



# BMP Medium Profile Unit Cooler

**50**  
Hz

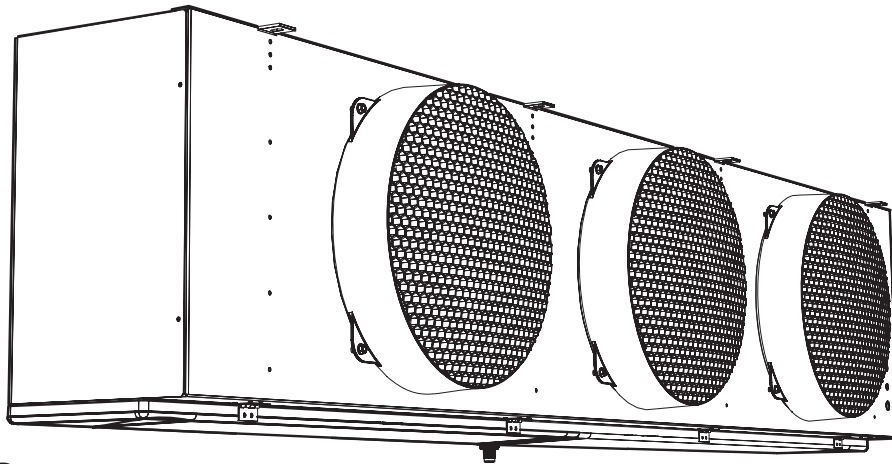
## PRODUCT DATA & INSTALLATION

Bulletin B30-BMP-PDI-50-4

1082853-50

Air, Electric, Hot Gas  
& Warm Fluid Defrost

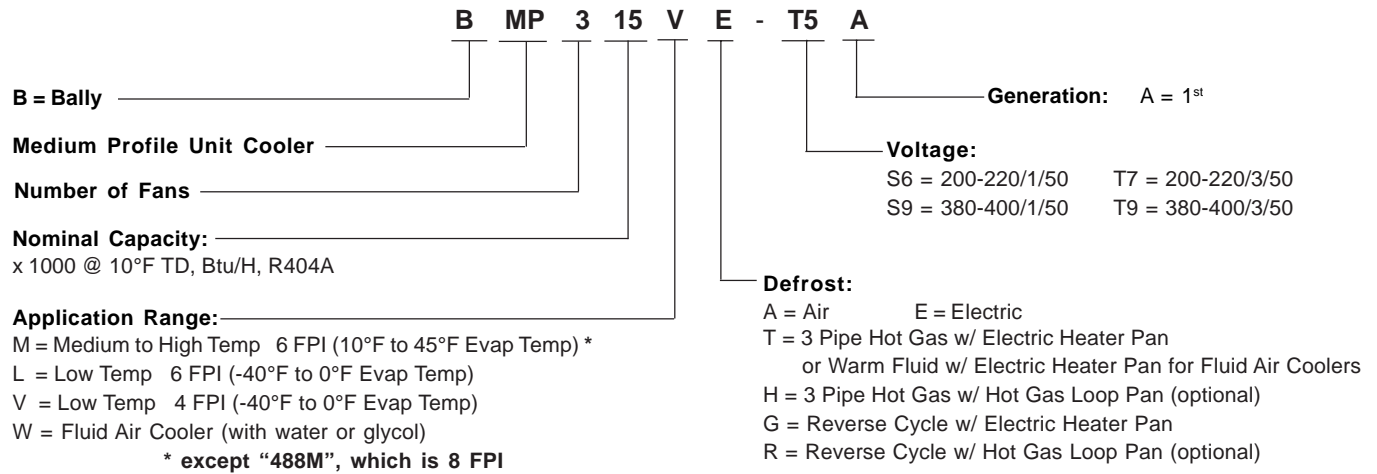
Electrical Power:  
200-220/1/50, 200-220/3/50,  
380-460/1/50, 380-400/3/50



## CONTENTS

	<b>Page</b>
Nomenclature.....	2
Features & Options.....	2
Capacity Data.....	3
Electrical Data.....	4 - 9
Wiring Diagrams.....	10 - 18
Dimensional Data/Specifications.....	19 - 20
Shipping Weights.....	21
Glycol Fluid Cooler Data.....	21
Factory Installed Distributor Nozzles.....	22
Recommended Expansion Valve Selections.....	23 - 25
Installation Instructions.....	26 - 28
Hot Gas Piping Schematics.....	29 - 30
Generic Service Parts List.....	31 - 32
Warranty.....	35
Project Information.....	35
“As Built” Service Parts.....	BACK

# NOMENCLATURE



## STANDARD FEATURES

- Modern look
- Totally enclosed high efficiency PSC motors
- High efficiency and high strength fan guard
- Hinged doors
- Compact
- Internally enhanced tubing
- More uniform air flow
- Reverse cycle & 3 pipe hot gas available
- Ample electrical and header compartments
- Lower heater wattage
- Proven motor/fan/motor mount design
- Liquid line solenoid valve wire harness factory installed
- Schrader valve on suction header
- Positive slope, hinged drain pan
- Central drain connections (approximate)
- Universal drain fitting
- Large 3/4" ID (3/4" MPT) drain hole
- Shipped in upright position

## OPTIONAL FEATURES

- Hot gas loop pan with hot gas defrost models
- Wire fan guard
- Factory installed expansion valve, solenoid valve and room thermostat

# CAPACITY DATA ALL MODELS

# 50Hz

## Medium Temperature Models - Capacity @ 6 F.P.I. \*

Medium Temp. Models			118M	122M	228M	236M	245M	355M	368M	480M	488M *
Number Of Fans			1	1	2	2	2	3	3	4	4
Capacity BTUH (WATTS)	Evap Temp. °F (°C)	25 (-4)	16500 (4850)	20200 (5930)	25700 (7550)	33100 (9700)	41300 (12100)	50500 (14800)	62400 (18300)	73700 (21600)	80800 (23700)
		15 (-9)	3920 (1149)	5000 (1465)	6180 (1811)	7830 (2295)	10000 (2931)	12770 (3743)	15440 (4525)	18220 (5340)	20890 (6123)
		10 (-12)	3880 (1137)	4950 (1451)	6120 (1794)	7750 (2271)	9900 (2902)	12640 (3705)	15290 (4481)	18030 (5284)	20680 (6061)
Air Flow	CFM (L/S)		2860 (1350)	2690 (1270)	6060 (2860)	5720 (2700)	5400 (2550)	8580 (4050)	8090 (3820)	10800 (5110)	10200 (4800)
Refrigerant Charge (R404A)	LB. (KG)		3.6 (1.6)	4.8 (2.2)	4.2 (1.9)	7.0 (3.2)	9.1 (4.1)	10 (4.7)	14 (6.3)	16 (7.4)	16 (7.4)

\* "488M" models are 8 F.P.I.

## Low Temperature Models - Capacity @ 6 F.P.I.

Low Temp. Models			116L	119L	225L	232L	240L	348L	356L	471L
Number Of Fans			1	1	2	2	2	3	3	4
Capacity BTUH (WATTS)	Evap Temp. °F (°C)	0 (-18)	15200 (4450)	18500 (5420)	24300 (7120)	31300 (9190)	38900 (11400)	45400 (13300)	52500 (15400)	67200 (19700)
		-10 (-23)	15000 (4390)	18000 (5280)	23600 (6930)	30500 (8950)	37900 (11100)	45000 (13200)	52200 (15300)	66500 (19500)
		-20 (-29)	14700 (4310)	17500 (5120)	23000 (6740)	29400 (8630)	36800 (10800)	44000 (12900)	51500 (15100)	65100 (19100)
		-30 (-34)	13700 (4020)	16200 (4740)	21200 (6230)	27100 (7950)	34100 (10000)	41300 (12100)	48400 (14200)	61000 (17900)
		-40 (-40)	12700 (3720)	14700 (4310)	19400 (5690)	24600 (7220)	31000 (9100)	38200 (11200)	45000 (13200)	56300 (16500)
Air Flow	CFM (L/S)		2860 (1350)	2690 (1270)	6060 (2860)	5720 (2700)	5400 (2550)	8580 (4050)	8090 (3820)	10800 (5110)
Refrigerant Charge (R404A)	LB. (KG)		3.6 (1.6)	4.8 (2.2)	4.7 (2.1)	7.0 (3.2)	9.4 (4.2)	10 (4.7)	14 (6.3)	16 (7.4)

## Low Temperature Models - Capacity @ 4 F.P.I.

Low Temp. 4 FPI Models			113V	117V	222V	228V	234V	339V	350V	459V
Number Of Fans			1	1	2	2	2	3	3	4
Capacity BTUH (WATTS)	Evap Temp. °F (°C)	0 (-18)	12200 (3590)	16300 (4770)	21000 (6150)	26900 (7900)	32500 (9520)	40200 (11800)	50500 (14800)	55600 (16300)
		-10 (-23)	12100 (3560)	16000 (4690)	20700 (6070)	26400 (7740)	31900 (9350)	38200 (11200)	48800 (14300)	54900 (16100)
		-20 (-29)	11900 (3500)	15600 (4580)	20200 (5930)	25700 (7550)	31300 (9170)	35800 (10500)	46000 (13500)	54200 (15900)
		-30 (-34)	11200 (3290)	14500 (4260)	18900 (5530)	23900 (7010)	29200 (8550)	32800 (9620)	42300 (12400)	51200 (15000)
		-40 (-40)	10500 (3070)	13400 (3940)	17400 (5090)	22000 (6440)	26800 (7870)	29200 (8550)	37900 (11100)	47400 (13900)
Air Flow	CFM (L/S)		3030 (1430)	2860 (1350)	6400 (3020)	6060 (2860)	5720 (2700)	9090 (4290)	8580 (4050)	11400 (5390)
Refrigerant Charge (R404A)	LB. (KG)		3.6 (1.6)	4.8 (2.2)	4.7 (2.1)	7.0 (3.2)	9.4 (4.2)	10 (4.7)	14 (6.3)	16 (7.4)

Capacities rated using R404A with 10°F (5.6°C) TD & 100°F (38°C) liquid temperature.

Capacities at other TD within a range of 8 to 15 °F (4.4 to 8.3°C) are directly proportional to TD, or use formula:

$$\text{Capacity} = \text{Rated capacity} \div 5.6 \times \text{TD.}$$

For capacities at TD outside of range 8 to 15 °F (4.4 to 8.3°C), or liquid temperature lower than 75°F (24°), consult factory.

# ELECTRICAL DATA - 200-220/1/50

# 50Hz

## AIR DEFROST &

## HOT GAS DEFROST WITH HOT GAS LOOP PAN MODELS

MODEL	FPI	FAN MOTORS				
		QUANTITY	HP	FLA TOTAL	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)
118M#-S6A	6	1	1/3	1.7	2.1	15
122M#-S6A		1	1/3	1.7	2.1	15
228M#-S6A		2	1/3	3.4	3.8	15
236M#-S6A		2	1/3	3.4	3.8	15
245M#-S6A		2	1/3	3.4	3.8	15
355M#-S6A		3	1/3	5.1	5.5	15
368M#-S6A		3	1/3	5.1	5.5	15
480M#-S6A		4	1/3	6.8	7.2	15
488M#-S6A		8	4	1/3	6.8	7.2
116L†-S6A	6	1	1/3	1.7	2.1	15
119L†-S6A		1	1/3	1.7	2.1	15
225L#-S6A		2	1/3	3.4	3.8	15
232L#-S6A		2	1/3	3.4	3.8	15
240L#-S6A		2	1/3	3.4	3.8	15
348L#-S6A		3	1/3	5.1	5.5	15
356L#-S6A		3	1/3	5.1	5.5	15
471L#-S6A		4	1/3	6.8	7.2	15
113V†-S6A		4	1	1/3	1.7	2.1
117V†-S6A	1		1/3	1.7	2.1	15
222V#-S6A	2		1/3	3.4	3.8	15
228V#-S6A	2		1/3	3.4	3.8	15
234V#-S6A	2		1/3	3.4	3.8	15
339V#-S6A	3		1/3	5.1	5.5	15
350V#-S6A	3		1/3	5.1	5.5	15
459V#-S6A	4		1/3	6.8	7.2	15

# = A, H or R. Refer to Nomenclature for details

† = H or R. Refer to Nomenclature for details

# ELECTRICAL DATA - 380-400/1/50

# 50Hz

## AIR DEFROST &

## HOT GAS DEFROST WITH HOT GAS LOOP PAN MODELS

MODEL	FPI	FAN MOTORS				
		QUANTITY	HP	FLA TOTAL	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)
118M#-S9A	6	1	1/3	0.9	1.1	15
122M#-S9A		1	1/3	0.9	1.1	15
228M#-S9A		2	1/3	1.8	2.0	15
236M#-S9A		2	1/3	1.8	2.0	15
245M#-S9A		2	1/3	1.8	2.0	15
355M#-S9A		3	1/3	2.7	2.9	15
368M#-S9A		3	1/3	2.7	2.9	15
480M#-S9A		4	1/3	3.6	3.8	15
488M#-S9A		8	4	1/3	3.6	3.8
116L†-S9A	6	1	1/3	0.9	1.1	15
119L†-S9A		1	1/3	0.9	1.1	15
225L#-S9A		2	1/3	1.8	2.0	15
232L#-S9A		2	1/3	1.8	2.0	15
240L#-S9A		2	1/3	1.8	2.0	15
348L#-S9A		3	1/3	2.7	2.9	15
356L#-S9A		3	1/3	2.7	2.9	15
471L#-S9A		4	1/3	3.6	3.8	15
113V†S9A	4	1	1/3	0.9	1.1	15
117V†S9A		1	1/3	0.9	1.1	15
222V#-S9A		2	1/3	1.8	2.0	15
228V#-S9A		2	1/3	1.8	2.0	15
234V#-S9A		2	1/3	1.8	2.0	15
339V#-S9A		3	1/3	2.7	2.9	15
350V#-S9A		3	1/3	2.7	2.9	15
459V#-S9A		4	1/3	3.6	3.8	15

# = A, H or R. Refer to Nomenclature for details

† = H or R. Refer to Nomenclature for details

**ELECTRICAL DATA -  
200-220/1/50 & 200-220/3/50  
ELECTRIC DEFROST MODELS**

50Hz

MODEL	FPI	FAN MOTORS					DEFROST HEATERS						
		QTY.	HP	FLA TOTAL	MCA (A)	MAX. FUUSE (AMPS)	TOTAL WATTS	200-220/1/50			200-220/3/50		
								TOTAL AMPS	MCA (A)	MAX. FUUSE (AMPS)	TOTAL AMPS	MCA (A)	MAX. FUUSE (AMPS)
118ME-*A	6	1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
122ME-*A		1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
228ME-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
236ME-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
245ME-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
355ME-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
368ME-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
480ME-*A		4	1/3	6.8	7.2	15	9700	44	55	60	30	37	40
488ME-*A	8	4	1/3	6.8	7.2	15	9700	44	55	60	30	37	40
116LE-*A	6	1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
119LE-*A		1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
225LE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
232LE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
240LE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
348LE-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
356LE-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
471LE-*A		4	1/3	6.8	7.2	15	9700	44	55	60	30	37	40
113VE-*A	4	1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
117VE-*A		1	1/3	1.7	2.1	15	3050	14	17	20	9.5	12	15
222VE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
228VE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
234VE-*A		2	1/3	3.4	3.8	15	5660	26	32	35	18	22	25
339VE-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
350VE-*A		3	1/3	5.1	5.5	15	8270	38	47	50	26	32	35
459VE-*A		4	1/3	6.8	7.2	15	9700	44	55	60	30	37	40

\* = S6 or T7. Refer to Nomenclature for details

**ELECTRICAL DATA -  
380-400/1/50 & 380-400/3/50  
ELECTRIC DEFROST MODELS**

**50Hz**

MODEL	FPI	FAN MOTORS					DEFROST HEATERS						
		QTY.	HP	FLA TOTAL	MCA (A)	MAX. FUSE (AMPS)	TOTAL WATTS	380-400/1/50			380-400/3/50		
								TOTAL AMPS	MCA (A)	MAX. FUSE (AMPS)	TOTAL AMPS	MCA (A)	MAX. FUSE (AMPS)
118ME-*A	6	1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
122ME-*A		1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
228ME-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
236ME-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
245ME-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
355ME-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
368ME-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
480ME-*A		4	1/3	3.6	3.8	15	9700	24.3	30	35	15	19	20
488ME-*A	8	4	1/3	3.6	3.8	15	9700	24.3	30	35	15	19	20
116LE-*A	6	1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
119LE-*A		1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
225LE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
232LE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
240LE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
348LE-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
356LE-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
471LE-*A		4	1/3	3.6	3.8	15	9700	24.3	30	35	15	19	20
113VE-*A	4	1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
117VE-*A		1	1/3	0.9	1.1	15	3050	7.6	9.5	15	4.6	6	15
222VE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
228VE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
234VE-*A		2	1/3	1.8	2.0	15	5680	14.2	18	20	8.7	11	15
339VE-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
350VE-*A		3	1/3	2.7	2.9	15	8310	20.8	26	30	13	16	20
459VE-*A		4	1/3	3.6	3.8	15	9700	24.3	30	35	15	19	20

\* = S9 or T9. Refer to Nomenclature for details

**ELECTRICAL DATA - 200-220/1/50**  
**HOT GAS DEFROST**  
**WITH DRAIN PAN HEATER MODELS**

50Hz

MODEL	FPI	FAN MOTORS					DRAIN PAN HEATERS			
		QTY.	HP	FLA TOTAL	MCA (A)	MAX. FUSE (AMPS)	TOTAL WATTS	TOTAL AMPS	MCA (A)	MAX. FUSE (AMPS)
118M <sup>^</sup> -S6A	6	1	1/3	1.7	2.1	15	489	2.2	2.8	15
122M <sup>^</sup> -S6A		1	1/3	1.7	2.1	15	489	2.2	2.8	15
228M <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
236M <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
245M <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
355M <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
368M <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
480M <sup>^</sup> -S6A		4	1/3	6.8	7.2	15	1310	6.0	7.4	15
488M <sup>^</sup> -S6A	8	4	1/3	6.8	7.2	15	1310	6.0	7.4	15
116L <sup>^</sup> -S6A	6	1	1/3	1.7	2.1	15	489	2.2	2.8	15
119L <sup>^</sup> -S6A		1	1/3	1.7	2.1	15	489	2.2	2.8	15
225L <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
232L <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
240L <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
348L <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
356L <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
471L <sup>^</sup> -S6A		4	1/3	6.8	7.2	15	1310	6.0	7.4	15
113V <sup>^</sup> -S6A	4	1	1/3	1.7	2.1	15	489	2.2	2.8	15
117V <sup>^</sup> -S6A		1	1/3	1.7	2.1	15	489	2.2	2.8	15
222V <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
228V <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
234V <sup>^</sup> -S6A		2	1/3	3.4	3.8	15	812	3.7	4.6	15
339V <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
350V <sup>^</sup> -S6A		3	1/3	5.1	5.5	15	1130	5.1	6.4	15
459V <sup>^</sup> -S6A		4	1/3	6.8	7.2	15	1310	6.0	7.4	15

<sup>^</sup> = T or G. Refer to Nomenclature for details



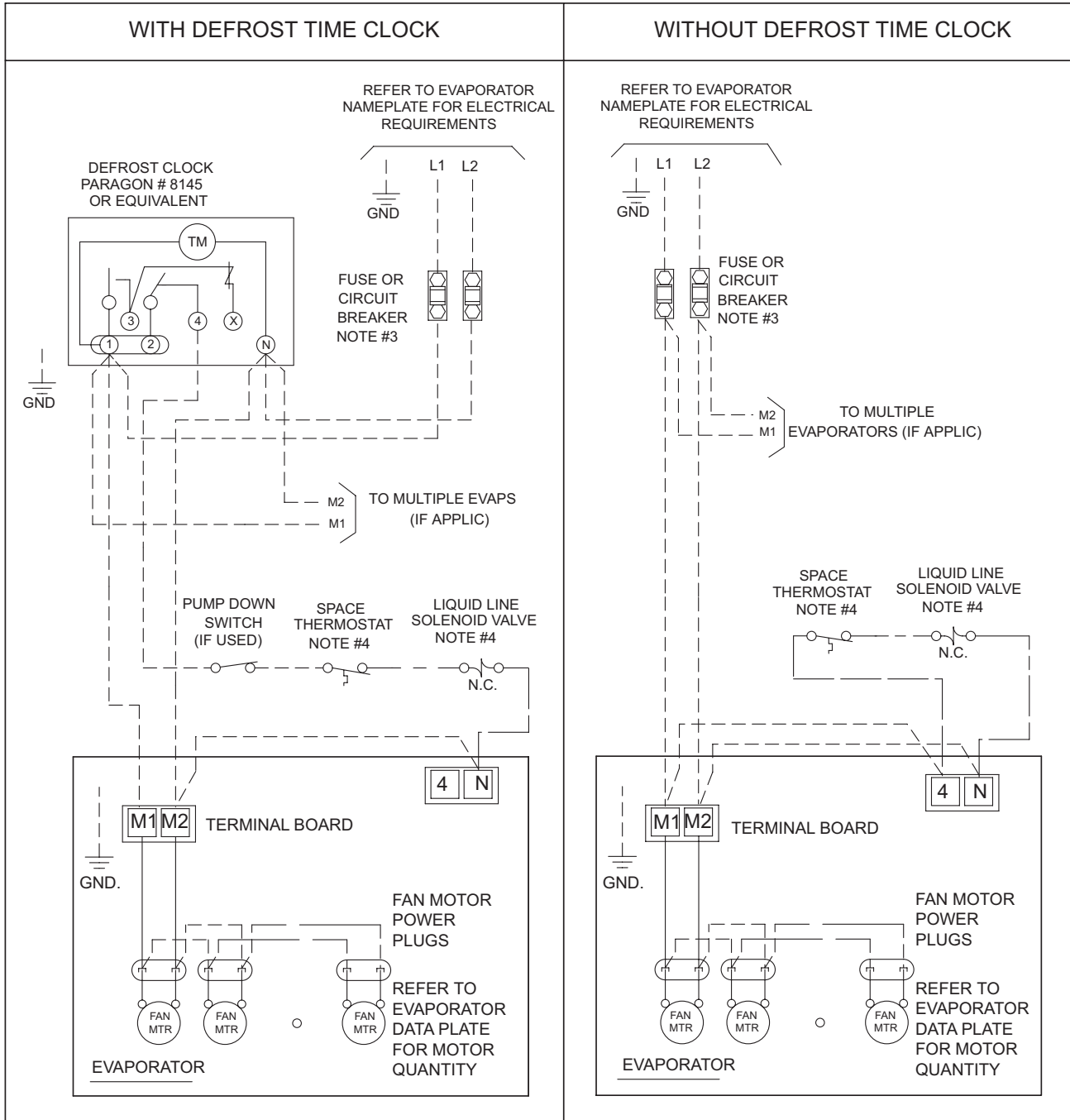
**ELECTRICAL DATA - 380-400/1/50**  
**HOT GAS DEFROST**  
**WITH DRAIN PAN HEATER MODELS**

**50Hz**

MODEL	FPI	FAN MOTORS					DRAIN PAN HEATERS			
		QTY.	HP	FLA TOTAL	MCA (A)	MAX. FUSE (AMPS)	TOTAL WATTS	TOTAL AMPS	MCA (A)	MAX. FUSE (AMPS)
118M <sup>^</sup> -S9A	6	1	1/3	0.9	1.1	15	404	1.0	1.3	15
122M <sup>^</sup> -S9A		1	1/3	0.9	1.1	15	404	1.0	1.3	15
228M <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
236M <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
245M <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
355M <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
368M <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
480M <sup>^</sup> -S9A		4	1/3	3.6	3.8	15	1080	2.7	3.4	15
488M <sup>^</sup> -S9A	8	4	1/3	3.6	3.8	15	1080	2.7	3.4	15
116L <sup>^</sup> -S9A	6	1	1/3	0.9	1.1	15	404	1.0	1.3	15
119L <sup>^</sup> -S9A		1	1/3	0.9	1.1	15	404	1.0	1.3	15
225L <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
232L <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
240L <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
348L <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
356L <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
471L <sup>^</sup> -S9A		4	1/3	3.6	3.8	15	1080	2.7	3.4	15
113V <sup>^</sup> -S9A	4	1	1/3	0.9	1.1	15	404	1.0	1.3	15
117V <sup>^</sup> -S9A		1	1/3	0.9	1.1	15	404	1.0	1.3	15
222V <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
228V <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
234V <sup>^</sup> -S9A		2	1/3	1.8	2.0	15	671	1.7	2.1	15
339V <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
350V <sup>^</sup> -S9A		3	1/3	2.7	2.9	15	938	2.3	2.9	15
459V <sup>^</sup> -S9A		4	1/3	3.6	3.8	15	1080	2.7	3.4	15

<sup>^</sup> = T or G. Refer to Nomenclature for details

# WIRING DIAGRAM - 200-220/1/50 AIR DEFROST MODELS



### NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4). MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR .

1-MP AIR 230V 11/05

### TERMINALS

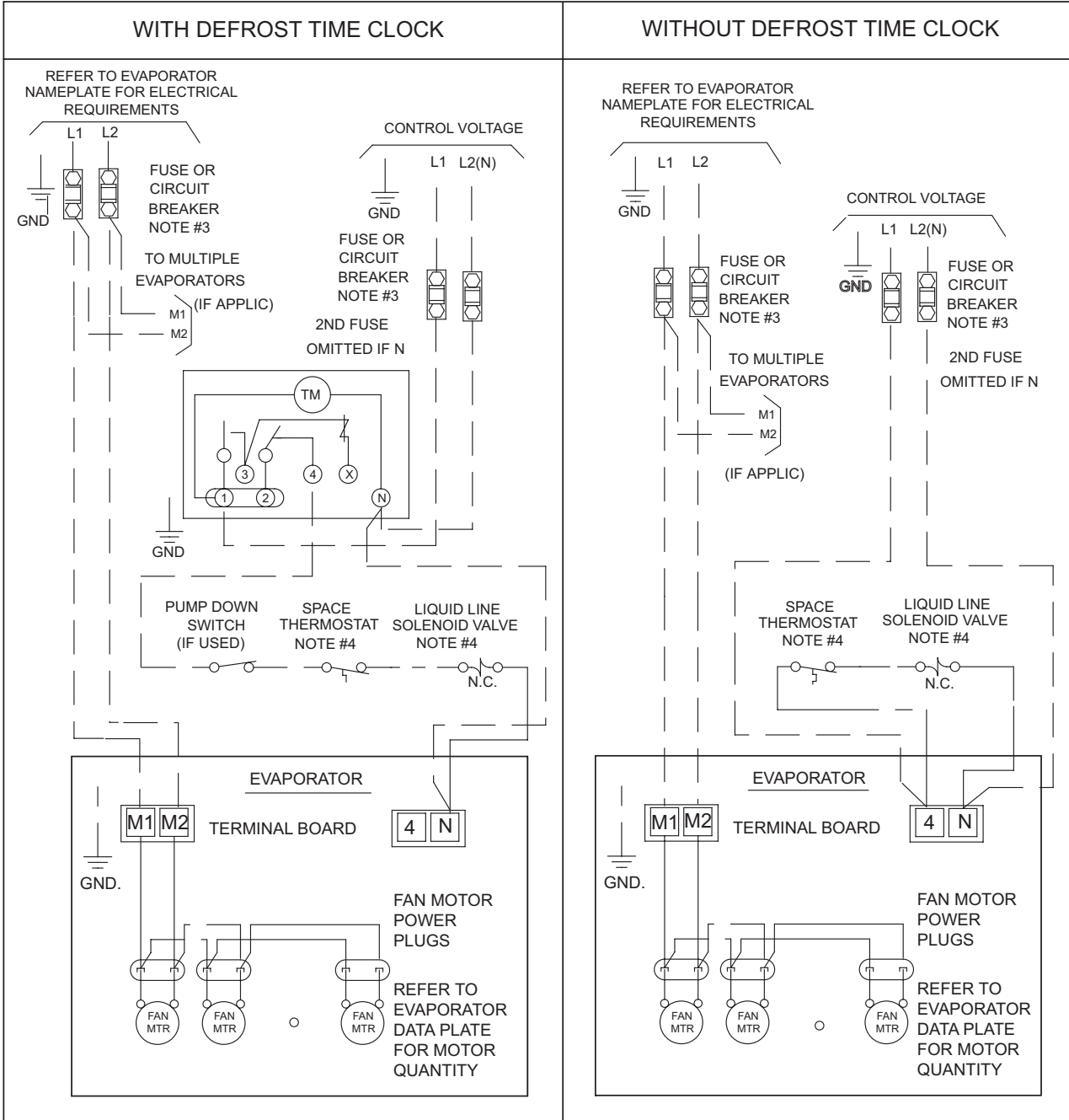
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

### CONDUCTORS/WIRING

- FACTORY WIRING
- - - - - WIRING BY OTHERS
- OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM - 380-400/1/50 AIR DEFROST MODELS



**NOTES**

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4). MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR.

2-MP AIR 460-575 10/05

**TERMINALS**

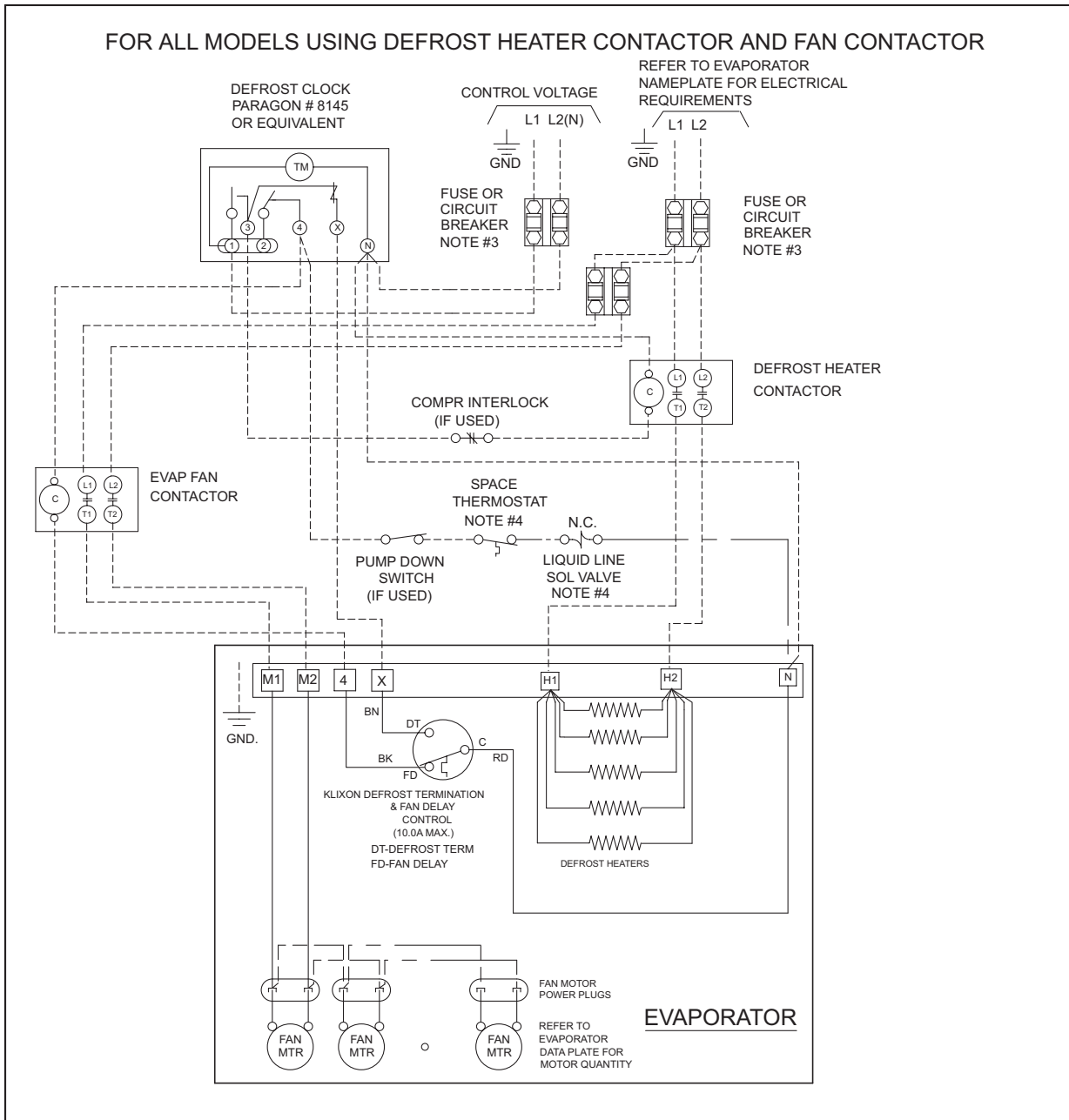
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

**CONDUCTORS/WIRING**

- FACTORY WIRING
- WIRING BY OTHERS
- -- OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM - 200-220/1/50, 380-400/1/50 ELECTRIC DEFROST MODELS -SINGLE EVAPORATOR



## NOTES

- 1.) USE COPPER CONDUCTORS ONLY
- 2.) USE 90°C WIRE (OR HIGHER)
- 3.) OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

4A-MP ED 1 ph. ALL SINGLE 11/05

## TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

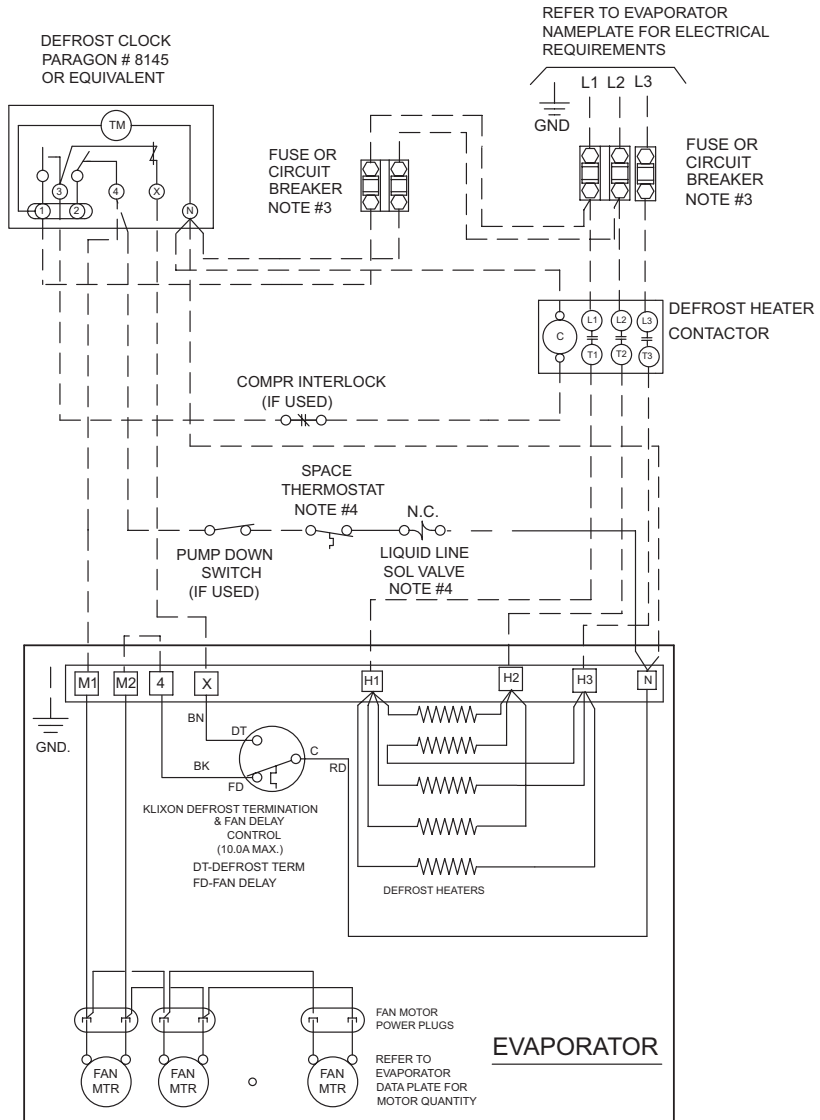
## CONDUCTORS/WIRING

- FACTORY WIRING
- WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM - 200-220/3/50 ELECTRIC DEFROST MODELS WITHOUT FAN CONTACTOR

FOR ALL MODELS USING THREE PHASE DEFROST HEATER CONTACTOR  
WITHOUT FAN CONTACTOR



## NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

## TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

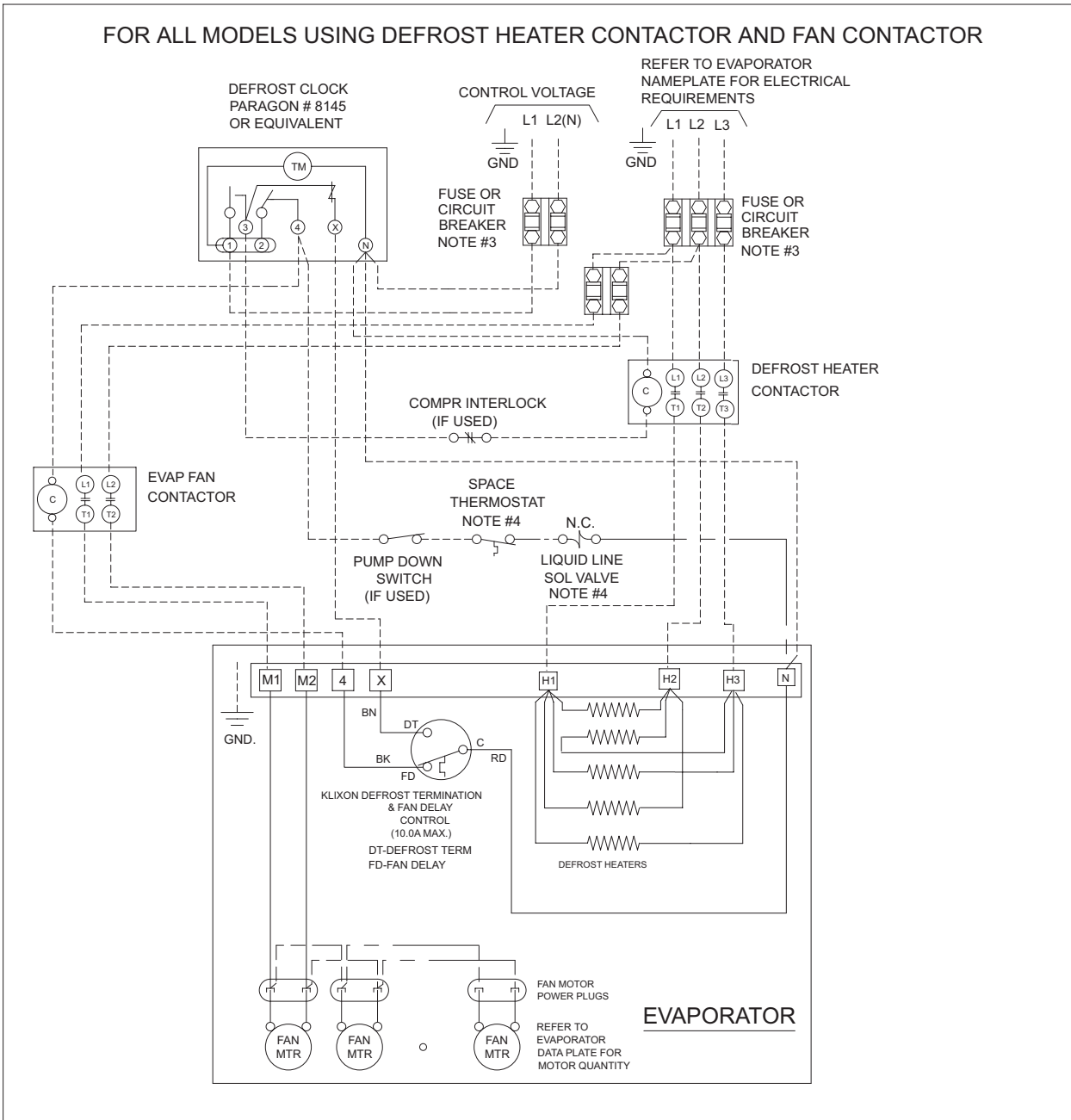
## CONDUCTORS/WIRING

- FACTORY WIRING
- - - - - WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

3-MP ED 230V single 10/05

# WIRING DIAGRAM - 200-220/3/50, 380-400/3/50 ELECTRIC DEFROST MODELS - SINGLE EVAPORATOR



### NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

4-MP ED ALL SINGLE 10/05

### TERMINALS

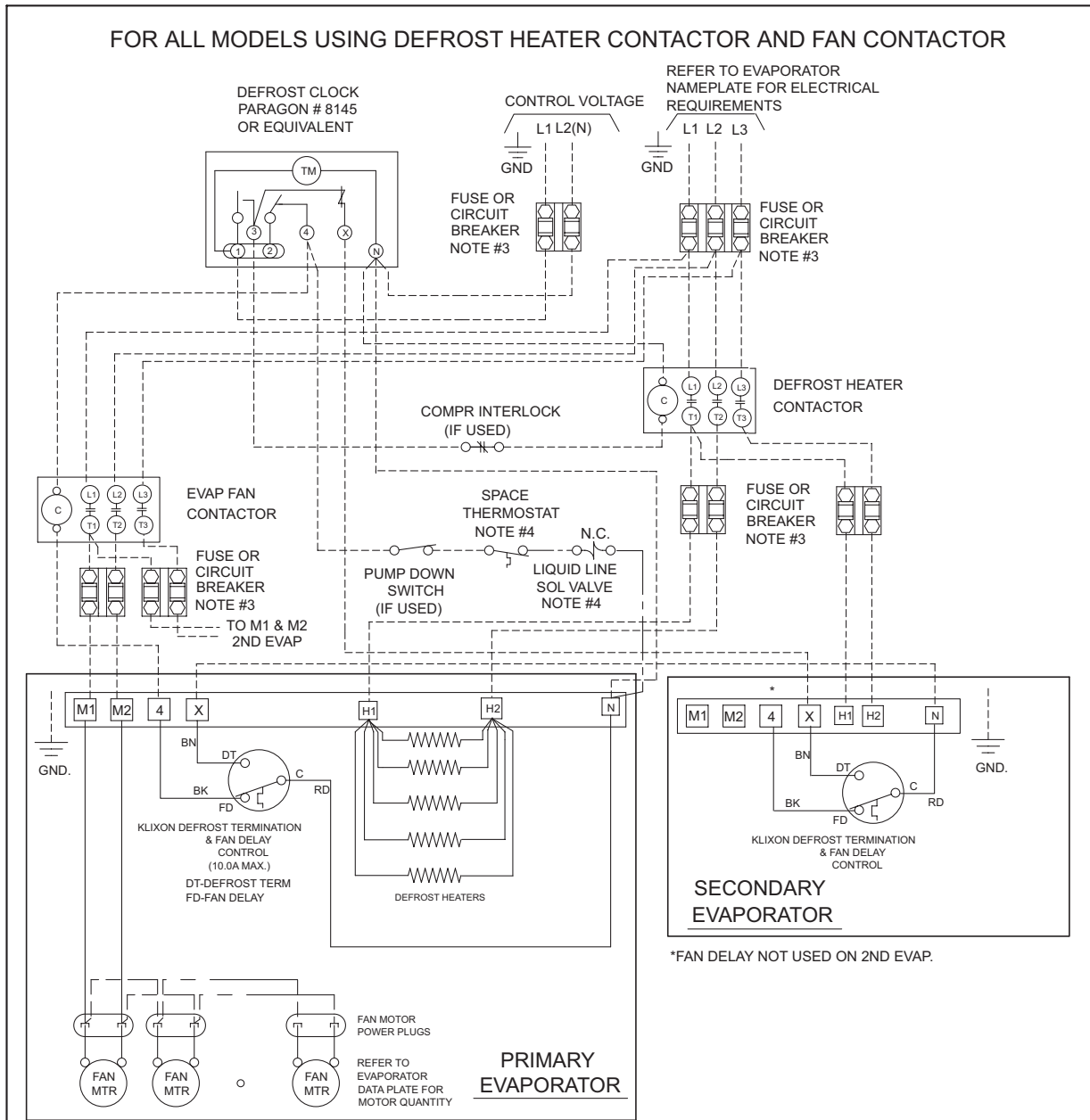
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

### CONDUCTORS/WIRING

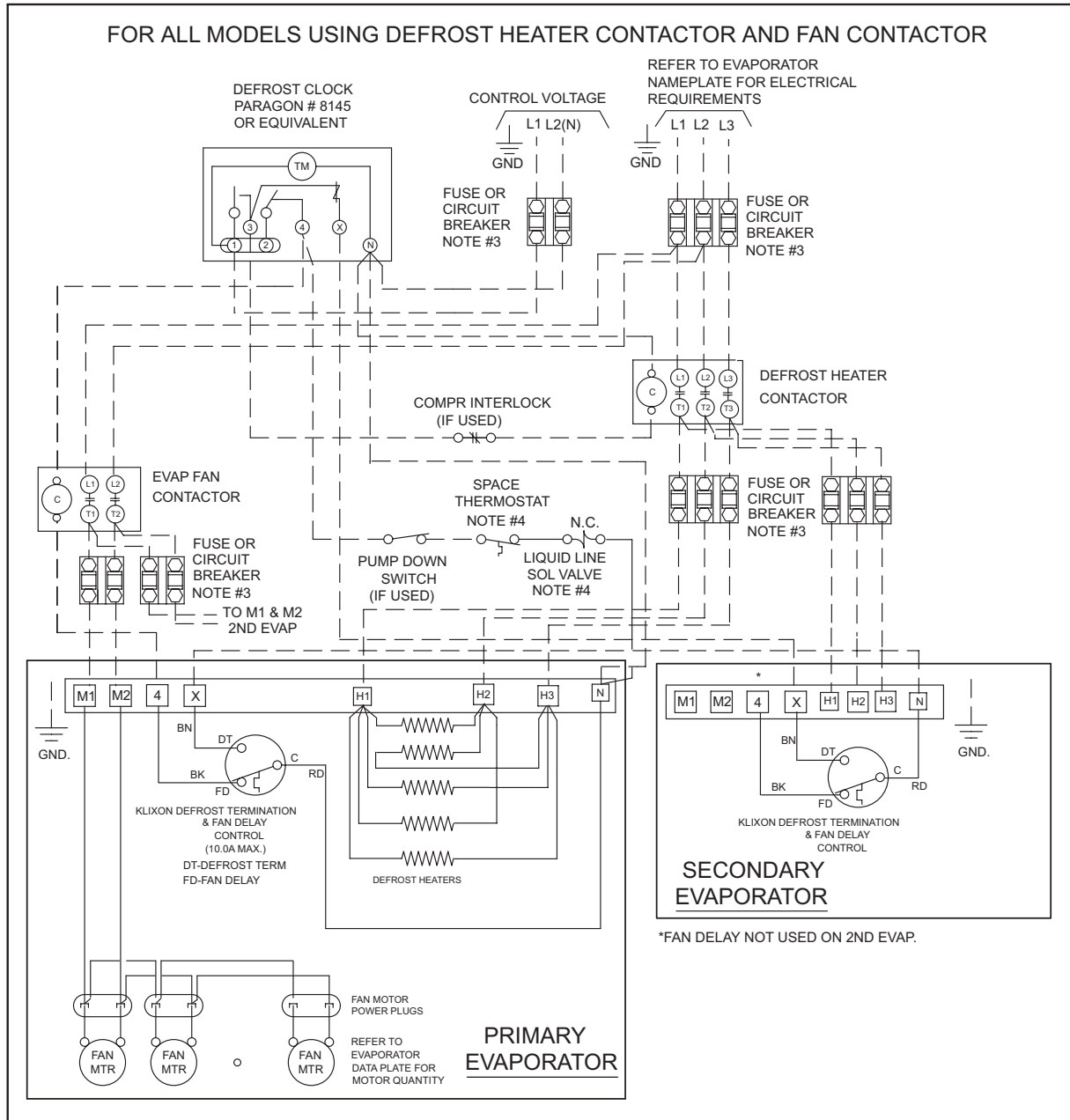
- FACTORY WIRING
- WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM - 200-220/3/50, 380-400/3/50 ELECTRIC DEFROST MODELS - MULTIPLE SINGLE PHASE EVAPORATORS



# WIRING DIAGRAM - 200-220/3/50, 380-400/3/50 ELECTRIC DEFROST MODELS - MULTIPLE THREE PHASE EVAPORATORS



## NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

5-MP ED ALL MULTI 10/05

## TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

## CONDUCTORS/WIRING

- FACTORY WIRING
- WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.



# WIRING DIAGRAM - 200-220/1/50 HOT GAS DEFROST MODELS

USING MAXIMUM 15A HEATER OVERCURRENT PROTECTION

REFER TO EVAPORATOR  
NAMEPLATE FOR ELECTRICAL  
REQUIREMENTS

L12(N)

GND

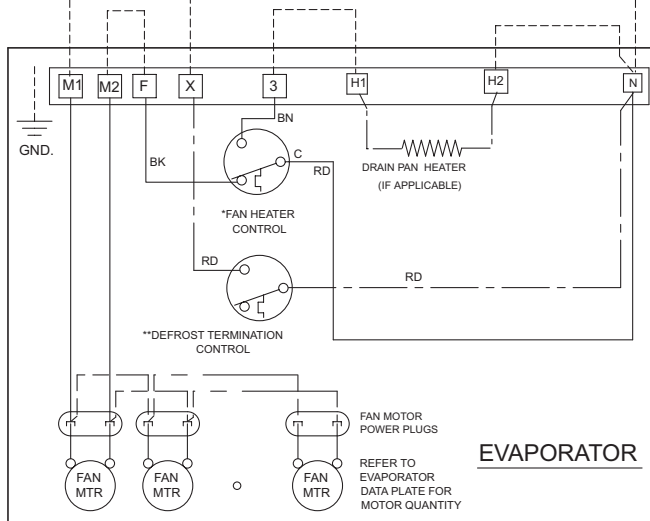
FUSE OR  
CIRCUIT  
BREAKER

15A

FAN MOTOR / HEATER WIRING

REFER TO SPECIFIC SYSTEM WIRING DIAGRAM  
(BY OTHERS) FOR FIELD CONTROL WIRING

230v CONTROL VOLTAGE SHOWN



**\*FAN HEATER CONTROL**  
ON REVERSE CYCLE LOCATED AT SUCTION LINE.  
ON THREE-PIPE LOCATED AT DISTRIBUTOR SIDE PORT.  
NOTE: DURING THE HOT GAS DEFROST CYCLE  
THE FAN/HEATER CONTROL DE-ENERGIZES THE  
EVAPORATOR FANS AND ENERGIZES THE  
DRAIN PAN HEATER.  
(ANYTIME THE TEMPERATURE OF THE INCOMING  
REFRIGERANT GAS IS ABOVE 50° F).

**\*\*DEFROST TERMINATION CONTROL**  
OPTIONAL FACTORY WIRED OR BY OTHERS  
LOCATED ON TUBE END SHEET  
THE CONTROL CLOSES WHEN REACHES 55° F

## NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

6-MP HG 230V 11/05

## TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

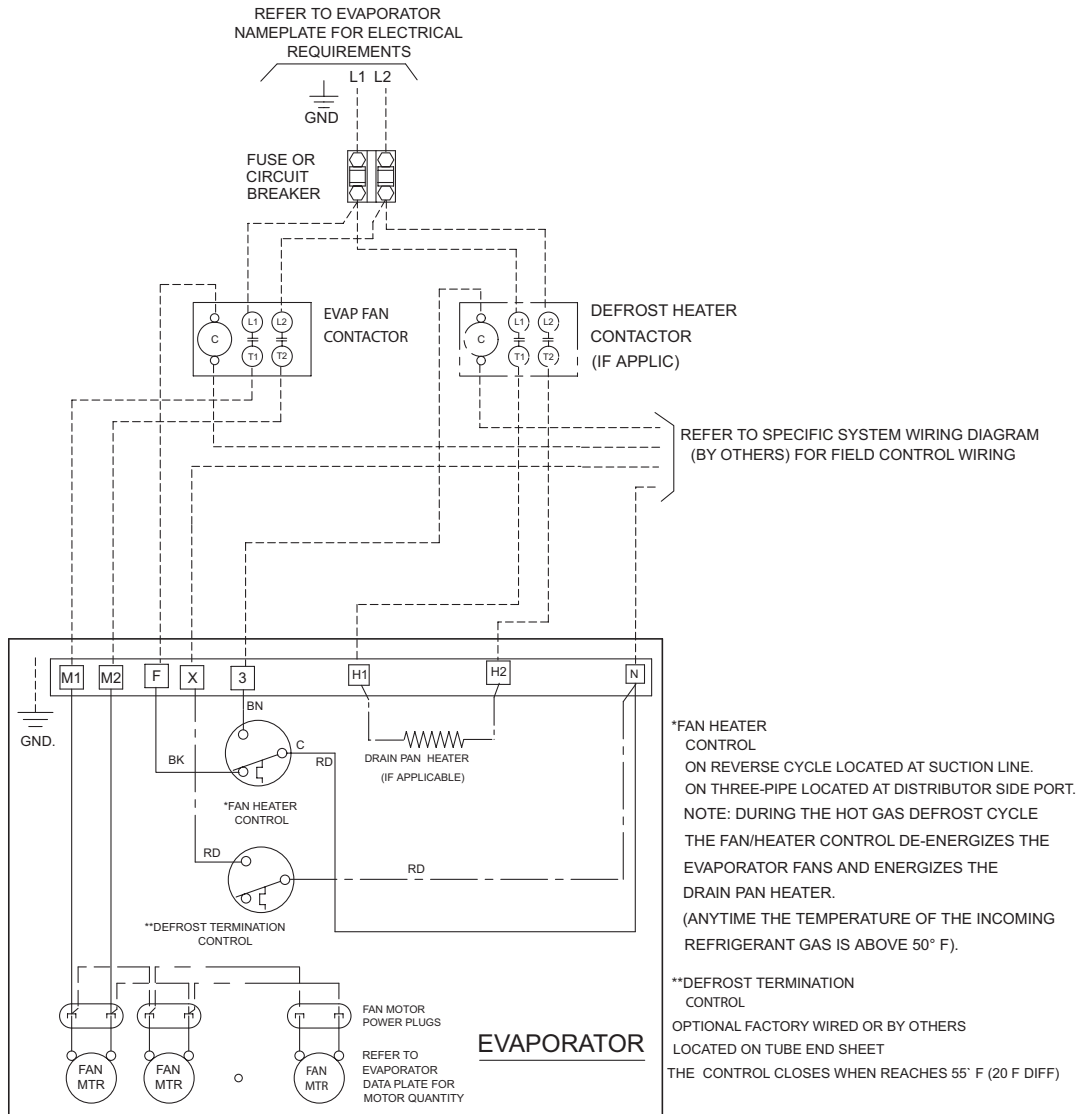
## CONDUCTORS/WIRING

- FACTORY WIRING
- WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM - 380-400/1/50 HOT GAS DEFROST MODELS

USING FAN CONTACTOR ( AND HEATER CONTACTOR IF APPLIC)



## NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 90°C WIRE (OR HIGHER)
- 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.
- 4.) MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR

## TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

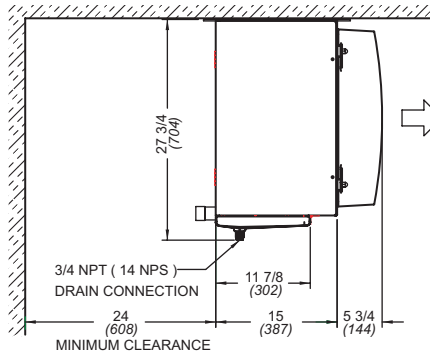
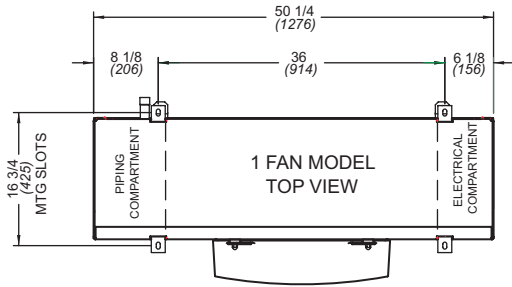
## CONDUCTORS/WIRING

- FACTORY WIRING
- WIRING BY OTHERS
- - - - - OPTIONAL FACTORY OR BY OTHERS

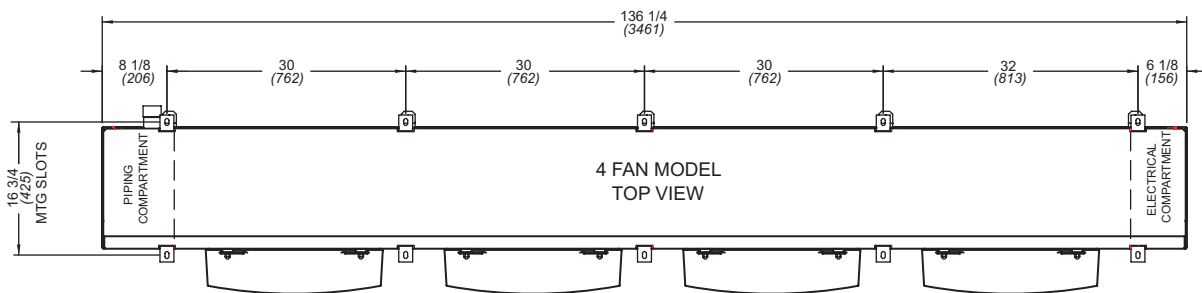
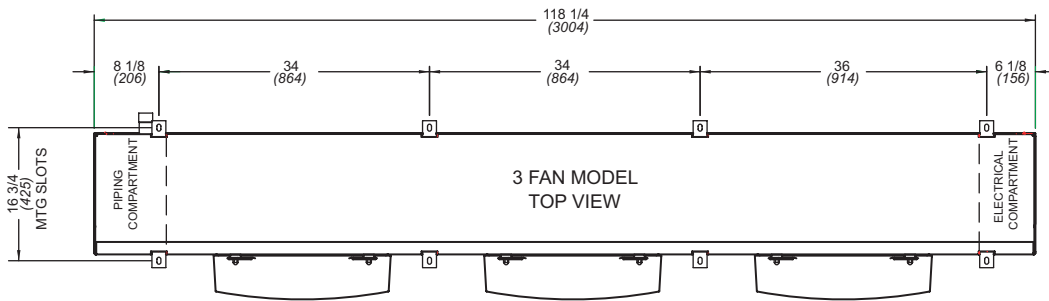
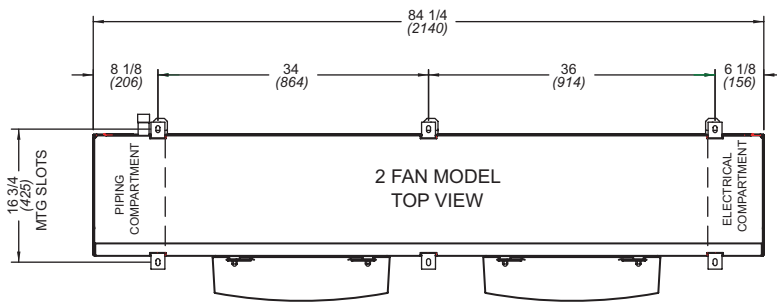
ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

7-MP ALL HG 11/05

# DIMENSIONAL DATA



ALL MODELS  
AIR THROW :  
APPROX. 75 FEET  
(23 METERS)  
IN OPEN SPACE



# DIMENSIONAL DATA/SPECIFICATIONS

## Medium Temperature Air and Electric Defrost Models

MODEL	NO. OF FANS	SUCTION CONNECTION (ID) SWEAT	DISTRIBUTOR INLET SIZE
118M#	1	7/8	5/8
122M#	1	1 1/8	5/8
228M#	2	1 1/8	5/8
236M#	2	1 3/8	5/8
245M#	2	1 3/8	7/8
355M#	3	1 5/8	7/8
368M#	3	1 5/8	7/8
480M#	4	1 5/8	7/8
488M#	4	1 5/8	7/8

# = A or E. Refer to Nomenclature for details

## Low Temperature Electric Defrost Models

MODEL	NO. OF FANS	SUCTION CONNECTION (ID) SWEAT	DISTRIBUTOR INLET SIZE
116LE	1	1 1/8	5/8
119LE	1	1 1/8	5/8
225LE	2	1 3/8	5/8
232LE	2	1 3/8	7/8
240LE	2	1 5/8	7/8
348LE	3	1 5/8	7/8
356LE	3	1 5/8	1 1/8
471LE	4	2 1/8	1 1/8
113VE	1	1 1/8	5/8
117VE	1	1 1/8	5/8
222VE	2	1 3/8	5/8
228VE	2	1 3/8	7/8
234VE	2	1 5/8	7/8
339VE	3	1 5/8	7/8
350VE	3	1 5/8	7/8
459VE	4	1 5/8	1 1/8

## Hot Gas Defrost Models

MODEL	NO. OF FANS	SUCTION CONNECTION (ID) SWEAT	REVERSE CYCLE DEFROST		3 PIPE DEFROST		HOT GAS DRAIN PAN LOOP CONNECTION (OD) SWEAT
			DISTRIBUTOR INLET SIZE (OD) SWEAT	SIDE PORT CONNECTION (OD) SWEAT	DISTRIBUTOR INLET SIZE (OD) SWEAT	SIDE PORT CONNECTION (OD) SWEAT	
118M^	1	7/8	5/8	1/2	5/8	1/2	7/8
122M^	1	1 1/8	7/8	1/2	7/8	1/2	7/8
228M^	2	1 1/8	7/8	1/2	7/8	1/2	7/8
236M^	2	1 3/8	7/8	1/2	7/8	1/2	7/8
245M^	2	1 3/8	1 1/8	5/8	1 1/8	5/8	7/8
355M^	3	1 5/8	1 1/8	5/8	1 1/8	5/8	1 1/8
368M^	3	1 5/8	1 3/8	7/8	1 3/8	7/8	1 1/8
480M^	4	1 5/8	1 3/8	7/8	1 5/8	7/8	1 3/8
488M^	4	1 5/8	1 3/8	7/8	1 5/8	7/8	1 3/8
116L^	1	1 1/8	7/8	1/2	7/8	1/2	7/8
119L^	1	1 1/8	7/8	1/2	7/8	1/2	7/8
225L^	2	1 3/8	7/8	1/2	1 1/8	5/8	7/8
232L^	2	1 3/8	1 1/8	5/8	1 3/8	7/8	7/8
240L^	2	1 5/8	1 3/8	7/8	1 3/8	7/8	7/8
348L^	3	1 5/8	1 5/8	1 1/8	1 5/8	1 1/8	1 1/8
356L^	3	1 5/8	1 5/8	1 1/8	1 5/8	1 1/8	1 1/8
471L^	4	2 1/8	1 5/8	1 1/8	1 5/8	1 1/8	1 3/8
113V^	1	1 1/8	7/8	1/2	7/8	1/2	7/8
117V^	1	1 1/8	7/8	1/2	7/8	1/2	7/8
222V^	2	1 3/8	7/8	1/2	1 1/8	5/8	7/8
228V^	2	1 3/8	1 1/8	5/8	1 1/8	5/8	7/8
234V^	2	1 5/8	1 3/8	7/8	1 3/8	7/8	7/8
339V^	3	1 5/8	1 1/8	5/8	1 3/8	7/8	1 1/8
350V^	3	1 5/8	1 3/8	7/8	1 5/8	7/8	1 1/8
459V^	4	1 5/8	1 5/8	1 1/8	1 5/8	1 1/8	1 3/8

^ = T, H, G, or R. Refer to Nomenclature for details

# SHIPPING WEIGHTS

AIR DEFROST		
MODEL #	SHIPPING WEIGHT	
	LB.	(kg.)
118MA	154	(70)
122MA	161	(73)
228MA	224	(102)
236MA	240	(109)
245MA	254	(115)
355MA	326	(148)
368MA	349	(158)
480MA	414	(188)
488MA	433	(196)

ELECTRIC DEFROST				
MODEL #	SHIPPING WEIGHT			
	LB.	(kg.)		
118ME	163	(74)		
122ME	171	(77)		
228ME	241	(109)		
236ME	257	(116)		
245ME	270	(123)		
355ME	349	(158)		
368ME	372	(169)		
480ME	441	(200)		
488ME	460	(209)		
116LE	164	(74)		
119LE	171	(78)		
225LE	243	(110)		
232LE	257	(117)		
240LE	273	(124)		
348LE	352	(160)		
356LE	377	(171)		
471LE	443	(201)		
113VE	160	(73)		
117VE	166	(75)		
222VE	238	(108)		
228VE	250	(113)		
234VE	263	(119)		
339VE	346	(157)		
350VE	362	(164)		
459VE	425	(193)		

HOT GAS DEFROST											
WITH HOT GAS LOOP						WITH ELECTRIC HEATER PAN					
MODEL #		SHIPPING WEIGHT				MODEL #		SHIPPING WEIGHT			
		LB.	(kg.)					LB.	(kg.)		
118MH	118MR	160	(72)			118MG	118MT	156	(71)		
122MH	122MR	168	(76)			122MG	122MT	164	(74)		
228MH	228MR	239	(108)			228MG	228MT	228	(104)		
236MH	236MR	255	(116)			236MG	236MT	244	(111)		
245MH	245MR	269	(122)			245MG	245MT	258	(117)		
355MH	355MR	353	(160)			355MG	355MT	332	(150)		
368MH	368MR	376	(170)			368MG	368MT	355	(161)		
480MH	480MR	453	(205)			480MG	480MT	421	(191)		
488MH	488MR	472	(214)			488MG	488MT	440	(200)		
116LH	116LR	161	(73)			116LG	116LT	157	(71)		
119LH	119LR	168	(76)			119LG	119LT	164	(75)		
225LH	225LR	241	(109)			225LG	225LT	230	(104)		
232LH	232LR	256	(116)			232LG	232LT	245	(111)		
240LH	240LR	272	(123)			240LG	240LT	261	(119)		
348LH	348LR	356	(162)			348LG	348LT	335	(152)		
356LH	356LR	382	(173)			356LG	356LT	360	(164)		
471LH	471LR	455	(206)			471LG	471LT	423	(192)		
113VH	113VR	157	(71)			113VG	113VT	153	(70)		
117VH	117VR	163	(74)			117VG	117VT	160	(72)		
222VH	222VR	236	(107)			222VG	222VT	226	(102)		
228VH	228VR	249	(113)			228VG	228VT	238	(108)		
234VH	234VR	262	(119)			234VG	234VT	252	(114)		
339VH	339VR	350	(159)			339VG	339VT	329	(149)		
350VH	350VR	367	(166)			350VG	350VT	346	(157)		
459VH	459VR	438	(198)			459VG	459VT	406	(184)		

## GLYCOL FLUID AIR COOLER DATA

# 50Hz

MODEL	NO. OF FANS	CAPACITY * - 15 USGPM (.095 L/S), 3/8" TUBING							CAPACITY * - 40 USGPM (.25 L/S), 1/2" TUBING						
		AIR FLOW		BTU/H	(WATTS)	P.D. (FT. H <sub>2</sub> O)	P.D. (kPa)	CONN. SIZE (IN/OUT)	AIR FLOW		BTU/H	(WATTS)	P.D. (FT. H <sub>2</sub> O)	P.D. (kPa)	CONN. SIZE (IN/OUT)
		CFM	(L/S)						CFM	(L/S)					
118W	1	2860	(1350)	8350	(2450)	4.8	(14.3)	1 3/8	2630	(1240)	10200	(3000)	7.8	(23.3)	1 5/8
122W	1	2690	(1270)	9650	(2830)	2.8	(8.4)	1 3/8	2480	(1170)	11900	(3500)	4.6	(13.7)	1 5/8
236W	2	5720	(2700)	14300	(4200)	8.1	(24.2)	1 3/8	5250	(2480)	20100	(5900)	13	(37.4)	1 5/8
245W	2	5400	(2550)	16800	(4940)	4.8	(14.3)	1 3/8	4980	(2350)	21100	(6200)	7.4	(22.1)	1 5/8
355W	3	8580	(4050)	19200	(5630)	11.1	(33.2)	1 3/8	7900	(3730)	29700	(8700)	17	(51.7)	1 5/8
368W	3	8090	(3820)	22400	(6580)	6.7	(20.0)	1 3/8	7440	(3510)	29300	(8600)	10	(31.1)	1 5/8
480W	4	10800	(5110)	25700	(7550)	7.6	(22.7)	1 3/8	9960	(4700)	34800	(10200)	12	(35.3)	1 5/8

The above capacities were rated based on 30% Propylene Glycol, 25°F (-4°C) glycol entering temperature and 35°F (2°C) air entering temperature with glycol flow rate listed. For all other conditions, please use "Pi-Coil" software (contact factory).

# FACTORY INSTALLED DISTRIBUTOR NOZZLES

Note: For Hot Gas Defrost models only. Air and Electric Defrost models use Venturi distributors and no nozzle is required.

## Medium Temperature Reverse Cycle Defrost Models

MODEL		R404A / R507	R22	R134a
118MT	118MH	J-1 1/2	J-1	J-2
122MT	122MH	G-2	G-1 1/2	G-2
228MT	228MH	G-2 1/2	G-1 1/2	G-2 1/2
236MT	236MH	G-3	G-2	G-3
245MT	245MH	E-4	E-2-1/2	E-4
355MT	355MH	E-5	E-3	E-5
368MT	368MH	C-6	C-4	C-6
480MT	480MH	C-8	C-5	C-10
488MT	488MH	C-10	C-5	C-10

## Medium Temperature 3 Pipe Defrost Models

MODEL		R404A / R507	R22	R134a
118MG	118MR	J-1 1/2	J-1	J-2
122MG	122MR	G-2	G-1 1/2	G-2
228MG	228MR	G-2 1/2	G-1 1/2	G-2 1/2
236MG	236MR	G-3	G-2	G-3
245MG	245MR	E-4	E-2-1/2	E-4
355MG	355MR	E-5	E-3	E-5
368MG	368MR	C-6	C-4	C-6
480MG	480MR	A-8	C-5	C-10
488MG	488MR	A-10	C-5	C-10

## Low Temperature Reverse Cycle Defrost Models

MODEL		R404A / R507
116LT	116LH	G-2-1/2
119LT	119LH	G-3
225LT	225LH	G-4
232LT	232LH	E-5
240LT	240LH	C-6
348LT	348LH	A-8
356LT	356LH	A-10
471LT	471LH	A-12

## Low Temperature 3 Pipe Defrost Models

MODEL		R404A / R507
116LG	116LR	G-2-1/2
119LG	119LR	G-3
225LG	225LR	E-4
232LG	232LR	C-5
240LG	240LR	C-6
348LG	348LR	A-8
356LG	356LR	A-10
471LG	471LR	A-12

MODEL		R404A / R507
113VT	113VH	G-2
117VT	117VH	G-2-1/2
222VT	222VH	G-3
228VT	228VH	E-4
234VT	234VH	C-5
339VT	339VH	E-6
350VT	350VH	C-8
459VT	459VH	A-10

MODEL		R404A / R507
113VG	113VR	G-2
117VG	117VR	G-2-1/2
222VG	222VR	E-3
228VG	228VR	E-4
234VG	234VR	C-5
339VG	339VR	C-6
350VG	350VR	A-8
459VG	459VR	A-10

# RECOMMENDED THERMAL EXPANSION VALVE SELECTIONS MEDIUM TEMPERATURE MODELS

## DANFOSS

MODEL	R404A / R507	R22	R134a
118M	TUAE-07	TUAE-06	TUAE-07
122M	TUAE-08	TUAE-07	TUAE-08
228M	TUAE-09	TUAE-08	TUAE-09
236M	TUAE-09	TUAE-08	TUAE-09
245M	TCAE-2	TUAE-09	TCAE-2
355M	TCAE-3	TCAE-1	TCAE-3
368M	TDEBS 5.8	TCAE-2	TDEBN 8.5
480M	TDEBS 8.0	TCAE-3	TDEBN 9.6
488M	TDEBS 8.0	TCAE-3	TDEBN 9.6

## SPORLAN\*

MODEL	R404A / R507	R22	R134a
118M	EGSE-1 1/2-C	EGVE-1-1/2-C	EGJE-1-C
122M	EGSE-1 1/2-C	EGVE-1-1/2-C	EGJE-1 1/2-C
228M	EGSE-2-C	EGVE-2-C	EGJE-1 1/2-C
236M	SSE-3-C	EGVE-3-C	SJE- 2 1/2-C
245M	SSE-4-C	EGVE-3-C	SJE-3-C
355M	SSE-4-C	SVE-4-C	SJE-3-C
368M	SSE-6-C	SVE-5-C	SJE-5-C
480M	SSE-7-C	SVE-5-C	SJE-6-C
488M	SSE-7-C	SVE-8-C	SJE-6-C

\* For R507, refrigerant code for Sporlan expansion valve will be "P" instead of "S" . i.e.: "EGSE" becomes "EGPE"

## ALCO

MODEL	R404A / R507	R22	R134a
118M	HFESC - 1-1/4 - SC	HFESC - 1-1/2 - HC	HFESC - 1-1/2 - MC
122M	HFESC - 1-1/2 - SC	HFESC - 2 - HC	HFESC - 1-3/4 - MC
228M	HFESC - 2 - SC	HFESC - 2 - HC	HFESC - 1-3/4 - MC
236M	HFESC - 3-1/2 - SC	HFESC - 2-1/2 - HC	HFESC - 2-1/2 - MC
245M	HFESC - 3-1/2 - SC	HFESC - 3 - HC	HFESC - 4 - MC
355M	HFESC - 3-1/2 - SC	HFESC - 5-1/2 - HC	HFESC - 4 - MC
368M	HFESC - 5 - SC	HFESC - 5-1/2 - HC	HFESC - 6 - MC
480M	HFESC - 7 - SC	HFESC - 5-1/2 - HC	HFESC - 6 - MC
488M	HFESC - 7 - SC	HFESC - 8 - HC	HFESC - 7-1/2 - MC

Above selections based on:

- 1) 100°F (38°C) vapor free liquid entering expansion valve
- 2) 110°F (43°C) Condensing temperature
- 3) 8 -12°F (4.4 -6.7°C) evaporator TD

If correct nozzle is not available, the proper orifice size can be drilled in the field using the following chart

NOZZLE ORIFICE No.	DRILL SIZE IN.
1/2	.070
3/4	.086
1	.0995
1-1/2	.120
2	.1406
2-1/2	.157
3	.172
4	.199
5	.211
6	.242
8	.266
10	.281

# RECOMMENDED THERMAL EXPANSION VALVE SELECTIONS LOW TEMPERATURE R404A/R507\* MODELS

## DANFOSS

MODEL	0° F (-18° C) EVAP.	-10° F (-23° C) EVAP.	-20° F (-29° C) EVAP.	-30° F (-34° C) EVAP.	-40° F (-40° C) EVAP.
116L	TUAE-08	TUAE-09	TUAE-09	TUAE-09	TCAE-1
119L	TUAE-09	TUAE-09	TCAE-1	TCAE-1	TCAE-1
225L	TCAE-1	TCAE-1	TCAE-2	TCAE-2	TCAE-2
232L	TCAE-2	TCAE-2	TCAE-2	TCAE-3	TCAE-3
240L	TCAE-3	TCAE-3	TCAE-3	TDEBS 5.8	TDEBS 5.8
348L	TCAE-3	TDEBS 5.8	TDEBS 5.8	TDEBS 8.0	TDEBS 8.0
356L	TDEBS 5.8	TDEBS 8.0	TDEBS 8.0	TDEBS 8.0	TDEBS 8.0
471L	TDEBS 8.0	TDEBS 9.1	TDEBS 11.7	TDEBS 11.7	TDEBS 11.7
113V	TUAE-08	TUAE-08	TUAE-08	TUAE-09	TUAE-09
117V	TUAE-08	TUAE-09	TUAE-09	TUAE-09	TCAE-1
222V	TUAE-09	TCAE-1	TCAE-1	TCAE-1	TCAE-2
228V	TCAE-1	TCAE-2	TCAE-2	TCAE-2	TCAE-3
234V	TCAE-2	TCAE-2	TCAE-3	TCAE-3	TCAE-3
339V	TCAE-3	TCAE-3	TCAE-3	TDEBS 5.8	TDEBS 5.8
350V	TDES 5.5	TDEBS 5.8	TDEBS 8.0	TDEBS 8.0	TDEBS 8.0
459V	TDEBS 5.8	TDEBS 8.0	TDEBS 8.0	TDEBS 9.1	TDEBS 9.1

## SPORLAN\*

MODEL	0° F (-18° C) EVAP.	-10° F (-23° C) EVAP.	-20° F (-29° C) EVAP.	-30° F (-34° C) EVAP.	-40° F (-40° C) EVAP.
116L	EGSE-1-C	EGSE-1 1/2-ZP	EGSE-1 1/2-ZP	EGSE-1 1/2-ZP	EGSE-2-ZP
119L	EGSE-1 1/2-C	EGSE-1 1/2-ZP	EGSE-2-ZP	EGSE-2-ZP	EGSE-2-ZP
225L	EGSE-2-C	EGSE-2-ZP	SSE-3-ZP	SSE-3-ZP	SSE-3-ZP
232L	SSE-3-C	SSE-3-ZP	SSE-4-ZP	SSE-4-ZP	SSE-4-ZP
240L	SSE-4-C	SSE-4-ZP	SSE-4-ZP	SSE-6-ZP	SSE-6-ZP
348L	SSE-4-C	SSE-6-ZP	SSE-6-ZP	SSE-7-ZP	SSE-7-ZP
356L	SSE-6-C	SSE-6-ZP	SSE-7-ZP	SSE-7-ZP	OSE-9-ZP
471L	SSE-7-C	SSE-7-ZP	OSE-9-ZP	OSE-12-ZP	OSE-12-ZP
113V	EGSE-1-C	EGSE-1-ZP	EGSE-1-ZP	EGSE-1 1/2-ZP	EGSE-1 1/2-ZP
117V	EGSE-1 1/2-C	EGSE-1 1/2-ZP	EGSE-1 1/2-ZP	EGSE-2-ZP	EGSE-2-ZP
222V	EGSE-2-C	EGSE-2-ZP	EGSE-2-ZP	EGSE-2-ZP	SSE-3-ZP
228V	EGSE-2-C	SSE-3-ZP	SSE-3-ZP	SSE-3-ZP	SSE-3-ZP
234V	SSE-3-C	SSE-3-ZP	SSE-4-ZP	SSE-4-ZP	SSE-4-ZP
339V	SSE-4-C	SSE-4-ZP	SSE-4-ZP	SSE-4-ZP	SSE-6-ZP
350V	SSE-4-C	SSE-6-ZP	SSE-6-ZP	SSE-7-ZP	SSE-7-ZP
459V	SSE-6-C	SSE-6-ZP	SSE-7-ZP	OSE-9-ZP	OSE-9-ZP

\* For R507, refrigerant code for Sporlan expansion valve will be "P" instead of "S" . i.e.: "EGSE" becomes "EGPE"

Above selections based on:

- 1) 100°F (38°C) vapor free liquid entering expansion valve
- 2) 110°F (43°C) Condensing temperature
- 3) 8 -12°F (4.4 -6.7°C) evaporator TD



# RECOMMENDED EXPANSION VALVE SELECTIONS

## LOW TEMPERATURE R404A/7507 MODELS (CONT'D)

### ALCO

MODEL	0° F (-18° C) EVAP.	-10° F (-23° C) EVAP.	-20° F (-29° C) EVAP.	-30° F (-34° C) EVAP.	-40° F (-40° C) EVAP.
116L	HFESC - 1-1/4 - SC	HFESC - 1-1/2 - SW45	HFESC - 2 - SW35	HFESC - 2 - SW45	HFESC - 2 - SW45
119L	HFESC - 1-1/2 - SC	HFESC - 1-1/2 - SW35	HFESC - 2 - SW35	HFESC - 2 - SW45	HFESC - 3-1/2 - SW45
225L	HFESC - 2 - SC	HFESC - 2 - SW35	HFESC - 3-1/2 - SW35	HFESC - 3-1/2 - SW45	HFESC - 3-1/2 - SW45
232L	HFESC - 2 - SC	HFESC - 3-1/2 - SW35	HFESC - 3-1/2 - SW35	HFESC - 3-1/2 - SW45	HFESC - 5 - SW45
240L	HFESC - 3-1/2 - SC	HFESC - 3-1/2 - SW35	HFESC - 5 - SW35	HFESC - 5 - SW45	HFESC - 5 - SW45
348L	HFESC - 3-1/2 - SC	HFESC - 5 - SW35	HFESC - 5 - SW35	HFESC - 7 - SW45	HFESC - 7 - SW45
356L	HFESC - 3-1/2 - SC	HFESC - 5 - SW35	HFESC - 7 - SW35	HFESC - 7 - SW45	HFESC - 10 - SW45
471L	HFESC - 5 - SC	HFESC - 7 - SW35	HFESC - 10 - SW35	HFESC - 10 - SW45	HFESC - 13 - SW45
113V	HFESC - 1 - SC	HFESC - 1-1/4 - SW35	HFESC - 1-1/2 - SW35	HFESC - 1-1/2 - SW45	HFESC - 2 - SW45
117V	HFESC - 1-1/4 - SC	HFESC - 1-1/2 - SW35	HFESC - 2 - SW35	HFESC - 2 - SW45	HFESC - 3-1/2 - SW45
222V	HFESC - 1-1/2 - SC	HFESC - 2 - SW35	HFESC - 2 - SW35	HFESC - 3-1/2 - SW45	HFESC - 3-1/2 - SW45
228V	HFESC - 2 - SC	HFESC - 2 - SW35	HFESC - 3-1/2 - SW35	HFESC - 3-1/2 - SW45	HFESC - 3-1/2 - SW45
234V	HFESC - 3-1/2 - SC	HFESC - 3-1/2 - SW35	HFESC - 3-1/2 - SW35	HFESC - 5 - SW45	HFESC - 5 - SW45
339V	HFESC - 3-1/2 - SC	HFESC - 3-1/2 - SW35	HFESC - 5 - SW35	HFESC - 5 - SW45	HFESC - 5 - SW45
350V	HFESC - 3-1/2 - SC	HFESC - 5 - SW35	HFESC - 5 - SW35	HFESC - 7 - SW45	HFESC - 7 - SW45
459V	HFESC - 5 - SC	HFESC - 5 - SW35	HFESC - 7 - SW35	HFESC - 10 - SW45	HFESC - 10 - SW45

Above selections based on:

- 1) 100°F (38°C) vapor free liquid entering expansion valve
- 2) 110°F (43°C) Condensing temperature
- 3) 8-12°F (4.4-6.7°C) evaporator TD

# INSTALLATION INSTRUCTIONS

## INSTALLATION

The installation and start-up of Unit Coolers should only be performed by qualified refrigeration mechanics. This equipment should be installed in accordance with all applicable codes, ordinances and local by-laws.

## INSPECTION

Inspect all equipment before unpacking for visible signs of damage or loss. Check shipping list against material received to ensure shipment is complete.

**IMPORTANT:** Remember, you, the consignee, must make any claim necessary against the transportation company. Shipping damage or missing parts, when discovered at the outset, will prevent later unnecessary and costly delays.

**If damage or loss during transport is evident, make claim to carrier, as this will be their responsibility, not the manufacturer's.**

Should carton be damaged, but damage to equipment is not obvious, a claim should be filed for "concealed damage" with the carrier.

**IMPORTANT:** The electrical characteristics of the unit should be checked at this time to make sure they correspond to those ordered and to electrical power available at the job site.

Save all shipping papers, tags and instruction sheets for reference by installer and owner.

## APPLICATION

MP unit coolers are designed for walk-in cooler, walk-in refrigerated warehouse and food processing plant applications used with refrigerant R22 or R404A. For room temperatures above 35°F (2°C) AND evaporating temperatures above 26°F (-3°C), positive defrosting means (with electric or hot gas) may not be required, otherwise, electric defrost or hot gas defrost models should be used. Electric defrost models come with defrost termination and fan delay as standard to control the defrost cycle termination and fan delay, while defrost initiation means (e.g. defrost timer) is not included.

For other types of refrigerant, contact factory.

The coil must not be exposed to any abnormal atmospheric or acidic environments. This may result in corrosion to the cabinet and possible coil failure (leaks). (Consult manufacturer for optional baked on phenolic protective coatings).

## LOCATION

The unit location in the room should be selected to ensure uniform air distribution throughout the entire space to be refrigerated. Be sure that the product does not obstruct the free circulation of air. Allow a minimum of 24" clearance at each end. Do not locate evaporators over doors. Consideration should be given to the coil location in order to minimize the piping run length to the condensing unit and floor drain.

## EXPANSION VALVE (TXV) SELECTION

All units require the use of an **externally equalized** expansion valve. (A 1/4" (6 mm) O.D. equalizer line has been provided on the coil) TX valves should **not** be selected strictly by their nominal ton rating. (This rating is based at a specific pressure differential and entering liquid temperature). Since applications will differ it is suggested the following selection procedure be followed.

1. Determine actual unit cooler capacity.  
The nominal rating is based at 10°F T.D. (5.6°C) (Entering Air Temp. minus Evap. Temp.), R404A refrigerant. For R22, use the rated capacity x 0.95. For medium temperature R134a, use the rated capacity x 0.90. Note that a higher / lower operating T.D. will increase / decrease this capacity rating by their direct ratio within a range of 8 to 12°F (4.4 to 6.7°C) T.D.
2. Determine the pressure drop across the valve by subtracting the evaporating pressure and distributor pressure drop from the high side liquid pressure. The distributor pressure drop is typically in the range of 20 to 35 psig (1.4 to 2.4 bar) depending on the type of refrigerant and operating conditions.
3. Estimate entering liquid temperature. Temperatures lower than 100°F (38 °C) increase valve capacity ratings. Refer to valve manufacturer's specs for details.
4. Select valve from the valve manufacturer selection charts or software for the appropriate refrigerant, evaporating temp and pressure drop.

For best performance, the outlet of the expansion valve should be installed directly to the distributor body. If this is not possible, a straight tube up to 12 inches may be used for the connection.

Locate the expansion valve bulb on a horizontal length of suction line preferably 3 to 6 inches from the suction header. Locate the bulb at 4 or 8 clock position and insulate with a waterproof type of insulation. Clamp the bulb to ensure 100% contact of the bulb with the suction line.

For hot gas defrost models, ensure appropriate nozzle has been installed in the distributor before installing valve. After following the manufacturer's installation instructions and after the room has reached the desired temperature the valve superheat should be checked. This will confirm that the evaporator is operating properly and performing to maximum efficiency. The superheat should be around 60 to 80% of T.D. Too high or low a super heat will result in unsatisfactory system performance and possible compressor problems.

# INSTALLATION INSTRUCTIONS

## NOZZLE INSTALLATION

All air defrost and electric defrost models use venturi distributors and no nozzles required. For hot gas defrost models, a nozzle has been pre-selected and factory installed for common applications (Medium temp. R404A, R22, 8 to 12°F (4.4 to 6.7°C) T.D.; low temp. R404A, 8 to 12°F (4.4 to 6.7°C) T.D.). For other applications, refer to the nozzle manufacturer for selection method. When replacing a nozzle, the nozzle retainer clip (in distributor) must be removed before inserting nozzle. Re-install clip ensuring nozzle is properly in place. A small nozzle can be drilled larger using the drill size listed in table on page 25. Ensure the hole must be accurately centered and smooth. A lathe is preferred for the drilling.

## MOUNTING

Refer to dimensional drawing for recommended mounting arrangements. Ensure adequate clearance is provided behind the coil as well as each end. The evaporators may be mounted flush with ceiling with bolts, or hanging down with rod hangers. When using rod hangers, allow adequate space between the top of the unit and the ceiling for cleaning to comply with NSF Standard 7.

**Ensure that the ceiling is level since the drain pan has been sloped for drainage during the defrost cycle.**

## DRAIN LINE

The drain line should be run from the drain connection, sloping at least 1" (25 mm) per foot and should have the size at least as large as the drain connection. A trap in a warm area outside the room must be provided to allow proper draining through the tubing. Connection should be made to proper drainage facilities that comply with local regulations.

To prevent freeze-up when the temperature of the refrigerated space is 35°F (2 °C) or lower, the drain line should be heated along its run inside the cold room. The heated drain line should be insulated. It is recommended that the heater be energized at all times. A heat input of 20 watts per foot in a 28°F (-2°C) room and 30 watts per foot for -20°F (-29°C) rooms, is satisfactory. Drain line heaters are not required for constant room temperature above 35°F (2°C).

Always trap evaporator drain line individually to prevent vapor migration.

**Ensure that the drain line has sufficient slope for proper drainage (prevention of ice build up/blockage in pan).**

## PIPING

Refrigeration grade piping must be used for all field refrigeration piping. Refrigerant line sizes are important and **may not** be the same size as the coil connections. Consult ASHRAE handbook or other similar reference book for proper line sizing.

Refrigerant piping and control system should be designed to prevent possible liquid slugging (from oil or refrigerant) of the compressors on start-up after the defrost cycle. Also, it should prevent oil logging and minimize refrigerant pressure drop.

For hot gas models, see pages 29 to 30 for recommended piping.

# INSTALLATION INSTRUCTIONS

## WIRING

Wire system in accordance with governing standards and local codes. See data and wiring diagrams on pages 4 to 21 for typical wiring arrangement. Electrical wiring is to be sized in accordance with minimum circuit ampacity rating (MCA). Size fuses used must not exceed the Maximum Fuse Size ratings.

For ease of identifying the proper wiring terminal, unit wiring is color coded and terminal block connections are identified.

When **fan delay thermostats** (combination fan delay and defrost termination) are installed, on start-up, the fans do not operate until the coil temperature is reduced to approximately 25°F (-4°C). It is normal for the fans to cycle a few times until the room temperature is brought down. At higher evaporating temperatures this control may not close and therefore should either be by-passed temporarily or replaced with an adjustable type. (set for a higher temperature cut-in point).

## MAINTENANCE

The unit should be periodically inspected for any dirt or ice build-up on the fin surface and cleaned if necessary with a soft whisk or brush. Also ensure coils inner (and outer) drain pans do not have any ice build-up from improper defrost operation. When replacing heater elements first remove heater retainer brackets and heater clips.

## SYSTEM CHECK

### Before Start-Up:

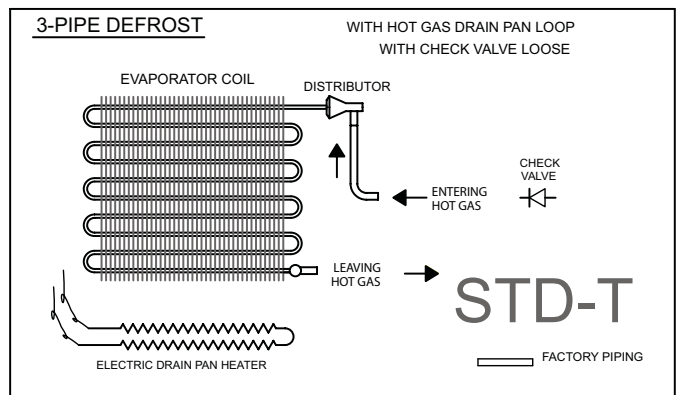
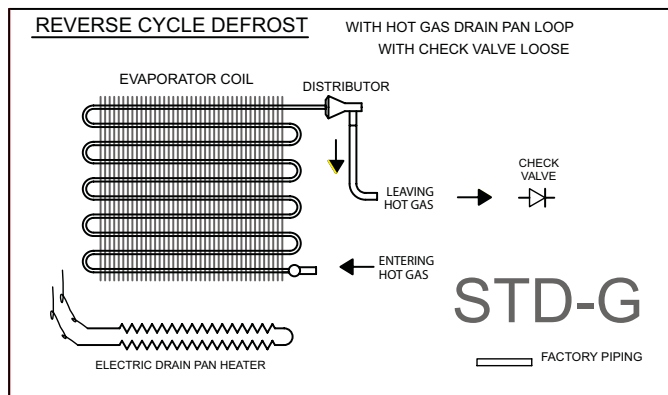
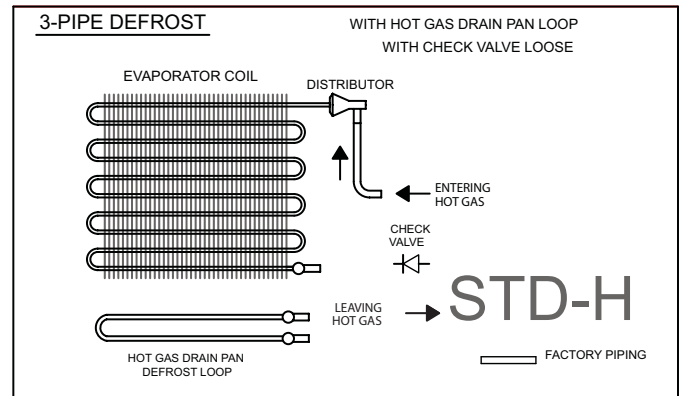
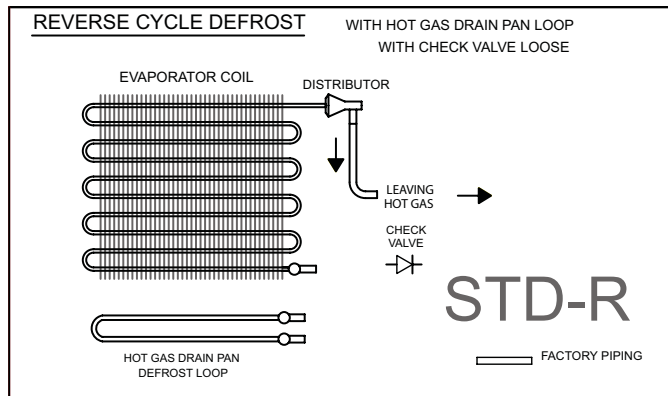
1. All wiring should be in accordance with local codes.
2. Refrigerant lines should be properly sized.
3. All systems preferably include a liquid line solenoid valve at immediately up stream of the expansion valve.
4. Thorough evacuation and dehydration has been performed.
5. The suction, discharge, and receiver service valves must be open.
6. The system preferably include a liquid line filter drier moisture indicator and suction filter.
7. Pour enough water into the drain pan to allow a good check on drainage and seal the trap.

### After Start-Up:

1. Check the oil level to be sure the oil charge is correct.
2. On initial start up the fans do not start until coil temperature is pulled down to approximately 25°F (-4 °C) on the coil. Also, it is normal for the fan to cycle a few times until the room temperature is pulled down.
3. If necessary, temporarily by-pass fan delay control (to run fans until room temp is lowered).
4. Be sure that the expansion valve is properly set to provide the correct amount of superheat.
5. After the box temperature is close to reaching the desired temperature, the evaporator superheat must be checked and adjustment made if necessary. In general, evaporators running with a TD of 10°F (5.6 °C) should have a superheat reading of 6° to 8°F (3.3°C to 4.4 °C). For evaporators with another T.D., the general rule is that the superheat should be around 60 to 80% of T.D.
6. Heavy moisture loads are usually encountered when starting the system for the first time. This may cause a rapid build-up of frost on the unit cooler. During the initial pull down, we suggest that the frost build-up be watched and defrosted manually as required.
7. Observe that the system goes through at least one complete DEFROST CYCLE.

# HOT GAS PIPING SCHEMATICS STANDARD CONFIGURATIONS

Refer to Nomenclature for details



## Standard Offering: All Models

Check Valve is included with the coil shipped loose as it is a must have component for system operation.

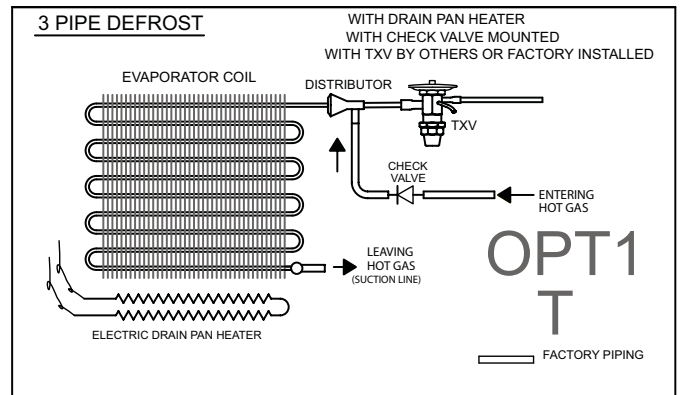
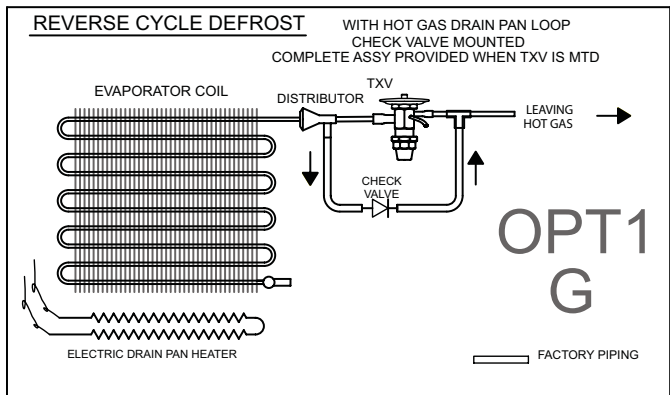
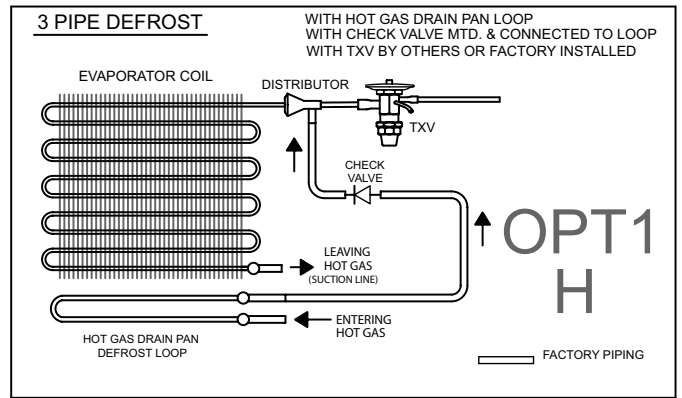
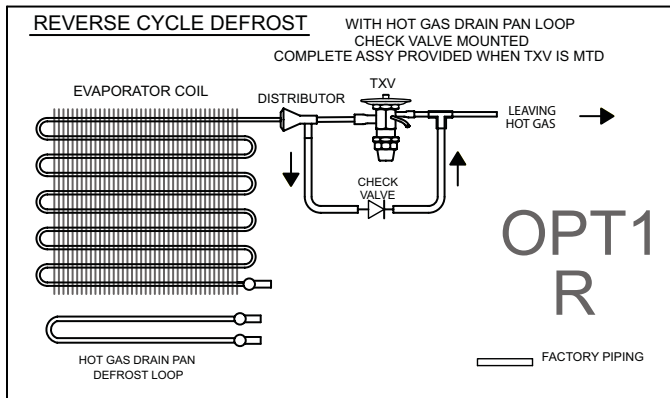
## Check Valve & TXV - See next page (OPT 1)

When a TXV is ordered with a HG defrost coil: Its only option will be **Factory Installed**. The bypass check valve will be **factory installed** as well as part of the same option.

- **Reverse Cycle PanHeater (G Models)** when ordered with TXV & Check Valve:
  - TXV, Check Valve and bypass Tee are factory installed
- **Reverse Cycle PanLoop (R Models)** when ordered with TXV & Check Valve:
  - TXV, Check Valve and bypass Tee are factory installed
- **3-Pipe PanHeater (T Models)** when ordered with TXV & Check Valve:
  - TXV and Check Valve are factory installed
- **3-Pipe PanLoop (H Models)** when ordered with TXV & Check Valve:
  - TXV and Check Valve are factory installed

# HOT GAS PIPING SCHEMATICS OPTIONAL CONFIGURATIONS

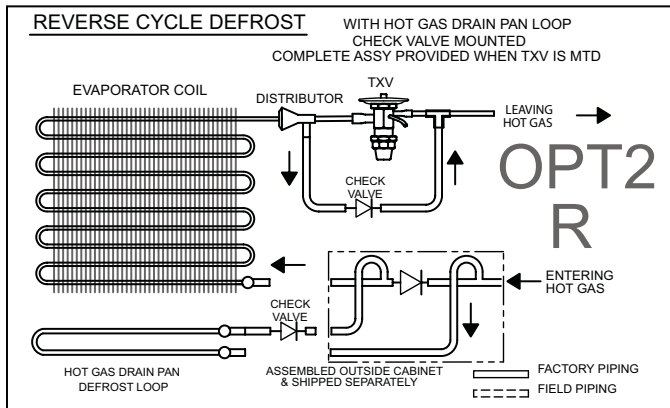
Refer to Nomenclature for details



## Drain pan Loop Kit - See below (OPT 2)

Drain pan loop kit is an assembly that is fully assembled and shipped loose for field installation outside the cabinet. Two check valves are included, depending on the model size, one or both are factory installed.

- **Reverse Cycle PanLoop (R Models)** when ordered with TXV & Check Valve:
  - Suction line piping shipped as a pre-piped assembly for field installation



## Solenoid Valve

Solenoid valves are available as a shipped loose item due to limited space inside the cabinet



# GENERIC SERVICE PARTS LIST

# 50Hz

## Miscellaneous

DESCRIPTION	PART #	DESCRIPTION	PART #
FAN MOTOR 208-230/1/60, 200-220/1/50	1082710	TERMINAL BOARD AIR DEFROST (460V)	1045017
FAN MOTOR 460/1/60, 380-400/1/50	1082711	INSULATOR, for 460V terminal board #1045017	171159
FAN MOTOR 575/1/60	1082712	TERMINAL BOARD ED & HG	1083880
MOTOR MOUNT	1045031	DRAIN FITTING	1085310
FAN BLADE 3020LCW30 / #6124340001	1082709	LOCKNUT - DRAIN FITTING	1081102
FAN GUARD (PLASTIC)	1082703	GASKET - DRAIN FITTING	1081103
FAN GUARD (WIRE)	1045091	HEATER HOLD DOWN BRKT-DRAIN PAN	1083005
ACORN NUT #CN3/8-16 PANTONE GREY#429-C	1082951	HANGER BRKT MP	1082481
NUT/WHIZ-LOCK 3/8-16-UNC #N-70 for use with WIRE GUARD	1045090	SCREWS: #12 x 5/8" lg.	1081100
HEATER RETAINER CLIP-COIL LP/MP (WIRE CLIP)	1048609	SCREWS: #14 x 3/4" lg.	1043774
HINGE ASSY #8820-16GA-2"X2"OP-STAINLESS STEEL	160401		

## Defrost Heaters - Electric Defrost Models

MODELS			PART NUMBER			
			COIL FACE HEATER		DRAIN PAN HEATER (1 REQUIRED)	
			200-220V (4 REQUIRED)	380-400V (5 REQUIRED)	200-220V	380-400V
118ME	116LE	113VE	640W / 1083028-001	529W / 1083028-101	489W / 1083029-001	404W / 1083029-101
122ME	119LE	117VE	640W / 1083028-001	529W / 1083028-101	489W / 1083029-001	404W / 1083029-101
228ME	225LE	222VE	1212W / 1083028-002	1002W / 1083028-102	812W / 1083029-002	671W / 1083029-102
236ME	232LE	228VE	1212W / 1083028-002	1002W / 1083028-102	812W / 1083029-002	671W / 1083029-102
245ME	240LE	234VE	1212W / 1083028-002	1002W / 1083028-102	812W / 1083029-002	671W / 1083029-102
355ME	348LE	339VE	1784W / 1083028-003	1474W / 1083028-103	1130W / 1083029-003	938W / 1083029-103
368ME	356LE	350VE	1784W / 1083028-003	1474W / 1083028-103	1130W / 1083029-003	938W / 1083029-103
480ME	471LE	459VE	2087W / 1083028-004	1725W / 1083028-104	1310W / 1083029-004	1080W / 1083029-104
488ME	N/A	N/A	2087W / 1083028-004	1725W / 1083028-104	1310W / 1083029-004	1080W / 1083029-104

# GENERIC SERVICE PARTS LIST

# 50Hz

## Defrost Heaters - Hot Gas Defrost with Electric Drain Pan

MODELS						PART NUMBER	
						DRAIN PAN HEATER (1 REQUIRED)	
						200-220V	380-400V
118MT	118MG	116LT	116LG	113VT	113VG	489W / 1083029-001	404W / 1083029-101
122MT	122MG	119LT	119LG	117VT	117VG	489W / 1083029-001	404W / 1083029-101
228MT	228MG	225LT	225LG	222VT	222VG	812W / 1083029-002	671W / 1083029-102
236MT	236MG	232LT	232LG	228VT	228VG	812W / 1083029-002	671W / 1083029-102
245MT	245MG	240LT	240LG	234VT	234VG	812W / 1083029-002	671W / 1083029-102
355MT	355MG	348LT	348LG	339VT	339VG	1130W / 1083029-003	938W / 1083029-103
368MT	368MG	356LT	356LG	350VT	350VG	1130W / 1083029-003	938W / 1083029-103
480MT	480MG	471LT	471LG	459VT	459VG	1310W / 1083029-004	1080W / 1083029-104
488MT	488MG	N/A	N/A	N/A	N/A	1310W / 1083029-004	1080W / 1083029-104

## Drain Pan Assemblies

NUMBER OF FANS	AIR DEFROST - "MA" MODELS	ELECTRIC DEFROST - "ME", "LE" & "VE" MODELS HOT GAS WITH ED PAN - "MT, LT & VT" MODELS "MG, LG & VG" MODELS	HOT GAS DEFROST HG LOOP IN PAN "MH, LH & VH" MODELS "MR, LR & VR" MODELS
1 FAN	1083111-1AD	1083111-1ED	1083111-1HG
2 FANS	1083111-2AD	1083111-2ED	1083111-2HG
3 FANS	1083111-3AD	1083111-3ED	1083111-3HG
4 FANS	1083111-4AD	1083111-4ED	1083111-4HG

Drain pan assemblies include drain fitting, hinge and heater hold down brackets when applicable.

Drain pan assemblies do not include heaters or hot gas loops.



# NOTES

# NOTES

## FINISHED GOODS WARRANTY

The terms and conditions as described below in the General Warranty Policy cover all products manufactured by National Refrigeration.

### GENERAL WARRANTY POLICY

Subject to the terms and conditions hereof, the Company warrants all Products, including Service Parts, manufactured by the Company to be free of defects in material or workmanship, under normal use and application for a period of one (1) year from the original date of installation, or eighteen (18) months from the date of shipment from the Company, whichever occurs first. Any replacement part(s) so supplied will be warranted for the balance of the product's original warranty. The part(s) to be replaced must be made available in exchange for the replacement part(s) and reasonable proof of the original installation date of the product must be presented in order to establish the effective date of the warranty, failing which, the effective date will be based upon the date of manufacture plus thirty (30) days. Any labour, material, refrigerant, transportation, freight or other charges incurred in connection with the performance of this warranty will be the responsibility of the owner at the current rates and prices then in effect. This warranty may be transferred to a subsequent owner of the product.

### THIS WARRANTY DOES NOT COVER

(a) Damages caused by accident, abuse, negligence, misuse, riot, fire, flood, or Acts of God (b) damages caused by operating the product in a corrosive atmosphere (c) damages caused by any unauthorized alteration or repair of the system affecting the product's reliability or performance (d) damages caused by improper matching or application of the product or the product's components (e) damages caused by failing to provide routine and proper maintenance or service to the product (f) expenses incurred for the erecting, disconnecting, or dismantling the product (g) parts used in connection with normal maintenance, such as filters or belts (h) products no longer at the site of the original installation (i) products installed or operated other than in accordance with the printed instructions, with the local installation or building codes and with good trade practices (j) products lost or stolen.

**No one is authorized to change this WARRANTY** or to create for or on behalf of the Company any other obligation or liability in connection with the Product(s). There is no other representation, warranty or condition in any respect, expressed or implied, made by or binding upon the Company other than the above or as provided by provincial or state law and which cannot be limited or excluded by such law, nor will we be liable in any way for incidental, consequential, or special damages however caused.

The provisions of this additional written warranty are in addition to and not a modification of or subtraction from the statutory warranties and other rights and remedies provided by Federal, Provincial or State laws.

## PROJECT INFORMATION

System	
Model Number	Date of Start-Up
Serial Number	Service Contractor
Refrigerant	Phone
Electrical Supply	Fax

**“AS BUILT” SERVICE PARTS LIST**

**Service Parts List  
Label  
To Be Attached  
*HERE***



**General Sales, Parts & Service Manufacturing & Engineering**  
135 Little Nine Drive, Morehead City, NC 28557  
252-240-2829 • 1-800-24-BALLY • FAX: 252-240-0384  
e-mail: [ballysales@ballyrefboxes.com](mailto:ballysales@ballyrefboxes.com) • [www.ballyrefboxes.com](http://www.ballyrefboxes.com)

DISTRIBUTED BY:

*Due to Manufacturer's policy of continuous product improvement,  
the Manufacturer reserves the right to make changes without notice.*

