

HUSSmann®



RFLNS, RFMNS & RFLTM Freedom Line

Low or Medium Temperature
Compressor Ready
Tall or Narrow Footprint
Reach-in
Merchandisers



Installation & Operation Manual

Shipped With Case Data Sheets

IMPORTANT

**Keep in store for
future reference!**

P/N 0539221_T

August 2021

Spanish P/N 0541249

MANUAL- I/O FREEDOM REACH-IN



BEFORE YOU BEGIN

Read these instructions completely and carefully.



PERSONAL PROTECTION EQUIPMENT (PPE)

Personal Protection Equipment (PPE) is required whenever servicing this equipment. Always wear safety glasses, gloves, protective boots or shoes, long pants, and a long-sleeve shirt when handling glass.



WARNING

Do not use mechanical devices or other means to accelerate the defrosting process.

Do not use electrical appliances inside the food storage compartments of the case(s).



WARNING

Case ventilation openings must be clear of any obstructions. Do not damage the refrigerant circuit.

FOR CALIFORNIA INSTALLATIONS ONLY:



WARNING:

Cancer and Reproductive Harm
www.P65Warnings.ca.gov

August 31, 2018

3069575

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.

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IMPORTANT
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Quality that sets industry standards!

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Freedom Line Reach-in

REVISION HISTORY

REVISION T - Revised Maintenance Section for Condensate Pump; Updated Checklist on Page, 4-4.

REVISION R - Added Warning Page; Updated Bulletin; Changed wall clearance; Updated pan and pump install; Coupling Tightening; Facade install; Added joining instructions, revised shipping block; Added controller wiring diagram; Added controller setpoints

REVISION P - August 2018
Updated Quick Connect Coupling, Page 2-4-2-6; Updated California Warning

REVISION N - September 2017
Revised for new Controller

REVISION M - February 2017
Updated Page 4-1

REVISION L - Update for Team Center

REVISION K - January 2017
Added new model - RFLTM throughout manual Updated Page 1-1 UL Listing; Federal Regulations and DOE 2017 Updated Page 2-4 to 2-6; Quick Connect Couplings; Page 2-13 updated low temp Settings; Note on Page 4-2; Updated Page 6-2

REVISION J - August 2015
Revised checklist GFCI, Page 4-3
Revised Connect lines and Refrigerant Lines, Page 2-5

REVISION H — WIND CHILL

REVISION G – March 2015
Removed references on page 3-3 and 5-3

REVISION F – February 2015
Clearance, Page 1-1

REVISION E – October 2014
Added California Warning Page 1-2;
Installing Air Flow Baffle Page 3-3.
Revised fork life pockets, Page 1-3
End photos and text, Page 1-6
Rear Bracket, Page 2-2 Detail A text, Page 2-4
text, Page 2-7 Photo removed Page 3-1, 3-2, changed page 3-4,
New Optional Drip Pipe Section 7

REVISION D – July 2014
Updated Cover Photo

REVISION C – July 2014

ANSI Z535.5 DEFINITIONS



• **DANGER** – Indicate[s] a hazardous situation which, if not avoided, will result in death or serious injury.



• **WARNING** – Indicate[s] a hazardous situation which, if not avoided, could result in death or serious injury.



• **CAUTION** – Indicate[s] a hazardous situation which, if not avoided, could result in minor or moderate injury.

• **NOTICE** – Not related to personal injury – Indicates[s] situations, which if not avoided, could result in damage to equipment.

INSTALLATION

UL LISTING

These merchandisers are manufactured to meet ANSI/ UL 471 standard requirements for safety. Proper installation is required to maintain the listing.

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 merchandiser carries a label identifying the environment for which the merchandiser was designed for use.

In compliance with DOE 2017, standard low temp Reach In cases with Innovator I Doors are equipped with an anti-sweat controller that maintains the door heat at a level that meets DOE energy limits. Any factory or field-installed anti-sweat controller applied to a low temp Reach In case with Innovator I Doors must be programmed to cycle the heaters at no more than 50% run time at design conditions of 75 degrees, 55% RH for frozen food operating condition.

ANSI/NSF-7 Type I – Display Refrigerator / Freezer
Intended for 75°F / 55%RH Ambient Application

ANSI/NSF-7 Type II – Display Refrigerator / Freezer
Intended for 80°F / 55%RH Ambient Application

ANSI/NSF-7 – Display Refrigerator
Intended for Bulk Produce

FREEDOM LINE DESCRIPTION

The Freedom Line RFLTM, RFLNS and RFMNS cases are designed to be ready for remote installation of a top-mounted air-cooled condensing unit, such as Hussmann's TCLSA through TCMSD series of condensing units. They are controlled by an electronic control. The case temperature is controlled by cycling the compressor based on the discharge air temperature input.

The sensor for this input is located above the discharge air honeycomb. A defrost termination sensor is located on the bottom, center evaporator coil return bends.

The controller is pre-programmed for low or medium temperature operation and may be adjusted to desired operating temperature by the control keypad.

Cases running on individual condensing units may be installed as stand-alone cases with ends, or as a part of a lineup.



LOCATION

These merchandisers are designed for displaying 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%. Placing refrigerated merchandisers in direct sunlight, near hot tables or near other heat sources could impair their 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 merchandisers. To prevent sweating on the exterior surfaces of merchandisers, there must be a **MINIMUM CLEARANCE OF 4 INCHES (102 MM)** between the merchandisers and other fixtures or walls. **A 5.5 inch (140 mm) space is required between facade top and the ceiling. A louvered Facade Panel kit is available that will allow for a top spacing minimum clearance of 3 inches (76 mm).**

Product should always be maintained at proper temperature. This means that from the time the product is received, through storage, preparation and display, the temperature of the product must be controlled to maximize the life of the product. Condensing units installed on top of the merchandiser require air circulation to operate properly. Blocking or restricting air flow will adversely affect performance and may damage the refrigeration system.

**CAUTION**

**Do not store items or flammable materials atop the unit.
Do not walk on case.**

When installed in a lineup, Hussmann recommends that partitions be installed between individual cases to prevent frost buildup and other issues that might result from different defrost schedules and operating temperatures. *These partitions may be acrylic or insulated, depending on case's operating temperature.*

If the ceiling and/or walls are built up around the merchandiser, allow for a sufficient gap above or behind the merchandiser to provide adequate air circulation. When merchandisers are installed in a lineup, case must be taken to ensure that warm condenser air is not blown from one unit into the condenser of the adjacent unit.

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. The carrier will supply necessary forms.

Concealed Loss Or Damage

When loss or damage is not apparent until after equipment is uncrated, a claim for concealed damage is made. Upon discovering damage, make request in writing to carrier for inspection within 15 days and retain all packing. The carrier will supply inspection report and required claim forms.

SHIPPING BRACES

Move the merchandiser as close as possible to its permanent location and then remove all packaging. Check for damage before discarding packaging. Remove all separately packed accessories such as kits and shelves.

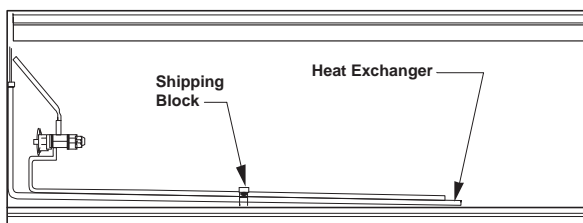


Front Shipping Brace

SHIPPING BLOCK(s)

Shipping block(s) must be removed before operating cases(s).

Locate and remove the shipping block(s) near the heat exchanger as shown below.



Interior View of Case Bottom

This block was installed to minimize shipping vibration. Remove the bottom display pans and air return grilles from the case(s).

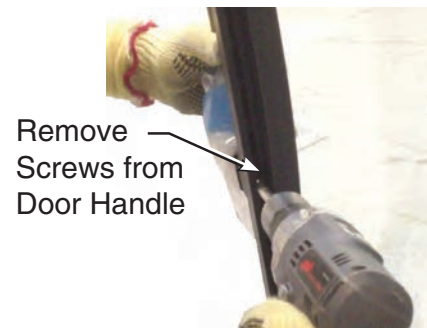
EXTERIOR LOADING

Do NOT walk on top of merchandisers or damage to the merchandisers and serious personal injury could occur. **THEY ARE NOT STRUCTURALLY DESIGNED TO SUPPORT EXCESSIVE EXTERNAL LOADING** such as the weight of a person. Do not store items or flammable materials atop the case.

MOVING MERCHANDISER THROUGH NARROW STORE ENTRANCES

Door handles may be disassembled for transit access through small doors or passage ways. The minimum door opening for RFLNS & RFMNS cases is 36 in. x 80 in. The minimum door opening for RFLTM cases is 44 in. x 87.5 in.

The door handles can be removed for narrow store entrances.



MERCHANDISERS SHIPPED WITH END INSTALLED (not for RFLTM)

If the case was shipped with the end installed, two long bolts were used to hold the shipping brace to the end. If the shipping bolts are reinserted after removing the brace, they will extend into the product area and may damage the coil.

THEREFORE, BE SURE TO REPLACE THESE BOLTS WITH THE SHORTER BOLTS PROVIDED.

Be careful not to damage the factory-installed end while moving the merchandiser. Make sure that tools are positioned past the end and beneath the merchandiser's support bar.

LEVELING

Merchandisers must be installed level to ensure proper operation of the refrigeration system and to ensure proper drainage of defrost water. 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 POINT OF THE STORE FLOOR.

Place 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.

See illustrations on next page.

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

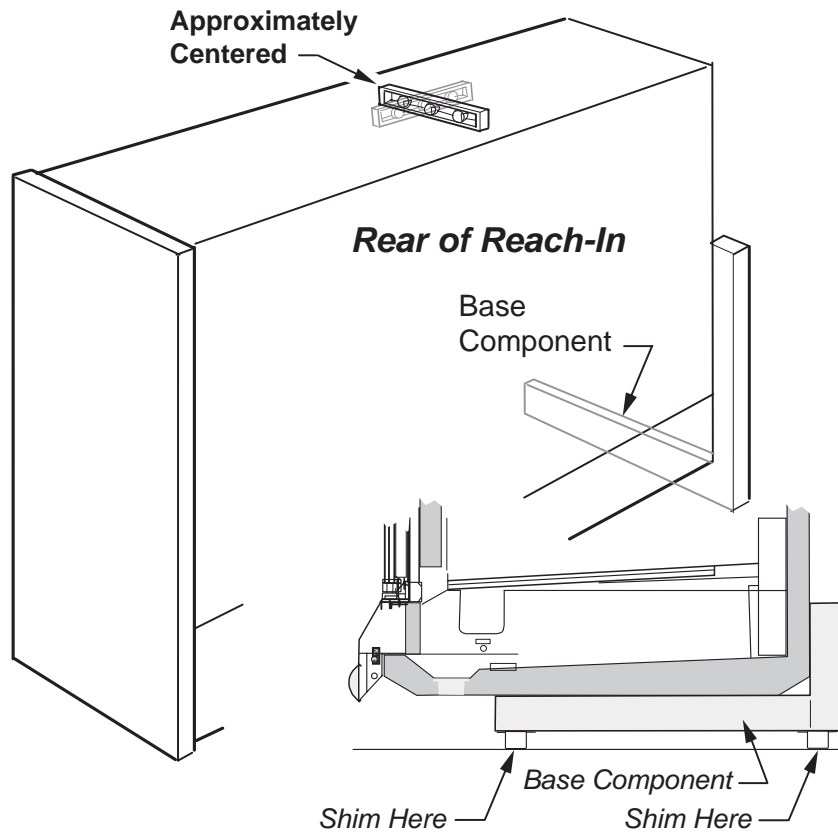


Case Leveling

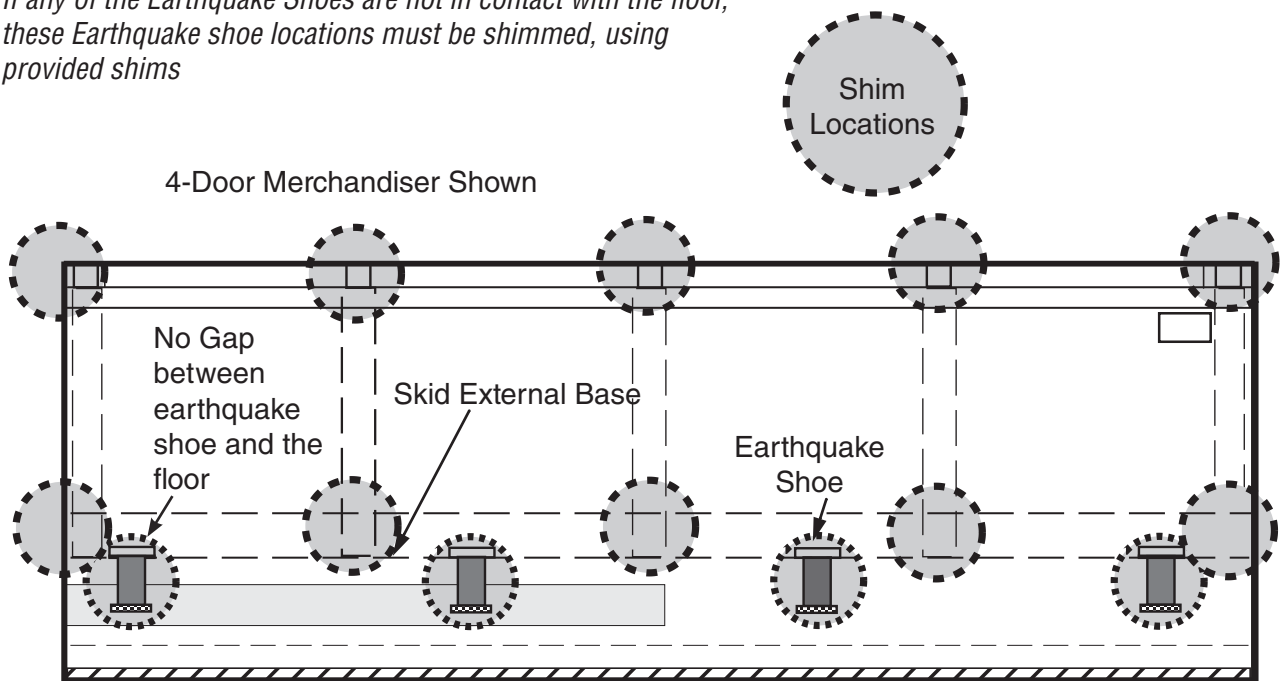
Placing shims at other locations will cause uneven distribution of weight leading to piping leaks, as well as sagging or wracked doors.



Shim Case



If any of the Earthquake Shoes are not in contact with the floor, these Earthquake shoe locations must be shimmed, using provided shims



Correct Shim Location is Critical

DOOR ADJUSTMENT

After leveling and joining the merchandisers, adjust and level doors according to manufacturer's instructions shipped with each product. Factory settings may be lost due to vibration during shipment.

JOINING

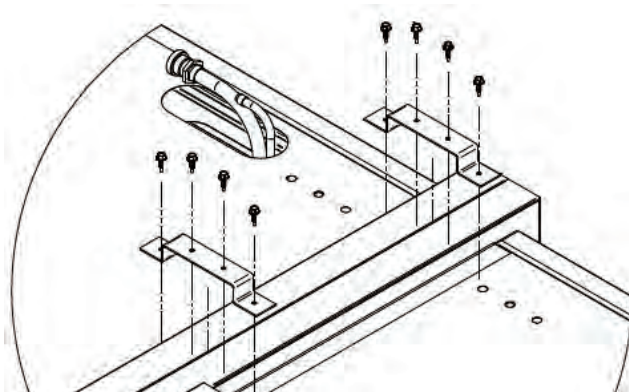
Sectional construction means that two or more merchandisers may be joined in line yielding one long continuous display requiring only one pair of ends. **Joining kits and instructions are shipped with each merchandiser.**

To join merchandisers with independent ends, a joining kit is required.

The painted caps for the end assembly bolt holes may be kept with this manual. Insert two insulating plugs into each bolt hole of the ends to be joined. After leveling and aligning the top edge of the ends, install the two case-to-case brackets on to the top with sheet metal screws as shown below.

To join unlike fixtures, or like fixtures operating at different temperatures, a 2 inch (51 mm) partition kit is required. To join same temperature merchandisers on different defrost cycles, a plexiglass partition kit is required. Install 'J' trim between cases.

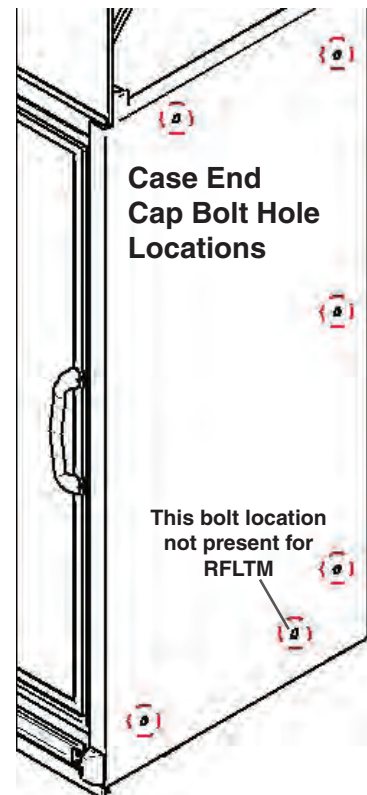
ALL JOINTS MUST BE AIR-TIGHT TO PREVENT FORMATION OF ICE OR CONDENSATION.



Use J-Bar to Align Cases for Joining



Remove Top Panel



REFRIGERATION / ELECTRICAL / CONTROLLER**REFRIGERANT**

Freedom cases and condensing unit are shipped separately with the correct charge amount to equal the total charge needed for proper operation. Labels are placed on top of the case near the condensing unit connections 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 sightglass. Charging to a “clear” sightglass may result in compressor failures due to excessive refrigerant.

**CAUTION**

When brazing pipes be sure to use the insulation blanket shipped with the merchandiser to prevent damage to the plastic case bottom.

**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.

**WARNING**

Refrigeration lines are under pressure. Depressurize and recover refrigerant before attempting any connection or repair.

Refrigerant vapor is hazardous to your health and can cause death. Avoid breathing refrigerant and lubrication vapor or mist. Exposure may irritate eyes, nose and throat. If accidental system discharge occurs, ventilate work area before resuming service.

Always wear safety goggles and protective gloves when working with refrigerants. Contact with refrigerant may cause injury. Disconnect hoses with extreme caution! All hoses may contain liquid refrigerant under pressure.

Be sure that any room where you are working is thoroughly ventilated, especially if a leak is suspected.

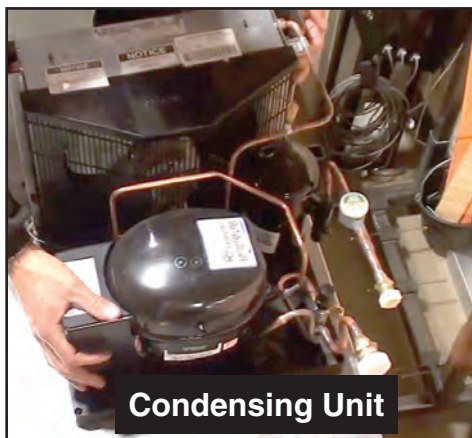
Read all safety information regarding the safe handling of refrigerant and refrigerant oil, including the Material Safety Data Sheet. MSDS sheets can be obtained from your refrigerant supplier.

FIELD INSTALLATION OF CONDENSING UNIT

A mounting plate is provided on top of the case with pilot holes that provide specific attachment points for the condensing unit base. The mounting plate is located above the next to last door on the right.

The condensate pan, if selected by the end user, is packed inside the case and must also be installed and leveled on top of the case, then plugged into the 120V GFCI outlet provided.

Exact component location is not critical; however, the components should be mounted in the general locations shown below to ensure that electrical connections reach, and the condensate pan has adequate air flow from the condenser.



Condensing Unit

Insulation Sponge 5/8 inch x 3/4 inch wall insulation to cover entire length from Condenser Unit connection to end of copper tubing, where it enters at top of case, including quick connects

Facades

Right side of case looking from the front

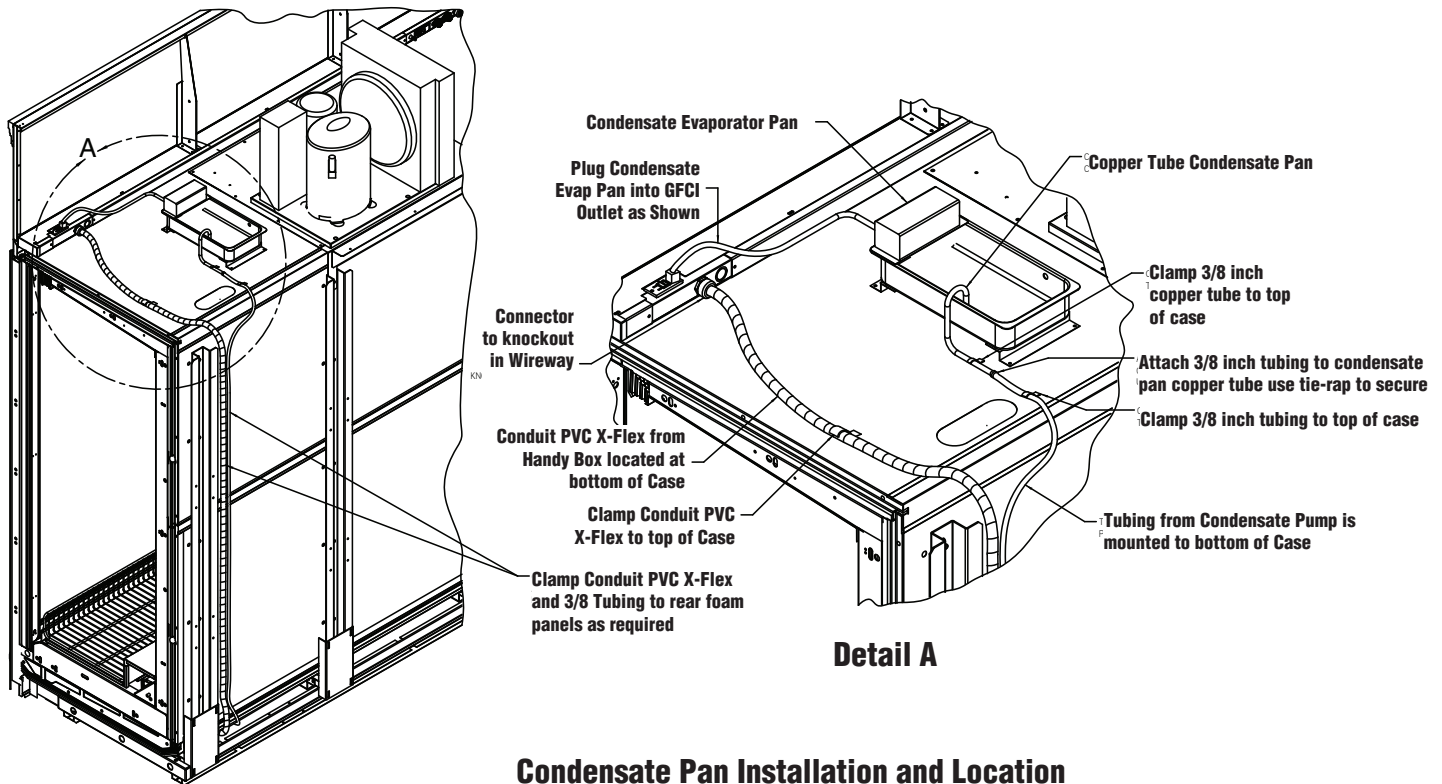
Orient the Condenser Unit as shown on top of the case. Line up mounting holes on base of condenser unit with holes on mounting plate and secure using (4) 12-14 x 2 1/4 inch screws and flat washers

Apply Rubber Gasket along base edges that contact mounting plate (8) places (2 each side) as shown

Rear Bracket used on 4 & 5 Door Cases Only. Sound Panel Kits Use Similar Bracket For 3 Door Cases. Rear bracket not necessary for RFLTM.

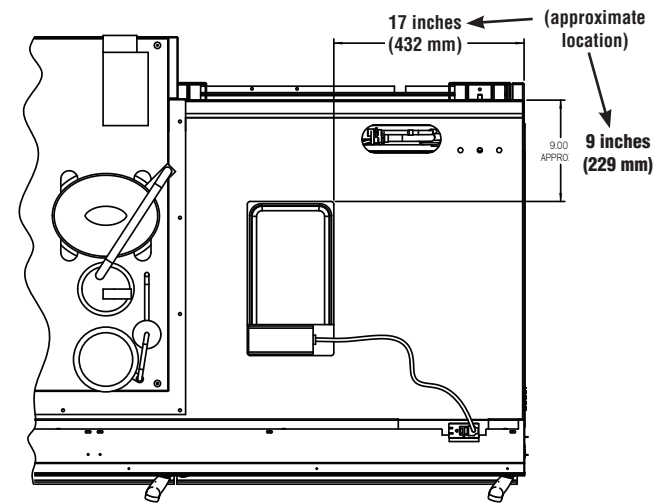
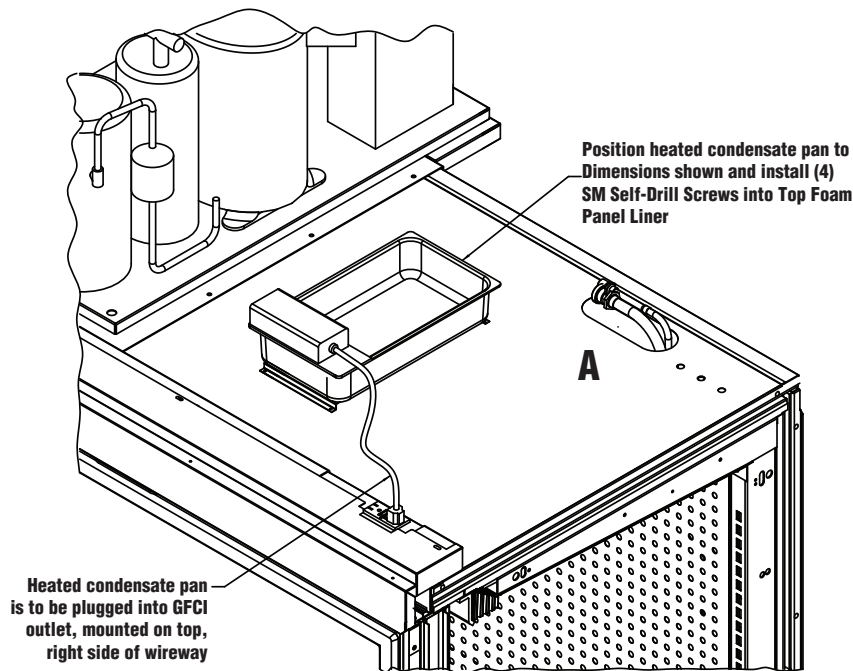
Connect quick connects on flexible liquid & suction lines from condensing unit to quick connects on pipes exiting top right of case

5-Door Case & Condenser Unit Shown



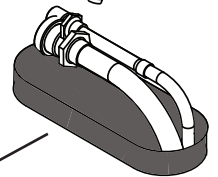
CAUTION

Blocked drain lines will cause water to back up in the case and spill onto the floor, causing a slip hazard.



View is looking at top of case, right side

Foam Seal must be in place, sealant must be applied around the copper lines after connecting the condensing unit.



Detail A

Condensate Pan Installation, Location and Electrical

ABOUT QUICK CONNECT COUPLINGS

Quick Connect fittings are provided on both the case inlet and outlet lines, and on Hussmann's TCL and TCM series of condensing units. The case and condensing unit are pre-charged with the correct amount of R404A refrigerant, and the lines are sealed. Connecting the Quick Connects together breaks the seals to connect the refrigeration lines of the unit to the case. The Quick Connects must be properly torqued to avoid refrigerant leaks.

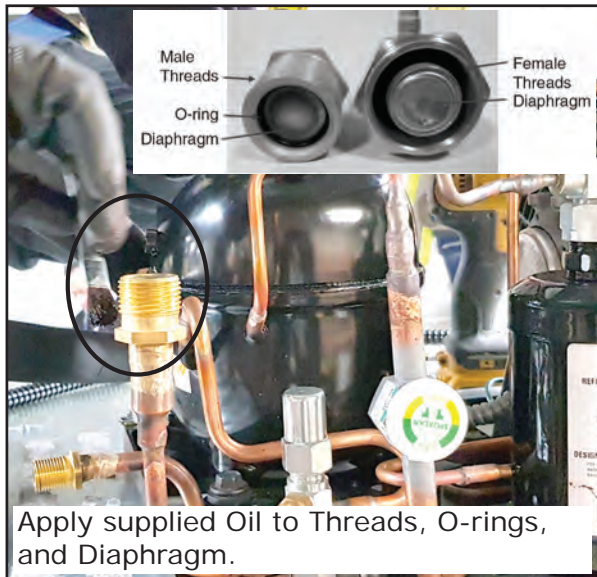
CONNECT LINES

Mount the suction line and liquid line to the condensing unit. When ready to connect, remove protector caps and plugs from the Quick Connect Couplings.

If necessary, carefully wipe coupling seats and threaded surfaces with a clean cloth to prevent the inclusion of dirt or any foreign material in the system.

Step 1:

Apply refrigerant oil to the entire surface of diaphragm, o-ring and threaded area of male coupling assembly. The amount of lubricant used must cover all designated surfaces sufficiently. Ideal application is a small applicator brush saturated with lubricant and applied liberally.



Step 2:

Ensure that the coupling halves are held in proper alignment with each other prior to starting the threads of the female coupling nut onto the male half.

The coupling end faces should be parallel with each other and visually in line with each other, this allows the female coupling nut to easily be threaded on by hand for the initial 2-3 rotations of the union nut. These initial rotations will bring the diaphragm in contact and a sharp increase in torque will be felt when they come into contact and start to pierce the diaphragms on each coupling half.

If the nut will not start by hand, adjust the position of the line set to ensure proper coupling alignment and eliminate/minimize all side load force on the coupling during assembly.



Step 3:

Using appropriate size wrenches, reference table below for the female coupling body and female union nut, tighten the female union nut, according to the torque specs below, while preventing rotation of the female body with respect to the male half. The nut should be tightened until a definite increase in resistance, metal to metal contact occurs, is felt (at this point, the nut will have covered most of the threads on the male body). It is important to ensure the male and female coupling bodies **DO NOT ROTATE** during any portion of the wrench installation.



Step 4:

Using a permanent marker or scribe, mark a line lengthwise from the female coupling union nut to either the bulkhead or female coupling body. Then tighten an additional one (1) wrench flat (60°); refer to the marking on the union nut to confirm the rotation has occurred. The final rotation is necessary to ensure the formation of the leak-proof seal, between the male and female couplings.

CORRECTLY TIGHTENED COUPLING

The swivel nut end contains one diaphragm in the center post. The male fitting contains the knife blades and its own diaphragm.

The wiring connection for the condensing unit is provided with 5-ft leads. The conduit must be connected to the condensing unit electrical box, and the leads are connected to the condensing unit input terminals. The heated condensate pan, if provided, is plugged into the 120V GFCI receptacle at the top of the case. failure.

Coupling	Hex Wrench Size
3/8 in. Male	3/4 in.
3/8 in. Female	13/16 in.
5/8 in. Male	1 1/16 in.
5/8 in. Female	1 5/16 in.

Coupling Size	Foot Pounds (Ft. Lbs.)
3/8 in.	10-12
5/8 in.	35-45



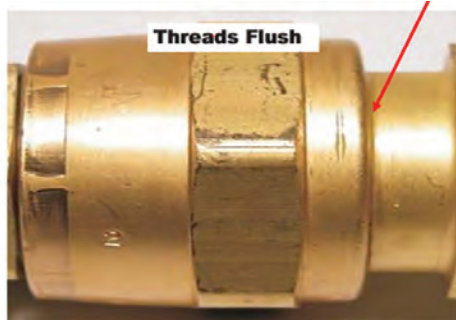
Fully Open



Fully Open

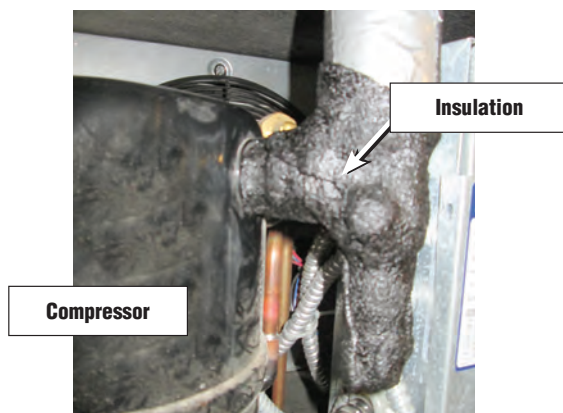
IMPORTANT!

Tighten swivel fitting until the fitting has significant resistance (fittings bottoming out). Apply ¼ turn past the resistance. Ensure no threads are visible.



INSULATE REFRIGERANT LINES

Check that all suction lines are adequately covered with insulation from case penetration to compressor, including suction service valves, and accumulator on low temp units, as some insulation may have been dislodged during shipping and installation. Suction lines are insulated to prevent condensation; extra insulation is provided to cover the field connected tubing sections. These exposed sections must be covered with insulation. Check that all suction lines are adequately covered with insulation from case penetration to compressor; including suction service valves as some insulation may have been dislodged during shipping and installation. Do not locate the tubing above the electrical box in order to prevent condensation from dripping onto electrical components.



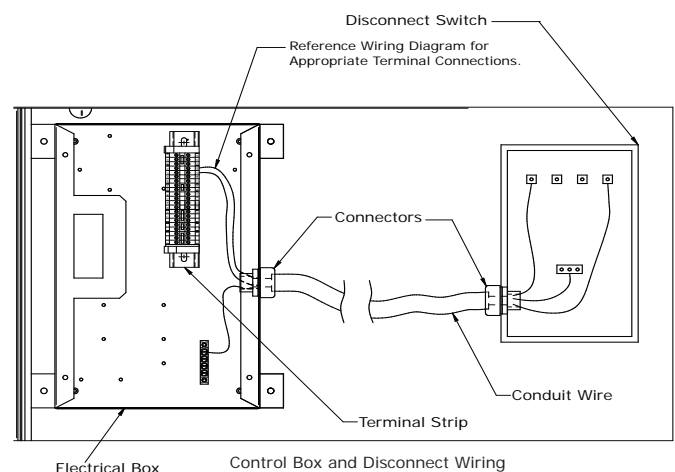
FIELD WIRING

All wiring must be in compliance with NEC and local codes. Field wiring must be sized for component amperes stamped on the serial plate. Actual ampere draw may be less than specified. Field wiring lands on the line side of the service disconnect.

Terminal blocks are used for field connection of the 120V single phase and 208/230V single phase power supply. The terminal blocks

are located inside the electrical box on top of the case. The wiring diagram and circuit requirements are provided on the Technical

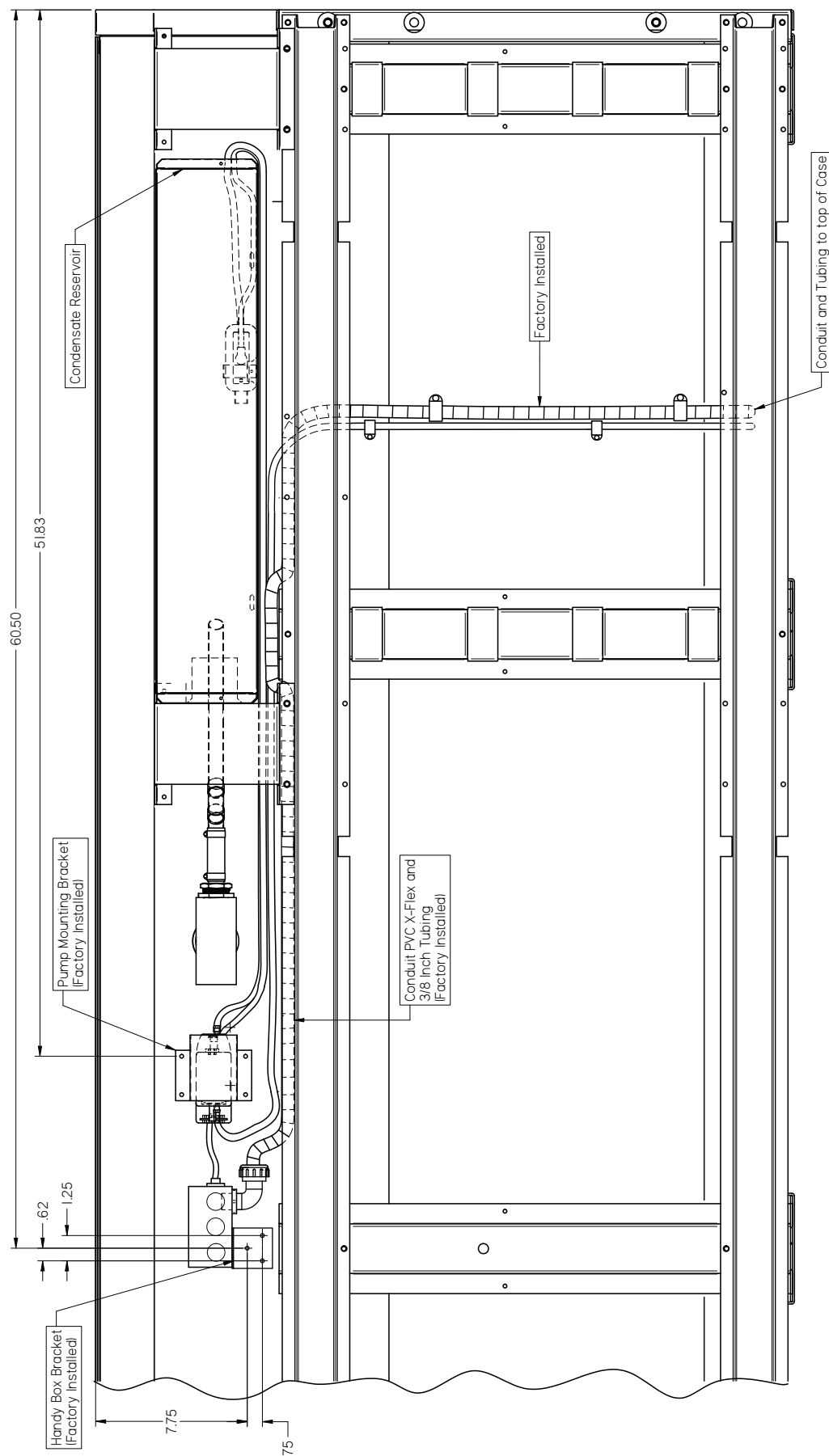
Data Sheets provided with the case and condensing unit. A disconnect switch may be provided as an option. When this switch is off, some electrical terminals in the case wireway may be energized. The wiring connection for the condensing unit is provided with 5-ft leads and 1/4-inch terminals. The conduit must be connected to the condensing unit electrical box, and the leads are connected to the condensing unit input terminals. The heated condensate pan, if provided, is plugged into the GFCI receptacle at the top of the case.



IMPORTANT:

Refer to specific wiring diagrams or condensing unit data sheets. Field wiring lands on the line side of the service disconnect.

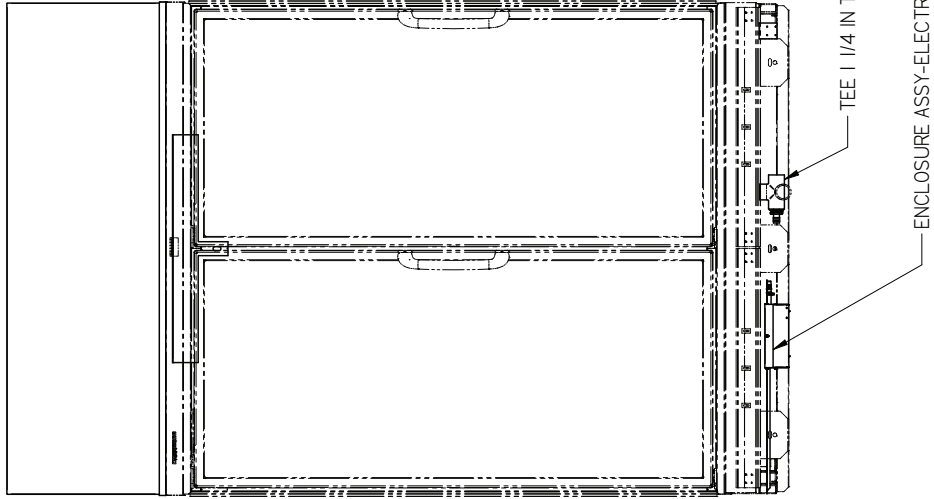
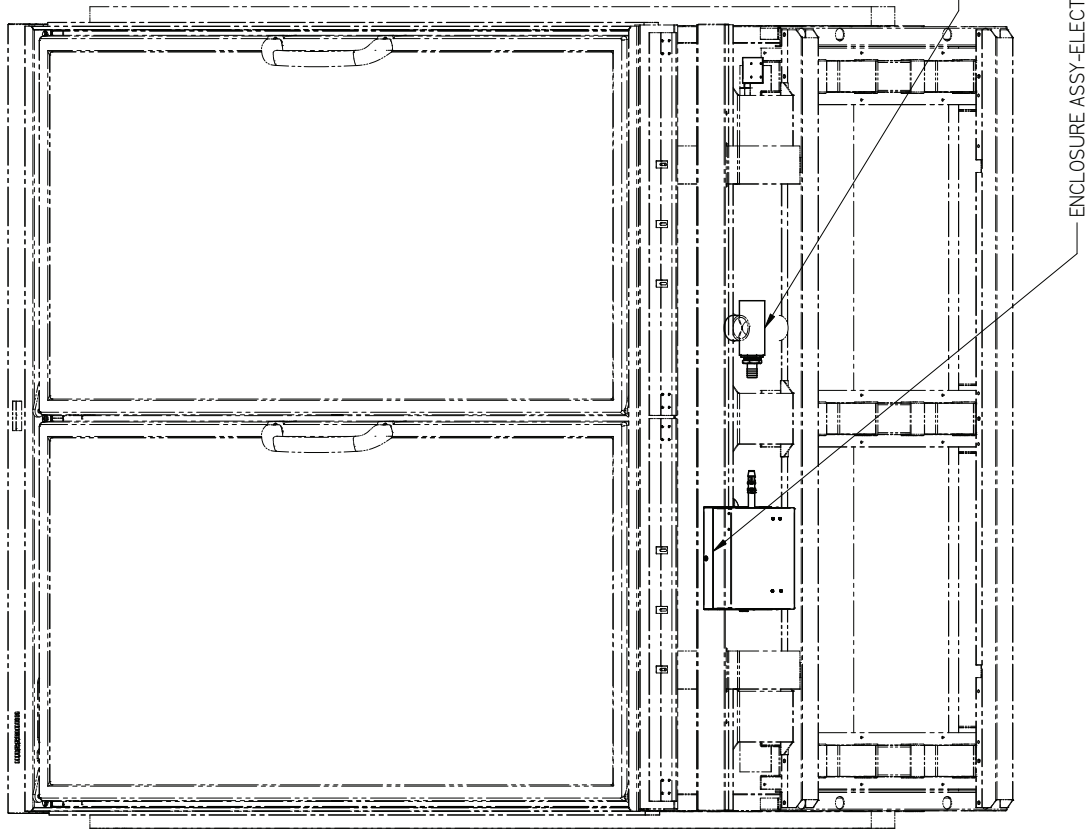




Bottom RH View of 4-Door RFL™ Case

Dimensions in Inches

PUMP LOCATION SHOWN FOR RFLNS 2 AND 4 DOOR CASE



RFLNS2 DOOR CASE SHOWN

ELECTRONIC CONTROLLER

Safety controls are installed on Freedom condensing units to protect the compressor from various errors or adverse conditions:

- High pressure safety control
- Low pressure safety control
- Compressor discharge temperature sensor

Air cooled condensing units with Electronic Unit Controller:

On condensing units that are equipped with the Emerson Electronic Unit Controller, the pressure controls and discharge line alarm are incorporated into the controller on the condensing unit.

The high pressure cut-out is a non-adjustable pressure switch with a cut-out of 440 psig. The low pressure control and compressor discharge temperature setpoint are programmed into the electronic unit controller on the condensing unit. The compressor discharge temperature is set to cut out at 225°F. The low pressure control is set to cut out at 15 psig, and cut in at 25 psig. For low temp units, the control is set to cut out at 5 psig and cut in at 15 psig.

Air cooled condensing units without Electronic Unit Controller:

On Freedom cases that have condensing units that are not equipped with the Emerson Electronic Unit Controller, including water cooled units, the high and low pressure safety controls are connected to terminals 18 and 19 of the XR75 case controller. Air cooled unit have a discharge line sensor, which is connected to terminals 21 and 23. The case controller parameters are set at the factory to incorporate the controls. The pressure controls are not adjustable. The discharge safety is set in the case controller to cut out at 230°F.

These controls must be connected after installation of the condensing unit. Harnesses are provided and marked to show the connections (see wiring diagram on next page).

The parameters in the Dixell XR75 are set up in the factory to enable the pressure control functionality. The parameters affecting this control are shown in the diagram below.

Parameter	Description	Value
P4P	Fourth probe presence	yes
AP2	Probe selection for condenser temperature alarm	P4
AU2	Condenser high temperature alarm	220
AH2	Differ for condenser temperature alarm recovery	45
Ad2	Condenser temperature alarm delay	15
dA2	Delay of condenser temperature alarm at startup	0
AC2	Compressor off for condenser high temperature alarm	yes
tbA	Alarm relay switch off by pushing a key	yes
i1F	Digital input 1 configuration	dor
i2P	Digital input 2 polarity	OP
i2F	Digital input 2 configuration	PAL
did	Digital input 2 alarm delay	30
nPS	Number of activations of pressure switch	3

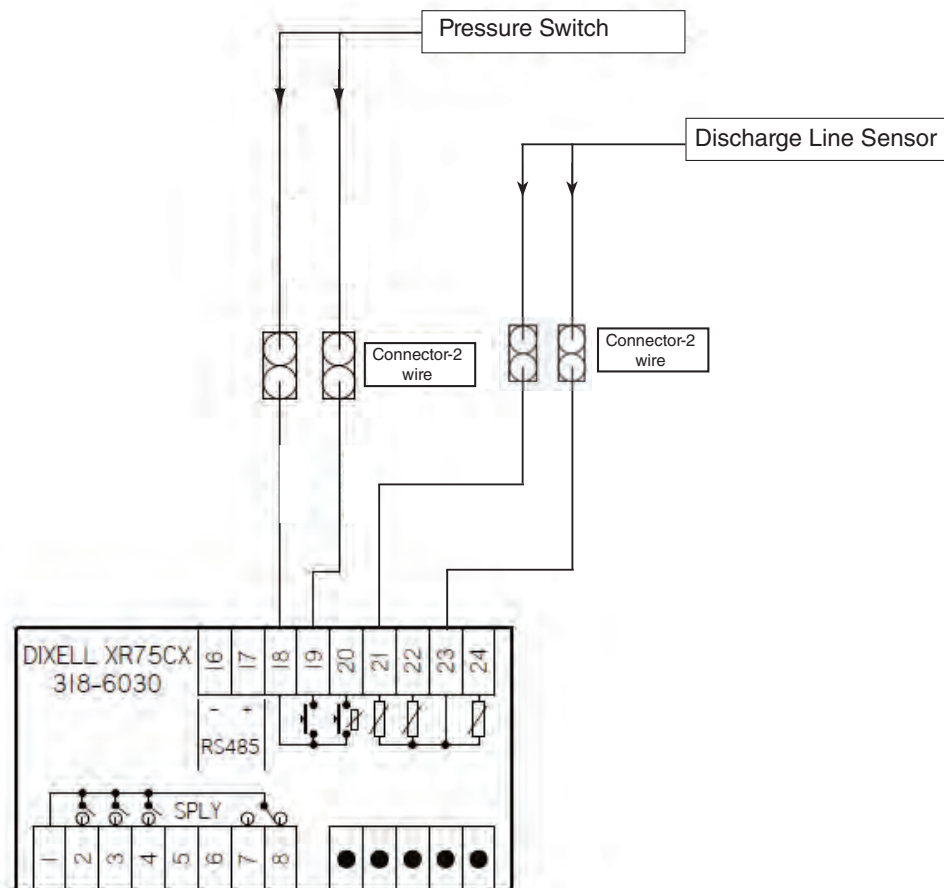
The high pressure switch will shut off the compressor if the high side pressure exceeds 440 psig. The control settings allow the compressor to re-start automatically up to two times, but if the high pressure switch trips 3 times within a 30 minute period the Dixell controller must be manually re-set by turning off the control circuit and then back on again. This is an indication that field support is required to diagnose the problem causing the high pressure condition. The alarm may be silenced by pressing any of the buttons on the front of the controller display.

Possible causes of high/low pressure alarm:

- Excessive refrigerant
- Lack of refrigerant
- Lack of air flow into the condenser
- Superheat too high
- High temperatures at startup
- Service valves closed



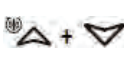


High and low pressure alarm will show up as the same alarm signal on the controller display. If this alarm condition exists, the unit must be serviced by a qualified technician.




Discharge temperature alarm is an indication that the condenser is blocked and needs to be cleaned, or remove blockage (such as balloons, paper, etc). Refer to supplemental manuals and wiring diagrams for special options and other controllers.










CONTROLLER OPERATION

Follow the tables to use the commands. The keypad display is located on the front of the merchandiser.

	Switches the device ON and OFF, if onF = oFF
	Switches the light ON and OFF, if oA1 = Lig
	Locks/Unlocks the keyboard
SET + 	To enter programming mode
SET + 	Returns to room temperature display

Key	Function
SET	Press to display target setpoint, to select a parameter in programming mode, or to confirm an operation
	Starts a manual defrost
	Press the UP arrow to see the MAX temperature, to browse the parameter codes in programming mode, or to increase the currently displayed temperature value.
	Press the DOWN arrow to see the MIN temperature, to browse the parameter codes in programming mode, or to decrease the currently displayed temperature value.

Follow the LED commands to operate and control the case's lighting.

LED	Mode	Function
	ON	Compressor enabled
	Flashing	Anti-short cycle delay enabled
	ON	Defrost enabled
	Flashing	Drip time in progress
	ON	Fans enabled
	Flashing	Fans delay after defrost in progress.
	ON	An alarm is occurring

How to see the setpoint:

1. Push and immediately release the SET key. The display will show the setpoint value.
2. Push and immediately release the SET key or wait for 5 seconds to display the present value again.

How to change the setpoint:

The controller is shipped from the factory with Frozen Food settings. To modify the temperature for Ice Cream application, follow these instructions:

1. Push and hold the SET key for more than 2 seconds to change the setpoint value.
2. The value of the setpoint will be displayed and the °C or °F LED starts blinking.
3. To change the setpoint value push the UP or DOWN arrows within 10 seconds.
4. To memorize the new setpoint value, push the SET key again or wait 10 seconds.

How to start a manual defrost:

Push and hold the DEF key for more than 2 seconds and a manual defrost will start.

How to lock the keyboard:

1. Keep the UP + DOWN arrow keys pressed for more than 3 seconds.
2. The PoF message will be displayed and the keyboard will be locked. At this point it will be possible to see the setpoint of the MAX or Min temperature stored only.
3. If a key is pressed for more than 3 seconds the PoF message will be displayed.

How to unlock the keyboard:

Press the UP and DOWN arrow keys together for more than 3 seconds until the Pon message displays.

Alarms:

- P1 Discharge temperature probe failure
- P2 Defrost termination probe failure
- HA Max temperature alarm
- LA Min temperature alarm

How to set defrost start time

The defrost will occur 24 hours after the controller is first powered up, then every 24 hours after that.

Controller Location

How to unlock the keyboard:

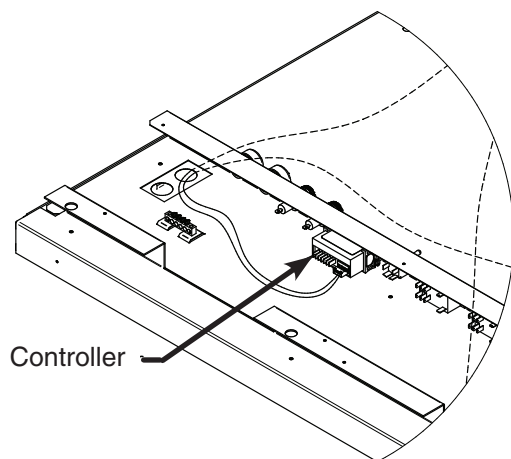
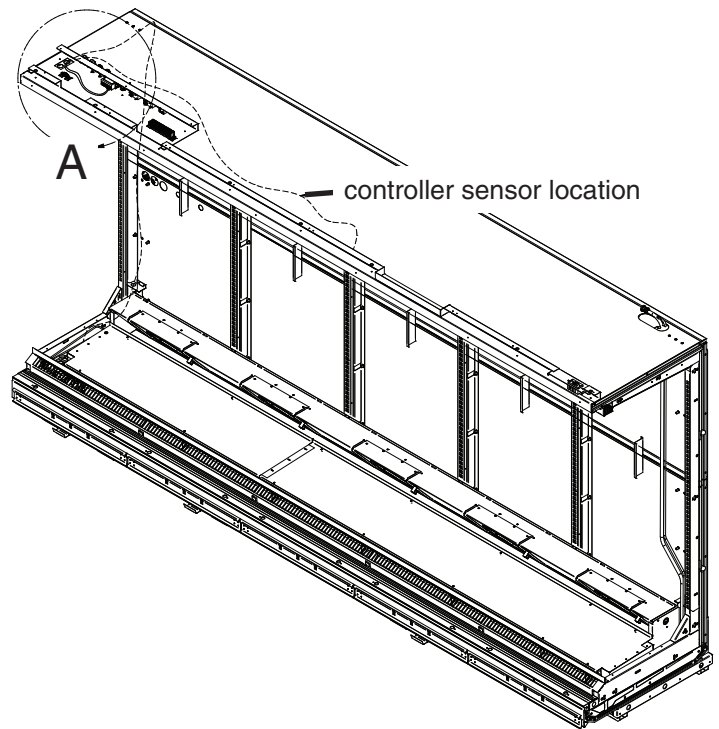
Press the UP and DOWN arrow keys together for more than 3 seconds until the Pon message displays.

Alarms:

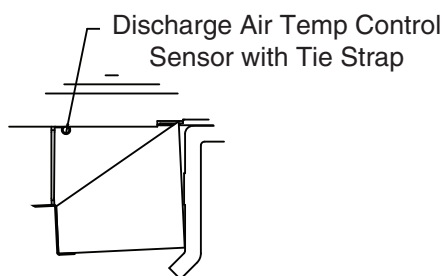
- P1 Discharge temperature probe failure
- P2 Defrost termination probe failure
- HA Max temperature alarm
- LA Min temperature alarm

How to set defrost start time

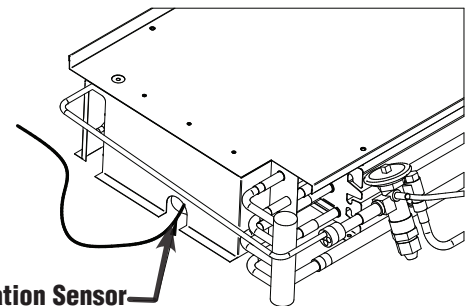
The defrost will occur 24 hours after the controller is first powered up, then every 24 hours after that.



Detail A



Detail B



Defrost Termination Sensor
located on the bottom row
return bend closest to the
center of the coil.

NOTE: Do NOT load product until AFTER merchandiser operates for 24 hours and reaches desired operating temperature.

WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

WARNING

The OFF Position does not disconnect line voltage to the input terminal blocks.

ALWAYS CHECK THE SERIAL PLATE FOR COMPONENT AMPERES.

Electric Defrost is standard for low temperature merchandisers and requires temperature termination. Off Time Defrost is standard for medium temperature merchandisers and is time terminated.

MERCHANDISER ELECTRICAL DATA

Merchandiser data sheets for specific models are shipped with this manual. The data sheets provide merchandiser electrical data, standard electrical schematics, parts lists and performance data. *Refer to the merchandiser data sheets and merchandiser serial plate for electrical information. Refer to the separate wiring diagrams shipped with the case for specific information about the merchandiser and any optional wiring kits that may have been applied.*

ELECTRICAL CONNECTIONS

All wiring must be in compliance with NEC and local codes.



WARNING

Terminal block NOT for case-to-case wire connection.

IDENTIFICATION OF WIRING

Leads for all electrical circuits are identified by colored plastic bands. These bands correspond to the color code sticker (shown below) located inside the merchandiser wireway.



It is the contractor's responsibility to install merchandiser(s) in accordance with all local building and health codes.

WIRING COLOR CODE

Leads for all electrical circuits are identified by a colored plastic band: neutral wire for each circuit has either White insulation or a White plastic sleeve in addition to the color band.

PINK REFRIG. THERMOSTAT LOW TEMP.
 LIGHT BLUE . REFRIG. THERMOSTAT NORM TEMP.
 DARK BLUE . DEFROST TERM. THERMOSTAT
 PURPLE ANTI-SWEAT HEATERS
 BROWN FAN MOTORS
 GREEN* GROUND

ORANGE OR
 TAN.....LIGHTS
 MAROON.....RECEPTACLES
 YELLOW*DEFROST HEATERS, 120V
 RED*DEFROST HEATERS, 208V

*EITHER COLORED SLEEVE OR COLORED INSULATION
ELECTRICIAN NOTE: Use copper conductor wire only.
CASE MUST BE GROUNDED

THESE ARE MARKER COLORS WIRES MAY VARY.

CONTROLS and ADJUSTMENTS

Refrigeration Controls			Defrost Controls			
Model	Product Application	Discharge Air Temperature	Defrost Frequency (per day)	Type of Defrost	Termination Temperature	Failsafe Time (Minutes)
RFLNS	Frozen Food	-5° F	1	Electric	48°F	45
RFLNS	Ice Cream	-12° F	1	Electric	48°F	45
RFMNS	Medium Temp. (Dairy, Deli)	32° F	1	Off Time	NA	60
RFLTM	Frozen Food	-5° F	1	Electric	48°F	45

1. The controller controls refrigeration temperature. This is factory installed in the control panel. Adjust this control keypad to maintain the discharge air temperature shown. Measure discharge air temperatures at the center of the honeycomb.

For low temperature models, defrosts are time initiated and temperature terminated. The defrost setting is factory set as shown.

To ensure a thorough defrost, the defrost must be terminated by the temperature termination setting — not by time.

For medium temperature models, defrost is time initiated and time terminated.

NOTES:

FACADE, SPLASHGUARD AND BUMPERS**INSTALL FACADE**

Position facade supports and fasten to top of case using predrilled holes.

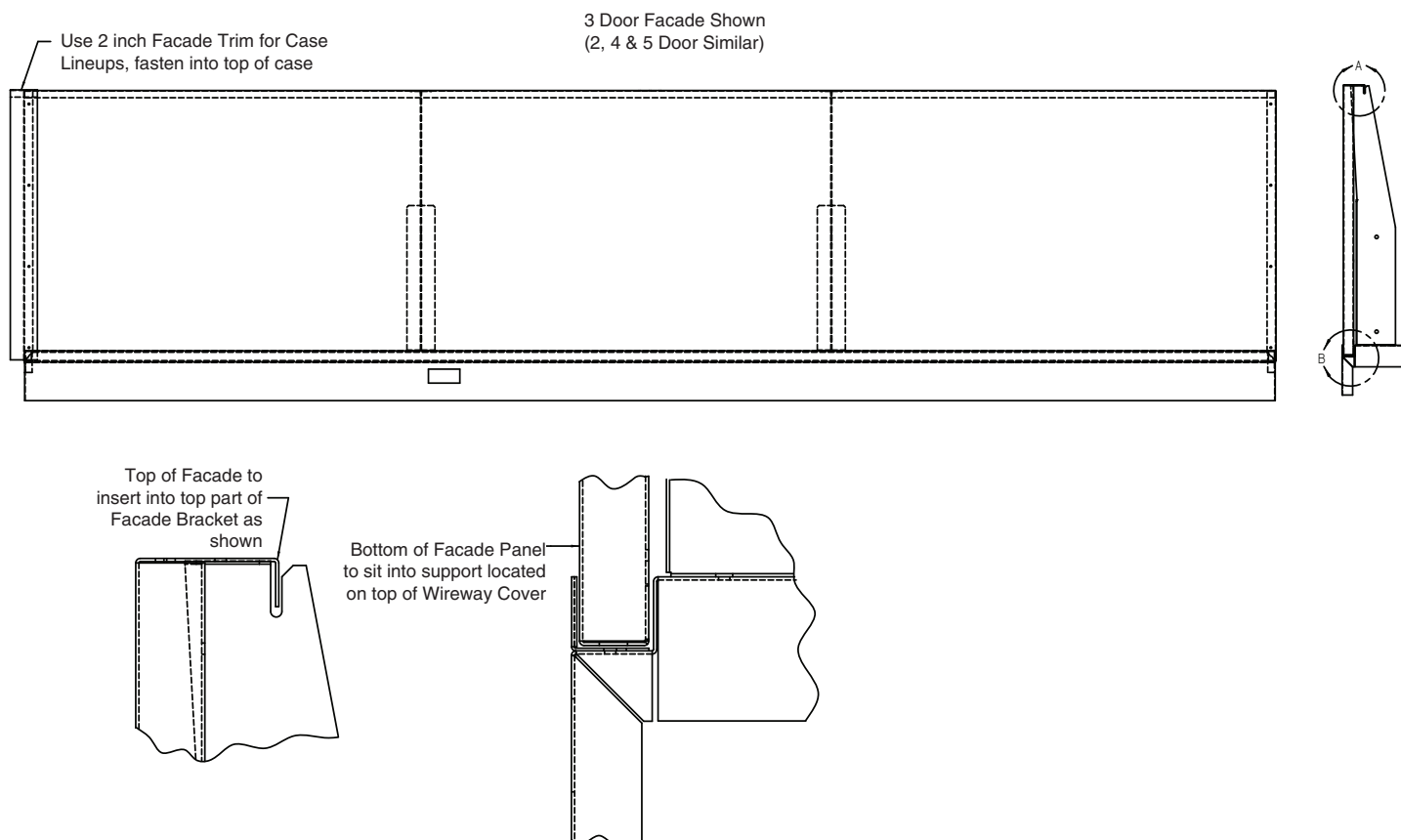
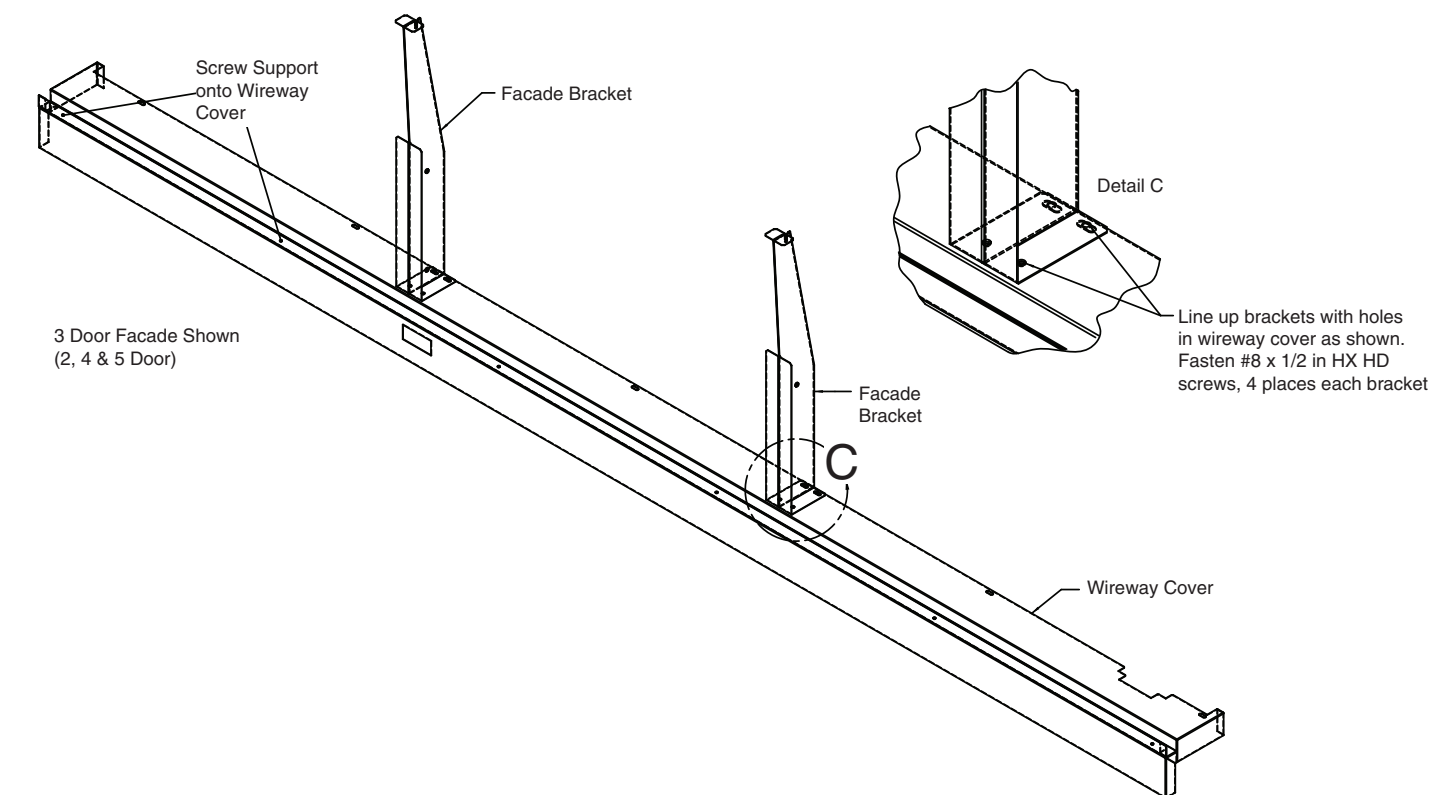
See illustrations on next page.



**Install Facade Supports
using holes provided**

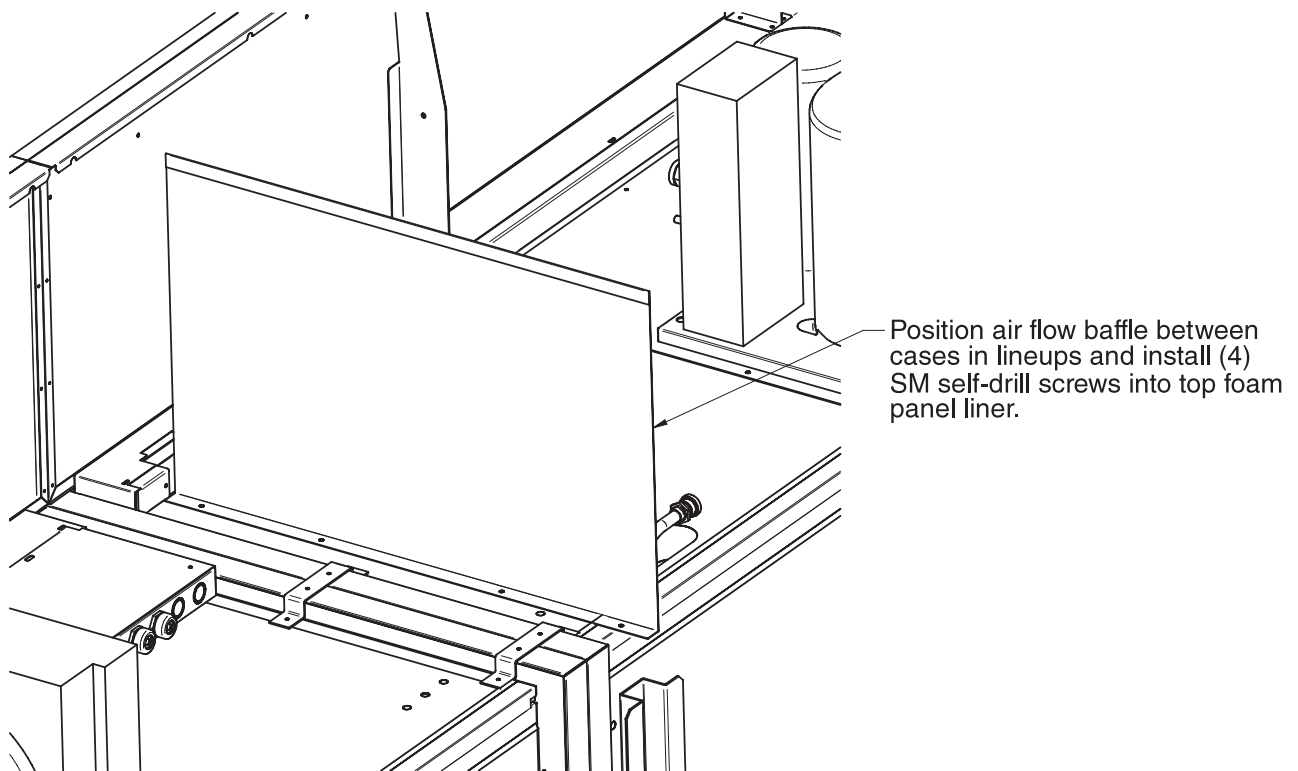


**Fasten end facade to front facade as
shown where seamless options apply.**



AIR FLOW BAFFLE

Air flow baffles are required to be installed between cases to ensure proper air flow circulation of the refrigeration systems. The air flow baffle should be positioned as shown and are fastened at the top of the merchandiser using sheet metal screws.



Air Flow Baffle Installation and Location

INSTALLING SPLASHGUARDS AND BRACKETS

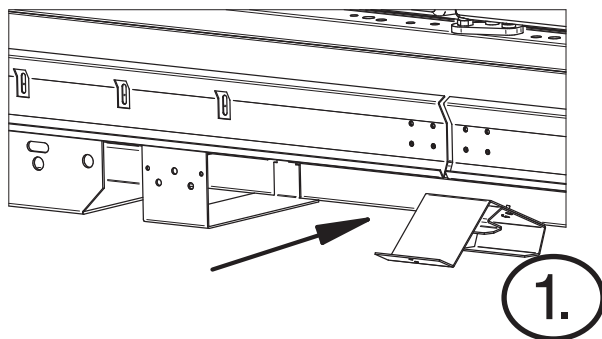
The splashguard is shipped inside each merchandiser. **AFTER** merchandisers have been leveled and joined, and all drip piping, electrical and refrigeration work has been completed, re-install the splashguards.

Splashguards are joined with a galvanized metal splice connector that comes with the joint kit. Join the splashguards before installing on case. The leveling brackets have a maximum extension of one (1) inch (25 mm) for uneven floors.

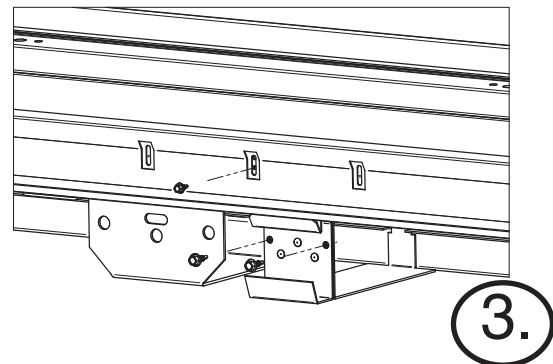
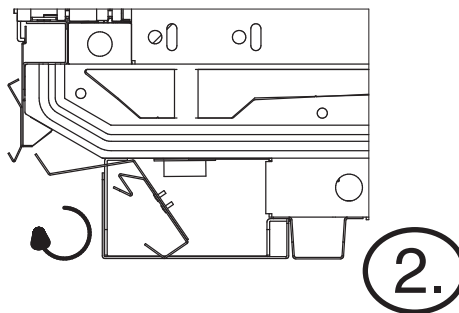
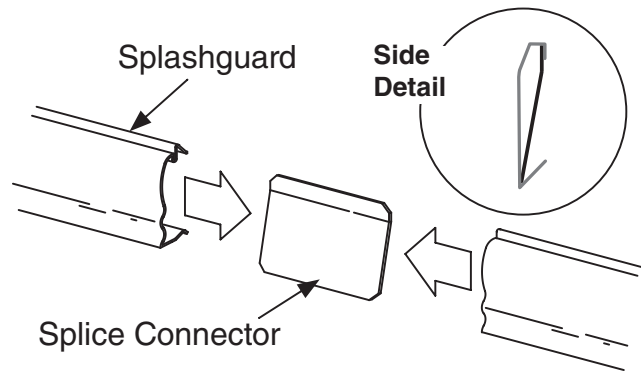
To install splashguards and brackets:

- ① Slide the splashguard support bracket's small flange into base rail slots. Next, slide the splashguard retainer assembly under the case as shown.
- ② Rotate the retainer assembly clockwise (from right hand side) while pulling towards the front of the case, until the forward most flange sits flush with the back of the color panel.
- ③ Align the retainer assembly with and attach to the support bracket using #10 screws. Then install a #8 screw through the color panel into the top retainer flange.

DO NOT PLACE SHIMS UNDER SPLASHGUARD BRACKETS.



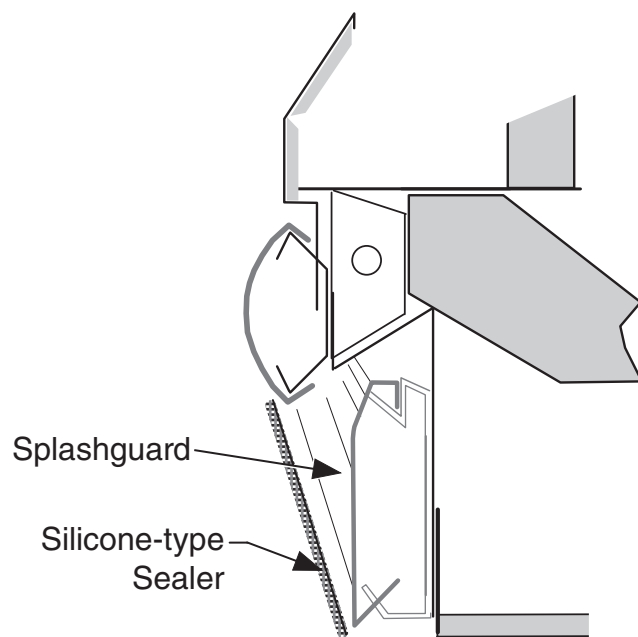
Splashguards Installation



SEALING SPLASHGUARD TO FLOOR

IF REQUIRED by local sanitation codes, or if desired by the customer, plastic splashguards may be sealed to the floor using silicone type sealer. The amount needed will depend on how much the floor is out of level.

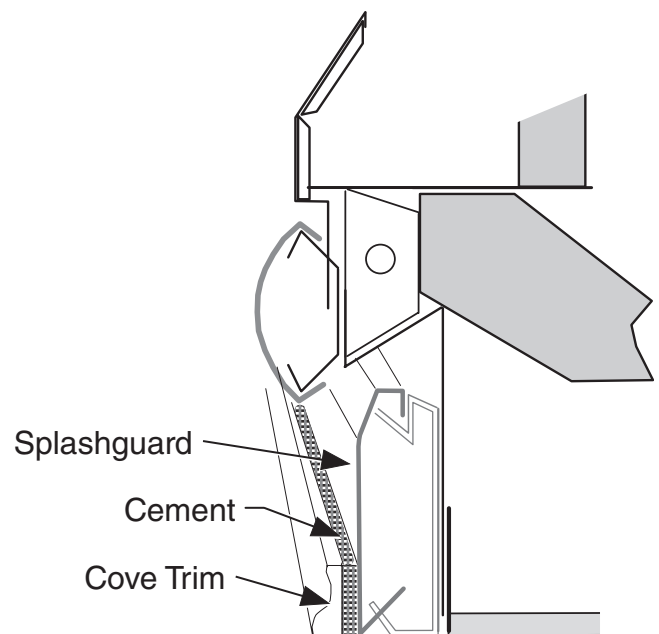
- Remove all dirt, wax and grease from the area of the splashguard where adhesion will be necessary. This is to ensure a good, secure installation.
- Apply a good silicone type sealer along the bottom of the splashguard. Sealant must be removed and replaced when servicing.



OPTIONAL stainless steel splashguards may be sealed to the floor using a vinyl cove base trim. The size of trim needed will depend on how much the floor is out of level.

To install the trim to the splashguard:

- Remove all dirt, wax and grease from the area of the splashguard where adhesion will be necessary. This is to ensure a good and secure installation.
- Apply a good contact cement to the cove trim and allow proper drying time according to the directions supplied with the cement.
- Install the trim to the splashguard so that it is lying flush with the floor. **DO NOT SEAL THE TRIM TO THE FLOOR.**
- **If required by local health codes** Cove Trim may be sealed to the floor using a silicone type sealer. Sealant must be removed and replaced when servicing.



INSTALLING BUMPERS

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

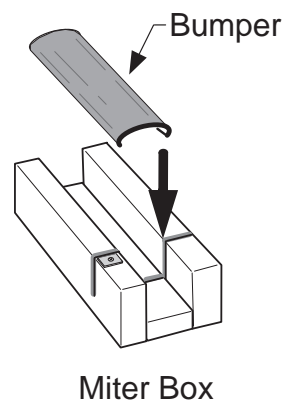
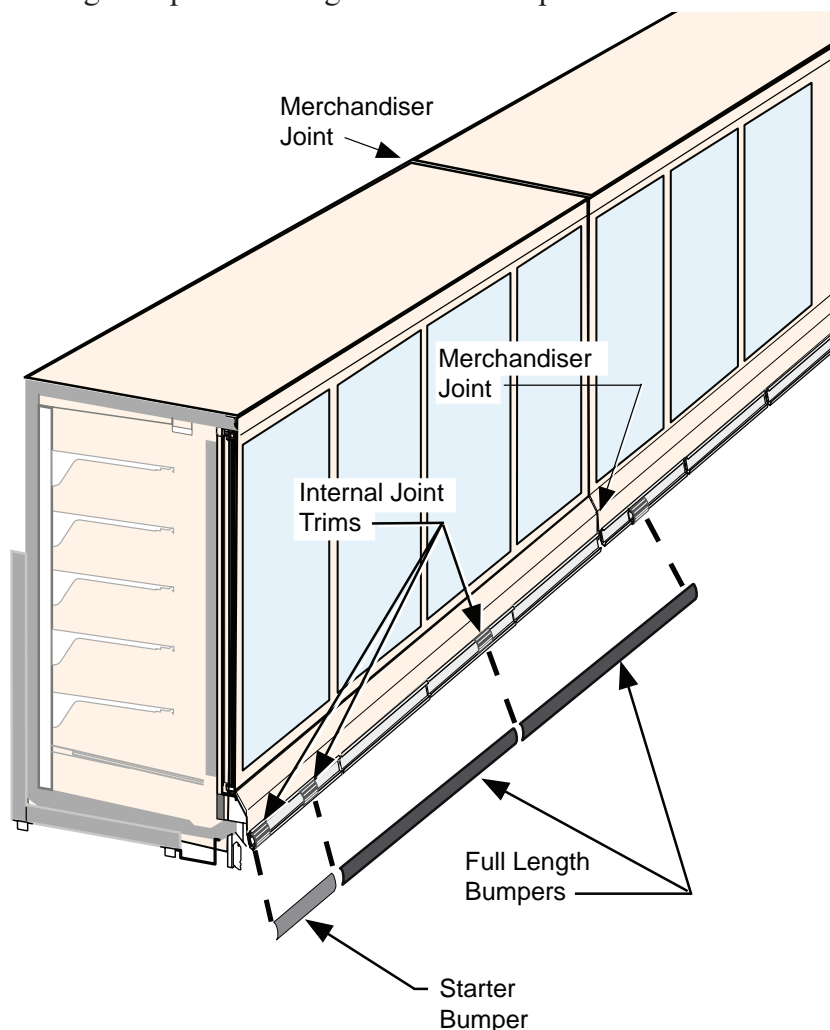
Begin at the left end of the line-up. A starter bumper is factory-installed with end kits. Insert the internal joint trim, then add the full-length bumper.

Align each bumper section with its retainer and push into place, working from the end of the lineup. Install full length bumpers and internal joint trims offset across joints. Make sure that no gaps exist between sections. Continue installing bumpers the length of the line up.

Do NOT install the last bumper sections at this time. These sections will be installed in the last step.

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.



START UP / OPERATION

ATTENTION

Merchandiser must operate for 24 hours before loading product!

Regularly check merchandiser temperatures.

Do not break the cold chain. Keep products in cooler or freezer before loading into merchandiser.

Medium temperature merchandisers are designed for loading **ONLY** pre-chilled products.

Low temperature merchandisers are designed for loading **ONLY** frozen products.



EXPANSION VALVE ADJUSTMENT

Expansion valves on Freedom cases are pre-adjusted from the factory, but some adjustment may be necessary to adjust for specific store conditions. Before attempting to adjust valves, make sure the evaporator is either clear or only lightly covered with frost, and that the merchandiser is within 10 deg F (6.5 deg C) of its expected operating temperature. Adjust valves as follows:

Method 1 (recommended): Attach a sensing probe (either thermocouple or thermistor) to the evaporator outlet, under the clamp holding the expansion valve bulb. Attach a pressure probe to the access valve on the suction line. Measure superheat by subtracting the saturation temperature at the measured pressure from the measured outlet temperature.

Method 2: Attach two sensing probes.

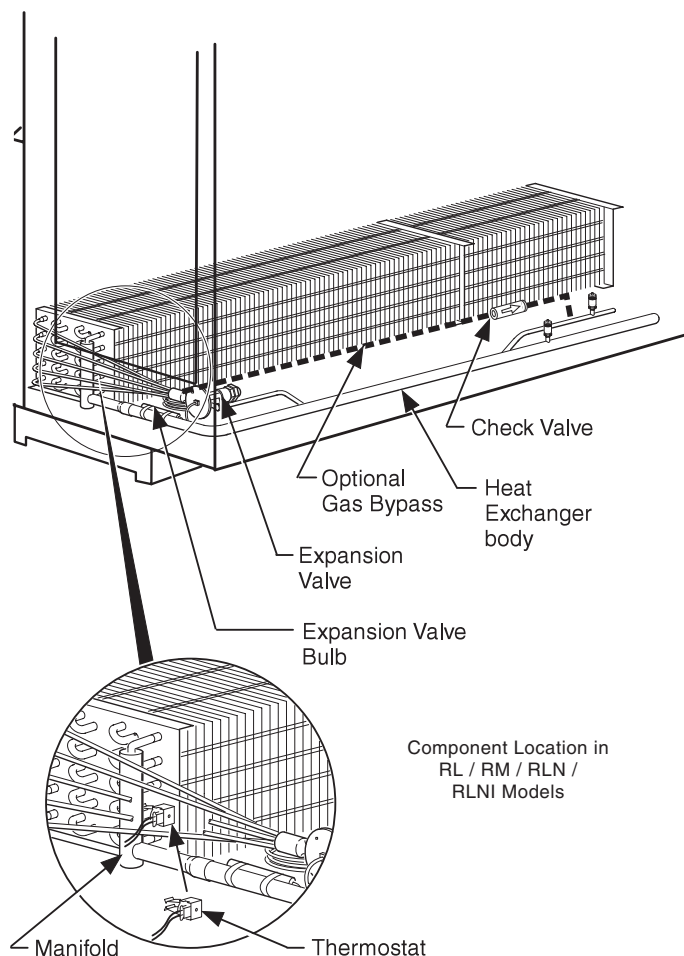
Note:

When using high glide refrigerants (e.g., R-407A, R-448A), use the evaporator pressure and subtract the dew point from the coil outlet refrigerant temperature to measure the superheat level.

Attach two sensing probes (either thermocouple or thermistor) to the evaporator. Position one under the clamp holding the expansion valve bulb; securely tape the other to the coil inlet line.

Some “hunting” of the expansion valve is normal. The valve should be adjusted so that during the hunting THE GREATEST DIFFERENCE BETWEEN THE TWO PROBES IS 3–5 deg F (1.7–2.8 deg C). With this adjustment, during a portion of the hunting the temperature difference between the probes will be less than 3 deg F (1.7 deg C) and at times 0.

Make adjustments of no more than $\frac{1}{4}$ turn for Balanced Port TEV and $\frac{1}{2}$ turn at a time for other valve models. Wait at least 15 minutes before rechecking the probe temperature or making further adjustments.





PRIOR TO START UP CHECKLIST

- Is the case connected to a power supply as specified on the nameplate?
- Is the power on at the breaker panel?
- Are the doors properly torqued? Are they self closing? Check each door from a fully open position and from about a 1-inch open positions.
- Are the evaporator fans plugged in? Do they rotate freely? (The fans can be inspected by lifting the deck pans in the bottom of the cases. Manually rotate each fan to confirm it is free and visually inspect to confirm that each fan is plugged into its receptacle.)
- Verify that refrigeration line shutoff valves are in the back-seated (open) position.

START UP CHECKLIST

- Once the case is considered ready for start up, move the main switch.
This main switch is located at the rear of the wireway on the top, left side of the case. This toggle switch turns on the power to the condensing unit, and all case electrical components, including anti-sweat heaters, lights and fans.
- Check the reading on the display; it should be displaying the case temperature. The display is located in the center of the front of the facade above the doors. The displayed temperature will show the merchandiser's discharge air temperature.
- Listen for any unusual sounds or events. For example: evaporator fan blade interference, compressor trip on overload, or high head due to excessive ambient temperature, circuit breaker trip, etc.
- Check the fan at each door to ensure all fans are running. The discharge air output at the top inside front of the case should be relatively even across the length of the case (honeycomb area).

Excessive ambient conditions may cause condensation and therefore sweating of doors.

Facility operators should monitor doors and floor conditions to ensure safety of persons.

DEFROST

Defrost will occur 24 hours after switching the disconnect switch to the ON position, then back on again 24 hours before the desired defrost time. Defrost can be set to any time desired by switching the unit off, then back on again, 24 hours before the desired defrost time. “Df” is displayed on the display during defrost. It will show the discharge air temperature when the evaporator coil has returned back to stabilized operating temperature.

During defrost, the condensate pump will pump defrost water to the condensate pan located at the top of the merchandiser. On low temperature cases, the fans shut off during defrost, and electric defrost heaters energize to melt the frost off the evaporator coil. Defrost terminates when the evaporator coil reaches approximately 48 °F. On medium temperature cases, the fans runs continuously, there are no defrost heaters, and defrost is time-terminated after 60 minutes.

CONTROL SETTINGS AND OPERATION

These instructions are written for normal frozen food, ice cream, or medium temperature application, and provide optimum settings for normal store conditions. There is also a chart that shows low temp. and medium temp. Freedom settings.

**CAUTION**

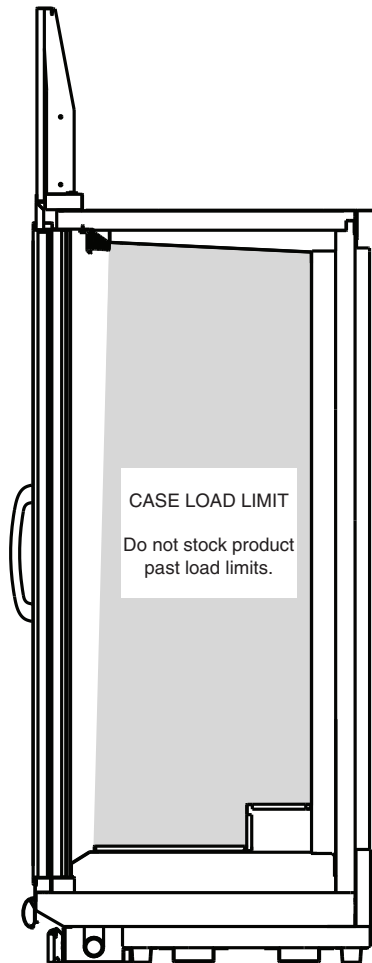
**Do not store items or flammable materials on top of the unit.
Do not walk on case.**

CHECKLIST AFTER 12 HOUR RUN TIME

- Check case temperature.
- Verify that the fans are running. (The fans will be off if the case is in a defrost cycle. They will come back on after the completion of this cycle.)
- Initiate a defrost cycle and ensure the heaters are working properly. See the controller instructions for how to force a defrost cycle. Check the amp draw at the terminal block, located in the front electrical raceway, just below the right most door of the case.
- Check the door operation again, to ensure they close properly once the case is down to operating temperature.
- Are all inspection plates and covers properly replaced?
- Inspect for any water accumulation resulting from incorrect or unsealed penetrations where electrical or other lines pass through the case insulated walls.
- Check that the lights come on when the light switch is in the **on** position.
- Check that the condensate pump and condensate pan turns on by pouring a gallon of water into the drain. Condensate pump pumps water to the condensate pan during defrost. Check to ensure there are no leaks. If pump or condensing pan does not energize, GFCI may need to be reset.
- See the merchandiser’s Data Sheet Set for refrigerant settings and defrost requirements. Bring merchandisers down to the operating temperatures listed on the data sheet.

LOAD LIMITS

Shelf life of perishables will be short if load limit is violated. **AT NO TIME SHOULD MERCHANDISERS BE STOCKED BEYOND THE LOAD LIMITS INDICATED.**



CAUTION

**Do not store items or flammable materials atop the unit.
Do not walk on case.**

STOCKING

Product should **NOT** be placed in merchandisers until all refrigeration controls have been adjusted and merchandisers are at proper operating temperature.

All shelves and the lower deck are intended to display product. Shelf height is adjustable in one inch increments. Spacing of 12 inches is recommended for most applications. Maximum load per shelf is 170 pounds. Merchandisers may be ordered with optional “L” shaped wire shelves. 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.

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 hamper air curtain performance.

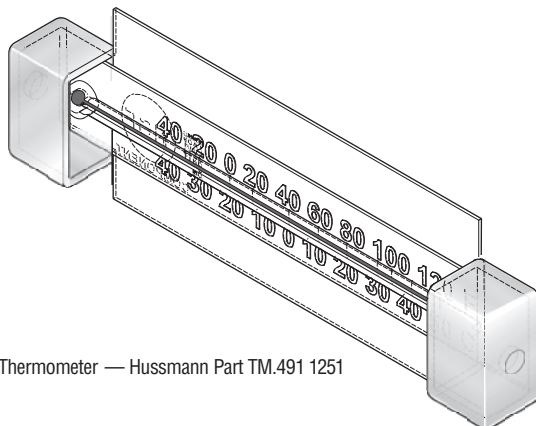
Do not prop doors open while stocking. And keep the doors closed as much as possible to prevent coil frosting and high merchandiser temperature.

INSTALLING FDA/NSF REQUIRED THERMOMETER

The following pages provide the same information that ships with the thermometer. This requirement does not apply to display refrigerators intended for bulk produce (refer to Page 1-1).

Please note that the tape cannot be exposed after installation.

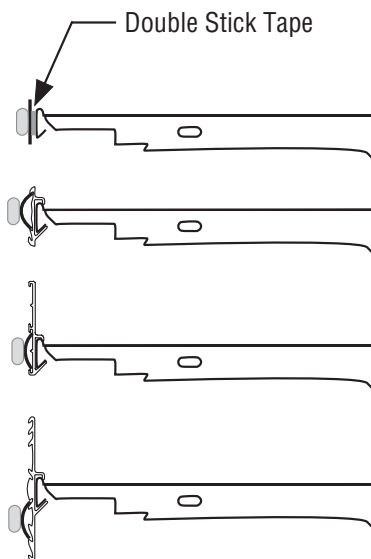
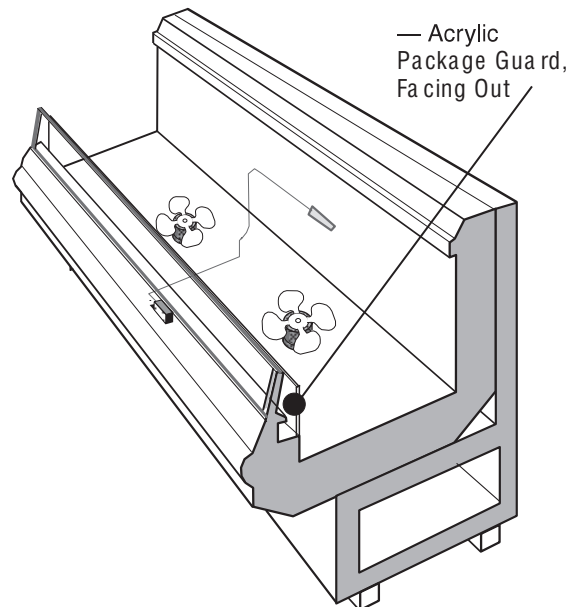
This is an NSF-7 & US FDA Food Code Required Thermometer



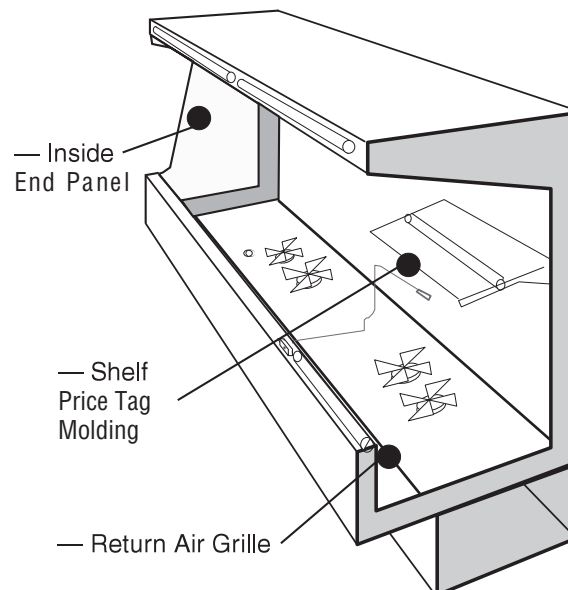
Thermometer — Hussmann Part TM.491 1251

Hussmann Corporation • 12999 St. Charles Rock Road • Bridgeton, MO 63044-2483
U.S. & Canada 1-800-922-1919 • Mexico 1-800-890-2900 • www.hussmann.com
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Suggested Mounting Locations in Single Deck Glass Front Merchandisers



Flexible Plastic
Fits in Price Tag
Moldings



Suggested Mounting Locations
in Multi-deck Merchandisers

Hussmann P/N 0429971_C

10/2007

Important – Please read!

This thermometer is provided in response to United States
Food and Drug Administration (US FDA) Food Code [<http://www.fda.gov/>]
and
National Sanitation Foundation (NSF / ANSI) Standard 7 [<http://www.nsf.org/>]

Each installation will be different depending on how the unit is stocked, shopping patterns in the department and ambient conditions of the store. The suggested locations provided herein are possible locations. It is the responsibility of the purchaser / user to determine the location with the food storage area of the unit that best meets the code requirements above.

The thermometer may need to be moved several times to find the warmest location. Mounting options include flexible plastic for price tag molding application, magnet applied to back of flexible plastic for steel end wall, and double stick tape. Tape must not be exposed after installation.

Questions about either code should be addressed to local agencies or other appropriate officials.

**Keep with merchandiser
or give to store manager.**

DO NOT DESTROY.

NOTES:

MAINTENANCE

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, these merchandisers should be thoroughly cleaned, all debris removed and the interiors washed down, weekly.

Always*Clear™ Glass

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. Refer to manual that ships with doors.

Exterior Surfaces

The exterior surfaces should be cleaned with a mild detergent and warm water to protect and maintain their attractive finish. **NEVER USE ABRASIVE CLEANSERS OR SCOURING PADS.**

Interior Surfaces

The interior surfaces may be cleaned with most domestic detergents, ammonia based cleaners and sanitizing solutions with no harm to the surface.

Do Not Use:

- Abrasive cleansers and scouring pads, as these will mar the finish.
- Solvent, oil or acidic based cleaners on any interior surfaces.
- Ammonia based cleaners on acrylic surfaces.

WARNING

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:

- 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 hot 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.**
- Remove screws and lift hinged fan plenum for cleaning. **BE SURE TO REPOSITION THE FAN PLENUM AFTER CLEANING MERCHANDISER.**
- Take care to minimize direct contact between fan motors and cleaning or rinse water.
- 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

Do NOT use HOT water on COLD glass surfaces. This can cause the glass to shatter and could result in personal injury. Allow glass doors to warm before applying hot water.

Fan Plenum

To facilitate cleaning, the fan plenum is hinged and also fastened with screws at each end. After cleaning be sure the plenum is properly lowered into position and that screws are reinstalled OR PRODUCT LOSS WILL RESULT due to improper refrigeration.

**SHUT FANS OFF DURING
CLEANING PROCESS.**

CLEANING HONEYCOMB ASSEMBLIES

Honeycombs should be cleaned every six months. Dirty honeycombs will cause merchandisers to perform poorly. The honeycombs may be cleaned with a vacuum cleaner. Soap and water may be used if all water is removed from the honeycomb cells before reassembling. Be careful not to damage the honeycombs.

1. Remove the sheet metal screws located in the front metal retainer which holds the honeycomb assembly in place.
2. Lift the honeycomb assembly out of the L-bracket to remove it.
3. Clean and dry the honeycomb.
4. After cleaning, reassemble in reverse order of removal.

**CLEANING STAINLESS STEEL
SURFACES**

Use non-abrasive cleaning materials, and always polish with grain of the steel. Use warm water or add a mild detergent to the water and apply with a cloth. Always wipe rails dry after wetting.

Use alkaline chlorinated or non-chlorine containing cleaners such as window cleaners and mild detergents. Do not use cleaners containing salts as this may cause pitting and rusting of the stainless steel finish. Do not use bleach.

Clean frequently to avoid build-up of hard, stubborn stains. A stainless steel cleaning solution may be used periodically to minimize scratching and remove stains. Rinse and wipe dry immediately after cleaning. Never use hydrochloric acid (muriatic acid) on stainless steel.

CLEANING 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.

CLEANING CONDENSATE PUMP AND HEATED EVAPORATION PANS

(for case with field-installed option)

ALWAYS DISCONNECT POWER AT THE MAIN CASE DISCONNECT BEFORE SERVICING THE EQUIPMENT.

These items are optional items and are not provided with the case.

- The condensate water outlet for the self-contained models empties into a limited capacity evaporation pan.
- Clean product spills immediately. If a product spill enters the Condensate Pump or Heated Evaporation Pans, a maintenance technician may be required to clean both the pump and heated pans.
- Clean case interior with a sponge or soft cloth, wetted with mild soap and water. Do not pour water from a bucket or hose into case drain. Water introduced during cleaning will cause the evaporation pan to overflow.
- Sediment and debris will clog the Condensate Pump and plastic tubing for water delivery to the Heated Evaporation Pans.
- The Condensate Pump and the Heated Evaporation Pans require regular monthly inspection. The Condensate Pump is located below the case bottom. The Heated Evaporation Pans are located on the case top. Evidence of excess water or odor is an indication that immediate service is required.
- It is recommended to clean the Condensate Pump and Heated Evaporation Pans with mild soap and water. Disconnect power before cleaning. Empty pump sump and heater pans of water before reapplying power.

WARNING

Evaporation Pan is Hot!
and poses risk of bodily injury
— Always wear gloves and protective eye wear when servicing condensate pump and heated evaporation pans. Turn off evaporation pan heater, and allow pan to cool before servicing.

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

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 or top rail.
2. Clean area.
3. Apply vinyl or car wax and polish surface for a smooth glossy finish.

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.

**Minimum Suggested Cleaning and Maintenance Frequency
with Separate TOP-MOUNTED Condensing Unit***

Case Component	Type of Scheduled Maintenance	Maintenance Frequency (Times / Year)*	Average Maintenance Duration (hours)*	Total Estimated Maintenance Time/Year (hours)
Evaporator Coil / Case Interior	Cleaning	1	2	2
Honeycomb	Cleaning	1	0.05	0.05
Return Air Grille	Cleaning	12	0.1	1.2
Drip Piping	Cleaning	6	0.1	0.6
Condenser Coil	Cleaning	4	0.1	0.4
Condensate Evaporation Pan	Cleaning	4	0.2	0.8
Condensate Evaporation Pan Heater	None	N/A	N/A	N/A
Condensate Pump	Cleaning	6	0.05	0.03
Compressor	None	N/A	N/A	N/A
Electromechanical Thermostats	Replacement	0.2	1	0.2
Compressor Power Relays	Replacement	0.2	1	0.2

***This table is provided for reference only.** The suggested maintenance frequency is the minimum required to reduce unexpected equipment failure. Performance and efficiency may be enhanced with more frequent cleaning. Individual cleaning schedules must take into account local environment and usage, as well as all applicable health codes.

SERVICE

REPLACING FAN MOTORS AND BLADES

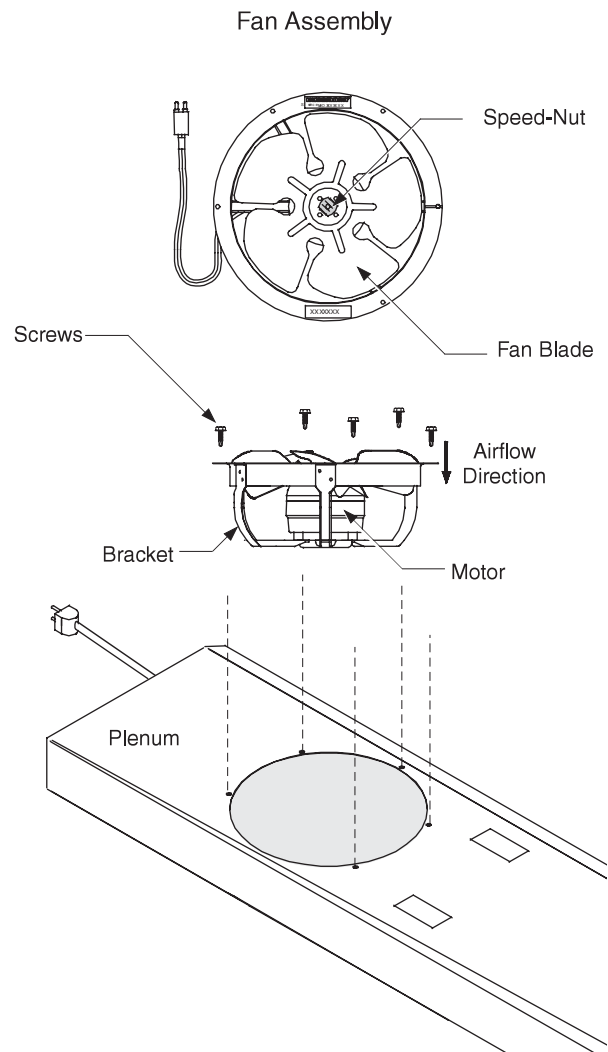
For access to these fans:

1. Turn off power.
2. Remove bottom display pans.
3. Disconnect fan from wiring harness.
4. Remove fan blade.
5. Lift fan plenum and remove screws holding bottom of motor to fan basket.
6. Replace fan motor and blade.
7. Lower fan plenum.
8. Reconnect fan to wiring harness.
9. Turn on power.
10. Verify that motor is working and blade is turning in the correct direction.
11. Close large air gaps under fan plenum.
Warmer air moving into refrigerated air reduces effective cooling. If the plenum does not rest against the case bottom without gaps, apply foam tape to the bottom of the fan plenum to reduce improper air movement, however defrost water should not be blocked by fan plenum. Do NOT seal fan plenum so that water can not drain.
12. Replace display pans. Bring merchandiser to operating temperature before restocking.

Husmann recommends against frame heater cycling with *Innovator* doors to prevent door seals from freezing to the frames and tearing.

! WARNING

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 fans, heaters, thermostats and lights.



! WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.



WARNING

Product will be degraded and may spoil if allowed to sit in a non-refrigerated area.

REPLACING ELECTRIC DEFROST HEATERS

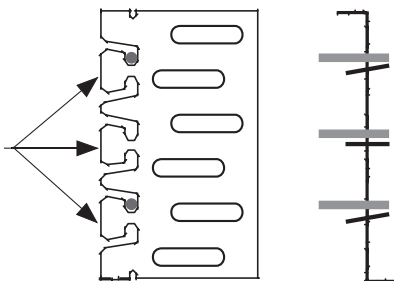
Electric defrost requires a heater on the front and rear of the coil as shown. The heaters are held in place by tabs in the coil brackets.

Defrost Heater

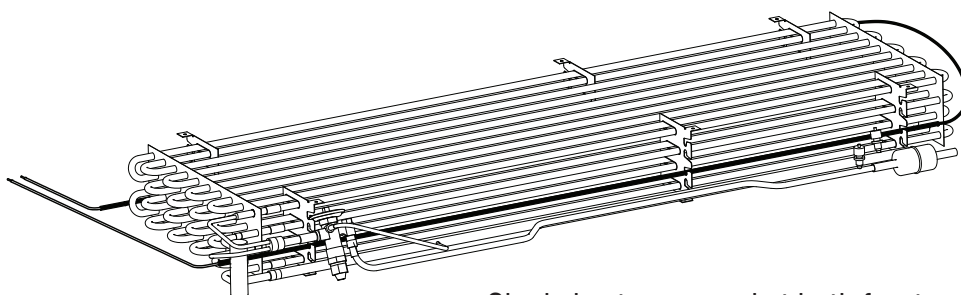
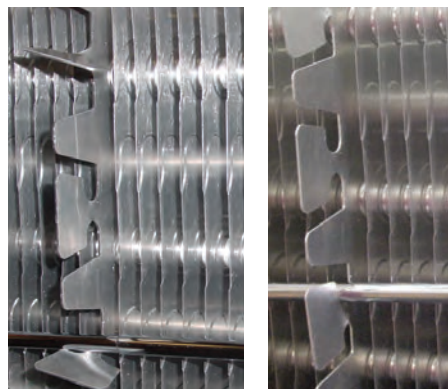
1. Disconnect power.
2. Remove deck pans.
3. Take out screws (qty 2) securing the side coil covers to coil baffles.

Electric Defrost

Bend Tabs on Each Bracket to Release or Secure Heaters



4. Slide the coil forward to gain access to rear heater.
5. Remove clips holding heater to coil tube.
6. Remove heater from slots in coil bracket.
7. Position new heater in slots and replace clips
8. Slide coil back to original position and replace the securing screws.
9. Turn on power.
10. Verify the heater is working correctly.
11. Replace display pans. Bring merchandiser to operating temperature before restocking.



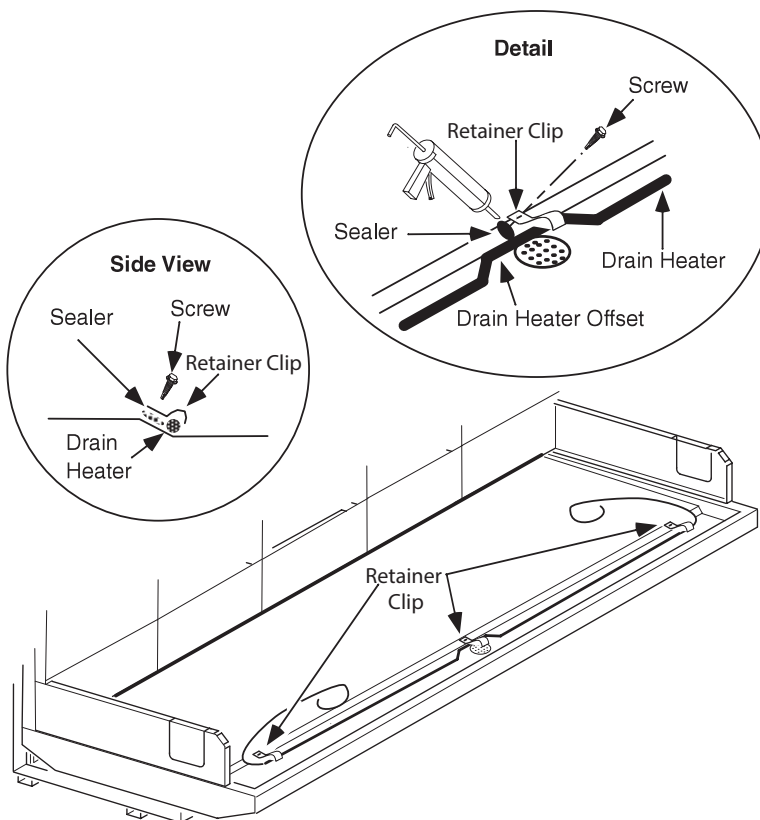
Single heater secured at both front and back of coil

REPLACING DRAIN PAN HEATER — ELECTRIC AND GAS DEFROST (Low Temperature Only)

The drain pan heater is located as shown below.

Remove Drain Pan Heater

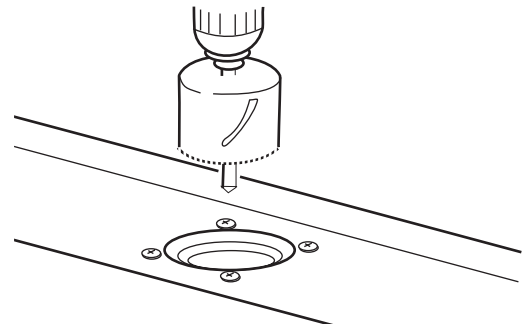
1. Disconnect power.
2. Pull heater out from under retainer clips.
3. Position new heater under retainer clips.
Be sure offset is properly positioned around the drain.
4. Reconnect power.
5. Verify that heater is working correctly.



REPLACING DAMAGED DRAIN FITTING (OPTIONAL)

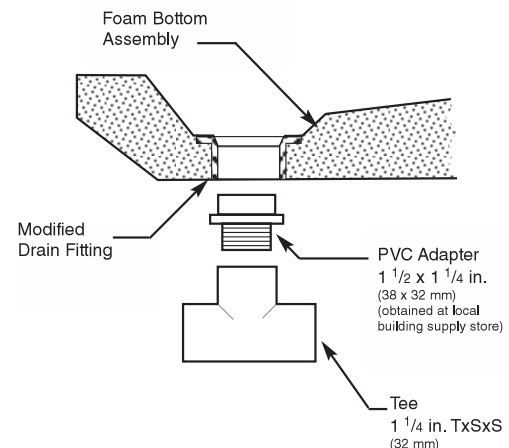
The following procedure is for the field repair of a broken drain fitting.

1. Use a drill with a 1 7/8-inch (48 mm) hole saw to drill out the bottom of the drain fitting. Be sure to drill completely through fitting and bottom liner.



Drain Fitting Viewed from Inside Case

2. Insert adapter into drain fitting. **Do NOT use thread sealer on ABS drain fitting. If sealer is used the ABS drain fitting may crack or leak!** (Tee should be tightened no more than 4 turns.) Do not overtighten threads.



Do NOT use Thread Sealer on Drain Fitting!

End Section View

REPAIRING ALUMINUM COIL

The aluminum coils used in Hussmann merchandisers may be easily repaired in the field. Materials are available from local refrigeration wholesalers.

Hussmann recommends the following solders and technique:

Solders

Aladdin Welding Products Inc.
P.O. Box 7188
1300 Burton St.
Grand Rapids, MI 49507
Phone: 1-800-645-3413
Fax: 1-800-645-3414

X-Ergon
1570 E. Northgate
P.O. Box 2102
Irving, TX 75062
Phone: 1-800-527-9916

NOTE:

Hussmann Aluminum melts at 1125°F (607°C)

Aladdin 3-in-1 rod at 732°F (389°C)

X-Ergon Acid core at 455°F (235°C)

Technique:

1. Locate Leak.
2. REMOVE ALL PRESSURE.
3. Brush area UNDER HEAT.
4. Use PRESTOLITE TORCH ONLY.
Number 6 tip.
5. Maintain separate set of stainless steel brushes and USE ONLY ON ALUMINUM.
6. Tin surface around area.
7. Brush tinned surface UNDER HEAT, thoroughly filling the open pores around leak.
8. Repair leak. Let aluminum melt solder, NOT the torch.
9. Don't repair for looks. Go for thickness.
10. Perform a leak check.
11. Wash with water.
12. Cover with a good flexible sealant.

WARNING

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 fans, heaters, thermostats and lights.

OPTIONAL DRIP PIPING

WASTE OUTLET AND WATER SEAL

Drip piping must be installed for cases without evaporation pans. Drip piping is located between the front merchandiser base and the splashguard fixture and runs parallel to the merchandiser (see Data Sheet for exact locations).

INSTALLING DRIP PIPING

Poorly or improperly installed drip pipes can seriously interfere with the merchandiser's operation and result in costly maintenance and product losses. Please follow the recommendations listed below when installing drip pipes to ensure proper installation.

- Never use drip piping smaller than the nominal diameter of the pipe or water seal supplied with the merchandiser.
- When connecting drip piping, the *water seal* must be used as part of the drip piping to prevent air leakage or insect entrance. Never use two water seals in series in any one drip pipe. **DOUBLE WATER SEALS IN SERIES WILL CAUSE AN AIR LOCK AND PREVENT DRAINING.**
- Pitch the drip piping in the direction of flow. There should be a minimum pitch of 1/4 in. per ft (20 mm per 1 m).
- Avoid long runs of drip piping. Long runs make it impossible to provide the pitch necessary for good drainage.

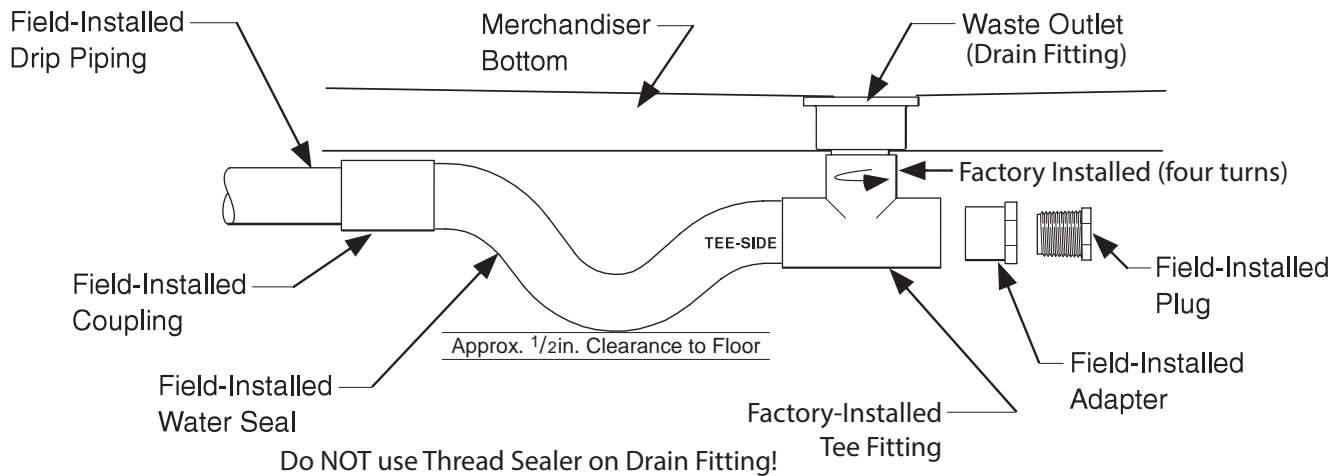
CAUTION

Splashguard *brackets* MUST be installed before piping merchandiser.

- Provide a suitable air break between flood rim of the floor drain and outlet of drip pipe. To meet code on low base merchandisers, it may be necessary to install a field-supplied drip pipe reducer. An alternative is to cut the last section of drip pipe at an angle.

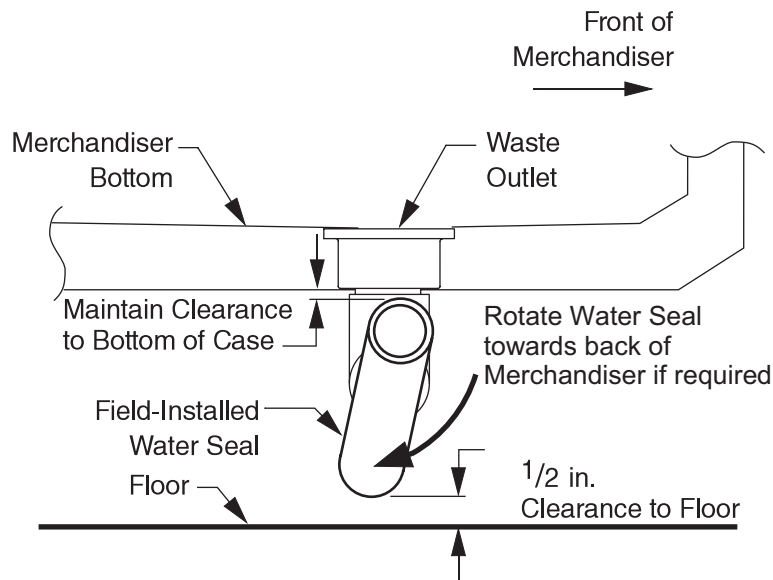


- Prevent drip pipes from freezing sweating or freezing:
 - A. Do NOT install drip pipes in contact with uninsulated suction lines. Suction lines should be insulated with a non-absorbent insulation material.
 - B. Where drip pipes are located in dead air spaces, such as between merchandisers or between a merchandiser and a store wall, provide means to prevent drip pipe from sweating. External ventilation fans may be required to prevent sweating.



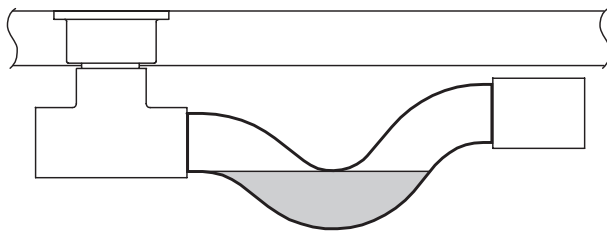
1. Tee is factory-installed. If adjustment is necessary, tighten factory-installed tee no more than $\frac{1}{4}$ turn. Do not overtighten threads, or the drain fitting or tee may become damaged.
2. **Do NOT use thread sealer on ABS drain fitting. If sealer is used the ABS drain fitting may crack or leak!** (If a tee needs to be installed it should be tightened no more than 4 turns.) Do not overtighten threads.
3. Dry fit the supplied water seal / trap to ensure approximately $\frac{1}{2}$ in. of clearance from the bottom of the trap to the floor as shown.

NOTE: It may be necessary to rotate water seal (trap) inside the tee a few degrees to ensure clearance at two locations. There must be clearance 1) between the bottom of the water seal and the floor, and 2) between the top of the water seal outlet and the bottom of the merchandiser. Do not over-rotate or gravity seal may be compromised. Always rotate trap bottom toward merchandiser support rail.

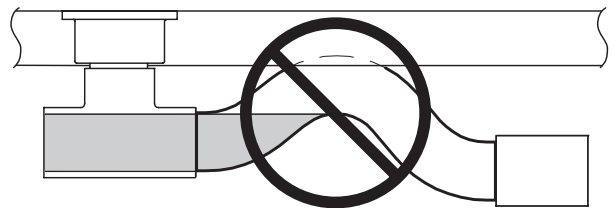


4. Install remaining PVC drain parts using recommended PVC cleaner, primer and cement per manufacturer's recommendations.
5. Thread plug into the adapter until snug but not to exceed four full rotations.
6. Installed drip piping may require additional support depending on the number and location of the hub floor drains. The installer should always provide adequate support to all drip piping arrangements to prevent excess stress on all drip piping components. The installer must provide additional support when "evac" type waste water systems are applied.

It is the installing contractor's responsibility to consult local agencies for local code requirements.



**Water Seal
Correct**



**Water Seal
NOT Correct**



HUSSmann®

**To obtain warranty information
or other support, contact your
Hussmann representative.
Please include the model and
serial number of the product.**