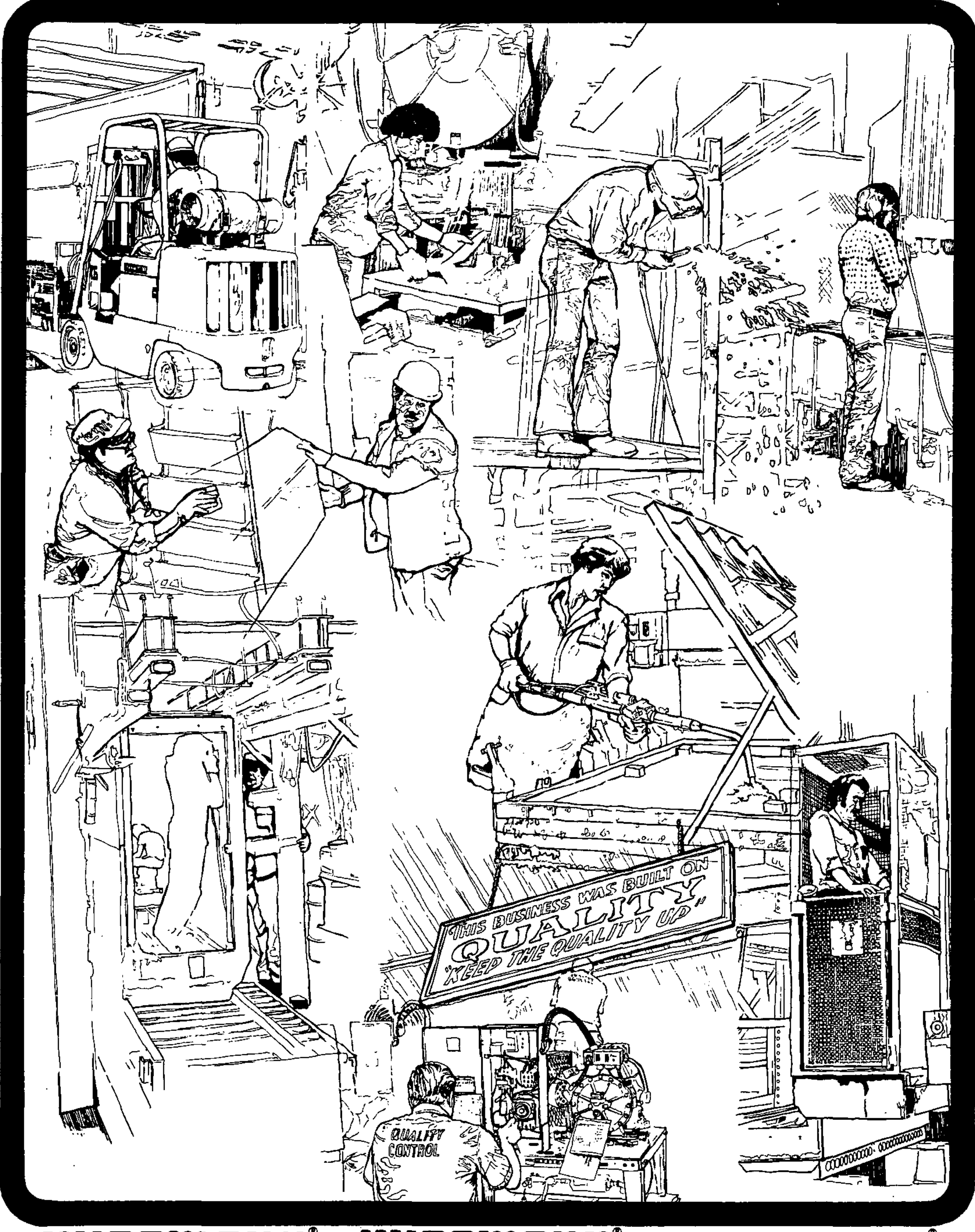


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DMA - DMDA

Reverse Air Defrost

REFRIGERATED MERCHANDISERS

for

DAIRY AND DELICATESSEN PRODUCTS

INSTALLATION / SERVICE INSTRUCTIONS

NO. 321831C

March, 1989
 Supersedes #321831B
 Dated August, 1987
 Section 5

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WARRANTY

REVISION "C"

1. R-502 Standard, page 3
2. Revised Low Pressure Control Settings, page 6

IMPORTANT
KEEP IN STORE FOR FUTURE REFERENCE

Quality that sets industry standards.

THIS REFRIGERATOR CONFORMS TO THE
COMMERCIAL REFRIGERATOR MANUFACTURER'S ASSOCIATION
HEALTH AND SANITATION STANDARD

CRS-S1-78

SECTION 1GENERAL INFORMATIONMODEL DESCRIPTION

This addendum covers only the refrigeration and electrical information for those refrigerated merchandisers listed in the following table that have been factory equipped with Reverse Air Defrost.

For additional information concerning the installation and use of this equipment, refer to Installation Instruction #258552 that was also sent with this instruction.

MODEL	PRODUCT
DMA-(*)Z	DAIRY
DMA-(*)ZA	DAIRY
DMDA(*)ZA	DELICATESSEN

* Indicates 8 ft. or 12 ft. length.

FOR SATISFACTORY PERFORMANCE AND TO MAINTAIN THE BEST PRODUCT CONDITION, STORE AIR SHOULD NOT EXCEED 75°F, 55% RELATIVE HUMIDITY.

SECTION 2**REFRIGERATION****REFRIGERANT**

These refrigerators will be equipped for operation on R-502 refrigerant unless otherwise specified on the factory order. The correct type of refrigerant will be stamped on the refrigerators serial plate located at the left hand end on the interior top liner.

REFRIGERANT PIPING

LINE SIZES: Liquid Line....3/8" OD
 Suction Line...1 1/8" OD

OUTLET LOCATION

The refrigerant line outlet is located at the right hand end of the refrigerator as viewed from the front beneath the display pans.

After connections have been made, seal this outlet thoroughly both on the inside and outside. We recommend using an aerosol dispensed urethane type of insulation

MULTIPLEXING

Piping of refrigerators operating on the same refrigeration system may be run from refrigerator to refrigerator through the end frame saddles provided for this purpose. DO NOT RUN REFRIGERANT LINES THROUGH REFRIGERATORS THAT ARE NOT ON THE SAME REFRIGERATION SYSTEM or poor refrigeration control and compressor failure can occur.

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.

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

Suction and liquid lines should be clamped or taped together and insulated for a minimum of 30 feet from the refrigerator. Additional insulation for the balance of liquid and suction lines is recommended and required wherever condensation and drippage would be objectionable.

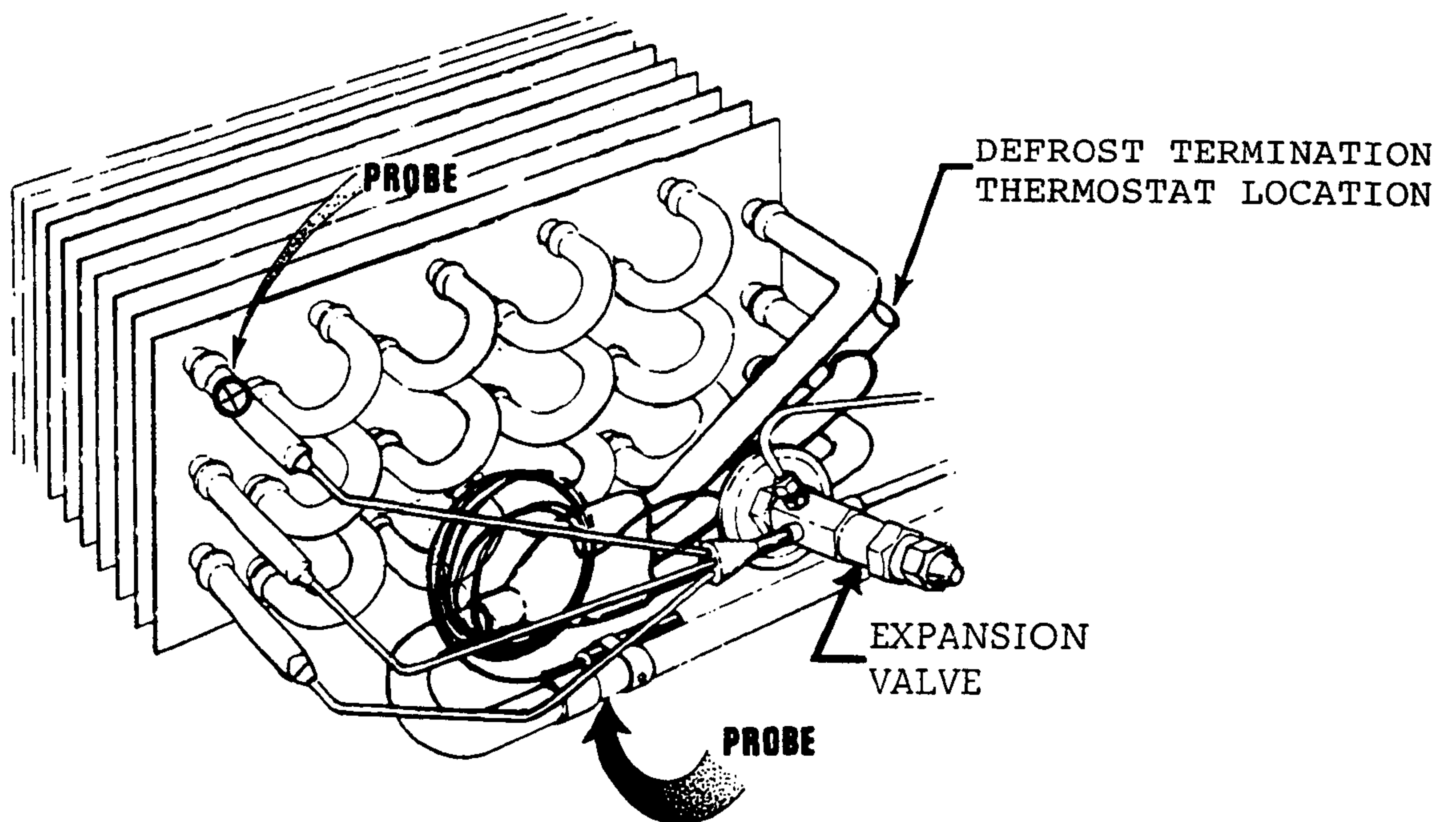
REFRIGERATION PARTS LIST (SPORLAN NOMENCLATURE)

REFRIGERANT	BALANCED PORT EXPANSION VALVE		DISTRIBUTOR	
	8 FT. CASE	12 FT. CASE	8 FT.	12 FT.
R-502	BFRE CC	BFRE CC	D115-3-1/4-1 1/2	D115-3-1/4-2
R-22	BFVE AC	BFVE CC	D115-3-1/4-1	D115-3-1/4-1 1/2
R-12	BFFE CC	BFFE CC	D115-3-1/4-1 1/2	D115-3-1/4-2

EXPANSION VALVE ADJUSTMENT

Expansion valves must be adjusted to fully feed the evaporator. Before attempting to adjust valves, make sure the evaporator is either clean 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 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 (as illustrated below). Some hunting of the expansion valve is normal. The valve should be adjusted so that during the hunting the greatest difference between the probes will be less than 3°F (at times as low as 0°F). Make adjustments of no more than one-half turn of the valve stem at a time and wait for at least fifteen minutes before rechecking the probe temperature and making further adjustments.



CONTROL AND ADJUSTMENTS - CONVENTIONAL MULTIPLEXING

Refrigeration temperature should be controlled by a refrigeration thermostat (one per condensing unit). When the optional refrigeration thermostat is factory installed, it will be located in the electrical raceway at the left hand end of the case and with its sensing bulb fastened above the evaporator.

Defrosts are time initiated and temperature terminated. The defrost termination thermostat will be factory installed on the evaporator outlet. It is a non-adjustable, single pole, single throw type thermostat.

REFRIGERATION CONTROLS				DEFROST CONTROLS			
APPLICATION	DISCHARGE AIR TEMPERATURE (1)	REFRIGERANT	LOW PRESSURE CONTROL		Defrost Frequency	Temperature Termination (3)	(4) Defrost Length Fail-Safe
			When Thermostat (2) controls Temperature				
			Cut-Out	Cut-In			
DAIRY	33° to 35°F	R-502	30 psig	63 psig	Every 8 Hours	48°F	40 Min.
DELI	30° to 32°F	R-502	30 psig	63 psig	Every 6 Hours		

- (1) Discharge air temperature is to be measured by attaching a service thermometer to the discharge honeycomb at the center of the case.
- (2) Set the pressure control as shown then adjust the thermostat to stop the compressor at the discharge air temperature shown above.
- (3) Defrost will terminate at approximately 48°F discharge air temperature. If more than one refrigerator is connected to the same condensing unit, the defrost termination thermostat of each refrigerator must be wired in series to the defrost timer.
- (4) Defrost must be terminated by the defrost termination thermostat. The defrost timer of outdoor condensing units must control a liquid line solenoid for pump-down prior to defrost. The failsafe setting for outdoor units must be increased 4 minutes to compensate for the pump-down period.

CONTROLS AND ADJUSTMENTS - MIXED MULTIPLEXING

Refrigeration temperature may be controlled by either a refrigeration thermostat or a CDA valve (Close on Drop in Air Temperature). Both of these controls are optional items and may be ordered factory installed.

The optional refrigeration thermostat is the same as that for conventional multiplexing. The optional CDA valve will have its sensor installed in the same location as the refrigeration thermostat bulb. The valve itself will be installed at the condensing unit. Further information on the CDA valve concerning wiring, adjusting and servicing can be found in the Instruction manual furnished with the condensing unit.

Standard defrost is the same as that for conventional multiplexing, and is time initiated and temperature terminated.

REFRIGERATION CONTROL		DEFROST CONTROL		
APPLICATION	Discharge Air Temperature (1)	DEFROST FREQUENCY	Temperature Termination	Failsafe
Dairy	33° to 35°F	EVERY 8 HOURS	48°F (2)	40 min.

REFRIGERATION CONTROL		DEFROST CONTROL		
APPLICATION	Discharge Air Temperature (1)	DEFROST FREQUENCY	Temperature Termination	Failsafe
Delicatessen	30° to 32°F	EVERY 6 HOURS	48°F (2)	40 min.

(1) Discharge air temperature is to be measured by attaching a service thermometer to the discharge honeycomb at the center of the case. Adjust the refrigeration control (CDA valve or refrigeration thermostat) to maintain the discharge air temperature shown.

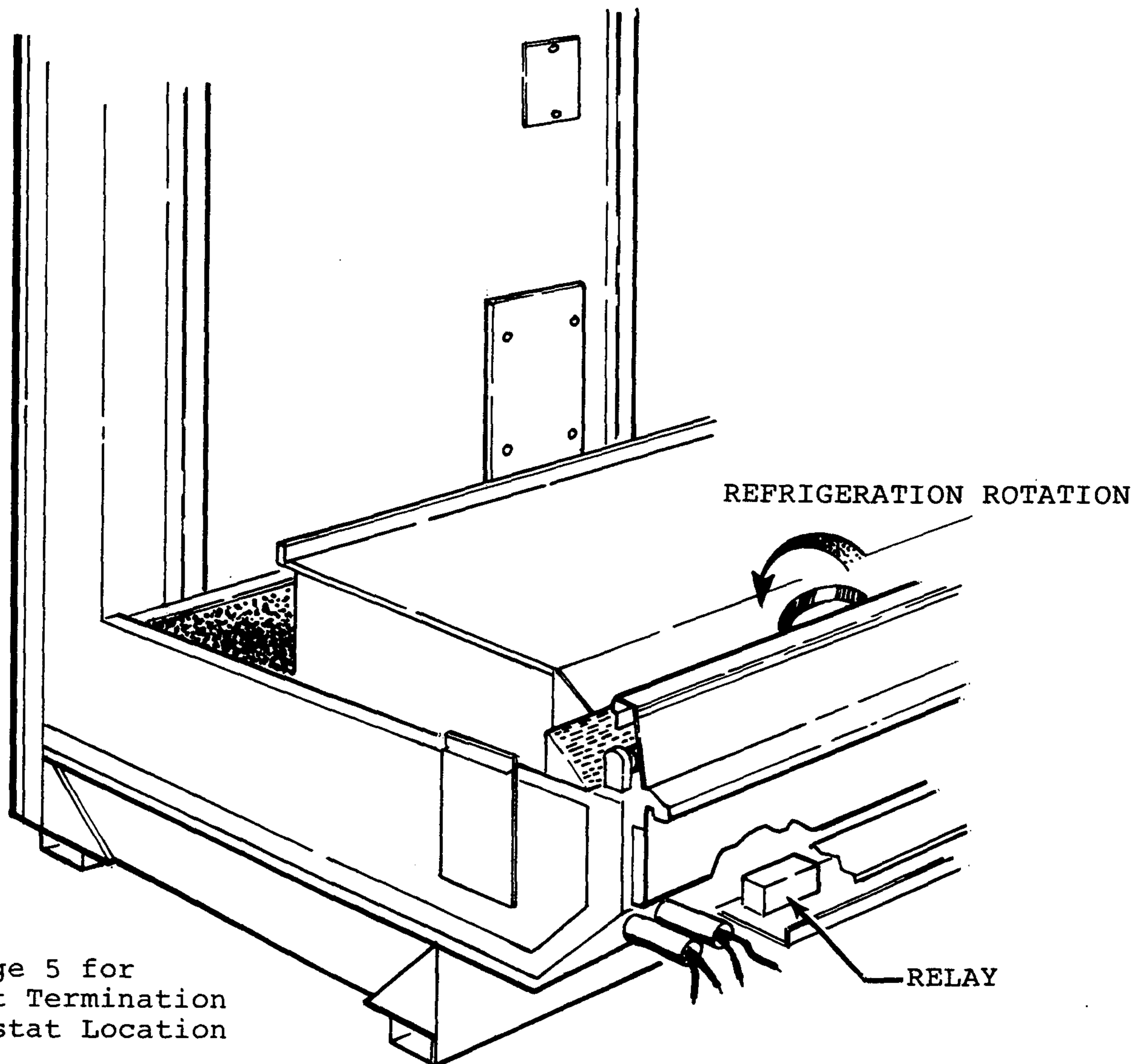
(2) All like refrigerators connected to the same condensing unit must have their defrost termination thermostat wired in series.

REVERSE AIR DEFROST

The Reverse Air Defrost method uses store air which is moved into and circulated through the refrigerator. The defrost cycle is time initiated and temperature terminated. When defrost is initiated:

1. The 208 volt pilot circuit energizes the Reversing relay causing its contacts to switch which reverses the 120 volt polarity and rotation of the fans.
2. The reversed fans will then move store air from the ambient, into the honeycomb and circulate the air down through the coil and out the return grille.
3. Defrost is terminated when the non-adjustable defrost termination thermostat senses a rise in temperature to 48°F allowing the relay to switch back to its normal position and the fans back to their refrigeration rotation.

SOLID BACK MODEL



See Page 5 for
Defrost Termination
Thermostat Location

SECTION 3

ELECTRICAL

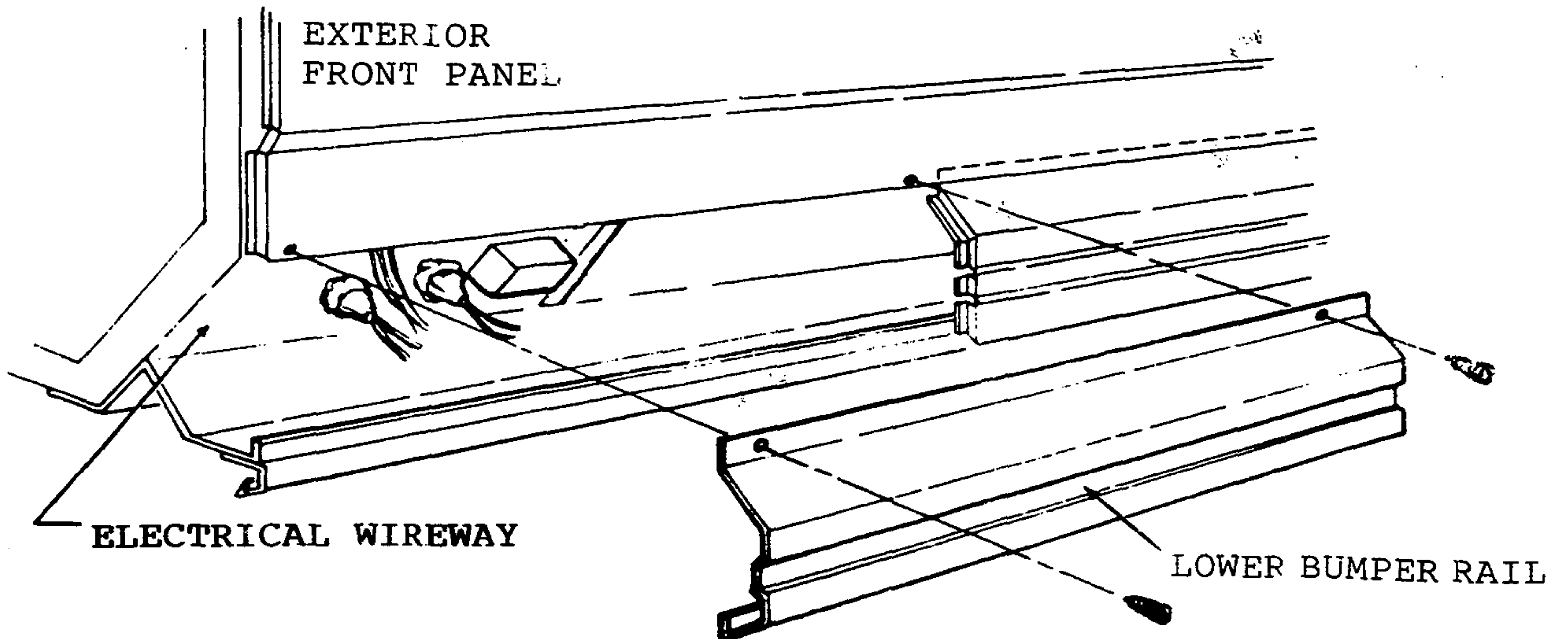
CONNECTIONS

All electrical connections are to be made in the electrical wireway behind the lower bumper rail at the left hand end of the case (shown below).

IDENTIFICATION OF WIRING

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

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	
<u>ELECTRICIAN NOTE: CASE MUST BE GROUNDED</u>	



SERIAL PLATE AMPERAGES

Serial Plate amperages are the amperage figures that are stamped on the refrigerator's Serial Plate. All field wiring must be sized to the Serial Plate amperages, however, the actual amps may be less than that specified.

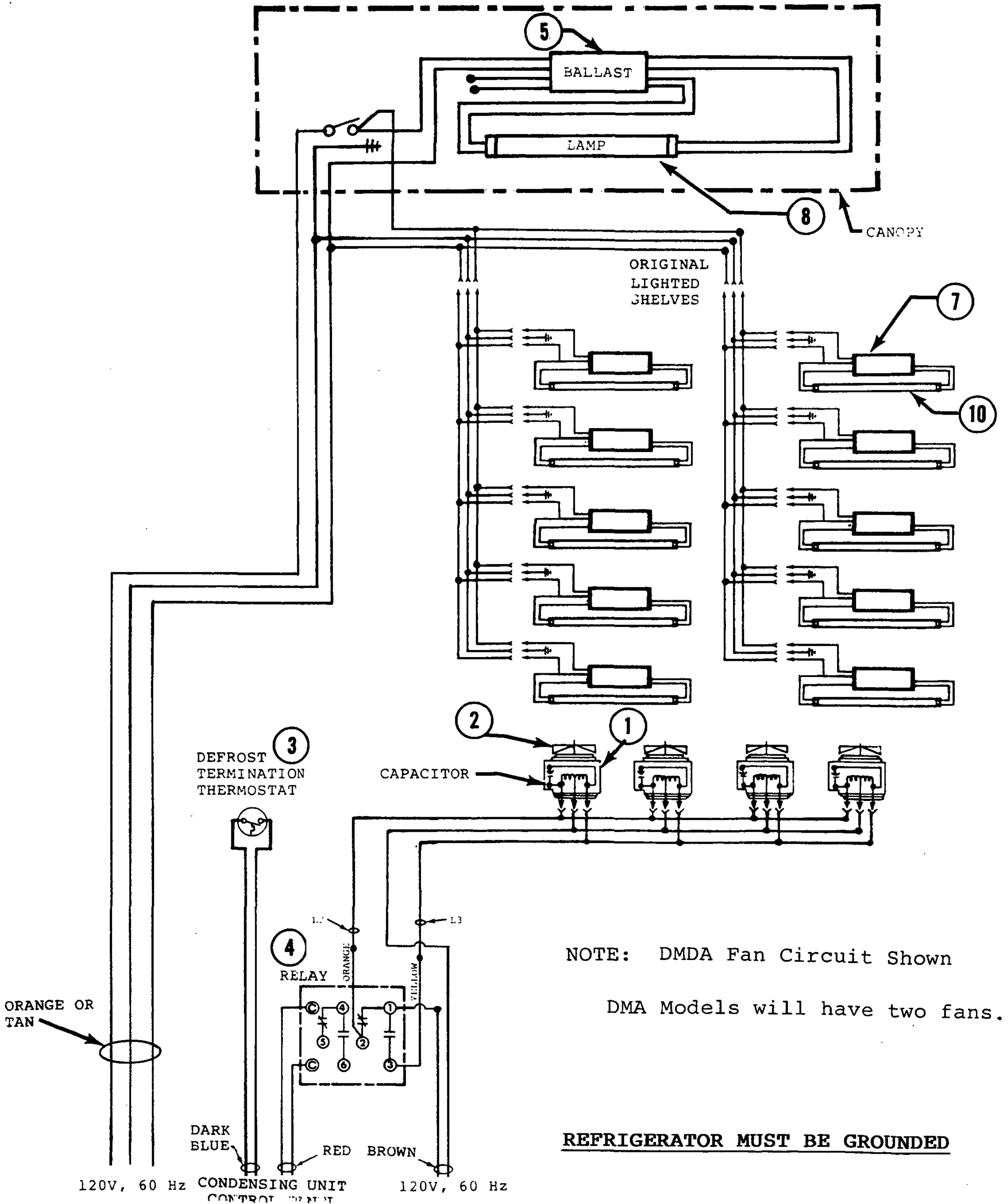
MODEL	120 VOLT, 60 HZ CIRCUITS			
	FANS	LIGHTS ^① AMPS		
	AMPS ^①	^②	^③	^④
DMA-8Z	0.6	7.8	8.7	10.0
DMA-12Z	0.9	11.9	14.0	16.0
DMDA-8Z	1.2	7.8	8.7	10.0
DMDA-12Z	1.8	11.9	14.0	16.0

NOTES:

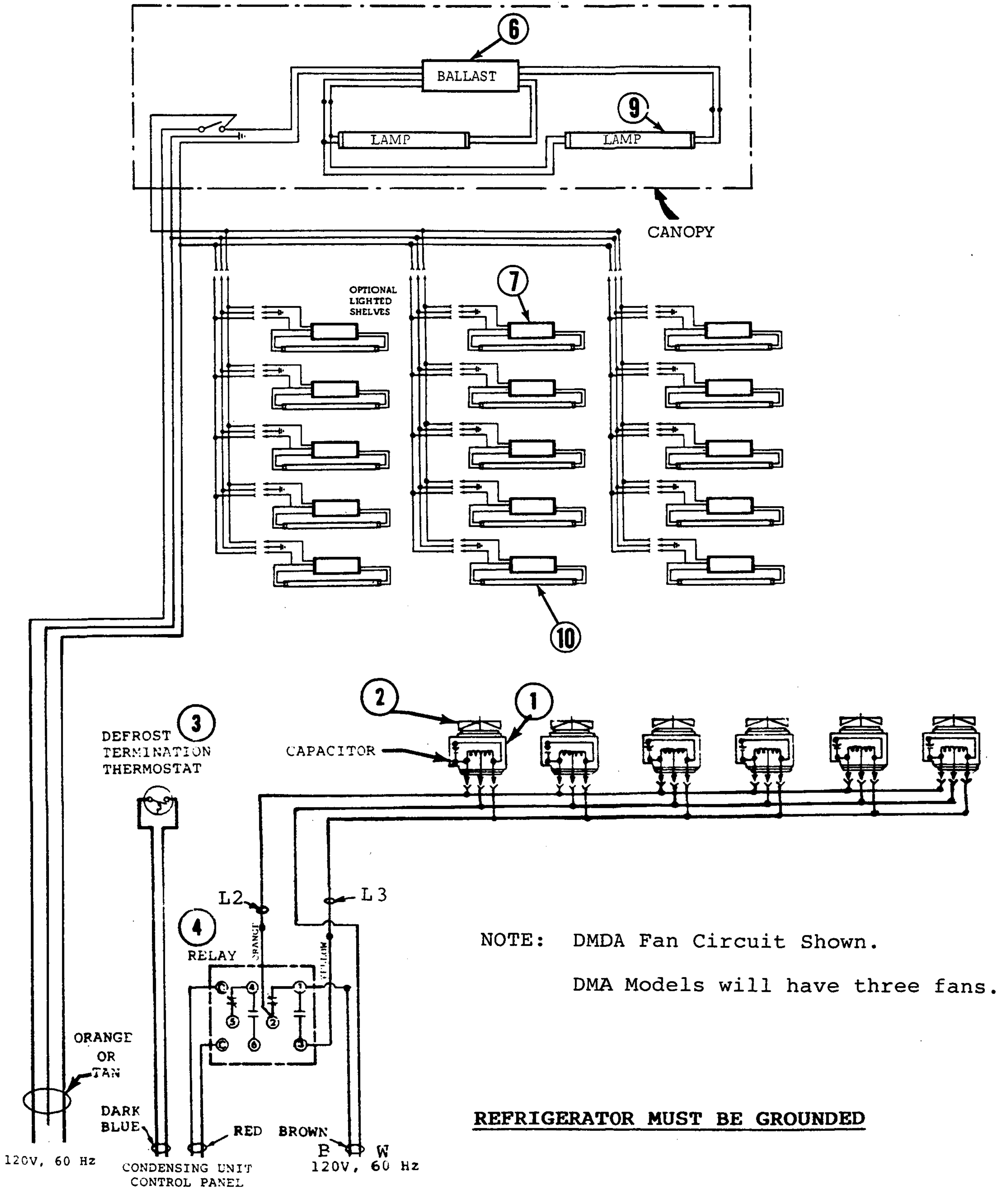
- ① The fans must operate continuously.
- ② These amperages are for standard case lighting.
- ③ These amperages are for cases equipped with the optional double row of canopy lighting or the optional front rail lighting.
- ④ These amperages are for cases equipped with the optional double row of canopy lighting and the optional front rail lighting.
- 5 Cases which are "less shelf light RECEPTACLES", subtract 8 amps from those listed by 8' cases and subtract 12 amps from those listed by the 12' cases. (Unlighted shelves DO NOT constitute "less receptacles").
- 6 In addition to the circuits described above, each of the following components require control wiring from the refrigerator to the condensing unit control panel (see Wiring Diagrams in this section).
- a. REFRIGERATION THERMOSTAT
(field or factory installed)
 - b. RELAY
 - c. DEFROST TERMINATION THERMOSTAT

NOTE: ALL FIELD INSTALLED WIRING MUST COMPLY WITH N.E.C. AND LOCAL CODES.

WIRING DIAGRAM
DMA/DMDA -8' CASE



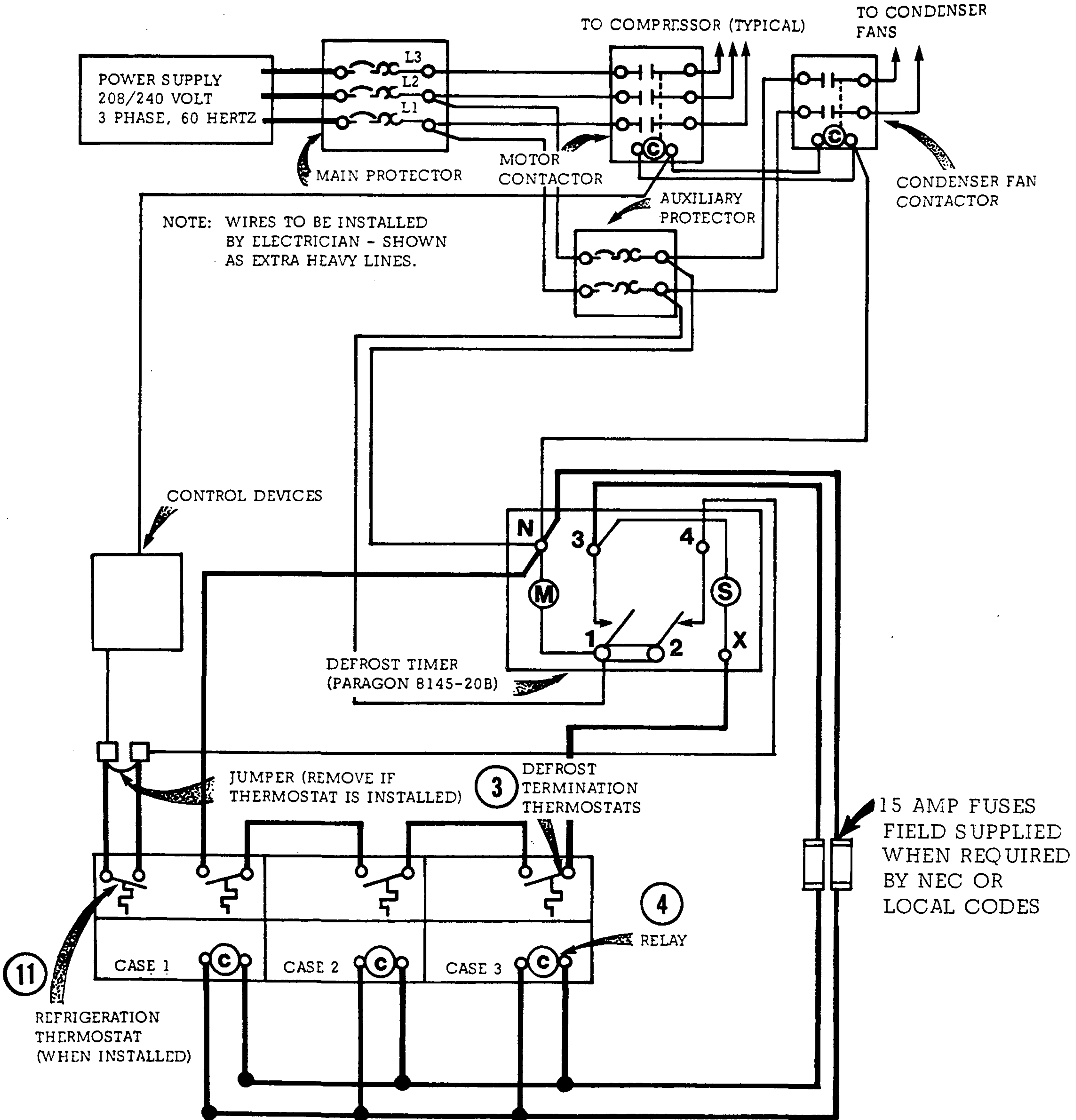
WIRING DIAGRAM
DMA/DMDA - 12' CASE



NOTE: DMDA Fan Circuit Shown.
DMA Models will have three fans.

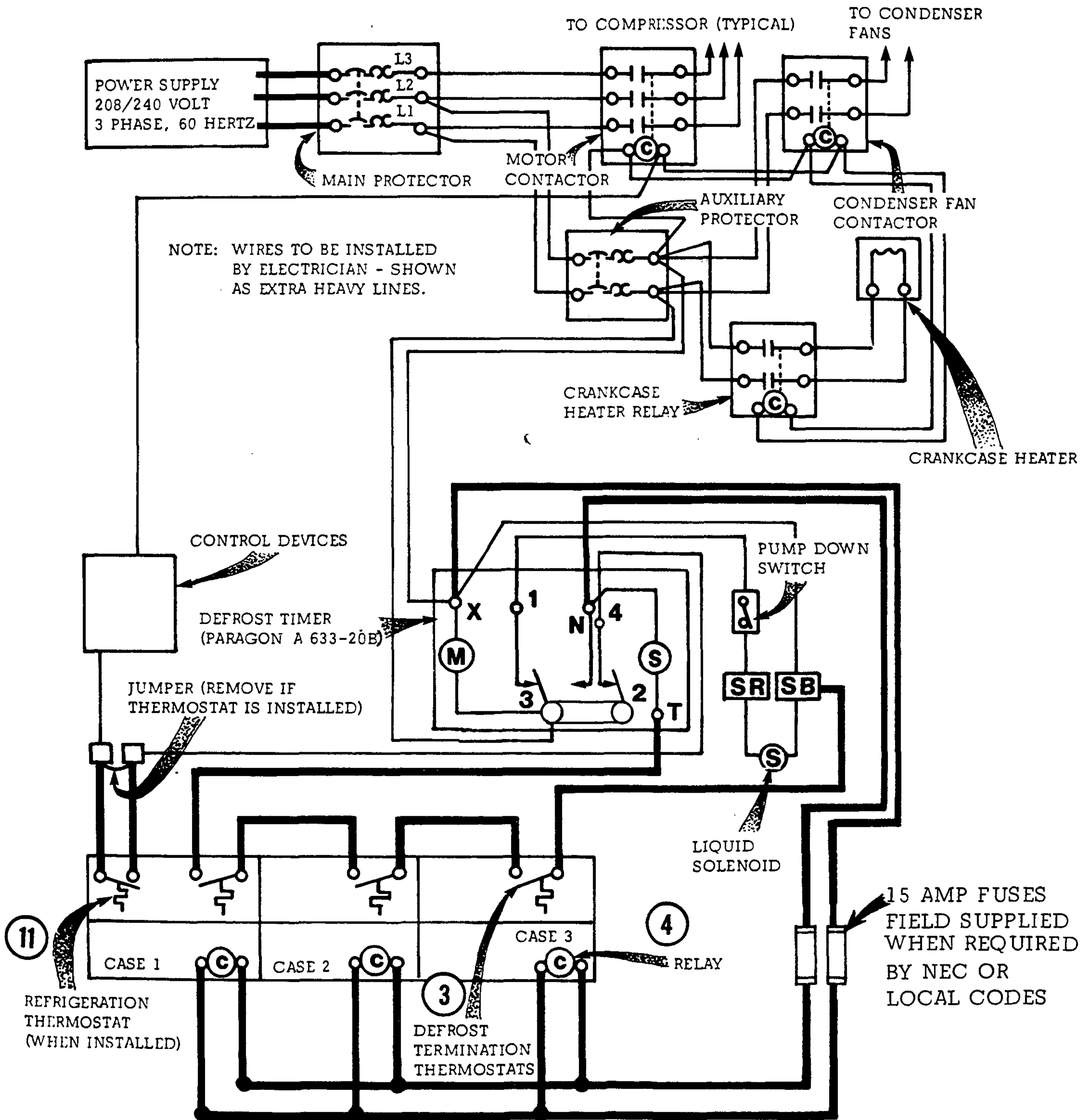
REFRIGERATOR MUST BE GROUNDED

**CONVENTIONAL MULTIPLEXING - INDOOR TYPE UNIT
CONDENSING UNIT & CONTROL PANEL WIRING DIAGRAM**



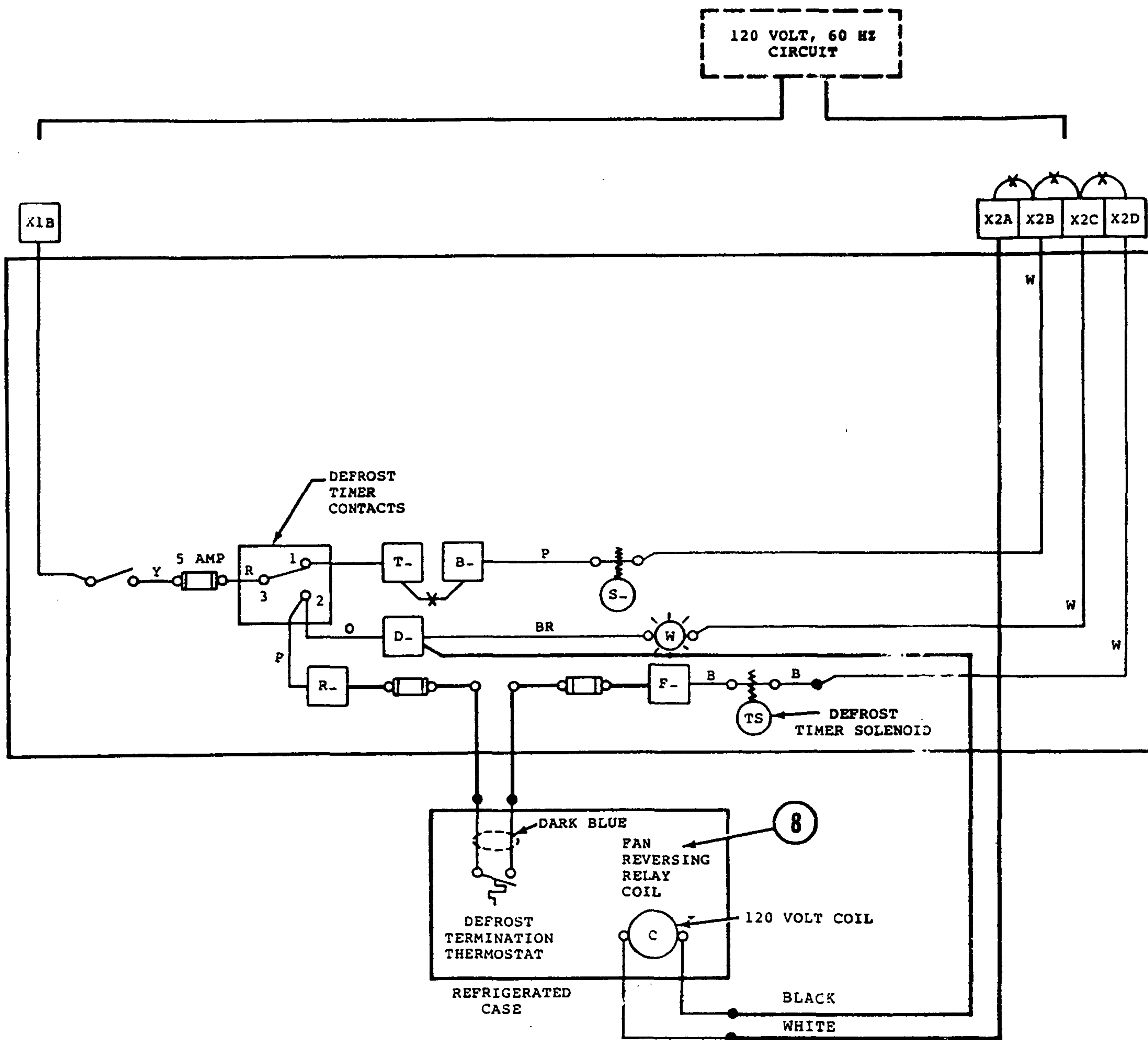
WARNING: REFRIGERATOR MUST BE GROUNDED

**CONVENTIONAL MULTIPLEXING - OUTDOOR TYPE UNIT
CONDENSING UNIT & CONTROL PANEL WIRING DIAGRAM**



WARNING: REFRIGERATOR MUST BE GROUNDED

WIRING DIAGRAM
REVERSE AIR DEFROST CASE
TO
SUPER PLUS CONTROL PANEL



NOTES :

- 1 REFER TO THE WIRING DIAGRAM IN SUPER PLUS MANUAL FOR LEGEND AND NOTES PERTAINING TO CONTROL PANEL WIRING AND COMPONENTS.
- 2 FIELD WIRING SHOWN AS HEAVY LINES.
3. WHEN DEFROST TIMER SOLENOID IS ENERGIZED THE DEFROST TIMER CONTACTS MECHANICALLY SWITCH FROM DEFROST MODE TO REFRIGERATION MODE.

REPLACEMENT PARTS LIST

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1.	0302555	Fan Motor, Reversing EMS #RS4BEB9 E1
2.	0124150	Fan Blade, embossing toward motor, DMA cases Morrill #FV800 CW 30S
	0141070	Fan Blade, embossing toward motor, DMDA cases Morrill #FV800 CW 20S
3.	0119422	Defrost Termination Thermostat Thermostat Disk Type
4.	0253630	Relay, 2PDT Essex #93-203333-23000B
5.	0147091	Ballast, Canopy GE #8G 3900
6.	0137843	Ballast, Canopy GE #8G 1141 WT
7.	0143354	Ballast, Optional Shelf GE #6G 1075
8.	0137846	Fluorescent Lamp, Canopy F96T12 CW HO
9.	0137847	Fluorescent Lamp, Canopy F72T12 CW HO
10.	0020725	Fluorescent Lamp, Optional Shelf F40T12 CWX
11.	0137880	Refrigeration Thermostat, Optional White Rodger #1609-103

NOTES: Capacitor Supplied with fan motor, 2.5 mfd.

SEE PRECEDING WIRING DIAGRAMS FOR APPLICATION AND
USAGE.

SECTION 4SERVICE TIPSWARNING

ALWAYS DISCONNECT THE ELECTRICAL POWER AT THE MAIN DISCONNECT WHEN SERVICING OR REPLACING ANY ELECTRICAL COMPONENT OF THIS REFRIGERATOR. THIS INCLUDES, BUT IS NOT LIMITED TO SUCH ITEMS AS FANS, HEATERS, THERMOSTATS AND FLUORESCENT LAMPS.

I. ALL MOTORS STOPPED

A. Cause: Open Circuit; Faulty Relay

Test: Check voltage to fan motors
Remove and check relayII. ALL MOTORS FAIL TO REVERSE

Cause: Faulty relay

Test: Remove and check relay

III. ONE MOTOR MALFUNCTIONS

Cause: Faulty Motor

Test: Substitute with new motor

IV. MOTOR ROTATION INCORRECT

(See page 8 for correct rotation)

Cause: Motor polarity reversed

Test: Check wiring: of fan circuit to relay

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

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.