

Service Manual

This manual is to be used by qualified appliance technicians only. Viking does not assume any responsibility for property damage or personal injury for improper service procedures done by an unqualified person.

Built-In All Freezer

This Base Manual covers general and specific information including, but not limited to the following models:

VCFB5301
VCFB5361



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SAVE THESE INSTRUCTIONS

REVIEW ALL SERVICE INFORMATION IN THE APPROPRIATE SERVICE MANUAL AND TECHNICAL SHEETS BEFORE BEGINNING REPAIRS.

Pride and workmanship go into every product to provide our customers with quality products. It is possible, however, that during its lifetime, a product may require service. Products should be serviced only by a qualified service technician that is familiar with the safety procedures required in the repair and who is equipped with the proper tools, parts, testing instruments, and the appropriate service manual.

Safety Information

We have provided many important safety messages in this manual and on the appliance. Always read and obey all safety messages. This is the safety alert symbol.



This symbol alerts you to hazards that can kill or hurt you and others. All safety messages will be preceded by the safety alert symbol and the word "DANGER", "WARNING", or "CAUTION". These words mean:

DANGER

IMMEDIATE HAZARDS WHICH WILL RESULT IN SEVERE PERSONAL INJURY OR DEATH.

WARNING

Hazards or unsafe practices which COULD result in severe personal injury or death.

CAUTION

Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

WARNING

To avoid risk of serious injury or death, repairs should not be attempted by unauthorized personnel.

CAUTION

VIKING will not be responsible for any injury or property damage from improper service procedures. If performing service on your own product, you must assume responsibility for any personal injury or property damage which may result.

Technical support for authorized servicers:

1-800-914-4799

Address your written correspondence to:

Viking Preferred Service
 1803 HWY 82 West
 Greenwood, MS 38930

Important Information



Warnings

Read and follow all instructions before using this appliance to prevent the potential risk of fire, electric shock, personal injury, or damage to the appliance as a result of improper usage of the appliance. Use appliance only for its intended purpose as described in this manual.

To ensure proper and safe operation: appliance must be properly installed and grounded by a qualified technician. DO NOT attempt to adjust, repair, service, or replace any part of your appliance unless it is specifically recommended in this manual. All other servicing should be referred to a qualified servicer.

Make sure that incoming voltage is the same as unit rating. An electric rating plate specifying voltage, frequency, wattage, amperage, and phase is attached to the product.

Electrical Requirements

Assure that the electrical installation is adequate and in conformance with the National Electrical Code, ANSI/NFPA 70-latest edition or Canadian Electrical Code C22.1-1998 and C22.2 No. 0-M91 (or latest edition), and all local codes and ordinances. A 115 volt, 60-Hz, 15 amp, fused, electrical supply is required. It is required that

a separate circuit serving only this appliance be provided. This appliance is equipped with a power supply cord having a 3-prong grounding plug.

To minimize possible shock hazard, the cord must be plugged into a mating 3-prong, grounding-type wall receptacle. DO NOT use an extension cord.

Tip Over Hazard

Most of the unit's weight is at the top. Extra care is needed when moving the unit to prevent tipping. Keep doors closed until appliance is completely installed and secured per installation instructions. Use two or more people to move and install appliance. Failure to do so can result in death or serious injury.



WARNING

TIP OVER HAZARD

Appliance is top heavy and tips easily when not completely installed. Keep doors closed until appliance is completely installed and secured per installation instructions. Use two or more people to move and install appliance. Failure to do so can result in death or serious injury.



WARNING

ELECTRICAL SHOCK HAZARD

Disconnect power or turn power disconnect switch to "OFF" position before removing top grille. Failure to do so can result in death or electrical shock.



WARNING

ELECTRICAL SHOCK HAZARD

Plug into a grounded 3-prong outlet. If a 2-prong wall receptacle is encountered, contact a qualified electrician.
DO NOT remove ground prong. Unit must be grounded at all times. DO NOT use an adapter. DO NOT use an extension cord.
Failure to follow these instructions can result in death, fire, or electrical shock.



WARNING

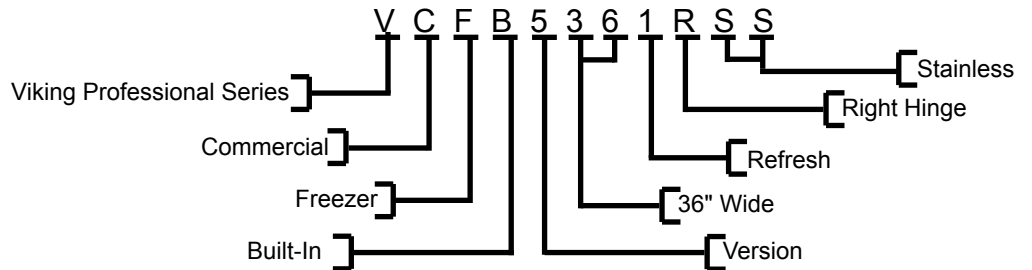
BURN HAZARD

DO NOT touch condenser coils near defrost pan. Doing so can result in burns.

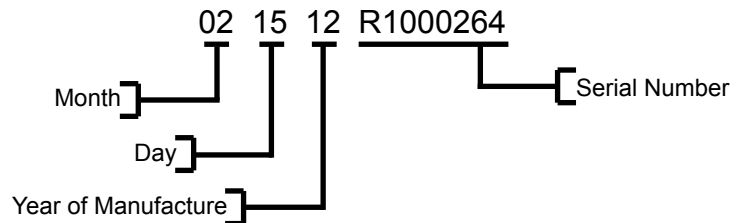
Model – Serial Number Matrix

The serial number and model number for your appliance are located on the identification plate mounted on the upper right of the interior compartment.

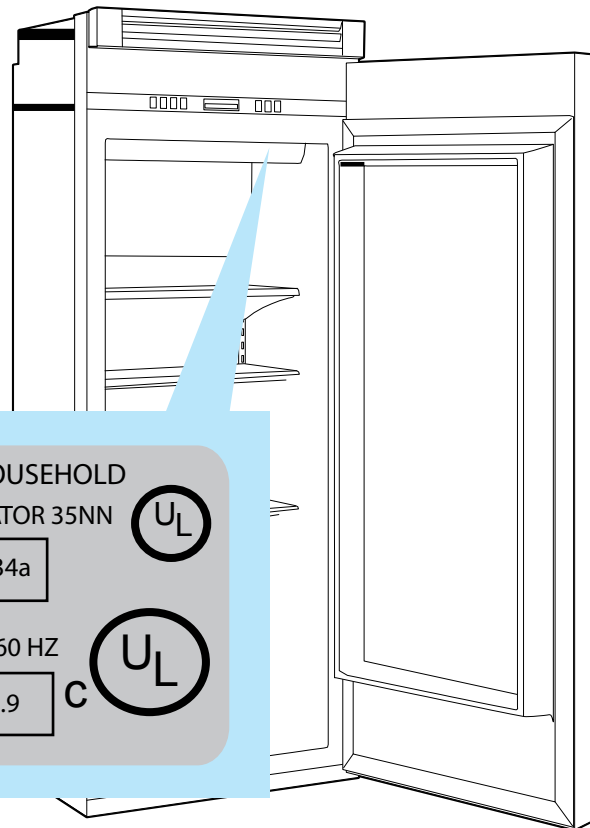
Model Numbers



Serial Numbers



The serial number and model number for your appliance are located on the identification plate mounted on the upper left side of the door opening.



VIKING RANGE CORP. GREENWOOD, MISSISSIPPI 38930		LISTED HOUSEHOLD REFRIGERATOR 35NN		
MODEL/MODELE NUMBER/NUMERO	VCFB5361LSS	8.5 oz R134a		
SERIAL/SERIE NUMBER/NUMERO	021512R10000264	115 VAC/60 HZ		
PE920095		AMPS: 9.9		



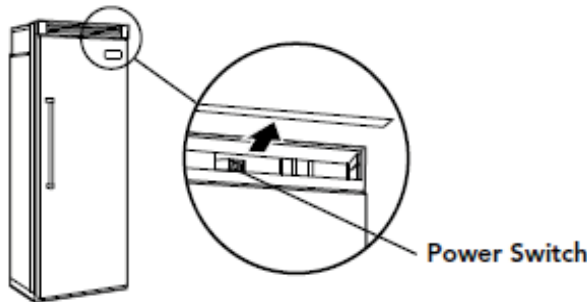
Settings and Functions

In order for your new refrigerator to work properly, it is important that you understand its various features, controls, and how to use them.

Power On/Off Switch (Power Interruption Switch) The power on/off switch is located behind your refrigerator's top grille. It is used to turn the power "OFF" when cleaning the refrigerator or changing the light bulbs. Your refrigerator arrives from the factory with the power interruption switch "ON".

To turn power "OFF", remove the center grille blade. Press the power on/off switch to the "OFF" position.

To turn power "ON", press power on/off switch to the "ON" position. Replace the center grille blade.



IMPORTANT: Be sure the power on/off switch is in the "ON" position after cleaning or changing light bulbs.

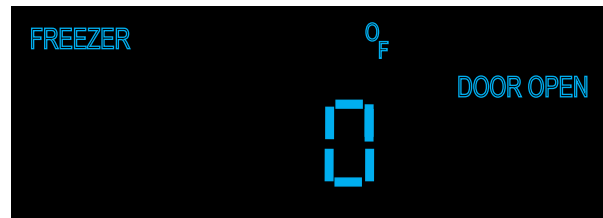
Electronic Temperature Settings

Your refrigerator's electronic controls are located behind the door above the cabinet interior. To activate the electronic control panel, press "ACTIVATE CONTROLS" pad. All other pads, except the "Alarm Off" pad, will remain inactive until the "ACTIVATE CONTROLS" pad is pressed. Once activated, pad remains programmable for at least ten minutes

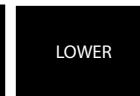


Electronic Temperature Settings

When power is first applied to the refrigerator, there will be two dashes displayed as in illustration. After approximately thirty seconds the digital display will change to numbers, indicating temperature in the freezer compartment along with the word FREEZER and degrees Fahrenheit.



To adjust temperature, enable the key pad controls by pressing and releasing the "ACTIVATE CONTROLS" pad. Press and release "FRZ TEMP" pad. The temperature is then adjusted in the freezer section by pressing "HIGHER or LOWER" pad while observing digital readout.



Key Press Confirmation

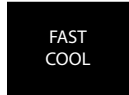
The key press confirmation is the "beep" that is heard when a control pad is pressed. This audible confirmation can be made active or inactive.

To deactivate the confirmation beep press and hold "ACTIVATE CONTROLS" pad for three seconds, three long beeps will be heard, confirming deactivation.

To activate the confirmation beep press and hold "ACTIVATE CONTROLS" pad for three seconds, three long beeps will be heard, confirming activation.

Fast Cool

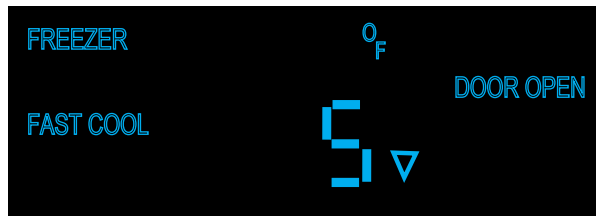
Fast Cool is enabled by pressing and releasing the "ACTIVATE CONTROLS" pad and then pressing and releasing the "FAST COOL" pad.



This causes the control to temporarily (predetermined time, factory default is 2 hours) replace the freezer setpoint to Max Frz temperature (factory default -5° F) and also the refrigerator setpoint to Max Ref temperature (factory default 33° F).

Max Frz and Max Ref time duration is adjustable in Program Mode B, range is 1 to 20 hours in 1 hour increments.

The only temperature speed used during this mode of operation is high speed (115HZ).



When "FAST COOL" is selected by pressing the pad, "FAST COOL" is illuminated on the display as shown in illustration above. The down arrow will flash 1 sec on and 1 sec off until cabinet temperature reaches set point temperature.

Fast Cool will terminate after the time duration has expired or if another mode is selected or if temperature is increased or decreased by pressing "HIGHER or LOWER" tabs. Fast Cool can be cancelled by pressing "FAST COOL" again, the Fast Cool will extinguish on the display.

MAX FRZ

Max Frz is enabled by pressing and releasing the "ACTIVATE CONTROLS" pad and then Pressing

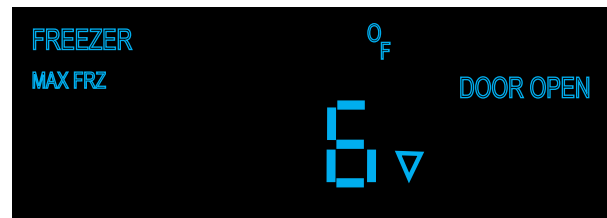


and releasing the "MAX FRZ" tab.



This causes the control to temporarily (factory setting is 6 hours) change the current freezer set point to -5° F. This set point temperature is not adjustable and is programmed from factory.

The time duration is adjustable in Program Mode B, range is 1 to 20 hours in 1 hour increments.



When MAX FRZ is selected, the display illuminates "MAX FRZ" as shown above. The temperature display will move towards that set point temperature (- 5° F) as the unit pulls down. The down arrow will flash 1 sec on and 1 sec off until cabinet temperature reaches set point temperature.

Max Frz will terminate at the conclusion of the time duration or if another mode is selected, or if the temperature is manually changed by pressing "HIGHER or LOWER" tabs. Max Frz can also be terminated by again pressing and releasing "MAX FRZ".

The conclusion or termination of this mode is confirmed by "MAX FRZ" extinguishing from display.

Forced Pull-Down (Forced compressor start)

To enter Forced pull-down, first press and release "ACTIVATE CONTROLS", then press and hold "LOWER" pad, then press and hold "DISPLAY OFF" pad also until you get an audible consisting of three beeps.



This causes the control to immediately energize the appropriate outputs in an effort to reach both of the cut-out temperatures (refrigerator and freezer).

This function will ignore compressor dwell time and cause immediate compressor start up in the high speed mode (115HZ).

Forced pull-down will terminate after both cut-out temperatures are met, or if a defrost or forced defrost is initiated, or if an extended power loss occurs.

Forced Defrost

To enter Forced defrost, first press and release "ACTIVATE CONTROLS", then press and hold "HIGHER" pad, then press and hold "DISPLAY OFF" pad until you get an audible consisting of three beeps.



This causes the control to immediately suspend all temperature control operations and start a defrost cycle, regardless of compressor dwell time and defrost start delay.

If defrost terminator temperature is satisfied defrost heaters will come on at this time for a normal defrost cycle.

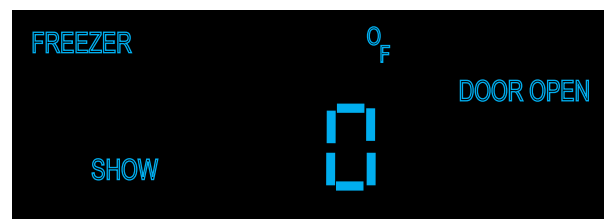
Forced defrost will terminate when defrost terminator opens (completion of cycle defrost) or if forced pull-down is initiated or if there is a long power loss..



When forced defrost is initiated the temperature numbers are replaced with "dEF" in the seven segment displays, as shown above. When defrost is complete the displayed "dEF" will again be replaced with displayed temperature numerals.

Showroom Mode

To enter Showroom mode: Press and hold the "ACTIVATE CONTROLS" pad. While holding, press and hold the "HIGHER" and "ALARM OFF" pad simultaneously. Continue holding until three beeps are heard and then "SHOW" is illuminated along with Refrigerator and 38°F or Freezer and 0°F. Whichever section was active prior to to showroom mode being entered will determine which one is displayed.



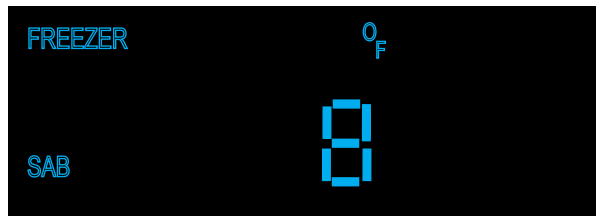
To exit Showroom mode: Press and hold the "ACTIVATE CONTROLS" pad. While holding, press and hold the "HIGHER" and "ALARM OFF" pad simultaneously. Continue holding until three beeps are heard. The display will revert to normal operation

Sabbath Mode

To enter Sabbath mode, press and hold "ACTIVATE CONTROLS" pad then press and hold "DISPLAY OFF" pad, together for three seconds this will cause an audible three beeps, signifying that Sabbath mode has been entered.



When Sabbath mode has been entered the display goes blank except for the "SAB", see illustration below, which will remain illuminated whether the door(s) are open or closed, it will not change state.



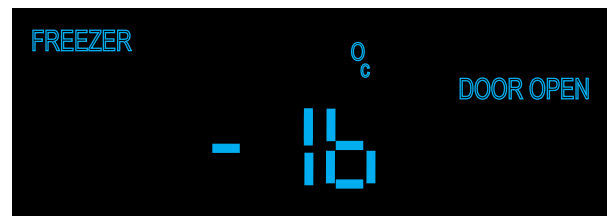
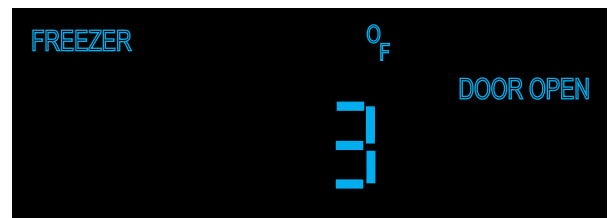
Sabbath mode is used to control the refrigerator without interior lights, LED display changes and enunciators. Alarms are suppressed, you will not get visual or audible alarms during Sabbath mode, although they are recorded in memory and will be displayed upon exiting Sabbath mode.

The freezer/refrigerator outputs (compressor, fans, etc.) should not have an immediate reaction from a user action. If the control calls for an action because the door was opened or closed, the control shall delay its reaction randomly (15-25 seconds).

To exit "SABBATH" mode, press and hold "ACTIVATE CONTROLS" and then "DISPLAY OFF" together for three seconds, an audible three beeps will be heard and "SAB" on display will extinguish. The display will return to normal and any alarms will be visually and audibly displayed.

Fahrenheit to Celsius

Factory default for readout is Fahrenheit, to change to Celsius, press and hold "ACTIVATE CONTROLS" and then press and hold "DISPLAY OFF" for three seconds and °F will change to °C. To change back to Fahrenheit, repeat same steps.



Display Panel Operation

The unit being serviced has a control panel that allows operation of the unit as well as diagnostic abilities. See the information below for details.

Operation	Description	How to Access Function
Keyboard Entry Tone	Indicates a pad was pressed, command was read, and accepted	To turn off entry tone, press and hold "ACTIVATE CONTROLS" pad for 3 to 5 seconds
Command Accepted Tone	Three short tones sound indicating a command has been accepted	
"ACTIVATE CONTROLS" Pad	If the pad is activated, the display panel remains active at least 10 minutes after the door is closed	Press the "ACTIVATE CONTROLS" pad
"FRZ TEMP" Pad	"FREEZER" will light up and buffered freezer temperature will be displayed. Factory setting is 0° F	Press "HIGHER" or "LOWER" pad
"HIGHER" Pad	Raises temperature settings one degree at a time	Press "HIGHER" pad. To raise temperature at a faster rate, hold the pad down
"LOWER" Pad	Lowers temperature settings one degree at a time	Press "LOWER" pad. To lower temperature at a faster rate hold, the pad down
"FAST COOL" Pad	"FAST COOL" will light up enabling the fast cool function which changes the freezer set point to max frz and the ref set point to max ref for a factory default of 2 hours.	Press "FAST COOL" pad. A second press will disengage feature.
"MAX RFZ" Pad	Sets freezer temperature to coldest setting (-5° F). Factory setting is 6 hours	Press "MAX FRZ" Pad to engage. A second press will disengage feature
"ALARM OFF" Pad	Deactivates (partially or fully), audio/visual alarm signals	Press "ALARM OFF" to terminate audible alarm, visual alarm indicators will continue to blink until alarm condition is cleared or permanently disabled. To reactivate press and hold "ALARM OFF" pad for 3 seconds.
"DISPLAY OFF" Pad	Deactivates control panel except for "ACTIVATE CONTROLS" and "DISPLAY OFF" pads	Press "DISPLAY OFF" pad to deactivate display. Press "ACTIVATE CONTROLS" pad to reactivate

Temperature Control Operation

For any temperature setting, outputs will be turned off/on based on cut-in/cut-out temperature determined by resistance levels of freezer or refrigerator thermistors.

Freezer Thermistor (NTC)

As temperature decreases, resistance increases. As temperature increases, resistance decreases.

Note: Open thermistor or thermistor circuit or a shorted thermistor will result in freezer continuing to cool with error code displayed. The section will call for cooling 100 percent of time except during defrost cycle

Deg F	Deg C	K-Ohms
-24	-31	565
-22	-30	531
-20	-29	499
-18	-28	469
-16	-27	441
-15	-26	415
-13	-25	391
-11	-24	368
-9	-23	347
-8	-22	327
-6	-21	308
-4	-20	291
-2	-19	274
0	-18	259
1	-17	245
3	-16	231
5	-15	218
7	-14	206
9	-13	195

Deg F	Deg C	K-Ohms
10	-12	185
12	-11	175
14	-10	165
16	-9	157
18	-8	148
19	-7	141
21	-6	133
23	-5	126
25	-4	120
27	-3	114
28	-2	108
30	-1	103
32	0	97
34	1	93
36	2	88
37	3	84
39	4	80
41	5	76
43	6	72

Deg F	Deg C	K-Ohms
45	7	69
46	8	65
48	9	62
50	10	59
52	11	56
54	12	54
55	13	51
57	14	49
59	15	47
61	16	44
63	17	42
64	18	41
66	19	39
68	20	37
70	21	35
72	22	34
73	23	32
75	24	31
77	25	30

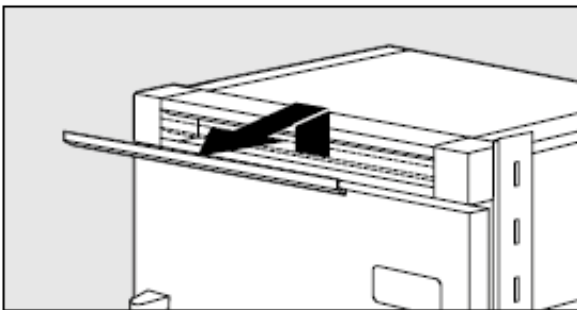
Freezer temperature setting and thermistor value will determine if compressor/condenser fan and evaporator fan switches are open or closed. Compressor/ condenser fan switch must be open for 6 minutes before switch can close again (compressor dwell time). Refrigerator temperature setting and thermistor value will determine if fresh food switch is open or closed. Cut-out and cut-in temperature values must be reached and maintained for 15 seconds before output state will change (digital delay). Freezer control calibration can be adjusted in Program Mode A.

Door Hinge Adjustment

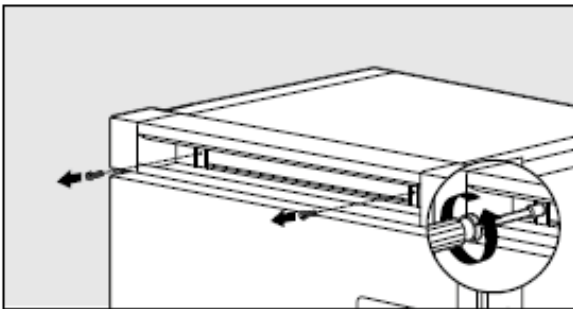
Removal of the upper grille assembly allows access to door hinge for adjustment.

To remove upper grille:

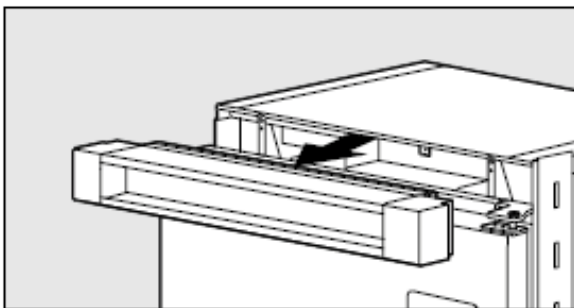
1. Lift center grille louver up and pull out.



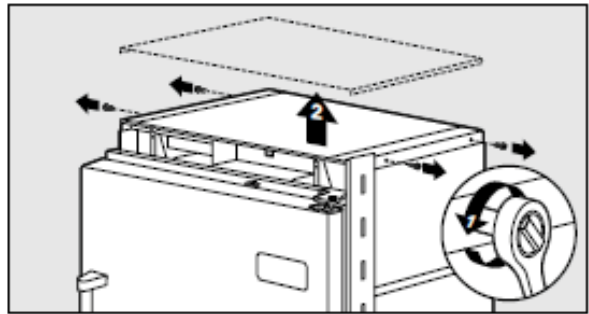
2. Using an 8" magnetic nut driver, remove the two 1/4" screws.



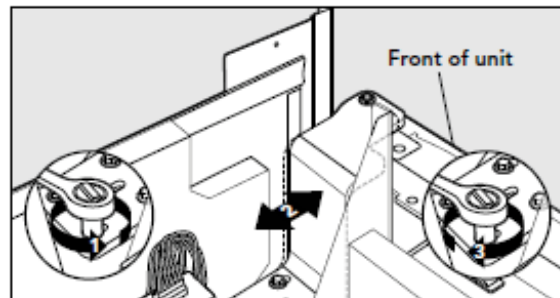
3. Remove grille assembly.



1. Remove four side screws and remove unit top. This step gives you the best access to the hinge bolts but is not absolutely required. You can reach in where grille was removed with ratchet to get to hinge bolts.



2. Loosen the four hinge bolts. Adjust door.

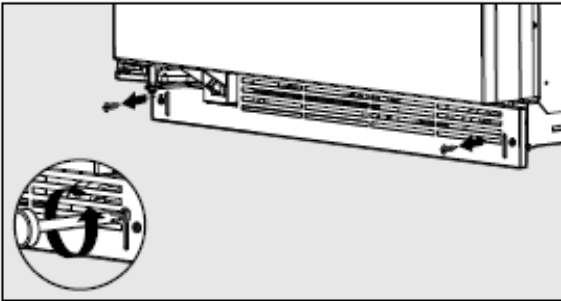


3. Reverse procedure for reinstallation.

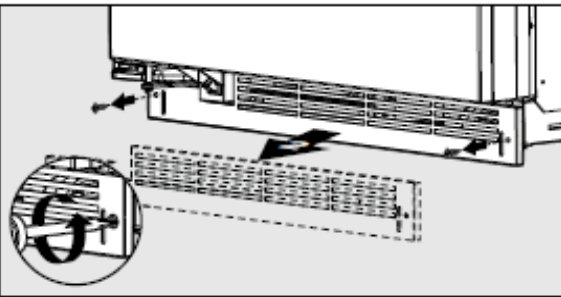
Height Adjustment

Removal of the kickplate allows access to rollers and stabilizing legs for height adjustment.

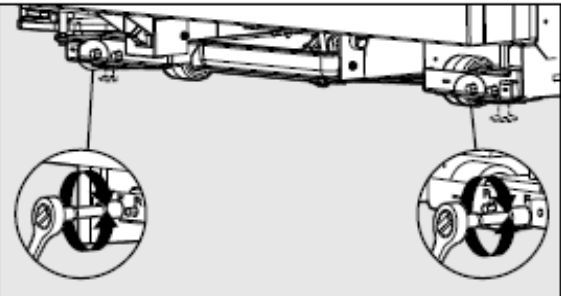
1. Remove lower kickplate screws using a Phillips screwdriver.



2. Remove upper kickplate screws using a Phillips screwdriver. Remove kickplate assembly.

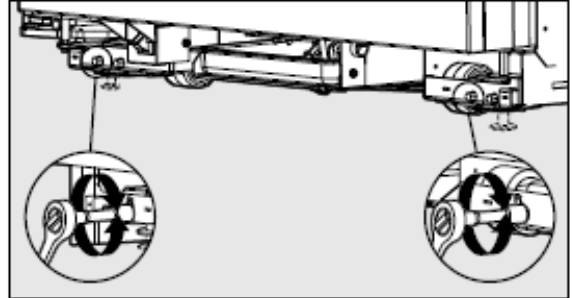


3. Using a 5/16" head wrench, turn the front (F) adjustment screws to raise or lower the front of the freezer.



Note: *DO NOT* use an electric device. Overtightening can cause damage.

4. Using a 5/16" head wrench, turn the rear (R) adjustment screws to raise or lower the rear of the refrigerator.



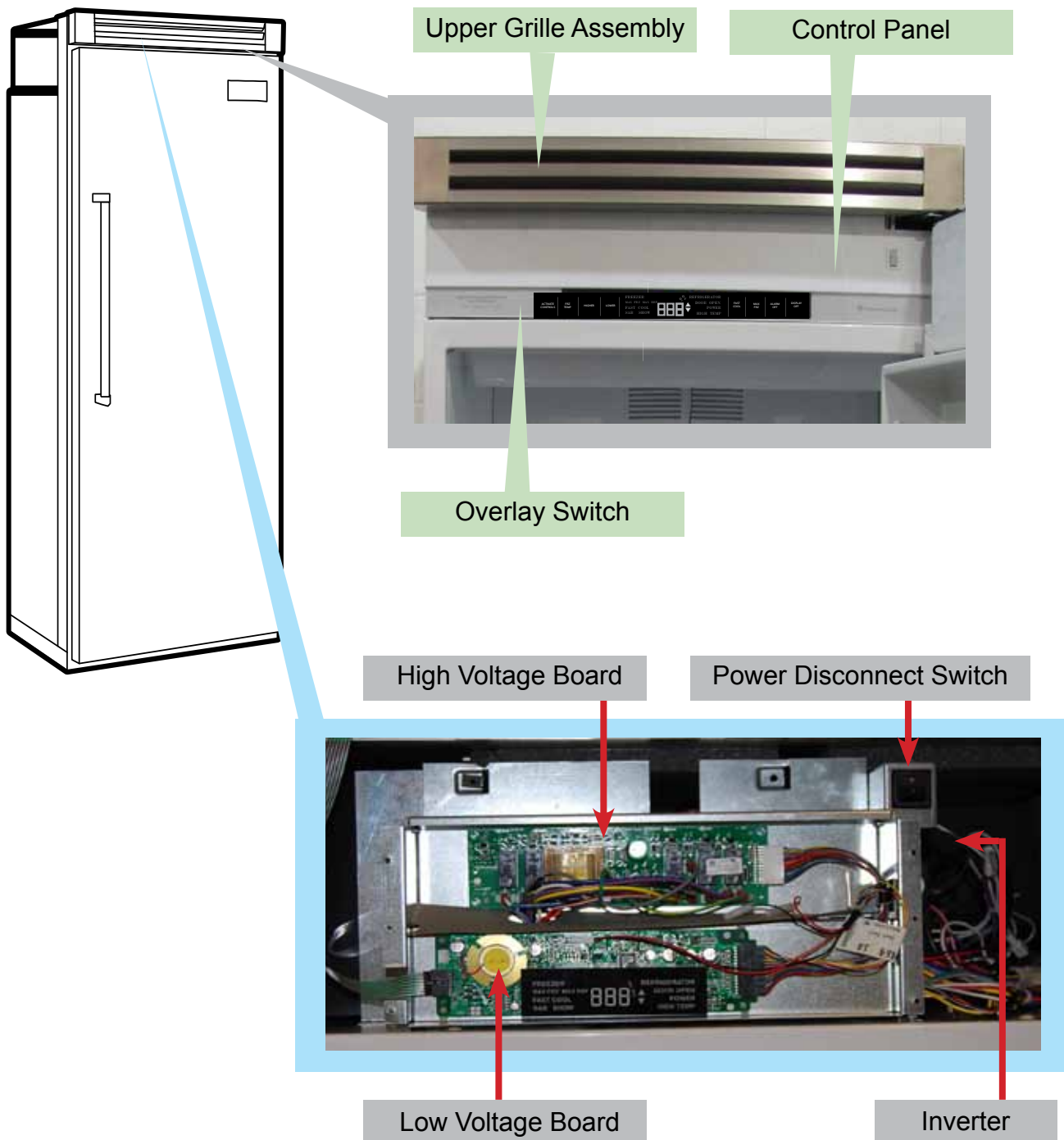
Note: *DO NOT* use an electric device. Overtightening can cause damage.

5. Reinstall kickplate.

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Parts Location—Control Panel



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

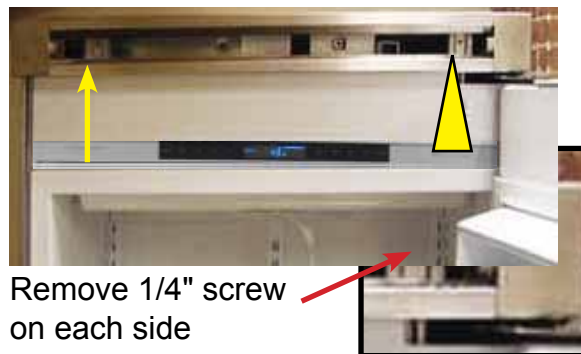
Upper Grille Assembly

Removal of the upper grille assembly allows access to the control assembly.

1. To remove the upper grille assembly, slide out the middle air louver.



2. With the middle grille louver removed, remove the (2) 1/4" hex screws securing the grille assembly.



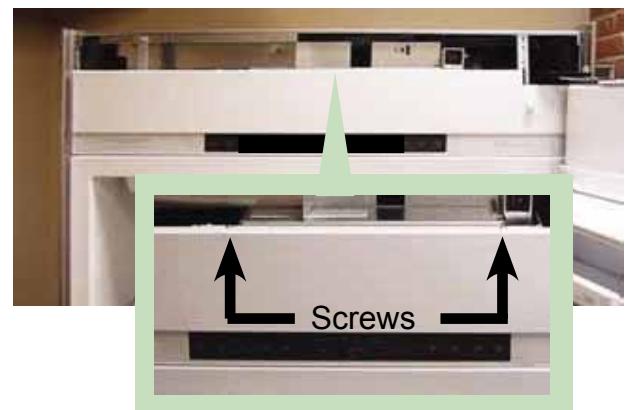
3. Remove the grille assembly



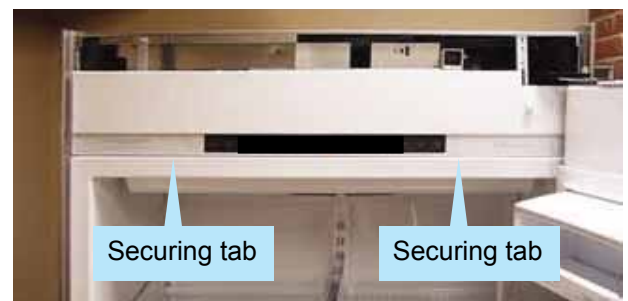
Control Panel

The control panel has an overlay switch attached to it that allows user input to the control boards.

1. To access the control panel, remove the upper air grill assembly (see Upper Grill Removal section), remove (2) screws securing the control panel.



2. Pull control panel from securing tabs.



3. Lower the control panel. Take caution with the ribbon cable to prevent damage.



Disassembly



WARNING

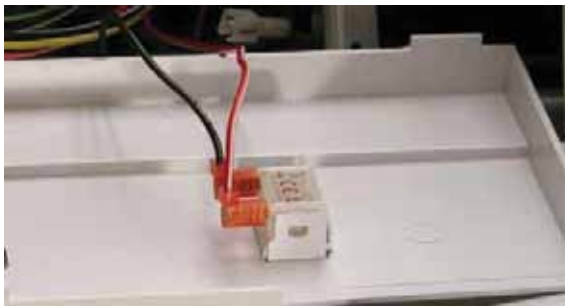
To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Control Panel (continued)

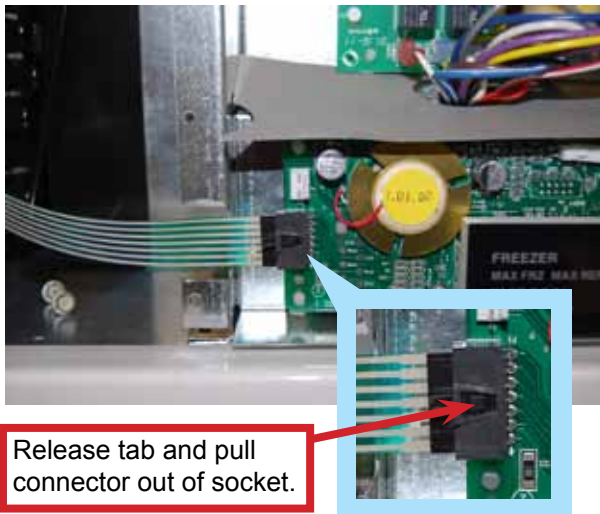
1. Remove the four screws securing the control board cover. Remove control board cover



2. Disconnect the door switch from the back of the control panel.



3. Disconnect the ribbon from the control board. Take caution with the ribbon cable to prevent damage.



4. Remove the two strain relief screws.



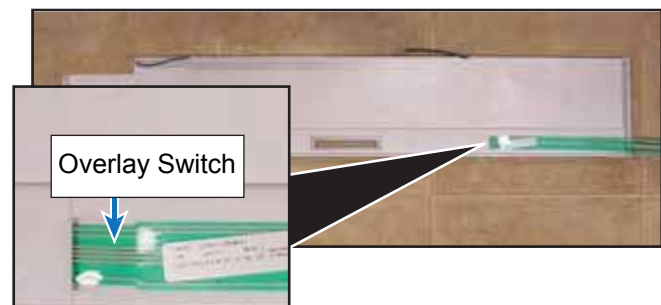
5. The control panel can now be removed and the high voltage and low voltage boards are accessible

6. Reverse procedure to reinstall

Overlay Switch

The unit uses an overlay switch to communicate user input to the control boards. The overlay connects to the control board via a ribbon cable.

1. To replace the overlay switch, remove the upper air grill assembly, remove the control panel (see Air Grill and Control Panel Removal sections, Page 15).
2. Disconnect overlay switch from control.



⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

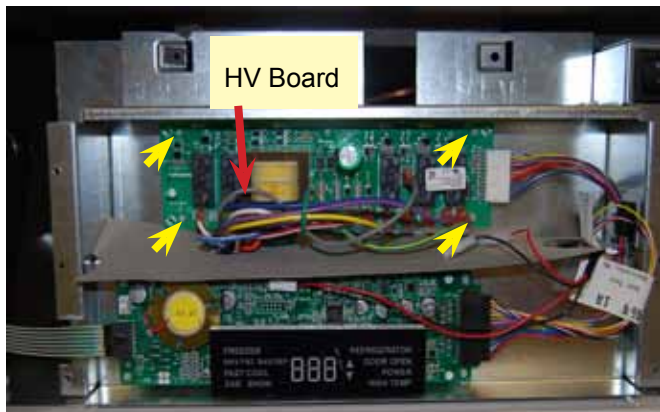
Overlay Switch (continued)

3. Peel overlay off control panel and remove (remove adhesive to ensure replacement overlay adheres properly)
4. Reverse procedure to reinstall.

High Voltage Board

A control board is used to operate functions of the unit. Once an input is received from the low voltage board, the high voltage board sends an output to activate the components.

1. To access the high voltage board, remove the upper air grill assembly, and control panel (see Air Grill and Control Panel Removal sections, Page 15).
2. Compress plastic standoffs securing the high voltage board and pull towards you.



3. High voltage board is now accessible. To check high voltage board, refer to chart on Page 41.
4. Reverse procedure to reinstall.

Low Voltage Board

The unit uses a control board in conjunction with an overlay switch to operate functions of the refrigerator/freezer. Interaction with the low voltage board is via the ribbon cable attached to the overlay switch.

1. To access the low voltage board, remove the upper air grill assembly, control panel (see Air Grill and Control Panel Removal sections, Page 15).
2. Compress plastic standoffs securing low voltage board, disconnect wiring and remove.



LV Board

3. To check low voltage board, refer to chart on Page 42.
4. Reverse procedure to reinstall

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Power Disconnect Switch

The unit has a rocker switch, located in the upper right corner of the unit, that allows power to the unit to be turned “OFF” without removal of the unit.

DANGER

ON/OFF switch has 120 vac connected to one side of switch at all times, remove power with circuit breaker box when removing switch.

1. To access the power disconnect switch, remove the upper air grill assembly (see Air Grill Removal section, Page 14). The power disconnect is now accessible on the right side.

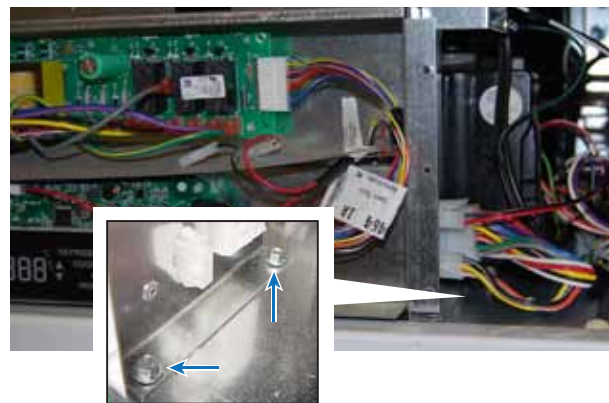


2. Verify contacts 4-5 open when the switch is in the “0” position and contacts 4-5 close when in the “|” position. 120 VAC should be measured when in the “0” position and 0 VAC should be measured when in the “|” position.
3. Switch bracket is mounted on electronics box with two 1/4" hex head screws.
4. Reverse procedure to reinstall.

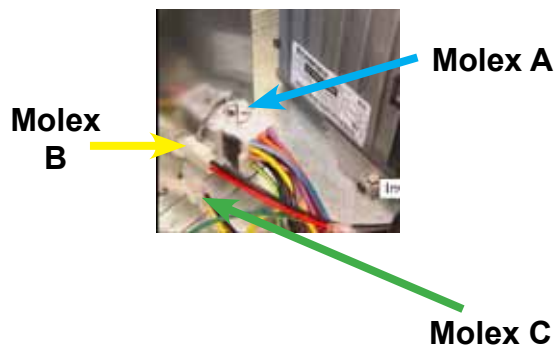
Inverter

The Compressor is operated by a Inverter that varies the voltage to the compressor. This is determined by the frequency input from the low voltage board

1. To access the inverter, remove upper air grill assembly, remove control panel assembly (see Air Grill and Control Panel Removal sections, Page 14).
2. Remove the control box in order to gain easy access to the door hinge area for service. There are 4 1/4" hex screws (2 on each side) holding the control box to the refrigerator housing. Remove these screws.



3. Unplug the 15-pin Molex power plug (A), as well as the 2-wire converter frequency cable (B) and the 3-wire thermistor plug (C).

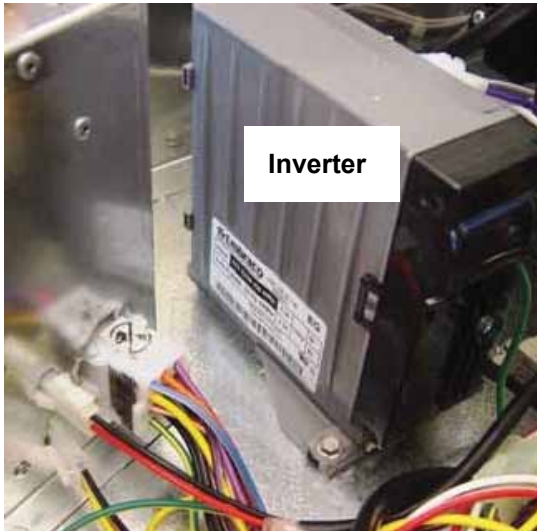


⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Inverter (continued)

4. The inverter is now accessible on the right side.



120 VAC is supplied to the inverter from E4 on the High Voltage Board. The LV board sends 5 VDC to the inverter to operate the compressor.

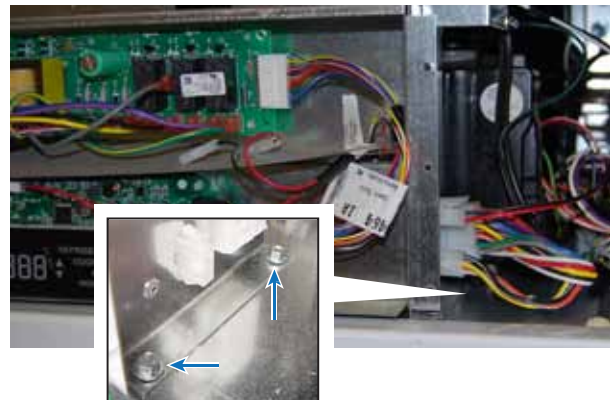
5. Reverse procedure to reinstall.

Condenser Fan

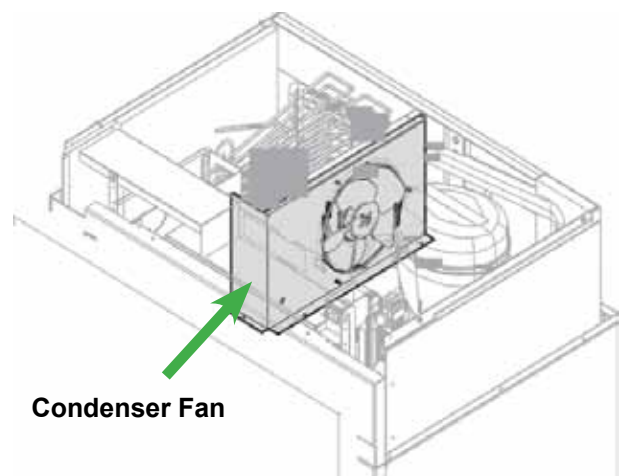
The condenser fan is located in the upper machine compartment of the unit. 120 VDC is supplied to the fan when the Compressor/ Condenser Fan relay closes to E4 on the High Voltage Board.

1. To access the condenser fan assembly, remove upper air grill assembly, remove control panel assembly (see Air Grill and Control Panel Removal sections, Page 14).

2. Remove the control box in order to gain easy access to the door hinge area for service. There are 4 1/4" hex screws (2 on each side) holding the control box to the refrigerator housing. Remove these screws.



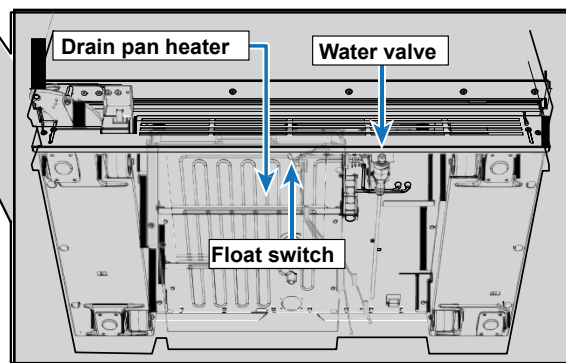
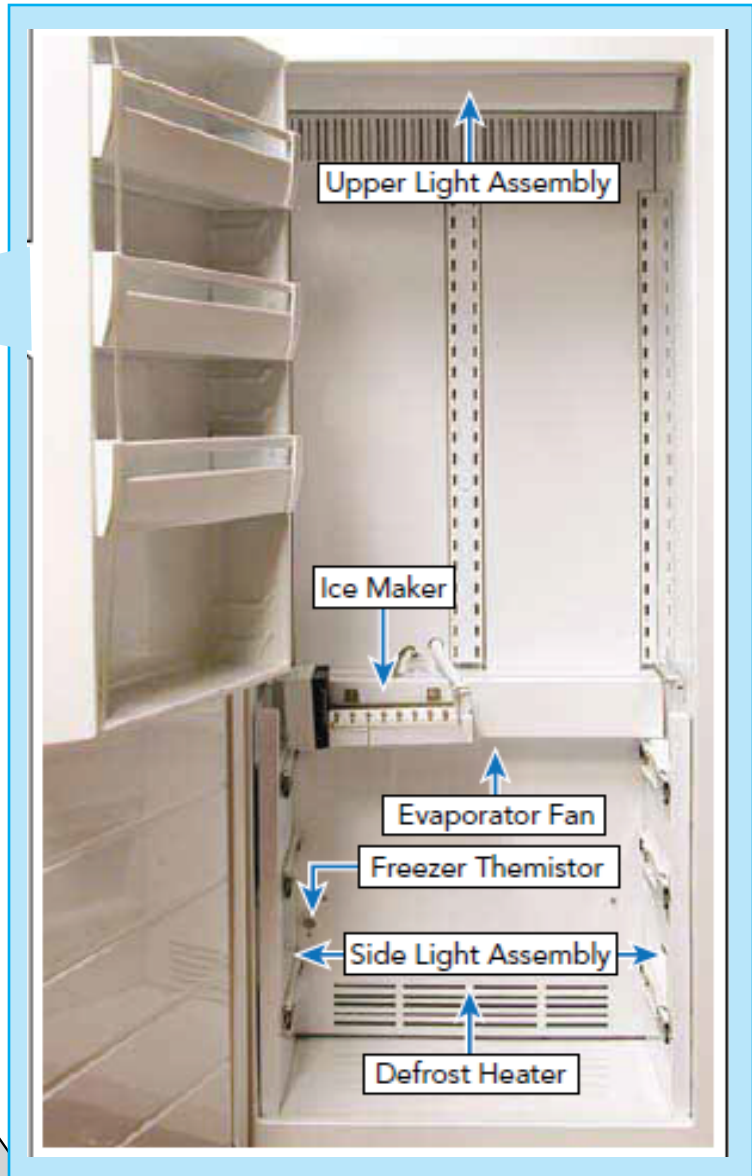
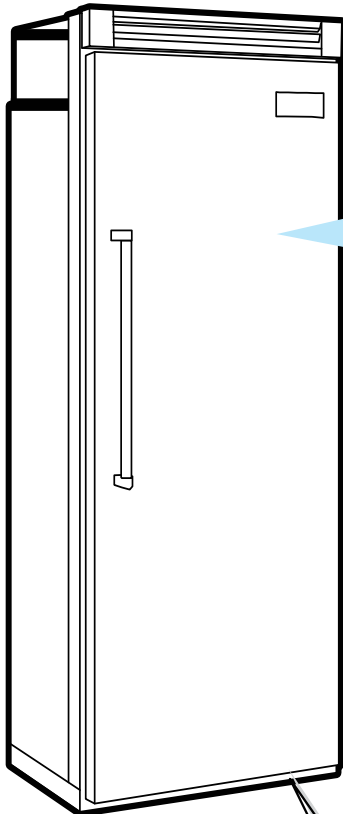
3. Unplug the 15-pin Molex power plug, as well as the 2-wire converter frequency cable and the 3-wire thermistor plug. Remove electronics box and set aside to gain access to condenser fan assembly.
4. Remove the three 1/4" hex screws holding fan assembly in place, remove fan assembly



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Parts Location – Freezer Compartment



⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Ice Maker (shown here with cover off)



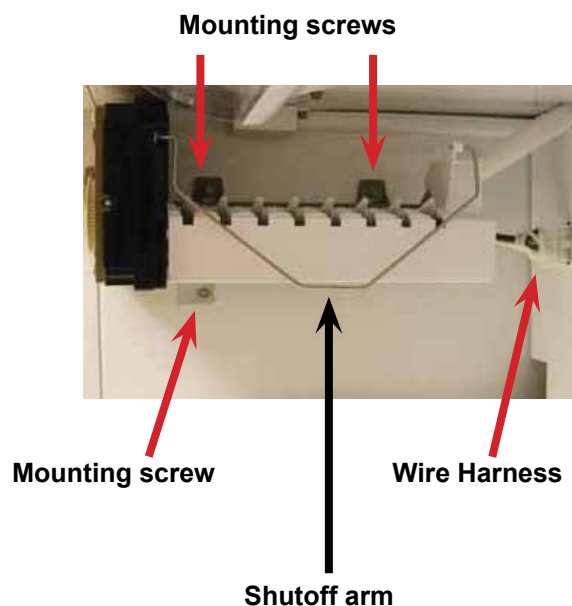
The unit uses an ice maker that consists of a mold heater, thermostat, motor, and wire harness. The ice maker always starts from and stops at the “park” position. In the park position (the ejector blades are pointing horizontally towards the back of the ice maker). Just before reaching the park, position the mold is filled with water. At the park position all electrical components are de-energized, even though the shut-off arm is down, and the ice maker is ready for the next freeze cycle. The ice maker takes from 30 minutes to one hour to freeze the water. The primary time factors are the temperature in the freezer and the amount of airflow around the ice maker. Colder freezer settings and free air space around the ice maker to let air circulate will help make ice faster. After the ice forms, the ice maker continues to wait until it reaches 15°F before it starts the harvest cycle. This ensures that the ice is solid in all the cavities. At 15°F the thermostat closes, the mold heater turns on, and the ejector blades rotate up and forward until they stall out against the ice. The motor is designed to stall out and is geared to generate a lot of pressure. This minimizes the amount of melting needed to extract the ice. As soon as the ice is loose enough to move, the ejector pushes the ice out of

the mold during the second half of the first revolution. During the second revolution, the ejector pushes the ice into the bucket.

Just before the ejector completes the second revolution, the ice maker turns the water valve on for approximately 7 seconds and refills the mold with approximately 4 ounces of water and the freezing cycle is ready to begin again.

To access the ice maker, open the freezer door, remove bottom cover and the ice maker is accessible.

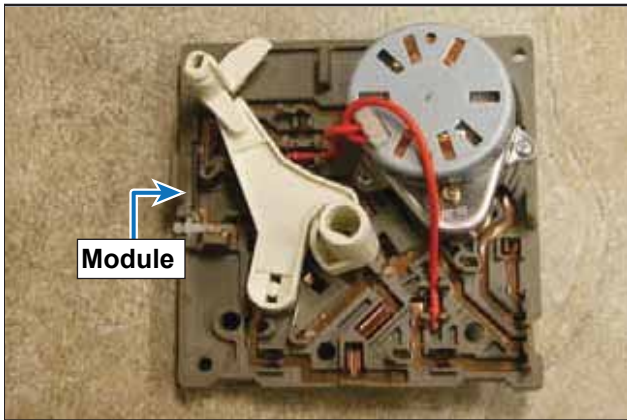
To access module, motor, and support assembly loosen screws in module access ports, disconnect shutoff arm, disconnect wiring harness and remove mold from support assembly.



WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

To access module and heater assembly, remove three screws on front of module and remove support assembly.



N - Neutral side of line voltage

M - Motor connection

H - Heater connection

T - Thermostat connection

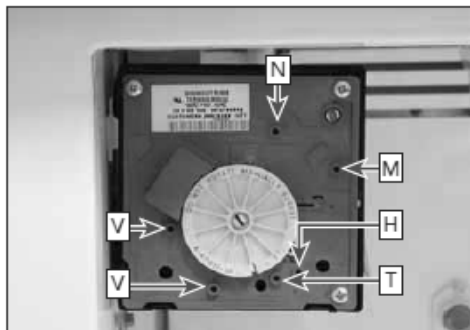
L - L1 (hot) side of line voltage

V - Water valve connection

To make ice, an ice maker needs power, water, and sub-freezing temperatures.

Note: The freezer door switch turns off power to the ice maker when the freezer door is open. It will be necessary to manually close the freezer door switch for some troubleshooting steps. Ensure that the shut-off arm is down and instruct customer on its use if necessary.

To ensure power to the ice maker without a meter, remove the module cover and take note of the test points.



Place a 14 gauge jumper wire across test points T and H. With hands clear of the ice maker, manually close the freezer door switch. This will put the ice maker in a manual cycle. If the ejector does not rotate, this indicates no power to the ice maker.

Trace power from the wall socket to the door switch and to the connector. Repair circuit and connections or replace door switch as needed. If the ejector begins to rotate (very slowly) there is power. With power present, verify 0 VAC between test points T and H (this verifies the thermostat has closed). Verify heater resistance is approximately 264 Ω . With motor running, verify heater is heating. If no heat is detected, replace mold assembly. Next ensure water is supplied to the ice maker. When the ejector blade gets to the 11:00 position, the water valve is energized for 7.5 seconds.

Verify the water valve has 120 VAC between test points V and N and approximately 4.75 ounces of water is dispensed. If voltage is present and water is not dispensed verify water supply and fill rate. Poor water quality can cause ice maker to fail or produce unacceptable cubes. Install a water filter

⚠ WARNING

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to eliminate bad taste, odor, and visible contaminates. Mineral content or sand can restrict screen in water fill valve or particles of sand can keep valve from seating properly.

If water valve does not operate properly, the following could occur: no ice production, small or hollow ice cubes, flooding of ice container. Mineral content can cause lime build up in the mold, wicking of water over the mold and poor cube release. Mineral content can also restrict saddle valves. Verify water supply line is "ON", water pressure is not below 20 psi, saddle valve

is fully open clear restrictions by fully closing and opening valve to dislodge sediment (if necessary, remove valve and enlarge pierced hole to 3/16" diameter with a drill and reinstall saddle valve) ensure water line to unit is not pinched/kinked/ clogged, ice is not present in inlet tube blocking water flow, water pressure is not above 120 psi. Water fill can be increased by turning the adjustment screw counterclockwise and decreased by turning the screw clockwise. One half turn will adjust the fill by approximately two thirds of an ounce. If supply is OK replace water valve. If no voltage is present, verify harness. If OK, replace module.

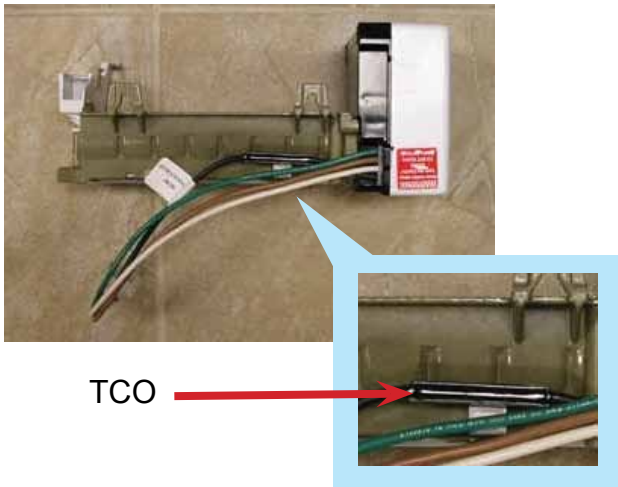
Module Ohmmeter Checks No power to icemaker and Ejector blades in end of cycle			
Test Points	Component	Module Position	Ohms
L-H	Mold & Heater	Attached to support	264
L-M	Motor	Separate from heater	16,100
Module Voltage checks with motor or test light power to icemaker			
Test Points	Component	Line Voltage	0 Volts
L-N	Module	Power On	Power Off
T-H	Bimetal	Open	Closed
L-H	Heater	On	Off
L-M	Motor	On	Off
N-V	Water valve	On	Off

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Thermal Cut Out (TCO)

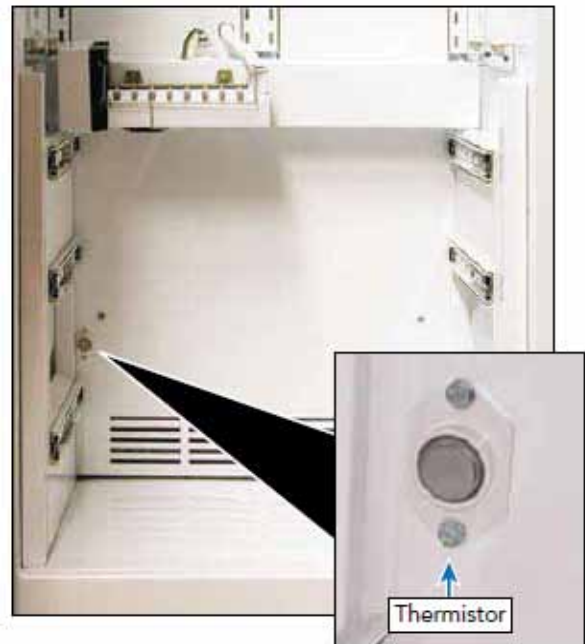
The TCO is a safety device and must NOT be bypassed. If the TCO is found to be electrically open, this indicates an overheat in the ice maker and the ice maker must be replaced.



Freezer Thermistor

The freezer thermistor is a device that reads freezer temperatures. The temperature of the freezer is measured and the thermistor cycles the compressor on and off to achieve the freezer setting selected by the end user. Readings can be checked in Service mode A or continuity at the LV board

1. To access the freezer thermistor, remove all shelves, drawers. Remove screws securing the thermistor, disconnect wiring, and repair/replace thermistor.



2. In order to check the Thermistor, refer to Mode A Programming on Page 29 or thermistor resistance chart on Page 11.

⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

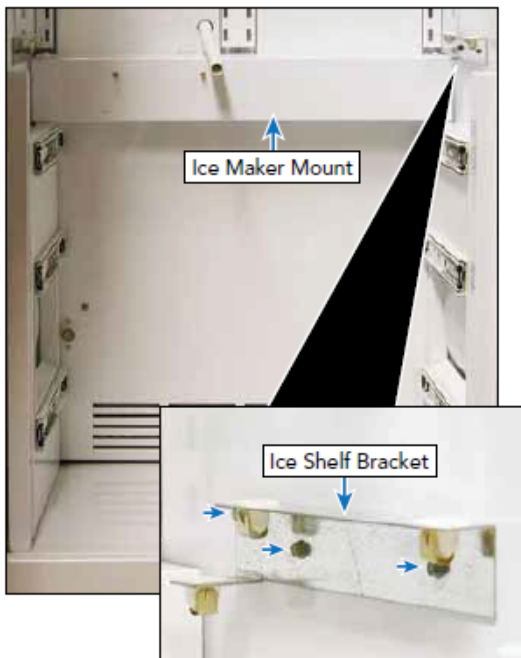
Freezer Fan

The 30" unit uses a fan motor to pull air over the evaporator coil and circulate it throughout the unit.

The 36" unit uses two fan motors to pull air over the evaporator coil and circulate it throughout the unit.

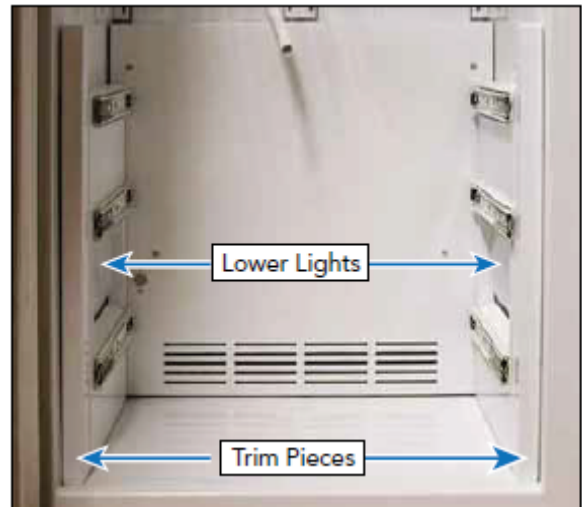
30" Unit

1. To access the freezer fan, remove all shelves, drawers, and ice maker (see Ice Maker section).

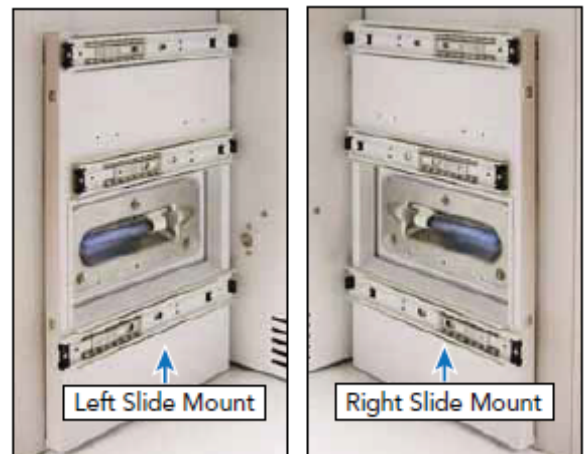


2. Remove lower light covers (see lower light section) and left and right trim pieces.

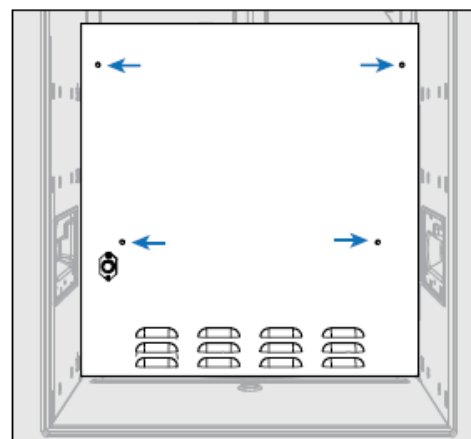
Note: The trim pieces and slide mounts have a clip attached that engages in a catch. To remove assembly, disengage clip from catch.



3. Remove left and right slide mounts.



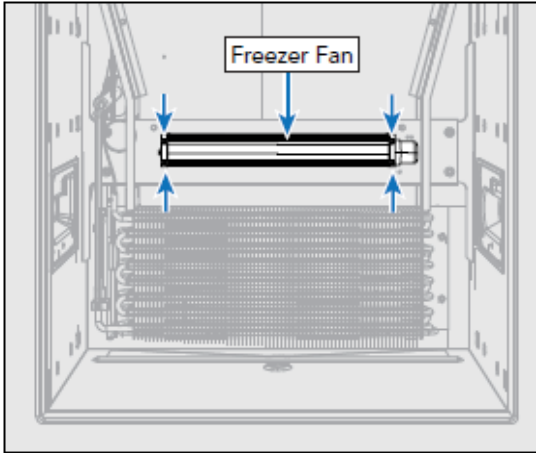
4. Remove screws, remove rear cover, and disconnect wiring.



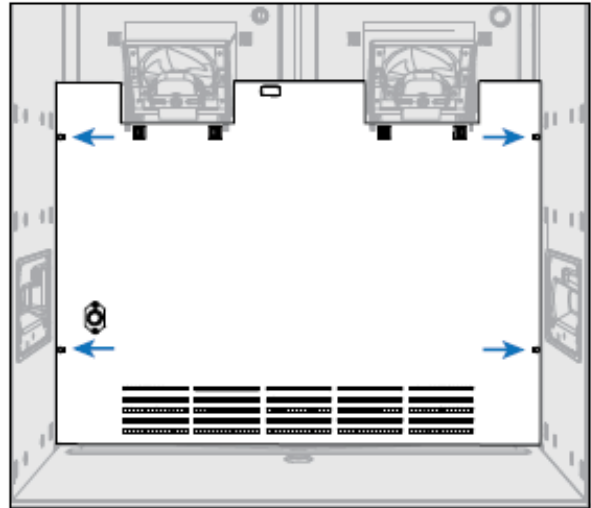
WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

5. Remove screws securing freezer fan, disconnect wiring, and repair/replace fan.



2. Remove screws, remove rear cover, and disconnect wiring.

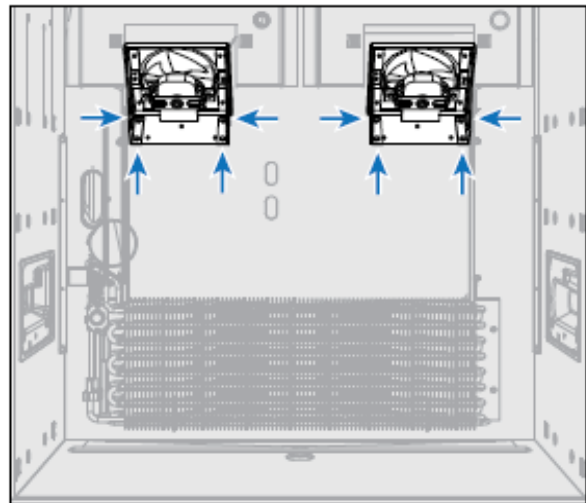
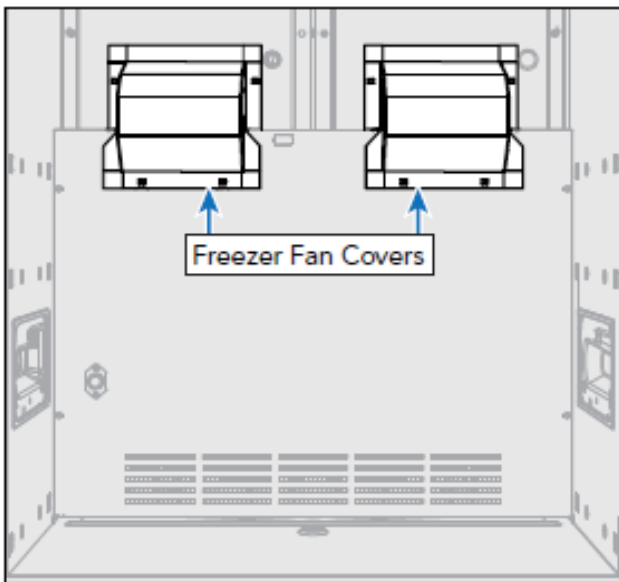


6. Reverse procedure to reinstall.

3. Remove screws securing freezer fans, disconnect wiring, and repair/replace fans.

36" Unit

1. Remove fan covers



4. Reverse procedure to reinstall.

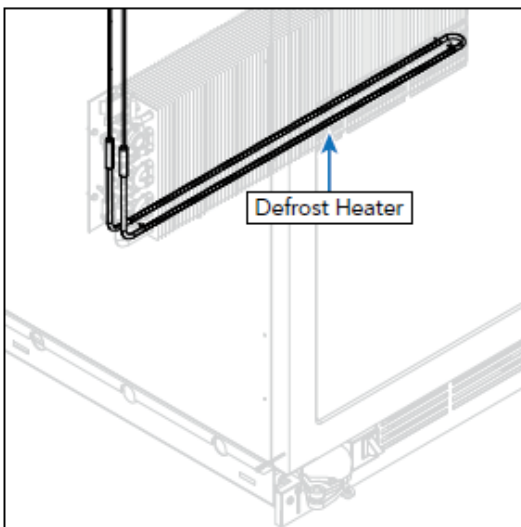
⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Defrost Heater

The unit uses a heater to help remove ice build-up during the defrost cycle. When the defrost terminator closes, voltage is supplied to the heater via the control board.

1. To access the defrost heater, (see freezer fan access section). With back cover removed, the defrost heater is clipped to the bottom of the evaporator. Remove the clips, remove the heater, disconnect the wiring, and replace/repair as needed.

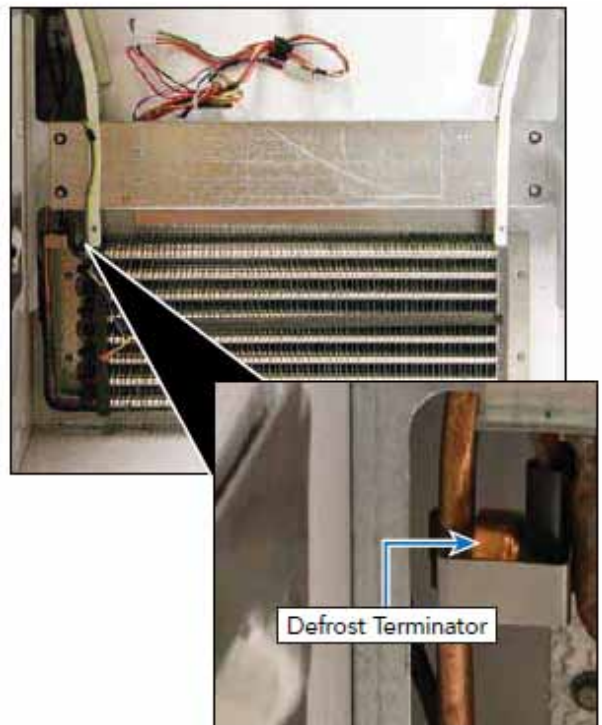


2. With the main power switch OFF, the defrost Heater can be tested by removing the orange wire off of terminal E6 on the HV board. Using an ohm meter, check the brown wire and Neutral and you should read approximately 30 Ω . During the defrost cycle line voltage passes through the Defrost Terminator the into terminal E5 (orange wire). With the defrost heater relay activated, the voltage exits the HV board from Terminal E6 (orange) to the heating element. If voltage is present at E5 but not at E6, then the Defrost relay is open. If there are 0 volts at E5, then the terminator is open.

Defrost Terminator

The defrost terminator is a bimetal switch that is normally open. Below 20+/-8.5 °F, the terminator is closed. In order to test, first switch the main power switch to "OFF", then locate the brown wire on E5 of the HV board. Unplug the wire and check for continuity between the brown wire and the black wire at E10. In the defrost cycle, this circuit will supply line voltage to the defrost relay.

1. To access the defrost terminator (see freezer fan access section). With rear cover off, defrost thermostat is located on the left side of the evaporator. Un-clip the terminator, disconnect wiring, repair/replace terminator.



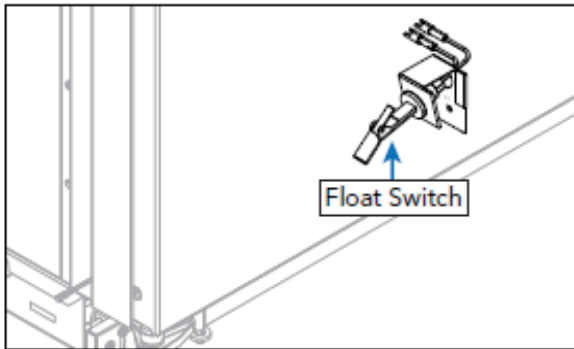
WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Float Switch

The unit uses a float switch to activate the pan heater which in turn dissipates water from the defrost cycle. When the switch is in the down position, the switch reads open and when the switch is in the up position it reads continuity.

1. To access the float switch, remove the lower access panel and the switch is accessible on the left hand side. Loosen the securing nut, disconnect wiring, and repair/replace as necessary.



Water Valve

The All Freezer uses a 120 VAC 35 watt valve to supply water to the ice maker.

1. To access, remove the lower access panel and the valve is accessible on the left-hand side. To check the valve, ensure water supply, verify coil resistance approximately 192.2 Ω , and 120 VAC.



Drain Pan Heater

The unit uses a drain pan heater to vaporize condensate created by the refrigerator cooling process. The pan heater is energized once the float switch closes supplying 120VAC.

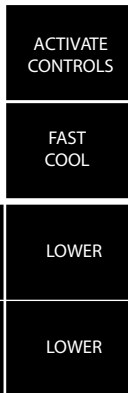
1. To access the drain pan heater, remove the lower access panel and the drain pan heater is accessible. Verify the resistance is approximately 790 Ω . Verify 120VAC to the heater and the float switch is closed. If the switch is closed and no voltage is supplied, verify wiring, power disconnect switch has not been turned "ON", and supply voltage. If voltage is supplied, the float switch is closed, and the heater does not energize, replace the heater.



Program Modes

Program Mode A

Program mode A is entered by first pressing and releasing "ACTIVATE CONTROLS", then press and release "FAST COOL" once and within five seconds press and release the following pads in sequence, "HIGHER, LOWER, HIGHER, LOWER" You will hear an audible three beeps and the numeric display will change to "PrA", see illustration below.



Display Frz Temperature

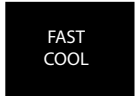
Press "FRZ TEMP" pad once to display the value of the thermistor temperature with the offset, no filtering is applied to the display. This readout will reflect instantaneous temperature changes on the freezer thermistor as shown in illustration, next column.



Defrost mode selection

Unit is shipped in Adaptive defrost mode, this can be changed to Conventional defrost mode using the following procedure while in Mode A.

Press the "FAST COOL" pad once to display the current defrost mode. This will result in a display of "Add" for adaptive or "Cnd" for conventional as shown in the illustrations below.



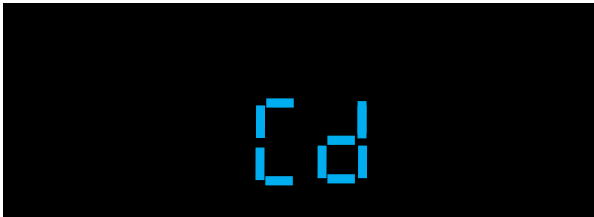
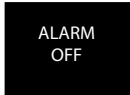
At this point pressing and releasing the "FAST COOL" pad will toggle between adaptive and conventional defrost modes of operation.

Conventional defrost time adjustment (CRTD)

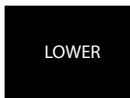
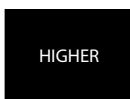
The conventional defrost is adjusted based upon compressor run time between defrost cycles (CRTD). This time can be adjusted from between 4 hours (minimum) to 24 hours (maximum) in one hour increments.

Conventional defrost must first be selected as shown in previous step.

Press and hold the "ALARM OFF" pad for three seconds until you hear 3 audible beeps and the display changes to "Cd".



Pressing the "HIGHER or LOWER" pads will result in number of hours being displayed and can be adjusted in one hour increments from 4 hours to 24 hours CRTD interval.

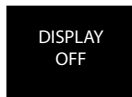


To exit this time period adjustment press and release "ACTIVATE CONTROLS" one time which will result in "PrA" being displayed. You are now back in Mode A.

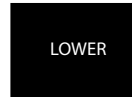
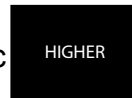
Compressor low speed frequency

Compressor low speed frequency is set to a predetermined value based upon model of refrigerator. This value can be set in Mode A as a separate adjustment or can be set automatically in Mode C when selecting model code, where several control values are set by eeprom Table 1, Page 39, lists eeprom values set by model code.

To enter low speed frequency adjustment in Mode A, press and release "DISPLAY OFF" once, this will result in the display "CLF".



Pressing and releasing "HIGHER or LOWER" pads will bring the numeric display up, pressing and releasing changes in increments of 1 HZ, holding the key down changes in increments of 5 HZ.



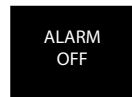
This value should be set at 75HZ for this model refrigerator, see Table 1, Page 39.

To exit the low speed adjustment press and release "ACTIVATE CONTROLS" one time which will result in "PrA" being displayed. You are now back in Mode A.

Adjust Cut-In Hysteresis

Cut-In hysteresis for the refrigerator and freezer are set to predetermined values, based upon model of refrigerator. This value can be set in Mode A as a separate adjustment or can be set automatically in Mode C when selecting model code, where several control values are set by eeprom. Table 1, on page 39 lists eeprom values set by model code.

While still in Mode A press and hold "ALARM OFF" and then "HIGHER" pad for three seconds, the display will change to "CIH"..



Press and release "FRZ TEMP", this will result in "FREEZER" illuminating on display.



The freezer section should be set to appropriate value in table below.



Freezer Cut-In	
Model	Value
5301	7
5361	6

Using Higher and Lower pads set to correct value as in illustration below.

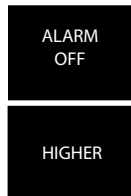


To exit the cut-in adjustment press and release "ACTIVATE CONTROLS" one time which will result in "PrA" being displayed. You are now back in Mode A.

Adjust Cut-Out Hysteresis

Cut-Out hysteresis for the refrigerator and freezer is set to predetermined values, based upon model of refrigerator. This value can be set in Mode A as a separate adjustment or can be set automatically in Mode B when selecting model code, where several control values are set by eeprom. Table 1, Page 39, lists eeprom values set by model code.

While still in Mode A press and hold "ALARM OFF" and "LOWER" pads at the same time for three seconds, the display will change to "COH".

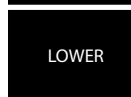


Press and release "FRZ TEMP", this will result in "FREEZER" illuminating on display.

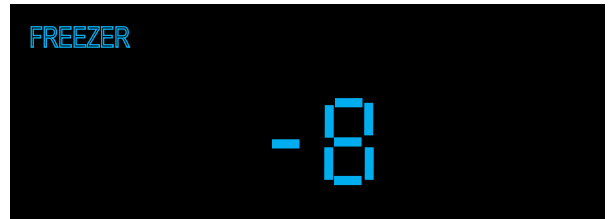


The freezer section should be set to appropriate value in table below.

Freezer Cut-Out	
Model	Value
5301	-8
5361	-6



Using Higher and Lower pads set to correct value as in illustration below.



To exit the cut-out adjustment press and release "ACTIVATE CONTROLS" one time which will result in "PrA" being displayed. You are now back in Mode A.

Display Software Version

While in Mode A, press and hold "DISPLAY OFF" for three seconds to show the software version on the temperature display. Pressing "HIGHER or LOWER" will cycle between a letter prefix and a two digit version as follows:



"A" + the major version
 "B" + the minor version
 "C" the build number



Exiting Mode A

To exit Mode A and retain any changes made in system up to this point you must press and hold "ACTIVATE CONTROLS" for three seconds until you hear three audible beeps. This signifies that the changes were written to the eeprom and that the system has left Mode A and returned to normal operation. Failure to do this will cause system to time out after 10 minutes and any changes will be lost.

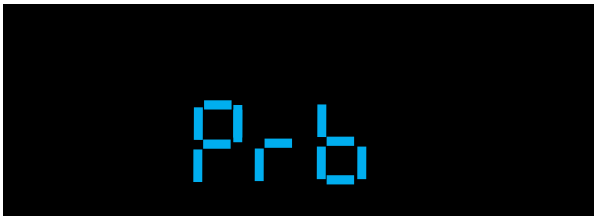
ACTIVATE CONTROLS

Program Mode B

If you are not already in Mode A, go back to Mode A instructions on Page 29.

Once you are in Mode A (PrA in display), press and release "ACTIVATE CONTROLS" one time and display will change to "Prb", signifying that control is now in Program Mode B, see illustration below.

ACTIVATE CONTROLS



Adjust Freezer Temperature Offset

Freezer temperature offset is a predetermined value, based upon model of refrigerator. This value can be set in Mode B as a separate adjustment or can be set automatically in Mode B when selecting model code, where several control values are set by eeprom. Table 1, Page 39 lists eeprom values set by model code.

Press and release "FRZ TEMP" pad once, the "FREEZER" indicator will illuminate and the current freezer offset will be displayed along with °F.

FRZ TEMP

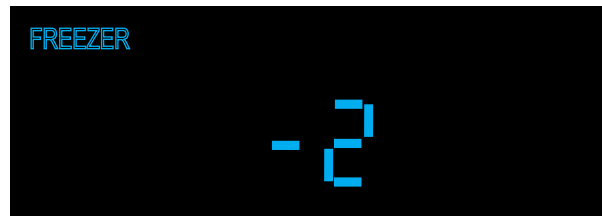
This value should be set to appropriate value in table below.

HIGHER

LOWER

Freezer Offset	
Model	Value
5301	-2
5361	1

Using "HIGHER and LOWER" pads adjust value as in illustration below.



Adjust MAX FRZ duration

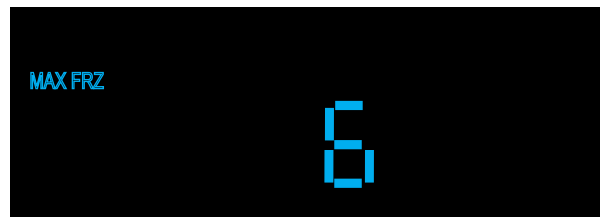
While in Mode B, press and release "MAX FRZ" one time, this will result in "MAX FRZ" illuminating on the display along with the current numeric value in hours that MAX FRZ is set at. Factory default for this adjustment is 6 hours. Range is 1 to 20 hours in 1 hour increments.

MAX FRZ

The duration is adjusted using the "HIGHER and LOWER" pads.

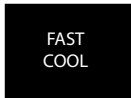
HIGHER

LOWER

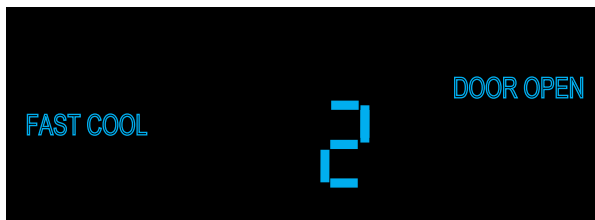
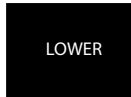


Adjust FAST COOL duration

While in Mode B, press and release "FAST COOL" one time, this will result in "FAST COOL" illuminating on the display along with the current numeric value in hours that FAST COOL is set at. Factory default for this adjustment is 2 hours. Range is 1 to 20 hours in 1 hour increments.

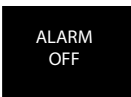


The duration is adjusted using the "HIGHER and LOWER" pads.

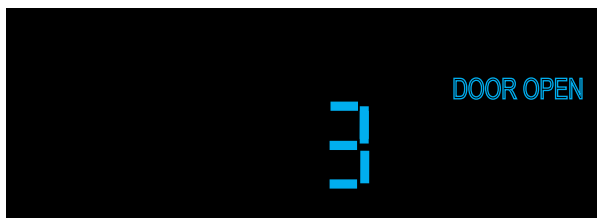
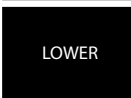
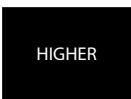


Adjust Door Open Alarm delay

While in Mode B, press and release "ALARM OFF" one time, this will result in "DOOR OPEN" illuminating on the display along with the current numeric value in minutes that the delay is set at. Factory default for this adjustment is 3 minutes. Range is 1 to 20 minutes in 1 minute increments.



The duration is adjusted using the "HIGHER and LOWER" pads.



Adjust Compressor Dwell Time

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "Cdt" in the display, immediately exit Mode B by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Adjust Compressor High Frequency

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "CHF" in the display, immediately exit Mode B by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Adjust DC Fan Cycling On Time

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "dCo" in the display, immediately exit Mode B by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Adjust DC Fan Cycling Off Time

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "dCF" in the display, immediately exit Mode B by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Exiting Mode B

To exit Mode B and retain any changes made in system up to this point you must press and release "ACTIVATE CONTROLS" one time, the display changes to "PrA". This signifies that the changes were written to the eeprom and that the system has left Mode B and returned to Mode A.



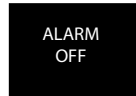
The other way to ensure changes have been written into the eeprom is to press and hold "ACTIVATE CONTROLS" for three seconds and you will get three audible tones along with a normal temperature display. This indicates that you have left Mode B and returned to normal operation.

Failure to do this will cause system to time out after 10 minutes and any changes will be lost.

Program Mode C

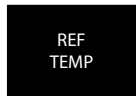
If you are not already in Mode B, go back to Mode B instructions on Page 32.

Once you are in Mode B (Prb in display), press and hold "ALARM OFF" for three seconds and display will change to "PrC", signifying that control is now in Program Mode C, see illustration below.

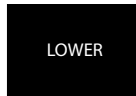


Set Model type

While in Mode C, press and release, either "FRZ TEMP or REF TEMP" to display the current model type setting, a three digit number in the display.



Pressing and releasing either "HIGHER or LOWER" pads will allow you to change model types until you get to the proper three digit number for your unit, see Table 1 on Page 39. Set the correct model code from table below.



Model code	
Model	Value
5301	530
5361	536

The "REFRIGERATOR and/or FREEZER" indicators will illuminate for each model type as it is selected depending upon the model configuration. (example: code 430 will only illuminate the "REFRIGERATOR" indicator because it is an All Refrigerator)



Setting the model code is required whenever the low voltage board is replaced, this will update all of the settings indicated in Table 1, page 39 for the model you select. With this setting you can program all necessary settings with one input for the appliance.

Adjust Freezer Upper Temperature Limit

While in Mode C, press and hold "MAX FRZ" and then hold the "HIGHER" pad for three seconds, this will result in the display changing to "FUL".



Pressing and releasing "HIGHER and LOWER" pads will increase or decrease the set point, which should be set at 7° F.



Adjust Freezer Lower Temperature Limit

While in Mode C, press and hold "MAX FRZ" and then hold the "LOWER" pad for three seconds, this will result in the display changing to "FLL".



Pressing and releasing "HIGHER and LOWER" pads will increase or decrease the set point, which should be set at -5° F.



Defrost lockout adder

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "dLA" in the display, immediately exit Mode C by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Defrost start delay

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "dSd" in the display, immediately exit Mode C by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Defrost termination delay

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "dtd" in the display, immediately exit Mode C by holding "ACTIVATE CONTROLS" for three seconds until you get three audible beeps. Return to your previous actions.

Constant Evaporator fan mode

This mode only applies to All Refrigerator units and is ignored by any other unit configuration.

Plant mode

This adjustment is not a field adjustment and should not be performed by technicians. This is a factory only adjustment.

If you see "Pt" in the display, immediately turn power switch to OFF. Turn power back on and start over.

To exit Mode C and retain any changes made in system up to this point you must press and release "ACTIVATE CONTROLS" one time, the display changes to "Prb". This signifies that the changes were written to the eeprom and that the system has left Mode C and returned to Mode B.



ACTIVATE
CONTROLS

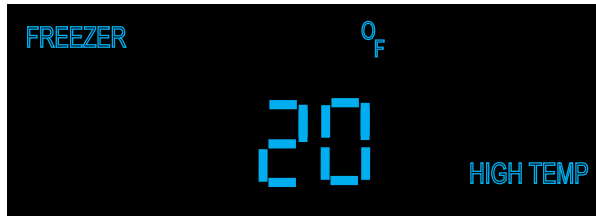
The other way to ensure changes have been written into the eeprom is to press and hold "ACTIVATE CONTROLS" for three seconds and you will get three audible tones along with a normal temperature display. This indicates that you have left Mode C and returned to normal operation.

Failure to do this will cause system to time out after 10 minutes and any changes will be lost.

ALARMS

There are five alarms that signify faulty conditions, they will each be covered in detail.

1. High Temp Alarm



Freezer High Temp alarm

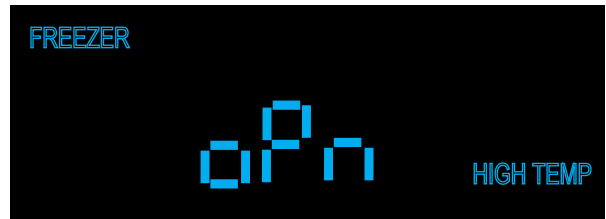
When the freezer temperature reaches the high temp level (15° F), set in the EEPROM at factory, for a predetermined time (3 hours), also set in EEPROM, the "HIGH TEMP" indicator will come on and the "FREEZER" indicator will flash. You will also get a continuous audible alarm, consisting of a beep pattern (ON - 0.5 sec, OFF 2 sec's).

If the condition(s) change and the unit's temperature(s) are brought back within limits as described above, the audible alarm will turn off. The "HIGH TEMP" and the appropriate zone (Refrigerator or Freezer) indicator will continue to operate as described above.

To cancel the audible alarm when condition first occurs, press and release "ALARM OFF", this will result in shutting off the audible alarm only. To clear the "HIGH TEMP" and flashing zone light (FREEZER), the temperature must be brought down below the limit temperature as described in the appropriate zone above. Then pressing and releasing "ALARM OFF" once will clear the "HIGH TEMP" off the screen and the zone indicator will stop flashing.

2. Open Thermistor Alarm

The controller will sense an open thermistor condition within 15 seconds of power on.



Open Freezer Thermistor Alarm

When the control senses that the unit's thermistor is open, "oPn" is displayed on the control along with the zone, "FREEZER". If the control was in the Refrigerator zone when the condition occurred, it automatically switches over to the faulty zone ("FREEZER"). You also receive an audible alarm consisting of five beeps that occurs only one time. The visual alarms as described above will continue until the condition is corrected.

The unit will continue to execute temperature control and defrost operations as required until the condition is corrected. The control does this through software programming, acting as if the cut-out temperature is never reached in the faulty zone, temperature control in the other zone is unaffected.

The visual alarms will reset by themselves within 15 seconds of the open thermistor condition being corrected and temperature control reverts back to normal operation.

3. Shorted Thermistor Alarm

The controller will sense a shorted thermistor condition within 15 seconds of power on.



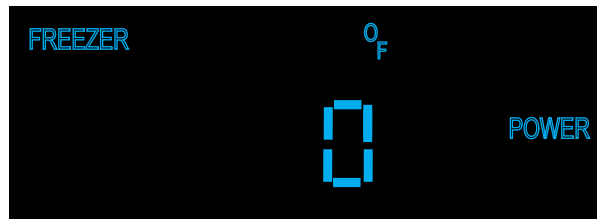
Shorted Freezer Thermistor Alarm

When the control senses that the freezer thermistor is shorted, "Shr" is displayed on the control along with the zone, "FREEZER". If the control was in the Refrigerator zone when the condition occurred, it automatically switches over to the faulty zone ("FREEZER"). You also receive an audible alarm consisting of five beeps that occurs only one time. The visual alarms as described above will continue until the condition is corrected.

The unit will continue to execute temperature control and defrost operations as required until the condition is corrected. The control does this through software programming, acting as if the cut-out temperature is never reached in the faulty zone, temperature control in the other zone is unaffected.

The visual alarms will reset by themselves within 15 seconds of the open thermistor condition being corrected and temperature control reverts back to normal operation.

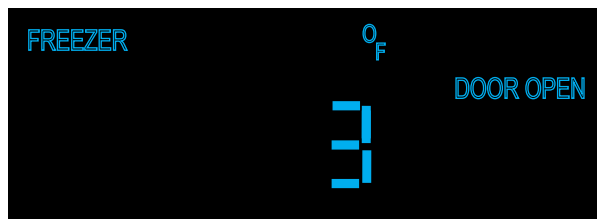
4. Power Loss Alarm



If the control experiences a power loss condition and power is restored, the Power Loss alarm is displayed. This consists of the "POWER" indicator being flashed on and off along with the temperature digits flashing on and off. All other indicators will be off and only "ACTIVATE CONTROLS and ALARM OFF keys are active on the control panel.

There is no audible alarm indication associated with the power loss alarm. Pressing and releasing the "ALARM OFF" pad will result in "POWER" indicator extinguishing and the temperature digits revert back to normal temperature display.

5. Door Open Alarm



If the control senses that a door is open for a period of time, equal to the door open delay (factory default is 3 minutes, this time can be adjusted in service mode B) a continuous audible alarm will sound. At the same time "DOOR OPEN" illuminates on LED display and will remain on until condition is corrected.

Press the "ALARM OFF" pad and the audible alarm will cease. Pressing and holding the "ALARM OFF" pad for three seconds will disable the audible door alarm, until the "ALARM OFF" pad is again held for three seconds which will enable the audible door alarm once again.

These actions will not clear the visual "DOOR" alarm, that can only be cleared by shutting the doors and allowing the control to reset it.

TABLE 1 - Model types

Model Type	Model Code	VCC Freq Low HZ	REF Offset °F	FRZ Offset °F	REF Cut-In °F	REF Cut-out °F	FRZ Cut-In °F	FRZ Cut-out °F	REF user default temp	REF user default temp
BM36	136	65	-9	0	6	-6	7	-8	38	0
SxS42	342	75	-6	-2	6	-6	7	-7	38	0
SxS42D	242	75	-8	4	6	-6	7	-7	38	0
SxS48	348	75	-4	-5	6	-6	7	-7	38	0
SxS48D	248	75	-8	1	6	-6	7	-7	38	0
AF30	530	75		-2			7	-8	38	0
AF36	536	75		1			6	-6	38	0
AR30	430	75	-6		6	-6			38	0
AR36	436	65	-5		6	-6			38	0

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

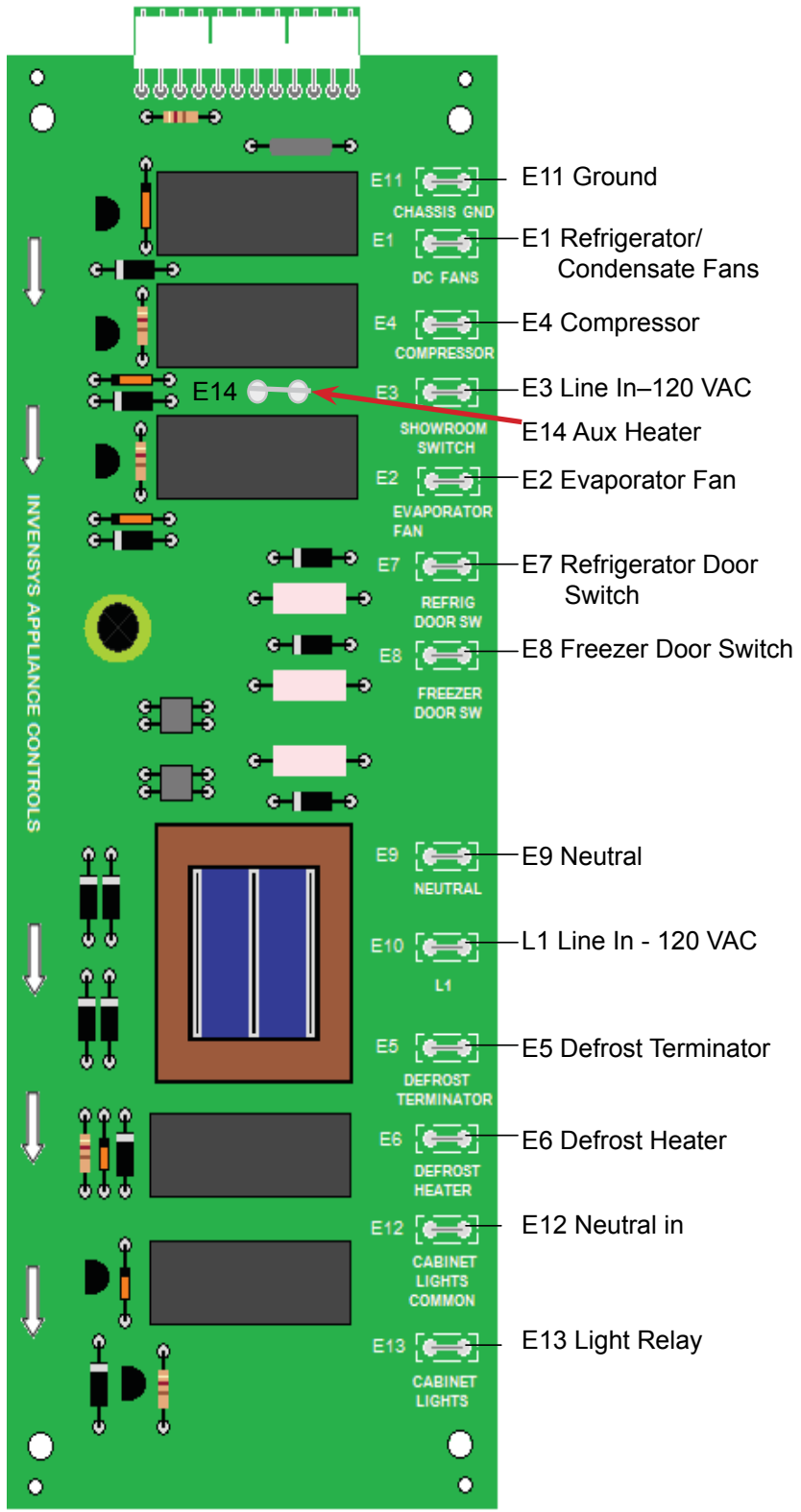
VCC3 Inverter Diagnostic Codes

Code	Compressor Status	Possible Fault	Service Action
1 Flash (every 15 seconds)	ON	1. No failure detected	<ul style="list-style-type: none"> If system is not working properly, check other refrigeration components.
	OFF	<ol style="list-style-type: none"> No signal from control board Open Thermistor 	<ul style="list-style-type: none"> If refrigerator settings (thermistor conditions) are at levels in which the compressor should be "ON". Unplug inverter from power supply and wait for 2 minutes, reconnect the inverter to the power supply and wait for 12 minutes. If inverter still shows 1 flash code and compressor is OFF, then check the control board.
2 Flashes (every 5 seconds)	OFF	1. No signal from the control board	<ul style="list-style-type: none"> Check frequency cable connection If frequency cable connection is good, replace inverter.
3 Flashes (every 5 seconds)	OFF	<ol style="list-style-type: none"> Compressor / inverter cable open circuit Compressor winding open circuit 	<ul style="list-style-type: none"> Check compressor/inverter cable connection Check compressor winding resistances (among the 3 terminal hermetic pins) If resistances are within specifications and compressor/inverter cable is OK, replace inverter.
4 Flashes (every 5 seconds)	OFF	1. Compressor damaged / system damaged	<ul style="list-style-type: none"> Check compressor input power Check compressor winding resistances Check leakage current between hermetic terminal pins and compressor shell. If resistance or leakage current is out of spec, replace the compressor. If resistance and leakage current are within spec, check inverter/compressor cable for open circuit. Unplug inverter from power supply and wait for 2 minutes, reconnect the inverter to the power supply and wait for 12 minutes. If inverter still shows 4 flash code and compressor is OFF, replace the compressor.
No Flash	OFF	<ol style="list-style-type: none"> No input power Inverter damaged 	<ul style="list-style-type: none"> Check the input power (115V) If there is no signal, check input power connections If voltage is within specs, unplug inverter from power supply and wait for 2 minutes, reconnect the inverter to the power supply and wait for 12 minutes. If inverter still shows no flash code and compressor is OFF, change the inverter. If the inverter shows no flash code and the compressor is ON, diagnostic function is not working properly.

⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

High Voltage Board

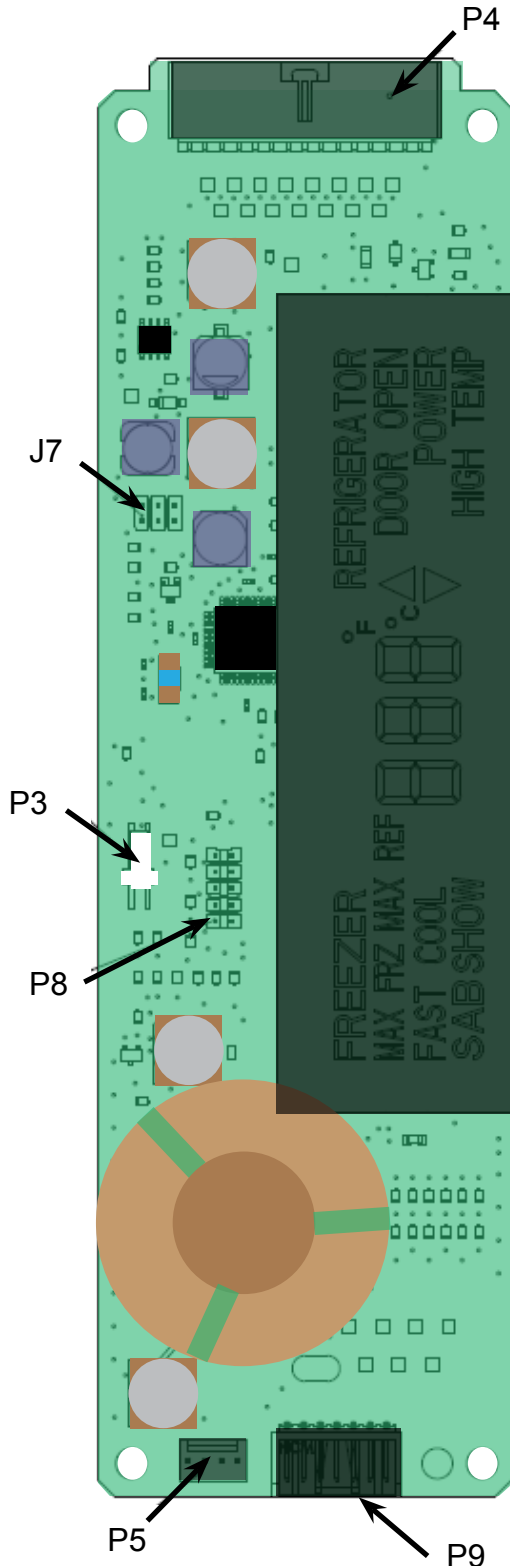


High Voltage Board		
Component	Test Point	Reading
Refrigerator/Condensate Fans	E1-E11	24 VDC
Evaporator Fans	E2-E11	115 VAC
L1	E3-E11	115 VAC
Compressor / Condenser Fan	E4-E11	115 VAC
Defrost Terminator (closed)	E5-E11	0 VAC
Defrost Terminator (open)	E5-E11	115 VAC
Defrost Heater	E6-E11	115 VAC
Ref door switch (top right light)	E7-E11	115 VAC
Freezer door switch (left light)	E8-E11	115 VAC
Neutral In	E9-E11	N/A
Line In	E10-E11	115 VAC
Ground	E11	N/A
Neutral In (lights)	E12-E11	N/A
Neutral Out (lights)	E13-E11	115 VAC
Aux Heater (Dispenser units only)	E14-E11	115 VAC

⚠ WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Low Voltage Board



Pin location	Function	Voltage range	Signal
P4-1	Dc supply to thermistors	4.5 - 5.5 VDC, ref to P4-12	DC
P4-2	Freezer thermistor input	0 - 5.5 VDC, ref to P4-12	DC
P4-3	Refrigerator thermistor input	0 - 5.5 VDC, ref to P4-12	DC
P4-4	Provide zero timing	26 V p-p to 34V p-p, ref P4-12	See Note 1 below
P4-5	DC Fan enable	17.8 vdc - 38 vdc, ref to chassis grnd.	DC
P4-6	Defrost termination	17.8 vdc - 38 vdc, ref to chassis grnd.	See Note 2 below
P4-7	Evaporator fan enable	17.8 vdc - 38 vdc, ref to chassis ground	See Note 2 below
P4-8	Compressor enable	17.8 vdc - 38 vdc, ref to chassis ground	See Note 2 below
P4-9	Defrost termination signal	25.8 vdc - 38 vdc, ref to chassis grnd	See Note 2 below
P4-10	Door signal	25.8 vdc - 38 vdc, ref to chassis grnd	See Note 2 below
P4-11	PS Reference	0 vdc	DC
P4-12	-30 vdc	22.8 vdc - 38 vdc, ref to chassis ground	See Note 2 below
P4-13	Not used		AC
P4-14	Not used		AC
P4-15	Light enable relay	17.8 vdc - 38 vdc, ref to chassis ground	See Note 2 below

NOTE 1 : Requires an oscilloscope to measure

NOTE 2 :DC voltage- load of meter can affect measurement

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Troubleshooting Guide

Below and on the following page are some general guides should a problem be detected. Please refer to the test procedures in this manual to determine the defective component.

Problem	Probable Cause	Correction
Unit will not operate	Power supply Circuit breaker Power switch	Verify voltage Reset breaker Turn to the "ON" position
Water overflows defrost pan	Unit not level Float switch Pan heater	Ensure unit is level Verify operation of float switch Verify heater is working
Ice maker will not operate	Freezer too warm Shut off arm Open TCO or defective ice maker Water valve Water supply	Verify freezer temperature Verify the arm is in the "ON" position Replace Ice Maker Verify valve operation Verify water supply
Freezer too warm (AF Model)	Control setting Door seal Dirty condenser Defective thermistor Control board	Move control to medium setting Verify closure, replace if needed Clean condenser coil Replace thermistor Verify operation
Freezer too cold (AF Model)	Temperature setting Defrost thermostat Defective thermistor Control board	Move to medium setting Verify thermostat is closing Replace thermistor Verify operation
Unit runs continually	Control setting Door seal Dirty condenser Condenser/evaporat or fan Defective	Move to medium setting Verify closure, replace if needed Clean condenser coil Verify movement/operation of fan Replace thermistor
Frost on evaporator	Defrost thermostat Evaporator fan Defrost heater Door not sealing	Check indicator Check connection and possible short open condition Check connection and possible short open condition Adjust door seal or replace.
Unit running and no lights	Sabbath Mode Open circuit	Take out of Sabbath Mode Repair/replace wiring

WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Ice Production Issues	Action
Jammed cubes (small or oversized cubes)	Adjust fill level or level ice maker or refrigerator
Hollow cubes	Adjust low fill or remove restrictions in supply line Level ice maker or refrigerator Remove obstructions to air flow at fill end so it freezes before thermostat end
Ice build-up on ejector blades	Usually caused by hollow cubes See hollow cubes above Remove ice maker, thaw out
Cubes falling back into mold during ejection	If some cubes are small, check fill level Check if fill cup is displaced and blocking ice Fix fill cup or replace ice maker
Cubes falling over back of ice maker	Check if fill cup is displaced and blocking ice Fix fill cup or replace ice maker
Power Problems	Action
No power to ice maker at connector socket	Determine discontinuity by tracing power
No power to water valve	Determine discontinuity by tracing power
Ice Maker – No Water (AF Models)	Action
No water to refrigerator	Turn on supply Look for obstructions in supply line or valve
No water to ice maker	Look for obstructions in water valve or fill tube
Clogged water valve	Clean or replace water valve depending on type
Insufficient water to ice maker (with correct fill time)	Check for restrictions in supply line and valve, especially saddle valves
Low water pressure at supply	Increase water pressure to 20 – 120 PSI
Low water pressure at water valve	Look for restrictions in line
Excessive water pressure	Install pressure regulator and set to 60 PSI
Low water fill volume	Adjust water fill screw, clear obstructions in supply line or supply valve, or replace water valve
Excessive water fill volume	Adjust water fill screw, reduce water pressure, or replace water valve
Water overflows fill cup	Reposition fill-tube in fill cup or remove obstruction in fill cup
Water overflows mold	Adjust water fill screw, level ice maker or refrigerator, reduce water pressure, or replace water valve or ice maker
Leaky water valve	Tighten connections or replace water valve
Temperature Problems	Action
Freezer too warm (AF Model)	Adjust freezer setting or repair freezer


WARNING

To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

Ice maker Problems	Action
Raised shut-off arm	Lower shut-off arm to "ON" position
Broken or bent shut-off arm	Repair arm or replace ice maker
Shut-off arm stuck or obstructed	Remove obstruction
Ice maker not level	Check level of refrigerator first, then level ice maker
Can't level ice maker	Level refrigerator first, then try again
Open thermostat (won't close below 17°F)	Replace ice maker
Closed thermostat (won't open above 32°F)	Replace ice maker
Heater not staked in mold	Replace ice maker
Won't cycle test with power available	Replace ice maker
Won't eject ice with power available	Replace ice maker

⚠ WARNING

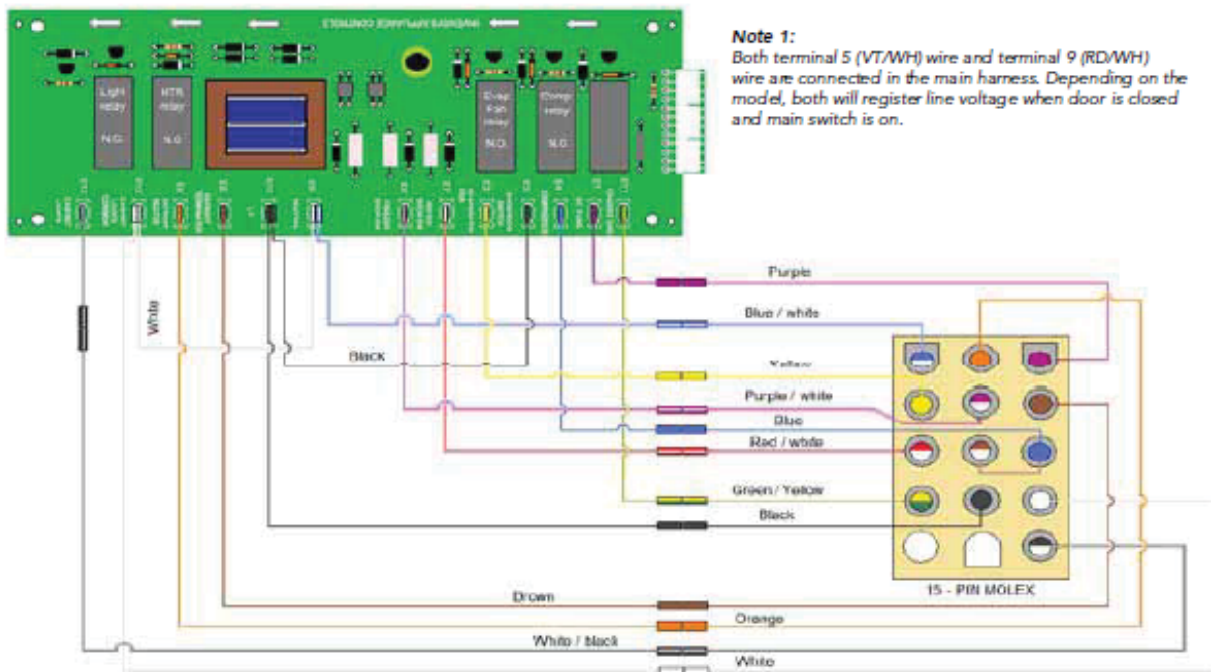
To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

HV Board Wiring 30" Freezer

Wiring and Component Testing—High Voltage Board 30" AF

Terminal	Terminal	Description	Wire Colors	Ω - V	Volts	Notes
1	★	Capped off on AF30 models	Purple			
2	3	Defrost Heater	Orange to Blue w/White	30.3 Ω	120 VAC	
4	11	Defrost Bimetal	Brown to Black	0 or ∞	0 or 120 V	
5	11	Line in from left door switch	Purple w/White to Black	0 or ∞	0 or 120 V	NOTE 1
6	10	Line out to Primary of Power supply	Yellow to White	17m Ω	120 V	
7	10	Line out to Inverter board	Blue to White	2m Ω	120 VAC	
8	10	Line out to Condenser fan motor	Brown w/White to White	550 Ω	120 VAC	
9	11	Line in from right door switch	Red w/White to Black	0 or ∞	120 VAC	NOTE 1
11	10	Main in to HV Board	Black to White	N/A	0 or 120 V	
12	★	Ground	Green w/Yellow			
13	★	Neutral OUT to cavity lights	White w/Black	N/A	N/A	

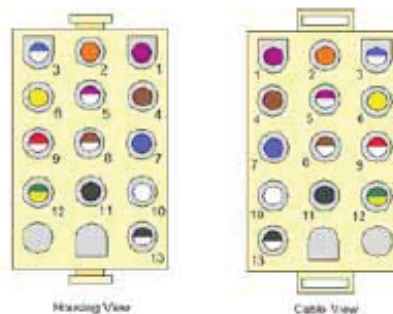
Chart for cable view layout below



Note 1:
Both terminal 5 (VT/WH) wire and terminal 9 (RD/WH) wire are connected in the main harness. Depending on the model, both will register line voltage when door is closed and main switch is on.

Molex Connection	Wire Colors	HV Board connection
1	Purple	E1
2	Orange	E6
3	Blue w/White tracer	E9
4	Brown	E5
5	Purple w/White tracer	E8
6	Yellow	E2
7	Blue	E4
8	Brown w/White tracer	E4
9	Red w/White tracer	E1
10	White	E12
11	Black	E10
12	Green w/Yellow tracer	E11
13	White w/Black tracer	E13

Chart above for Cable view below



⚠ WARNING

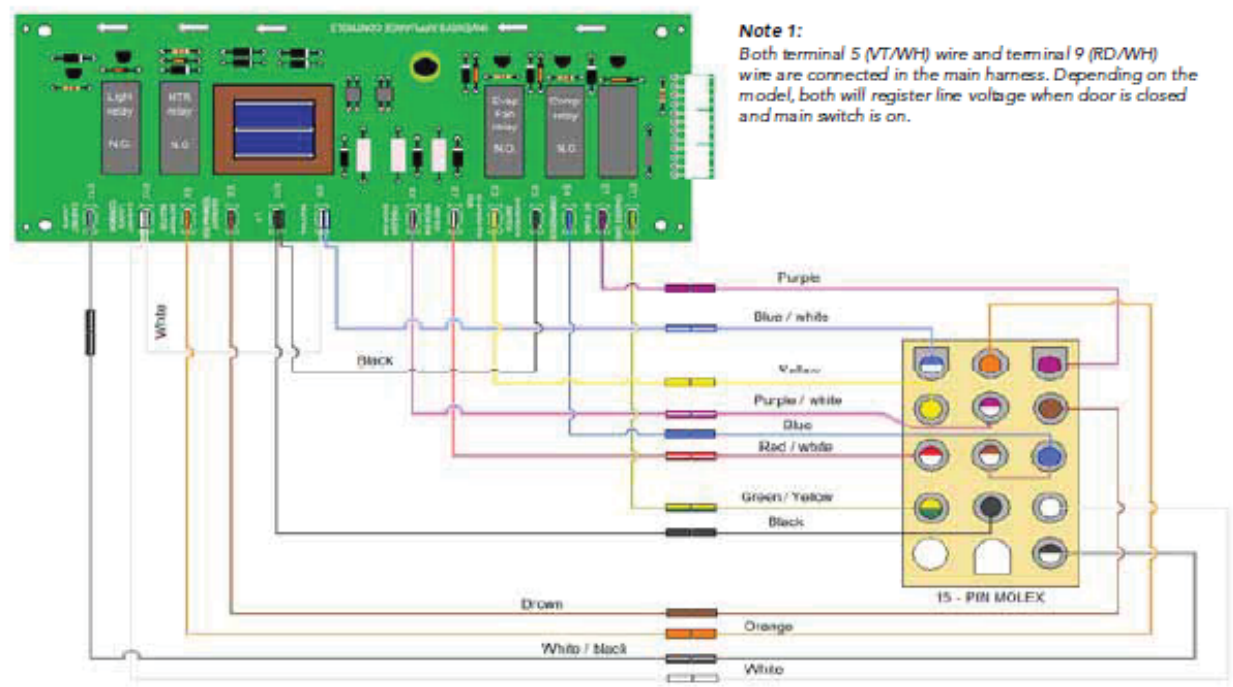
To avoid risk of electrical shock, personal injury, or death, disconnect electrical power source to unit, unless test procedures require power to be connected. Discharge capacitor through a resistor before attempting to service. Ensure all ground wires are connected before certifying unit as repaired and/or operational.

HV Board Wiring 36" Freezer

Wiring and Component Testing—High Voltage Board 36" AF

Terminal	Terminal	Description	Wire Colors	Ω - V	Volts	Notes
1	Ground	Service fan	Purple	0 or 3.23 m Ω	24 VDC	
2	3	Defrost Heater	Orange to Blue w/White	30.3 Ω	120 VAC	
4	11	Defrost Bimetal	Brown to Black	0 or ∞	0 or 120 V	
5	11	Line in from left door switch	Purple w/White to Black	0 or ∞	0 or 120 V	NOTE 1
6	10	Evaporator Fan Motors (2)	Yellow to White		120 V	
7	10	Line out to Inverter board	Blue to White	2m Ω	120 VAC	
8	10	Line out to Condenser fan motor	Brown w/White to White	550 Ω	120 VAC	
9	11	Line in from right door switch	Red w/White to Black	0 or ∞	120 VAC	NOTE 1
11	10	Main in to HV Board	Black to White	N/A	0 or 120 V	
12	*	Ground	Green w/Yellow			
13	*	Neutral OUT to cavity lights	White w/Black	N/A	N/A	

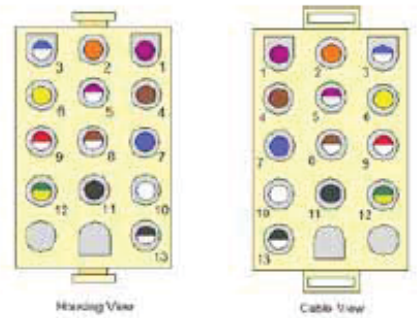
Chart for cable view layout



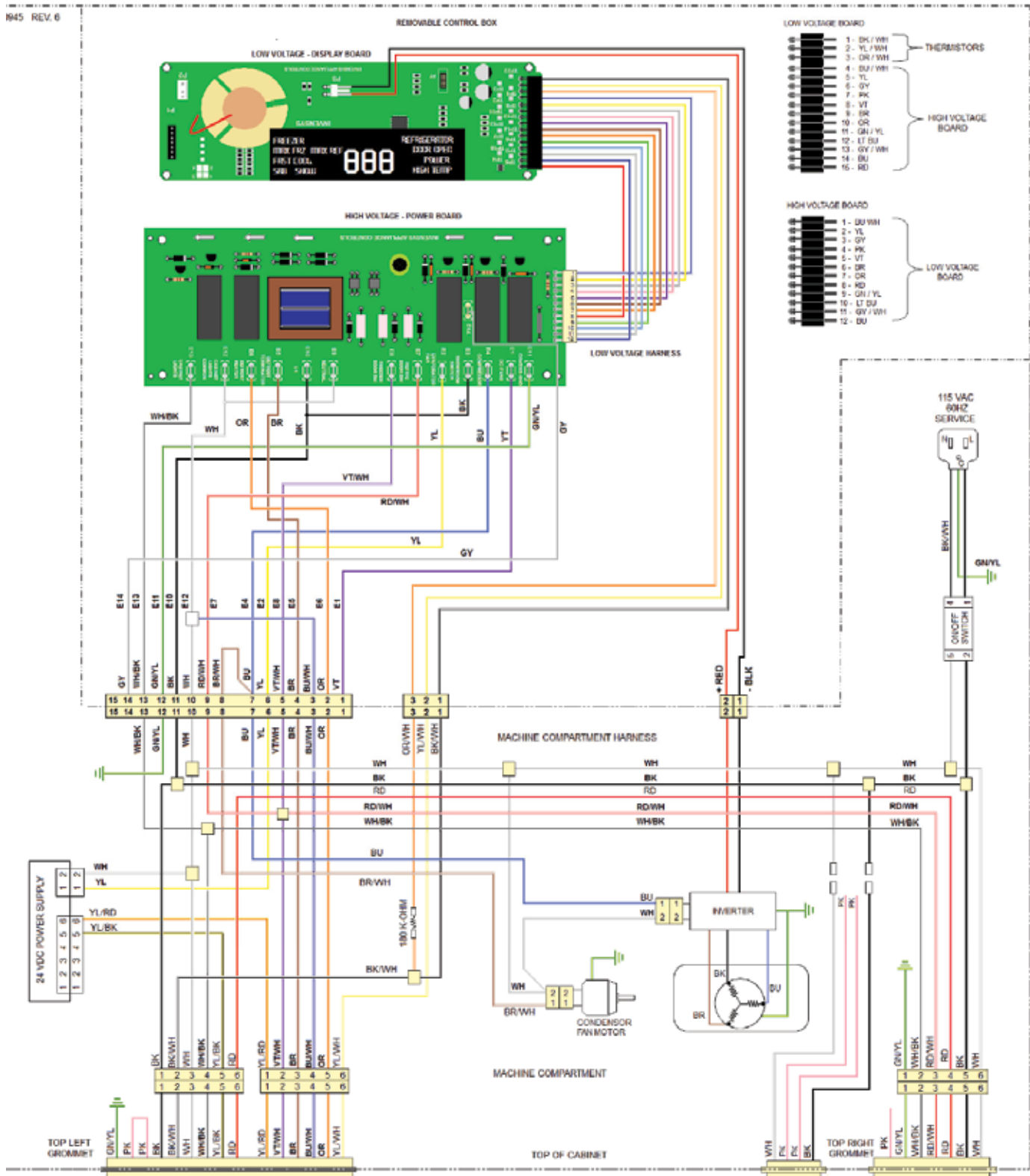
Note 1:
Both terminal 5 (VT/WH) wire and terminal 9 (RD/WH) wire are connected in the main harness. Depending on the model, both will register line voltage when door is closed and main switch is on.

Molex Connection	Wire Colors	HV Board connection
1	Purple	E1
2	Orange	E6
3	Blue w/White tracer	E9
4	Brown	E5
5	Purple w/White tracer	E8
6	Yellow	E2
7	Blue	E4
8	Brown w/White tracer	E4
9	Red w/White tracer	E1
10	White	E12
11	Black	E10
12	Green w/Yellow tracer	E11
13	White w/Black tracer	E13

Chart above for Cable view below

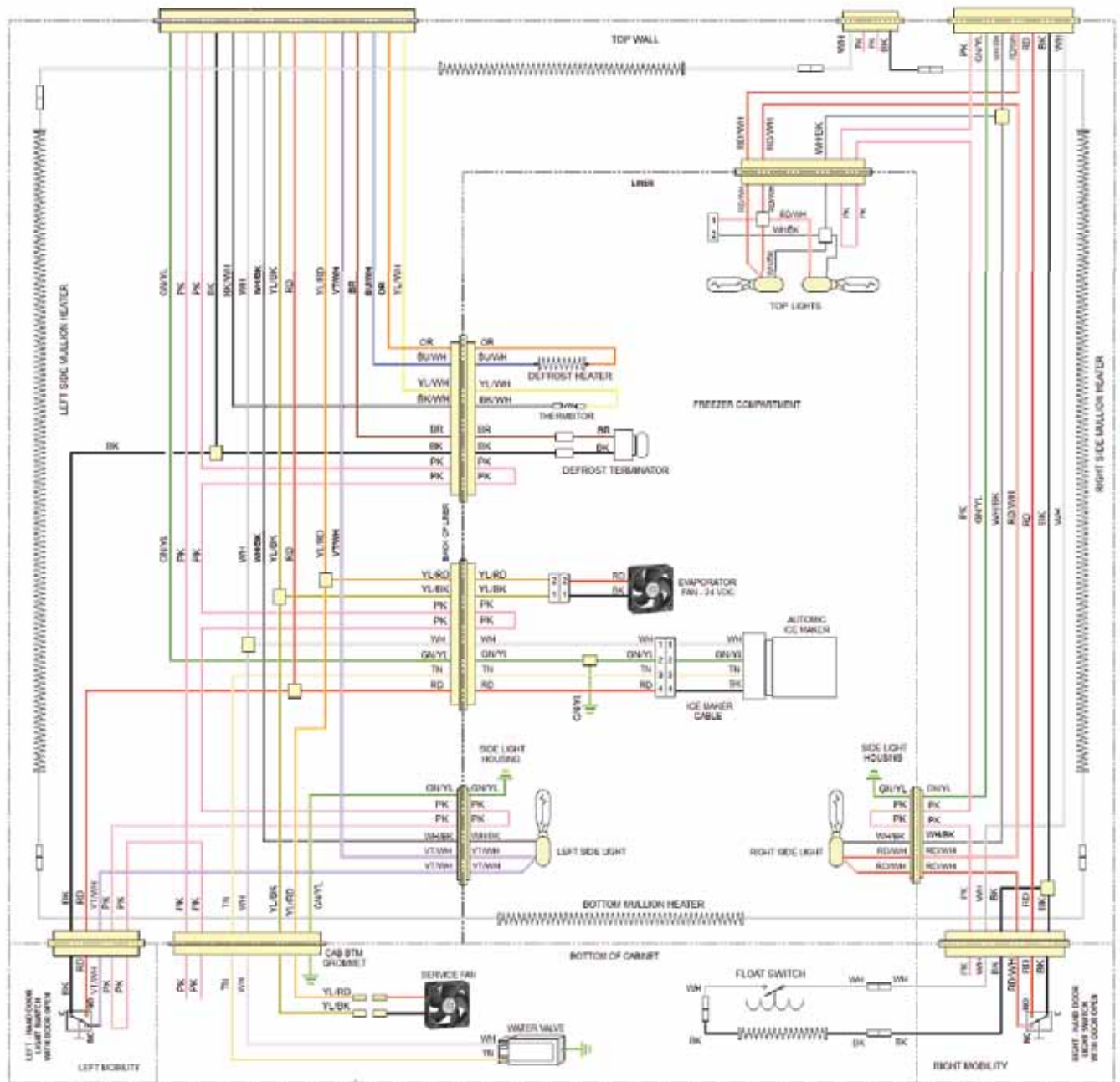


30" All Freezer Schematic, Upper Section



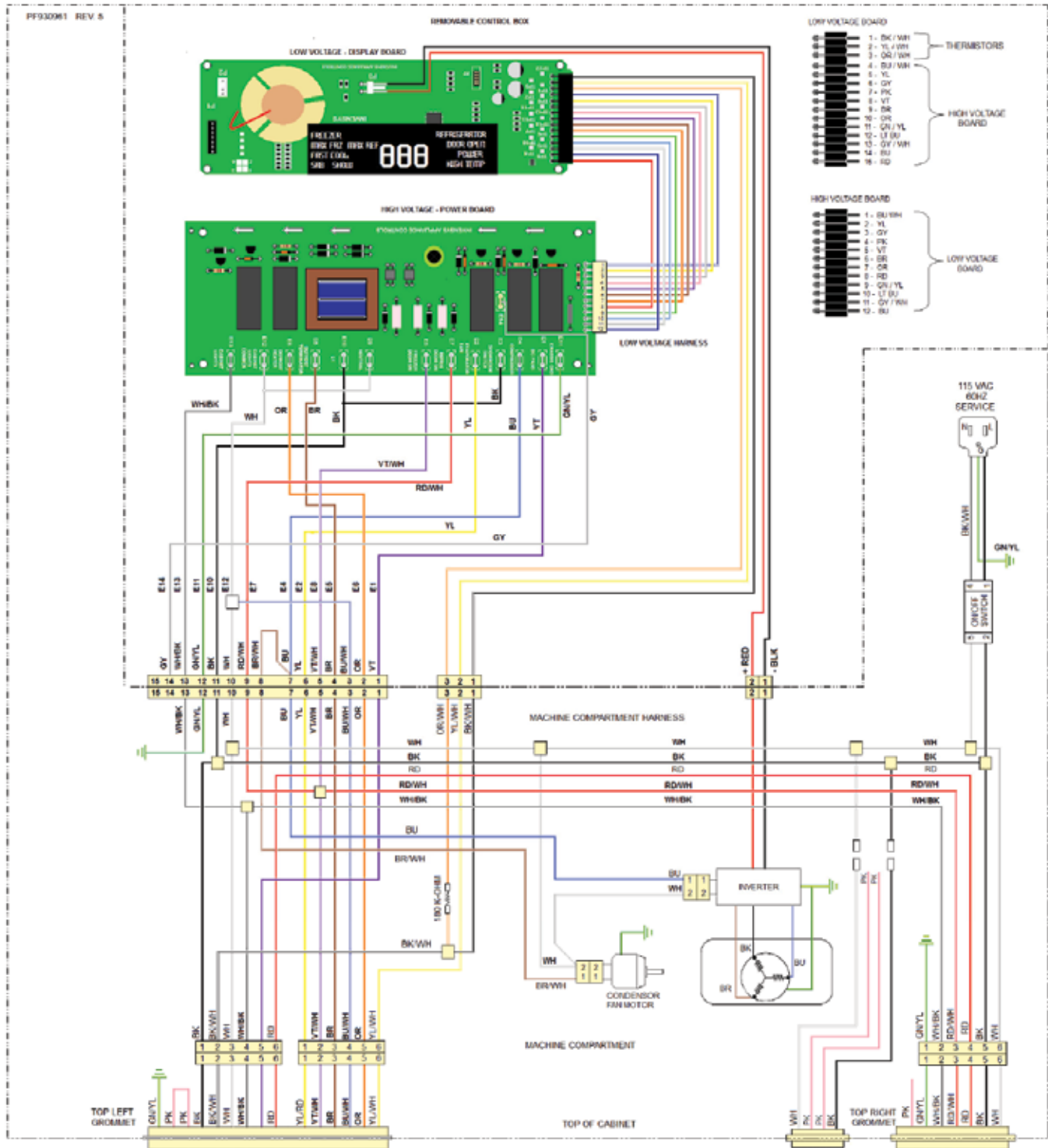
TOP SECTION

30" All Freezer Schematic, Lower Section



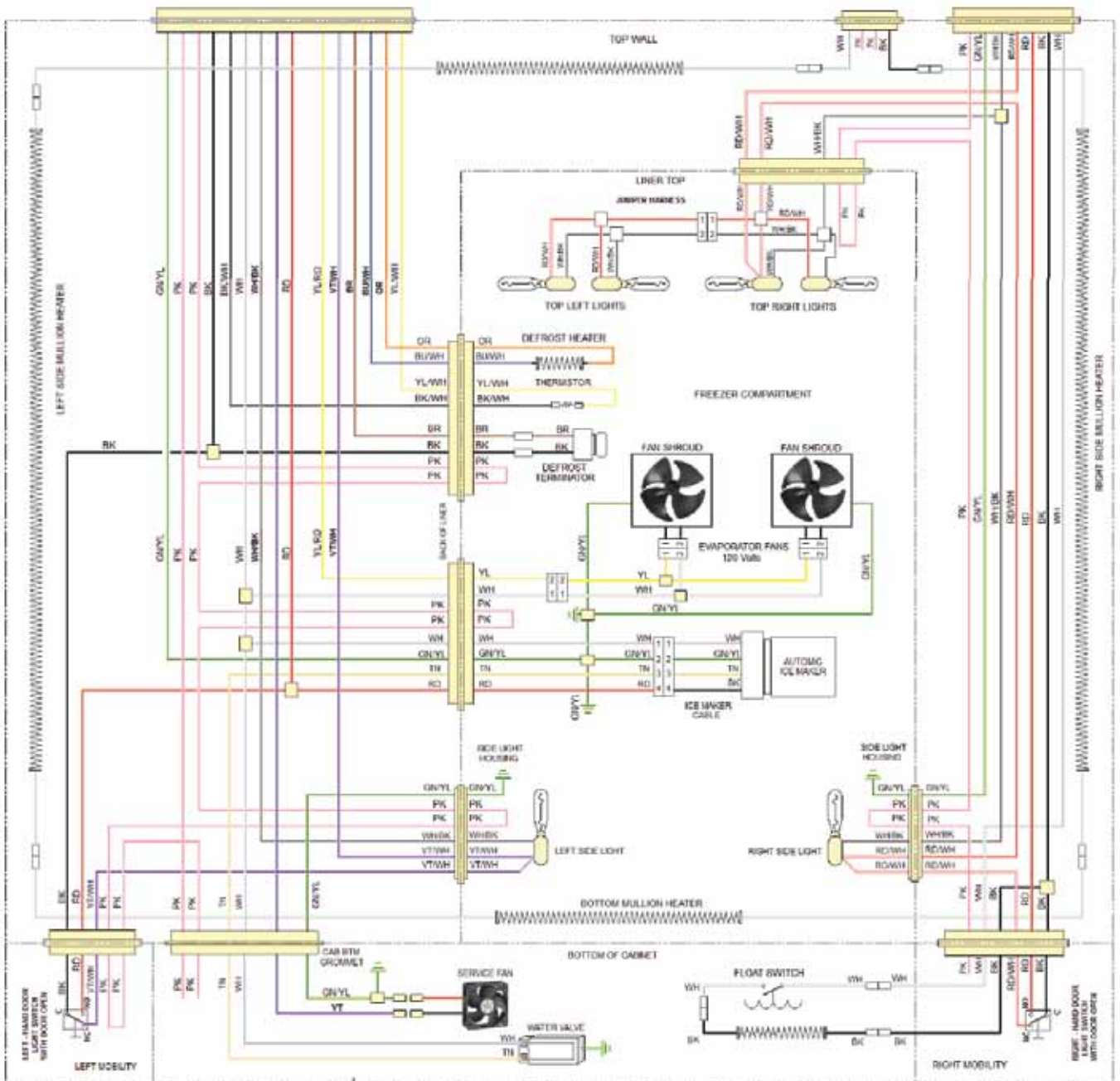
LOWER SECTION

36" All Freezer Schematic, Upper Section



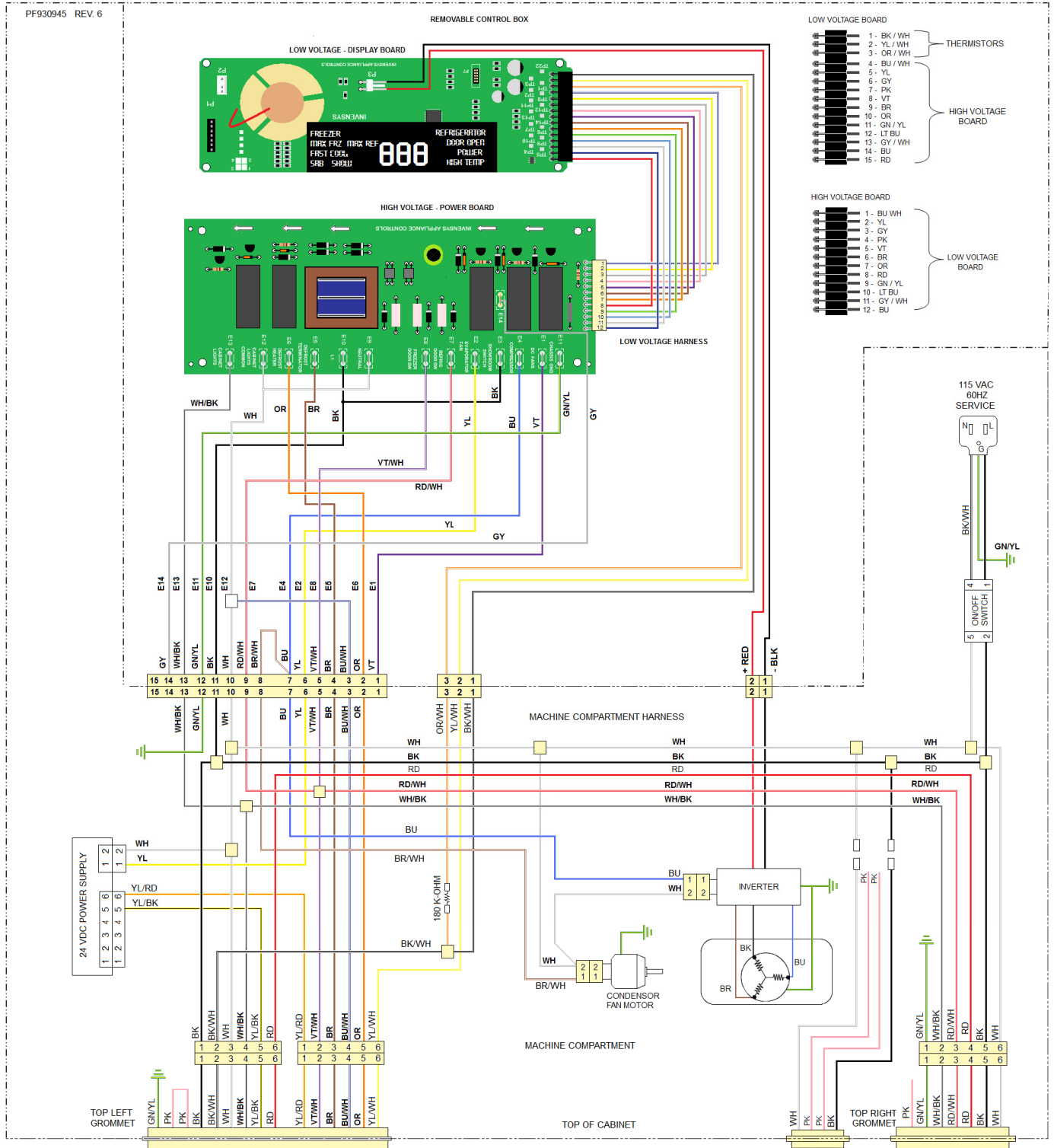
TOP SECTION

36" All Freezer Schematic, Lower Section



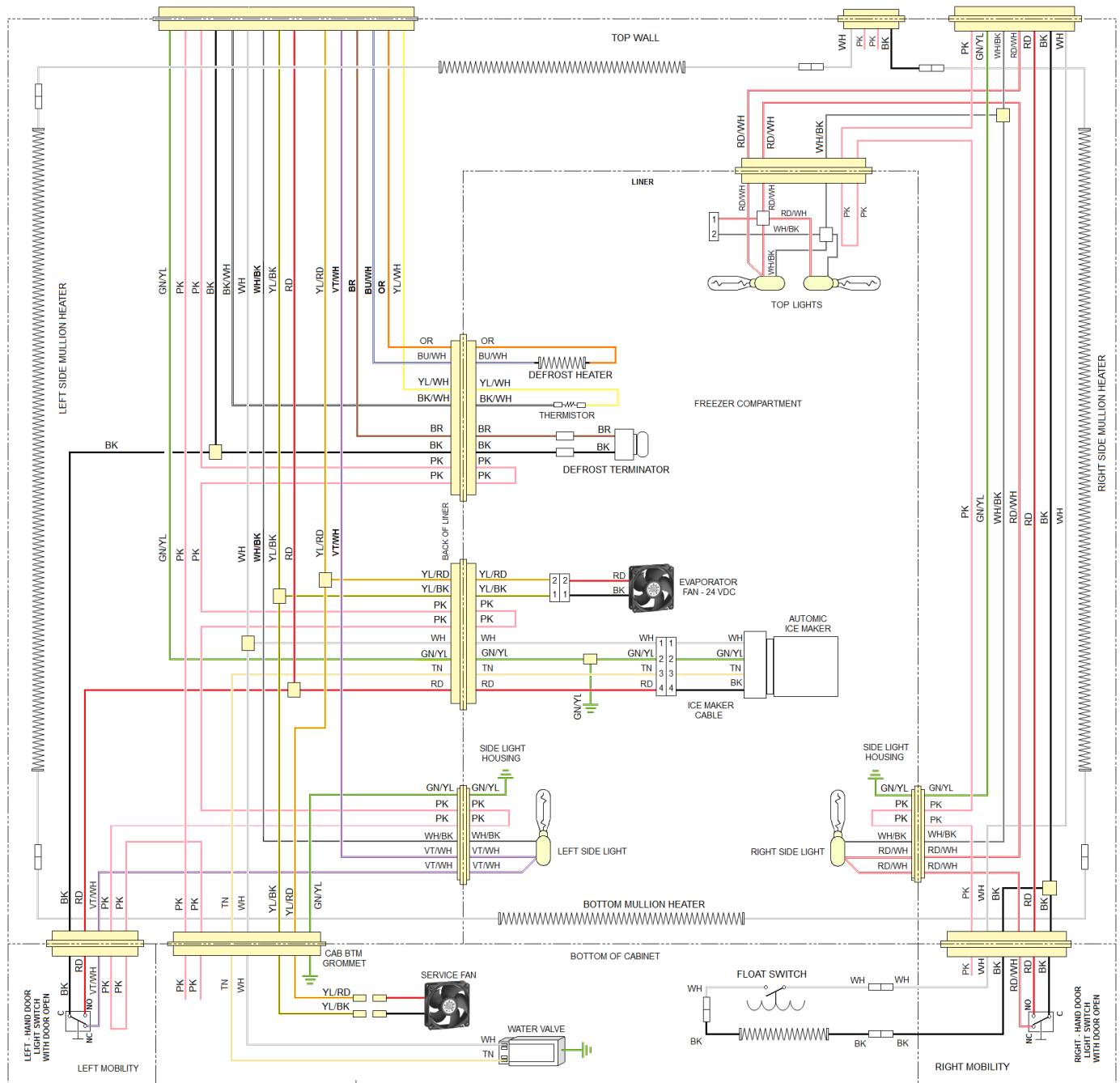
LOWER SECTION

WIRING - 30"



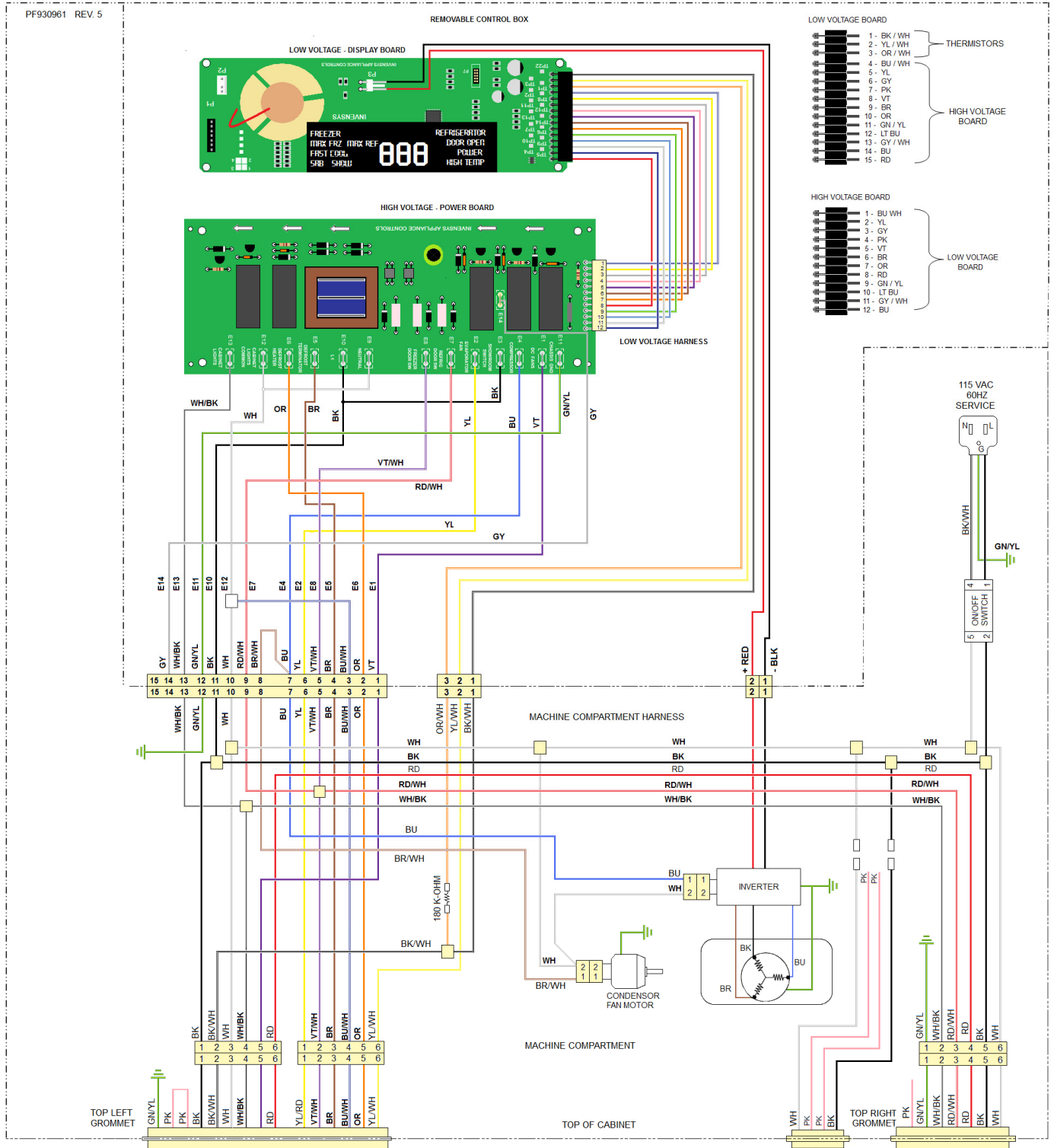
UPPER SECTION

WIRING - 30"



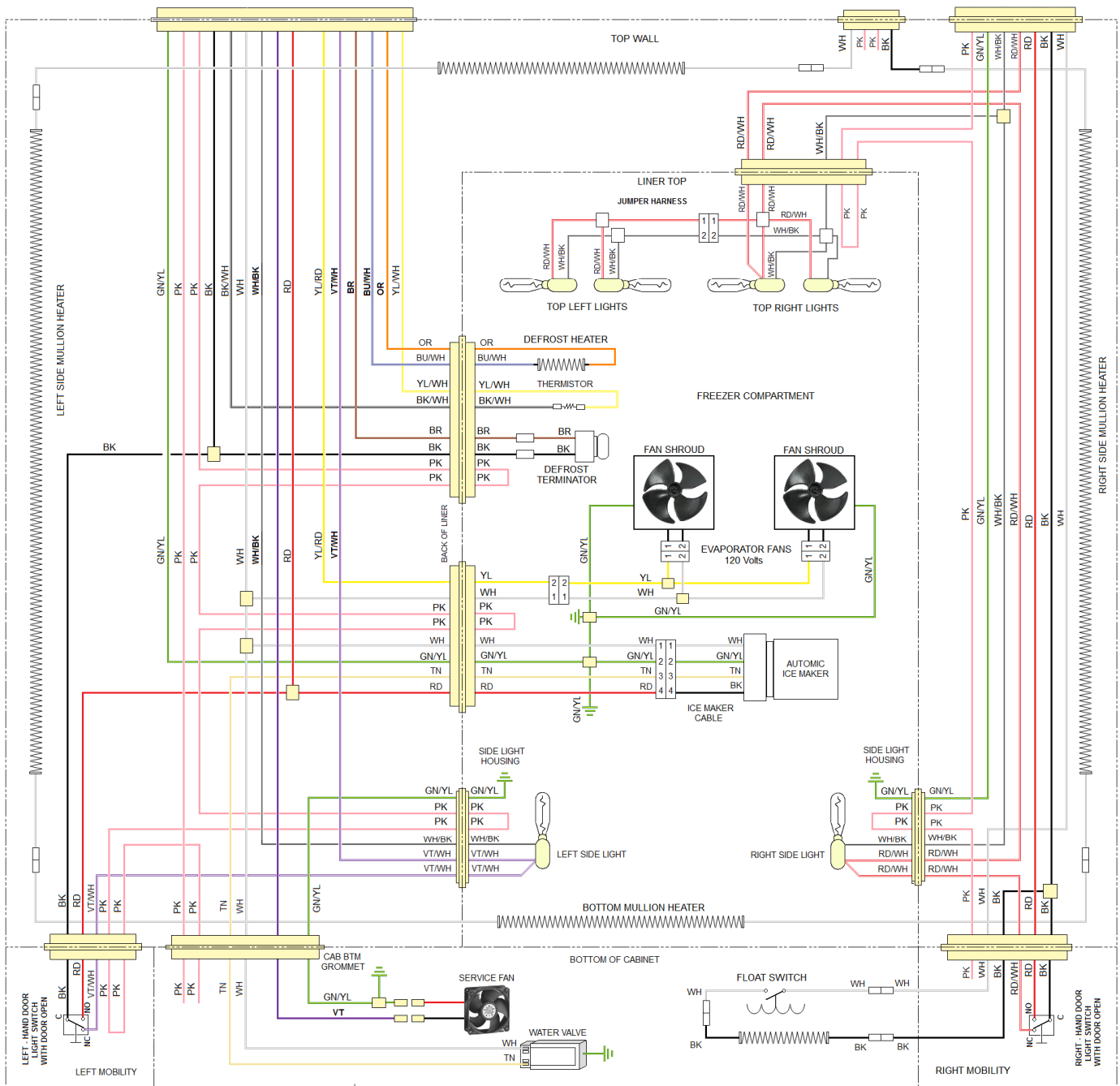
LOWER SECTION

WIRING - 36"



UPPER SECTION

WIRING - 36"



LOWER SECTION