure of protection for the unit against power surges and fluctuation. If the fuse is blown, it must be replaced before the unit will continue to operate. The circuit breaker can be reset by pushing in the extended button. The reason for power interruption should be cleared before replacement of the fuse or resetting of the circuit breaker is done.

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Figure 1



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Section 4

OPERATION

WARNING: THESE BATHS ARE NOT INTENDED FOR USE AS ACID BATHS. USE AS AN ACID BATH WILL CAUSE SEVERE DAMAGE TO BATH COMPONENTS. DO NOT USE DEIONIZED WATER, TAP WATER, OR CHEMICALS. USE DISTILLED WATER ONLY. DO NOT TURN THE UNIT ON UNLESS THE TANK HAS WATER IN IT. IF RAN DRY AT MAXIMUM TEMPERATURE, COATING MIGHT PEEL OFF.

4.1 Check power supply against unit serial plate; they must match. Plug service cord into the electrical outlet.

4.2 Fill bath to your required depth with DISTILLED WATER. DO NOT USE tap water. DO NOT USE deionized water. Note that normal depth is two-thirds full, but depth must be at least 5cm.

4.3 Push the main power switch to the ON position, and turn the Over Temperature Safety to its maximum position, clockwise, using a screwdriver or coin.

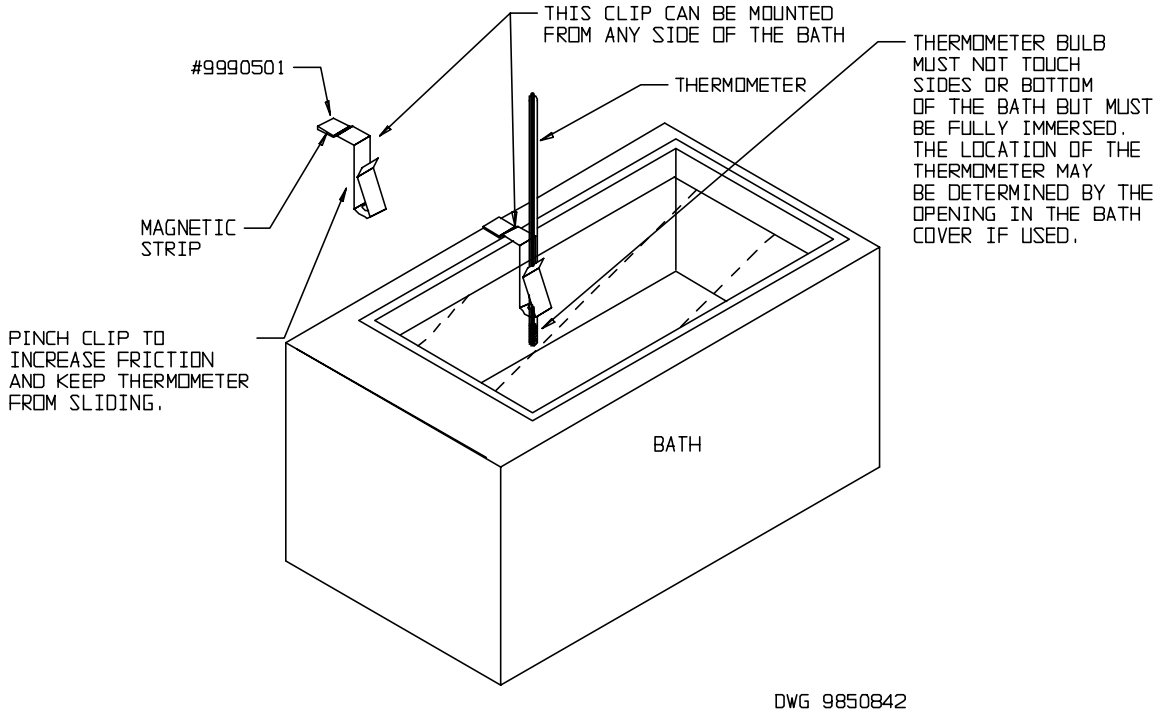
4.4 **Set Main Temperature Control:** Enter desired set point temperature. To enter set point mode on the Control, press the Up or Down arrow pad one time. The digital display will start to blink, going from bright to dim. While blinking, the digital display is showing the set point. To change the set point, use the Up and Down arrow pads. If the arrow pads are not pressed for five (5) seconds, the display will stop blinking and will read the temperature in the bath. Allow the water bath at least two hours to stabilize once set point is established.

4.5 **Calibrating the Control:** It is recommended that the digital display be calibrated once the unit is in its working environment. The water bath, having reached set point and allowed to stabilize, is ready to calibrate. Place a certified reference thermometer in the bath (a clip is provided with your accessory package. **See figure 2** for placement). Allow the thermometer to reach temperature where it remains stabile for one hour. Compare the reading on the reference thermometer with the digital display. If there is a difference, put the display into calibrate mode by pressing the UP/DOWN arrow pads at the same time until the two outside decimal points start to flash. When the decimal points are flashing, the display can be changed to match the reference thermometer by pressing the UP or DOWN arrow pads until the display reads the correct value. If the arrow pads are not pressed for five (5) seconds the display will revert back to its original parameter. Allow the unit to stabilize again then verify that the display matches the reference thermometer.

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4.6 **Set Over Temperature Safety Thermostat:** As mentioned in step 4.3, the Safety Thermostat should be initially set to its maximum position to allow the water bath to stabilize. Once the bath is stabile at the set point, turn the Safety Thermostat counterclockwise until the OTP light turns on. Next turn the Thermostat clockwise just until the OTP light turns off. Then turn the Thermostat clockwise two (2) of the smallest divisions on its scale past the point where the light went out. This will set the Safety Thermostat at approximately 1°C above Main Temperature set point.

Figure 2



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Section 5

MAINTENANCE

Note: Prior to any maintenance or service on this unit, disconnect service cord from the power supply.

5.1 **Cleaning:** Heavy water bath use causes soiling. Clean the bath with mild soap and water solution, rinse with clean water and wipe dry with 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. The "PC" models, polymer coated stainless steel tanks, should only be cleaned with mild soap - NO ABRASIVES. DO NOT USE chlorine-based bleaches or harsh abrasives as this can damage the tank, regardless if it is stainless steel or polymer coated. DO NOT USE spray cleaners that might leak through openings and cracks and get on electrical parts or that may contain solvents that will harm coatings. **Failure to do this may permanently damage the unit.**

WARNING: Never clean the unit with alcohol or flammable cleaners with the unit connected to the electrical supply. Always disconnect the unit from the electrical service when cleaning and assure all volatile or flammable cleaners are evaporated and dry before reattaching the unit to the power supply.

Note: 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 may strain interior surfaces so this should not be allowed to occur.

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

5.2 There is no maintenance required on any of the electrical components. If the unit fails to operate as specified, please review Section 6.0 Troubleshooting, prior to calling Customer Service.

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Section 6

TROUBLESHOOTING

TEMPERATURE

Temperature too high	
	1/ Main controller set too high-see section 4.4 2/ Main controller failed on – call Customer Service. 3/ wiring error – call Customer Service.
Display reads "HI" or "400"+	
	probe is unplugged, is broken or wire to sensor is broken – call Customer Service.
Temperature spikes over set point and then settles to set point	
	recalibrate – see section 4.5
Temperature too low	
	1/ Main controller set too low – see section 4.4 2/ bath temperature not recovered from water being added – wait for display to stop changing. 3/ unit not recovered from power failure or being turned off – bath will need a minimum of 2 hours to warm up and stabilize. 4/ element failure – compare current draw to data plate. 5/ Main controller failure – confirm with front panel lights that controller is calling for heat. 6/ wiring problem – check all functions and compare wiring to wiring schematic in section 7.0 - especially around any areas recently worked on. 7/ loose connection – call Customer Service.
Display reads "LO"	
	1/ sensor is plugged in backwards – call Customer Service. 2/ if ambient temperature is lower than range of unit – compare set points and ambient temperature to rated specifications in section 7.0, Unit Specifications.
Unit will not heat over a temperature that is below set point	
	1/ confirm that amperage and voltage match data plate. 2/ confirm that set point is set high enough. 3/ check calibration – using independent thermometer, follow instructions in section 4.5
Unit will not heat up at all	
	1/ check amperage – amperage should be virtually at maximum rated (data plate) amperage. 2/ do all controller functions work? 3/ has the fuse/circuit breaker blown?
Indicated bath temperature unstable	
	1/ ±0.1 may be normal, especially without the use of bath cover. 2/ is ambient room temperature radically changing – either door opening or room airflow from heaters or air conditioning ? – stabilize ambient conditions.

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	3/ calibration sensitivity – recalibrate, see section 4.5. Call customer service if re-calibration does not resolve fluctuation. 4/ assure that the bath is at least 1/3 full. 5/ electrical noise – remove nearby sources of RFI including motors, arcing relays or radio transmitters. 6/ bad connection on temperature sensor or faulty sensor – call Customer Service.
Will not maintain set point	
	1/ assure that set point is at least 5 degrees over ambient room temperature. 2/ see if ambient is fluctuating.
Display and Reference thermometer don't match	
	1/ calibration error – see section 4.5. 2/ temperature sensor failure – call Customer Service. 3/ controller failure – call Customer Service. 4/ allow at least two hours to stabilize. 5/ verify that reference thermometer is certified.
Can't adjust set points or calibration	
	1/ turn entire unit off and on to reset. 2/ if repeatedly happens, call Customer Service.
Calibrated at one temperature, but not at another	
	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.
MECHANICAL	
Water leaking	
	1/ dry bath and check the tank with flashlight to see if leak is noticeable. 2/ fill tank again and see if leak repeats and find source of leak. Call Customer Service if continues.
Holes or rust in water bath tanks	
	1/ assure that clean, distilled water is used – Deionized water, tap water and chemicals should never be used in the tank. USE DISTILLED WATER ONLY. 2/ assure that no test sample has leaked into bath water. 3/ no metallic products should be in the tank with exception of the polymer coated rack.
OTHER	
controller on at all times - "locked-up"	
	1/ turn unit off and on to reset. 2/ if cannot change any condition on the front panel, call Customer Service.
front panel displays are all off	
	Check for wire damage.
unit or wall fuse/circuit breaker is blown	
	1/ check wall power source. 2/ compare current draw and compare to specs on data plate. 3/ see what other loads are on the wall circuit.
unit will not turn on	
	1/ check wall power source.

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	2/ check fuse/circuit breaker on unit or in wall. 3/ check all wiring connections, esp. around the on/off switch.
Unit is smoking – out of box	
	This is not an uncommon occurrence for new units. The elements will burn off protective coatings. Run the bath at high temperature for one hour until smoke dissipates.

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Section 7

PARTS LIST

Description	115V	220V
Element – 1225/1225PC, 1255/1255PC Sm Tank	9570704	9570575
Element – 1235/1235PC, 1255/1255PC Lg Tank	9570576	9570577
Element – 1245/1245PC	9570578	9570579
Element – 1295PC	9570743	9570744
Fuse, 6.3 AMP	NA	103555
Gable Covers – 1225/1225PC, 1255/1255PC(Sm)	9750508	9750508
Gable Covers – 1235/1235PC, 1255/1255PC(Lg)	9750509	9750509
Gable Covers - 1245, 1245PC	9750510	9750510
Gable Covers - 1295PC	9750511	9750511
Microprocessor Main Temp Control	1750591	1750592
Over Temperature Safety Control	1750614	1750614
Pilot Lamp, Green	200021	200021
Pilot Lamp, Red	200020	200020
Power Cord	1800516	101990
Power Cord – European, detachable	NA	X1000778
Power Switch	103351	103351
Rubber Feet w/ Screws	300091	300091
Tank Gasket	103554	103554
Tanks – 1225, 1255 (Sm)	890058	890058
Tanks – 1225PC, 1255PC (Sm)	7930503	7930503
Tanks – 1235, 1255 (Lg)	890062	890062
Tanks – 1235PC, 1255PC (Lg)	7930501	7930501
Tanks – 1245	890060	890060
Tanks – 1245PC	7930502	7930502

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Tanks – 1295PC	7930510	7930510

UNIT SPECIFICATIONS

Weight	Shipping	Net
1225, PC	21 lbs.	14 lbs
1235, PC	26.5 lbs.	18 lbs.
1245, PC	29 lbs.	25 lbs.
1255, PC	29 lbs.	32 lbs.
1295PC	34.3 lbs.	28.1 lbs.

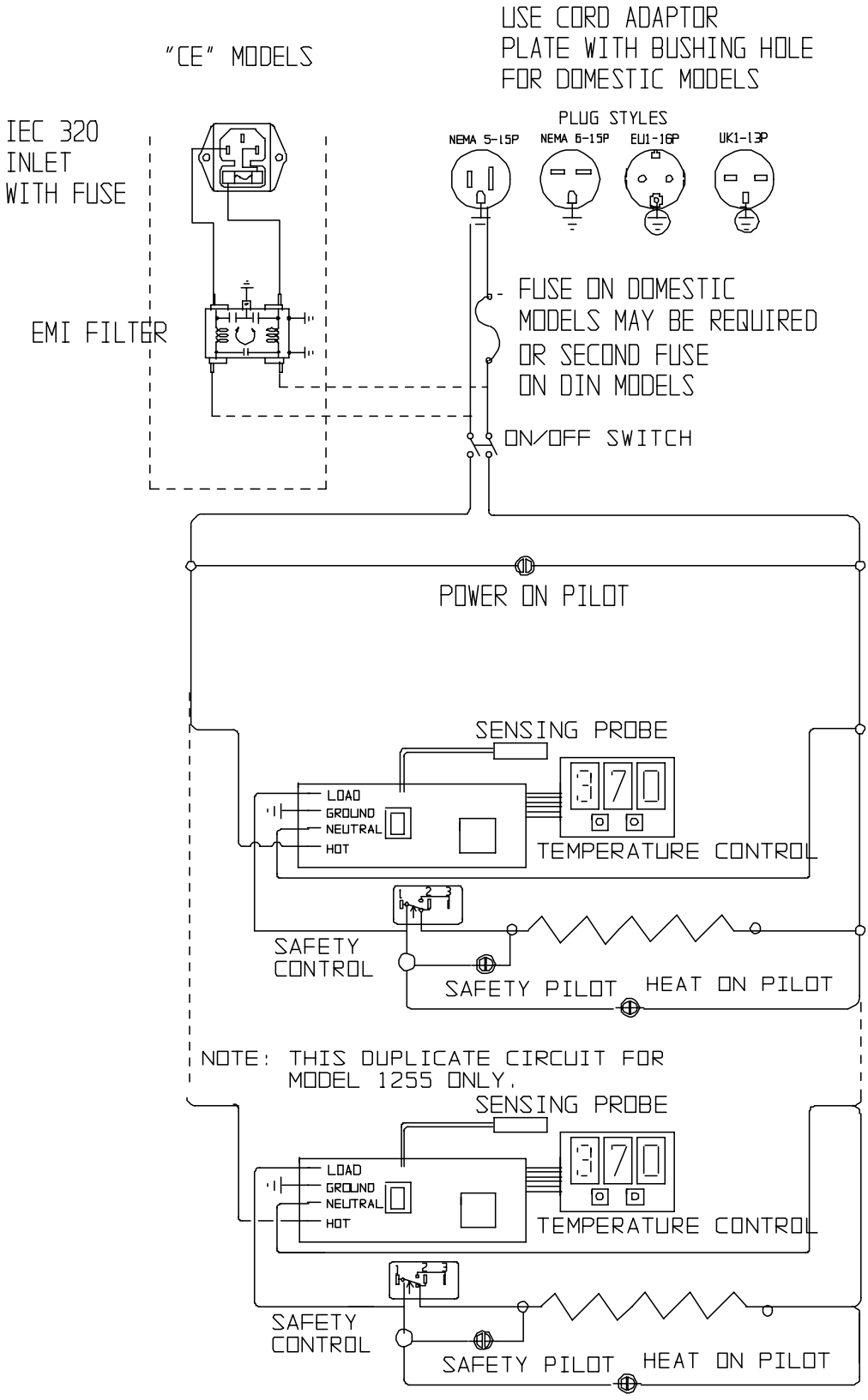
Dimensions	Exterior WxDxH (in.)	Interior WxDxH (in.)
1225, PC	14 x 12.5 x 9.8	11.8 x 5.8 x 6
1235, PC	14 x 19.3 x 9.5	11.8 x 12.8 x 5.8
1245, PC	14 x 26 x 10	11.5 x 19.5 x 6
1255, PC	23.5 x 19.3 x 9.3	26.5 20 x 20.5
1295PC	16 x 19 x 16	12 x 14 x 11

Capacity	Liters
1225, PC	6
1235, PC	14
1245, PC	20
1255, PC	6 & 14
1295PC	30

Temperature	Range	Uniformity
1225, PC	Amb. 5° to 100°C	±0.2°C @ 37°
1235, PC	Amb. 5° to 100°C	±0.2°C @ 37°
1245, PC	Amb. 5° to 100°C	±0.2°C @ 37°
1255, PC	Amb. 5° to 100°C	±0.2°C @ 37°
1295PC	Amb. 5° to 100°C	±0.3°C @ 37°

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WIRE DIAGRAM



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