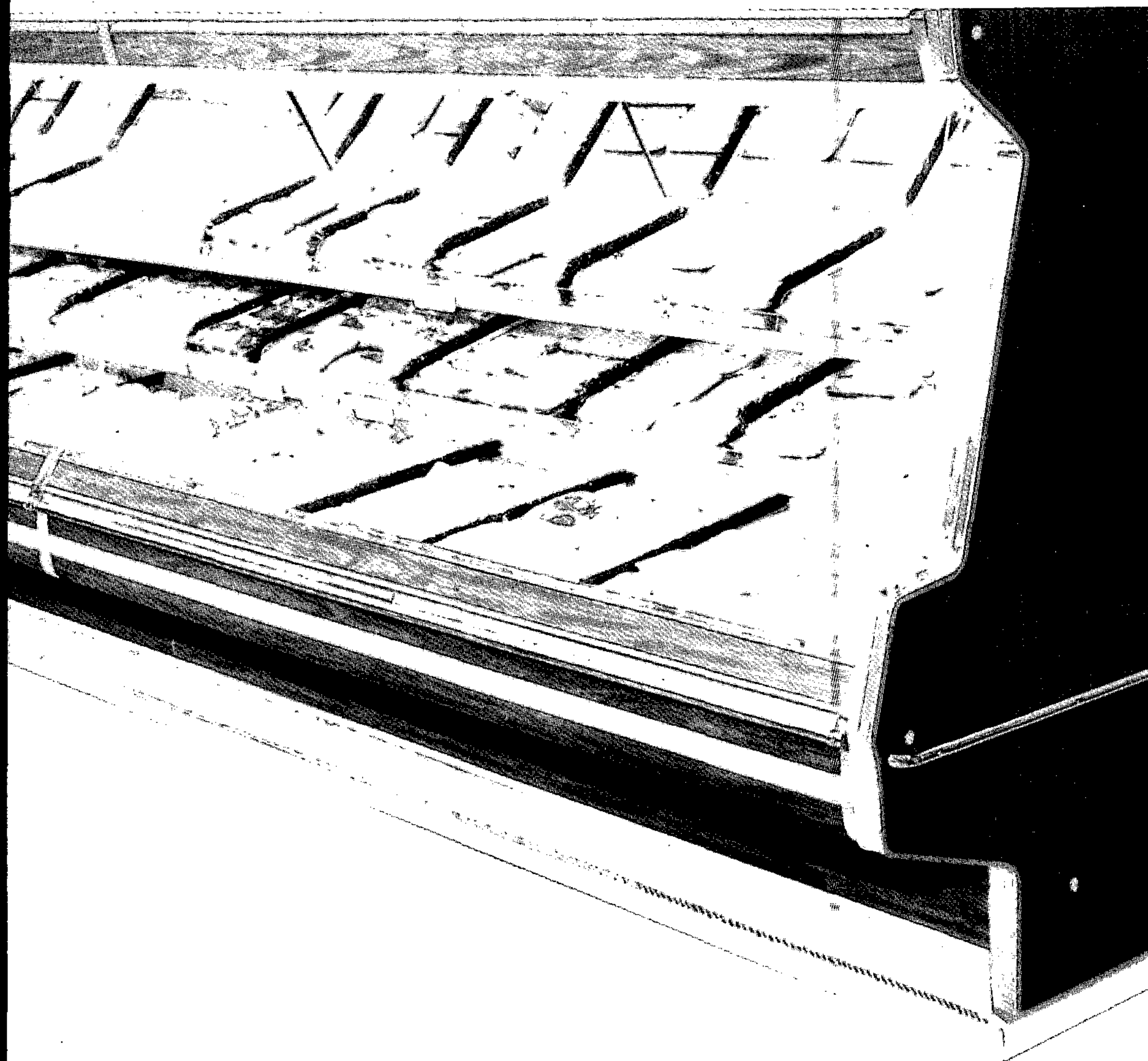


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**FHMA, FHMGA, FHMSA,
FHMSGGA, MHFA & MHFGA**

**REVERSE AIR DEFROST
REFRIGERATED MERCHANDISERS
FOR FRESH MEAT OR DELICATESSEN PRODUCTS
INSTALLATION/SERVICE INSTRUCTIONS**

P/N 353970
April, 1991
Section 1

INTRODUCTION

This addendum covers only the electrical information for merchandisers listed in the following table that have been factory equipped with Reverse Air Defrost. The information contained in this addendum supersedes Section 4—ELECTRICAL of the parent installation instructions (P/N 353968 and P/N 139648).

For additional information concerning the installation and use of this equipment refer to the parent instruction.

To assure satisfactory Reverse Air Defrost performance and to maintain the best product condition, store air should not exceed 75°F or 55% relative humidity.

MODEL DESCRIPTION

This instruction covers the merchandisers listed below. Basic design features are listed to the right of each merchandiser. Each merchandiser comes in 8 and 12' lengths and is designed to display either fresh meat or delicatessen products.

- FHMA Multideck Meat & Deli, 3 levels
(2 shelves), ambient fans
- FHMGA Multideck Meat & Deli, 3 levels
(2 shelves), ambient fans front glass
- FHMHA Multideck Meat & Deli, 4 levels
(3 shelves), ambient fans
- FHMGHA Multideck Meat & Deli, 4 levels
(3 shelves), ambient fans front glass
- MHFA Multideck Meat & Deli,
3 levels (2 shelves)
- MHFGA Multideck Meat & Deli, 3 levels
(2 shelves), front glass
- MHFHA Multideck Meat & Deli,
4 levels (3 shelves)
- MHFGHA Multideck Meat & Deli, 4 levels
(3 shelves), front glass

- FHMSA Multideck Meat & Deli, 3 levels
(2 shelves), ambient fans
rear loading
- FHMSGGA Multideck Meat & Deli, 3 levels
(2 shelves), ambient fans
rear loading, front glass

WARNING

It is imperative that a partition kit be installed between merchandisers that are joined together in the same lineup, but not connected to the same refrigeration system.

Reverse Air Defrost depends on the surrounding warmer store air which is pulled into, and circulated through, the merchandiser for defrosting. Therefore, any adjacent merchandiser that is not on defrost at the same time, nor separated by a partition, will pump its cold refrigerated air into the defrosting merchandiser, critically affecting the performance of both merchandisers.

SERVICE

1. All Motors Stopped
Cause: Open circuit; faulty relay
Test: Check voltage to fan motors
Remove and check relay
2. All Motors Fail to Reverse
Cause: Faulty relay
Test: Remove and check relay
3. One Motor Malfunctions
Cause: Faulty motor
Test: Substitute with new motor
4. Motor Rotation Incorrect
Cause: Motor polarity reversed
Test: Check wiring of fan circuit to relay

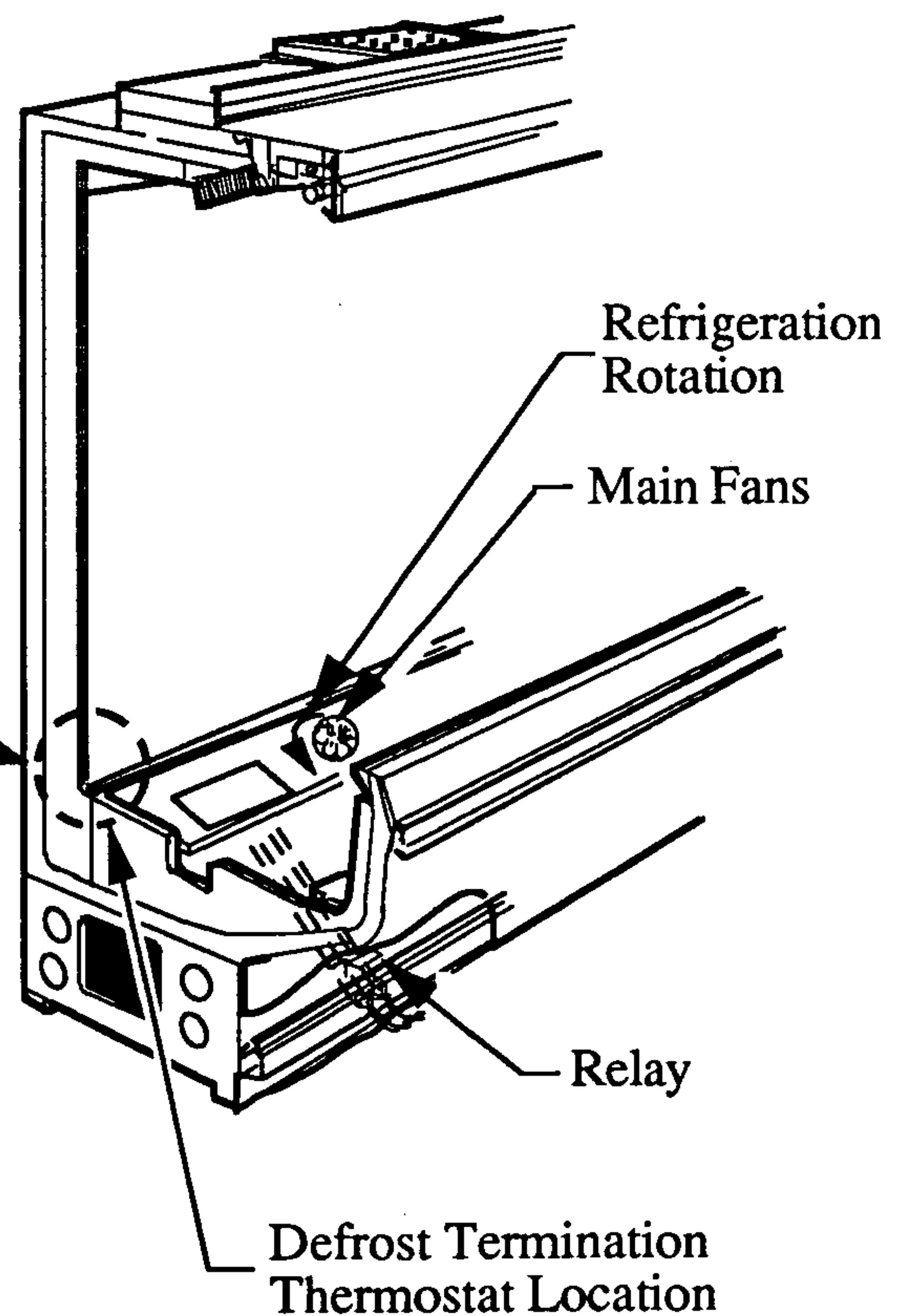
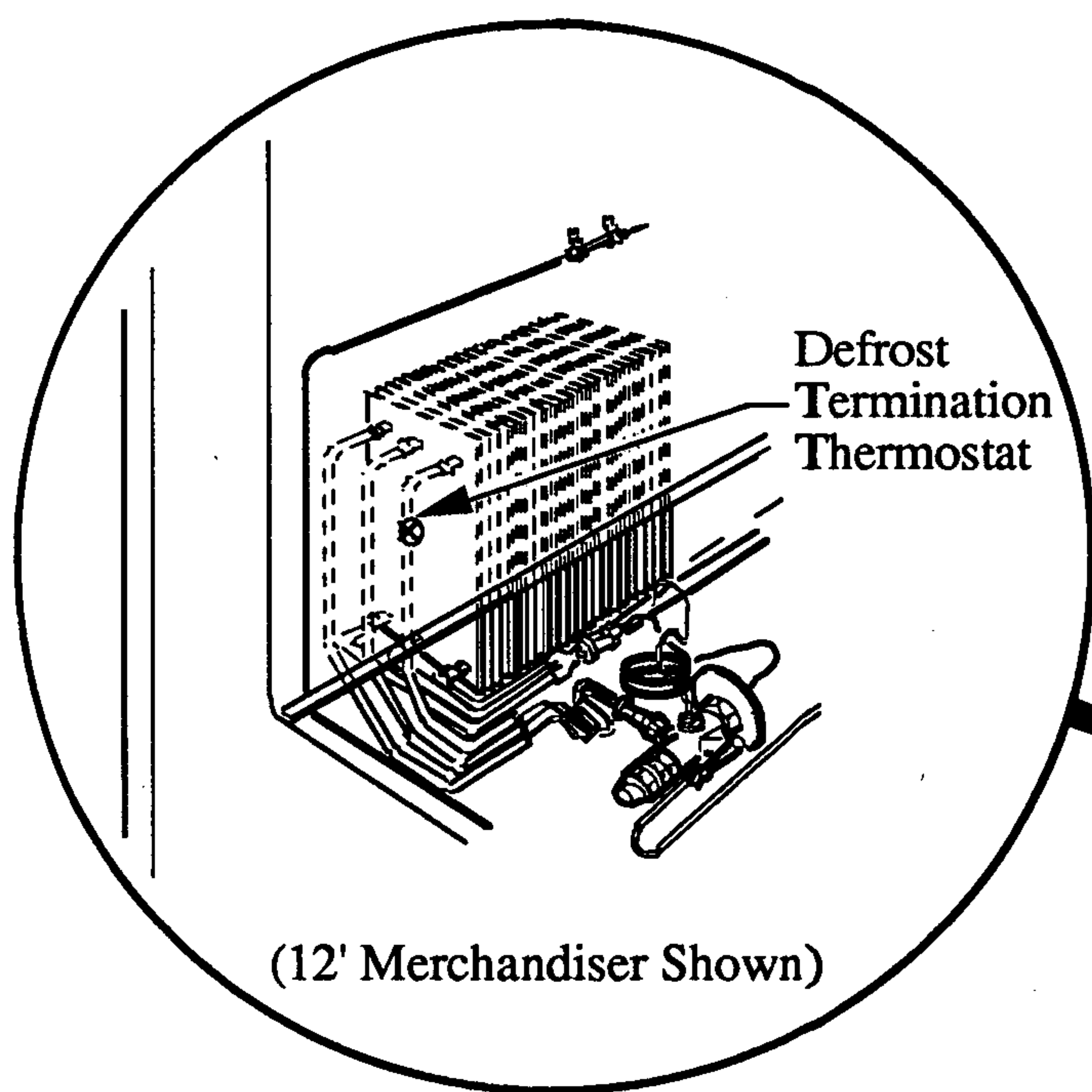
REVERSE AIR DEFROST

2

REVERSE AIR DEFROST PROCEDURE

The Reverse Air Defrost method circulates the warmer store air through the merchandiser. The defrost cycle is time initiated and temperature terminated. When defrost is initiated:

1. The 208 volt pilot circuit energizes the fan reversing relay causing its contacts to switch, which reverses the 120 volt polarity and the rotation of the fans.
2. The reversed fans move the warmer store air into the honeycomb and circulate it down through the coil and out the return grill.
3. When the non-adjustable defrost termination thermostat senses that the temperature is at 48°F, it switches the relay back to its normal position which returns the fans to their refrigeration rotation and terminates the defrost. Failsafe—40 minutes; defrost frequency—every 6 hours.



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 splashguard/lower front panel on the left-hand end of the merchandiser. 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) which is located inside the merchandiser's 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.

PINKREFRIG. THERMOSTAT LOW TEMP.

LIGHT BLUE..REFRIG. THERMOSTAT NORM TEMP.

DARK BLUE..DEFROST TERM. THERMOSTAT

PURPLE.....ANTI-SWEAT HEATERS

BROWNFAN MOTORS

GREEN*GROUND

ORANGE OR

TANLIGHTS

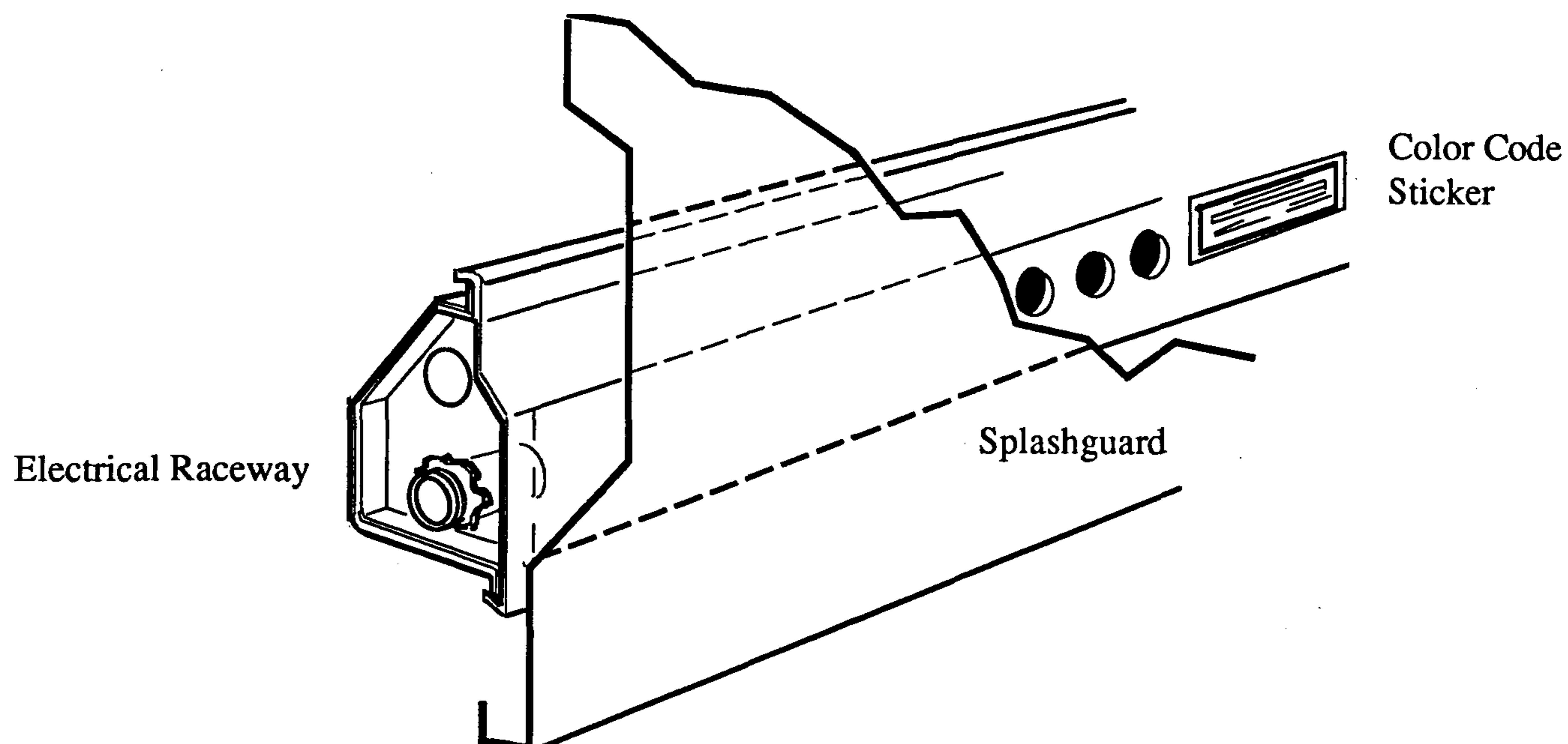
MAROON...RECEPTACLES

YELLOW...DEFROST HEATERS, 120V

RED*DEFROST HEATERS, 208V

*EITHER COLORED SLEEVE OR COLORED INSULATION

ELECTRICIAN NOTE: CASE MUST BE GROUNDED



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.

REVERSE AIR DEFROST

4

SERIAL PLATE AMPERAGES

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.

Model	120V 1PH 60Hz						
	Fans	Anti-sweat Heaters	Lights—Includes full complement of lighted shelves.				
	(1)	(2)	Standard	Option	Option	Option	Option
FHM			(3)	(4)	(5)	(6)	(7)
8'	2.1	1.6	4.7	6.0	5.5	6.3	6.7
12'	3.0	1.9	7.2	9.2	8.3	9.5	10.2
MHF							
8'	0.9	—	5.4	—	—	6.3	6.7
12'	1.2	—	8.1	—	—	9.5	10.2
FHMS							
8'	2.1	4.0	4.7	6.0	5.5	6.3	6.7
12'	3.0	5.1	7.2	9.2	8.3	9.5	10.2

(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) All anti-sweat heaters can be cycled off by connecting them to an energy saving controller. The circuit will be tagged in the raceway as a cyclical anti-sweat heaters. They may be run parallel to the fan circuit for continuous duty.

Each column applies to light configurations listed below:

(3) FHM & FHMS Models—One row of canopy fluorescent lamps. MHF Models—One row of fluorescent lamps in front of honeycomb and one row fluorescent lamps behind honeycomb.

(4) One row of fluorescent lamps and one row of incandescent lights, both in front of honeycomb discharge.

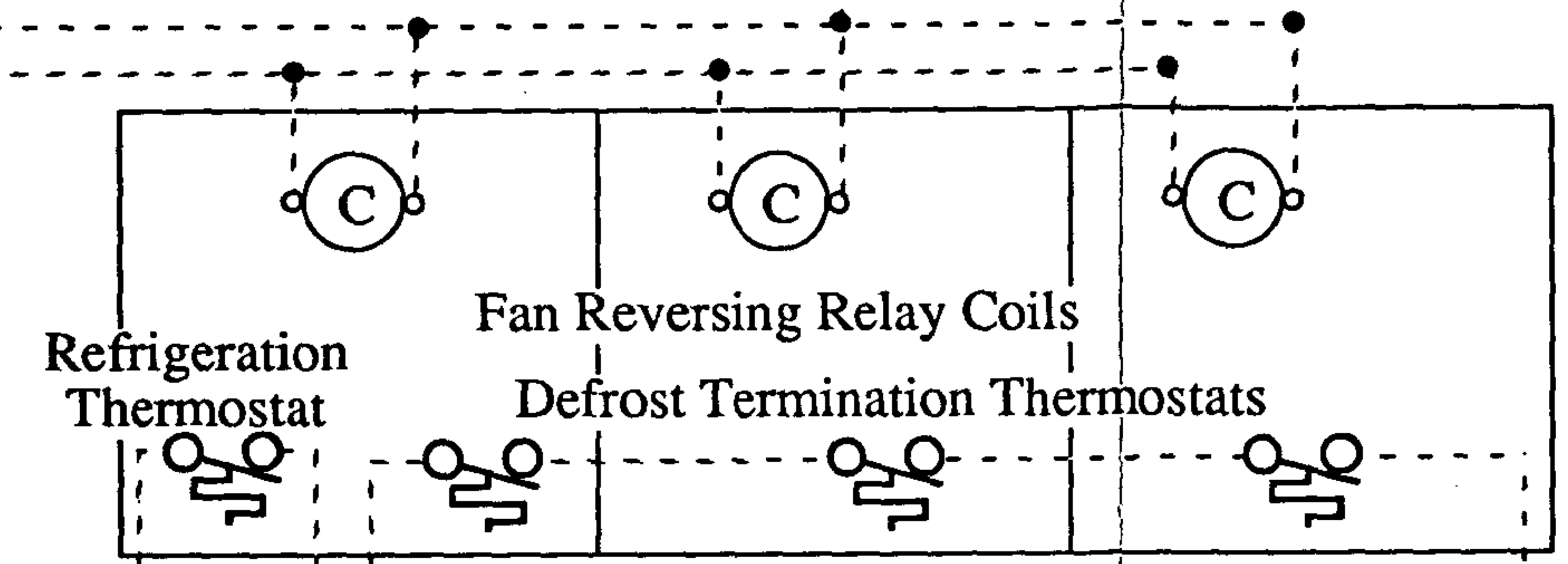
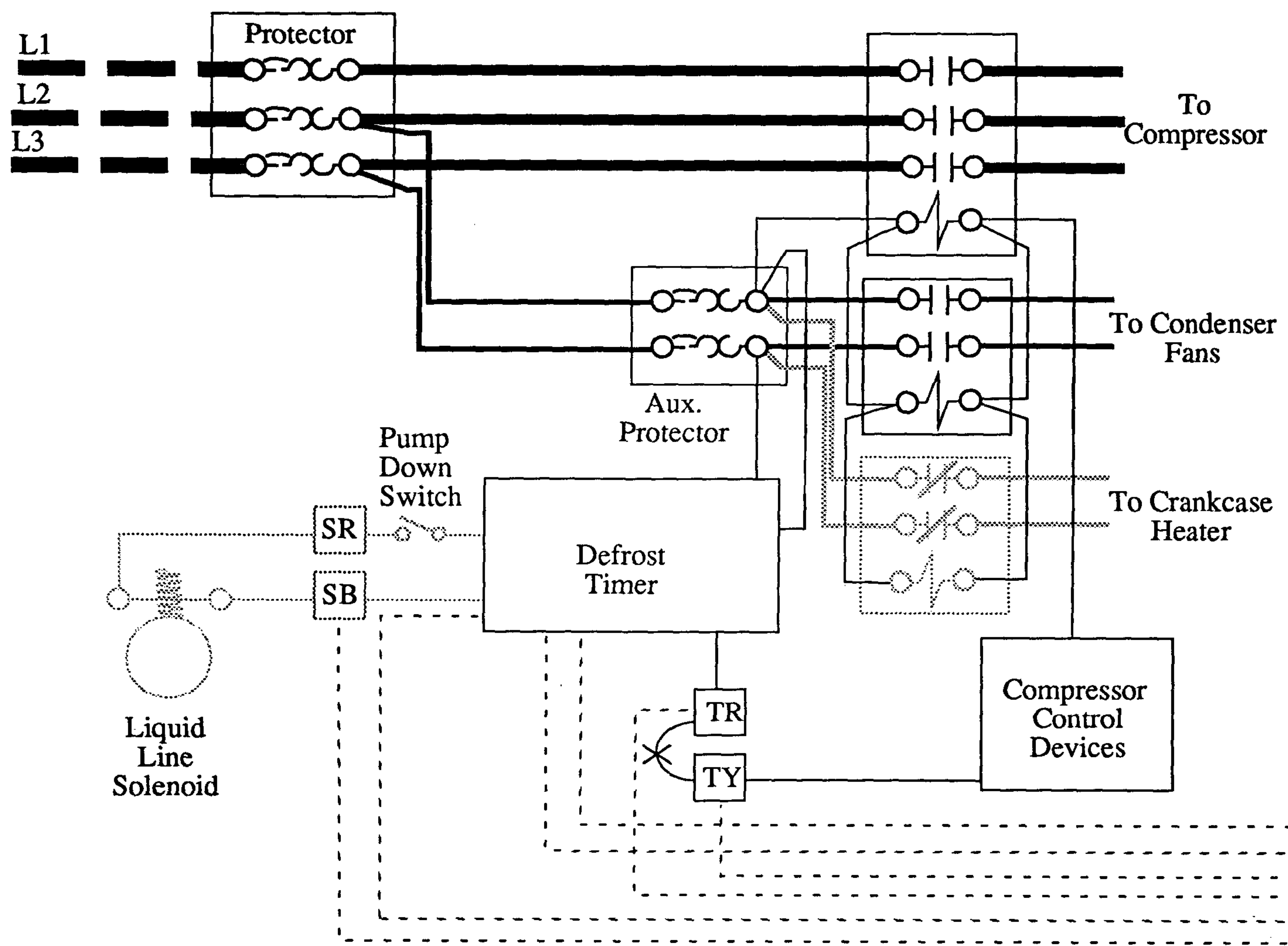
(5) Two rows of fluorescent lamps in front of honeycomb.

(6) Two rows of fluorescent lamps in front of honeycomb, and one row behind the honeycomb.

(7) One row of fluorescent lamps and one row of incandescent lights in front of honeycomb, and one row of fluorescent lamps behind the honeycomb.

In addition to the circuits described above, each of the following components requires control wiring from the merchandiser to the condensing unit control panel (see wiring diagrams).

1. Refrigeration Thermostat or CDA Sensor (field or factory installed)
2. Reverse Air Defrost Relay
3. Defrost Termination Thermostat

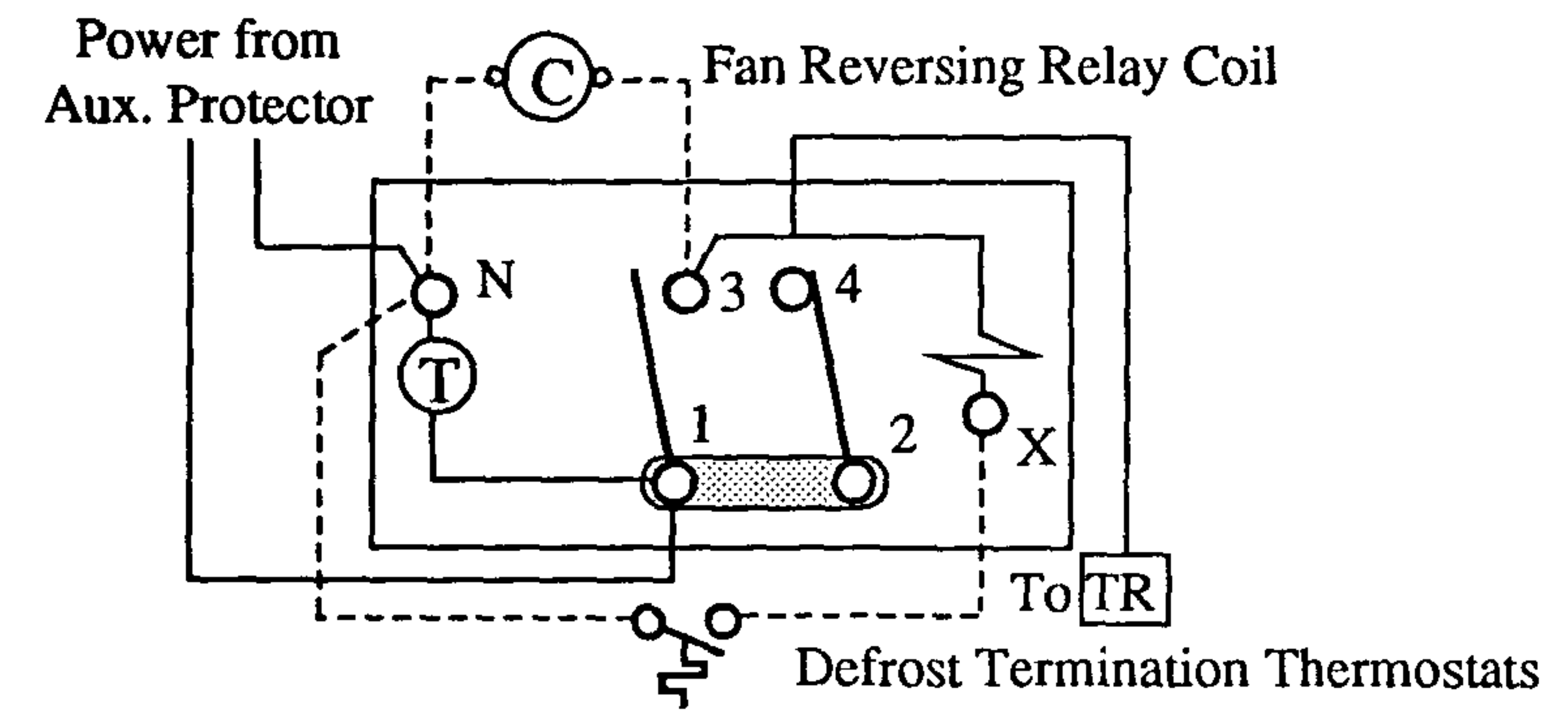


**Medium Temperature Merchandisers
Field Wiring Indoor and Outdoor
Condensing Units**

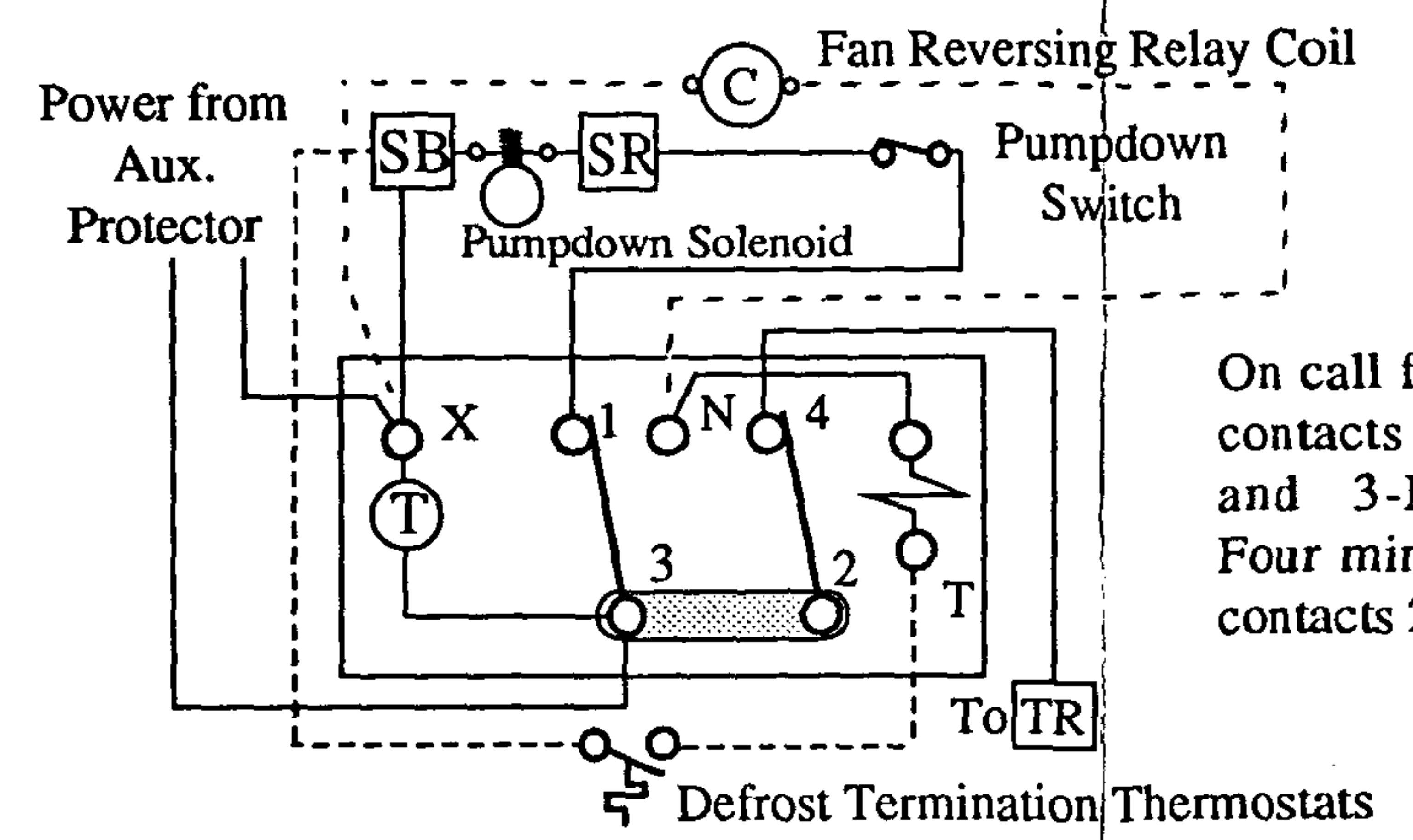
WARNING
All components must have mechanical ground, and the Merchandiser must be grounded.

- Notes:
- Broken lines indicate field wiring
 - All field wiring is supplied and installed by the electrical contractor in accordance with NEC and local codes.
 - Grayed Components are found on Outdoor Units only
 - Remove Jumper TR to TY when Refrigeration Thermostat is used

**8145 Clock
Indoor
Time-Temperature**



**A633 Clock
Outdoor
Time-Temperature**



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

Multideck Meat & Deli—FHM & FHMS Models

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.

Optional shelf lighting uses one single light ballast per shelf.

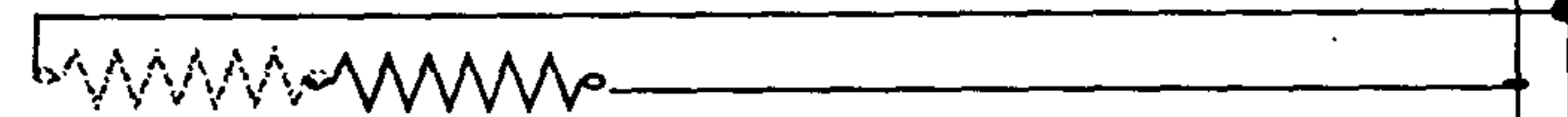
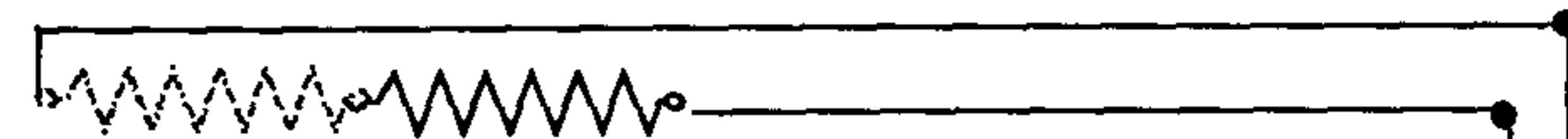
Canopy lighting uses both one and two light ballasts.

Grayed components in 12' models only.

FHMS Only Door Track Heaters

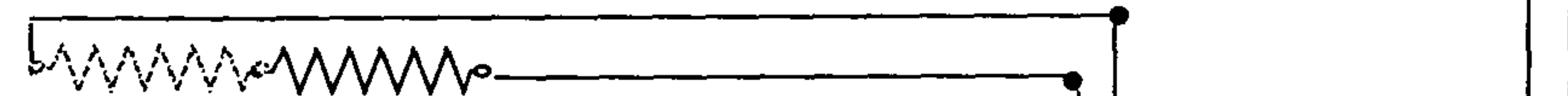
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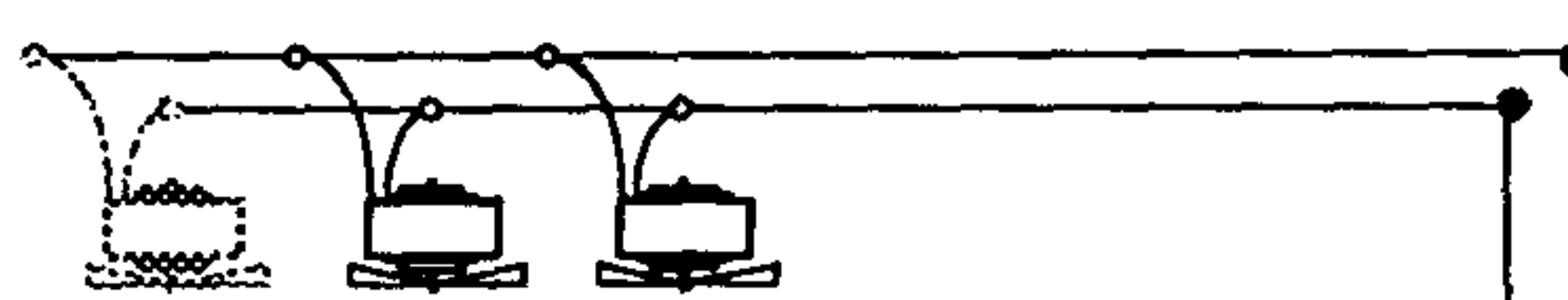
Discharge Splitter Heaters

5



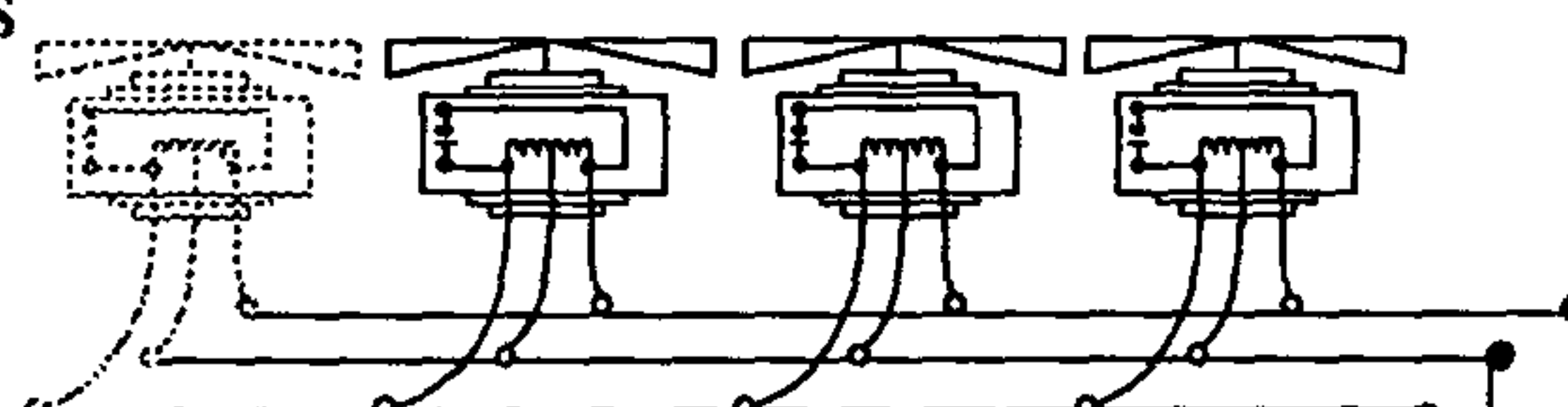
Ambient Fans

2 3 16



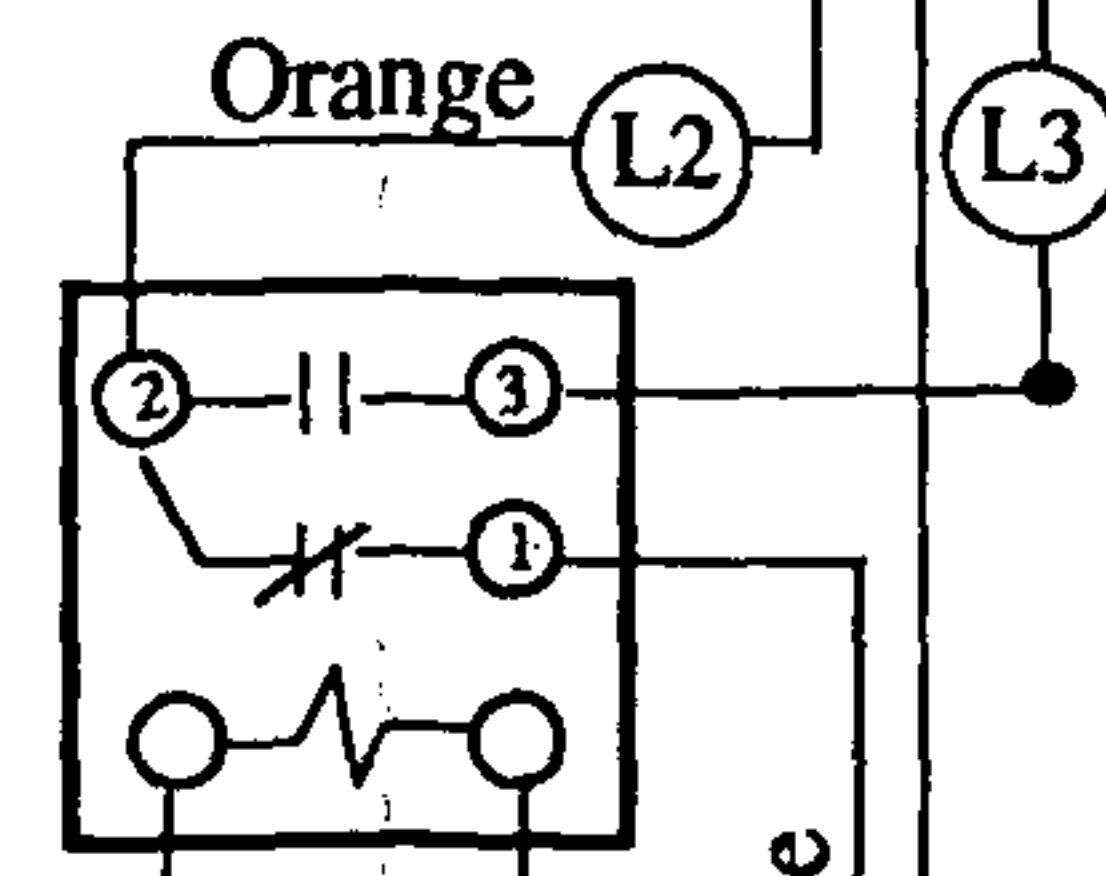
Evaporator Fans

1 3



Relay

4



Red

Brown

(120V Only)

Brown

(120V Only)

Yellow

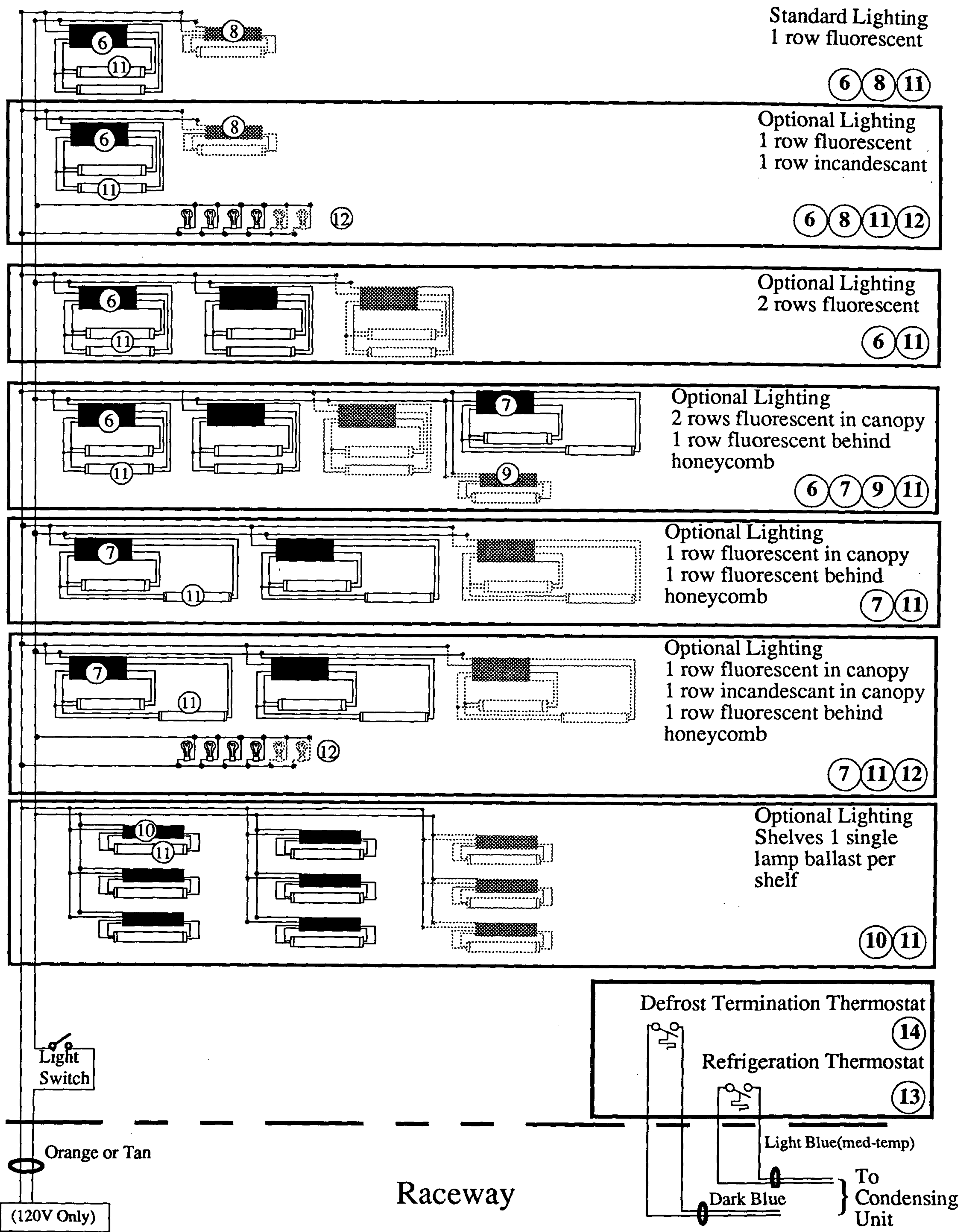
(120V Only)

Yellow

(120V Only)

To Defrost
Timer

Raceway



Standard Lighting
1 row fluorescent

6 8 11

Optional Lighting
1 row fluorescent
1 row incandescent

6 8 11 12

Optional Lighting
2 rows fluorescent

6 11

Optional Lighting
2 rows fluorescent in canopy
1 row fluorescent behind
honeycomb

6 7 9 11

Optional Lighting
1 row fluorescent in canopy
1 row fluorescent behind
honeycomb

7 11

Optional Lighting
1 row fluorescent in canopy
1 row incandescent in canopy
1 row fluorescent behind
honeycomb

7 11 12

Optional Lighting
Shelves 1 single
lamp ballast per
shelf

10 11

Defrost Termination Thermostat

14

Refrigeration Thermostat

13

Light Blue (med-temp)

Dark Blue

To
Condensing
Unit

Raceway

Orange or Tan

(120V Only)

Multideck Meat & Deli—MHF Models

WARNING

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

Notes:

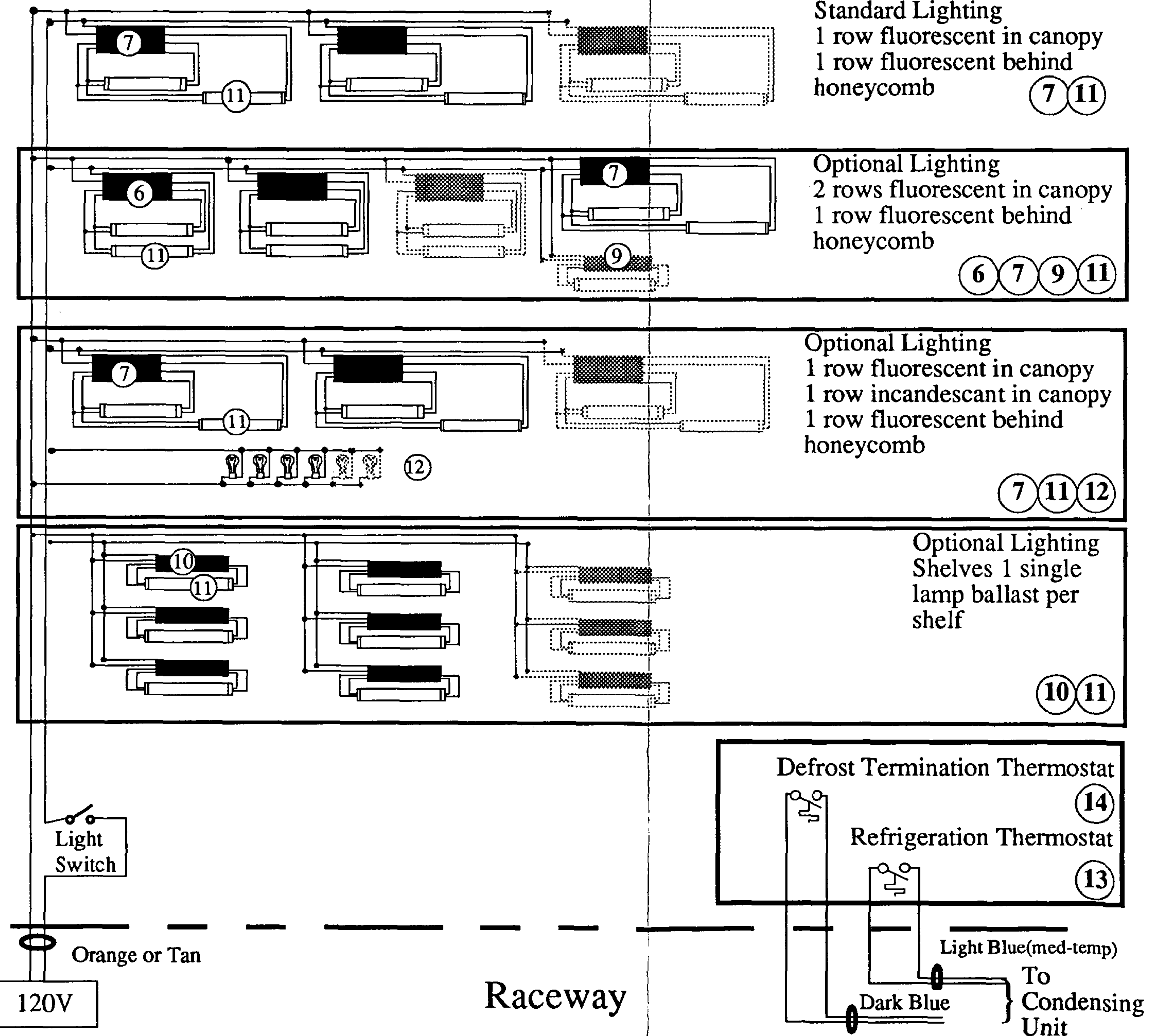
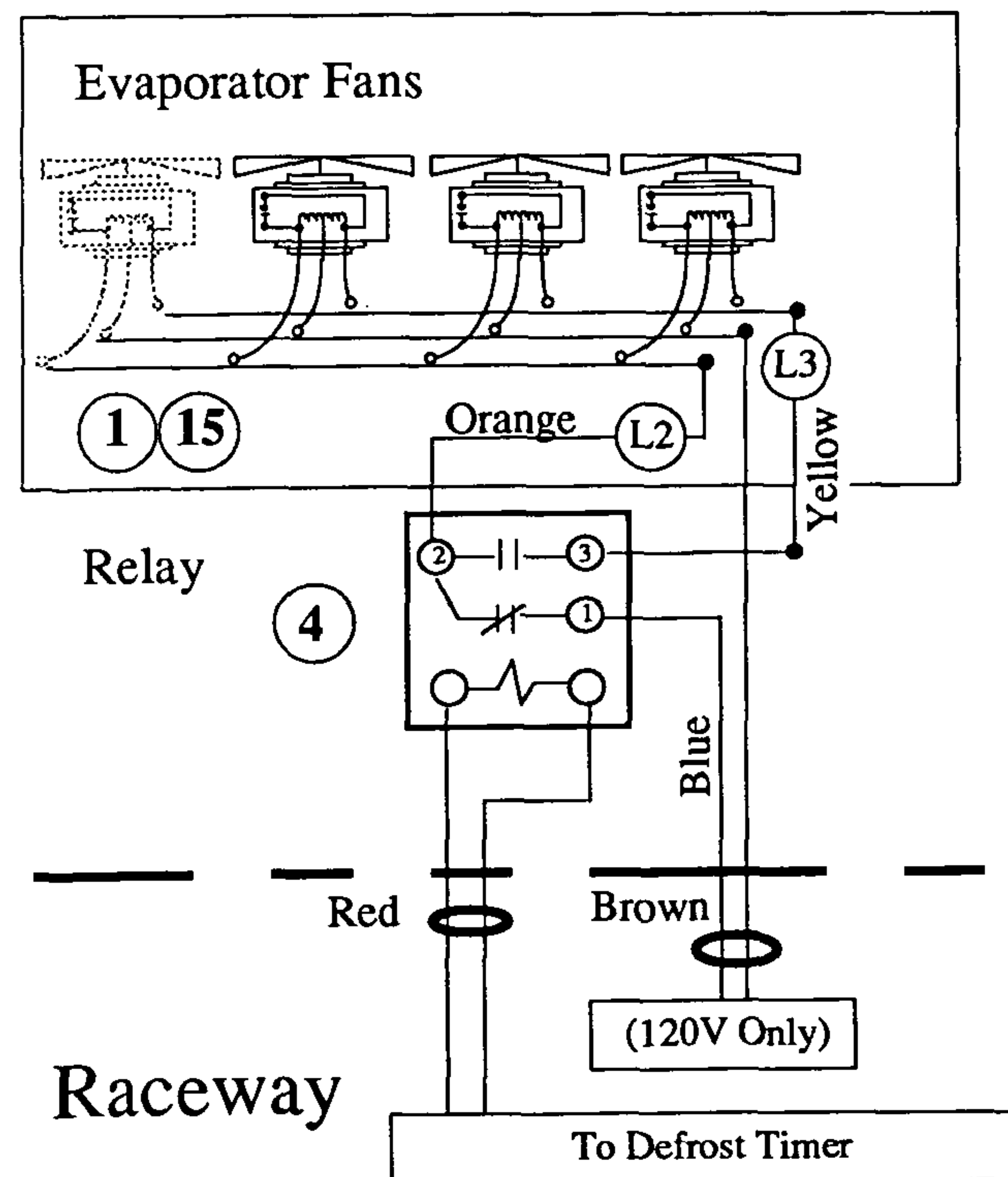
Schematic shows both standard and optional components. Not all components will be on each merchandiser.

Check store legend for specifics.

Optional shelf lighting uses one single light ballast per shelf.

Canopy lighting uses both one and two light ballasts.

Grayed components in 12' models only.



REPLACEMENT PARTS LIST

Part Item Number	Description	Part Item Number	Description
1. 0302555	Fan Motor, Main 120V, 9W, CW EMS #RS4BEB9 E1	12. 0330275	Incandescent Lamp 40W 125/130V
2. 0058698	Fan Motor, Ambient 120V, 9W, CW GE #KSM51ECG3264	13. 0176457	Refrigeration Thermostat WR #1701-117, FHM & FHMS Models
3. 0124150	Fan Blade, embossing toward motor Morrill #FV800 CW 30S	0113625	Refrigeration Thermostat Penn Control #A19AGD-21, MHF Models
4. 0123592	Relay, DPDT 208V Honeywell #R422D-1047	14. 0311588	Defrost Termination Thermostat TI #20425F
0253603	Relay, DPDT 120V (Super Plus) Honeywell #R422D-1005	15. 0315470	Fan Blade, P/N toward motor Thorgren #8 CW 34
5. 0058250	Anti-Sweat Heater, Discharge Splitter 8ft, 120V, 1.6A, 77Ω	16. 0141070	Fan Blade, embossing toward motor Morrill #FV800CW20S
0058251	Anti-Sweat Heater, Discharge Splitter 12ft, 120V, 1.8A, 144Ω	17. 0111234	Anti-Sweat Heater, Upper Door Track 8ft, 120V, 0.83A, 144Ω
6. 0147080	Ballast 2 Lamps GE #6G1022G49	0111235	Anti-Swear Heater, Upper Door Track 12ft, 120V, 1.3A, 96Ω
7. 0147089	Ballast 2 Lamps GE #8G3905 WT	18. 0058250	Anti-Sweat Heater, Lower Door Track 8ft, 120V, 1.6A, 77Ω
8. 0147082	Ballast 1 Lamp GE #6G1063	0058251	Anti-Sweat Heater, Lower Door Track 12ft, 120V, 1.8A, 62Ω
9. 0147090	Ballast 1 Lamp GE #8G3688 WT		
10. 0143354	Ballast 1 Lamp, Shelf GE #6G1075		
11. 0020725	Fluorescent Lamp F40T12 CWX		

NOTE: Capacitor supplied with main fan motor, 2.5 MFD. See wiring diagram for application and usage.