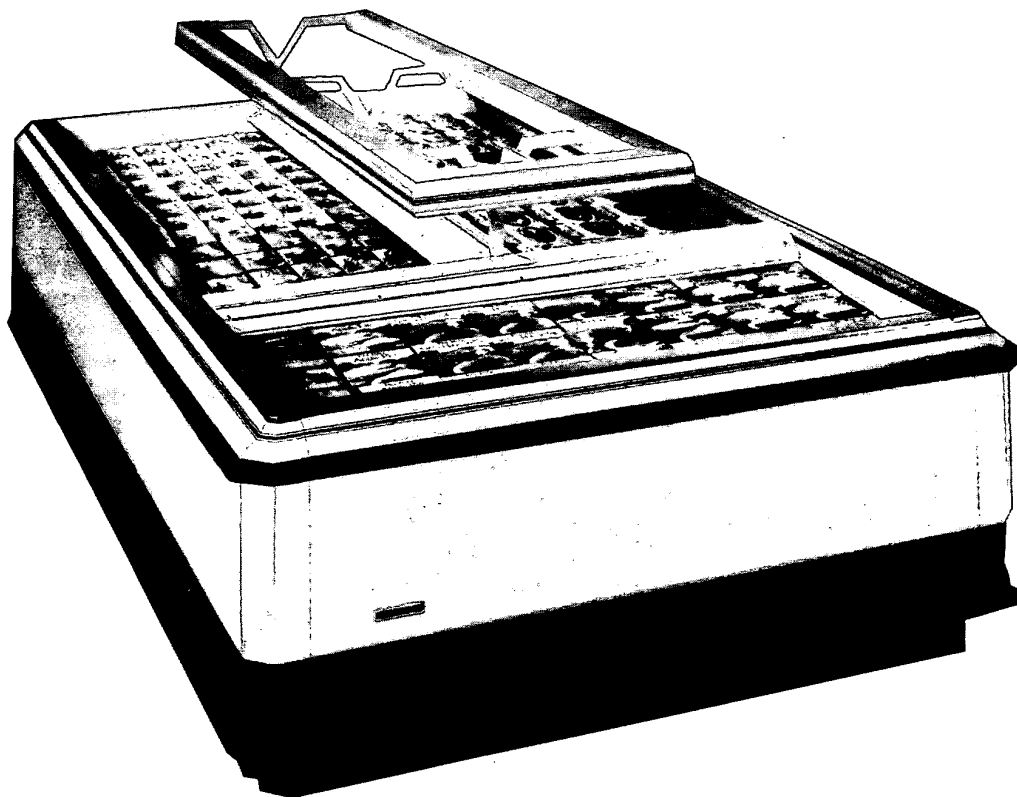


HUSSmann®

**NF1, NC1, NFFS, NCFS, NF1N, NC1N
NFN, NCN, NFW, NCW & NFCW
NFE, NCWE & NFCWE**



**Single Deck
Frozen Food and Ice Cream
Merchandisers**

Vision Series

Installation / Service Manual

**P/N 358027
April, 1992
Section 3**

Update to Instructions

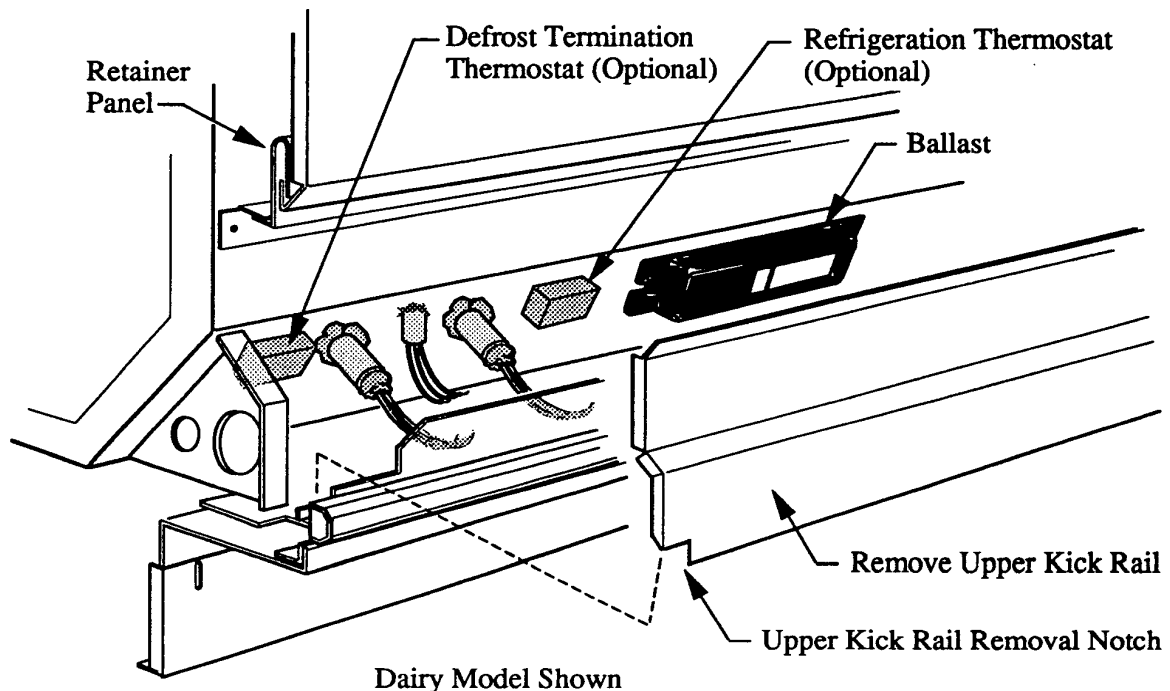
Instruction P/N: 345901, 348045, 352946, 345913, 345911 and 358027

The design of the upper kick rail has been changed. Please follow the instructions below.

REMOVING UPPER KICK RAIL

Remove the upper kick rail by pushing in and up to free it from the bumper area. If kick rail is difficult to remove, carefully slide a small slotted screw driver between the bumper and the kick rail. Insert screw driver in the removal notch (located at each end) and lift the kick rail up. Once the bottom is free, lower the upper kick rail out from behind the front panel.

To install, slide the upper kick rail into retainer behind front panel. Position the lower edge of the kick rail behind the bumper and in front of the adjustable bracket.



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WARRANTY

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

Single Deck Frozen Food & Ice Cream

MODEL DESCRIPTIONS

This instruction covers the merchandisers listed below. Basic design features are listed to the right of each case. All models except NFFS, NCFS, NFWE, NCWE, & NFCWE are available in 8 and 12' lengths.

Frozen Food

NFFS	Single Deck Frozen Food, free standing 6'
NF1	Single Deck Frozen Food, wall
NF1N	Single Deck Frozen Food, narrow island
NFN	Single Deck Frozen Food, intermediate island
NFW	Single Deck Frozen Food, wide island
NFWE-90,-138	Single Deck Frozen Food, wide island, end & center unitized

Ice Cream*

NCFS	Single Deck Ice Cream, free standing 6'
NC1	Single Deck Ice Cream, wall
NC1N	Single Deck Ice Cream, narrow island
NCN	Single Deck Ice Cream, intermediate island
NCW	Single Deck Ice Cream, wide island
NCWE-90,-138	Single Deck Ice Cream, wide island, end & center unitized

Frozen Food & Ice Cream

NFCW	Single Deck Frozen Food & Ice Cream, twin temperature wide island
NFCWE-90,-138	Single Deck Frozen Food & Ice Cream, twin temp wide island, end & center unitized

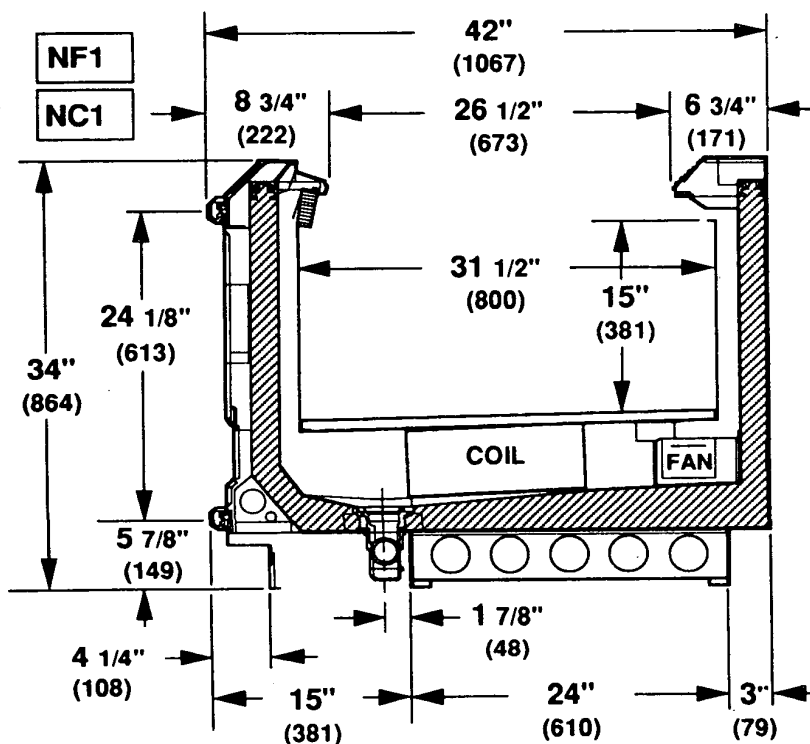
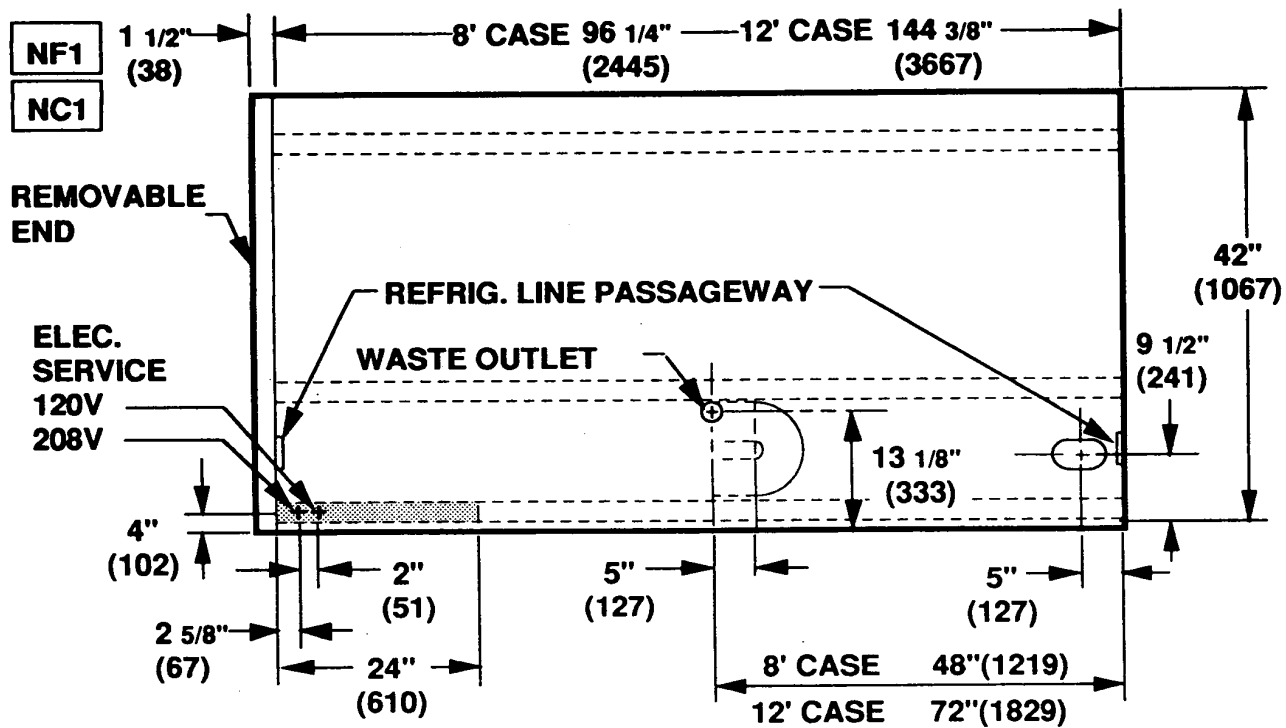
*Night covers are supplied for ice cream applications.

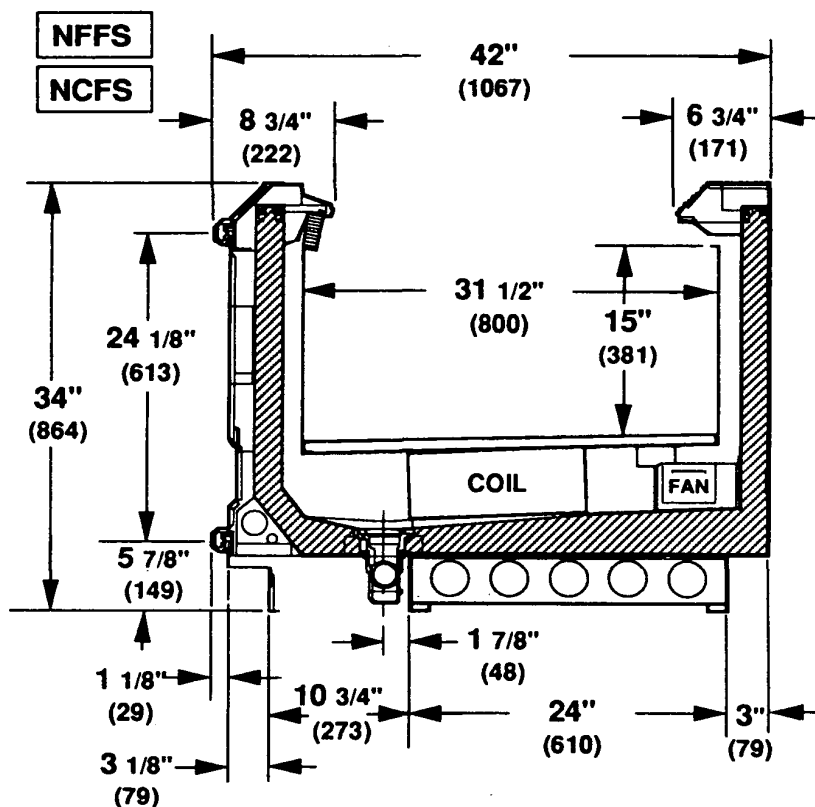
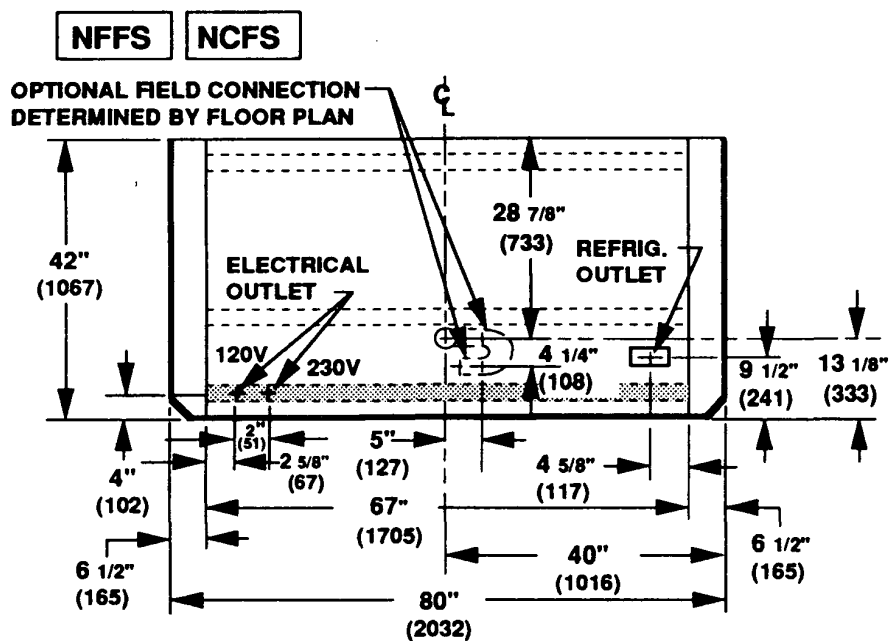
APPLICATION

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.

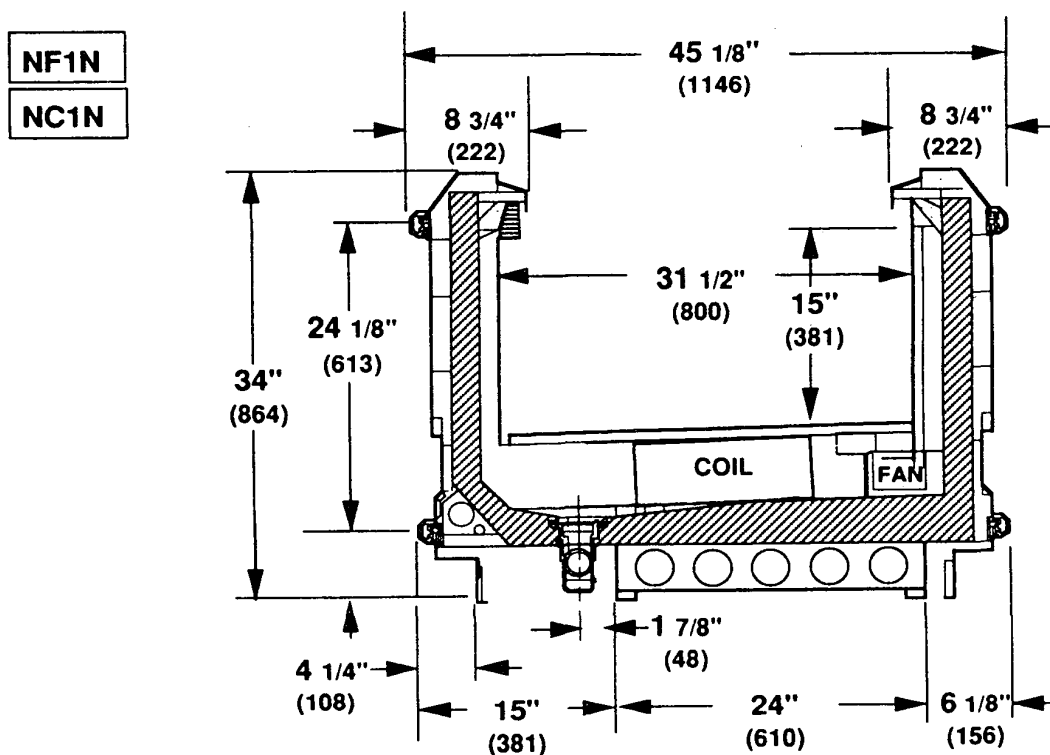
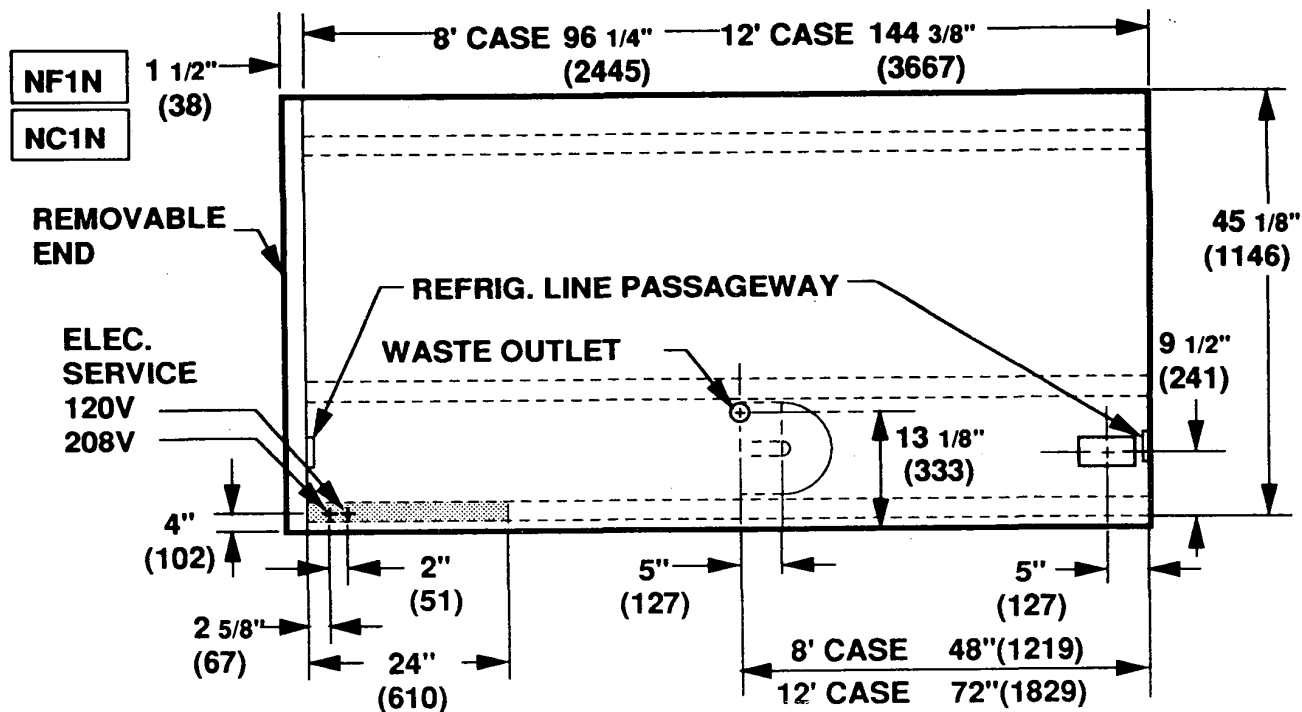
NOTE: Plan view and cross section measurements are given in inches and in millimeters.

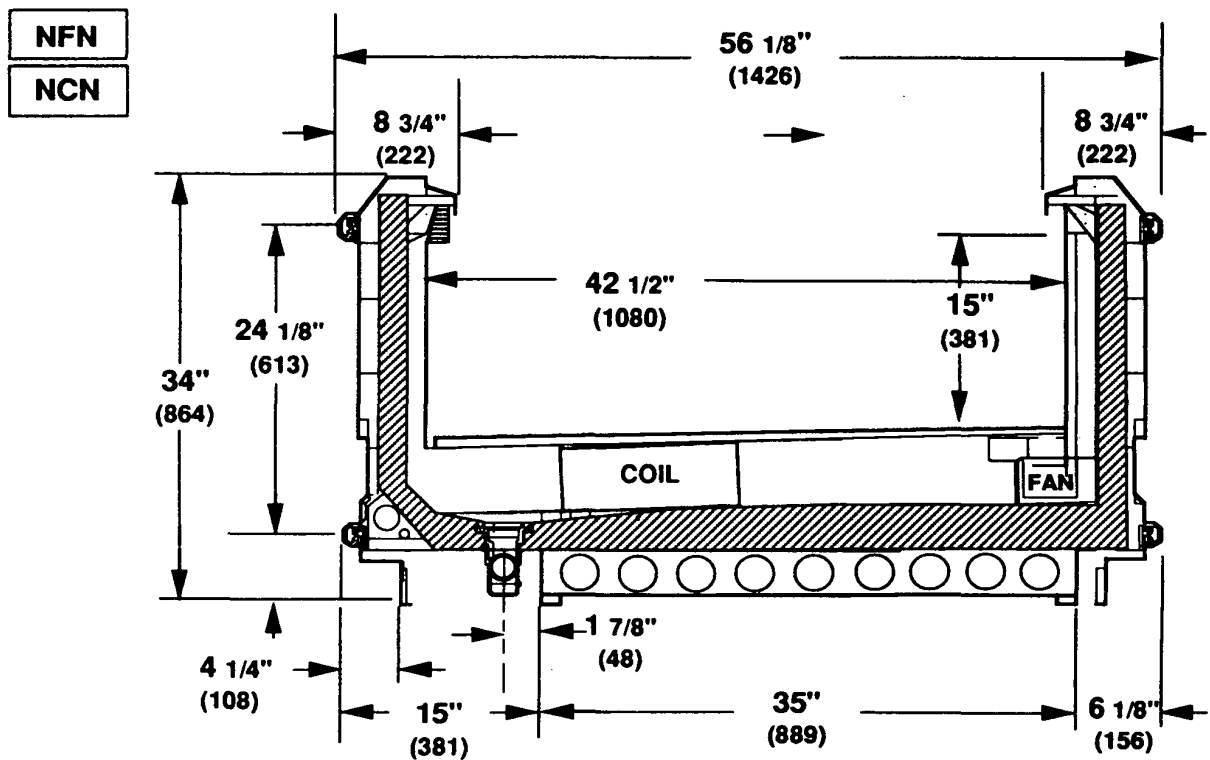
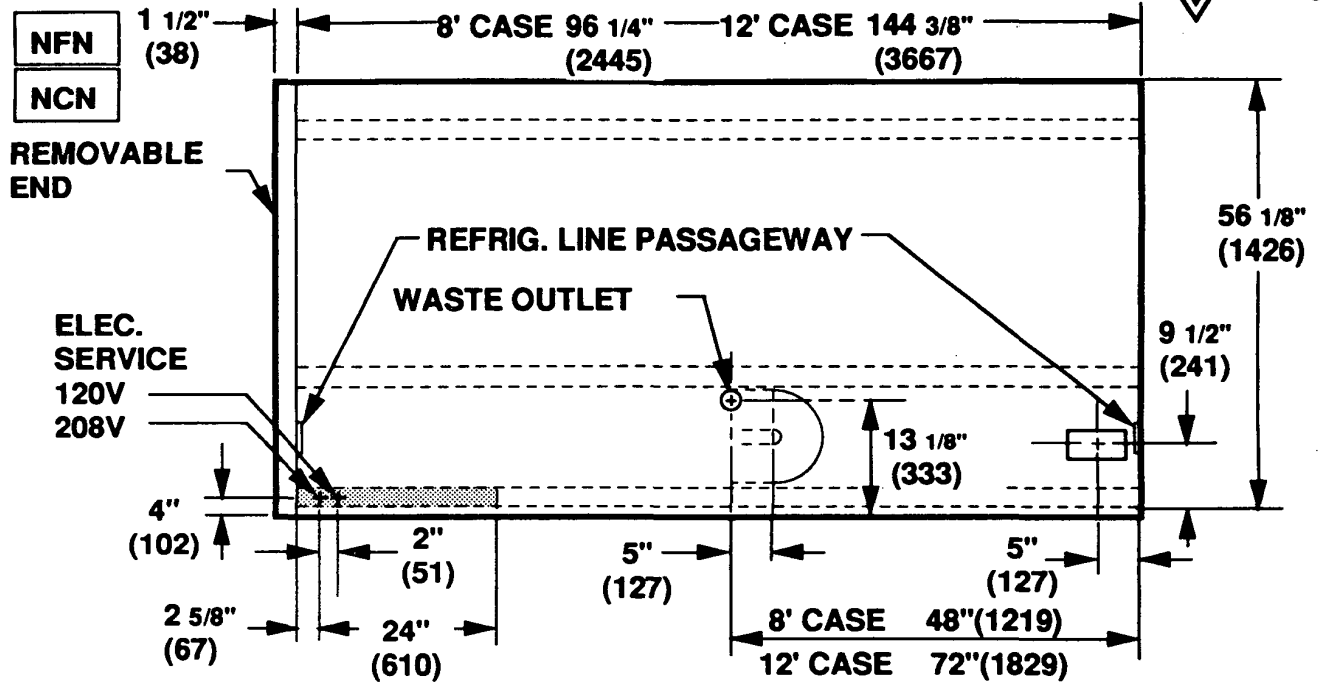
1-2 GENERAL INFORMATION



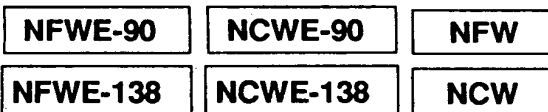


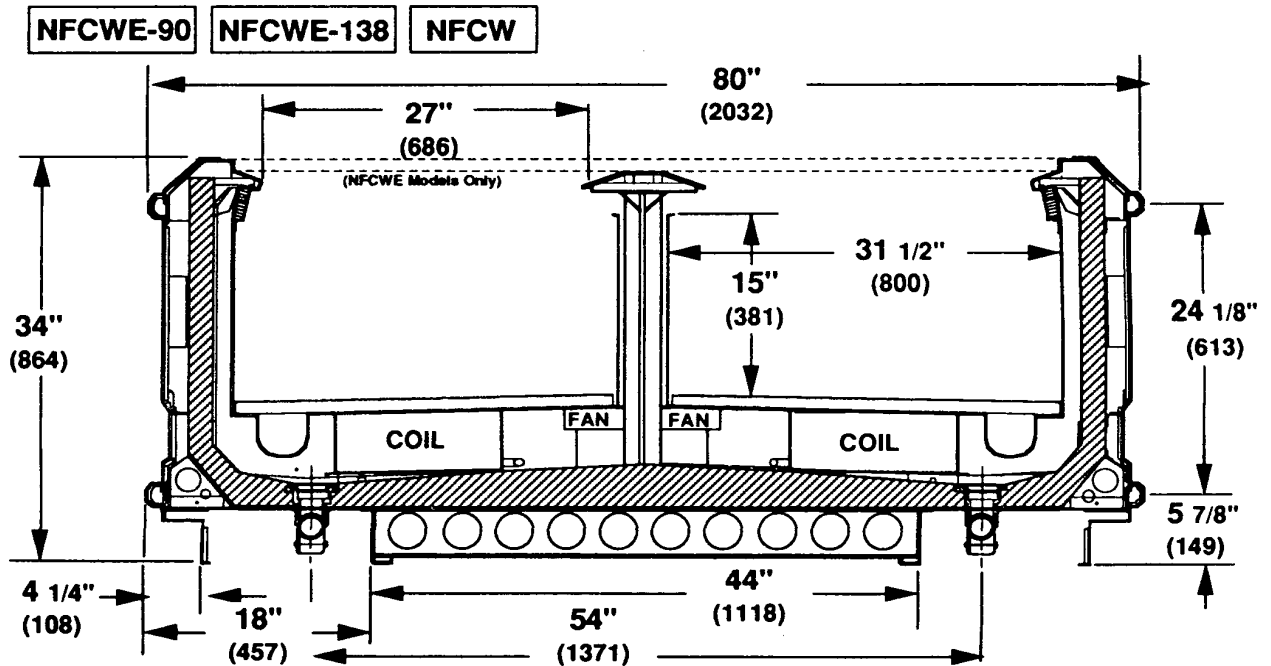
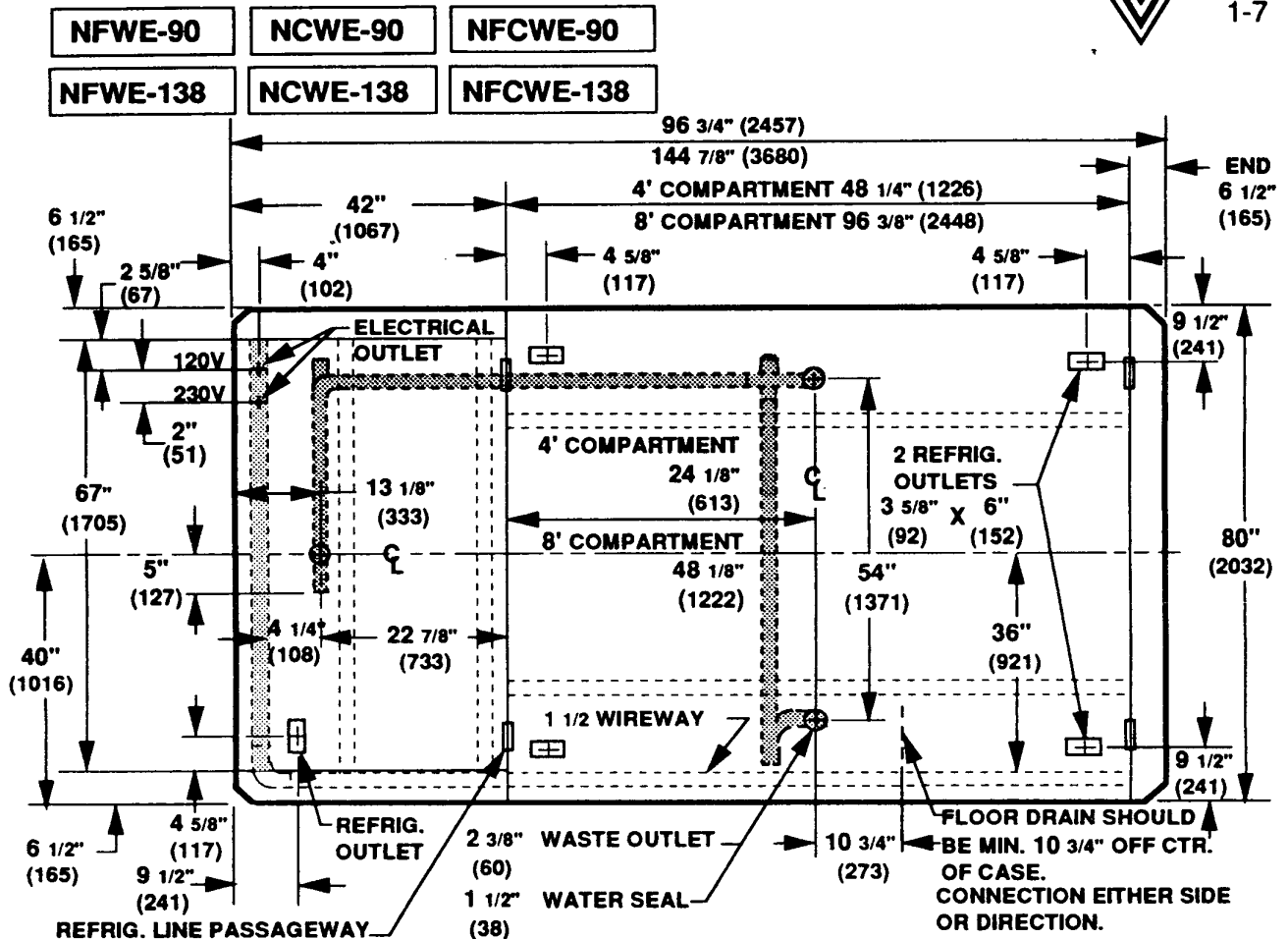
1-4 GENERAL INFORMATION





1-6





Single Deck Frozen Food & Ice Cream

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.

WARNING

Exercise caution at all times when moving merchandisers with "L" shaped riders. They are top heavy and should NEVER be left in the vertical position.

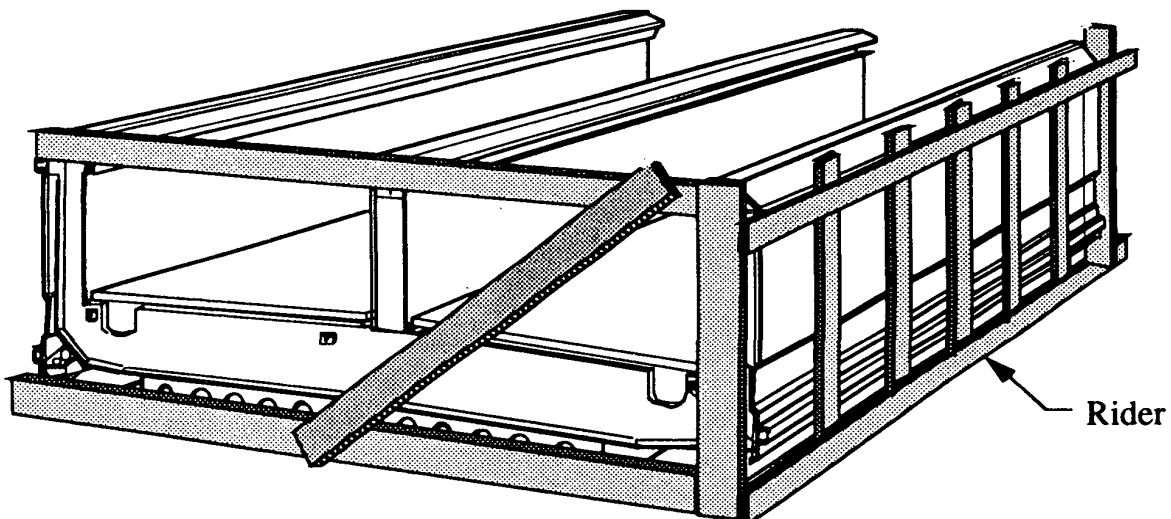
SHIPPING BRACES (Not All Merchandisers)

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

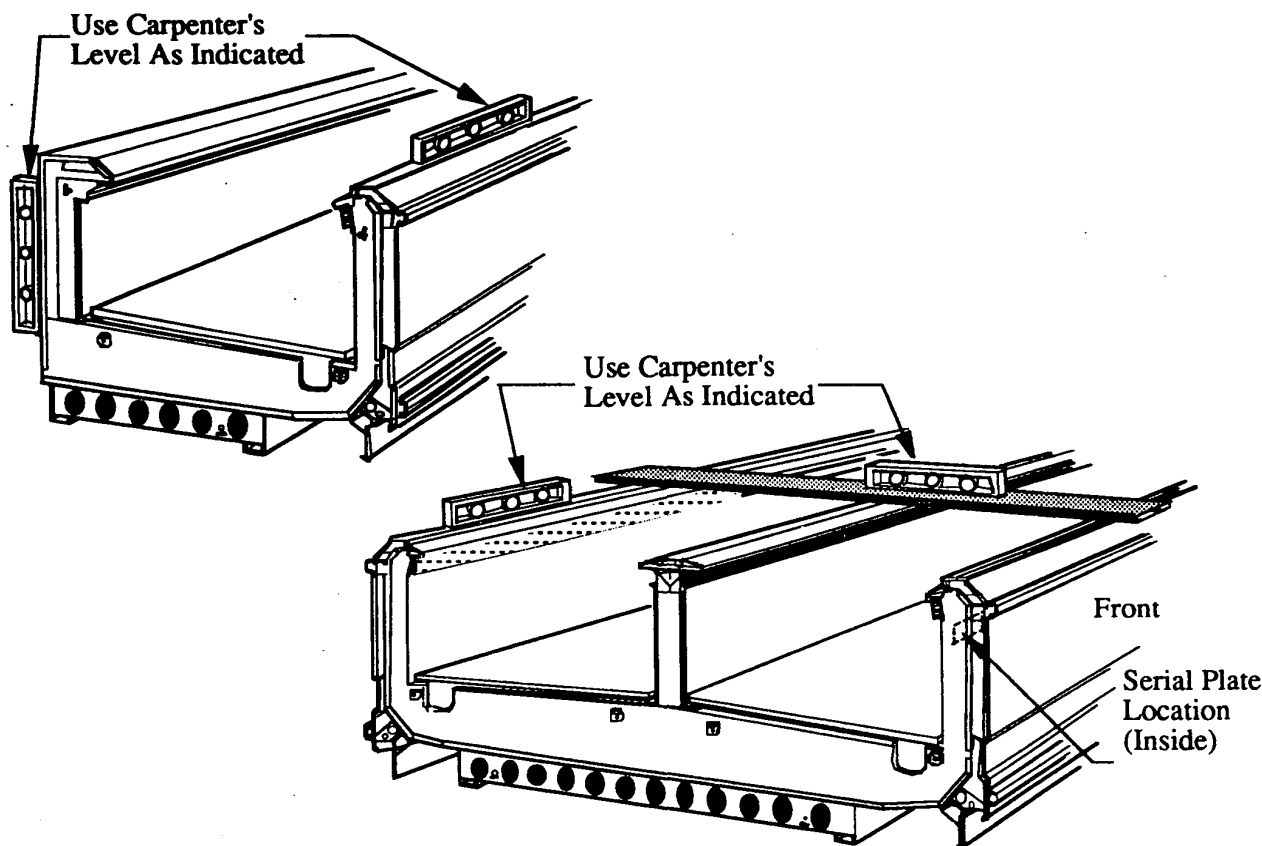
LOCATION

Like other open 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, there must be a minimum clearance of 4" between merchandisers and other fixtures or walls.



2-2 INSTALLATION



LEVELING

Merchandisers must be installed level to ensure proper operation of the refrigeration system and to ensure proper drainage of defrost water. Use a carpenter's level as shown when leveling merchandisers. Use a 24" carpenter's level as shown in the illustration. **NOTE:** To avoid removing concrete flooring, begin lineup leveling from the highest point of the store floor.

JOINING

The merchandisers are of sectional construction which means that two or more may be joined in line yielding one long continuous display requiring only one pair of ends. A separate Joint Instruction is supplied.

WASTE OUTLET AND WATER SEAL

The waste outlet is located as shown on the plan views allowing drip piping to be run under the merchandiser lengthwise, to the front or the rear.

A water seal is supplied with each merchandiser. The water seal must be installed to prevent air leakage and insect entrance into the merchandiser.

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

INSTALLING DRIP PIPING

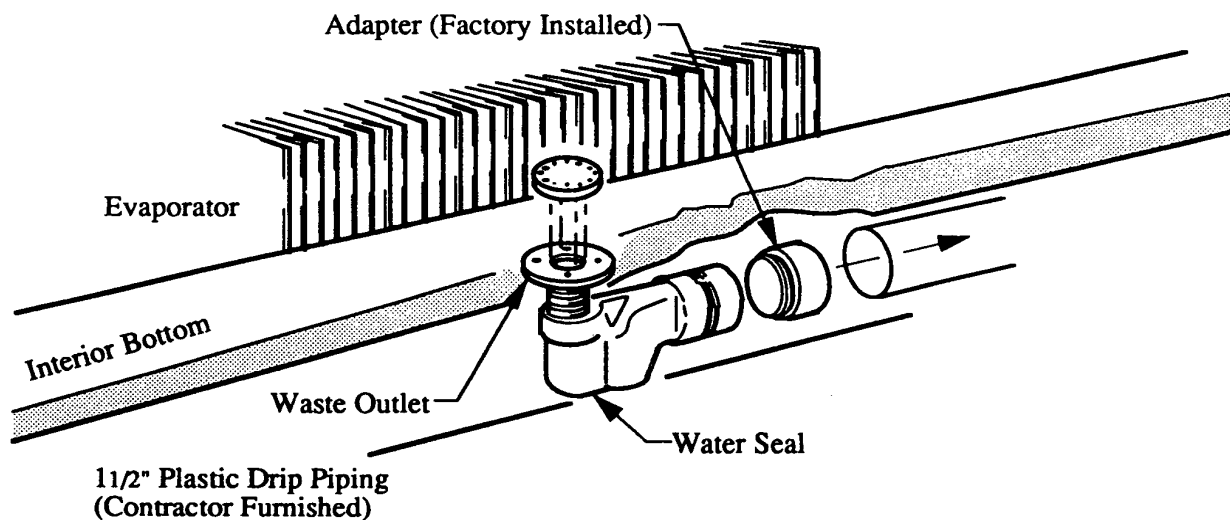
Poorly or improperly installed drip pipes can seriously interfere with the merchandiser's operation and result in costly maintenance and product losses.

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" 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.

Wall, Narrow Island, Intermediate Island and Free Standing Models (NF1, NC1, NF1N, NC1N, NFN, NCN, NFFS, & NCFS)

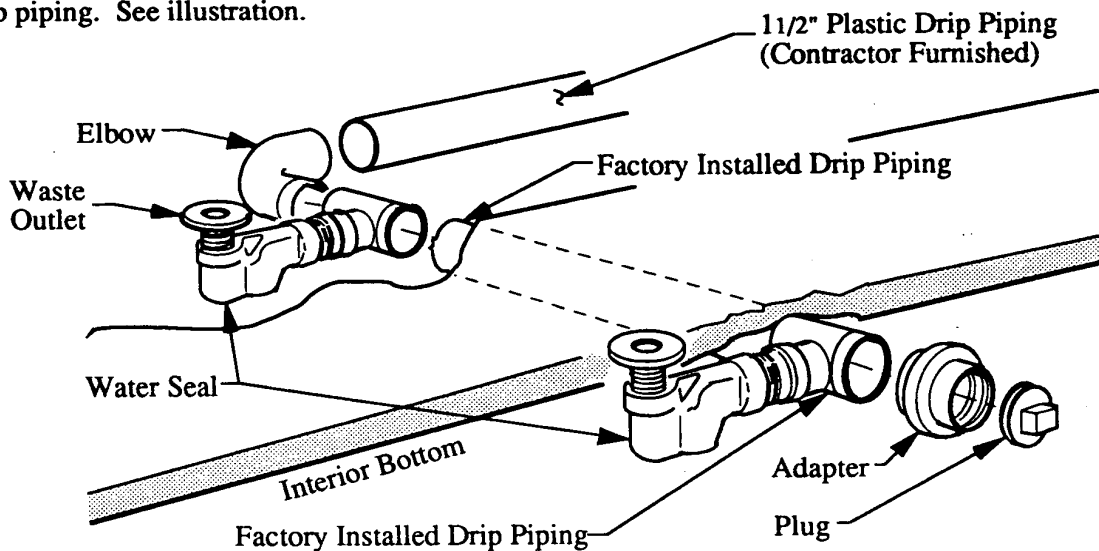
Connect installer furnished fittings and piping to the factory installed adapter. Merchandisers are sized for 1 1/2" drip piping. The installer has the option of running the drip piping towards the front or rear and either left or right. See illustration.



2-4 INSTALLATION

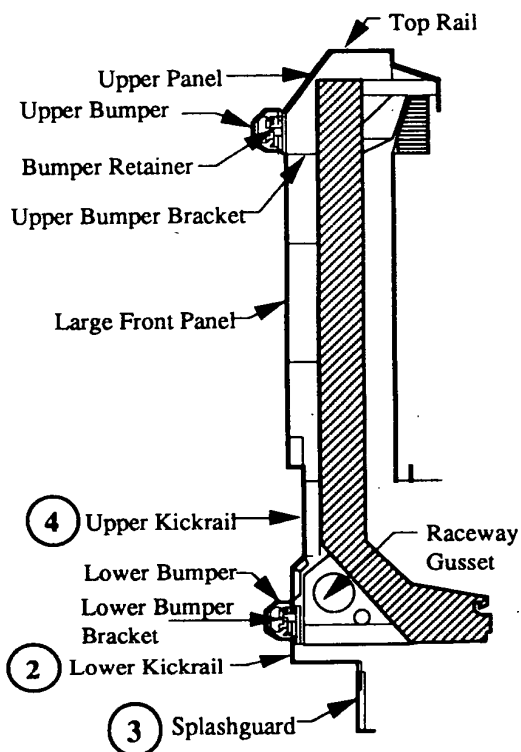
Wide Island and Unitized Units

Hussmann supplied Elbow, Adapter and Plug may be installed on either side of factory installed 1 1/2" drip piping. See illustration.



INSTALLING SPLASHGUARDS

The splashguard and lower kickrail shipped inside each merchandiser must be fastened together before installation. They may be installed after all merchandisers have been leveled and joined, and all drain piping, electrical and refrigeration work has been completed. Do not install the lower bumper until the upper kick rail and lower kickrail/splashguard assembly have been installed. To accommodate uneven floors, the splashguard has vertical slots which provide adjustability. It is assembled from two pieces and is adjustable after installation.

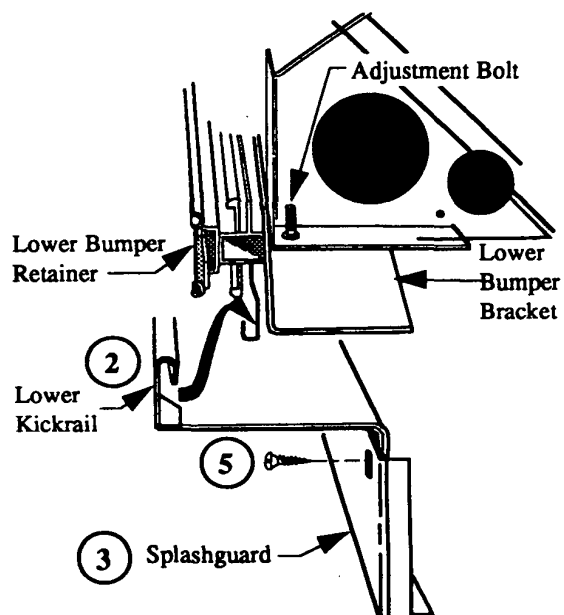


Parts List

Item	Description	NF1/NC1		NF1N/NC1N		NFCW		NFFS		NFW		NFCWE	
		NF1/NC1		NFN/NCN		NFW		NFFS		NFW		NFCWE	
		8'	12'	8'	12'	8'	12'	6'		8'	12'	90	138
1.	Splashguard (1 each side)	1	1	2	2	2	2	3		3	3		
2.	Lower Kick Rail	1	1	2	2	2	2	3		3	3		
3.	Splashguard Corner	—	—	—	—	—	—	—		2	2		
4.	Upper KickRail (1 each side)	1	1	2	2	2	2	3		7	9		
5.	#8 x 1/2" Truss Head Sheet Metal Screw	8	10	5	10	5	10	7		8	8		

Installing Splashguard

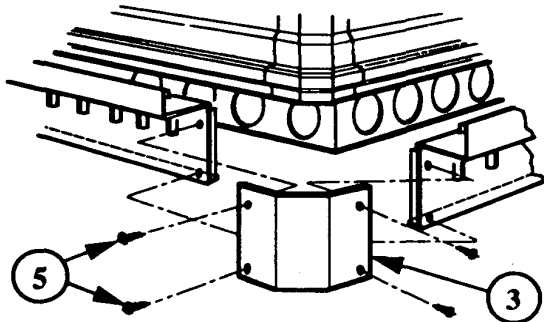
1. The lower bumper **MUST BE REMOVED** to install or remove the splashguard.
2. Attach the stainless steel splashguard to the lower kickrail with screws (Item 5) provided.
3. Install splashguard/lower kickrail assembly by hooking lower kickrail into lower bumper extrusion.
4. If necessary to adjust the splashguard to accomodate uneven floors, loosen screw (Item 5) and move vertical slot up or down.



2-6 INSTALLATION

Splashguard Corners (NFFS, NCFS, NFWE, NCWE & NFCWE Only)

Install splashguard corners (Item 3) with #8 x 1/2" Truss Head sheet metal screws (Item 5) as shown in the illustration.

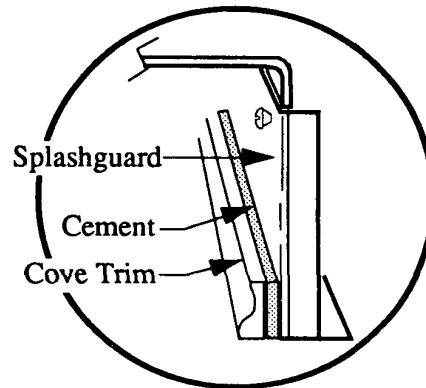


SEALING SPLASHGUARD TO FLOOR

If required by local sanitation codes or if desired by the customer, the splashguard 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.



Sealing Splashguard to Floor

REFRIGERANT

The correct type of refrigerant will be stamped on each merchandiser's serial plate.

REFRIGERANT PIPING

Connection Sizes

Liquid Line	3/8" OD
Suction Line	7/8" OD

Connection Location

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

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

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 Koolgas 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.

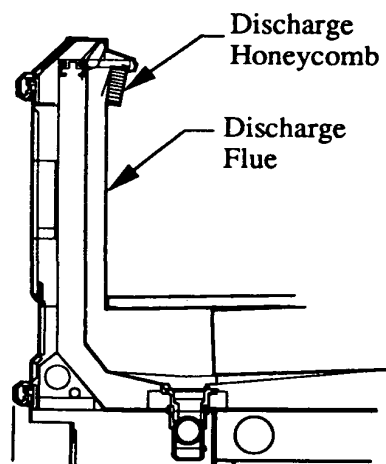
Line Sizing

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 the Hussmann Application Engineering Manual for guidance.

WARNING

Use extreme care when making refrigeration line connections. Heat from the torch can travel up the discharge flue to the back side of the plastic discharge honeycomb and possibly damage the honeycomb.

To avoid this possibility, we suggest that the section of honeycomb above the area where connections are to be made be removed until connections are complete.



3-2 REFRIGERATION

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

For merchandisers with other than KOOLGAS defrost: the suction and liquid lines should be clamped or taped together and insulated for a minimum of 30' from the merchandiser; for merchandisers with KOOLGAS defrost, the suction and liquid lines should NOT contact each other and should be insulated separately for a minimum of 30' from the merchandiser. Additional insulation for the balance of the liquid and suction lines is recommended wherever condensation drippage is objectionable.

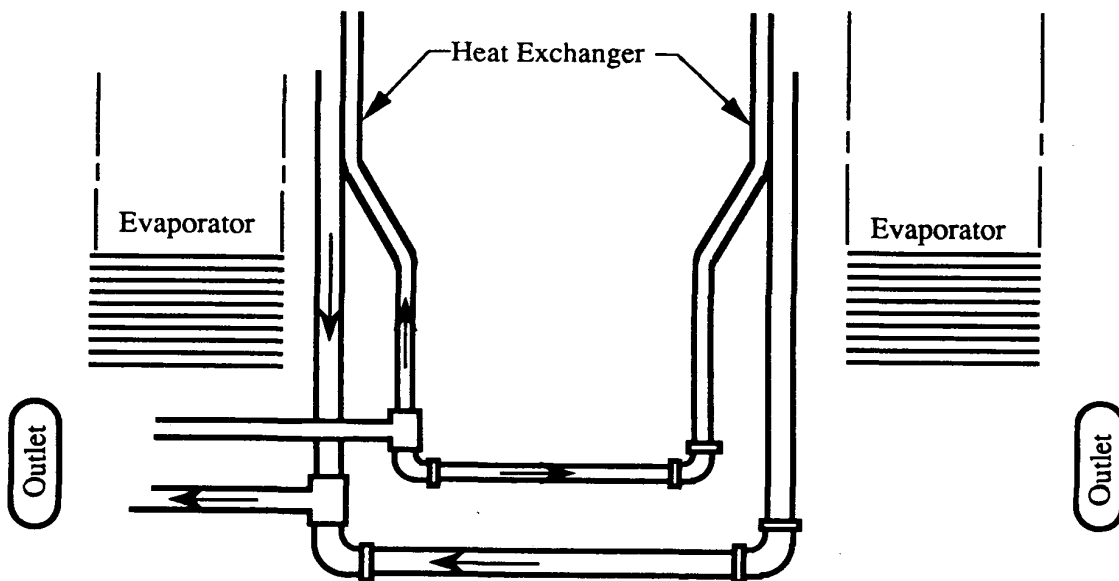
Oil Traps

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

FROZEN FOOD WIDE ISLAND (NFW, NCW) ONLY

The evaporators on these models must be connected parallel to a common refrigerant supply. The material and method are to be supplied by the installing contractor. The refrigerant supply line may enter the merchandiser from either side: Install the evaporator connecting lines accordingly. See illustration below.

When installing the connecting lines, we recommend that the tee fittings be installed in a "Head-on" position as shown. This will equalize the suction and refrigerant distribution between both evaporators.



Refrigerant R502				
NFN & NCN	Electric Defrost		Koolgas Defrost	
	Expansion Valve	Distributor	Expansion Valve	*Distributor
8ft	BFRE AZ	D115—2—1/4—1	BFRE AZ	D116—2—1/4—1
12ft	BFRE AZ	D115—2—1/4—1 1/2	BFRE AZ	D116—2—1/4—1 1/2
NFWE90 NCWE90 NFCWE90 parent compartment	BFR AAZ	—	Y920 BGR AZ	—
All Others	BFR AZ	—	Y920 BGR AZ	—

Refrigerant R22				
NFN & NCN	Electric Defrost		Koolgas Defrost	
	Expansion Valve	Distributor	Expansion Valve	*Distributor
8ft	BFVE AAZ	D115—2—1/4—1/2	BFVE AAZ	D116—2—1/4—1/2
12ft	BFVE AAZ	D115—2—1/4—1	BFVE AAZ	D116—2—1/4—1
NFWE90 NCWE90 NFCWE90 parent compartment	BFV AAZ	—	Y920 BGV AAZ	—
All Others	BFV AAZ	—	Y920 BGV AAZ	—

*These distributors are provided with a special 3/8" side outlet port that allows the liquid condensed in the coil during defrost to bypass the expansion valve and flow into the liquid line.

NOTE: Wide Island (NFW, NCW & NFCW) models have two (2) expansion valves.
Unitized wide island models (NFWE, NCWE & NFCWE) have three (3) expansion valves.

3-4 REFRIGERATION

CONTROL SETTINGS

Island, Frozen Food, Ice Cream (1)		Conventional Single Compressor		Parallel Compressor Rack	
		Frozen Food	Ice Cream	Frozen Food	Ice Cream
Discharge Air Temperature °F		-10	-20	-10	-20
Evaporator Temperature °F		-20	-30	-20	-30
REFRIGERATION CONTROLS					
		(2)	(2)	(6)	(6)
EPR When used, EPR Valve setting must maintain evaporator temperature listed above.					
Thermostat	Cut-out °F	-10	-20	-10	-20
CDA Valve	Set Point °F	—	—	-10	-20
Fan Cycling	Cut-in/Cut-out °F	—	—	—	—
DEFROST CONTROLS					
		(3)	(3)	(7)	(7)
Frequency		Every 24 Hours		Every 24 Hours	
Termination					
Temperature °F	Electric	52	52	52	52
Time Refer to Length below					
Fail-safe		(4)	(4)	(8)	(8)
minutes	Single Compressor				
	Outdoor Condenser pumpdown included	64	64		
	Reverse Air	90	90	90	90
	All Other Applications	60	60	60	60
Length					
minutes	Koolgas	—	—	20	24
	Electric	60	60	60	60
Low Pressure Settings		(5)	(5)		
with CDA or Thermostat Temperature Control					
Cut-in/Cut-out psig		R502	32/10 15/4	—	—
		R22	25/6 10/0	—	—

FOOTNOTES

(1) Measure Discharge Temperature at the center of the discharge honeycomb at the center of the merchandiser. Remember that the NFCW and NFCWE have front and rear temperature controls. Each evaporator must be adjusted independently of the other.

Conventional Single Compressor

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

(3) Standard Electric Defrost is temperature terminated at 52°F. Optional Reverse Air is temperature terminated at 48°F. 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.

(4) On outdoor units the defrost timer will control a liquid line solenoid beginning a defrost pump-down 4 minutes before defrost.

(5) Low pressure control settings are applicable to outdoor condenser units where ambient does not fall below 0°F. Set Low Pressure control according to chart. Thermostat must control Merchandiser temperature.

Parallel Compressor Rack

(6) Merchandiser temperature must be controlled by a thermostat or a CDA. 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.

(7) Standard Electric Defrost is temperature terminated at 52°F. Optional Reverse Air is temperature terminated at 48°F. 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.

(8) Optional Koolgas defrost is time terminated. 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.

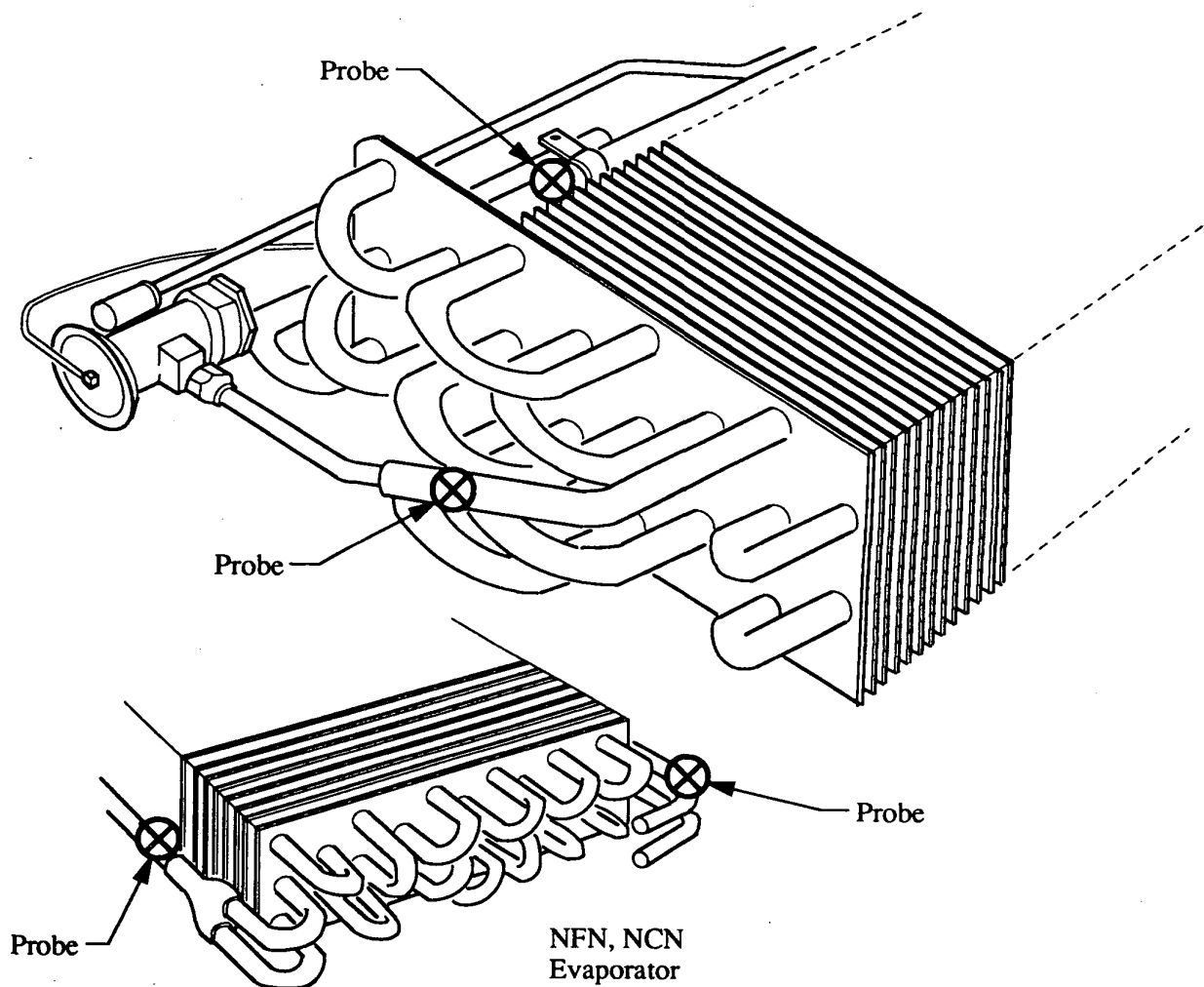
3-6 REFRIGERATION

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 fixture 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, one under the clamp holding the expansion valve bulb and the other securely taped 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 little as 0°F). Make adjustments of no more than one-quarter (1/4) turn for Balanced Port TEV and one-half (1/2) turn for "G" Body valves at a time. Wait for at least 15 minutes before rechecking the probe temperature and making further adjustments.

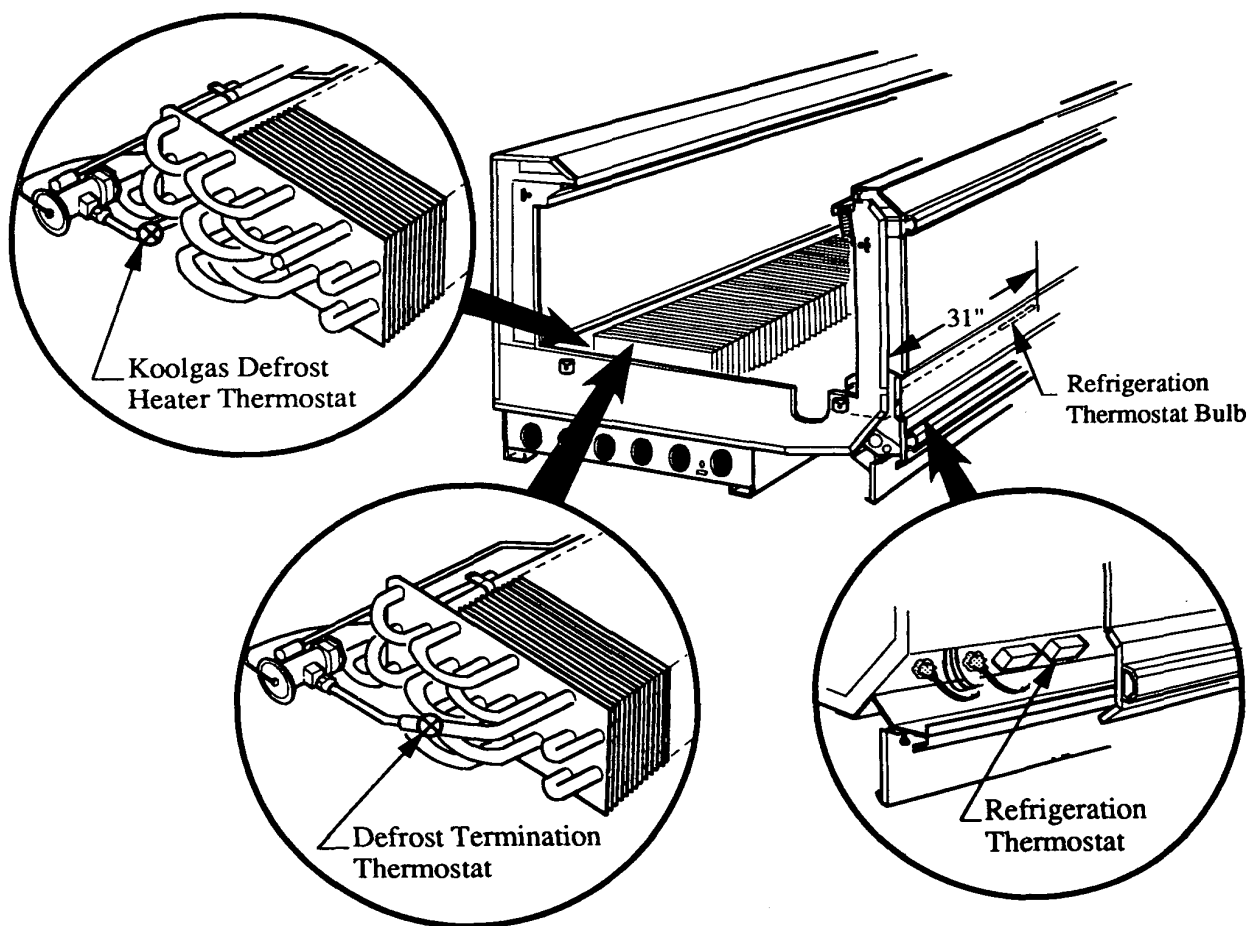


REFRIGERATION THERMOSTAT

Factory installation of optional thermostat is shown below. The thermostat body is located under the overhang at the left end of the merchandiser. The bulb, when factory installed, is located in the discharge flue under the display pan and is fastened to the lower lip of the front shelf support. Twin temperature models will have two thermostats – one for each side of fixture.

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. Twin temperature models will have two sensors – one for each side of fixture.



CONNECTIONS

All wiring must be in compliance with NEC and local codes. All electrical connections are made in the electrical connection box located at the left-hand end of the merchandiser (facing front), behind the lower front panel, except for the NFWE, NCWE & NFCWE which are made in the end case. The front is identified by locating the serial plate. See illustration.

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's raceway.

The defrost heaters, defrost termination thermostats and refrigeration thermostats of wide island models are tagged with identification as being either front or rear case display section defrost and refrigeration controls.

WIRING COLOR CODE

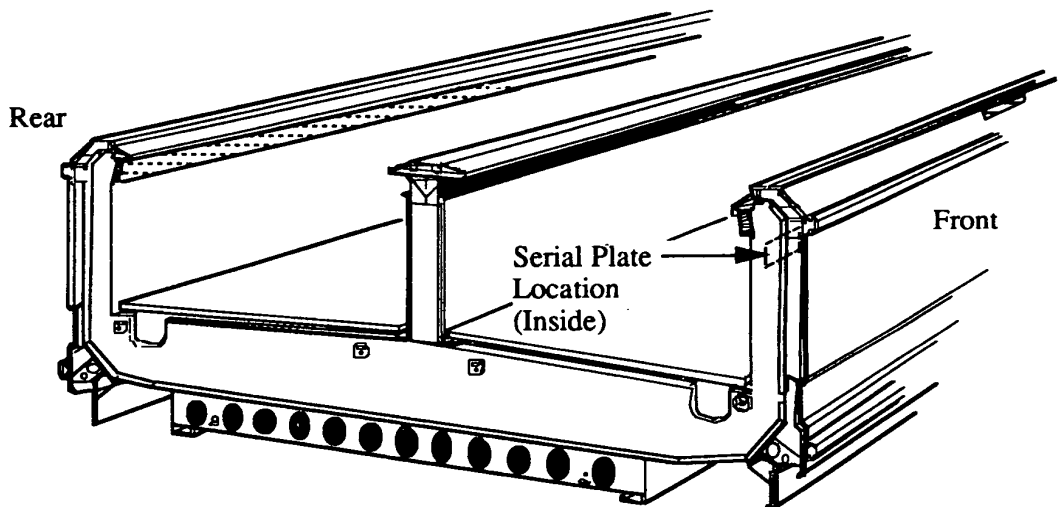
Leads for all electrical circuits are identified by a colored plastic band: neutral wire for each circuit has either White insulation or a White plastic sleeve in addition to the color band.

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



4-2 ELECTRICAL

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 defrost termination thermostats and for optional refrigeration

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.

Serial Plate Amperages

Model	120V 1PH 60Hz				208V 1PH 60Hz
	Fans & Anti-sweat Heaters	Superstructure Option	Cycling A/S	Koolgas Supplemental Heater	Standard Defrost Heater
	(1)	(2)		(3)	(4)
Wall 8' 12'	2.1 3.3	— —	— —	0.2 0.2	8.2 12.1
Narrow 8' 12'	2.1 3.3	— —	— —	0.2 0.2	8.2 12.1
Intermediate 8' 12'	1.8 2.8	— —	— —	0.2 0.2	10.5 15.7
Wide Island 8' 12'	2.8 4.2	6.5 9.2	2.9 3.7	0.4 0.4	16.4 24.2
Dual Temp. 8' 12'	4.0 6.0	6.5 9.2	2.9 3.7	0.4 0.4	16.4 24.2
FreeStanding 6'	1.8	—	—	0.2	5.1
NFCWE90 NFCWE138	3.1 4.4	2.6 5.2	1.4 2.9	0.5 0.5	13.1 21.5
NFCWE90 NFCWE138	3.7 5.6	2.6 5.2	1.4 2.9	0.5 0.5	13.1 21.5

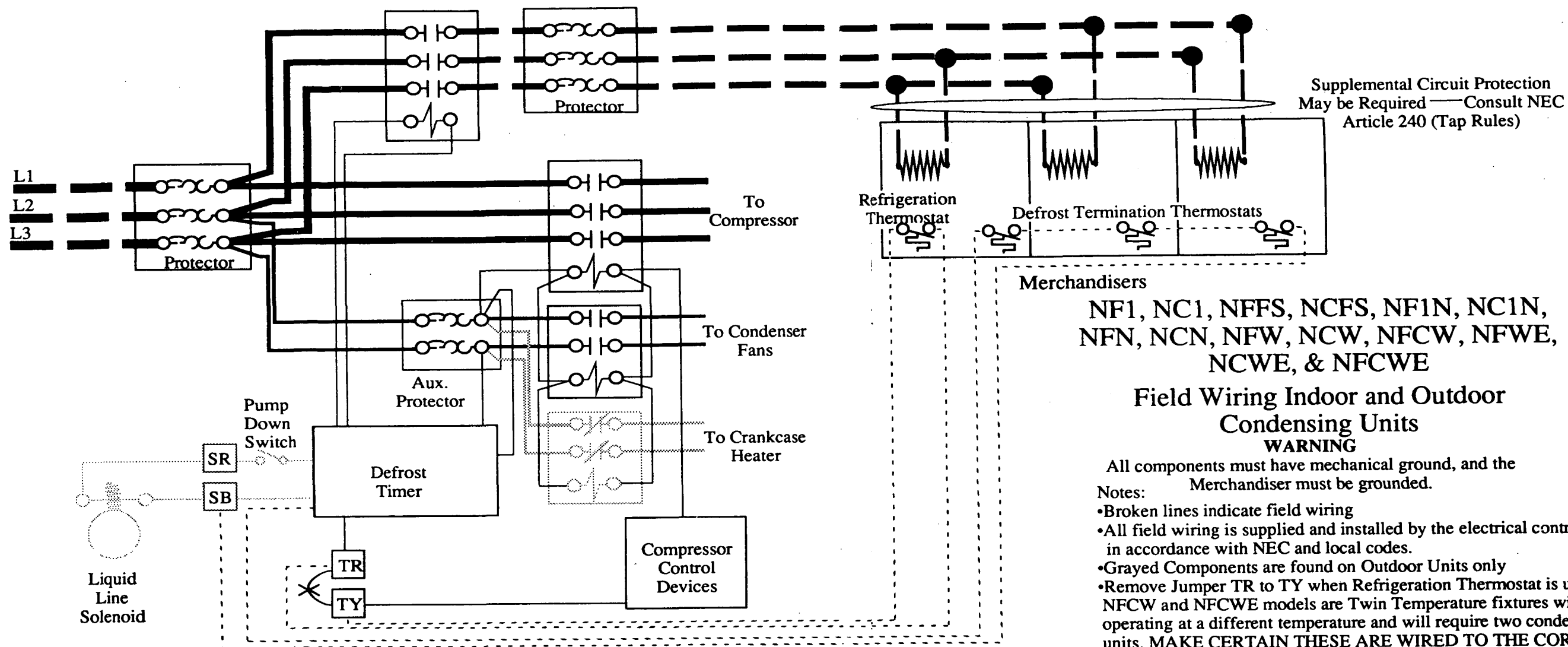
(1) Fans and anti-sweat heaters should be on a separate circuit from the lights to avoid turning them off with the store lights.

(2) These values apply when lighted shelves are to be used in the optional superstructure.

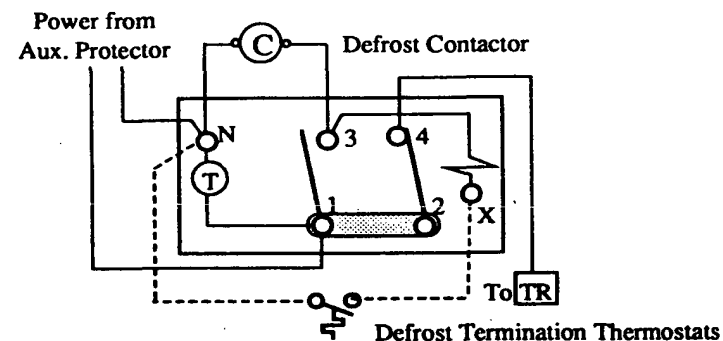
(3) This circuit is for the heater controlled by disc-type thermostat mounted on evaporator. It is energized during Koolgas defrost only and may be

connected in parallel with the fan and anti-sweat heater circuit.

(4) Electric defrost only. Not required for Koolgas defrost. The values given are for BOTH sides of the case. NCW/NFW models require one circuit; use values shown for sizing. NFCW & NFCWE models require two circuits; use half the values shown for sizing.



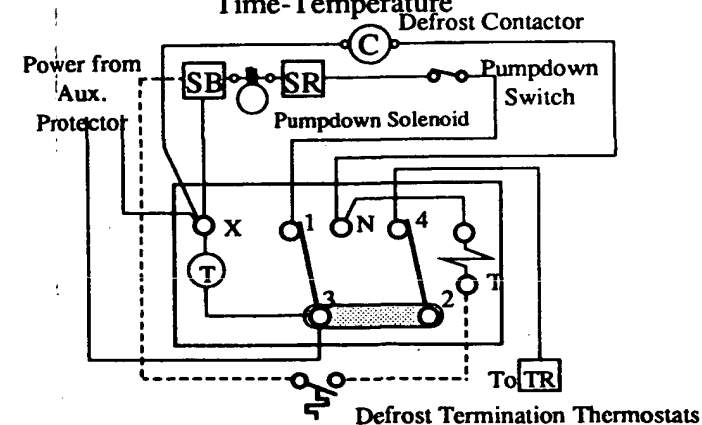
**8145 Clock
Indoor
Electric
Time-Temperature**



**A633 Clock
Outdoor**

On call for defrost contacts 3-1 open and 3-N
close. Four minutes later contacts 2-4 open.

**Electric
Time-Temperature**



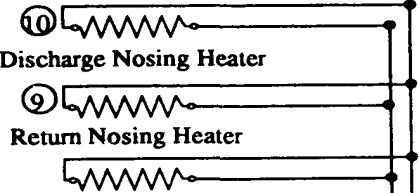
Single Deck, Free Standing, Wall, Narrow & Intermediate
Frozen Food / Ice Cream
NFFS, NCFS, NF1, NC1, NF1N, NC1N, NFN & NCN

WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

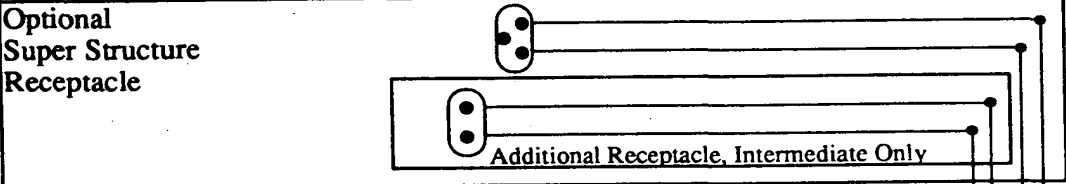
Notes:
Schematic Shows Both Standard And Optional Components. Not All Components Will Be On Each Merchandiser.
Check Store Legend For Specifics.
Grayed Components For 12' Only.

Anti-sweat Heaters



⑦ ⑧ ⑨ ⑩

Rear Cap or Wall ⑦ Rear Overhang (Wall Only) ⑧

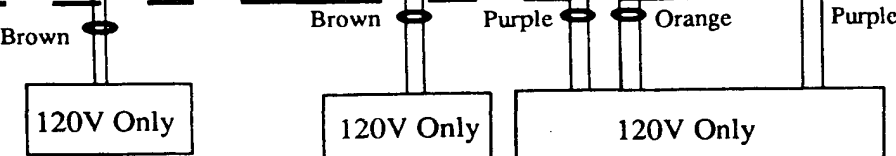


Evaporator Fans All 8' & 12' Models

① ②

Evaporator Fan, 6' Free Standing

① ②



Electrical Connection Box

Electric Defrost Heaters

Finned Heaters

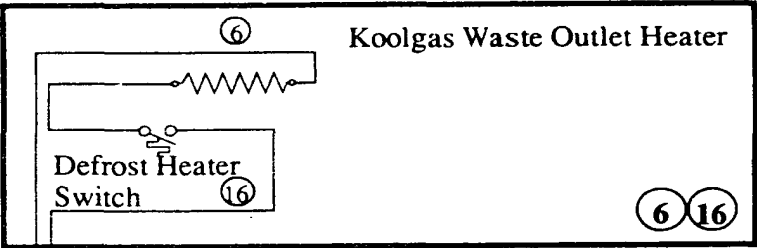
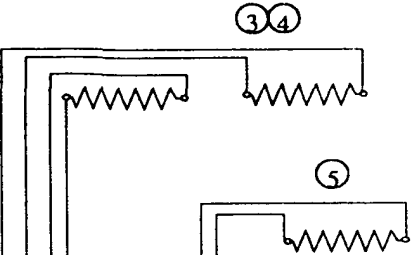
Intermediate model has 2 heaters

Free Standing, Narrow and Wall models have 1 heater

Drip Pan Heaters

Narrow and Intermediate models have 1 heater
Free Standing has none

③ ④ ⑤



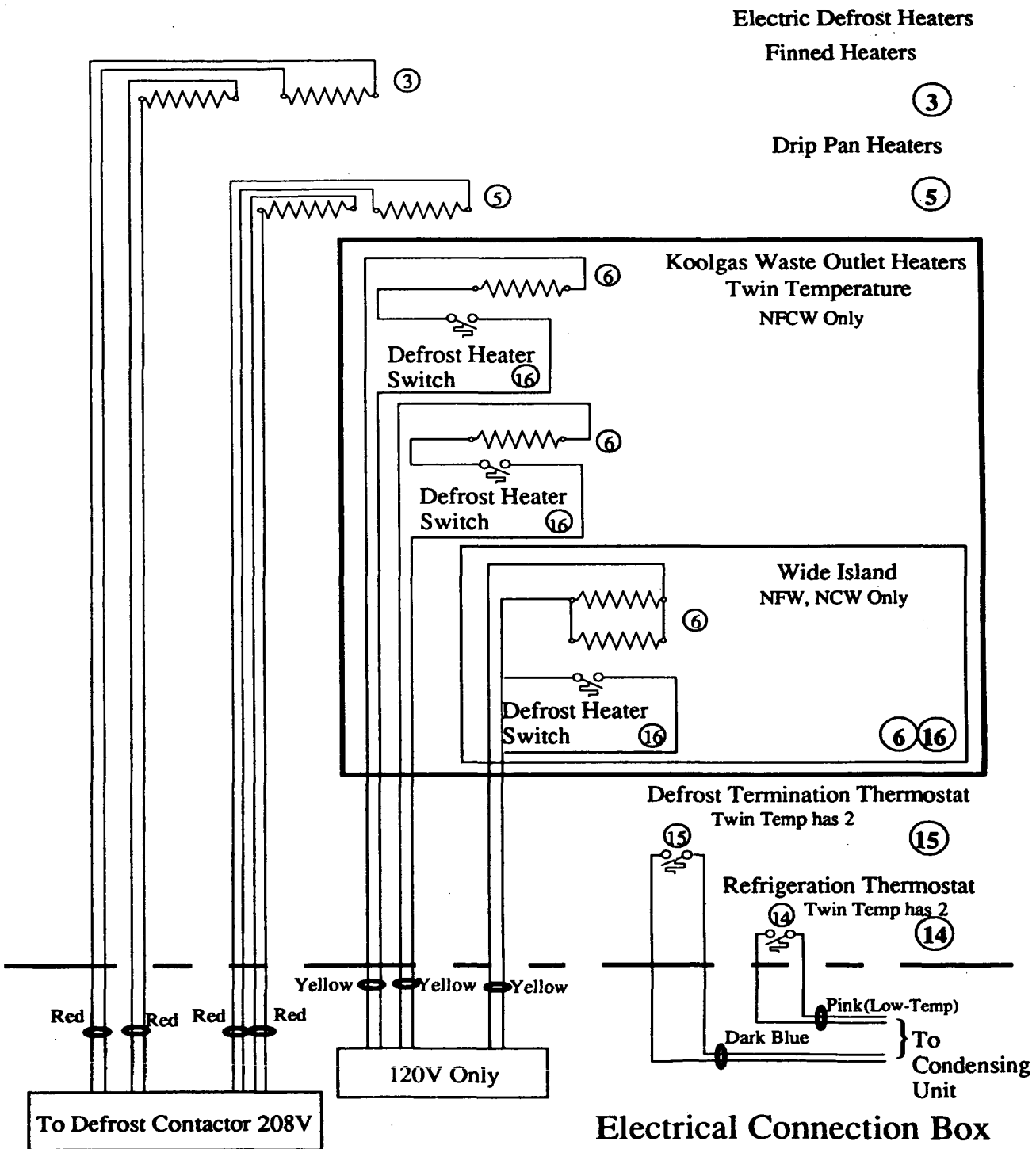
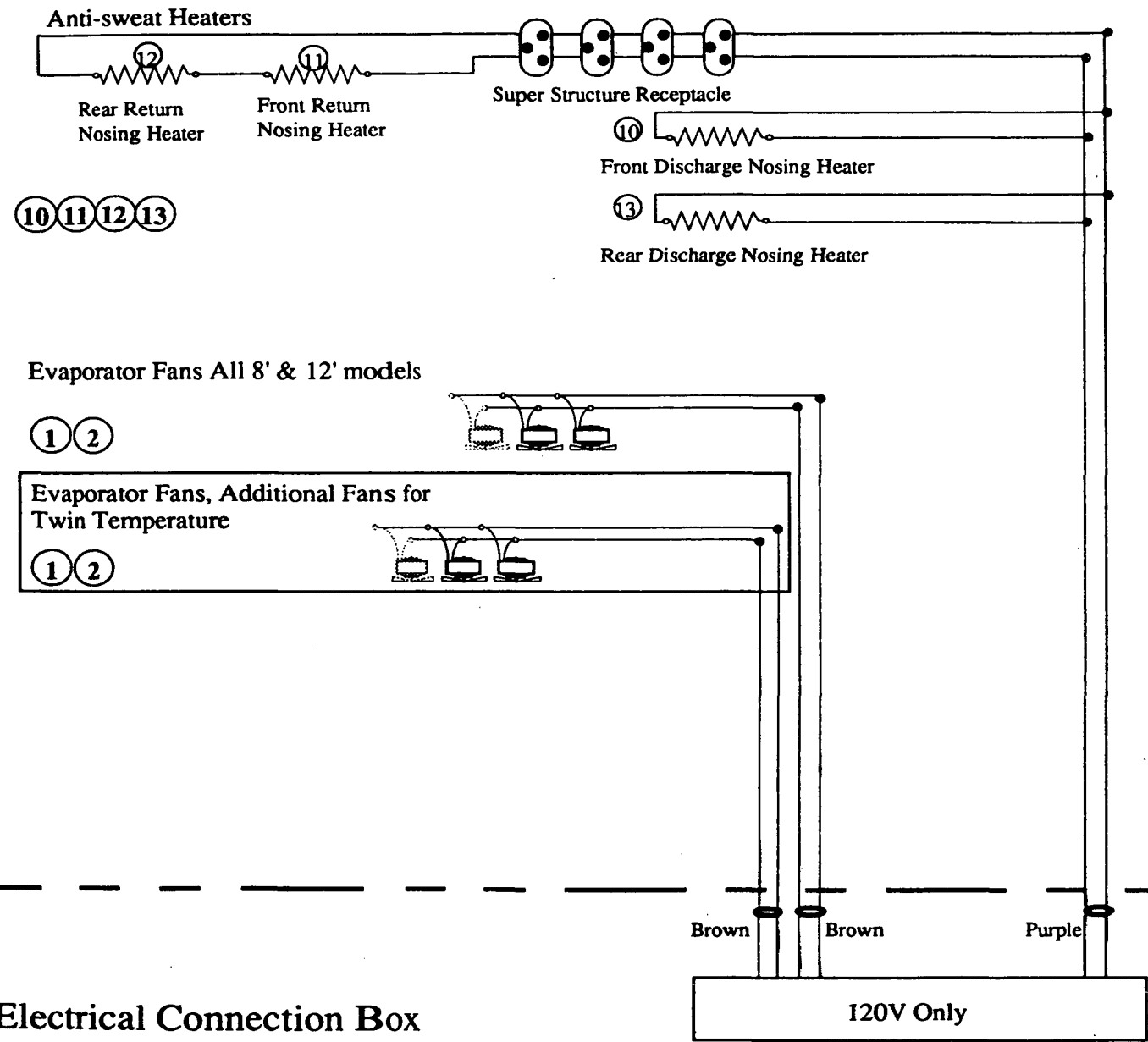
Single Deck, Wide Island, Frozen Food / IceCream
NFW, NCW & NFCW

WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes:

Twin Temperature models will have 2 sets of controls and components.
Schematic Shows Both Standard And Optional Components. Not All Components Will Be On Each Merchandiser.
Check Store Legend For Specifics.
Grayed Components For 12' Only.



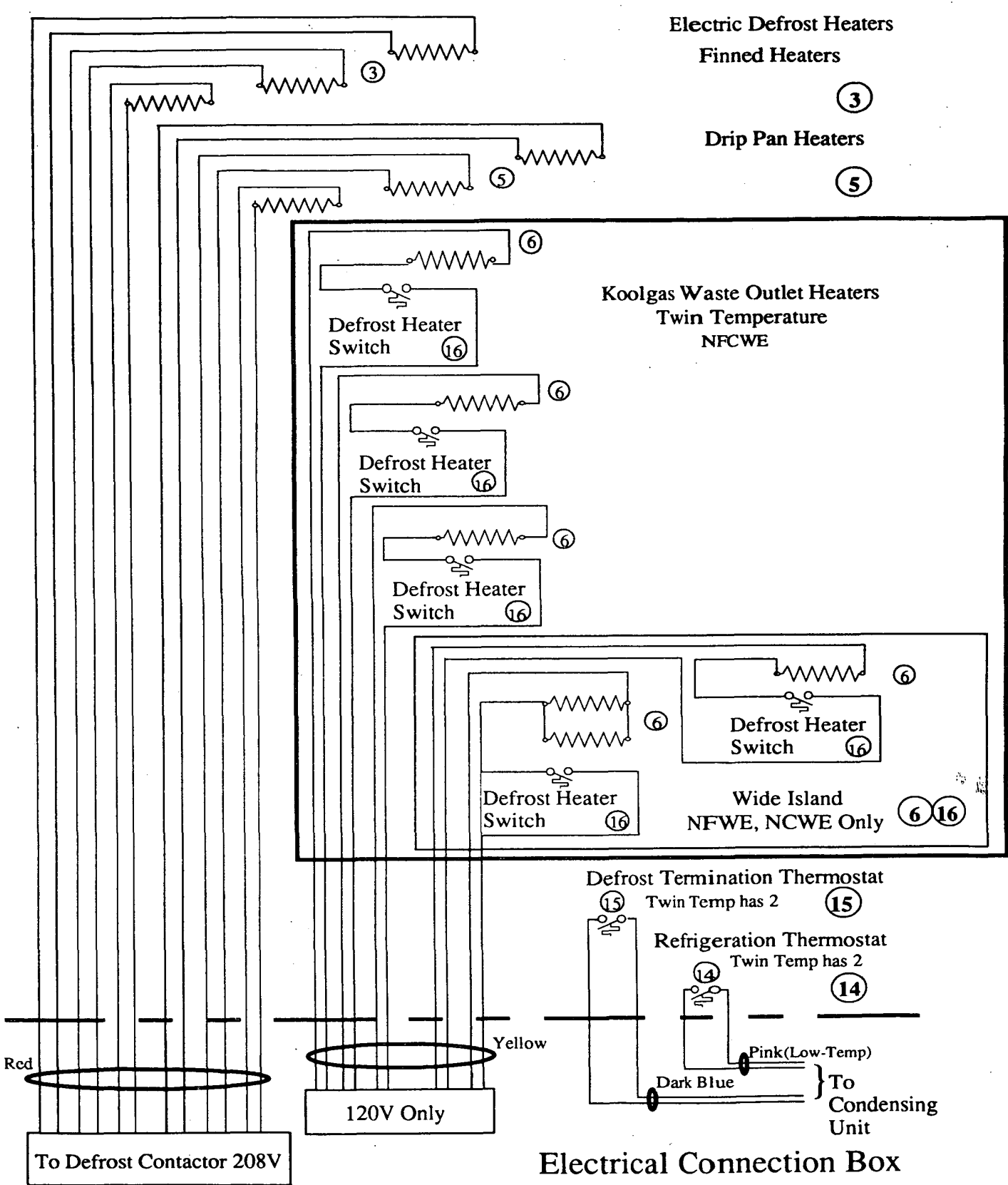
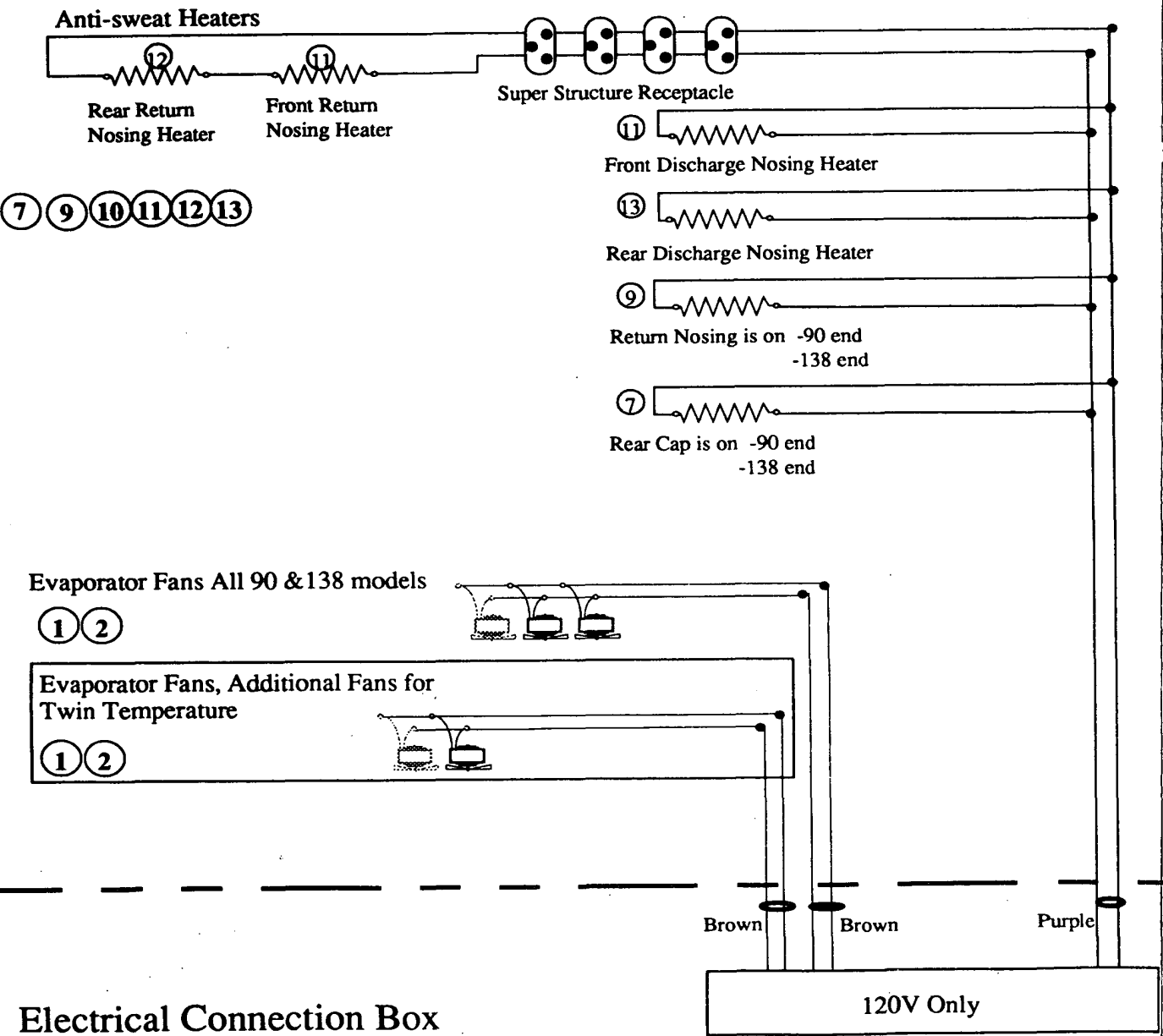
Single Deck, Wide Island, Unitized, Frozen Food / IceCream NFEWE-90, -138 / NCWE-90, -138 / NFCWE -90, -138

WARNING

All components must have mechanical ground, and the merchandiser must be grounded.

Notes

Twin Temperature models will have 2 sets of controls and components.
Schematic Shows Both Standard And Optional Components. Not All Components Will Be On Each Merchandiser.
Check Store Legend For Specifics.
Grayed Components For 138 Only.



REPLACEMENT PARTS LIST

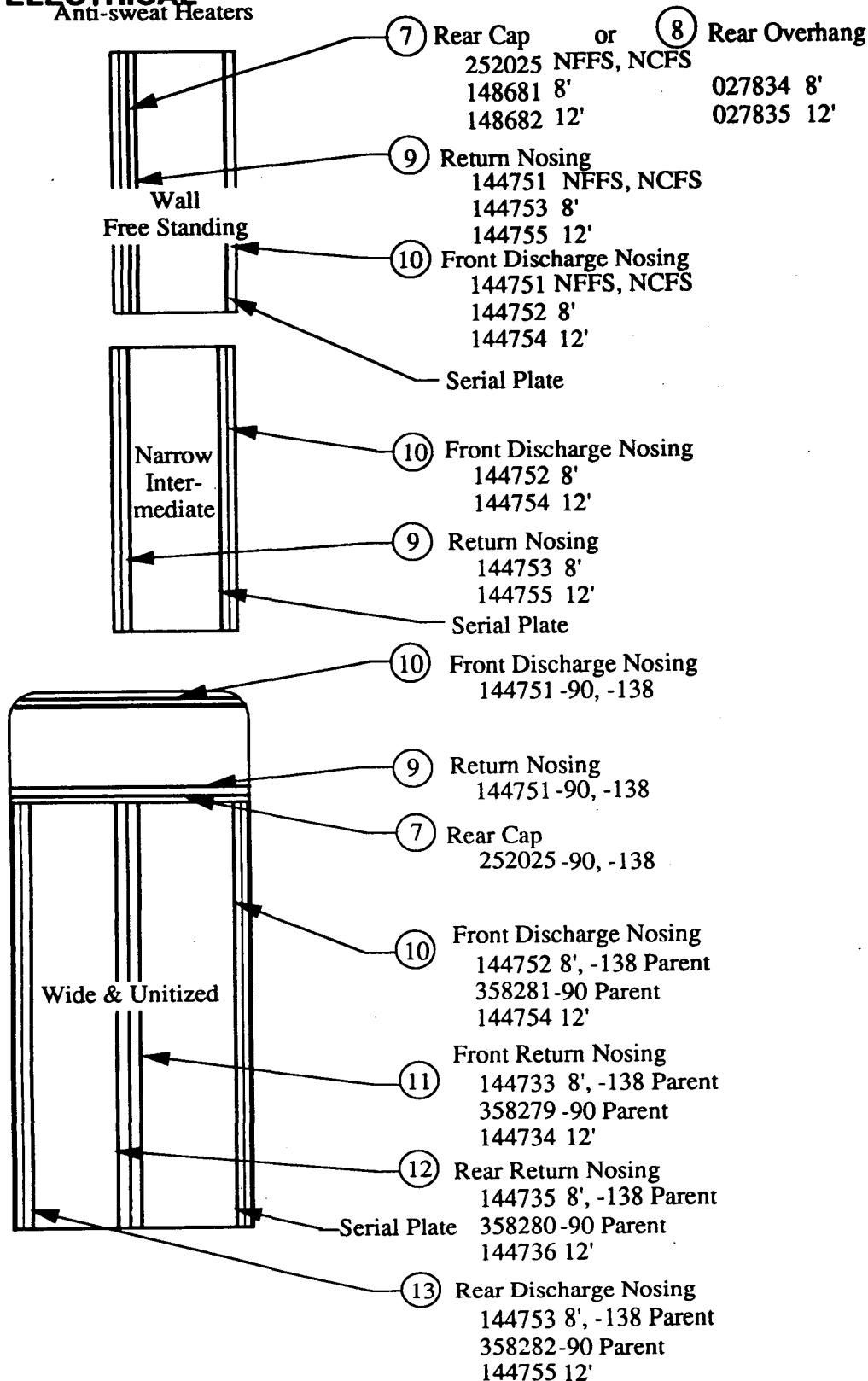
Item	Part Number	Description	Used on
Fans			
1.	0058698	Fan Motor, Evaporator, 120V, 6W, CW GE #KSM51ECG3264	All
2.	0252116	Fan Blade, Evaporator, embossing toward motor Morrill #FV700 CW 15S	Twin Temp only 8, 12', -90 & -138 parent compartment
	0136260	Fan Blade, Evaporator, embossing toward motor Morrill #FV700 CW 20S	NFFS, NCFS and -90, &-138 end compartment
	0136261	Fan Blade, Evaporator, embossing toward motor Morrill #FV700 CW 25S	All Other 8, 12', and -90, -138 parent compartment
Electric Defrost			
3.	0252030	Defrost Heater, Finned 208V, 5.1A, 41 Ω	NFFS, NCFS and -90, -138 end compartment
	0144619	Defrost Heater, Finned 208V, 6.9A, 30 Ω	All 8', except Intermediate, -138 parent compartment
	0144620	Defrost Heater, Finned 208V, 10.2A, 20 Ω	All 12', except Intermediate
	0358283	Defrost Heater, Finned 208V, 3.4A 61.2 Ω	NFWE-90, NCWE-90, NFCWE-90 parent compartment
4.	0309624	Defrost Heater, Finned, LH (short leads)	Intermediate 8'
	0309625	Defrost Heater, Finned, RH (long leads) 208V, 4.6A, 45 Ω	
	0309626	Defrost Heater, Finned, LH (short leads)	Intermediate 12'
	0309627	Defrost Heater, Finned, RH (long leads) 208V, 6.9A, 30 Ω	
Drip Pan Heaters			
5.	0358275	Drip Pan Heater, Front (short leads)	NFWE-, NCWE-, NFCWE-90
	0358276	Drip Pan Heater, Rear (long leads) 208V 0.59, 353 Ω	
	0358483	Drip Pan Heater, Front (short leads)	NFWE-, NCWE-, NFCWE-138
	0358482	Drip Pan Heater, Rear (long leads)	
	0254027	Drip Pan Heater, Front (short leads)	All 8'
	0254025	Drip Pan Heater, Rear (long leads, Wide Islands only) 208V, 1.3A, 160 Ω	
	0254028	Drip Pan Heater, Front (short leads)	All 12'
	0254026	Drip Pan Heater, Rear (long leads, Wide Islands only) 208V, 1.9A, 109 Ω	

4-8 ELECTRICAL

Item	Part Number	Description	Used on
Koolgas Defrost			
6.	0254641	Waste Outlet Heater 120V, 0.16A, 750Ω	All
Anti-sweat Heaters			
7.	0252025	Anti-sweat Heater, Rear Cap 120V, 0.65A, 185Ω	NFFS, NCFS, -90, -138 End
	0148681	Anti-sweat Heater, Rear Cap 120V, 0.31A, 385Ω	Wall 8'
	0148682	Anti-sweat Heater, Rear Cap 120V, 0.46A, 260Ω	Wall 12'
8.	0027834	Anti-sweat Heater, Rear Overhang 120V, 0.83A, 144Ω	Wall 8'
	0027835	Anti-sweat Heater, Rear Overhang 120V, 1.29A, 93Ω	Wall 12'
9.	0144751	Anti-sweat Heater, Return Nosing 120V, 0.21A, 571Ω	NFFS, NCFS, -90, -138 End
	0144753	Anti-sweat Heater, Return Nosing 120V, 0.31A, 385Ω	Wall, Narrow, Intermediate 8'
	0144755	Anti-sweat Heater, Return Nosing 120V, 0.46A, 260Ω	Wall, Narrow, Intermediate 12'
10.	0358281	Anti-sweat Heater, Front Discharge Nosing 120V, .0.15A, 782Ω	-90 parent
	0144751	Anti-sweat Heater, Front Discharge Nosing 120V, 0.21A, 571Ω	-90, -138 End, NFFS, NCFS
	0144752	Anti-sweat Heater, Front Discharge Nosing 120V, 0.31A, 385Ω	Wide 8', -138 Parent
	0144754	Anti-sweat Heater, Front Discharge Nosing 120V, 0.46A, 260Ω	Wide 12'
11.	0358279	Anti-sweat Heater, Front Return Nosing 120V, See Note next page, 123Ω	-90 Parent
	0144733	Anti-sweat Heater, Front Return Nosing 120V, See Note next page, 63Ω	Wide 8', -138 Parent
	0144734	Anti-sweat Heater, Front Return Nosing 120V, See Note next page, 43Ω	Wide 12'

Item	Part Number	Description	Used on
Anti-sweat Heaters (cont'd)			
12.	0358280	Anti-sweat Heater, Rear Return Nosing 120V, See Note, 123Ω	-90 Parent
	0144735	Anti-sweat Heater, Rear Return Nosing 120V, See Note, 63Ω	-138 Parent
	0144736	Anti-sweat Heater, Rear Return Nosing 120V, See Note, 43Ω	Wide 12'
NOTE: Front and Rear Return Nosing Heaters are connected in series.			
Total ratings are:			
		120V, 0.49A, 246Ω	-90 Parent
		120V, 0.95A, 126Ω	Wide 8', -138 Parent
		120V, 1.40A, 86Ω	Wide 12'
13.	0358282	Anti-sweat Heater, Rear Discharge Nosing 120V, 0.15A 782Ω	-90 Parent
	0144753	Anti-sweat Heater, Rear Discharge Nosing 120V, 0.31A, 385Ω	Wide 8', -138 Parent
	0144755	Anti-sweat Heater, Rear Discharge Nosing 120V, 0.46A, 260Ω	Wide 12'
Thermostats			
14.	0144732	Refrigeration Thermostat WR #1701-123	All
15.	0252122	Defrost Termination Thermostat TI #20425F32-497-897	All Electric Defrost
16.	0119422	Defrost Heater Switch TI #20425F32-443-914	All Wide w/Koolgas
	0122940	Defrost Heater Switch TI #20420F28-442-343	All Other w/Koolgas

4-10 ELECTRICAL Anti-sweat Heaters



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, merchandisers should be thoroughly cleaned, all debris removed and the interiors washed down, at least every three months.

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:

- Remove the product and all loose debris to avoid clogging the waste outlet.
- Thoroughly clean all surfaces with soap and hot water.
- 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.

Do NOT use

- Mineral oil based solutions, as these will dissolve the butyl sealants used in the merchandiser's construction.
- Abrasive cleansers and scouring pads, as these will mar the finish.
- Steam or high water pressure hoses to wash the interior. These will destroy the merchandisers' sealing causing leaks and poor performance.

STOCKING AND STOCK ROTATION

Product should not be placed in merchandisers until they have been in operation for at least five hours. This will allow for adjustments and complete heat removal from the merchandiser.

At no time should product be placed above the load limit line clearly marked on the merchandiser, **nor should the discharge or return flues be obstructed.** Overloading the fixture will result in poor product and case temperature.

Since ice cream and frozen foods are perishable and should not stay long on display, packages on display for a week should be rotated. Product rotation will also prevent excessive frost accumulation and sticking of packages.

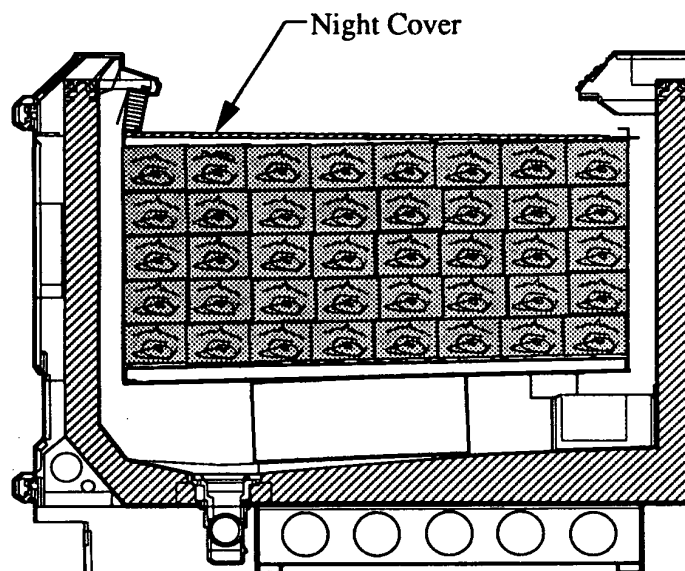
Merchandise should NOT be displayed on the return flue cap located in the center of merchandiser. Condensation will occur on items that are placed on this cap.

5-2 USER INFORMATION

NIGHT COVER USAGE

The ice cream models are supplied with night covers. (Frozen food products do not require night covers.) Night covers are made of polished aluminum which prevents the top packages from softening due to radiant heat or defrost air. Other materials that are porous or non-reflective will not give the same result.

The night covers should be placed flat on top of the packages each night at store closing. They should NOT extend above the load limit decal as this would cause defrost temperature air to be trapped between product and cover.



REPLACING ANTI-SWEAT HEATERS

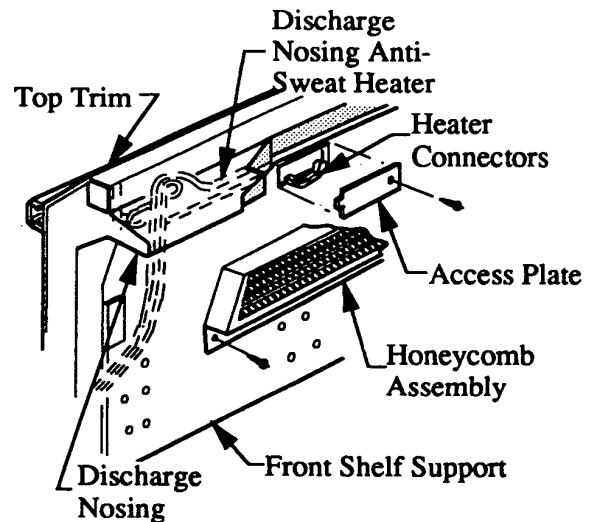
CAUTION: Do NOT remove heaters by cutting the heater wiring.
Disconnect heater at connector.

WARNING

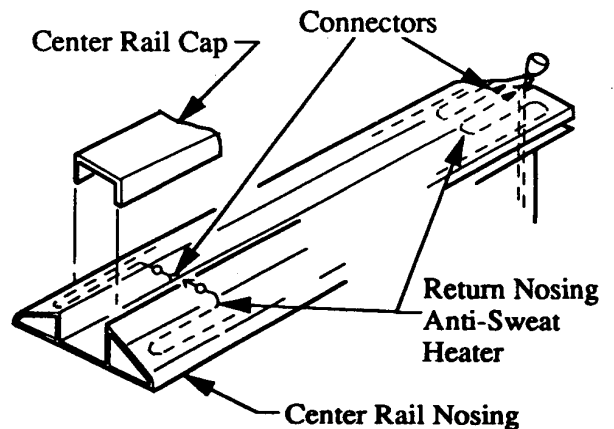
Always disconnect the electrical power at the main disconnect when servicing or replacing any electrical component. This includes, but is not limited to such items as fans, heaters, thermostats and lights.

Discharge Nosing Heater

1. TURN OFF POWER TO ANTI-SWEAT HEATER CIRCUIT.
2. Remove top trim.
3. Remove discharge nosing.
4. Remove honeycomb and access plate.
5. Unplug heater at disconnect.
6. Remove heater.
7. Install new heater in reverse order of removal.

**Return Nosing Heater (Wide Island Only)**

1. TURN OFF POWER TO ANTI-SWEAT HEATER CIRCUIT.
2. Remove end center rail covers (left and right).
3. Remove center rail nosings from both sides.
4. Unplug heater at disconnect.
5. Remove heater.
6. Install new heater in reverse order of removal.

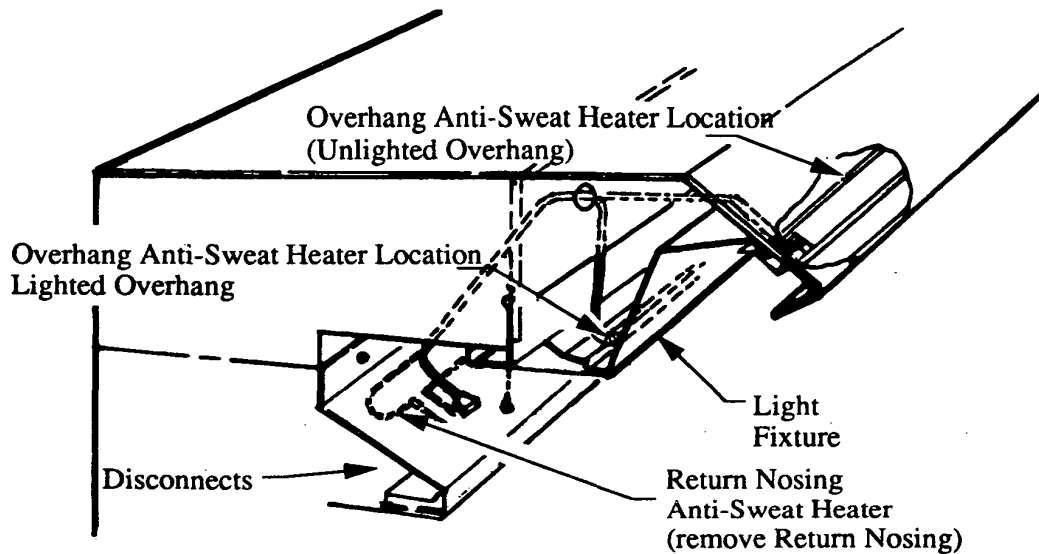
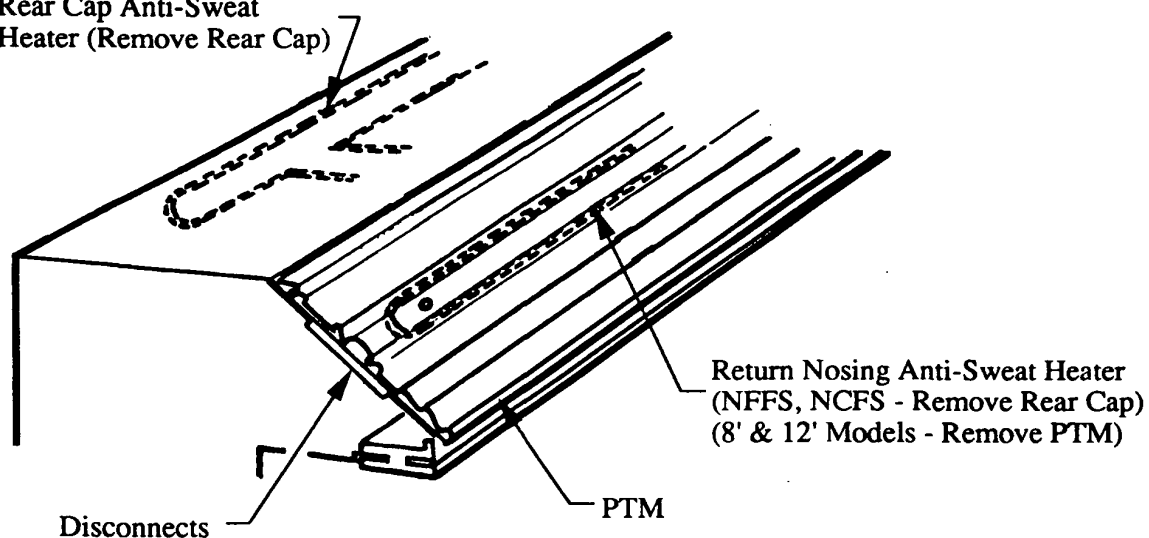


6-2 SERVICE

Return Nosing, Rear Cap or Rear Overhang Heaters (All Models Except Wide Island)

1. TURN OFF POWER TO ANTI-SWEAT HEATER CIRCUIT
2. See illustrations for location of heaters and disconnect plugs.
3. Remove items as noted for access to heater.
4. Unplug heater at disconnect and remove.
5. Install new heater in reverse order.

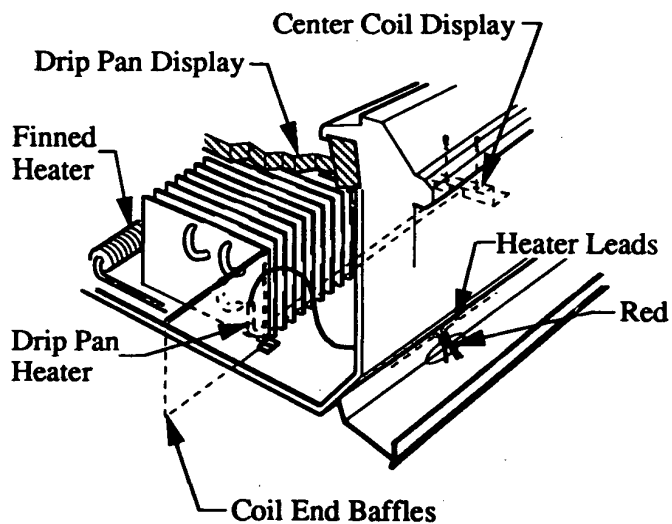
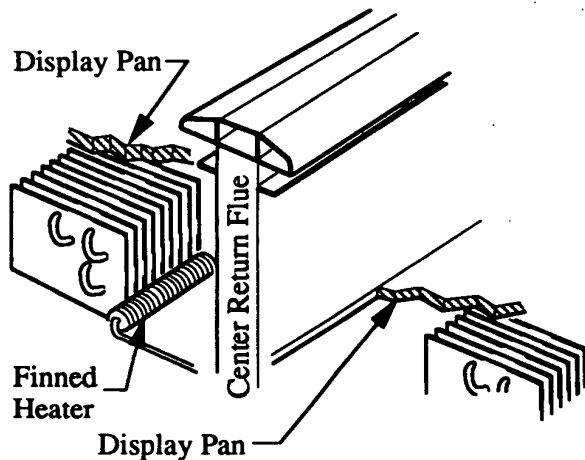
Rear Cap Anti-Sweat Heater (Remove Rear Cap)



REPLACING DEFROST HEATERS

Finned Heater

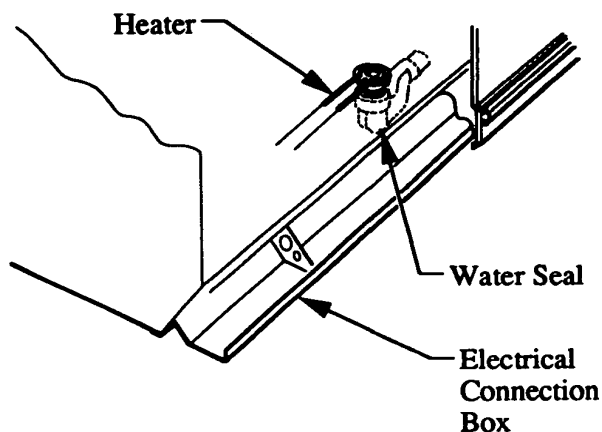
1. TURN OFF POWER ON CIRCUIT.
2. Remove display pans.
3. Disconnect heater leads from connections inside electrical raceway (left front corner of merchandiser).
4. Remove heater.
5. Install new heater in reverse order of removal.
(Be sure to reconnect heater leads to correct condensing unit circuit.)



6-4 SERVICE

Drip Pan Heater

1. TURN OFF POWER ON CIRCUIT.
2. Loosen the front retainer nut of the coil at both ends.
3. It may be necessary to remove the coil end baffles.
4. Slide drain pan heater and retainer out from under front of coil.
5. Disconnect heater leads from connections inside electrical raceway (left front corner of case).
6. Install new heater inside retainer and slide back under front of coil. Reconnect heater.
7. Replace parts.

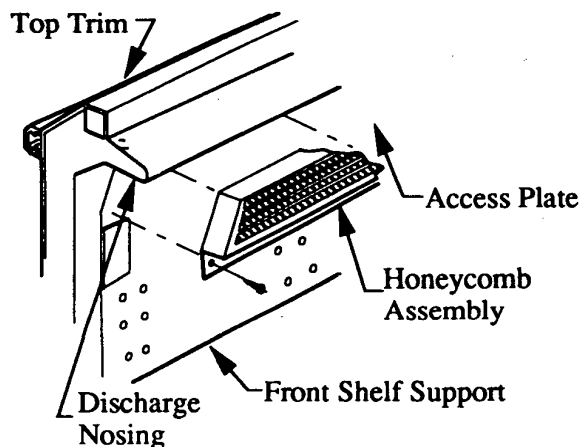


REPLACING WASTE OUTLET HEATER (KOOLGAS DEFROST)

1. TURN OFF POWER TO HEATER CIRCUIT.
2. Unscrew clamps holding heater.
3. Disconnect heater from 120 volt circuit.
4. Connect new heater leads to fan and anti-sweat heater circuit.

REPLACING HONEYCOMB

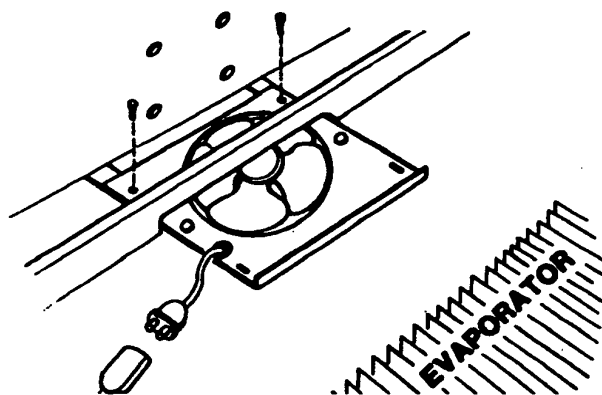
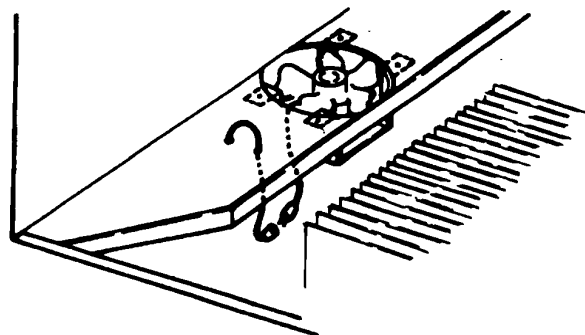
1. Remove screws that fasten honeycomb discharge assembly to the front shelf support (directly below honeycomb assembly).
2. Remove honeycomb discharge assembly.
3. Clean or replace honeycomb.
4. Install honeycomb discharge assembly in reverse order.
5. Be sure honeycomb is nested behind plastic extrusion.



REPLACING FAN MOTORS AND BLADES

The evaporator fans are located directly beneath the display pans. Should the fans or blades ever need servicing, always replace the fan blades with the raised embossed side of the blade toward the motor.

1. Remove bottom display pans.
2. Disconnect fan from wiring harness.
3. Remove fan blade.
4. Remove screws that hold fan bracket to plenum.
5. Slide fan motor and bracket to right. **NOTE: Wide Island Models** slide toward serial plate side of merchandiser. See illustration.
6. Lift bracket and motor up and out through fan plenum.
7. Replace in reverse order.



Wide Island Models

6-6 SERVICE

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 at1125° F
Aladdin 3-in-1 rod at732° F
X-Ergon Acid core at455° F
Factory Solder at aluminum
to copper transitions855° F

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.