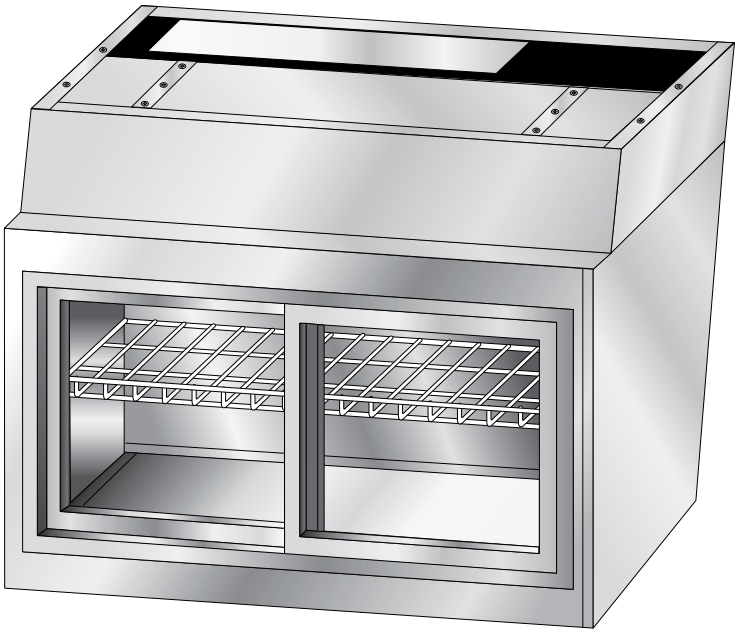
SERVICE MANUAL

Your Solutions Partner

OVERHEAD REFRIGERATED MERCHANDISER OHRM-39



IMPORTANT WARNING AND SAFETY INFORMATION

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

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

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

Duke Manufacturing Co.

2305 N. Broadway
St. Louis, MO 63102
Phone: 314-231-1130
Toll Free: 1-800-735-3853
Fax: 314-231-5074
www.dukemfg.com

IMPORTANT WARNING AND SAFETY INFORMATION

WARNING

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

WARNING

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

WARNING

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

WARNING

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

WARNING

IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, SERVICE OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATING AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING THIS EQUIPMENT.

FOR YOUR SAFETY

Electricity and water do not mix. Unplug the unit before cleaning. If repairs are required, use a qualified service agent. While repairs are being made, be sure the unit is not plugged in. Do not store highly combustible substances on or near the unit. Be sure the compressor compartment has adequate ventilation.

CAUTION

Observe the following:

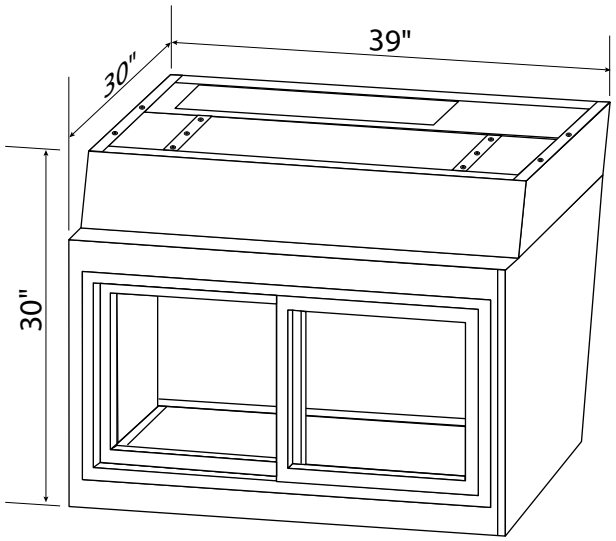
- Provide and maintain adequate minimum clearances from all walls and combustible materials.
- Provide and maintain adequate clearance for air openings.
- Keep the equipment area free and clear of combustible material.
- Operate equipment only on the type of electricity indicated on the specification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

TABLE OF CONTENTS

INSTALLATION

LOCATION

Units represented in this manual are intended for indoor use only. Be sure the location chosen has a floor or counter strong enough to support the total weight of the units. Reinforce the counter if necessary to provide for maximum loading. For the most efficient operation, be sure to provide good air circulation inside and out. Major service to the refrigeration system is done from the top and rear of the cabinet.



INSTALLATION – INSIDE UNIT

Take care not to block air flow to the fans and allow space along the front, back and sides.

INSTALLATION – OUTSIDE UNIT

Be sure that the unit has access to ample air; avoid hot corners and locations near stoves and ovens.

CAUTION:

This unit exhausts air to the top and intakes air from the top and back. Do not seal the unit to the wall or block air flow from the top. The ventilation slots must remain open.

Installation Clearances:

12 in. top and rear.
0 in. sides and bottom.

Open to the front.

INSTALLATION – ELECTRICAL WIRING

The OHRM-39 is available as a 120VAC, 60 Hz model. All electrical connections should be performed by a certified electrician and should comply with local electrical codes for your municipality.

WARNING

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

REMOVAL AND REPLACEMENT OF PARTS

ELECTRICAL LOCKOUT/TAGOUT PROCEDURE

WARNING

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

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

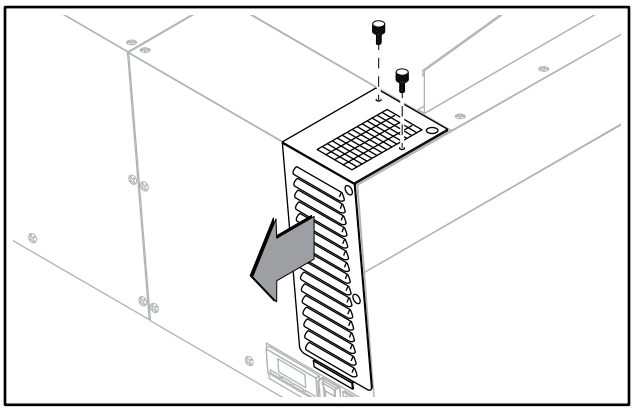
1. In electrical box, place appliance circuit breaker into OFF position.
2. Place a lock or other device on the electrical box cover to prevent someone from placing the circuit breaker ON.
3. Place a tag on electrical box cover to indicate that appliance has been disconnected for service and power should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

COVERS AND PANELS

Louvered Rear Cover

The Louvered Rear Panel gives top and rear access to the Condenser Coil for cleaning and service.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove and retain the 2 thumb screws from the Louvered Rear Panel on the top of the unit.

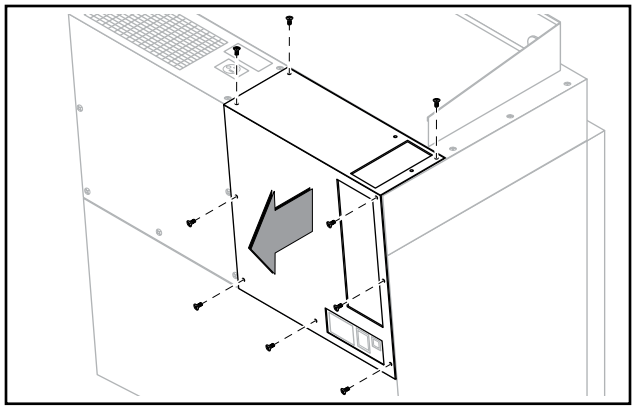


3. Swing the top of the Louvered Rear Panel out and lift off the cover.
4. Reinstall the Louvered Rear Panel by reversing the previous steps.
5. Restore power to the unit and test for proper function.

Right Rear Panel

The Right Rear Panel gives access to the Compressor and Condenser Fan for maintenance and service

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove the Louvered Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove and retain the 9 screws (3 on top, 6 on rear) from the Right Rear Panel and remove from the unit.

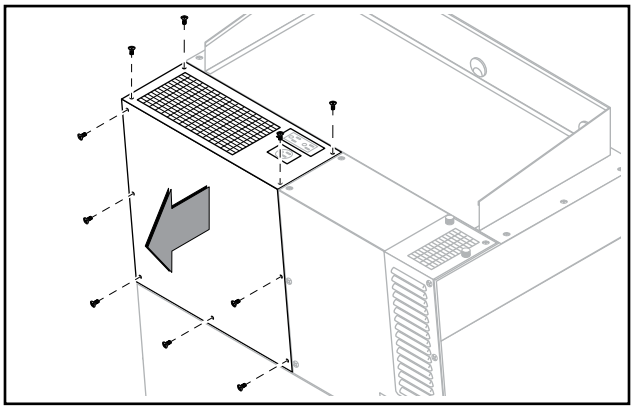


4. Slide the Right Rear Panel out to disengage lips on the top of panel and remove.
5. Reverse these steps to reinstall Right Rear Panel.
6. Restore power to the unit and test for proper function.

Left Rear Panel

The Left Rear Panel gives access to the Condensate Evaporator Pan and Condensate Evaporator Coil.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove and retain the 10 screws (3 on top, 7 on rear) from the panel and remove from the unit.

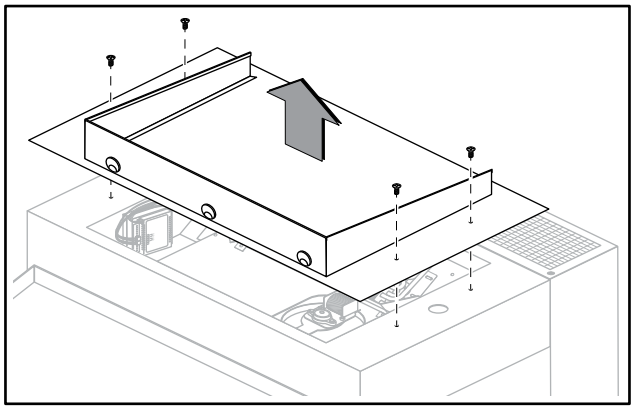


3. Reverse these steps to reinstall Left Rear Panel.
4. Restore power to the unit and test for proper function.

Top Panel

The Top Panel gives access to the Controller and Evaporator components for cleaning and service.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove and retain the 4 screws securing the Top Panel to unit and remove.

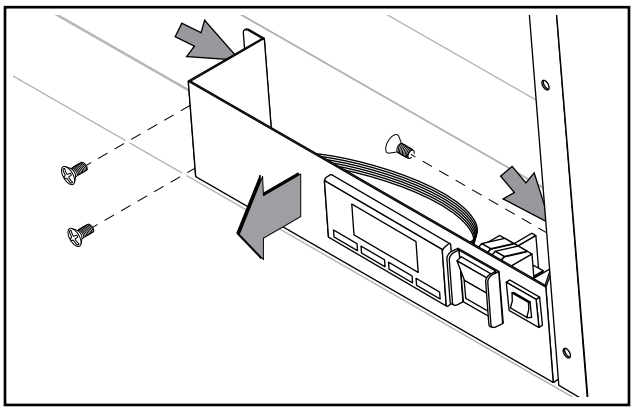


3. Reverse these steps to reinstall Top Panel.

Control Panel

The Control Panel is located on the right rear side of the unit, under the Right Rear Panel. It secures the Power ON/OFF Switch, Circuit Breaker, and Digital Thermostat Display to the unit.

1. Place the unit's Power ON/OFF Switch in the "OFF" position and follow the proper Lockout/Tagout procedures.
2. Remove the Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove and retain the 3 screws that secure the Control Panel to the unit.



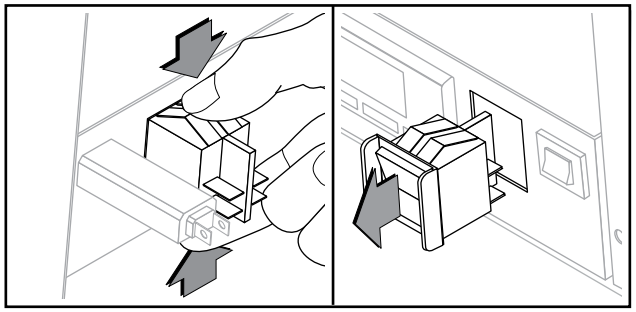
4. Reinstall the Control Panel by reversing the previous steps.
5. Restore power to the unit and test for proper function.

ELECTRICAL COMPONENTS

Power ON/OFF Switch

The Power ON/OFF Switch is located on the right rear side of the unit on the Control Panel.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove the Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove the Control Panel. See procedure in COVERS AND PANELS section.
4. Mark and disconnect the ON/OFF Switch wires.
5. The Power ON/OFF Switch is secured to the Control Panel with spring clips. Depress the spring clips and slide the ON/OFF Switch out of the Control Panel.

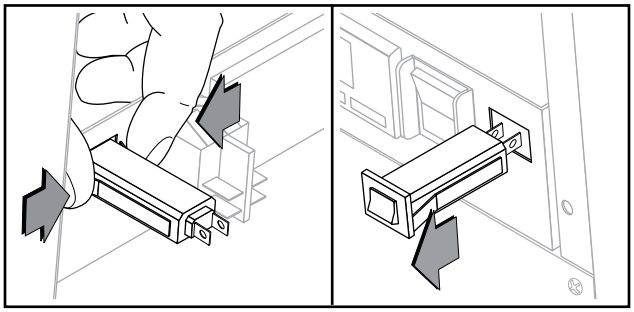


6. To install replacement Power ON/OFF Switch, reverse these steps.
7. Restore power to unit and test for proper function.

Circuit Breaker

The Circuit Breaker is located in the Control Panel and is used to prevent the unit from shorting out should a leak occur inside the unit.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures
2. Remove the Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove and retain the 3 screws that secure the Control Panel to the unit.
4. Mark and disconnect the Circuit Breaker wires.
5. The Circuit Breaker is secured to the Control Panel with spring clips. Depress the spring clips and slide the breaker from the panel.

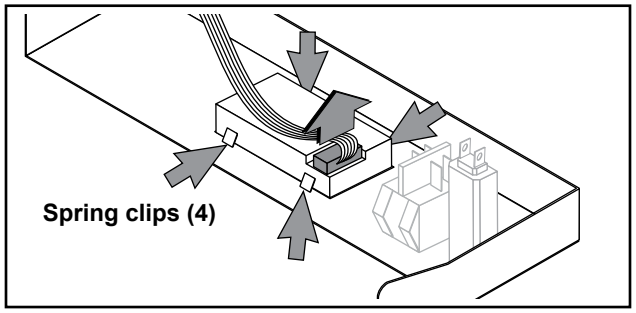


6. To install replacement Circuit Breaker, reverse these steps.
7. Restore power to unit and test for proper function.

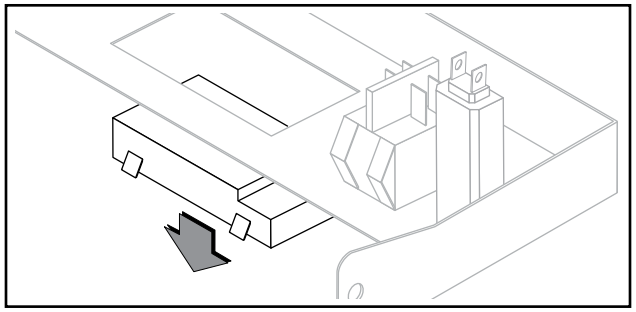
Digital Thermostat – Display

The Digital Thermostat is located in the Control Panel at the right rear of the unit. It displays and controls the current temperature inside the unit.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove the Control Panel. See procedure in COVERS AND PANELS section.
4. Remove the ribbon cable from the back of the Digital Thermostat Display.



5. The Digital Thermostat Display is secured to the Control Panel with spring clips. Depress the spring clips and slide the display from the panel.



6. To install replacement Thermostat Display, reverse these steps.

NOTE: The ribbon cable is polarized (red wire) and must be plugged in correctly

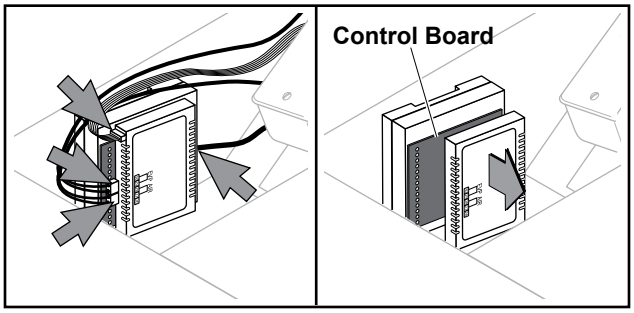
7. Restore power to unit and test for proper function.

Controller

The Controller is located under the Top Panel and is used to control and provide information to the Digital Thermostat Display and Thermocouple Probes.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Top Panel. See procedure in COVERS AND PANELS section.
3. Mark and disconnect the 4 Thermocouple Probe wires, Digital Thermostat Display cable, and the 3 power wires from the Controller.
4. Remove the Controller cover by pulling it off its base (which remains secured to the unit).

NOTE: The control board inside the Controller is not attached to the base.



5. Install the replacement Controller control board into the base and secure by replacing the cover.
6. Reattach all of the wires:

   Thermocouple Probe – Evaporator sensor wires at terminals 29 and 30

   Thermocouple Probe – Air Temperature sensor wires at terminals 27 and 28

   Power – Black to terminals 9 and 10; Neutral (white) to terminal 14

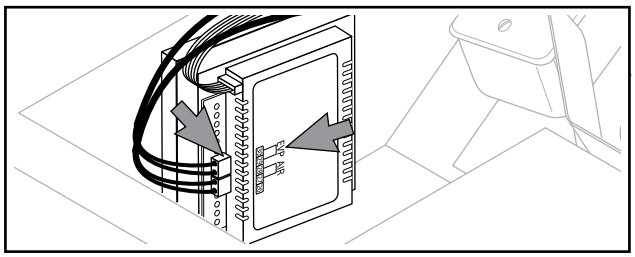
   Digital Thermostat Display cable

   NOTE: The ribbon cable is polarized (red wire) and must be plugged in correctly
7. Reinstall Top Panel by reversing the previous steps.
8. Restore power to the unit and test for proper function.
9. Consult the operations manual (P/N 229240) for operation and programming instructions.

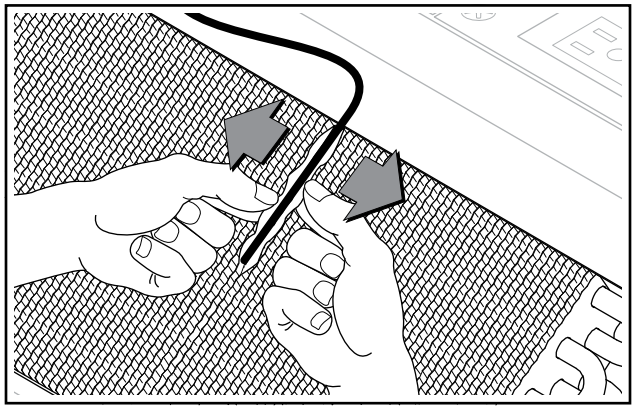
Thermocouple Probe – Evaporator

The Thermocouple Probe – Evaporator is attached to the front of the Evaporator Coil, under the Top Panel. It monitors the temperature at the Evaporator.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Top Panel. See procedure in COVERS AND PANELS section.
3. Disconnect the Evaporator Thermocouple Probe sensor wires at Controller pins 29 and 30. They are marked as "EVP".



4. Remove the foil tape securing the wires to the Evaporator Coil.
5. Carefully open the Evaporator fins crimped around the Evaporator Thermocouple Probe and remove it.

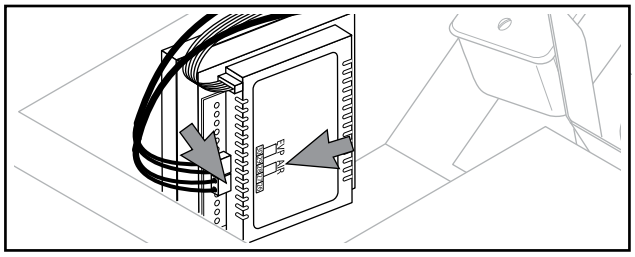


6. Remove Thermocouple from Evaporator Coil.
7. To install replacement Thermocouple, reverse these steps.
6. Restore power to unit and test for proper function.

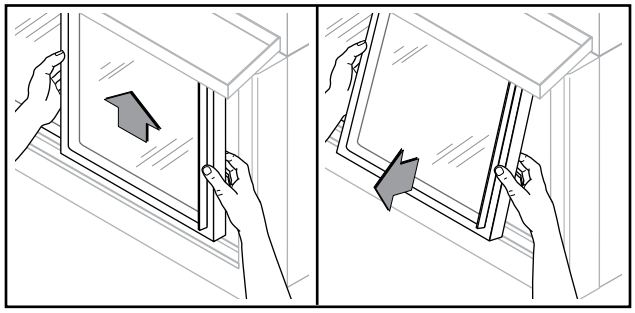
Thermocouple Probe – Air Temperature Sensor

The Air Temperature Thermocouple Probe monitors the air temperature inside the unit.

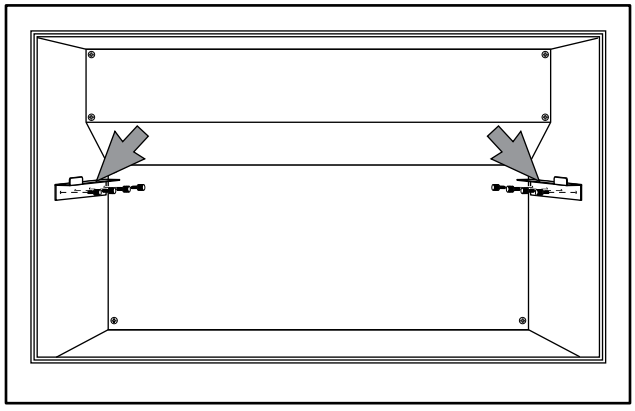
1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Top Panel. See procedure in COVERS AND PANELS section.
3. Disconnect the Air Temperature Thermocouple Probe sensor wires at Controller pins 27 and 28. They are marked as "AIR".



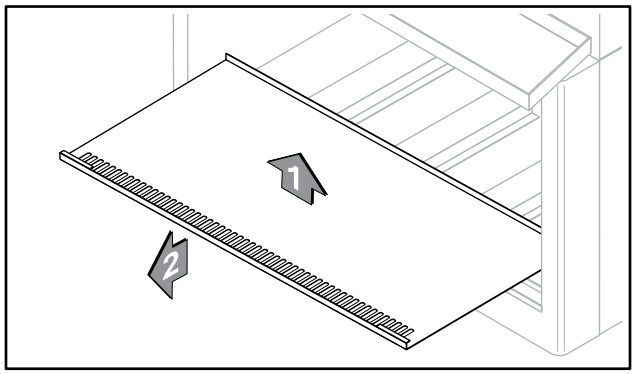
4. From the front of the unit, remove both doors by lifting up and pulling out at their bottom.



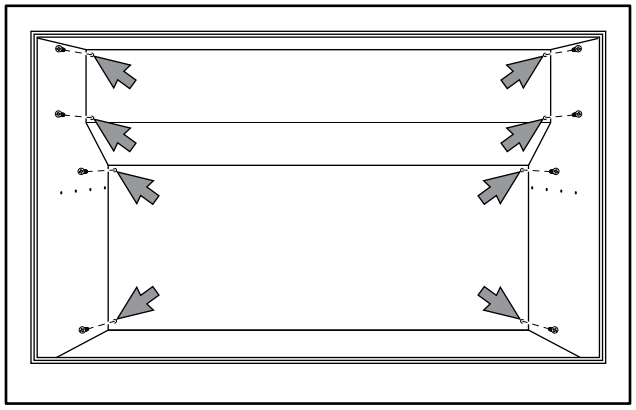
5. Remove all equipment from the interior of unit.
6. Remove the 4 thumb screws securing each rack rail and remove.



7. Remove the interior compartment bottom panel by lifting up and out of the unit.



8. Remove the 8 screws securing interior compartment back panel and remove the panel.

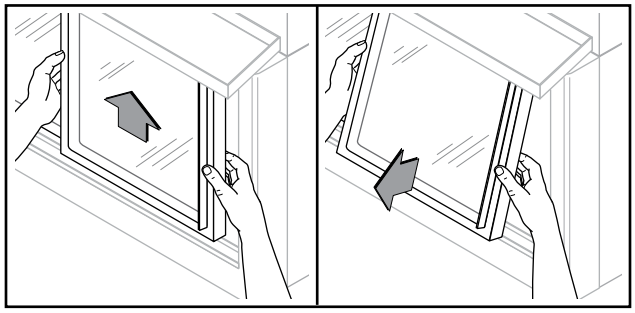


9. Remove the screw from the hold-down loop and remove the Air Temperature Thermocouple Probe.
10. To install replacement Thermocouple, reverse these steps.
11. Restore power to unit and test for proper function.

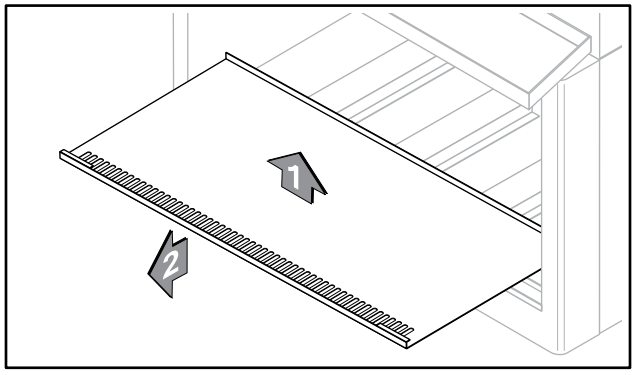
LED Light Power Supply

The LED Light Power Supply powers the 12 LED Light Sticks (9 in the interior, 3 in the burger chute). It is located inside the interior of the unit, below the interior compartment bottom panel.

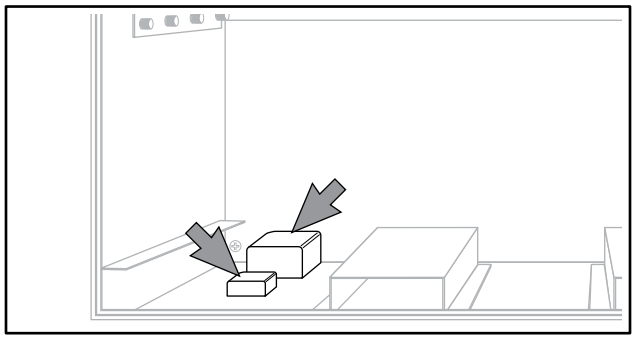
1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove both doors by lifting up and pulling out at their bottom.



3. Remove all equipment from the interior of the unit.
4. Remove the interior compartment bottom panel by lifting up and out of the unit.



5. Mark and disconnect all wires from the LED Light Power Supply and remove.



6. To install replacement LED Light Power Supply, reverse these steps.

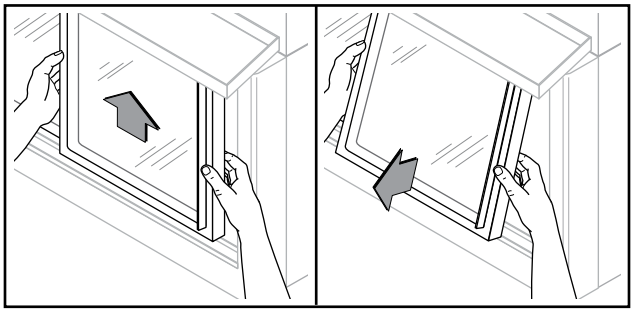
7. Restore power to unit and test for proper function.

LED Light Sticks - Interior

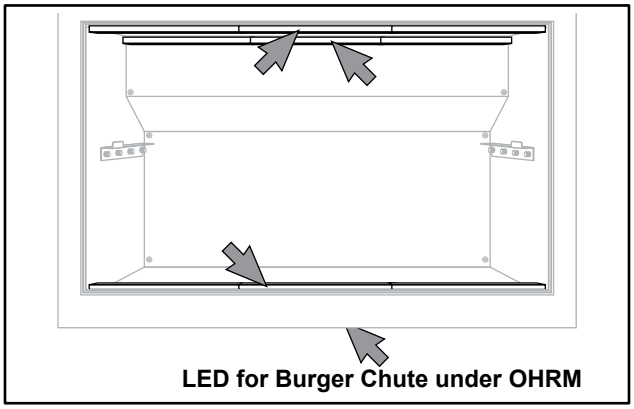
There are 9 LED Light Sticks, connected together in groups of 3 (3 in top-front, 3 in top-rear, 3 in bottom-front), that are used to illuminate the interior compartment of the unit.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.

2. Remove both doors by lifting up and pulling out at their bottom.



3. The LED Light Sticks are connected together in groups of three (3 in top-front, 3 in top-rear, 3 in bottom-front) and are held in place by clips. Snap out the entire group that contains the effected light stick(s) from their respective clips.



4. If replacing any LED Light Sticks in the rear, remove all equipment from the interior of the unit to allow for easier access.

5. Remove the faulty LED stick(s) by unplugging from its group.

6. Install the replacement LED stick(s) by plugging the group of 3 LED Light Sticks back together and reinstalling into their respective clips.

7. If necessary, reinstall the interior equipment.
8. Reinstall the doors.
9. Restore power to the unit and test for proper function.

LED Light Sticks - Burger Chute

There are 3 LED Light Sticks located in the Burger Chute, near the front of the unit, which are used to illuminate the Burger Chute.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. The Burger Chute LED Light Sticks are connected together in a group of 3, held in place by clips. Remove the screws securing the clips and snap out the entire group from its clips.
3. Remove the faulty LED stick(s) by unplugging from its group.
4. Install the replacement Burger Chute LED Light Stick(s) by plugging the LED light sticks back together and reinstalling into its clips.
5. Restore power to unit and test for proper function.

Compressor Motor Capacitor

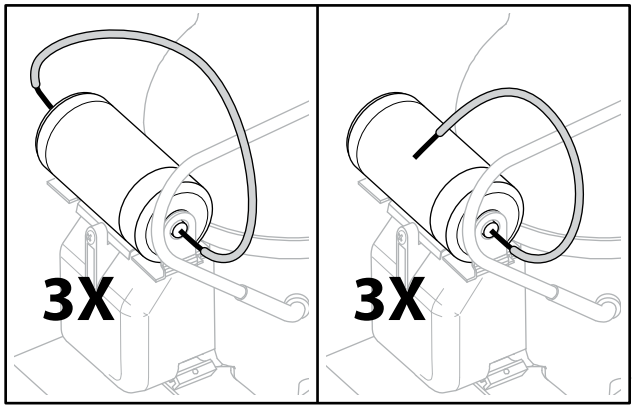
The Compressor Motor Capacitor is attached to a mounting bracket on the top of the electrical box cover at the rear of the Compressor. It is used to keep the Compressor Motor running more efficiently and cooler.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Even though the Compressor Motor Capacitor is physically located behind the Right Rear Panel, it is easily accessed via the Left Rear Panel. Remove Left Rear Panel. See procedure in COVERS AND PANELS section.

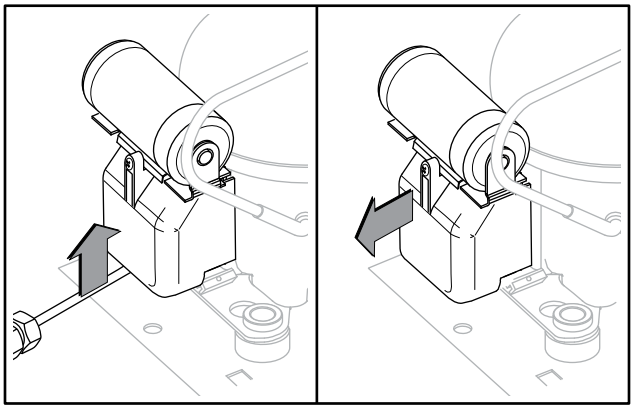
WARNING

CAPACITORS STORE AN ELECTRICAL CHARGE EVEN AFTER THE POWER SOURCE HAS BEEN REMOVED. HANDLE WITH EXTREME CAUTION.

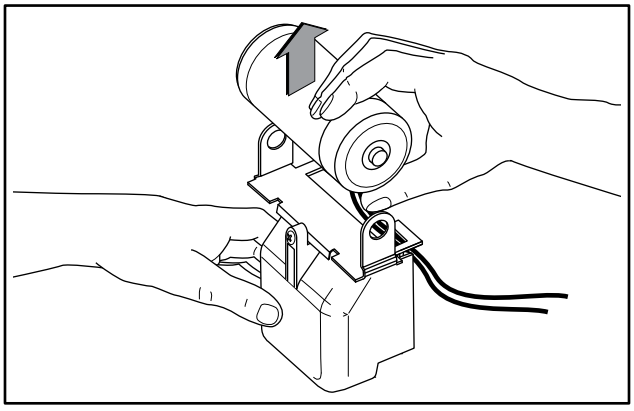
3. With a pair of electrically insulated pliers, mark and disconnect the wires from the Compressor Motor Capacitor.
4. With a short length of insulated, large gauge wire stripped on each end, bridge between each terminal and from each terminal to the case of the Compressor Motor Capacitor.



5. Repeat 3 times. If correctly done, the Compressor Motor Capacitor will be completely discharged and safe to handle.
6. Remove the electrical box cover by prying it from its base at the bottom and pulling it away from the Compressor.



7. Remove the Compressor Motor Capacitor from its mounting bracket on top of electrical box cover.

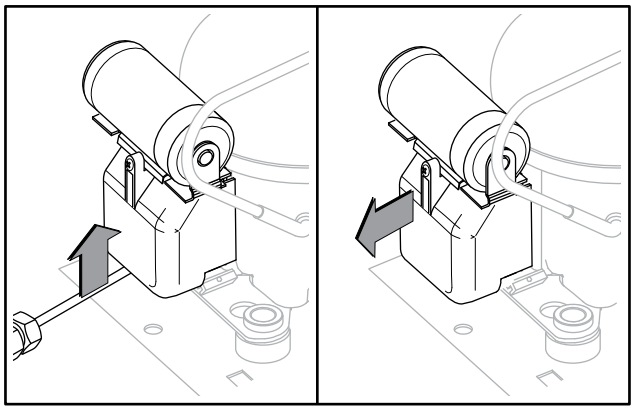


8. Attach the replacement Compressor Motor Capacitor to the mounting bracket on top of the electrical box cover.
9. Reinstall the electrical box cover.
10. Reconnect the Compressor Motor Capacitor wires.
11. Reinstall the Left Rear Panel by reversing the previous steps.
12. Restore power to the unit and test for proper function.

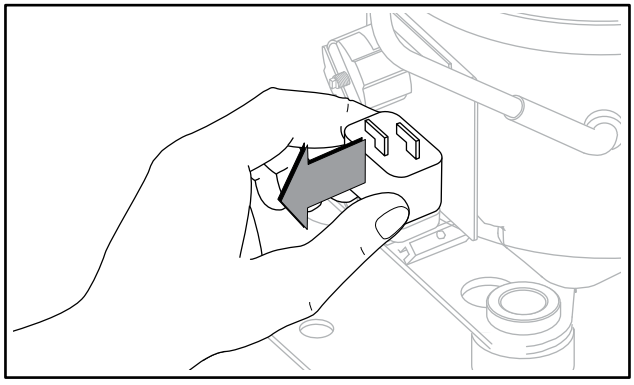
Compressor Motor Start Relay

The Compressor Motor Start Relay is inside the electrical box cover at the rear of the Compressor.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. The Compressor Motor Start Relay is physically located behind the Right Rear Panel, but is accessed via the Left Rear Panel. Remove the Left Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove the electrical box cover at the rear of the Compressor by prying it from its base at the bottom and pulling it away.



4. Mark and disconnect all wires attached to Compressor Motor Start Relay.
5. Remove the Compressor Motor Start Relay (the lower one) by pulling it away from its electrical pin.

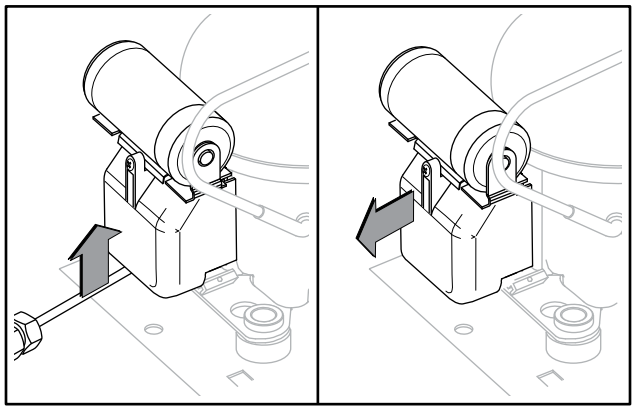


6. To install replacement Compressor Motor Start Relay, reverse these steps.
7. Restore power to unit and test for proper function.

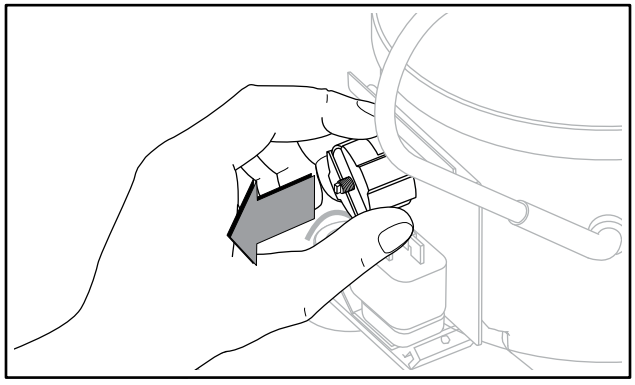
Compressor Motor Overload Relay

The Compressor Motor Overload Relay is inside the electrical box cover at the rear of the Compressor.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. The Compressor Motor Overload Relay is physically located behind the Right Rear Panel, but is accessed via the Left Rear Panel. Remove Left Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove the electrical box cover at the rear of the Compressor by prying it from its base at the bottom and pulling it away.



4. Mark and disconnect all wires attached to Compressor Motor Overload Relay.
5. Remove the Compressor Motor Overload Relay (the upper one) by simply pulling it away from its electrical pin.



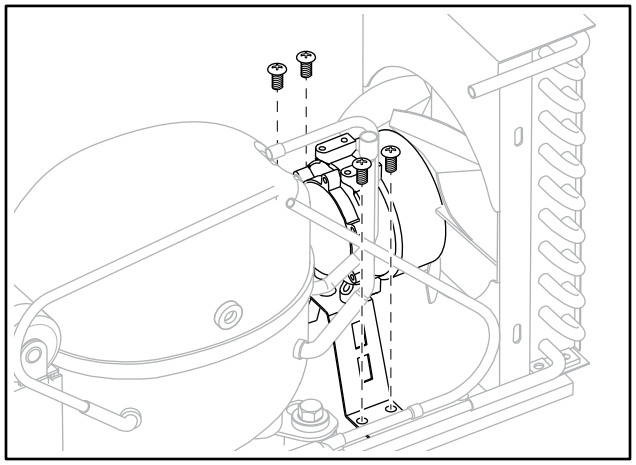
6. To install replacement Compressor Motor Overload, reverse these steps.
7. Restore power to unit and test for proper function.

Condenser Fan Motor

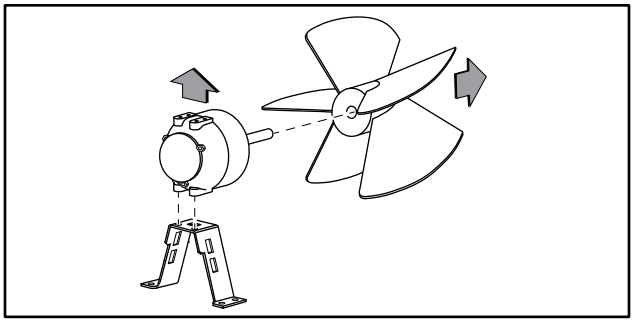
The Condenser Fan Motor is attached to a mounting bracket between the Compressor and Condenser Coil. It is used to circulate air across the Condenser Coil to increase the transfer of heat.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Remove and retain the 4 bolts securing the Condenser Fan Motor to its mounting bracket and remove from the unit.

NOTE: Fan blade clearance is important. Measure and record distance of fan to condenser coil.



4. Remove the fan motor from its mounting bracket.

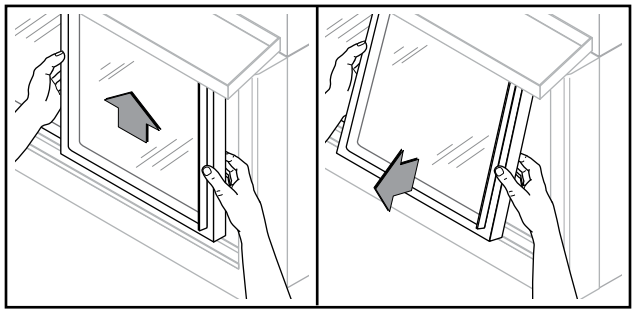


5. Mark and disconnect wiring to the motor.
6. Remove the fan blade from its motor shaft.
7. Reattach the fan blade to the replacement Condenser Fan Motor.
8. Attach the replacement motor to its mounting bracket.
9. To install replacement Compressor Motor Capacitor, reverse these steps.
10. Restore power to unit and test for proper function.

Evaporator Fan

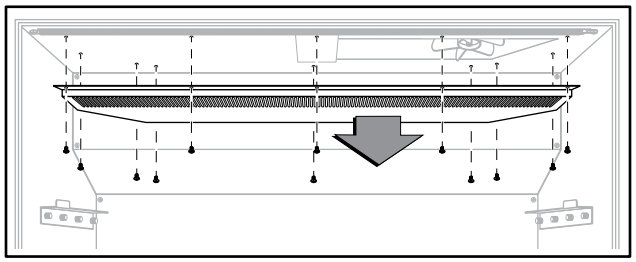
The Evaporator Fan is located between the interior compartment and the top compartment. It is used to provide chilled air from the Evaporator Coil to the interior compartment.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Top Panel. See procedure in COVERS AND PANELS section.
3. Mark and disconnect the wires to the Evaporator Fan motor.
4. From the front of the unit, remove both doors by lifting up and pulling out at their bottom.

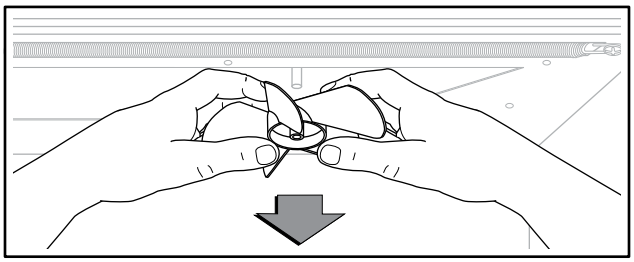


5. Remove all equipment from the interior compartment of the unit.
6. Remove and retain the 12 screws (5 across the front, 2 on each angled side, and 3 across the back) securing the interior compartment top panel to the unit.

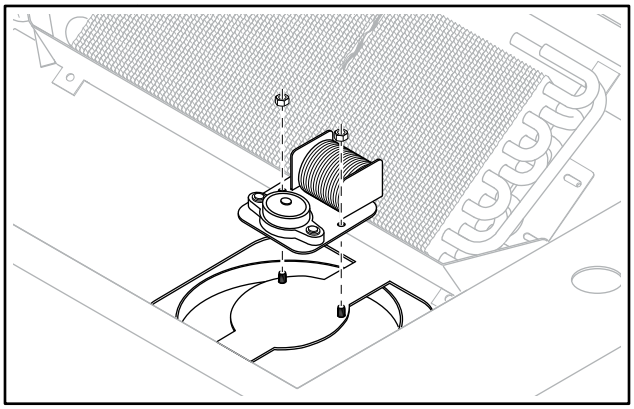
NOTE: Be careful of the top interior LED lights as even though there is enough slack for them to not need to be removed, their clips are attached to the top panel and the wires to the front LED lights pass through an access hole in the top panel.



7. From inside the interior compartment, carefully remove the Evaporator Fan blade by pulling straight down with equal pressure on to sides as close to the shaft as possible.



8. From the top of the unit, remove and retain the 2 screws securing the Evaporator Fan to its mounting bracket.



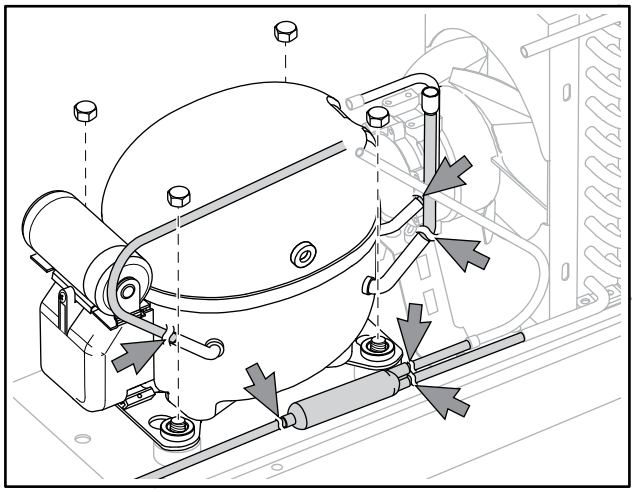
9. Attach the replacement Evaporator Fan to its mounting bracket using its screws.
10. To install replacement Evaporator Fan, reverse these steps.
11. Restore power to unit and test for proper function.

REFRIGERATON COMPONENTS

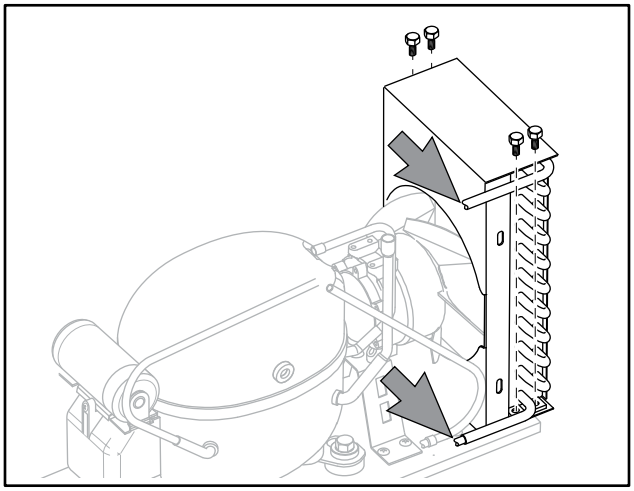
Condenser/Compressor Unit

The Condenser/Compressor Unit is located behind the Right Rear Panel. It contains the Compressor, Condenser Coil, Condenser Fan, Dryer, Compressor Motor Capacitor, and Compressor Motor Relays of the OHRM in a single unit.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. Cut refrigeration lines close to Compressor/ Condenser Unit.



5. Mark and disconnect all wiring to Compressor/ Condenser Unit.
6. Remove and retain the hex nuts securing the Compressor/Condenser Unit base plate.

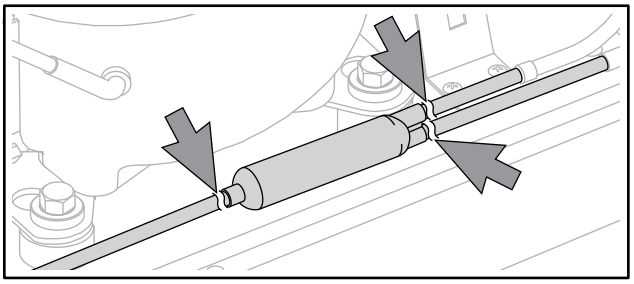


7. Lift and remove the Compressor/Condenser Unit.
8. Set the replacement Compressor/Condenser Unit in place on its studs and secure with its hex nuts.
9. Braze the refrigerant lines to connect to existing lines. Add tubing as needed.
10. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
11. Recharge the refrigerant system according to the data plate.
12. Replace all panels.
13. Restore power to unit and check for proper function.

Dryer

The Dryer is located behind the Right Rear Panel. It is used to provide refrigeration system filtration and adsorb system contaminants.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. Cut refrigeration lines close to the Dryer and remove from the unit.

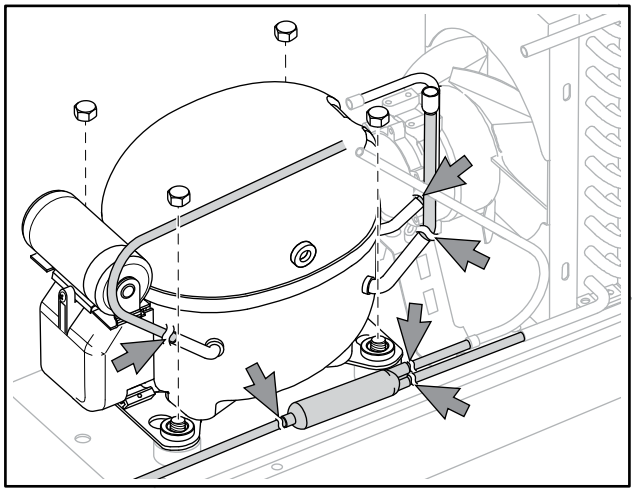


5. Braze a replacement Dryer in place.
6. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
7. Recharge the refrigerant system according to the data plate.
8. Replace all panels.
9. Restore power to unit and test for proper function.

Compressor

The Compressor is located behind the Right Rear Panel. It is used to pressurize, heat, and move refrigerant through the refrigeration system.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. Cut the refrigeration lines close to the Dryer.
5. Cut the refrigeration lines close to the Compressor.
6. Mark and disconnect all wiring to the Compressor.
7. Remove and retain the hex nuts securing the Compressor to its base.

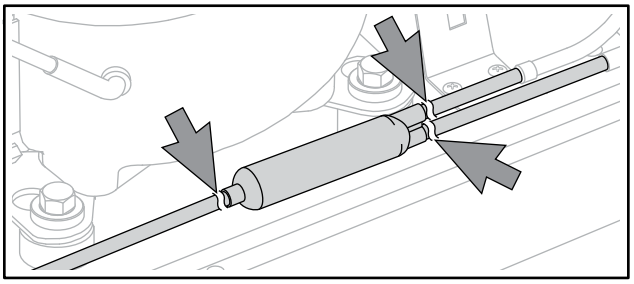


8. Remove the Compressor from the unit.
9. Set the replacement Compressor in place and secure with its hex nuts.
10. Braze the refrigerant lines to connect a replacement Dryer and existing lines to the replacement Compressor. Add tubing as needed.
11. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
12. Recharge the refrigerant system according to the data plate.
13. Replace all panels.
14. Restore power to unit and check for proper function

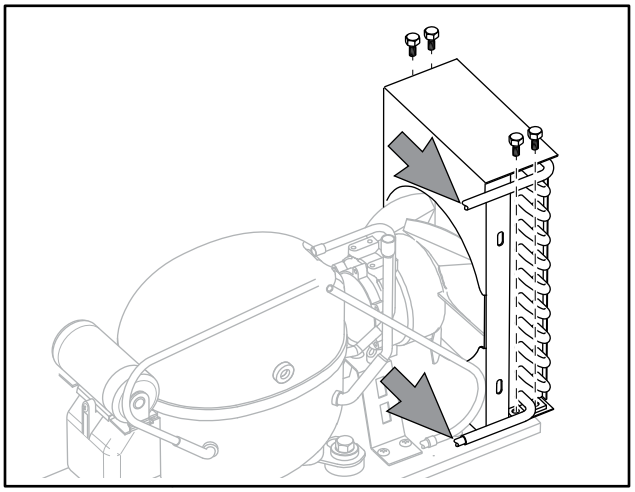
Condenser Coil

The Condenser Coil is located behind the Louvered Rear Panel. It is used to remove heat from the refrigeration system.

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. Cut the refrigeration lines close to the Dryer and remove from the unit.



5. Cut the refrigeration lines close to Condenser Coil.

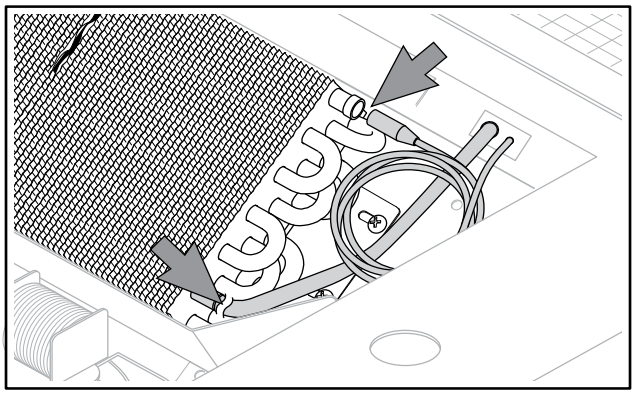


6. Remove the 4 bolts mounting the Condenser Coil to its mounting plate and remove the coil.
7. Remove and retain the screws securing the Condenser Fan shroud.
8. Set replacement Condenser Coil in place and secure with its bolts.
9. Braze the refrigerant lines to connect the replacement Condenser Coil to existing lines. Add tubing as needed.
10. Reinstall the Condenser Fan shroud.
11. Braze a replacement Dryer in place.
12. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
13. Recharge the refrigerant system according to the data plate.
14. Replace all panels.
15. Restore power to unit and test for proper function.

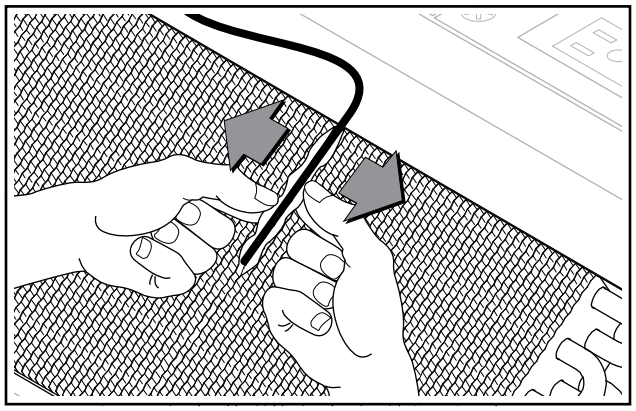
Evaporator Coil

The Evaporator Coil is located inside the top compartment under the Top Panel. It is used to cool and condition the air that flows through the interior compartment by drawing out heat and moisture.

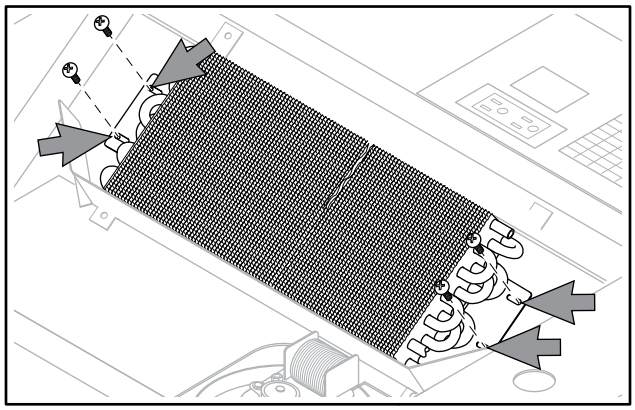
1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Top Panel. See procedure in COVERS AND PANELS section.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. De-braze the capillary tube and remove from the Evaporator Coil.
5. Cut the remaining refrigeration line close to the Evaporator Coil.



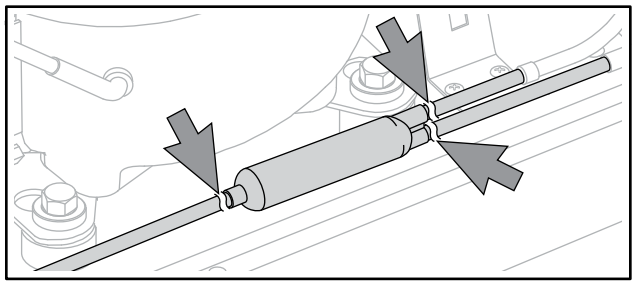
6. Remove the foil tape securing the wires to the Evaporator Coil.
7. Carefully open the evaporator fins crimped around Evaporator Thermocouple Probe and carefully remove it from the Evaporator Coil.



8. Remove and retain 4 screws securing the Evaporator Coil to the unit and remove from the unit.



9. Remove Right Rear Panel. See procedure in COVERS AND PANELS section.
10. Cut refrigeration lines close to the Dryer and remove from the unit.



11. Braze a replacement Dryer in place.
12. Mount the replacement Evaporator Coil in place using its screws.
13. Braze the capillary tube and suction line to the replacement Evaporator Coil.
14. Reinstall replacement Evaporator Thermocouple Probe by carefully crimping the probe and wire into the Evaporator Coil and replacing foil tape.
15. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
16. Recharge the refrigerant system according to the data plate.
17. Replace all panels.
18. Restore power to unit and test for proper function

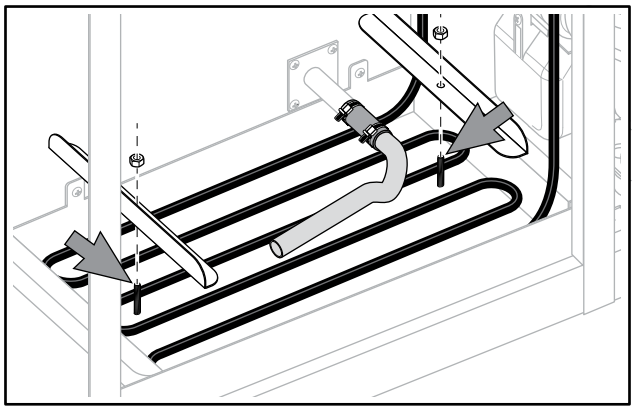
Condensate Evaporator Coil

The Condensate Evaporator Coil is located behind the Left Rear Panel. It is used to assist in evaporating the excess moisture from the Evaporator Coil in the drip pan.

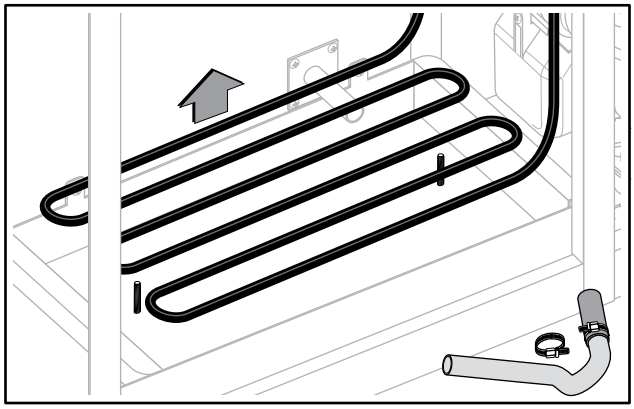
WARNING

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

1. Place the unit's Power ON/OFF Switch is in the OFF position and follow the proper Lockout/Tagout procedures.
2. Remove Left and Right Rear Panels. See procedure in COVERS AND PANELS sectiona t.
3. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
4. Cut the refrigeration lines close to the Condensate Evaporator Coil.
5. Remove and retain the 2 hex nuts and hold-down brackets securing the Condensate Evaporator Coil.



6. Remove and retain the adjustable hose clamp, hose and copper drain pipe attached to the stainless outlet pipe.
7. Remove the Condensate Evaporator Coil.



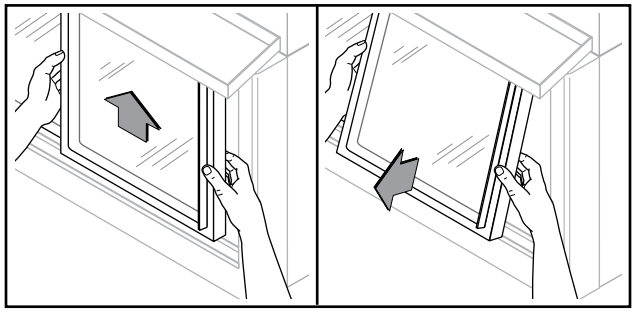
8. Set the replacement Condensate Evaporator Coil in place and secure to the unit with the hold-down brackets.
9. Trim the lines to proper dimension and braze the lines to connect the replacement Condensate Evaporator Coil.
10. Cut refrigeration lines close to the Dryer and remove from the unit.
11. Braze a replacement Dryer in place.
12. Evacuate the refrigerant system according to Duke Manufacturing Service Bulletin #26 (page 28).
13. Recharge the refrigerant system according to the data plate.
14. Replace all panels.
15. Restore power to unit and test for proper function.

DOOR PARTS

Doors

The spring-loaded doors are easily removed for repair and access to the interior compartment components of the unit.

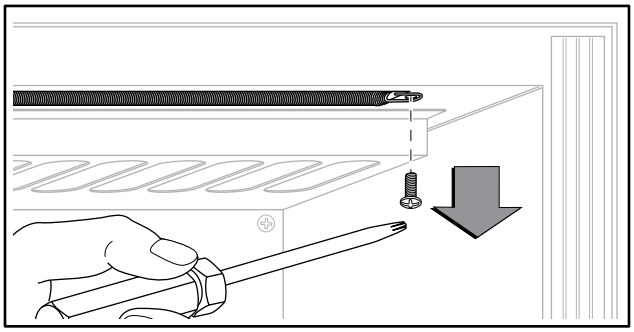
1. Slide the outermost door open slightly.
2. Grasp with both hands and lift up.
3. Swing the lower edge out and remove door.



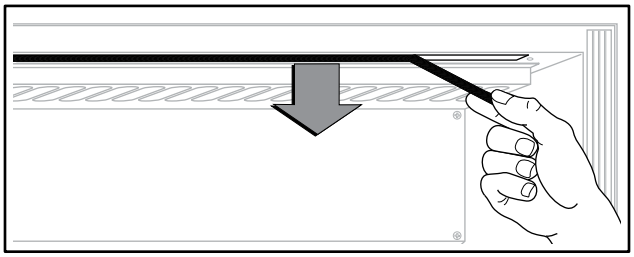
4. Repeat for innermost door.
5. Reinstall the doors, innermost first, by grasping the inner door with both hands.
6. Use the upper corner of the inner door to push the spring slide until enough clearance is made to slide the door into the upper door track.
7. Slide the upper edge of the inner door into the upper track.
8. Swing the bottom of the inner door into the bottom door track.
9. Test for proper operation, sliding back-and-forth across the entire length of the track.
10. Repeat the previous steps for the outer door.

Door Springs

1. Remove Doors. See Doors section above.
2. Remove the Phillips head screw securing the spring end in the affected upper door track.

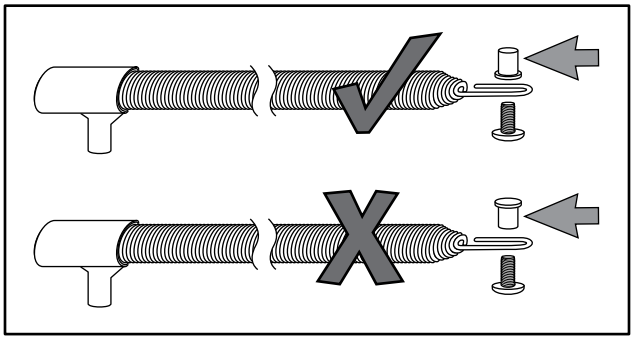


3. Pull the spring and slide mechanism out of the effected upper door track(s).



4. Slide the replacement door spring assembly into the affected upper door track, making sure the spring eyelet is installed as shown.

CAUTION: Inverting the spring eyelet will cause the door to catch when opened or closed.



5. Reinstall the Phillips head screw securing the spring end of the spring assembly into the effected door track(s).
6. Reinstall the doors. See Doors section above.

TROUBLESHOOTING GUIDE

Symptom	Possible Cause	Remedy
Cabinet too warm	Unit not plugged in	Plug unit in
	Thermostat set too high	Set Thermostat to a lower setting for a colder temperature
	Thermostat faulty	Replace Thermostat
	Condenser Fan Motor not running	Check and repair or replace Condenser Fan Motor
	Dirty Condenser Coil	Clean Condenser Coil
	Refrigerant leak	Find leak, repair and recharge
	Doors not closing fully	Ensure doors are fully closed
	Product not pre-chilled	Ensure only pre-chilled product is placed inside.
Cabinet too cold	Thermostat set too low	Set Thermostat to a higher setting for a warmer temperature
	Thermostat faulty	Replace Thermostat

SERVICE INFORMATION

RECHARGING REFRIGERATION SYSTEM

General

To analyze the performance of a refrigeration system, temperature readings are recorded and converted to pressure readings using a standard pressure/ temperature chart.

When it is necessary to service a factory sealed refrigeration system and return it to its properly sealed condition, strictly adhere to the following approved procedure.

Tools

Standard hand and refrigeration tools

Refrigerant Type: 134a

Charging Procedure

NOTE: Prior to refrigeration system service, special care must be taken during the evacuation process to remove air, moisture and other non-condensables from the system. Duke Manufacturing recommends the following triple evacuation method. Failure to follow this procedure may result in poor refrigeration system performance.

1. Evacuate system to 1500 microns
2. Break vacuum to 2 psig with dry nitrogen. If dry nitrogen is unavailable, use same type of refrigerant as used in system.
3. Evacuate system to 1500 microns.
4. Break vacuum to 2 psig with dry nitrogen. If dry nitrogen is unavailable, use same type of refrigerant as used in system.
5. Evacuate system to 500 microns.

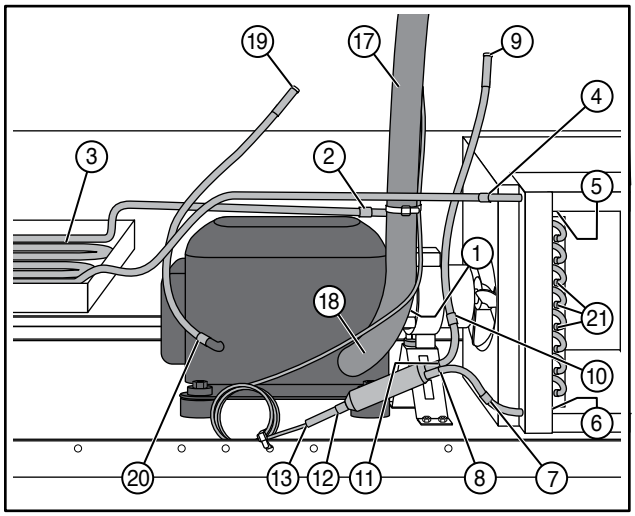
The system is now ready to receive refrigerant charge according to information on data plate.

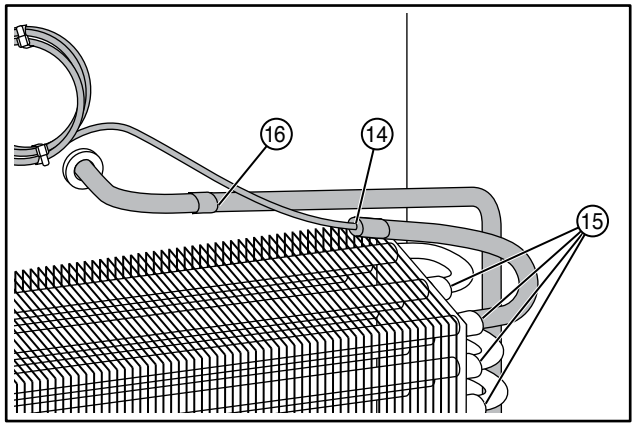
CAUTION: Never use oxygen or acetylene in place of dry nitrogen or refrigerant for leak testing. A violent explosion may result causing property damage, personal injury or death. When using nitrogen to pressure test, always use a pressure regulator. Failure to do so will result in extremely high pressure of the compressor or other system components and result in property damage, personal injury or death.

NOTICE: Prior to repair; ensure there is enough process hose (approximately 12”) present to complete the repair using the above procedure. If not, install a new process hose before repair sequence.

1. Install a temporary access valve on the high and low side of process hoses as close to factory crimps as possible.
2. Use temporary valves to perform repair. Duke Manufacturing will not reimburse the cost of permanently installed valves.
3. After completing repair, evacuate system using the triple evacuation method described in Duke Manufacturing Service Bulletin Number 26.
4. After completing proper evacuation method, recharge system, using proper refrigerant according to information on data plate.
5. Continue crimping process hose just below temporary valve and again 2” below crimp.
6. With crimp tool in place, remove temporary valve.
7. Braze shut end of process hose.
8. Allow to cool for about 5 minutes.
9. Remove crimp tool.
10. Check brazed end for leaks.

REFRIGERATION SYSTEM JOINT MAPPING DIAGRAM





In the event a leak is found , use the following list to document the joint repaired.

1. Outlet from compressor toward condenser.
2. Outlet from compressor to condensation pan coil.
3. Condensation evaporation pan coil.
4. Inlet to condenser – A.
5. Inlet to condenser – B.
6. Outlet from condenser – A.
7. Outlet from condenser – B.
8. Inlet to filter/drier from condenser.
9. High pressure process tube termination.
10. High pressure process tube inlet to filter/drier – A.
11. High pressure process tube inlet to filter/drier – B.
12. Outlet from filter/drier to capillary tube – A.
13. Outlet from filter/drier to capillary tube – B.
14. Captube inlet to evaporator.
15. Evaporator coil elbows (multiple).
16. Outlet from evaporator to compressor – A.
17. Outlet from evaporator to compressor – B.
18. Inlet to compressor from evaporator.
19. Low pressure process tube termination.
20. Inlet to compressor from low pressure process tube.
21. Condenser coil elbows (multiple).

SERVICE BULLETIN NUMBER 26 – NOVEMBER 12, 2003

Refrigeration System Evacuation Process

When service of the refrigeration system is necessary, care must be giving during the evacuation process to ensure removal of air, moisture, and other non-condensables from the system. To evacuate a system properly, Duke Manufacturing recommends a triple evacuation procedure outlined below. Failure to follow this process could cause poor performance of the refrigeration system.

- Evacuate system to 1500 microns
- Break the vacuum to 2 psig with dry nitrogen, if dry nitrogen is unavailable use the same type of refrigerant as used in the system
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- Evacuate system to 500 microns
- The system is now ready to receive the refrigerant charge per the data plate information.

CAUTION: NEVER USE OXYGEN OR ACETYLENE IN PLACE OF REFRIGERANT AND DRY NITROGEN FOR LEAK TESTING. A VIOLENT EXPLOSION MAY RESULT, CAUSING PERSONAL INJURY OR DEATH.

ALWAYS USE A PRESSURE REGULATOR WHEN USING NITROGEN TO PRESSURE TEST. FAILURE TO DO SO WILL RESULT IN EXTREMELY HIGH PRESSURE, WHICH COULD EXCEED THE BURST PRESSURE OF THE COMPRESSOR OR OTHER SYSTEM COMPONENTS AND RESULT IN PERSONAL INJURY OR DEATH.

MAINTENANCE

STAINLESS STEEL CARE

Cleaning

Stainless steel contains 70-80% iron, which will rust if not properly maintained. It also contains 12-30% chromium, which forms an invisible passive, protective film that shields against corrosion. If the film remains intact, the stainless steel will remain intact. However, if the film is damaged, the stainless steel can break down and rust. To prevent stainless steel breakdown, follow these steps:

CAUTION: Never use any metal tools. Scrapers, files, wire brushes or scouring pads (except for stainless steel scouring pads) will mar the surface.

CAUTION: Never use steel wool, which will leave behind particles that rust.

CAUTION: Never use acid-based or chloride-containing cleaning solutions, which will break down the protective film.

CAUTION: Never rub in a circular motion.

CAUTION: Never leave any food products or salt on the surface. Many foods are acidic. Salt contains chloride.

For routine cleaning, use warm water, mild soap or detergent and a sponge or soft cloth.

For heavy-duty cleaning, use warm water, a degreaser and a plastic, stainless steel or Scotch-Brite pad.

Always rinse thoroughly. Always rub gently in the direction of the steel grain.

Preserving & Restoring

Special stainless steel polishing cleaners can preserve and restore the protective film.

Preserve the life of stainless steel with a regular application of a high quality stainless steel polishing cleaner as a final step to daily cleaning.

If signs of breakdown appear, restore the stainless steel surface. First, thoroughly clean, rinse and dry the surface. Then, on a daily basis, apply a high-quality stainless steel polish according to manufacturer's instructions.

CLEANING THE CONDENSER COIL

WARNING

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

Failure to maintain a clean condenser coil can cause high temperatures and excessive run times. Continuous operation with dirty or clogged condenser coils can result in compressor failure. Neglecting the condenser coil cleaning procedures will void the compressor warranty.

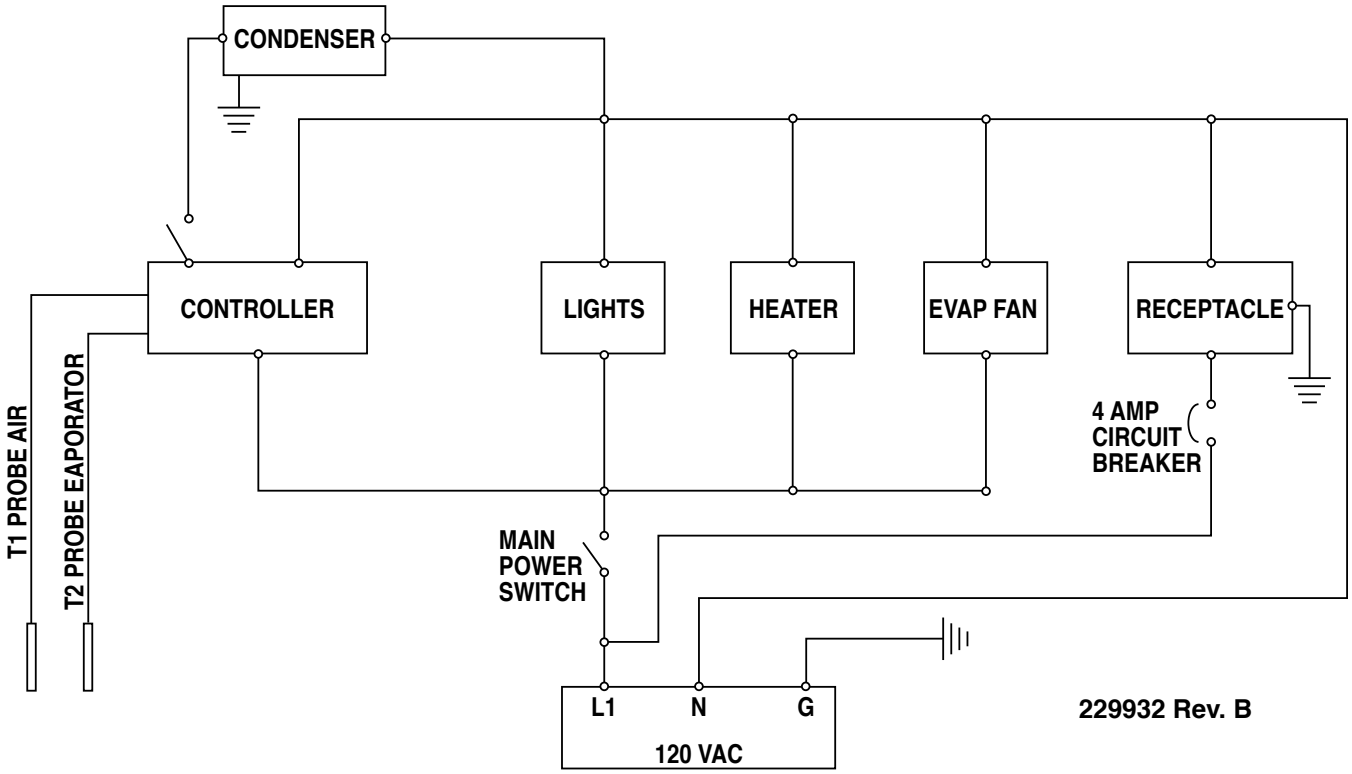
CAUTION: Never use high-pressure water to clean the condenser. High-pressure water can damage electrical components located at or near the condenser coil.

The condenser coil is located at and accessed to the rear of the unit. A Louvered Panel allows access. The condenser coil requires regular cleaning and should be done every 60 days. However, if large amounts of dust and grease accumulate more often, clean the condenser coil every 30 days. For light dust, use a soft, non-wire brush. For heavier dust, use a vacuum cleaner or blow with compressed air.

For heavy grease, use a degreasing agent made specifically for condenser coils on refrigeration units. Spray the degreasing agent on the coil and then blow with compressed air. Never wash the condenser with high-pressure water. High pressure water can damage or bend the cooling fins on the condenser, reducing its efficiency.

Water can also damage the electrical components located near the condenser coil.

WIRING DIAGRAM



CUSTOMER ASSISTANCE

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

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

FOR WARRANTY, PARTS & SERVICE:

DUKE CORPORATE,
CANADA, LATIN AMERICA

2305 N. Broadway
St. Louis, MO 63102
Phone: 314-231-1130
Toll Free: 800-735-3853
Fax: 314-231-2460
service-dispatch@dukemfg.com

DUKE ASIA PACIFIC

Duke Manufacturing
No.3 Building
Lane 28, Yu Lv Road
Malu Town, Jiading District
Shanghai 201801, China
Phone: +86 21 59153525 / 59153526
Fax: +86 21 33600628
service.asiapac@dukemfg.com

DUKE EMEA - EUROPE,
MIDDLE EAST, AFRICA, RUSSIA

Duke Manufacturing CR, s.r.o.
Na Dlouhem 86
Jazlovice, Ricany
Building number DC 4 on the
ProLogis Park Prague D1 West
Prague 251 01
Czech Republic
Phone: +420 323 608 193
Fax: +420 323 608 144
service.emea@dukemfg.com

DUKE EMEA – UK, IRELAND

Phone: +44 (0) 1395 234140
Fax: +44 (0) 1395 234154
service.emea@dukemfg.com

TO ACCESS INTERNET: www.dukemfg.com

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

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