HUSSMANN®

# Impact

EVOLVE® R-290

RMN-A

Installation, Operation, and Service Manual

## RLN-A & RMN-A

**Self-contained, Low and Medium Temperature with Microblock™ Technology**

**P/N** 3221507 **Rev** B

August 2025

### Models Covered

RLN2A, RLN3A, RLN4A, RLN5A,
RMN2A, RMN3A, RMN4A, RMN5A

### Certifications

c UL us LISTED

CLASSIFIED UL EPH

Over the counter (OTC) parts exchanges are not available for this product. For product warranty support, call Hussmann Performance Parts 1-855-487-7778.

WARNINGS:

**READ THE ENTIRE MANUAL BEFORE INSTALLING OR USING THIS EQUIPMENT.**

If the information in these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury or death. Installation and service must be performed by a qualified installer or service agency.

The unit uses R-290 gas as the refrigerant. R-290 is flammable and heavier than air. It collects first in low areas but can be circulated by the fans. If propane gas is present or even suspected, do not allow untrained personnel to attempt to find the cause. The propane gas used in the unit has no odor. The lack of smell does not indicate a lack of escaped gas. If a leak is detected, immediately evacuate all persons from the store, and contact the local fire department to advise them that a propane leak has occurred. Do not let any persons back into the store until the qualified service technician has arrived and that technician advises that it is safe to return to the store. No open flames, cigarettes, or other possible sources of ignition should be used inside or in the vicinity of the units.

**FAILURE TO ABIDE BY THIS WARNING COULD RESULT IN AN EXPLOSION, DEATH, INJURY, AND PROPERTY DAMAGE.**


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**Spanish P/N 3221561**
**French P/N 3221557**

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## User Safety and Product Information

### Legal Disclaimer

Review all safety warnings on the case and in this manual before attempting start-up. Hussmann shall not be liable for any repair of replacement made without the written consent of Hussmann, or when the product is installed or operated in a manner contrary to the printed instructions covering installation and service which accompanied such product. Please note that failure to follow the instructions in this document may void your factory warranty.

### ANSI Z535.5 Definitions

The definitions below are used to clarify the magnitude and urgency of harm and damage, considering problems arising from misuse. Relative to their potential danger, the definitions are divided into five parts according to ANSI Z535 Series.

**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION** indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

**NOTICE** is used to address practices not related to personal injury.

**SAFETY INSTRUCTIONS** (or equivalent) signs indicate specific safety-related instructions or procedures.

### Proposition 65


This warning does not mean that Hussmann products will cause cancer or reproductive harm, or is in violation of any product-safety standards or requirements. As clarified by the California State Government, Proposition 65 can be considered more of a 'right-to-know' law than a pure product safety law. When used as designed, Hussmann believes that our products are not harmful.
We provide the Proposition 65 warning to stay in compliance with California State law. It is your responsibility to provide accurate Proposition 65 warning labels to your customers when necessary. For more information on Proposition 65, please visit the California State Government website.

**NOTICE**

- Merchandiser must operate for 24 hours before loading product!
- Regularly check merchandiser temperatures.
- Do not break the cold chain. Keep products in cooler before loading into merchandiser.
- Merchandisers are designed for loading ONLY pre-chilled products.


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# RLN-A, RMN-A

## User Safety and Product Information

### General Safety Instructions

**SAFETY INSTRUCTIONS**

This manual was written in accordance with originally prescribed equipment that is subject to change. Hussmann reserves the right to change or revise specifications and product design in connection with any feature of our products.

Only qualified personnel (installer or service agency) should install and service this equipment. Personal Protection Equipment (PPE) is required. Wear safety glasses, gloves, protective boots or shoes, long pants, and a long-sleeve shirt when working with this equipment and while handling glass.

The safety of our customers and employees is paramount. The precautions and procedures described in this manual are intended as general methods for safe use of this equipment. Please be sure to comply with the precautions described in this manual to protect you and others from possible harm. Always follow OSHA standards for safety.

This unit is designed only for use with R-290 gas as the designated refrigerant. If the information in these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury or death. Observe all precautions on tags, stickers, labels and literature provided and referenced for this equipment.

Use only Hussmann approved parts approved through the Hussmann Performance Parts Website. Verify that all repair parts are identical models to the ones they are replacing. Do not substitute parts such as motors, switches, relays, heaters, compressors, power supplies, or solenoids.

Read all safety information regarding the safe handling of refrigerant and refrigerant oil, including the Material Safety Data Sheet. MSDS sheets can be obtained from your refrigerant supplier. Service is to be performed by factory-authorized service personnel, so as to minimize the risk of possible injury due to incorrect parts or improper service. Contact your Hussmann representative to arrange servicing.

### UL Listing

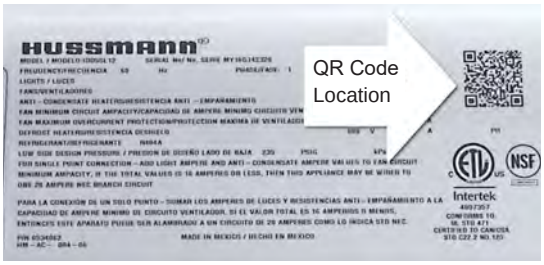
These merchandisers are manufactured to meet UL 60335-2-89 standard requirements for safety. Proper installation is required to maintain this listing. This appliance is to be installed in accordance with the Safety Standard for Refrigeration Systems, ANSI/ASHRAE 15.

### Federal / State Regulation

These merchandisers at the time they are manufactured, meet all federal and state/provincial regulations. Proper installation is required to ensure these standards are maintained. Near the serial plate, each case carries a label identifying the environment (temperature and relative humidity) for which the case was designed for use.

### Serial Plate / QR Code Location

Serial plates are located on the left side, facing the case. Serial plate contains all pertinent information such as model, serial number, amperage rating, refrigerant type, and charge. A QR code is located on the serial plate. Once the QR is scanned with a smart phone, the user can view details about the case such as datasheets, wiring diagrams, the user manual, and replacement parts from Hussmann's Performance Parts website.



## User Safety and Product Information

**DANGER**

- DANGER—Risk of fire or explosion. Flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.
- DANGER—Risk of fire or explosion due to flammable refrigerant used. Follow handling instructions carefully in compliance with national regulations.
- DANGER—Risk of fire or explosion. A3 flammable refrigerant is used in this unit.
- DANGER—Risk of fire or explosion due to flammable refrigerant used. Follow handling instructions carefully in compliance with national regulations.
- Failure to follow instructions can result in an explosion, death, injury and property damage.

**WARNING**

**READ THE ENTIRE MANUAL BEFORE INSTALLING OR USING THIS EQUIPMENT.**

- Installation and service must be performed by a qualified installer or service agency only as recommended by the manufacturer.
- The refrigerant loop is sealed. Only a qualified and authorized technician should attempt to service.
- Propane is flammable and heavier than air. It collects first in the low areas but can be circulated by fans.
- The propane gas used in the unit has no odor. The lack of smell does not indicate a lack of escaped gas. If R-290 is present or even suspected, do not allow untrained personnel to attempt to find the cause.
- If a leak is detected, immediately evacuate all persons from the store, and contact the local fire department to advise them that a propane leak has occurred. Do not let any persons back into the store until the qualified service technician has arrived and that technician advises that it is safe to return to the store.
- A hand-held propane leak detector ("sniffer") will be used before any repair and/or maintenance.
- No open flames, cigarettes, or other possible sources of ignition should be used inside the building where the units are located until the qualified service technician and/or local fire department determines that all propane has been cleared from the area and from the refrigeration systems.
- Excessive ambient conditions may cause condensation and sweating on doors. Facility operators are responsible for monitoring doors and floor conditions and ensuring the safety of all persons present.
- WARNING: Keep clear of obstruction, all ventilation openings in the appliance enclosure or in the structure for build-in.
- WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.
- WARNING: Do not damage the refrigerating circuit.
- WARNING: Do not use electrical appliances inside the food storage compartments unless they are the type recommended by the manufacturer.
- WARNING: In order to reduce flammability hazards the installation of this appliance must only be carried out by a suitably qualified person.
- Do not use any means to clean, other than those recommended by the manufacturer.

## User Safety and Product Information

**⚠WARNING**

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- 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).
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odour.
- WARNING – Risk Of Fire – Auxiliary devices which may be ignition sources shall not be installed in the ductwork, other than auxiliary devices listed for use with the specific appliance.
- Do not store items or flammable materials atop the unit. Do not walk on case.
- Do not store explosive substances, such as aerosol cans with flammable propellant, in this appliance.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the 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.
- Any insulation shall be suitable for use with the material being insulated.
- Protection devices, piping, and fittings shall be protected as far as possible against adverse environmental effects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris.

**Additional warnings related to servicing and maintaining equipment can be found in the maintenance and service section. Read all warnings prior to installing, performing maintenance, or servicing the equipment in any way.**

**⚠CAUTION**

- Do NOT block air vents. Obstructing air vents will affect case performance, which could potentially lead to case failure.
- Do NOT use HOT water on cold glass surfaces. This can cause the glass to shatter and could result in personal injury. Allow glass fronts, to warm before applying hot water.
- Do NOT allow cleaning agent or cloth to contact food product.
- Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

### Model Description

RLN-A models are designed to display low-temperature products. RMN-A models are designed to display Medium Temperature products. Each Propane (R-290) model has a condensing unit(s) and evaporator(s). The refrigeration system is air-cooled and ready for operation when electrical service is connected. An electronic control controls the Microblock™ (refrigeration system). The case temperature is controlled by cycling the compressor based on the discharge air temperature input. The controller is programmed for low or medium-temperature operation and is adjusted for the required temperature by the keypad on the front of the controller, located at the top of the case. Over the counter (OTC) parts exchanges are not available for this product. For product warranty support, call Hussmann Performance Parts.

## Installation Information

### Hussmann Product Control

Serial number and shipping date of all equipment is recorded in Hussmann's files for warranty and replacement part purposes. All correspondence pertaining to warranty or parts ordering must include the serial number of each piece of equipment involved. This is to ensure the customer is provided with the correct parts.

### Shipping Damage

All equipment should be thoroughly examined for shipping damage before and during unloading. This equipment has been carefully inspected at our factory. Any claim for loss or damage must be made to the carrier. The carrier will provide any necessary inspection reports and/or claim forms.

### Apparent Loss or Damage

If there is an obvious loss or damage, it must be noted on the freight bill or express receipt and signed by the carrier's agent; otherwise, carrier may refuse claim.

### Concealed Loss or Damage

When loss or damage is not apparent until after equipment is uncrated, retain all packing materials and submit a written response to the carrier for inspection within 15 days.

### Location

These merchandisers are designed to display products in air-conditioned stores where temperature is maintained at or below the ANSI / NSF-7 specified level and relative humidity is maintained at or below 55%. The recommended ambient operating temperature is 75° F (24° C), and the maximum relative humidity is 55%.

**An air gap of four inches (102 mm) must be maintained at the rear of the case and the wall, and an air gap of six inches must be maintained above the unit.**

Do not install a merchandiser in public corridors or lobbies. Placing refrigerated merchandisers in direct sunlight, near hot tables, or other heat sources could impair efficiency. Like other merchandisers, these are sensitive to air disturbances. Air currents passing around merchandisers will seriously impair their operation. Do NOT allow air conditioning, electric fans, open doors or windows, etc., to create air currents around the merchandiser.

*Be sure to position self-contained merchandisers properly. Blocking or restricting airflow will adversely affect performance and may damage the refrigeration system. The appliance shall be stored in an area where the room size corresponds to the room area as specified for operation.*

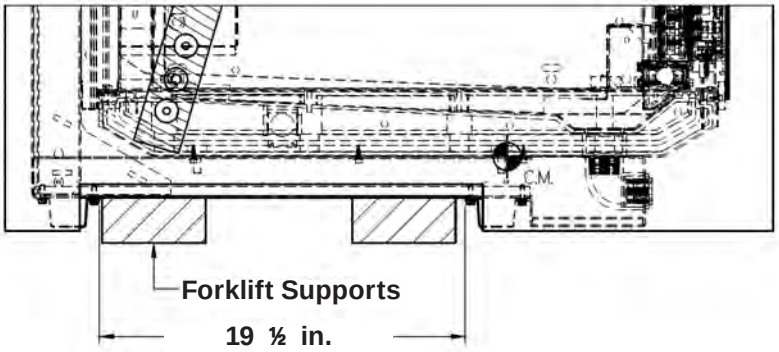
# RLN-A, RMN-A

## Installation Information

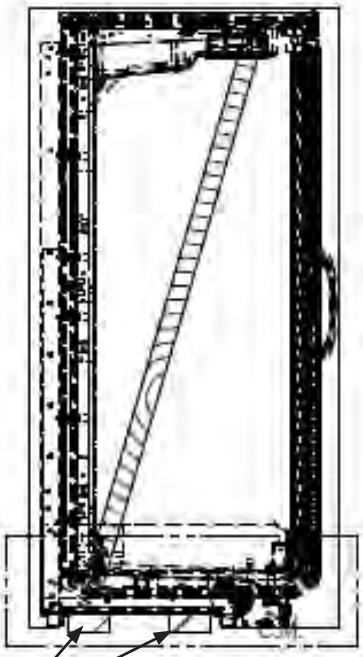
### Unloading, Moving, and Transporting Case

Improper handling may cause damage to the case when unloading. To avoid damage do not drag the case out of the trailer. Use a pallet jack, lever bar (J-Bar), or caster dolly. Use the shipping brace and forklift support locations to lift when unloading or maneuvering cases.

- Do not drag the merchandiser out of the trailer. Use a forklift or caster dolly.
- Do not lift the case by the case bottom. Lift with the forklift supports as shown in Detail A below.
- Do not lift from the bottom edge of the end panel.


**Detail A**



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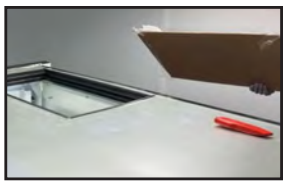
# RLN-A, RMN-A

## Installation Information

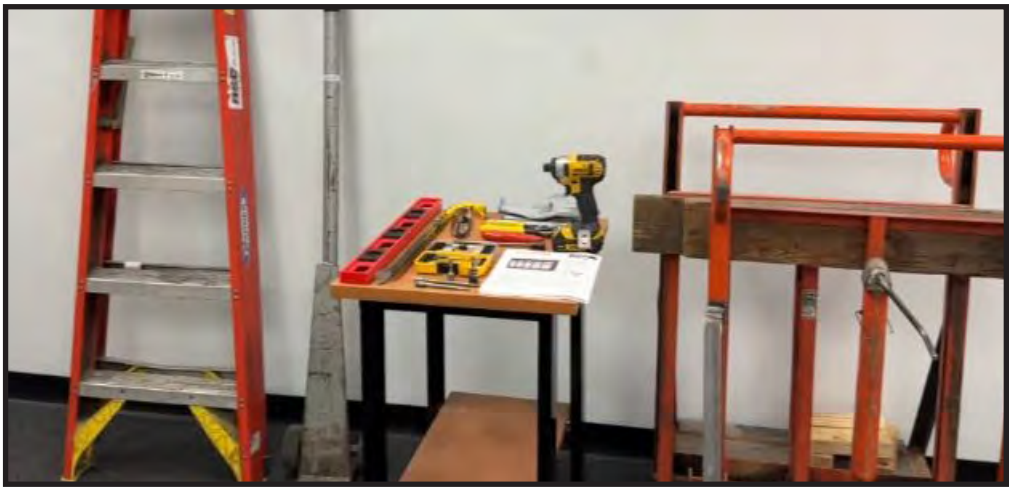
**Do NOT remove shipping braces or shipping rider until the merchandiser is positioned for installation.**

1. Move the merchandiser as close as possible to its permanent location but with safe access to the rear of the case. Controls attached to the back of the case will need to be relocated.
2. Remove packaging. Check for damage before discarding packaging.
3. Remove straps and packaging from top of case. Remove cardboard cutouts.
4. Remove all separately packed accessories, shipping tape, straps and tie wraps.
5. Remove shelves and equipment boxes from case.



Recommended Tools

| | |
|---|---|
| Johnson Bar or J-bar | 5/16 in. Socket |
| Pallet Jack or Forklift | ½ in. Socket |
| Level, 4 ft (suggested) | Cordless Impact Drill |
| Ratchet | Caulking Gun 10 in. |
| ¼ in. Socket | Crescent Wrench |
| Ladder (2) | Box Cutter |





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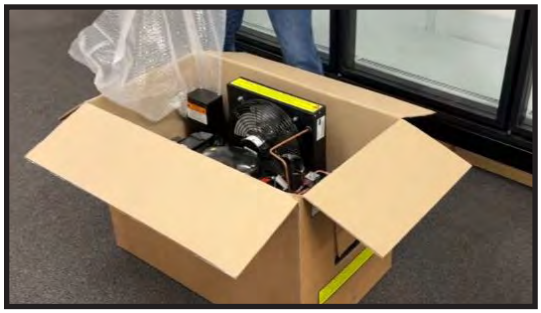
## Installation Information

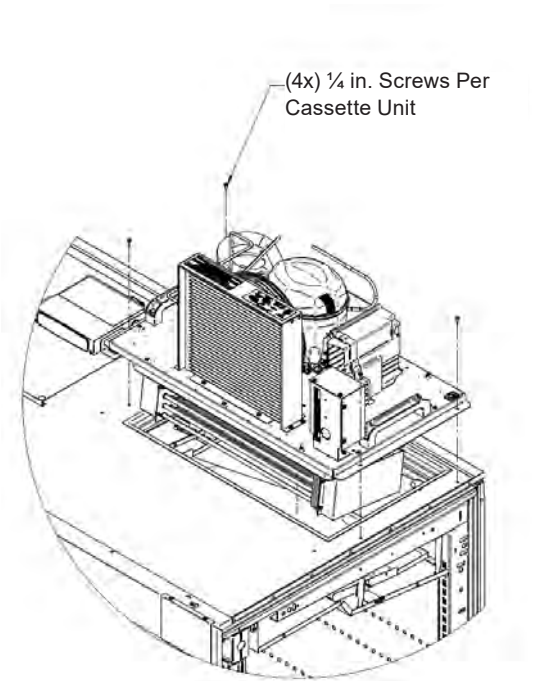
### Installing Refrigeration System(s)

Unpack refrigeration system unit(s) from the boxes and place unit(s) in the openings on top of case. 5-door low temperature cases have three units; 2-door cases have one unit. All other cases employ two refrigeration system units. A mounting plate with pilot holes provide specific attachment Locations for the unit base is provided on top of the case. Ensure a tight seal of the gasket on the unit base(s).



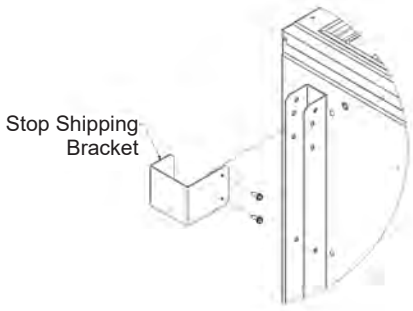
Place unit on top of case, then remove tie wraps (4x) at the corners and protective cardboard from around the evaporator.

Fasten system unit base(s) with supplied screws to the case canopy using the pre-drilled holes as shown in the details below.



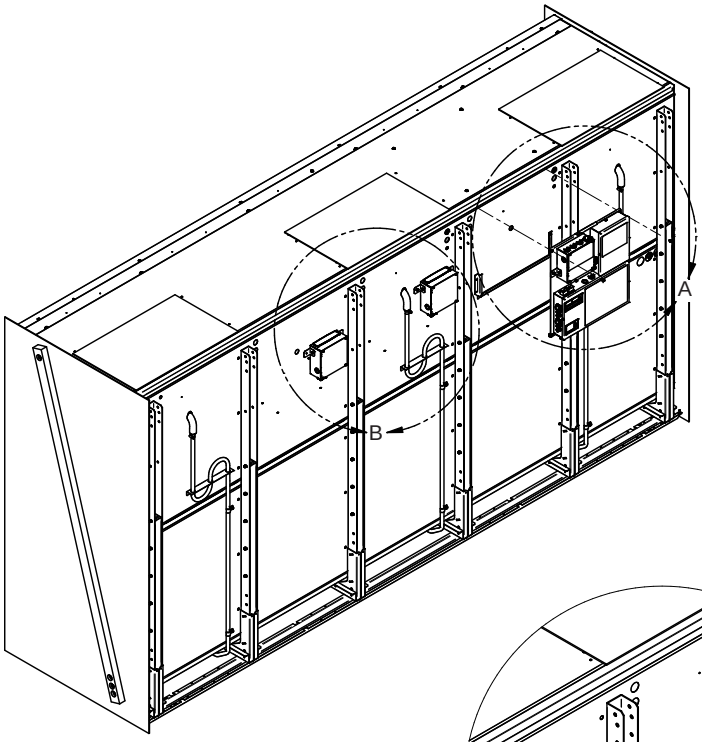

## Installation Information

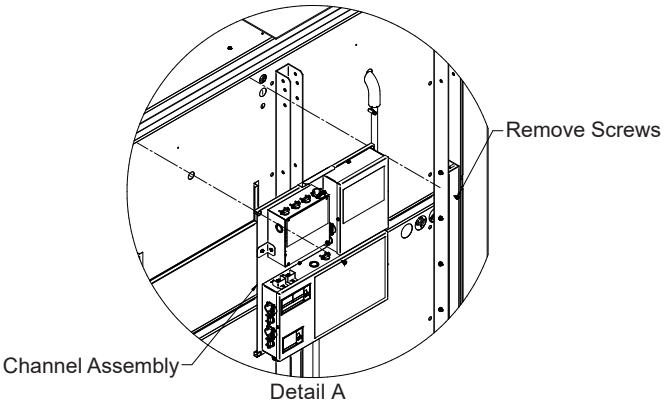
### Installing Control Boxes

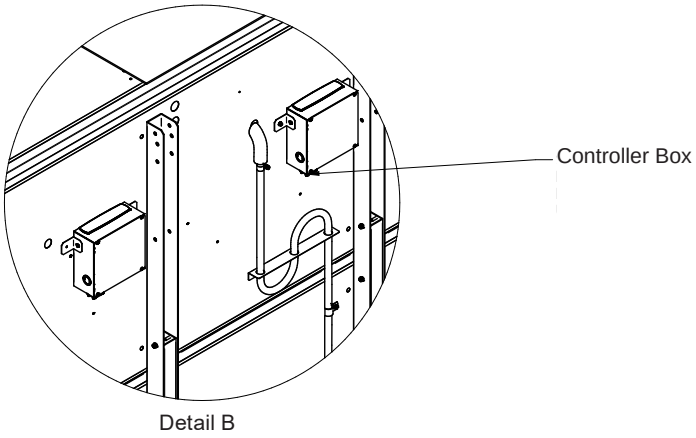



Control boxes on the back of the case need to be moved and fastened in their final position on top of the case.

1. Remove the stop shipping brackets at each end of the case
2. Remove the harnesses and tie wrap straps
3. Remove the screws that hold the channel assembly to the back of the case.





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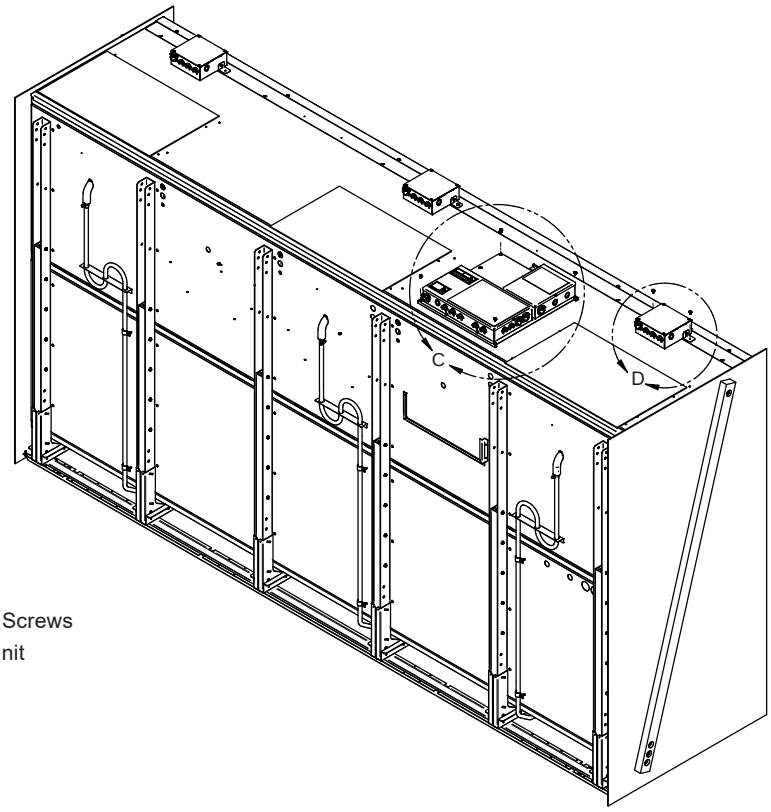
## Installation Information

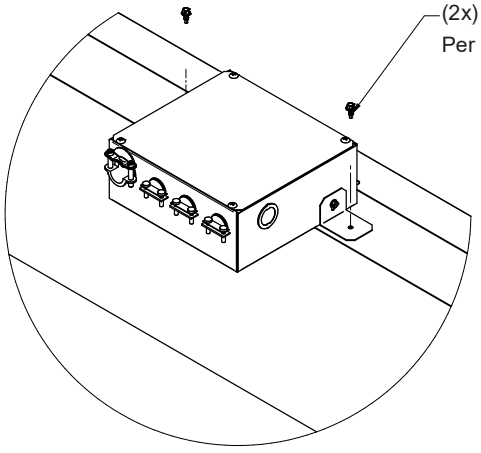
4. Remove the channel assembly from the base (back of case) and place on top of case.
5. Remove each controller box from the back and place on top of case. Use using pre-drilled reference holes. The same screws to attach on top of case
6. Relocate the control module using the pre-drilled reference holes. Additional location views for the control boxes are on the next page.

NOTE:

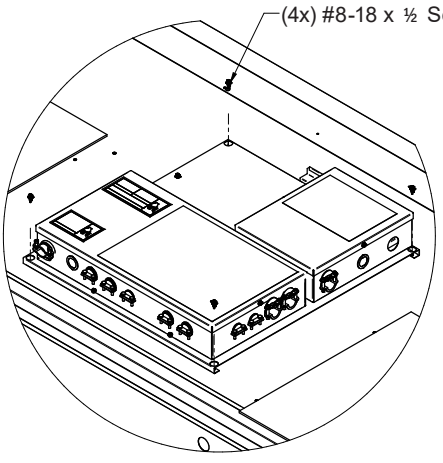
Cases with a solid facade will have a different mounting location than for cases with controller display cutouts.




RELOCATE THE CONTROL MODULE ON THE TOP OF THE CASE
1/4" HEX WRENCH/SCREWDRIVER NEEDED




Detail D

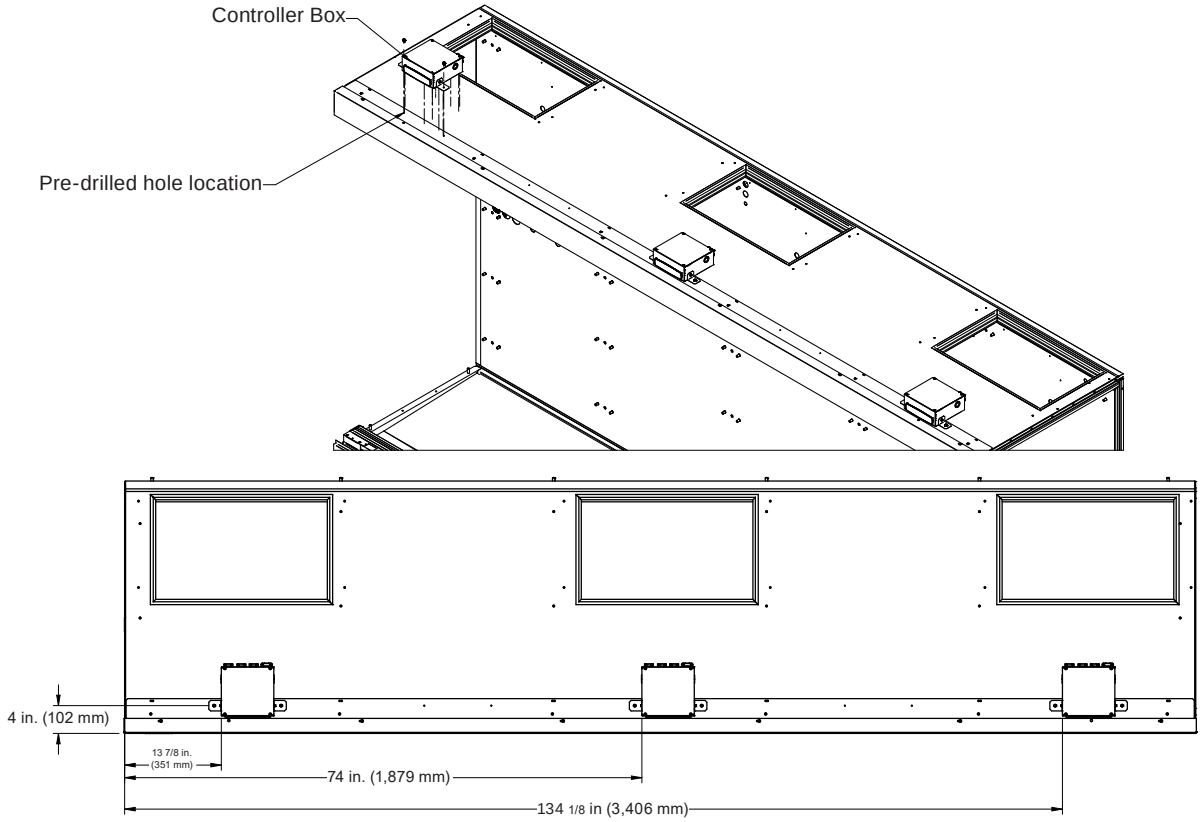



Detail C

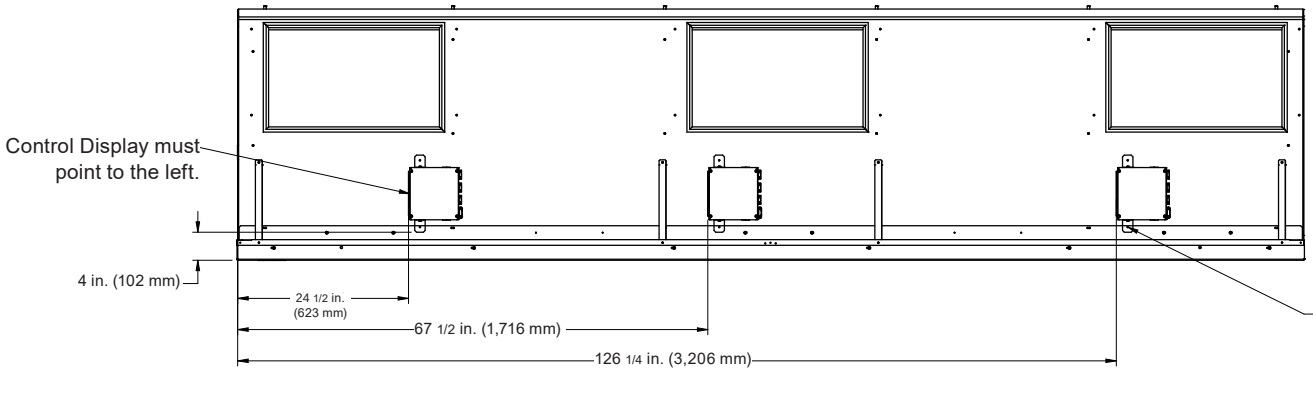
# RLN-A, RMN-A

## Installation Information

Control box position for cases with controller display facade cutout.




Control box position for cases with solid facade





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## Installation Information

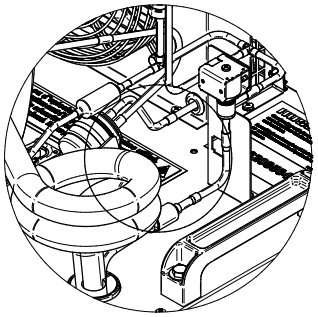
### Field Electrical Connections

There are two 2-pin sensor harnesses, one for discharge air temperature and one for defrost. Each sensor is labeled for identification. The defrost sensor includes a dedicated connector and is positioned after passsing through the case opening that accommodates the suction line. This sensor originates from within the refrigerated compartment.

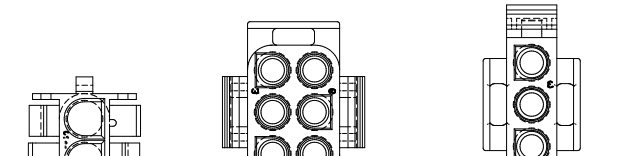
1. Connect each 2-pin sensor harness to each condensing unit.
2. Connect the 6-pin condensing unit harness to each condensing unit.
3. Connect the 3-pin controller harness to each condensing unit.

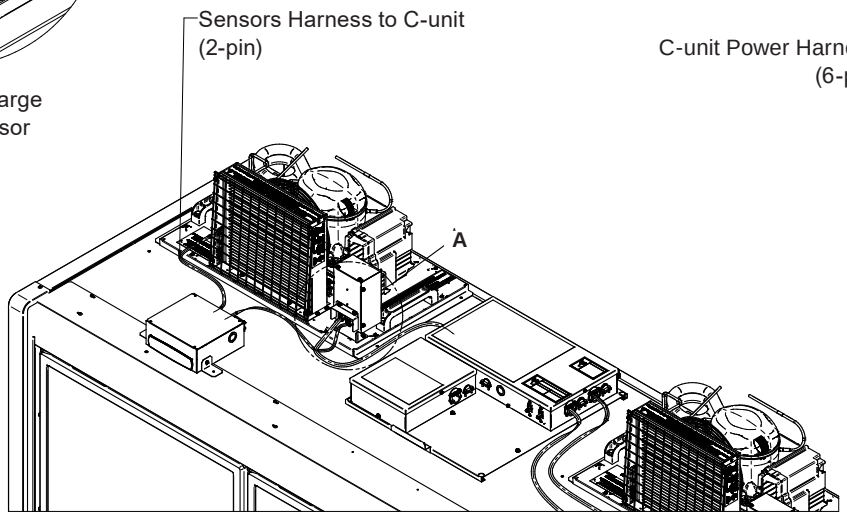
Discharge Sensor

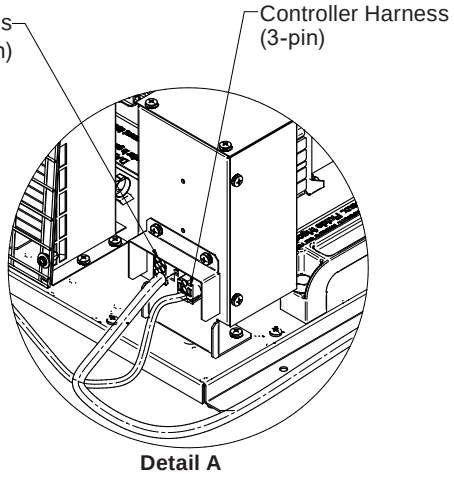

Defrost Sensor

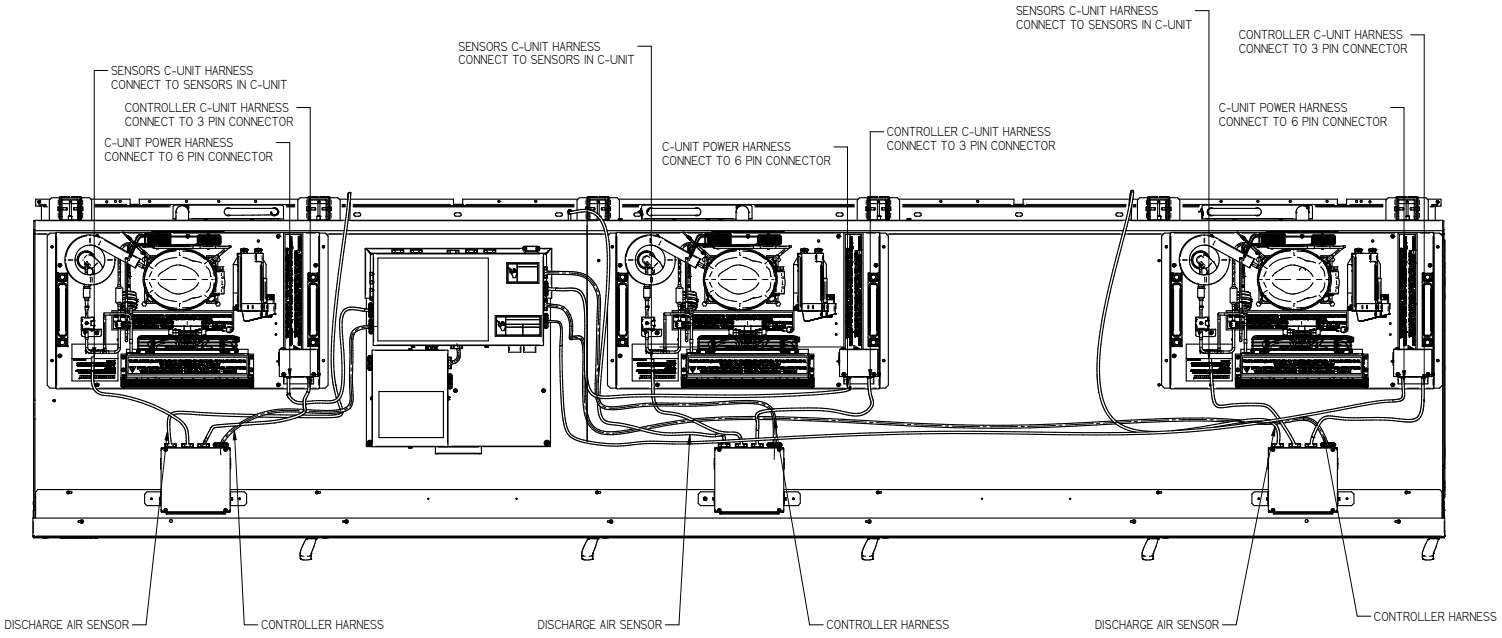


Location of Discharge and Defrost Sensor



## Installation Information

### Final Case Placement

1. Move case(s) to its final location.
2. Remove the end panel shipping braces. Discard bolts and flat washers used to hold end panel shipping braces. Bolts are too long to be used for putting on an end panel or joining cases.
3. Remove front shipping brace.

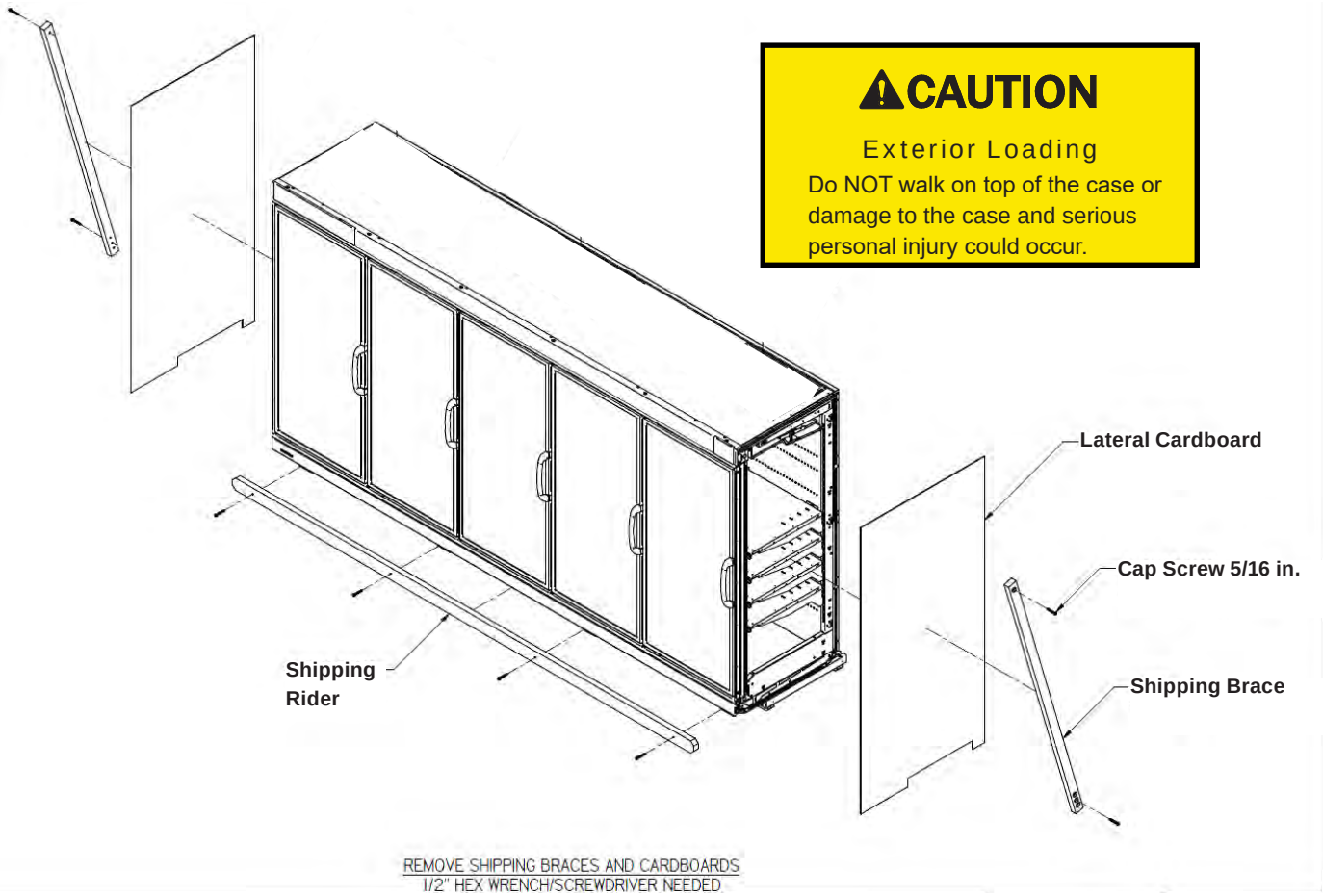
Remove Shipping Brace and lateral cardboards

Remove Front Shipping Brace

**⚠CAUTION**

Exterior Loading

Do NOT walk on top of the case or damage to the case and serious personal injury could occur.




REMOVE SHIPPING BRACES AND CARDBOARDS
1/2" HEX WRENCH/SCREWDRIVER NEEDED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## Installation Information

### Leveling Case

Be sure to position merchandisers properly, then level all four corners. If cases are to be joined together in a lineup each case must be leveled before Merchandiser(s) must be installed
level to ensure proper operation of the refrigeration system, and to ensure proper drainage of defrost water. This merchandiser must be installed level (from back to front, and side to side) to allow maximum draining of the condensate water as well as proper door alignment and operation. Choose a level area to install case. When leveling merchandisers, use a carpenter's level as shown. Metal leveling shims or wedges are provided with each merchandiser for use if needed.

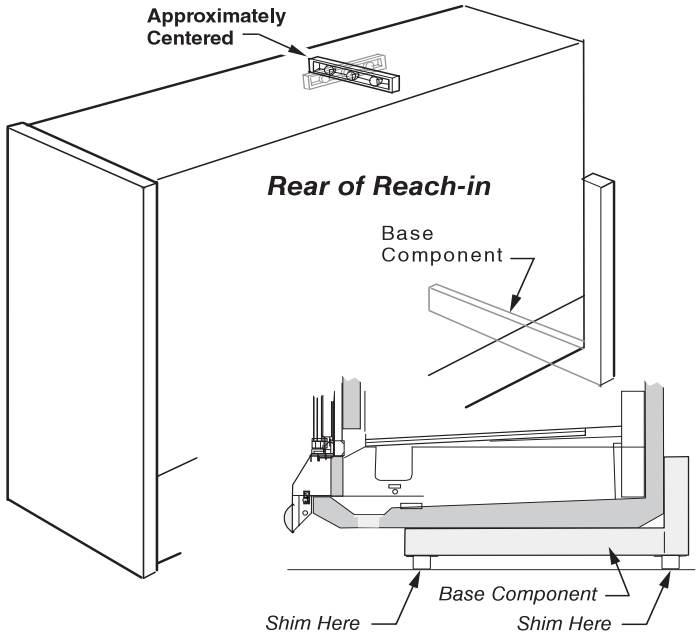
**Note:** Begin lineup leveling from the highest Location of the store floor.

Place provided metal shims under the rail and make sure that they are positioned at a base component (crossbar). This transfers the weight directly from the loaded case through to the floor.

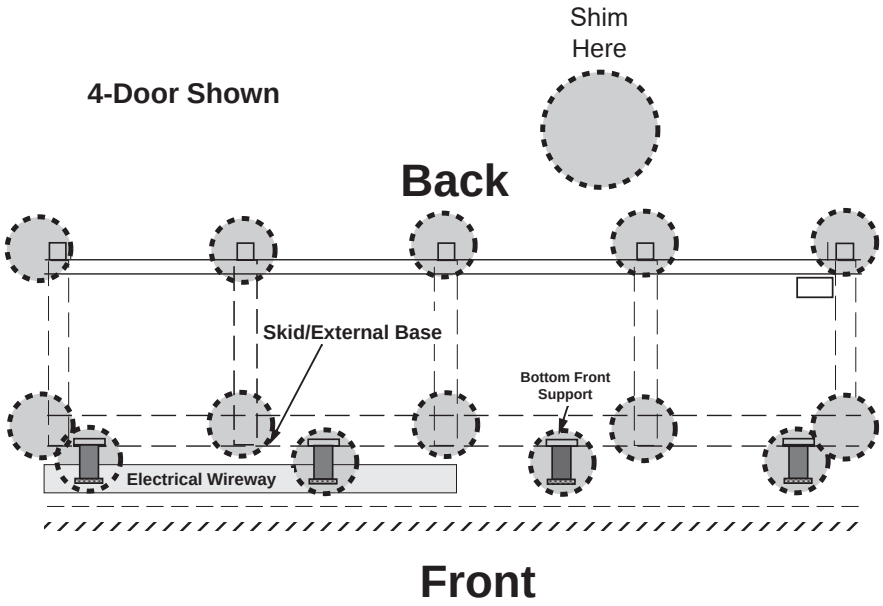
**⚠CAUTION**

Exterior Loading

Do not place heavy objects on case.
Do not store items or flammable materials on top of the unit.
Do not walk on top of case.




Placing provided metal shims at other locations will cause uneven distribution of weight leading to piping leaks, as well as sagging or wracked doors.




Correct Shim Location is Critical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## Installation Information

### Joining Cases in a Lineup

If cases are not to be joined together for this installation, proceed to page 26. Sectional construction means that two or more merchandisers may be joined in line yielding one long continuous display requiring only one pair of ends. Joining kits with partitions are packed out with each merchandiser.

Merchandisers operating on different temperature such as a low temperature case joined to a medium temperature case require a solid insulated partition. All joints must be airtight to prevent formation of ice or condensation.

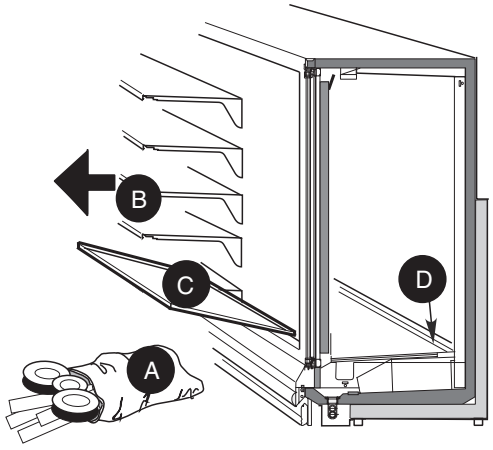
Case-to-case Joining Kit Parts List

| Item | Quantity | Material |
|---|---|---|
| 1 | 1 | Donut Gasket |
| 2 | 2 | Gasket 0.906 x 1/2 x 200 in. |
| 3 | 2 | Gasket 1/2 x 1/4 x 600 in. |
| 4 | 6 | Screw Cap 5/16-18 X 1 1/4 |
| 5 | 6 | Washers 5/16 |
| 6 | 3 | Joint Trims |
| 7 | 1 | Binder Post and Screws |
| 8 | 1 | Butyl Sealant |

Make sure cases to be joined are leveled. Carefully unpack and inspect the joining parts listed above to verify completeness and that there is no damage.

1 Prepare cases for joining as shown in Figure 1.

a. Remove packing materials
b. Remove shelves (if installed).
c. Remove display racks and pans from ends to be joined.
d. Remove plenum covers.




Prepare Cases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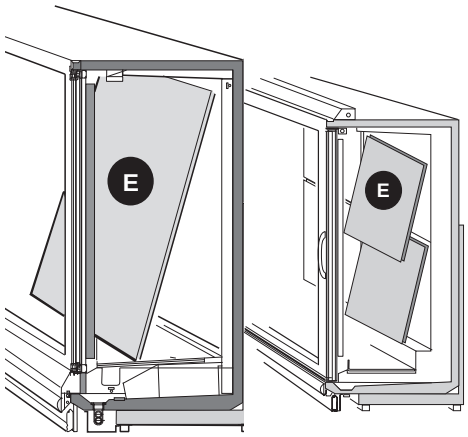
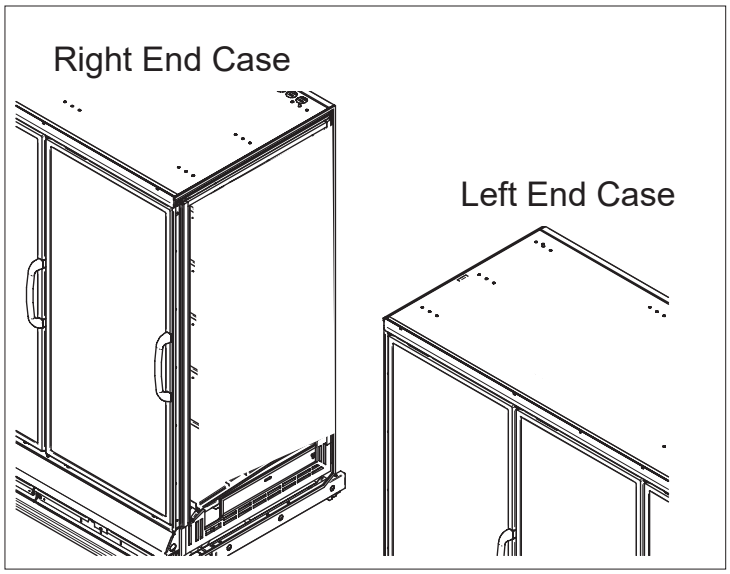
## Installation Information

e. Remove back panels from ends to be joined by lifting up and out near the bottom. No tools are necessary.



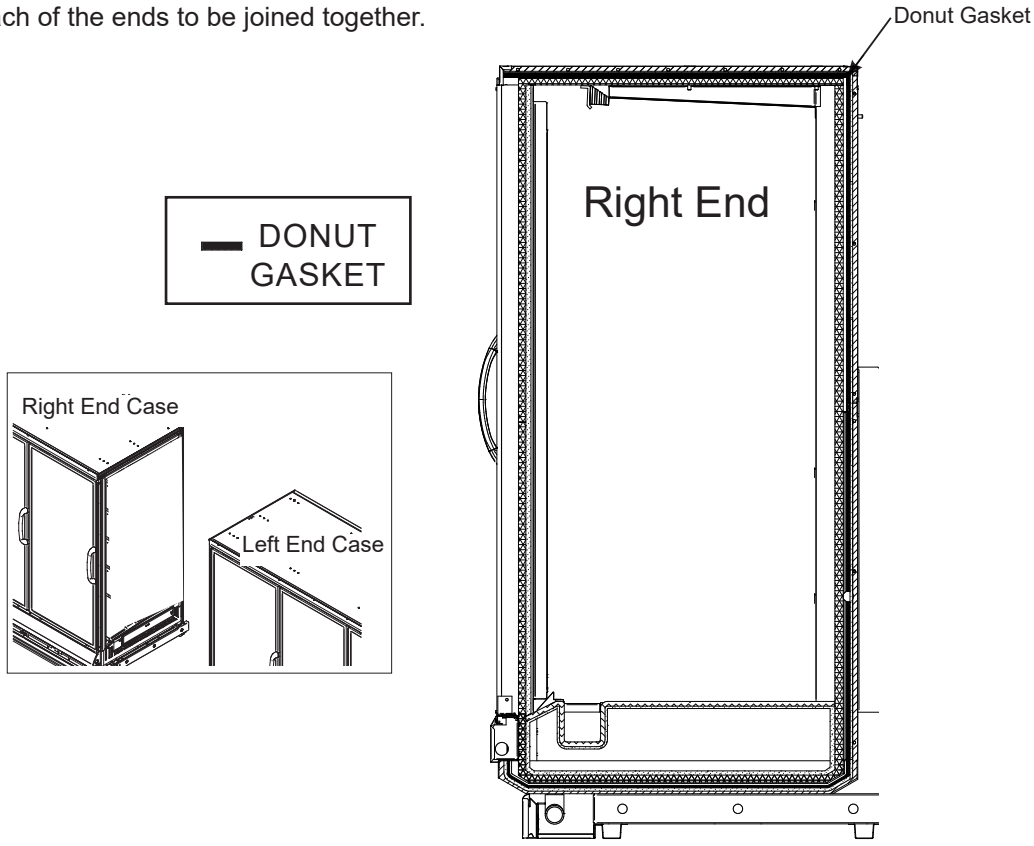

2 Snap a chalk line on the floor to use as a guide for positioning the front of the cases in the line-up. The front base frame should be on the chalk line. Level and shim each case beginning with the right end case



## Installation Information

3 Apply gaskets. First, apply Donut Gasket in the recess around right end frame as shown below.

See the following pages for the application of all the gaskets for each of the ends to be joined together.




Apply Donut Gasket to Right End Frame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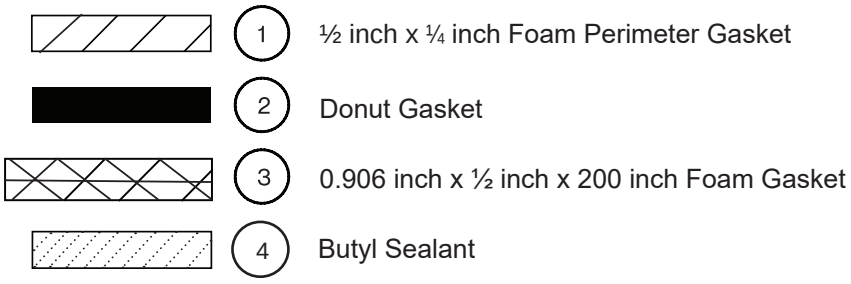
## Installation Information

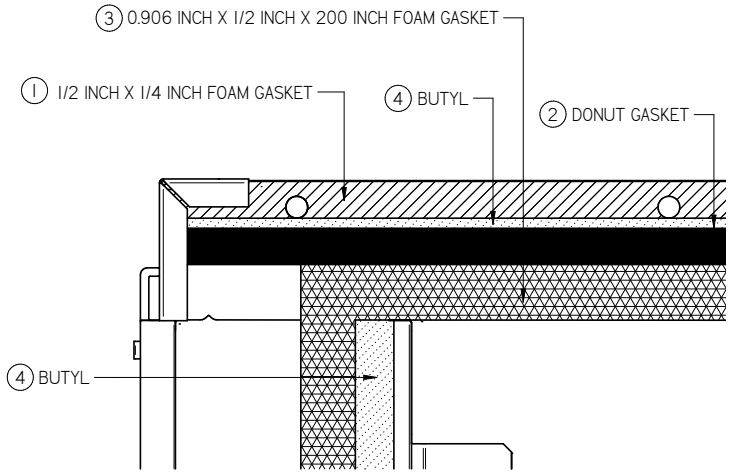
**4** Apply the wider Foam Tape Gasket (3) around the whole case frame. Refer to the illustrations on the next page.

Apply gasket first, then apply the narrower Foam Tape Gasket (1) around the perimeter of the end frames outside of the donut gasket. Also apply framing to the End Shoe Part of the case.

- Gaskets will only be applied to merchandisers joined in a line up.
- Do not double the number of gaskets, as this will cause air leaks between joined cases. (See illustration on next page)
- Lap gaskets at lower corners.
- Check that there are no gaps between gasket and case.
- Do not stretch gasket, especially around corners. To make sharp corners, paper backing can be torn without removing from gasket.
- Do not butt gaskets; always lap joints.
- Remove paper backing after gasket is applied to keep gasket free of debris.
- Foam gaskets have high-tack adhesive and must be properly placed the first time.



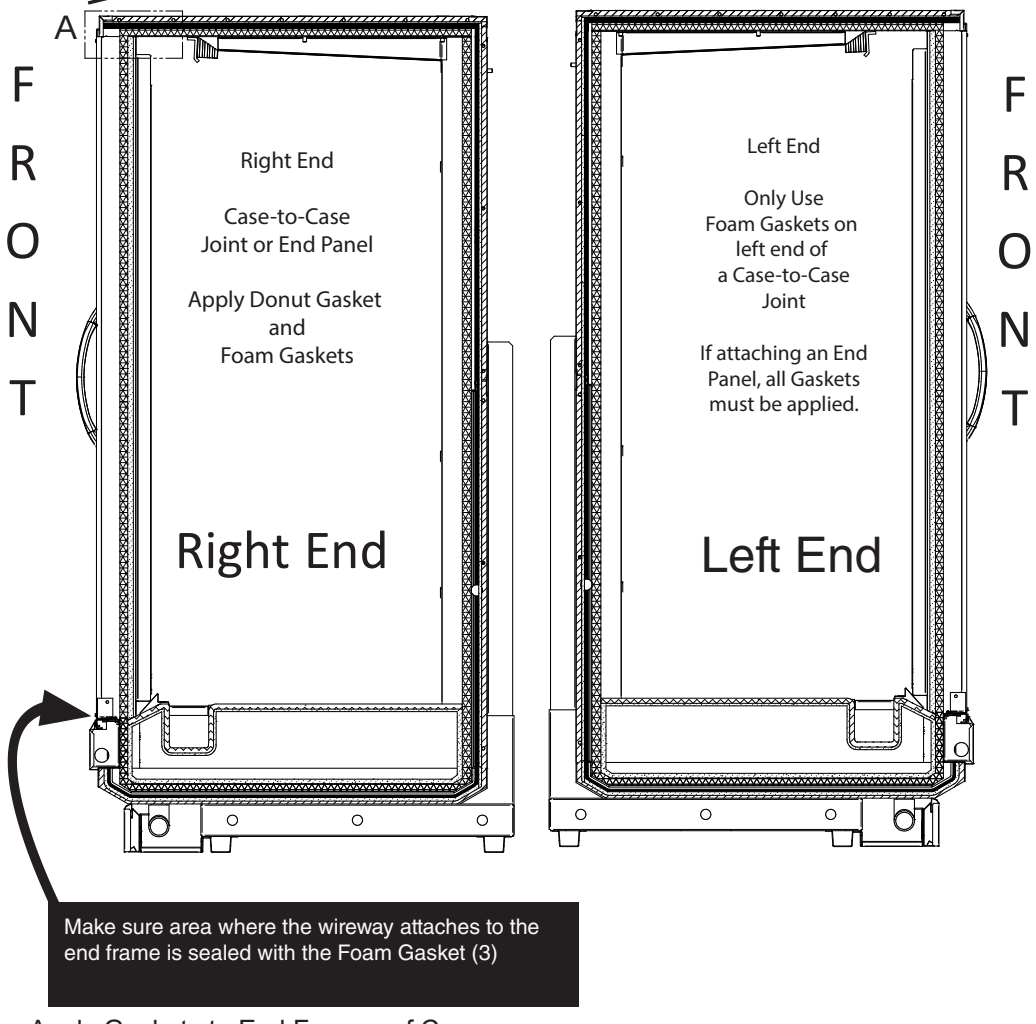
## Installation Information




Note:
Butyl Tape is NOT an acceptable substitute for donut or foam gasket.

DETAIL A

A




Make sure area where the wireway attaches to the end frame is sealed with the Foam Gasket (3)

Apply Gaskets to End Frames of Cases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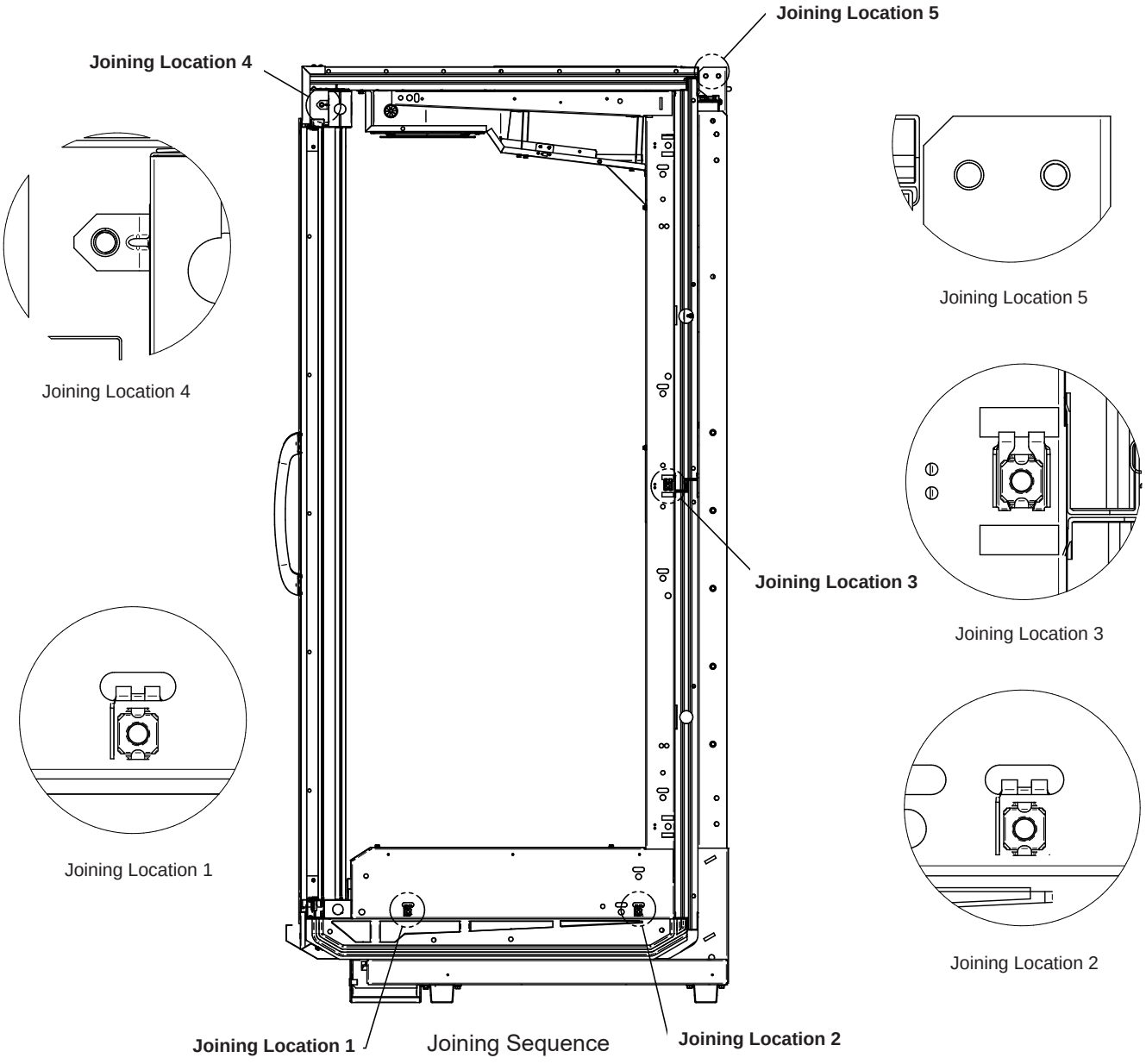
## Installation Information

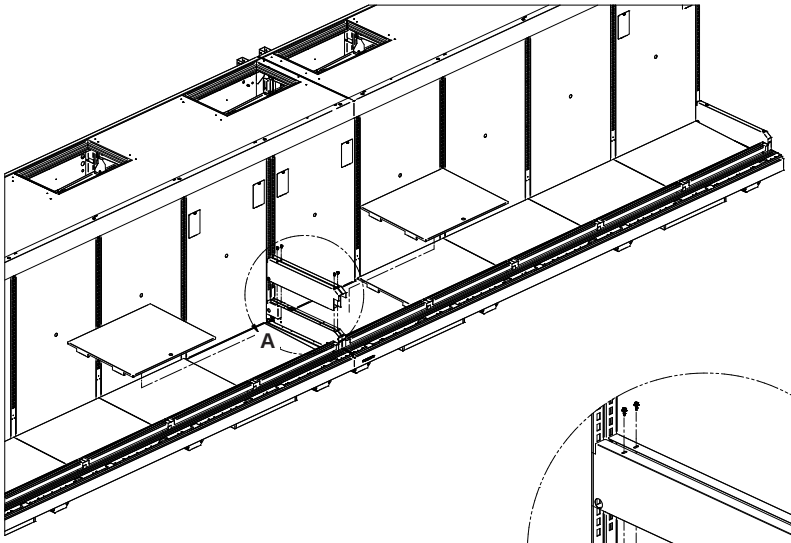
5 Move the second merchandiser against first, mating alignment pins with corresponding holes. Use care when pushing the cases together.

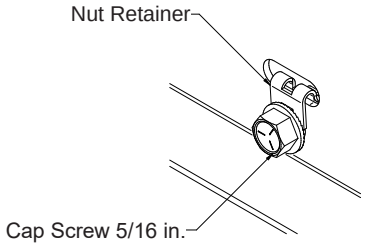
Loosely insert Cap Screw with Lock Washer into each nut retainers and joining brackets. Do not tighten completely. Follow the joining location details on the following pages.

Following the same sequence, joining locations 1-5. Tighten each screw fully until the merchandisers are joined with a snug fit and the gaskets are compressed.

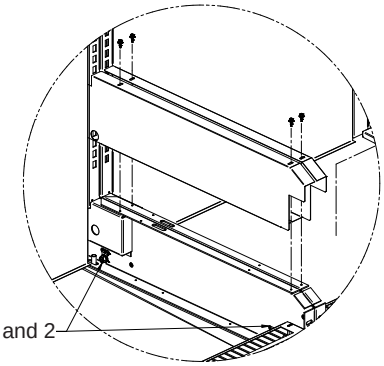


a. Remove the deck pans and shoe covers between the case joints.
b. Locate the nut retainers in the front and rear of the shoe (joining locations 1 and 2). Join with 5/16 in. screws.



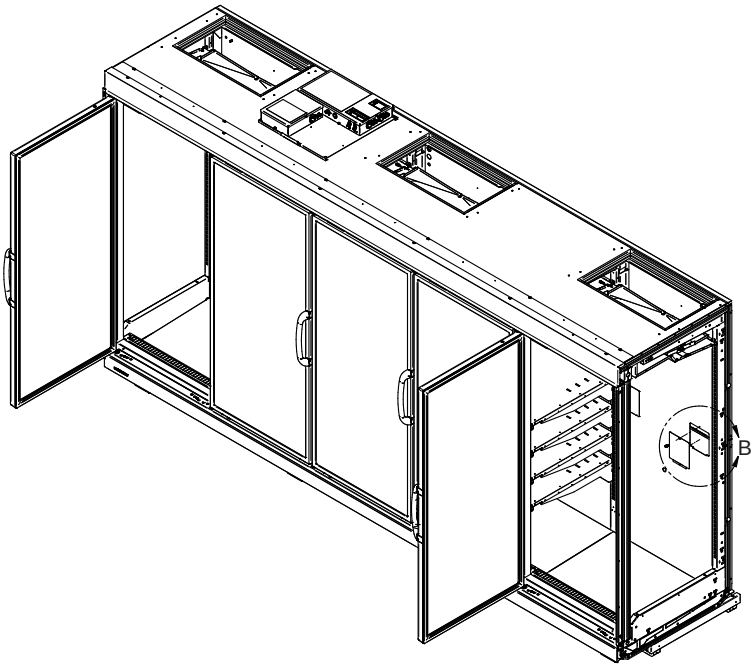




Joining Locations 1 and 2 Detail

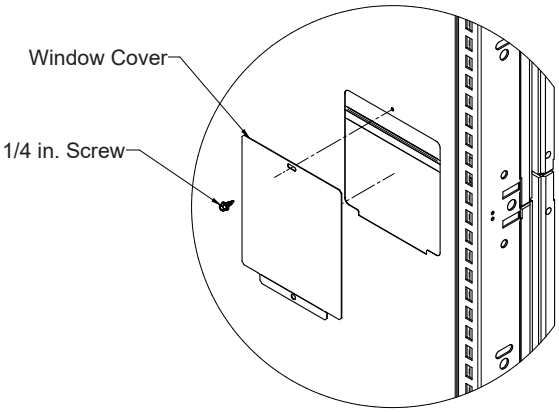



Remove Cover Shoes and Pan Displays Detail A

c. Remove the internal joining window covers on the back panels.
d. Join with 5/16 in. screws (joining location 3) as shown in Detail B.

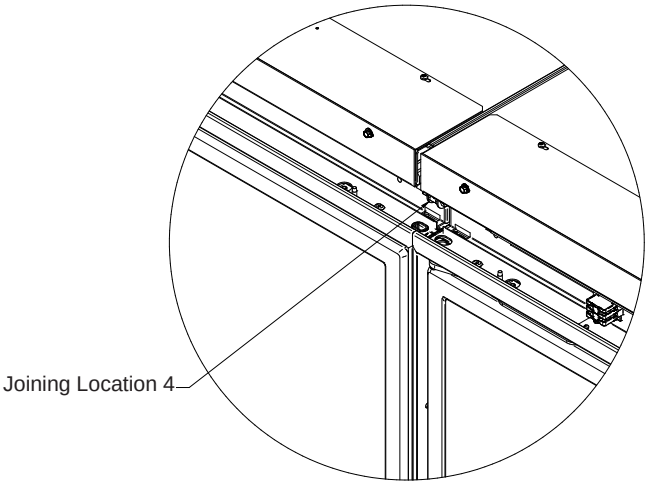



Remove Shelves and Internal Joining Window Covers

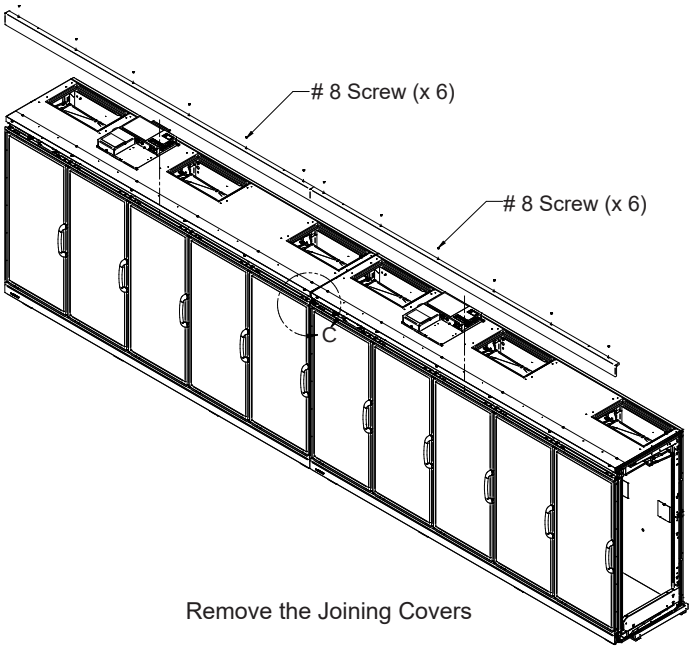



Detail B (Joining Location 3)

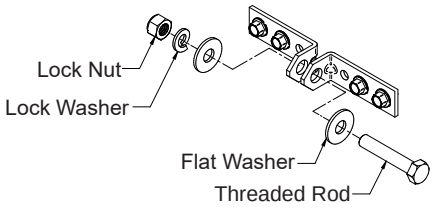
e. Remove the joining covers from the top of each case (front of case).
f. Join case together with washers and 5/16 in. cap screw and hex nut (joining location 4).



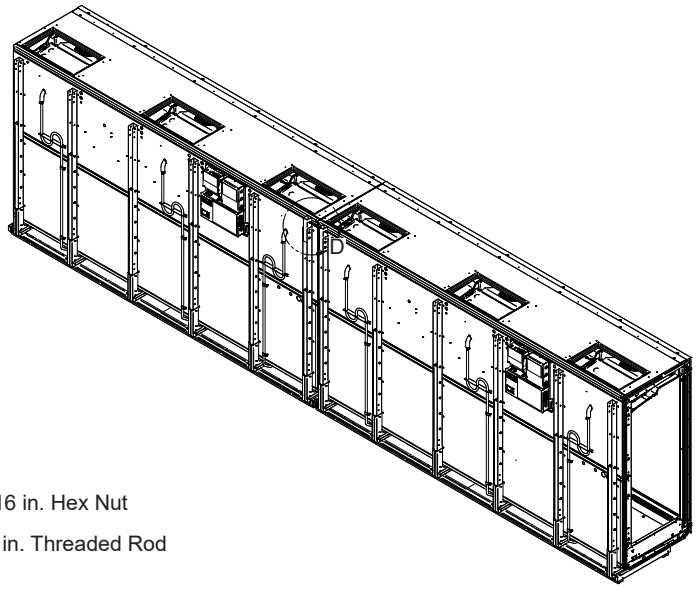

Detail C

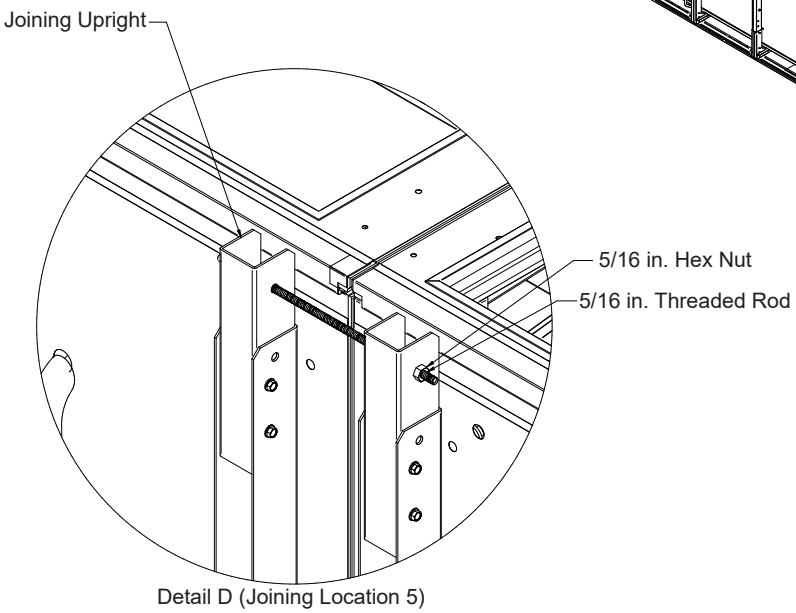



Remove the Joining Covers



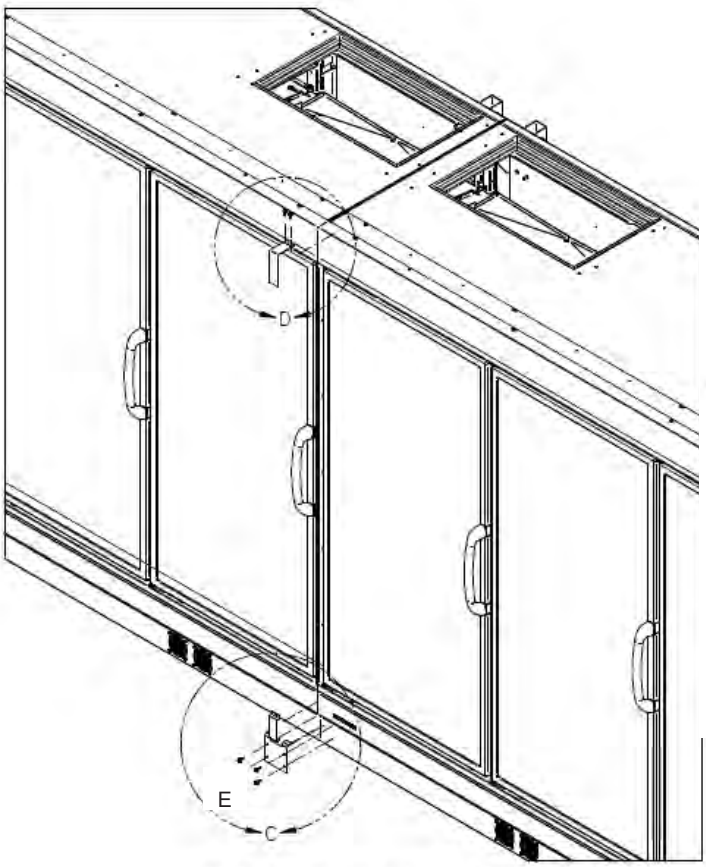

g. Use threaded rod to join cases at the rear.
h. Fasten with hex nut (joining location 5) as shown in Detail D.

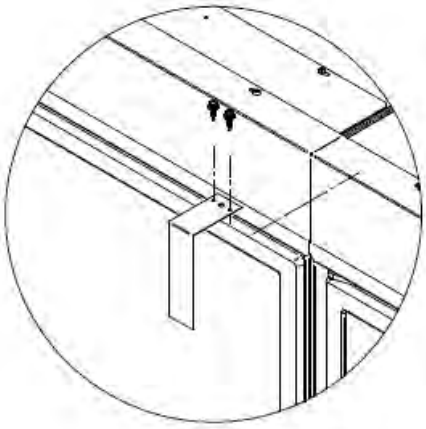


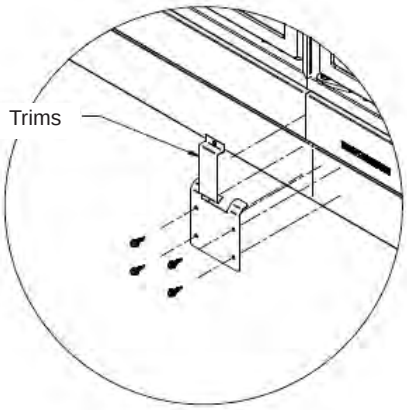

Detail D (Joining Location 5)

6 Install joint trim to mask the section joints in the case lineup. Trim pieces must be centered on the cases.Remove protective tape from the trims. Use 1/4 in. hex head screws (4) to attach trim to front panels at top and bottom of case joints.



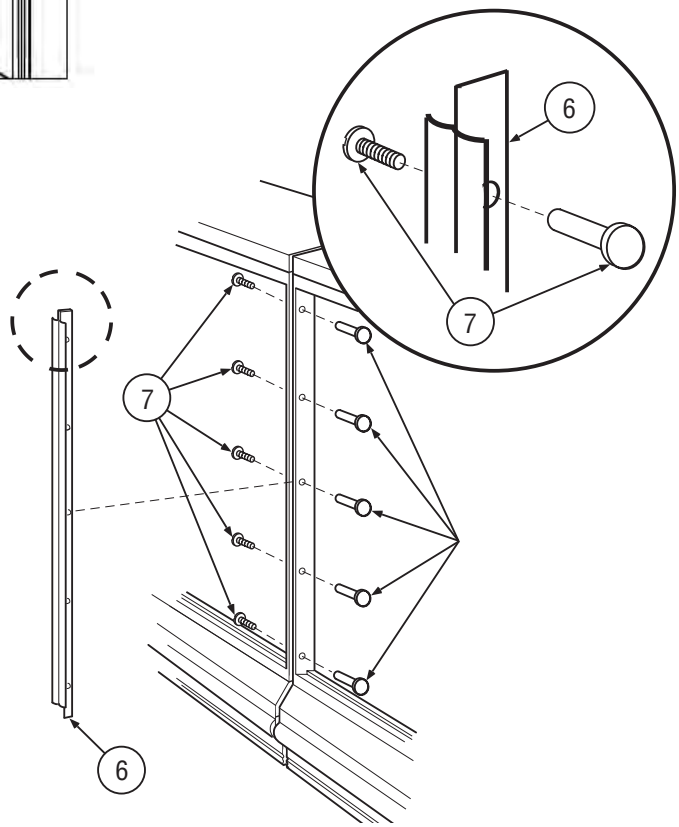
Detail F




Detail E

7 (Optional Interior Joint Trim)

Align holes in frame with holes in Joint Trim – 6. Fasten cases together using Binder Post and Screws – 7 as shown below.



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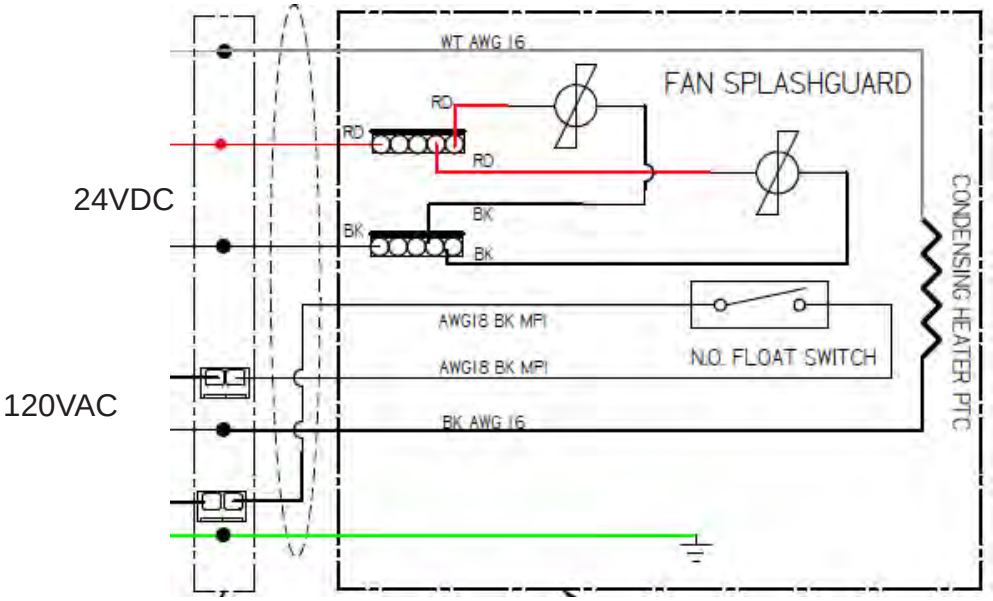
## Installation Information

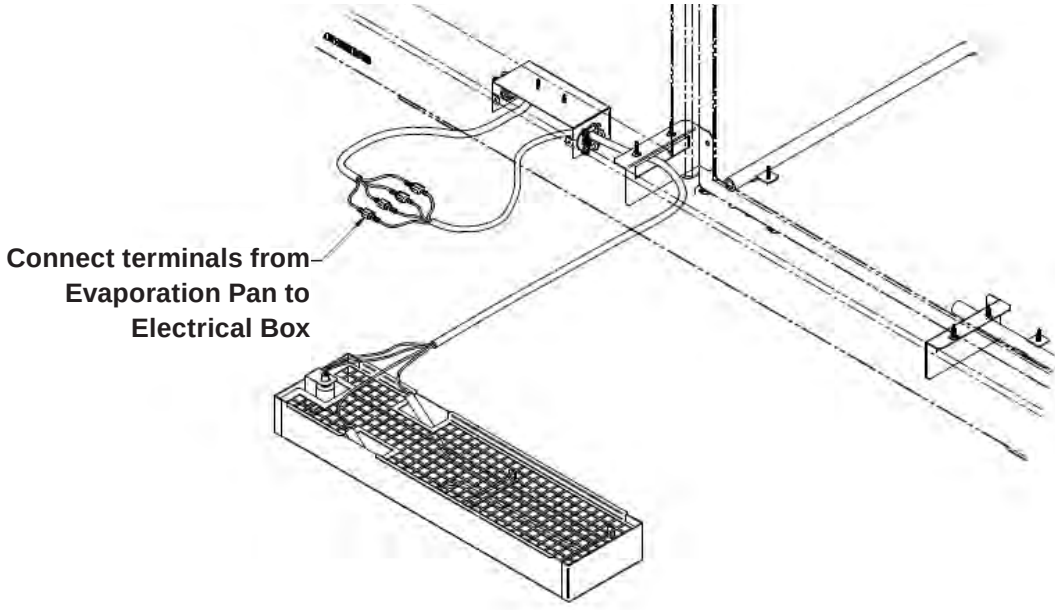
### Installing Evaporation Pan(s)

The evaporation pan is packed inside the case and must be installed and leveled at the bottom of the case, then hard-wired at the electrical box. The exact location of the components is not critical; however, the components should be mounted in the general locations shown on the following page to ensure that electrical connections are reached and that the evaporation pan has adequate air flow.

NOTE:
Some models have two evaporation pans depending on case length.
Make the electrical connections, securing the terminals. Review wiring diagrams of the unit's data sheet for reference.

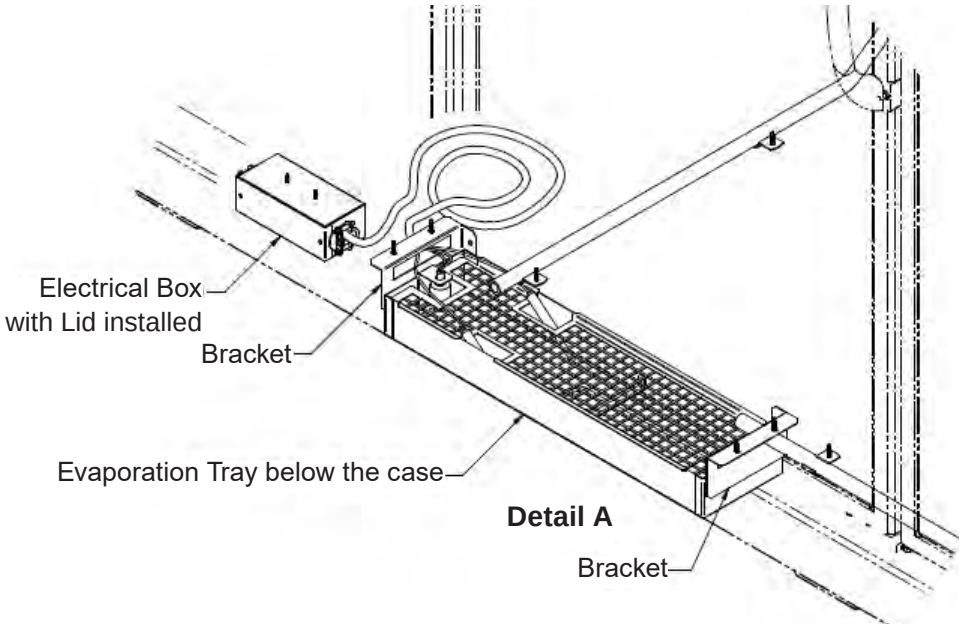
- **Fan Splashguards are rated for 24V DC.**
- **The heater and floating switch connect to 120V AC.**

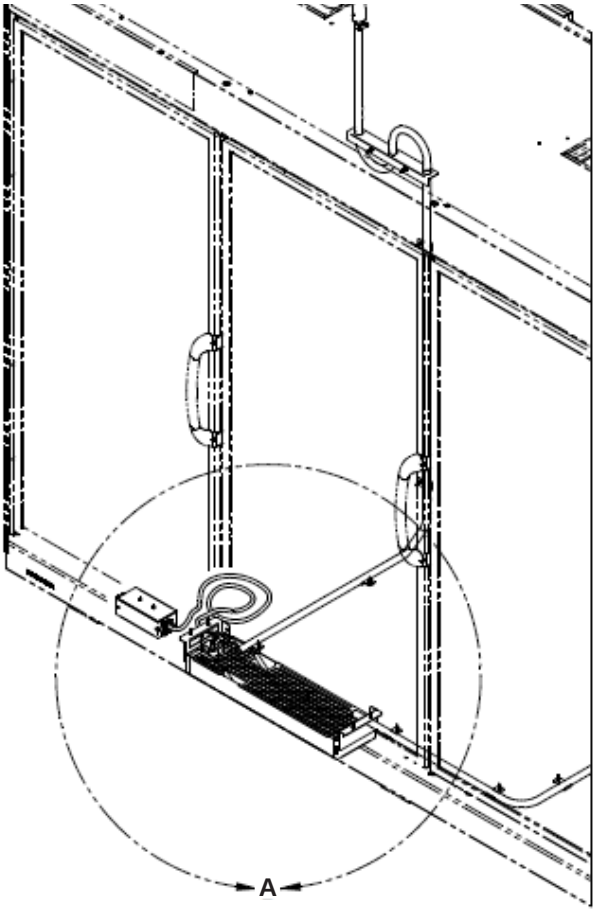


## Installation Information

1. Once the terminals are connected, place connections inside the electrical box, and install the lid.
2. Next, slide the evaporation tray under the case using the case base supports as a guide to place the tray in its final position.
3. Make sure the plastic drain hose is located inside of the evaporation pan.





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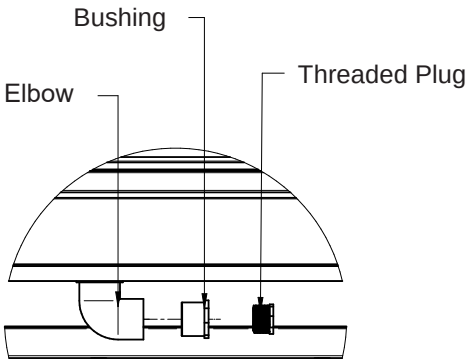
## Installation Information

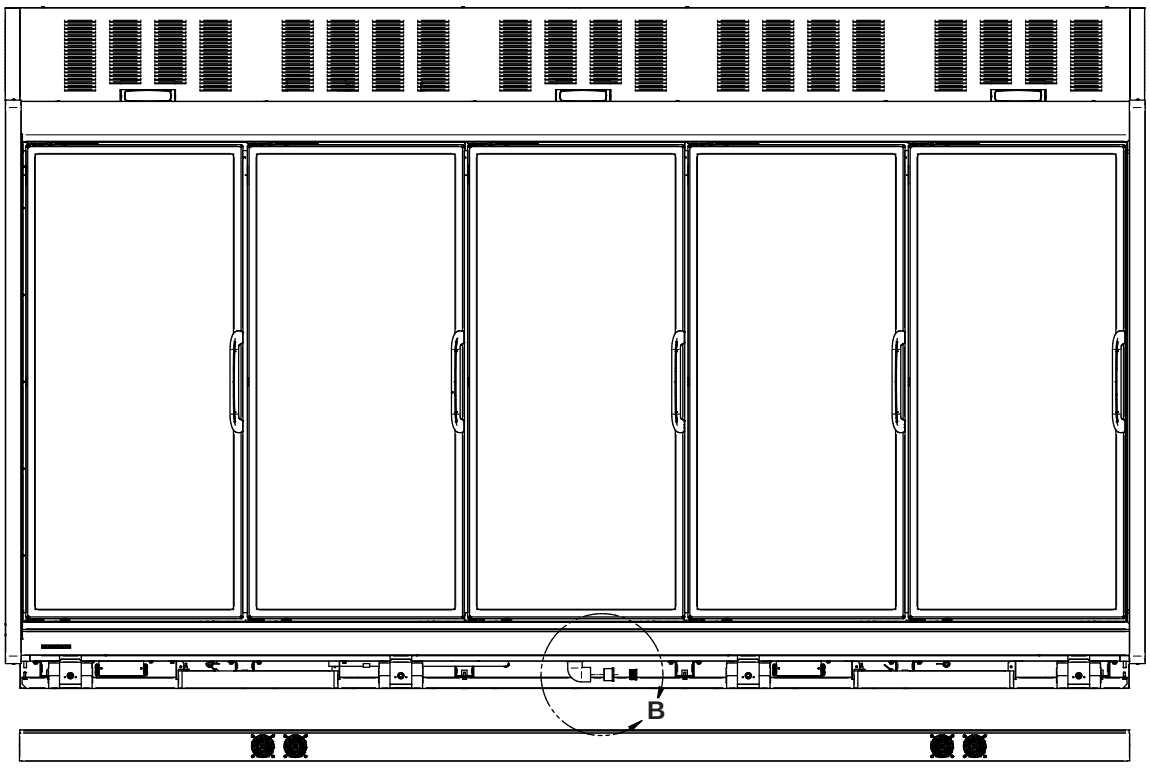
### Bottom Drain and Plug

There is drain that facitilates cleaning and draining of excess debris from the bottom of the case. The drain has a threaded plug. The drain is located underneath the case in the middle of the case. Ensure that the plug is attached to the drain before installing the fan splashguard shown on the next page.




Elbow

DETAIL D

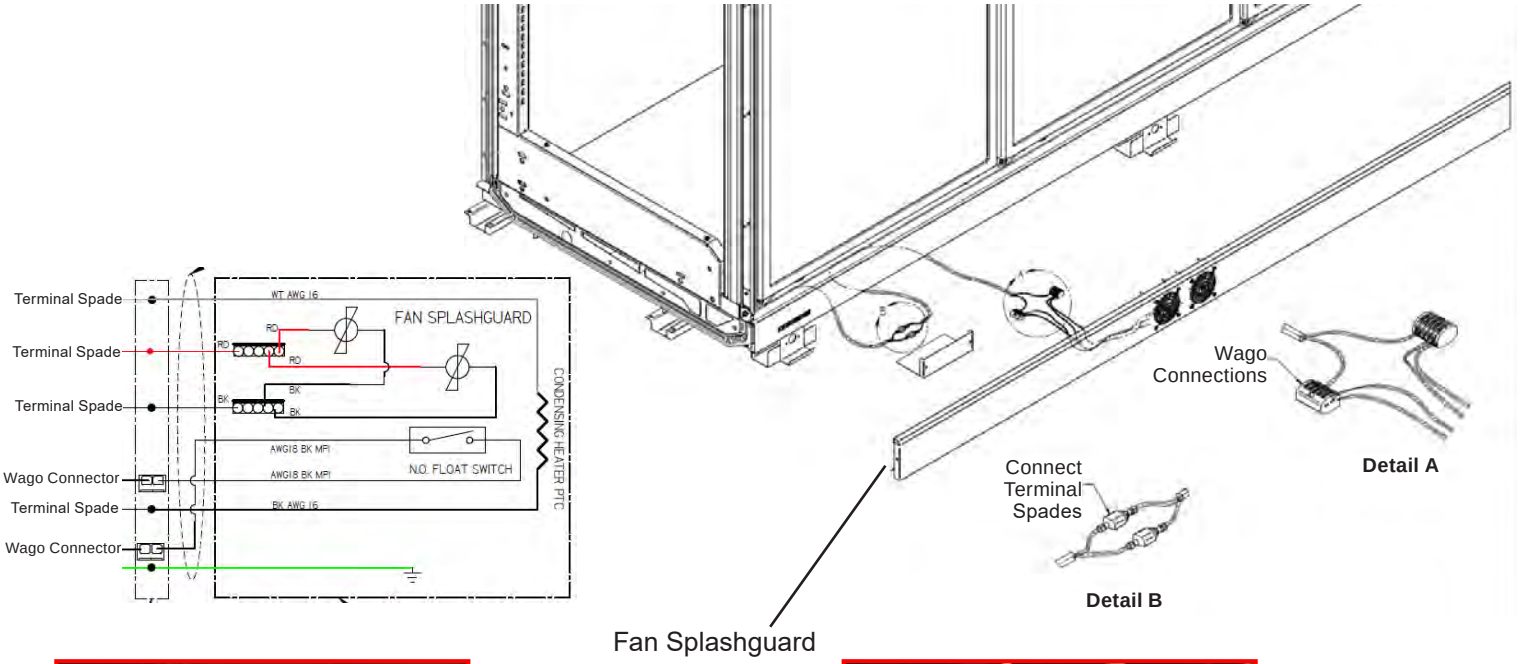



BOTTOM DRAIN VIEW

## Installation Information

### Installing Fan Splashguards

1. Unpack Splashguard fan, and remove the electrical cover from under the case.
2. Identify wiring and pass wiring through conduit beneath the case.
3. Use Wago connectors to connect fans to electrical power. Fan splashguards are rated for 24V DC.
4. Connect the terminal spades.




(Step 1) Remove Electrical Box Cover.

(Step 3) Fan Splashguard Connection

(Step 2) Pass wiring through conduit.

(Step 4) Condensate Heater
No Float Switch Connection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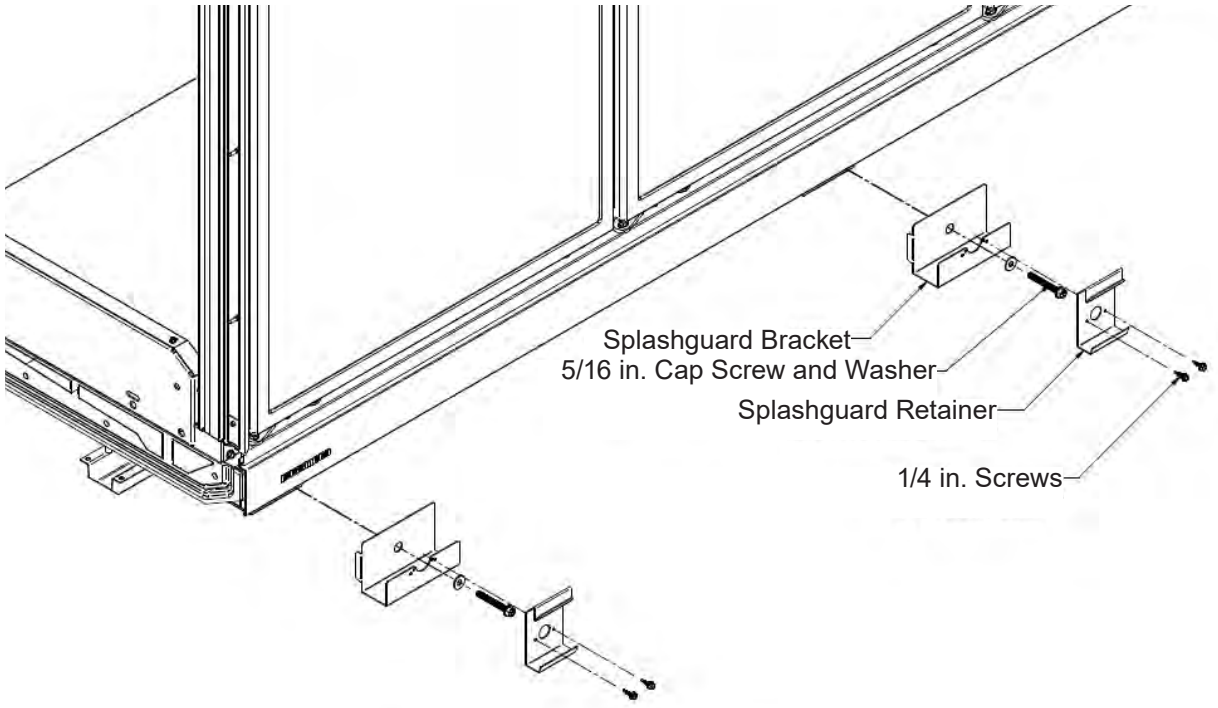
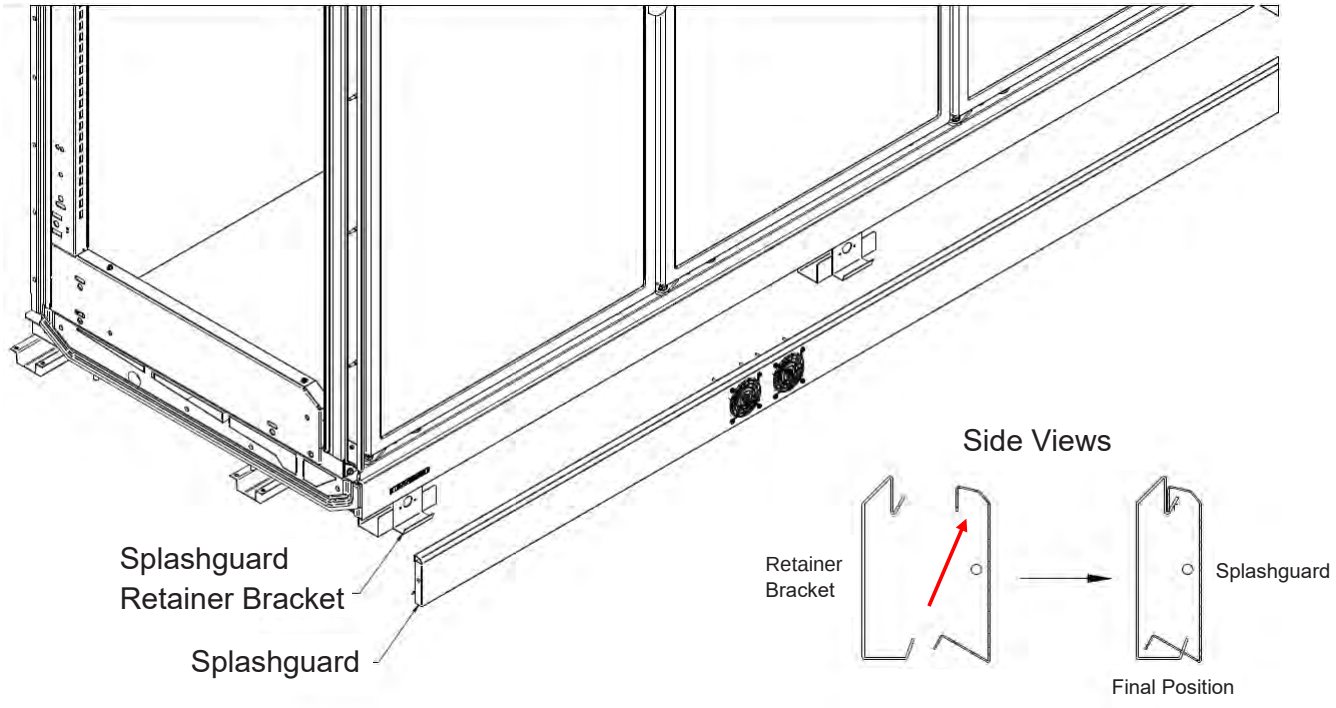
5. Install the splashguard supports and retainers as shown below .
   Fasten with washer, 5/16 cap screw and sheet metal screws.




6. Fit the fan splashguard assembly onto the splashguard retainer.
7. Hook it into the top flange first, then push splashguard assembly in at the bottom.
8. The splashguard will snap into place as shown in the side views below.





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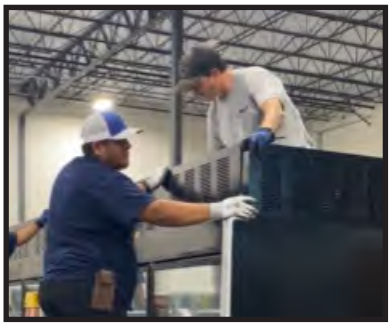
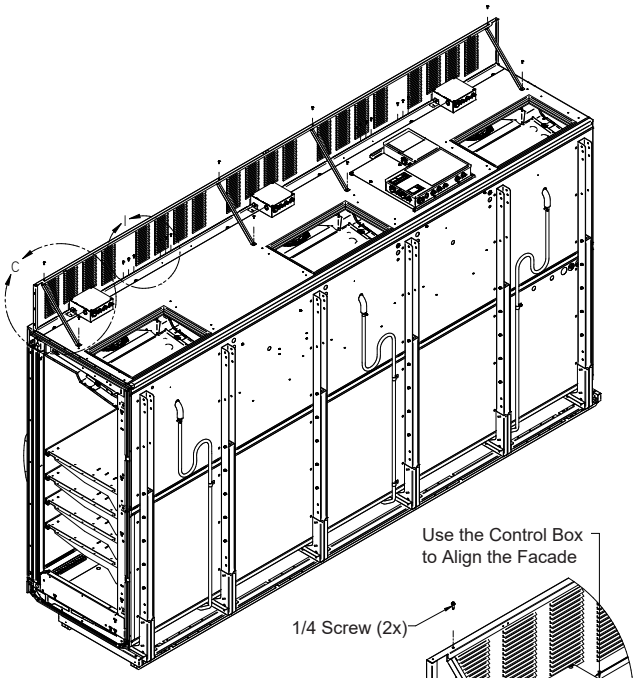
# RLN-A, RMN-A

## Installation Information

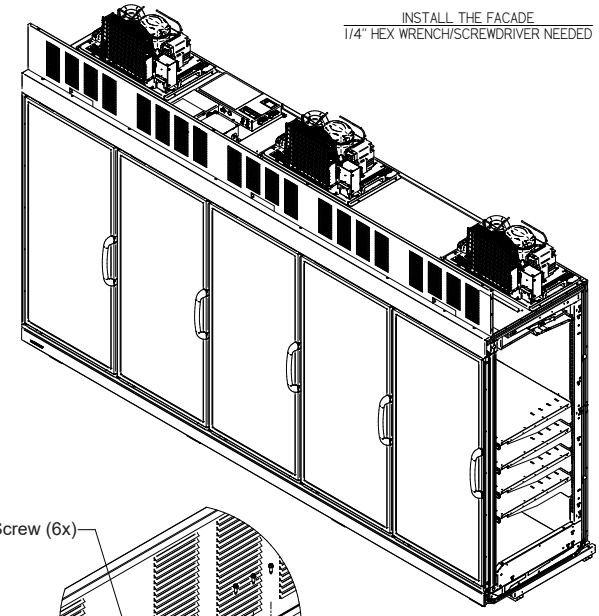
### Installing Facades



1. Attach the front facade using the braces as show in Detail A.
2. Fasten facade panels to using the pre-drilled holes as shown in Detail B.



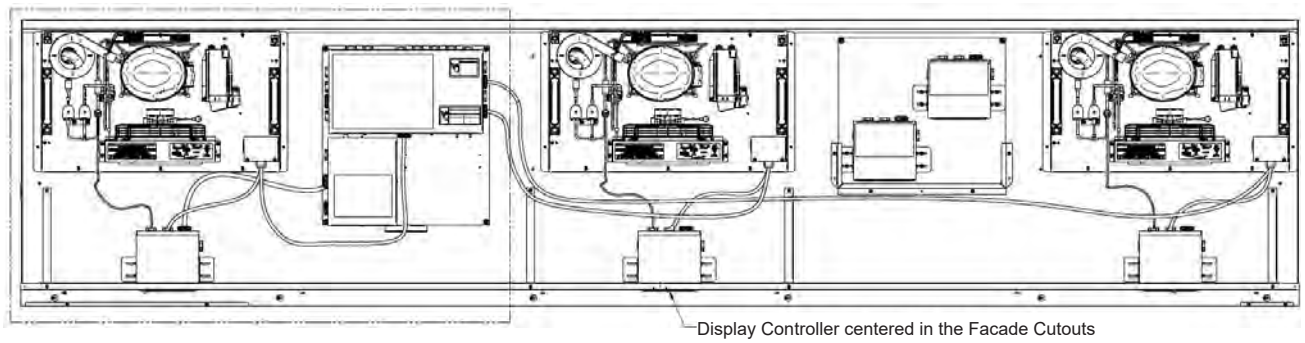

Detail A (4x)




Detail B (2x)

### Installing Controller Displays

Ensure controller displays are centered in the facade cutouts.



Display Controller centered in the Facade Cutouts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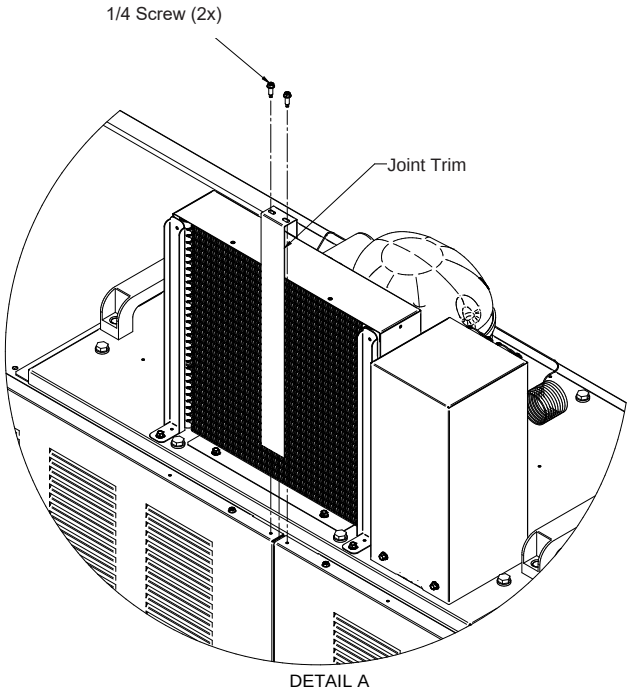
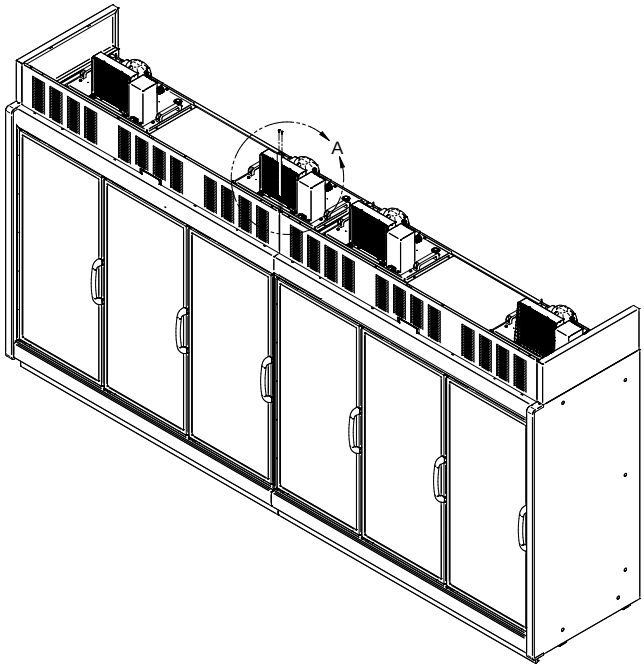
## Installation Information

### Installing Facades at end of Case(s)

1. Attach the joint trim between facade joints as shown in Detail A.
2. Fasten with 1/4 in. screws



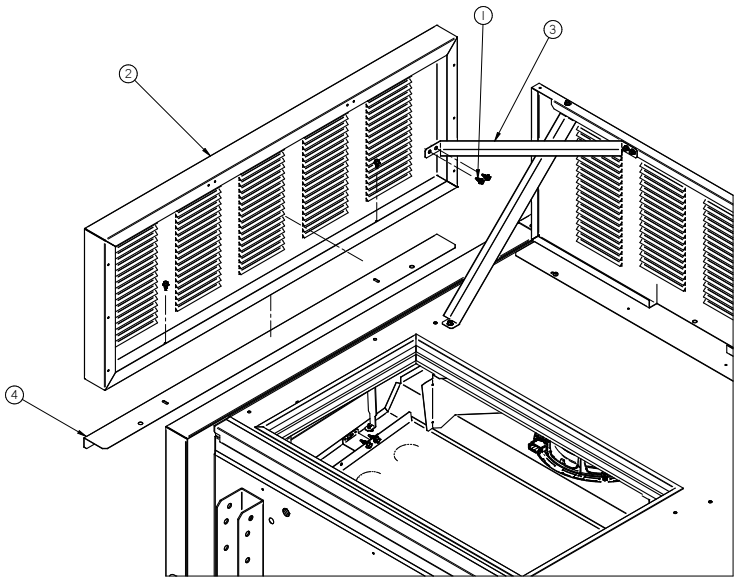

DETAIL A




3. Place item 4 (facade trim) on top of the end of the case. Attach to top of case using 1/4 in. screws.
4. Install end facade panel. Fasten to top of case using 1/4 in. screws.
5. Attach facade reinforcement and fasten with 1/4 in. screws.

OPTIONAL FACADE SIDE

| PART LIST - ASSEMBLY | |
|---|---|
| ITEM | TITLE |
| 1 | 1/4" SCREW-SM 8-1/2 PHILL AB |
| 2 | PANEL-END FACADE 13 IN LOUVERS |
| 3 | REINFORCEMENT-FACADE TO AIR BAFFLE |
| 4 | TRIM-FACADE END |





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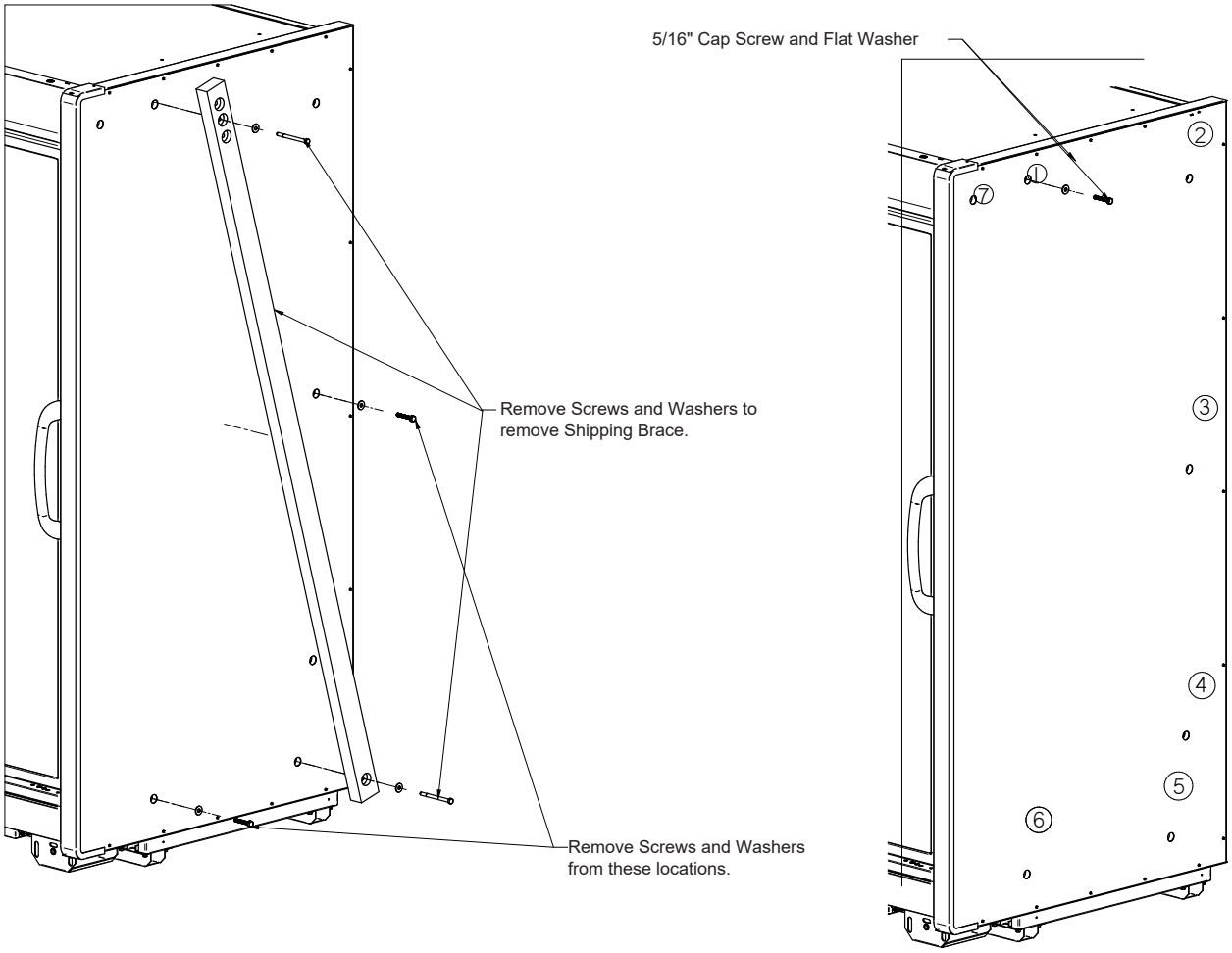
## Installation Information

### Installing Partitions

Partitions are to be installed between cases operating at different temperatures.All joints must be air tight to prevent formation of ice or condensation.

1. Remove Shipping Brace
2. Locate and remove all cap screws and washers securing the shipping brace. Discard shipping brace cap screws.
3. Carefully detach the brace and set it aside.
4. Remove screws and washers from designated mounting points.
5. Only install screws at positions 1, 2, and 4 using 5/16" cap screws and 5/16" flat washer.





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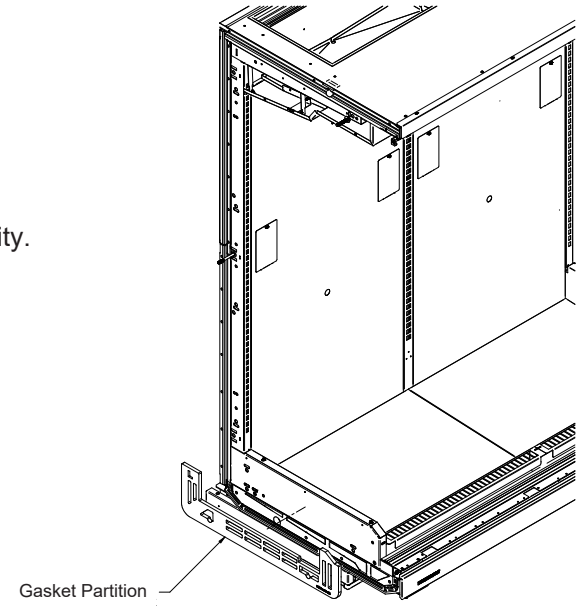
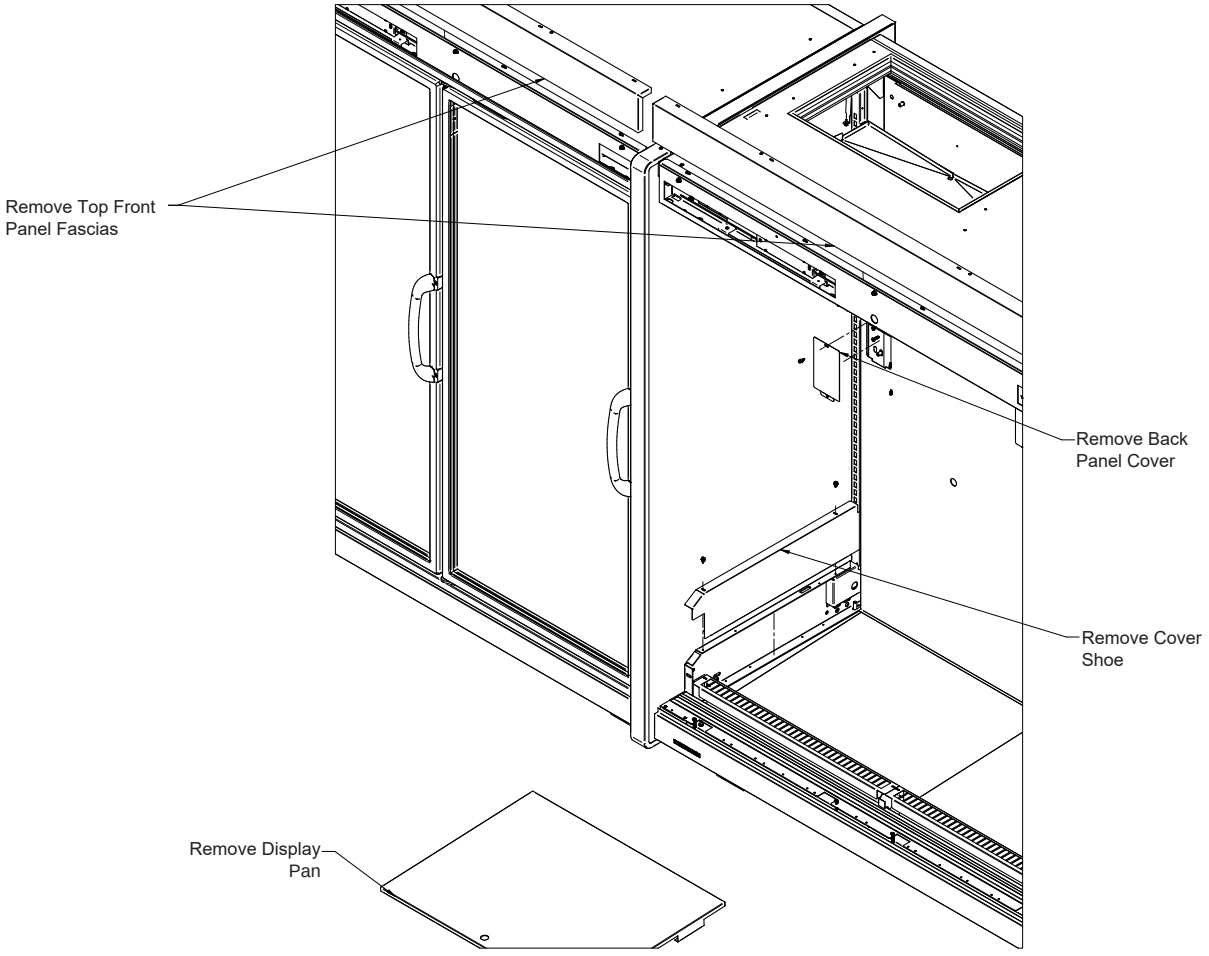
6. Leave positions 3, 5, 6, and 7 free of screws.
7. Before proceeding with the partition installation, apply the following gaskets to the RH case:
8. Gasket Donut RLN End – Part No. 0511304, Gasket 1/2 x 1/4 x 600 – Part No. 0136172002, and Gasket .906" x 1/2 x 200 – Part No. 0560316.
9. Refer to the gasket pattern diagram for correct placement, page 21.

NOTE: RH case frame and grille are hidden in diagrams for clarity.




10. Remove the top front panel fascias, back panel cover, cover shoe, and display pans.



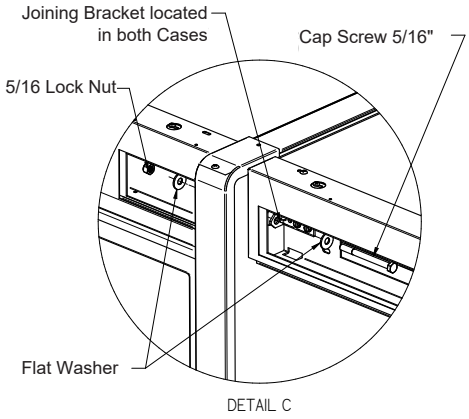
# RLN-A, RMN-A

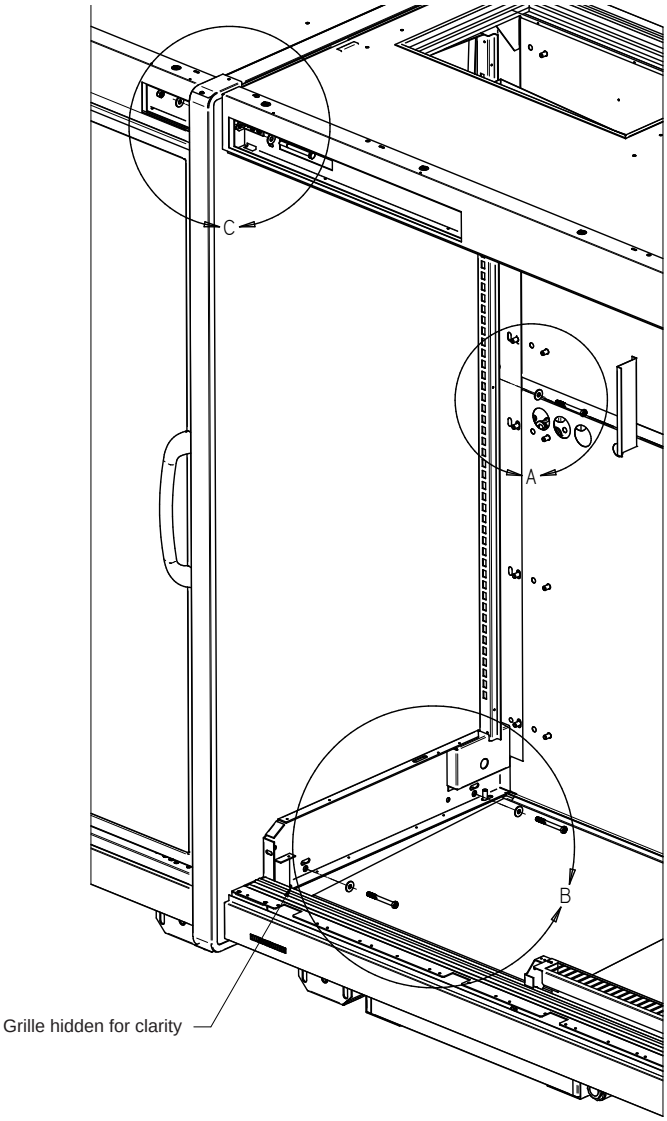
## Installation Information

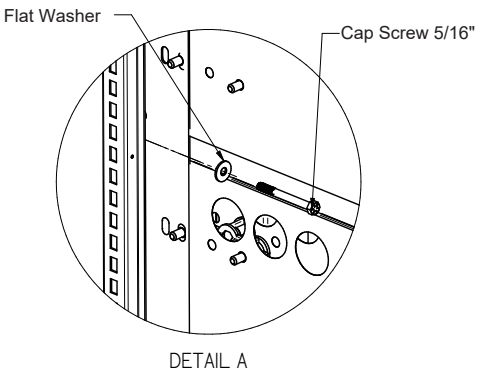
Position the acrylic partition in place. Use the following hardware to secure the partition and join the cases:

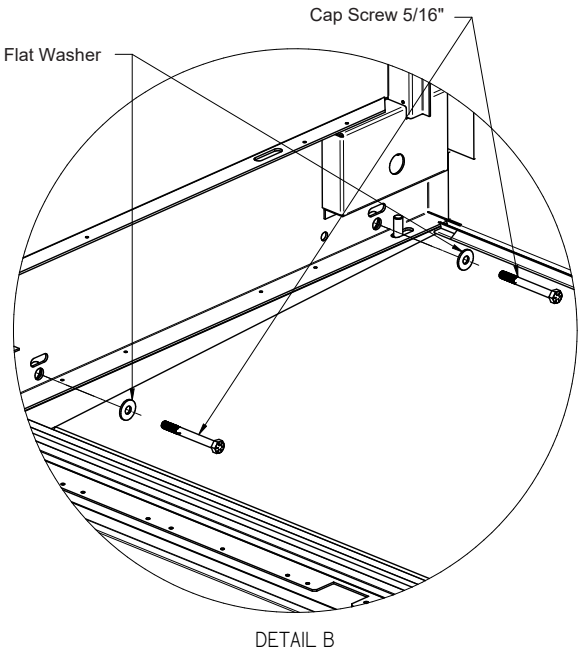
11. Join using cap screw 5/16", flat washer 5/16", and lock nut 5/16". Joining brackets are located in both cases.
12. Secure the partition according to the assembly diagram.

Note: The acrylic partition does not interfere with the standard case joining process.





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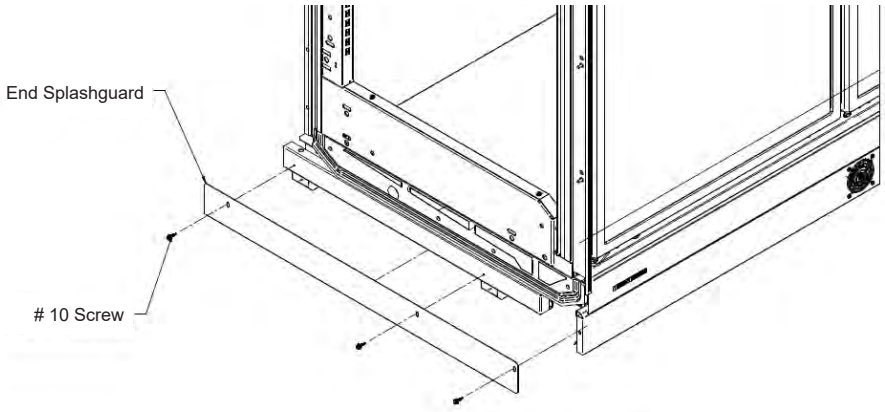
## Installation Information

### Installing End Splashguard Panel

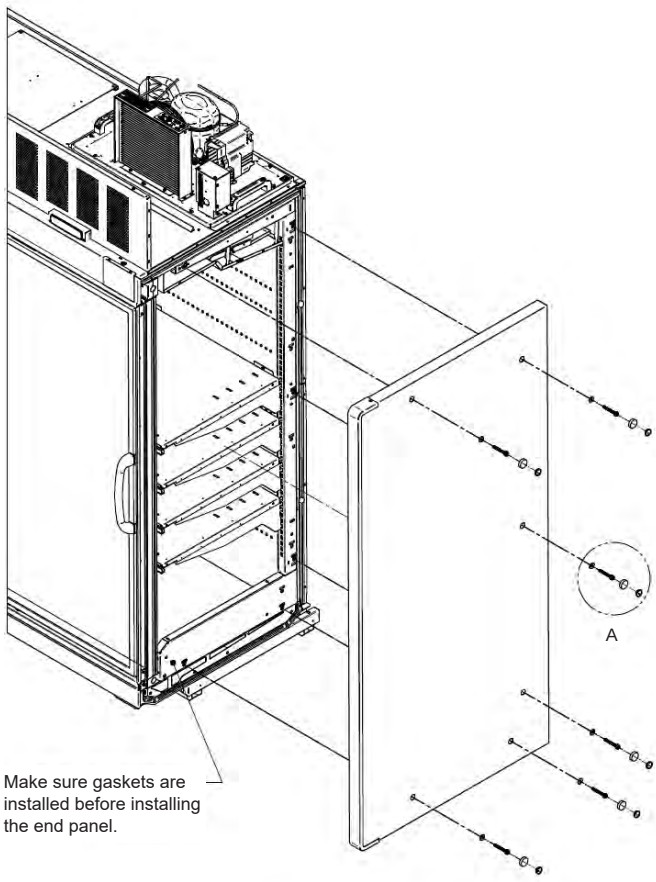
Install the splashguard end panel before attaching a case end.
Use sheet metal screws (3) to attach the panel to the fan splashguard and base case end as shown below.

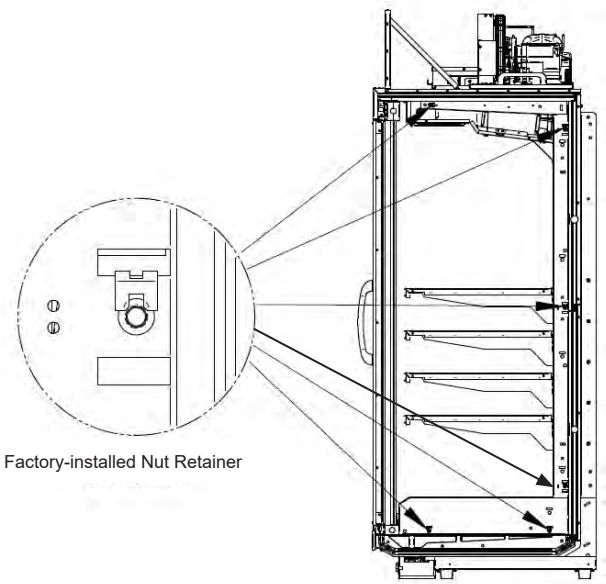


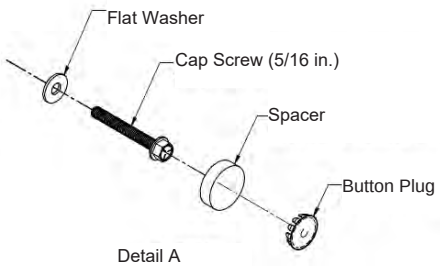

Only add the splashguard end to cases that need an end panel put on it.

### Installing an End Panel

There may be some instances where it is necessary to install an end panel at the end of a case lineup. Attach the end panel to the case as shown in the illustration below. Do not use the bolts that were attached to the shipping brace, use the shorter 2½" screws. Use the plug bolts and button to cover bolt locations.



## Installation Information

### Installing Bumpers

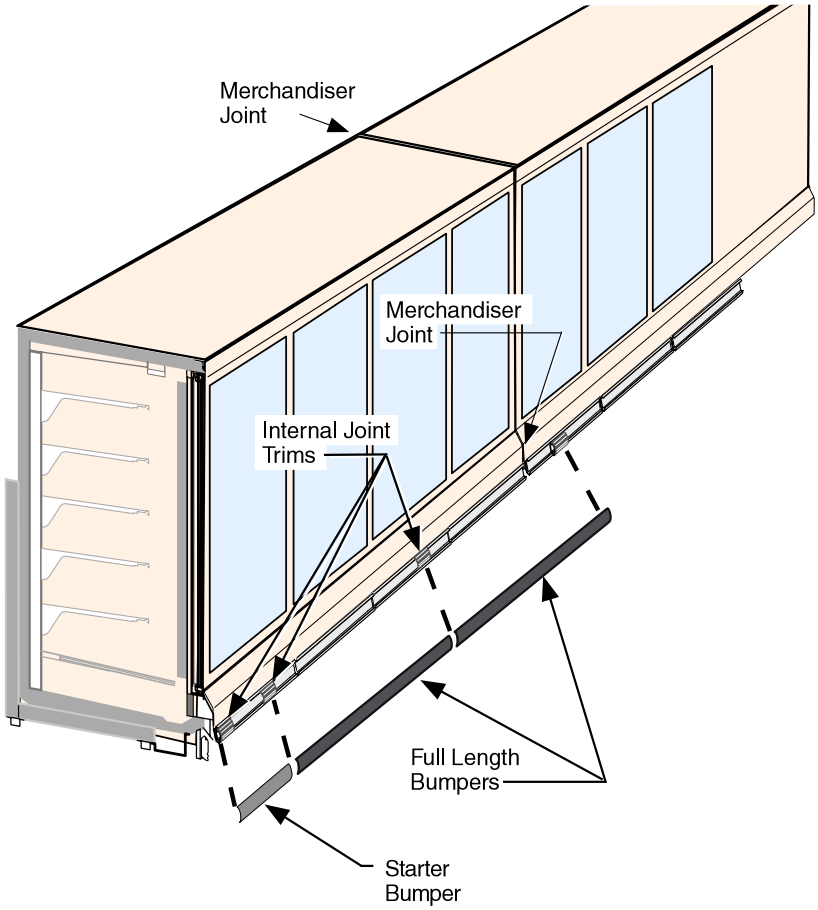
Offsetting the bumpers and front rails helps to disguise the joint locations, giving the lineup a smoother look.

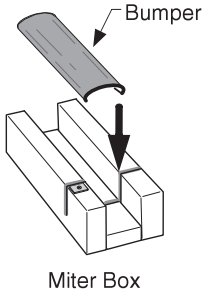
Begin at the left end of the line-up. If factory-installed with ends, insert the first full-length bumper, then insert the internal joint trim. Align each bumper section with its bracket and push into place, working from the end of the lineup. Install full length bumpers and internal joint trims offset across joints.

Check that no gaps exist between sections. Continue installing the bumpers the length of lineup. Once all except the last section of bumper have been installed, refrigerate the case line-up for at least six (6) hours. The last sections of bumper should be kept inside a refrigerated case or cooler during this time to allow the bumpers to contract.

Before installing the last full-length section, measure the remaining space. Use a miter box and fine tooth saw to cut last bumper to length. Install the last section.

Remove protective film from bumpers once installation is complete. Optional end bumpers are factory-installed. Bumper End Caps can be adjusted horizontally to eliminate gaps.





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# RLN-A, RMN-A

## Electrical Information

### Plug and Outlet

Before the merchandiser is connected to any wall circuit, use a voltmeter to check that the outlet is at 100% of the rated voltage. The wall circuit must be dedicated for the merchandiser. Failure to do so voids the warranty. Do not use an extension cord or adapters. Never plug in more than one merchandiser per electrical circuit.

The power cord extends 85 in. (2159 mm) from the case and exits on left side at the rear of the merchandiser. When shipped, the plug end will be strapped to the rear of the case.

Disconnect power before servicing. RLN-A and RMN-A merchandisers require a dedicated electrical circuit with ground. 18 AWG is the minimum acceptable wire size. Consult equipment datasheet for additional electrical specifications.

**NEMA Electrical Plug**

| Model | RLN2A, RLN3A | RLN4A, RLN5A |
|---|---|---|
| NEMA Plug | 14-30P  | 14-50P  |

**NEMA Electrical Plug**

| Model | RMN2A | RMN3A | RMN4A | RMN5A |
|---|---|---|---|---|
| NEMA Plug | 5-15P  | 5-20P  | 5-30P  | 5-30P  |

**⚠WARNING**

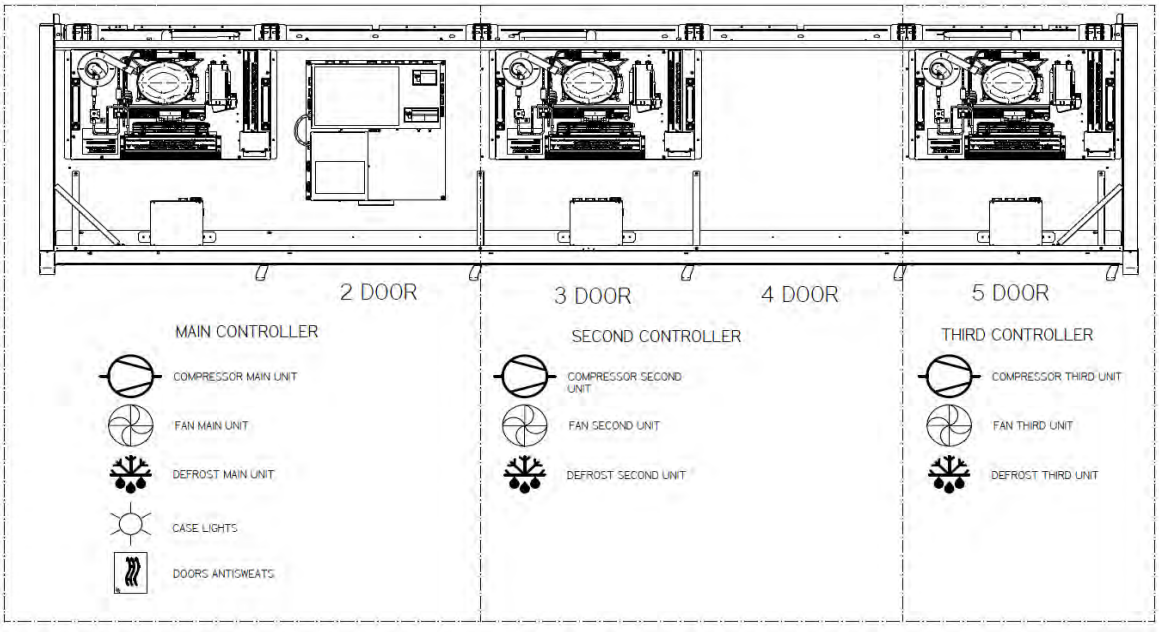
- Always use a dedicated circuit with the amperage stated on the unit.
- Plug into an outlet designed for the plug.
- If in doubt, call an electrician.
- Risk of electrical shock. If cord or plug becomes damaged, replace only with a cord or plug of the same type. Merchandiser must be grounded. Do not remove the power supply cord ground.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agents or similarly qualified persons in order to avoid hazard.
- Do not remove the power supply cord ground.
- To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.
- Merchandiser must be grounded. All wiring must be in compliance with NEC and local codes.

# RLN-A, RMN-A

## Controls

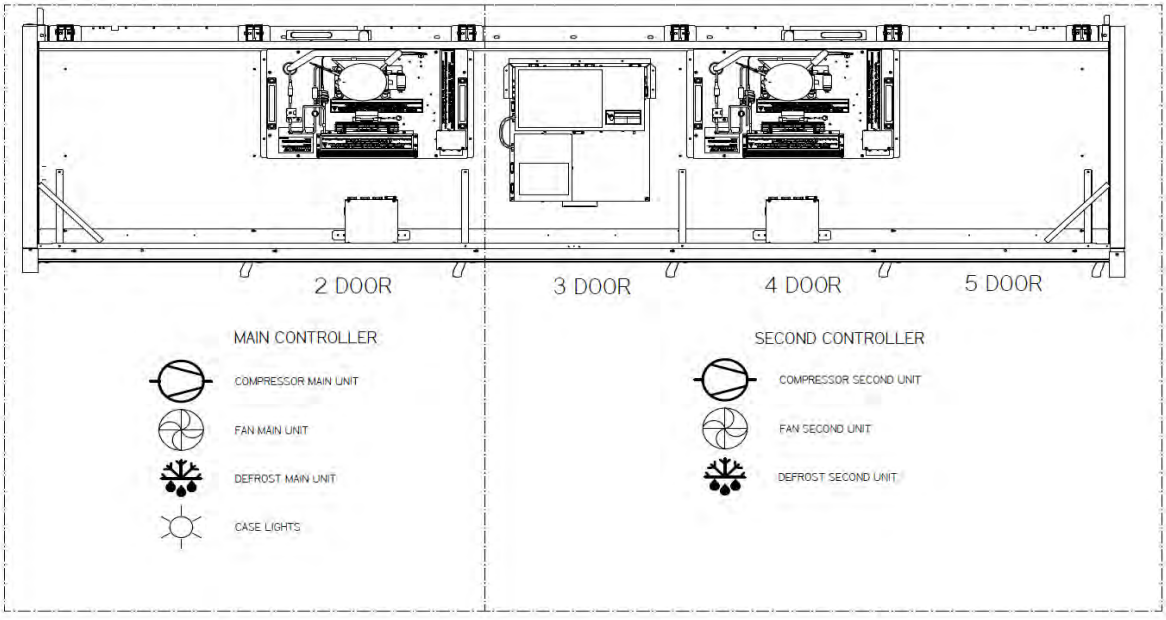
### Controller

All cases in the lineup must have the same date, time, and defrost schedule. Hussmann recommends setting each case lineup on a 1-hour delayed schedule between each lineup. RLN-A cases can have up to 3 controllers. These case models use the Carel iJF controller. Main controller (left side) handles case lights, case door, anti-sweat heaters, and respective Microblock unit (compressor, evaporator fan, defrost). Secondary controllers handle only respective Microblock unit (center or right side).




LOW TEMPERATURE CASES

RMNA can have up to 2 controllers. Main controller handles case lights and respective Microblock unit (compressor, evap fan, defrost). Secondary controllers handle only respective Microblock unit (center or right side).



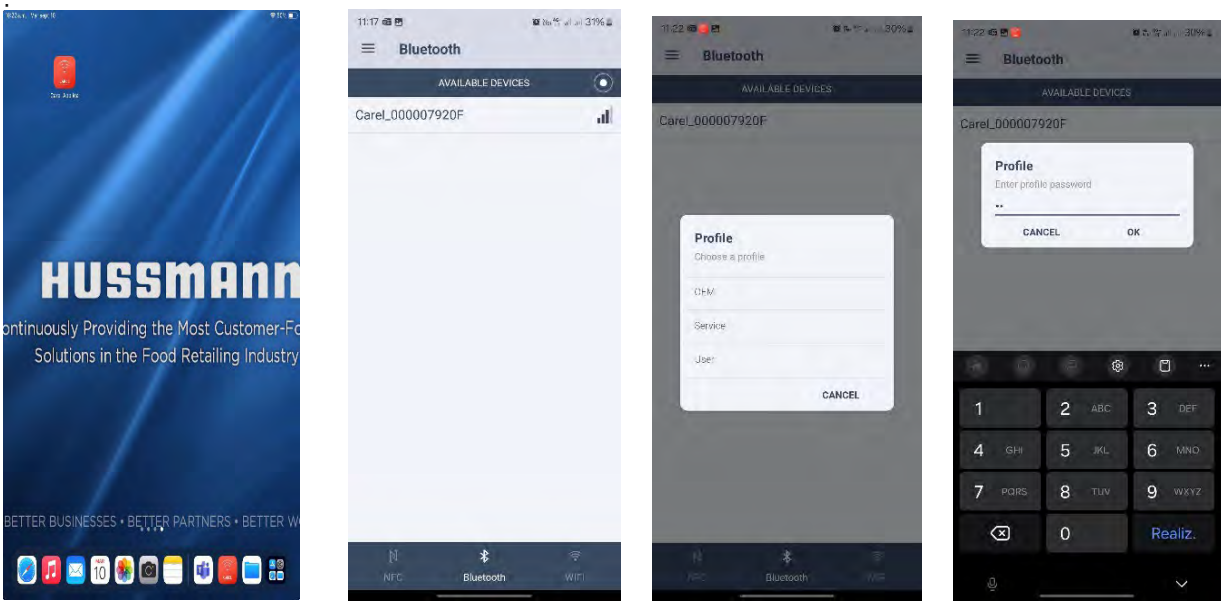

MEDIUM TEMPERATURE CASES

## Controls

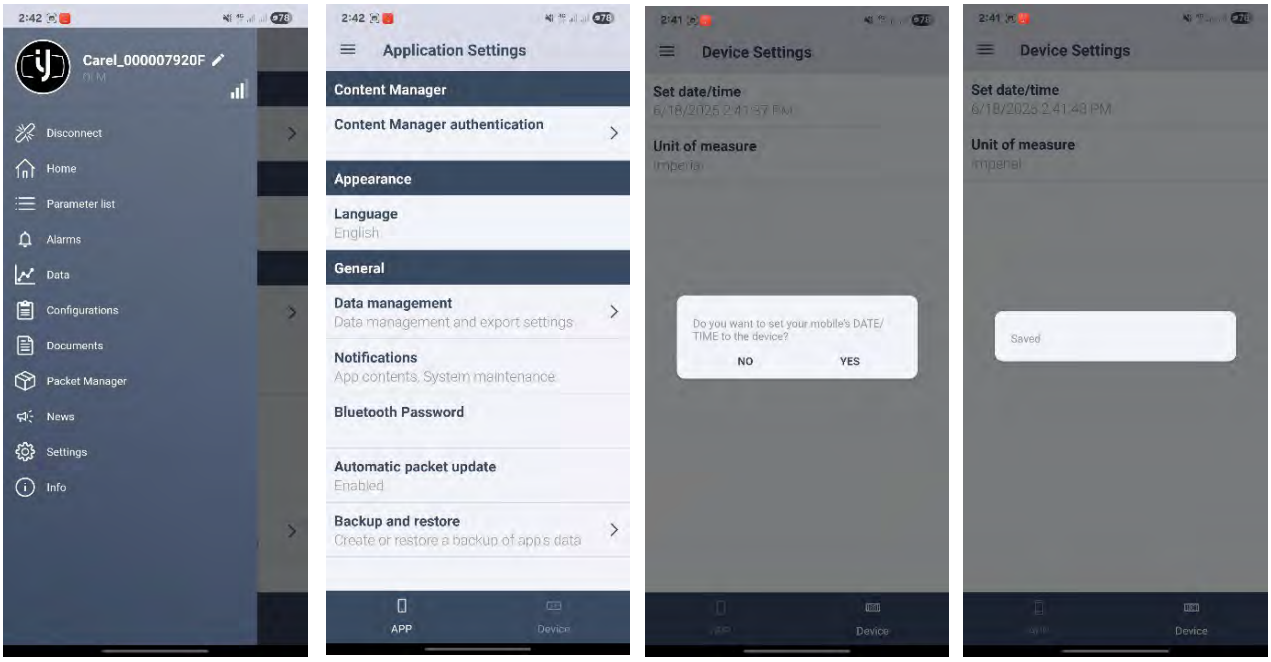
### Controller Startup

When all cases are connected and ready for startup, follow the next steps to assure operation for the controls.

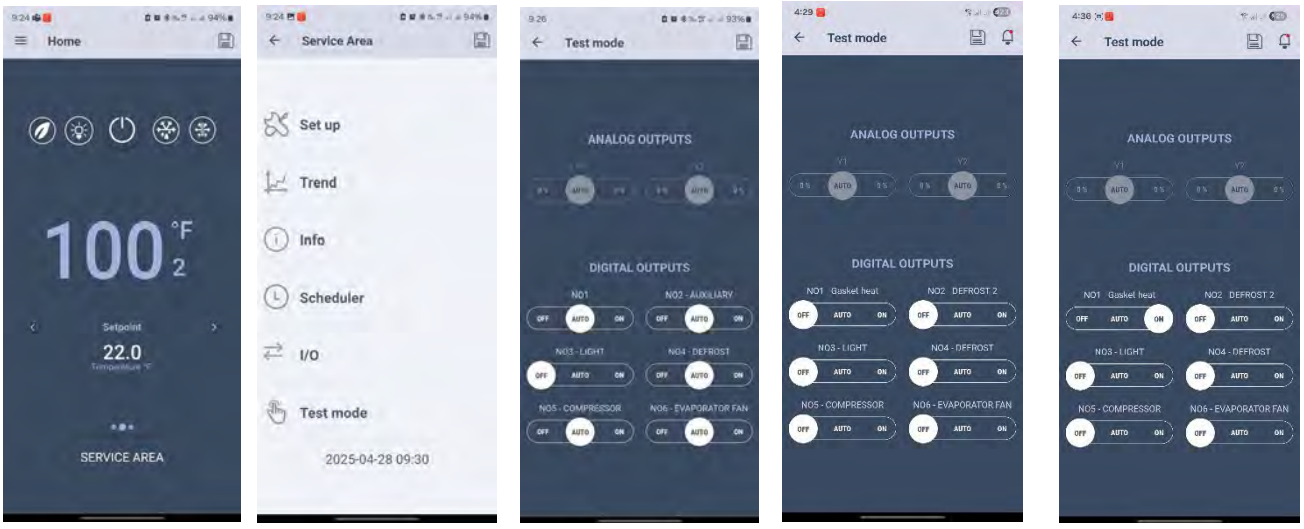
1. Connect power cord to its respective receptacle.
2. Turn ON case with main circuit breakers. While energized, controls will startup.
3. Connect to controller via Bluetooth using the Carel App "Applica". Using "OEM" user, access with Password: 11



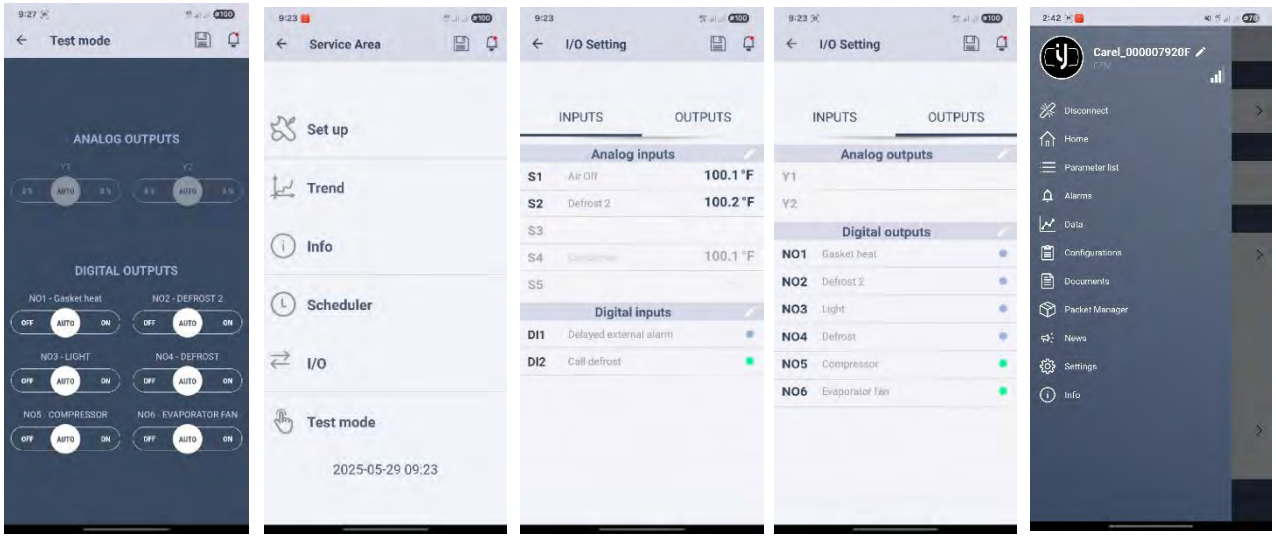

4. Go to the main menu and look for the setting sub-menu. Select device settings and select "Set date/time" and confirm operation. This will set up the controller with your device date/time. All cases in the lineup must have the same date, time, and defrost schedule. Hussmann recommends setting each case lineup on a 1-hour delayed schedule between each lineup.



5. Go back to "Home" display→ select "Service area"→Select test mode.
6. Put all selectors in "OFF" position.
7. Select each switch separately to "On" position and confirm the related relay activates the right component.




8. After relay activation testing, switch all selectors to "Auto" position, navigate back to service area menu → Access "I/O" menu→ Access "Inputs" menu and verify temperature sensor values. If case is operating in "Auto" mode, you will see temperatures S1 & S2 decreasing and S4 Increasing while in pulldown operation. DI1 represents the door switches input, It will color green while any door is open.



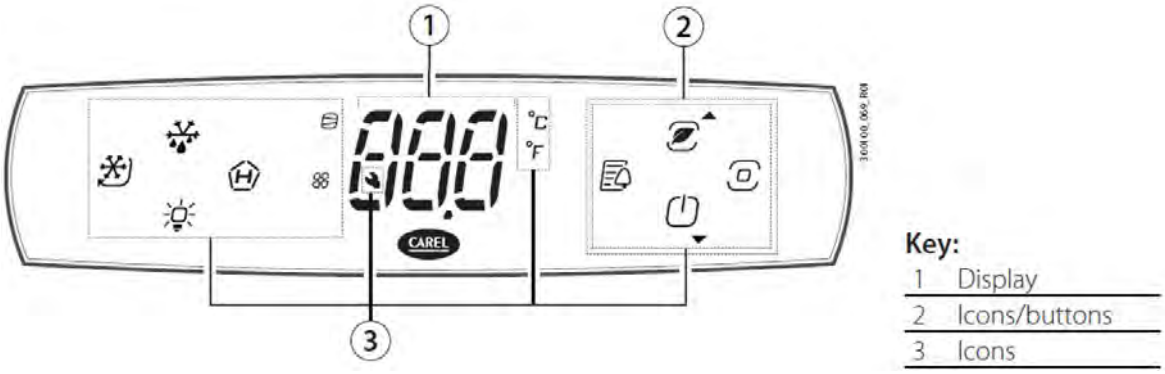

9. Access Outputs menu to review which relay outputs are working (green).
10. To disconnect from controller go back to main menu ("I/O" →"Service Area"→"main menu") and tap "Disconnect" option.

# RLN-A, RMN-A

## Controls

The wiring diagram and circuit requirements are provided on the Technical Data Sheets provided with the case. When this switch is off, some electrical terminals in the case wireway may be energized.

Controller Layout




Note: Do not change pre-configured settings unless advised to do so by your Hussmann representative.

Press SET and UP to return to the temperature display.

### Controller Operation

The controller controls refrigeration temperature. This is factory installed in the control panels. Defrosts are initiated by time and terminated by time for this system.

1. Plug the merchandiser plug into its receptacle.
   a. The controller display will illuminate.
   b. The interior light will illuminate.
2. After the control preprogrammed time delay of up to 6 minutes, the compressor and evaporator fan(s) will start if the control is calling for cooling.
3. The control will cycle the compressor on and off determined by the set-Location and differential temperatures.
   a. The set-Location is the adjustable preprogrammed temperature.
   b. The differential is the non-adjustable preprogrammed temperature.
   c. The Control is designed to read and display a cabinet temperature not a product temperature.
4. This cabinet temperature may reflect the refrigeration cycle of the Set-Location and its Differential. The most accurate temperature on a cabinet's operation is to verify the product temperature.
5. Confirm set-Location according to table below:

| Model | Software | Description | Set Location (°F) |
|---|---|---|---|
| RLN2A | 3198361 | SW-IJFPLA-R290-FF-RLNA-2DR | -11 |
| RLN3A | 3198360 | SW-IJFPLA-R290-FF-RLNA-3DR | -8 |
| RLN4A | 3198359 | SW-IJFPLA-R290-FF-RLNA-4DR | -11 |
| RLN5A | 3198358 | SW-IJFPLA-R290-FF-RLNA-5DR | -5 |
| RMN2A | 3198365 | SW-IJFPLA-R290-MT-RMNA-2DR | 32 |
| RMN3A | 3198364 | SW-IJFPLA-R290-MT-RMNA-3DR | 25 |
| RMN4A | 3198363 | SW-IJFPLA-R290-MT-RMNA-4DR | 27 |
| RMN5A | 3198362 | SW-IJFPLA-R290-MT-RMNA-5DR | 22 |

## Controls

### Display Symbols

The below symbols will appear on the screen under certain circumstances.
Use this table to determine the meaning of any symbol that is being displayed.

Keypad

| Icon/button | Description | On | | Flashing |
|---|---|---|---|---|
| SET | Set point/Up arrow | Increase value<br>Scroll menu | | - |
| | Program | Pressed briefly:<br>• enter menu branch<br>• save value and return to the parameter code | Pressed and held (3 s):<br>• from standby, unlock keypad and enter programming mode<br>• when scrolling, go to the previous parameter | - |
| | On-Off/Down arrow (DOWN) | • Unit ON<br>• Decrease value<br>• Scroll menu<br>• Switch unit on/off | | - |
| | Defrost | Active/stop | | Awaiting/start |
| | Continuous cycle | Active/stop | | Awaiting/start |
| | Lights | Active/stop | | Activation |
| | HACCP | • HACCP alarms present<br>• Direct access to HACCP menu | | - |
| | Alarm log | • Logged alarms present<br>• Direct access to the alarm log menu | | - |
| AUX | Auxiliary output | Active | | - |
| | Compressor | Active | | Awaiting |
| | Evaporator fan | Active | | - |
| | Clock | Scheduler active | | - |
| °C | °C | Unit of measure °C | | - |
| °F | °F | Unit of measure °F | | - |
| | Service Maintenance | Active alarms | | - |

### Display Signals

Signals are messages shown on the display to notify the user of the control procedures in progress (e.g. defrost) or to confirm keypad input.

| Display code | Description |
|---|---|
| Ble | Bluetooth™ connection in progress |
| dEF | Defrost running |
| Loc | Display locked |
| Off | Switch OFF |
| On | Switch ON |
| tSt | Test outputs via BMS serial port active |

### Alarm Codes

| Display code | Log code | Description | Icon display | Alarm relay | Reset | Effects on control |
|---|---|---|---|---|---|---|
| **E1** | 1 | Probe 1 faulty or disconnected | NO | NO | Auto | According to the associated function (See belove) |
| **E2** | 2 | Probe 2 faulty or disconnected | NO | NO | Auto | According to the associated function (see below) |
| **E3** | 3 | Probe 3 faulty or disconnected | NO | NO | Auto | |
| **E4** | 4 | Probe 4 faulty or disconnected | NO | NO | Auto | |
| **E5** | 5 | Probe 5 faulty or disconnected | NO | NO | Auto | |
| **E6** | 6 | Probe S1H faulty or disconnected | NO | NO | Auto | |
| **E7** | 7 | Probe S2H faulty or disconnected | NO | NO | Auto | |
| **Etc** | 9 | Clock error | NO | NO | Manual | Time bards disabled |
| **Ed1** | 10 | Defrost terminated after maximum time | NO | NO | Auto | |
| **Ed2** | 11 | Defrost on second evaporator terminated after maximum time | NO | NO | Auto | |
| **rE** | 12 | Control probe faulty or disconnected | YES | YES | Auto | Compressor operation in duty setting mode (par. 04); dead band OFF |
| **IA** | 13 | Immediate alarm from external contact | YES | YES | Auto | Compressor operation in duty setting mode (par. A6); dead band OFF |
| **dA** | 14 | Delayed alarm from external contact | YES | YES | Auto | Compressor operation in duty setting mode (pan AS; dead band, lights and auxiliary output OFF |
| **dor** | 15 | Door open | YES | YES | Auto | See “Door management” |
| **cht** | 17 | High condensing temperature warning | NO | NO | Auto | |
| **CHt** | 18 | High condensing temperature alarm | NO | NO | Manual | Compressor OFF |
| **GHI** | 19 | Generic alarm high threshold | YES | YES | Auto | |
| **GLO** | 20 | Generic alarm low threshold | YES | YES | Auto | |
| **HA** | 21 | Type HA H4CCP alarm (high temp during operation) | NO | NO | Manual | |
| **HF** | 22 | Type HF HACCP alarm (nth temp after blackout) | NO | NO | Manual | |
| **LO** | 23 | low temperature | YES | YES | Auto | |
| **HI** | 24 | High temperature | YES | YES | Auto | |
| **Pd** | 26 | Maximum pump down time | YES | YES | Auto | |
| **SF** | 27 | Configuration rot competed correctly | NO | NO | Manual | |
| **CE** | 28 | Configuration write error | NO | NO | Auto | |
| **Afr** | 29 | Frost protection | YES | YES | Auto | Compressor OFF |
| **Ats** | 30 | Restart in pump down | NO | NO | Auto | |
| **rSF** | 31 | Refrigerant leak alarm | YES | YES | Manual | Switch off all actuators |
| **LP** | 32 | Low Pressure | YES | YES | Semi-auto | Compressor OFF |
| **UCF** | 33 | VCC operation error | YES | YES | Auto | |
| **COM** | 34 | VCC communication error | YES | YES | Auto | |
| **SRC** | 35 | Maintenance request | YES | YES | Manual | |
| **EHI** | 36 | High power supply voltage alarm | YES | YES | Auto | |
| **ELO** | 37 | Low power supply voltage alarm | YES | YES | Auto | |
| **MAn** | 38 | Output status overridden in manual mode | YES | YES | Auto | |

## Startup

### Self-Contained Refrigeration Equipment Start-Up Checklist

**Please note that failure to follow this start-up document may void your factory warranty**

The below steps should be done in order and must be completed before the unit is put into operation.

- ☐ Locate, read and maintain install/operation manual in a safe place for future reference.
- ☐ Examine unit. Confirm there is no damage or concealed damage.
- ☐ Level the unit, side to side and front to rear.
- ☐ Remove all shipping blocks, braces, cardboard, tape and tie-wraps from the cases
- ☐ Unit must be run on a dedicated electrical circuit without the use of an extension cord.
- ☐ Ensure that the proper electrical requirements for the equipment are supplied.
- ☐ Verify field electrical connections are tight.
- ☐ Verify all electrical wiring is secured and clear of any sharp edges or hot lines.
- ☐ Verify the condensate drain line is properly trapped and pitched.
- ☐ Verify all required clearances on the sides and back of unit.
- ☐ Verify there are no air disturbances external to the unit. Heat and air registers, fans, and doors etc.
- ☐ Check that the doors are properly torqued and are self-closing correctly.
- ☐ Verify the evaporator fans are operating and rotating freely without interference.
- ☐ Review the operation of units using the Carel Controller IJF application.
- ☐ Check the reading on the display; it should be displaying the case temperature. The displayed temperature will show the merchandiser's discharge air temperature.
- ☐ Listen for any unusual sounds. Check compressor trip on overload, or high head due to excessive ambient temperature, circuit breaker trip, etc.

Advise owner/operator that merchandiser must operate at temperature for 24 hrs prior to loading with product.

Hussmann shall not be liable for any repair or replacements made without the written consent of Hussmann, or when the product is installed or operated in a manner contrary to the printed instructions covering installation and service which accompanied such product.

### Leak Detection

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. 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 and fluorescent method agents.

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. Removal of refrigerant shall be according to the Refrigerant Recovery section provided.

# RLN-A, RMN-A

## Startup

### Shelf Installation

After the cabinet is leveled, the shelves may be installed. RLN-A and RMN-A models may be equipped with four or 5 shelves.

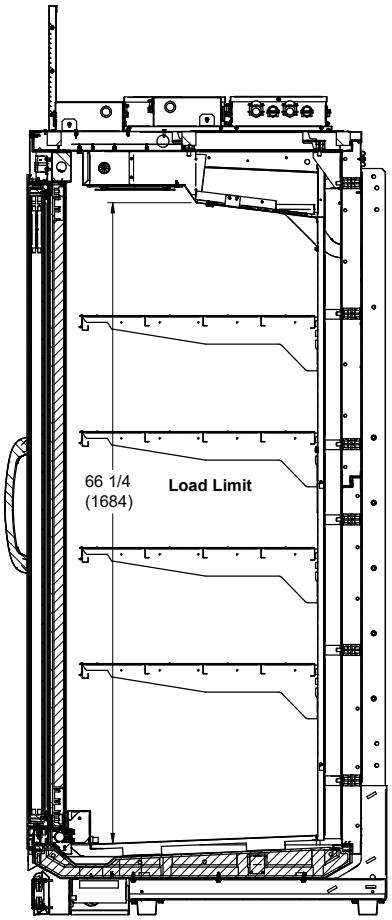
Install the shelf support brackets first to the desired height before installing each shelf. Place the rear of the bracket in the desired slot. Raise the front of the brackets towards the rear of the cabinet. Once the ends are in the slot, rotate the bracket forward, locking it in place. Place the shelf on the bracket. The shelves are not to be slanted and must remain in the horizontal position unless otherwise noted by your Hussmann representative.

### Load Limits

The standard shelves are rated for 200 lb (90.7 kg) each load capacity. Exceeding this load can cause damage to the shelves, case, damage to store products, and potentially create a hazardous condition for customers and store personnel. Product must be within designated load limit to ensure proper refrigeration and air curtain performance. Product shelves should be loaded so that the product does not extend over the front edge of the shelf. Product loaded over the edge will interfere with air circulation in the cabinet. It is also desirable to leave a small space between the rear interior wall and the product on the shelves, to allow air to enter the cabinet interior through the perforations in the rear wall. Various shelf depths are offered with Reach In cases.

### Shelf Load Limits

| Shelf Depth | Max. Load Limit (at 0° tilt) |
|---|---|
| 20 in. (508 mm) | 200 lb (90.7 kg) |
| 22 in. (559 mm) | 200 lb (90.7 kg) |
| 24 in. (610 mm) | 200 lb (90.7 kg) |



## Startup

### Product Stocking

Product should always be maintained at proper temperature. This means the temperature of the product must be controlled that from the time the product is received through storage, preparation, and display to maximize the life of the product.

Product should not be placed inside the merchandisers until merchandisers are at proper operating temperature. Allow merchandiser 24 hours to operate before loading product.

Proper rotation of product during stocking is necessary to prevent product loss. Always bring the oldest product to the front and set the newest to the back.

All air discharge and return flues must remain open and free of obstruction at all times to provide proper refrigeration and air curtain performance. Do not allow product, packages, signs, etc., to block these grilles. Do not use non-approved shelving, baskets, display racks, or any accessory that could disrupt air curtain performance.

**⚠CAUTION**

Excessive ambient conditions such as relative humidity and temperature may cause condensation and therefore sweating of doors. Facility operators should monitor doors and floor conditions to ensure safety of persons.



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## DANGER

- DANGER—Risk of fire or explosion. Flammable refrigerant used. To be repaired only by trained service personnel. Do not puncture refrigerant tubing.
- DANGER—Risk of fire or explosion due to flammable refrigerant used. Follow handling instructions carefully in compliance with national regulations.
- DANGER—Risk of fire or explosion. A3 flammable refrigerant is used in this unit.
- DANGER—Risk of fire or explosion due to flammable refrigerant used. Follow handling instructions carefully in compliance with national regulations.
- Failure to follow instructions can result in an explosion, death, injury and property damage.

## WARNING

**READ ALL WARNINGS BEFORE SERVICING OR PERFORMING MAINTENANCE ON THIS EQUIPMENT.**

If the information in these instructions are not followed exactly, a fire or explosion may result, causing property damage, personal injury or death.

- Installation and service must be performed by a qualified installer or service agency only as recommended by the manufacturer.
- The refrigerant loop is sealed. Only a qualified and authorized technician should attempt to service.
- Propane is flammable and heavier than air. It collects first in the low areas but can be circulated by fans.
- The propane gas used in the unit has no odor. The lack of smell does not indicate a lack of escaped gas. If R-290 is present or even suspected, do not allow untrained personnel to attempt to find the cause.
- If a leak is detected, immediately evacuate all persons from the store, and contact the local fire department to advise them that a propane leak has occurred. Do not let any persons back into the store until the qualified service technician has arrived and that technician advises that it is safe to return to the store.
- A hand-held propane leak detector ("sniffer") will be used before any repair and/or maintenance.
- No open flames, cigarettes, or other possible sources of ignition should be used inside the building where the units are located until the qualified service technician and/or local fire department determines that all propane has been cleared from the area and from the refrigeration systems.
- WARNING – Risk of fire or explosion. Dispose of properly in accordance with federal or local regulations. Flammable refrigerant used.

**FAILURE TO ABIDE BY THIS WARNING COULD RESULT IN AN EXPLOSION, DEATH, INJURY, AND PROPERTY DAMAGE.**

## Maintenance and Service

### Before Working with Refrigerant

#### Safety Checks

- Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimised.
- 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.
- 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.
- 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., non-sparking, adequately sealed, or intrinsically safe.
- 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 CO2 fire extinguisher should be adjacent to the charging area.
- 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.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
- The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:
  a. The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
  b. The ventilation machinery and outlets are operating adequately and are not obstructed;
  c. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
  d. Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
  e. 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.

## Maintenance and Service

### Checks and Repairs to Electrical Devices

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.

Initial safety checks shall include:

a. That capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
b. That no live electrical components and wiring are exposed while charging, recovering or purging the system;
c. That there is continuity of earth bonding.

**⚠WARNING**

- LOCK OUT / TAG OUT — To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.
- To reduce the risk of fire, electrical shock or injury when cleaning this merchandiser:
  -Unplug the merchandiser before cleaning.
  -Keep all liquids away from electrical and electronic components.
- To avoid serious injury or death from electrical shock, always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to, such items as doors, lights, fans, heaters, and thermostats.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agents or similarly qualified persons in order to avoid hazard.
- Do not remove the power supply cord ground. Merchandiser must be grounded. All wiring must be in compliance with NEC and local codes.
- 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 is mounted securely.
  -Ensure that seals or sealing materials have not degraded to the Location that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.
- Component parts are designed for propane and are non-incendive and non-sparking. Component parts shall be replaced with like components, and servicing shall be done by factory authorized service personnel only, so as to minimize the risk of possible ignition due to incorrect parts or improper service.
- 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.
- 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 the manufacturer. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.

## Maintenance and Service

### Care and Cleaning

Long life and satisfactory performance of any equipment is dependent upon the care it receives. To ensure long life, proper sanitation and minimum maintenance costs, this unit should be thoroughly cleaned, all debris removed and the interiors washed down. Cleaning often will control or eliminate odor buildup. Frequency of cleaning is dependent on usage and local health requirements.

### Cleaning Glass Doors

Wipe inside of glass with isopropyl alcohol and a soft cloth. Allow surface to dry before closing door. Use of other cleaners or abrasives may damage the Always*Clear surface, and/or void the warranty.

### Interior Surfaces

The interior surfaces may be cleaned with most sanitizing solutions and domestic detergents with no harm to the surface. Self-contained models empty into a limited capacity evaporation pan, which will overflow if excess water is used in cleaning. There is a drain plug located underneath the case in the center behind the fan splashguard. The plug can be removed for washing out the case bottom if necessary.

### Exterior Surfaces

The exterior surfaces must be cleaned with warm water to protect and maintain their attractive finish.

Do Not Use:

- Abrasive cleansers and scouring pads, as these will mar the finish.
- Coarse paper towels on coated glass.
- Ammonia-based cleaners on acrylic parts.
- Solvent, oil or acidic based cleaners on any interior surfaces.
- High-pressure water hoses
- Do not flood the merchandiser with water

Do:

- Disconnect electrical power before cleaning.
- Remove the product and all loose debris to avoid clogging the waste outlet.
- Store product in a refrigerated area such as a freezer. Remove only as much product as can be taken to the freezer in a timely manner.
- First turn off refrigeration, then disconnect electrical power.
- Thoroughly clean all surfaces with soap and warm water. Do not use steam or high water pressure hoses to wash the interior. These will destroy the merchandisers' sealing causing leaks and poor performance.
- Take care to minimize direct contact between fan motors and cleaning or rinse water.
- Rinse with warm water, but do not flood. Never introduce water faster than the waste outlet can remove it.
- Allow merchandisers to dry before resuming operation.
- After cleaning is completed, turn on power and refrigerant to the merchandiser.
- Verify that merchandiser is working properly.

**⚠WARNING**

- All case cleaning and maintenance procedures should be performed with the power disconnected at the breaker.
- Do NOT allow cleaning agent or cloth to contact food product.
- Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.
- Do not use hot water on cold glass surfaces. This can cause the glass to shatter and could result in personal injury. Allow glass fronts, ends and service doors to warm before applying hot water.

## Maintenance and Service

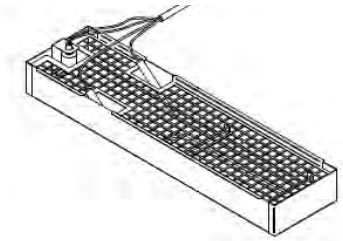
### Cleaning Condenser Coils

Condenser coils should be cleaned at least once per month. Additional cleaning may be needed depending on the operational environment. A dirty condenser blocks normal airflow through the coils. Never use sharp objects around coils. Use a soft brush or vacuum brush to clean debris from coils. Do not puncture coils! Do not bend fins. Contact an authorized service technician if a coil is punctured, cracked, or otherwise damaged.

Ice in or on the coil indicates the refrigeration and defrost cycle is not operating properly. Contact an authorized service technician to determine the cause of icing, and to make adjustments as necessary. To maintain product integrity, move all product to a cooler until the unit has returned to normal operating temperatures.

Airflow blockage increases energy consumption and reduces the merchandiser's ability to maintain operating temperature. To clean the coils, use a vacuum cleaner with a wand attachment and a soft (non-metallic) brush to remove dirt and debris. Do not bend coil fins. Always wear gloves and protective eye wear when cleaning near sharp coil fins and dust particles.

### Cleaning Evaporation Pan



The condensate water outlet for self contained models empties into a limited capacity evaporation pan. These pans are designed only for water. Debris or dirt accumulation inside the condensate evaporation pan will reduce the pan's evaporation capacity and cause premature heater failure. Condensate pans need to be checked for dust and dirt buildup and cleaned periodically. The evaporation pan waste water will overflow and spill onto the floor if the heater is not properly operating. Remove accumulated debris from the evaporation pan. Wipe down heater coil with a cloth and warm water. Be sure to remove any dirt, debris or liquids from the heater coil. Water introduced during cleaning will cause the evaporation pan to overflow.

### Cleaning Under Merchandisers

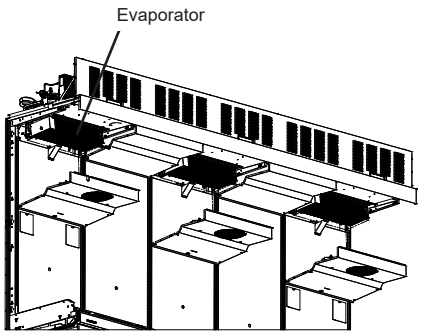
Remove splashguards not sealed to floor. Use a vacuum with a long wand attachment to remove accumulated dust and debris from under the merchandiser.

### Removing Scratches from Bumper

Most scratches and dings can be removed using the following procedure.

1. Use steel wool to smooth out the surface area of the bumper.
2. Clean area.
3. Apply vinyl or car wax and polish surface for a smooth glossy finish.

### Cleaning Evaporators




Evaporators should be cleaned periodically to remove dirt and debris.

1. Remove product, and shelves from underneath the evaporator.
2. Disconnect electrical power to the case. Remove product and shelves. Place product in cooler or freezer.
3. Remove the top panels.
4. If there is ice accumulation on the evaporator(s), allow it to melt naturally, and call for service.
5. Use a soft brush or vacuum with a brush attachment to remove dust and debris.
6. For sticky grime, lightly dampen cloth and wipe with warm water and mild detergent.
7. Ensure everything is completely dry.
8. Return power to the case and monitor it for proper cooling.

## Maintenance and Service

### Self-Contained Refrigeration Equipment Maintenance Checklist (Quarterly)

**Warranty does not cover issues caused by improper installation or lack of basic preventative maintenance.**

For visual inspection items, mark "okay" or "complete" in the correct cell when the Preventative Maintenance has been performed. Where data is requested, fill in the corresponding cell with the requested data.

**The below procedures are intended to be done quarterly. Post this on or near the unit or retain somewhere else on location if not possible. This sheet should be replaced yearly, but previous copies should be retained on location for future reference as needed.**

| | | | | | |
|---|---|---|---|---|---|
| **Record Starting Date** | | **Unit Model Number** | | | |
| **Store Name and Number** | | **Unit Serial Number** | | | |
| **Store Address** | | **Contractor/Technician** | | | |
| **Quarter** | | **Q1** | **Q2** | **Q3** | **Q4** |
| **Technician** | | | | | |
| **Preventative Maintenance Date** | | | | | |
| Check in with store manager, and record any complaints or issues they have with the unit. | | | | | |
| Look unit over for any damage, vibrations, or abnormal noise. | | | | | |
| Verify unit is level side to side and front to rear. | | | | | |
| Verify fan motor(s) and motor mounts are tightly attached. | | | | | |
| Confirm fan blade(s) do not have excessive play and are not rubbing or hitting housing. | | | | | |
| Make sure all electrical connections —factory and field—are tight. | | | | | |
| Verify electrical connections at lamps are secure and dry. | | | | | |
| Check all electrical wiring and make sure it is secured and not contacting sharp edges or hot lines. | | | | | |
| Check for and replace any frayed or chaffed wiring. | | | | | |
| Check for external air disturbances such as heat and air registers, fans, doors, etc. | | | | | |
| Check for water leaks. | | | | | |
| Verify condenser and evaporator fans are working. | | | | | |
| Record condenser air inlet temperature. | | | | | |
| Record condenser air outlet temperature. | | | | | |
| Is condenser air inlet or air exhaust restricted or recirculating? | | | | | |
| Use a handheld propane leak detector ("sniffer") to check for refrigerant leaks. | | | | | |
| Record case product temperature. | | | | | |
| Record unit discharge air temperature. | | | | | |
| Record unit return air temperature. | | | | | |
| Record ambient conditions around unit (wet and dry bulb temperature). | | | | | |
| Check product loading to ensure nothing is being loaded beyond the unit load limits. | | | | | |
| Verify clearances on sides and back of unit. | | | | | |
| Confirm door switches function. | | | | | |
| Verify unit doors and gaskets work and are sealed correctly. | | | | | |
| Verify that all the panels, shields, and covers are in place. | | | | | |

| **Technician Notes:** |
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Note: Make certain to also review the annual checklist on the corresponding page.

### Self-Contained Refrigeration Equipment Maintenance Checklist (Annual)

**Warranty does not cover issues caused by improper installation or lack of basic preventative maintenance.**

For visual inspection items, mark "okay" or "complete" in the correct cell when the Preventative Maintenance has been performed. Where data is requested, fill in the corresponding cell with the requested data. **The below procedures are intended to be done annually. Post this on or near the unit or retain somewhere else on location if not possible. This sheet should be replaced yearly, but previous copies should be retained on location for future reference as needed.**

| | | | |
|---|---|---|---|
| **Record Starting Date** | | **Unit Model Number** | |
| **Store Name and Number** | | **Unit Serial Number** | |
| **Store Address** | | **Contractor/Technician** | |
| **Technician** | | | |
| **Preventative Maintenance Date** | | | |
| Clean evaporator coil(s) and fan blade(s). Do not use an acid base cleaner. Rinse off any cleaner residue when complete. | | | |
| Clean discharge air fans or grilles. Do not use an acid base cleaner. Rinse off any cleaner residue when complete. | | | |
| Clean condenser coil(s) and fan blade(s). Do not use an acid base cleaner. Rinse off any cleaner residue when complete. | | | |
| Verify condensate drain lines are clear and functioning. | | | |
| Record voltage reading at unit with unit powered off. | | | |
| Record voltage reading with unit running. | | | |
| Record compressor amp draw. | | | |
| Record defrost heater voltage and amp draw. | | | |
| Record anti-sweat heater voltage and amp draw. | | | |
| Check unit controller for proper operation. See the controller manual or unit installation and operation manual for details related to proper controller operation. | | | |

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| **Technician Notes:** |

Note: Make certain to also review the quarterly checklist on the corresponding page.

Replacement Parts

## Visual Description of R-290 Replacement Parts

Carel iJF Controller

Float Switch

Solid State Relay

Door Switch

**⚠WARNING**

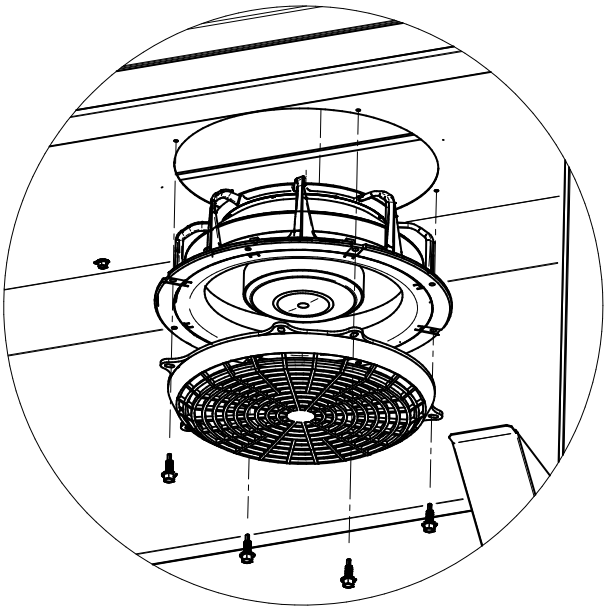
- Component parts are specifically chosen for propane exposure and therefore non-incendive and non-sparkling. Component parts shall be replaced with identical components, and servicing shall be done by factory authorized service personnel only, so as to minimize the risk of possible ignition due to incorrect parts or improper service.
- Replacement parts shall be in accordance with the manufacturer'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.
- 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 the manufacturer. Other parts can result in the ignition of refrigerant in the atmosphere from a leak.
- 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 is mounted securely.
- Ensure that seals or sealing materials have not degraded to the Location that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

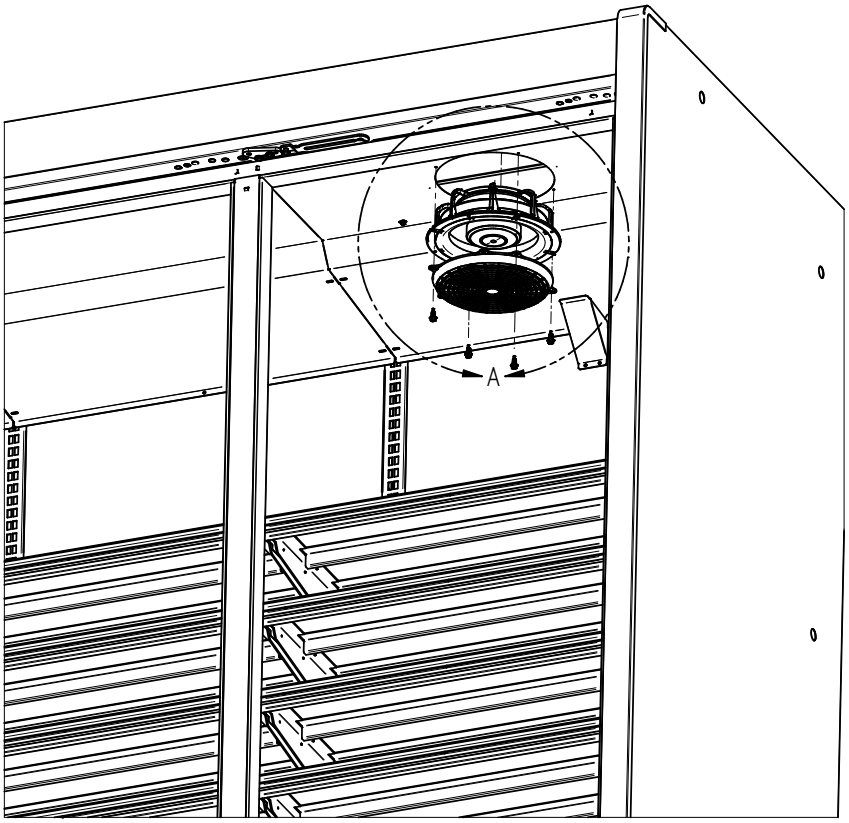
### Replacing Evaporator Fan

Should it ever be necessary to service or replace the evaporator fan, be certain that the fan blades are reinstalled correctly.

For access to these fans:

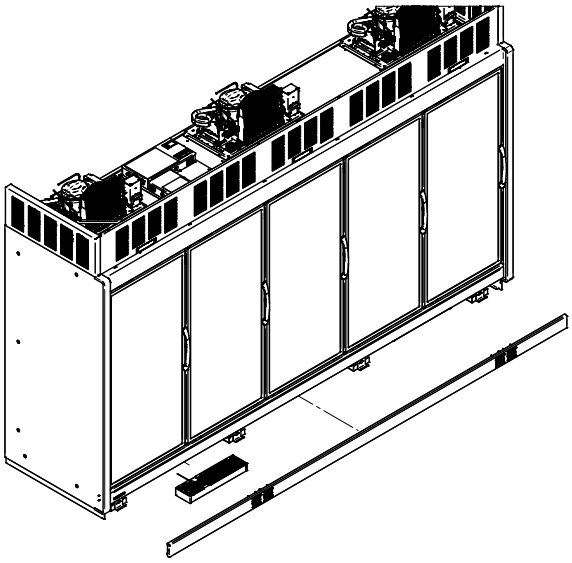
1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator.
3. Remove fan motor 5/16 in. hex head screws.
4. Remove the fan guard.
5. Disconnect fan harness.
6. Replace with new evaporator fan assembly. Connect new fan harness and fasten fan guard with 5/16 in hex head screws.
7. Return power to the case and check for proper operation of the evaporator fan.



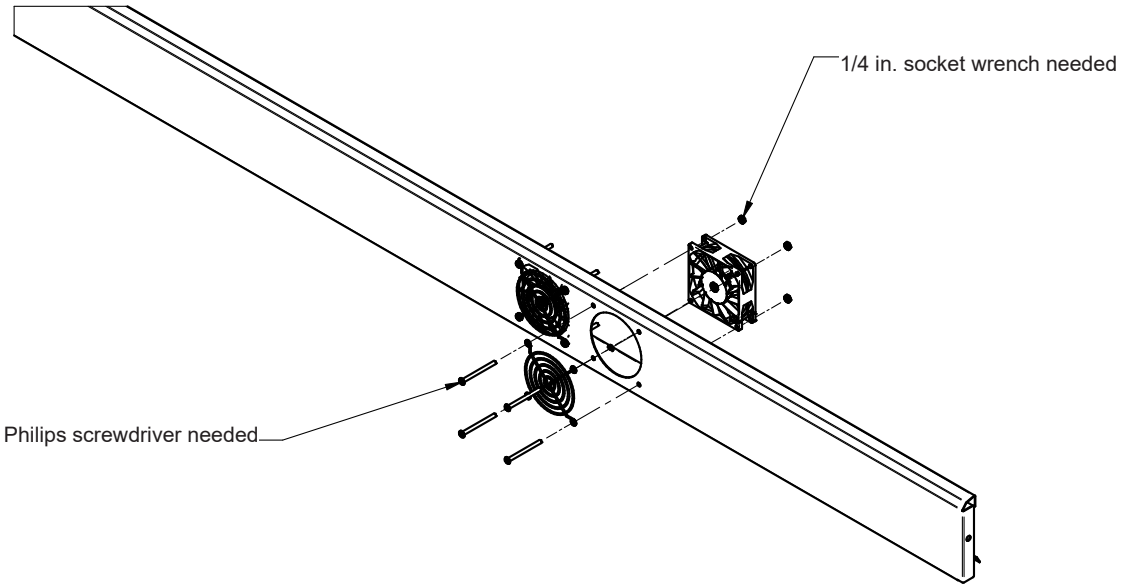


### Replacing Splashguard Fan

1. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator.
3. Unhook the splashguard fan from the bottom of the case by liftin up and out.
4. Detach the fan connection.
5. Remove the fan screws using a Philips screw-driver.
6. Replace with new fan. Reconnect power harness.
7. Replace Splashguard.



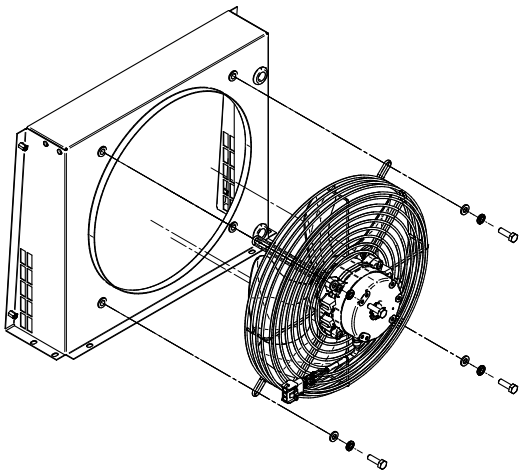
Unhook the splashguard from bottom of case.

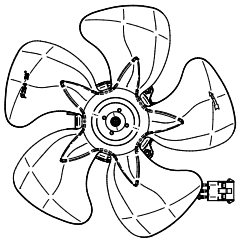


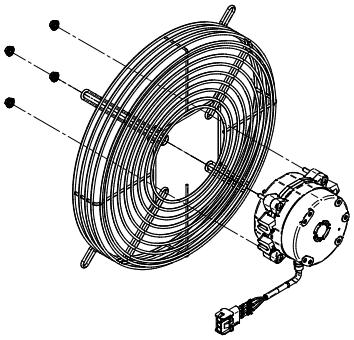
## Replacing Condensing Unit Motor and Blades

For access to these fans:

1. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator.
3. Remove the front facade (remove screws).
4. Locate condensing unit with the inoperable fan.
5. Remove screws (2 on each side - total of 4) to remove fan bracket from the unit.
6. Change the failed part.
7. If the only damaged part is the motor, remove blade.
8. Reverse the process and make sure everything is in place.
9. Turn power back on to the case, and verify operation.







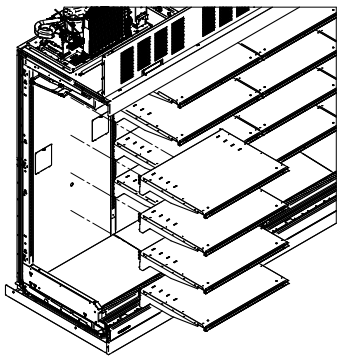
## Maintenance and Service

### Replacing Collector Heater

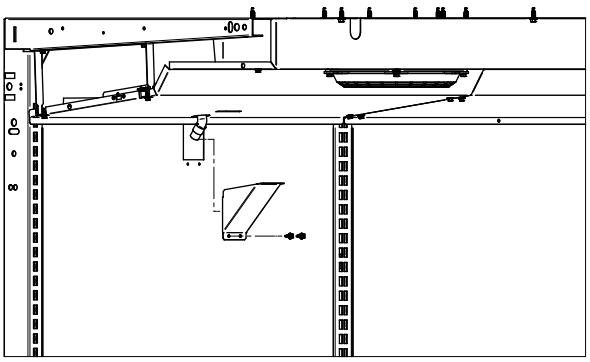
If it is determined that the heater collector is not working and needs to be replaced, follow these steps.

To access the collector heater:

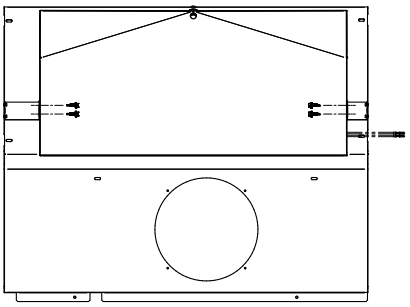
1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator
3. Remove shelves.
4. Remove the 1/4 in. screws of the drain cover
5. Remove drain cover.
6. Unscrew the top panel and detach the fan motor.
7. Remove the top panel.
8. Disconnect collector heater.
9. Replace with new heater.
10. Reassemble top panel and drain cover.
11. Turn on power and ensure the new collector heater is working correctly.
12. Replace shelves.



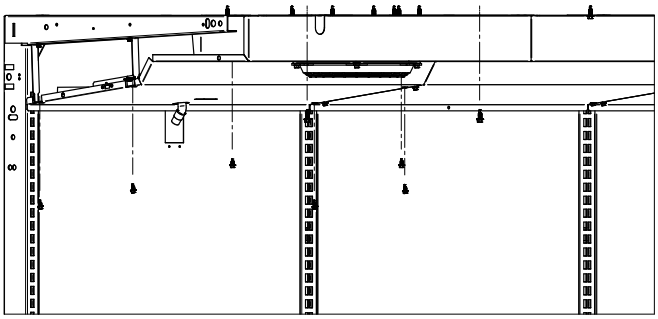
Remove Shelves



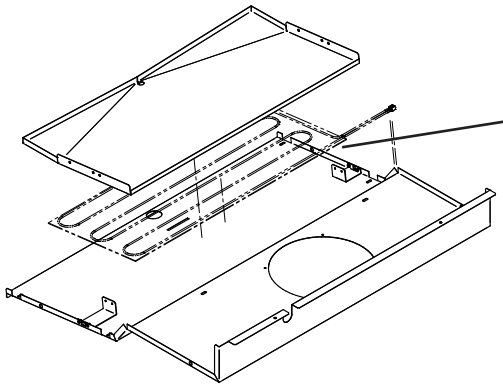
Remove Drain Cover



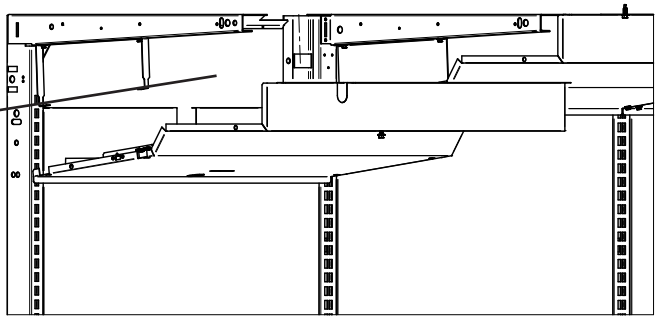
Remove 1/4 in. screws of the pan assembly.



Remove Top Panel Screws



Remove the old heater and clean surface.



Remove Top Panel

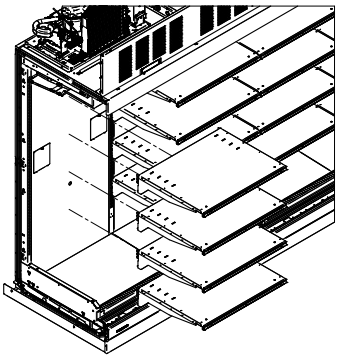
## Maintenance and Service

### Replacing Drain Tube Heater

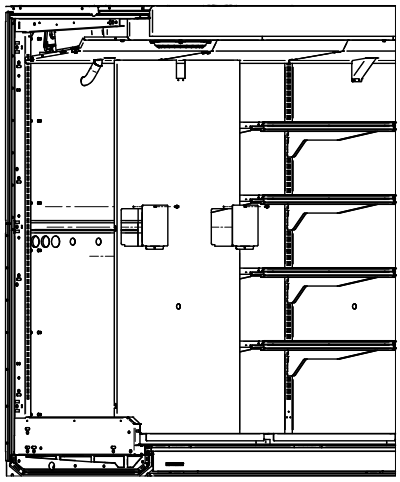
If it is determined that the drain tube heater is not working and needs to be replaced, follow these steps.

To access the drain tube heater:

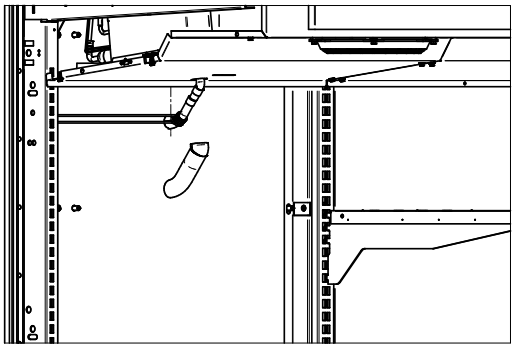
1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator.
3. Remove back panels and join covers.
4. Remove foam and disconnect the tube heater.
5. Unravel the heater and install the new one.
6. Reassemble foam, back panels, and join covers.
7. Turn on power and ensure the new tube heater is working correctly.
8. Replace shelves.



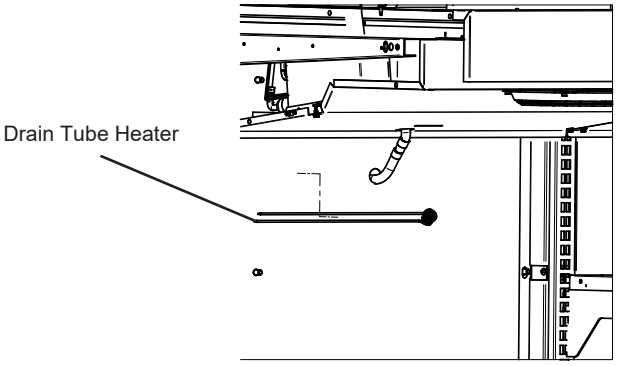
Remove Shelves



Remove Back Panels and Join Covers if necessary.



Remove Foam and disconnect Tube Heater.




Unravel the Heater and repeat the same action to install the new one.

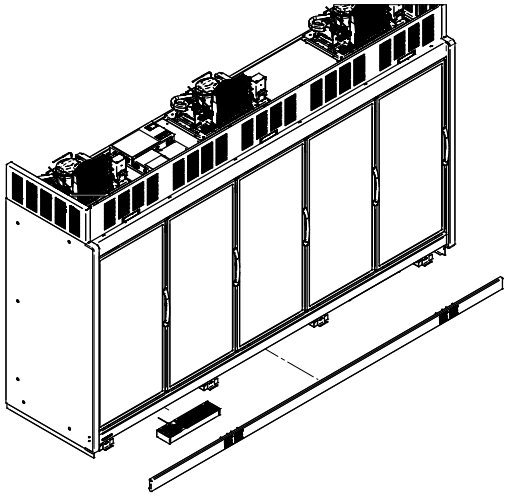
## Maintenance and Service

### Replacing Evaporation Pan Components

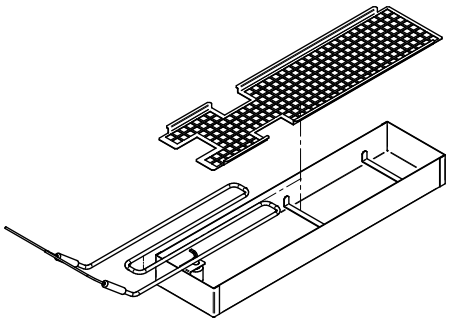
If it is determined that the evaporation pan is not working and needs a new heater, follow these steps.

To access the evaporation pan components:

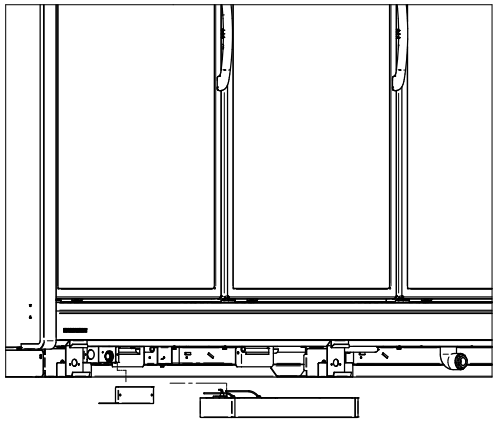
1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Make sure there is no voltage in the refrigerator.
3. Remove the fan splashguard.
4. Locate the electrical box and remove the cover. Disconnect harness.
5. Unscrew the pan assembly to separate the cover.
6. Take off float and remove it.
7. Remove the old heater and clean the surface inside the pan.
8. Replace with new heater and reassembly in reverse order.
9. Turn on power and verify evaporation pan operation.



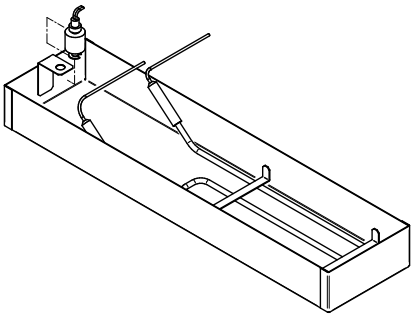
Remove splashguard fan.



Remove cover before changing heater.



Remove electrical box cover



Take off flow nut to remove float



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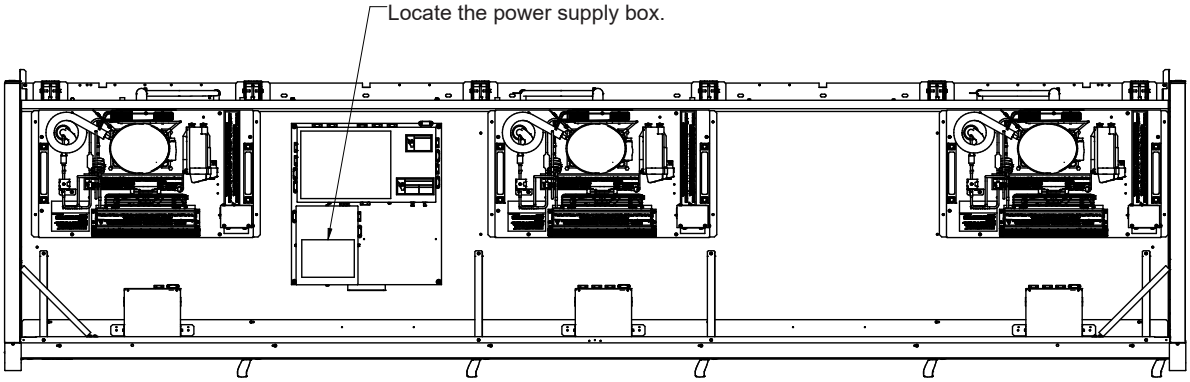
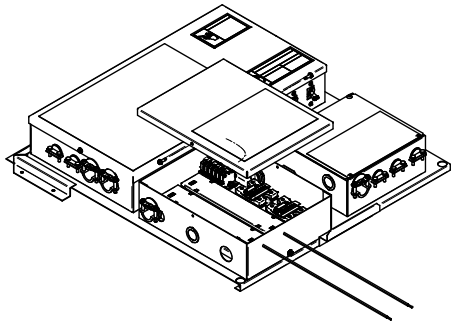
### Replacing Power Supplies, Relays and LED Lighting

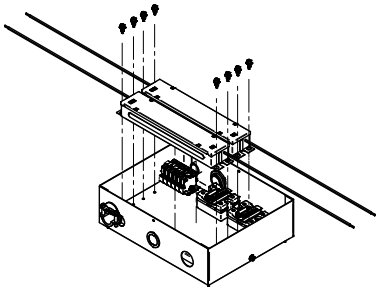
If it is determined that an LED light bar or if the LED power supplies are not working and needs to be replaced, follow these steps.

1. Remove product and place in a refrigerated area. Turn off power to the merchandiser.
2. Locate the LED Power Supply Box
3. Identify the power supply box mounted on top of the case, within the control module area.
4. Using a 1/4-inch screwdriver, remove the screws securing the cover of the power supply box.
5. Power supplies are also located at the top of the case below the joining covers. Use 5/16" hex wrench to remove the cover.
6. Carefully lift and set aside the cover to expose the internal components.
7. Disconnect and remove the existing LED power supplies from the box.

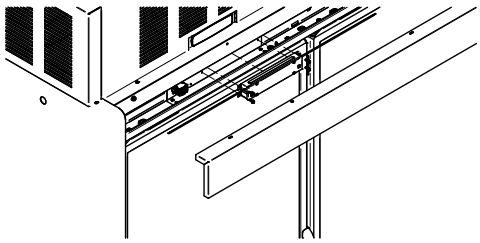


Remove electrical box cover using 1/4" hex wrench.

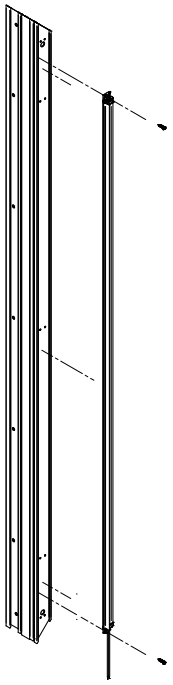


Remove power supplies using 5/16" hex wrench.

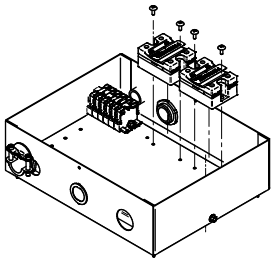


Remove cover from the canopy. Remove power supplies using 5/16" hex wrench.

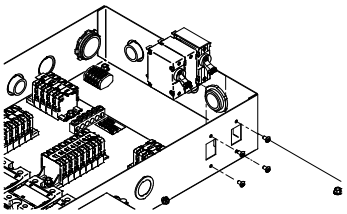
8. Remove any associated relays connected to the power supplies.
9. Locate the mullion LED assembly that requires replacement.
10. Confirm the specific LED bar needing replacement by visual inspection or diagnostic testing.
11. Remove the Mullion LED Assembly
12. Unscrew the two fasteners securing the LED light bar to the mullion.
13. Gently disconnect the wiring harness from the LED light bar.
14. Position the new LED light bar in place of the old one.
15. Connect the wiring using the new connectors provided with the replacement LED bar.
16. Use crimping pliers to securely crimp each connection, ensuring a solid electrical contact.
17. Route and conceal all wiring to prevent exposure and ensure a clean installation.
18. Use cable ties or clips as needed to secure wires out of sight and away from moving parts.
19. Verify Installation
20. Cross-check the completed circuit against the appropriate wiring diagram for accuracy.
21. Restore power and test the new LED light bar to confirm proper operation.



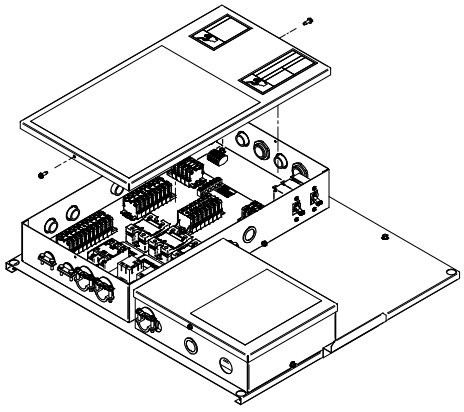
DISCONNECT LED BEFORE REMOVE IT
PHILLIPS SCREWDRIVER NEEDED



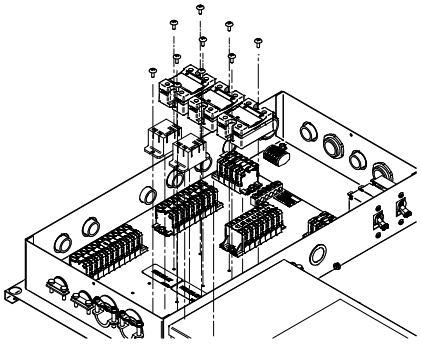
REMOVE RELAYS
PHILLIPS SCREWDRIVER NEEDED



REMOVE RELAYS
PHILLIPS SCREWDRIVER NEEDED



REMOVE RELAYS
PHILLIPS SCREWDRIVER NEEDED



REMOVE RELAYS
PHILLIPS SCREWDRIVER NEEDED

## Maintenance and Service

### Refrigerant Removal, Evacuation, and Recovery

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:

a. Safely remove refrigerant following local and national regulations;
b. Purge the circuit with inert gas;
c. Evacuate;
d. Purge with inert gas;
e. Open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. 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.

Refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

### Recovery Procedure

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 supplier. 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.

## Maintenance and Service

### Refrigerant Charging Procedure

Microblock unit are shipped with the correct charge amount to equal the total charge needed for proper operation. Labels are placed on top of the case that show the correct refrigerant type and total charge quantity.

When evacuating and re-charging, charge with the total quantity shown on this label. With the correct refrigerant charge, some vapor may be present in the sight-glass. Charging to a "clear" sight-glass may result in compressor failures due to excessive refrigerant.

A calibrated scale with +/-2 gram accuracy must be used to charge the system. The charge amount is shown on the serial plate. Only R-290 grade refrigerant can be used. Standard propane does not meet the purity/ moisture content of R-290, and therefore cannot be used to charge cases.

No gas charge adjustments are allowed. When connecting hoses between the refrigeration system, manifold gauges, and refrigerant cylinder, ensure that the connections are secure and there are no potential sources of ignition nearby. Ensure that contamination of different refrigerants does not occur when using charging equipment.

Use dedicated hoses to service R-290 (propane) refrigeration systems. Hoses or lines should be as short as possible to minimize the amount of refrigerant contained in them.

Ensure that the refrigeration system is properly grounded prior to charging the system with refrigerant, to avoid the potential for static build-up.

In addition to conventional charging procedures, the following requirements shall be followed:

a. 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.
b. Cylinders shall be kept in an appropriate position according to the instructions.
c. Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
d. Label the system when charging is complete (if not already).
e. 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.

Extreme care must be taken not to over fill the refrigeration system. After charging, carefully disconnect the hoses, attempting to minimize the quantity of refrigerant released. Further leak check the service ports, hoses, refrigerant tanks. The service ports shall be checked for leaks using a hydrocarbon leak detector with a sensitivity of 3 grams/year (0.106 oz/year) leak rate.

Thoroughly leak check the service ports. If no leak is present, use a pinch-off tool to close the ends of the service tubes before brazing them shut. If a Schrader valve is used on the compressor service tube, it must be removed and the previous steps followed in order to braze the service tube shut.

## Decommissioning

### Decommissioning Process

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its details. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample should 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.

a. Become familiar with the equipment and its operation.
b. Isolate the system electrically.
c. Before attempting the procedure, ensure:
   i. Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
   ii. All personal protective equipment is available and being used correctly.
   iii. The recovery process is supervised at all times by a qualified, competent person.
   iv. Recovery equipment and cylinders conform to the appropriate standards.
d. Pump down refrigerant system, if possible.
e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f. Make sure that cylinder is situated on the scales before recovery takes place.
g. Start the recovery machine and operate in accordance with instructions.
h. Do no overfill cylinders (no more than 80% volume liquid charge).
i. Do not exceed the maximum working pressure of the cylinder, even temporarily.
j. 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.
k. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

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 refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

## Warranty

To obtain warranty information or other support, contact your Hussmann representative or visit: https://www.hussmann.com/services/warranty.

Please include the model and serial number of the product.

For questions about your equipment, please contact our Technical Support Team at 1-866-785-8499

For general support or service calls, contact our Customer Support Call Center at 1-800-922-1919

**Over the counter (OTC) parts exchanges are not available for this product.**

For ordering aftermarket warranty parts, call 1-855-HussPrt (1-855-487-7778) or email the following address: Hussmann_part_warranty@hussmann.com

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Revision History

Revision B: Updated part exchange info, page 1, 6 and 67

Revision A: Original Issue

Scan the QR code on your mobile device to access additional product information or order parts.

Parts may also be ordered at:
**parts.hussmann.com**
Call toll free: 1.855.487.7778