



30043

INSULATED HUMIDIFIED HOLDING & PROOFING CABINET

VHU18

- NOTICE -

This Manual is prepared for the use of trained Vulcan Service Technicians and should not be used by those not properly qualified.

This manual is not intended to be all encompassing. If you have not attended a Vulcan Service School for this product, you should read, in its entirety, the repair procedure you wish to perform to determine if you have the necessary tools, instruments and skills required to perform the procedure. Procedures for which you do not have the necessary tools, instruments and skills should be performed by a trained Vulcan Service Technician.

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SERVICE UPDATES

SERVICE UPDATES

April 2018

- Updated SPECIFICATIONS chart.
- Updated FOOD COMPARTMENT FAN.
- Updated order and added symptom in TROUBLESHOOTING.

GENERAL

INTRODUCTION

This manual is applicable only to models listed on the cover page. Procedures in this manual will apply to all models unless specified. Pictures and illustrations can be of any model unless they need to be model specific.

INSTALLATION, OPERATION AND CLEANING

For detailed installation, operation and cleaning instructions, refer to the Installation & Operation Manual sent with each unit. The manual is also available online at www.vulcanequipment.com.

TOOLS

Standard

1. Standard set of hand tools.
2. VOM with minimum of NFPA-70E CATIII 600V, UL/CSA/TUV listed. Sensitivity of at least 20,000 ohms per volt. Meter leads must also be rated at CAT III 600V.
3. Clamp on type amp meter with minimum of NFPA-70E CAT III 600V, UL/CSA/TUV listed.
4. Temperature tester (thermocouple type).
5. ESD (Electrostatic discharge) Protection Kit.

Special

- Handheld, digital temperature and humidity sensor Grainger No. 3LYH7 or equivalent.

SPECIFICATIONS

Electrical			
Model	Volts	Wattage	Amperage
VHU18	120	1,500	12.5

Heating Elements			
Model	Wattage	Voltage	Resistance
VHU18	1500 (Standard)	120	8.80-10.27

Pan Capacity		
Model	Capacity *	
	12" X 20" X 2 1/2"	18" X 26" SHEET PANS
VHU18	36	18

(*) Capacity based on 3" spacing between pans.

SERVICE PROCEDURES AND ADJUSTMENTS

TEMPERATURE AND HUMIDITY CALIBRATION

⚠ WARNING

The warmer and its parts are hot. Use care when operating, cleaning or servicing the oven.

1. Check room temperature.
2. Place temperature and humidity probe at the center of the cabinet.
3. Set unit temperature to 145°F.
4. Set relative humidity to 65%RH.
5. Wait 45 minutes.
6. The temperature setting should be between 138 - 152°F° and relative humidity between 45%RH - 85%RH.

If temperature setting numbers do not match, check the following...

- A. Check continuity to both Humidity and Air heating elements.
- B. Make sure VHU Interior Pan has black coating on the bottom.

VERIFY

- When using cabinet, frequently opening the door will affect average internal temperature. Modify set temperature and humidity as necessary to ensure product is held above appropriate food safe temperature.

RESET SENSOR CODES

⚠ WARNING

The warmer and its parts are hot. Use care when operating, cleaning or servicing the oven.

1. Reset unit (turn it off, then on).
2. Turn unit off and remove sensor cover.

NOTE: Sensor board is located within the food cavity, behind the control board, under a sheet metal cover.

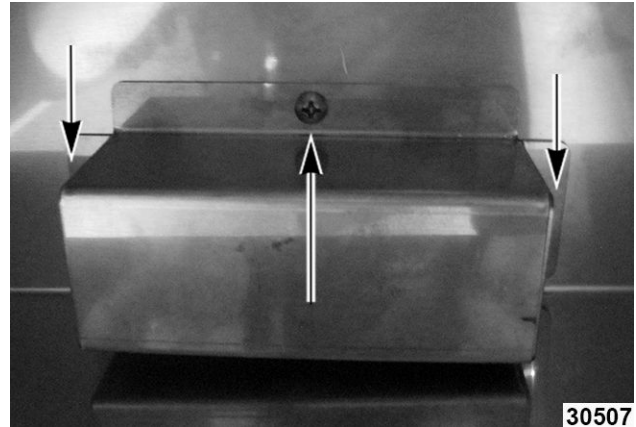


Fig. 1

3. Dry off sensor and wires.

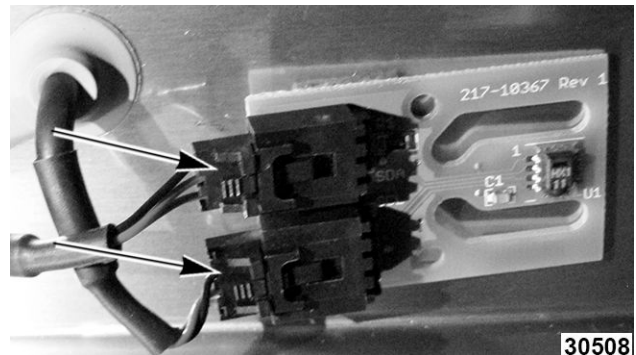


Fig. 2

4. Disconnect sensor wire harness plugs and dry out any moisture in connectors.
5. Plug sensor wire connectors into board.
6. Turn unit on to verify error code has cleared.
7. If error codes are not clear, replace both SENSOR BOARD AND WIRE HARNESS.
8. Install sensor board cover.
9. Verify operation.

HEATER ELEMENT TEST



⚠ WARNING

Certain procedures in this section require electrical test or measurements while power is applied to the machine. Exercise extreme caution at all times and follow Arc Flash procedures. If test points are not easily accessible, disconnect power and follow Lockout/Tagout procedures, attach test equipment and reapply power to test.

1. Access the heater element being tested.
 - HUMIDITY ELEMENT (VHU INTERIOR PAN)
 - AIR ELEMENT
2. Check resistance using HEATING ELEMENT table.

Heating Elements			
Model	Wattage	Voltage	Resistance
VHU18	1500	120	8.80-10.27

NOTE: If numbers do not match, replace HEATING ELEMENT.

REMOVAL AND REPLACEMENT OF PARTS

TOP COVER



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove eight screws securing top cover to cabinet.

NOTE: Fig. 3 Shown without top vent fan (First Generation Production). Fig. 4 Shown with top cooling fan (Second Generation Production).



Fig. 3

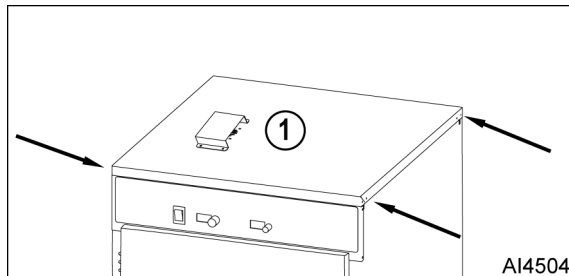


Fig. 4

2. Unplug fan cord, if applicable.
3. Lift top cover off cabinet.
4. Reverse procedure to install.

FOOD COMPARTMENT FAN



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove upper pans and pan supports for clearance to access food compartment fan.
2. Loosen fan mounting screws.

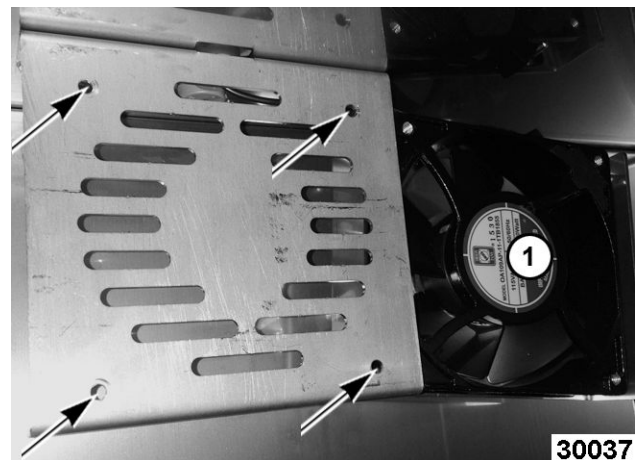


Fig. 5

3. Slide fan (1, Fig. 5) to access power connector.
4. Disconnect power connector.
5. Reverse procedure to install and check for proper operation.

HEATING ELEMENT



WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

Humidity Element (VHU Interior Pan)

1. Remove pans and universal tray slides.
2. Remove VHU interior pan.
3. Remove screw securing heating element mounting clip to bottom of cabinet.

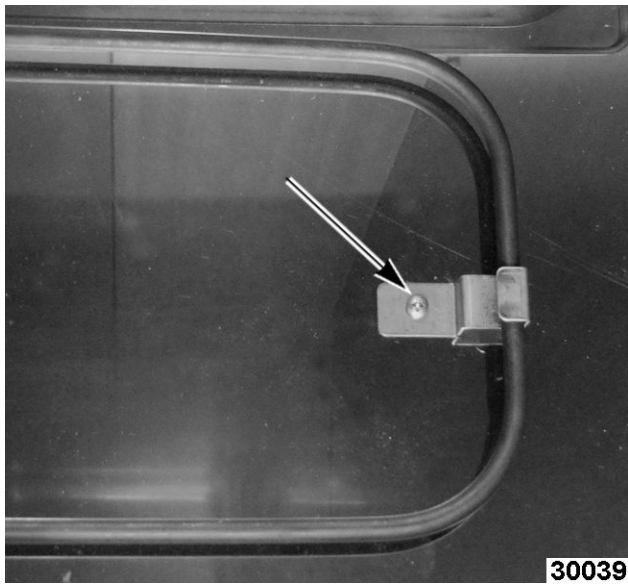


Fig. 6

4. Remove two screws securing element.



Fig. 7

5. Pull element out.
6. Disconnect heating element wires.

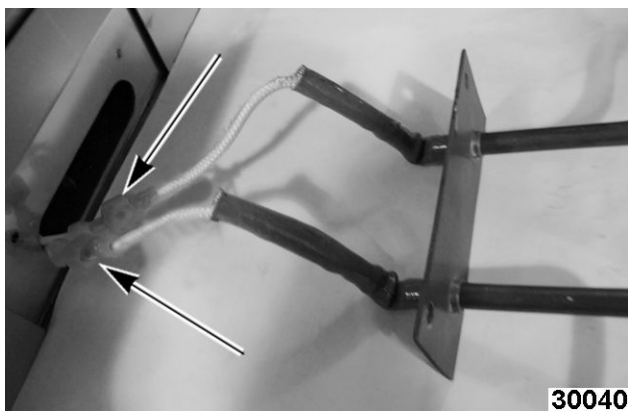


Fig. 8

7. Reverse procedure to install and check for proper operation.

Air Element

1. Remove pans and universal tray slides.
2. Loosen rail guide support screws.
3. Remove rail guides.



Fig. 9

4. Remove bottom screws from side panel.

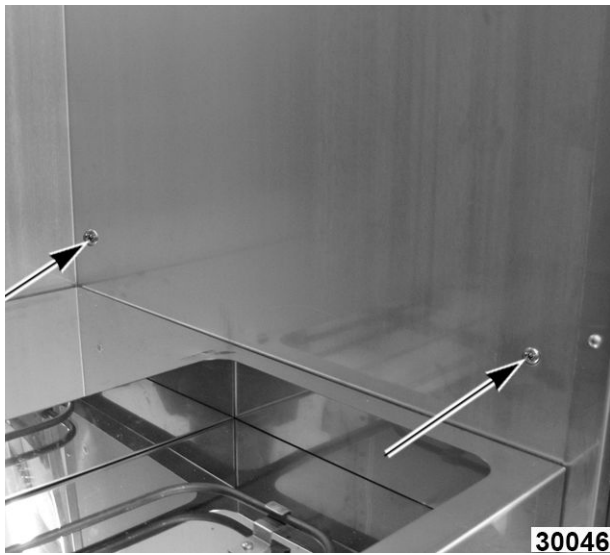


Fig. 10

5. Remove bottom cover screws.



Fig. 11

6. Carefully clear element while lifting cover from right side.



Fig. 12

7. Remove two screws securing element.



Fig. 13

8. Pull element out.
9. Disconnect heating element wires.

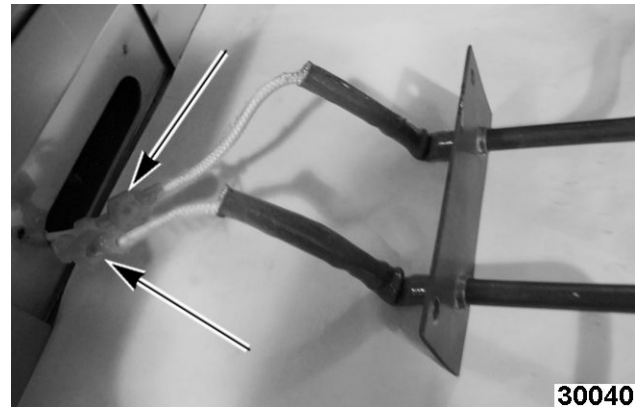


Fig. 14

10. Reverse procedure to install and check for proper operation.

CONTROLLER BOARD - TEMPERATURE & HUMIDITY



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove temperature and humidity control knobs.
2. Remove two nuts on front of board.
3. Remove TOP COVER.
4. Lift insulation and fold back toward rear of cabinet.
5. Remove controller board mounting nuts.

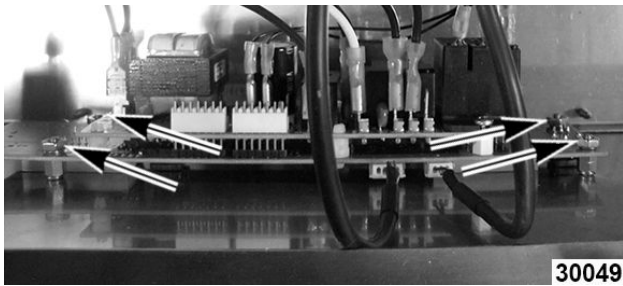


Fig. 15

6. Lift controller board to access wire connections.
7. Note wire locations and disconnect from controller board.
8. Reverse procedure to install and check for proper operation.

SENSOR BOARD - TEMPERATURE & HUMIDITY



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

NOTE: Sensor board is located within the food cavity, behind the control board, under a sheet metal cover.

Sensor Board

1. Disconnect power supply.
2. Remove sensor board cover.

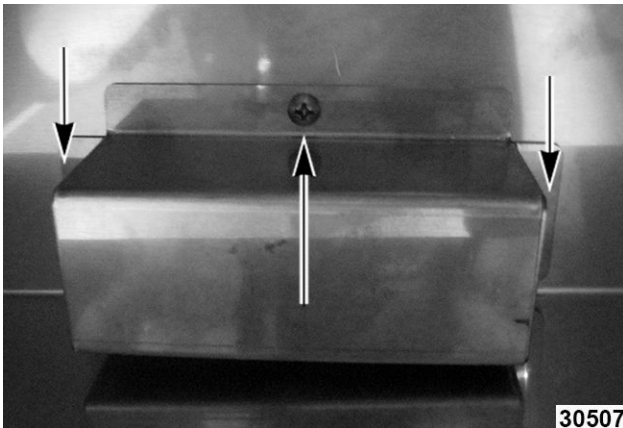


Fig. 16

3. Disconnect sensor wire plugs.

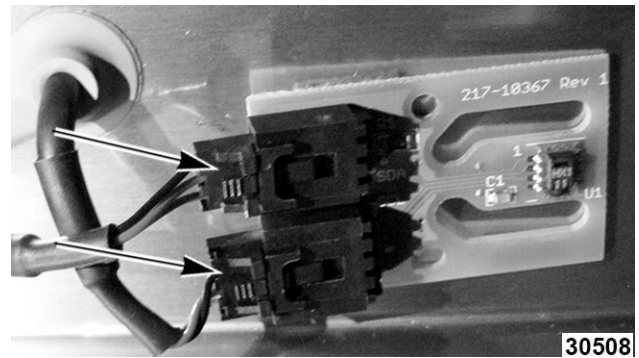


Fig. 17

4. Remove double-sided tape from cabinet surface.
5. Clean cabinet surface.
6. Apply double-sided tape to sensor and mount.
7. Plug sensor wire connectors into board.
8. Verify proper operation.

Sensor Board Wire Harness

1. Remove sensor board cover.

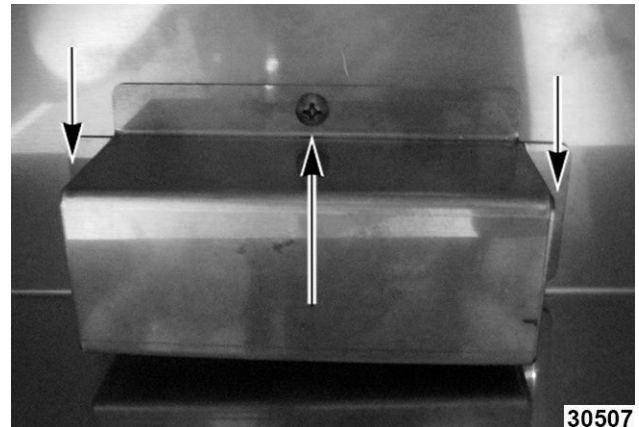


Fig. 18

2. Disconnect sensor wire plugs.

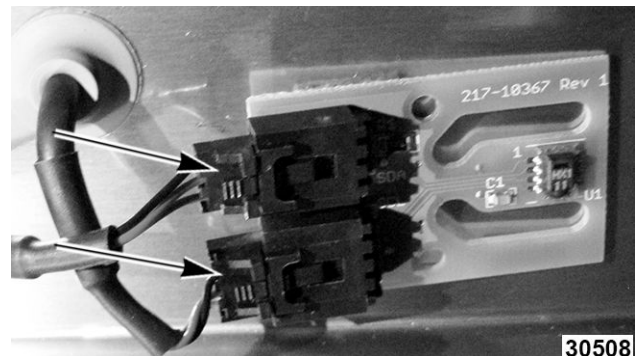


Fig. 19

3. Remove TOP COVER.
4. Disconnect wire harness plugs from board.

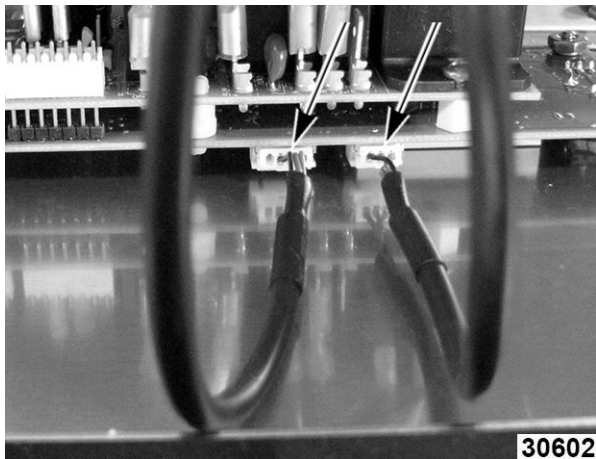


Fig. 20

5. Release grommets from top panel.

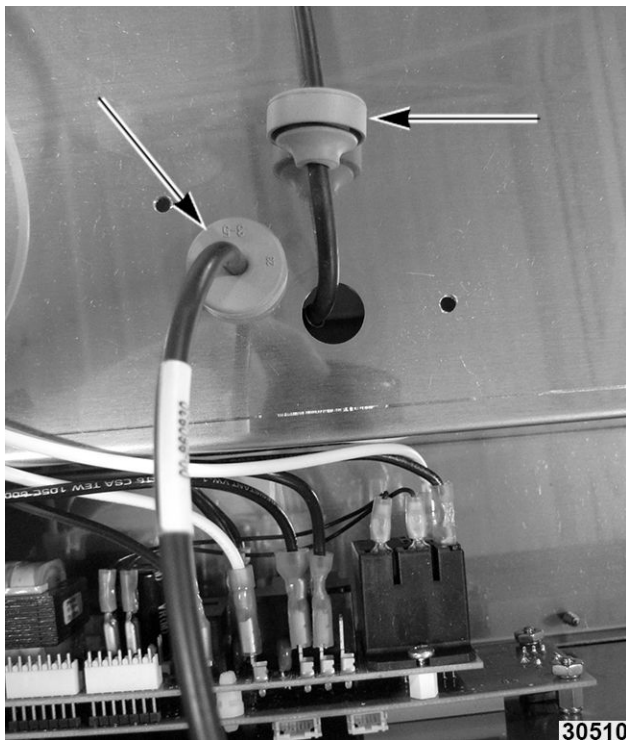


Fig. 21

6. Pull wire harness out.
7. Reverse steps to install.

NOTICE

Position grommets correctly during installation so they retain moisture from escaping.

8. Verify proper operation.

DOOR ASSEMBLY

1. Remove door hinge covers (1, Fig. 22) from lower and upper door hinge.

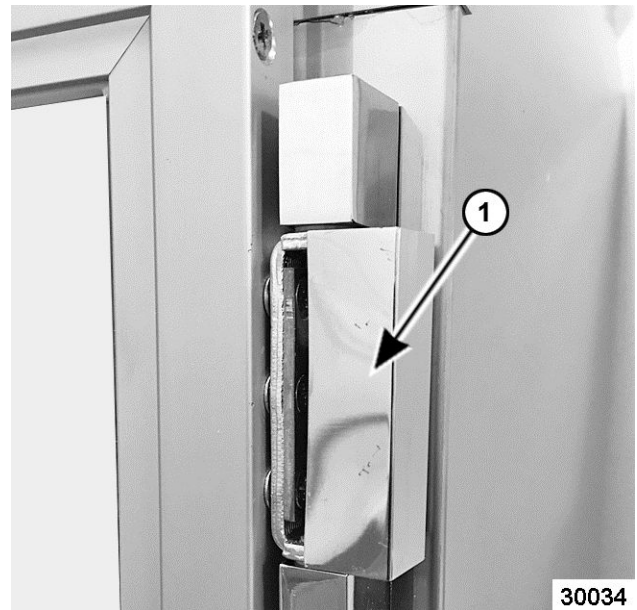


Fig. 22

WARNING

Remain in control of door when removing hinges.

2. Remove door hinge inside mounting screws from **lower door hinge** first.



Fig. 23

3. Remove door hinge inside mounting screws from **upper door hinge** while supporting door weight.
4. Lift door assembly from cabinet.
5. Reverse procedure to install.
6. Check for proper operation.

DOOR GASKET

1. Open door to access gasket.
2. Remove door gasket by pulling it out from retaining channel in door assembly.

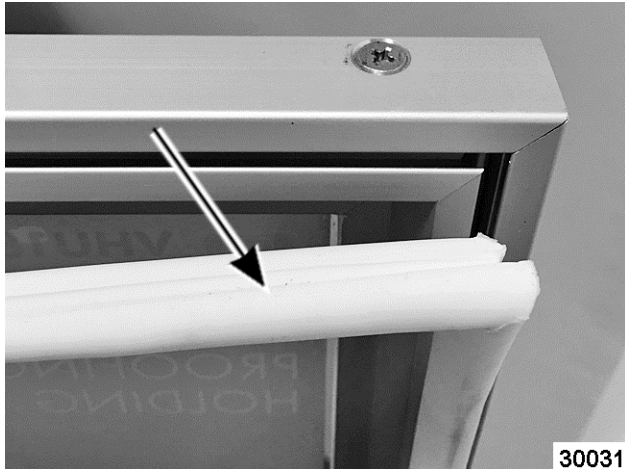


Fig. 24

3. Install gasket in each corner on door assembly.
 - A. Press gasket retaining lip into channel on door assembly.
 - B. Work gasket into channel about four inches away from corner, in each direction.

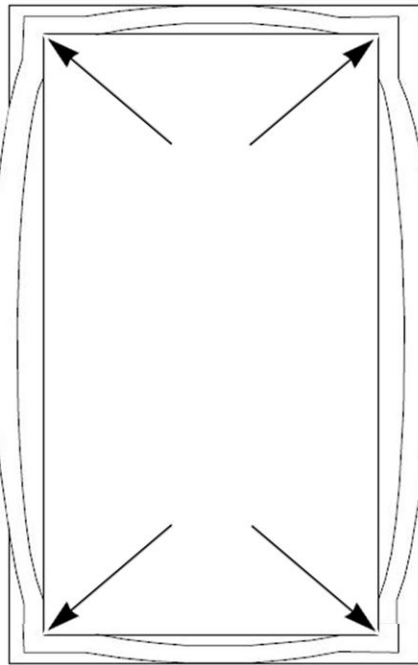


Fig. 25

4. Starting at the top, press gasket retaining lip into channel on door assembly while moving toward **middle**.

5. Repeat each side to complete gasket installation.
6. Check door for proper operation.

DOOR LATCH (MAGNETIC)

1. Open door.
2. Remove screws securing door latch to door assembly.

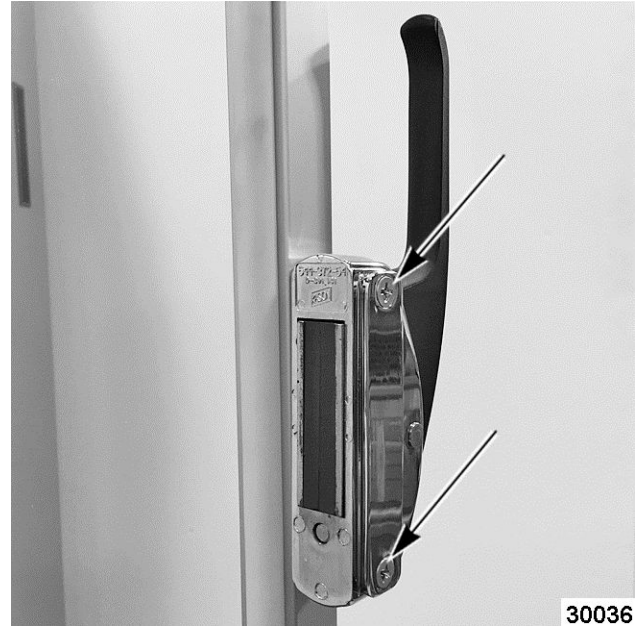


Fig. 26

3. Reverse procedure to install.
4. Check for proper operation.

FUSE



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Unscrew fuse cover from back panel.

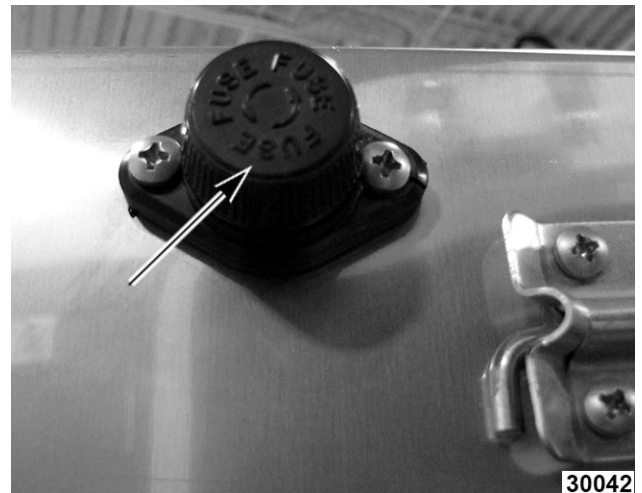
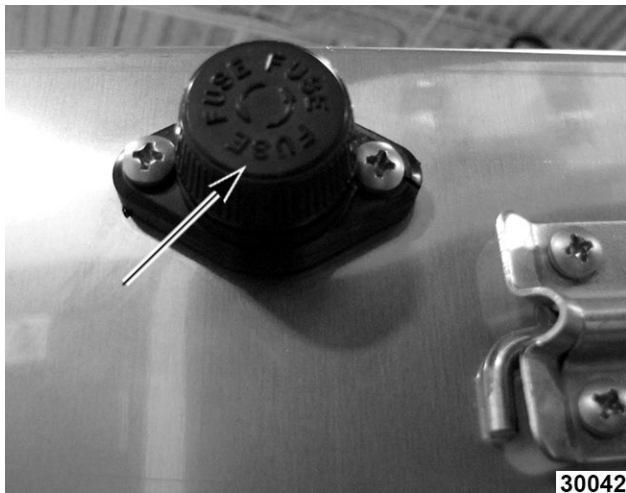


Fig. 29

2. Replace with same size and type of fuse.
3. Install cover.

4. Reverse procedure to install and verify proper operation.

FUSE HOLDER



⚠ WARNING

Disconnect the electrical power to the machine and follow lockout / tagout procedures.

1. Remove TOP COVER.
2. Note fuse wiring and disconnect.

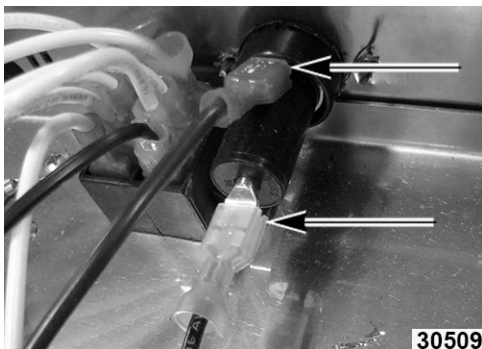
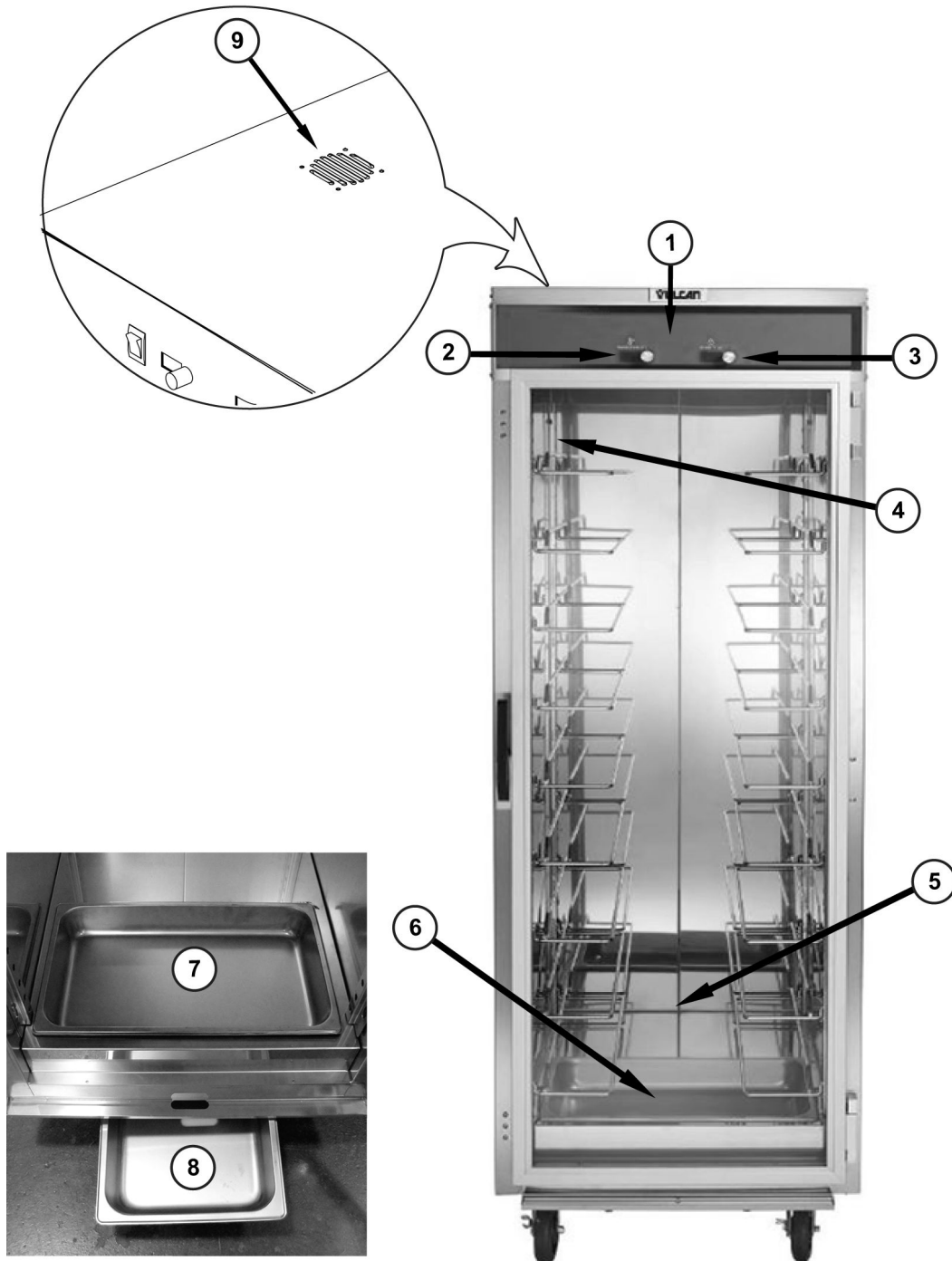


Fig. 28

3. Remove fuse holder mounting screws on back panel.

ELECTRICAL OPERATION

COMPONENT LOCATIONS



30030

Fig. 30

Item	Description
1	Temperature & humidity Controller (behind control panel)
2	Temperature Display and Control Knob
3	Humidity Display and Control Knob
4	Food Compartment Fan
5	Heating element air (below bottom cover)
6	Heating element humidity (VHU interior pan)
7	VHU Interior Pan: Special Stainless Steel Pan with High temp black coating on bottom; gets placed in opening above heating element
8	VHU Exterior Pan: Standard Stainless Steel Pan located under unit for water collection
9	Cooling Fan

COMPONENT DESCRIPTIONS

ITEM	DESCRIPTION
Fuse	Protects controller board and electrical components.
Power Switch	Provides power to the control circuit. Internal red light indicates ON (SPST).
Food Compartment Fan	Circulates air inside the cabinet. Moisture resistant with metal fan blades.
Sensor Board	Senses temperature and humidity inside the cabinet and transmits signal to controller board.
Controller Board	Controls the temperature, humidity and fan inside the cabinet.
Heating Element - VHU Interior Pan	Heats the water to provide humidity.
Heating Element - Dry	Heats the air to keep prepared food at the proper serving temperatures.
Vent Fan	Circulates air in the electrical component area.

WIRING DIAGRAM

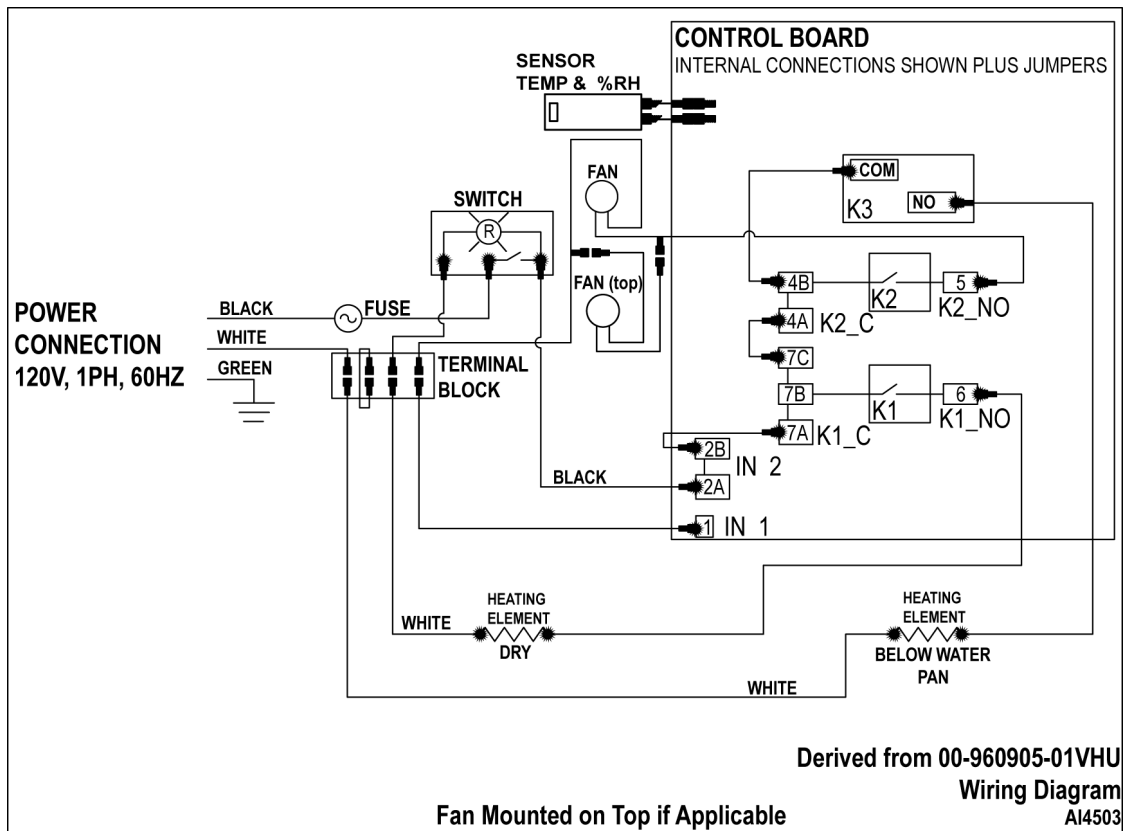


Fig. 31

SEQUENCE OF OPERATION

1. Conditions.
 - A. Unit connected to correct voltage and is properly grounded.
 - B. Power switch is off.
2. Power switch turned on.
 - A. Relays K1, K2 and K3 are de-energized (contacts N.O.).
 - B. Controller board performs diagnostic test and verifies temperature and humidity input signals are present.
 - C. If no errors codes display, the temperature and humidity settings flash in each display window.
3. Fan relay K2 is energized, K2 contacts close and power the fans.
4. Based on temperature and humidity settings, the board determines whether K1 relay will be energized to power element 1 (dry air); or K3 relay will be energized to power element 2 (humid air).

NOTE: When temperature or humidity settings are changed, after a brief pause, both element relays (K1 & K3) will be de-energized and return to N.O. position. Heating and humidity generation stop. The relay numbers will flash in each display window. Based on temperature and humidity level in cabinet vs. setting, the controller board determines which relay to energize. The number of the energized relay will flash in display window.

5. Adjust temperature and humidity to desired levels.
6. Turn power switch off stops heating cycle.

TROUBLESHOOTING

TROUBLESHOOTING

Symptom	Possible Cause
Cabinet not operating.	<ol style="list-style-type: none"> 1. Cabinet not connected to power source or circuit breaker tripped. 2. Cabinet lighted power switch not ON or malfunctioning.
Ground Fault Circuit Indicator (GFCI) tripped.	<ol style="list-style-type: none"> 1. Shorted heating element. 2. Pinched/damaged wiring (heating elements or fan). 3. Damaged power cord.
Cabinet connected to power, switch is ON, circuit breaker is ON but cabinet not heating.	<ol style="list-style-type: none"> 1. Heating element malfunction. 2. Temperature controller malfunction.
Cabinet not heating properly.	<ol style="list-style-type: none"> 1. Black coated water pan should be used inside unit. 2. Element wires disconnected from element. Replace wire assembly and element. 3. Fan not circulating air or malfunction. 4. Door not sealing properly. 5. Temperature controller needs calibrating or malfunction.
Fan not operating	<ol style="list-style-type: none"> 1. Temperature controller not supplying power to fan (malfunction). 2. Fan wiring not connected or malfunction. 3. Fan not circulating air or malfunction.
Error codes, E01, E02, or E03.	<ol style="list-style-type: none"> 1. Refer to: <u>RESET SENSOR CODES</u>.
Moisture present at the top of the cabinet near the control board.	<ol style="list-style-type: none"> 1. Fan mounted to top cover blocked off. 2. Fan mounted to top cover not functioning. 3. Fan mounted to top cover missing.
Corrosion present inside cabinet.	<ol style="list-style-type: none"> 1. Periodic cleaning needed. Refer to Operations manual. 2. Hardware has rusted. Replace rusted hardware with 18-8 stainless steel components and replace food cavity fan.

ERROR CODES

Code	Description	Correction
E01	Displays when controller detects and open temperature sensor	Refer to: <u>RESET SENSOR CODES</u>
E02	Displays when controller detects a shorted temperature sensor.	
E03	RH Display is ON and there is a short 10 RH error.	