

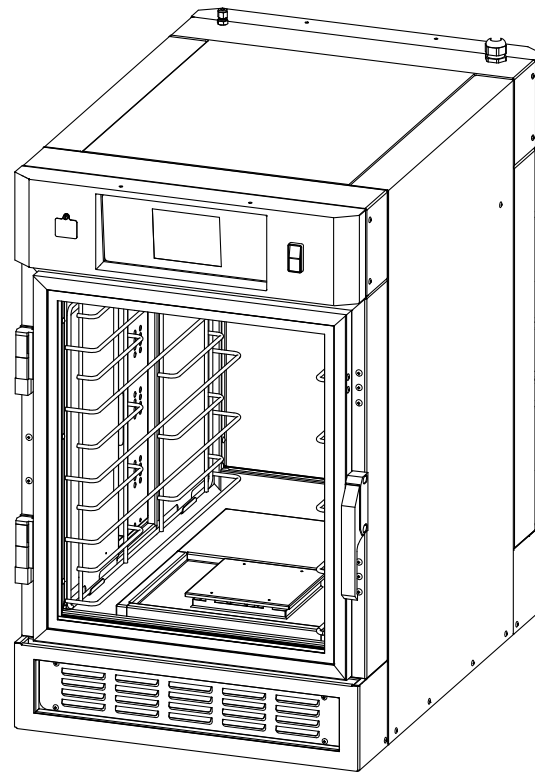


Your Solutions Partner

Service Manual

FLEXTECH™ HUMIDIFIED HOLDING CABINET

MODEL
FTU-5



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

THIS MANUAL HAS BEEN PREPARED FOR PERSONNEL QUALIFIED TO INSTALL ELECTRICAL EQUIPMENT, WHO SHOULD PERFORM THE INITIAL FIELD STARTUP AND ADJUSTMENTS OF THE EQUIPMENT COVERED BY THIS MANUAL.

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

⚠ WARNING FAILURE TO FOLLOW ALL THE INSTRUCTIONS IN THIS MANUAL CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING ELECTRICAL CONNECTIONS SHOULD BE PERFORMED ONLY BY A CERTIFIED PROFESSIONAL.

⚠ WARNING ELECTRICAL AND GROUNDING CONNECTIONS MUST COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRIC CODE AND/OR ALL LOCAL ELECTRIC CODES. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING BEFORE CONNECTING THE UNIT TO THE ELECTRICAL SUPPLY, VERIFY THAT THE ELECTRICAL AND GROUNDING CONNECTIONS COMPLY WITH THE APPLICABLE PORTIONS OF THE NATIONAL ELECTRIC CODE AND/OR OTHER LOCAL ELECTRICAL CODES. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING BEFORE CONNECTING THE UNIT TO THE ELECTRICAL SUPPLY, VERIFY THAT THE ELECTRICAL CONNECTION AGREES WITH THE SPECIFICATIONS ON THE DATA PLATE. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING UL73 GROUNDING INSTRUCTIONS: THIS APPLIANCE MUST BE CONNECTED TO A GROUNDED, METAL, PERMANENT WIRING SYSTEM. OR AN EQUIPMENT-GROUNDING CONDUCTOR MUST BE RUN WITH THE CIRCUIT CONDUCTORS AND CONNECTED TO THE EQUIPMENT-GROUNDING TERMINAL OR LEAD ON THE APPLIANCE. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING APPLIANCES EQUIPPED WITH A FLEXIBLE ELECTRIC SUPPLY CORD, ARE PROVIDED WITH A THREE-PRONG GROUNDING PLUG. IT IS IMPERATIVE THAT THIS PLUG BE CONNECTED INTO A PROPERLY GROUNDED THREE-PRONG RECEPTACLE. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING IF THE RECEPTACLE IS NOT THE PROPER GROUNDING TYPE, CONTACT AN ELECTRICIAN. DO NOT REMOVE THE GROUNDING PRONG FROM THE PLUG. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING BEFORE PERFORMING ANY SERVICE THAT INVOLVES ELECTRICAL CONNECTION OR DISCONNECTION AND/OR EXPOSURE TO ELECTRICAL COMPONENTS, ALWAYS PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE. DISCONNECT ALL CIRCUITS. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING BEFORE REMOVING ANY SHEET METAL PANELS OR SERVICING THIS EQUIPMENT, ALWAYS PERFORM THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE. BE SURE ALL CIRCUITS ARE DISCONNECTED. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING DO NOT OPERATE THIS EQUIPMENT WITHOUT PROPERLY PLACING AND SECURING ALL COVERS AND ACCESS PANELS. FAILURE TO COMPLY WITH THIS PROCEDURE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING DO NOT USE OR STORE GASOLINE OR OTHER FLAMMABLE VAPORS OR LIQUIDS IN THE VICINITY OF THIS OR ANY OTHER APPLIANCE. FAILURE TO COMPLY CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

⚠ WARNING IN THE EVENT OF A POWER FAILURE, DO NOT ATTEMPT TO OPERATE THIS APPLIANCE. FAILURE TO COMPLY CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

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INTRODUCTION

INSTALLATION

For detailed installation instructions, refer to the Owner’s Manual P/N 169695

SEQUENCE OF OPERATION

For specific instructions, refer to the Owner’s Manual P/N 169695

OPERATION

For specific operating instructions, refer to the Owner’s Manual P/N 169695

TOOLS

- Standard set of hand tools.
- VOM with AC current tester. (Any quality VOM or DVM with a sensitivity of at least 20,000 Ohms per Volt can be used.)

CLEANING

For specific instructions, refer to the Owner’s Manual P/N 169695






SPECIFICATIONS

US and Foreign Patents Pending FTU-5 Model

Unit Weight: 285 lbs/ 129.X kg

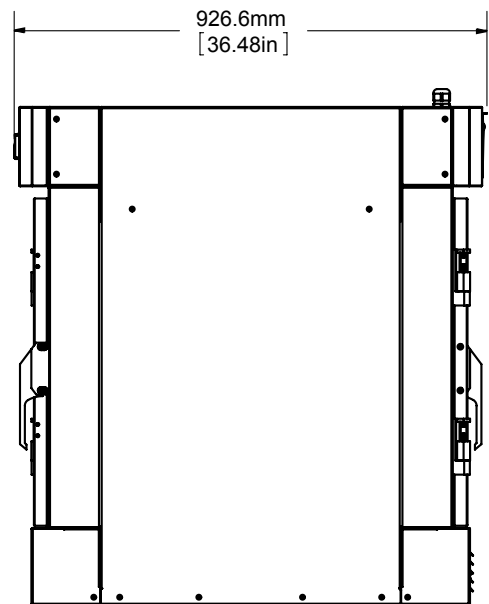
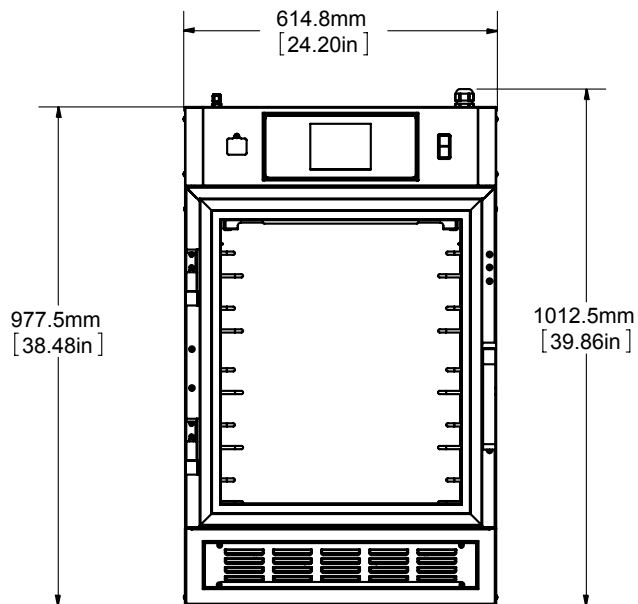
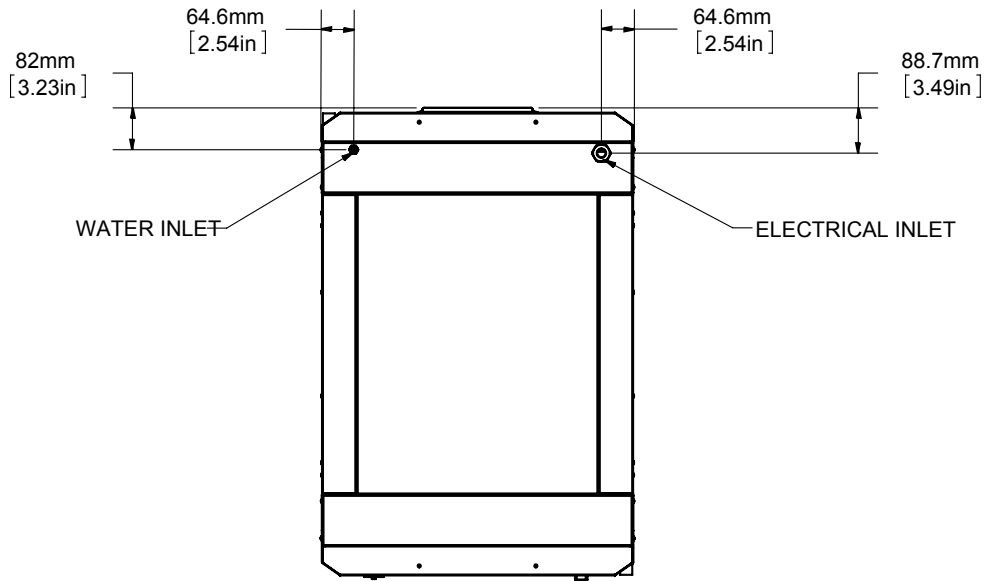
ELECTRICAL SPECIFICATIONS

AC Voltage	HZ	Phase	Watts	Amperage
208	60	Single Phase	4,450	23
230	50	Single Phase	4,450	17
240	60	Single Phase	4,450	20

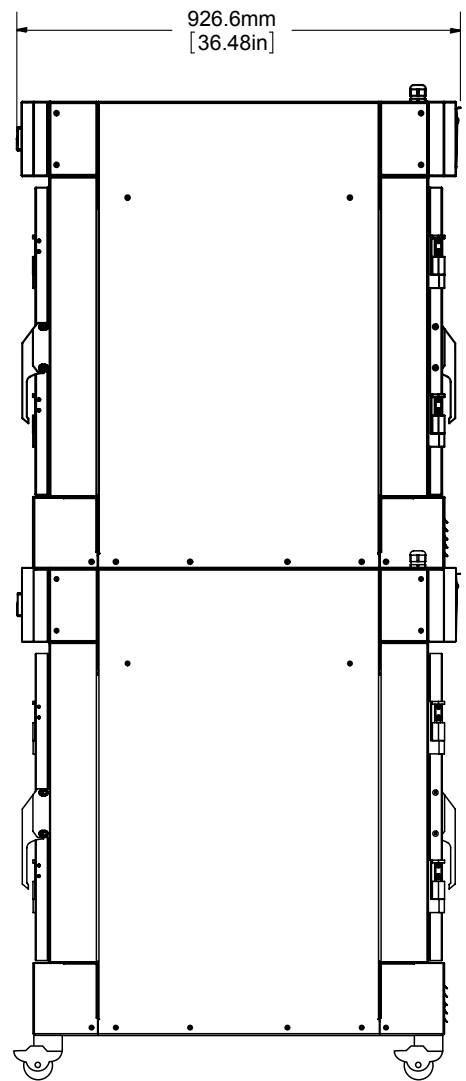
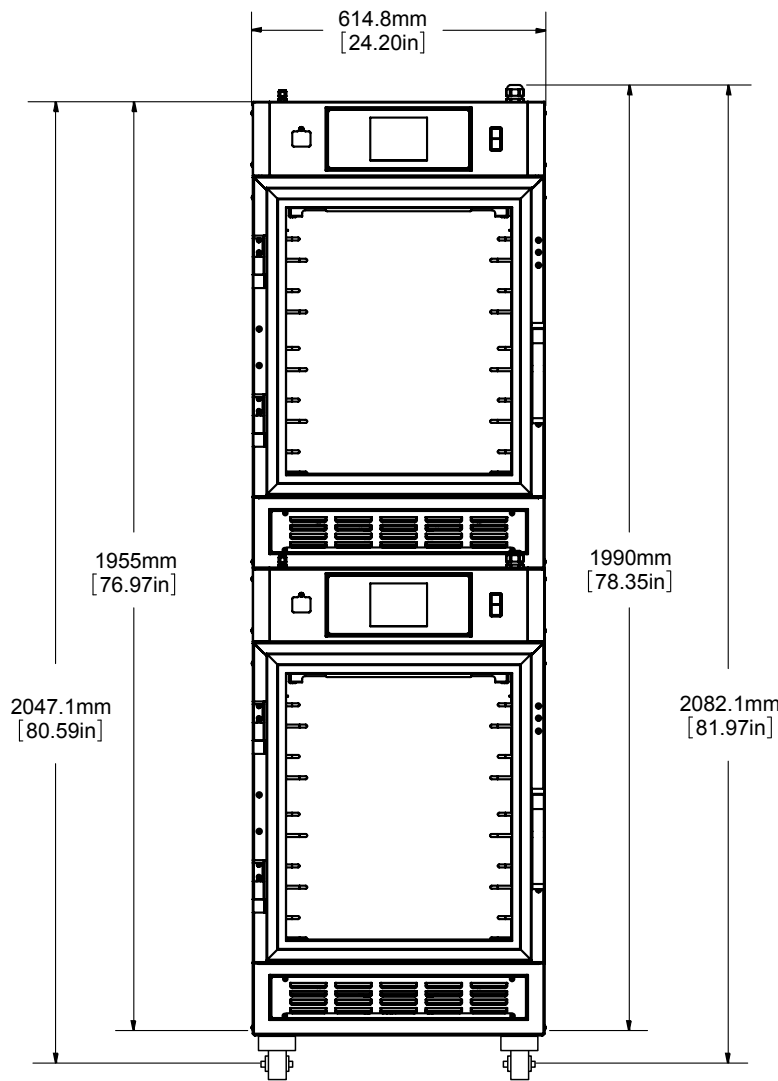
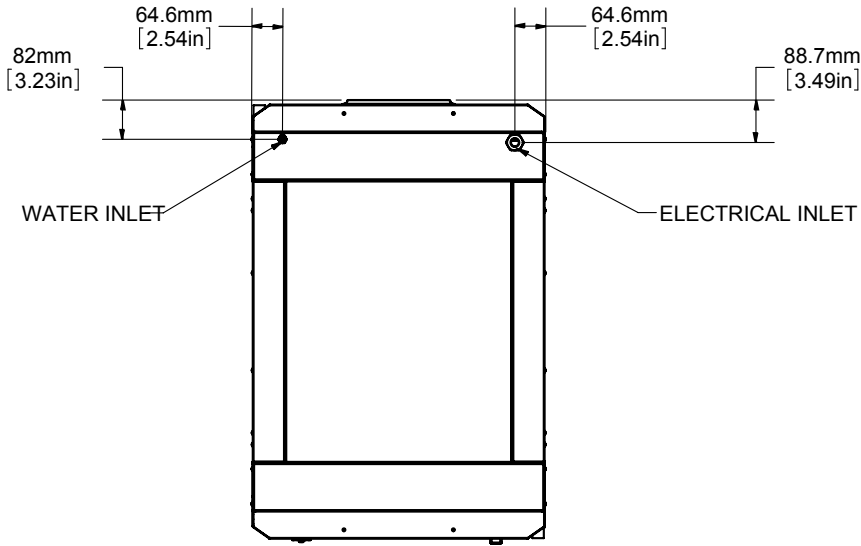
Compliance Declaration - FTU with Touch Screen Control		
	LISTED COMMERCIAL COOKING APPLIANCE	Standard: UL197 File: KNGT.E17421
	INDOOR COMMERCIAL APPAREL DC OUTLINE	Standard: CSA-C22.2 No. 109 File: KNGT7.E17421
		Standard: ANSI / NSF 4 File: TSQT.E157479
	Directive 2006/95/EC: EN60335 -1:2010 EN 60335-2-49:2008	Directive 89/336/EEC: EN62233:2008 EN61000-6-3:2010 EN55014-2:20081
	WEEE Directive 2002/96/EC RoHS 2011/65/EU	
Rated IPX3 for Counter Configuration		
Rated IPX4 for Stacked Configuration		

DIMENSIONS

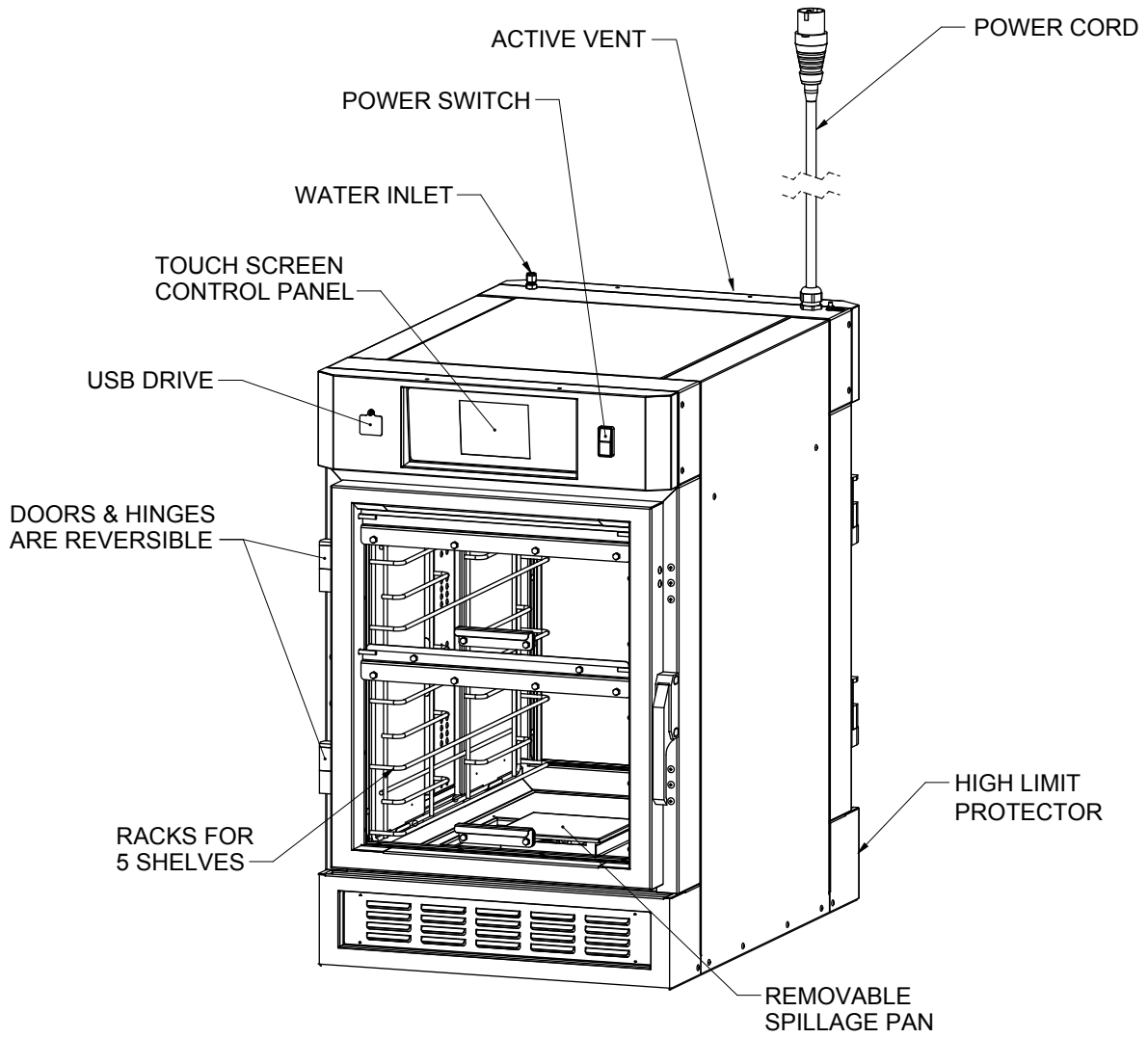
COUNTER CONFIGURATION



STACKED CONFIGURATION



MAIN FEATURES



REMOVAL AND REPLACEMENT OF PARTS

ELECTRICAL LOCKOUT/TAGOUT PROCEDURE



WARNING

BEFORE PERFORMING ANY SERVICE THAT INVOLVES ELECTRICAL CONNECTION OR DISCONNECTION AND/OR EXPOSURE TO ELECTRICAL COMPONENTS, ALWAYS FOLLOW THE ELECTRICAL LOCKOUT/TAGOUT PROCEDURE. DISCONNECT ALL CIRCUITS. FAILURE TO COMPLY CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH.

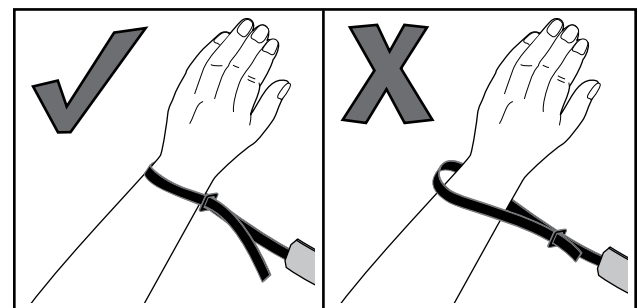
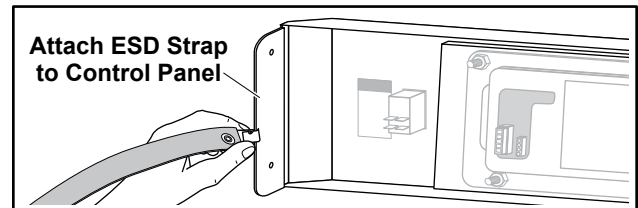
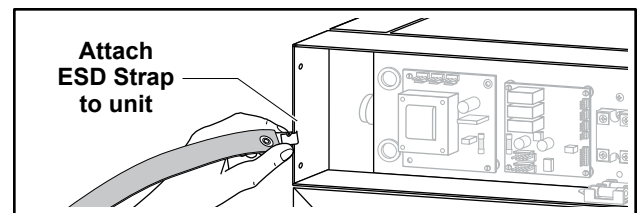
The Electrical LOCKOUT/TAGOUT Procedure is used to protect personnel working on an electrical appliance. Before performing any maintenance or service that requires exposure to electrical components, follow these steps:

1. In electrical box, place appliance circuit breaker into OFF position.
2. Place a lock or other device on the electrical box cover to prevent someone from placing the circuit breaker ON.
3. Place a tag on electrical box cover to indicate that appliance has been disconnected for service and power should not be restored until tag is removed by maintenance personnel.
4. Disconnect the appliance power cord from the electrical outlet.
5. Place a tag on the cord to indicate that unit has been disconnected for service and power should not be restored until tag is removed.

ESD WRIST STRAP

An ESD Wrist Strap is required when replacing certain components.

1. Place both of the unit's power ON/OFF Switches in the "OFF" position and follow the proper LOCKOUT/TAGOUT Procedure.
2. Remove and retain the screws securing the Control Panel to the unit.
3. Tilt the Control Panel down and away from unit far enough to access the component(s).
4. Depending on the component being replaced, properly connect the ESD Wrist Strap to the unit or Control Panel and secure it properly on the wrist.



COVERS AND PANELS

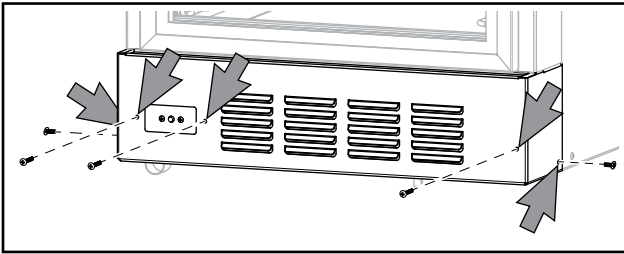
Before removing any cover or panel that may expose electrical components or wiring to contact, turn main Power Switch to the OFF position, and unplug unit or turn off power supply by switching off building circuit breaker.

Perform an Electrical Lockout/Tagout procedure as described on the previous page.

REAR LOWER LOUVERED PANEL

The Rear Lower Louvered Panel provides access to the High Limit Thermostat, water Inlet Solenoid, Water Pressure Regulator and Blower.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.

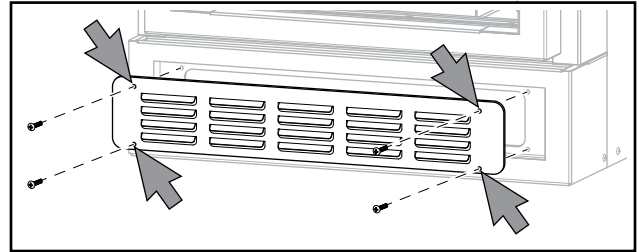


3. Reverse these steps to reinstall the Rear Lower Louvered Panel.

FRONT LOWER LOUVERED PANEL

The Front Lower Louvered Panel provides access to the Heating Elements.

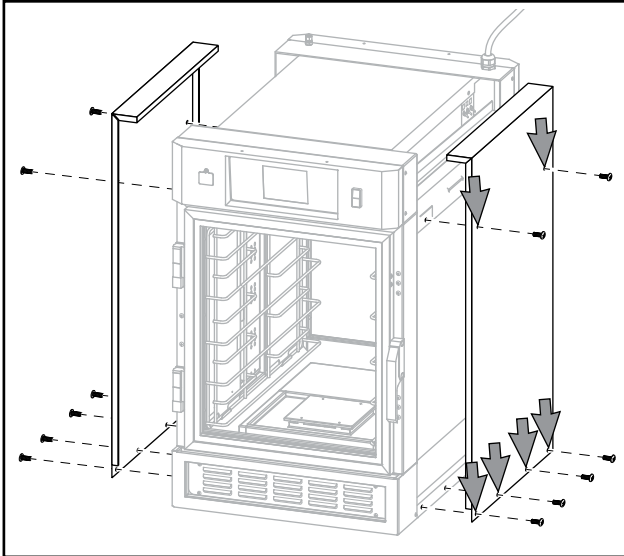
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws securing the Front Lower Louvered Panel and remove panel.



3. Reverse these steps to reinstall the Front Lower Louvered Panel.

SIDE PANELS

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew the 6 Phillips-head screws securing the Side Panel(s) and remove.

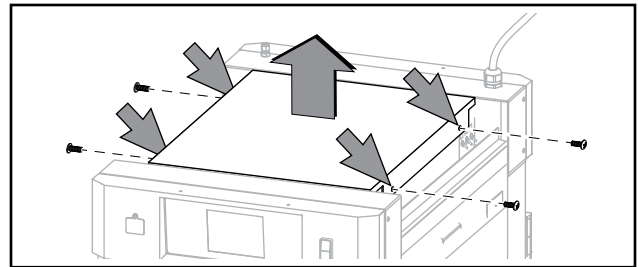


3. Reverse these steps to reinstall the Side Panel(s).

TOP PANEL

The Top panel gives access to the Humidity Vent Fan.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Remove the Side Panels. See procedure in previous instructions.
3. Unscrew 4 Phillips-head screws securing the Top Panel and remove the panel.

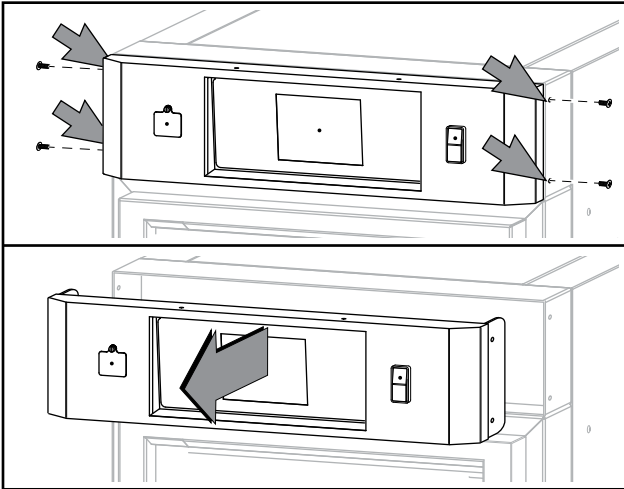


4. Reverse these steps to reinstall the Top Panel.

CONTROL PANEL

The Control Panel allows access to the Control Module, ON/Off Switch, Power Supply Board, Relay Board, Solid State Relays, Power Relays, Transformer, USB Socket, Fuses and Fuse Holder.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.

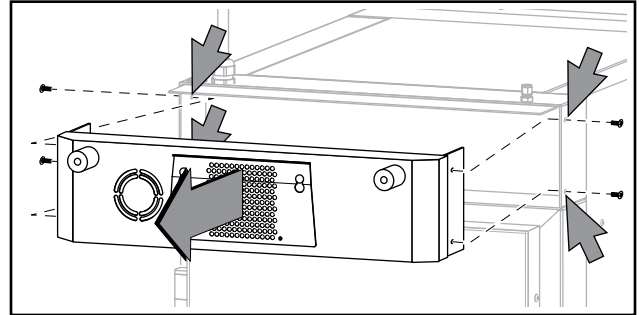


3. Tag and disconnect all wires and harnesses.
4. Remove Control Panel.
5. Reverse these steps to reinstall the Control Panel.

UPPER REAR PANEL

The Upper Rear Panel allows access to the Upper Rear Cooling Fan.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Upper Rear Panel, slide panel away from unit.

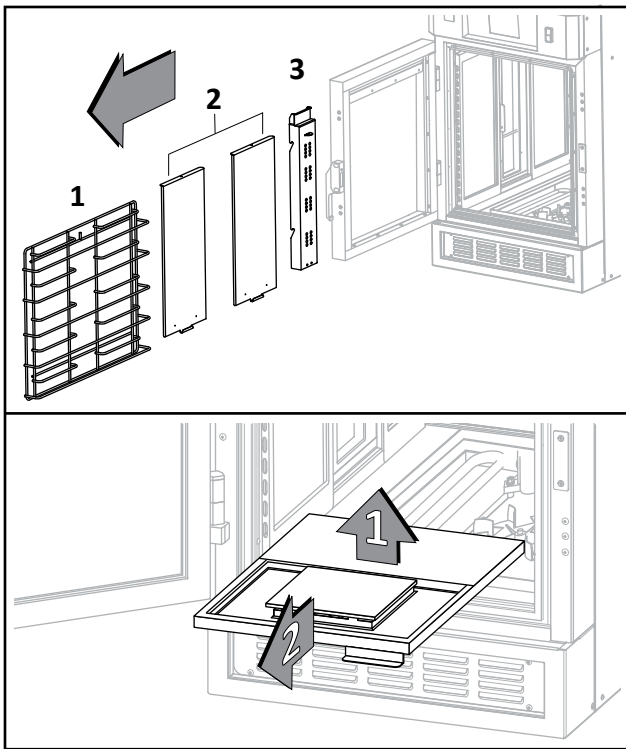


3. Reverse these steps to reinstall the Side Panel(s).

BOTTOM PANEL

The Bottom Panel inside the Food Holding Compartment is removable.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports in the order shown. Components 1, 2 and 3 are easily removed by slightly lifting and tilting the bottom toward the center of the cavity.

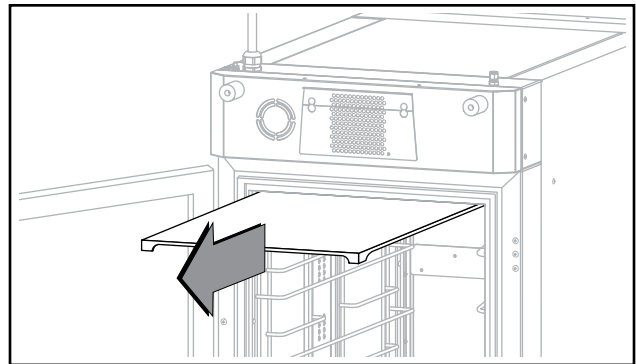


4. Bottom Panel will lift out without the use of tools.

UPPER CAVITY PANEL

There is a removable upper panel inside the Food Holding Cavity.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open Rear Door.
4. Upper Cavity Panel slides out without the use of tools.



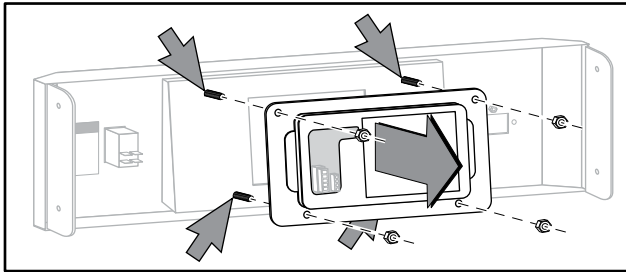
CONTROL COMPARTMENT PARTS

CONTROL MODULE

The Control Module is the user interface mounted to the Control Panel.

An ESD Wrist Strap (provided in replacement kit) is required when replacing the Control Module.

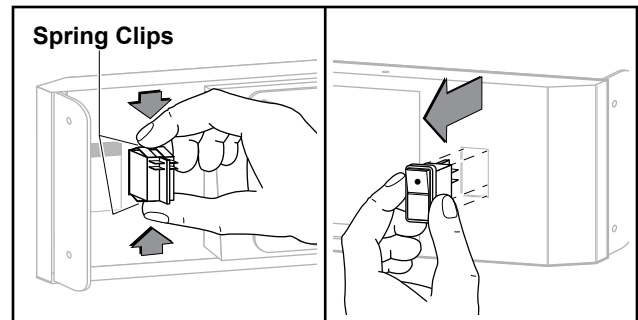
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Remove 4 hex nuts securing Control Module to panel and remove module.



4. To replace Control Module reverse these steps.
5. Restore power to unit and test for proper function

POWER ON/OFF SWITCH

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and remove all wiring from Power On/Off Switch.
4. Depress Spring Clips Securing Power On/Off Switch to Control Panel and remove switch.

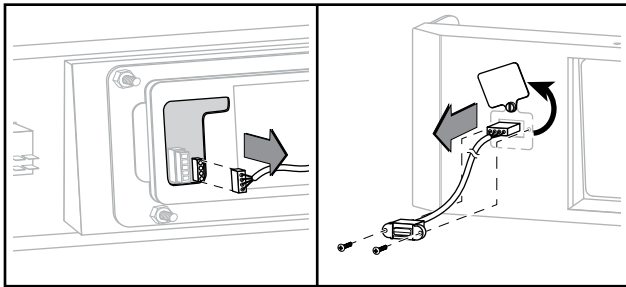


5. Snap replacement switch in place and rewire switch.
6. To replace Power On/Off Switch reverse these steps.
7. Restore power to unit and test for proper function

USB PORT

The USB Port is mounted to the Control Panel beneath a swinging, protective shield.

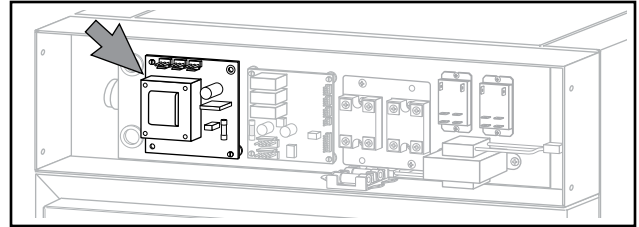
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Disconnect USB Harness from Control Board.
4. Swing Protective Shield up to gain access to USB Port.
5. Remove 2 Phillips-head Screws securing USB Port to Control Panel and pull port through opening in Control Panel.



6. To install replacement USB Port, reverse these steps.
7. Restore power to unit and test for proper function.

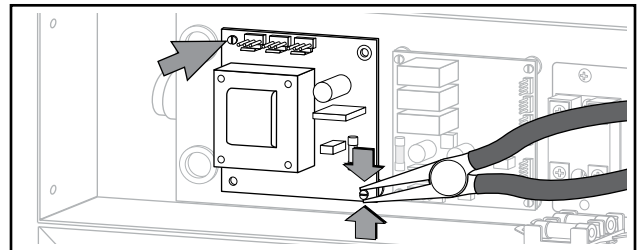
POWER SUPPLY BOARD

The Power Supply Board is mounted inside the Control Compartment behind the Control Panel.



An ESD Wrist Strap (provided in replacement kit) is required when replacing the Power Supply Board.

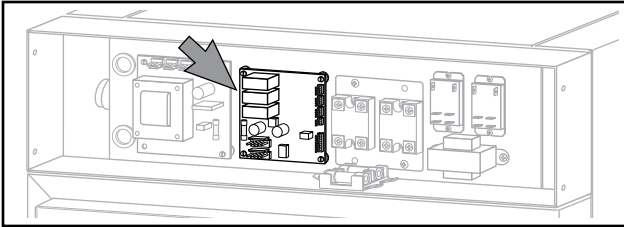
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and remove all wiring from Power Supply Board.
4. The Power Supply Board is mounted on barbed Nylon posts. Use pliers to squeeze ends to release board.



5. Snap replacement Power Supply Board onto posts.
6. Rewire board according to tags.
7. Replace wires and harnesses to Control Panel and reinstall Control Panel.
8. Restore power to unit and test for proper function.

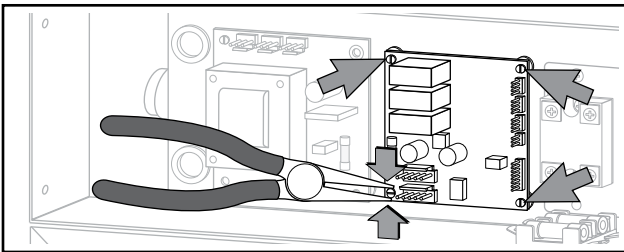
CONTROL BOARD

The Control Board is mounted inside the Control Compartment behind the Control Panel.



An ESD Wrist Strap (provided in replacement kit) is required when replacing the Control Board.

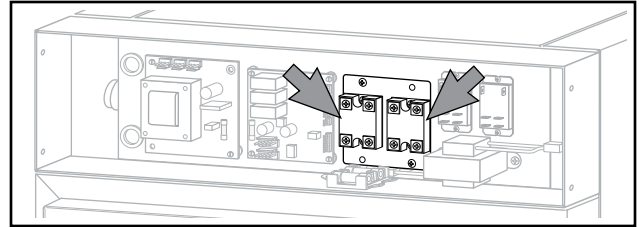
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and remove all wiring and harnesses from Control Board.
4. The Control Board is mounted on barbed Nylon posts. Use pliers to squeeze ends to release board.



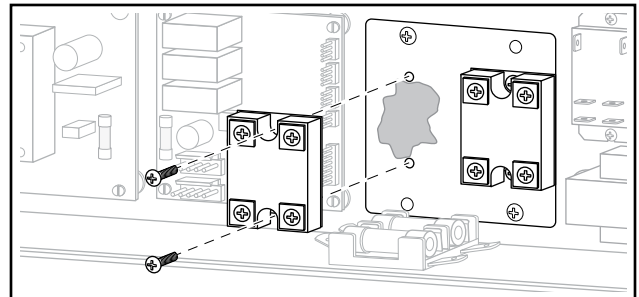
5. Snap replacement Control Board onto posts.
6. Rewire board according to tags.
7. Replace wires and harnesses to Control Panel and reinstall Control Panel.
8. Restore power to unit and test for proper function.

SOLID STATE RELAYS

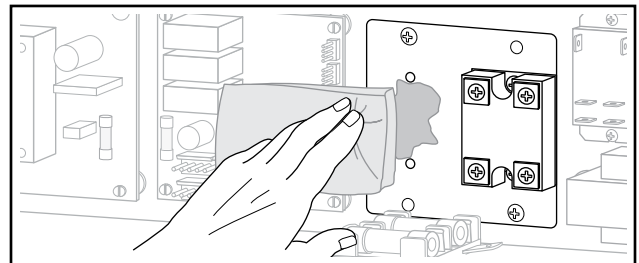
There are 2 Solid State Relays mounted inside the Control Compartment behind the Control Panel.



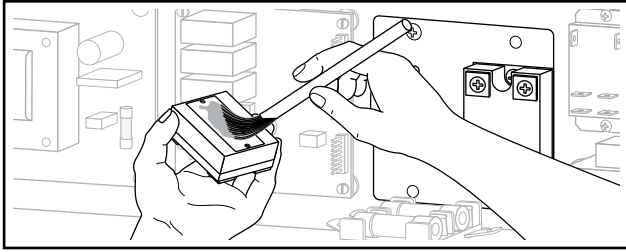
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and remove all wiring and harnesses from Solid State Relay(s).
4. Remove 2 Phillips-head screws from each relay to be replaced.



5. Remove Solid State Relay from Heat Sink.
6. Clean mounting area to remove any residual heat transfer compound.



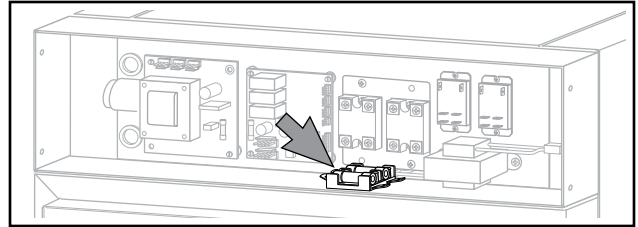
7. Apply heat transfer compound to mounting surface of Solid State Relay(s).



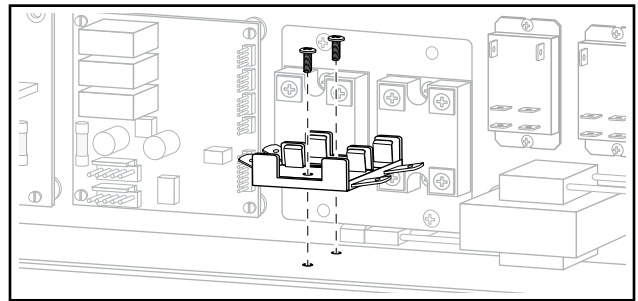
8. Secure Relay(s) with screws.
9. Rewire Solid State Relay(s) according to tags.
10. Replace wires and harnesses to Control Panel and reinstall Control Panel.
11. Restore power to unit and test for proper function.

FUSES AND FUSE HOLDER

There are two (2) 12.5 Amp Fuses mounted in a fuse holder inside the Control Compartment behind the Control Panel.



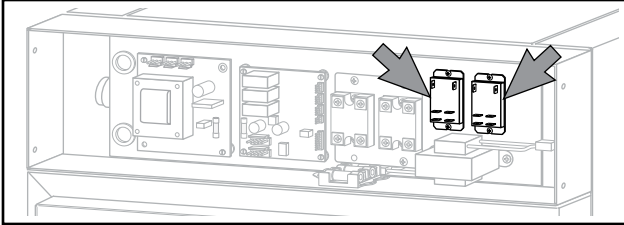
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Remove Fuse(s) with fuse puller.
4. If only replacing Fuse(s), insert replacement Fuse in Fuse Holder and snap in place.
5. If replacing Fuse holder, with fuses removed, tag and remove all wires attached to fuse holder.
6. Remove 2 Phillips-head screws securing Fuse Holder to Control Compartment and remove Fuse Holder.



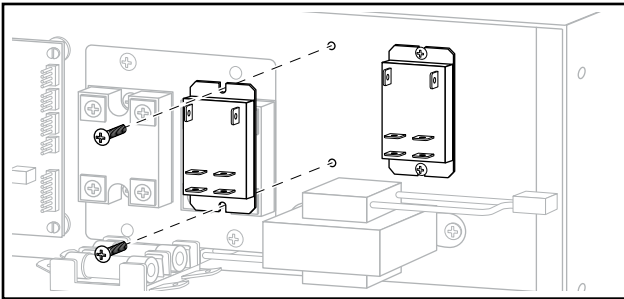
7. To replace Fuse Holder, reverse these steps.
8. Restore power to unit and test for proper function.

POWER RELAYS

There are 2 Power Relays mounted inside the Control Compartment behind the Control Panel.



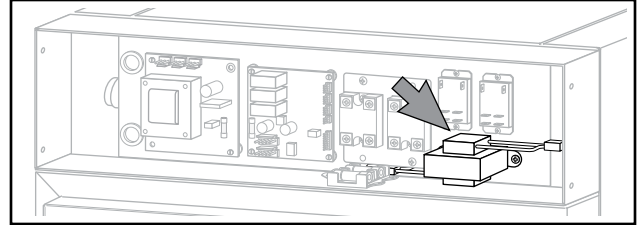
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and remove all wires attached to Power Relay(s).
4. Remove 2 Phillips-head screws securing Power Relay to Control Compartment and remove relay.



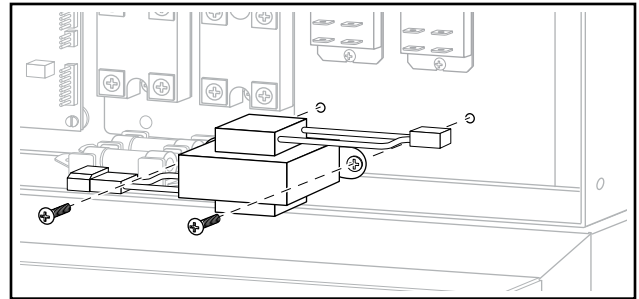
5. To install replacement Power Relay, reverse these steps.
6. Restore power to unit and test for proper function.

TRANSFORMER

There is a 240V/24V 40VA transformer mounted in the Control Compartment behind the Control Panel.



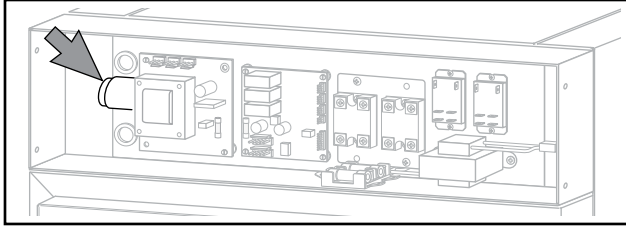
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Tag and disconnect all wires attached to Transformer.
4. Remove 2 Phillips-head screws securing Transformer to Control Compartment and remove Transformer.



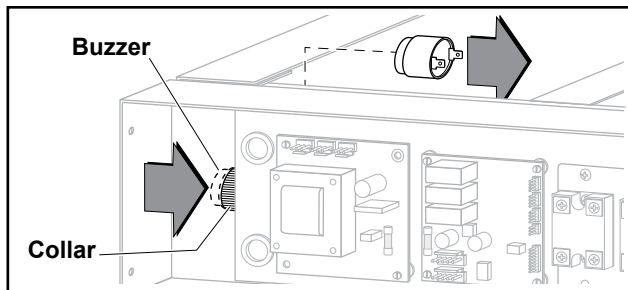
5. To install replacement Transformer, reverse these steps.
6. Restore power to unit and test for proper function.

BUZZER

There is a buzzer located in the Control Compartment behind the Control Panel.



1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
3. Unscrew 4 Phillips-head screws securing the Top Panel and remove the panel.
4. From top of unit, tag and disconnect all wires attached to Buzzer.
5. From front of unit, unscrew collar securing Buzzer in place. Remove Buzzer from top of unit.

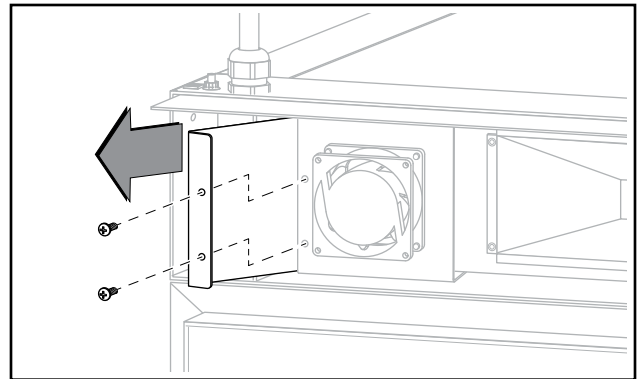


6. To replace Buzzer, reverse these steps.
7. Restore power to unit and test for proper function.

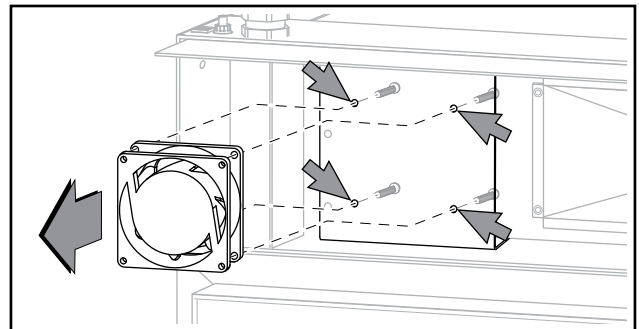
UPPER REAR COOLING FAN

An Axial Cooling fan is located behind the upper rear panel.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Upper Rear Panel, slide panel away from unit.
3. Remove 2 Phillips-head screws securing water guard and slide water guard out from behind Cooling Fan mounting panel.



4. From behind Cooling Fan mounting panel, disconnect wires from spade connectors.
5. From behind Cooling Fan mounting panel, remove and retain 4 Phillips-head screws securing Cooling Fan and remove Fan.

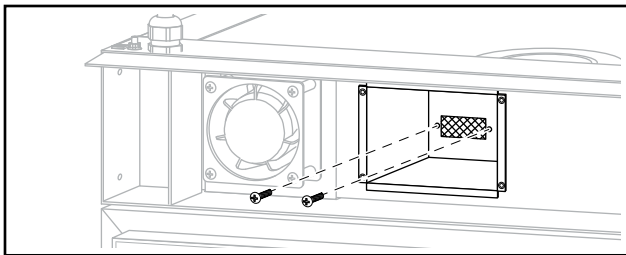


6. To install replacement Upper Rear Cooling Fan, reverse these steps.
7. Restore power to unit and test for proper function.

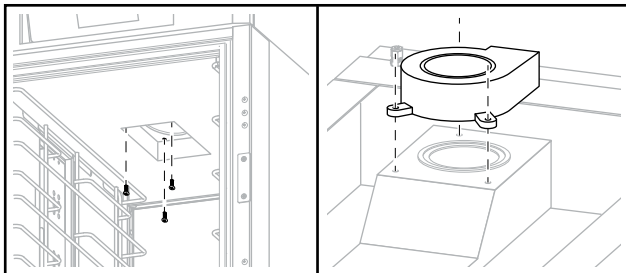
HUMIDITY VENT FAN

A Squirrel-Cage “Biscuit” Fan is located at the top rear of the unit beneath the Top Panel.

1. Place the unit’s Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew 4 Phillips-head screws (2 on each side) securing the Upper Rear Panel, slide panel away from unit.
3. Unscrew 4 Phillips-head screws securing the Top Panel and remove the panel.
4. Remove insulation from top.
5. Remove Upper Cavity Panel. See Covers and Panels section.
6. Remove 2 Phillips-head screws securing blower outlet flange from inside rear duct.



7. From inside cavity, locate upper duct. Inside upper duct, loosen and remove 3 Phillips-head screws securing Blower body to top of duct.

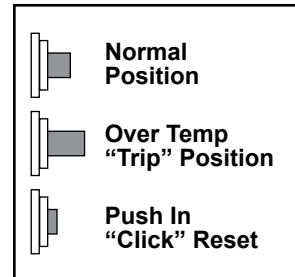


8. Disconnect 2 Spade Terminals and remove Humidity Vent Fan.
9. To replace Humidity Vent Fan reverse these steps.
10. Restore power to unit and test for proper function.

BOTTOM COMPARTMENT PARTS

HIGH LIMIT THERMOSTAT

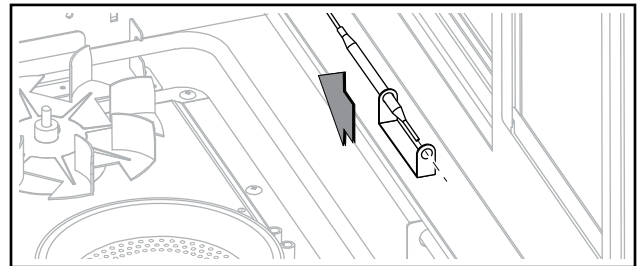
A High-Limit Thermostat is mounted behind the Rear Louvered Panel.



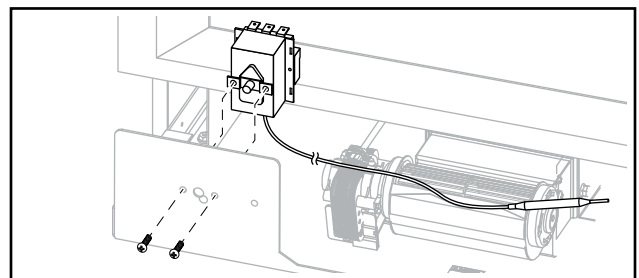
Note: The High-Limit Thermostat may trip if the sensor bulb detects a temperature in excess of 400°F (204°C). Once the unit has cooled sufficiently, the High-Limit Thermostat can be reset.

1. Place the unit’s Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove High-Limit Thermostat Sensor from mounting bracket.

Note: Do not crush, pinch or kink High-Limit Thermostat capillary tube. This will render the component inoperable.



6. Tag and disconnect all wires attached to High-Limit Thermostat.
7. Remove 2 screws securing High-Limit Thermostat.



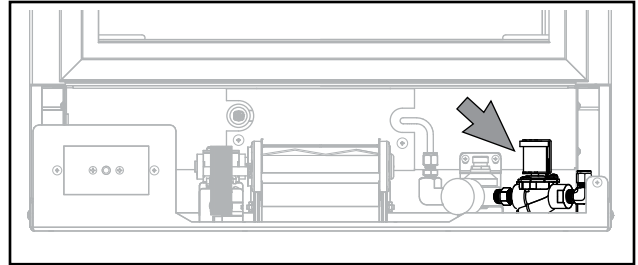
8. Remove High-Limit Thermostat from unit.
9. To install replacement High-Limit Thermostat, reverse these steps.

Note: Do not crush, pinch or kink High-Limit Thermostat capillary tube. This will render the component inoperable.

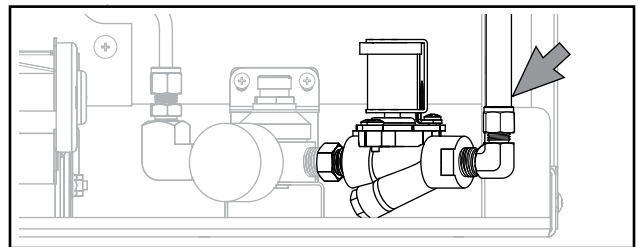
10. Restore power to unit and test for proper function.

WATER INLET SOLENOID

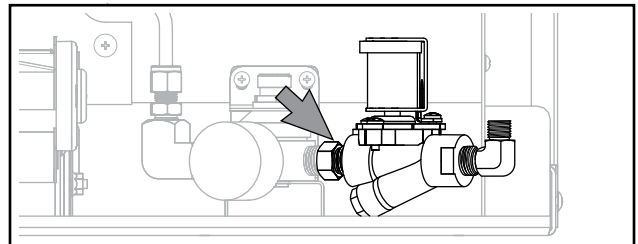
The Water Inlet Solenoid is mounted behind the Rear Louvered Panel.



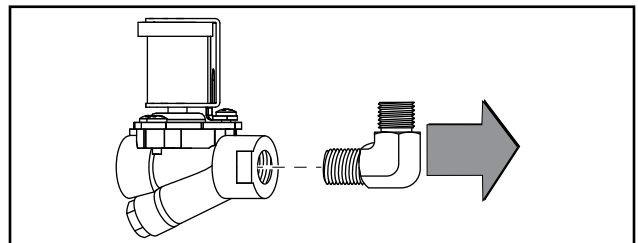
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Turn off water at supply valve.
3. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
4. Tag and disconnect wires connected to Solenoid Coil.
5. Disconnect water supply line at elbow.



6. Unscrew Solenoid from fittings.



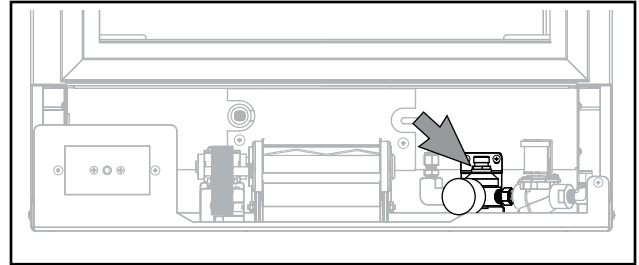
7. Remove elbow from Solenoid.



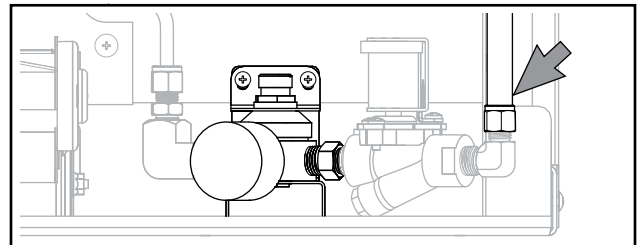
8. Clean all threads.
9. Wrap all threads with Teflon tape.
10. Thread replacement Solenoid onto fitting and tighten. Orient coil vertically and “Y” Strainer in the down position.
11. Thread elbow onto Solenoid Valve and tighten. Elbow should point up.
12. Reattached water supply line to elbow.
13. Turn on water supply valve and test for leaks. Repair as needed.
14. Restore power to unit, turn unit on, and activate solenoid. Test for leaks. Repair as needed.
15. Disconnect unit from power supply and reinstall all panels and covers.
16. Restore power to unit and test for proper function.

WATER REGULATOR

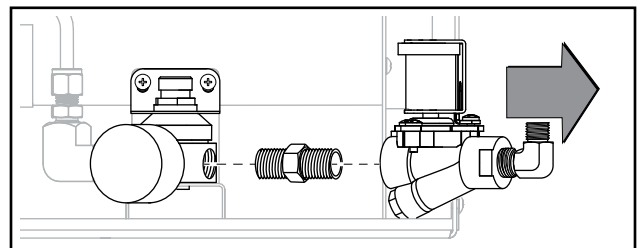
The Water Regulator is mounted behind the Rear Louvered Panel.



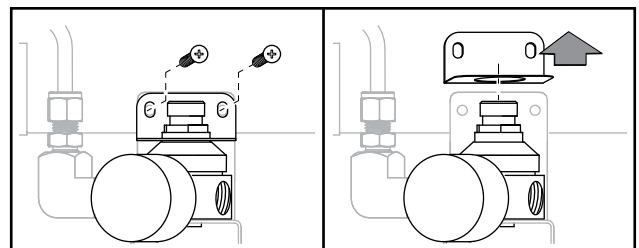
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. Turn off water at supply valve.
3. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
4. Disconnect water supply line at elbow.



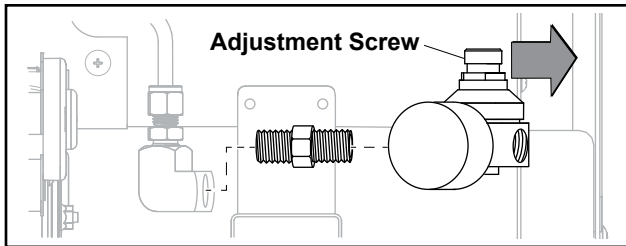
5. Remove Solenoid and fittings from Water Regulator.



6. Remove 2 Phillips-head screws from mounting bracket and remove bracket.



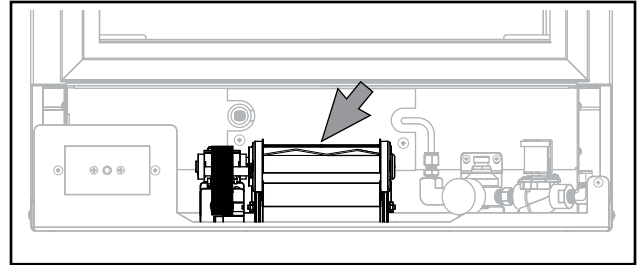
- Remove Regulator from fitting.



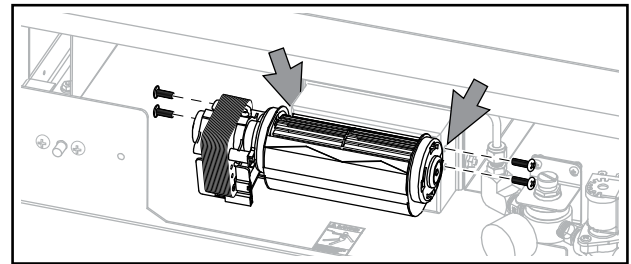
- Clean all threads.
- Wrap all threads with Teflon tape.
- Thread replacement Water Regulator onto fitting and tighten. Water Regulator adjustment screw must be in vertical position.
- Reinstall Bracket with 2 Phillips-head screws.
- Thread Solenoid onto Water Regulator.
- Reconnect water supply line.
- Turn on water supply valve and test for leaks. Repair as needed.
- Restore power to unit, turn unit on, and activate solenoid. Test for leaks. Repair as needed.
- Disconnect unit from power supply and reinstall all panels and covers.
- Restore power to unit and test for proper function.

BOTTOM COOLING BLOWER

A tangential Blower used to circulate air throughout the lower part of the unit is located behind the Lower Rear Panel.



- Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
- Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
- Mark and disconnect wires to Blower motor.
- Remove 4 Phillips-head screws securing the Blower to the plenum. Remove Blower.

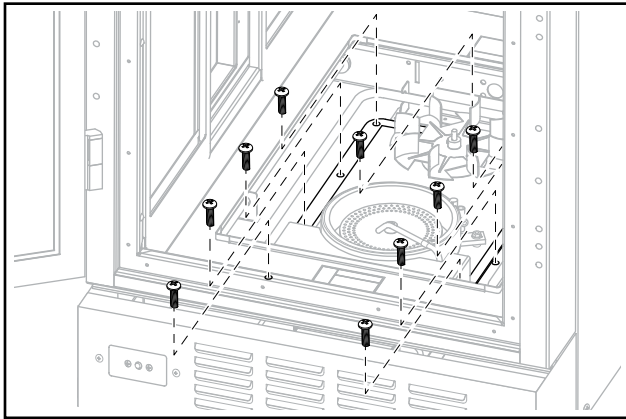


- To replace Blower, reverse these steps.
- Restore power to unit and test for proper function.

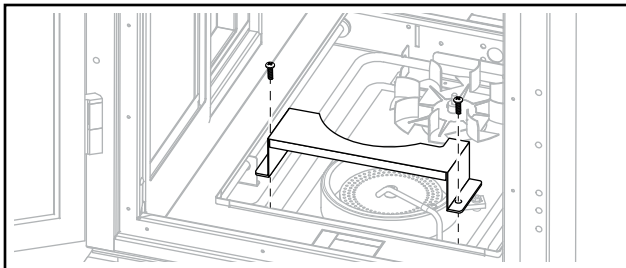
HUMIDIFICATION MOTOR

A Motor that spins a slinger disc is located under the bottom panel of the food holding compartment.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove 9 Phillips-head screws securing the motor pan to the unit.

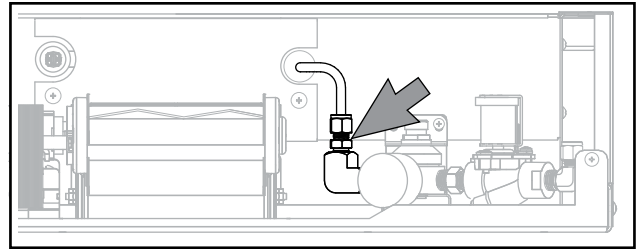


6. Remove Snap-Disc Thermostat cover.

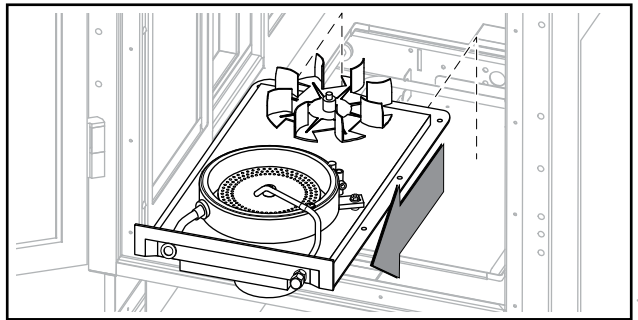


7. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
8. Mark and disconnect wires to motors, element and Snap-Disc Thermostat.

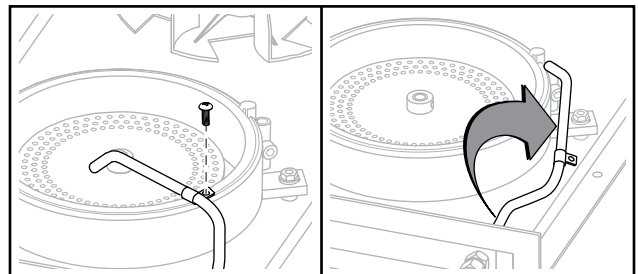
9. Disconnect fitting between Water Regulator and Humidification Cylinder.



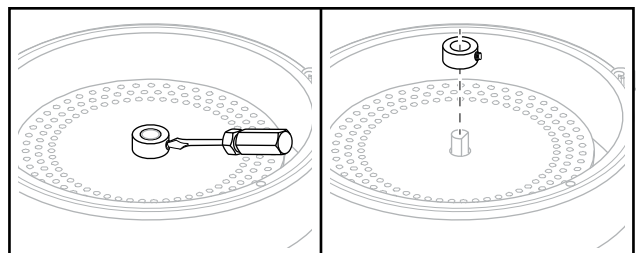
10. Lift motor pan from unit.



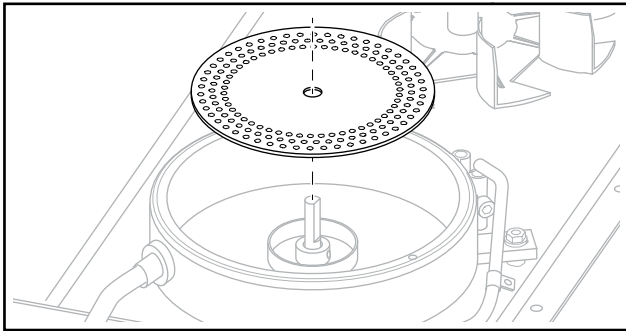
11. Remove Phillips-head screw securing water delivery tubing and rotate tubing away.



12. Loosen set screw on outer shaft collar and remove collar.



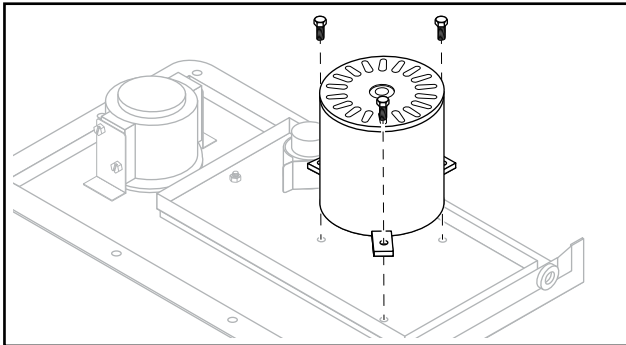
13. Remove Atomizer Disc.



14. Loosen set screw on inner shaft collar and remove collar.

15. Invert pan.

16. To remove the Humidification Motor, loosen and remove 3 hex-head bolts securing Motor to motor pan. Remove Motor.



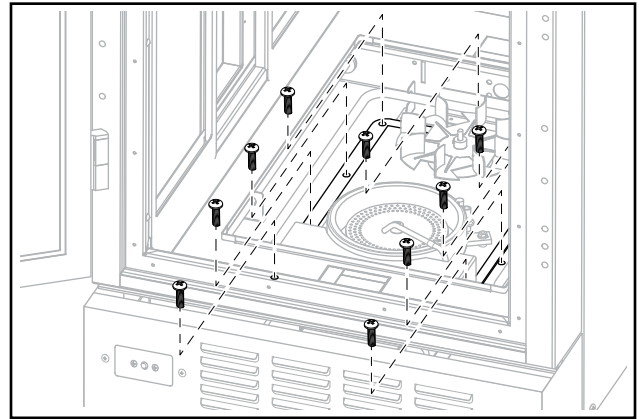
17. To replace Humidification Motor, reverse these steps.

18. Restore power to unit and test for proper function.

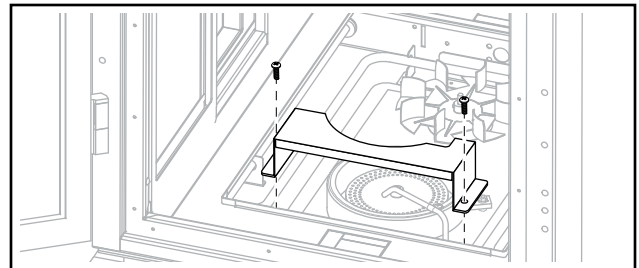
CAPACITOR

The Capacitor is located under the bottom panel of the food holding compartment.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove 9 Phillips-head screws securing the motor pan to the unit.

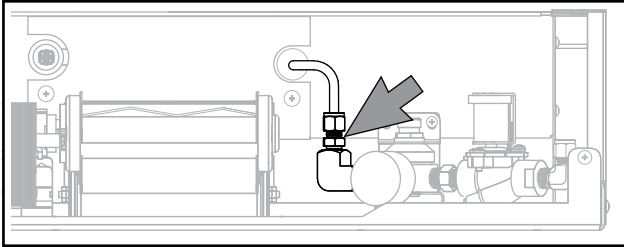


6. Remove Snap-Disc Thermostat cover.

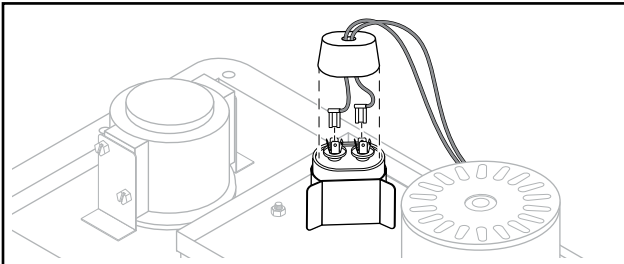


7. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
8. Mark and disconnect wires to motors, element and Snap-Disc Thermostat.

- Disconnect fitting between Water Regulator and Humidification Cylinder.



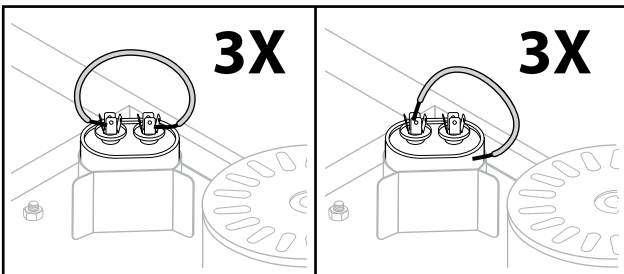
- Lift motor pan from unit.
- Invert pan.
- To remove Capacitor, carefully remove rubber boot to expose terminals.



WARNING

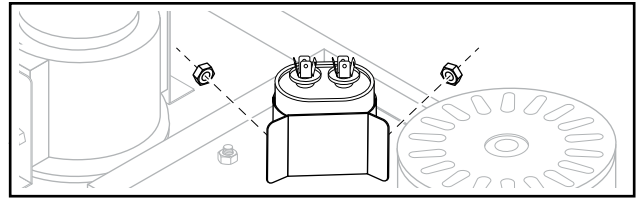
CAPACITORS STORE AN ELECTRICAL CHARGE AND MUST BE FULLY DISCHARGED BEFORE THEY ARE SAFE TO HANDLE. FAILURE TO DO SO CAN DELIVER AN ELECTRICAL SHOCK THAT CAN CAUSE INJURY, AND IN EXTREME CASES, DEATH.

- Discharge Capacitor using a length of heavy gauge insulated wire. While touching only the insulation, bridge across both terminals. Then bridge from each terminal to the outer case. Repeat these steps 3 times.

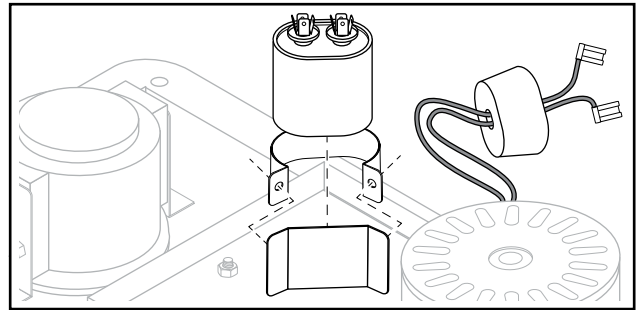


- Mark and disconnect wires.

- Remove hex nuts securing mounting bracket.



- Remove bracket and capacitor.



- To replace the Capacitor, reverse these steps.

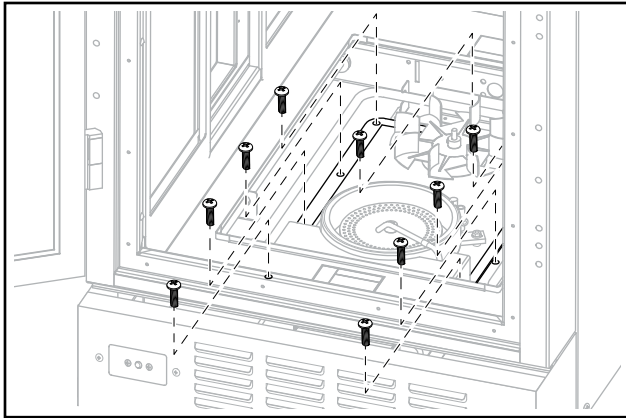
- Restore power to unit and test for proper function.

CIRCULATING FAN MOTOR

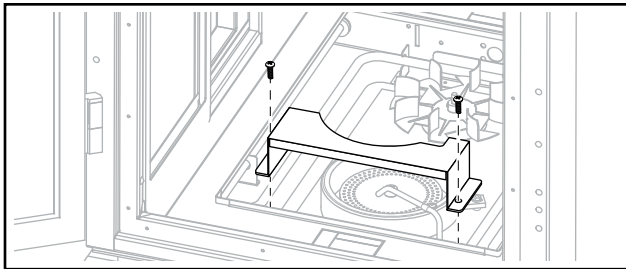
A Circulating Fan is located under the bottom panel of the food holding compartment.

Note: This procedure is similar to the removal and replacement of the Humidification Motor.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove 9 Phillips-head screws securing the motor pan to the unit.

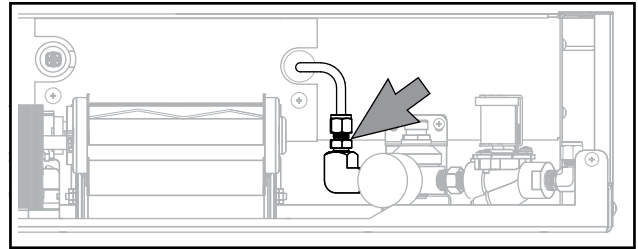


6. Remove High-Limit Cover.

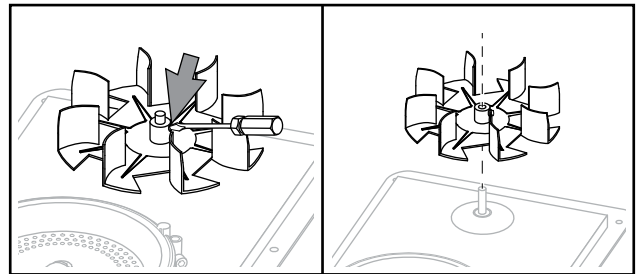


7. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
8. Mark and disconnect wires to motors, element and Snap-Disc Thermostat.

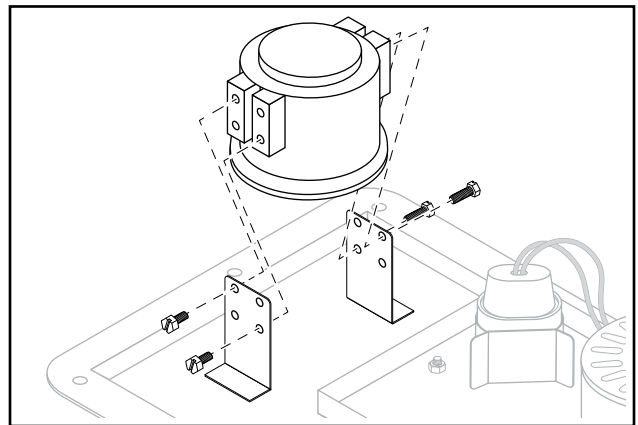
9. Disconnect fitting between Water Regulator and Humidification Cylinder.



10. Lift motor pan from unit.
11. Loosen set screw on Fan Blade and remove Fan Blade.



12. Invert pan.
13. Remove 4 hex-head screws securing Fan Motor to motor pan and remove Circulating Fan Motor.

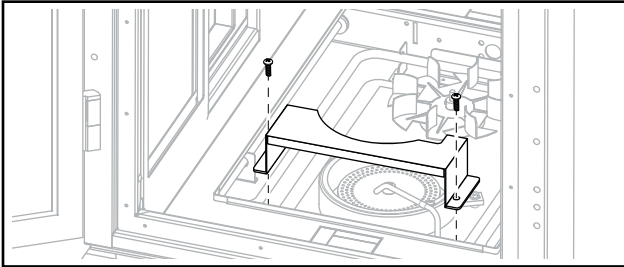


14. To replace Circulating Fan Motor, reverse these steps.
15. Restore power to unit and test for proper function.

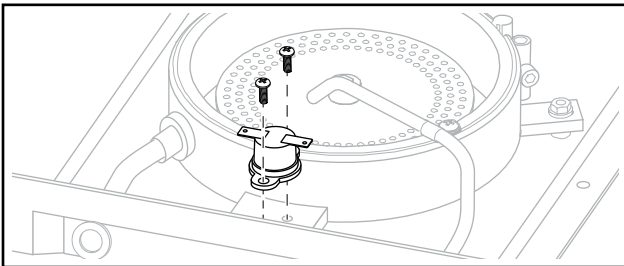
SNAP-DISC THERMOSTAT

A Snap-Disc type high-limit Thermostat is located under the bottom panel of the food holding compartment.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove the 2 Phillips-head screws securing the Snap-Disc Thermostat cover and remove cover.



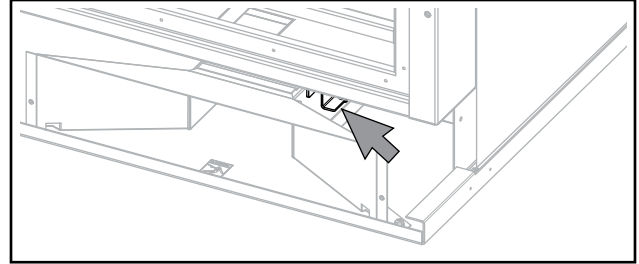
6. Mark and disconnect 2 wires connected to Snap-Disc Thermostat.
7. Remove the 2 Phillips-head screws securing Snap-Disc Thermostat to motor pan and remove Snap-Disc Thermostat.



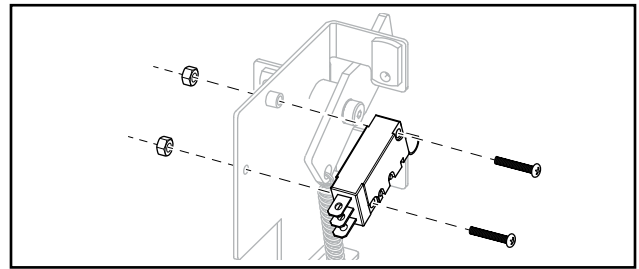
8. To replace High-Limit Thermostat, reverse these steps.
9. Restore power to unit and test for proper function.

BOTTOM PANEL INTERLOCK SWITCH

An interlock switch that prevents the unit from running when the Bottom Panel has been removed is located behind the Front Lower Panel.



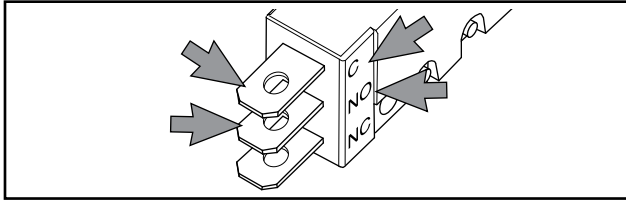
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Unscrew 4 Phillips-head screws securing the Front Lower Louvered Panel and remove panel.
4. Open the Doors and remove all racks and rack supports.
5. Bottom Panel will lift out without the use of tools.
6. Mark and remove wires connected to Bottom Panel Interlock Switch.
7. Remove the two (2) Phillips-head machine screws and hex nuts that secure the Bottom Panel Interlock Switch.



8. Mount replacement switch on bracket using Machine Screws and Hex Nuts and adjust so actuator mechanism functions correctly.

9. Rewire Switch.

Note: Wires are connected to Common (C) and Normally Open (NO) terminals. Connecting any other way will prevent the unit from functioning properly.



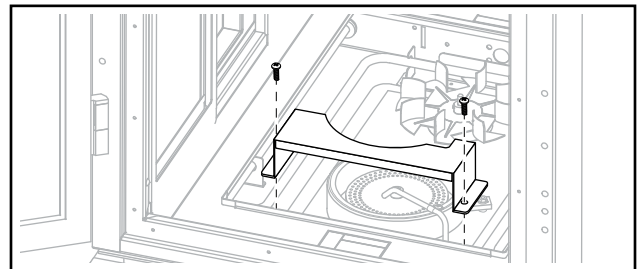
10. Replace all covers and panels.

11. Restore power to unit and test for proper function.

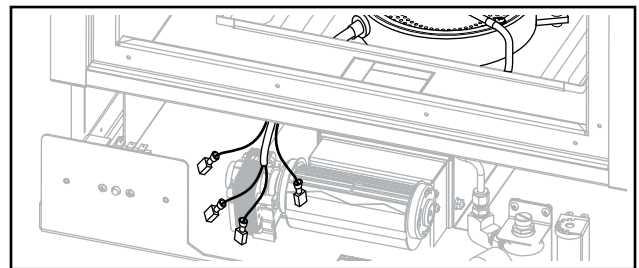
**HUMIDIFICATION SYSTEM
HEATING ELEMENT RING**

A Heating Element Ring wraps around the Humidification Cylinder and is located under the bottom panel of the food holding compartment.

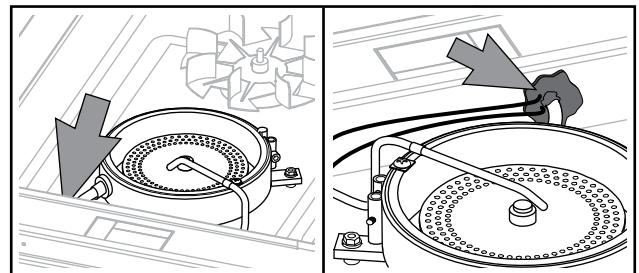
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Bottom Panel will lift out without the use of tools.
5. Remove High-Limit Cover.



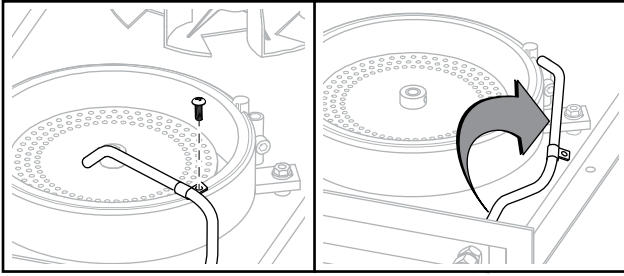
6. Unscrew the 5 Phillips-head screws securing the Rear Lower Louvered Panel and remove panel.
7. Mark and disconnect wires for Heating Element Ring.



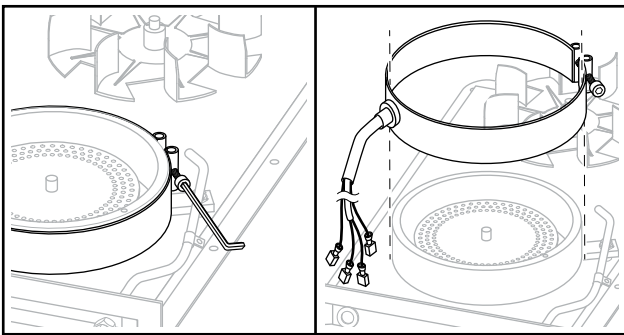
8. Break the high-temp silicone seal around the tube containing wiring.



- Remove Phillips-head screw securing water delivery tubing and rotate tubing away.



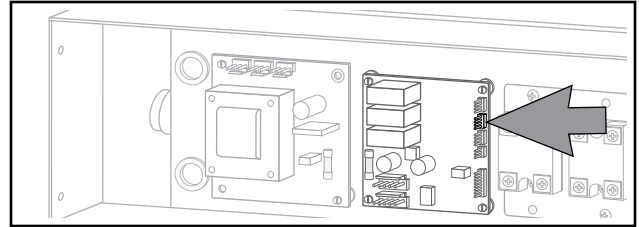
- Loosen clamping bolt on Heating Element Ring and slide Ring from around Humidification Cylinder.



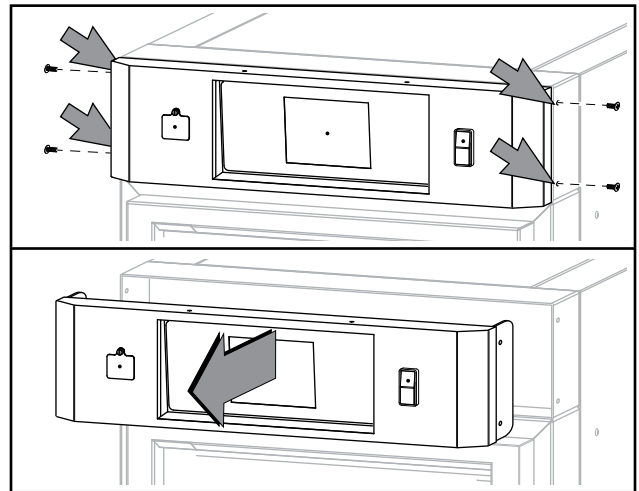
- To replace Heating Element Ring, reverse these steps.
- Add new high-temp silicone sealant around wiring tube.
- Restore power to unit and test for proper function.

RING TEMPERATURE SENSOR (RTD)

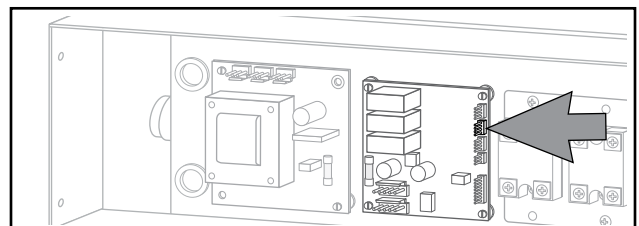
An RTD-type Temperature Sensor is located under the bottom panel.



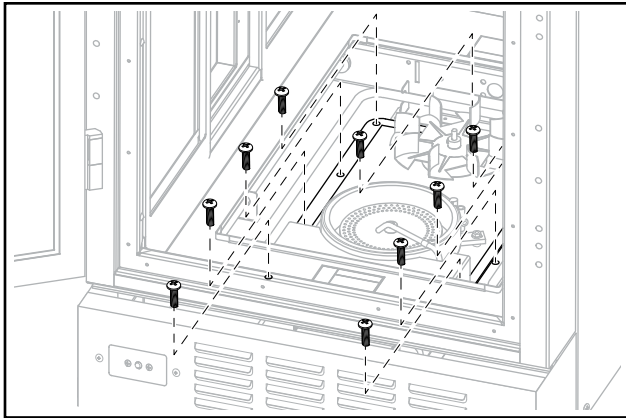
- Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
- If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
- Open the Doors and remove all racks and rack supports.
- Remove Bottom Panel from inside compartment. Bottom Panel will lift out without the use of tools.
- Unscrew the 6 Phillips-head screws securing the Left Side Panel(s) and remove.
- Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.



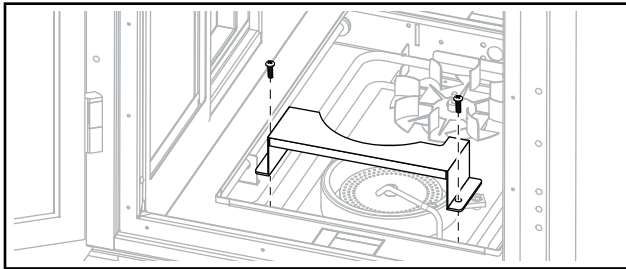
- Disconnect Sensor wire from Control Board.



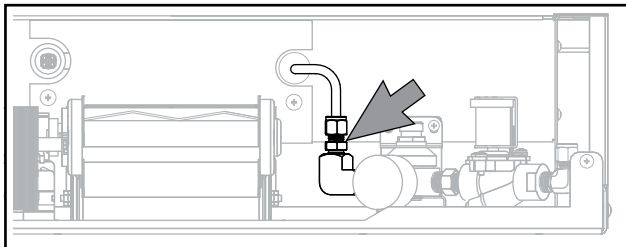
8. Remove the 9 Phillips-head screws securing the Motor Pan to the unit.



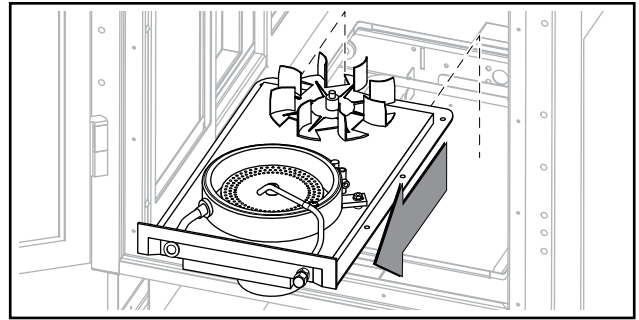
9. Remove the High-Limit Cover.



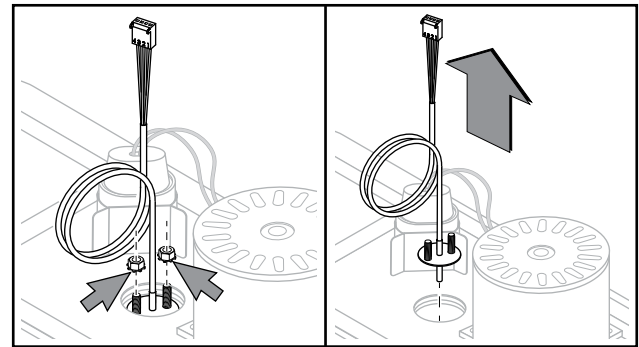
10. Remove Lower Rear Panel to access wire connections. See Covers and Panels section.
11. Mark and disconnect wires to motors, element and High-Limit Thermostat.
12. Disconnect fitting between Water Regulator and Humidification Cylinder.



13. Lift Motor Pan from unit.



14. Invert Motor Pan.
15. Remove 2 hex nuts securing Ring Temperature Sensor to Motor Pan and remove Sensor.

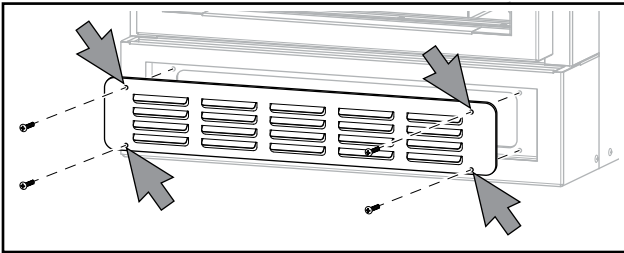


16. Install replacement sensor and secure with hex nuts.
17. Route Sensor wire to Control Board.
18. Reconnect all wiring and water fittings.
19. Reinstall all components.
20. Reinstall all panels.
21. Restore power to unit and test for proper function.

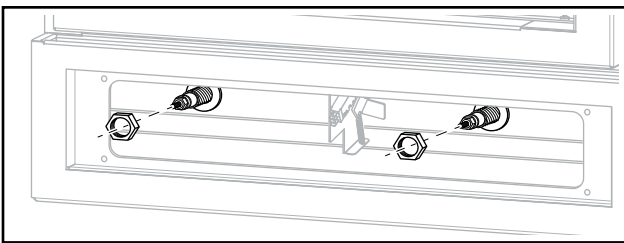
CAVITY HEATING ELEMENT

A tubular Heating Element is used to maintain the food holding compartment temperature. It is located under the bottom panel of the food holding compartment.

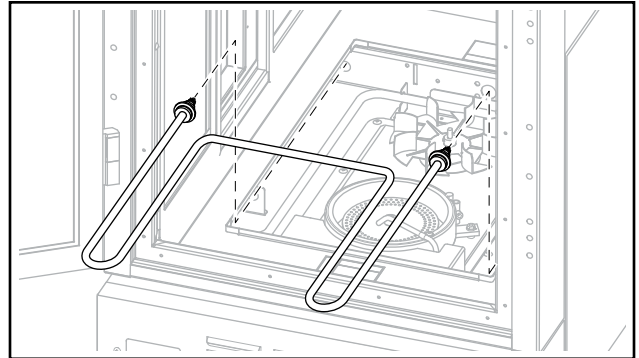
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Open the Doors and remove all racks and rack supports.
4. Remove Bottom Panel from inside compartment. Bottom Panel will lift out without the use of tools.
5. Unscrew 4 Phillips-head screws securing the Front Lower Louvered Panel and remove panel.



6. Mark and disconnect wires from Heating Element.
7. Remove hex nuts securing each end of Heating Element.



8. From inside food holding compartment, pull Heating Element until free of mounting standoffs and remove Element from unit.



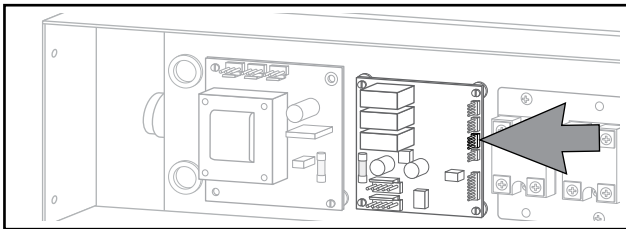
9. To replace Heating Element, reverse these steps.
10. Restore power to unit and test for proper function.

LEFT SIDE COMPONENTS

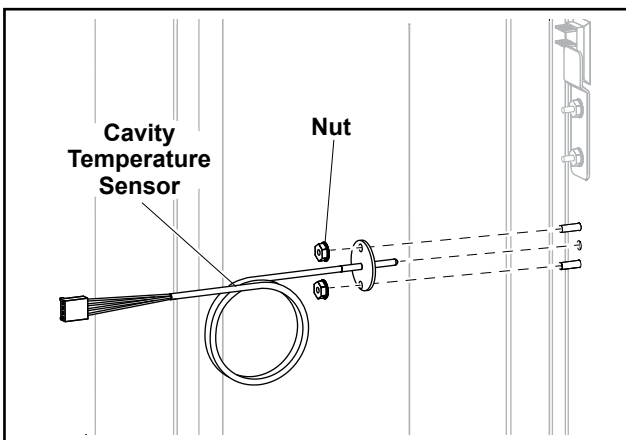
CAVITY TEMPERATURE SENSOR

The Cavity Temperature Sensor (RTD) is used to control the Food Holding Cavity temperature and is located behind the Left Side Panel.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Unscrew the 6 Phillips-head screws securing the Left Side Panel(s) and remove.
4. Remove insulation for access.
5. Unscrew 4 Phillips-head screws (2 on each side) securing the Control Panel. Slide panel away from unit.
6. Locate Temperature Sensor plug on Control Board and disconnect.



7. Remove 2 hex nuts securing Cavity Temperature Sensor and remove sensor.

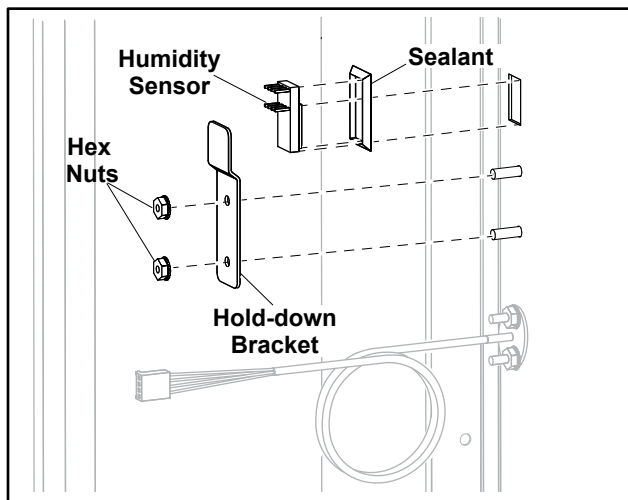


8. Remove any remaining sealant from mounting surface.
9. To replace Cavity Temperature Sensor, apply a small amount of silicone sealant to flange, mount sensor on studs and secure with hex nuts.
10. Route Sensor wire to controller and connect Molex plug into correct location on Board.
11. Replace all Insulation and panels.
12. Restore power to unit and test for proper function.

HUMIDITY SENSOR

The Humidity Sensor is used to control the Humidification System and is located behind the Left Side Panel.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Unscrew the 6 Phillips-head screws securing the Left Side Panel(s) and remove.
4. Remove insulation for access.
5. Remove 2 hex nuts securing Humidity Sensor hold-down bracket and remove bracket and sensor.



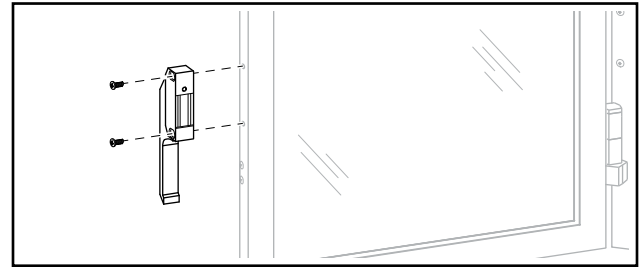
6. Remove any remaining sealant from mounting surface.
7. Unplug wiring harness from Humidity Sensor.
8. Apply a small amount of silicone sealant to surface.
9. Insert replacement Humidity Sensor into opening in cavity side.
10. Remove excess sealant.
11. Reinstall hold-down bracket and secure with hex nuts.
12. Plug wiring harness into Humidity Sensor.
13. Replace all insulation and panels.
14. Restore power to unit and test for proper function.

DOOR PARTS

DOOR LATCH

The unit has a magnetic Door Latch mounted to the edge of each of its 2 doors.

1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. Before replacing Door Latch, check to make sure it's in adjustment. See procedure in ADJUSTMENTS AND CALIBRATIONS section.
4. Open the Door and unscrew the 2 screws securing the Door Latch. Remove the door latch.

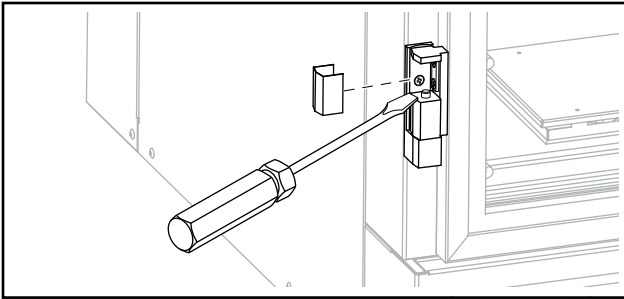


5. To replace Door Latch, reverse these steps.
6. Adjust Door Latch per procedure in ADJUSTMENTS AND CALIBRATIONS section.

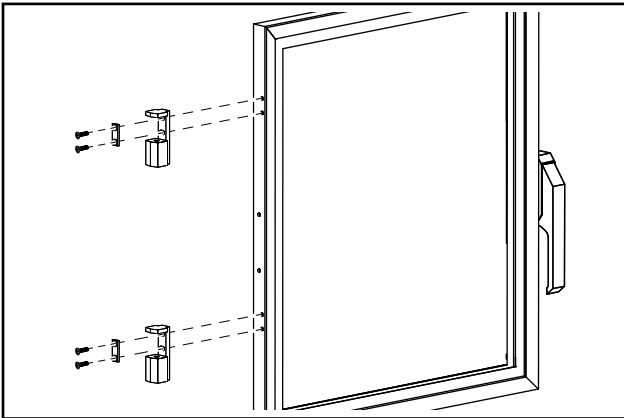
DOOR HINGE

The unit has two hinges on the edge of each of its 2 doors.

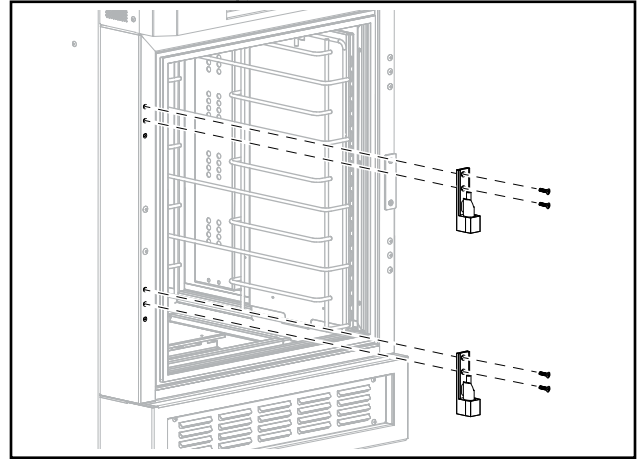
1. Place the unit's Power ON/OFF Switch in the OFF position, and follow the proper Lockout/Tagout procedures.
2. If the unit has been in use, allow ample time for the unit to cool down to avoid burns.
3. With Door closed, pry off Door Hinge cover for both hinges.



4. Open Door and lift Door off hinge pins.
5. Remove 2 screws securing each Hinge Half to Door edge.



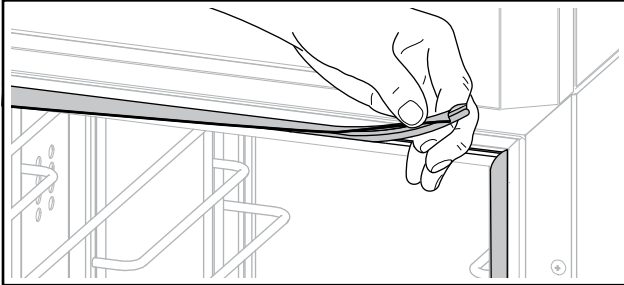
6. Remove Hinge plate and Hinge half.
7. Remove 2 Screws securing each Hinge Half to unit face.



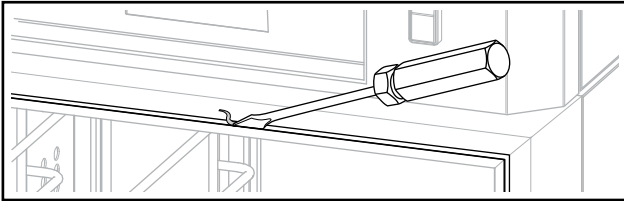
8. To replace Door Hinges, reverse these steps.
9. Adjust Door Hinges per procedure in ADJUSTMENTS AND CALIBRATIONS section.

DOOR GASKET

1. Place the unit's Power Switch in its OFF position.
2. Remove the old gasket by pulling it out of the groove in the unit face.

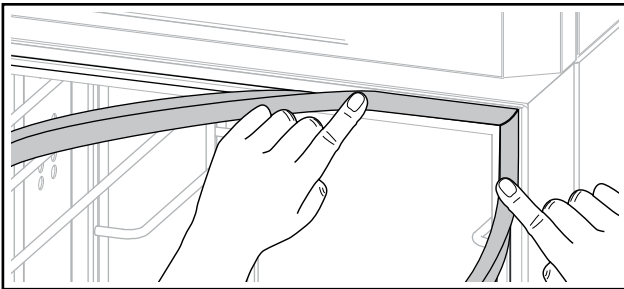


3. Clean groove with a screwdriver or other flat-bladed tool to remove any dirt or gasket pieces.



4. Press the new gasket into the groove. Make sure it is fully seated in the groove and flat against the door frame.

Note: Start at a corner and work both directions a little at a time.



5. Caution: Do not use sharp objects to pry door gasket. Damage to gasket will result.
6. Check the door adjustment to make sure there are no leaks or that the gasket is not compressed too much, making the door hard to close. See section in ADJUSTMENTS AND CALIBRATIONS for adjustment procedure

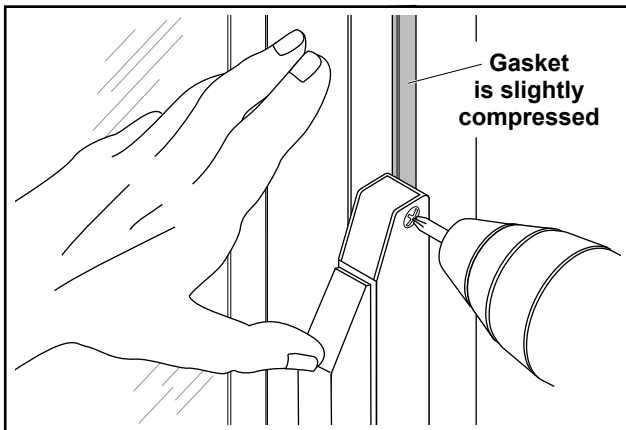
ADJUSTMENTS AND CALIBRATIONS

DOOR LATCH ADJUSTMENT

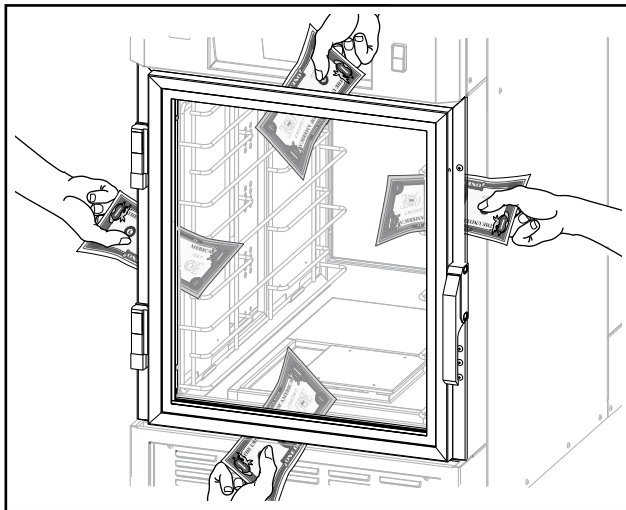
This procedure should be performed when the door no longer contacts the door gasket or after door gasket replacement and may be done in conjunction with Hinge Adjustment.

1. Turn Power ON/OFF Switch to OFF position and allow unit to cool.
2. Loosen but do not remove 2 screws securing the Door Latch to the door frame.
3. With the Door closed and latched, press on Door until Door Gasket compresses slightly onto Door Frame.
4. While gasket is still compressed, tighten screws on Door Latch.

Caution: Be careful not to over-compress the gasket or it will cause door hinge binding.



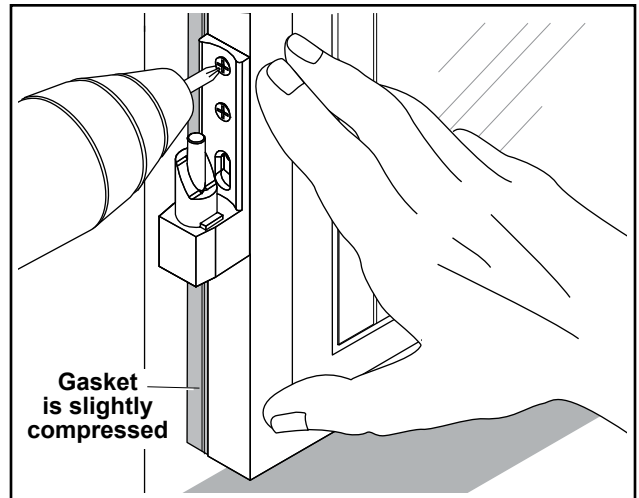
5. Test by closing a strip of paper or dollar bill in between door gasket and unit face. Strip should hold in place when released. Test several places around perimeter of door.



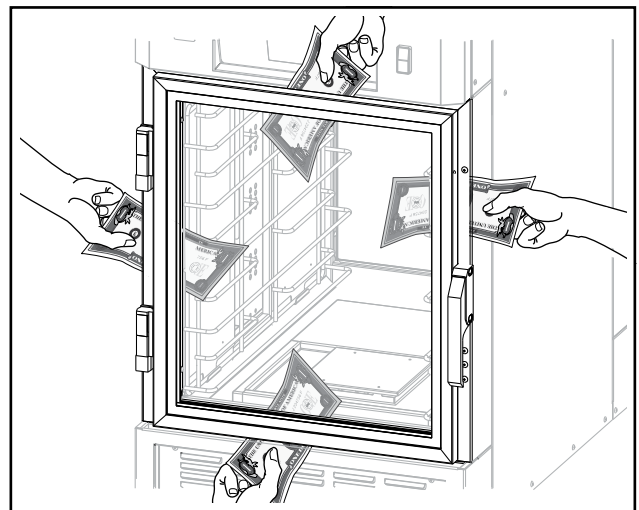
HINGE ADJUSTMENT

This procedure should be performed when the door no longer contacts the door gasket or after door gasket replacement and may be done in conjunction with Door Latch Adjustment.

1. Turn Power ON/OFF Switch to OFF position and allow unit to cool.
2. Loosen but do not remove 2 screws securing the each Hinge to the door frame.
3. With the Door closed and latched, press on Door until Door Gasket compresses slightly onto unit face.
4. While gasket is still compressed, tighten screws on both Hinges.



5. Test by closing a strip of paper or dollar bill in between door gasket and unit face. Strip should hold in place when released. Test several places around perimeter of door.

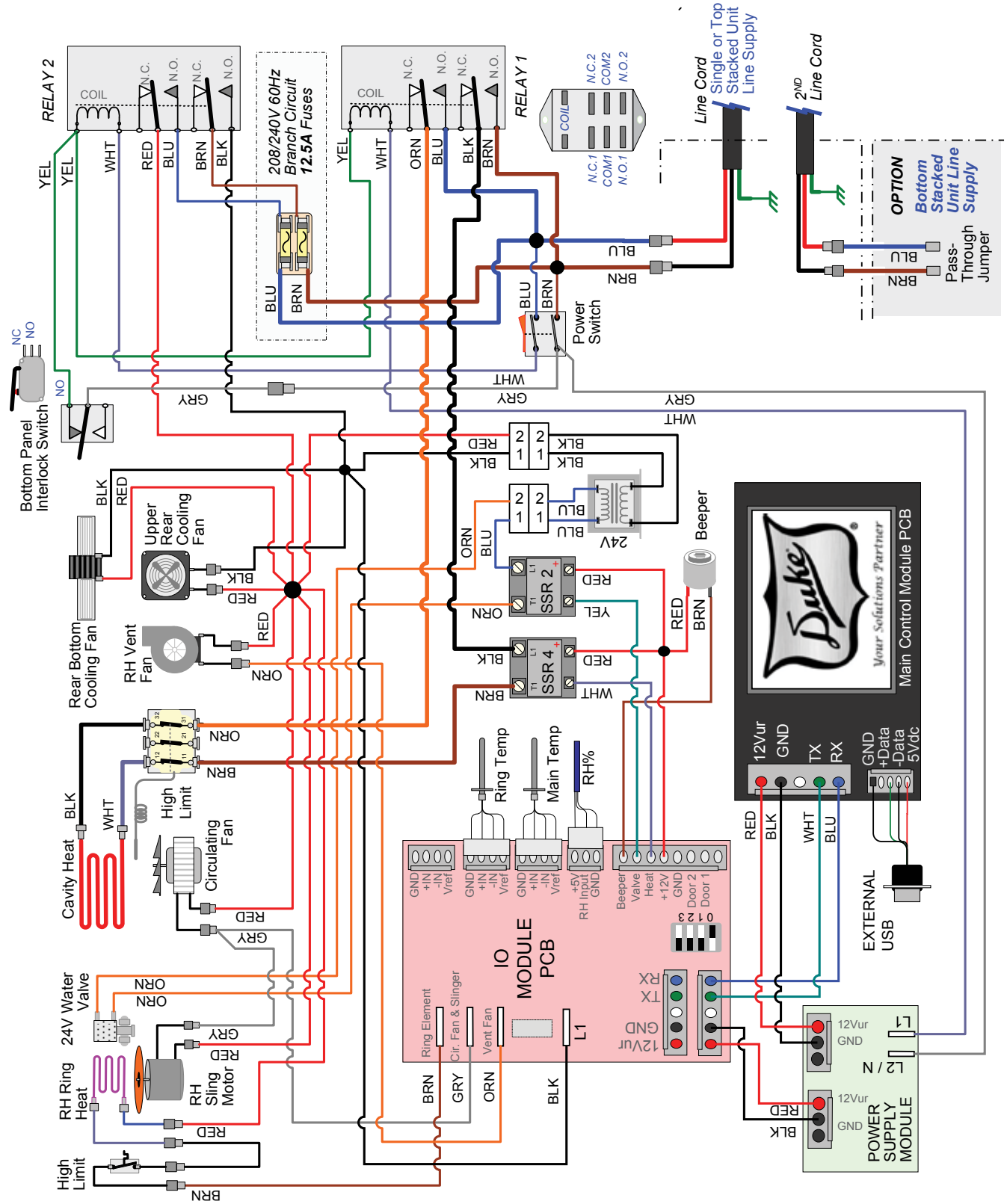


TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Unit is not ON	Unit is unplugged	Connect plug to correct outlet
	Power ON/OFF Switch in OFF position	Turn ON Power ON/OFF Switch
	Supply Circuit Breaker is tripped	Reset breaker
	Power ON/OFF Switch failure	Replace Power ON/OFF Switch
	Control Module failure	Replace Control Module
Unit is ON but not heating	Temperature set too low	Adjust Temperature
	High-Limit Thermostat is tripped.	Reset High Limit
	Heating Element failure	Replace Heating Element
	Temperature Sensor failure	Replace Temperature Sensor
	Control Module failure	Replace Control Module
Unit is ON and heating but not reaching set point temperature	Door(s) not closed	Close Door(s)
	Door Gasket not sealing	Inspect Gasket, clean and/or adjust as needed
	Internal duct or vent panels missing or incorrectly installed	Correctly install all components
	Control Module failure	Replace Control Module
	Temperature Sensor failure	Replace Temperature Sensor
Unit is ON but not humidifying	Water supply is turned OFF	Turn on Water Supply
	Water line is blocked	Clear blockage and confirm water to unit.
	Door(s) not closed	Close Door(s)
	Door Gasket not sealing	Inspect Gasket, clean and/or adjust as needed
	Internal duct or vent panels missing or incorrectly installed	Correctly install all components
	Humidity Sensor failure	Replace Humidity Sensor
	Water Solenoid failure	Replace Solenoid
	Humidification Heating Element failure	Replace Humidification Heating Element
	Humidification Motor failure	Replace Humidification Motor
	Humidification Motor Capacitor failure	Replace Humidification Motor Capacitor
	Control Module failure	Replace Control Module
Unit is ON and Humidifying but not reaching humidity set point	Water line is restricted	Clear restriction and confirm water to unit.
	Door(s) not closed	Close Door(s)
	Door Gasket not sealing	Inspect Gasket, clean and/or adjust as needed
	Internal duct or vent panels missing or incorrectly installed	Correctly install all components
	Water Solenoid failure	Replace Solenoid
	Humidification Heating Element failure	Replace Humidification Heating Element
	Humidification Motor failure	Replace Humidification Motor
	Humidification Motor Capacitor failure	Replace Humidification Motor Capacitor
	Control Module failure	Replace Control Module
Inconsistent cavity temperature and/or humidity	Incorrect settings for Vent ON/OFF	Adjust settings to tighter tolerance (Vent OFF at 1% above set point to prevent overshoot)
	Internal duct or vent panels missing or incorrectly installed	Correctly install all components
	Pan(s) not loaded correctly	Position all pans in center of rack to allow for circulation
	Door(s) open for extended times	Close Door(s) quickly after use.
	Water Solenoid failure	Replace Solenoid
	Humidification Heating Element failure	Replace Humidification Heating Element
	Humidification Motor failure	Replace Humidification Motor
	Humidification Motor Capacitor failure	Replace Humidification Motor Capacitor
	Control Module failure	Replace Control Module

WIRING DIAGRAM

P/N 169694



CUSTOMER ASSISTANCE

To aid in reporting this unit in case of loss or theft, please record below the model number and serial number located on the unit. We also suggest you record all the information listed and retain for future reference.

MODEL NUMBER:	SERIAL NUMBER:
DATE OF PURCHASE:	
DEALER:	TELEPHONE:
SERVICER:	TELEPHONE:

FOR WARRANTY, PARTS & SERVICE:

**DUKE CORPORATE,
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TO ACCESS INTERNET: www.dukemfg.com

Please provide the following information when you write or call: model number, serial number, date of purchase, your complete mailing address (including zip code), and description of the problem.



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