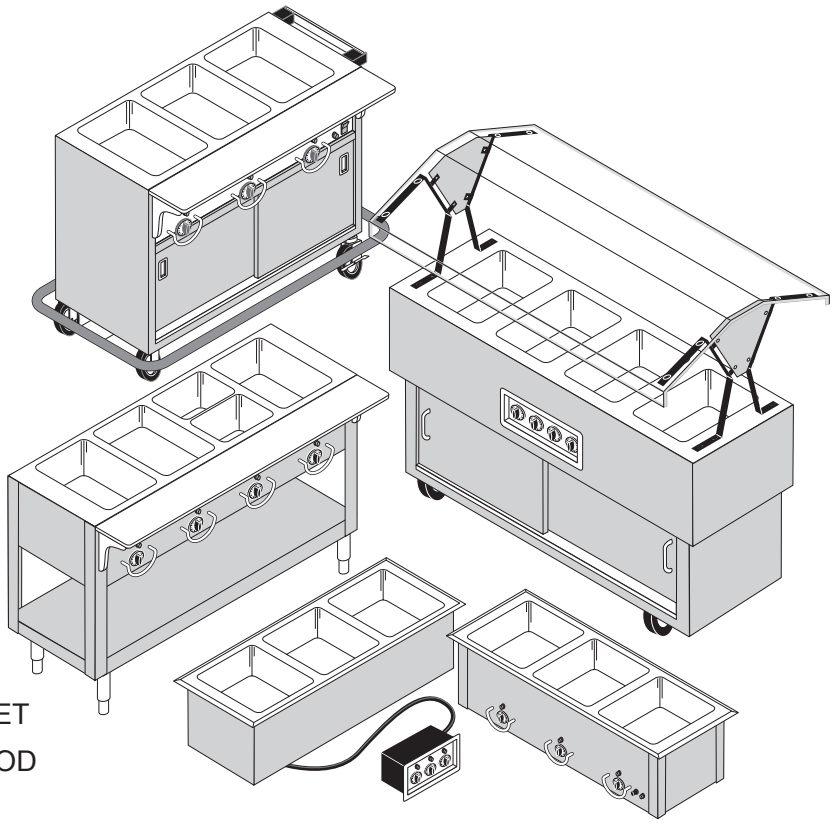
# *Service Manual*

# *ELECTRIC SEALED WELL FOOD WARMERS*



*MODELS*

THURMADUKE STEAM TABLES

THURMADUKE SERVING SYSTEMS

AEROHOT SEALED WELL MODELS

AEROSERV SERVING SYSTEMS

HERITAGE HOT FOOD ELECTRIC BUFFET

NEXT GENERATION ELECTRIC HOT FOOD SERVING SYSTEMS

**Please read this manual completely before attempting to install, operate or service this equipment**

**This document is prepared for trained Duke service technicians. It is not to be used by anyone not properly qualified to perform these procedures.**

**This Service Manual is not all encompassing. If you have not been trained on servicing this product, be sure to read the manual completely before attempting servicing. Be sure all necessary tools, test equipment, and skills are available. Those procedures for which you do not have the proper skills and test equipment must be performed only by a qualified Duke trained service technician.**



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# IMPORTANT WARNING AND SAFETY INFORMATION

**WARNING**

**READ THIS MANUAL THOROUGHLY BEFORE OPERATING, INSTALLING, OR PERFORMING MAINTENANCE ON THE EQUIPMENT.**

**WARNING**

**FAILURE TO FOLLOW INSTRUCTIONS IN THIS MANUAL CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.**

**WARNING**

**DO NOT STORE OR USE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE.**

**WARNING**

**DO NOT OPERATE THIS EQUIPMENT WITHOUT PROPERLY PLACING AND SECURING ALL COVER AND ACCESS PANELS.**

**CAUTION**

Observe the following:

- Provide and maintain adequate minimum clearances from all walls and combustible materials.
- Provide and maintain adequate clearance for air openings.
- Keep the equipment area free and clear of combustible material.
- Operate equipment only on the type of electricity indicated on the specification plate.
- Retain this manual for future reference.

# TABLE OF CONTENTS

# SPECIFICATIONS

| MODEL | DESCRIPTION | VOLTAGE | SIZE |
|---|---|---|---|
| E302SW – E305SW | Aerohot Sealed Well | 115VAC, 208VAC & 236VAC | Variable 2 well to 5 well |
| ADI1ESW – ADI5ESW | Aerohot Drop-in Sealed Well | 115VAC, 208VAC & 236VAC | Variable 1 well to 5 well |
| ASI1ESW – ASI5ESW | Aerohot Slide-in Sealed Well | 115VAC, 208VAC & 236VAC | Variable 1 well to 5 well |
| E-2-CBSS – E-6-CBSS | Stainless Steel Thurmaduke | 115VAC, 208VAC & 236VAC | Variable 2 well to 6 well |
| E-2-CBPG – E-6-CBPG | Painted Thurmaduke | 115VAC, 208VAC & 236VAC | Variable 2 well to 6 well |
| E302-25 – E305-25 | AeroServ Serving System | 115VAC, 208VAC & 236VAC | Variable 2 well to 5 well |
| HB2HF – HB5HF | Heritage Buffet | 115VAC, 208VAC & 236VAC | Variable 2 well to 5 well |
| TEHF-32 – TEHF88 | Thurmaduke Serving System | 115VAC, 208VAC & 236VAC | Variable 2 well to 6 well |
| NG32HF – NG74HF | Next Generation Hot Food | 115VAC, 208VAC & 236VAC | Variable 2 well to 5 well |

# INSTALLATION

### Location

The food warmers represented in this manual are intended for indoor use only. Be sure the chosen location has a floor strong enough to support the total weight of the unit fully loaded with food product. Reinforce the floor (stationary units) or cabinet (drop-in or slide-in units) if necessary to provide for maximum loading. Portable units (units with optional casters) should be placed on a level surface capable of supporting the unit's fully loaded weight. For the most efficient operation, be sure to provide good air circulation inside and out.

### Leveling

Be sure floor units are placed on a firm, flat surface/ floor. Check for cracks in flooring or tile and avoid these areas if possible. If necessary place support pads, properly rated for the weight of the unit, to "bridge" uneven or cracked flooring. Level the unit accordingly using the leg adjusters.

Make sure the top of the cabinet is level before installing Aerohot drop-in or slide-in units. It may be necessary to shim the unit or cabinet to make it level.

### Stabilizing

Use the leg adjustments to ensure that the unit is solid to the floor surface at all contact points. Ensure that the unit does not rock when pressure is applied to the top corners. Units with casters will require spacers to make them level on uneven surfaces. The spacers should be placed under the locking casters for maximum stability. Casters must be locked when the unit is in service.

### Electrical Connection

The Electric Sealed Well Food Warmers are available as 115VAC, 208VAC, or 236VAC, 50/60 Hz. Portable units are available with a properly rated and wired cord. Direct wiring of units to the power supply must be performed by a certified electrician and must comply with local electrical codes for your municipality.

**WARNING:**

**REFER TO THE AMPERAGE DATA LIST IN THE SPECIFICATIONS OR THE SERIAL TAG DATA AND YOUR LOCAL CODE OR THE NATIONAL ELECTRICAL CODE TO BE SURE UNIT IS CONNECTED TO THE PROPER POWER SOURCE. A PROTECTED CIRCUIT OF THE CORRECT VOLTAGE AND AMPERAGE MUST BE RUN FOR CONNECTION OF THE SUPPLY CORD OR PERMANENT CONNECTION TO THE UNIT. THE POWER MUST BE TURNED OFF AND DISCONNECTED WHENEVER PERFORMING MAINTENANCE OR REPAIR FUNCTIONS.**

# PARTS REPLACEMENT

**WARNING**

**ALWAYS DISCONNECT THE UNIT FROM ITS POWER SOURCE BEFORE SERVICING.**

## INFINITE SWITCH REPLACEMENT

**Aerohot Sealed Well Models, AeroServ Serving System, Heritage Hot Food Electric Buffet and Next Generation Electric Hot Food Serving System**

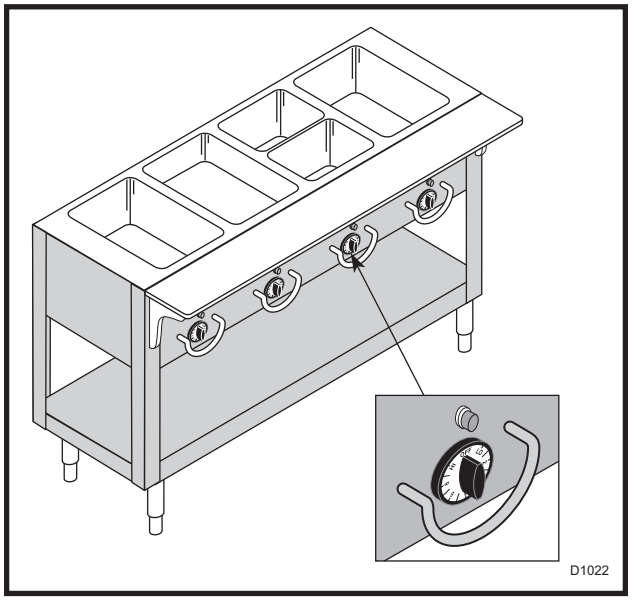



**Figure 1. Location of Infinite Switch**

Infinite switches are located on the operator's side of the unit. Each switch is located directly below its corresponding pan. Figure 1 depicts the location of the switches on most sealed well units.

1. Disconnect unit from power source.

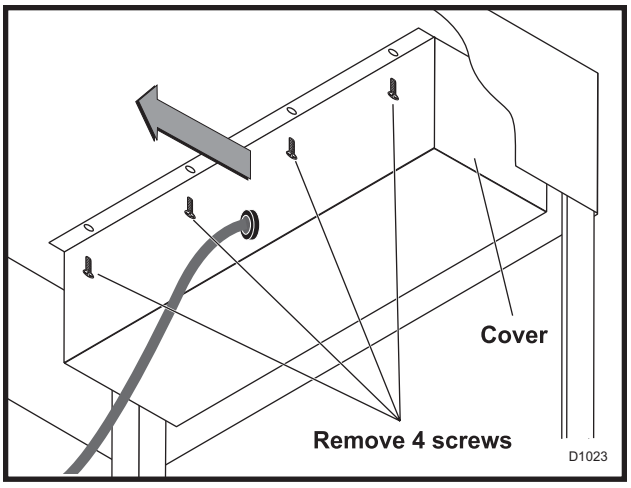



**Figure 2. Removing bottom cover**

2. Remove the screws that hold the bottom cover in place (see Figure 2).
3. Slide the bottom cover toward the back of the unit. Provide support for it to prevent damage to the wiring harness.

**Note:** Tag the power cable wires and disconnect them. Doing this allows for complete removal of the bottom cover.

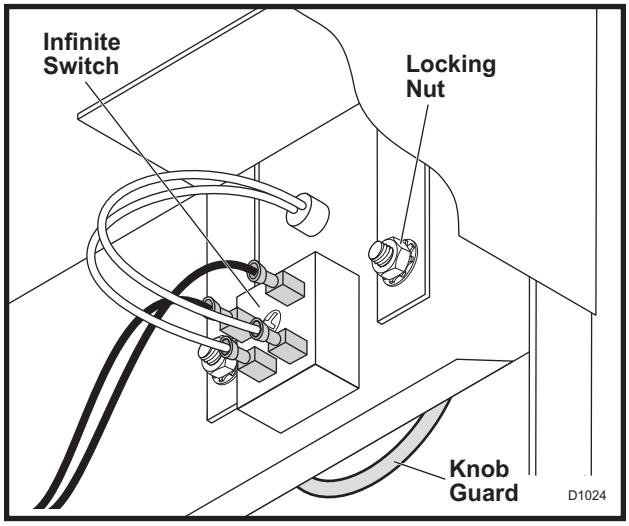



**Figure 3. View of infinite switch wiring.**

4. Tag and disconnect the infinite switch wiring. An example of the infinite switch wiring is seen in Figure 3.

5. Remove the knob.
6. Remove the two screws that secure the infinite switch to the panel.
7. Remove the switch from the back of the panel.
8. Install replacement infinite switch, mounting screws and knob.
9. Reference the tags to reconnect the wires to the infinite switch.
10. Reconnect the power wiring and reinstall the bottom cover.
11. Connect the unit to its power source.

**Aerohot ADI1SW through ADI5SW Models**

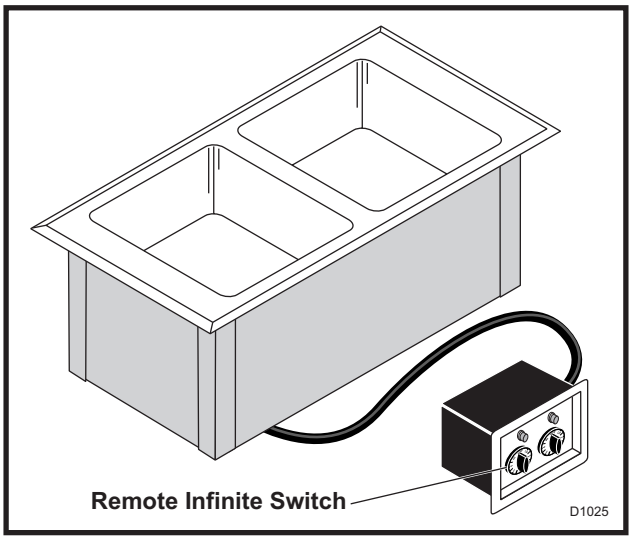



**Figure 4. Location of Infinite Switch – Aerohot Drop-in (ADI) models**

Infinite switches are located in a separate control panel that is mounted to the front of the cabinet. Figure 4 depicts an uninstalled ADI unit with the remote infinite switch control panel.

1. Disconnect unit from power source.
2. Remove the screws that hold the unit and its remote infinite switch controller in the cabinet.
3. Pull the remote infinite switch controller out of the cabinet for servicing.
4. Remove screws holding the back cover of the remote infinite switch control panel in place.
5. Tag and disconnect the infinite switch wiring. Wiring is depicted in Figure 3.
6. Remove the knob.
7. Remove infinite switch mounting screws.
8. Remove the infinite switch from the remote control panel.
9. Install replacement infinite switch, mounting screws and knob.
10. Reference the tags to reconnect the wires to the infinite switch.
11. Reinstall the back cover of the remote infinite switch control.
12. Reconnect the power wires and reinstall the unit into the cabinet.
13. Connect the unit to its power source.

**THERMOSTAT REPLACEMENT**

**Aerohot ASI1SW through ASI5SW Models**

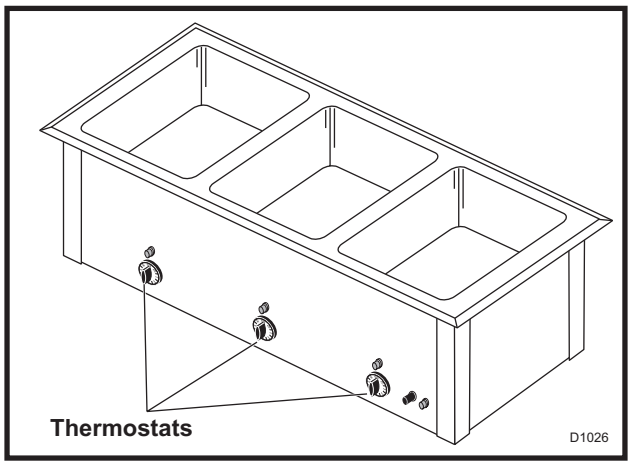



**Figure 5. Location of Thermostat – Aerohot Slide-in (ASI) models**

Thermostats are located in front on the control panel below each pan. Figure 5 depicts the location of the thermostat.

1. Disconnect the unit from its power source.
2. Slide the unit out of its cabinet.
3. Turn the unit upside down and remove the screws that hold the bottom cover in place.

4. Slide the bottom cover toward the back of the unit and lift it out as depicted in Figure 2.
5. Tag and disconnect the thermostat wiring.
6. Remove the knob.
7. Remove the thermostat mounting screws.
8. Remove the thermostat and sensor probe.
9. Install the thermostat probe into the slide-in tube in the pan.

**Note:** Do not kink the thermostat probe when reinstalling it.

10. Install the new thermostat, mounting screws and knob.
11. Reference the tags to reconnect the wiring to the thermostat.
12. Install the bottom cover.
13. Slide the unit back into its cabinet.
14. Connect the unit to its power source.

**Thurmaduke Steam Tables and Thurmaduke Serving Systems**

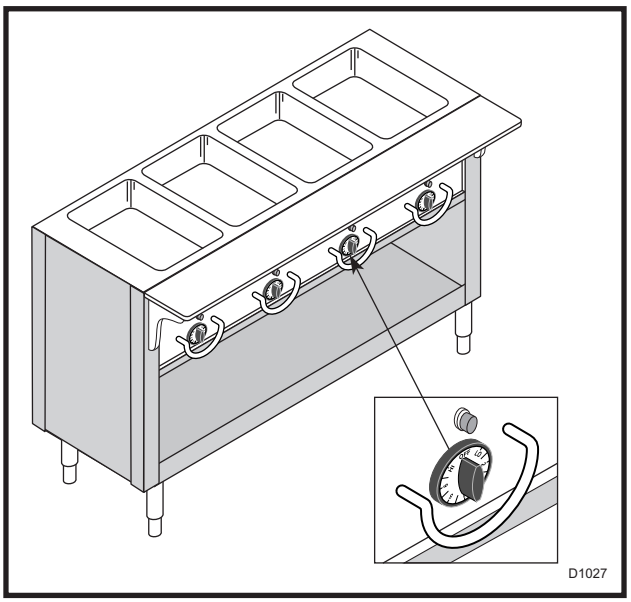



**Figure 6. Location of Thermostat – Thurmaduke models**

Thermostats are located on the operator's side of the Thurmaduke models as depicted in Figure 6. Each thermostat is mounted directly below the sealed pan it controls.

1. Disconnect unit from power source.
2. Remove the screws that hold the bottom cover (see Figure 2) in place.
3. Slide the bottom cover toward the back of the unit. Provide support for it to prevent damage to the wiring harness.

**Note:** Tag the power cable wires and disconnect them. Doing this allows for complete removal of the bottom cover.

4. Tag and disconnect the thermostat wiring.
5. Remove the knob guard. The knob guard is held on by two locking nuts on the inside of the front panel.
6. Remove the knob.
7. Remove the screws securing the thermostat to the panel.

8. Remove the thermostat from the back of the panel.
9. Install replacement thermostat, mounting screws, knob and knob guard.
10. Reference the tags to reconnect the wires to the thermostat.
11. Reconnect the power wires and reinstall the bottom cover.
12. Connect the unit to its power source.

## INDICATOR LAMP REPLACEMENT

### All Models Except ADI / Areohot Models

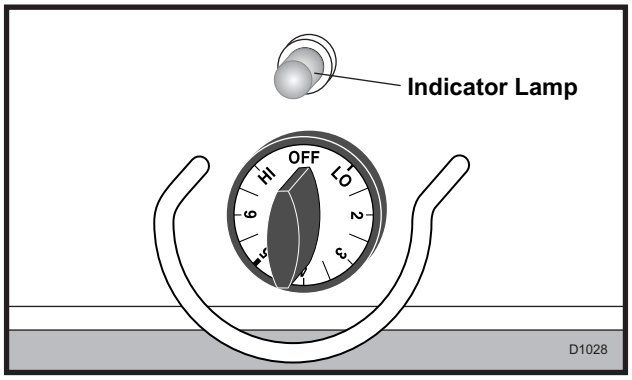



**Figure 7. Location of Pan Indicator Lamp**

The pan indicator lamp is located on the control panel above the infinite switch or electronic thermostat on all electric units as depicted in Figure 7. The lamp is lit when the pan is in operation.

Thurmaduke models are equipped with a power-on indicator lamp located next to the power toggle switch on the operator's right side.

1. Disconnect unit from power source.

**Note:** Slide-in and drop-in units must be removed from their cabinets.

2. Remove the screws that hold the bottom cover in place.
3. Slide the bottom cover toward the back of the unit and lift it out as depicted in Figure 2.

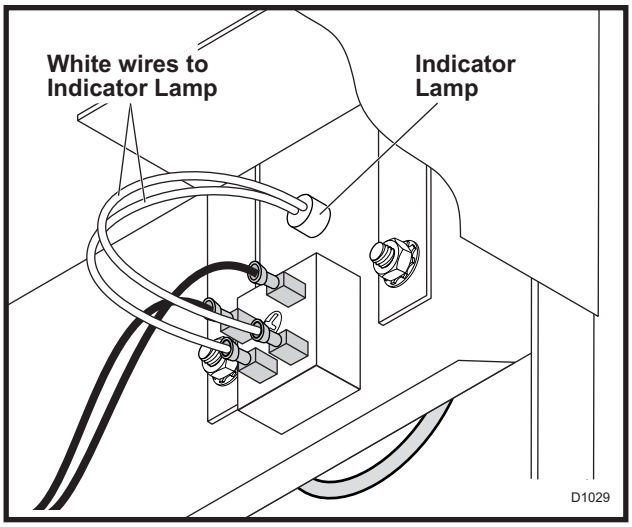



**Figure 8. Inside of panel showing location of pan indicator lamp**

4. Pan Indicator Lamps – Disconnect the indicator lamp wiring from the infinite switch or electronic thermostat as depicted in Figure 8.

   Power Indicator Lamp (Thurmaduke models only) – Disconnect the indicator lamp wires from the back of the power toggle switch.
5. Remove the indicator lamp assembly. The lamp is held in place by crimp springs.
6. Replace the indicator lamp assembly.
7. Replace the lamp with a new one.

**Note:** If the lamp assembly is held on by a nut, the nut must be screwed on prior to reattaching the lens.

8. Reconnect the indicator lamp wiring.
9. Reconnect the power wires and install the bottom cover.
10. Connect the unit to its power source.

## POWER TOGGLE SWITCH REPLACEMENT

### Thurmaduke Models

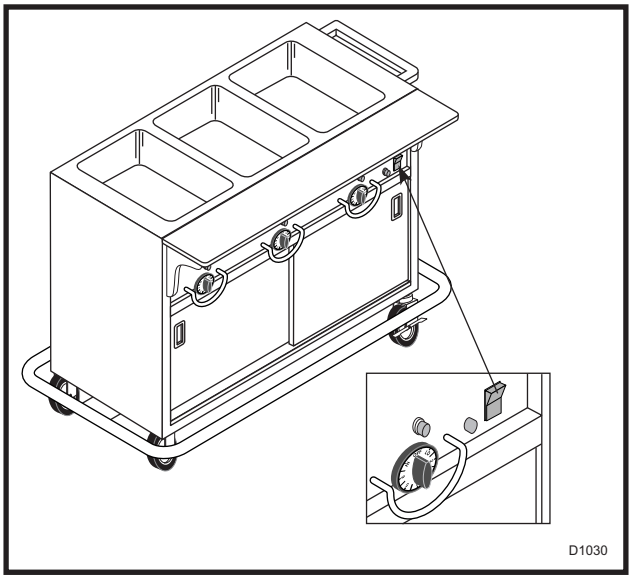



**Figure 9. Location of power toggle switch on all Thurmaduke models**

All Thurmaduke models are equipped with a power toggle switch. The switch is located on the operator's control panel to the right of the power indicator lamp as depicted in Figure 9.

1. Disconnect unit from power source.
2. Remove the screws that hold the bottom cover in place (see Figure 2).
3. Slide the bottom cover toward the back of the unit. Provide support for it to prevent damage to the wiring harness.

**Note:** For easier access, tag power cable wires then disconnect and remove the bottom cover.

4. Tag and disconnect the power toggle wiring.
5. Remove the toggle switch. It may be held in place by crimp springs, screws or a spin nut on the toggle shaft. Toggles that are held in by screws or a spin nut will be removed from the rear of the panel. Toggles held in place by crimp springs will be removed by squeezing the crimp springs and pushing the toggle out through the front of the panel.
6. Install replacement toggle switch.
7. Reference the tags to reconnect the wires to the toggle switch.
8. Reconnect the power wires and reinstall the bottom cover.
9. Connect the unit to its power source.

## ELEMENT REPLACEMENT

### All Models

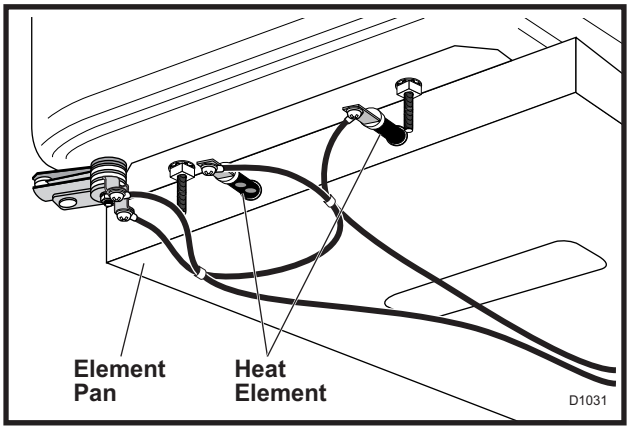



**Figure 10. Location of heat elements**

The heat element is located under each pan and is housed in an element pan for protection as depicted in Figure 10. Use replacement elements that are rated for the model being serviced.

1. Disconnect unit from power source.

**Note:** Drop-in and slide-in units must be removed from their cabinets.

2. Remove the screws that hold the bottom cover in place.
3. Slide the bottom cover toward the back of the unit and lift it out as depicted in Figure 2. In order to protect the wiring, either the bottom cover must be supported to prevent damage or the wiring must be tagged and disconnected with the cover set aside for reassembly.
4. Tag and disconnect the element wiring.

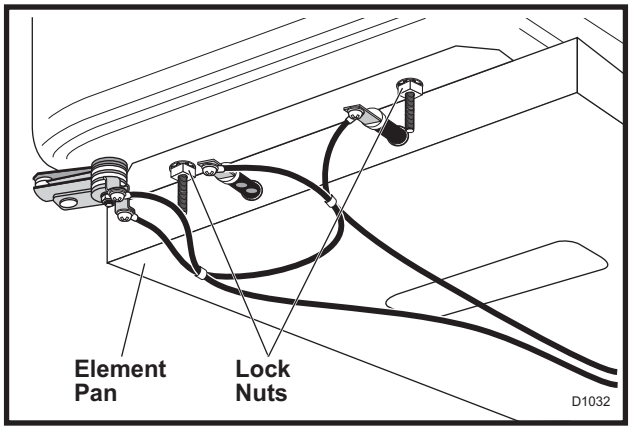



**Figure 11. Location of element pan lock nuts, two each side**

5. Remove the lock nuts that hold the element pan to the bottom of the sealed pan as depicted in Figure 11.
6. Slide the element pan away from the drain support and out of the unit.
7. Remove the element support clips on the end of the pan.
8. Remove the element from the center support bracket and lift it out of the element pan.

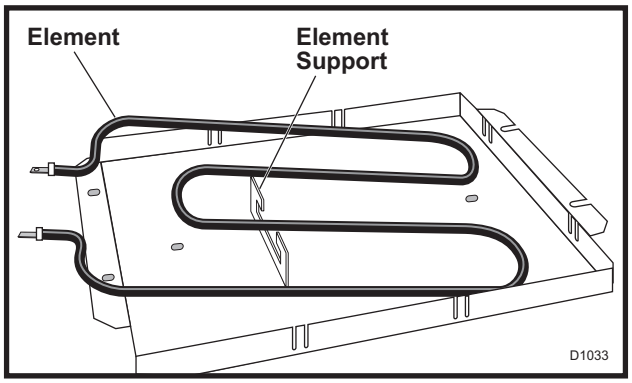



**Figure 12. Element replacement**

9. Replace the element. Gently flex element to fit it securely under the center support bracket.

**Caution: Use care when handling the new element. Elements can break very easily.**

10. Replace the element support clips that support the element loops on the edge of the pan.
11. Place the element pan over the studs on the sealed pan.
12. Replace the lock nuts to secure the element pan in place under the sealed pan.
13. Reference the tags to connect element wiring.
14. Reconnect the power wires and install the bottom cover.
15. Connect the unit to its power source.

## HI-LIMIT THERMOSTAT REPLACEMENT

### All Models

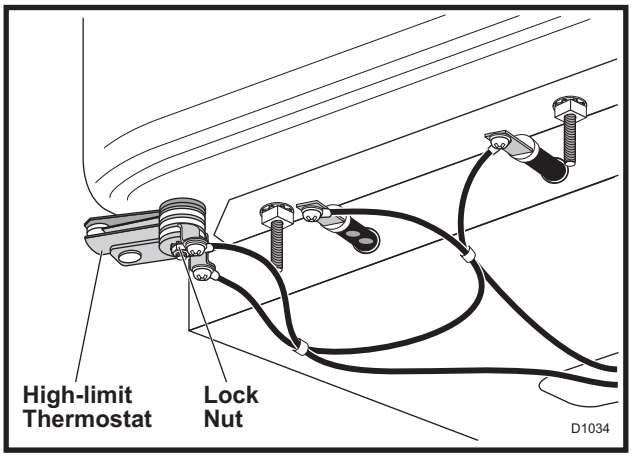



**Figure 13. Location of the Hi-Limit Thermostat**

The hi-limit thermostatic switch is located on the bottom of each pan next to the element wire connections. It is connected directly to the sealed pan as depicted in Figure 13.

1. Disconnect unit from power source.
2. Remove the bottom cover as depicted in Figure 2.

**Note:** Tag and disconnect the power wires, set the bottom cover aside for reassembly.

3. Tag the wires to the hi-limit thermostatic switch and disconnect them.
4. Remove the lock nut that holds the hi-limit thermostat in place and lift the hi-limit thermostatic switch off of its mounting stud.
5. Place the new hi-limit thermostatic switch onto the mounting stud.

6. Replace the lock nut.

**Caution: Do not overtighten the lock nut. Overtightening will damage the hi-limit thermostat.**

7. Reference the tags to reconnect the hi-limit thermostatic switch wiring.
8. Reconnect the power wires and install the bottom cover.
9. Connect the unit to its power source.

## CARVING BOARD SHELF REPLACEMENT

### All Models

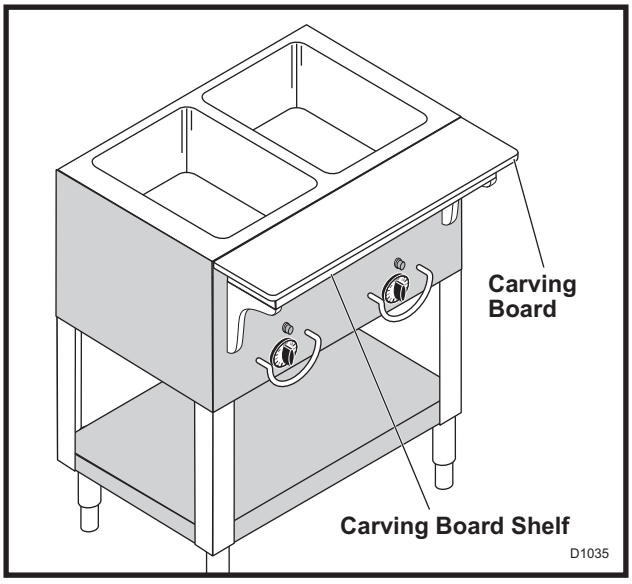



**Figure 14. Location of Carving Board Shelf**

The carving board and carving board shelf are located on the server's side of the unit as depicted in Figure 14. If needed, the carving board is replaceable as a separate unit. Aerohot Drop-in and Slide-in units are not available with carving boards.

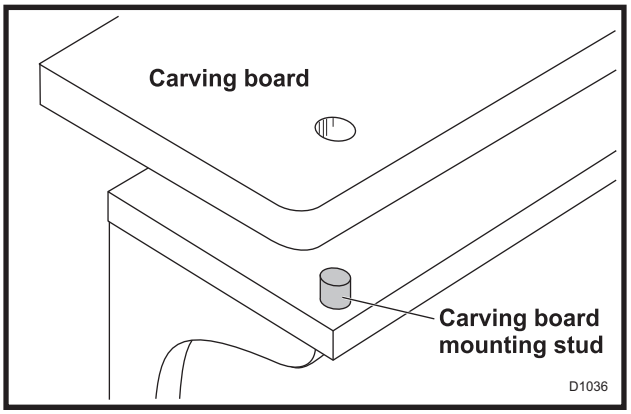



**Figure 15. Carving board mounting stud**

1. Lift the carving board off its mounting studs as depicted in Figure 15.

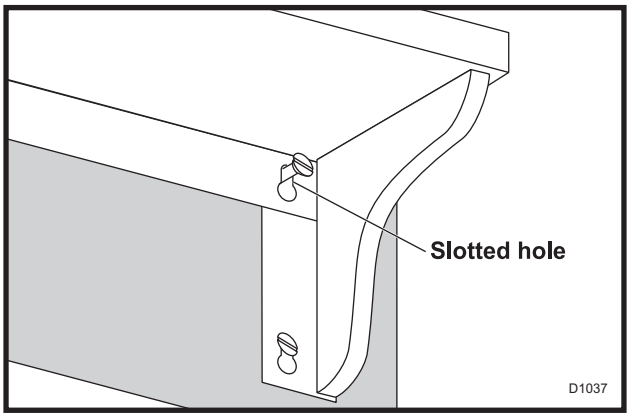



**Figure 16. Carving board shelf mounting brackets**

2. Loosen the top screw in the slotted hole at the top of the bracket on both sides of the unit as depicted in Figure 16.
3. Remove the rest of the screws that hold the shelf on the unit.
4. Lift the shelf up and away from the unit.
5. Replace the shelf with the new one.
6. Reinstall the screws.
7. Tighten the screws in the slotted holes.
8. Insert the new carving board onto the mounting studs on the shelf.

## CASTER REPLACEMENT

### Thurmaduke Serving System, AeroServ and Heritage Models

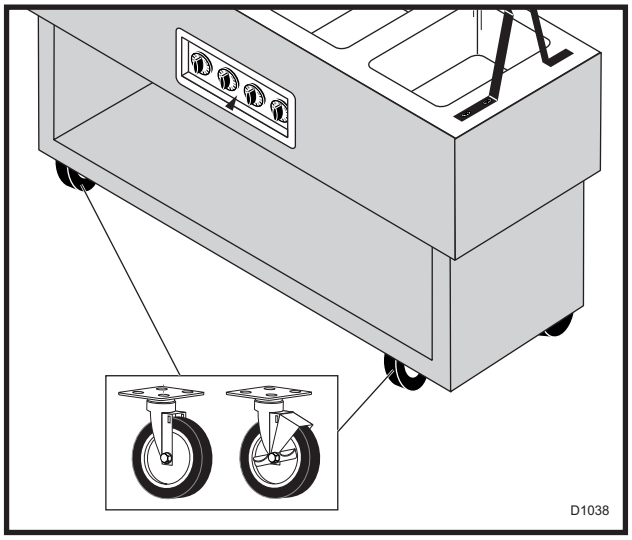



**Figure 17. Units with casters**

Thurmaduke, AeroServ and Heritage models are supplied with NSF listed 5" black swivel casters. Each unit is supplied with a pair of locking casters.

1. Disconnect the unit from its power source.
2. Make sure pans have been completely emptied.
3. Raise and support the side of the unit that requires a new caster.
4. Remove the four screws that hold the caster to the channel at the bottom of the unit.

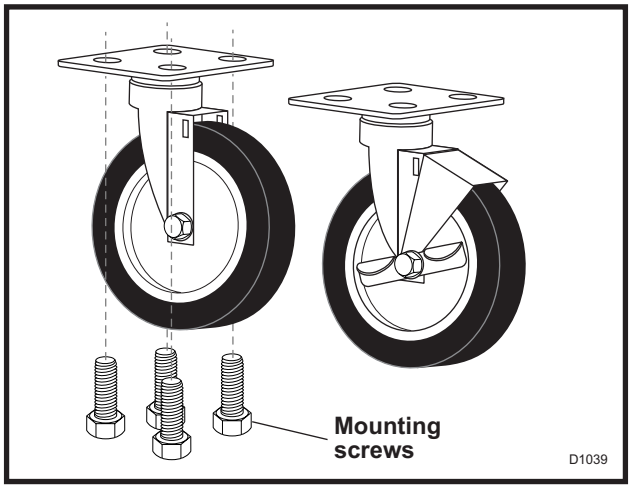



**Figure 18. Location of mounting holes on caster flange**

5. Slide the old caster off of the leg channel.
6. Line up the holes in the caster flange with the mounting holes in the leg channel.
7. Slide the new caster into position.

   Always replace locking casters with locking casters.
8. Reattach and tighten the mounting screws.
9. Remove the unit from the supports.
10. Reconnect the unit to its power source.

## PUSH BAR REPLACEMENT

### Thurmaduke, AeroServ and Heritage Serving Systems

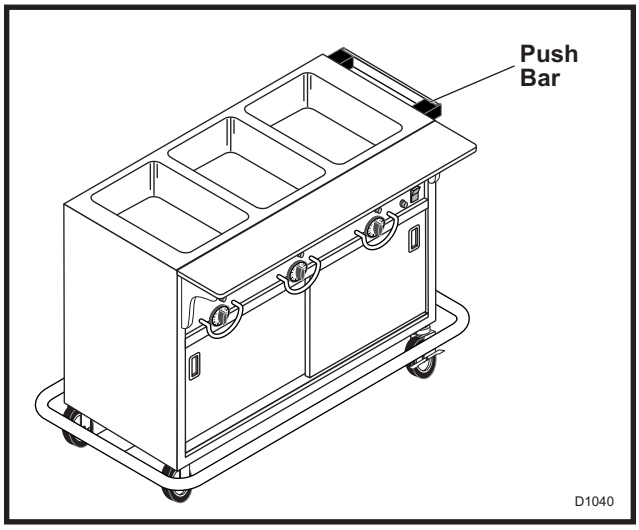



**Figure 19. Push bar on Thurmaduke Serving Systems**

Push bars are mounted on the side of the serving system that has the locking casters. Generally, this is the operator's right side. Push bars are optional with the Thurmaduke, Heritage and AeroServ Serving Systems.

1. Remove the unit from its power source.
2. Remove the bottom cover as depicted in Figure 2.

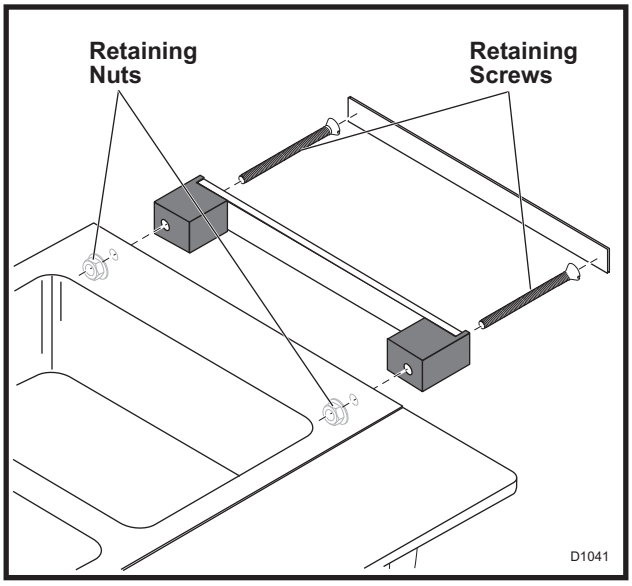



**Figure 20. View of Push Bar retaining nuts/screws.**

3. Remove the retaining nuts and washers from the push bar studs.
4. Gently pull the push bar free of the unit.

**Caution:** **Be very careful when removing the push bar from painted models to prevent scratching or peeling of paint.**

5. Insert new push bar into handle holes in the unit.
6. Reattach washers and nuts.
7. Reattach any wires that were disconnected when the bottom cover was removed.
8. Reinstall the bottom cover.
9. Connect the unit to its power source.

## MASTER DRAIN VALVE REPLACEMENT

### All Models

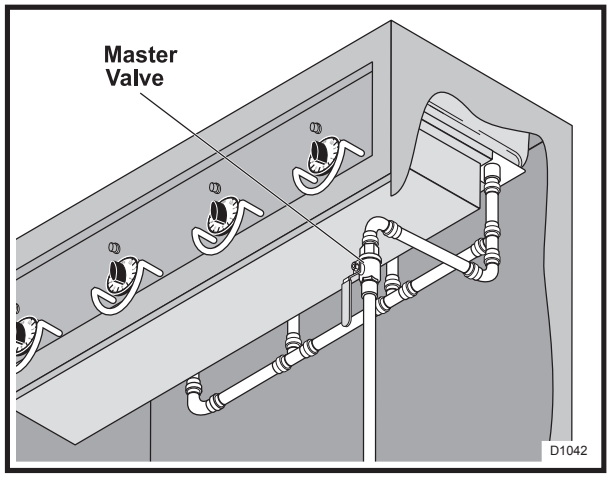



**Figure 21. Location of Master Drain Valve**

All sealed well units are provided with a drain system. The drain system may be provided in copper or PVC depending on the model. The master drain valve is located below the drain manifold as depicted in Figure 21.

1. Disconnect the unit from its power source.
2. Make sure pans are drained.

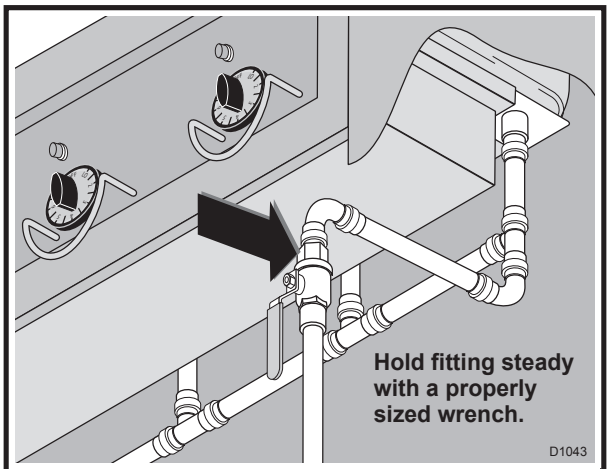



**Figure 22. Master Valve and Valve Fitting**

3. Remove the old valve.

**Caution:** **The valve may be very tight. It is important to hold the pipe fitting (see Figure 22) with a wrench of the proper size connected to the coupler to prevent damage to the plumbing. Copper is a very soft material and will bend. PVC is brittle and breaks very easily.**

4. Apply pipe sealer (“pipe dope”) to the threads of the new valve.
5. Screw the new valve onto the pipe fitting on the manifold. Make sure it is tight but do not overtighten it.
6. Test the valve for leaks. Tighten as necessary.
7. Reconnect the unit to its power source.

# SERVICE INFORMATION

## TROUBLESHOOTING PROCEDURE

| SYMPTOM | CAUSE | REMEDY |
|---|---|---|
| Element does not heat | Unit not plugged in | Plug unit in |
| | No power to unit | Check circuit breakers or fuses |
| | Defective thermostat or infinite switch | Replace with proper part rated for the model |
| | Open hi-limit thermostat | Replace hi-limit thermostat |
| | Open element | Test for continuity and replace if necessary |
| Unit not level (wobbles) | Legs not adjusted properly (floor models) | Using the leg adjusters, adjust the legs until level |
| | Cabinet not level (drop-in or slide-in units) | Shim cabinet until level |
| Master valve leaks | Compression fitting not tight enough | Tighten the compression fitting |
| Wells will not drain | Valve mechanism worn | Replace master valve |
| | Master valve closed | Open valve |
| | Master valve clogged | Remove, clean and replace valve |
| | Valve handle moves but does not open valve | Replace valve with new one |

# MAINTENANCE

## STAINLESS STEEL CARE AND CLEANING

Stainless steel contains 70-80% iron. Iron will rust. It also contains 12-30% chromium. Chromium forms an invisible, passive film over the steel surface and acts as a shield against corrosion. As long as the protective film remains intact, the metal will not corrode. However, if the film is broken or contaminated, outside elements can begin to break down the steel and form rust or discoloration. To prevent rust and discoloration on stainless steel, several important steps need to be taken.

**CAUTION: Never use steel wool pads, wire brushes or scrapers.**

**Avoid cleaning solutions that contain alkaline or chloride.**

Use non-alkaline-based or non-chloride cleaning solutions. Anything containing chloride will damage the protective film on stainless steel. Chlorides are found in household and industrial cleaners and also in hard water and salts. If a chloride or alkaline cleaner has been used, rinse repeatedly and dry thoroughly.

Always use only soft cloths or plastic scouring pads. For routine cleaning, use warm soapy water. For stubborn stains, use a non-abrasive cleanser. For heavy grease, use a degreaser. For best results, rub with the grain of the steel.

Pitting and cracking are early signs of stainless steel breakdown. Special stainless steel cleaners can restore and preserve the protective film. If signs of breakdown appear, thoroughly clean and dry all surfaces. Begin regular application of a high quality stainless steel cleaner according to the manufacturer's instructions. Again, always rub with the grain of the steel for best results.

**CAUTION: Never use an acid-based cleanser! Be sure to clean all food products from any stainless surface. Many food products contain acid, which can deteriorate the finish. Common foods include tomatoes, peppers and other vegetables.**

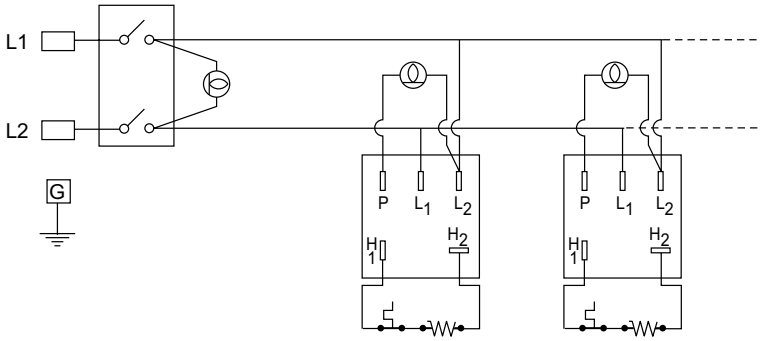
## CARE AND CLEANING: PAINTED OR POWDER COATED UNITS

Paint and Powder Coat are applied finishes. They are applied to a paint-ready steel surface. Like stainless steel, units with these coatings should be cleaned with mild soap and a soft cloth. Stubborn stains can be removed with a plastic scrubbing pad. Never use abrasive materials to clean painted or powder coated surfaces. After cleaning with mild soap and a soft cloth, painted and powder coated surfaces must be rinsed with warm water and a soft cloth to remove soap residue. Always wipe painted or powder coated surfaces dry with a soft dry cloth after they are cleaned.

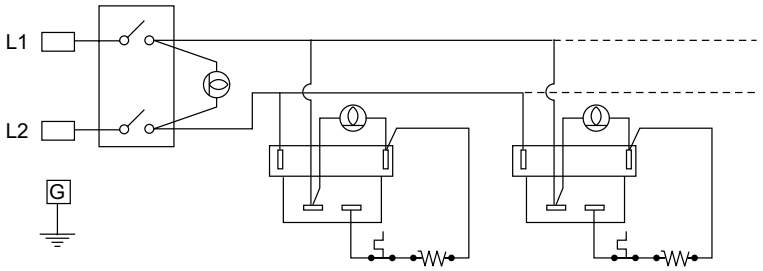
**WARNING:**

**THE POWER MUST BE TURNED OFF AND DISCONNECTED AT ALL TIMES DURING MAINTENANCE OR REPAIR FUNCTIONS.**

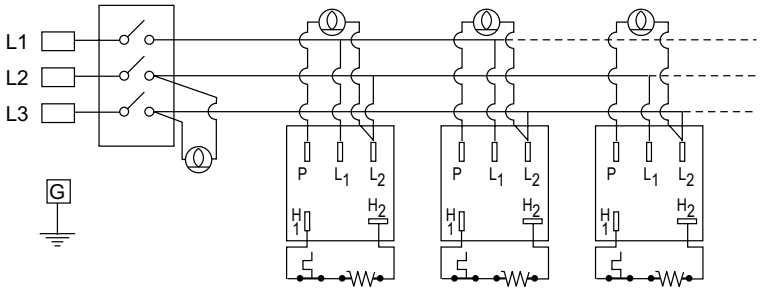
# SCHEMATICS



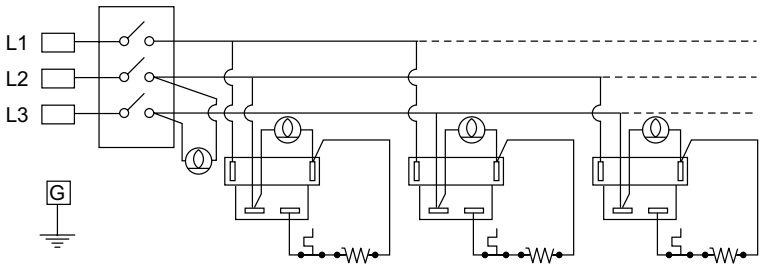

**Single Phase 120VAC to 240VAC with Infinite Switch**




**Single Phase 120VAC to 240VAC with Thermostatic Control**




**Three Phase 120VAC to 240VAC with Infinite Switch.**




**Three Phase 120VAC to 240VAC with Thermostatic Control**

**Figure 23. Schematics of Sealed Well Units with Electronic Thermostats or Infinite Switches**

**NOTES:**

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