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CORPORATION

RCA, RCVA*
RFA and RFVA*

Low Temperature Reach-in Merchandisers

*Only Draft Copy Data Available At This Time.

INSTALLATION / SERVICE INSTRUCTIONS

P/N 332397K
September, 1993

CONTENTS

REVISION CHANGES ("C")

1. Added Vertical Lighting Models RCVA and RFVA, Page 1-1.
2. Changed Cross Section, Page 1-2
3. New Cross Section, Page 1-3.
4. Serial Plate Amperage, Page 4-2.
5. Electrical Schematic, Page 4-6.
6. Servicing Vertical Lighting, Page 6-4.

IMPORTANT
KEEP IN STORE FOR FUTURE REFERENCE
Quality that sets industry standards

This merchandiser conforms to the
Commercial Refrigeration Manufacturer's Association
Health and Sanitation Standard
CRS-S1-86

HUSSMANN® 12999 St. Charles Rock Road • Bridgeton, MO 63044 USA • (314) 291-2000 •FAX (314) 298-4767

REPLACEMENT PARTS LIST

Refer to door manufacturer's manual for replacement part numbers of mullion, door frame, perimeter anti-sweat heaters and vertical lighting.

Item	Part Number	Description	Used on
		Fans	
1.	0138119	Fan Motor, Evaporator, 120V, 25W, CW EMS ESPL 25 EMV 16	Ice Cream
	0047000	Fan Motor, Evaporator, 120V, 9W, CW GE #5KSM51ECG3799	Frozen Food
2.	0135659	Fan Blade, Evaporator, embossing toward motor Torrington #JU850-6, CW	Ice Cream
	0315470	Fan Blade, Evaporator, part number toward motor Thorgen #8CW34 (plastic)	Frozen Food
		Electric Defrost Heaters	
3.	0331741	Rear Finned Defrost Heater 208V, 8.5A, 24Ω	2 Door
	0331742	Rear Finned Defrost Heater 208V, 14.2A, 15Ω	3 Door
	0331743	Rear Finned Defrost Heater 208V, 17.6A, 12Ω	4 Door
	0331744	Rear Finned Defrost Heater 208V, 21.6A, 10Ω	5 Door
4.	0338328	Front Pan Heater-Rod, 208V, 0.5A, (2 required)	2 Door
	0338329	Front Pan Heater-Rod, 208V, 0.8A, (2 required)	3 Door
	0338330	Front Pan Heater-Rod, 208V, 1.1A, (2 required)	4 Door
	0338331	Front Pan Heater-Rod, 208V, 1.4A, (2 required)	5 Door
		Gas Defrost Pan Heaters	
5.	0338314	Front Pan Heater 120V 1.1A, (2 required)	2 Door
	0338304	Rear Pan Heater 120V 1.5A, (2 required)	
	0338315	Front Pan Heater 120V 1.6A, (2 required)	3 Door
	0338305	Rear Pan Heater 120V 2.0A, (2 required)	
	0338316	Front Pan Heater 120V 2.2A, (2 required)	4 Door
	0338306	Rear Pan Heater 120V 2.6A, (2 required)	
	0338317	Front Pan Heater 120V 2.8A, (2 required)	5 Door
	0338307	Rear Pan Heater 120V 3.2A, (2 required)	

Item	Part Number	Description	Used on
		Defrost Relays and Thermostats	
6.	0342599	Relay-SPST, 208V Coil	Electric
7.	0342598	Relay-SPDT, 120V Coil	Electric and Gas
8.	0338130	Thermostat-Relay Control, ±5°F Closes 35°/Opens 20°F (Pilot Duty only)	Electric and Gas
9.	0344662	Thermostat-Heater Limit, Closes 54°, ±3°F/Opens 90°, ±6°F	Electric and Gas
10.	0331798	Defrost Termination Thermostat Closes 54°, ±3°F/Opens 24°, ±6°F	Electric
		Refrigeration Controls	
11.	0113625	Refrigeration Thermostat Penn #A19AGD-21	Electric and Gas
		Horizontal Lighting	
12.	0137843	Ballast 2 lamps, Advance #RS2S110TP	3 Door
	0147091	Ballast 2 lamps, Advance #RC2S85TP	2, 4 and 5 Door
13.	0254418	Fluorescent Lamp, F84T12 CW HO	3 Door
	0119500	Fluorescent Lamp, F60T12 CW HO	2 and 4 Door
	0137847	Fluorescent Lamp, F72T12 CW HO	5 Door
		Vertical Lighting	
14.	0371548	Electronic Ballast, 2 lamp	3 Door
	0371549	Electronic Ballast, 1 Lamp	All
15.	0371550	Fluorescent Lamp, F040W-T8 60 inch	All

GENERAL INFORMATION

MODEL DESCRIPTIONS

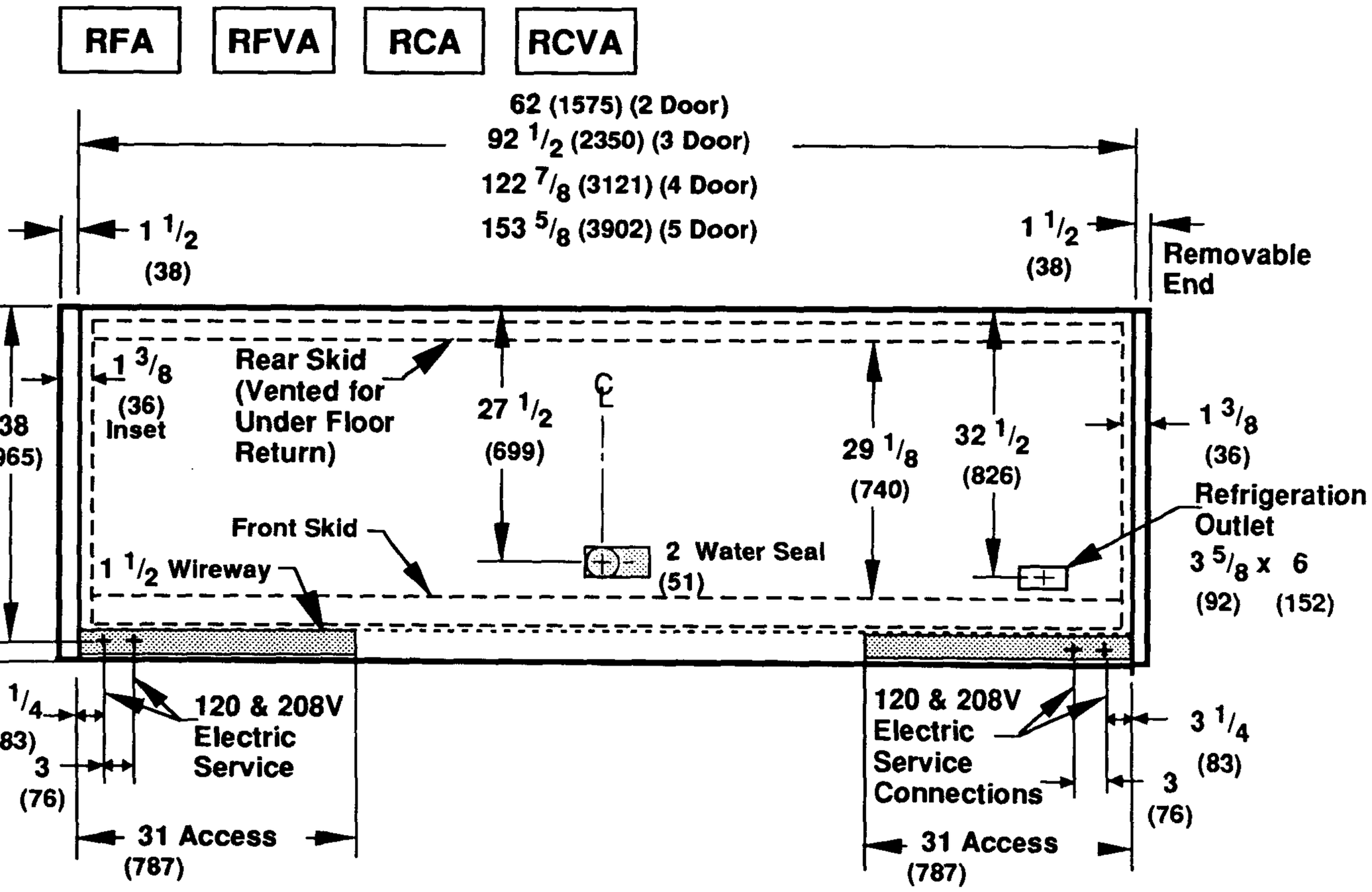
This instruction covers the merchandisers listed below. Basic design features are listed to the right of each merchandiser. You must specify right- or left-hand door swing. For example, a RFA4R is a frozen food merchandiser with four doors; each hinged on the right.

RFA	Reach-in, Frozen Food 2, 3, 4, or 5 Doors
RFVA	Reach-in, Frozen Food with vertical lighting 2, 3, 4, or 5 Doors
RCA	Reach-in, Ice Cream 2, 3, 4, or 5 Doors
RCVA	Reach-in, Ice Cream with vertical lighting 2, 3, 4, or 5 Doors

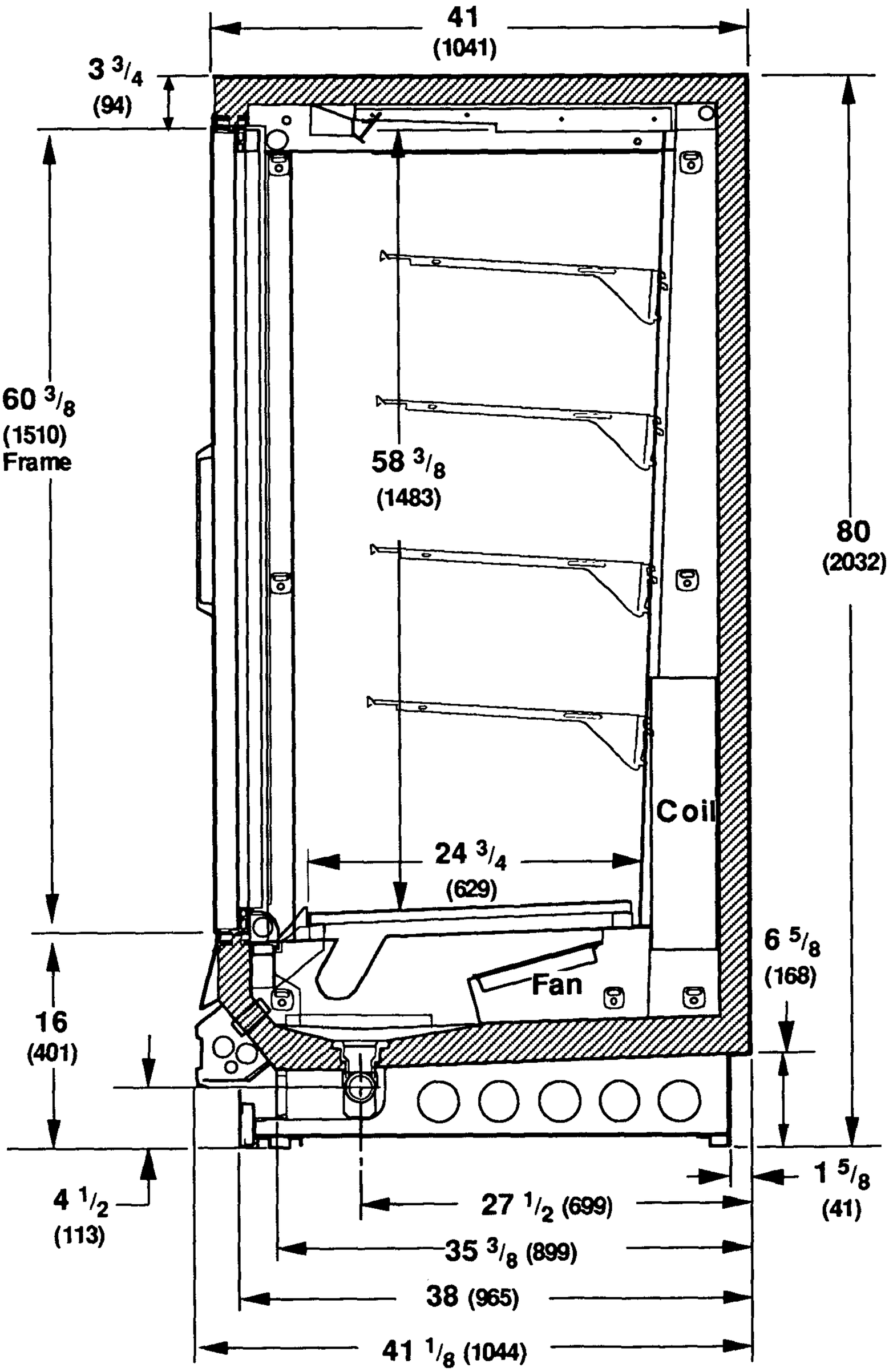
APPLICATION

These low temperature merchandisers are designed for displaying frozen food and ice cream in air conditioned stores where temperature and humidity are maintained at or below 75°F dry bulb temperature and 55% relative humidity.

NOTE: Plan view and cross section measurements are given in inches and in millimeters.



RCA RFA


41
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3 3/4
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Frame
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Coil
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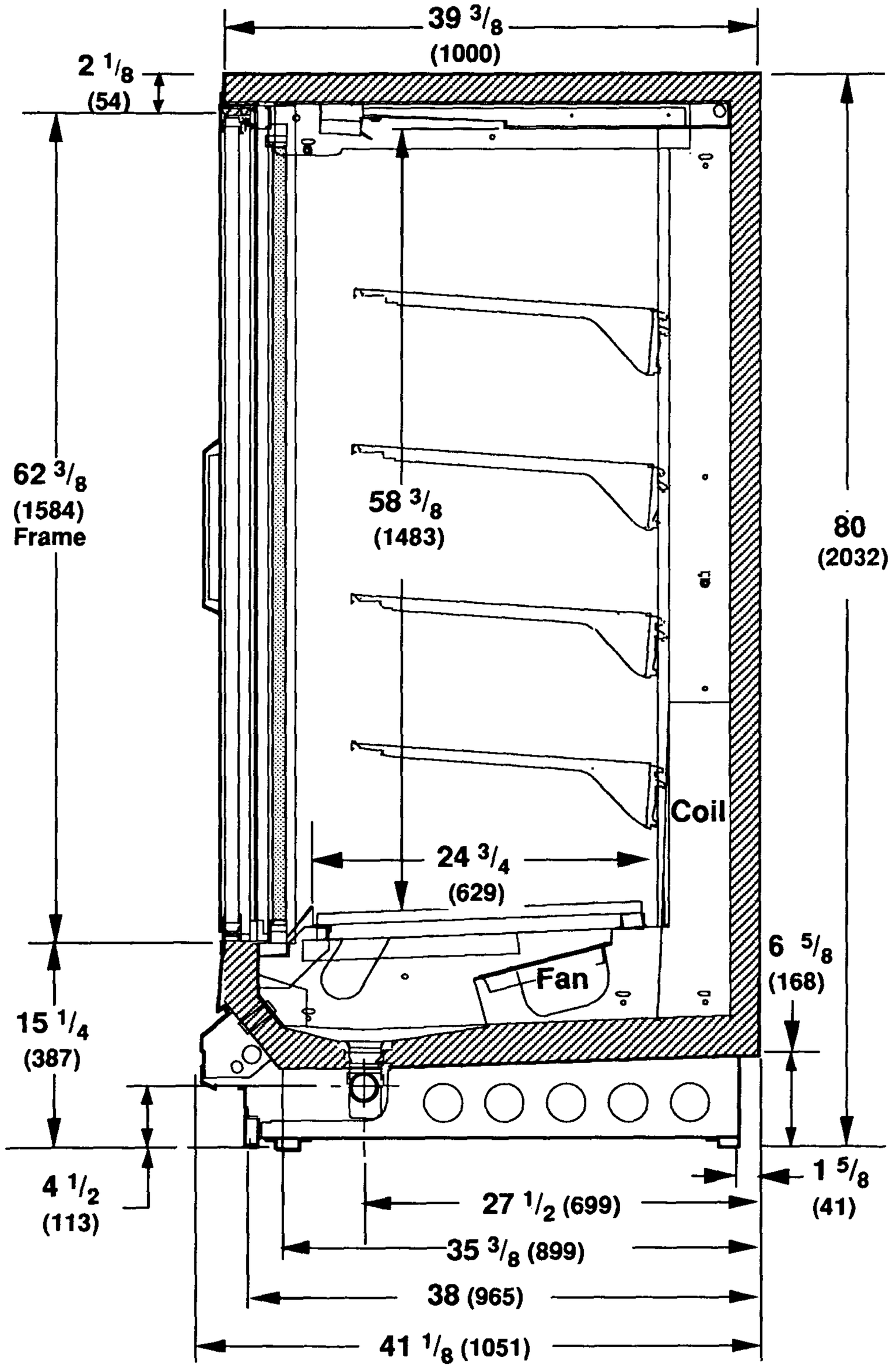
(629)
Fan
6 5/8
(168)
16
(401)
4 1/2
(113)
1 5/8
(41)
27 1/2 (699)
35 3/8 (899)
38 (965)
41 1/8 (1044)

RCVA **RFVA**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(1000)
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62 3/8
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Frame
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80
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Coil
24 3/4
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Fan
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15 1/4
(387)
4 1/2
(113)
1 5/8
(41)
27 1/2 (699)
35 3/8 (899)
38 (965)
41 1/8 (1051)

INSTALLATION

SHIPPING DAMAGE

All equipment should be thoroughly examined for shipping damage before and during unloading.

This equipment has been carefully inspected at our factory and the carrier has assumed responsibility for safe arrival. If damaged, either apparent or concealed, claim must be made to the carrier.

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.

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.

LOCATION

Like other merchandisers, these are sensitive to air disturbances. Air currents passing around the merchandisers will seriously impair their operation. Do NOT allow air conditioning, electric fans, open doors or windows, etc. to create air currents around merchandisers.

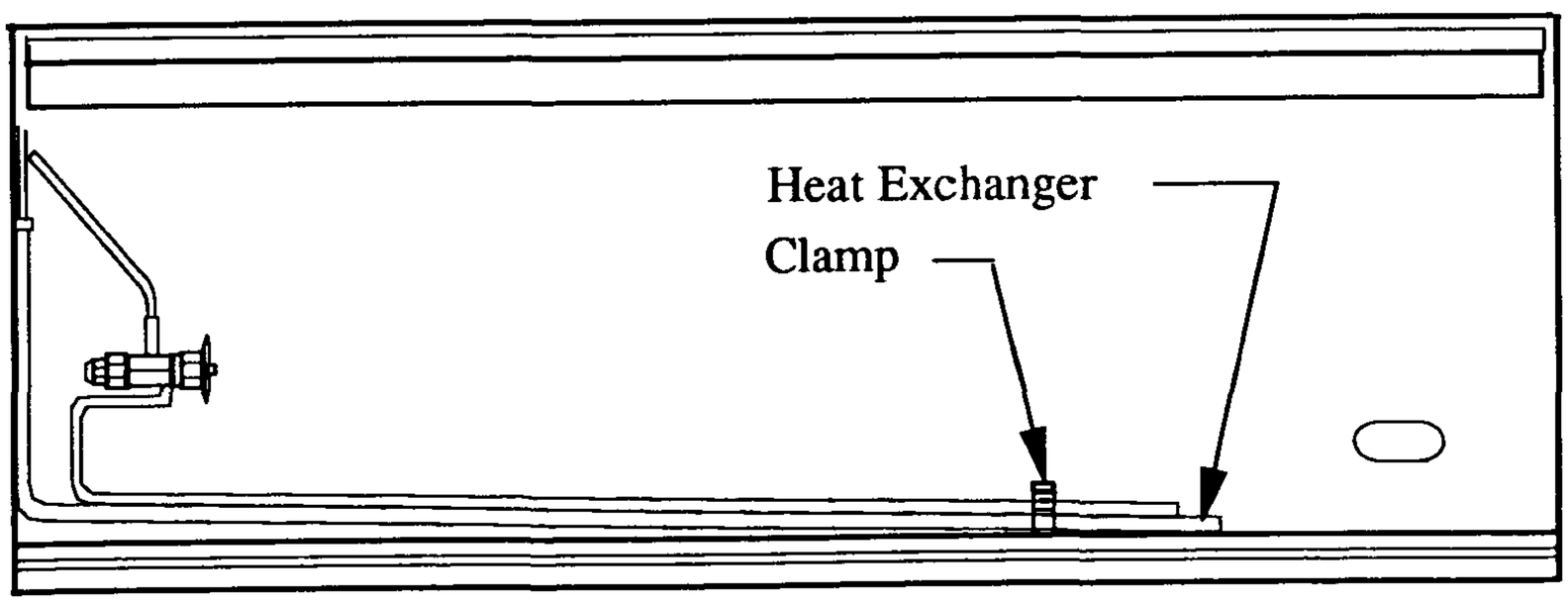
To prevent sweating on the exterior surfaces of merchandisers, there must be A MINIMUM CLEARANCE OF 4 INCHES between the merchandisers and other fixtures or walls.

SHIPPING BRACES

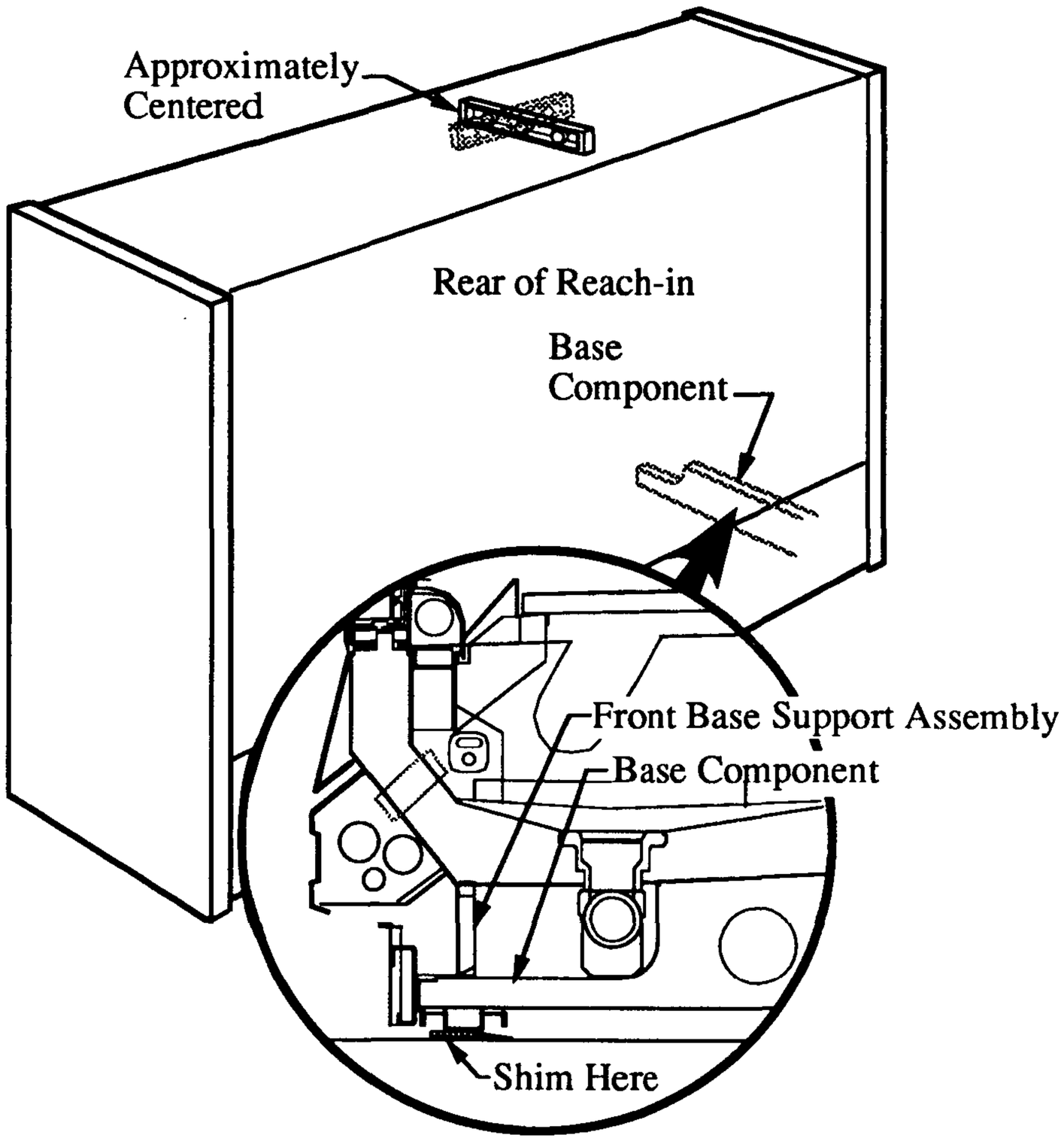
Move the merchandiser as close as possible to its permanent location and then remove all packaging. Check for damage before discarding packaging. Remove all separately packed accessories such as kits and shelves.

> **NOTE:** 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. THEREFORE, BE SURE TO REPLACE THESE BOLTS WITH CAP SCREWS.

Locate the clamp on the right-hand end of the heat exchanger (see illustration), and remove it before piping the merchandiser. This clamp was installed to minimize shipping vibration.



Top View of Merchandiser



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. 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.

DOOR ADJUSTMENT

After leveling and joining the merchandisers, adjust and level doors according to manufacturer's instructions shipped with each product. The doors are not fine adjusted at the factory since they will go out of adjustment 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. Joint kits and instructions are shipped with each merchandiser.

To join like fixtures, a joint assembly is required. To join unlike fixtures, or like fixtures operating at different temperatures, a 1 $^1/_2$ inch partition kit is required. To join same temperature fixtures on different defrost cycles, a plexiglass partition kit is required. ALL JOINTS MUST BE AIR-TIGHT TO PREVENT FORMATION OF ICE OR CONDENSATION.

WASTE OUTLET AND WATER SEAL

The waste outlet is located at the center of each merchandiser allowing drip piping to be run under the fixture lengthwise, to the front or to the rear.

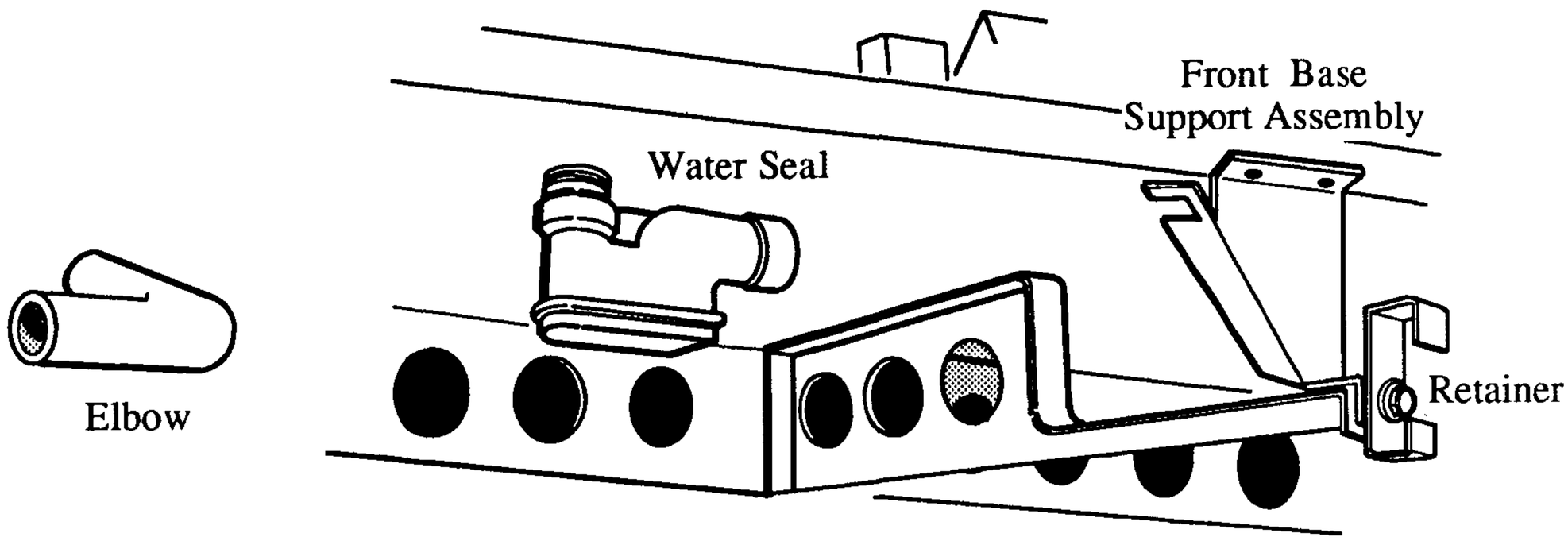
A 2 inch water seal is supplied with each fixture. The water seal must be installed to prevent air leakage and insect entrance into the fixture. See illustration.

NOTE: PVC–DWV solvent cement is recommended. Follow the manufacturer's instructions.

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.

1. Never use drip piping smaller than the nominal diameter of the pipe or water seal supplied with the merchandiser.
2. 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.**
3. Pitch the drip piping in the direction of flow. There should be a minimum pitch of $^1/_8$ inch per foot.
4. Avoid long runs of drip piping. Long runs make it impossible to provide the pitch necessary for good drainage.
5. Provide a suitable air break between flood rim of the floor drain and outlet of drip pipe.
6. Prevent drip pipes from freezing:
   A. Do NOT install drip pipes in contact with uninsulated suction lines. Suction lines should be insulated with a nonabsorbent 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 freezing.



NOTE: Only one of the front support brackets may be removed at a time for field piping. If one is removed, it must be reinstalled exactly as it was originally to maintain the structural integrity of the case.

INSTALLING SPLASHGUARDS

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, install the splashguards. The leveling brackets have a maximum extension of one (1) inch for uneven floors.

1. Loosely assemble the splashguard and the lower kick rail with #8 x $^1/_2$ sheet metal screws.

2. Hook the lip on the top edge of the kick rail to the bottom lip on the bumper extrusion, and swing assembly into place.

3. With the splashguard positioned on the floor, tighten the sheet metal screws to hold the assembly in place.

SEALING SPLASHGUARDS TO FLOOR

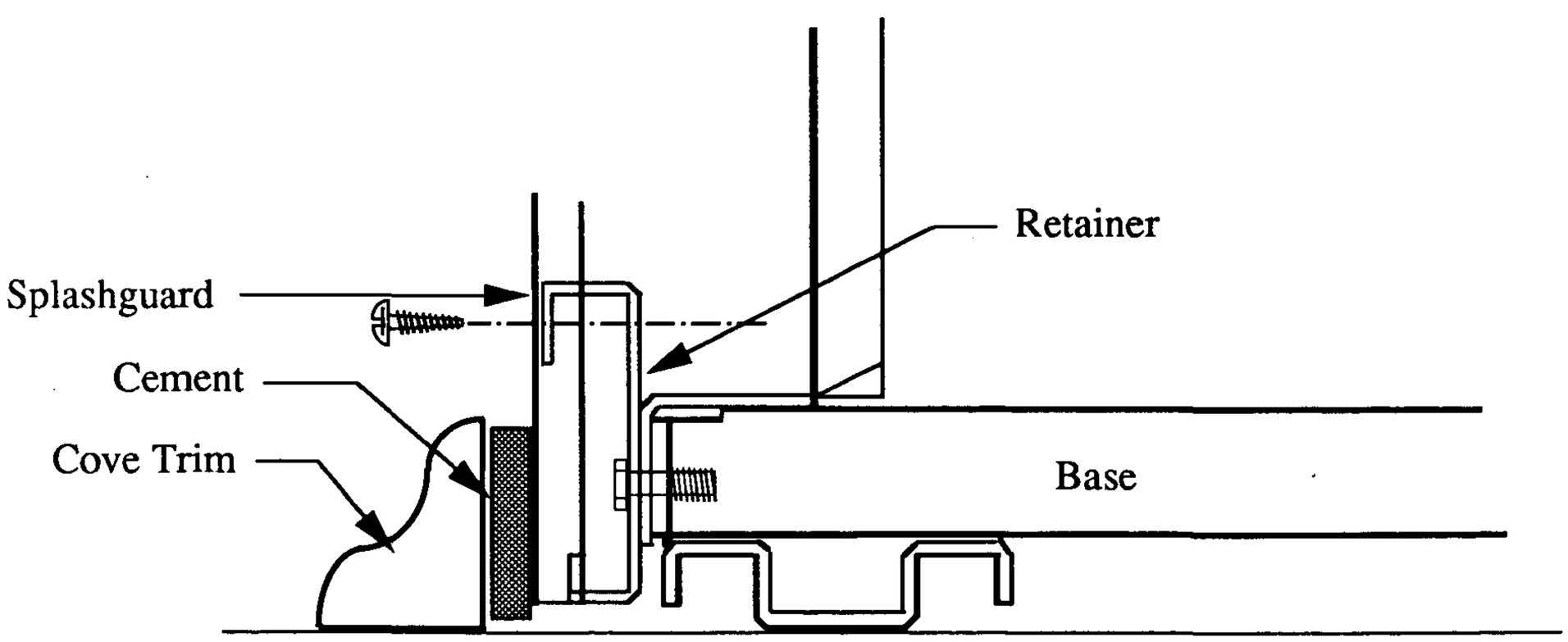
IF REQUIRED by local sanitation codes or if desired by the customer, the splashguards may be sealed to the floor using a vinyl cove base trim. The size of trim needed will depend on how much the floor is out of level.

To install the trim to the splashguard:

1. 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.

2. Apply a good contact cement to the trim and allow proper drying time according to the directions supplied with the cement.

3. Install the trim to the splashguard so that it is lying flush with the floor.



REFRIGERATION

REFRIGERANT

The correct type of refrigerant will be stamped on each merchandiser's serial plate which is located on the left-hand end of the interior top liner.

REFRIGERANT PIPING

Connection Sizes

Liquid Line	$^3/_8$ inches OD
Suction Line	$^7/_8$ inches OD

Connection Location

The refrigerant line connections are at the right-hand end of the merchandiser (as viewed from the front) beneath the display pans.

After connections have been made, seal this outlet thoroughly. Seal both the inside and the outside. We recommend using an expanding polyurethane foam insulation.

Multiplexing

Piping of merchandisers operating on the same refrigeration system may be run from merchandiser to merchandiser through the end frame saddles provided for this purpose. **DO NOT RUN REFRIGERANT LINES THROUGH MERCHANDISERS THAT ARE NOT ON THE SAME REFRIGERATION SYSTEM** as this may result in poor refrigeration control and compressor failure.

NOTE: If Gas defrost is used, the liquid line will need to be increased two sizes larger inside the merchandiser area. This is necessary to ensure even liquid drainage from all evaporators during defrost.

Line Sizing

Refrigerant lines should be sized as shown on the refrigeration legend that is furnished for the store (not furnished by Hussmann). If a legend has not been furnished, refer to either the Hussmann Conventional or Systems Application Manual for guidance.

Oil Traps

P-traps (oil traps) must be installed at the base of all suction line vertical risers.

Pressure Drop

Pressure drop can rob the system of capacity. To keep the pressure drop to a minimum, keep the refrigerant line run as short as possible using a minimum number of elbows. Where elbows are required, USE LONG RADIUS ELBOWS ONLY.

INSULATION

With GAS Defrost

The suction and liquid lines should NOT contact each other and should be insulated separately for a minimum of 30 feet from the merchandiser.

With OTHER Than Gas Defrost

The suction and liquid lines should be clamped or taped together and insulated for a minimum of 30 feet from the merchandiser.

With EITHER of Above

Additional insulation for the balance of the liquid and suction lines is recommended wherever condensation drippage is objectionable or the lines are exposed to ambient conditions.

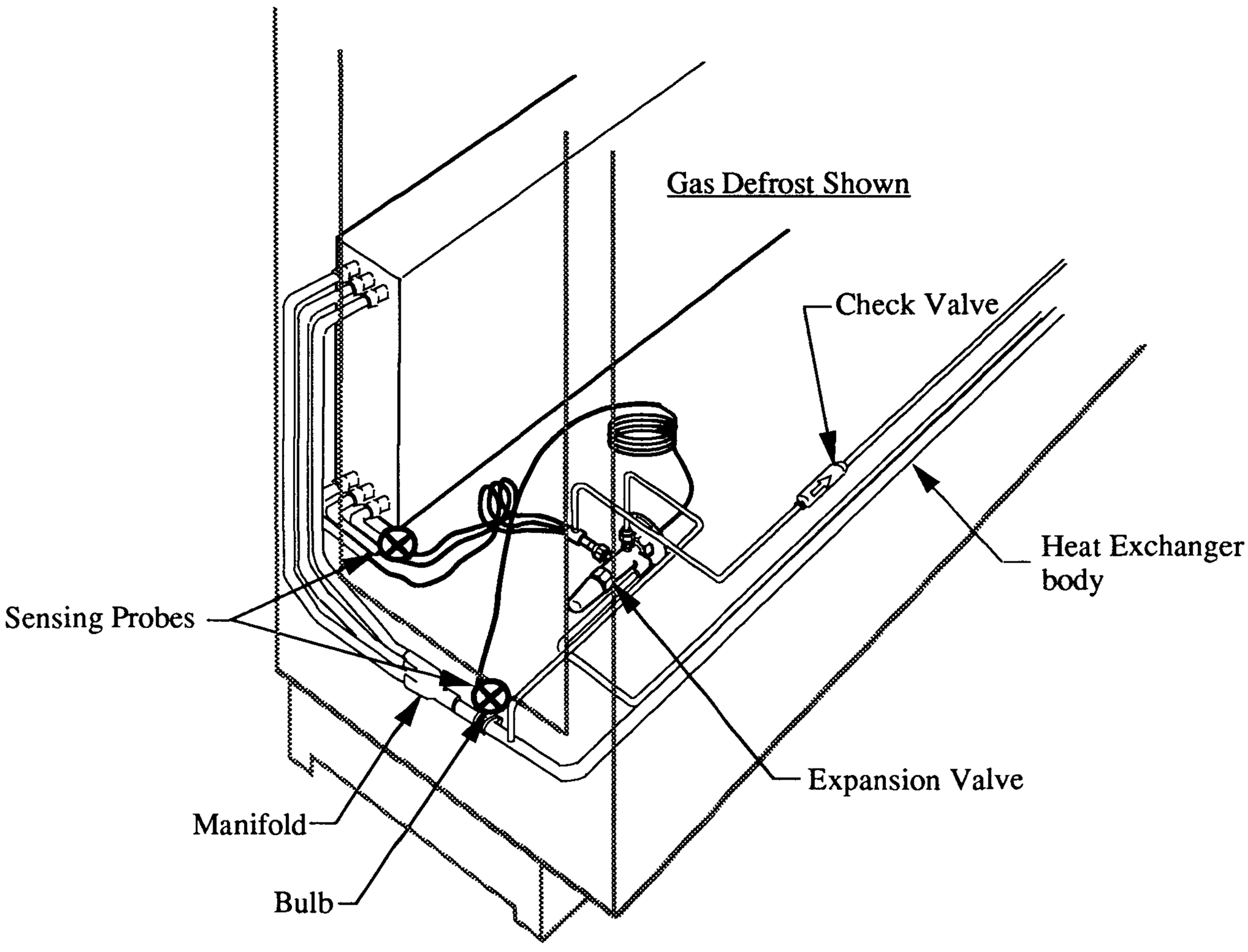
EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to fully feed the evaporator. 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°F of its expected operating temperature. Adjust valves as follows.

Attach two (2) 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 (see illustration).

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°F.** With this adjustment, during a portion of the hunting the temperature difference between the probes will be less than 3°F (at times as low as 0°F). Make adjustments of no more than $^1/_4$ turn for Balanced Port TEV and $^1/_2$ turn for "G" Body TEV at a time. Wait for at least 15 minutes before rechecking the probe temperature and making further adjustments.

NOTE: Gas Defrost has coil inlet at the bottom as shown. Electric Defrost has coil inlet at the top.



REFRIGERATION THERMOSTAT

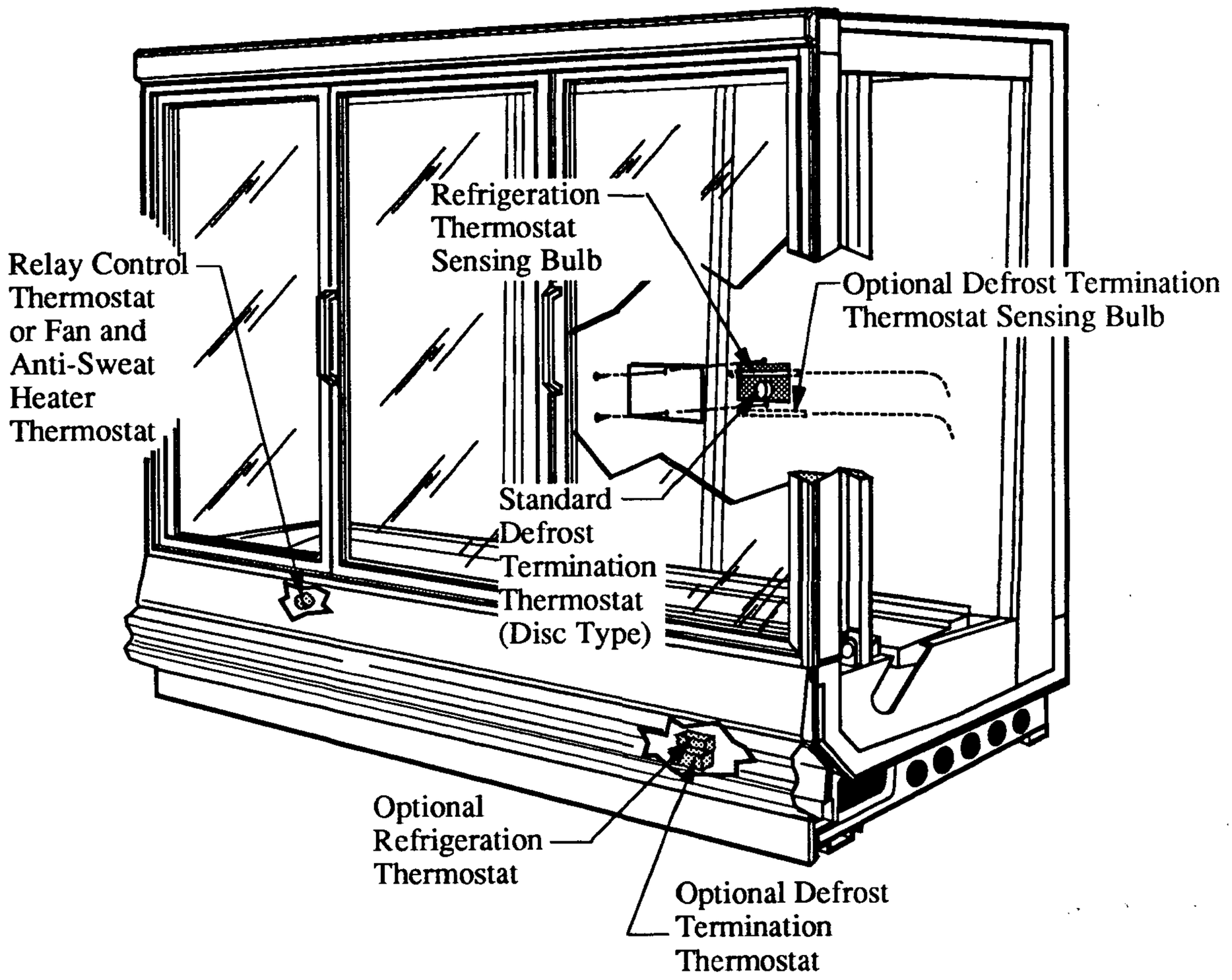
Factory installation of optional thermostat is shown below. The thermostat body is located in the electrical raceway at the right-hand end of the merchandiser. Its sensing bulb is fastened behind an access panel located on the inside back of the merchandiser.

CDA SENSOR

Factory installed optional CDA sensor is located where the thermostat bulb would normally be located. Its leads will be routed through the electrical raceway and to the rack control panel. Leads are tagged in the raceway.

DEFROST TERMINATION THERMOSTAT

The defrost termination thermostat is located behind the access panel on the inside back. If an optional variable thermostat is used its components will parallel the refrigeration thermostat's.



CONTROL SETTINGS

Conventional Single Compressor

Measure Discharge Temperature
at the center of the case
at the discharge honeycomb.

Merchandiser temperature must be controlled by a thermostat with a 3–6°F differential. It will be wired to control the compressor motor contactor.

Standard Electric defrost is temperature terminated. The defrost termination thermostats for all the merchandisers on one compressor are wired in series. Failsafe must not control defrost cycle length, especially when less than 208V power supply is used for defrost heaters, or if frost build up is heavy from shopping demands.

On outdoor units the defrost timer will control a liquid line solenoid beginning a defrost pumpdown 4 minutes before defrost.

Optional Gas defrost is temperature terminated and has fan cycling thermostat. The defrost frequency and lengths listed may require adjustment for specific store conditions. Factors include:

- Store temperature and humidity
- Low head pressure
- Long refrigerant line runs
- Seasonal changes
- Merchandiser temperature lower than recommended

When practical, defrost when store is closed.

Low pressure control settings are applicable to outdoor condenser units where ambient does not fall below 0°F.

Refrigeration Data

	Frozen Food	Ice Cream
Discharge Air °F	-5	-12
Evaporator °F	-11	-19
Fan Cycling CI/CO		
Gas Defrost ONLY °F	20/35	20/35

Defrost Data

Frequency Hrs	24	24
Electric		
Temp Term °F	54	54
Failsafe Min	40	40
Gas		
Temp Term °F	54	54
Failsafe Min	20	20
Offtime		
Failsafe Min	N/A	N/A
When Thermostat Controls Temperature		
Low Pres Backup Control CI/CO (PSIG)		
R-22	11/1	7/0
R-502	17/7	11/1

Parallel Compressor Rack

Measure Discharge Temperature
at the center of the case
at the discharge honeycomb.

Merchandiser temperature must be controlled by a CDA or EPR. The CDA sensor will be mounted in the same location as a thermostat sensing bulb. The CDA valve and control board will be mounted on the rack.

Standard Electric defrost is temperature terminated. Failsafe must not control defrost cycle length, especially when less than 208V power supply is used for defrost heaters, or if frost build up is heavy from shopping demands.

Optional Gas defrost is time terminated and has fan cycling thermostat. The defrost frequency and lengths listed may require adjustment for specific store conditions. Factors include:

Store temperature and humidity
Low head pressure
Long refrigerant line runs
Seasonal changes
Merchandiser temperature lower than recommended

Stagger defrosts to maintain stable compressor loading and sufficient defrost gas. When practical, defrost when store is closed.

Refrigeration Data	Frozen Food	Ice Cream
Discharge Air °F	-5	-12
Evaporator °F	-11	-19
Fan Cycling CI/CO		
Gas Defrost ONLY °F	20/35	20/35
Defrost Data		
Frequency Hrs	24	24
Electric		
Temp Term °F	54	54
Failsafe Min	40	40
Gas		
Temp Term °F	N/A	N/A
Duration Min	20	20
Offtime		
Failsafe Min	N/A	N/A

ELECTRICAL

CONNECTIONS

All wiring must be in compliance with NEC and local codes. All electrical connections are to be made in the electrical raceway behind the kick rail at the right-hand end of the merchandiser (facing front).

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 raceway.

WIRING COLOR CODE

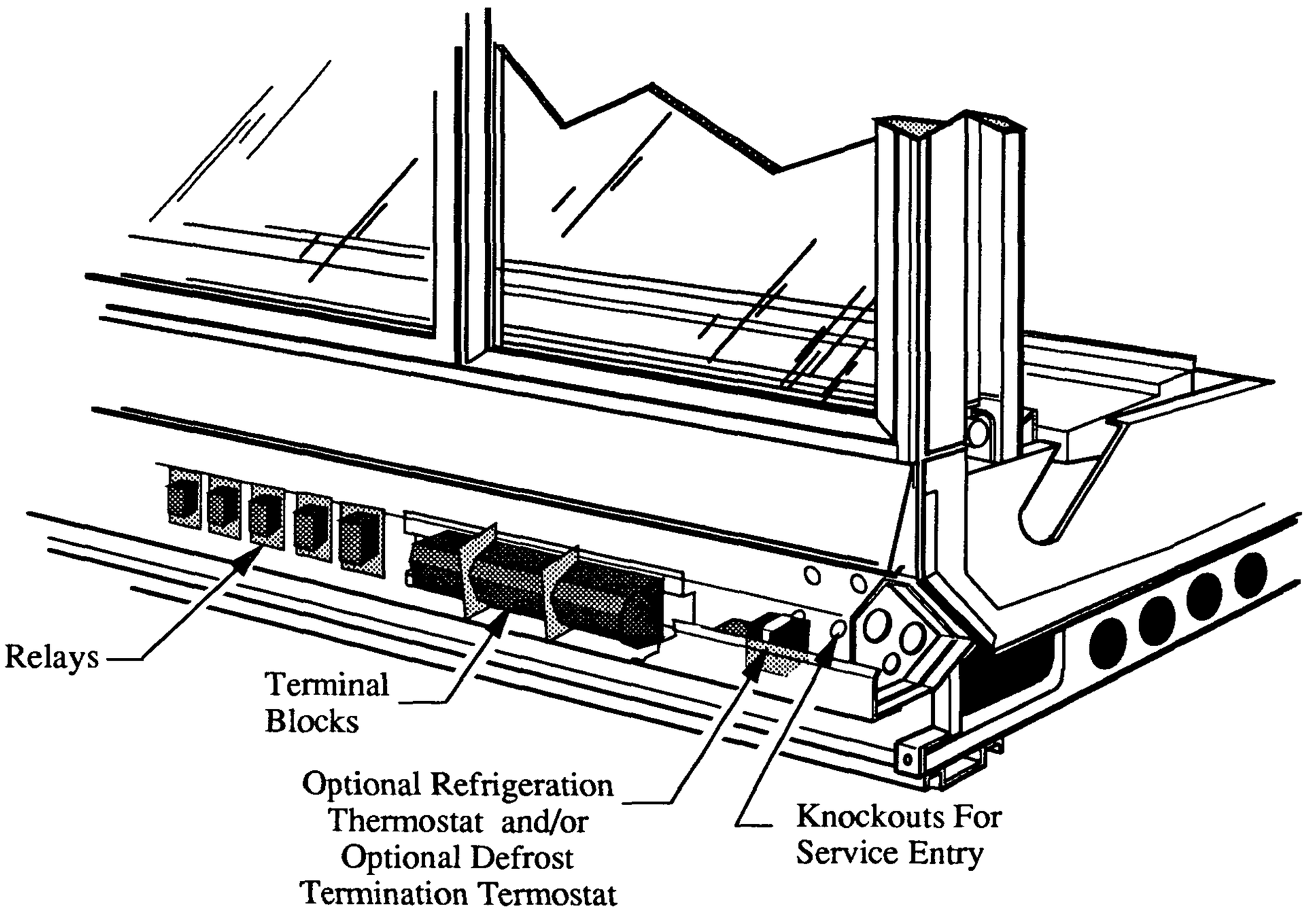
Leads for all electrical circuits are identified by a colored plastic band: neutral wire for each circuit has either White insulation or a White plastic sleeve in addition to the color band.

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: CASE MUST BE GROUNDED



FIELD WIRING

Field wiring must be sized for component amperes stamped on the serial plate. Actual ampere draw may be less than specified. Field wiring from the refrigeration control panel to the merchandisers is required for optional refrigeration thermostats, defrsot termination thermostats or CDA sensors. When multiple merchandisers are on the same defrost circuit the defrost termination thermostats are wired in series. Most component amperes are listed below; **ALWAYS CHECK THE SERIAL PLATE.**

When two or more merchandisers with full length raceways are installed in line, remove the splashguards, end caps and raceway covers, and install the nipple and nuts (supplied) providing electrical passage from one merchandiser to the next. Partial length raceways require additional material (not supplied). In both applications, following NEC and local codes is the responsibility of the electrical contractor.

Serial Plate Amperages

120V 1PH 60 Hz										208V 1PH 60Hz
Model	Fans		Door Anti-sweat Heaters			Lights				Optional	Standard Electric
	FF	IC	Horizontal		Vertical	Horizontal			Vertical	Gas Heaters	Defrost Heaters
			Ardco	Anthony	Anthony	Std	Opt 1	Opt 2	Std		
Low Temp	(1)		(1, 2)	(1, 2)	(1, 2)	(3)	(4)	(5)	(6)	(7)	
2-Door	1.4	1.7	3.3	3.6	3.4	1.6	2.6	2.9	2.0	5.2	9.5
3-Door	2.1	2.5	4.7	5.3	5.0	2.2	3.5	3.7	2.6	7.2	14.7
4-Door	2.8	3.3	6.1	7.0	6.6	3.2	4.8	5.8	3.3	9.6	19.8
5-Door	3.5	4.2	7.6	8.9	8.2	3.3	5.0	6.0	3.9	12.0	24.4

(1) Fan and anti-sweat heaters should be wired in a separate circuit from the lights to avoid turning them off when the store lights are turned off.

(2) Anthony Mach II or Ardco Scan-X Cycling Controls may be ordered for low-temp merchandisers. When ordered, these energy control systems will be factory installed and wired into the frame and door condensate heater circuit. For further information and servicing, refer to the instruction manual furnished with the control.

(3) Standard Lighting—1 row canopy and 1 row interior ledge.

(4) Lighting Option 1—2 row canopy and 1 row interior ledge.

(5) Lighting Option 2—1 row VHO Canopy and 1 row VHO interior ledge.

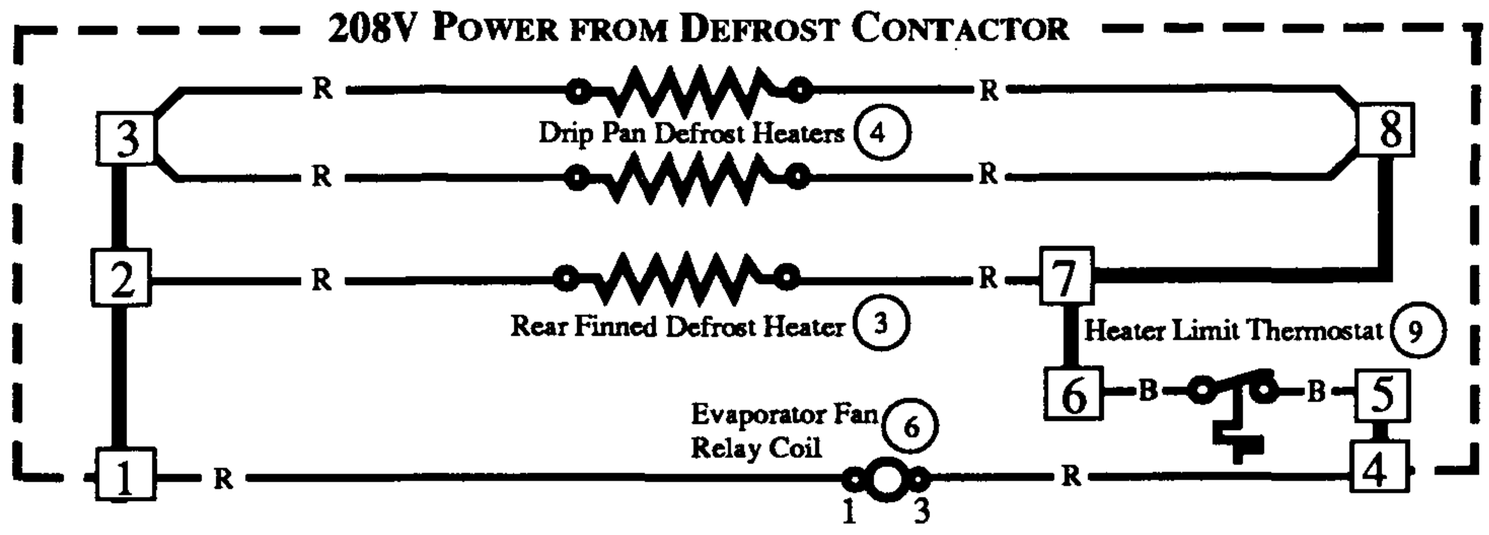
(6) Supplied by door manufactuer.

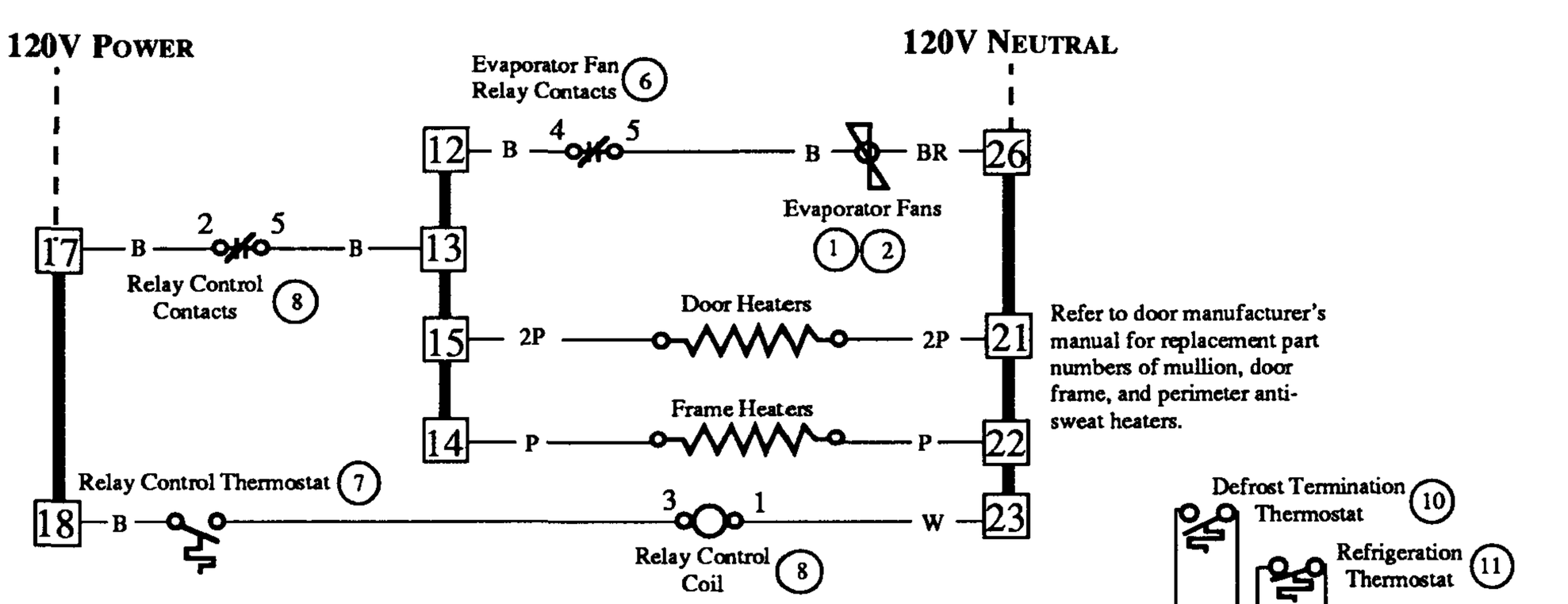
(7) Used only with optional Gas defrost (Offtime is standard). Heaters are non-concurrent with fan and anti-sweat heaters.

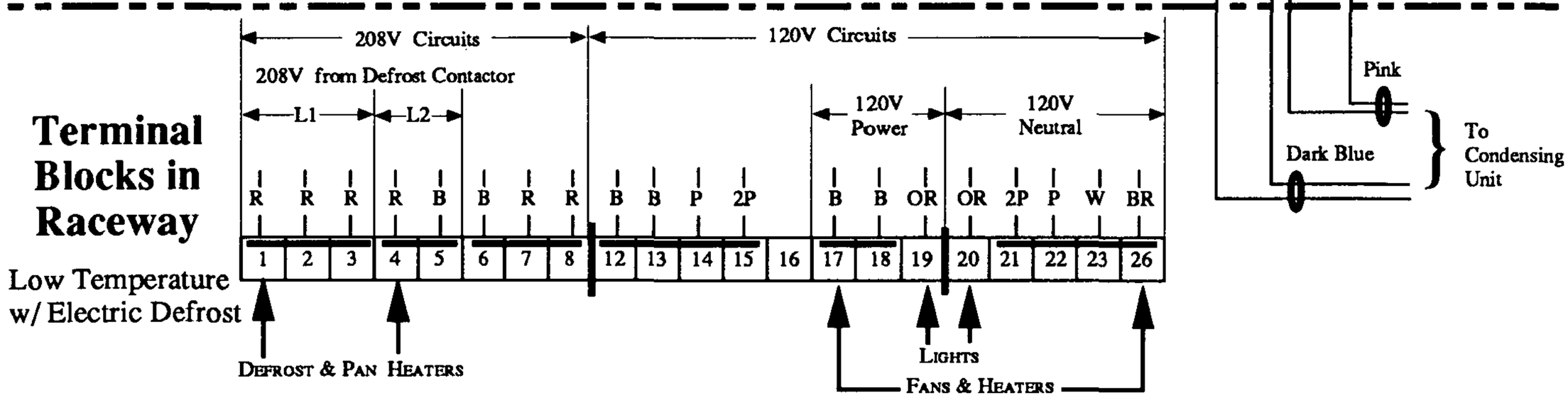
Fan and Heater Circuits – Electric Defrost (standard)

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

R = Red P = Purple 2P = Purple (2 Bands) B = Black BR = Brown W = White OR = Orange







Electric Defrost Sequence — Low Temperature

1. Power from the defrost contactor energizes Defrost Heaters and 208V Evaporator Fan Relay Coil. Relay Contacts open the Fan circuit.

2. If the Pan Heaters exceed 90°F the Heater Limit Thermostat will open.

3. Temperature rise of the evaporator closes the Relay Control Thermostat at about 35°F, energizing 120V Relay Control Coil. This relay's contacts open the Frame and Door Heater Circuits and also opens power supply to Fan Relay Contacts.

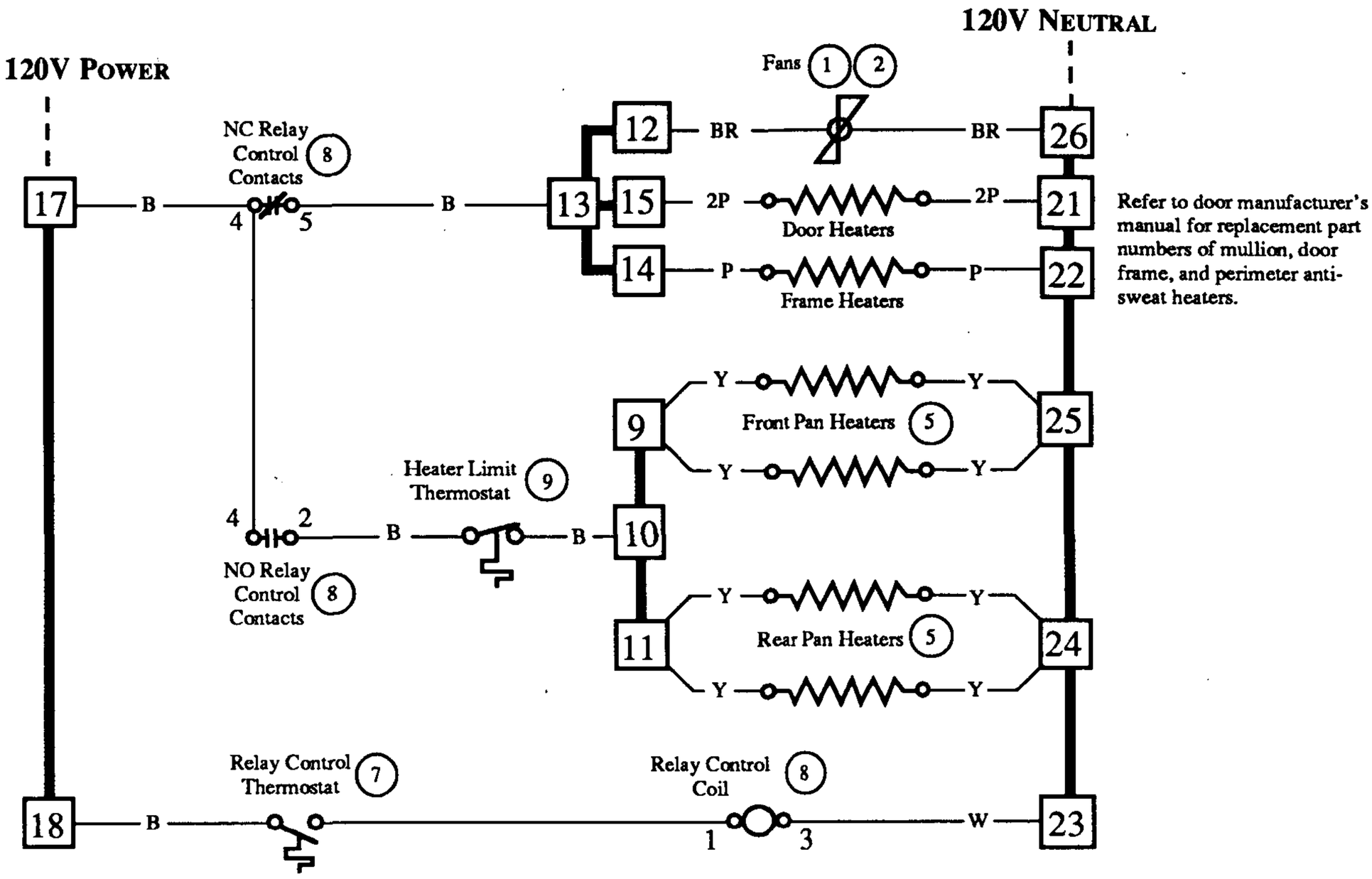
4. When Defrost Termination Thermostat ends defrost period, the defrost contactor opens the Defrost Heater and Evaporator Fan Relay Coil circuits.

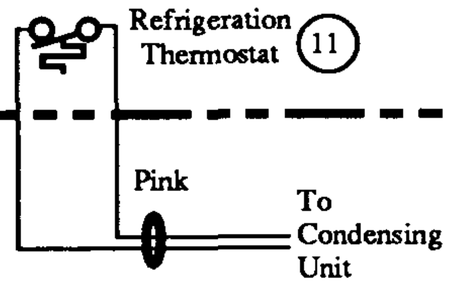
5. Temperature fall of the evaporator opens the Relay Control Thermostat at about 20°F, De-energizing 120V Relay Control Coil. Relay Control Contacts close the Frame and Door Heater Circuits, and the Evaporator Fan Circuit.

Fan and Heater Circuits – Gas Defrost (optional)

CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

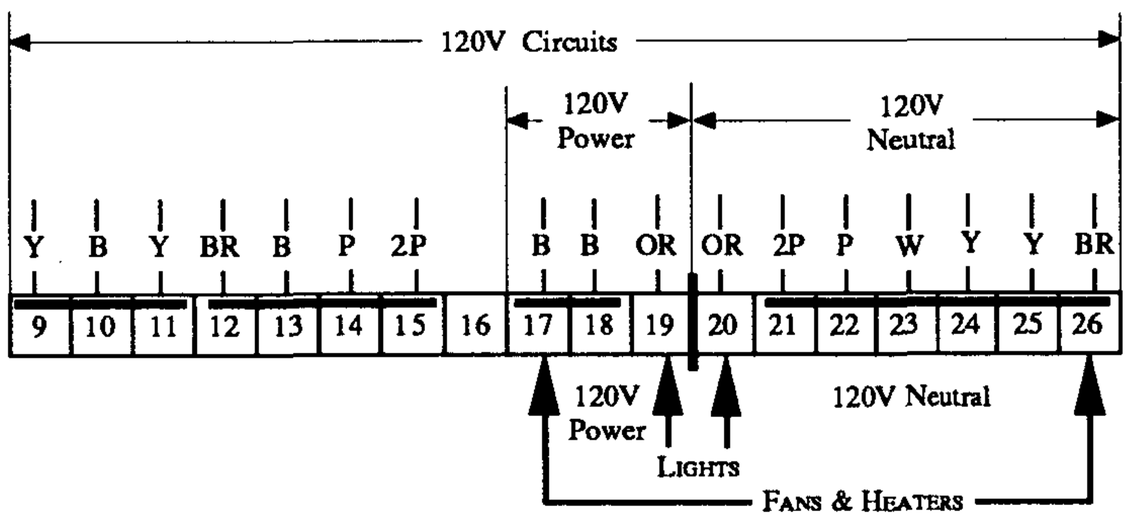
Y = Yellow P = Purple 2P = Purple (2 Bands) B = Black BR = Brown W = White OR = Orange





Terminal Blocks in Raceway

Low Temperature w/ Gas Defrost



Gas Defrost Sequence — Low Temperature

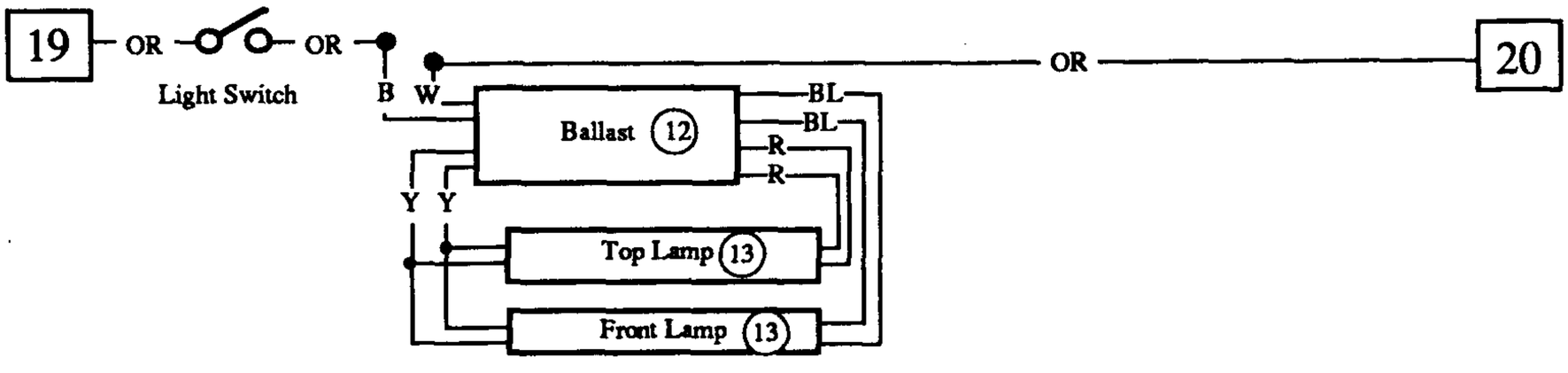
1. Defrost vapor enters the evaporator causing a rise in temperature. At about 35°F the Relay Control Thermostat closes the Relay Control Coil circuit. The Coil opens Contacts 4-5 and closes 4-2. Contacts 4-5 open the Fan, Door Heater, and Frame Heater Circuits. Contacts 4-2 energize the Front and Rear Pan Heater Circuits.

2. If the Pan Heaters exceed 90°F the Heater Limit Thermostat will open.

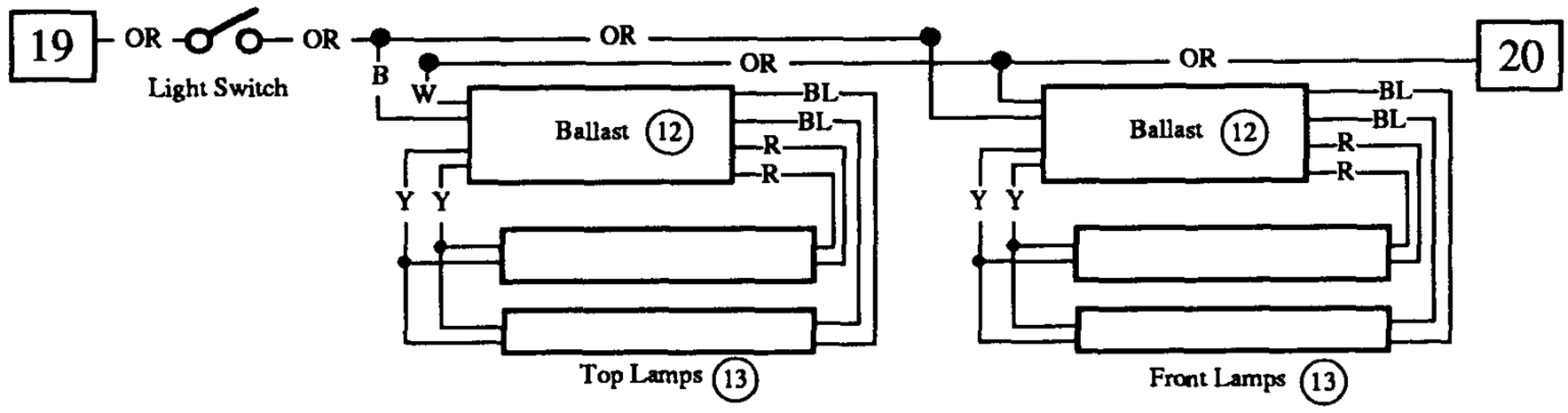
3. When defrost timer ends the defrost period, the evaporator temperature will start to fall. At about 20°F, the Relay Control Thermostat will open, DE-energizing the Relay Control Coil. Contacts 4-2 will open the Pan Heater circuits, and contacts 4-5 will close the condensate heaters and fan circuits.

Horizontal Light Circuits

Standard 2 & 3 Door



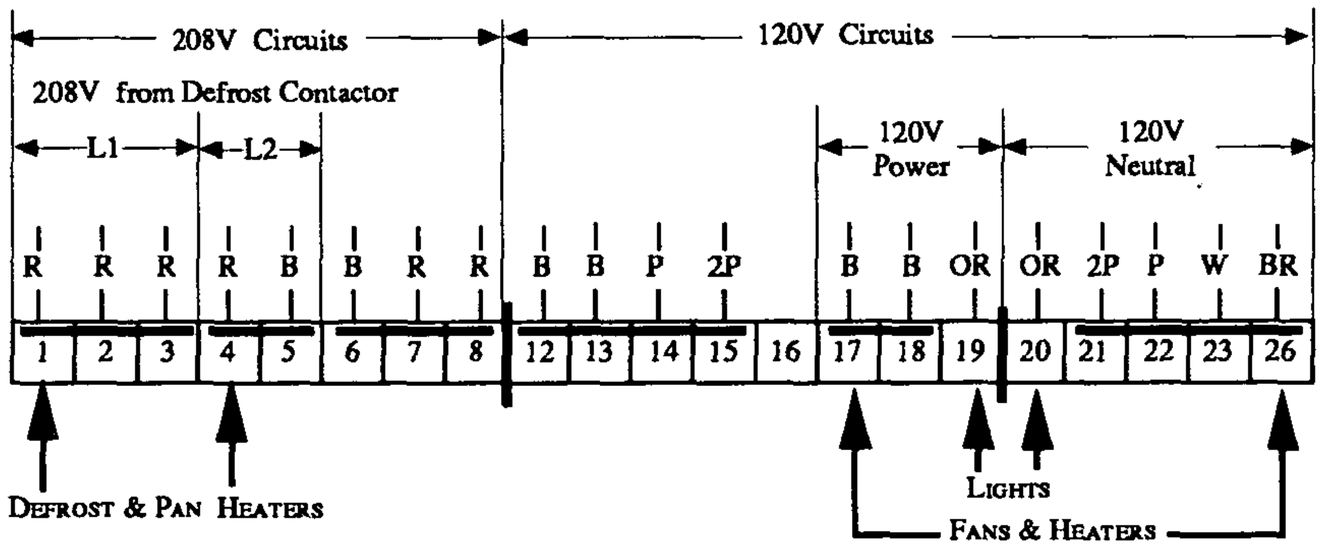
Standard 4 & 5 Door



NOTE: Vertical Light, ballast (14) and lamps (15), are part of the door (refer to door manufacturer's manual). These lights are connected in the raceway to the same terminals used for horizontal lights.

Terminal Blocks in Raceway

Low Temperature w/ Electric Defrost



CIRCLED NUMBERS = PARTS LIST ITEM NUMBERS

P = Purple 2P = Purple (2 Bands) BR = Brown OR = Orange B = Black W = White Y = Yellow R = Red BL = Blue

ALTERNATE COLOR FOR ORANGE WIRES = TAN

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.

CAUTION: SHUT FANS OFF DURING CLEANING PROCESS.

Exterior Surfaces

The exterior surfaces must 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:

•Mineral oil based solutions, as these will dissolve the butyl sealants used in constructing the merchandisers.

•Abrasive cleansers and scouring pads, as these will mar the finish.

Do:

•Remove the product and all loose debris to avoid clogging the waste outlet.

•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.

•Rinse with hot water, but do NOT flood. **NEVER INTRODUCE WATER FASTER THAN THE WASTE OUTLET CAN REMOVE IT.**

•Allow merchandisers to dry before resuming operation.

•When cleaning lighted shelves, wipe down with a damp sponge or cloth so that water does not enter the light channel. **DO NOT USE A HOSE OR SUBMERGE SHELVES IN WATER.**

SHELF ALIGNMENT

Taped to one of the shelves of each merchandiser is a small plastic bag containing shelf alignment strips. These strips are designed to enhance the appearance of the shelves by aligning the front edge of each shelf with that of an adjacent shelf. See illustration.

When installing the shelves on the merchandisers:

1. Insert one of the alignment strips into the slot behind the front edge of each shelf.
2. After all shelves are installed, slide the strip across the shelf joint wherever two shelves are adjacent. This will lock them together.

NOTE: Some PTM styles are pop riveted to the shelf. In these instances, the alignment strips must be cut in half before inserting them into the shelf.

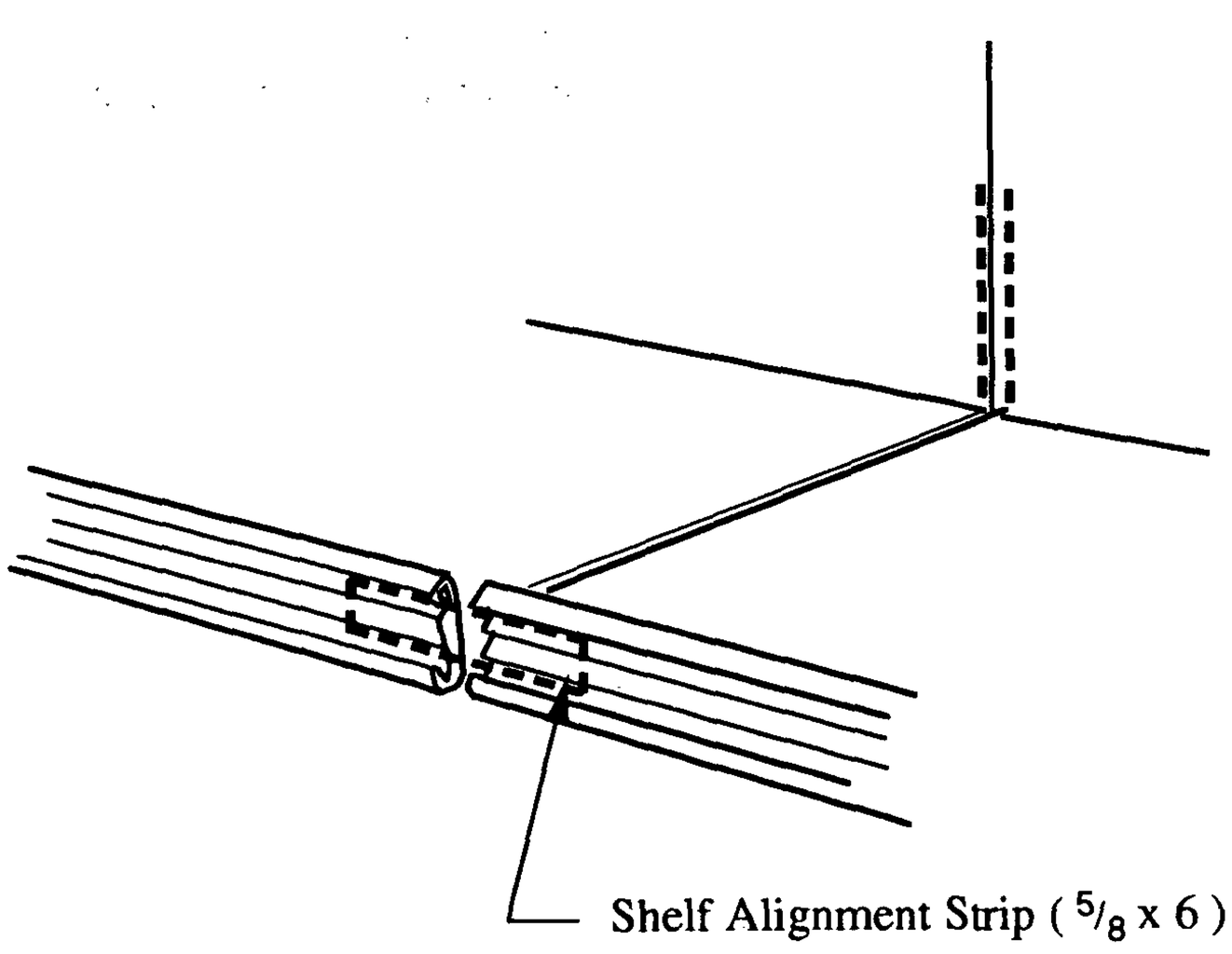
STOCKING

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 200 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.

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



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.

REPLACING FAN BLADES

Replace fan blades with the raised, embossed side of the blade TOWARD the motor.

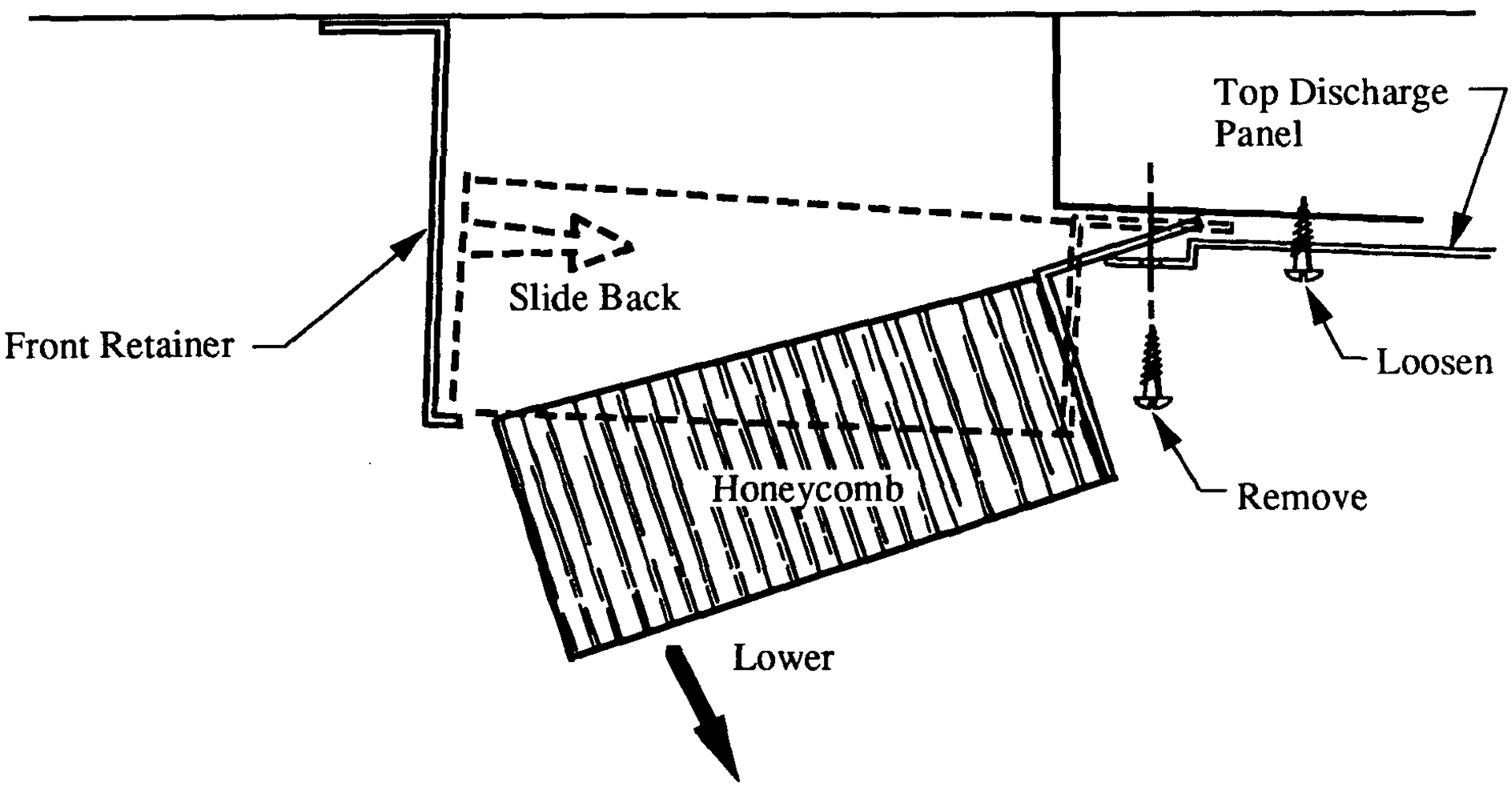
DOORS AND FRAMES

See manufacturer's service manual for servicing information. One manual is shipped with each merchandiser.

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 metal retainer which holds the forward edge of the honeycomb in place.
2. Holding the honeycomb sections in place, back off the retainer from the honeycomb.
3. Clean and dry the honeycomb.
4. After cleaning reassemble in reverse order of removal.



ELECTRIC DEFROST HEATERS

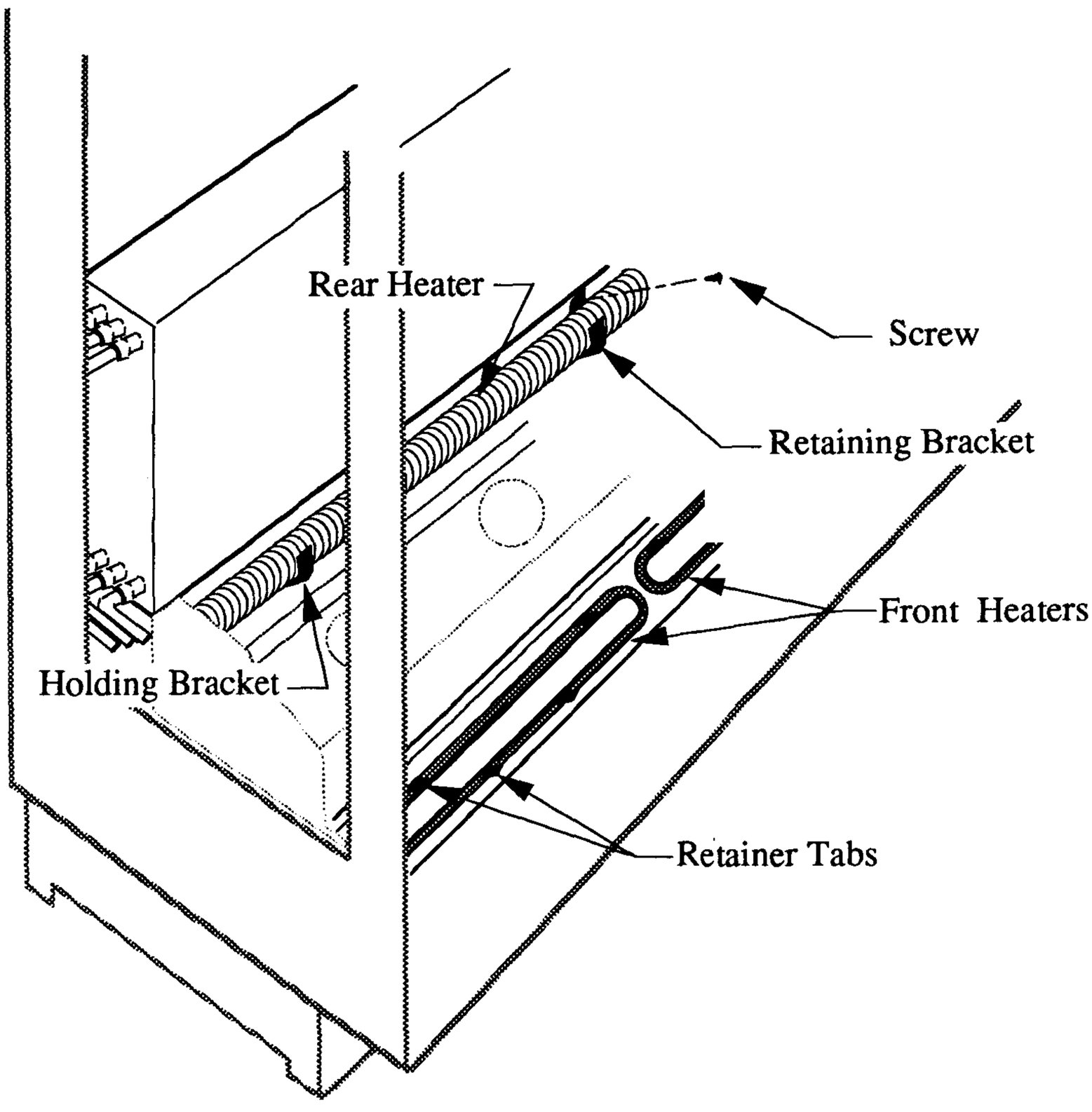
The front defrost heaters are located as shown below. These heaters are installed on slave plates. Electric defrost requires a finned rear heater which is located behind the fan plenum in retaining brackets below the evaporator. See illustration.

Remove Front Heaters

1. Disconnect Power.
2. Disconnect ground wire.
3. Bend retainer tabs open slightly and lift front heater from bracket.
4. RECONNECT GROUND WIRE to replacement heaters.

Remove Rear Defrost Heater

1. Disconnect Power.
2. Remove fan plenum.
3. Remove screw and retaining bracket from center of merchandiser and slip rear heater out of holding bracket.



OPTIONAL GAS DEFROST HEATERS

The front defrost heaters are located as shown below. These heaters are installed on slave plates. Gas defrost rear heaters are very similar to the front heaters. The rear heaters are located behind the fan plenum and below the evaporator, they are held in place by the same retainer tabs used to secure the front heaters.

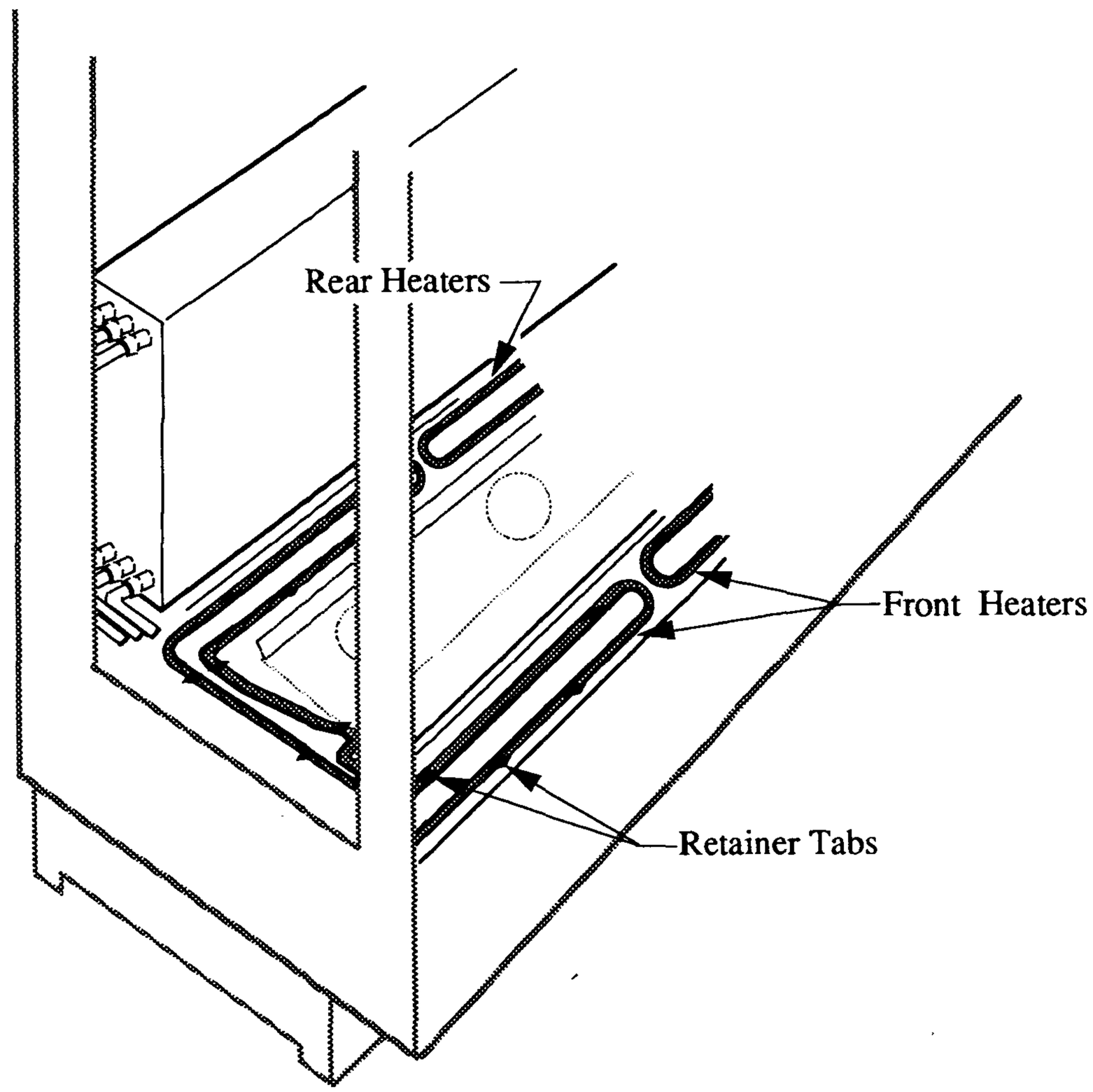
Remove Front Heaters

1. Disconnect Power.
2. Disconnect ground wire.
3. Bend retainer tabs open slightly and lift front heater from bracket.
4. RECONNECT GROUND WIRE to replacement heaters.

Remove Rear Defrost Heaters

1. Disconnect Power.
2. Remove fan plenum.
3. Bend retainer tabs open slightly and lift heater from bracket.

NOTE: When replacing rear heaters, you may have to remove the plenum end cap. If so, be sure to reseal the merchandiser exactly as it was originally sealed.



SERVICING VERTICAL LIGHTING

Refer to door manufacturer's manual for servicing of ballasts and lamps.

SERVICING HORIZONTAL LIGHTING

Removing Ledge Lamp Shields

1. Press down on lamp shield to release it from the top retainer.
2. Lift shield out and away from light fixture flanges.

NOTE: When installing shield, be sure it covers the entire length of the light fixture.

Lamp Ballasts

The lamp ballasts are located behind the lower bumper rail at the left-hand end of the merchandiser.

TO GAIN ACCESS:

1. Disconnect the electrical power to the light fixture.
2. Remove the lower bumper rail.
3. Service or replace ballasts as required. Reassemble items as they were originally installed.

Replacing Fluorescent Lamps

Fluorescent lamps are furnished with moisture resistant lamp holders and shields. WHENEVER A FLUORESCENT LAMP IS REPLACED, BE CERTAIN TO REINSTALL THE LAMP SHIELDS.

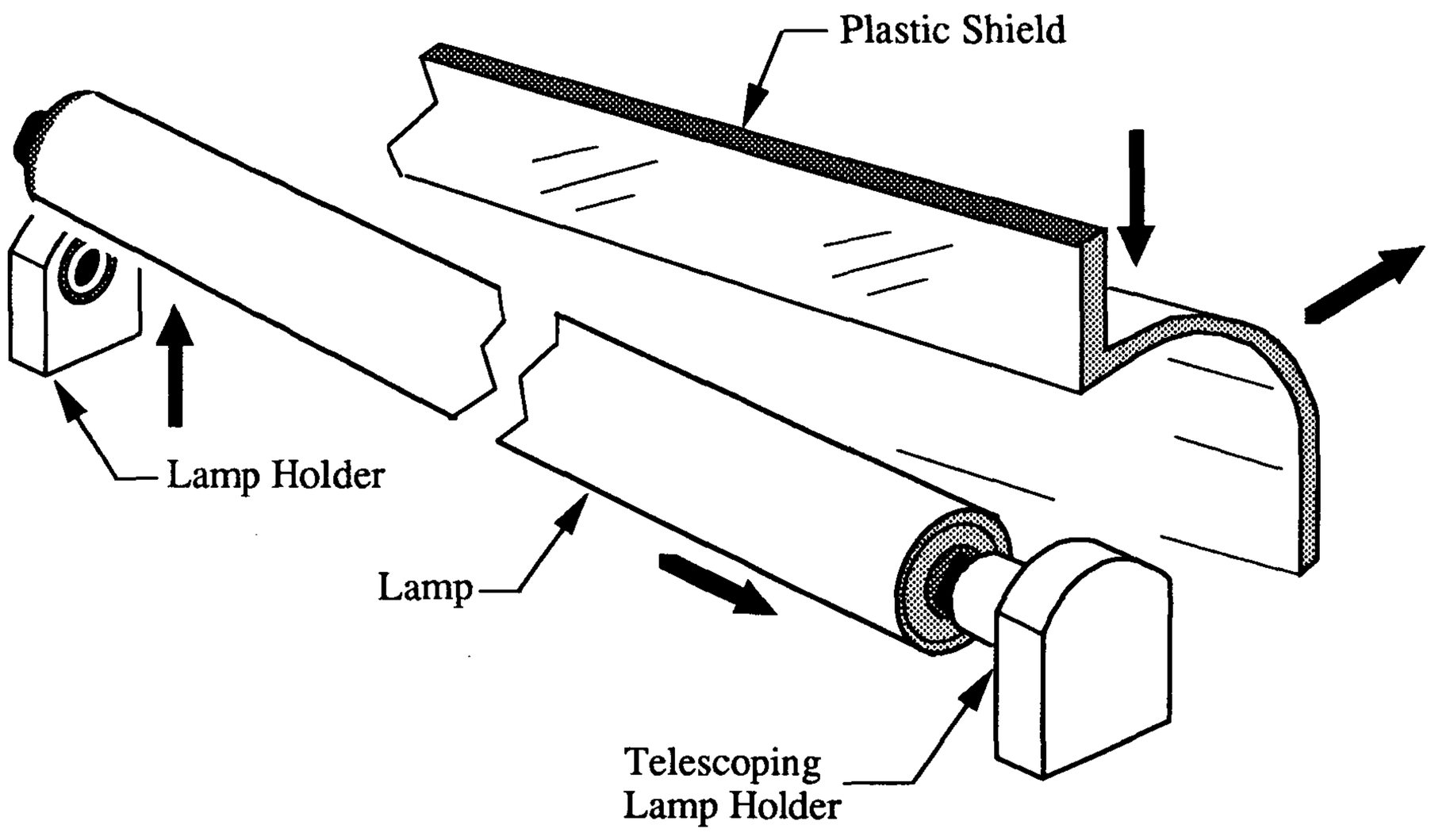
NOTE: Do NOT twist the lamp.

REMOVE LAMP

To remove a lamp, simply push the lamp toward telescoping lamp holder and raise the other end.

INSTALL LAMP

To install a lamp, first position it inside telescoping lamp holder, then lower and position the opposite end.



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
(616) 243-2531

X-Ergon
1570 E. Northgate
P.O. Box 2102
Irving, TX 75062
(800) 527-9916

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.

NOTE:

Hussmann Aluminum melts at .....1125°F
Aladdin 3-in-1 rod at .....732°F
X-Ergon Acid core at .....455°F
Factory Solder at aluminum
to copper transitions .....855°F