



# HOSHIZAKI

## Service Manual

Cubelet Icemaker/Dispenser

Models

DCM-27IBAK(-OS)



[hoshizakiamerica.com](http://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](http://www.hoshizakiamerica.com). No service should be undertaken until the technician has thoroughly read this Service Manual. Failure to install, operate, maintain, and service the appliance in accordance with this manual will adversely affect safety, performance, component life, and warranty coverage and may result in costly water damage. 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](mailto: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.

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## Important Safety Information

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

	<h3>R-290 Class A3 Flammable Refrigerant Used</h3>
<b>⚠ DANGER</b>	<p>Indicates a hazardous situation that, if not avoided, will result in death or serious injury.</p>
<b>⚠ WARNING</b>	<p>Indicates a hazardous situation that, if not avoided, could result in death or serious injury.</p>
<b>NOTICE</b>	<p>Indicates a situation that, if not avoided, could result in damage to the appliance or property.</p>
<b>IMPORTANT</b>	<p>Indicates important information about the use and care of the appliance.</p>
<b>⚠ DANGER</b>	
<p><b><u>Risk of Fire or Explosion</u></b> <b><u>Flammable Refrigerant Used</u></b></p> <ul style="list-style-type: none"> <li>• Only qualified service technicians should install and service the appliance.</li> <li>• No installation, operation, or maintenance should be undertaken until the technician has thoroughly read this Instruction Manual. All safety precautions must be followed.</li> <li>• No service should be undertaken until the technician has thoroughly read the Service Manual available at <a href="http://www.hoshizakiamerica.com">www.hoshizakiamerica.com</a>. All safety precautions must be followed.</li> <li>• This appliance to be installed in accordance with the Safety Standard for Refrigeration Systems ANSI/ASHRAE 15.</li> <li>• Follow handling instructions carefully in compliance with national regulations.</li> <li>• Do not use mechanical devices or other means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.</li> <li>• Do not puncture refrigerant tubing. Risk of fire or explosion due to puncture of refrigerant tubing; follow handling instructions carefully.</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Component parts shall be replaced with like components. so as to minimize the risk of possible ignition due to incorrect parts.</li> <li>• Dispose of properly in accordance with federal or local regulations.</li> <li>• Do not pierce or burn.</li> <li>• Be aware that refrigerants may not contain an odor.</li> <li>• Do not damage the refrigeration circuit.</li> <li>• See nameplate for R-290 refrigerant charge:             <ul style="list-style-type: none"> <li>• If greater than 114 g (4 oz.), do not install in public corridor or lobby.</li> <li>• If greater than 152 g (5.3 oz.), do not install within 6 m (20 ft) of open flame.</li> </ul> </li> <li>• 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).</li> </ul>

**⚠ 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.
- Aucune installation, opération ou maintenance ne doit être entreprise avant que le technicien n'ait lu attentivement ce manuel d'instructions. Toutes les précautions de sécurité doivent être suivies.
- Aucune opération d'entretien ne doit être entreprise avant que le technicien n'ait lu attentivement le manuel d'entretien disponible sur le site [www.hoshizakiamerica.com](http://www.hoshizakiamerica.com). 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 règlements 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.


## **⚠ DANGER Continué**

- Les pièces doivent être remplacées par des pièces similaires, de manière à réduire au minimum le risque d'inflammation dû à des pièces incorrectes.
  - Mettre au rebut conformément aux règlements fédéraux ou locaux.
  - Ne pas percer ou brûler.
  - Attention, les fluides frigorigènes 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 install, operate, 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.
  - The appliance requires an independent power supply of proper capacity. See the nameplate for electrical specifications. Failure to use an independent power supply of proper capacity can result in a tripped breaker, blown fuse, damage to existing wiring, or component failure. This could lead to heat generation or fire.
- **THE APPLIANCE MUST BE GROUNDED.** The appliance is equipped with a NEMA 5-15 three-prong grounding plug  to reduce the risk of potential shock hazards. It must be plugged into a properly grounded, independent 3-prong wall outlet. If the outlet is a 2-prong outlet, it is your personal responsibility to have a qualified electrician replace it with a properly grounded, independent 3-prong wall outlet. Do not remove the ground prong from the 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 switch or plug with damp hands.
  - To reduce the risk of electric shock, make sure the control switch 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.
  - Do not make any alterations to the appliance. Alterations could result in electric shock, injury, fire, or damage to the appliance.
  - Appliance is heavy. Use care when lifting or positioning. Work in pairs when needed to prevent injury or damage.

**⚠ 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 allow children or animals to do so. Serious injury could occur or the appliance could be damaged.
- Be careful not to pinch fingers when opening and closing the door. Be careful when opening and closing the door 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.

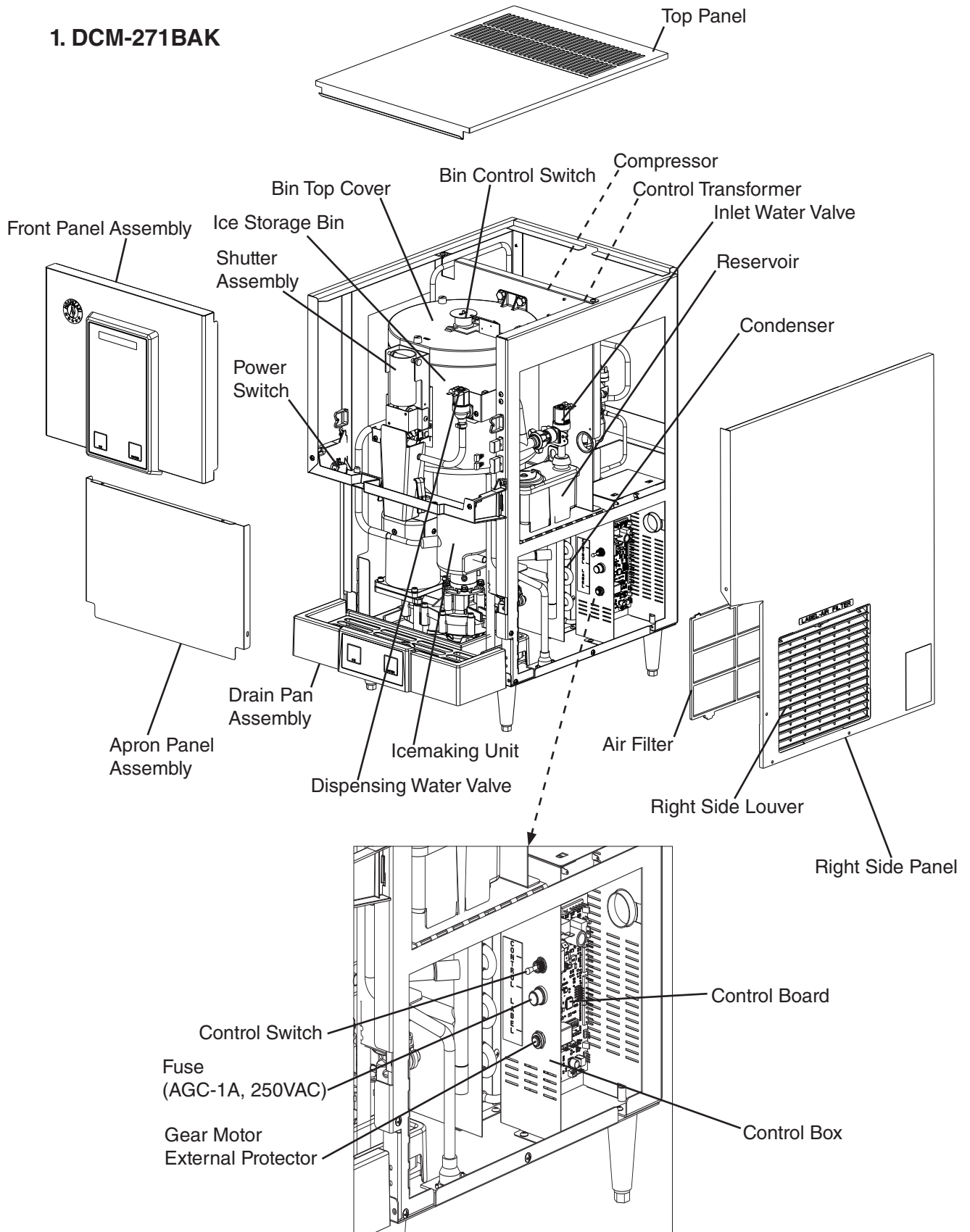
**NOTICE**

- Follow the water supply, drain connection, and maintenance instructions carefully to reduce the risk of costly water damage.
- In areas where water damage is a concern, install in a contained area with a floor drain.
- 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."
- If water seeps from the base of the appliance, turn off the appliance and close the water supply line shut-off valve. Call for service. Failure to do so could lead to costly water damage.
- Do not place objects on top of the appliance.
- The ice storage bin is for ice use only. Do not store anything else in the ice storage bin.
- Protect the floor when moving the appliance to prevent damage to the floor.
- Do not allow the appliance to bear any outside weight.

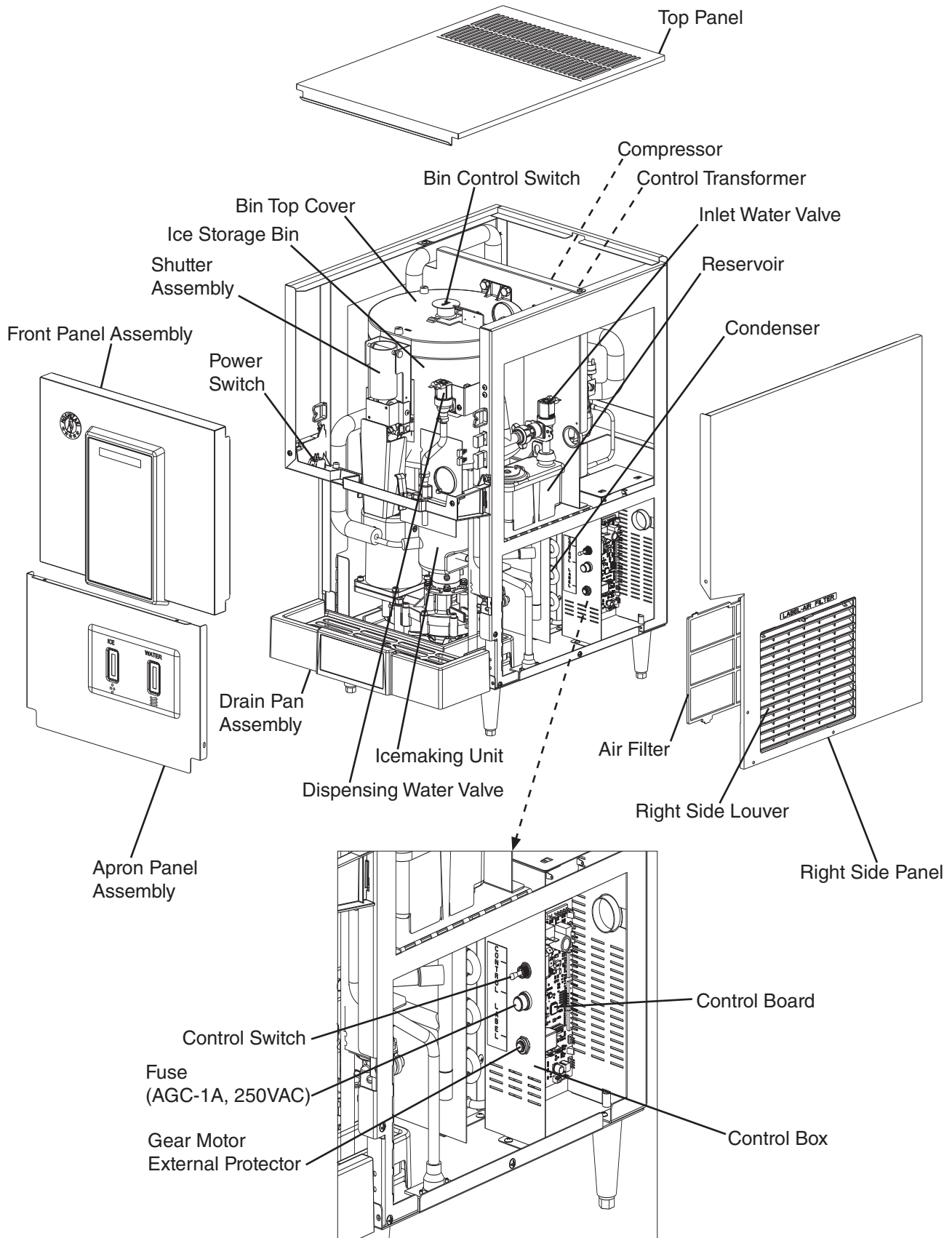
# I. Construction and Water/Refrigeration Circuit Diagrams

## A. Construction

### 1. DCM-271BAK

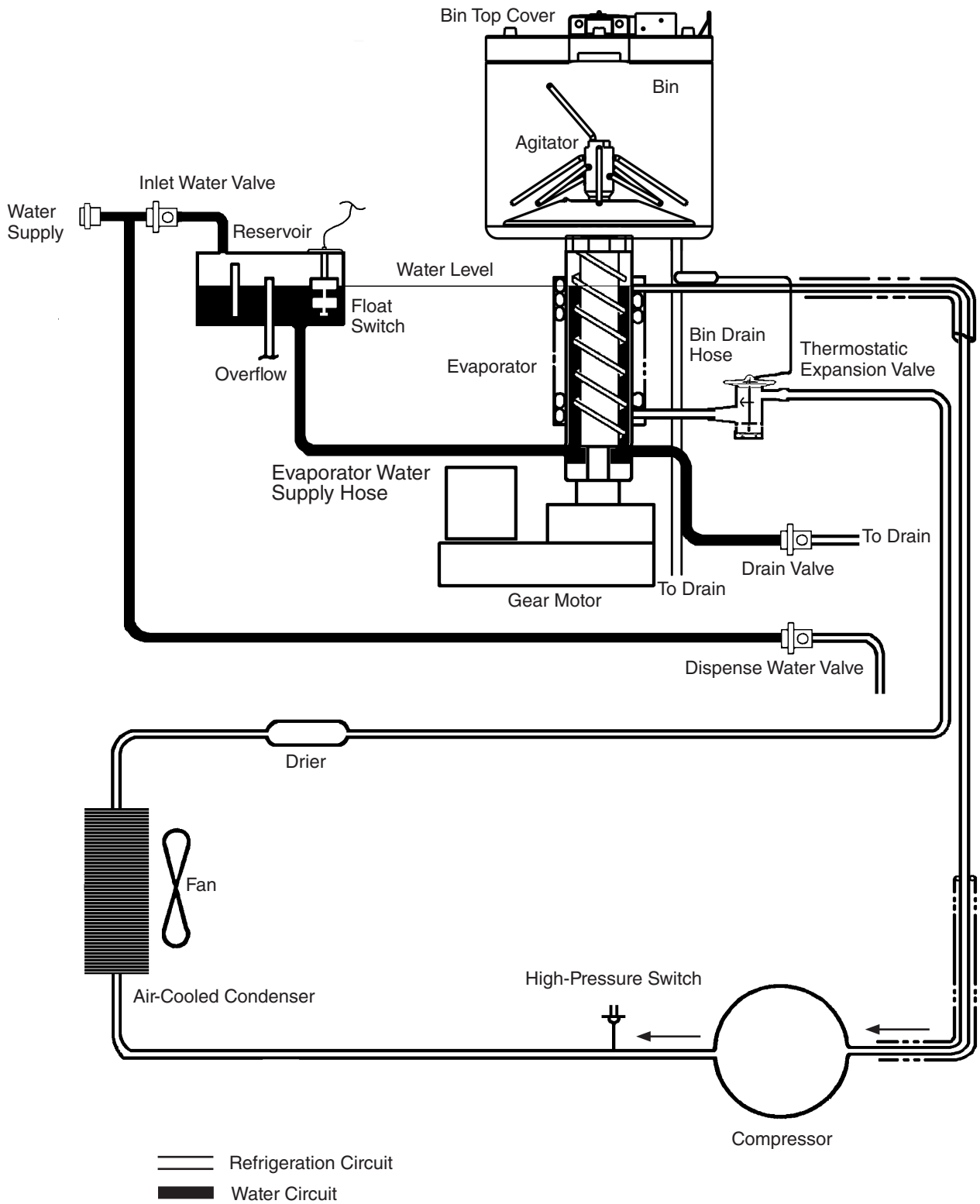


## 2. DCM-271BAK-OS



## B. Water/Refrigeration Circuit Diagrams

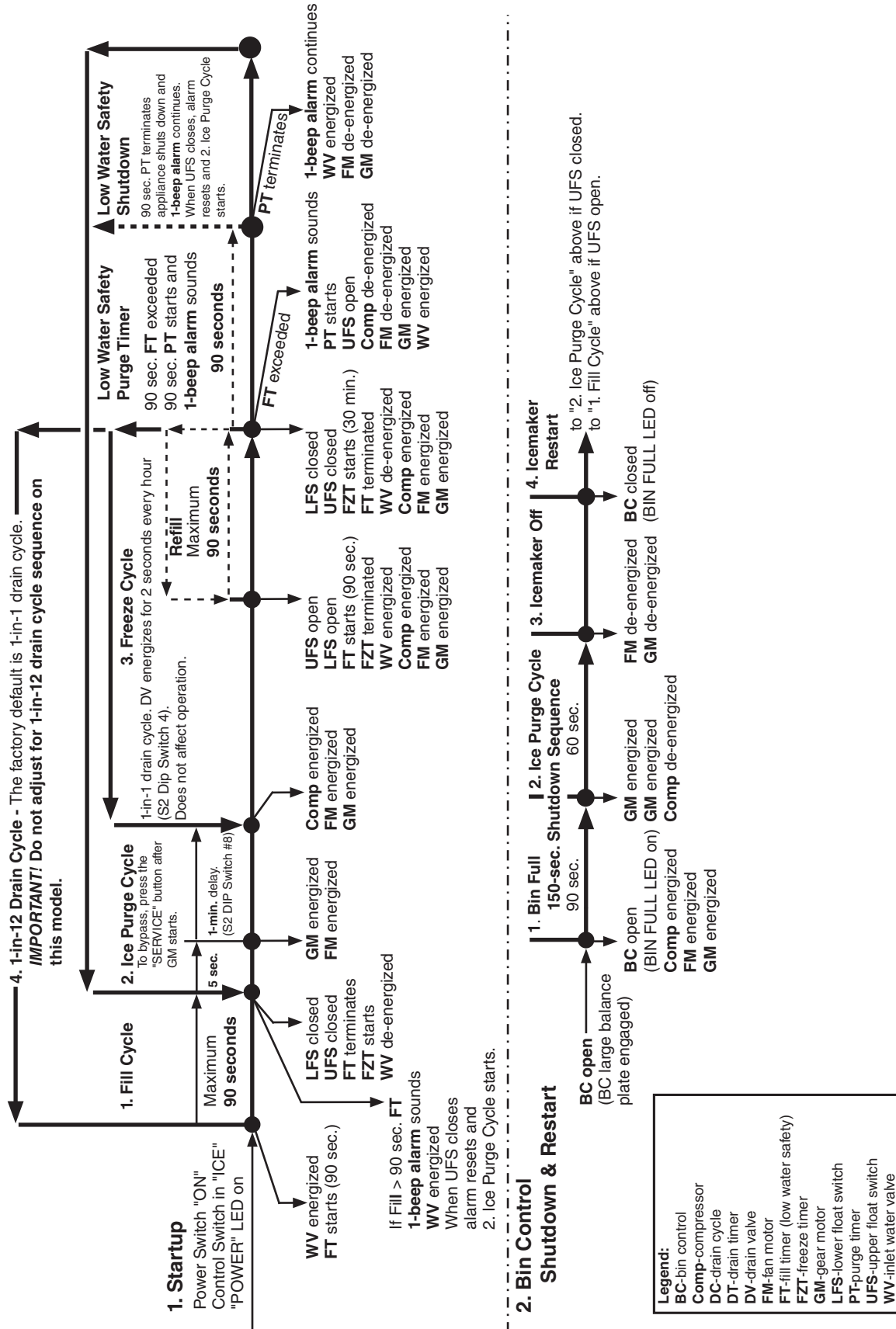
### DCM-271BAK(-OS)



## II. Sequence of Operation

### A. Sequence of Operation Flow Chart

#### Sequence Flow Chart DCM-271BAK(-OS)



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

#### A. Safety Precautions When Servicing | Précautions de sécurité 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<sub>2</sub> 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 or brazing
- 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.

## 2. Français



### 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 règlements 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 frigorigènes 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<sub>2</sub> 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.

## **⚠ DANGER Continué**

- 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 ou brasage
- 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 vanes 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.

## **⚠ DANGER Continué**

- 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.
- 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.
- Risk of electric shock. Control switch in "OFF" position does not de-energize all loads (optional drain pump).
- Move the control switch to the "OFF" position, then unplug the appliance from the electrical outlet before servicing.
- Moving parts (e.g., fan blade) can crush and cut. Keep hands clear.
- **CHOKING HAZARD:** Ensure all components, fasteners, and thumbscrews are securely in place after the appliance is serviced. Make sure that none have fallen into the ice storage bin.
- Make sure all food zones in the appliance are clean after service.

## 1. Ice Production Check

To check ice production, remove the front, top, and left side panels. Place a container under the spout and dispense all ice from the icemaker. Note: The ice dispense switch times out after 20 sec. Re-engage every 20 sec. until bin is empty. Move the control switch and power switch to the "OFF" position. Remove the bin top cover. Pour warm water over the remaining ice. After the ice is removed/melted, place the bin top cover in its original position. Do not secure at this time. Remove the control box cover, then move the control switch to the "ICE" position and the power switch to the "ON" position. Once the gear motor starts, press the "SERVICE" button on the control board (located in the control box). **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.** Lift the bin top cover and monitor the evaporator extruding head. **WARNING! Keep hands, hair, and loose clothing clear of the agitator rotating inside of the ice storage bin.** Once ice begins to fill the bin, start a 10 min. timer. After 10 min., move the power switch to the "OFF" position. Place an empty container under the spout and dispense all ice from the icemaker. Note: The ice dispense switch times out after 20 sec. Re-engage every 20 sec. until bin is empty. Move the power switch to the "OFF" position. Weigh the ice to establish the batch weight (minus the weight of the container). Multiply the batch weight by 144 for the total production in 24 hr. Replace the control box cover and bin top cover in their correct positions and secure. Replace all panels in their correct positions and secure. Move the power switch to the "ON" position to start the automatic icemaking process.

## 2. Diagnostic Procedure

The diagnostic procedure is a sequence check that allows you to diagnose the electrical system and components. Before proceeding, check for correct installation, adequate water pressure of 10 PSIG (68.9 kPa) to 113 PSIG (779.1 kPa), and proper voltage per unit nameplate.

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

- When checking low voltage (24VAC), always choose a neutral (LBU) wire.
- When checking control board DC voltage (5VDC), always place the red positive test lead from the multimeter to CB K7:1 red connector pin #1, (closest to CB K8:2 white connector). See "III.B.3. Control Board Check."
- To speed up the diagnostic process, the ice purge cycle may be bypassed by pressing the "SERVICE" button on the control board after the gear motor starts. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.**
- If the icemaker is in alarm, see "III.B.8. LED Lights and Audible Alarm Safeties."
- CB monitors the following switches with 5VDC during the icemaking process: Control Switch (CS), High-Pressure Switch (HPS), Float Switch (FS), Compressor Control Relay (CCR), and Bin Control (BC).  
When 5VDC is present across any of these switches, the switch is open.

- 1) Move the power switch to the "OFF" position, then unplug the power cord from the electrical outlet. Remove the front, top, and left side panels.
- 2) Plug the power cord back into the electrical outlet, then move the power switch to the "ON" position.
- 3) Move the control switch to the "DRAIN" position. CB "POWER" LED and "DRAIN" LED turns on.  
**Diagnosis "POWER" LED:** Check that CB "POWER" LED is on. If not, check for 115VAC at control transformer brown (BR) wire to neutral (W). If 115VAC is not present, check the power switch, power cord connection, and breaker. If 115VAC is present, check control transformer continuity. Replace as needed. Next, check for 24VAC at control transformer red (R) wire to neutral (LBU). If 24VAC is not present, check control transformer continuity. Replace as needed. If 24VAC is present, check 24VAC 1A fuse. If fuse is good, check for 24VAC at CB K8 #1 (W/R) to CB K8 #2 (LBU). If 24VAC is present and "POWER" LED is off, replace CB.  
**Diagnosis DV:** If DV does not energize, check for 24VAC at CB K2 #10 (W/BU) to neutral (LBU). If 24VAC is not present, check control switch continuity. If open while in the "DRAIN" position, replace control switch. If closed, check for 5VDC at CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) to K9 #1 (W/BK) and to K9 #2 (W/BK). If 5VDC is present between K7:1 red connector pin #1 (closest to CB K8:2 white connector) and K9 #1 and not at K9 #2 and control switch is closed, replace CB. If 24VAC is present, check for restricted DV and DV solenoid continuity. Clean or replace as needed.
- 4) Allow the water system to drain completely. Move control switch to the "ICE" position.
- 5) **Startup—CB "POWER" LED is on.** Turn on the power supply, then move the power switch to the "ON" position. CB "POWER" LED is on and "BIN FULL" orange LED is off.  
**Diagnosis CB "POWER" LED:** Check that CB "POWER" LED is on. If not, check for 115VAC at control transformer black (BK) wire to neutral (W). If 115VAC is not present, check the power switch, power cord connection, and breaker. If 115VAC is present, check control transformer continuity. Replace as needed. Next, check for 24VAC at control transformer red (R) wire to neutral (LBU). If 24VAC is not present, check control transformer continuity. Replace as needed. If 24VAC is present, check 24VAC 1A fuse. If fuse is good, check for 24VAC at CB K8 #1 (W/R) to CB K8 #2 (LBU). If 24VAC is not present, check control switch continuity. If open while in the "ICE" position, replace control switch. If 24VAC is present and "POWER" LED is off, replace CB.

- 6) **Fill Cycle – "WTRIN" LED is on.** Reservoir is empty and LFS and UFS are open. 90-sec. FT starts. WV energizes and fill cycle starts. LFS closes. Nothing occurs at this time. Reservoir continues to fill until UFS closes. When UFS closes, WV de-energizes, 90-sec. FT is terminated, CB "WTRIN" LED turns off, 30-min. FZT and 5-sec. GM delay timer start. If UFS remains open longer than 90 sec. after LFS opens, FT exceeded and CB sounds a 1-beep alarm. WV remains energized until UFS closes. Alarm resets automatically when UFS closes. **Diagnosis:** If reservoir is empty and "WTRIN" LED is off, confirm LFS status. See "III.B.5. Float Switch Check." If LFS is open and "WTRIN" LED is off, replace CB. If "WTRIN" LED is on, check that the reservoir fills. If not, check water supply line shut-off valve, water filters, and WV screen. If "WTRIN" LED is on and WV is off, check CB K2 #8 (O) to a neutral (LBU) for 24VAC. If 24VAC is not present, check CB K2 #9 (W/R) to a neutral (LBU) for 24VAC. If 24VAC is present on CB K2 #9 (W/R) and not on CB K2 #8 (O), replace CB. If 24VAC is present on CB K2 #8 (O), check continuity through WV solenoid. If open, replace WV. If WV is energized and refill exceeds FT with no water in the reservoir, check for DV leaking. If reservoir is full and overflowing check for open UFS. See "III.B.5. Float Switch Check." If UFS is closed, check that WV de-energizes. If not, check CB K2 #8 (O) to a neutral (LBU) for 24VAC. If 24VAC is present, replace CB. If WV de-energizes and water continues to fill the reservoir, replace WV.
- Note: **Low Water Safety**– If UFS remains open 90 sec. after WV energizes, a 1-beep alarm sounds. This alarm resets automatically once UFS closes.

- 7) **Ice Purge Cycle – "GM" LED is on.** 5-sec. GM delay timer terminates. GM, FM, and CCR energize. Once CCR energizes, 5VDC circuit closes through CCR terminal #3 (W/O) and terminal #5 (W/O) and CB K9 #5 (W/O) and K9 #6 (W/O). After 5VDC circuit closes, 1-min. ice purge timer starts. To bypass the 1-min. Ice Purge Cycle, press the "SERVICE" button on CB after the "GM" LED turns on. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.** CCR cannot energize unless GM circuit is complete (GM external protector and GM internal protector). See "III.B.3.(1)(c) Compressor Control Relay (Ice Purge Timer Circuit)."
- If CCR de-energizes, CB K9 #5 W/O and CB K9 #6 W/O circuit opens and an 8-beep alarm occurs. See "III.B.8. LED Lights and Alarm Safeties." Note: To bypass ice purge cycle and go straight to freeze cycle, press the "SERVICE" button on CB after GM energizes.

**Diagnosis CB:** If "GM" LED is off, check that UFS closes and WV de-energizes. If UFS is closed, 30 sec. has passed, and "GM" LED remains off, replace CB. If "GM" LED is on and GM is off, check CB K1 #2 (BK) to a neutral (W) for 115VAC. If 115VAC is not present, check 115VAC power supply. If 115VAC is present, check CB K1 #3 (P) to neutral (W). If 115VAC is present on CB K1 #2 (BK) and not on CB K1 #3 (P), replace CB.

**Diagnosis GM:** If 115VAC is present at CB K1 #3 (P) to neutral (W), check GM external protector. If tripped, reset. If GM external protector is closed, check GM internal protector (windings). If open, allow time for GM to cool down and internal protector to reset. If not, replace GM. Next, check GM capacitor and GM coupling between auger and GM.

**Diagnosis FM:** If FM does not start, check that fan blades are not binding. Next, check FM capacitor, FM windings, and FM bearing.

**Diagnosis CCR:** See "III.B.3.(1)(c) Compressor Control Relay (Ice Purge Timer Circuit)." Once 1-min. ice purge timer terminates or the "SERVICE" button is pressed, freeze cycle begins.

8) **Freeze Cycle – "COMP" and "GM" LEDs are on.** The 1-min. ice purge timer terminates or the "SERVICE" button is pressed. "COMP" LED turns on. "GM" LED continues. Comp energizes. GM, FM, and CCR continue. Ice production begins 4 to 6 minutes after Comp energizes depending on ambient and water conditions. As ice is produced, the water level in the reservoir drops. UFS opens. Nothing happens at this time. When LFS opens, WV energizes and refill cycle begins, FZT terminates, and FT starts.

**FZT: 30-Min. Freeze Safety Timer:** FZT starts when UFS closes and terminates when LFS opens. If LFS does not open within 30 min. of UFS closing, CB shuts down the icemaker and sounds a 5-beep alarm. See "III.B.8. LED Lights and Audible Alarm Safeties." To reset, turn the power supply off and on again. See "III.B.6. Diagnostic Tables" for troubleshooting details.

**Icemaker Diagnosis (CCR):** 1-min. ice purge timer terminates, CB "COMP" LED turns on and COMP energizes. If not, check for 5VDC between CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) and CB K9 connector #5 (W/O). If 5VDC is not present, replace CB. If 5VDC is present, check for 5VDC between CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) and CB K9 connector #6 (W/O). If 5VDC is present and CB "Comp" LED is off, COMP not energized, replace CB. If 5VDC is not present, check for 115VAC between CCR terminal #7 (R) to CCR terminal #8 (W) for 115VAC. If 115VAC is not present, GM not energized, see step 7 above. If 115VAC is present and CCR contacts are open (5VDC present between terminals #3 (W/O) and #5 (W/O)), check CCR solenoid continuity. If open, replace CCR.

Note: If CCR de-energizes, CB K9 #5 W/O and CB K9 #6 W/O circuit opens, Comp de-energizes and an 8-beep alarm occurs. See "III.B.8. LED Lights and Alarm Safeties."

**Diagnosis COMP:** If "COMP" LED is on and COMP is not energized, check CB X1 relay BK wire to a neutral (W) and CB X1 relay R wire to a neutral (W) for 115VAC. If 115VAC is present on CB X1 BK wire and not on CB X1 R wire, replace CB. If 115VAC is present on CB X1 R wire and COMP is not energized, check Comp windings (internal protector), start relay, and capacitor.

9) **Refill Cycle/Low Water Safety** – As ice is produced, the water level in the reservoir drops. UFS opens. Nothing occurs at this time. When LFS opens, WV energizes, 90-sec. low water safety timer (fill timer) starts. Comp, GM, CCR, and FM continue. When UFS closes, WV de-energizes, 90-sec. low water safety timer (fill timer) terminates and 30-min. freeze timer resets. If UFS remains open 90 sec. after WV energizes (fill timer exceeded), a 90-sec. shutdown cycle starts. Comp de-energizes and CB signals a 1-beep alarm every 5 sec. 90-sec. ice purge timer starts. FM, GM, and CCR continue to clear ice from the evaporator. 90-sec. ice purge timer terminates, FM, GM and CCR de-energize. WV and 1-beep alarm continue until UFS closes.

**Diagnosis** – Check that "WTRIN" LED is on. If not, check LFS. See "III.B.5. Float Switch Check and Cleaning." If LFS is open and "WTRIN" LED is off, replace CB. If "WTRIN" LED is on, check that the reservoir fills. If not, check the water supply line, restricted water filters, WV solenoid, restricted WV screen. If WV is energized and refill exceeds 90-sec. low water safety timer (fill timer), check DV leaking by or open UFS. See "III.B.5. Float Switch Check and Cleaning."

Note: Each time UFS closes, 30-min. freeze timer starts. The 30-min. freeze timer resets when UFS closes again. If UFS does not close again within 30 min., CB shuts down the icemaker and sounds a 5-beep alarm every 5 sec. See "III.B.8. LED Lights and Alarm Safeties."

## 10) Drain Cycle

- a) **1-n-1 Drain Cycle:** DV energizes once every hour when the 1-in-1 drain cycle is activated (S2 dip switch 4 in the "OFF" position (factory default position)). GM, FM, and Comp continue. DV energizes for 2 sec. every hour. This setting is recommended for optimum icemaker performance. The 1-in-1 drain cycle allows any sediment to drain from the evaporator without interrupting the icemaking process.
- b) **1-in-12 Drain Cycle (optional):** DV energizes once every 12 hours when the 1-in-12 drain cycle is activated (S2 dip switch 4 in the on position (optional)). 12-hour drain cycle timer terminates, Comp de-energizes. GM and FM continue. The 1-min. ice purge timer starts. When the 1-min. ice purge timer terminates, GM and FM de-energize. 10-min. DT starts, DV energizes. After 10-min. DT terminates, DV de-energizes icemaking process restarts and 12-hour drain cycle timer starts.
- c) **Manual Drain:** Manual drain is used when servicing evaporator components and cleaning and sanitizing the unit. When the unit is making ice and the control switch is moved to the "DRAIN" position, there is a 3-sec. delay, then Comp de-energizes and the 1-min. ice purge timer begins. When the 1-min. ice purge timer terminates, GM and FM de-energize. DV energizes to drain the evaporator and reservoir. To avoid the 5-min. shutdown delay, turn off the power supply, then move the control switch to the "DRAIN" position. Turn on the power supply. DV energizes to drain the evaporator and reservoir. DV de-energizes when the control switch is moved to the "ICE" position.
- Diagnosis DV:** If DV does not energize, check for 24VAC at CB K2 #10 (W/BU) to neutral (LBU). If 24VAC is not present, check control switch continuity. If open while in the "DRAIN" position, replace control switch. If closed, check for 0VDC at control board K9 #1 (W/BK) to K9 #2 (W/BK). If 5VDC is present and control switch is closed, replace CB. If 24VAC is present, check for restricted DV and DV solenoid continuity. Clean or replace as needed.

## 11) Shutdown

Bin fills with ice activating BC. "BIN FULL" LED turns on. CB starts 90-sec. Comp shutdown timer. Once 90-sec. Comp shutdown timer terminates, Comp de-energizes and 60-sec. GM shutdown timer starts. Once 60-sec. GM shutdown timer terminates, FM and GM de-energize and icemaker is off.

**Shutdown Diagnosis:** Check that BC large balance plate is activated and not sticking. Check BC micro-switch continuity. When BC large balance plate is down (icemaking), BC micro-switch is closed. When BC large balance plate is up BC micro-switch is open. If not, replace BC micro-switch. If BC micro-switch is open and Comp, FM, and GM do not de-energize, replace CB. If BC micro-switch is open and "BIN FULL" LED is not on, replace CB. See "III.B.3. Control Board Check."

Legend: **BC**—bin control; **CB**—control board; **CCR**—compressor control relay;  
**Comp**—compressor; **CT**—control transformer; **DV**—drain valve; **FM**—fan motor;  
**GM**—gear motor; **LFS**—lower float switch; **UFS**—upper float switch; **WV**—inlet water valve

### 3. Control Board Check

Before replacing a CB that does not show a visible defect and that you suspect is bad, always conduct the following check procedure. This procedure will help you verify your diagnosis. Before proceeding, check for proper voltage per appliance nameplate. Check that the 24VAC 1A fuse is good and 115VAC 3A GM external protector is closed.

- Check the S2 dip switch settings to assure that they are in the factory default position. For factory default settings, see "III.B.9. Default Dip Switch Settings." S2 dip switch 7 determines bin control application. **WARNING! Do not adjust S2 dip switch 4, 7, 8, or 9 dip switches out of their factory default positions. These dip switches must be left in the factory default position or the appliance will not operate correctly.**
  - When checking for 115VAC high-voltage (primary), always choose a 115VAC neutral (W) to establish a good neutral connection.
  - When checking for 24VAC low-voltage (secondary), always choose a 24VAC neutral (LBU) to establish a good neutral connection. If the appliance is in alarm, see "III.B.8. LED Lights and Audible Alarm Safeties."
  - When checking for 5VDC, use CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) to K9 pin 1 to complete DC circuit.
- 1) **Startup-"POWER" LED on:** Move control switch to "ICE" position, then move power switch to "ON" position. "POWER" LED turns on. "POWER" LED remains on unless power supply is interrupted.  
**Diagnosis:** Check that "POWER" LED is on. If not, check for proper 115VAC supply voltage to CT (main breaker or fuse, power supply cord, and power switch). Next, check for proper 24VAC output from CT. Next, check that 1A fuse is good. Check for 24VAC from CB K8 connector pin #1 (W/R) to CB K8 connector pin #2 (LBU). If 24VAC is not present, check control switch continuity. If open while in the "ICE" position, replace control switch. If 24VAC is present and "POWER" LED is off, replace CB.
  - 2) **5VDC Output Checks:** There are seven 5VDC circuits on the appliance.
    - a) 3 circuits at CB K9 connector: Control switch, high-pressure switch (HPS), and compressor control relay (CCR).
    - b) 2 circuits at CB K8 connector: Bin control (BC) and float switch (FS upper and lower).
    - c) 2 circuits at CB K7 connector: Ice dispense (push button, and OS sensor), and water dispense (push button and OS sensor).

(1) **5VDC CB K9 Connector:** See Fig. 1.

(a) **Control Switch "DRAIN" Position**

CB K9 connector pins #1 (W/BK) and #2 (W/BK):

- "ICE" Position: When the control switch is in the "ICE" position, CB K9 connector pin #1 and pin #2 are open. 5VDC is present between CB K9 connector pin #1 (W/BK) and pin #2 (W/BK). If not, check control switch position and continuity (open). Replace as needed. Next, confirm 5VDC between pin #1 (W/BK) and CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If 5VDC is not present, replace CB.
- "DRAIN" Position: When control switch is in the "DRAIN" position, CB K9 connector pin #1 (W/BK) and pin #2 (W/BK) are closed. 0VDC is present between pin #1 (W/BK) and pin #2 (W/BK). If not, check control switch position and continuity. Next, confirm 5VDC is present between both CB K9 connector pin #1 (W/BK) and pin #2 to CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If 5VDC is not present on both pins, replace CB.

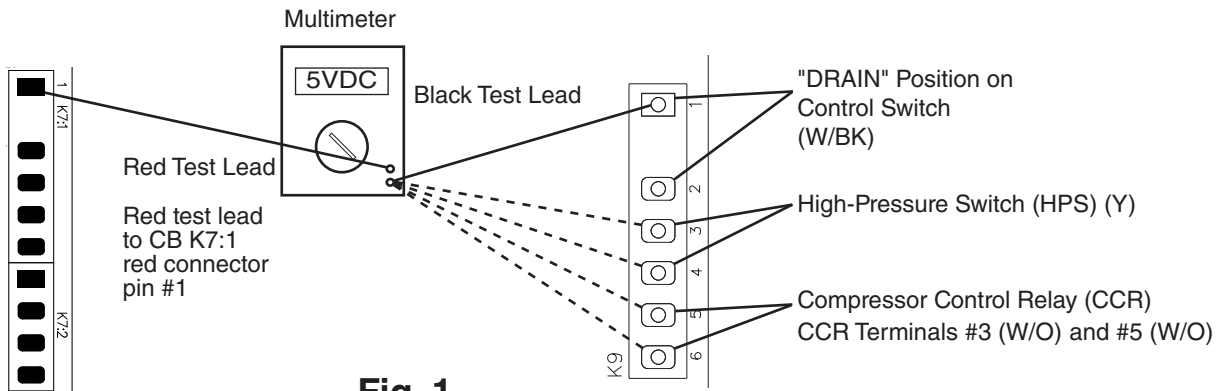
(b) **High-Pressure Switch (HPS)**

CB K9 connector pins #3 (Y) and #4 (Y): When HPS is closed, 5VDC is present between both CB K9 connector pins #3 (Y) and pin #4 (Y) to CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If 5VDC is not present on pin #3 (Y) or pin #4 (Y), replace CB. If 5VDC is present on CB K9 connector pin #3 (Y) and not on CB K9 connector pin #4 (Y), HPS is most likely open. CB sounds a 3-beep alarm. Check HPS continuity. If HPS is open and CB is not in alarm, replace CB.

(c) **Compressor Control Relay (CCR):** See Fig. 1.

CB K9 connector pins #5 (W/O) and #6 (W/O): When CCR is de-energized (GM off), CCR terminals #3 and #5 are open and 5VDC is present between CB K9 connector pin #5 (W/O) and CB K9 connector pin #6 (W/O). If 5VDC is not present, check CCR continuity between terminals #3 and #5. If closed and CCR is de-energized, replace CCR. Check for 5VDC at CB K9 pin #5 (W/O) and CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If 5VDC is not present, replace CB. When CCR is energized, CCR terminals #3 and #5 close and 0VDC is present between CB K9 pin #5 (W/O) and pin #6 (W/O). 5VDC is present between CB K9 pin #5 (W/O) to CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) and CB K9 pin #6 (W/O) to CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If GM is energized and CCR terminals #3 & #5 are open, an 8-beep alarm occurs. See "III.B.8. LED Lights and Audible Alarm Safeties." If CCR terminals #3 and #5 are closed, Comp delay timer starts. If Comp does not energize after Comp delay timer terminates, replace CB.

5VDC CB K9 Connector	
Component	Pin # (Wire Color)
Control Switch "DRAIN" Position	#1 (W/BK) and #2 (W/BK)
High-Pressure Switch (HPS)	#3 (Y) and #4 (Y)
Compressor Control Relay (CCR) (CCR relay terminals #3 W/O and #5 W/O)	#5 (W/O) and #6 (W/O)



**Fig. 1** Control Board K9 Connector

(2) **5VDC CB K8 Connector:** See Fig. 2.

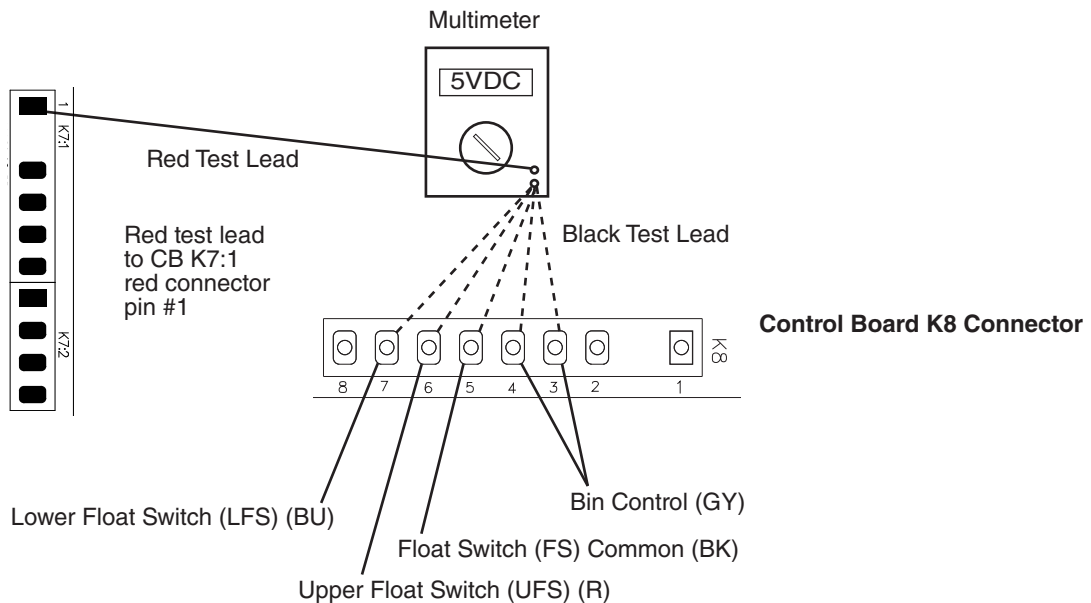
(a) **Bin Control (BC)**

CB K8 pin #3 (GY) and pin #4 (GY): When BC is closed (icemaking), 5VDC is present between CB K8 pin #3 (GY) and pin #4 (GY) to CB K7:1 red connector pin #1 (closest to CB K8:2 white connector). If 5VDC is not present on either pin, replace CB. If 5VDC is present on pin #3 (GY) and not on pin #4 (GY), BC is open. See "III.B.4. Bin Control Check."

(b) **Float Switch (FS): Upper (UFS) and Lower (LFS):**

CB K8 pin #5 common (BK), pin #6 UFS (R), and pin #7 LFS (BU): 5VDC is present between CB K8 pin #5 common (BK) and CB K7:1 red connector pin #1 (closest to CB K8:2 white connector) at all times. If 5VDC is not present, replace CB. For further float switch diagnostics, see "III.B.5. Float Switch Check and Cleaning."

5VDC CB K8 Connector	
Component	Pin # (Wire Color)
Bin Control (BC)	#3 (GY) and #4 (GY)
Float Switch (FS) Common	#5 (BK) Common
Upper Float Switch (UFS)	#6 (R)
Lower Float Switch (LFS)	#7 (BU)



**Fig. 2**

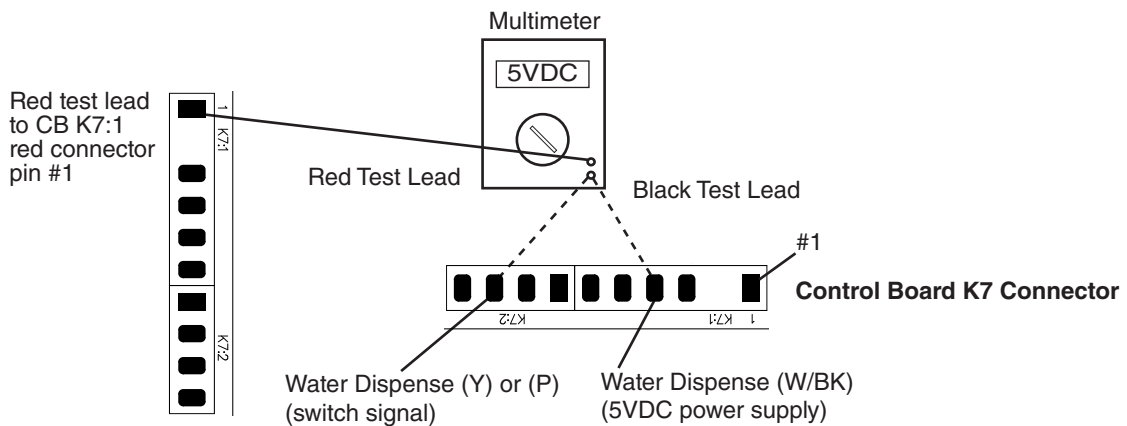
(3) **5VDC CB K7 Connector:** See Figs. 3, 4, 5, and 6.

(a) **Water Dispense**

**1. Push Button Model**

CB K7 pin #3 (W/BK) and pin #8 (P): "WTRDP" LED is on: Before engaging the water dispense switch, check for the correct VDC from the locations given in the "Disengaged" column in the table below. If the VDC is different than in the table, replace CB. If the VDC is correct, engage the water dispense switch. "WTRDP" LED turns on. If not, confirm that the water dispense signal VDC matches the "Engaged" column in the table below. If not, check the water dispense switch continuity when engaged (closed). If the water dispense switch is open when engaged, replace the water dispense switch. If the VDC matches the "Engaged" column below and the "WTRDP" LED does not turn on, replace CB.

5VDC CB K7 Connector					
Component	Pin # (Wire Color)	To	CB VDC Ground	Disengaged	Engaged
5VDC Power Supply	#3 (W/BK)	To	K7:1 red connector pin #1	5VDC	5VDC
Water Dispense Signal	#8 (P)			0VDC	5VDC



**Fig. 3**

## 2. Opti-Serve Model

CB K8 connector pins #7 (R), #8 (P), and #9 (BK): Before engaging the water dispense OS sensor, check for the correct VDC from the locations given in the "Disengaged" column in the table below. If the VDC is different than in the table, replace CB. If the VDC is correct, engage the OS sensor. "WTRDP" LED turns on. If not, confirm that the water dispense signal VDC matches the "Engaged" column in the table below. If not, replace the OS sensor. If the VDC matches the "Engaged" column below and the "WTRDP" LED does not turn on, replace CB.

5VDC CB K7 Connector					
Component	Pin # (Wire Color)	To	CB VDC Ground	Disengaged	Engaged
VDC Sensor Ground	#7 (R)	To	K7:1 red connector pin #1	0VDC	0VDC
Water Dispense Signal	#8 (P)			0VDC	5VDC
5VDC Power Supply	#9 (BK)			5VDC	5VDC

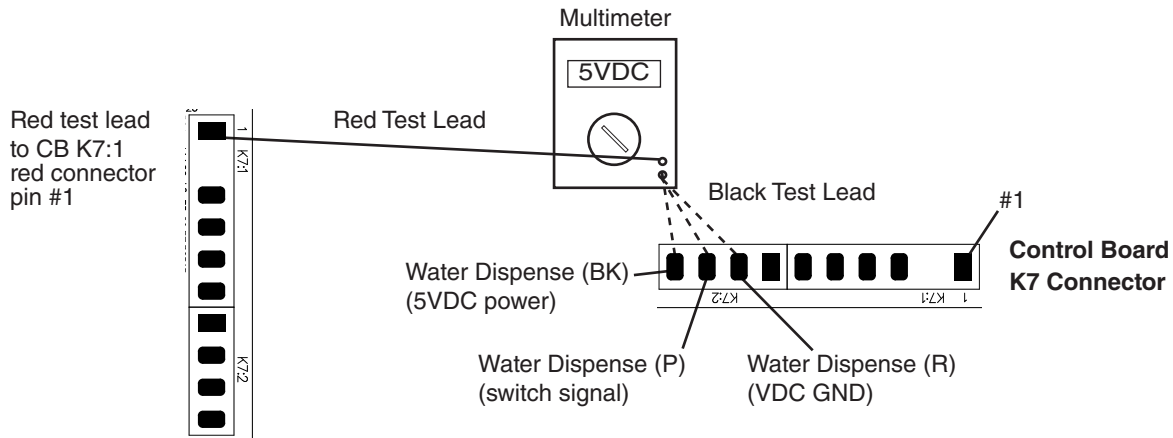


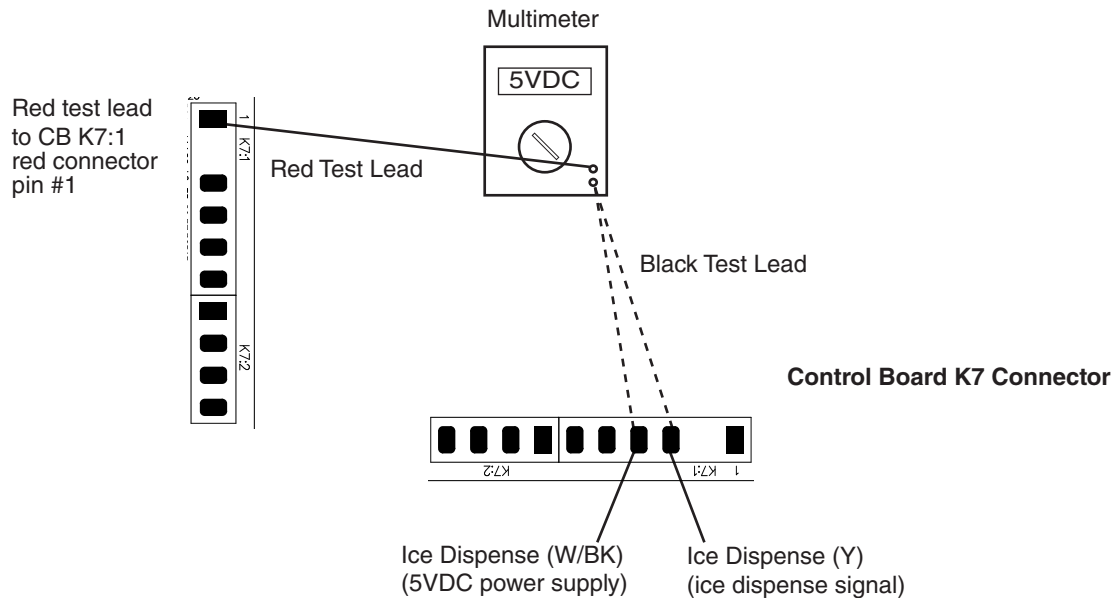
Fig. 4

**(b) Ice Dispense**

**1. Push Button Model**

CB K7 connector pins #2 (Y) and #3 (W/BK): "ICE" and "AM" LEDs are on: Before engaging the ice dispense switch, check for the correct VDC from the locations given in the "Disengaged" column in the table below. If the VDC is different than in the table, replace CB. If the VDC is correct, engage the ice dispense switch. "ICE" LED turns on. If not, check the ice dispense switch continuity when engaged (closed). If the ice dispense switch is open when engaged, replace. If the VDC matches the "Engaged" column below and the "ICE" LED does not turn on, replace CB.

5VDC CB K7 Connector					
Component	Pin # (Wire Color)	To	CB VDC Ground	Disengaged	Engaged
5VDC Power Supply	#3 (W/BK)	To	K7:1 red connector pin #1	5VDC	5VDC
Ice Dispense Signal	#2 (Y)			0VDC	5VDC

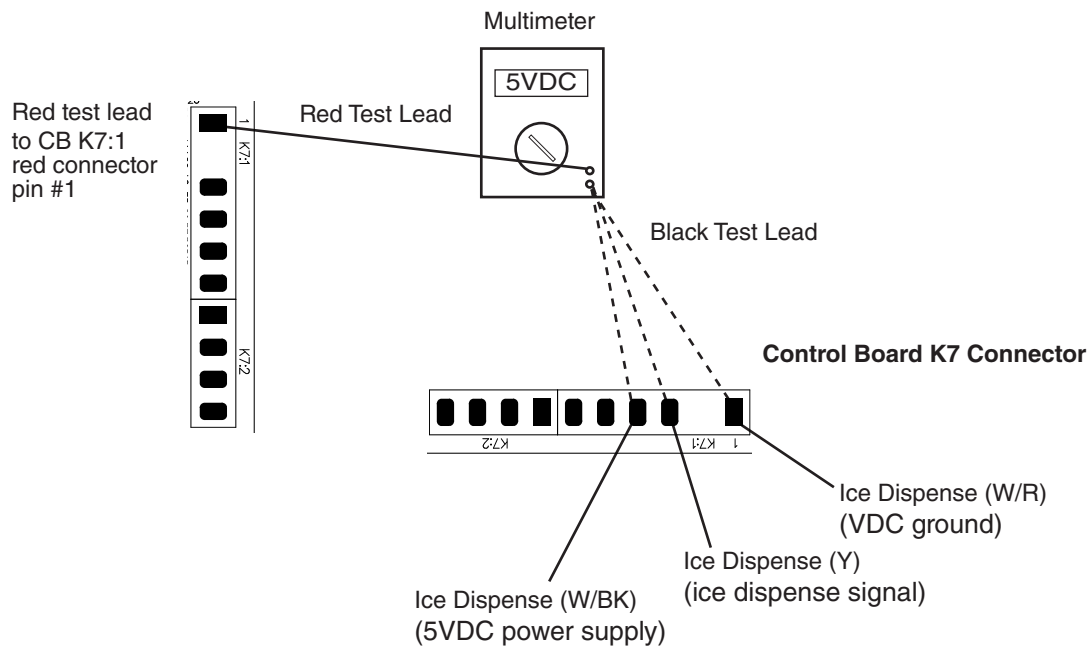


**Fig. 5**

## 2. Opti-Serve Model

CB K8 pin #1 (W/R), pin #2 (Y), and pin #3 (W/BK): Before engaging the ice dispense OS sensor, check for the correct VDC from the locations given in the "Disengaged" column in the table below. If the VDC is different than in the table, replace CB. If the VDC reading is correct, engage the OS sensor. "ICE" LED turns on. If not, confirm that the ice dispense signal VDC matches the "Engaged" column in the table below. If not, replace the OS sensor. If the VDC matches the "Engaged" column below and the "ICE" LED does not turn on, replace CB.

5VDC CB K7 Connector					
Component	Pin # (Wire Color)	To	CB VDC Ground	Disengaged	Engaged
VDC Sensor Ground	#1 (W/R)	To	K7:1 red connector pin #1	0VDC	0VDC
Ice Dispense Signal	#2 (Y)			0VDC	5VDC
5VDC Power Supply	#3 (W/BK)			5VDC	5VDC



**Fig. 6**

- c) **Fill Cycle—"WTRIN" LED is on:** "WTRIN" LED turns on only when the reservoir water level is low enough to open LFS. **Diagnosis:** Confirm LFS is open. If "WTRIN" LED is off and LFS is open and the control switch is in the "ICE" position (open), replace CB. If "WTRIN" LED is on and water is not filling the reservoir, check for 24VAC at CB K2 connector between pin #8 (O) and neutral (LBU). If the "WTRIN" LED is on and 24VAC is not present between CB K2 connector pin # 8 (O) and neutral (LBU), confirm 24VAC at CB K2 connector between pin #7 (W/R) and neutral (LBU). If 24VAC is present between CB K2 connector pin #7 (W/R) and neutral (LBU) and not between CB K2 connector pin #8 (O) and neutral (LBU), replace CB.

24VAC CB K2 Connector					
Connector	Pin # (Wire Color)	To	Neutral (LBU)	LFS Open	LFS Closed
K2 (CB input power)	Pin #7 (W/R)	To	K8 pin #2 (LBU)	24VAC	24VAC
K2 (WV power)	Pin #8 (O)			0VAC	24VAC

- d) **Ice Purge Cycle—"GM" LED is on:** "GM" LED turns on once UFS closes (reservoir full). If UFS is closed and "GM" LED is off, replace CB. If "GM" LED is on but GM does not start, check for 115VAC from CB K1 connector pin #3 (P) to neutral (W). If 115VAC is not present, confirm 115VAC from CB K1 connector pin #2 (BK) to neutral (W). If 115VAC is present on CB K1 connector pin #2 (BK) but not on CB K1 connector pin #3 (P), replace CB. Once GM energizes, CCR energizes and PT (1-min.) starts.
- e) **Freeze Cycle—"GM" and "COMP" LED are on:** PT terminates or press the "SERVICE" button on CB after the "GM" LED turns on to bypass ice purge cycle. **WARNING!** Risk of electric shock. Care should be taken not to touch live terminals. After PT terminates, "COMP" LED turns on. If not, confirm CCR contacts are closed. See step "(1)(c). Compressor control relay" above. If CCR contacts are closed, replace CB. If "COMP" LED turns on and Comp does not start, check for 115VAC from the CB X1 black (BK) wire and red (R) wire to neutral (W). If 115VAC is present on CB X1 black (BK) wire and not on CB X1 red (R) wire, replace CB. If 115VAC is present on CB X1 red (R) wire and Comp is not energized, CB operation confirmed, check Comp external overload, start capacitor, start relay, motor windings, locked rotor.

Legend: **AM**—agitating motor (gear motor this model); **BC**—bin control; **CB**—control board; **CCR**—compressor control relay; **Comp**—compressor; **CT**—control transformer; **DV**—drain valve; **FM**—fan motor; **FT**—fill timer (90-sec. low water safety); **GM**—gear motor; **PT**—purge timer; **LFS**—lower float switch; **UFS**—upper float switch; **WV**—inlet water valve

#### 4. Bin Control Check

When BC (micro-switch) is not engaged, BC circuit (CB K8 #3 (GY) and CB K8 #4 (GY)) is closed and the appliance produces ice. When ice fills the bin and engages BC large balance plate, BC opens. CB "BIN FULL" LED turns on.

**NOTICE! Do not place S2 dip switch 7 or S2 dip switch 8 out of the factory default position. These dip switches must be left in the factory default position or the appliance will not operate correctly. For details, see "III.B.9. Settings and Adjustments."**

CB dip switch 8 and 9 off; CB starts the 90-60 shutdown sequence.

- 1) Move the power switch to the "OFF" position.
- 2) Remove the front, top, and left side panels.
- 3) Move the control switch to the "OFF" position.
- 4) Remove the thumbscrews securing the storage bin cover. **WARNING! Keep hands, hair, and loose clothing clear of the agitator rotating inside of the storage bin.**
- 5) Disconnect BC connector from the back of the control box.
- 6) Check for continuity across BC micro-switch. If BC large balance plate is not engaged and BC micro-switch is open, replace BC micro-switch.
- 7) Press and hold BC large balance plate. While BC large balance plate is engaged, check for continuity across BC micro-switch. If BC large balance plate is engaged and BC micro-switch is open, replace BC micro-switch.
- 8) Disengage BC large balance plate.
- 9) Reconnect BC connector. Remove the control box cover.
- 10) Move the control switch to the "ICE" position, then move the power switch to the "ON" position.
- 11) Make sure the "GM" LED is on. There is a delay of at least 5 seconds before the "GM" LED turns on after power-up. After the "GM" LED turns on, press the "SERVICE" button on CB to bypass the ice purge timer. **WARNING! Risk of electric shock. Care should be taken not to touch live terminals.** "COMP" LED turns on.
- 12) When Comp starts, press and hold BC large balance plate. CB "BIN FULL" LED turns on.
- 13) 90-sec. Comp shutdown timer starts. Once 90-sec. Comp shutdown timer terminates, Comp de-energizes and 60-sec. GM shutdown timer starts. Once 60-sec. GM shutdown timer terminates, GM and FM de-energize.  
**Diagnosis:** If BC micro-switch is found open and the appliance continues to run, replace CB.
- 14) Move the power switch to the "OFF" position. Leave the control switch in the "ICE" position.
- 15) Replace the storage bin cover and secure.
- 16) Replace the control box cover, left side, top, and front panels in their correct positions.
- 17) Move the power switch to the "ON" position to start the automatic icemaking process.

Legend: **BC**—bin control; **CB**—control board; **Comp**—compressor; **FM**—fan motor;  
**GM**—gear motor

## 5. Float Switch Check and Cleaning

### a) Float Switch Check

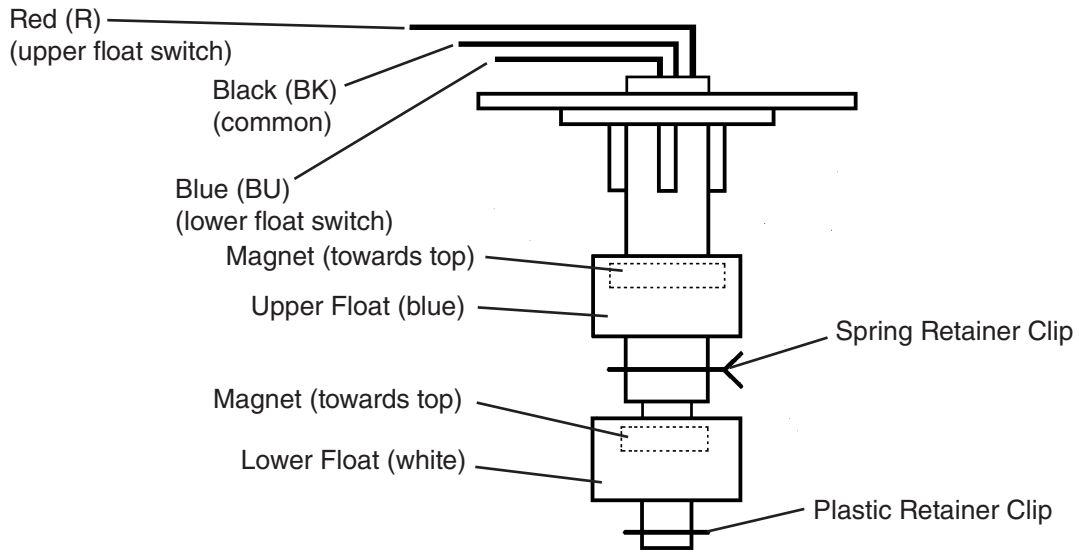
- 1) Remove the front, top, and left side panels, then move the control switch to the "DRAIN" position.
- 2) After the water has drained from the reservoir, remove the FS molex plug from the control box and check continuity across FS wires. Common (BK) to UFS (R) and common (BK) to LFS (BU). See Fig. 7. With the reservoir empty, float switches are open. If open, continue to step 3. If closed, follow the steps in "III.B.5. Float Switch Cleaning." After cleaning, check them again. Replace if necessary.
- 3) Replace the FS molex plug on the control box.
- 4) Move the control switch to the "ICE" position.
- 5) The reservoir fills. Once UFS closes GM starts.
- 6) Move the control switch to the "OFF" position.
- 7) Remove the FS molex plug from the control box and check continuity across FS wires. Common (BK) to UFS (R) and common (BK) to LFS (BU). With the reservoir full, float switches are closed. If open, follow the steps in "III.B.5. Float Switch Cleaning." After cleaning, check them again. Replace if necessary.
- 8) Move the control switch to the "ICE" position.
- 9) Replace the left side, top, and front panels in their correct positions.

### b) Float Switch Cleaning

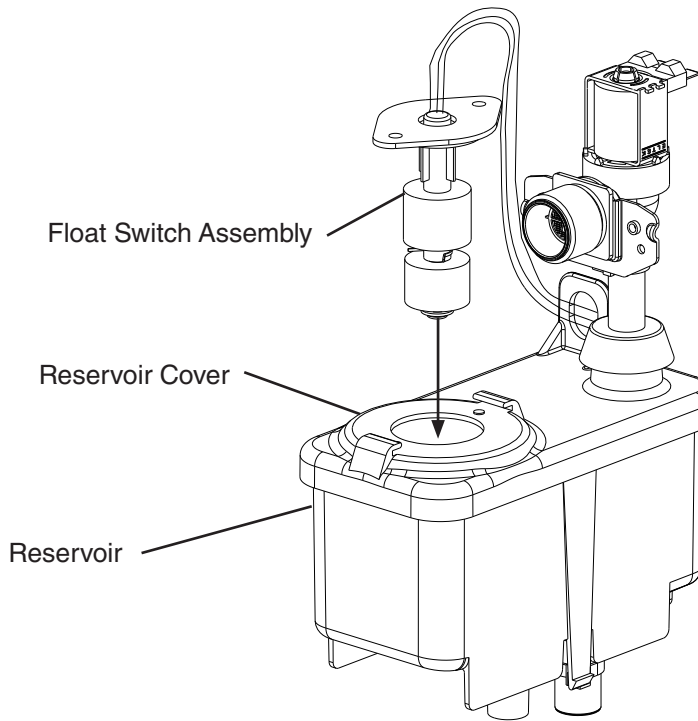
Depending on water conditions, scale may build up on FS. Scale on the switch can cause the floats to stick. In this case, FS should be cleaned and checked.

- 1) Remove the front, top, and left side panels, then move the control switch to the "DRAIN" position.
- 2) After the water has drained from the reservoir, move the control switch to the "OFF" position and the power switch to the "OFF" position.
- 3) Remove FS assembly from the reservoir cover. See Fig. 8.
- 4) Wipe down FS assembly with a mixture of 1 part Hoshizaki Scale Away and 25 parts warm water. Rinse the FS assembly thoroughly with clean water.
- 5) While not necessary, the floats can be removed from the shaft during cleaning. If you remove them, note that the blue float is on top. The floats must be installed with the magnets inside them towards the top of the switch. See Fig. 8. Installing the floats upside down will affect the timing of FS operation.
- 6) Rinse FS assembly thoroughly with clean water and replace in its correct position.
- 7) Move the control switch to the "ICE" position.
- 8) Replace the left side, top, and front panels in their correct positions.
- 9) Move the power switch to the "ON" position to start the automatic icemaking process.

Legend: **Comp**—compressor; **FS**—float switch; **GM**—gear motor



**Fig. 7**



**Fig. 8**

## 6. Diagnostic Tables

Before consulting the diagnostic tables, check for correct installation, proper voltage per appliance nameplate, and adequate water pressure (10 to 113 PSIG). Check control board using the steps in "III.B.3. Control Board Check."

### a) No Ice Production

<b>No Ice Production - Possible Cause</b>	
<b>Startup</b>	
1. Power Supply	a) Unplugged, off, blown fuse, tripped or defective circuit breaker. b) Loose connection. c) Not within specifications.
2. Cord and Plug	a) Loose connection. b) Defective.
3. Wiring	a) Loose connection. b) Faulty.
4. Power Switch	a) "OFF" position. b) Defective.
5. Control Transformer	a) Coil winding open or shorted.
6. 1A 24VAC Fuse (Control Box)	a) Defective.
7. Control Switch	a) In "DRAIN" position. b) Defective.
8. Control Board See "III.B.3. Control Board Check"	a) In alarm. See "III.B.8. LED Lights and Audible Alarm Safeties." b) Defective.
9. Bin Control	a) Tripped with bin filled with ice. b) Micro-switch defective. c) Large balance plate does not move freely.
10. High-Pressure Switch	a) Control board in 3 or 4-beep alarm. See "III.B.8. LED Lights and Audible Alarm Safeties."
<b>Fill Cycle</b>	
1. Control Board	a) No power to inlet water valve (24VAC). b) No power to float switch (5VDC) or not reading float switch condition.
2. Inlet Water Valve	a) Screen or orifice clogged. b) Coil winding.
3. Water Supply	a) Water supply off or improper water pressure. b) External water filters clogged.
4. Float Switch	a) Float does not move freely. b) Defective.
5. Drain Valve	a) Sticking.

<b>No Ice Production - Possible Cause</b>	
<b>Ice Purge Cycle</b>	
1. Control Board See "III.B.3. Control Board Check"	a) No power to gear motor.
2. Gear Motor	a) 3A external protector tripped.
	b) Internal protector open.
	c) Motor winding.
	d) Mechanical failure.
3. Coupling	a) Defective.
4. Compressor Control Relay	a) Defective.
<b>Freeze Cycle</b>	
1. Control Board See "III.B.3. Control Board Check"	a) No power to compressor control relay circuit (5VDC) or not reading circuit.
	b) Compressor relay defective
2. Start Relay	a) Defective.
3. Start Capacitor	a) Defective.
4. Compressor	a) External protector.
	b) Motor winding.
	c) Mechanical failure.
5. High-Pressure Switch Activates	a) Dirty condenser.
	b) Ambient temperature too warm.
	c) Fan motor not operating.
	d) Refrigerant overcharged.
	e) Defective.
	f) Refrigerant lines or components restricted.
6. Fan Motor	a) Capacitor defective.
	b) Motor winding.
	c) Bearing worn out or locked rotor.
7. Evaporator	a) Dirty.
	b) Damaged or defective.
8. Thermostatic Expansion Valve (TXV)	a) Bulb loose.
	b) Operating erratically.
9. Refrigerant Charge	a) Low.
10. Drain Valve	a) Dirty, leaking by.
	b) Defective coil.
	c) Defective control board.
11. Water System	a) Water leaks.

<b>No Ice Production - Possible Cause</b>	
<b>Refill</b>	
1. Water Supply	a) Off.
2. Control Board	a) No power to float switch (5VDC) or not reading float switch condition.
	b) No power to inlet water valve (24VAC).
3. Float Switch	a) Float does not move freely.
	b) Defective.
4. Inlet Water Valve	a) Clogged or defective.
<b>Shutdown</b>	
1. Bin Control	a) Large balance plate sticking.
	b) Micro-switch defective.
2. Control Board See "III.B.3. Control Board Check"	a) S2 dip switch settings not set correctly.
	b) Defective.

### b) Ice/Water Dispensing

<b>Ice Dispense-Push Button</b>	
1. Power Supply	a) Off, blown fuse, or tripped breaker.
2. Control Board	a) No power from control board to dispense board (5VDC) or not reading signal.
	b) No power to ice dispense solenoid or dispense relay (115VAC).
3. Dispense Board	a) Defective.
4. Gear Motor	a) Defective.
5. Shutter Assembly	a) Defective.
<b>Ice Dispense-Opti-Serve</b>	
1. Power Supply	a) Off, blown fuse, or tripped breaker.
2. Control Board See "III.B.3. Control Board Check"	a) No power from control board to OS sensor (5VDC) or not reading signal.
	b) No power to ice dispense solenoid or dispense relay (115VAC).
3. OS Sensor (infrared)	a) Defective.
4. Ice Dispense Solenoid	a) Defective or loose connection.
5. Gear Motor	a) Defective.
6. Shutter Assembly	a) Defective.

<b>Water Dispense-Push Button</b>	
1. Power Supply	a) Off, blown fuse, or tripped breaker.
2. Control Board See "III.B.3. Control Board Check"	a) No power from control board to dispense board (5VDC) or not reading signal.
	b) No power to dispense water valve (24VAC).
3. Dispense Board	a) Defective.
4. Water Dispense Valve	a) Water supply turned off.
	b) Defective.
<b>Water Dispense-Opti-Serve</b>	
1. Power Supply	a) Off, blown fuse, or tripped breaker.
2. Control Board See "III.B.3. Control Board Check"	a) No power from control board to OS sensor (5VDC) or not reading signal.
	b) No power to water dispense valve (24VAC).
3. OS Sensor (infrared)	a) Defective.
4. Water Dispense Valve	a) Water supply turned off.
	b) Defective.

## 7. Control Board Layout

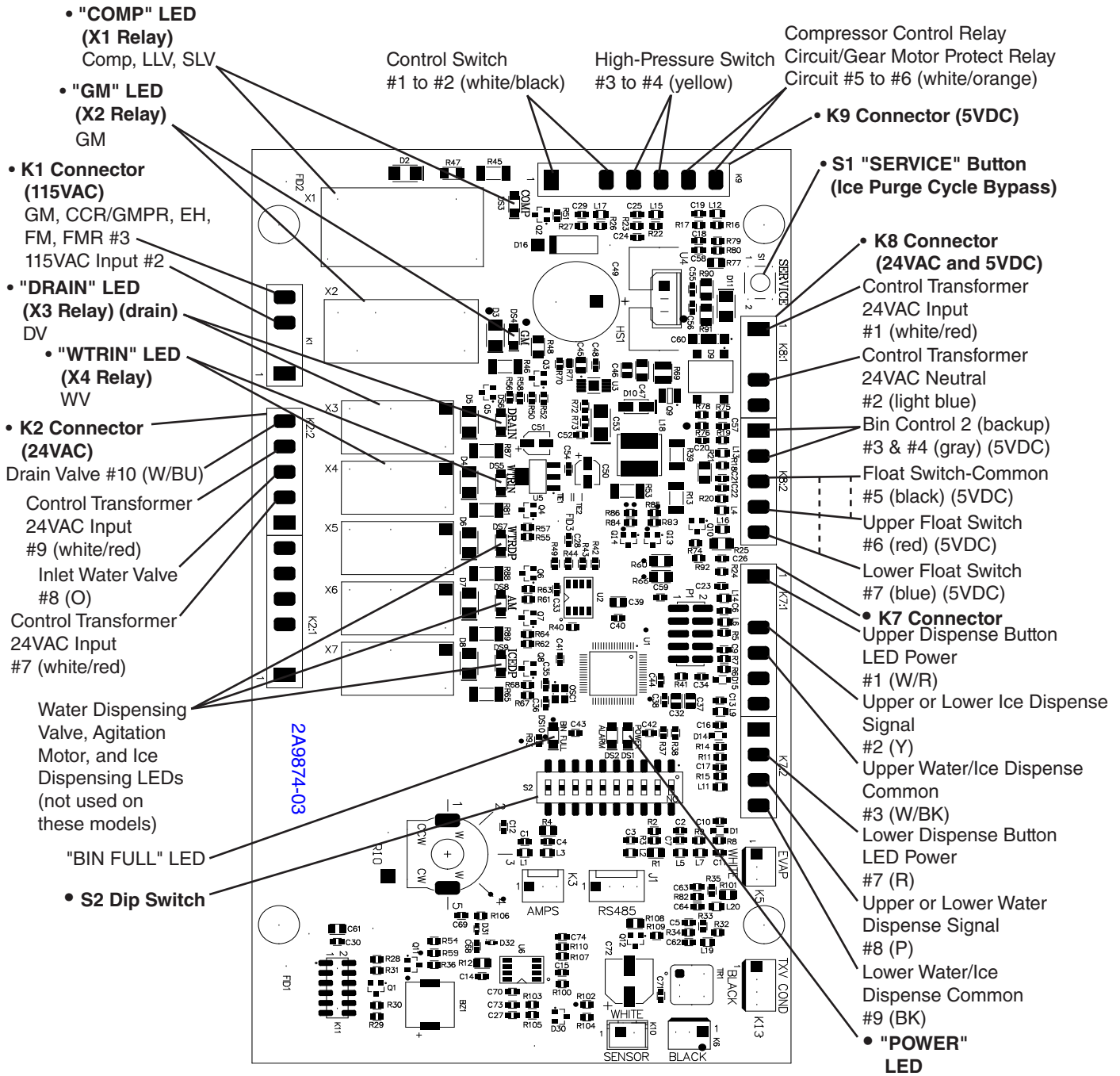
- A Hoshizaki exclusive control board is employed in DCM series appliances.
- All models are pre-tested and factory adjusted.

### ***NOTICE***

- The control board is fragile; handle very carefully.
- The control board contains integrated circuits, which are susceptible to failure due to static discharge. It is especially important to touch the metal part of the icemaker before handling or replacing the control board.
- Do not touch the electronic devices on the control board or the back of the control board.
- Do not change wiring and connections. Do not misconnect terminals.
- Do not short out power supply to test for voltage.
- Always replace the whole control board assembly if it goes bad.

# 1. DCM-271BAK

## a) Control Board

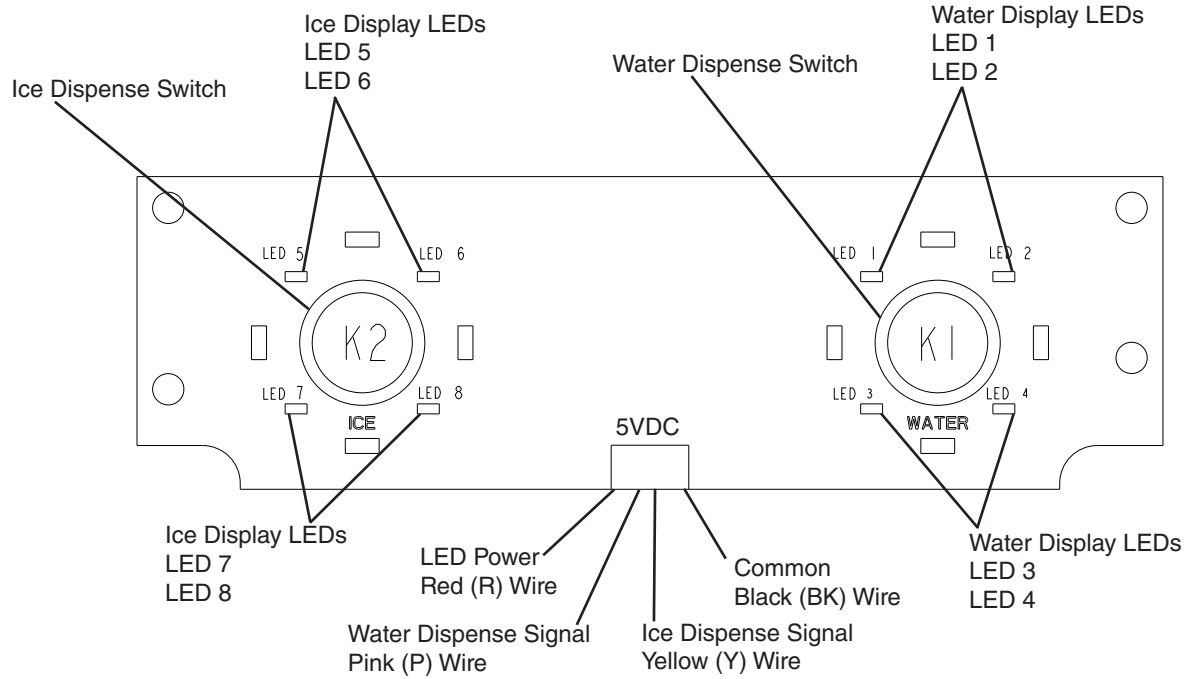


- LED Legend:**  
**AM**-agitator motor  
**COMP**-compressor  
**DRAIN**-drain valve  
**GM**-gear motor  
**ICEDP**-ice dispense motor  
**WTRDP**-water dispense valve  
**WTRIN**-inlet water valve

Control Board	
Part Number	2A9874-03

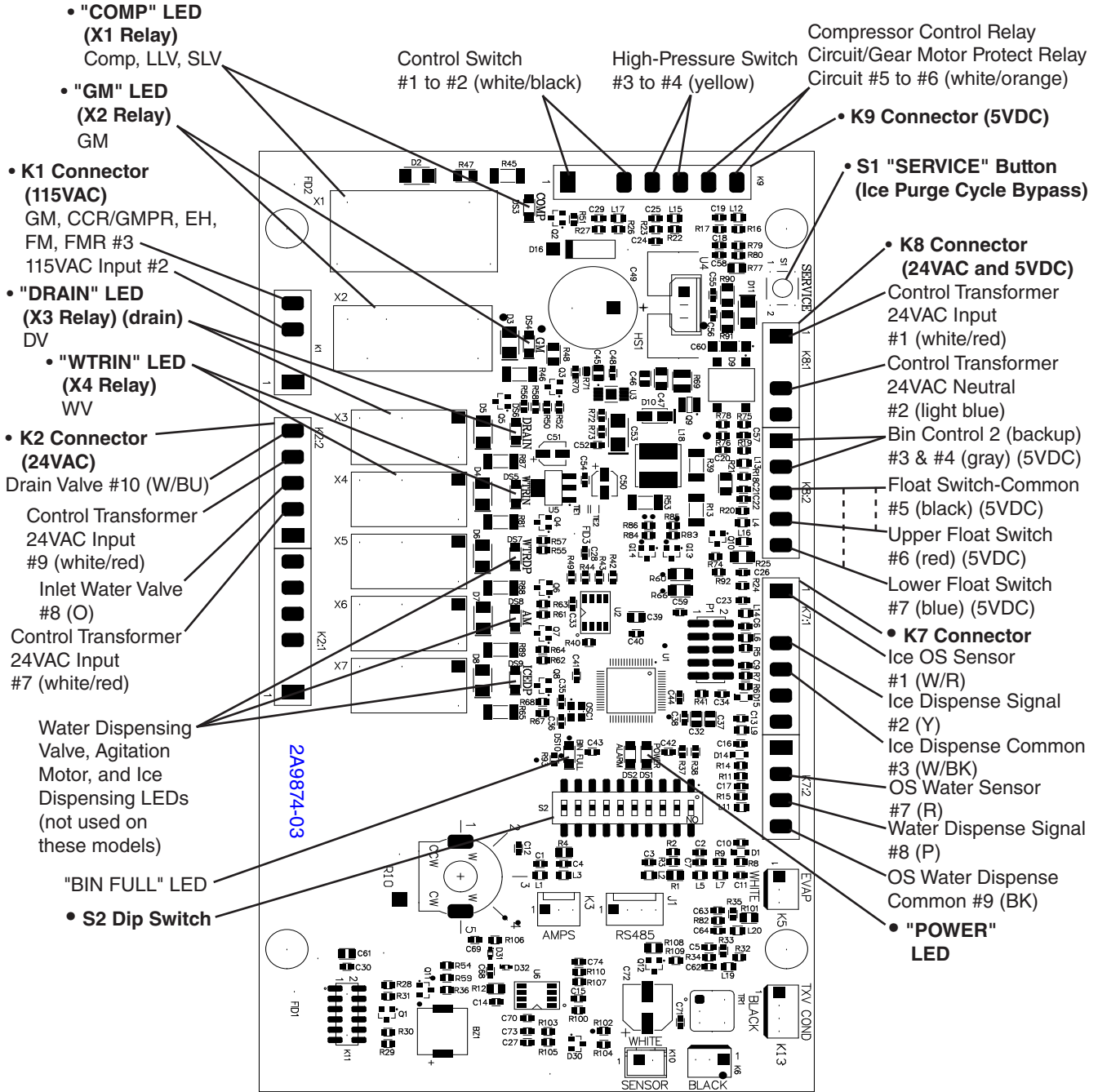
Fig. 9a

**b) Upper/Lower Water and Ice Dispense Board**



<b>Water/Ice Dispense Board</b>	
Part Number	<a href="#">2A9885-02</a>

## 2. DCM-271BAK-OS



### LED Legend:

- AM-agitator motor
- COMP-compressor
- DRAIN-drain valve
- GM-gear motor
- ICEDP-ice dispense motor
- WTRDP-water dispense valve
- WTRIN-inlet water valve

Control Board	
Part Number	2A9874-03

Fig. 9b

## 8. LED Lights and Audible Alarm Safeties

The "POWER" LED indicates proper control voltage and will remain on unless a control voltage problem occurs. For further details, see "III.B.2. Service Diagnosis."

Icemaking Sequence				
Sequence Step	LED	Energized Components	Min.	Max.
Fill Cycle	WTRIN	WV	-	-
Ice Purge Cycle	GM	GM, EH, FM	1 min.	5 min.
Freeze Cycle (with refill)	GM, WTRIN* (refill), COMP	GM, Comp, FM, WV* (refill)	-	*On until UFS closes. Alarm sounds after 90 sec.
1-1 hr or 1-12 hr Drain Cycle	DRAIN <b>Do not adjust for 1-in-12 on this model.</b>	1-in-1: DV- Icemaker status does not change 1-in-12: DV	2 sec.	10 min.
Dispensing Sequence				
Sequence Step	LED	Energized Components	Time LEDs are on	**Dispense Mode Switch
				Continuous
Ice Dispense Activation	ICE	GM, **IDSV	Factory set for 20 sec.	IDSV de-energizes on internal overload after 3 to 4 min. Resets when cool.
Dispense Water Valve Activation	WTRDP	DispWV		

The built-in safeties shut down the appliance and have alarms as listed below.

No. of Beeps (every 5 sec.)	Type of Alarm	Reset Options
1	<b>Low-Water Safety</b> UFS open > 90 sec. after WV energized.	Automatic reset once water supply is restored and UFS closes.
2	<b>Control Switch</b> In "DRAIN" position longer than 15 min.	Automatic reset once the control switch is moved to the "ICE" position.
3	<b>High-Pressure Switch</b> First and second activation in 1 hr.	Automatic reset once pressure drops below the high pressure threshold and the high-pressure switch closes.
4	<b>High-Pressure Switch</b> Third activation in 1 hr.	Turn power off. Call for service. To avoid possible catastrophic failure, it is recommended to leave the icemaker off until this alarm is resolved.
5	<b>Freeze Timer</b> WV off > 30 min. since last WV activation.	Call for service. Manual reset. Turn power off and on again. Check for FS stuck (up), WV leaking by, TXV defective, LLV not opening, low charge, HM not bypassing, or inefficient Comp.
6	<b>Low Voltage</b> 92VAC ± 5% or less.	Green "POWER" LED turns off if voltage protection operates.
7	<b>High Voltage</b> 147VAC ± 5% or more.	Control voltage safeties automatically reset when voltage is corrected.
8	<b>Gear Motor Fuse or Protector Open</b> CCR contacts fail to close.	Turn power off. Check for GM fuse or protector open. Replace fuse or let protector cool and reset. If persistent trips occur, call for service.

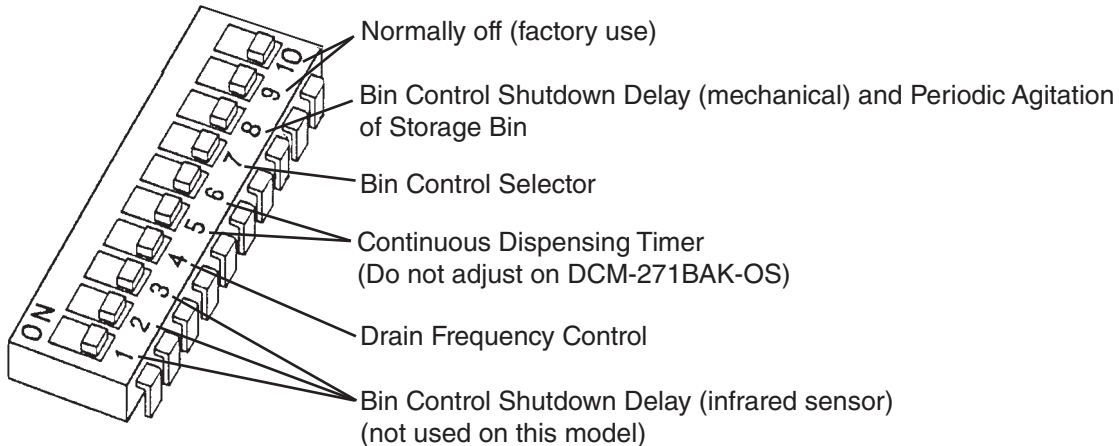
Legend: **CB**—control board; **CCR**—compressor control relay; **Comp**—compressor; **DispWV**—dispense water valve; **DV**—drain valve; **FM**—fan motor; **GM**—gear motor; **IDSV**—ice dispense solenoid valve; **MBC**—mechanical bin control; **UFS**—upper float switch; **WV**—inlet water valve

## 9. Settings and Adjustments

### a) Default Dip Switch Settings

The S2 dip switch settings are factory-set to the following positions:

Dip Switch No.	1	2	3	4	5	6	7	8	9	10
DCM-271BAK(-OS)	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF



### b) Bin Control Shutdown Delay (Infrared Sensor) (S2 dip switch 1, 2, 3)

#### NOTICE

Do not adjust. Setting not used on this model. When dip switch 7 is off, dip switch 1, 2, and 3 are ignored.

Factory set. DCM-271BAK(-OS) does not use a bin control with an infrared sensor. The appliance uses a bin control with a mechanical micro-switch for ice level control.

### c) Drain Frequency Control (S2 dip switch 4)

The appliance is factory set for optimum performance with the 1-in-1 drain cycle (S2 dip switch 4 in the "OFF" position). This setting allows for removal of sediment from the evaporator without interrupting the icemaking process. **NOTICE! Do not adjust S2 dip switch 4 out of the factory default position. This dip switch must be left in the factory default position or the appliance will not operate correctly.**

S2 Dip Switch Setting	Drain Timer Interval	Drain Valve Open
<b>No. 4</b>		
OFF (1-in-1)	1 Hour	2 Seconds
ON (1-in-12)	11 Hours 45 Minutes	10 Minutes

**d) Continuous Dispensing Timer (S2 dip switch 5 & 6)**

The factory setting allows ice to be dispensed continuously for 20 sec. The DCM-271BAK may be adjusted to other dispense time options.

**NOTICE! On DCM-271BAK-OS, do not adjust S2 dip switch 5 & 6 out of the factory default position.**

S2 Dip Switch Setting		Dispense Time
No. 5	No. 6	
OFF	OFF	No Limit
ON	OFF	20 Seconds
OFF	ON	60 Seconds
ON	ON	No Limit

Note: The ice dispense solenoid has an internal overload protector. When set to "No Limit" the internal protector may open if ice dispense solenoid is energized longer than 3 to 4 min. at one time.

**e) Bin Control Selector (S2 dip switch 7)**

The appliance is factory set with mechanical bin control operation. No adjustment is required. In the factory default position (S2 dip switch 7 in the off position), the gear motor delay after the upper float switch closes is 5 seconds. **WARNING! Do not adjust S2 dip switch 7 out of the factory default position. This dip switch must be left in the factory default position or the appliance will not operate correctly.**

S2 Dip Switch Setting	Bin Control Application	Gear Motor Delay
No. 7		
OFF	Bin Control (Mechanical)	5 seconds
ON	Bin Control (Infrared Sensor) with optional Mechanical Bin Control Backup	30 seconds

**f) Bin Control Shutdown Delay, Agitation, and Ice Purge Timer (S2 dip switch 8)**

The shutdown delay is the time between the bin control micro-switch opening and the control board shutting down the appliance. **WARNING! Do not adjust S2 dip switch 8 out of the factory default position. This dip switch must be left in the factory default position or the appliance will not operate correctly.**

S2 Dip Switch Setting	Storage Bin Periodic Agitation	Ice Purge Timer
No. 8		
OFF	2 Seconds	60 Seconds (1 min.)
ON	No Agitation	300 Seconds (5 min.)

**g) Bin Control Shutdown Delay (S2 dip switch 9)**

The shutdown delay is the time between the bin control micro-switch opening and the control board shutting down the appliance. **WARNING! Do not adjust S2 dip switch 9 out of the factory default position. This dip switch must be left in the factory default position or the appliance will not operate correctly.**

<b>S2 Dip Switch Setting</b>	<b>Bin Control Shutdown Delay</b>
<b>No. 9</b>	
OFF	90-60 Second Sequence (150 sec. total)
ON	6 to 10 Seconds

**h) Audible Alarm Silencer (S2 Dip Switch 10)**

This setting allows audible alarms (beeps) to be silenced. The default position is "OFF", which allows audible alarms to sound. The default position is recommended as the audible alarms notify the end user and service technicians of issues with the appliance. See "III.B.8. LED Lights and Audible Alarm Safeties."

<b>S2 Dip Switch Setting</b>	<b>Audible Alarm Silencer</b>
<b>No. 10</b>	
OFF	Audible Alarm Sounds
ON	Audible Alarm Suppressed

## 10. Switches

The power switch and control switch are used to control the operation of this icemaker.

### 1) Power Switch

The power switch has 2 positions, "OFF" and "ON."

### 2) Control Switch

The control switch is a double-pole double-throw switch with 3 positions, "ICE," "OFF," and "DRAIN."

#### a) ICE

When the control switch is in the "ICE" position;

Pole #1 (W/R) (24VAC) closes and 24VAC is present at CB K8 pin #1.

Pole #2 (W/BK) (5VDC) is an open circuit for "ICE" between CB K9 pin #1 and CB K9 pin #2. 5VDC is present between CB K9 pin #1 and CB K9 pin #2, and the automatic icemaking process starts.

#### b) OFF

When the control switch is in the "OFF" position, pole #3 is open and 24VAC is removed from K8 pin #1 and the icemaker is off.

#### c) DRAIN

When the control switch is in the "DRAIN" position;

Pole #1 (W/R) (24VAC) closes and 24VAC is present at CB K8 pin #1.

Pole #2 (W/BK) (5VDC) is a closed circuit for "DRAIN" between CB K9 pin #1 and CB K9 pin #2. 0VDC is present between CB K9 pin #1 and CB K9 pin #2, and the drain process starts.

## C. Refrigeration Circuit Service



### 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<sub>2</sub> 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 or brazing
- 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<sub>2</sub> 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 ou brasage
- 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.
- Vous devez avoir un détecteur de fuite de gaz combustible dans la zone de travail immédiate en tout temps.
- Assurez-vous que la zone est dégagée de la vapeur de réfrigérant avant de braser.
- La charge réfrigérante doit être récupérée dans les bouteilles de récupération correctes si la ventilation n'est pas autorisée par les codes locaux et nationaux. Pour les appareils contenant des réfrigérants inflammables, le système doit être purgé avec de l'azote exempt d'oxygène pour assurer la sécurité de l'appareil pour les réfrigérants inflammables. Ce processus peut être répété plusieurs fois. L'air comprimé ou l'oxygène ne doivent pas être utilisés pour la purge des systèmes de réfrigérants.

## **WARNING**

- Wear appropriate personal protective equipment (PPE) when servicing the appliance.
- Notify all persons in the immediate area that you are working with a flammable refrigerant.
- Do not use silver alloy or copper alloy containing arsenic.

### 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) Move the control switch to the "OFF" position, 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 (20.6 to 34.5 kPa). **▲ 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 (20.6 to 34.5 kPa).

#### **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 (1310 kPa)). 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 10.
- 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 low-side refrigerant 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.

#### D. Component Service Information

	<b>R-290 Class A3 Flammable Refrigerant Used</b>
<b>▲ DANGER</b>	
<b><u>Risk of Fire or Explosion. Flammable Refrigerant Used.</u></b>	
<ul style="list-style-type: none"> <li>• 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."</li> <li>• Component parts shall be replaced with like components. So as to minimize the risk of possible ignition due to incorrect parts.</li> <li>• This appliance should be diagnosed and repaired only by qualified service personnel to reduce the risk of death, electric shock, serious injury, or fire.</li> <li>• 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.</li> <li>• Confirm that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.</li> <li>• Confirm that no live electrical components and wiring are exposed while charging, recovering, or purging the system.</li> <li>• Confirm that there is continuity of earth bonding (grounding).</li> </ul>	

## **⚠ 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.»
- 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.

<b>Component</b>	<b>Notes</b>
Compressor	Install a new drier, start capacitor, and start relay.
Fan Motor	Install a new capacitor.
Thermostatic Expansion Valves	<ul style="list-style-type: none"><li>• Attach the thermostatic expansion valve bulb to the suction line in the same location as the previous bulb.</li><li>• The bulb should be between the 10 and 2 o'clock positions on the tube.</li><li>• Secure the bulb with the clamp and holder, then insulate it.</li></ul>
Upper and Lower Bearings	<ul style="list-style-type: none"><li>• Inspect the upper bearing for wear. See "III.E.1. Upper Bearing Wear Check." Replace if necessary.</li><li>• When replacing the upper bearing it is advised to also change the lower bearing at the same time.</li></ul>
Evaporator	<ul style="list-style-type: none"><li>• Install a new drier.</li><li>• Inspect the mechanical seal and O-ring prior to installing the new evaporator. If worn, cracked, or scratched, the mechanical seal should also be replaced.</li></ul>
Gear Motor	Install a new gear motor capacitor.

# Icemaking Unit

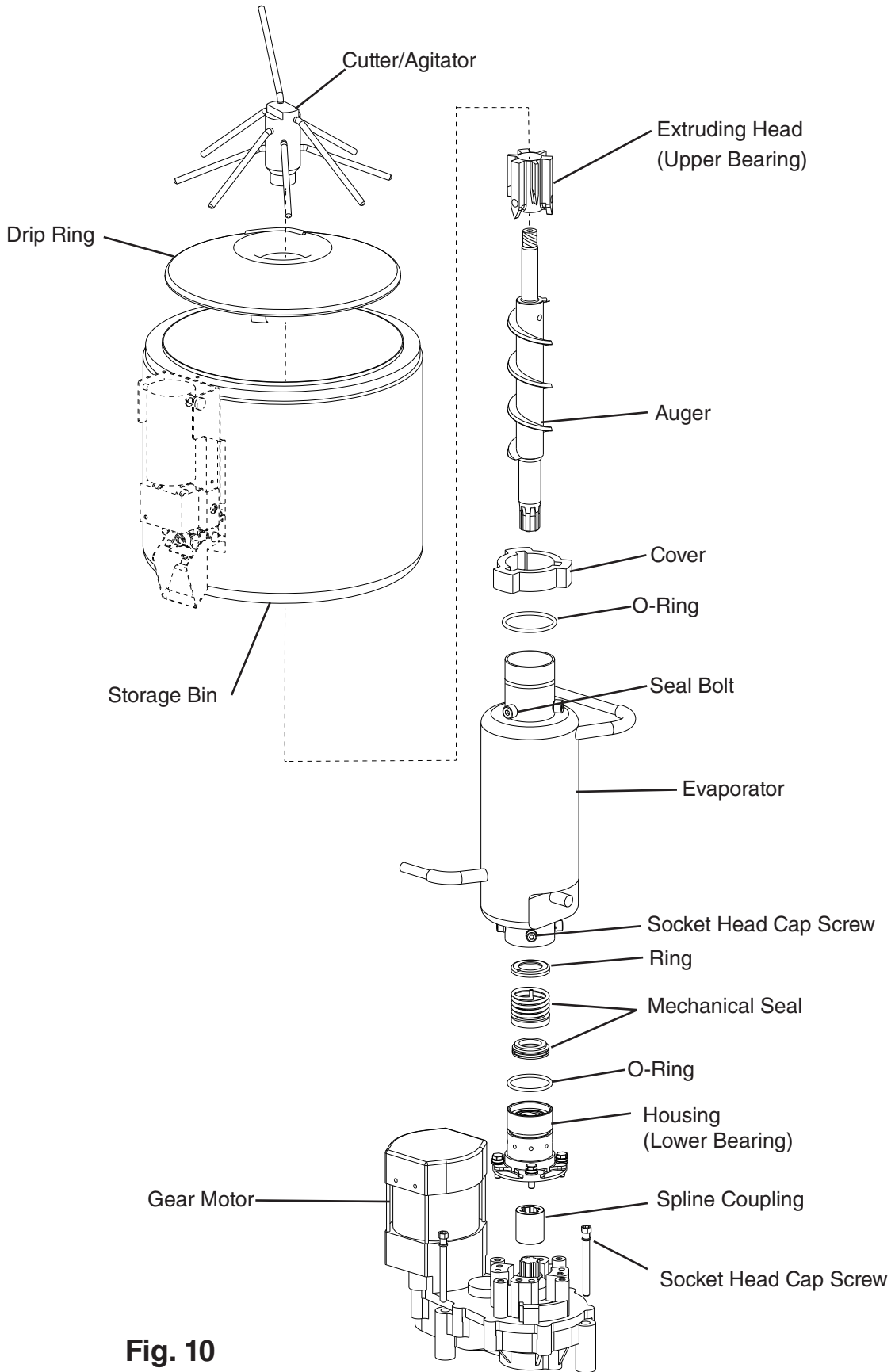


Fig. 10

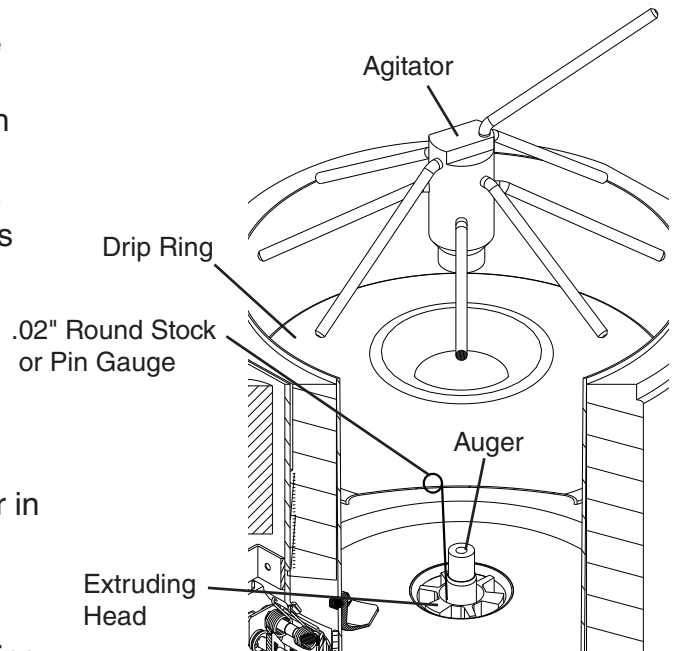
## E. Icemaking Unit

### 1. Upper Bearing Wear Check

To ensure that the bearing inside the extruding head does not exceed the wear tolerance of .02", follow the instructions below. See Fig. 11.

- 1) Move the power switch to the "OFF" position, then unplug the appliance from the electrical outlet. Remove the front and top panels. On the push-button model, disconnect the push-button switch wire connectors.
- 2) Remove the storage bin top cover, then remove the cutter/agitator by turning it counter-clockwise, then lift the drip ring out of the storage bin.
- 3) Grasp the top of the auger and move the auger towards you, then try to insert a .02" round stock or pin gauge in between the back side of the auger shaft and the bearing surface. Check several locations around the auger shaft. If the gauge goes between the shaft and the bearing at any point or if the bearing is scratched or cracked, both the top bearing in the extruding head and the lower bearing in the lower housing should be replaced. Instructions for removing the extruding head and lower housing are located later in this procedure.

Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and lower housing.



**Fig. 11**

- 4) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions.
- 5) Replace the top and front panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 6) Plug the appliance into the electrical outlet. Move the power switch to the "ON" position to start the automatic icemaking process.

## 2. Icemaking Unit Component Removal and Replacement Preparation

- 1) Move the power switch to the "OFF" position, then remove the right side louver panel.
- 2) Move the control switch to the "DRAIN" position, then move the power switch to the "ON" position and drain the water. Next, place a container under the ice dispense spout. Press the ice dispense button or activate the OS ice sensor and dispense the ice from the storage bin.
- 3) After all the water has drained and all the ice has been dispensed, move the power switch to the "OFF" position, then unplug the appliance from the electrical outlet. Remove the front, top, left, and right panels. On the push-button model, disconnect the push-button switch wire connectors.
- 4) Remove the storage bin top cover and remove any remaining ice from the storage bin.

### **a. Extruding Head**

- 1) Remove the cutter/agitator by turning it counter-clockwise, then lift the drip ring out of the storage bin.
- 2) Remove the seal bolts, then lift the extruding head out of the evaporator.
- 3) Place the new extruding head on the auger. Next, secure the extruding head with new seal bolts and tighten to 11.1 ft-lb/15 N·m. **NOTICE! Seal bolts must be replaced once removed because seal material is one-time use only. If new seal bolts do not have preapplied threadlocker, apply Loctite 243 or equivalent threadlocker to seal bolt threads.**
- 4) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions.
- 5) Move the control switch to the "ICE" position, then replace the panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 6) Plug the appliance back into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

### **b. Auger**

- 1) Remove the cutter/agitator by turning it counter-clockwise, then lift the drip ring out of the storage bin.
- 2) Remove the seal bolts, then screw the cutter/agitator back on and use it to lift the auger and extruding head out of the evaporator. Remove the extruding head and upper part of the mechanical seal from the auger and place them on the new auger. **NOTICE! To help prevent water leaks, be careful not to damage the surfaces of the O-ring or mechanical seal.**
- 3) Place the new auger assembly back in the evaporator with the upper part of the mechanical seal and extruding head attached. Next, secure the extruding head with new seal bolts and tighten to 11.1 ft-lb/15 N·m. **NOTICE! Seal bolts must be replaced once removed because seal material is one-time use only. If new seal bolts do not have preapplied threadlocker, apply Loctite 243 or equivalent threadlocker to seal bolt threads.**

- 4) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions.
- 5) Move the control switch to the "ICE" position, then replace the panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 6) Plug the appliance back into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

### **c. Evaporator**

<b>NOTICE</b>
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<p>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.</p>
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- 1) Recover the refrigerant and store it in an approved container.
- 2) Remove the cutter/agitator by turning it counter-clockwise, then lift the drip ring out of the storage bin.
- 3) Remove the seal bolts, then screw the cutter/agitator back on and use it to lift the auger and extruding head out of the evaporator.
- 4) Disconnect the water hoses.
- 5) Disconnect the inlet and outlet tubing.
- 6) Remove the socket head cap screws securing the evaporator to the lower housing.
- 7) Lift off the evaporator.
- 8) Inspect the mechanical seal and O-ring prior to installing the new evaporator. The mechanical seal consists of two parts. One moves along with the auger, and the other is fixed on the lower housing. **NOTICE! If the contact surfaces of these two parts are worn, cracked, or scratched, the mechanical seal may cause water leaks and should be replaced.** Instructions for removing the mechanical seal and lower housing are located later in this procedure.
- 9) Make sure the lower mechanical seal is in place, then place the new evaporator in position. Secure the evaporator to the lower housing using the socket head cap screws.
- 10) Remove the drier, then place the new drier in position. Connect the inlet and outlet tubing to the new evaporator.
- 11) Braze all fittings while purging with nitrogen gas flowing at a pressure of 3 to 4 PSIG.
- 12) Use an electronic leak detector or soap bubbles to check for leaks. Add a trace of refrigerant to the system (if using an electronic leak detector), and then raise the pressure using nitrogen gas (140 PSIG). Do not use R-404A as a mixture with pressurized air for leak testing.
- 13) Evacuate the system, and charge it with refrigerant. See the nameplate for the required refrigerant charge.

- 14) Place the auger assembly back in the evaporator with the upper part of the mechanical seal and extruding head attached. Next, secure the extruding head with new seal bolts and tighten to 11.1 ft-lb/15 N·m. **NOTICE! Seal bolts must be replaced once removed because seal material is one-time use only. If new seal bolts do not have preapplied threadlocker, apply Loctite 243 or equivalent threadlocker to seal bolt threads.**
- 15) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions, then reconnect the water hoses.
- 16) Move the control switch to the "ICE" position, then replace the panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 17) Plug the appliance back into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

#### ***d. Mechanical Seal and Lower Housing***

##### **1. Mechanical Seal**

- 1) Remove the cutter/agitator by turning it counter-clockwise, then lift the drip ring out of the storage bin.
- 2) Remove the seal bolts, then screw the cutter/agitator back on to the auger and use it to lift the auger out of the evaporator.
- 3) The mechanical seal consists of two parts. One moves along with the auger, and the other is fixed on the lower housing. **NOTICE! If the contact surfaces of these two parts are worn, cracked, or scratched, the mechanical seal may cause water leaks and should be replaced.**
- 4) Remove the socket head cap screws securing the evaporator to the lower housing.
- 5) Lift the evaporator up to access the lower housing.
- 6) Remove the mechanical seal from the lower housing. If only replacing the mechanical seal, proceed to step 9. **NOTICE! To help prevent water leaks, be careful not to damage the surfaces of the O-ring or mechanical seal.**

##### **2. Lower Housing**

- 7) Remove the O-ring from the lower housing and the bolts securing the lower housing to the gear motor, then remove the lower housing from the gear motor. If inspection of the upper bearing inside the extruding head (see "III.E.1. Upper Bearing Wear Check") indicates that it is out of tolerance, replace both it and the bearing inside the lower housing.

Note: Replacing the bearing requires a bearing press adaptor. If one is not available, replace the whole extruding head and lower housing.

- 8) Place the O-ring on to the new lower housing, then mount the lower housing on the gear motor.
- 9) Place the lower part of the mechanical seal on the lower housing.

- 10) Place the evaporator in its correct position, then secure the evaporator to the lower housing using the socket head cap screws.
- 11) Place the auger assembly back in the evaporator with the upper part of the mechanical seal and extruding head attached. Next, secure the extruding head with new seal bolts and tighten to 11.1 ft-lb/15 N·m. **NOTICE! Seal bolts must be replaced once removed because seal material is one-time use only. If new seal bolts do not have preapplied threadlocker, apply Loctite 243 or equivalent threadlocker to seal bolt threads.**
- 12) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions. Confirm all water hose connections are secure.
- 13) Move the control switch to the "ICE" position, then replace the panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 14) Plug the appliance back into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

**e. Gear Motor**

- 1) Remove the bolts securing the lower housing to the gear motor. Lift the evaporator up slightly.
- 2) Remove the gear motor bolts.
- 3) Disconnect the wiring from the gear motor, then lift the evaporator up slightly and remove the gear motor.
- 4) Remove the spline coupling from the old gear motor and attach to the new gear motor.
- 5) Place the new gear motor in its correct position and secure.
- 6) Connect the gear motor wires.
- 7) Lower the evaporator down and secure the lower housing to the gear motor.
- 8) Replace the drip ring, cutter/agitator, and storage bin top cover in their correct positions. Confirm all water hose connections are secure.
- 9) Move the control switch to the "ICE" position, then replace the panels in their correct positions. On the push-button model, reconnect the push-button switch wire connectors.
- 10) Plug the appliance back into the electrical outlet, then move the power switch to the "ON" position to start the automatic icemaking process.

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## IV. Maintenance

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.

### **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.
- Move the control switch to the "OFF" position and unplug the appliance from the electrical outlet before servicing.
- To reduce the risk of electric shock, do not touch the control switch or plug with damp hands.
- **CHOKING HAZARD:** Ensure all components, fasteners, and thumbscrews are securely in place after any maintenance is performed. Make sure that none have fallen into the ice storage bin.
- After service, make sure that there are no wires pinched between the panels and appliance. Make sure you do not damage or pinch the water supply line, drain line, or power cord.

## A. User Maintenance Schedule

The user 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 Filter	Inspect. Wash with warm water and neutral cleaner if dirty.
Monthly	Appliance Exterior	Wipe down with a clean, soft cloth. Use a damp cloth containing a neutral cleaner to wipe off oil or dirt build up. Clean any chlorine staining (rust colored spots) using a non-abrasive cleanser.

## B. Service Maintenance Schedule

The service maintenance schedule below is a guideline; service maintenance items are to be performed by qualified service technicians only. More frequent maintenance may be required depending on water quality, the appliance's environment, and local sanitation regulations.

Maintenance Schedule		
Frequency	Area	Task
Monthly	External Water Filters	Check for proper pressure and change if necessary.
Every 6 Months	Appliance and Ice Storage Bin	Clean and sanitize per the cleaning and sanitizing instructions provided in this manual.
	Dispense Drain Pan and Gear Motor Drain Pan	Wipe down with a clean cloth and warm water. Slowly pour one cup of sanitizing solution (prepare as outlined in the sanitizing instructions in this manual) into the dispense drain pan and gear motor drain pan. Be careful not to overflow the dispense or gear motor drain pan. Repeat with a cup of clean water to rinse.
	Appliance Drain	Check to make sure it is clear.
	Extruding Head Seal Bolts	Inspect for leakage around seal bolts. Tighten (see torque value below) or replace as necessary. Seal bolts must be replaced once removed because seal material is one-time use only. If new seal bolts do not have preapplied threadlocker, apply Loctite 243 or equivalent threadlocker to seal bolt threads. <ul style="list-style-type: none"> <li>• <i>Torque:</i> 11.1 ft-lb/15 N·m</li> </ul> Tighten 2 times. Allow at least 5 sec. in between each tightening.
Yearly	Inlet Water Valve, Dispense Water Valve, and Drain Valve	Close the water supply line shut-off valve and drain the water system. Clean the inlet water valve and dispense water valve screens and clean and inspect the drain valve.
	Water Hoses	Inspect the water hoses and clean/replace if necessary.
	Condenser	Inspect. Clean if necessary by using a brush or vacuum cleaner.
	Appliance	Inspect for oil spots, loose components, fasteners, and wires.
	Upper Bearing (extruding head)	Check for wear using .02" round stock or pin gauge. Replace both upper bearing and lower bearing if wear exceeds factory recommendations. See the Service Manual for details.
After 3 Years, then Yearly	Upper Bearing (extruding head); Lower Bearing and O-Ring (lower housing); Mechanical Seal; Evaporator Cylinder; Auger	Inspect. Replace both upper bearing and lower bearing if wear exceeds factory recommendations. Replace the mechanical seal if the seal's contact surfaces are worn, cracked, or scratched. See the Service Manual for details.

## V. 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.**

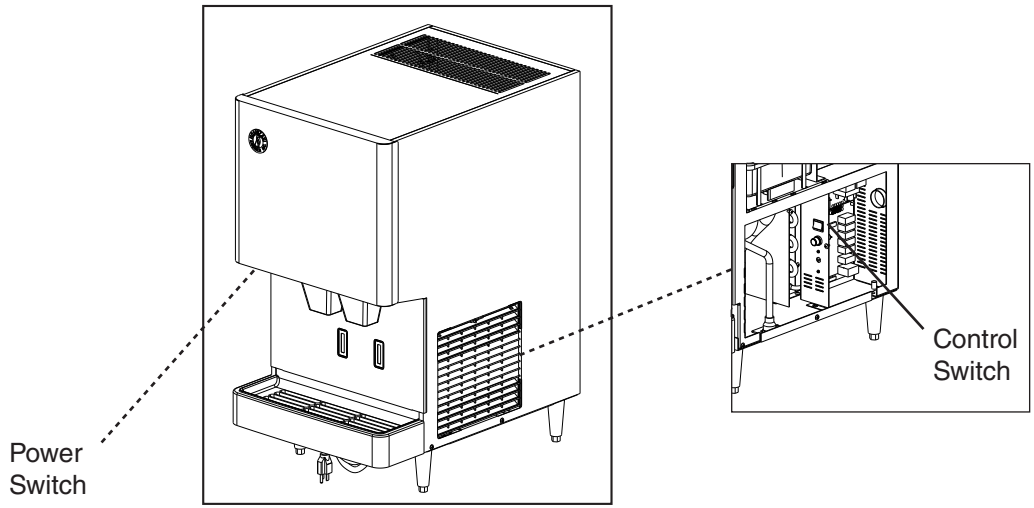
- Assurez-vous de suivre toutes les informations importantes de sécurité qui se trouvent au début du présent manuel et au début de la section «III.A. Précautions de sécurité lors de l'entretien.»
- Seuls des techniciens de service qualifiés doivent installer et entretenir l'appareil.
- L'appareil doit 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).

### **NOTICE**

- During extended periods of non-use, extended absences, or in sub-freezing temperatures, follow the instructions below to reduce the risk of costly water damage.
- When the appliance is not used for two or three days under normal conditions, it is sufficient to move the control switch to the "OFF" position.

- 1) Close the icemaker water supply line shut-off valve and open the icemaker water supply line drain valve.
- 2) Remove the louver and air filter, then move the control switch to the "DRAIN" position. Allow the water system to drain for 5 minutes.
- 3) Dispense all of the ice from the storage bin.
- 4) Attach a compressed air or carbon dioxide supply to the icemaker water supply line drain valve.

- 5) While engaging the water dispense switch, blow out the water dispense valve using the compressed air or carbon dioxide supply. After blowing out the water dispense valve, leave the compressed air or carbon dioxide supply flowing. Move the control switch to the "ICE" position to open the inlet water valve and briefly blow out the inlet water valve. After blowing out the inlet water valve, move the control switch to the "OFF" position.
- 6) Close the icemaker water supply line drain valve.
- 7) Move the power switch to the "OFF" position, then unplug the icemaker from the electrical outlet.
- 8) Remove the storage bin cover. Clean the storage bin liner and the storage bin cover using a neutral cleaner. Rinse thoroughly after cleaning. Replace the storage bin cover, front panel, air filter, and louver in their correct positions.



**Fig. 12**

## VI. 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 règlements nationaux.
- Mettre au rebut conformément aux conformément aux règlements 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.

## **DANGER Continué**

- 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.

## VII. Technical Information

We reserve the right to make changes in specifications and design without prior notice.

### A. Specification and Performance Data Sheets

Pressure data is recorded at 5 min. into freezing cycle. The data not in bold should be used for reference only.

#### 1. DCM-271BAK(-OS)

##### Specification Sheet

AC SUPPLY VOLTAGE (V/Hz/PH)	115/60/1	
AMPERAGE (A)	6.4	
MINIMUM CIRCUIT AMPACITY (A)	15	
MAXIMUM FUSE SIZE (A)	15	
ELECTRIC & WATER CONSUMPTION (Wtr/Air)(°C/°F)	32/21 (90/70)	21/10 (70/50)
ELECTRIC W (kWH/100 lbs.)	478 (5.30)	435 (3.65)
WATER gal./24HR (gal./100 lbs.)	25 (12.0)	34 (12.0)
SHAPE OF ICE	Cubelet	
ICE HARDNESS	Approx. 85%, Ice (32/21 (90/70))	
HARVEST RATE (lbs/day)	<=1000	
APPROXIMATE STORAGE CAPACITY (lbs/kg)	8.8 (4)	
ICE MAKING SYSTEM	Auger Type	
HARVESTING CONTROL SYSTEM	Direct Driven Auger	
ICE MAKING WATER CONTROL	Float Switch	
BIN CONTROL SYSTEM	Mechanical Bin Control	
REFRIGERANT CHARGE (g/oz.)	R290 150 (5.3)	
FOAM BLOWING AGENT	HFO 1233zd (E)	
DESIGN PRESSURE kPa (PSI)	HI-1979 (287) LO-883 (128)	

##### Performance Data Sheet

APPROXIMATE ICE PRODUCTION PER 24 HR.	AMBIENT TEMP. (°F/°C)	WATER TEMP. (°F/°C)					
		50/10		70/21		90/32	
	70/21	<b>286</b>	<u>130</u>	271	<u>123</u>	262	<u>119</u>
	80/27	253	<u>115</u>	244	<u>111</u>	236	<u>107</u>
	90/32	228	<u>103</u>	<b>210</b>	<u>95</u>	212	<u>96</u>
lbs./day (kg./day)	100/38	205	<u>93</u>	198	<u>90</u>	<b>200</b>	<u>91</u>
APPROXIMATE ELECTRIC CONSUMPTION	70/21	<b>435</b>		441		447	
	80/27	453		460		466	
	90/32	472		<b>478</b>		483	
watts	100/38	487		492		<b>496</b>	
APPROXIMATE WATER CONSUMPTION PER 24 HR.	70/21	<b>34</b>	<u>129.86</u>	32	<u>122.92</u>	31	<u>118.72</u>
	80/27	30	<u>114.66</u>	29	<u>110.74</u>	28	<u>106.96</u>
	90/32	27	<u>103.31</u>	<b>25</b>	<u>95.35</u>	25	<u>96.37</u>
gal./day (m <sup>3</sup> /day)	100/38	25	<u>93.08</u>	24	<u>89.90</u>	<b>24</b>	<u>90.86</u>
EVAPORATOR OUTLET TEMP. °F (°C)	70/21	20.4	<u>-6</u>	20.4	<u>-6</u>	20.4	<u>-6</u>
	80/27	20.4	<u>-6</u>	20.4	<u>-6</u>	20.4	<u>-6</u>
	90/32	20.4	<u>-6</u>	20.4	<u>-6</u>	20.6	<u>-6</u>
	100/38	20.9	<u>-6</u>	21.2	<u>-6</u>	21.4	<u>-6</u>
HEAD PRESSURE	70/21	<b>169</b>	<u>11.9</u>	177	<u>12.4</u>	184	<u>13.0</u>
	80/27	192	<u>13.5</u>	200	<u>14.0</u>	207	<u>14.6</u>
	90/32	215	<u>15.1</u>	<b>222</b>	<u>15.6</u>	229	<u>16.1</u>
PSIG (kg/cm <sup>2</sup> G)	100/38	235	<u>16.5</u>	242	<u>17.0</u>	<b>248</b>	<u>17.5</u>
SUCTION PRESSURE	70/21	<b>28</b>	<u>2.0</u>	29	<u>2.0</u>	29	<u>2.1</u>
	80/27	30	<u>2.1</u>	30	<u>2.1</u>	31	<u>2.2</u>
	90/32	31	<u>2.2</u>	<b>32</b>	<u>2.2</u>	32	<u>2.3</u>
PSIG (kg/cm <sup>2</sup> G)	100/38	33	<u>2.3</u>	33	<u>2.3</u>	<b>33</b>	<u>2.3</u>
TOTAL HEAT OF REJECTION FROM CONDENSER	3,000 BTU/h [AT 90°F (32°C) / WT 70°F (21°C)]						
TOTAL HEAT OF REJECTION FROM COMPRESSOR	500 BTU/h [AT 90°F (32°C) / WT 70°F (21°C)]						

## B. Wiring Diagram

SI DIP SWITCH SETTING	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10
DCM-271BAK(-OS)	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF

