Hoshizaki America, Inc.

Commercial Series
Refrigerated Kitchen Equipment

Models
Refrigerated Prep Table with Raised Rail
Refrigerated Equipment Stand

"A Superior Degree of Reliability"

www.hoshizaki.com

SERVICE MANUAL

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⚠ WARNING

Only qualified service technicians should install and service the appliance. To obtain the name and phone number of your local Hoshizaki Certified Service Representative, visit www.hoshizaki.com. No service should be undertaken until the technician has thoroughly read this Service Manual. Failure to service and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage. Proper installation is the responsibility of the installer. Product failure or property damage due to improper installation is not covered under warranty.

Hoshizaki provides this manual primarily to assist qualified service technicians in the service of the appliance.

Should the reader have any questions or concerns which have not been satisfactorily addressed, please call, send an e-mail message, or write to the Hoshizaki Technical Support Department for assistance.

Phone: 1-800-233-1940; (770) 487-2331
Fax: 1-800-843-1056; (770) 487-3360

E-mail: techsupport@hoshizaki.com

HOSHIZAKI AMERICA, INC.
618 Highway 74 South
Peachtree City, GA 30269
Attn: Hoshizaki Technical Support Department

Web Site: www.hoshizaki.com

NOTE: To expedite assistance, all correspondence/communication MUST include the following information:

- Model Number _____
- Serial Number _____
- Complete and detailed explanation of the problem.

IMPORTANT
This manual should be read carefully before the appliance is serviced. Read the warnings and guidelines contained in this booklet carefully as they provide essential information for the continued safe use, service, and maintenance of the appliance. Retain this booklet for any further reference that may be necessary.

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Important Safety Information

Throughout this manual, notices appear to bring your attention to situations which could result in death, serious injury, damage to the appliance, or damage to property.

⚠ WARNING **Indicates a hazardous situation which could result in death or serious injury.**

NOTICE **Indicates a situation which could result in damage to the appliance or property.**

IMPORTANT **Indicates important information about the use and care of the appliance.**

⚠ WARNING

The appliance should be destined only to the use for which it has been expressly conceived. Any other use should be considered improper and therefore dangerous. The manufacturer cannot be held responsible for injury or damage resulting from improper, incorrect, and unreasonable use. Failure to service and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage.

To reduce the risk of death, electric shock, serious injury, or fire, follow basic precautions including the following:

- Only qualified service technicians should install and service the appliance.
- The appliance must be installed in accordance with applicable national, state, and local codes and regulations. Failure to meet these code requirements could result in death, electric shock, serious injury, fire, or damage to the appliance.
- Appliance is heavy. Use care when lifting or positioning. Work in pairs when needed to prevent injury or damage. Do not lift using the refrigeration area, the top section, or the doors/drawers.
- To reduce the risk of electric shock, do not touch the plug with damp hands.
- Unplug the appliance before servicing.
- The appliance requires an independent power supply of proper capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of proper capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.
- **THE APPLIANCE MUST BE GROUNDED.** The appliance is equipped with a NEMA 5-15 three-prong grounding plug to reduce the risk of potential shock hazards. It must be plugged into a properly grounded, independent 3-prong wall outlet. If the outlet is a 2-prong outlet, it is your personal responsibility to have a qualified electrician replace it with a properly grounded, independent 3-prong wall outlet. Do not remove the ground prong from the plug and do not use an adapter plug. Failure to follow these instructions may result in death, electric shock, or fire.
- The GREEN ground wire in the factory-installed power cord is connected to the appliance. If it becomes necessary to remove or replace the power cord, be sure to connect the power cord's ground wire.
- Do not use an extension cord.

⚠ WARNING, continued

- Do not use an appliance with a damaged power cord. The power cord should not be altered, jerked, bundled, weighed down, pinched, or tangled. Such actions could result in electric shock or fire. To unplug the appliance, be sure to pull the plug, not the cord, and do not jerk the cord.
- Do not splash, pour, or spray water directly onto or into the appliance. This might cause short circuit, electric shock, corrosion, or failure.
- Do not make any alterations to the appliance. Alterations could result in electric shock, injury, fire, or damage to the appliance.
- The appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be properly supervised around the appliance.
- Do not climb, stand, or hang on the appliance or doors/drawers or allow children or animals to do so. Do not climb into the appliance or allow children or animals to do so. Death or serious injury could occur or the appliance could be damaged.
- Be careful not to pinch fingers when opening and closing the doors/drawers or rail cover. Be careful when opening and closing the doors/drawers or rail cover when children are in the area.
- Open and close the doors/drawers and rail cover with care. Opening the doors/drawers or rail cover too quickly or forcefully may cause injury or damage to the appliance or surrounding equipment.
- Do not use combustible spray or place volatile or flammable substances in or near the appliance. They might catch fire.
- Keep the area around the appliance clean. Dirt, dust, or insects in the appliance could cause harm to individuals or damage to the equipment.
- The appliance is designed only for temporary storage of food. Employ sanitary methods. Use for any other purposes (for example, storage of chemicals or medical supplies such as vaccine and serum) could cause deterioration of stored items.
- Do not block air inlets or outlets, otherwise cooling performance may be reduced.
- Do not tightly pack the cabinet. Allow some space between items to ensure good air flow. Also allow space between items and interior surfaces.
- Do not put warm or hot foods in the cabinet. Let them cool first, or they will raise the cabinet temperature and could deteriorate other foods in the cabinet or overload the appliance.
- All foods should be wrapped in plastic film or stored in sealed containers. Otherwise, foods may dry up, pass their smells onto other foods, cause frost to develop, result in poor appliance performance, or increase the likelihood of cross-contamination. Certain dressings and food ingredients, if not stored in sealed containers, may accelerate corrosion of the evaporator, resulting in failure.
- Do not store items near air outlets. Otherwise, items may freeze up and crack or break causing a risk of injury or contamination of other food.

⚠ WARNING, continued

CPT Models

- Do not throw anything onto the shelves or load any single shelf with more than 120 lb. (54.5 kg) of product. They might fall off and cause injury.
- Do not load any single drawer with more than 150 lb. (68 kg) of product. Depending on the weight of product in the drawers, secure the unit as necessary to prevent it from overturning. Do not open more than one drawer at a time.
- The entire rail must always be covered by rail dividers and pans. Otherwise, the appliance will not cool properly. Use only pans up to 6" (15 cm) deep. Do not use damaged rail dividers or pans.
- Ingredients must be pre-chilled to 37°F (3°C) or less before placing in rail.
- Keep the rail cover closed when not actively preparing food.
- The rail is for keeping ingredients cool while preparing food. If not actively preparing food for a long period such as overnight, seal pans with plastic wrap in addition to closing the rail cover. Depending on conditions, the cabinet temperature setting may need to be adjusted to prevent items from freezing. Alternatively, seal ingredients and store them in a refrigerator or freezer.
- For CPT46(-D) models, the anti-tip bracket must be properly installed and adjusted. Otherwise, the unit may tip resulting in injury or damage.

CRES Models

- A minimum of 4" (11 cm) clearance is required between the bottom of the cooking equipment heating element and the appliance top. When setting up cooking equipment, follow the cooking equipment manufacturer's setup procedure. Temperature at the appliance top must not exceed 180°F (82°C). For optimum performance, installation of a heat shield (supplied by others) is recommended.
- For cooking equipment on the cabinet, do not exceed the total maximum weight listed for your model.

Total Maximum Weight for Cooking Equipment on the Cabinet				
CRES36	**CRES49**	**CRES72**	**CRES85**	**CRES98**
700 lb. (318 kg)	700 lb. (318 kg)	1,200 lb. (544 kg)	1,200 lb. (544 kg)	1,500 lb. (680 kg)

- Do not load any single drawer with more than 75 lb. (34 kg) of product. Depending on the weight of product in the drawers, secure the unit as necessary to prevent it from overturning. Do not open more than one drawer at a time.
- All casters on the appliance are lockable. After positioning the appliance in its final location, lock all casters.
- Before servicing or cleaning the appliance, disconnect any cooking equipment on the appliance top and allow to cool.

NOTICE

- Protect the floor when moving the appliance to prevent damage to the floor.
- Keep ventilation openings, in the appliance enclosure or in the built-in structure, clear of obstruction. The factory-installed rear bumpers must be in place to ensure proper rear clearance. Blockage of airflow could negatively affect performance and damage the appliance.
- To prevent deformation or cracks, do not spray insecticide onto the plastic parts or let them come into contact with oil.
- To avoid damage to the gasket, use only the door/drawer handle when opening and closing.
- Do not leave the doors/drawers open.
- To avoid damage to the top seal, do not lift the appliance by the top section or remove the top section.

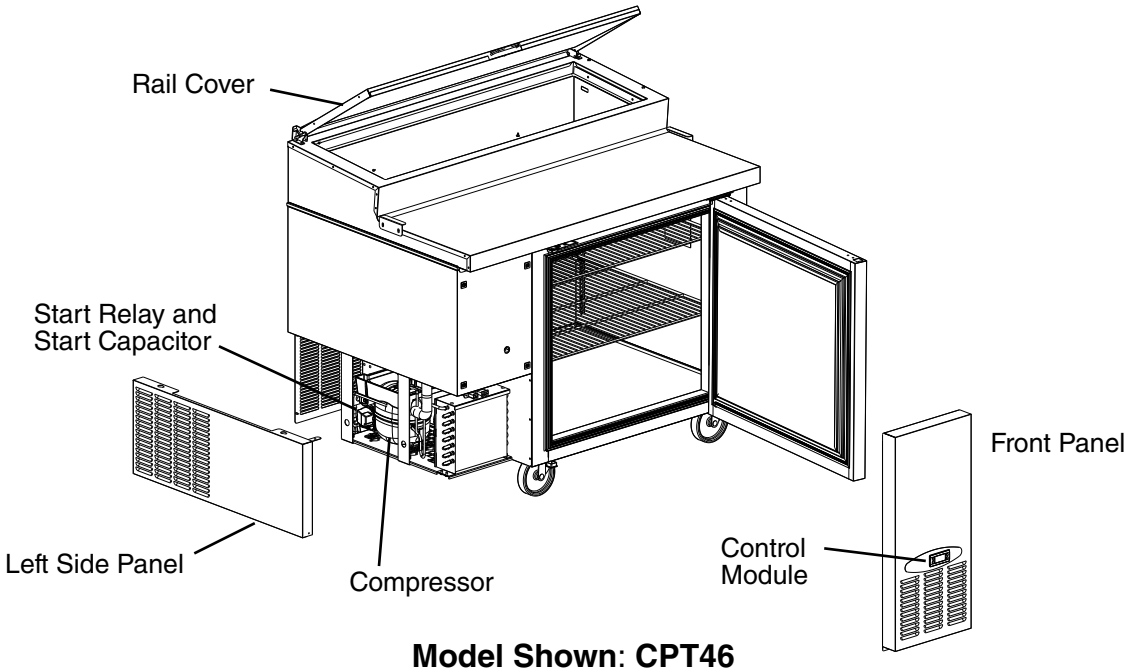
Additional Notice for CPT Models

- Do not allow the appliance to bear any outside weight.
- Do not place anything on top of the rail cover and do not lift the appliance by the rail cover. The rail cover is not designed to bear any outside weight.
- Do not place anything on the air duct panels beneath the pans in the rail. The air duct panels are not load-bearing.

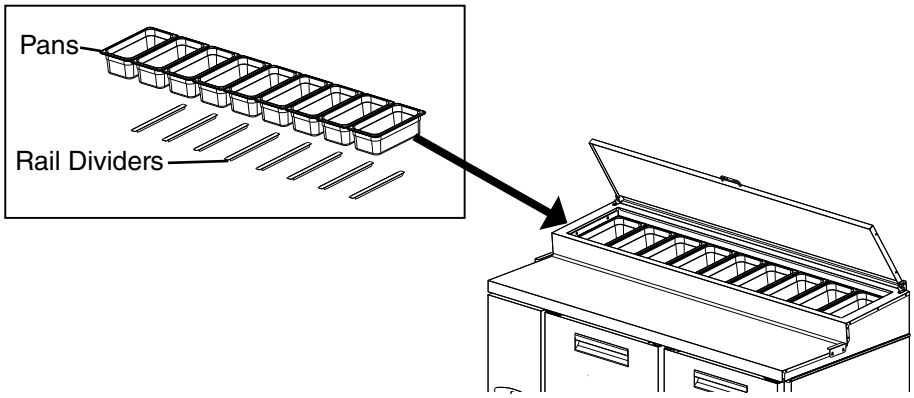
I. Construction and Refrigeration Circuit Diagram

A. Construction

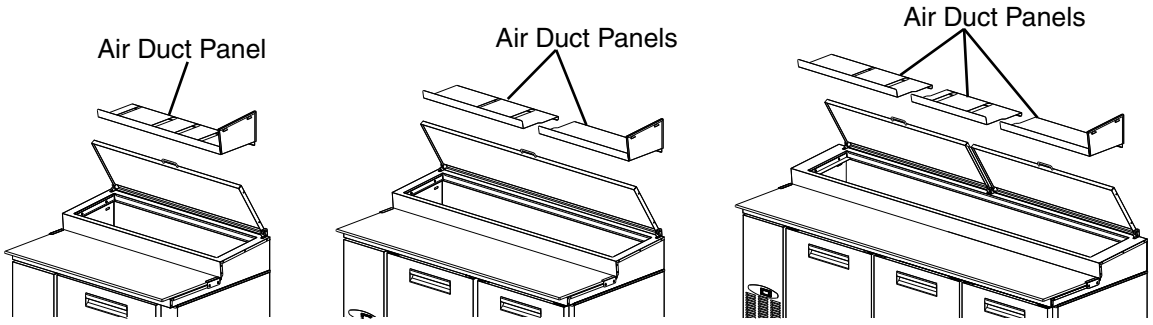
1. CPT



Model Shown: **CPT46**

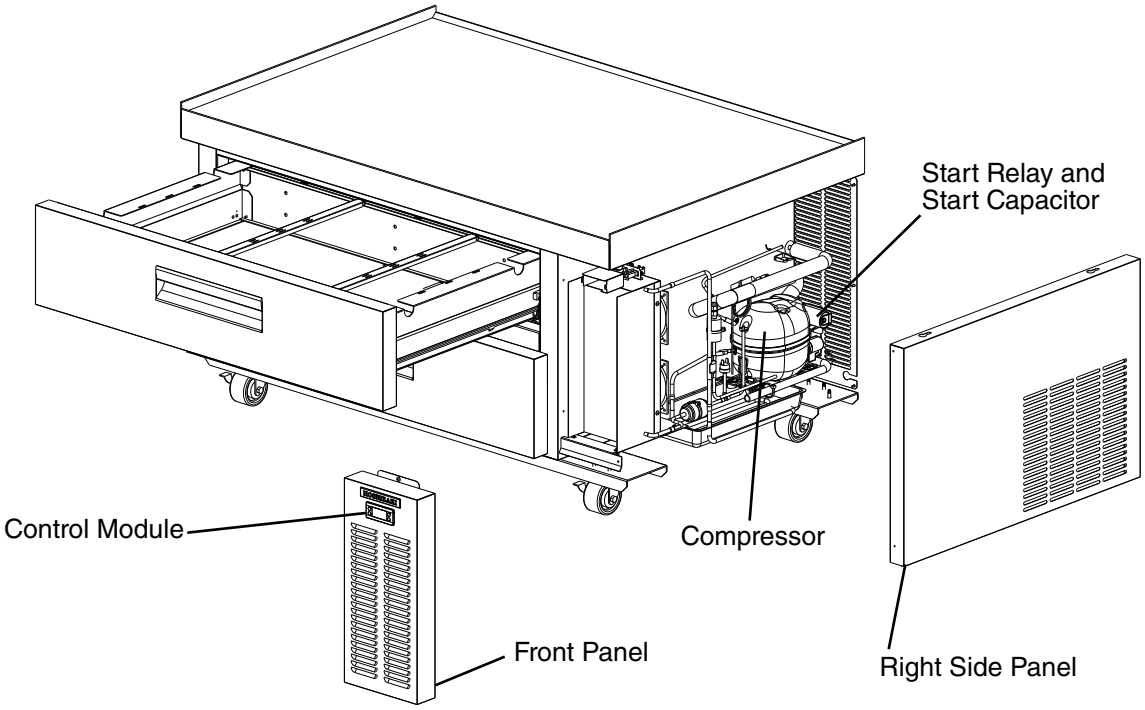


Model Shown: **CPT67**



CPT46 Series **CPT67 Series** **CPT93 Series**

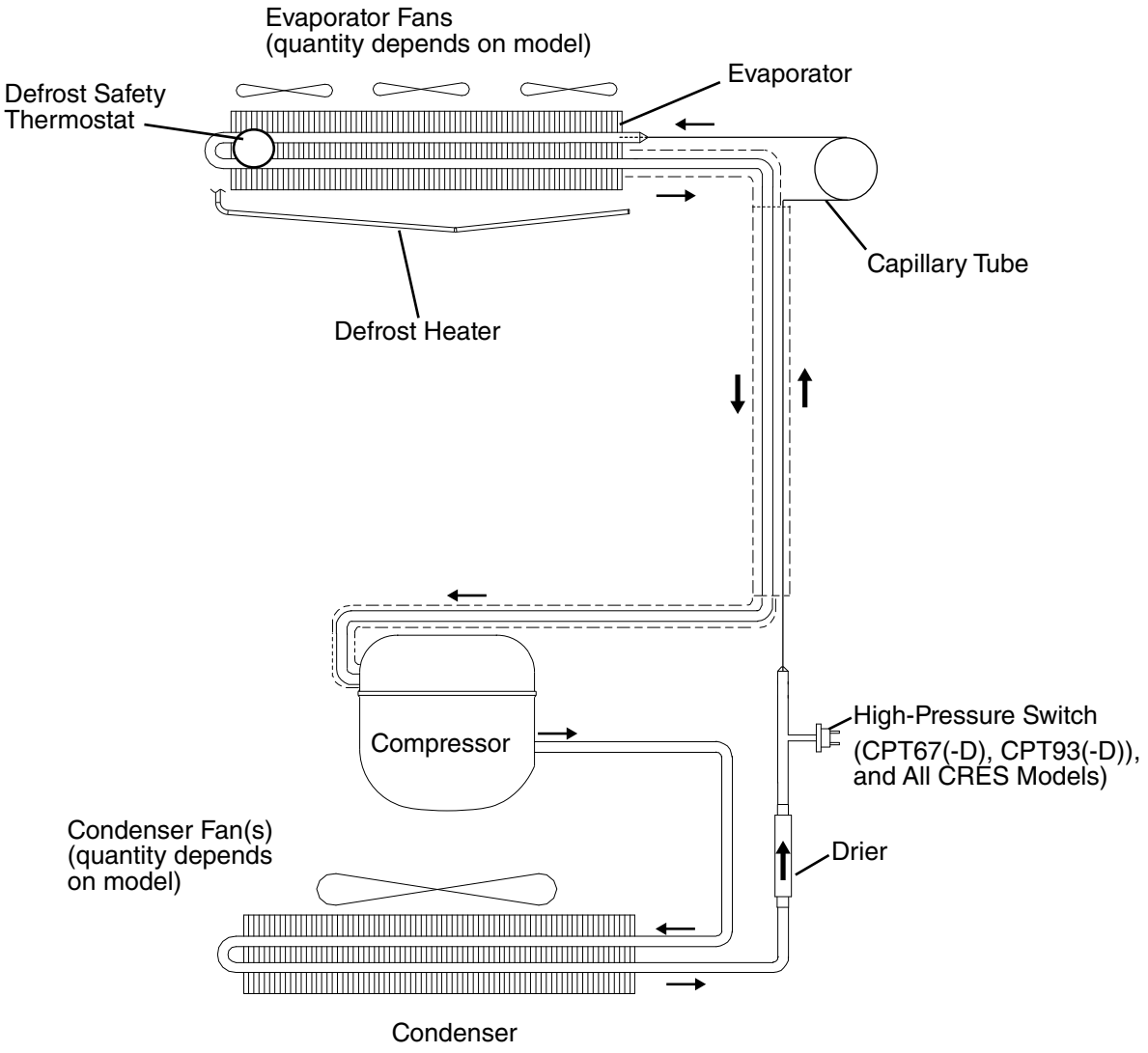
2. CRES



Model Shown: **CRES49**

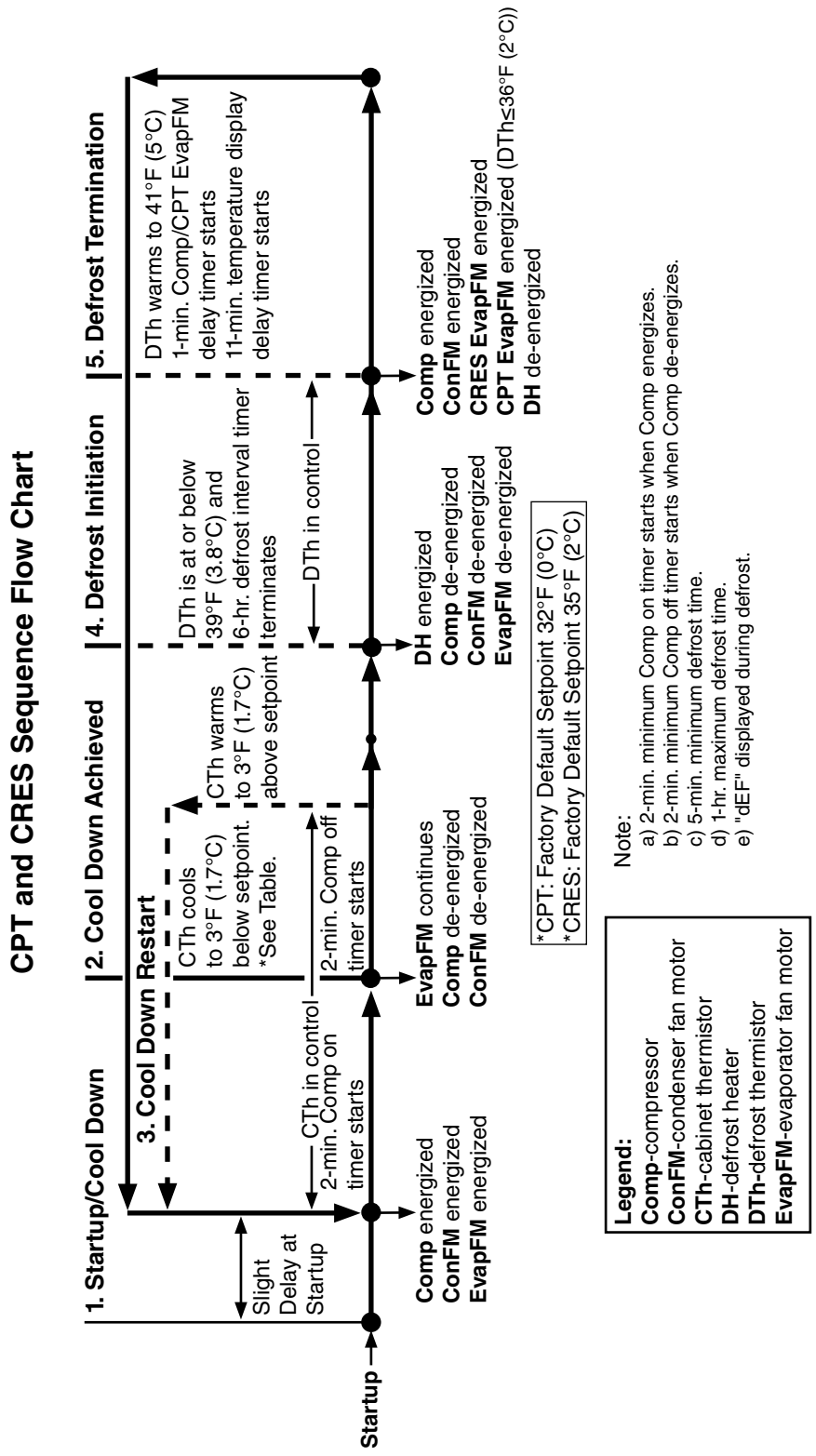
B. Refrigeration Circuit Diagram

1. CPT and CRES Models



II. Sequence of Operation and Service Diagnosis

A. Sequence of Operation Flow Chart



B. Service Diagnosis

⚠ WARNING

- The appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Risk of electric shock. Use extreme caution and exercise safe electrical practices.
- Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
- Make sure all food zones are clean after the appliance is serviced.
- **CRES**: **WARNING! A minimum of 4" (11 cm) clearance is required between the bottom of the cooking equipment heating element and the appliance top.**
- **CRES: WARNING! Temperature at the appliance top must not exceed 180°F (82°C). For optimum performance, installation of a heat shield (supplied by others) is recommended.**
- **WARNING! For cooking equipment on the cabinet, do not exceed the total maximum weight listed for your model.**

Total Maximum Weight for Cooking Equipment on the Cabinet				
CRES36	**CRES49**	**CRES72**	**CRES85**	**CRES98**
700 lb. (318 kg)	700 lb. (318 kg)	1,200 lb. (544 kg)	1,200 lb. (544 kg)	1,500 lb. (680 kg)

NOTICE

- The appliance is not intended for outdoor use.
- The appliance must not be located in a corrosive environment.
- Normal operating ambient temperature must be within:
  CPT 45°F to 86°F (7°C to 30°C)
  CRES 45°F to 100°F (7°C to 37.8°C)
- The appliance must not be located next to ovens, grills, or other high heat producing equipment.
- The appliance must be a minimum of 1" (3 cm) from side walls.
- The factory-installed rear bumpers must be in place to ensure proper rear clearance.
- CPT: A minimum of 10" (25 cm) clearance above the rail must be provided to allow the rail cover to open.

The diagnostic procedure is a sequence check that allows you to diagnose the electrical system and components. Before proceeding, check for correct installation and proper voltage per nameplate. If the display is in alarm, see "III.D. Alarm Safeties."

Note: When checking voltage (115VAC), always choose a white (W) neutral wire to establish a good neutral connection.

CPT Factory Default Temperature Settings:

a) Setpoint: 32°F (0°C).
b) Display Scale: °F.

CRES Factory Default Temperature Settings:

a) Setpoint: 35°F (2°C).

b) Display Scale: °F.

For further details, see "III. Controls and Adjustments."

Note: There is a minimum 2-min. Comp on time and 2-min. Comp off time.

1) Unplug the appliance from the electrical outlet.

2) Remove the front panel.

3) Plug the appliance back into the electrical outlet.

4) Confirm 115VAC at CM L2 (BK or BR) to neutral (W).

5) **Startup/Cool Down–**There is a slight delay, cabinet temperature appears on display and Comp and EvapFM icons turn on. Comp, ConFM, and EvapFM energize.

a) **CM Diagnosis**: Cabinet temperature appears on display. If not, check for 115VAC at CM L2 (BK or BR) to CM N3 neutral (W). If 115VAC is not present, check power cord connections and breaker/fuse. Confirm wiring connections are secure for both CM L2 (BK or BR) (power supply) and CM N3 (W) (neutral). If 115VAC is present and display is off, replace CM.

b) **Comp/ConFM Diagnosis**: Confirm Comp and ConFM energize. If not, check for 115VAC at CM C1 (BR or BK) to neutral (W). If 115VAC is not present at CM C1 (BR or BK) to neutral (W), check CTh status. See "II.C. Thermistor Check." If CTh ohm reading is in proper range, replace CM. If 115VAC is present at CM C1 (BR or BK) to neutral (W), check continuity of HPS (if applicable). If open, allow time for HPS to reset. If HPS does not reset, see "d) HPS Activation" below. If ConFM is energized but Comp is not, check for 115VAC from both sides of Comp external protector to neutral (W). If 115VAC is present on one side and not the other, allow time for Comp external protector to cool and reset. If Comp external protector does not reset, replace Comp external protector. If 115VAC is present on both Comp external protector wires, check Comp start capacitor, start relay, and Comp motor windings. If ConFM is not energized, check ConFM fan blades for binding and motor winding continuity.

If Comp and ConFM are energized and the cabinet does not cool down, check for a restriction in the refrigeration circuit and correct refrigerant charge.

c) **EvapFM Diagnosis**:

1. **CPT**: Confirm EvapFM energizes. If not, check for 115VAC at CM F5 (DBU) to neutral (W). If 115VAC is not present, replace CM. If 115VAC is present, check EvapFM blades for binding and EvapFM continuity.
2. **CRES**: Confirm EvapFM energizes when Comp energizes. If not, check for 115VAC at CM C1 (BR) to neutral (W). If 115VAC is not present, replace CM. If 115VAC is present, check for a loose wire, EvapFM blades binding, and EvapFM continuity.

d) **HPS Activation**: Confirm ConFM is energized and fan blade turns freely. Confirm condenser coil is not clogged or restricted. Confirm there are no restrictions in the refrigeration circuit (drier). Let refrigeration circuit pressures equalize. If HPS does not reset and pressures are equalized, replace HPS. If pressures are not equalized, reclaim refrigerant and diagnose refrigeration circuit restriction.

6) **Cool Down Achieved**–CTh cools to 3°F (1.7°C) below setpoint. EvapFM continues. Comp and ConFM de-energize. **Diagnosis**: Confirm Comp and ConFM de-energize. If not, and Comp and ConFM were energized longer than 2 min., check CTh status. See "II.C. Thermistor Check." If CTh ohm reading is in range and Comp and ConFM were energized longer than 2 min., check for 115VAC at CM C1 (BR or BK) to neutral (W). If 115VAC is present, replace CM.

7) **Defrost–** 6-hr. defrost timer terminates and DTh is at or lower than 39°F (3.8°C), defrost starts. If on, Comp and EvapFM icons turn off. Comp, ConFM, and EvapFM de-energize. The defrost icon turns on and "dEF" is displayed. DH energizes. There is a 5-min. minimum defrost time, 1-hr. maximum defrost time, 6-hr. minimum defrost interval, and 8-hr. maximum defrost interval.

1a) **Time-Initiation**: 6-hr. defrost interval timer terminates. Control module checks DTh. If DTh is at or lower than 39°F (3.8°C), defrost starts. If on, Comp and EvapFM icons turn off. Comp, ConFM, and EvapFM de-energize. Defrost icon turns on and "dEF" is displayed. DH energizes. If DTh is greater than 39°F (3.8°C), defrost is delayed for 2 hrs. (8-hr. defrost interval timer). Once the 8-hr. defrost interval timer terminates, defrost starts regardless of evaporator temperature.

1b) **Manual-Initiation**: To initiate a manual defrost, press and release the manual defrost button on display. If on, Comp and EvapFM icons turn off. Comp, ConFM, and EvapFM de-energize. Defrost icon turns on and "dEF" is displayed. DH energizes.

2) **Defrost-Termination**:

(1) DTh warms to 41°F (5°C). DH de-energizes. 1-min. Comp/EvapFM delay timer and 11-min. temperature display delay timer start. Defrost icon and "dEF" display continue.

(2) 1-min. Comp/EvapFM delay timer terminates. Defrost icon turns off. Comp icon turns on. Comp and ConFM energize. EvapFM on CRES energizes. If DTh is at 36°F (2°C) or lower, EvapFM icon turns on and EvapFM on CPT energizes. "dEF" display continues. 6-hr. defrost interval timer resets.
Note: If DTh is 37°F (3°C) or higher when 1-min. Comp/EvapFM delay timer terminates, CPT EvapFM remains off until evaporator temperature is 36°F (2°C) or lower.

(3) 11-min. temperature display delay timer terminates. Cabinet temperature replaces "dEF."

Defrost Diagnosis:

1) Time-Initiation: Has 6-hr. defrost timer terminated? Before proceeding, confirm DTh status. See "II.C. Thermistor Check." **Manual-Initiation**: Press and release the defrost button.

Check the following:

(1) **CM Diagnosis**: Confirm defrost icon turns on, Comp and EvapFM icons turn off, and "dEF" replaces cabinet temperature on display. If not, replace CM.

(2) **DH Diagnosis**: Confirm DH energizes. If not, check for 115VAC at CM H4 (R) to neutral (W). If 115VAC is not present, replace CM. If 115VAC is present, check DST continuity. If open, let cool and reset. If DST does not close, replace DST. If DST is closed, check DH amp draw and continuity.

(3) **Comp/ConFM/CRES EvapFM Diagnosis**: Confirm Comp, ConFM, and EvapFM de-energize. If not, check for 115VAC at CM C1 (BR or BK) to neutral (W). If 115VAC is present, replace CM.

(4) **CPT EvapFM Diagnosis**: Confirm EvapFM de-energizes. If not, check for 115VAC at CM F5 (DBU) to neutral (W). If 115VAC is present, replace CM.

2) **Defrost-Termination**: There is a 5 min. minimum defrost time and a 1 hr. maximum defrost time. Has 5-min. minimum defrost timer terminated? Confirm DTh status. See "II.C. Thermistor Check."

(1) **CM, DTh, and DH Diagnosis**: If 5-min. minimum defrost timer has terminated, has DTh warmed to 41°F (5°C)? If DTh has not warmed to 41°F (5°C), check DST and DH continuity. Next, check DH amp draw. If DTh is in proper range, DH de-energizes. If not, replace CM. Once DH de-energizes, 1-min. Comp/EvapFM delay timer and 11-min. temperature display delay timer start. Defrost icon and "dEF" display continue. If not, replace CM. If 41°F (5°C) is not achieved within 1 hr., CM terminates defrost.

(2) **Comp/ConFM/CRES EvapFM Diagnosis:** 1-min. Comp/EvapFM delay timer terminates. Comp icon turns on and Comp, ConFM, and CRES EvapFM energize. If not, confirm CTh is warm enough for Comp, ConFM, and CRES EvapFM operation. Next, check for 115VAC at CM C1 (BR or BK) to neutral (W). If 115VAC is not present, check CTh status. "II.C. Thermistor Check." If CTh ohm reading is in proper range, and Comp, ConFM, and CRES EvapFM do not energize, replace CM. If 115VAC is present at CM C1 (BR or BK), check that CRES EvapFM energize. If not, check for loose wiring, fan blades binding, and CRES EvapFM winding continuity. Relace as needed. Next, check for closed HPS. If closed, check Comp start components, Comp external protector, and Comp motor winding continuity. If ConFM is not energized, check ConFM fan blades for binding and motor winding continuity.

(3) **CPT EvapFM Diagnosis**: 1-min. Comp/EvapFM delay timer terminates. If DTh is at 36°F (2°C) or lower, EvapFM icon turns on and CPT EvapFM energizes. If not, confirm that DTh is at 36°F (2°C) or lower. If not, confirm Comp is on and cooling. See "II.B.5)b) Comp/ConFM Diagnosis" and "II.C. Thermistor Check." Once 36°F (2°C) or lower is achieved, check for 115VAC at CM F5 (DBU) to neutral (W). If 115VAC is not present, replace CM. If 115VAC is present, and CPT EvapFM is not energized, check CPT EvapFM blades for binding and CPT EvapFM winding continuity.

(4) **11-min. temperature display delay timer terminates**: "dEF" is replaced by cabinet temperature on display. If not, replace CM.

Legend: **CM**–control module; **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermistor; **DH**–defrost heater; **DST**–defrost safety thermostat; **DTh**–defrost thermistor; **EvapFM**–evaporator fan motors; **HPS**–high-pressure switch

C. Thermistor Check

The cabinet thermistor is used for cabinet temperature control and the defrost thermistor is used for defrost cycle initiation (39°F (3.8°C), defrost termination (41°F (5°C), and EvapFM initiation after defrost (36°F (2°C) or lower). Thermistor resistance varies depending on temperature. The control module monitors the thermistors to control system operation.
No adjustment is required.

To check thermistor resistance, follow the steps below.

1) Unplug the appliance.
2) Remove the front panel.
3) Disconnect and remove the thermistor in question.
4) Immerse the thermistor sensor portion in a glass containing ice and water for 2 to 3 min.
5) Check the resistance between the wires at the thermistor connector. Normal reading is within 16.0 to 16.7 kΩ. If outside the normal reading, replace the thermistor.
6) Reconnect and replace the thermistor in its correct position. See "IV.B. Component Service Information."
7) Plug the appliance back in.

D. Diagnostic Table

Check for correct appliance installation per the instruction manual and proper voltage per appliance nameplate.

1. Appliance Not Cooling

Appliance Not Cooling - Possible Cause	
1. Power Supply	a) Unplugged, blown fuse, or tripped or defective circuit breaker.
	b) Loose connection.
	c) Not within specifications.
2. Power Cord and Plug	a) Loose connection.
	b) Defective.
3. Wiring	a) Loose connection or open.
	b) Faulty.
4. Control Module See "III.D. Alarm Safeties."	a) In alarm or "- - -" shown on display module on models with remote display module.
	b) Defective.
5. Compressor External Protector	a) Dirty condenser.
	b) Condenser fan not operating.
	c) Defective.
	d) Start relay defective.
	e) Low charge.
	f) Start capacitor (if applicable) defective.
6. Compressor	a) Defective.
7. Condenser	a) Dirty.
8. Evaporator Fan	a) Defective.
	b) Fan blade binding.
9. Evaporator	a) Dirty or frozen up. See "2. Evaporator is Frozen Up."
10. Refrigerant/Refrigerant Lines	a) Gas leak.
	b) Refrigerant lines or components restricted.
11. High-Pressure Switch CPT67(-D), CPT93(-D), and all CRES Models	a) Dirty condenser.
	b) Ambient temperature too warm.
	c) Condenser fan not operating.
	d) Refrigerant overcharge.
	e) Refrigerant lines or components restricted.
	f) Defective.
12. Defrost Heater	a) Control module defective.
13. Rail Air Duct Panels CPT Models	a) Misaligned.
	b) Missing.

2. Evaporator is Frozen Up

Evaporator is Frozen Up - Possible Cause	
1. Evaporator	a) Dirty.
2. Evaporator Fan Motor	a) Defective.
	b) Fan blade binding.
	c) Defrost thermistor defective.
	d) Control module defective.
3. Defrost Thermistor	a) Out of position or defective.
4. Control Module	a) Defective.
5. Refrigerant Charge/Refrigerant Lines	a) Low.
	b) Component restriction (cap tube, drier).
6. Defrost Heater	a) Defective.
7. Defrost Timer	a) Defective.
8. Defrost Safety Thermostat	a) Defective.

3. Defrost Fails to Initiate or Terminate

Defrost Fails to Initiate - Possible Cause	
1. Defrost Thermistor (Confirm DTh status. See "II.C. Thermistor Check.")	a) Evaporator temperature 39°F (3.8°C) or lower not achieved. See "1. Appliance Not Cooling."
	b) Out of position or defective.
2. Control Module	a) Defective.
Defrost Fails to Terminate - Possible Cause	
1. Defrost Thermistor (Confirm DTh status. See "II.C. Thermistor Check.")	a) Evaporator temperature 41°F (5°C) not achieved.
	b) Defective.
2. Defrost Heater	a) Defrost safety thermostat defective.
	b) Defective.
3. Control Module	a) Defective.

III. Controls and Adjustments

A. Control Module

When the power cord is plugged in there is a slight delay, then the current cabinet temperature is displayed. From the control module, the cabinet setpoint and temperature display scale can be changed.

All models are pretested and factory set.

NOTICE
• The control module is fragile, handle very carefully. • Do not change wiring and connections. Never misconnect terminals. • Do not short out power supply to test for voltage.

1. Control Module Display Icons

Control Module Icons	
Icon	**Meaning**
	Compressor, condenser fan motor, and CRES evaporator fan motor Compressor running.
	Defrost Appliance is in defrost cycle. See "II.B. Service Diagnosis" for details.
	Evaporator Fan Motor (CPT model only) Evaporator fan motor is running. Evaporator fan motor de-energizes when appliance is in defrost.
	Alarm Appliance is in alarm. See "III.D. Alarm Safeties" for details.

2. Control Module Display Layout

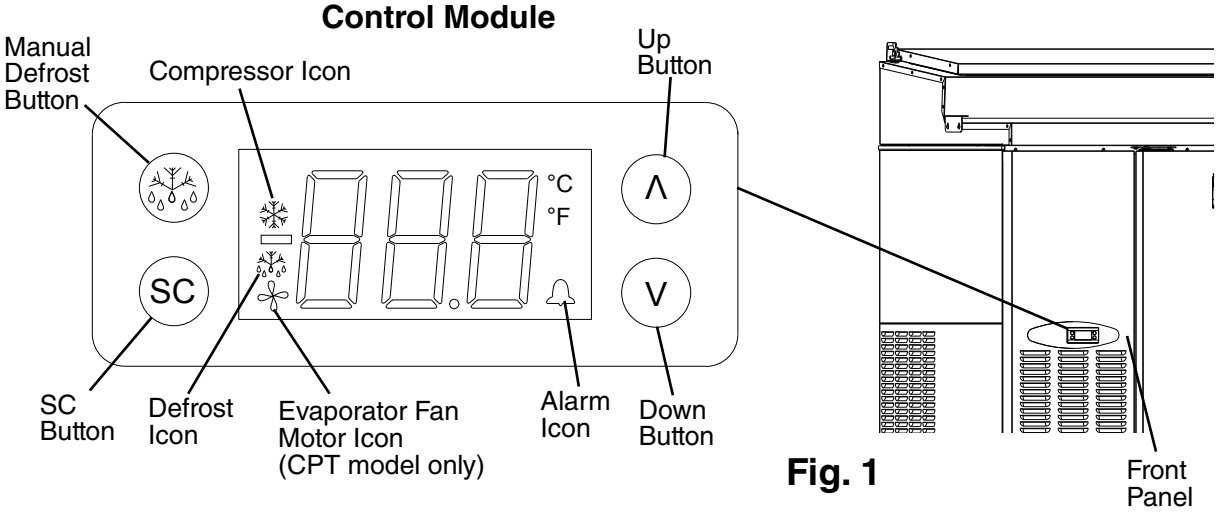


Fig. 1

3. Control Module Rear Layout

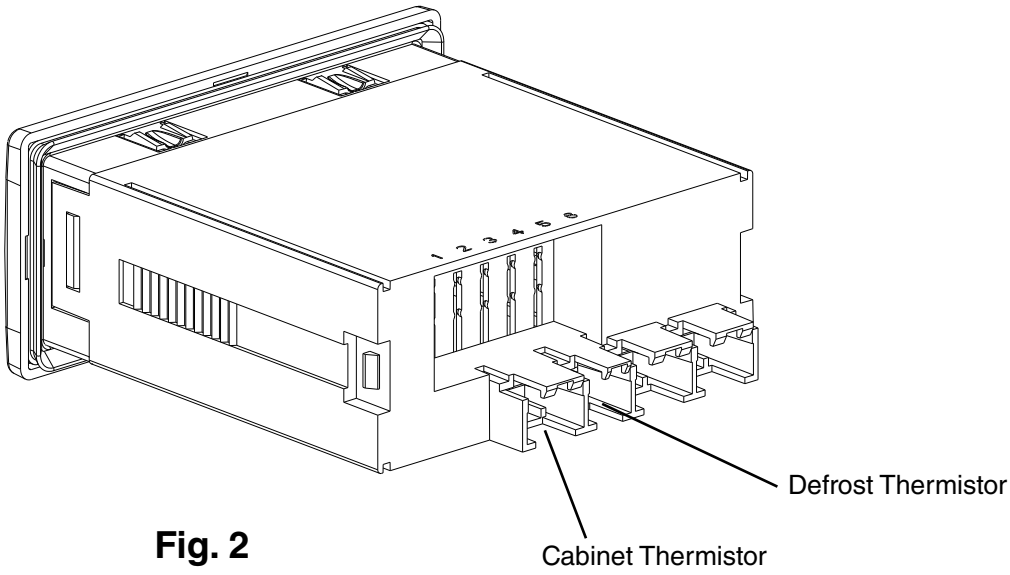
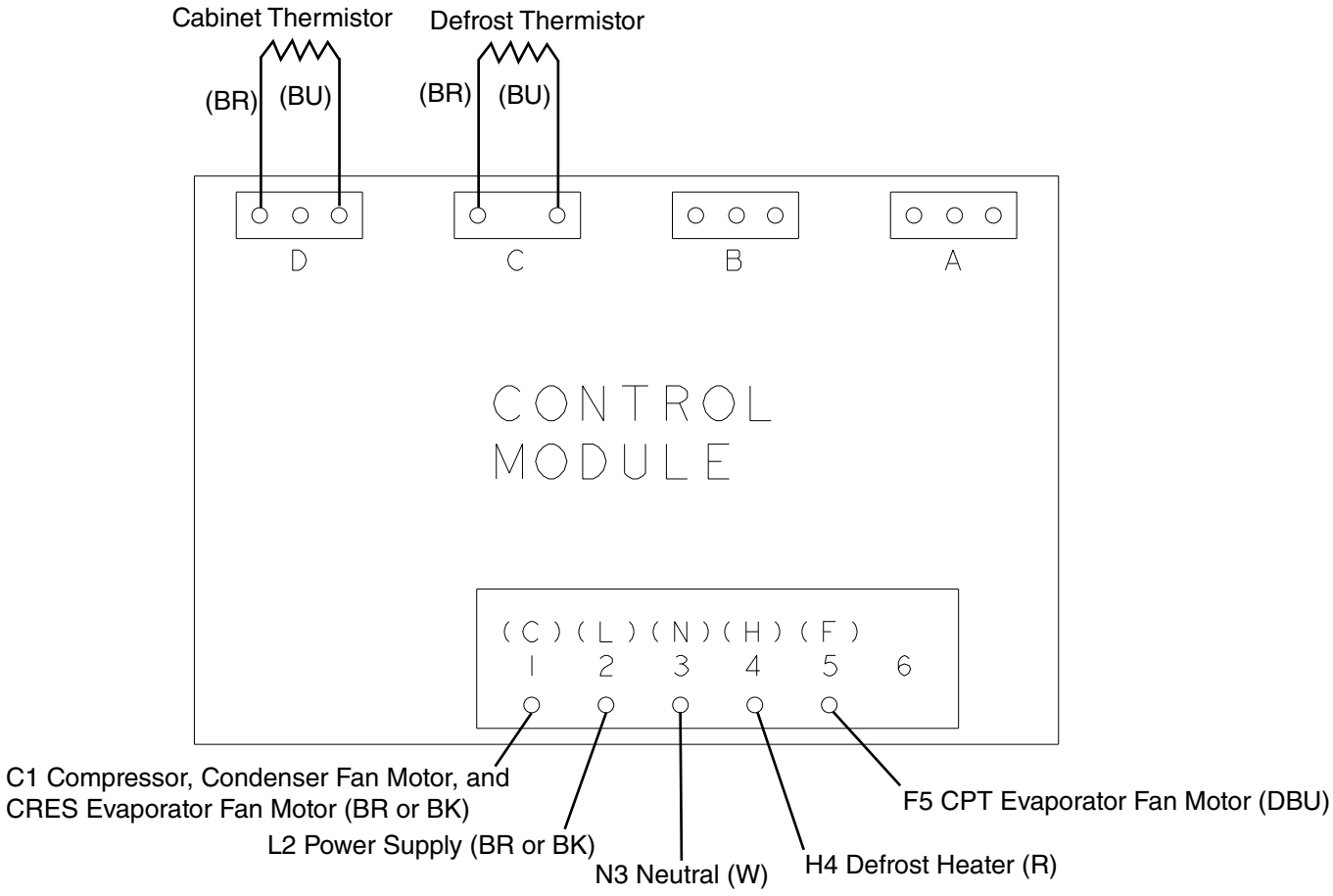


Fig. 2

4. Control Module Electrical Layout



B. Temperature

The default temperature scale is °F, but it can be changed to read °C. To change, see "III.B.3. Changing the Temperature Display Scale (°F or °C)."

1. Default Temperature Settings

a) CPT Setpoint: 32°F (0°C).
b) CRES Setpoint: 35°F (2°C).
c) Temperature Display Scale: °F.

2. Temperature Setpoint

The temperature setpoint is the value for the average cabinet temperature. The temperature differential for the compressor to turn on and off is ±3°F (±1.7°C) of the temperature setpoint. For example, for a temperature setpoint of 32°F (0°C), the compressor comes on at 35°F (2°C), and the compressor goes off at 29°F (-2°C). If necessary, adjust the temperature setpoint as follows:

1) Press and hold the up button briefly, then release. The current temperature setpoint appears.
2) Press the up or down button until the desired value is displayed. After a few sec., the display returns to the current cabinet temperature and the temperature setpoint is saved.

- The temperature setpoint is adjustable between 28°F and 45°F (-2°C and 7°C). The factory default is 32°F (0°C) for CPT and 35°F (2°C) for CRES.

NOTICE! **Do not adjust the temperature setpoint more than 2°F (1°C) at a time. Allow the temperature to stabilize for a minimum of 8 hrs. before making further temperature setpoint adjustments.**

3. Changing the Temperature Display Scale (°F or °C)

To change the temperature display scale, follow the steps below.

1) Press and hold both the up and down buttons for 5 sec. "PAS" appears briefly in the display, then "000" appears.
2) Press the up button to change the display to "001".
3) Press the SC button. "ƚHE" appears in the display. Press the up or down button until "diS" is displayed.
4) Press the SC button. "CFu" appears in the display. Press the SC button again. The current temperature display scale setting appears.
5) Press the up or down button to change the temperature display scale.
6) Press the SC button to save the setting. Wait 1 min. or press the manual defrost button twice to return to the temperature display.

C. Manual Defrost

To initiate a manual defrost, press and release the manual defrost button. The defrost icon and "dEF" appear in the display.

D. Alarm Safeties

Alarm signals are designed to protect the appliance and food product. These alarms give information or warnings in the event the appliance is operating out of acceptable parameters. Should one of the alarms occur, follow the instructions in the table below to address the alarm. The alarm code flashes once every second with audible alarm. To silence the alarm, press and release the upper button.

Alarm Signals		
Alarm Code	**Problem**	**Corrective Action/Reset Details**
E01	Cabinet Thermistor Malfunction Alarm Cabinet thermistor has failed.	Beeps for 10 sec., then silent for 50 sec. To silence the alarm, press and release the up button. Appliance cycles 5 min. on, 5 min. off.
E02	Defrost Thermistor Malfunction Alarm Defrost thermistor has failed.	Beeps for 10 sec., then silent for 50 sec. To silence the alarm, press and release the up button. Appliance cycles on and off with cabinet thermistor.
Hi	High Temperature Alarm Cabinet temperature has remained above 57°F (13.9°C) for more than 2 hr.	Beeps for 10 sec., then silent for 50 sec. To silence the alarm and clear "Hi" from the display, press and release the up button. The alarm icon stays on. Automatically resets when temperature returns to normal.
Lo	Low Temperature Alarm Cabinet temperature has remained below 20°F (-6.5°C) for more than 2 hr.	Beeps for 10 sec., then silent for 50 sec. To silence the alarm and clear "Lo" from the display, press and release the up button. The alarm icon stays on. Automatically resets when temperature returns to normal.
UHi	High-Voltage Alarm (135VAC±5% or more)	The compressor de-energizes if voltage protection operates. The voltage safeties automatically reset when voltage is corrected.
ULo	Low-Voltage Alarm (96VAC±5% or less)	

E. Safety Devices

1. Compressor External or Internal Protector

If combined temperature/amperage value is above the limit specified by the compressor manufacturer, the compressor protector operates independently to turn off the compressor. The compressor protector de-energizes the compressor until the temperature/amperage value returns to an acceptable level.

2. High-Pressure Switch (CPT67(-D), CPT93(-D) and all CRES models)

If pressure on the high-side of the appliance exceeds Hoshizaki specifications, the high-pressure switch activates and interrupts the compressor circuit, de-energizing the compressor until the pressure returns to an acceptable level.

If both the compressor and condenser fan motor are off, it is most likely the appliance is off or the high-pressure switch has opened. See "VIII.B. Wiring Diagrams."

IV. Refrigeration Circuit and Component Service Information

⚠ WARNING

- This appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- To reduce the risk of electric shock, do not touch the plug with damp hands.
- Unplug the appliance from the electrical outlet before servicing.
- Make sure all food zones in the appliance are clean after the appliance is serviced. For cleaning procedures, see the instruction manual.

A. Refrigeration Circuit Service Information

⚠ WARNING

- Repairs requiring the refrigeration circuit to be opened must be performed by properly trained and EPA-certified service personnel.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

NOTICE

- Always recover the refrigerant and store it in an approved container. Do not discharge the refrigerant into the atmosphere.
- Do not leave the system open for longer than 15 min. when replacing or servicing parts. The Polyol Ester (POE) oils used in R-134a appliances can absorb moisture quickly. Therefore it is important to prevent moisture from entering the system when replacing or servicing parts.
- Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

1. Refrigerant Recovery

No refrigerant access valves are provided on this appliance. Using proper refrigerant practices, utilize a temporary tap-line valve on the high side to recover the refrigerant. Store the refrigerant in an approved container. Do not discharge the refrigerant into the atmosphere.

After recovery is complete, replace the tap-line valve with a proper, permanent access valve.

2. Brazing

⚠ WARNING

- R-134a itself is not flammable at atmospheric pressure and temperatures up to 212°F (100°C).
- R-134a itself is not explosive or poisonous. However, when exposed to high temperatures (open flames), R-134a can be decomposed to form hydrofluoric acid and carbonyl fluoride both of which are hazardous.
- Do not use silver alloy or copper alloy containing arsenic.
- Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

1) Braze all fittings while purging with nitrogen gas flowing at a pressure of 3 to 4 PSIG.

NOTICE

- Always install a new drier every time the sealed refrigeration system is opened. Do not replace the drier until after all other repair or replacement has been made. Install the new drier with the arrow on the drier in the direction of the refrigerant flow.
- When brazing, protect the drier by using a wet cloth to prevent the drier from overheating. Do not allow the drier to exceed 250°F (121°C).

2) Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-134a as a mixture with pressurized air for leak testing.

3. Evacuation and Recharge (R-134a)

1) Attach a vacuum pump to the system. Be sure the high-side charging hose is connected to the field-installed high-side access valve.

IMPORTANT

The vacuum level and vacuum pump may be the same as those for current refrigerants. However, the rubber hose and gauge manifold to be used for evacuation and refrigerant charge should be exclusively for POE oils.

2) Turn on the vacuum pump, then open the high-side valve on the gauge manifold. Never allow the oil in the vacuum pump to flow backwards.

3) Allow the vacuum pump to pull down to a 29.9" Hg vacuum. Evacuating period depends on pump capacity.

4) Close the high-side valve on the gauge manifold.

5) Disconnect the gauge manifold hose from the vacuum pump and attach it to a refrigerant service cylinder. Remember to loosen the connection and purge the air from the hose. See the nameplate for the required refrigerant charge. Hoshizaki recommends only virgin refrigerant or reclaimed refrigerant which meets the requirements of ARI Standard 700 (latest edition) be used.

6) A liquid charge is recommended when charging an R-134a system. Place the service cylinder on the scales; if the service cylinder is not equipped with a dip tube, invert the service cylinder, then place it on the scales. Open the high-side valve on the gauge manifold.

7) Allow the system to charge with liquid until the proper charge weight is met.

8) Close the high-side valve on the gauge manifold, then close the refrigerant access valve (if applicable). Disconnect the gauge manifold hose.

9) Cap the access valve to prevent a possible leak.

B. Component Service Information

NOTICE
When replacing a component listed below, see the notes to help ensure proper operation.

Component	Notes
Compressor	Install a new start relay and compressor external protector. **WARNING! To reduce the risk of electric shock, be sure to reconnect the compressor's ground wire.**

C. CPT Door Reversal

This appliance is provided with a cabinet design which, after being delivered to the installation location, permits changing of the door swing from left to right or right to left. To change the door swing, follow the steps below. Example shows change from right hinged to left hinged.

⚠ WARNING

- Wear eye protection when reversing the doors.
- Keep fingers away from edge of upper hinge bracket. Spring cartridge can cause the upper hinge bracket to move suddenly with extreme force.

1) Make sure the appliance is unplugged from the electrical outlet and the casters are locked.
2) Open the door to the fully open position, then remove the inner screw from the upper hinge bracket. See Fig. 3.
3) Close the door. **WARNING! Keep away from upper hinge bracket. Upper hinge bracket kicks out when door is closed.** See Fig. 4. Remove the outer screw from the upper hinge bracket.

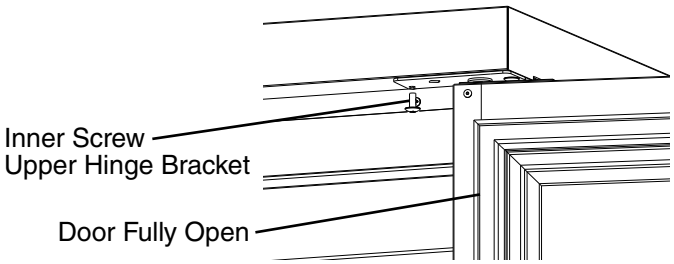


Fig. 3

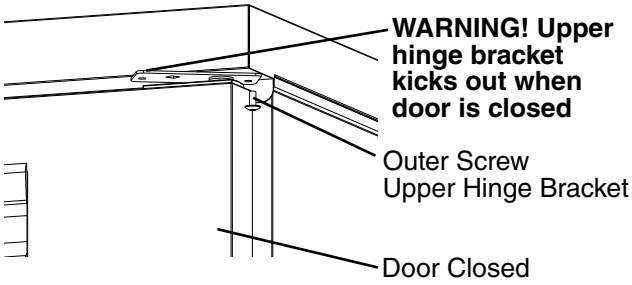


Fig. 4

4) While maintaining a hold on the door, remove the lower hinge bracket. See Fig. 5. Leave the thrust-washer in place.
5) Pull out the bottom of the door slightly and gently remove the door from the appliance.
6) Remove the upper hinge bracket from the spring cartridge. See Fig. 6.

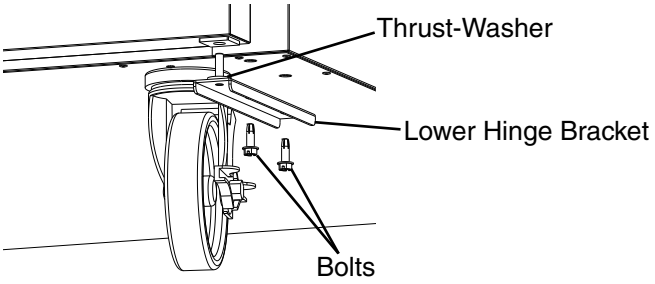


Fig. 5

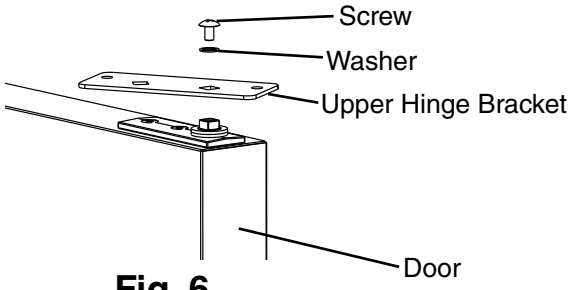


Fig. 6

7) Remove the filler cap, filler screws, and spring cartridge. See Fig. 7. Leave the thrust-washers in place on the spring cartridge. ***NOTICE!*** **Spring cartridge may be difficult to remove. Be careful not to damage the finish.**

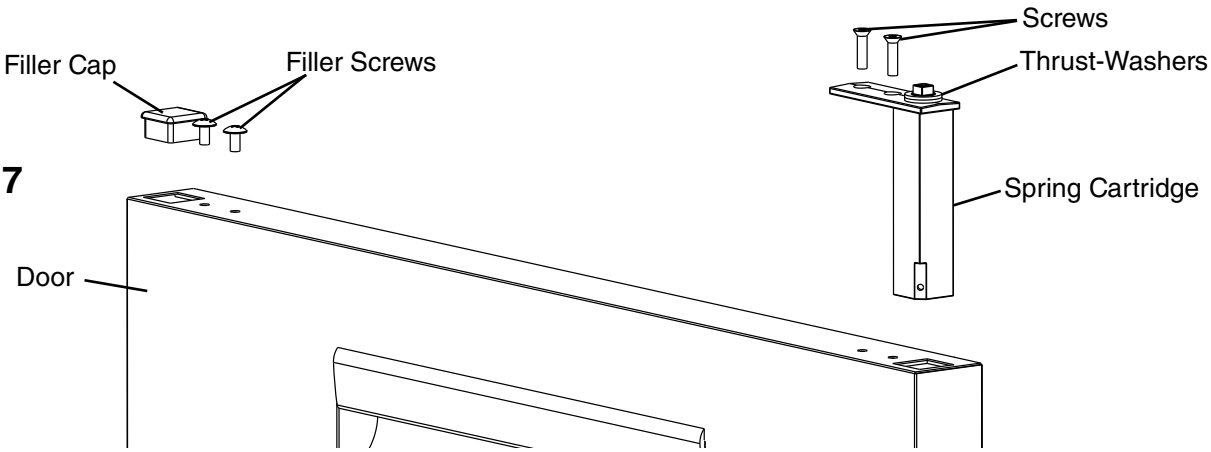


Fig. 7

8) Clear material from the spring cartridge hole to allow for spring cartridge installation. Reinstall the filler cap, filler screws, and spring cartridge on the opposite side of the door. See Fig. 8.

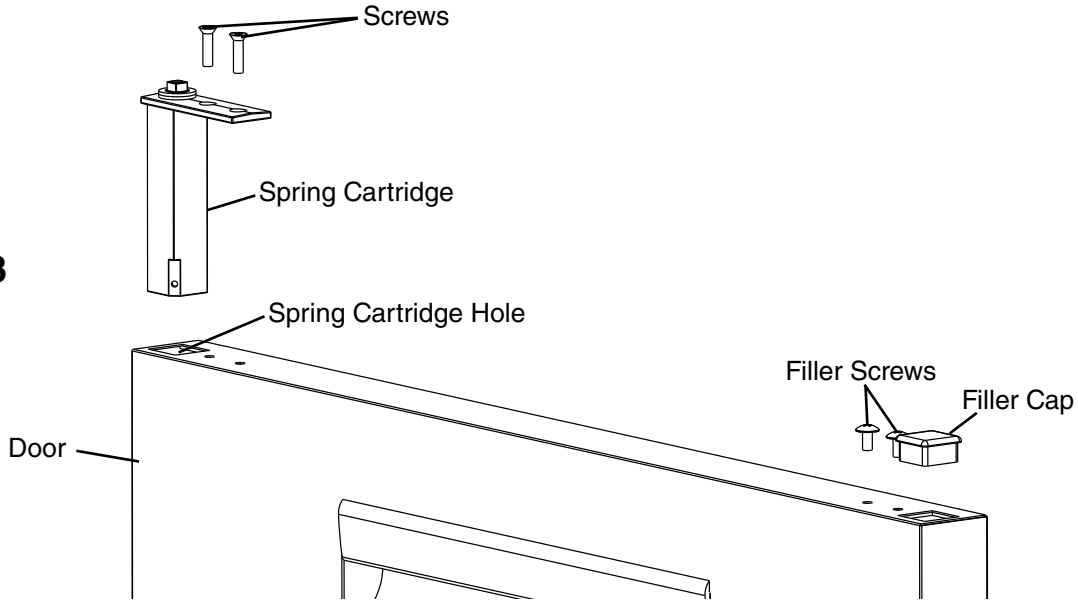


Fig. 8

9) Make sure the thrust-washers are in place on the spring cartridge, then install the upper hinge bracket onto the spring cartridge. See Fig. 9. The upper hinge bracket should be canted out towards the center as shown with the screw holes towards the back of the appliance.

10) Remove the filler cap and nylon bearing from the bottom of the door. See Fig. 10. Reinstall on the opposite side.

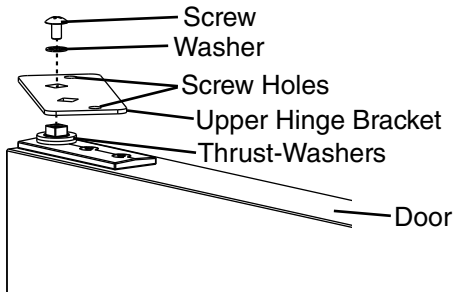


Fig. 9

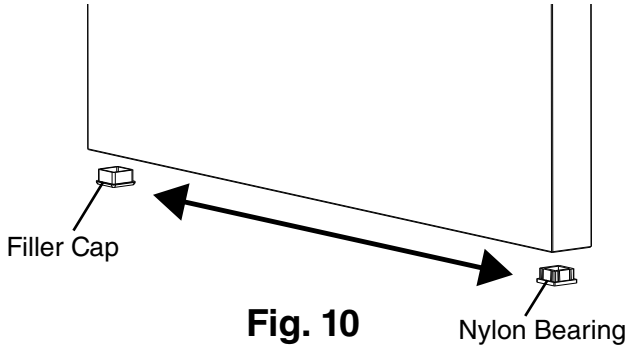


Fig. 10

11) Move the door into position and maintain a hold on the door. Make sure the thrust-washer is in place, then install the lower hinge bracket. Do not tighten the bolts yet. Start each bolt for a few threads only and leave loose. See Fig. 11.

12) Install the outer screw into the upper hinge bracket. Do not tighten the screw yet. Start the screw for a few threads only and leave loose. See Fig. 12. Note: The door being reversed must be in the closed position. However, the adjoining door may be opened for ease of access.

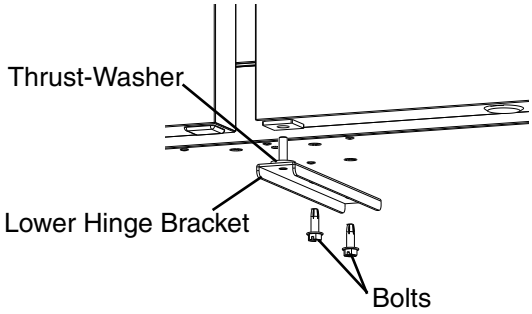


Fig. 11

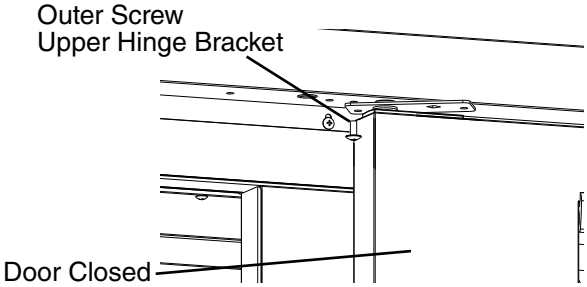


Fig. 12

13) Open the door to the fully open position.

14) Rotate the upper hinge bracket inward into position using channel locks. See Fig. 13. ***NOTICE!*** **Be careful not to damage the finish.** Install the inner screw into the upper hinge bracket.

15) Tighten all fasteners.

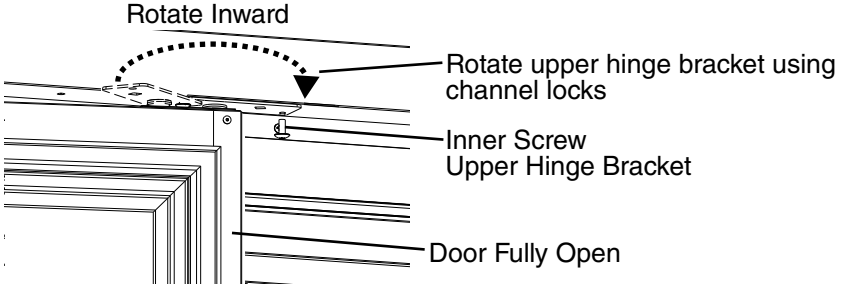


Fig. 13

V. Maintenance

The maintenance schedule below is a guideline. More frequent maintenance may be required depending on the appliance's environment, and local sanitation regulations.

⚠ WARNING

- Unplug the appliance before performing maintenance to prevent electric shock or injury by moving parts. To reduce the risk of electric shock, do not touch the plug with damp hands.
- Before servicing: Move all foods into another clean refrigerator or freezer.
- CRES: Before performing maintenance, disconnect any cooking equipment on the appliance top and allow to cool.

Maintenance Schedule		
Frequency	**Area**	**Task**
Twice a Year	CRES Condenser	Inspect. Clean if necessary by using a brush or vacuum cleaner. More frequent cleaning may be required depending on location.
Yearly	CPT Condenser	

Power Supply Connection

If the plug or power cord is damaged, contact your local Hoshizaki service representative or local Hoshizaki distributor immediately and ask for repairs.

VI. Preparing the Appliance for Periods of Non-Use

When shutting down the appliance for more than one week, follow the instructions below.

⚠ WARNING
When preparing the appliance for long storage, prevent the doors/drawers from closing to reduce the risk of children getting trapped.

NOTICE
When preparing the appliance for long storage, clean the appliance. See the instruction manual for cleaning details.

1) Before shutting down the appliance, move all foods into another clean refrigerator or freezer.
2) Unplug the appliance. **WARNING! To reduce the risk of electric shock, do not touch the plug with damp hands.**

VII. Disposal

When disposing of the appliance, follow the instructions below.

⚠ WARNING
When preparing the appliance for disposal, remove the doors/drawers to reduce the risk of children getting trapped. Leave the shelves in place so that children may not easily climb inside.

The appliance contains refrigerant and must be disposed of in accordance with applicable national, state, and local codes and regulations. Refrigerant must be recovered by properly certified service personnel.

VIII. Technical Information

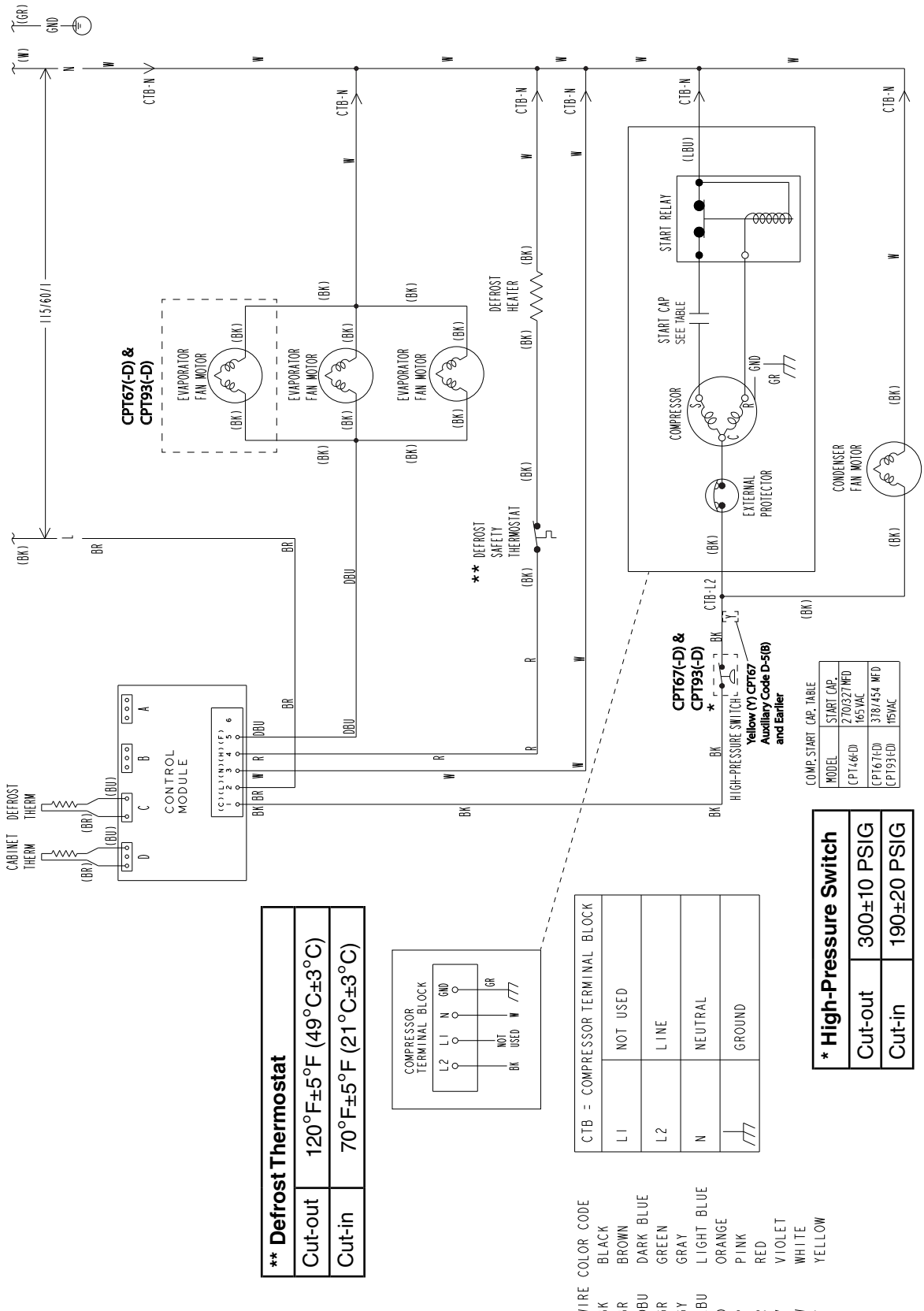
A. Electrical and Refrigerant Data

Model	AC Supply Voltage	Amperes	Design Pressure (PSIG)		Refrigerant (oz.)
			HIGH	LOW	134a
CPT46(-D)	115/60/1	3.7	290	120	6.5
CPT67(-D), CPT93(-D)	115/60/1	5.5	290	120	11.6
CRES36	115/60/1	4.3	330	120	8.5
CRES49	115/60/1	3.7	330	120	8.5
CRES72	115/60/1	4.3	330	120	8.5
CRES85	115/60/1	4.3	330	120	8.5
CRES98	115/60/1	4.3	330	120	8.5

See the nameplate for electrical and refrigeration specifications. The nameplate is located inside the cabinet.
We reserve the right to make changes in specifications and design without prior notice.

B. Wiring Diagrams

1. CPT46(-D), CPT67(-D), CPT93(-D)

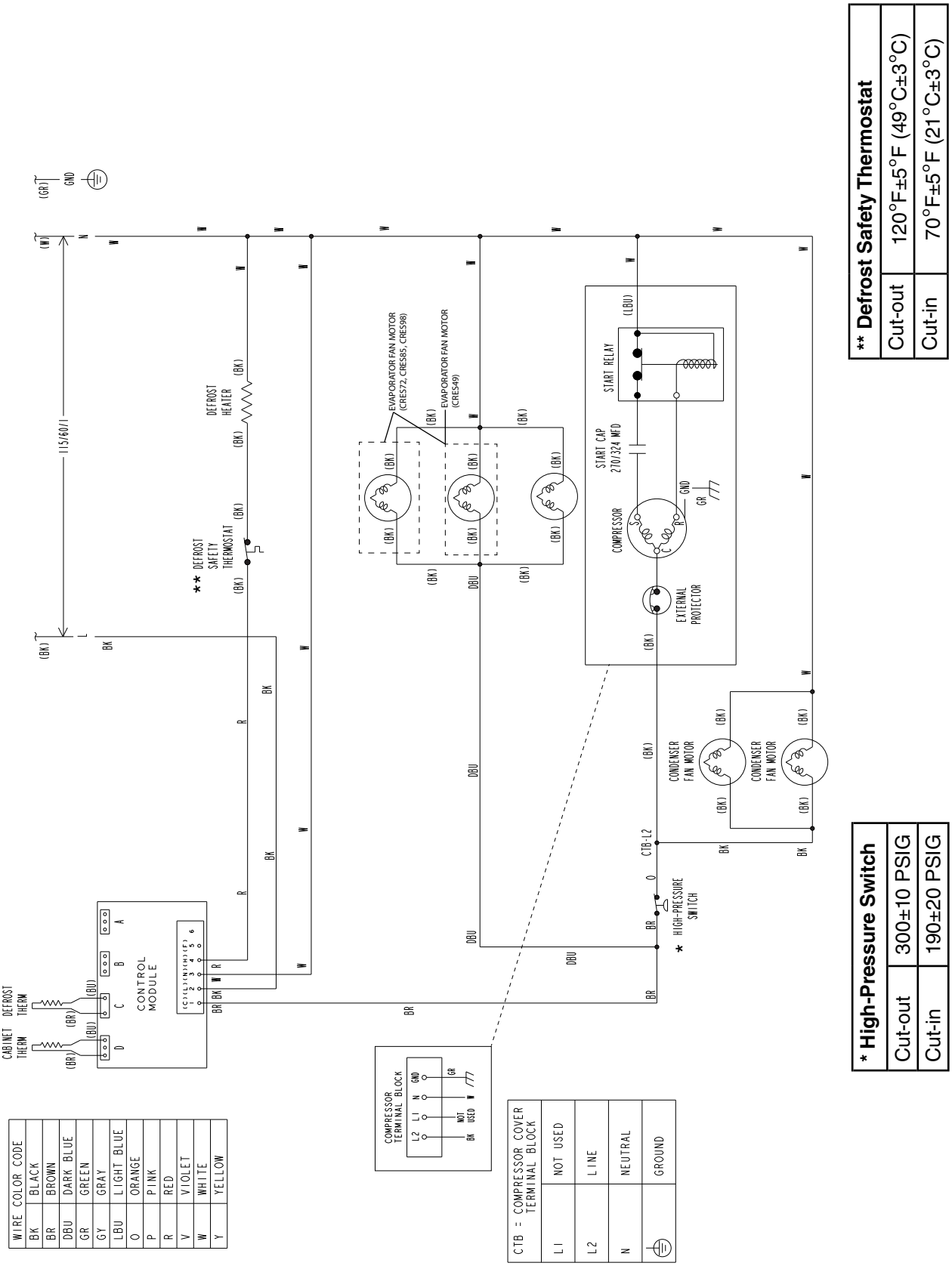


** Defrost Thermostat	
Cut-out	120°F±5°F (49°C±3°C)
Cut-in	70°F±5°F (21°C±3°C)

COMP. START CAP. TABLE	
MODEL	START CAP.
CPT46(D)	270/327 MFD 165 VAC
CPT67(D) CPT93(D)	378/454 MFD 115VAC

* High-Pressure Switch	
Cut-out	300±10 PSIG
Cut-in	190±20 PSIG

2. CRES36, CRES49, CRES72, CRES85, CRES98



** Defrost Safety Thermostat	
Cut-out	120°F±5°F (49°C±3°C)
Cut-in	70°F±5°F (21°C±3°C)

* High-Pressure Switch	
Cut-out	300±10 PSIG
Cut-in	190±20 PSIG