HOSHIZAKI

Service Manual

Steelheart Series
Refrigerated Kitchen Equipment

Models
Refrigerated Prep Table with Raised Rail
PR67B-Z

hoshizakiamerica.com

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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.hoshizakiamerica.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

E-mail: tech-support@hoshizaki.com

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

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 manual carefully as they provide essential information for the continued safe use, service, and maintenance of the appliance. Retain this manual for any further reference that may be necessary.

CONTENTS

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.

	**R-290 Class A3 Flammable Refrigerant Used**
⚠ DANGER	**Indicates a hazardous situation that, if not avoided, will result in death or serious injury.**
⚠ WARNING	**Indicates a hazardous situation that, if not avoided, could result in death or serious injury.**
NOTICE	**Indicates a situation that, if not avoided, could result in damage to the appliance or property.**
IMPORTANT	**Indicates important information about the use and care of the appliance.**

⚠ DANGER

Risk of Fire or Explosion
Flammable Refrigerant Used

- Only qualified service technicians should install and service the appliance. Qualified service technicians are those having the appropriate technical training and experience necessary to be aware of hazards to which they are exposed in performing a task and of measures necessary to minimize the danger to themselves or other persons.
- No service should be undertaken until the technician has thoroughly read this Service Manual. All safety precautions must be followed.
- This appliance to be installed in accordance with the Safety Standard for Refrigeration Systems ANSI/ASHRAE 15.
- Follow handling instructions carefully in compliance with national regulations.
- Do not use mechanical devices or other means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.
- Servicing shall be done by trained service personnel with certified competence in handling flammable refrigerants to minimize the risk of possible ignition due to incorrect parts or improper service.
- Component parts shall be replaced with like components so as to minimize the risk of possible ignition due to incorrect parts.
- Dispose of properly in accordance with federal or local regulations.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.
- Do not damage the refrigeration circuit.
- See nameplate for R-290 refrigerant charge:
  - If greater than 114 g (4 oz.), do not install in public corridor or lobby.
  - If greater than 152 g (5.3 oz.), do not install within 6 m (20 ft) of open flame.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

⚠ DANGER continued

- Do not place any potential ignition sources in or near the appliance.
- Keep clear of obstruction all ventilation openings in the appliance enclosure or in the structure for building-in.
- No potential sources of ignition are to be used in the searching for or detection of refrigerant leaks.
- Do not use electrical appliances inside the appliance unless they are of the type recommended by the manufacturer.
- Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Risque D'Incendie ou D'Explosion
Fluide Frigorigène Inflammable Utilisé

- Seuls des techniciens de service qualifiés doivent installer et entretenir l'appareil. Les techniciens de service qualifiés sont ceux qui possèdent la formation technique et l'expérience nécessaires pour être conscients des dangers auxquels ils sont exposés dans l'accomplissement d'une tâche et des mesures nécessaires pour réduire au minimum le danger pour eux-mêmes ou pour d'autres personnes.
- Aucune opération d'entretien ne doit être entreprise avant que le technicien n'ait lu attentivement ce manuel. Toutes les précautions de sécurité doivent être suivies.
- Cet appareil doit être installé conformément à la norme de sécurité pour les systèmes de réfrigération ANSI/ASHRAE 15.
- Suivez attentivement les instructions de manutention conformément aux réglements nationaux.
- Ne pas utiliser de dispositifs mécaniques ou d'autres moyens pour accélérer le processus de dégivrage ou pour nettoyer, autres que ceux recommandés par le fabricant.
- Ne pas perforer la conduite de fluide frigorigène. Risque d'incendie ou d'explosion en cas de perforation d'une canalisation de fluide frigorigène; suivez attentivement les instructions de manutention.
- L'entretien doit être effectué par du personnel formé et certifié pour la manipulation de réfrigérants inflammables afin de réduire au minimum le risque d'inflammation dû à des pièces incorrectes ou à un entretien inadéquat.
- Les pièces doivent être remplacées par des pièces similaires, de manière à réduire au minimum le risque d'inflammation dû à des pièces incorrectes.

⚠ DANGER Continué

- Mettre au rebut conformément aux réglements fédéraux ou locaux.
- Ne pas percer ou brûler.
- Attention, les fluides frigorigénes peuvent ne pas dégager d'odeur.
- Ne pas endommager les composants du circuit de réfrigération.
- Voir plaque signalétique pour la charge de réfrigérant R-290:
  - Si elle est supérieure à 114 g (4 oz.), ne pas l'installer dans un couloir public ou un hall d'entrée.
  - Si elle est supérieure à 152 g (5.3 oz.), ne pas l'installer à moins de 6 m (20 pi) d'une flamme nue.
- L'appareil doit être entreposé dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, appareil à gaz ou dispositif de chauffage électrique en fonctionnement, par exemple).
- Ne placer aucune source d'inflammation potentielle à l'intérieur ou à proximité de l'appareil.
- Ne pas obstruer les ouvertures de ventilation dans l'enceinte de l'appareil ou dans la structure d'encastrement.
- Aucune source potentielle d'inflammation ne doit être utilisée pour rechercher ou détecter des fuites de réfrigérant.
- Ne pas utiliser d'appareils électriques à l'intérieur de l'appareil, sauf s'ils sont du type recommandé par le fabricant.
- Ne pas entreposer dans cet appareil des substances explosives telles que des bombes aérosols contenant un gaz propulseur inflammable.
- Vérifier que le câblage ne sera pas soumis à l'usure, à la corrosion, à une pression excessive, à des vibrations, à des arêtes vives ou à tout autre effet environnemental négatif. Le contrôle doit également prendre en compte les effets du vieillissement ou des vibrations continues provenant de sources telles que les compresseurs ou les ventilateurs.
- S'assurer que la zone est à l'air libre ou qu'elle est correctement ventilée avant de pénétrer dans le système ou d'effectuer un travail à chaud. Une certaine ventilation doit être maintenue pendant la durée des travaux. La ventilation doit permettre de disperser en toute sécurité tout réfrigérant libéré et, de préférence, de l'expulser dans l'atmosphère.

⚠ 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 and may result in costly water damage.

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

- This appliance is not intended for use above 2,000 m (6,561 ft). Installation above 2,000 m (6,561 ft) may adversely affect safety, performance, and component life.
- Wear appropriate personal protective equipment (PPE) when servicing 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.
- 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.
- Do not make any alterations to the appliance. Alterations could result in electric shock, injury, fire, or damage to the appliance.
- **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 power cord and do not use an adapter plug. Failure to follow these instructions may result in death, electric shock, or fire.
- To reduce the risk of electric shock, do not touch the control module or plug with damp hands.
- To reduce the risk of electric shock, make sure the control module is in the "OFF" position before plugging in or unplugging the appliance.
- Unplug the appliance before servicing.
- 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 use an extension cord.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent, or similarly qualified persons in order to avoid a hazard. Upon replacement, the GREEN ground wire in the power cord must be connected to the designated grounding screw.
- Appliance is heavy. Use care when lifting or positioning. Work in pairs when needed to prevent injury or damage to the appliance.

⚠ WARNING continued

- 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.
- Do not splash, pour, or spray water directly onto or into the appliance. This might cause short circuit, electric shock, corrosion, or failure.
- Children should be supervised to ensure that they do not play with 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.
- Open and close the doors/drawers with care. Opening the doors/drawers too quickly or forcefully may cause injury or damage to the appliance or surrounding equipment.
- Be careful not to pinch fingers when opening and closing the doors/drawers. Be careful when opening and closing the doors/drawers when children are in the area.
- 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 appliance.
- The entire rail must always be covered by rail dividers and pans (1/3 size, up to 6" (15 cm) deep). Otherwise, the appliance will not cool properly.
- Use only 1/3 size pans up to 6" (15 cm) deep. Do not use damaged 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.

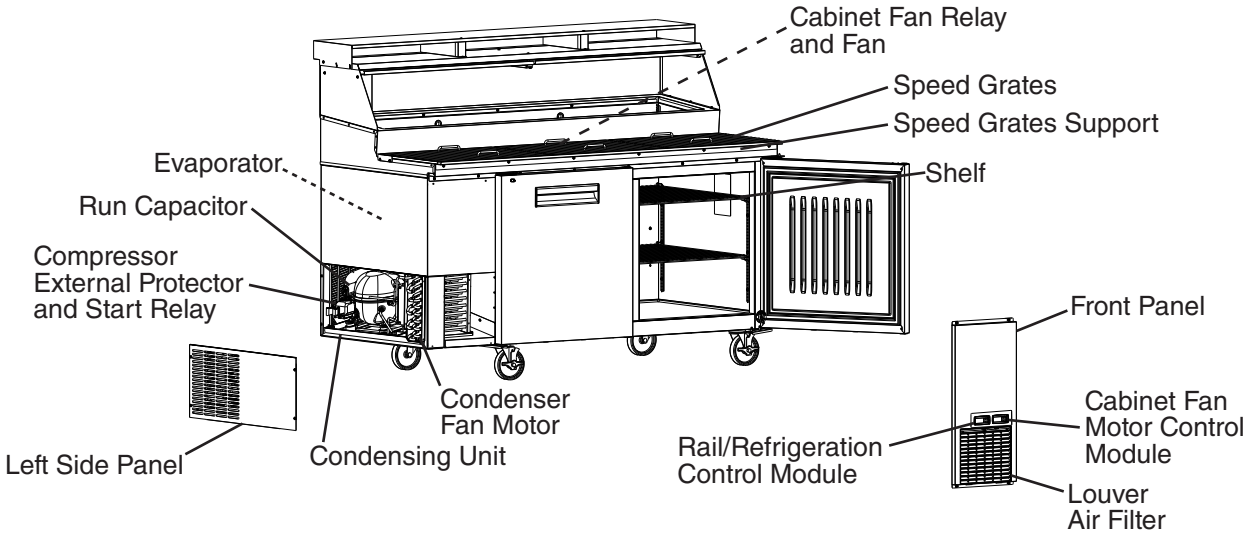
NOTICE

- Install the appliance in a location that stays above freezing. Normal operating ambient temperature must be within 45°F to 100°F (7°C to 38°C).
- Do not leave the appliance on during extended periods of non-use, extended absences, or in sub-freezing temperatures. To properly prepare the appliance for these occasions, follow the instructions in "VI. Preparing the Appliance for Periods of Non-Use."
- Protect the floor when moving the appliance to prevent damage to the floor.
- 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.
- Do not allow the appliance to bear any outside weight.
- 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.
- Do not place anything on top of 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.

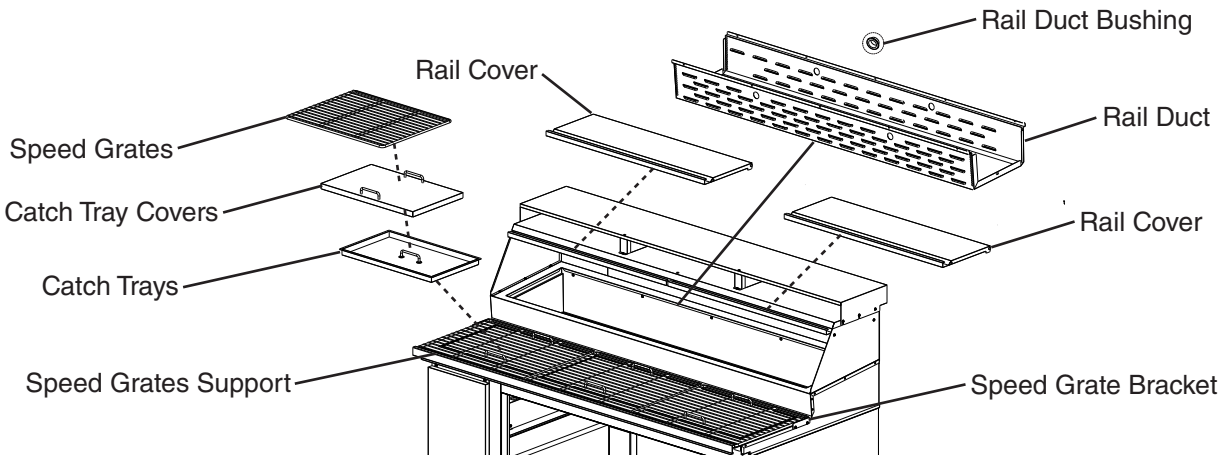
I. Construction and Refrigeration Circuit Diagram

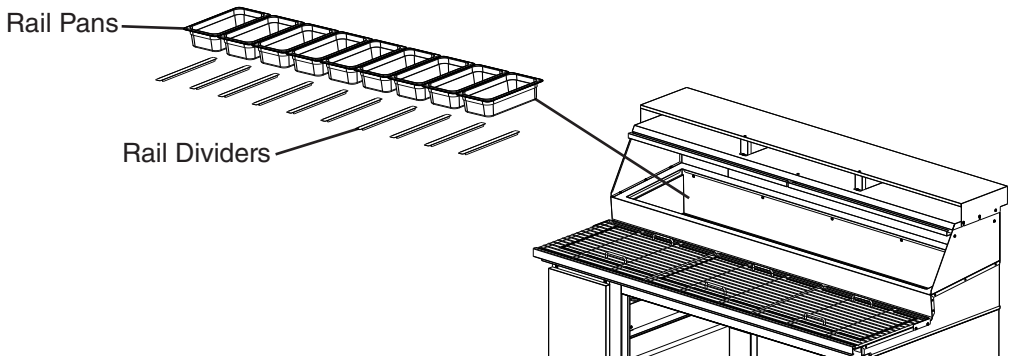
A. Construction

1. Refrigerated Prep Table with Raised Rail

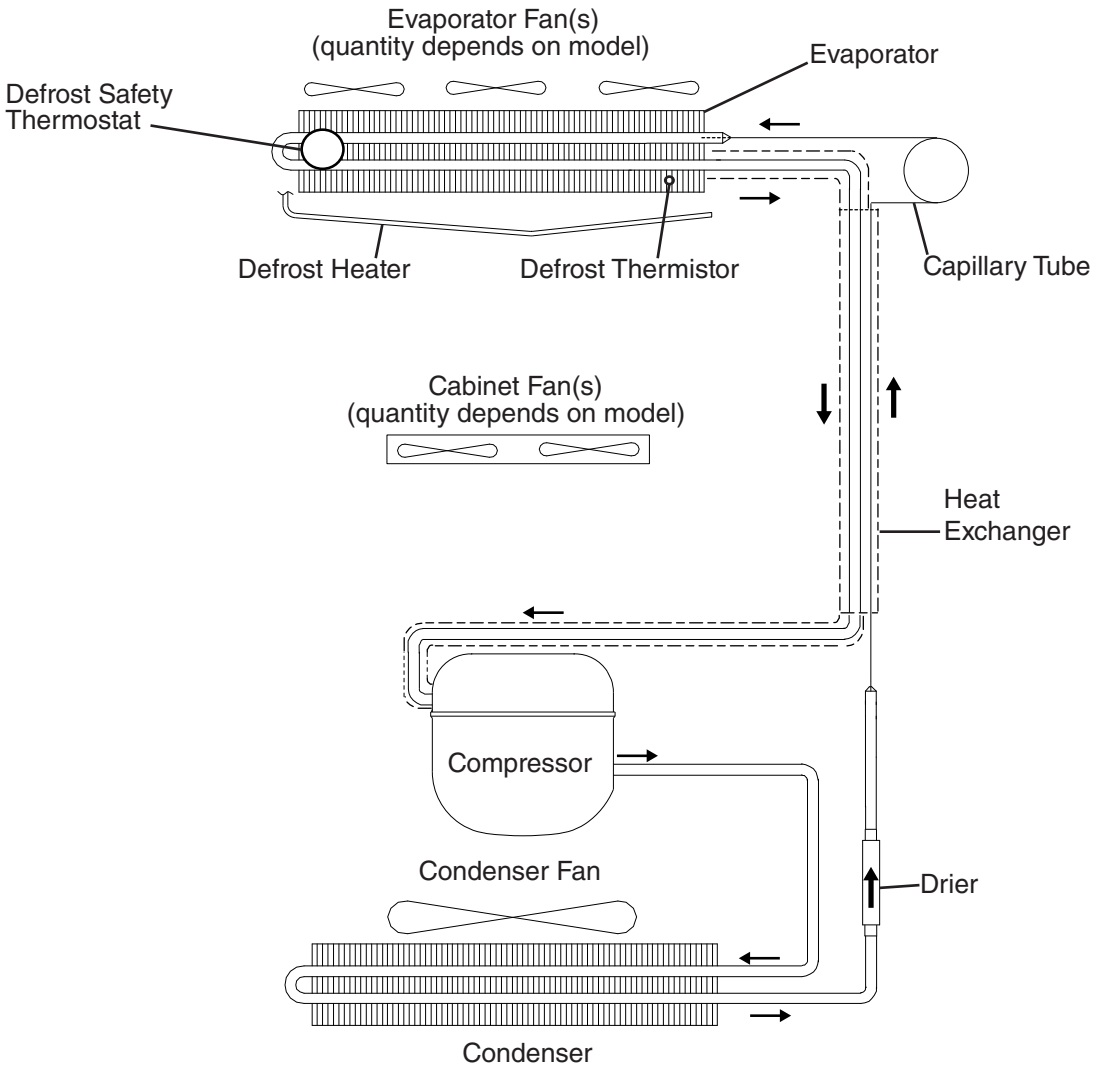


Model Shown: **PR67B-Z**





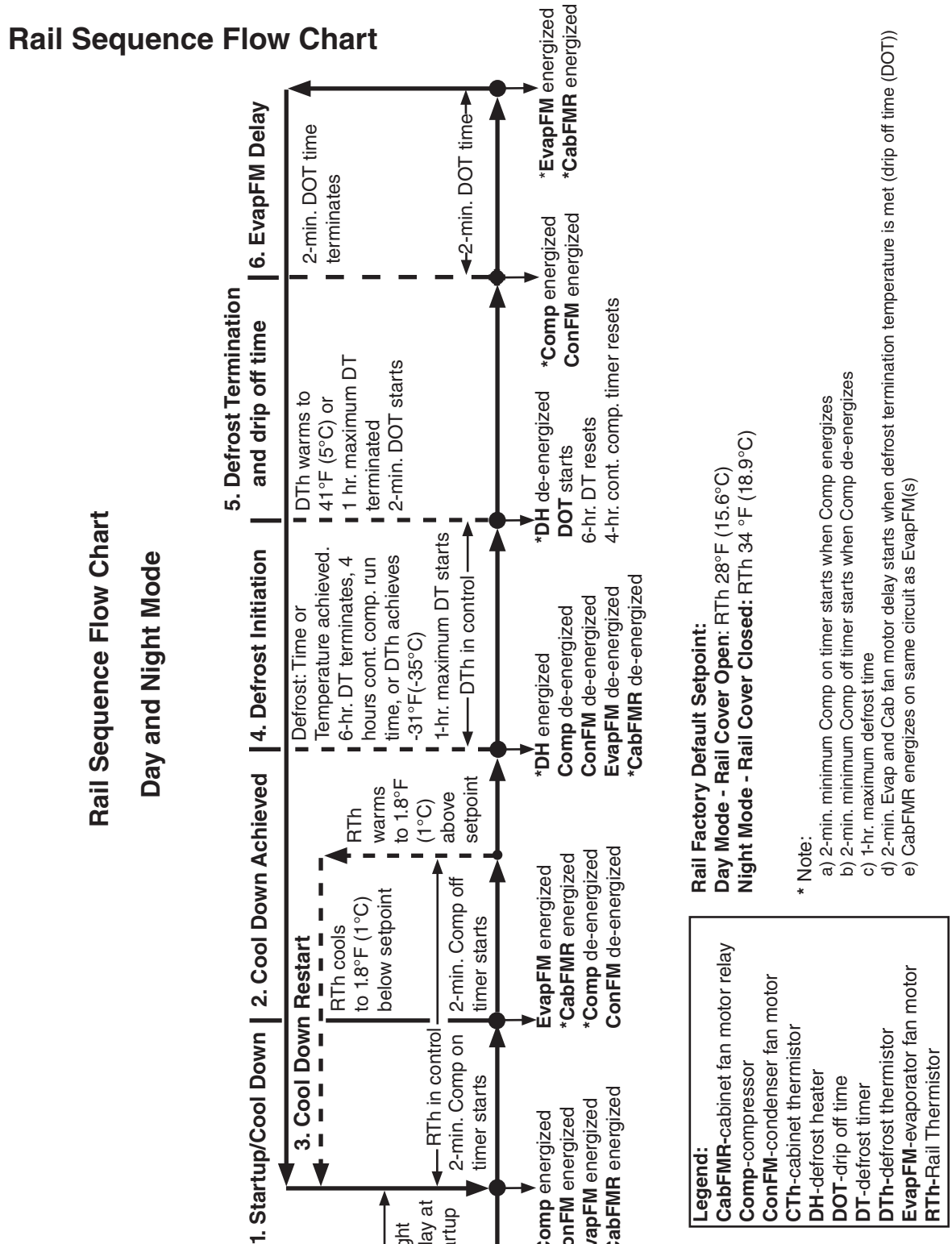
B. Refrigeration Circuit Diagram



II. Sequence of Operation

A. Sequence of Operation Flow Charts

1. Rail Sequence Flow Chart



Legend:
CabFMR-cabinet fan motor relay
Comp-compressor
ConFM-condenser fan motor
CTh-cabinet thermistor
DH-defrost heater
DOT-drip off time
DT-defrost timer
DTh-defrost thermistor
EvapFM-evaporator fan motor
RTh-Rail Thermistor

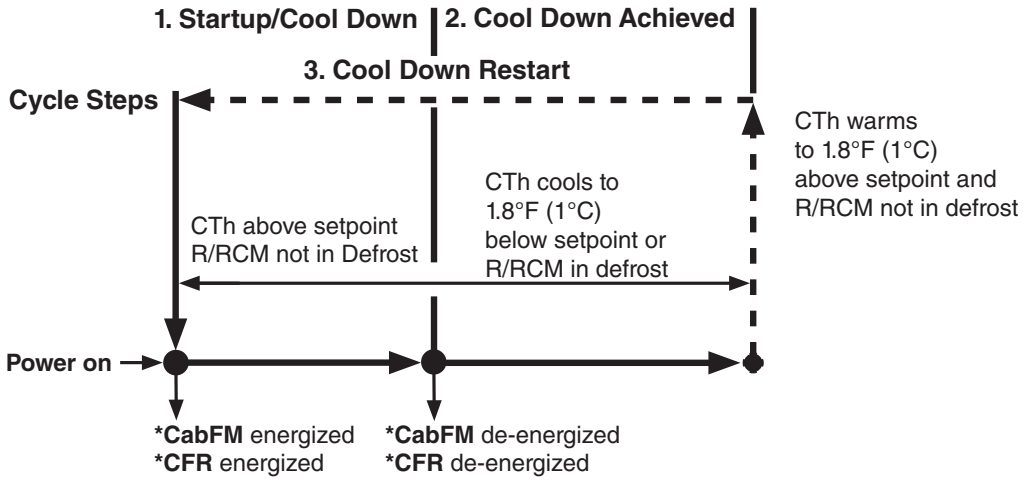
Rail Factory Default Setpoint:
Day Mode - Rail Cover Open: RTh 28°F (15.6°C)
Night Mode - Rail Cover Closed: RTh 34 °F (18.9°C)

* Note:
a) 2-min. minimum Comp on timer starts when Comp energizes
b) 2-min. minimum Comp off timer starts when Comp de-energizes
c) 1-hr. maximum defrost time
d) 2-min. Evap and Cab fan motor delay starts when defrost termination temperature is met (drip off time (DOT))
e) CabFMR energizes on same circuit as EvapFM(s)

2. Cabinet Sequence Flow Chart

Cabinet Sequence Flow Chart

Cabinet Fan Motor(s) relay energized through rail control module



Legend:
CabFM-cabinet fan motor
CFR-cabinet fan relay
CCM-cabinet control module
CTh-cabinet thermistor
R/RCM-rail/refrigerator control module

Cabinet Factory Default Setpoint:
Cabinet Fan Motor Control Module: 35°F (19.4°C)

*Note:
a) R/RCM de-energizes CFR when rail is in defrost.
b) CabFM is energized when the CCM cooling icon is on and CFR is energized. The cooling icon represents a call for cooling from the CTh. When displayed, CCM provides 115VAC to CabFM for CabFM operation. CFR only energizes when EvapFMs are energized through the R/RCM. The CCM cooling icon may be on when the CFR is not energized due to the appliance being in defrost.

III. Service Diagnosis, Refrigeration Circuit Service, and Component Service

A. Safety Precautions When Servicing | Précautions à prendre lors de l'entretien

1. English

R-290 Class A3 Flammable Refrigerant Used

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Be sure to follow all Important Safety Information located at the beginning of this manual and in this section.
- The appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Servicing shall be done by trained service personnel with certified competence in handling flammable refrigerants to minimize the risk of possible ignition due to incorrect parts or improper service.
- Follow handling instructions carefully in compliance with national regulations.
- Do not use mechanical devices or other means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- Be aware that refrigerants may not contain an odor.
- Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.
- Component parts shall be replaced with like components so as to minimize the risk of possible ignition due to incorrect parts.
- Do not place any potential ignition sources in or near the appliance.
- Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e., nonsparking, adequately sealed, or intrinsically safe. NOTE: The use of silicone sealant can inhibit the effectiveness of some types of leak detection equipment.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

⚠ DANGER continued

- The following leak detection methods are deemed acceptable for all refrigerant systems:
  - Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity might not be adequate, or might need recalibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed.
  - Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine can react with the refrigerant and corrode the copper pipe-work.

    Note: Examples of leak detection fluids are:
    - bubble method
    - fluorescent method agents
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available on hand. A dry chemical or CO_2 fire extinguisher should be adjacent to the charging area. You must have a Class B chemical fire extinguisher available at all times.
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment shall be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:
  - safely remove refrigerant following local and national regulations
  - purge the circuit with inert gas
  - evacuate (optional for A2L)
  - purge with inert gas (optional for A2L)
  - open the circuit by cutting
- If a leak is suspected, all naked flames shall be removed/extinguished.
- If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

⚠ DANGER continued

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.
- In addition to conventional charging procedures, the following requirements shall be followed:
  - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
  - Cylinders shall be kept in an appropriate position according to the instructions.
  - Ensure that the refrigerating system is earthed (grounded) prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigerating system.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

⚠ DANGER continued

- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.
- Confirm that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- Confirm that no live electrical components and wiring are exposed while charging, recovering, or purging the system.
- Confirm that there is continuity of earth bonding (grounding).
- During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, Hoshizaki America's maintenance and service guidelines shall be followed. If in doubt, consult Hoshizaki America's Technical Support department for assistance.
- Confirm the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
- Confirm the ventilation machinery and outlets are operating adequately and are not obstructed.
- Confirm marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
- Confirm refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
- Ensure that the apparatus (control box/component) is mounted securely.
- Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with Hoshizaki America’s specifications.
- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

⚠ DANGER continued

- Intrinsically safe components are the only types that can be worked on while live in the presence of a flammable atmosphere. The test apparatus shall be at the correct rating.
- Replace components only with parts specified by Hoshizaki America. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges, or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

R-290 Classe A3 Réfrigérant Inflammable Utilisé

⚠ DANGER

Risque De Feu Ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Assurez-vous de suivre toutes les informations importantes de sécurité situées au début de ce manuel et dans cette section.
- L'appareil ne doit être diagnostiqué et réparé que par un personnel qualifié afin de prévenir les risques de mort, d'électrocution, de blessures graves ou d'incendie.
- L'entretien doit être effectué par du personnel formé et certifié pour la manipulation de réfrigérants inflammables afin de réduire au minimum le risque d'inflammation dû à des pièces incorrectes ou à un entretien inadéquat.
- Suivez attentivement les instructions de manutention conformément aux réglements nationaux.
- Ne pas utiliser de dispositifs mécaniques ou d'autres moyens pour accélérer le processus de dégivrage ou pour nettoyer, autres que ceux recommandés par le fabricant.
- Attention, les fluides frigorigénes peuvent ne pas dégager d'odeur.
- Ne pas perforer la tubulure contenant le frigorigène. Risque de feu ou d'explosion si la tubulure contenant le frigorigène est perforée; suivre les instructions de manutention avec soin.
- Les pièces doivent être remplacées par des pièces similaires, de manière à réduire au minimum le risque d'inflammation dû à des pièces incorrectes.
- Ne placez aucune source d'inflammation potentielle dans ou près de l'appareil.
- Avant de commencer à travailler sur des systèmes contenant des réfrigérants inflammables, des contrôles de sécurité sont nécessaires pour s'assurer que le risque d'inflammation est minimisé.
- Tout le personnel d'entretien et les autres personnes travaillant dans la zone locale doivent être informés de la nature des travaux effectués. Les travaux dans des espaces confinés doivent être évités.
- Les travaux doivent être entrepris selon une procédure contrôlée afin de minimiser le risque de présence de gaz ou de vapeur inflammable pendant l'exécution des travaux.
- La zone doit être contrôlée à l'aide d'un détecteur de réfrigérant approprié avant et pendant les travaux, afin de s'assurer que le technicien est conscient de l'existence d'atmosphères potentiellement toxiques ou inflammables.
- Assurez-vous que l'équipement de détection des fuites utilisé est adapté à l'utilisation de tous les réfrigérants applicables, c'est-à-dire qu'il ne produit pas d'étincelles, qu'il est correctement scellé ou qu'il est intrinsèquement sûr. REMARQUE: L'utilisation de mastic silicone peut réduire l'efficacité de certains types d'équipements de détection des fuites.
- En aucun cas, des sources potentielles d'inflammation ne doivent être utilisées pour rechercher ou détecter des fuites de réfrigérant. Une lampe haloïde (ou tout autre détecteur utilisant une flamme nue) ne doit pas être utilisée.

⚠ DANGER Continué

- Les méthodes de détection de fuite suivantes sont considérées comme acceptables pour tous les systèmes de réfrigération:
  - Des détecteurs de fuites électroniques peuvent être utilisés pour détecter les fuites de réfrigérants, mais, dans le cas de réfrigérants inflammables, la sensibilité pourrait ne pas être adéquate ou nécessiter un réétalonnage. (L'équipement de détection doit être étalonné dans une zone sans réfrigérant.) Assurez-vous que le détecteur n'est pas une source potentielle d'inflammation et qu'il est adapté au réfrigérant utilisé. L'équipement de détection des fuites doit être réglé sur un pourcentage de la LII du réfrigérant et doit être étalonné en fonction du réfrigérant utilisé, et le pourcentage approprié de gaz (25% au maximum) est confirmé.
  - Les liquides de détection des fuites conviennent également à la plupart des réfrigérants, mais l'utilisation de détergents contenant du chlore doit être évitée, car le chlore peut réagir avec le réfrigérant et corroder la tuyauterie en cuivre.
    Remarque : Voici quelques exemples de liquides de détection de fuites :
    - méthode des bulles
    - agents de méthode fluorescents
- Si un travail à chaud doit être effectué sur l'équipement réfrigérant ou toute partie associée, un équipement d'extinction d'incendie approprié doit être disponible. Un extincteur à poudre chimique ou à CO_2 devrait être installé à proximité de la zone de chargement. Un extincteur chimique de classe B doit être disponible à tout moment.
- Il est interdit à toute personne effectuant des travaux en rapport avec un système réfrigérant qui impliquent la mise à nu d'une tuyauterie d'utiliser des sources d'inflammation de manière à entraîner un risque d'incendie ou d'explosion. Toutes les sources d'inflammation possibles, y compris la cigarette, doivent être suffisamment éloignées du site d'installation, de réparation, d'enlèvement et d'élimination, au cours desquels du réfrigérant peut éventuellement être libéré dans l'espace environnant. Avant d'entamer les travaux, la zone autour de l'équipement doit être étudiée pour s'assurer qu'il n'y a aucun risque d'inflammabilité ou d'inflammation. Des panneaux «Interdiction de fumer» doivent être affichés.
- Assurez-vous que la zone est à l'air libre ou qu'elle est correctement ventilée avant de pénétrer dans le système ou d'effectuer un travail à chaud. Un certain degré de ventilation doit être maintenu pendant la période où les travaux sont effectués. La ventilation doit permettre de disperser en toute sécurité tout réfrigérant libéré et, de préférence, de l'expulser dans l'atmosphère.
- Pour pénétrer dans le circuit du réfrigérant afin d'effectuer des réparations ou pour toute autre raison, des procédures conventionnelles doivent être utilisées. Toutefois, pour les réfrigérants inflammables, il est important de suivre les meilleures pratiques, car l'inflammabilité est un facteur à prendre en considération. La procédure suivante doit être respectée:
  - éliminer le réfrigérant en toute sécurité conformément aux réglementations locales et nationales
  - purger le circuit avec du gaz inerte
  - évacuer (en option pour A2L)
  - purger avec du gaz inerte (en option pour A2L)
  - ouvrir le circuit par coupure

⚠ DANGER Continué

- Si une fuite est suspectée, toutes les flammes nues doivent être enlevées/éteintes.
- Si une fuite de réfrigérant nécessitant un brasage est constatée, tout le réfrigérant doit être récupéré dans le système ou isolé (au moyen de vannes d'arrêt) dans une partie du système éloignée de la fuite.
- Lors de l'élimination du réfrigérant d'un système, que ce soit pour l'entretien ou la mise hors service, il est recommandé de veiller à ce que tous les réfrigérants soient éliminés en toute sécurité.
- Lors du transfert de réfrigérant dans des bouteilles, veillez à ce que seules des bouteilles de récupération de réfrigérant appropriées soient utilisées. Assurez-vous que le nombre de bouteilles nécessaires pour contenir la charge totale du système est disponible. Toutes les bouteilles à utiliser sont désignées pour le réfrigérant récupéré et étiquetées pour ce réfrigérant (c'est-à-dire des bouteilles spéciales pour la récupération du réfrigérant). Les bouteilles doivent être équipées d'une soupape de surpression et de soupapes d'arrêt associées qui sont en bon état de fonctionnement. Les bouteilles de récupération vides sont évacuées et, si possible, refroidies avant la récupération.
- L'équipement de récupération doit être en bon état de fonctionnement, accompagné d'un ensemble d'instructions concernant l'équipement disponible et doit être adapté à la récupération de tous les réfrigérants appropriés, y compris, le cas échéant, les réfrigérants inflammables. En outre, un ensemble de balances étalonnées doit être disponible et en bon état de fonctionnement. Les tuyaux doivent être complets, équipés de raccords de déconnexion sans fuite et en bon état. Avant d'utiliser la machine de récupération, vérifiez qu'elle est en bon état de fonctionnement, qu'elle a été correctement entretenue et que tous les composants électriques associés sont scellés pour éviter toute inflammation en cas de fuite de réfrigérant. Consulter le fabricant en cas de doute.
- Le réfrigérant récupéré doit être renvoyé au fournisseur de réfrigérant dans la bouteille de récupération appropriée et le bon de transfert de déchets correspondant doit être établi. Ne mélangez pas les réfrigérants dans les unités de récupération et surtout pas dans les bouteilles.
- Si les compresseurs ou les huiles de compresseur doivent être retirés, assurez-vous qu'ils ont été évacués à un niveau acceptable afin de s'assurer qu'il ne reste pas de réfrigérant inflammable dans le lubrifiant. Le processus d'évacuation doit être effectué avant que le compresseur ne soit renvoyé aux fournisseurs. Seul le chauffage électrique du boîtier du compresseur doit être utilisé pour accélérer ce processus. Lorsque l'huile est vidangée d'un système, cette opération doit être effectuée en toute sécurité.

⚠ DANGER Continué

- En plus des procédures de charge conventionnelles, les exigences suivantes doivent être respectées :
  - S'assurer qu'aucune contamination de différents réfrigérants ne se produit lors de l'utilisation de l'équipement de charge. Les tuyaux ou conduites doivent être aussi courts que possible afin de minimiser la quantité de réfrigérant qu'ils contiennent.
  - Les bouteilles doivent être maintenues dans une position appropriée conformément aux instructions.
  - S'assurer que le système de réfrigération soit mis à la terre avant de charger le système avec du réfrigérant.
  - Étiqueter le système lorsque la charge est terminée (si cela n'a pas déjà été fait).
  - Il faut veiller à ne pas trop remplir le système de réfrigération.
- Avant de recharger le système, celui-ci doit être testé sous pression avec le gaz de purge approprié. Le système doit être soumis à un essai de fuite à la fin de la charge, mais avant la mise en service. Un test de contrôle de fuite doit être effectué avant de quitter le site.
- La réparation et l'entretien des composants électriques incluent les contrôles de sécurité initiaux et les procédures d'inspection des composants. En cas de défaut susceptible de compromettre la sécurité, aucune alimentation électrique ne doit être connectée au circuit tant que le problème n'a pas été résolu de manière satisfaisante. Si le défaut ne peut être corrigé immédiatement mais qu'il est nécessaire de poursuivre l'exploitation, une solution temporaire adéquate doit être utilisée. Cela doit être signalé au propriétaire de l'équipement, afin que toutes les parties soient informées.
- S'assurer que les condensateurs sont déchargés : cette opération doit être effectuée en toute sécurité afin d'éviter tout risque d'étincelle.
- S'assurer qu'aucun composant ou câblage électrique sous tension n'est exposé lors de la charge, de la récupération ou de la purge du système.
- S'assurer de la continuité de la mise à la terre.
- Lors des réparations de composants scellés, toutes les alimentations électriques doivent être déconnectées de l'équipement sur lequel on travaille avant tout retrait des couvercles scellés, etc. Si l'alimentation électrique de l'équipement est absolument nécessaire pendant l'entretien, un dispositif de détection des fuites fonctionnant en permanence doit être placé au point le plus critique afin de signaler en cas de situation potentiellement dangereuse.
- Lorsque des composants électriques sont remplacés, ils doivent être adaptés à l'usage prévu et répondre aux spécifications correctes. Les directives de maintenance et d'entretien de Hoshizaki America doivent être respectées à tout moment. En cas de doute, consulter le service d'assistance technique de Hoshizaki America pour obtenir de l'aide.

⚠ DANGER Continué

- S'assurer que la charge réelle de réfrigérant est conforme à la taille de la pièce dans laquelle les pièces contenant du réfrigérant sont installées.
- S'assurer que les dispositifs et les sorties de ventilation fonctionnent correctement et ne sont pas obstrués.
- S'assurer que le marquage de l'équipement est toujours visible et lisible. Les indications et les panneaux illisibles doivent être corrigés.
- S'assurer que les tuyaux ou les composants de réfrigération sont installés dans un endroit où ils ne risquent pas d'être exposés à une substance susceptible de corroder les composants contenant du réfrigérant, à moins que les composants ne soient construits avec des matériaux intrinsèquement résistants à la corrosion ou qu'ils ne soient protégés de manière appropriée contre la corrosion.
- Une attention particulière doit être accordée aux points suivants afin de s'assurer qu'en travaillant sur les composants électriques, le boîtier n'est pas altéré de manière à ce que le niveau de protection soit affecté. Il s'agit notamment des dommages causés aux câbles, du nombre excessif de connexions, des terminaux non conformes aux spécifications d'origine, des dommages causés aux joints et du montage incorrect des presse-étoupes, etc.
- S'assurer que l'appareil (boîtier de commande/composant) est solidement fixé.
- S'assurer que les joints ou les matériaux d'étanchéité ne sont pas dégradés au point de ne plus pouvoir empêcher la pénétration d'atmosphères inflammables. Les pièces de rechange doivent être conformes aux spécifications de Hoshizaki America.
- N'appliquez aucune charge inductive ou capacitive permanente au circuit sans vous assurer que celle-ci ne dépassera pas la tension et le courant autorisés pour l'équipement utilisé.
- Les composants à sécurité intrinsèque sont les seuls types de composants sur lesquels il est possible de travailler sous tension en présence d'une atmosphère inflammable. L'appareil d'essai doit être adapté à la puissance requise.
- Ne remplacer les composants que par des pièces spécifiées par Hoshizaki America. D'autres pièces peuvent entraîner l'inflammation du réfrigérant dans l'atmosphère à la suite d'une fuite.
- Vérifier que le câblage ne sera pas soumis à l'usure, à la corrosion, à une pression excessive, à des vibrations, à des arêtes vives ou à tout autre effet environnemental négatif. Le contrôle doit également prendre en compte les effets du vieillissement ou des vibrations continues provenant de sources telles que les compresseurs ou les ventilateurs.

B. Service Diagnosis

R-290 Class A3 Flammable Refrigerant Used

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Be sure to follow all Important Safety Information located at the beginning of this manual and at the beginning of section "III.A. Safety Precautions When Servicing."
- Servicing shall be done by trained service personnel with certified competence in handling flammable refrigerants to minimize the risk of possible ignition due to incorrect parts or improper service.

Risque De Feu Ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Assurez-vous de suivre toutes les informations importantes de sécurité qui se trouvent au début du présent manuel et au début de la section «III.A. Précautions de sécurité lors de l'entretien.»
- L'entretien doit être effectué par du personnel formé et certifié pour la manipulation de réfrigérants inflammables afin de réduire au minimum le risque d'inflammation dû à des pièces incorrectes ou à un entretien inadéquat.

⚠ WARNING

- Risk of electric shock. Use extreme caution and exercise safe electrical practices.
- Wear appropriate personal protective equipment (PPE) when servicing the appliance.
- Press the "U" button to turn "OFF" the appliance, then unplug the appliance from the electrical outlet before servicing.
- Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
- Appliance is heavy. Use care when lifting or positioning. Work in pairs when needed to prevent injury or damage.
- Make sure all food zones in the appliance are clean after service.

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.

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

Rail Control	**Factory Default Temperature Settings**
Rail Day Mode	One or Both Rail Covers Open (28°F (-2.2°C))
Rail Night Mode	Both Rail Covers Closed (34°F (1.1°C))
Cabinet Control	**Factory Default Temperature Settings**
Cabinet Fan Control	35°F (1.7°C)

Display Scale: °F

Note: There is a minimum 2-min. Comp on time and 2-min. Comp off time. For further details, see "III. E. Controls and Adjustments."

1) Unplug the appliance from the electrical outlet.

2) Remove the front panel and left side panel.

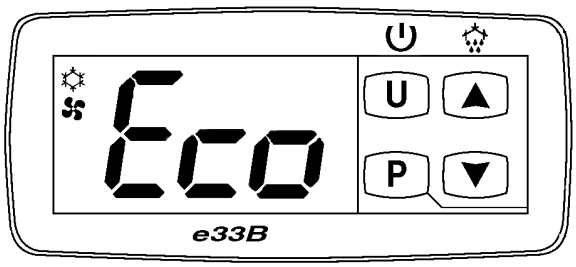
3) Plug the appliance back into the electrical outlet. R/RCM, CCM, EvapFMs, and CFR energize and 6-hr. defrost timer starts. R/RCM rail temperature and EvapFMs icon are displayed on the R/RCM. Note: EvapFMs and CFR remain energized until a defrost cycle initiates. RTh does not control EvapFMs operation. CCM cabinet temperature and CabFM icon are displayed.

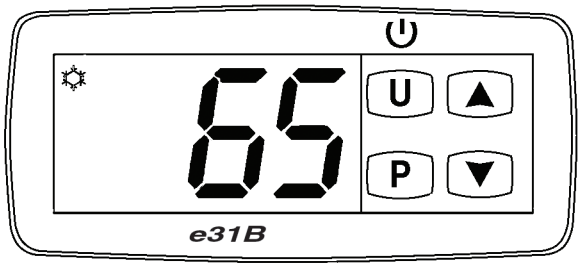
4) **Startup/Cool Down** – Rail and cabinet temperature above setpoint. RTh and CTh calling for cooling.
RTH: Comp and ConFM energize. R/RCM cooling icon turns on.
CTH: CabFM energizes. CCM cabinet temperature and cooling icon (CabFM operation) are displayed.

Rail/Refrigeration Display at Startup

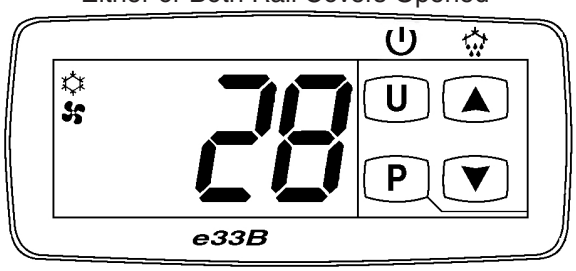
Cabinet Display at Startup

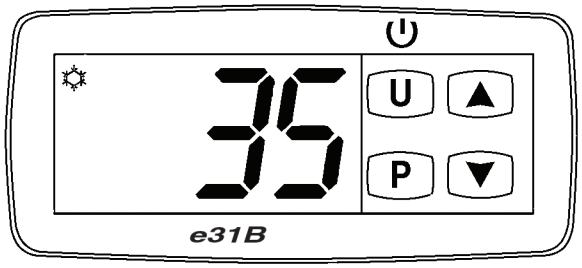
Bith Rail Covers Closed





Either or Both Rail Covers Opened





a) **Day Mode R/RCM, Comp/ConFM/EvapFMs Diagnosis**:
(1) **R/RCM**: With one or both rail cover(s) open and RTh calling for cooling, Comp and ConFM energize. EvapFMs and CFR continue. If not, confirm that the rail day mode temperature setting is correct. Next, check RTh. See "III.C. Thermistor Check." If RTh is out of range, replace RTh. If RTh is in range, check for 115VAC at R/RCM 7(L) black (BK), 4(L) black (BK), and 5(L) black (BK) wires, each to R/RCM 8(N) white (W) wire. If 115VAC is not present on either connection, check breaker/fuse for an open circuit and reset or replace as needed. Next, check for loose connections on 7(L) black (BK), 4(L) black (BK), 5(L) black (BK) wires, and 8(N) white (W) wire and power cord connections. If 115VAC is present at R/RCM 7(L) black (BK), 4(L) black (BK), and 5(L) black (BK) wires to 8(N) white (W) wire, check for 115VAC at R/RCM 3(C) violet (V) wire to R/RCM 8(N) white (W) wire. If 115VAC is not present, replace R/RCM. If 115VAC is present, continue to "(2) Comp/ConFM Diagnosis."

(2) **Comp/ConFM Diagnosis**: Comp and ConFM energize. If not, confirm 115VAC at R/RCM 3(C) violet (V) wire to 8(N) white (W) wire. If 115VAC is present at 3(C) violet (V) wire to 8(N) white (W) wire, check for 115VAC from both sides of Comp external protector red (R) wire and Comp terminal to neutral (W) wire.
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 connections (red (R) wire and Comp terminal) to neutral white (W), check Comp run capacitor, PTC relay, and Comp motor windings. Replace as needed.
If ConFM is not energized, check for 115VAC across ConFM black (BK) wires. If 115VAC is not present, check ConFM wiring connections. If 115VAC is present, check ConFM fan blades for binding and motor winding continuity. If defective, replace ConFM.

(3) **EvapFM Diagnosis**: EvapFMs energize when R/RCM energizes at power on. If EvapFM(s) do not energize, check for 115VAC at R/RCM 6(F) dark blue (DBU) wire to a neutral white (W) wire. If 115VAC is not present and R/RCM is energized, replace R/RCM. If 115VAC is present, check across EvapFM black (BK) wires. If 115VAC is not present, check EvapFM wiring connections. If 115VAC is present, check EvapFM fan blades for binding and motor winding continuity. If defective, replace EvapFM(s).

b) **CCM, CFR, and CabFM Diagnosis**: When R/RCM energizes, EvapFMs and CFR energize. Confirm that the cabinet temperature setting is correct. With CCM calling for cooling CabFM energizes.

(1) **CCM Diagnosis**: Check for 115VAC at CCM 8(L) black (BK) and 4(L) black (BK) to 7(N) white (W). If 115VAC is not present on either connection, check for loose connections on CCM 8(L) black (BK), 4(L) black (BK), and 7(N) white (W).
If 115VAC is present, confirm the cooling (CabFM) icon is on. Next, check for 115VAC at CCM 3(F) yellow (Y) to 7(N) white (W). If 115VAC is not present, check for 5VDC at CCM 9 light blue (LBU) to ground (GND). If 5VDC is not present, replace CCM. If 5VDC is present, check for 5VDC at CCM 11 light blue (LBU) to ground (GND). If 5VDC is present and no voltage at CCM 3(F) yellow (Y) to neutral white (W), replace CCM.

(2) **CFR Diagnosis**: If 5VDC is not present at CCM 11 light blue (LBU), check for 115VAC at CFR coil. If 115VAC is present, check for 5VDC across CFR contacts (light blue (LBU) to light blue (LBU)). If 5VDC is present, contacts are open, replace CFR.

(3) **CabFM Diagnosis**: With 5VDC present at CCM 11 light blue (LBU) to ground (GND), check for 115VAC at CCM 3(F) yellow (Y) to a 7(N) white (W). If 115VAC is present, and CabFM is not energized, check CabFM fan blade for binding and motor winding continuity. If defective, replace CabFM.

c) **Night Mode R/RCM, Comp/ConFM/EvapFM Diagnosis**: Confirm both rail covers are closed and rail switches are engaged (closed). "ECO" displayed on R/RCM.

(1) **R/RCM Diagnosis**: With both rail covers closed, EvapFMs and CFR continue. RTh calling for cooling, Comp and ConFM energize. Follow steps in "4.a) Day Mode R/RCM, Comp/ConFM/EvapFM Diagnosis" above for complete diagnostic steps.

d) **Night Mode CCM, CFR, and CabFM Diagnosis**: Confirm both rail covers are closed and rail switches are engaged (closed). CFR continues. CTh is calling for cooling. cabinet temperature displayed on CCM.

(1) **CCM Diagnosis**: With both rail covers closed and CTh calling for cooling, CabFM energizes. Follow steps in "4.b) CCM, CFR, and CabFM Diagnosis" above for complete diagnostic steps.

5) **R/RCM Day Mode or Night Mode Rail Cool Down Achieved** – RTh cools to 1.8°F (1°C) below setpoint. Comp and ConFM de-energize, EvapFMs and CFR continue. **Diagnosis**: Confirm Comp and ConFM de-energize and cooling icon turns off. If not, and Comp and ConFM were energized longer than 2 min., check RTh status. See "III.C. Thermistor Check." If RTh is good and Comp and ConFM were energized longer than 2 min., check for 115VAC at R/RCM 3(C) violet (V) to 8(N) white (W). If 115VAC is present, replace R/RCM.

6) **CCM Day Mode or Night Mode Cabinet Cool Down Achieved –** CTh cools to 1.8°F (1°C) below setpoint 35°F (1.7°C). CFR continues, CabFM de-energizes. **Diagnosis**: Confirm CabFM de-energizes and cooling (CabFM) icon turns off. If not, check CTh status. See "III.C. Thermistor Check." If CTh is good, check for 115VAC at CCM 3(F) yellow (Y) to 7(N) white (W). If 115VAC is present, replace CCM.

7) **Defrost –** Temperature/Time Initiated and Temperature/Time Terminated.

a) **Defrost -Initiation**: R/RCM and CCM display "dEF" and the defrost icons are on.
R/RCM de-energizes EvapFM, CFR, Comp, and CondFM.
CCM starts 30-min. display timer and CabFM de-energizes.
For R/RCM and CCM defrost icon and display sequence, see Fig. 1.

(1) **Temperature Initiated**: Defrost thermistor is at or below -31°F (-35°C), defrost initiates.

(2) **Time Initiated**: Power On Time: Once the 6-hr. "ON" Timer terminates or the 4-hr Continuous Compressor Run Timer terminates, defrost initiates.

Once defrost initiates, the maximum 1-hr. defrost timer starts.
The maximum defrost time is 1 hr. There is no minimum defrost time.

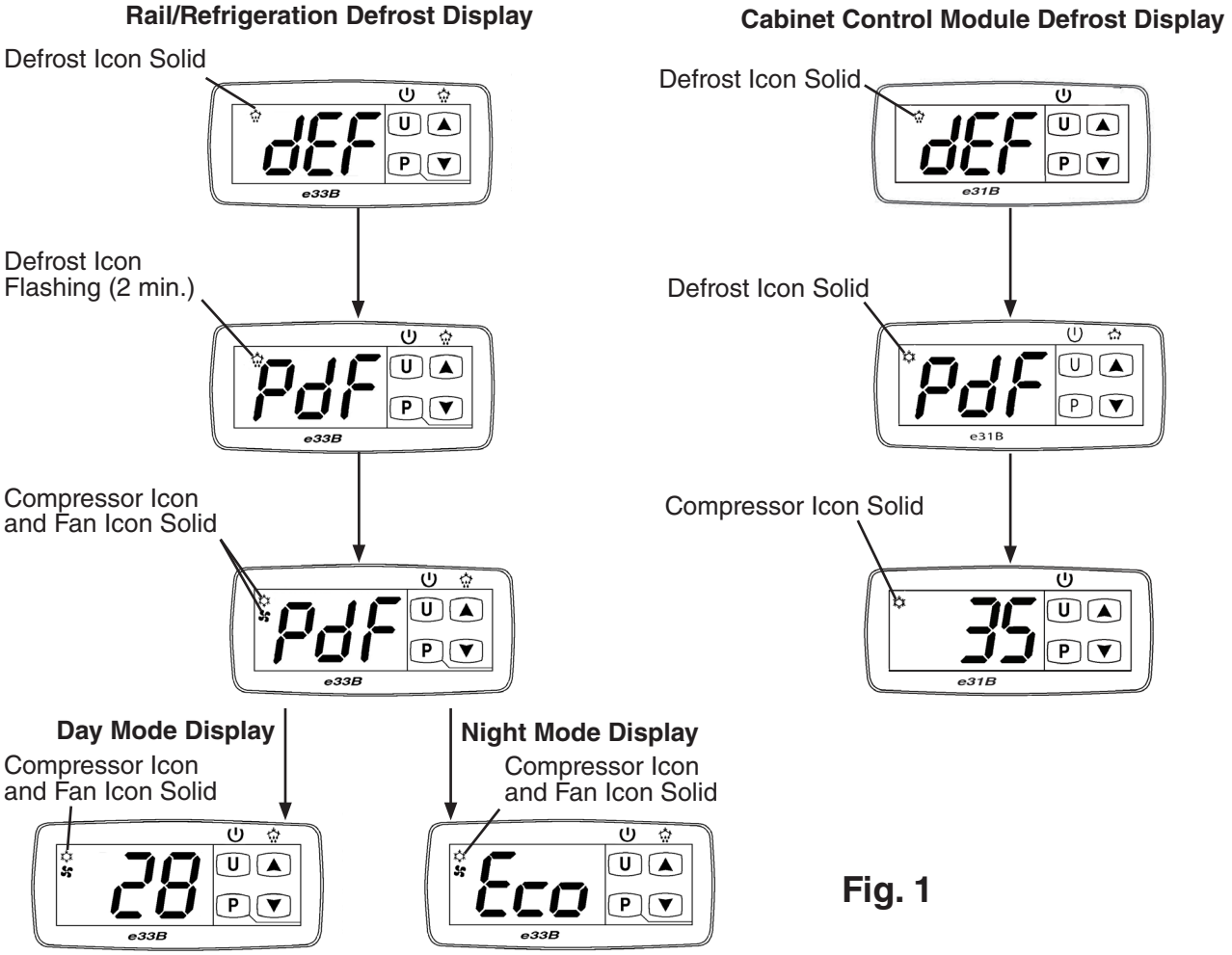


Fig. 1

(3) **Defrost Temperature/Time Initiation Diagnosis**: DTh is at or below -31°F (-35°C) or 6-hr. defrost timer terminates, defrost starts. R/RCM checks DTh status. EvapFMs, CFR, Comp, ConFM, and CabFM de-energize. If temperature at or below -31°F (-35°C) and defrost does not start, check DTh. See "II.C. Thermistor Check." Replace if needed. If DTh is good and at or below -31°F (-35°C) and defrost does not start, replace R/RCM. If DTh is at or above 42°F (5.5°C), R/RCM continues in cooling mode. If 6-hr. defrost timer terminates and defrost does not start, replace R/RCM.

(4) **DH and DST Diagnosis**: With the R/RCM defrost icon on and "dEF" on the display, confirm DH energizes. If not, check for 115VAC at R/RCM 2(H) red (R) wire to 8(N) white (W) wire. If 115VAC is not present, replace R/RCM. If 115VAC is present, check continuity of DST. If open, let cool and reset. If DST does not close, replace DST. If DST is closed, check DH amp draw and continuity. Replace if necessary.

(5) **R/RCM, EvapFM, CFR, Comp, ConFM, and CCM Diagnosis**: Confirm Comp and ConFM de-energize. If not, check for 115VAC at R/RCM 3(C) violet (V) wire to 8(N) white (W) wire. If 115VAC is present, replace R/RCM. Confirm EvapFMs de-energize. If not, check for 115VAC at R/RCM 6(F) dark blue (DBU) wire to 8(N) white (W) wire. If 115VAC is present, replace R/RCM. If 115VAC is not present at R/RCM 6(F) dark blue (DBU) and the CabFM continues, check CFR relay contacts. If closed with no power on CFR coil, replace CFR. Next, check for 115VAC at CCM 3(F) yellow (Y) to 7(N) white (W). If 115VAC is present, replace CCM.

b) **Defrost-Termination**: Once defrost termination temperature of 41°F (5°C) is achieved or the maximum timer times out, defrost terminates.

(1) **2-min. Off Time Delay**: DH de-energizes. If not, check for 115VAC at R/RCM 2(H) red (R) to neutral white (W). If 115VAC is present and the defrost icon is off, replace R/RCM. The R/RCM and CCM display's change from "dEF" to "PdF" and the R/RCM defrost icon starts flashing. CCM defrost icon remains solid. The 2-min. off drip time starts. All components de-energized.
R/RCM: Once the 2-min. off timer terminates, R/RCM cooling (Comp) and fan (EvapFM) icons turn on and "PdF" remains displayed. EvapFM, CFR, COMP, and ConFM energize. "PdF" continues until the rail temperature achieves 1.8°F (1°C) above temperature setpoint or the 15-min. timer terminates. Once 1.8°F (1°C) above temperature setpoint is achieved or the 15-min. timer terminates, R/RCM returns to rail temperature display.
CCM: Once the 2-min. off timer terminates, CFR energized from R/RCM, if CTh is 1.8°F (1°C) above cabinet temperature setpoint, cooling (CabFM) icon turns on and CabFM energizes. CCM continues "PDF" until 30-min. display delay timer terminates.

(2) **DTh and R/RCM Diagnosis**: R/RCM checks DTh status. If DTh is at or above 41°F (5°C), defrost terminates. DH de-energizes. If not, check DTh. See "II.C. Thermistor Check." Replace if needed. If DTh is within range, replace R/RCM. Once DH de-energizes or 1-hr. maximum defrost timer terminates, 2-min. drip off time starts. Confirm R/RCM defrost display is flashing and "PDF" is displayed on both.

(3) **Comp and CondFM Diagnosis:** 2-min. drip off time terminates.
R/RCM defrost icon turns off. Cooling (Comp) and fan (EvapFM and CFR) icon turns on. Confirm RTh is warm enough for Comp, ConFM, and EvapFMs operation. Next, check for 115VAC at R/RCM 1(C) violet (V) wire to neutral white (W) wire. If 115VAC is not present, check RTh status. "III.C. Thermistor Check." If RTh ohm reading is in proper range and Comp and ConFM do not energize, replace R/RCM. If 115VAC is present and Comp does not energize, check Comp external overload. If open, let it cool and reset. If it does not reset, replace external overload. If closed, check PTC relay, run capacitor, Comp windings for continuity, or motor binding. If ConFM is not energized, check ConFM fan blades for binding and winding continuity.

(4) **EvapFM Diagnosis**: 2-min. drip off time terminates. confirm R/RCM fan (EvapFM and CFR) icon is on. Next, confirm EvapFMs energized. If not, check for 115VAC at R/RCM 5(F) dark blue (DBU) wire to neutral white (W) wire. If 115VAC is not present, replace R/RCM. If 115VAC is present, and EvapFMs are not energized, check EvapFMs blades for binding and EvapFMs windings continuity.

(5) **CCM, CFR, and CabFM Diagnosis**: 2-min. drip off time terminates. CCM "PDF" display remains until 30-min. display delay timer terminates. Once 30-min. display delay terminates, CCM returns to cabinet temperature display. If CFR is energized and CTh is 1.8°F (1°C) above setpoint, CabFM energizes. If not, check for 115VAC at CFR dark blue (DBU) wire to neutral (W) wire. If 115VAC is not present, replace R/RCM. If 115VAC is present and CabFM is not energized, confirm the cooling (CabFM) icon is on. Next, check for 115VAC at CCM 3(F) yellow (Y) to 7(N) white (W). If 115VAC is not present, check for 5VDC at CCM 9 light blue (LBU) to ground (GND). If 5VDC is not present, replace CCM. If 5VDC is present, check for 5VDC at CCM 11 light blue (LBU) to ground (GND). If 5VDC is present and no voltage at CCM 3(F) yellow (Y) to neutral white (W), replace CCM.

(6) **CFR Diagnosis**: If 5VDC is not present at CCM 11 light blue (LBU), check for 115VAC at CFR coil. If 115VAC is present, check for 5VDC across CFR contacts (light blue (LBU) to light blue (LBU)). If 5VDC is present, contacts are open, replace CFR.

(7) **CabFM Diagnosis**: With 5VDC present at CCM 11 light blue (LBU) to ground (GND), check for 115VAC at CCM 3(F) yellow (Y) to a 7(N) white (W). If 115VAC is present, and CabFM is not energized, check CabFM fan blade for binding and motor winding continuity. If defective, replace CabFM.

c) **Manual-Initiation**: To initiate or terminate a manual defrost cycle: Press and hold 'Up' button on the R/RCM. Defrost initiates or terminates within 5 sec.
Note: When defrost is manually initiated it continues through the normal defrost cycle unless manually terminated. Comp must be on for a minimum of 2 min. to initiate defrost and off for a minimum of 2 min. to terminate defrost.

(1) **Defrost Manual-Initiation Diagnosis**: To initiate or terminate a manual defrost cycle: Press and hold 'up' button on rail controller defrost initiates or terminates within 5 sec. If not, replace R/RCM.

Note: Compressor must be on for a minimum of 2 min. to initiate defrost and off for a minimum of 2 min. to terminate defrost.

Legend: **CabFM**–cabinet fan motor; **CFR**–cabinet fan relay; **CCM**–cabinet control module; **Comp**–compressor; **ConFM**–condenser fan motor; **CTh**–cabinet thermistor; **DH**–defrost heater; **DST**–defrost safety thermostat; **DTh**–defrost thermistor; **EvapFMs**–evaporator fan motors; **R/RCM**–rail/refrigeration control module; **RTh**–rail thermistor

C. Thermistor Check

This appliance utilizes 3 thermistors: Rail thermistor, cabinet thermistor, and defrost thermistor. The rail thermistor is used for rail temperature control, the cabinet thermistor is used for cabinet temperature control and the defrost thermistor is used for defrost termination (41°F (5°C)). The defrost thermistor is also used for evaporator fan motor/ cabinet fan motor initiation after defrost (36°F (2.2°C) or lower). Thermistor resistance varies depending on temperature. The rail/refrigerator control module monitors the rail and defrost thermistors, while the cabinet control module monitors the cabinet thermistor.

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. If outside the normal reading, replace the thermistor.
    a) **Cabinet Thermistor** - 25 to 27 kΩ
    b) **Rail and Defrost Thermistor** - 25 to 27 kΩ
6) Reconnect and replace the thermistor in its correct position.
7) Plug the appliance back in.

D. Diagnostic Table

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

1a. Appliance Not Cooling - Rail Area

Appliance Not Cooling - Rail Area - Possible Cause		
1.	Power Supply	a) Unplugged, blown fuse, 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.	Rail/Refrigerator Control Module	a) In alarm (LED flashing red).
		b) In defrost.
		c) Defective.
5.	Rail Thermistor See "III.C. Thermistor Check"	a) Loose, disconnected, or out of position.
		b) Defective.
6.	Day/Night Rocker Switch	a) Defective.
7.	Compressor External Protector	a) Dirty condenser.
		b) Condenser fan motor not operating.
		c) Defective.
		d) PTC relay defective.
		e) Low charge.
		f) Run capacitor (if applicable) defective.
8.	Compressor	a) Defective.
9.	Condenser Fan Motor	a) Fan blade binding.
		b) Defective.
10.	Condenser	a) Dirty.
11.	Evaporator Fan Motor	a) Defective.
		b) Fan Blade Binding.
12.	Evaporator	a) Dirty or frozen up. See "III.D.2. Evaporator is Frozen Up."
13.	Refrigerant/Refrigerant Lines	a) Gas leak.
		a) Refrigerant lines or components restricted.
14.	Rail Air Duct Panel	a) Misaligned or missing.
15.	Pans and Rail Dividers	a) Misaligned with gaps in the rail area.
16.	Defrost Heater	a) Rail Control Module defective.

1b. Appliance Not Cooling - Cabinet Area

Appliance Not Cooling - Cabinet Area - 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. Rail/Refrigeration Control Module See "III.G. Rail/Refrigeration Control Module Alarm Safeties."	a) Loose connection.
	b) In alarm.
	c) Defective.
5. Cabinet Thermistor	a) Loose, disconnected, or defective.
6. Cabinet Fan Motor	a) Loose connection.
	b) Defective.
	c) Cabinet Control Module defective.
7. Cabinet Fan Relay	a) Loose connection.
	b) Defective.
8. Doors/Drawers/Gaskets	a) Open/Not sealing.

2. Evaporator is Frozen Up - Possible Cause

Evaporator is Frozen Up	
1. Evaporator	a) Dirty.
2. Evaporator Fan Motor	a) Defective.
	b) Fan blade binding.
	c) Defrost thermistor defective.
	d) Rail control module defective.
3. Rail/Refrigerator Control Module	a) Defective. 6-hr. defrost timer or 4-hr. continuous compressor run timer fails to initiate defrost.
4. Mechanical Switch	a) Incorrect position.
	b) Defective. Stuck in day mode while rail lids closed (Night mode).
5. Refrigerant Charge/Refrigerant Lines	a) Low.
	b) Component restriction (cap tube, drier).
6. Defrost Heater	a) Defective.
7. Defrost Safety Thermostat	a) Defective.
8. Doors/Drawers/Gaskets	a) Open/Not sealing.

3. Defrost Fails to Initiate or Terminate - Possible Cause

Defrost Fails to Initiate	
1. Rail/Refrigerator Control Module	a) Defective.
Defrost Fails to Terminate	
1. Defrost Thermistor (Confirm DTh status. See "III.C. Thermistor Check.")	a) Defective.
2. Rail/Refrigerator Control Module	a) Defective.

E. Controls and Adjustments

This appliance utilizes a rail/refrigerator control module, cabinet control module, and deflector.

See Fig. 2.

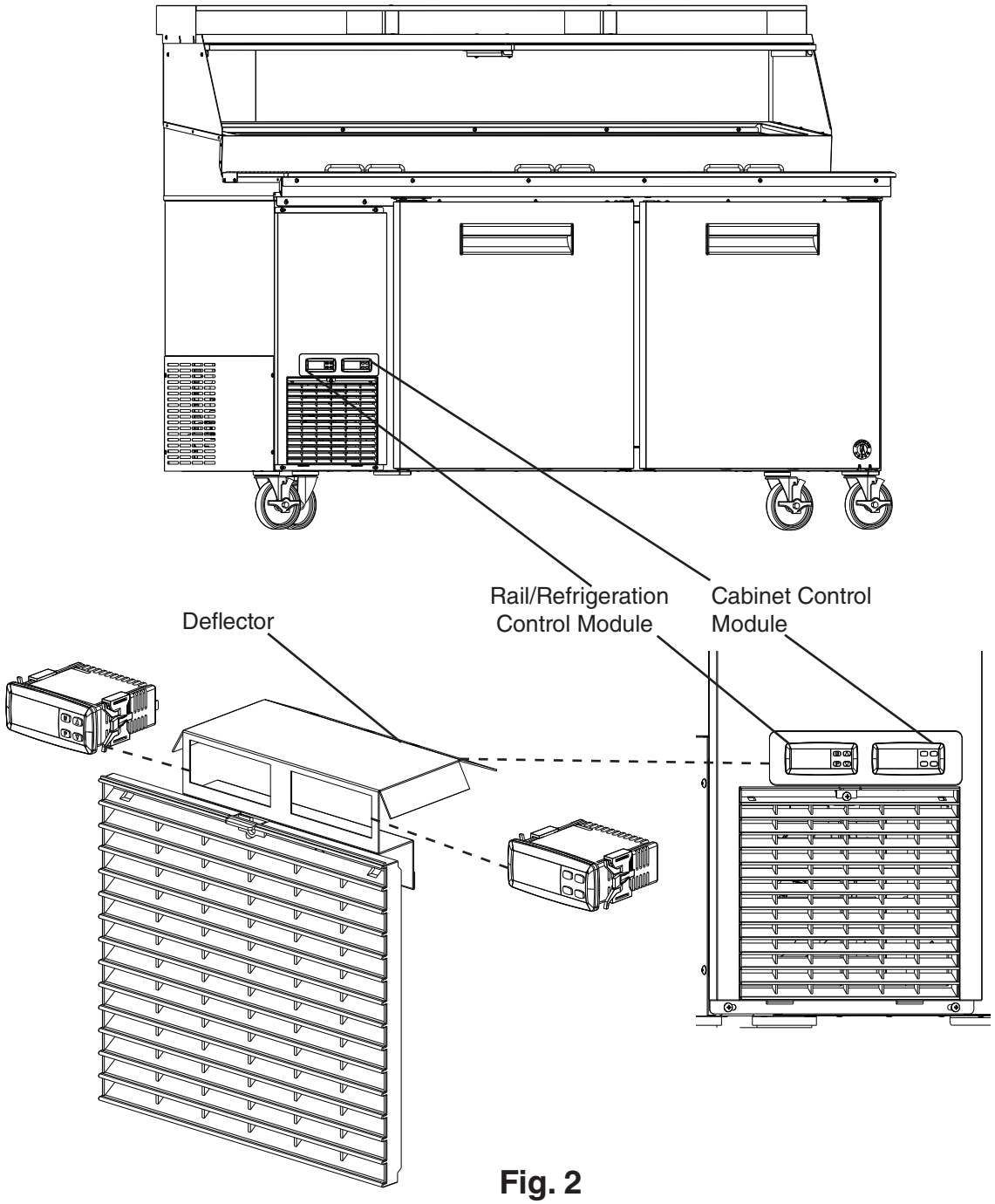


Fig. 2

1. Control Modules

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

All models are pretested and factory set.

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

a) Rail/Refrigeration Control Module Display Icons:

Control Module Icons	
Icon	**Meaning**
	Compressor Flashing: Compressor waiting for 2-min. compressor delay timer to terminate. Solid: Compressor energized.
	Defrost Flashing: 2-Min. Drip Time (compressor delay) Solid: Appliance is in defrost cycle. See "III.G. Defrost" for details.
	Evaporator Fan Motor Solid: Evaporator fan motor energized.
	Alarm Appliance is in alarm. See "III.H. Rail/Refrigeration Control Module Alarm Safeties" for details.

b) Rail/Refrigeration Control Module Display Layout

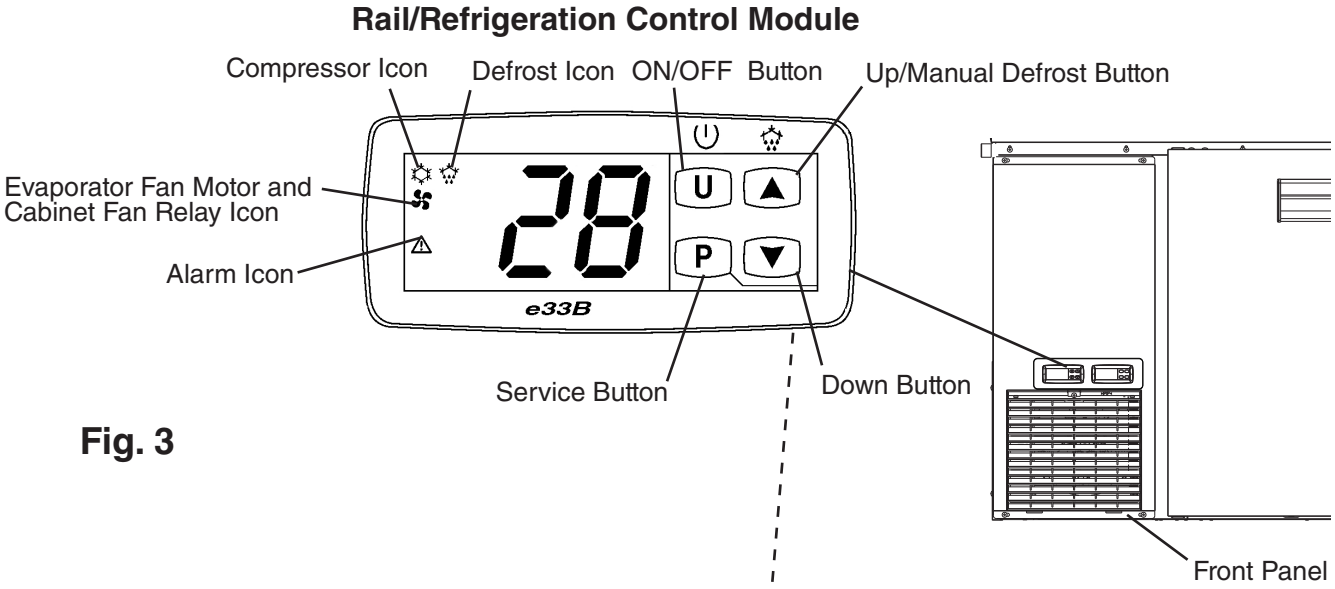


Fig. 3

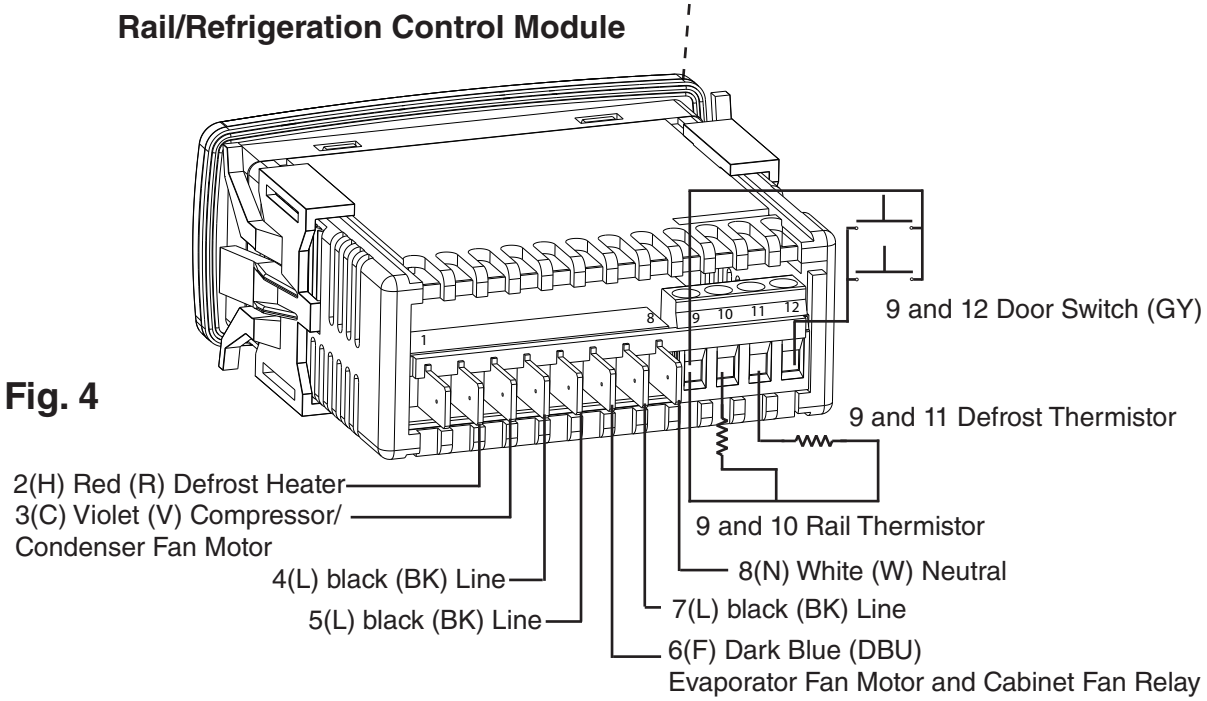


Fig. 4

c) Cabinet Control Module Display Icons:

Cabinet Fan Motor Control Module Icons	
Icon	**Meaning**
	Cooling icon used for Cabinet Fan Motor Cabinet thermistor calling for cooling. Cabinet fan motor energized if compressor energized. Note: Control module cooling icon used for cabinet fan motor operation.
	Defrost Appliance is in defrost cycle. See "III.G. Defrost" for details.
	Alarm Appliance is in alarm. See "III.H. Rail/Refrigeration Control Module Alarm Safeties" for details.

d) Cabinet Control Module Display Layout

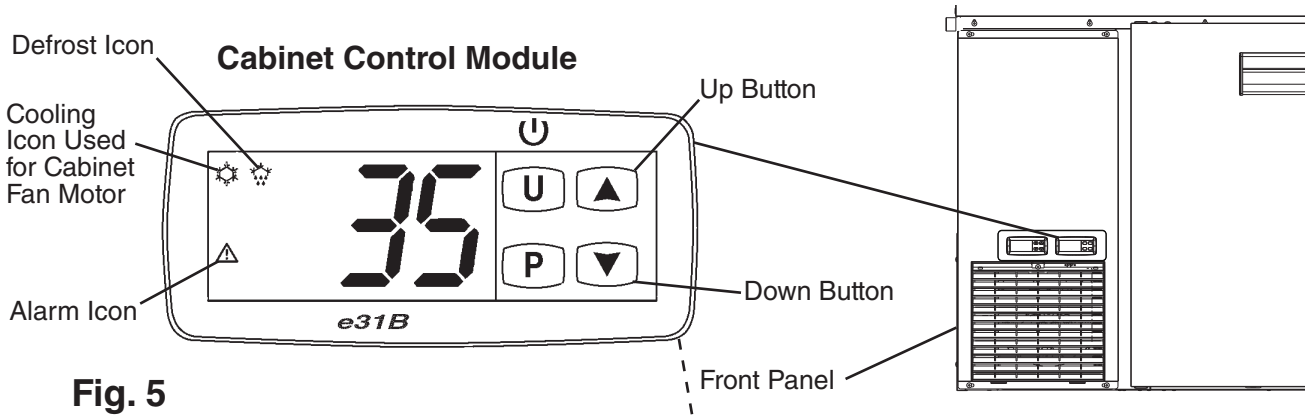


Fig. 5

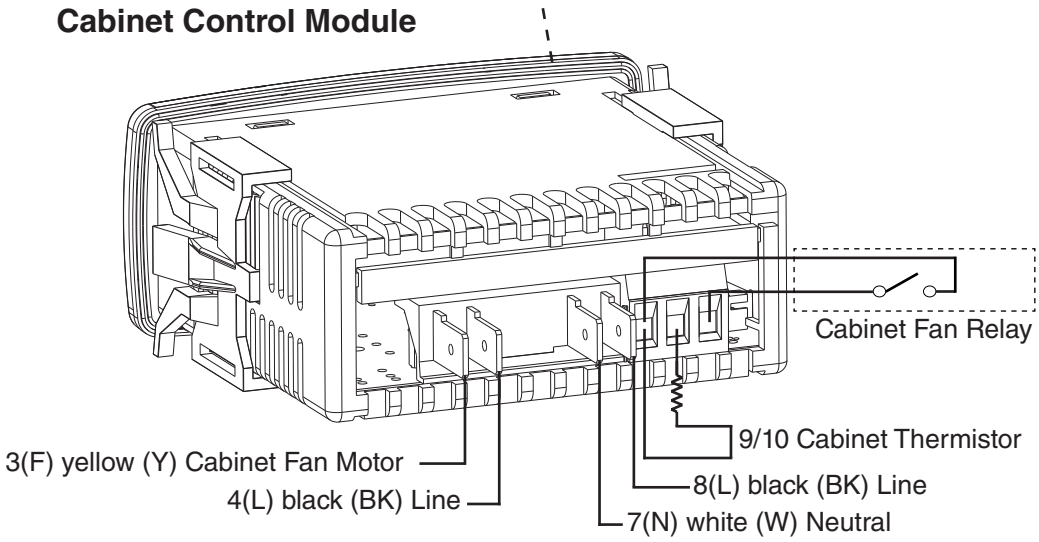


Fig. 6

F. Temperature

The default temperature scale is °F, but it can be changed to read °C. To change, see "III.F.4b. Cabinet Temperature Display Scale (°F or °C)."

1. Default Temperature Settings

a) Rail Area Day Mode - Rail Cover Open: 28°F (15.6°C).
b) Rail Area Night Mode - Rail Cover Closed: 34°F (18.9°C).
c) Cabinet Control Module Setpoint: 35°F (1.7°C).
d) Temperature Display Scale: °F.

2. Temperature Setpoint

The temperature setpoint is the value for the average temperature of the rail or cabinet. During Rail Day Mode, the temperature differential for the compressor (Rail/Refrigerator Control Module) to turn on and off, is ±1.8°F (1°C) of the temperature setpoint.
For example, for a temperature setpoint of 28°F (-2.2°C), the compressor comes on at 29.8°F (-1°C), and the compressor goes off at 26.2°F (-3°C).
The temperature for the Cabinet fan motor (Cabinet Control Module) to turn on and off, is ±1.8°F (1°C) of the temperature setpoint. For example, for a temperature setpoint of 35°F (1.7°C), the cabinet fan motor comes on at 36.8°F (2.7°C) and the cabinet fan motor goes off at 33.2°F (0.7°C) of the temperature setpoint.

Control Module	Factory Default Temperature Setting
Rail/Refrigeration	Day Mode: 28°F (-2.2°C) Night Mode: 34°F (1.1°C)
Cabinet	35°F (1.7°C)

Note: The day mode temperature setpoint cannot be set higher than the night mode setpoint and the night mode temperature setpoint cannot be set lower than the day mode setpoint.

NOTICE! **Do not adjust the temperature setpoint more than 1.8°F (1°C) at a time. Allow the temperature to stabilize for a minimum of 8 hrs. before making further temperature setpoint adjustments.**

3. Adjusting the Temperature Setpoint for Rail Area Cooling

This appliance utilizes the mechanical door switch to control the temperature in the rail area. The mechanical door switch communicates whether open or closed. This maintains a setpoint determined by the end user.

4a. Cabinet Temperature Control

The cabinet temperature is controlled by the cabinet thermistor, cabinet fan relay, and cabinet control module. The cabinet control module energizes the cabinet fan motors when needed, if the cabinet fan relay is energized and the temperature is warmer than the setpoint temperature. The cabinet control module does not energize or de-energize the compressor. **WARNING! Adjusting cabinet setpoint only affects cabinet fan motor operation. It does not control compressor operation.**

a) **Cabinet Temperature Setpoint Adjustment:** The cabinet temperature is displayed on the cabinet fan motor control module. To change the cabinet setpoint, press the up arrow and release. See Fig. 5. SP1 and the current cabinet setpoint flashes. Press the up or down arrow button to the desired setpoint. 5-sec. later, the setpoint is saved and the display returns to normal.

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

4b. Cabinet Temperature Display Scale (°F or °C)

There are 4 temperature display settings from which to choose. Same conversion process works for both display settings. The factory temperature display default is F0 for °F whole number. For a whole number temperature display scale value, select F0 or C0. For a temperature display scale value to one decimal point, select F1 or C1.

Display Scale	Temperature Display Style
F0 - Factory Default	35°F
C0	2°C
F1	35.0°F
C1	2.0°C

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

1) Press and hold both the "U" and "P" buttons for 5 seconds, ıu.P is displayed.
2) Press the "P" button. The current display setting (F0, F1, C0 or C1) and ıu.P start flashing.
3) Press the up or down button until the desired temperature display style is displayed.
4) Press the "P" button to save the selection. ıu.P is displayed. To return to normal display mode, press and hold the "U" button for 5 sec. Display returns to normal display mode. If no other button is pressed after pressing the "P" button, 25 sec. later, display returns to normal display mode.
   Note: If no selection is saved within 30 seconds, the display returns to normal mode and the temperature display scale remains unchanged.

G. Defrost

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Do not use mechanical devices to defrost.
- Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.

Risque De Feu Ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Ne pas utiliser d'appareils mécaniques pour dégivrer le réfrigérateur.
- Ne pas perforer la tubulure contenant le frigorigène. Risque de feu ou d'explosion si la tubulure contenant le frigorigène est perforée; suivre les instructions de manutention avec soin.

1. Rail/Refrigeration Automatic Defrost

Heated Defrost: Refrigerators have a temperature or time initiated heated defrost cycle. Note: There is a 1-hr. defrost lock-out after a defrost cycle terminates. This may be bypassed by initiating a manual defrost or unplugging and plugging back in to the electrical outlet.

- Temperature Initiated: When the defrost thermistor is at or below -31°F (-35°C), defrost starts.
- Time Initiated:

  a) Power On Time: Once the 6-hr. "ON" Timer terminates, defrost starts.

  b) Continuous Compressor Run Time: Once the 4hr. Continuous Compressor Run Timer terminates, defrost starts.

The maximum defrost time is 1 hr.

- When defrost initiates, the maximum 1-hr. defrost timer starts. Compressor, condenser fan motor, evaporator/rail fan motors, and cabinet fan motor de-energize. Defrost heater energizes.
- When the defrost thermistor reaches 41°F (5°C), or the maximum 1-hr. defrost timer terminates, defrost terminates. Evaporator/rail fan motors, compressor, condenser fan motor, and cabinet fan motor energize.

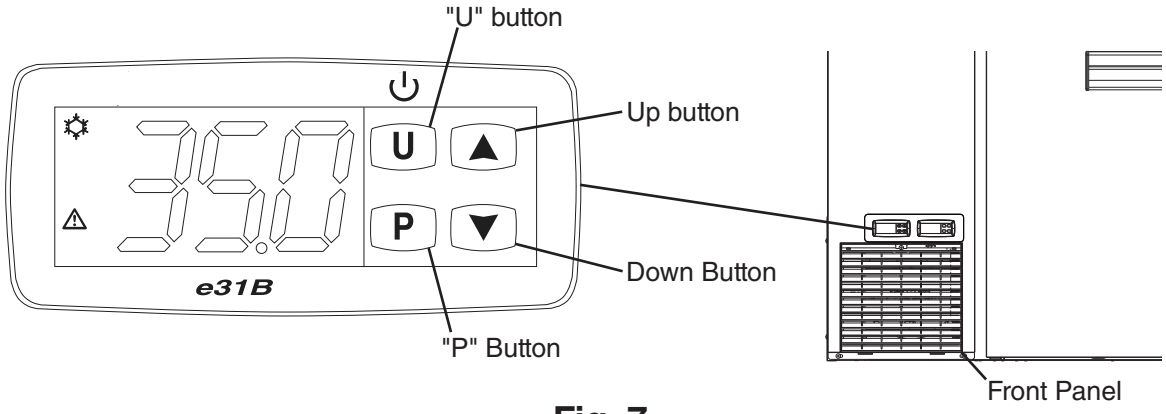


Fig. 7

a) **Rail/Refrigeration Control Module Defrost:** During defrost, "dEF" is displayed along with the defrost icon. The compressor and fan motor icons turn off. Once defrost termination temperature is achieved or the maximum timer times out, defrost terminates. The display changes from dEF to PdF and the defrost icon flashes for 2 min. Once the 2-min. timer terminates, the compressor and evaporator/rail fan motors icons turn on and PdF is remains displayed. PdF continues until the rail temperature achieves 1.8°F (1°C) above temperature setpoint or the 15-min. timer terminates. Once 1.8°F (1°C) above temperature setpoint is achieved or the 15-min. timer terminates, the rail temperature returns to display.

b) **Defrost Termination**
Defrost Termination Temperature: 41°F (5°C).

2. Defrost Display Sequence

Rail/Refrigeration Display

Cabinet Fan Motor Display

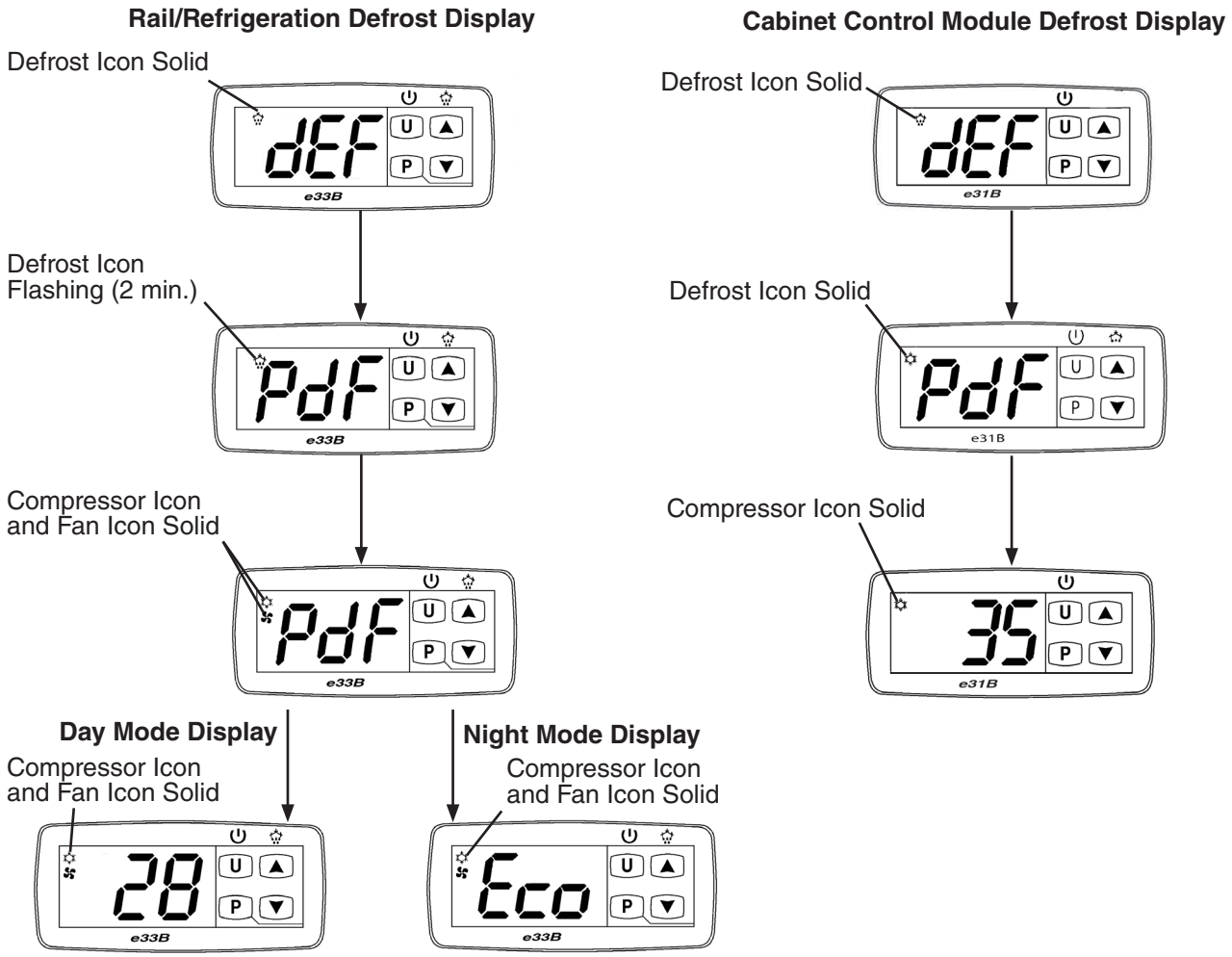


Fig. 8

3. Manual Defrost

To initiate a manual defrost, on the rail/refrigeration control module;
Press and hold the rail/refrigeration control module up button for 5 sec.
To terminate a defrost, on the rail/refrigeration control module;
Press and hold the rail/refrigeration control module up button for 5 sec. Note: Manual defrost only initiates when evaporator temperature (defrost thermistor) is at or below 41°F (5°C).

H. Cabinet and Control Alarm Safeties

1. Rail/Refrigeration Control Module Alarm Safeties:

These alarms give information in the event the cabinet area 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 and alarm icon flash with audible alarm. To silence the alarm, press and release any button.

Control Alarm Signals		
Alarm Code	**Problem**	**Corrective Action/Reset Details**
(-)E1	Rail Thermistor Malfunction Alarm Rail thermistor has failed.	Call a qualified service technician. Steady tone. To silence the alarm, press and release any button. Appliance cycles 5 min. on, 5 min. off. -E1 - Cabinet thermistor out of place or open. E1 - Cabinet thermistor shorted.
(-)E2	Defrost Thermistor Malfunction Alarm Defrost thermistor has failed.	Call a qualified service technician. Steady tone. To silence the alarm, press and release any button. Appliance defrost 20 min. every 6 hrs. -E2 - Rail thermistor out of place or open. E2 - Rail thermistor shorted.
Hi	High Temperature Alarm Rail temperature has remained above 57°F (13.9°C) for more than 1 hour.	If obvious corrections such as closing doors/drawers and cleaning the air filter and/or condenser do not bring temperature back in range, call a qualified service technician. Steady tone. To silence the alarm, press and release any button. The alarm icon stays on. Automatically resets when temperature returns to normal.
Lo	Low Temperature Alarm Rail temperature has remained below 10°F (-12°C) for more than 1 hour.	If obvious corrections do not bring the temperature back in range, call a qualified service technician. Steady tone. To silence the alarm, press and release any button. The alarm icon stays on. Automatically resets when temperature returns to normal.

2. Cabinet Control Module Alarm Safeties:

These alarms give information in the event the cabinet area 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 and alarm icon flash with audible alarm. To silence the alarm, press and release any button.

Cabinet Alarm Signals		
Alarm Code	**Problem**	**Corrective Action/Reset Details**
(-)E1	Cabinet Thermistor Malfunction Alarm Cabinet thermistor has failed.	Call a qualified service technician. Steady tone. To silence the alarm, press and release any button. Appliance cycles 5 min. on, 5 min. off. -E1 - Cabinet thermistor out of place or open. E1 - Cabinet thermistor shorted.
Hi	High Temperature Alarm Cabinet temperature has remained above 57°F (13.9°C) for more than 1 hour.	If obvious corrections such as closing doors/drawers and cleaning the air filter and/or condenser do not bring temperature back in range, call a qualified service technician. Steady tone. To silence the alarm, press and release any button. The alarm icon stays on. Automatically resets when temperature returns to normal.
Lo	Low Temperature Alarm Cabinet temperature has remained below 20°F (-6.6°C) for more than 1 hour.	If obvious corrections do not bring the temperature back in range, call a qualified service technician. Steady tone. To silence the alarm, press and release any button. The alarm icon stays on. Automatically resets when temperature returns to normal.

I. Safety Devices

1. Compressor External Protector

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

2. Short-Cycle Protection

There is a 2-min. minimum off-time and on-time for the compressor.

Note: Time may vary with compressor overload activation.

IV. Refrigeration Circuit and Component Service Information

R-290 Class A3 Flammable Refrigerant Used

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Be sure to follow all Important Safety Information located at the beginning of this manual and at the beginning of section "III.A. Safety Precautions When Servicing."
- Servicing shall be done by trained service personnel with certified competence in handling flammable refrigerants to minimize the risk of possible ignition due to incorrect parts or improper service.
- Confirm that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- A dry chemical or CO_2 fire extinguisher should be adjacent to the charging area. You must have a Class B chemical fire extinguisher available at all times.
- When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:
  - safely remove refrigerant following local and national regulations
  - purge the circuit with inert gas
  - evacuate (optional for A2L)
  - purge with inert gas (optional for A2L)
  - open the circuit by cutting
- Confirm that no live electrical components and wiring are exposed while charging, recovering, or purging the system.
- You must have a combustible gas leak detector in the immediate work area at all times.
- Be sure the area is clear of refrigerant vapor before brazing.
- The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

⚠ DANGER Continué

Risque De Feu Ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Assurez-vous de suivre toutes les informations importantes de sécurité qui se trouvent au début du présent manuel et au début de la section «III.A. Précautions de sécurité lors de l'entretien.»
- L'entretien doit être effectué par du personnel formé et certifié pour la manipulation de réfrigérants inflammables afin de réduire au minimum le risque d'inflammation dû à des pièces incorrectes ou à un entretien inadéquat.
- S'assurer que les condensateurs sont déchargés : cette opération doit être effectuée en toute sécurité afin d'éviter tout risque d'étincelle.
- Un extincteur à poudre chimique ou à CO_2 devrait être installé à proximité de la zone de chargement. Un extincteur chimique de classe B doit être disponible à tout moment.
- Pour pénétrer dans le circuit du réfrigérant afin d'effectuer des réparations ou pour toute autre raison, des procédures conventionnelles doivent être utilisées. Toutefois, pour les réfrigérants inflammables, il est important de suivre les meilleures pratiques, car l'inflammabilité est un facteur à prendre en considération. La procédure suivante doit être respectée:
  - éliminer le réfrigérant en toute sécurité conformément aux réglementations locales et nationales
  - purger le circuit avec du gaz inerte
  - évacuer (en option pour A2L)
  - purger avec du gaz inerte (en option pour A2L)
  - ouvrir le circuit par coupure
- S'assurer qu'aucun composant ou câblage électrique sous tension n'est exposé lors de la charge, de la récupération ou de la purge du système.
- Un détecteur de fuites de gaz combustible doit se trouver à tout moment dans la zone de travail immédiate.
- Assurez-vous que la zone est exempte de vapeur de réfrigérant avant de procéder au brasage.
- La charge de réfrigérant doit être récupérée dans les bouteilles de récupération appropriées si la ventilation n'est pas autorisée par les normes locales et nationales. Pour les appareils contenant des réfrigérants inflammables, le système doit être purgé avec de l'azote sans oxygène afin de rendre l'appareil inoffensif pour les réfrigérants inflammables. Cette procédure peut être répétée plusieurs fois. L'air comprimé ou l'oxygène ne doivent pas être utilisés pour la purge des systèmes de réfrigération.

A. Refrigeration Circuit Service Information

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Follow handling instructions carefully in compliance with U.S. government regulations.
- Do not use mechanical devices to defrost.
- Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.
- Component parts shall be replaced with like components.
- Servicing shall be done by factory authorized service personnel to minimize the risk of possible ignition due to incorrect parts or improper service.
- Consult instruction manual/service manual before attempting to install or service this product.
- Dispose of properly in accordance with federal or local regulations.
- Do not place any potential ignition sources in or near the appliance.

Risque De Feu Ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Suivre attentivement les instructions de manipulation conformément à la réglementation gouvernementale.
- Ne pas utiliser d'appareils mécaniques pour dégivrer le réfrigérateur.
- Ne pas perforer la tubulure contenant le frigorigène. Risque de feu ou d'explosion si la tubulure contenant le frigorigène est perforée; suivre les instructions de manutention avec soin.
- Les pièces des composants doivent être remplacées par des pièces et accessoires équivalents.
- L'entretien doit être effectué par le personnel de service autorisé par le fabricant afin de minimiser les risques d'inflammation attribuables à l'installation d'une pièce inadéquate ou à la mauvaise exécution du service.
- Consulter le manuel du propriétaire/guide de réparation avant de tenter une réparation. Toutes les mesures de sécurité doivent être respectées.
- Éliminer conformément aux règlements fédéraux ou locaux.
- Ne placez aucune source d'inflammation potentielle dans ou près de l'appareil.

⚠ WARNING

- Wear appropriate personal protective equipment (PPE) when servicing the appliance.
- Technician must utilize a combustible gas leak detector at all times.
- Notify everyone in the immediate area that you are working with flammable refrigerant.
- Do not work on appliance in a confined space. Confirm area is well ventilated.
- Identify and eliminate all possible ignition points in a 10 ft. (3 m) area around service area.
- Do not use mechanical devices to defrost.
- Use non-sparking tools.
- Class B dry chemical fire extinguisher or equivalent must be available.
- Do not pressurize system above 200 PSIG during leak check procedure or prior to evacuating refrigeration system.
- 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.

Refrigerant leaks must be repaired as soon as they are discovered. If not, refrigerant charge should be recovered from the system until the leak can be repaired.
When repairing a leak:

- Repair the leak properly – Remove the refrigerant, examine the leak source, determine the reason for the leak, and carry out the proper course of action.
- Before repairing the leak, ensure that the refrigerant has been recovered and the system purged with nitrogen when brazing.
- Be sure to remove piercing valves attached to the system after repairs are made.

a) Refrigerant Recovery

Using proper refrigerant practices, place piercing valves toward the end (crimped area) of the high and low-side process tubes, then recover the refrigerant into an approved container or device.

1) Press the "U" button for 1-sec. to turn the control module off, then unplug the appliance from the electrical outlet.

b) Brazing

2) Prior to brazing, purge with nitrogen gas for 2 min., flowing at a pressure of 3 to 5 PSIG.
⚠ DANGER! For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

3) Braze/repair/replace damaged component or fittings while purging with nitrogen gas, flowing at a pressure of 3 to 5 PSIG.

NOTICE
• Do not leave the system open for longer than 15 min. when replacing or servicing parts. The Polyol Ester (POE) oils used in R-290 applications 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).

4) Use soap bubbles to check for leaks. Raise the pressure using nitrogen gas (190 PSIG). Do not use any refrigerant as a mixture with pressurized air for leak testing.

5) Once leak checking is complete, release the nitrogen gas from the system.

c) Evacuation

6) 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.

7) 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.

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

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

10) 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 AHRI Standard 700 (latest edition) be used.

d) Recharge

⚠ DANGER

- In addition to conventional charging procedures, the following requirements shall be followed:
  - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
  - Cylinders shall be kept in an appropriate position according to the instructions.
  - Ensure that the refrigerating system is earthed (grounded) prior to charging the system with refrigerant.
  - Label the system when charging is complete (if not already).
  - Extreme care shall be taken not to overfill the refrigerating system.
- The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- En plus des procédures de charge conventionnelles, les exigences suivantes doivent être respectées :
  - S'assurer qu'aucune contamination de différents réfrigérants ne se produit lors de l'utilisation de l'équipement de charge. Les tuyaux ou conduites doivent être aussi courts que possible afin de minimiser la quantité de réfrigérant qu'ils contiennent.
  - Les bouteilles doivent être maintenues dans une position appropriée conformément aux instructions.
  - S'assurer que le système de réfrigération soit mis à la terre avant de charger le système avec du réfrigérant.
  - Étiqueter le système lorsque la charge est terminée (si cela n'a pas déjà été fait).
  - Il faut veiller à ne pas trop remplir le système de réfrigération.
- Avant de recharger le système, celui-ci doit être testé sous pression avec le gaz de purge approprié. Le système doit être soumis à un essai de fuite à la fin de la charge, mais avant la mise en service. Un test de contrôle de fuite doit être effectué avant de quitter le site.

11) R-290 can be charged in either the liquid or vapor state. Liquid charge is preferred. If refrigerant charging is done in the liquid state, 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.

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

13) Close the high-side valve on the gauge manifold. If charging is complete, skip to step 15.

14) If necessary, add any remaining charge to the system through the low-side.
NOTICE! **To prevent compressor damage, use a throttling valve or liquid dispensing device to add the remaining liquid charge through the field-installed low-side access valve with the compressor running.** Close the refrigerant cylinder valve and let the low-side refrigerant equalize to the system, then close the low-side manifold gauge.

15) Pinch off (crimp down) the process tubes just below the piercing valves.

16) Remove the piercing valves. Cut the process tubes to remove the piercing valve holes.

17) Confirm there are no leaks from the pinched off process tubes, then braze the process tubes closed. ⚠ **DANGER! Be sure there is no refrigerant leak before brazing.**

18) Use a combustible gas leak detector or soap bubbles to check for leaks again.

19) Place red sleeves over the process tubes.

20) Plug the appliance back into the electrical outlet.

B. Component Service Information

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Component parts shall be replaced with like components so as to minimize the risk of possible ignition due to incorrect parts.
- This appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.
- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment, so all parties are advised.
- Confirm that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
- Confirm that no live electrical components and wiring are exposed while charging, recovering, or purging the system.
- Confirm that there is continuity of earth bonding (grounding).

⚠ DANGER Continué

Risque D'Incendie ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Les pièces doivent être remplacées par des pièces similaires, de manière à réduire au minimum le risque d'inflammation dû à des pièces incorrectes.
- Cet appareil ne doit être diagnostiqué et réparé que par un personnel qualifié afin de réduire les risques de mort, d'électrocution, de blessures graves ou d'incendie.
- La réparation et l'entretien des composants électriques incluent les contrôles de sécurité initiaux et les procédures d'inspection des composants. En cas de défaut susceptible de compromettre la sécurité, aucune alimentation électrique ne doit être connectée au circuit tant que le problème n'a pas été résolu de manière satisfaisante. Si le défaut ne peut être corrigé immédiatement mais qu'il est nécessaire de poursuivre l'exploitation, une solution temporaire adéquate doit être utilisée. Cela doit être signalé au propriétaire de l'équipement, afin que toutes les parties soient informées.
- S'assurer que les condensateurs sont déchargés : cette opération doit être effectuée en toute sécurité afin d'éviter tout risque d'étincelle.
- S'assurer qu'aucun composant ou câblage électrique sous tension n'est exposé lors de la charge, de la récupération ou de la purge du système.
- S'assurer de la continuité de la mise à la terre.

NOTICE

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

Component	Notes
Compressor	Compressor included in condensing unit: PR67B-Z Prior to replacing condensing unit, confirm that the PTC relay and external protector are good. **WARNING! To reduce the risk of electric shock, be sure to reconnect the compressor's ground wire.**

V. Maintenance

This appliance must be maintained in accordance with the instruction manual and labels provided with the appliance. Consult with your local Hoshizaki Certified Service Representative about maintenance service.

⚠ WARNING

- Only qualified service technicians should service this appliance.
- Failure to install, operate, and maintain the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage.
- Press the "U" button for 1-sec. to turn the control module off, then unplug the appliance from the electrical outlet.
- To reduce the risk of electric shock, do not touch the control module or plug with damp hands.
- After service, make sure that there are no wires pinched between the panels and appliance. Make sure you do not damage the power cord

A. Maintenance Schedule

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

Maintenance Schedule		
Frequency	**Area**	**Task**
Bi-Weekly	Air Filters	Inspect. Wash with warm water and neutral cleaner if dirty.
Bi-Yearly	Condenser	Inspect. Clean if necessary by using a brush or vacuum cleaner. More frequent cleaning may be required depending on location.
	Power Supply Connection	Inspect. If the plug or power cord is damaged, contact your local Hoshizaki service representative or local Hoshizaki distributor immediately and ask for repairs. All other maintenance or service on this appliance should be performed in accordance with the Hoshizaki Instruction Manual by a qualified service technician.

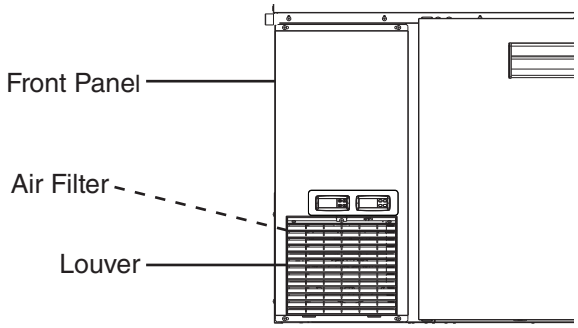


Fig. 9

VI. Preparing the Appliance for Periods of Non-Use

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Be sure to follow all Important Safety Information located at the beginning of this manual and at the beginning of section "III.A. Safety Precautions When Servicing."
- Only qualified service technicians should service this appliance.
- The appliance shall be stored in an area where the room size corresponds to the room area as specified for operation. See the nameplate or instruction manual for Minimum Room Floor Area.
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) or other potential ignition sources (for example an operating electric heater, hot surfaces).

Risque D'Incendie ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Assurez-vous de suivre toutes les informations importantes de sécurité qui se trouvent au début du présent manuel et au début de la section «III.A. Précautions de sécurité lors de l'entretien.»
- Seuls des techniciens de service qualifiés doivent installer et entretenir l'appareil.
- L'appareil doit être conservé dans une zone où la taille de la pièce correspond à la surface de la pièce spécifiée pour le fonctionnement.
- L'appareil doit être entreposé dans un local ne contenant pas de sources d'inflammation permanentes (flammes nues, appareil à gaz ou dispositif de chauffage électrique en fonctionnement, par exemple).

⚠ 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.

2) Unplug the appliance. **WARNING! To reduce the risk of electric shock, do not touch the plug with damp hands.**

VII. Decommissioning and Disposal

R-290 Class A3 Flammable Refrigerant Used

⚠ DANGER

Risk of Fire or Explosion. Flammable Refrigerant Used.

- Be sure to follow all Important Safety Information located at the beginning of this manual and at the beginning of section "III.A. Safety Precautions When Servicing."
- Servicing shall be done by trained service personnel with certified competence in handling flammable refrigerants to minimize the risk of possible ignition due to improper service.
- Follow handling instructions carefully in compliance with national regulations.
- Dispose of properly in accordance with federal or local regulations.
- Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.
- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e., special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

⚠ DANGER Continué

Risque D'Incendie ou D'Explosion. Fluide Frigorigène Inflammable Utilisé.

- Assurez-vous de suivre toutes les informations importantes de sécurité qui se trouvent au début du présent manuel et au début de la section «III.A. Précautions de sécurité lors de l'entretien.»
- L'entretien doit être effectué par du personnel formé et certifié pour la manipulation de réfrigérants inflammables afin de réduire au minimum le risque d'inflammation dû à un entretien inadéquat.
- Suivre attentivement les instructions de manutention conformément aux réglements nationaux.
- Mettre au rebut conformément aux conformément aux réglements fédéraux ou locaux.
- Ne pas perforer la conduite de fluide frigorigène. Risque d'incendie ou d'explosion en cas de perforation d'une canalisation de fluide frigorigène; suivez attentivement les instructions de manutention.
- Lors de l'élimination du réfrigérant d'un système, que ce soit pour l'entretien ou la mise hors service, il est recommandé de veiller à ce que tous les réfrigérants soient éliminés en toute sécurité.
- Lors du transfert de réfrigérant dans des bouteilles, veillez à ce que seules des bouteilles de récupération de réfrigérant appropriées soient utilisées. Assurez-vous que le nombre de bouteilles nécessaires pour contenir la charge totale du système est disponible. Toutes les bouteilles à utiliser sont désignées pour le réfrigérant récupéré et étiquetées pour ce réfrigérant (c'est-à-dire des bouteilles spéciales pour la récupération du réfrigérant). Les bouteilles doivent être équipées d'une soupape de surpression et de soupapes d'arrêt associées en bon état de fonctionnement. Les bouteilles de récupération vides sont évacuées et, si possible, refroidies avant la récupération.
- L'équipement de récupération doit être en bon état de fonctionnement, accompagné d'un ensemble d'instructions concernant l'équipement disponible et doit être adapté à la récupération de tous les réfrigérants appropriés, y compris, le cas échéant, les réfrigérants inflammables. En outre, un ensemble de balances étalonnées doit être disponible et en bon état de fonctionnement. Les tuyaux doivent être complets, équipés de raccords de déconnexion sans fuite et en bon état. Avant d'utiliser la machine de récupération, vérifiez qu'elle est en bon état de fonctionnement, qu'elle a été correctement entretenue et que tous les composants électriques associés sont scellés pour éviter toute inflammation en cas de fuite de réfrigérant. Consulter le fabricant en cas de doute.
- Le réfrigérant récupéré doit être renvoyé au fournisseur de réfrigérant dans la bouteille de récupération appropriée et le bon de transfert de déchets correspondant doit être établi. Ne mélangez pas les réfrigérants dans les unités de récupération et surtout pas dans les bouteilles.
- Si les compresseurs ou les huiles de compresseur doivent être retirés, assurez-vous qu'ils ont été évacués à un niveau acceptable afin de s'assurer qu'il ne reste pas de réfrigérant inflammable dans le lubrifiant. Le processus d'évacuation doit être effectué avant que le compresseur ne soit renvoyé aux fournisseurs. Seul le chauffage électrique du boîtier du compresseur doit être utilisé pour accélérer ce processus. Lorsque l'huile est vidangée d'un système, cette opération doit être effectuée en toute sécurité.

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

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

- Become familiar with the equipment and its operation.
- Isolate the system electrically.
- **Before attempting the procedure, ensure that:**
  - mechanical handling equipment is available, if required, for handling refrigerant cylinders
  - all personal protective equipment is available and being used correctly
  - the recovery process is supervised at all times by a competent person
  - recovery equipment and cylinders conform to the appropriate standards
- Pump down refrigerant system, if possible.
- If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- Make sure that cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do not overfill cylinders (no more than 80% volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Follow the steps below for decommissioning and disposal:

1. Recovery

1) Recover the refrigerant, and safely dispose of the refrigerant.
2) Evacuate the appliance.
3) Purge the refrigeration system with nitrogen.
4) Cut out the compressor and drain and dispose of the compressor oil. Compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. Dispose of compressor and compressor oil in compliance with national, state, and local codes and regulations.
5) Purge the refrigeration system with nitrogen.

2. Labeling

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerant, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

VIII. Technical Information

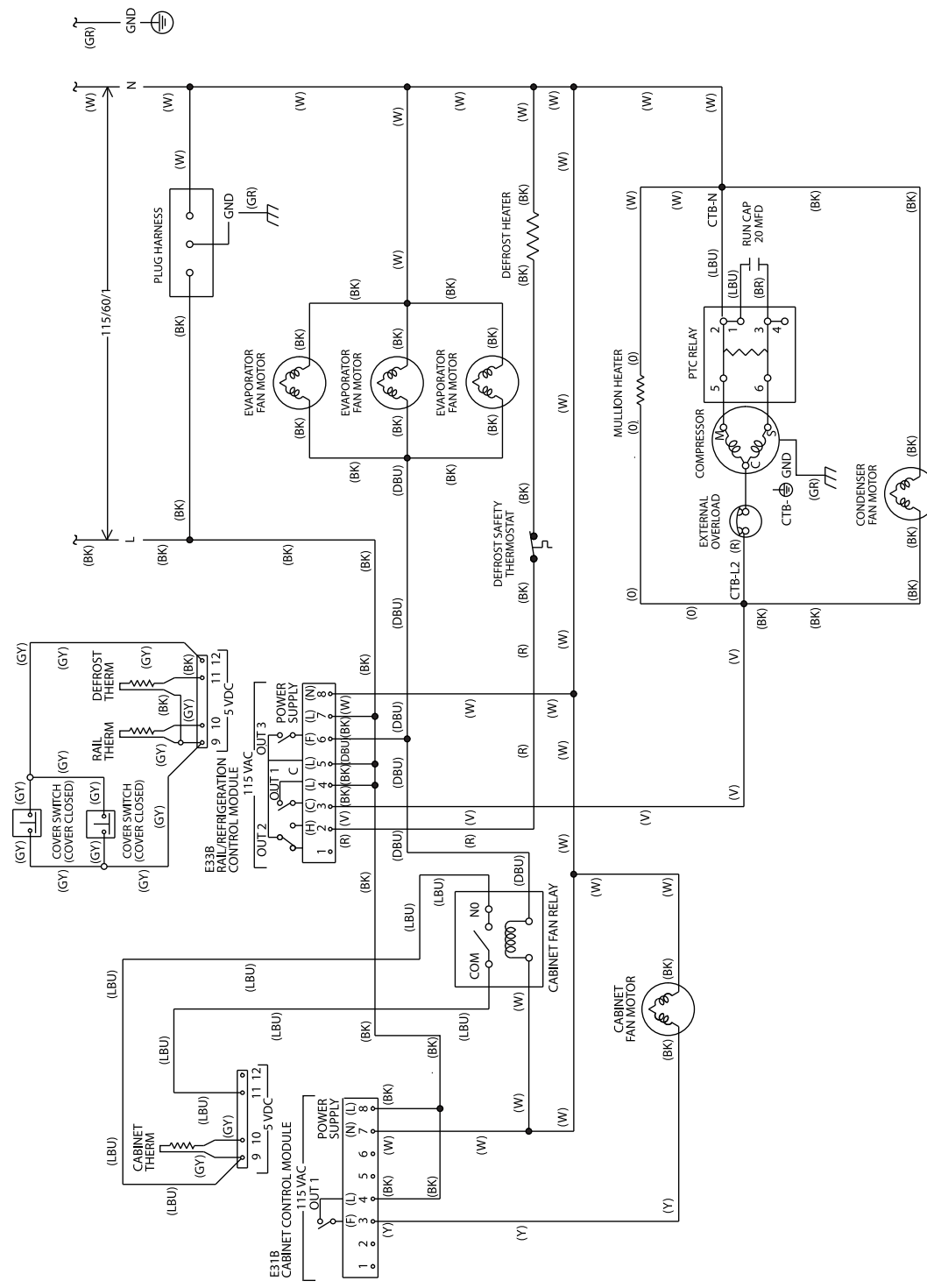
A. Electrical and Refrigerant Data

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.

Model Number	**PR67B-Z**
AC SUPPLY VOLTAGE	~115/60/1
AMPERES	6.0
DESIGN PRESSURE kPa (PSI)	HI-2482 (360) LO-1310 (190)
REFRIGERANT g (oz.)	R-290 76 (2.7)
CLIMATIC CLASS	5
INSULATION BLOWING GAS	HFO 1233zd(E)
MINIMUM ROOM FLOOR AREA m^2 (ft^2)	3.6 (39.1)

B. Wiring Diagram



WIRING COLOR CODE	
BK	BLACK
BR	BROWN
DBU	DARK BLUE
GR	GREEN
GY	GRAY
LBU	LIGHT BLUE
O	ORANGE
P	PINK
R	RED
V	VIOLET
W	WHITE
Y	YELLOW
W/BU	WHITE/BLUE

CTB = COMPRESSOR COVER TERMINAL BLOCK	
L1	NOT USED
L2	LINE
N	NEUTRAL
⏚	GROUND

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