TYLER REFRIGERATION

Carrier
A United Technologies Company

series Advantage

Installation & Service Manual

N5M/N5MG/N5MHP/N5MGHP

MULTI-SHELF MEAT/DELI/CRITICAL TEMP PRODUCE/ HIGH PERFORMANCE MERCHANDISERS
Medium Temperature Self Serve Display Cases

This manual has been designed to be used in conjunction with the General (UL/NSF) Installation & Service Manual.
Save the Instructions in Both Manuals for Future Reference!!

These merchandisers conform to the American National Standard Institute & NSF International Health and Sanitation standard ANSI/NSF 7 - 2003.

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CONTENTS

The following Medium Temperature Multi-Shelf Meat, Deli, Critical Temp Produce and High Performance Merchandiser models are covered in this manual:

MODEL	DESCRIPTION
N5MG	8’ & 12’ GLASS FRONT MULTI-SHELF MEDIUM TEMP MERCHANDISER
N5M	8’ & 12’ SOLID FRONT MULTI-SHELF MEDIUM TEMP MERCHANDISER
N5MGHP	8’ & 12’ GLASS FRONT MULTI-SHELF HIGH PERFORMANCE MERCHANDISER
N5MHP	8’ & 12’ SOLID FRONT MULTI-SHELF HIGH PERFORMANCE MERCHANDISER

SPECIFICATIONS

N5M/N5MG Multi-Shelf Meat/Deli/Critical Temp Produce Merchandisers

Refrigeration Data:

MODEL	CASE LENGTH	CASE USAGE	CAPACITY (BTUH / FT)		EVAPORATOR (°F)	UNIT SIZING (°F)	DISCHARGE AIR		AVG. REF. CHARGE (LBS/FT)
			PARALLEL	CONVENTIONAL			TEMPERATURE (°F)	VELOCITY (FPM)	
N5M	8'/12'	MED TEMP	1,574*	1,876*	+15**	+13	+28	267***	0.45
N5MG	8'/12'	MED TEMP	1,548*	1,786*	+15**	+13	+28	267***	0.45

* **Capacity data listed for cases with 2 rows of T-8 canopy lights and 4 rows of optional lighted shelves. Adjustments must be made to this base rating for each option installed on this case. DEDUCT 23 BTUH/FT for each row of unlighted shelves. For sizing all refrigeration equipment other than TYLER, use conventional BTUH values.**

** **Evaporator temperature is defined as the saturated suction temperature leaving the case.**

*** **Air velocity measured 1 hour after defrost at the top discharge air duct using an ALNOR JR. velometer with a scoop.**

FOR SPECIFIC COMPRESSOR SIZING INFORMATION, REFER TO TYLER APPLICATIONS FOR RACK SYSTEM COMPRESSORS AND/OR THE COMPRESSOR MANUFACTURERS FOR SINGLE COMPRESSORS. FOR LINE SIZING INFORMATION, REFER TO THE MISCELLANEOUS SECTION "BUFF" IN THE TYLER SPECIFICATION GUIDE.

Electrical Data:

Fans and Heaters (120 and 208 Volt)

MODEL	CASE LENGTH	FANS / CASE	TOTAL STANDARD FANS		TOTAL ECM FANS		TOTAL ANTI-SWEATS (120V)		208 VOLT DEFROST HEATER	
			AMPS	WATTS	AMPS	WATTS	DISCHARGE AIR AMPS	DISCHARGE AIR WATTS	AMPS	WATTS
N5M(G)	8'	2	1.06	96.0	0.64	34.0	0.30*	36.0	6.90	1,436
N5M(G)	12'	3	1.59	144.0	0.96	51.0	0.50*	60.0	10.30	2,143

* Discharge air anti-sweat heater will only be on when the canopy lights are off. Use highest amp draw of the two circuits to figure electrical case requirements..

Heaters (208 Volt)

208 VOLT DEFROST (AMPS)											
FT	8	12	16	20	24	28	32	36	40	44	48
1 PH	6.9 TG-30	10.3 TG-30	13.8 TG-30	17.2 TG-30	20.6 TG-30	24.1 TG-40	27.5 TG-40	30.9 TG-40	34.4 TG-50	37.8 TG-50	41.2 TG-50
3 PH	N/A	N/A	12.0 TG-3-30	15.0 TG-3-30	18.0 TG-3-30	15.0 TG-3-30	18.0 TG-3-30	18.0 TG-3-30	21.0 TG-3-30	25.0 TG-3-40	28.0 TG-3-40

T-8 Lighting with Electronic Ballasts (120 Volt)

MODEL	CASE LENGTH	CANOPY LIGHTS (2 ROWS)*		SHELF LIGHTS – PER ROW								MAXIMUM LIGHTING (6 ROWS)	
				AMPS				WATTS					
		AMPS	WATTS	1 ROW	2 ROWS	3 ROWS	4 ROWS	1 ROW	2 ROWS	3 ROWS	4 ROWS	AMPS	WATTS
N5M(G)	8'	0.95	114	0.90	1.20	1.60	1.90	108	144	192	228	2.85	342
N5M(G)	12'	1.40	168	1.35	1.80	2.40	2.85	162	216	288	342	4.25	510

Defrost Data:

DEFROST TYPE*	DEFROSTS PER DAY	DURATION TIME (MIN)	TERMINATION (°F)	EPR SETTINGS **		DEFROST WATER (LB / FT / DAY)
				R22 (PSIG)	R404A (PSIG)	
TIME OFF	6	32	- - -	38	49.5	11.4
ELECTRIC	6	36	50			
HOT GAS	6	12-15	55*			

* If an Electronic Sensor is used for termination, it should be set at 70°F termination temperature. The sensor must be located in the same location as the defrost termination klixon for that defrost type.

** Set EPR to give this pressure at the case.

DEFROST CIRCUITS: OFF CYCLE defrost is standard (use TC defrost module) – **OPTIONAL ELECTRIC** defrost uses a single or 3 phase 208V circuit – **OPTIONAL HOT GAS** defrost uses 2 control wires @ 208V per lineup.
UL SANITATION approved in accordance with ANSI/NSF – 7.

CASE BTUH REQUIREMENTS are calculated to produce approximately the indicated entering-air temperature with absolute maximum operating ambient limits of **75°F & 55RH**.

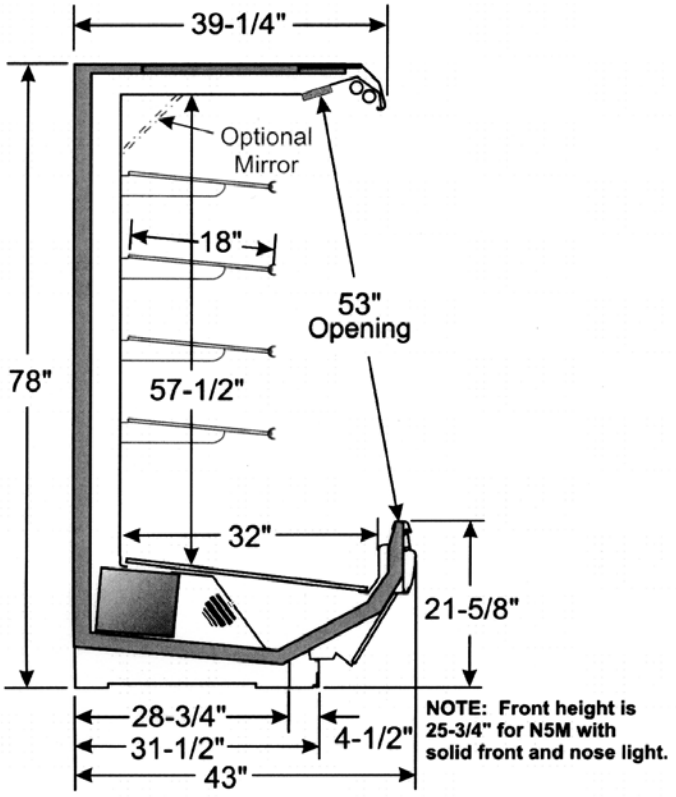
CASE-TO-CASE SUCTION LINE SUB-FEED BRANCH LINE SIZING											
MODEL	8'	12'	16'	20'	24'	28'	32'	36'	40'	44'	48'
N5M(G) / R22	7/8"	7/8"	7/8"	1 1/8"	1 1/8"	1 1/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"	1 3/8"

CASE CIRCUITS: This case requires a 120V circuit for fans, lights and anti-sweat heaters and a 208V circuit for Electric Defrost (if used).

Screens are standard. Shelving must be ordered separately. All rows of shelving require a shelf gasket. Use either 15" or 18" shelves, (NO MIXING). Shelves must be aligned to prevent disruption of airflow.

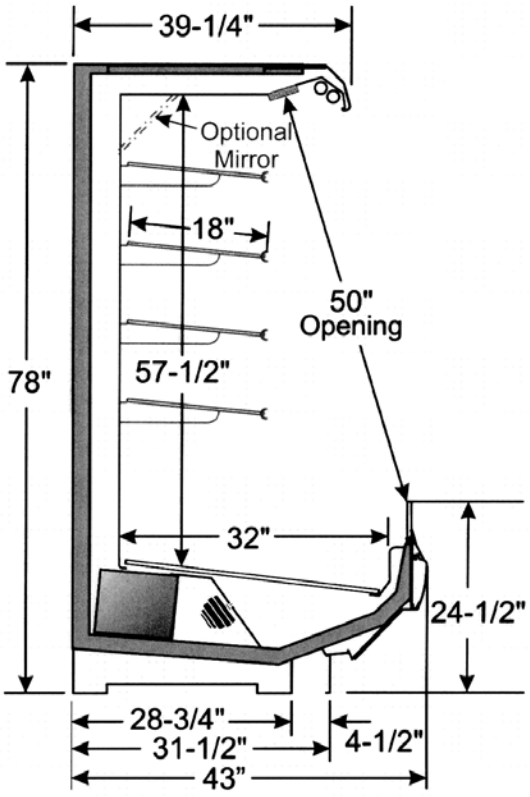
NOTE: 1 or 2 discharge holes must be left open between the top shelf and bottom of mirror.

N5M CROSS SECTION

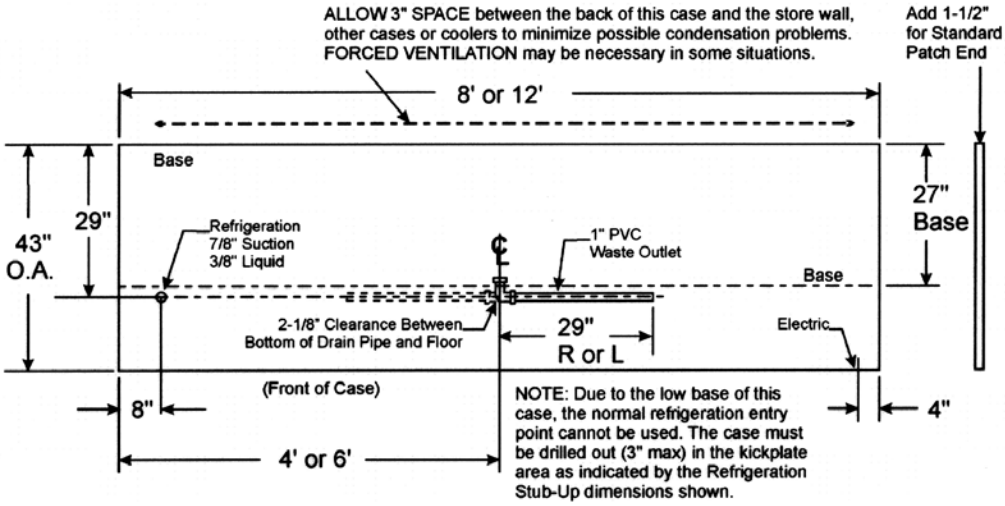


NOTE: Front height is 25-3/4" for N5M with solid front and nose light.

N5MG CROSS SECTION



N5M(G) FLOOR PLAN



N5MHP Solid Front Multi-Shelf High Performance Merchandisers
N5MGHP Glass Front Multi-Shelf High Performance Merchandisers

Refrigeration Data:

MODEL	CASE LENGTH	CASE USAGE	CAPACITY (BTUH/FT)*		EVAPORATOR (°F)**	UNIT SIZING (°F)	DISCHARGE AIR		AVG. REF. CHARGE (LBS/FT)
			PARALLEL	CONVENTIONAL			TEMPERATURE (°F)	VELOCITY (FPM)	
N5MHP	4'/ 6'/ 8'/ 12'	MED TEMP	1,399	1,569	+25	+23	+28.7	243***	0.67
N5MGHP	8'/ 12'	MED TEMP	1,376	1,543	+25	+23	+28.7	243***	0.67

* **Capacity data listed for cases with 2 rows of T-8 canopy lights and 4 rows of optional lighted shelves. DEDUCT 23 BTUH/FT for each row of unlighted shelves. For sizing all refrigeration equipment other than TYLER, use conventional BTUH values.**
** **Evaporator temperature is defined as the saturated suction temperature leaving the case.**
*** **Air velocity measured 1 hour after defrost at the top discharge air duct using an ALNOR JR. velometer with a scoop..**

FOR SPECIFIC COMPRESSOR SIZING INFORMATION, REFER TO TYLER APPLICATIONS FOR RACK SYSTEM COMPRESSORS AND/OR THE COMPRESSOR MANUFACTURERS FOR SINGLE COMPRESSORS. FOR LINE SIZING INFORMATION, REFER TO THE MISCELLANEOUS SECTION "BUFF" IN THE TYLER SPECIFICATION GUIDE.

Electrical Data:

Fans and Heaters (120 Volt)

MODEL	CASE LENGTH	FANS / CASE	TOTAL STANDARD FANS		TOTAL ECM FANS		TOTAL ANTI-SWEATS*	
			AMPS	WATTS	AMPS	WATTS	AMPS	WATTS
N5MHP	4'	1	0.80	71.0.0	0.53	22.0	0.18	22.0
N5MHP	6'	2	1.60	142.0	1.06	44.0	0.22	27.0
N5M(G)HP	8'	2	1.60	142.0	1.06	44.0	0.30	36.0
N5M(G)HP	12'	3	2.40	213.0	1.59	66.0	0.50	60.0

* Discharge air anti-sweat heater will only be on when the canopy lights are off. Use highest amp draw of the two circuits to figure electrical case requirements.

T-8 Lighting with Electronic Ballasts (120 Volt)

MODEL	CASE LENGTH	CANOPY LIGHTS		SHELF LIGHTS – PER ROW								MAXIMUM LIGHTING*	
		AMPS 2 ROWS	WATTS 2 ROWS	AMPS 1 ROW	AMPS 2 ROWS	AMPS 3 ROWS	AMPS 4 ROWS	WATT 1 ROW	WATT 2 ROWS	WATT 3 ROWS	WATT 4 ROWS	AMPS (6 ROWS)	WATTS (6 ROWS)
N5MHP	4'	0.50	60.0	0.45	0.60	0.80	0.95	54.0	72.0	96.0	114.0	1.45	174.0
N5MHP	6'	0.75	90.0	0.60	0.90	1.20	1.50	72.0	108.0	144.0	180.0	2.25	270.0
N5M(G)HP	8'	0.95	114.0	0.90	1.20	1.60	1.90	108.0	144.0	192.0	228.0	2.85	342.0
N5M(G)HP	12'	1.40	168.0	1.35	1.80	2.40	2.85	162.0	216.0	288.0	342.0	4.25	510.0

* Discharge air anti-sweat heater will only be on when the canopy lights are off. Use highest amp draw of the two circuits to figure electrical case requirements.

Defrost Data:

DEFROST TYPE*	DEFROSTS PER DAY	DURATION TIME (MIN)**	ELEK. THERMOSTAT / AIR SENSOR SETTINGS			EPR SETTINGS ***		CONVENTIONAL COMPRESSOR SETTINGS****				DEFROST WATER (LB / FT / DAY)	
			USAGE	CUT IN	CUT OUT	R22 (PSIG)	R404A (PSIG)	R22 (PSIG) CUT-IN	R22 (PSIG) CUT-OUT	R404A (PSIG) CUT-IN	R404A (PSIG) CUT-OUT	N5MHP	N5MGHP
TIME OFF – N5M(G)HP	6	26	MED TEMP	29°F	27°F	49	62	47	36	60	47	9.6	9.4

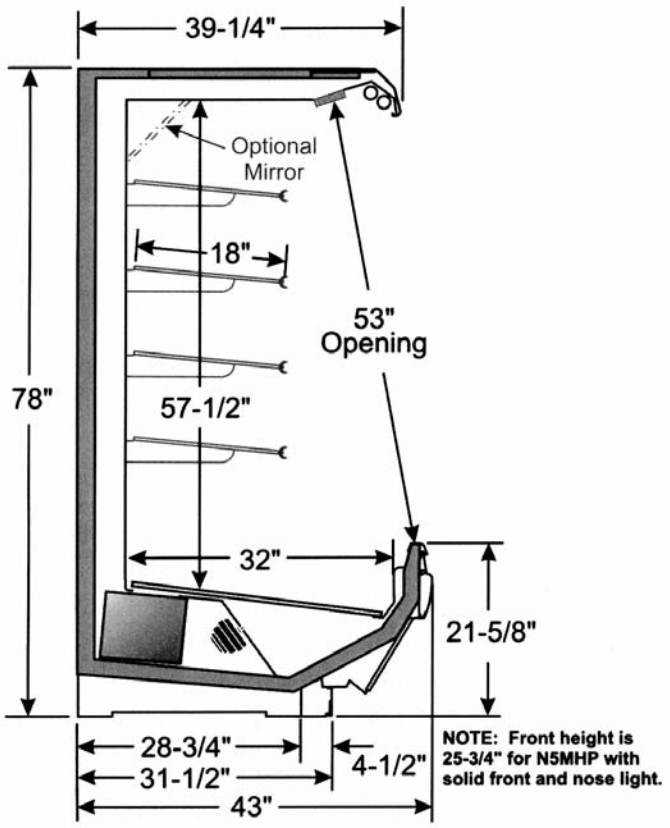
* All high performance cases use **OFF CYCLE** defrost
** **NOTE:** 26 minutes is for EPR with suction stop for defrost isolation. Defrost times increases by six minutes (32 min. total) when defrost isolation is by pump down.
*** If EPR is utilized, use the settings in the chart. **NOTE:** The customer will need to set the EPR on the parallel rack or single unit to the appropriate suction temperature and the N5M(G)HP cases must be on a separate suction stub with a separate EPR. **ADD** 0.5# to EPR setting for each 1000 foot rise in elevation.
**** Required setup for a conventional unit uses an electronic thermostat to assure accurate temperature control.

CASE-TO-CASE SUCTION LINE SUB-FEED BRANCH LINE SIZING											
MODEL	8'	12'	16'	20'	24'	28'	32'	36'	40'	44'	48'
N5MHP / R22	5/8"	7/8"	7/8"	7/8"	1 1/8"	1 1/8"	1 1/8"	1 1.8"	1 1/8"	1 3/8"	1 3/8"
N5MGHP / R22	5/8"	7/8"	7/8"	7/8"	1 1/8"	1 1/8"	1 1/8"	1 1.8"	1 1/8"	1 1/8"	1 3/8"

CASE CIRCUITS: This case requires a 120V circuit for fans, lights and anti-sweats.
Screens are standard. Shelving must be ordered separately. All rows of shelving require a shelf gasket.
UL SANITATION approved in accordance with ANSI/NSF – 7.

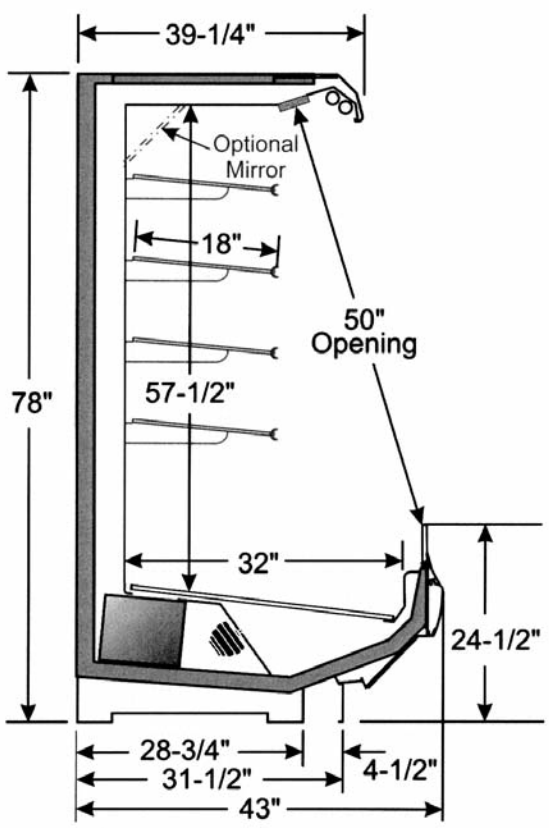
CASE BTUH REQUIREMENTS are calculated to produce approximately the indicated entering-air temperature with absolute maximum operating ambient limits of **75°F & 55RH.**

N5MHP CROSS SECTION

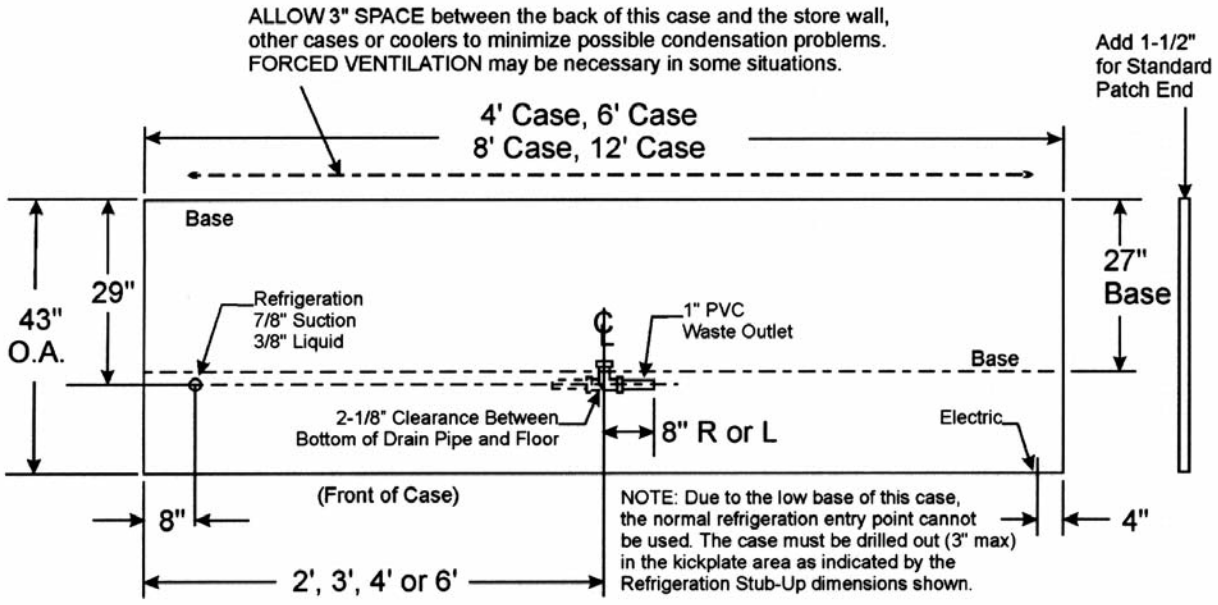


NOTE: Front height is 25-3/4" for N5MHP with solid front and nose light.

N5MGHP CROSS SECTION

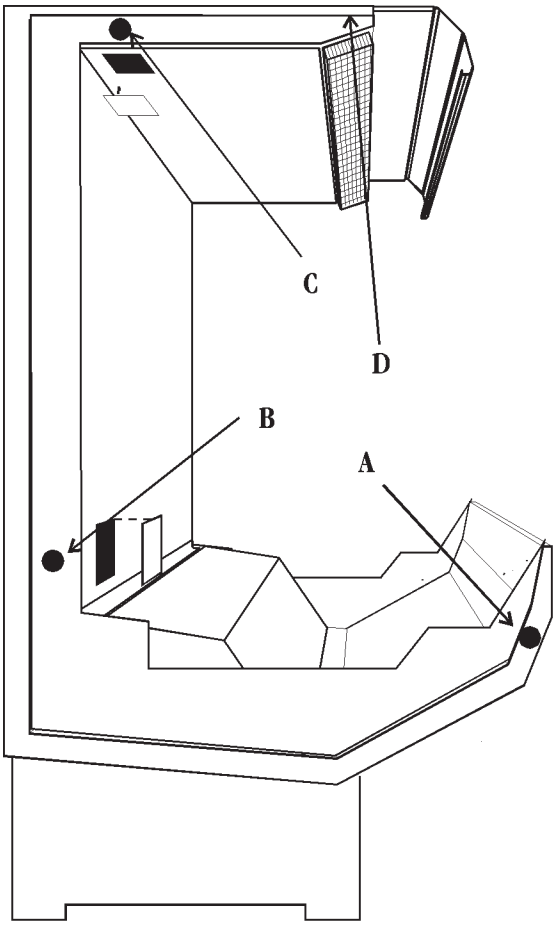


FLOOR PLAN



INSTALLATION PROCEDURES

Carpentry Procedures



Case Pull-Up Locations

The N5M(G) and N5M(G)HP models have four pull-ups at each end of the case. Pull-ups A, B, C and D are located as shown and should be installed and tightend starting with A and finishing with D.

See "General-UL/NSF I&S Manual" for line-up assembly instructions.

Electrical Procedures

Electrical Considerations

CAUTION

Make sure all electrical connections at components and terminal blocks are tight. This prevents burning of electrical terminals and/or premature component failure.

NOTE

The raceway houses the electrical wiring, components and terminal blocks for the case. Remove the lower front cladding to access the raceway.

Case Fan Circuit

This circuit is to be supplied by an uninterrupted, protected 120V circuit. The case fan circuit is not cycled, except when equipped for gas defrost. On gas defrost cases the fan circuit is controlled by a 50/40 klixon.

NOTE

With gas defrost, the fans will not start until the coil temperature reaches 40°F at the fan delay thermostat.

Fluorescent Lamp Circuit

N5M(G) and N5M(G)HP case lighting is supplied by T-8 electronic ballast lights. It is controlled by a light switch in each case. The standard lighting is 2-row of T-8 canopy lights. Case lighting options include up to 4 rows of T-8 shelf lights.

Anti-Sweat Heater Circuit

N5M(G) and N5M(G)HP cass have one anti-sweat heater in the discharge grid. The anti-sweat heater is wired to the hot side of the lighting power supply so it can operate at all times.

Defrost Information

See "General-UL/NSF I&S Manual" for operational descriptions for each type of defrost control.

Defrost Control Chart

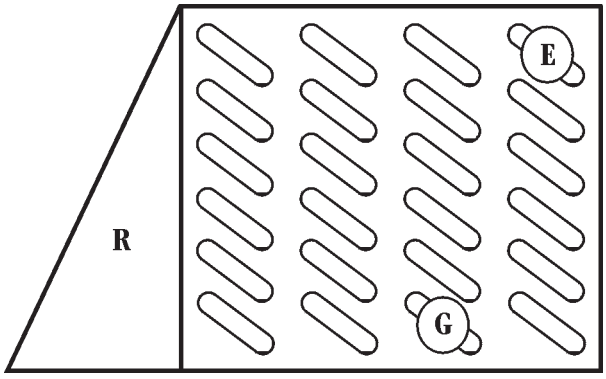
N5M(G) Defrost Option Settings

Defrost Type	Defrosts Per Day	Defrost Duration (Min)	Term. Temp.
Off Time	6	32	-----
Electric	6	36	50°F
Gas	6	12-15	55°F

N5M(G)HP Defrost Option Settings

Defrost Type	Defrosts Per Day	Defrost Duration (Min)	Term. Temp.
Off Time	6	26*	-----

*** See specification pages in this manual for pump down adjustment variations.**



E = Electric Defrost
G = Gas Defrost (Fan Delay)

All klixons are located on the right end of the evaporator coil. The above diagram shows the location for each defrost type that uses a klixon.

N5M(G)HP cases do not have any klixons.

NOTE

The termination thermostat for gas defrost is located on the bypass check valve at the left end of the evaporator coil.

CAUTION

If electronic sensors are used in place of the klixons, the sensors must be located in the same location as the klixons for that defrost type. Any other locations will effect the refrigeration efficiency of the case.

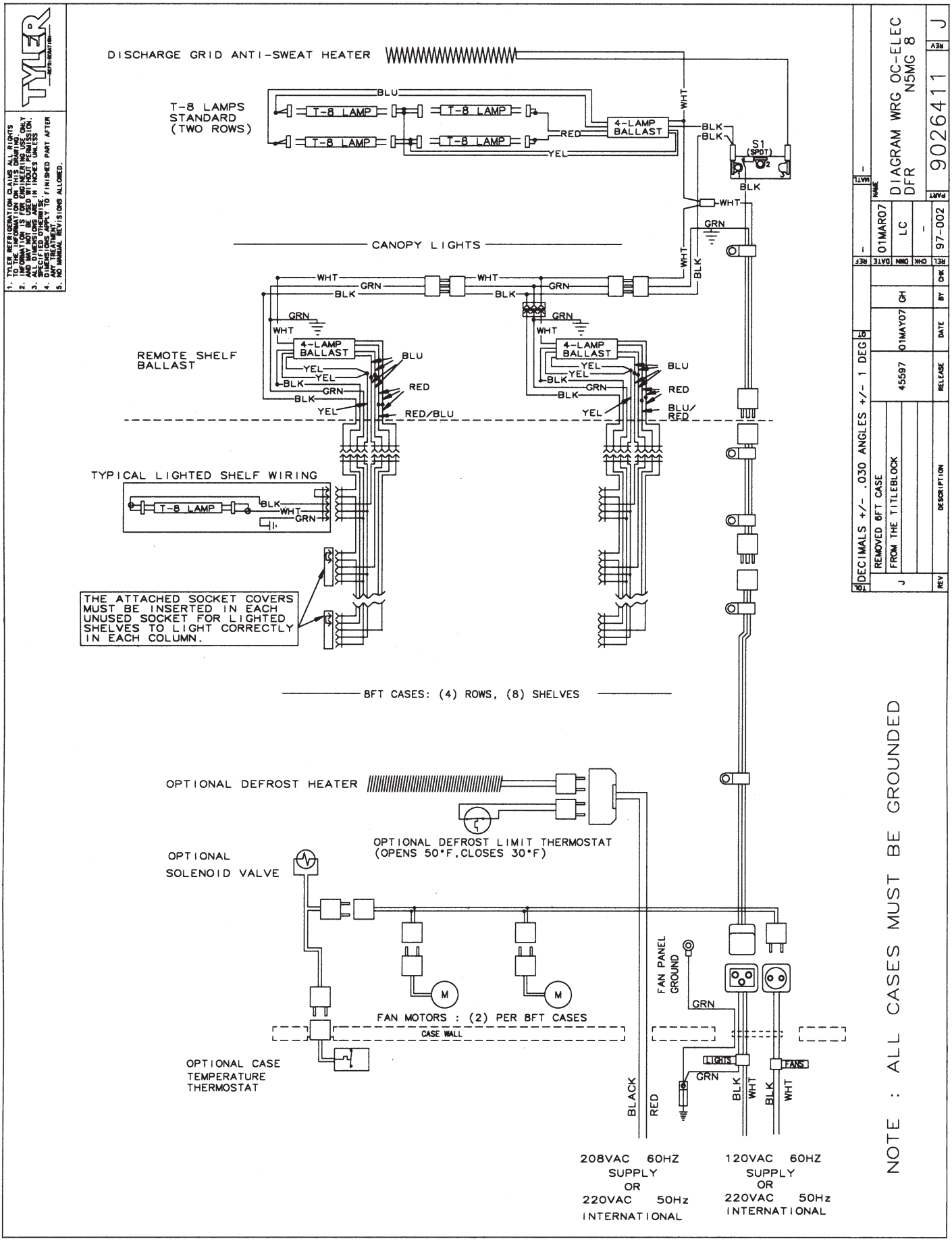
WIRING DIAGRAMS

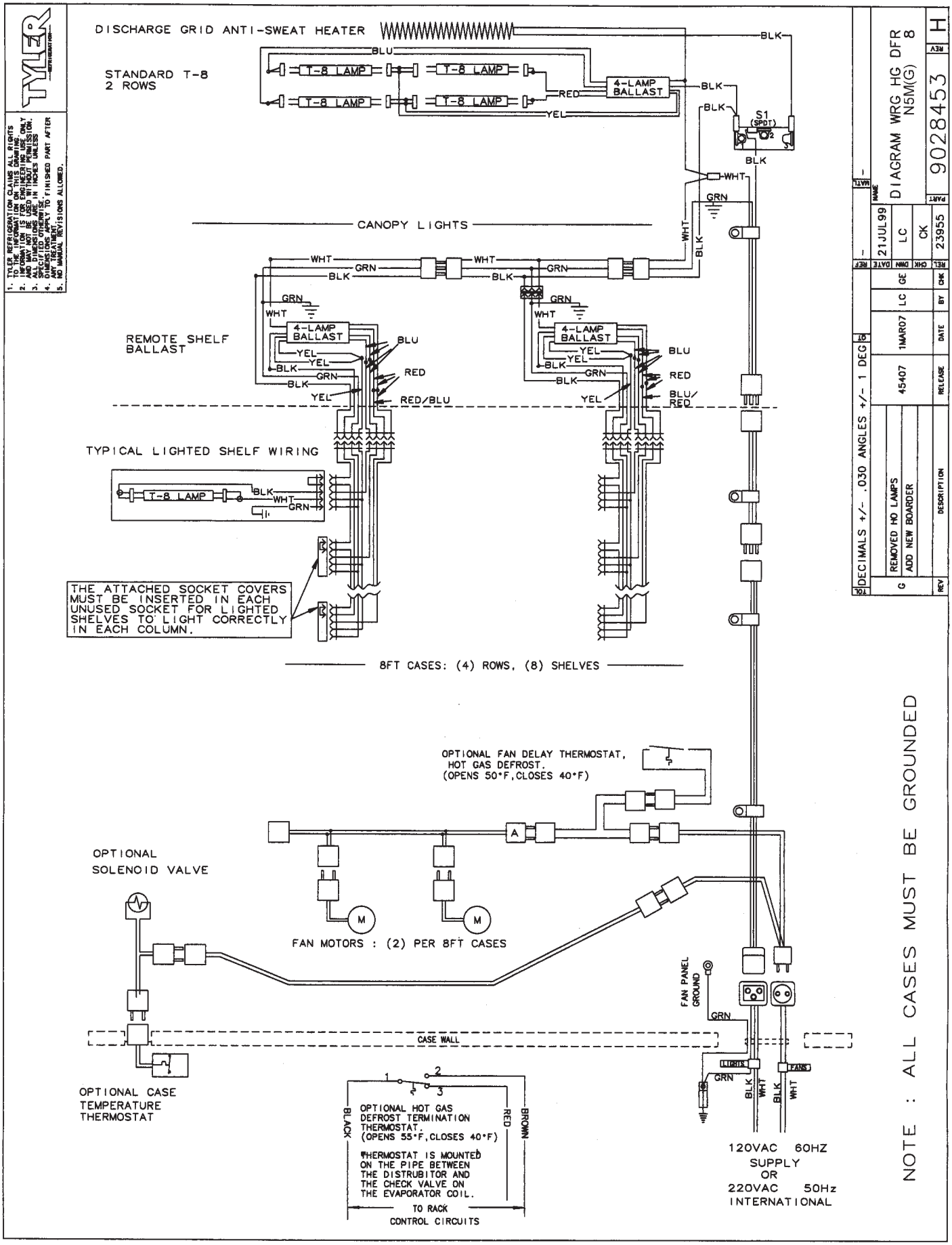
ELECTRICIAN NOTE - OVERCURRENT PROTECTION

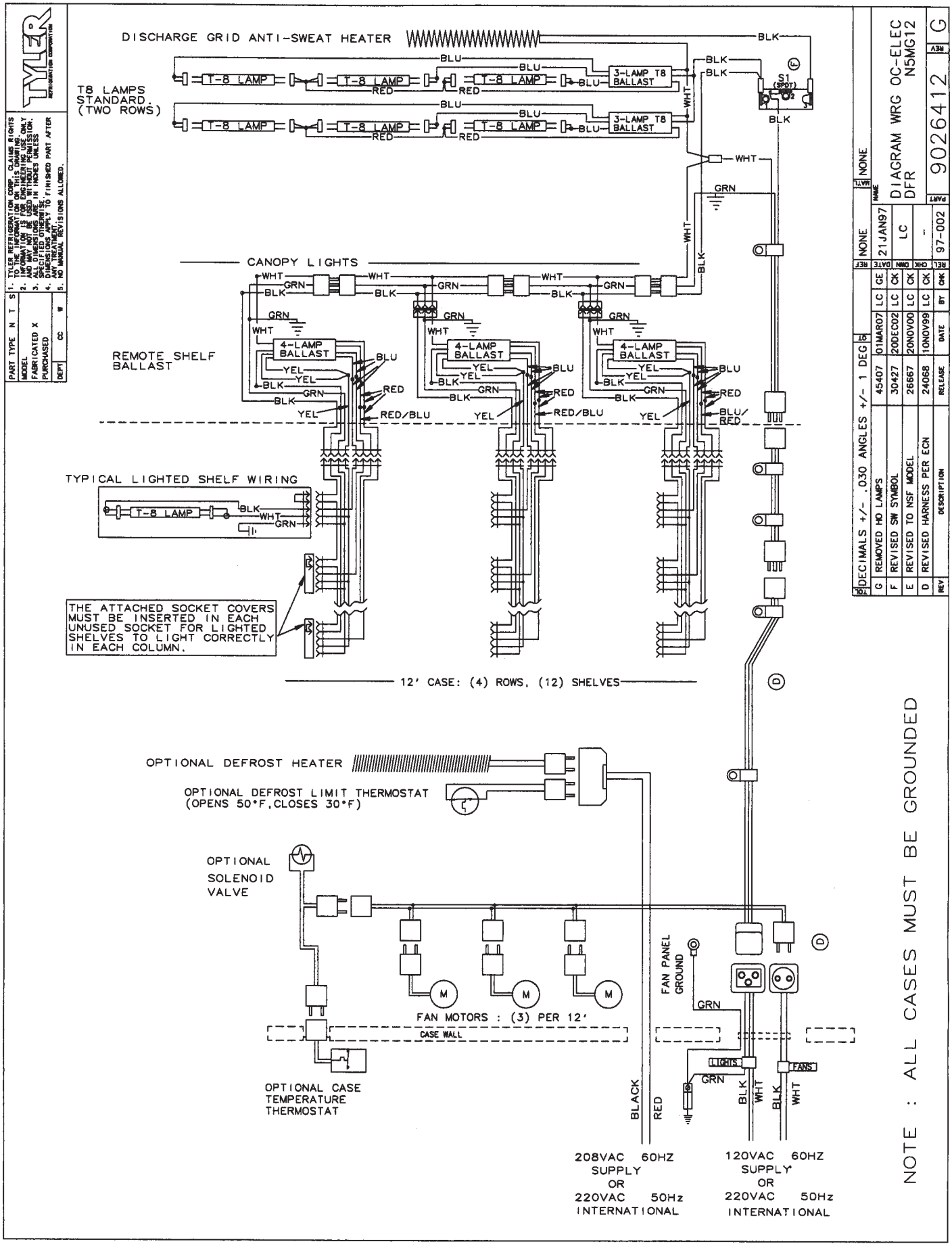
120V circuits should be protected by 15 or 20 Amp devices per the requirements noted on the cabinet nameplate or the National Electrical Code, Canadian Electrical Code - Part 1, Section 28. 208V defrost circuits employ No. 12 AWG field wire leads for field connections. On remote cases intended for end to end line-ups, bonding for ground may rely upon the pull-up bolts.

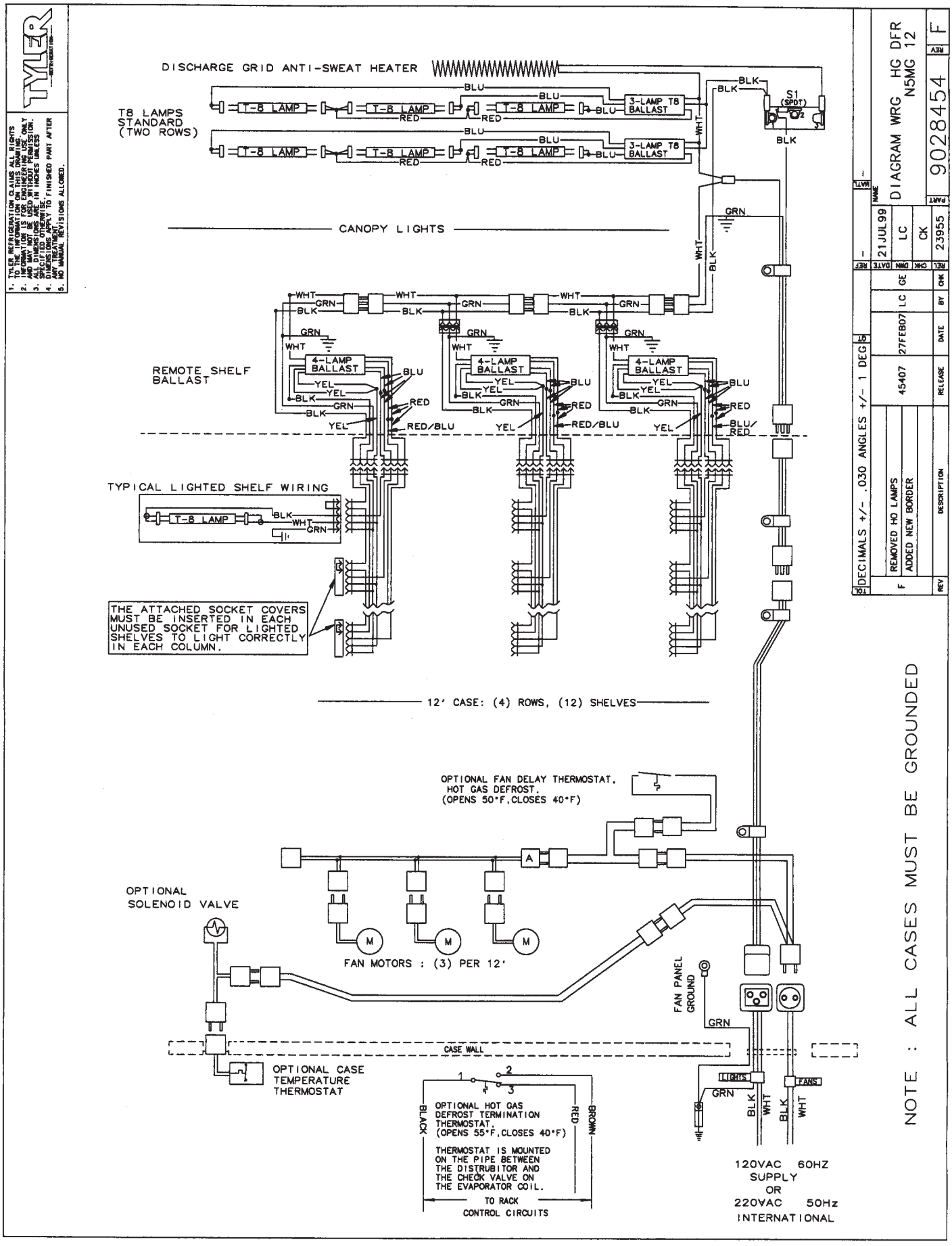
The following wiring diagrams on pages 10 thru 16 will cover the N5M(G) and N5M(G)HP case circuits, electric and gas defrost circuits and lighting wiring circuits.

N5M(G) Domestic & Export (50 Hz) Case Circuits (8' & 12' Cases)

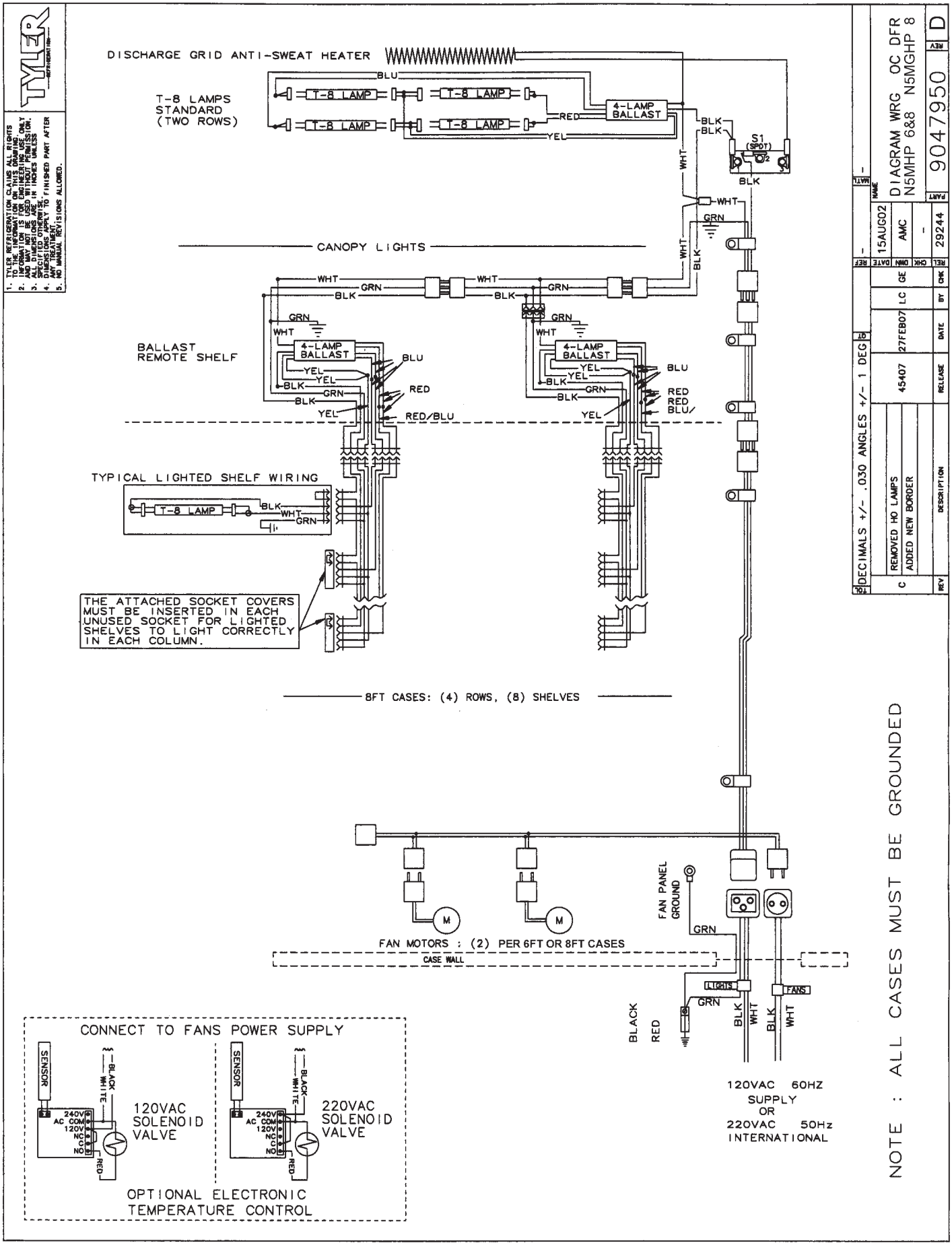


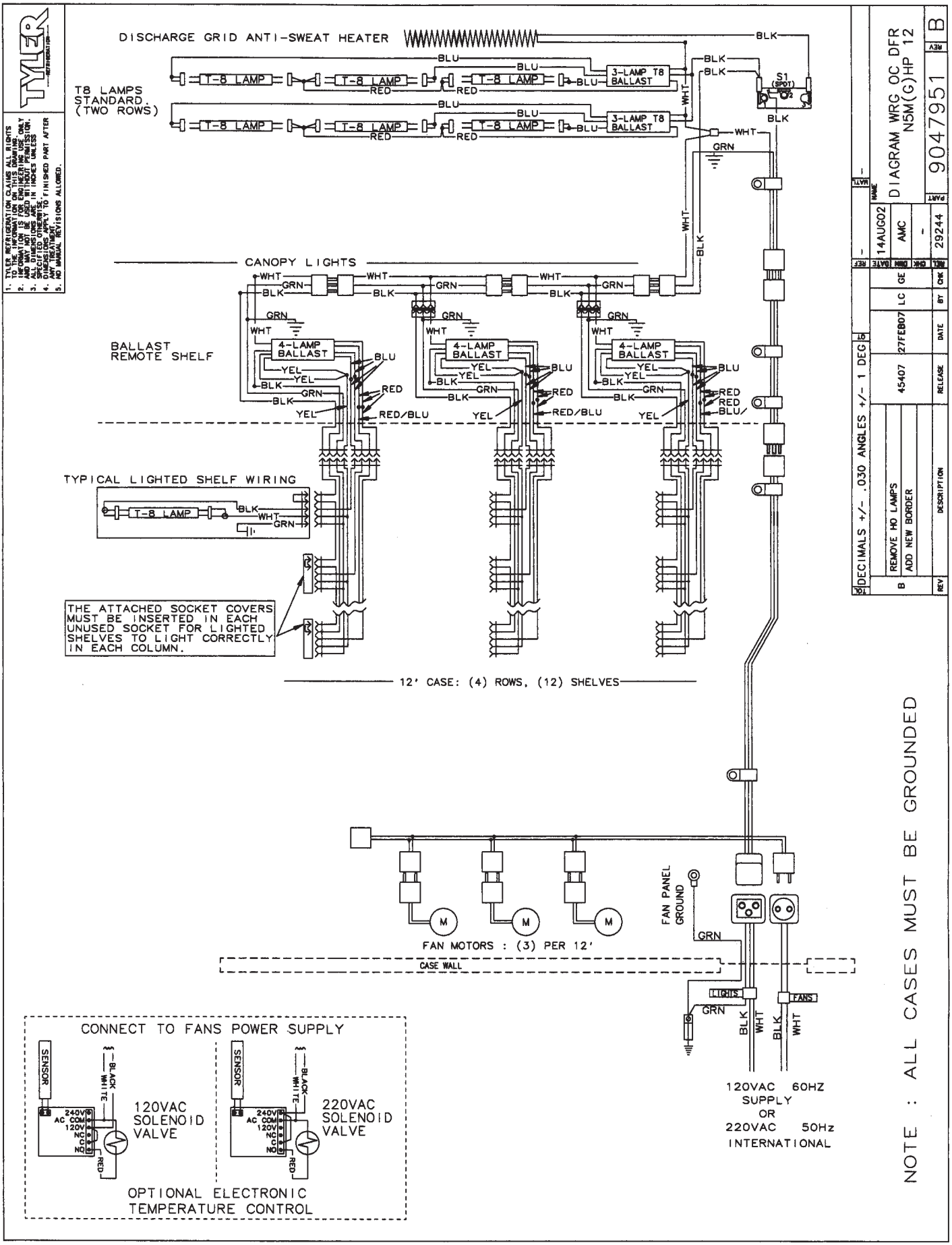

DISCHARGE GRID ANTI-SWEAT HEATER
STANDARD T-8
2 ROWS
T-8 LAMP
4-LAMP BALLAST
S1 (SPDT)
CANOPY LIGHTS
REMOTE SHELF BALLAST
TYPICAL LIGHTED SHELF WIRING
THE ATTACHED SOCKET COVERS MUST BE INSERTED IN EACH UNUSED SOCKET FOR LIGHTED SHELVES TO LIGHT CORRECTLY IN EACH COLUMN.
8FT CASES: (4) ROWS, (8) SHELVES
OPTIONAL FAN DELAY THERMOSTAT, HOT GAS DEFROST. (OPENS 50°F, CLOSES 40°F)
OPTIONAL SOLENOID VALVE
FAN MOTORS : (2) PER 8FT CASES
FAN PANEL GROUND
CASE WALL
OPTIONAL CASE TEMPERATURE THERMOSTAT
OPTIONAL HOT GAS DEFROST TERMINATION THERMOSTAT. (OPENS 55°F, CLOSES 40°F)
*THERMOSTAT IS MOUNTED ON THE PIPE BETWEEN THE DISTRUBITOR AND THE CHECK VALVE ON THE EVAPORATOR COIL.
TO RACK CONTROL CIRCUITS
LIGHTS
FANS
120VAC 60HZ SUPPLY OR 220VAC 50Hz INTERNATIONAL
NOTE : ALL CASES MUST BE GROUNDED
DIAGRAM WRG HG DFR N5M(G) 8
9028453
21JUL99
LC
CK
23955
45407
1MAR07
REMOVED HO LAMPS
ADD NEW BOARDER
DECIMALS +/- .030 ANGLES +/- 1 DEG


DISCHARGE GRID ANTI-SWEAT HEATER
T8 LAMPS STANDARD. (TWO ROWS)
T-8 LAMP
3-LAMP T8 BALLAST
CANOPY LIGHTS
REMOTE SHELF BALLAST
4-LAMP BALLAST
TYPICAL LIGHTED SHELF WIRING
THE ATTACHED SOCKET COVERS MUST BE INSERTED IN EACH UNUSED SOCKET FOR LIGHTED SHELVES TO LIGHT CORRECTLY IN EACH COLUMN.
12' CASE: (4) ROWS, (12) SHELVES
OPTIONAL DEFROST HEATER
OPTIONAL DEFROST LIMIT THERMOSTAT (OPENS 50°F, CLOSES 30°F)
OPTIONAL SOLENOID VALVE
FAN MOTORS : (3) PER 12'
CASE WALL
OPTIONAL CASE TEMPERATURE THERMOSTAT
FAN PANEL GROUND
LIGHTS
FANS
208VAC 60HZ SUPPLY OR 220VAC 50Hz INTERNATIONAL
120VAC 60HZ SUPPLY OR 220VAC 50Hz INTERNATIONAL
NOTE : ALL CASES MUST BE GROUNDED
DIAGRAM WRG OC-ELEC DFR N5MG12
9026412 G
97-002

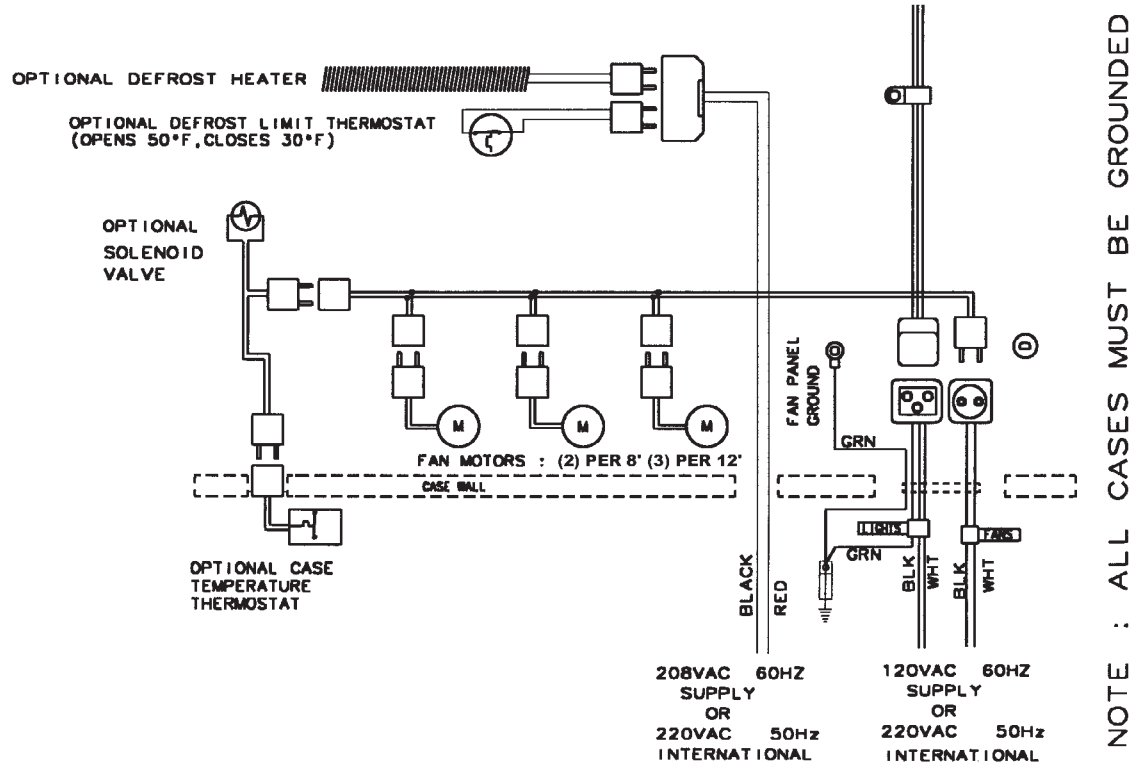

DISCHARGE GRID ANTI-SWEAT HEATER
T8 LAMPS STANDARD (TWO ROWS)
T-8 LAMP
3-LAMP T8 BALLAST
S1 (SPDT)
CANOPY LIGHTS
REMOTE SHELF BALLAST
4-LAMP BALLAST
TYPICAL LIGHTED SHELF WIRING
THE ATTACHED SOCKET COVERS MUST BE INSERTED IN EACH UNUSED SOCKET FOR LIGHTED SHELVES TO LIGHT CORRECTLY IN EACH COLUMN.
12' CASE: (4) ROWS, (12) SHELVES
OPTIONAL FAN DELAY THERMOSTAT, HOT GAS DEFROST. (OPENS 50°F, CLOSES 40°F)
OPTIONAL SOLENOID VALVE
FAN MOTORS : (3) PER 12'
FAN PANEL GROUND
CASE WALL
OPTIONAL CASE TEMPERATURE THERMOSTAT
OPTIONAL HOT GAS DEFROST TERMINATION THERMOSTAT, (OPENS 55°F, CLOSES 40°F)
THERMOSTAT IS MOUNTED ON THE PIPE BETWEEN THE DISTRUBITOR AND THE CHECK VALVE ON THE EVAPORATOR COIL.
TO RACK CONTROL CIRCUITS
LIGHTS
FANS
120VAC 60HZ SUPPLY OR 220VAC 50Hz INTERNATIONAL
NOTE : ALL CASES MUST BE GROUNDED
DIAGRAM WRG HG DFR N5MG 12
9028454
F
DECIMALS +/- .030 ANGLES +/- 1 DEG
REMOVED HO LAMPS
ADDED NEW BORDER
45407
27FEB07 LC
21JUL99 LC CK 23955

N5M(G)HP Domestic & Export (50 Hz) Case Circuits (6', 8' & 12' Cases)

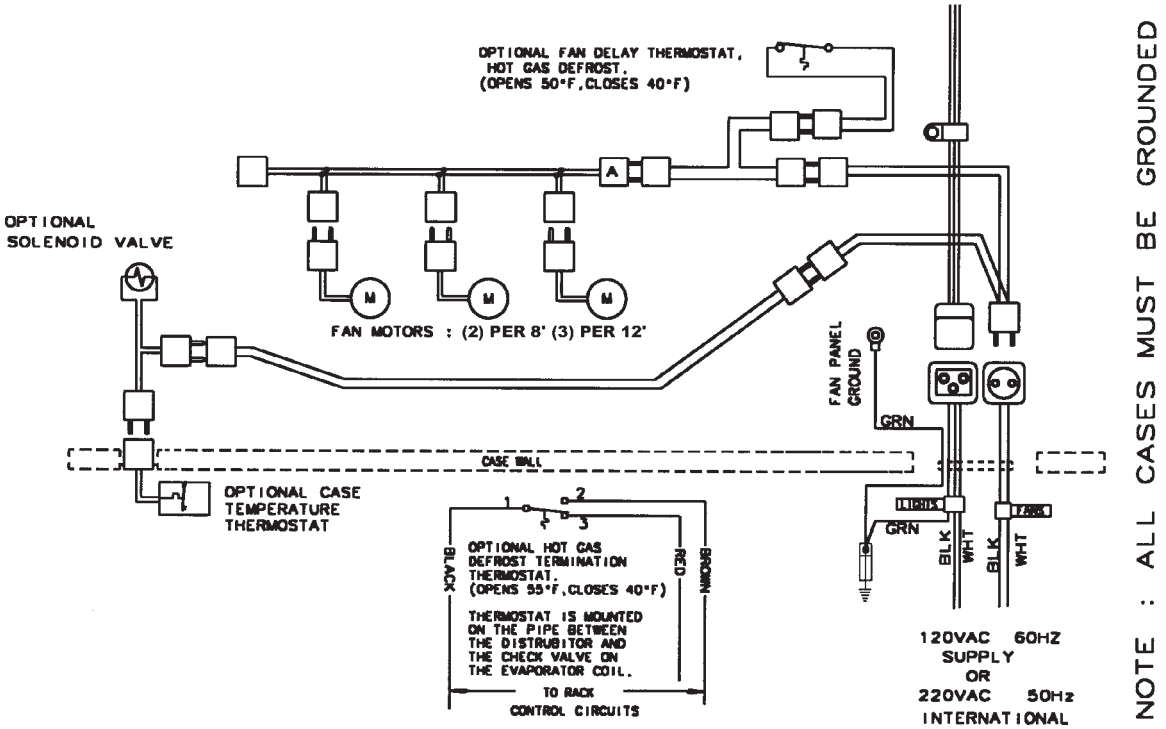



DISCHARGE GRID ANTI-SWEAT HEATER
T8 LAMPS STANDARD. (TWO ROWS)
T-8 LAMP
3-LAMP T8 BALLAST
S1 (SPDT)
CANOPY LIGHTS
BALLAST REMOTE SHELF
4-LAMP BALLAST
TYPICAL LIGHTED SHELF WIRING
THE ATTACHED SOCKET COVERS MUST BE INSERTED IN EACH UNUSED SOCKET FOR LIGHTED SHELVES TO LIGHT CORRECTLY IN EACH COLUMN.
12' CASE: (4) ROWS, (12) SHELVES
FAN MOTORS : (3) PER 12'
FAN PANEL GROUND
CASE WALL
LIGHTS
FANS
120VAC 60HZ SUPPLY OR 220VAC 50Hz INTERNATIONAL
CONNECT TO FANS POWER SUPPLY
SENSOR
120VAC SOLENOID VALVE
220VAC SOLENOID VALVE
OPTIONAL ELECTRONIC TEMPERATURE CONTROL
NOTE : ALL CASES MUST BE GROUNDED
DIAGRAM WRG OC DFR N5M(G)HP 12
9047951
B
DECIMALS +/- .030 ANGLES +/- 1 DEG
REMOVE HO LAMPS
ADD NEW BORDER
45407
27FEB07
14AUG02
AMC
29244

Electric Defrost Circuit (N5M and N5MG Only)



Optional Gas Defrost Circuit (N5M and N5MG Only)



CLEANING AND SANITATION

Component Removal and Installation Instructions for Cleaning

Shelves and Shelf Brackets

1. Remove product from shelves.
2. If shelf has a light, unplug the light cord from the socket in the rear duct panel. Completely insert socket cover in the light socket to protect the receptacle.
3. Push shelves back and then lift up and out to remove them from the shelf brackets.
4. Remove shelf brackets from slots in rear uprights.
5. After cleaning, replace in reverse order.

Mirrors

1. Remove srews and mirror end trim from case.
2. Carefully lift up and remove each mirror section from the top and bottom mirror supports.

NOTE

Position mirror sections together so all gaps are at the ends of the line-up.

3. After cleaning, replace in reverse order.

Bottom Trays

1. Remove product from bottom of case.
2. Grasp and lift out each of the bottom trays from the case interior.
3. After cleaning, replace in reverse order.

Front Air Ducts

1. Remove lower trays, see this page.
2. Lift out front air duct sections.
3. After cleaning, replace in reverse order.

Rear Duct Panels (w/o Shelf Light Sockets)

1. Remove shelves and bottom trays, see above.
2. Remove mounting screws and rear duct panels from case.
3. After cleaning, replace and secure rear duct panels in reverse order.

(with Shelf Light Sockets)

1. Remove shelves and bottom trays, see above.
2. For cases with 5 rows of lighted shelves, remove screw above top shelf socket and push socket assembly back through the hole in the rear duct panel.
3. Remove mounting screws from rear duct panel.
4. Slowly lift out rear duct panel until the shelf harness connector near the top of the panel can be accessed.
5. Disconnect shelf harness connector and complete removing the rear duct panel.

WARNING

Rear duct panels with electrical receptacles can be cleaned without removing the electrical receptacles. Do not get moisture on electrical wires when cleaning under this cover. Moisture on wires could cause premature product failure and/or personal injury or death from electrical shock.

6. After cleaning, reconnect the shelf harness connector: install the top socket assembly: replace and secure rear duct panels in reverse order.

Discharge Air Honeycomb

1. Loosen screws securing rear retainer plate.

NOTE

Note position of the honeycomb grid during removal so it can be reinstalled the same way.

2. Slide rear retainer plate back until the honeycomb grid sections can be removed from the top duct.

CAUTION

Improper installation of the honeycomb grid section could result in improper air flow and/or poor refrigeration.

3. After cleaning, replace honeycomb grid sections as they were removed and secure with the rear retainer plate and screws.

Top Duct

1. Remove shelves and shelf brackets, see above.
2. Remove screws, rear retainer plate and honeycomb grid sections from top of case.
3. Remove screws and top duct from case.
4. After cleaning, replace top duct and remaining components in reverse order.

Front Cladding

1. Remove front kickplate. (See General-UL/NSF I&S Manual.)
2. Remove color band, bumper and bumper retainer from the case. (See General-UL/NSF I&S Manual.)
3. Remove screws from top and bottom of front cladding and remove cladding.
4. After cleaning, replace front cladding and remaining front components in reverse order.

Cleaning Instructions

WARNING

TYLER Refrigeration does not recommend the use of high pressure cleaning equipment on display cases!! High pressure cleaners can penetrate and/or damage joint seals. Damaged seals allow water leaks and/or air leaks that can cause poor case refrigeration.

CAUTION

- **When cleaning this case, try not to introduce water into the case faster than it can be carried away by the waste outlet.**
- **Liquid chlorine bleach is corrosive to metals. The use of bleach or products containing bleach will damage metal surfaces and void the case warranty.**
- **Sanitize the case with Quaternary Ammonium Solutions (ex: KAYQUAT II, J-512 Sanitizer, SANIQUAT 512, etc...) approved per 21CFR 178.1010, followed by adequate draining and air drying. These solutions may be obtained from Kay Chemical Co., Johnson Wax Professional, Coastwide Laboratories, etc....**
- **Always use a soft cloth or sponge with mild detergent and water to clean any glass. Never use abrasives or scouring pads to clean glass. They can scratch and/or damage the glass.**

See "General (UL/NSF) I&S Manual" for case cleaning instructions.

Stainless Steel Cleaning Methods

The cleaning data in the following stainless steel cleaning chart was supplied by AISI. The information was supplied by Prime Metals Division, Alumax Aluminum Corporation.

TYPE OF CLEANING	CLEANING AGENT*	APPLICATION METHOD**	EFFECT ON FINISH
Routine cleaning	Soap, ammonia or detergent and water.	Sponge with cloth, then rinse with clear water and wipe dry.	Satisfactory for use on all finishes.
Smears and fingerprints	Arcal 20, Lac-O-Nu, Lumin Wash O'Cedar Cream Polish, Stainless Shine	Rub with cloth as directed on the package.	Satisfactory for use on all finishes. Provides barrier film
Stubborn spots and stains, baked-on splatter, and other light discolorations	Allchem Concentrated Cleaner	Apply with damp sponge or cloth.	Satisfactory for use on all finishes.
	Samae, Twinkle, or Cameo Copper Cleaner	Rub with damp cloth.	Satisfactory for use on all finishes if rubbing is light.

TYPE OF CLEANING	CLEANING AGENT*	APPLICATION METHOD**	EFFECT ON FINISH
	Grade FFF Italian pumice, whiting or talc	Rub with damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Liquid NuSteel	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Paste NuSteel or DuBois Temp	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Cooper's Stainless Steel Cleaner, Revere Stainless Steel Cleaner	Apply with damp sponge or. cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Grade F Italian pumice, Steel Bright, Lumin Cleaner, Zud or Restoro	Rub with a damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Penny-Brite or Copper-Brite	Rub with a dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
Heat tint or heavy discoloration	Penny-Brite or Copper-Brite	Rub with a dry cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Paste NuSteel or DuBois Temp	Rub with dry cloth. Use a small amount of cleaner.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Revere Stainless Steel Cleaner	Apply with a damp sponge or cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
	Allen Polish, Steel Bright, Wyandotte or Zud	Rub with a damp cloth.	Use in direction of polish lines on No. 4 (polished) finish. May scratch No. 2 (mill) and No. 7 and 8 (polished) finishes.
Burnt-on foods and grease, fatty acids, milkstone (where swabbing or rubbing is not practical)	Easy-Off, De-Grease-It, 4-6% hot solution of such agents as trisodium tripolyphospate, or 5-15% caustic soda solution	Apply generous coating. Allow to stand for 10-15 min. Repeated application may be necessary.	Excellent removal, satisfactory for use on all finishes.
Tenacious deposits, rusty discolorations, industrial atmospheric stains	Oakite No. 33, Dilac, Texo 12, Texo N.Y., Flash-Klenz, Caddy Cleaner, Turco Scale 4368 or Permag 57.	Swab and soak with clean cloth. Let stand 15 minutes or more according to directions on package. Rinse and dry.	Satisfactory for use on all finishes.
Hard water spots and scale	Vinegar	Swab or wipe with a cloth. Rinse with water and dry.	Satisfactory for use on all finishes.
	5% oxalic acid, 5% sulamic acid, 5-10% phospheric acid, or Dilac, Oakite No. 33, Texo 12 or Texo N.Y.	Swab or soak with a cloth. Let stand 10-15 minutes. Always follow with neutralizer rinse, and dry.	Satisfactory for use on all finshes. Effective on tenacious deposites or where scale has built up.

TYPE OF CLEANING	CLEANING AGENT*	APPLICATION METHOD**	EFFECT ON FINISH
Grease and oil	Organic solvents such as carbon tetrachloride, trichlorethylene, acetone, kerosene, gasoline, benzene, alcohol and chlorethane n.u.	Rub with a cloth. Organic solvents may be flammable and/or toxic. **Observe all precautions against fire. Do not smoke while vapors are present. Be sure area is well ventilated.**	Satisfactory for use on all finishes.

*** Use of proprietary names is intended only to indicate a type of cleaner, and does not constitute an endorsement, nor is omission of any proprietary cleanser to imply its inadequacy. It should be emphasized that all products should be used in strict accordance with instructions on package.**

**** In all applications a sponge or fibrous brush or pad are recommended. DO NOT use ordinary steel wool, steel brushes, chlorine bleach or products containing bleach for cleaning or sanitizing stainless steel.**

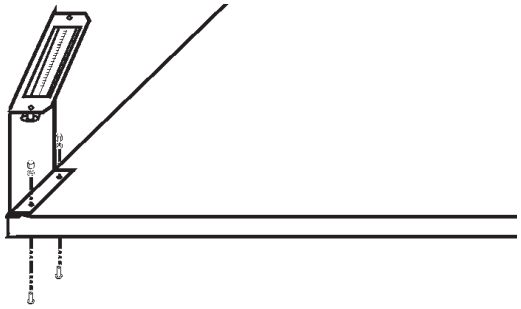
GENERAL INFORMATION

NSF Product Thermometer Installation

1. Unwrap the thermometer and bracket assembly shipped loose with the case.
2. Position bracket in front left corner of the left-most bottom tray. Making sure the bracket is flush with the left edge, use the bracket holes as a template for where to drill the holes.
3. Drill two .196” holes in the bottom tray.

NOTE

For ease of installation, position the washers and capnuts on the top side of the bracket and bottom tray.

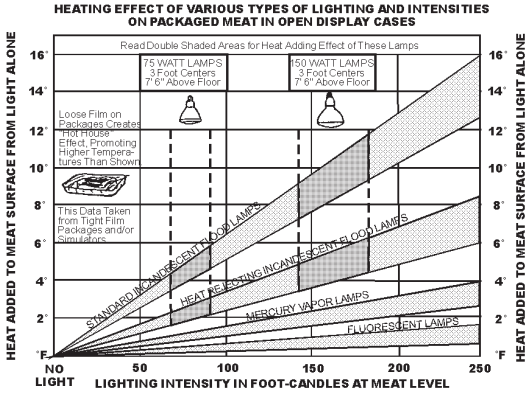


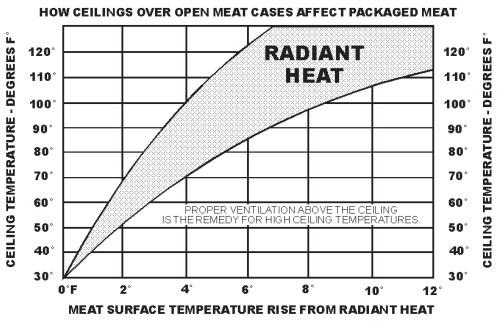
4. Mount the bracket to the bottom tray with two screws, washers and capnuts.

Mirror Installation

When installing mirrors you must be aware that on longer line-ups it is possible to end up with a gap at the end of the line-up. To help prevent this, leave a gap at the starting end that can be covered by the stainless steel trim. Additional mirror positioning adjustments may be required to make sure the gaps at each end of the line-up don’t show when the stainless steel trim is in place. Also make sure all mirrors have a good tight seal between each mirror.

Radiant Heat Information





A wide temperature range is shown for each type of lighting. This data does not show all situations. Many situations will have higher package warm-up figures than indicated.

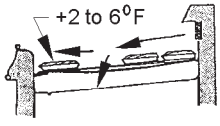
It is generally known that the temperature of displayed meat in refrigerated cases will run higher than the circulated air temperature of the cases. A dial thermostat stuck into the center of a piece of meat compared with one in the air stream quickly confirms this fact. Another fact is that the surface temperature of the meat will be higher than the center temperature due to radiant heat. TYLER's ongoing research identifies sources of radiant heat and accurately measures and records it. These charts were developed from the information gathered during this research. Two major sources of radiant heat are from display lights and ceiling surfaces. Additional heat sources come from bad display practices which either overload the case with product or allow voids in the product display. Poor display practices impair the efficiency of the refrigeration, adding to the surface temperature of the meat. Bacteria and molds grow when surface temperatures rise above 45°F. This prematurely discolors displayed meats and causes unnecessary meat department losses.

Radiant Heat Measurement

Place two accurate dial thermometers side by side in a case. Cover one of the thermometer stems with black friction tape. The temperature difference is the approximate amount of radiant heat. A change in display lighting or a reduction of high ceiling temperatures (over 80°F) could reduce the radiant heat in the case.

Display Practices

Encourage butchers to maintain all meat below the case load lines and to eliminate product voids. Case screens could be covered in some instances to keep the refrigerated air over the display.



Voids in display raise surface temperature of package in front of void 2 to 6⁰ F.

CAUTION

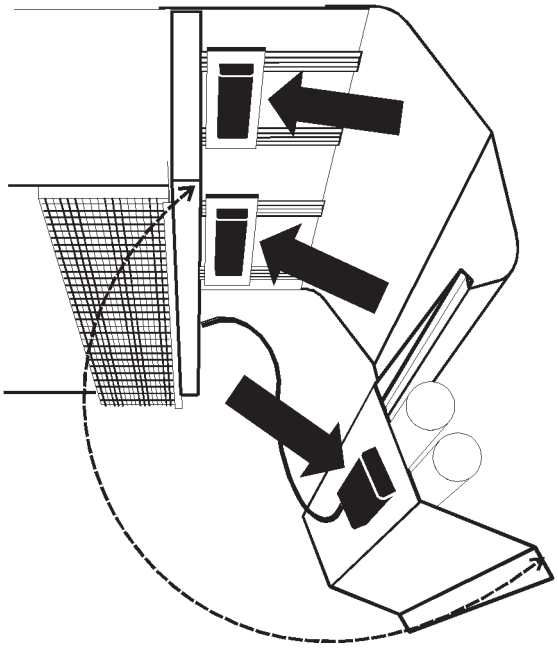
The quality damage done to meat products by high temperatures and/or contamination during delivery, cooler storage, cutting and wrapping cannot be repaired by placing the products into properly operating display cases.

SERVICE INSTRUCTIONS

Light Servicing

See "General-UL/NSF I&S Manual" for T-8 and 800MA lamp, ballast , fan blade and motor, and color band and bumper replacement instructions.

Ballast and Lighting Locations

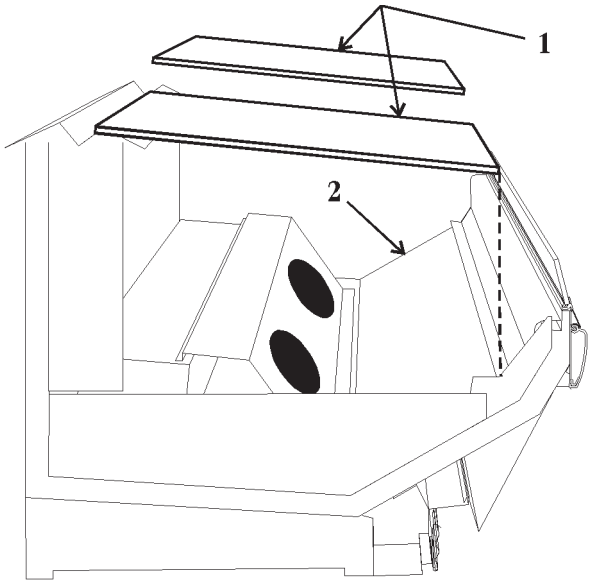


All light ballasts are located under the canopy and mounted on the top of the canopy light fixture. This includes remote ballasts for optional shelf lights. The canopy light(s) are under the canopy light fixture in the top of the case. The optional shelf lights are mounted in separate light fixtures under the front of each shelf section.

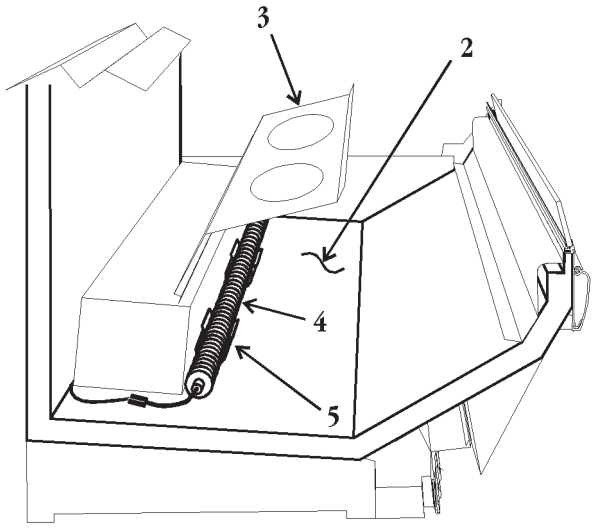
Defrost Heater Replacement

WARNING

Always shut off electricity to case before replacing a defrost heater. Automatic cycling of fans or electrical power to wire ends could cause personal injury and/or death.



1. Remove bottom trays (1) from case (2).



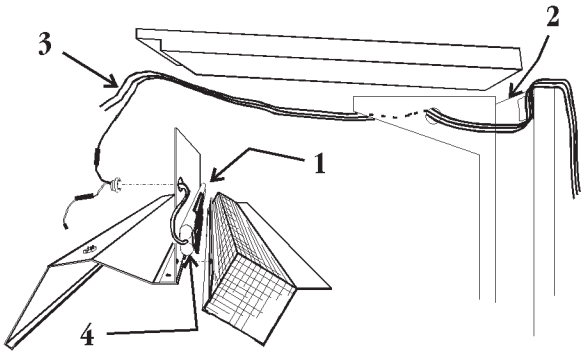
2. Unclip and lift up fan plenum (3).
3. Disconnect and remove defrost heater (4) from mounting clips (5) and case (2).
4. Install new defrost heater (4) in reverse order.
5. Restore electrical power to case.

Anti-Sweat Replacement

N5M(G) and N5M(G)HP cases have one anti-sweat heater in the discharge air grid. All anti-sweat heaters are wires that run the length of the above mentioned components. Use the following instructions to replace an anti-sweat heater.

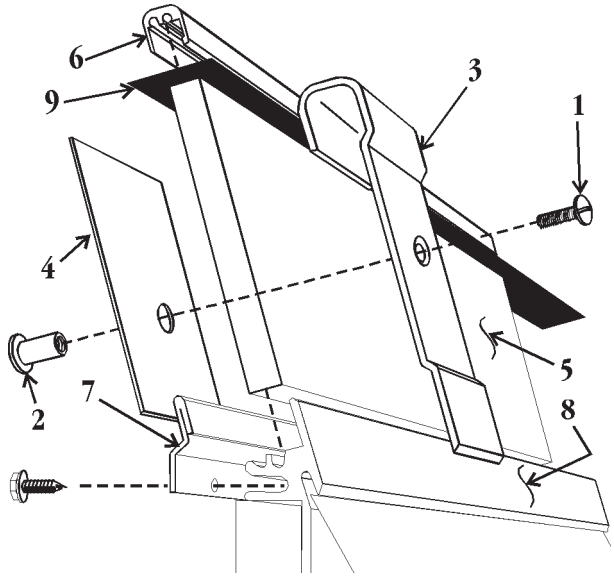
WARNING

Shut off or disconnect power supply to case before changing an anti-sweat. Electrical power from wire ends could damage other components and/or cause personal injury or death.



1. Expose the full length of the defective anti-sweat wire (1) in the case (2).
2. Disconnect or cut the defective anti-sweat wire (1) from the case wires (3).
3. Remove the aluminum tape (4) and defective anti-sweat wire (1) from the case (2).
4. Position new anti-sweat wire (1) in case (2) and secure with new aluminum tape (4).
5. Connect or splice the new anti-sweat wire (1) to case wires (3).
6. Replace all components that were removed to expose the anti-sweat wire (1).
7. Restore electrical power to case.

Front Glass Replacement (N5MG/N5MGHP Models)

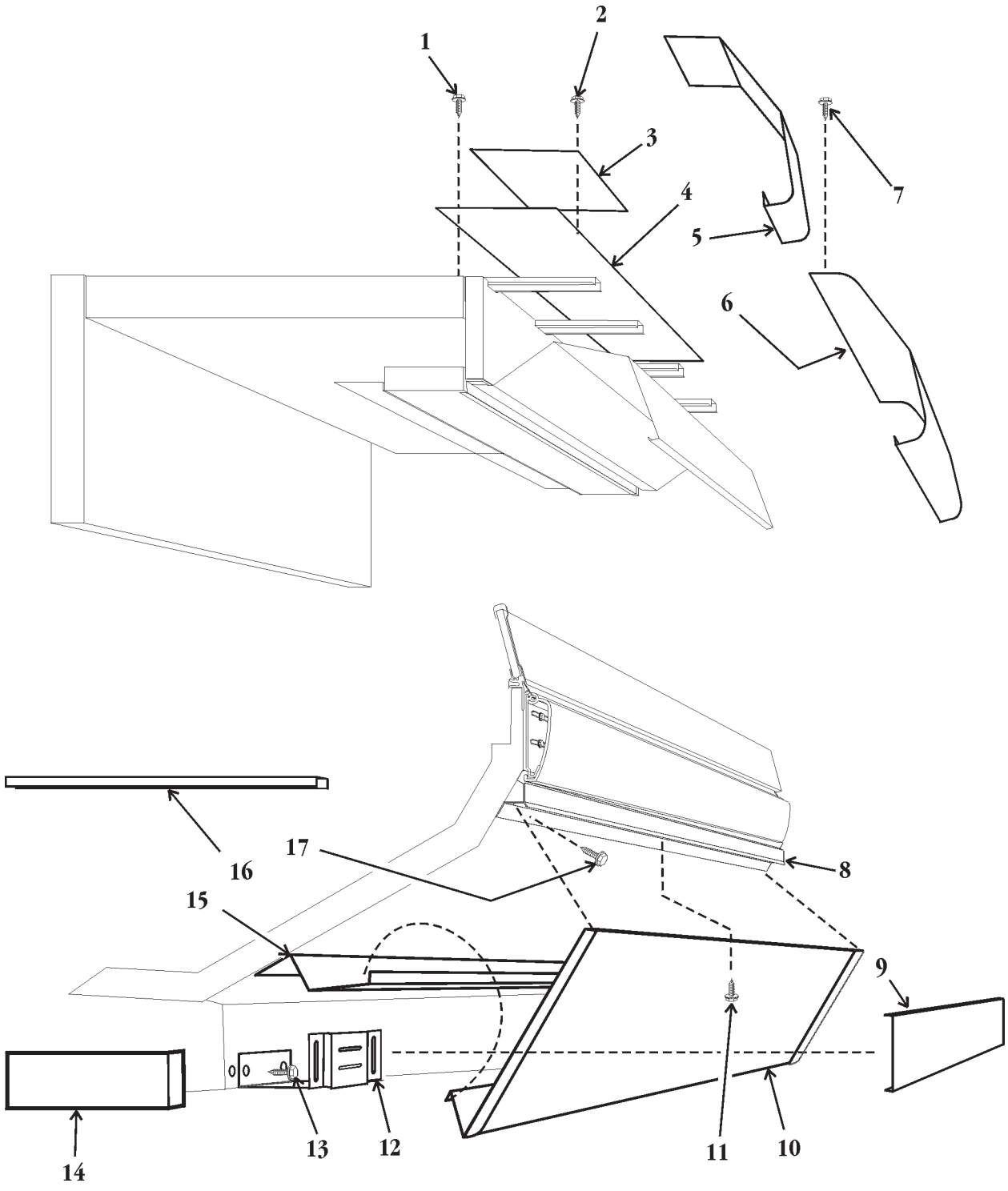


1. Remove screw (1), screw nut (2), glass joint trim (3) and glass joint backer (4) from both joints of the broken glass.
2. Remove glass trim rail (6) from top of glass (5).
3. Loosen rear retainer (7) and remove broken glass from glass retainer assembly (8).
4. Apply sealant tape (9) to top and bottom edge of new glass (5).
5. Position new glass (5) in glass retainer assembly (8) and secure by tightening rear retainer (7).
6. Install glass trim rail (6) over top edge of new glass (5).
7. Install glass joint backer (4), glass joint trim (3) with screw (1) and screw nut (2) over both joint areas of the glass (5).

PARTS INFORMATION

Cladding and Trim Parts List

Item	Description	N5M(G) and N5M(G)HP	
		8’	12’
1	Screw	5183536 (5)	5183536 (7)
2	Screw (per cover)	5183536 (4)	5183536 (4)
3	End Cover (1 per side)	9026103	9026103
4	Close-off, Hood	9026069	9026070
5	Canopy Hood Joint Trim, Ptd.	9029422	9029422
6	Canopy Hood, Ptd.	9025223	9025224
7	Screw	5183536 (8)	5183536 (10)
8	Upr. Front Cladding Support	9026387	9026388
9	Kickplate, Ptd.	9039016	9039017
	Kickplate Joint Trim, Ptd.	9039020	9039020
	Screw	9037551 (5)	9037551 (6)
10	Front Cladding, Ptd.	9026551	9026552
11	Screw	5183536 (5)	5183536 (7)
12	Kickplate Support Assy.	9043347 (3)	9043347 (4)
13	Shoulder Screw	9025833 (6)	9025833 (8)
14	LH End Close-off, Ptd.	9027919	9027919
	RH End Close-off, Ptd.	9027920	9027920
	Screw	5048626 (6)	5048626 (6)
15	Raceway	9026101	9026102
16	Horizontal Joint Trim	9025959	9025959
17	Screw	5183536 (6)	5183536 (6)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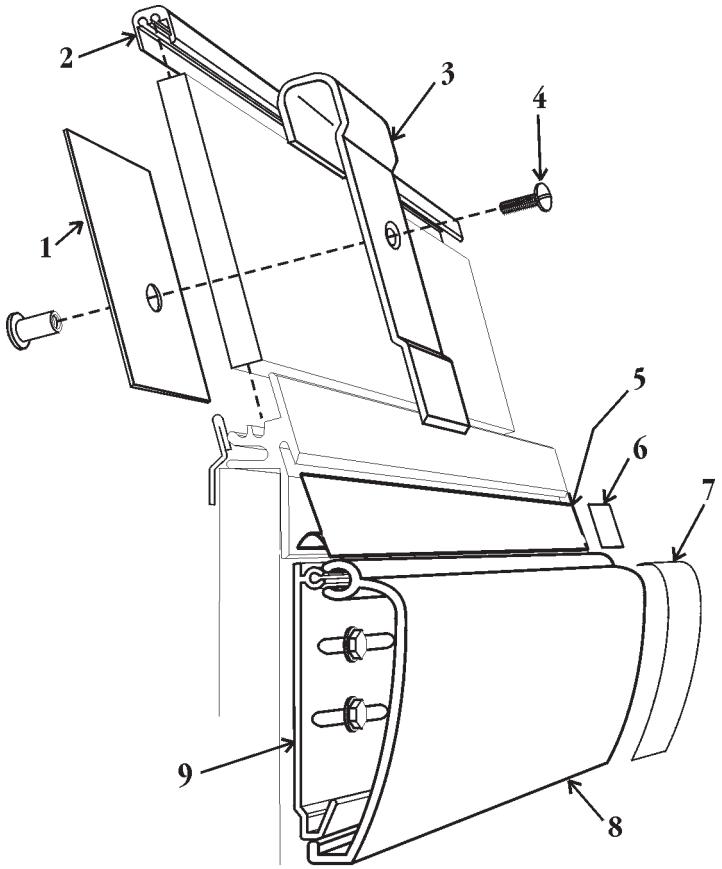
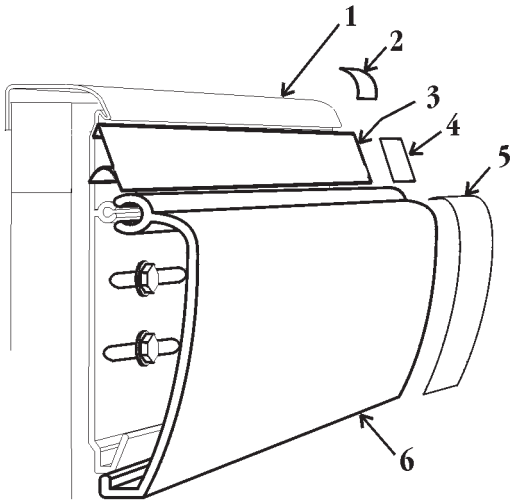
Front Glass and/or Bumper Trim Parts

Item	Description	N5MG and N5MGHP	
		8’	12’
1	Glass Joint Backer	9026404	9026404
2	Top Glass Trim Rail	9026561	9026562
3	Glass Joint Trim	9026907	9026907
4	Binder Screw	5222627	5222627
5	Color Band, Painted	9020971	9020972
6	Color Band Backer, Painted	9025982	9025982
7	Bumper Backer	color per order	
	Bumper End Trim (per patch end/not shown)	color per order	
8	Bumper	color per order	
9	Bumper Retainer	9025058	9025061

Item	Description	N5M and N5MHP	
		8’	12’
1	Hand Rail/Bumper Retainer	color per order	
2	Hand Rail Backer	9025316	9025316
3	Color Band, Painted	9023798	9023800
4	Color Band Backer, Painted	9040223	9040223
5	Bumper Backer	color per order	
	Bumper End Trim (per patch end/not shown)	color per order	
6	Bumper	color per order	



Front with Glass



Solid Front

Operational Parts List

Case Usage	Domestic			Export	
Electrical Circuit	115 Volt 60 Hertz			220 Volt 50 Hertz	
Case Size	6’	8’	12’	8’	12’
Fan Motor (N5M(G))	----	5243498 9 Watt	5243498 9 Watt	9458942 18.3 Watt	9458942 18.3 Watt
(N5MHP)	9458939 16 Watt	9458939 16 Watt	9458939 16 Watt	9458941 16 Watt	9458941 16 Watt
(N5MGHP)	----	9458939 16 Watt	9458939 16 Watt	9458941 16 Watt	9458941 16 Watt
Fan Motor Brackets (N5M(G))	----	5235087	5235087	5205112	5205112
(N5M(G)HP)	5205112	5205112	5205112	5205112	5205112
Fan Bracket Plate	9041077	9041077	9041077	9041077	9041077
Fan Blades (8.75” 25° 5B)(N5M(G))	----	5984399	5984399	5984399	5984399
(8.75” 40° 5B)(N5M(G)HP)	5643563	5643563	5643563	9038994	9038994
Opt. ECM Fan Motors (N5M(G))	----	9025000 12 Watt	9025000 12 Watt	----	----
(N5MHP)	9025003 16 Watt	9025003 16 Watt	9025003 16 Watt	----	----
(N5MGHP)	----	9025003 16 Watt	9025003 16 Watt	----	----
Opt. ECM Fan Motor Brackets	5205112	5205112	5205112	----	----
Opt. ECM Fan Blades (8.75” 25° 5B)(N5M(G))	----	5984399	5984399	----	----
(8.75” 35° 5B)(N5M(G)HP)	5643563	5643563	5643563	----	----
T-8 Ballast (canopy)	5966635	5966635	5991030	9322288	9322287
Opt. T-8 Ballast (shelf)	5966635	5966635	5966635	9028439	9028439
T-8 Lampholder (canopy)	9041897	9041897	9041897	9041897	9041897
T-8 Lampholder (shelf)	9041897	9041897	9041897	9041897	9041897
Light Switch (SPST)	5193982	5193982	5193982	5193982	5193982
Anti-Sweat Heater Wire (canopy)	5227379	5124216	5124217	5081147	5081148
Opt. Elec. Def. Heater	----	5124521	5124522	5124521	5124522
Opt. Elec. Def. Limit Switch (50/30 klixon)(N5M(G))	5125211	5125211	5125211	5125211	5125211
Opt. Gas Def. Fan Delay Switch (50/40 klixon)(N5M(G))	9023503	9023503	9023503	9023503	9023503
Opt. Gas Def. Term. T’stat (55/40 klixon)(N5M(G))	9023508	9023508	9023508	9023508	9023508
NSF Product Thermometer	5967100	5967100	5967100	5967100	5967100

For information on operational parts not listed above contact the TYLER Service Parts Department.