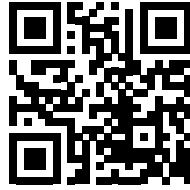




**PRODUCT DATA & INSTALLATION**

Bulletin T30-TTM-PDI-7  
1087841



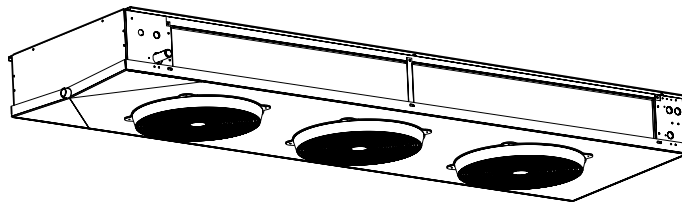
# TTM Two-Way Medium Profile Evaporators

High, Medium and Low Temperature Applications  
-10°F (-23.3 °C) or Above Box Temperature



**Air, Electric or Hot Gas Defrost (Reverse Cycle)**

Questions about this product?  
 Email: [evaps@t-rp.com](mailto:evaps@t-rp.com)  
 Call: 1-844-893-3222 x520



## SMARTSPEED™

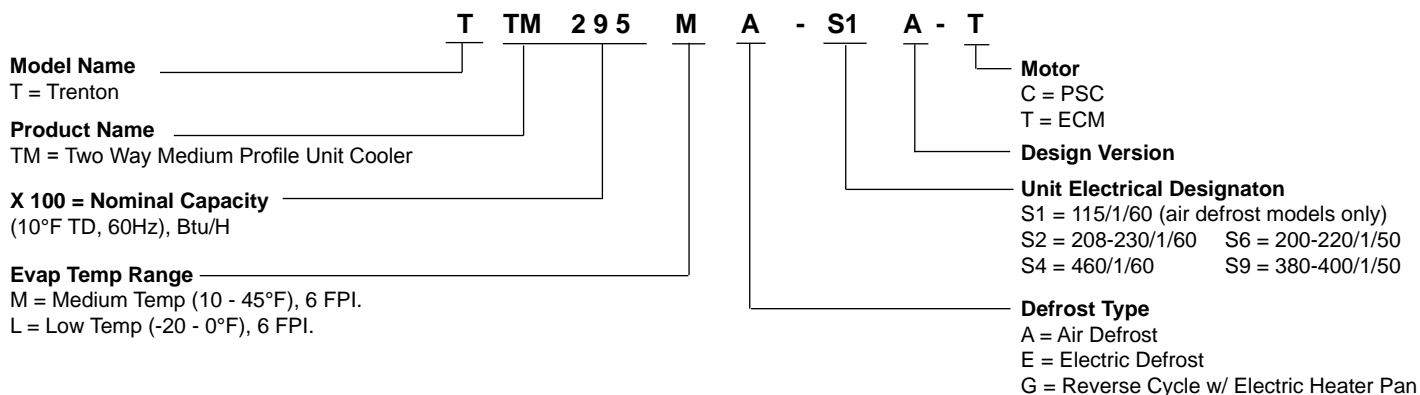
FAN MOTOR TECHNOLOGY  
See Page 11 for details



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# NOMENCLATURE




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## STANDARD FEATURES

- Compatible with Low GWP Refrigerants
- Internally enhanced tube.
- Heavy gauge textured aluminum cabinet construction resists scratches/corrosion and minimizes weight for shipment, installation and service.
- Attractive and durable high - density polyethylene fan guards.
- Capacity up to 29,500 BTUH nominal @ 10F TD.
- Standard PSC motors
- Dual refrigeration coils with two-way air distribution reduces air velocities to minimize product dehydration.
- Hinged drain pan provides convenient access for cleaning.
- Air enters through fan and discharges two ways out of each coil side.
- Terminal board allows for easy electrical connections.
- Low height compact size useable storage space.
- Reduced operating charge with 3/8" OD tubing
- Refrigerants R407A, R407C, R404A/R507, R22 and R134a.

## OPTIONAL FEATURES

- Factory mounted solenoid valve, TXV and Thermostat on air and electric defrost models.
- EC motors with patented SmartSpeed® Technology. See page 11
- Fin material and special coatings.
- Other options available - consult factory.

**MEDIUM TEMPERATURE MODELS - CAPACITY**

Medium Temp. Models		TTM115M	TTM139M	TTM172M	TTM208M	TTM236M	TTM260M	TTM295M	
Number of Fans		2	2	3	3	4	4	5	
Capacity BTUH (WATTS)	Evap Temp. 25°F (-4°C)	R407A	10930 (3202)	13210 (3870)	16340 (4789)	19760 (5791)	22420 (6570)	24700 (7239)	28000 (8214)
		R407C	10350 (3033)	12510 (3667)	15480 (4537)	18720 (5486)	21240 (6224)	23400 (6858)	26600 (7781)
		R404A R507	11500 (3370)	13900 (4074)	17200 (5041)	20800 (6096)	23600 (6916)	26000 (7620)	29500 (8646)
		R22	10930 (3202)	13210 (3870)	16340 (4789)	19760 (5791)	22400 (6570)	24700 (7239)	28000 (8214)
		R134a	10350 (3033)	12510 (3667)	15480 (4537)	18720 (5486)	21240 (6224)	23400 (6858)	26550 (7781)
Air Flow	CFM (L/s)	2020 (953)	1900 (897)	3030 (1430)	2850 (1345)	3700 (1746)	3780 (1760)	4630 (2185)	
Refrigerant ** Charge R407A	Lbs (Kg)	2.3 (1.1)	3.1 (1.4)	3.4 (1.5)	4.6 (2.1)	4.6 (2.1)	5.7 (2.6)	5.7 (2.6)	

**LOW TEMPERATURE MODELS - CAPACITY \***

Low Temp. Models		TTM105L	TTM124L	TTM153L	TTM188L	TTM210L	TTM235L	TTM265L	
Number of Fans		2	2	3	3	4	4	5	
Capacity BTUH (WATTS)	Evap Temp. -20°F (-28.9°C)	R407A	9980 (2923)	11780 (3452)	14540 (4260)	17860 (5235)	19950 (5846)	22300 (6543)	25200 (7378)
		R407C	9450 (2769)	11160 (3271)	13770 (4036)	16920 (4959)	18900 (5539)	21150 (6198)	23900 (6989)
		R404A R507	10500 (3077)	12400 (3634)	15300 (4484)	18800 (5510)	21000 (6154)	23500 (6887)	26500 (7766)
		R22	9980 (2923)	11780 (3452)	14540 (4260)	17860 (5235)	20000 (5846)	22300 (6543)	25200 (7378)
		R134a	9450 (2769)	11160 (3271)	13770 (4036)	16920 (4959)	18900 (5539)	21150 (6198)	23850 (6989)
Air Flow	CFM (L/s)	2020 (953)	1900 (897)	3030 (1430)	2850 (1345)	3700 (1746)	3780 (1760)	4630 (2185)	
Refrigerant ** Charge R407A	Lbs (Kg)	2.3 (1.1)	3.1 (1.4)	3.4 (1.5)	4.6 (2.1)	4.6 (2.1)	5.7 (2.6)	5.7 (2.6)	

Capacities rated using 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: Capacity = Rated capacity ÷ 10 x 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.

Capacities for R407A and R407C are based on mean temperature. Mean temperature is the average temperature between the saturated suction temperature and the temperature feeding the evaporator. For dew point ratings, consult factory.

**\* CAPACITY CORRECTION FACTORS FOR LOW TEMPERATURE UNITS**

SATURATED SUCTION TEMPERATURE °F (°C)	0 (-17.8)	-10 (23.3)	-20 (-28.9)
FACTOR	1.06	1.03	1.0

**\*\* REFRIGERANT CHARGE CONVERSION FACTORS**

R407C	R404A	R507	R22	R134a
0.99	0.92	0.93	1.02	1.03

**NO CORRECTION FACTOR REQUIRED FOR MEDIUM TEMP. UNITS**

**AIR DEFROST**

MODEL	No. of FANS	POWER SUPPLY	FAN MOTOR(S)							
			PSC-Standard				ECM-Optional			
			TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P	TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P
TTM115MA-S1	2	115/1/60	2.2	2.5	200	15	3	3.4	104	15
TTM139MA-S1	2	115/1/60	2.2	2.5	200	15	3	3.4	104	15
TTM172MA-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15
TTM208MA-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15
TTM236MA-S1	4	115/1/60	4.4	4.7	400	15	6	6.4	208	15
TTM260MA-S1	4	115/1/60	4.4	4.7	400	15	6	6.4	208	15
TTM295MA-S1	5	115/1/60	5.5	5.8	500	15	7.5	7.9	260	15
TTM115MA-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15
TTM139MA-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15
TTM172MA-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15
TTM208MA-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15
TTM236MA-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15
TTM260MA-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15
TTM295MA-S2	5	208-230/1/60	2.5	2.6	500	15	5.0	5.3	260	15
TTM115MA-S4	2	460/1/60	0.6	0.7	200	15	-	-	-	-
TTM139MA-S4	2	460/1/60	0.6	0.7	200	15	-	-	-	-
TTM172MA-S4	3	460/1/60	0.9	1.0	300	15	-	-	-	-
TTM208MA-S4	3	460/1/60	0.9	1.0	300	15	-	-	-	-
TTM236MA-S4	4	460/1/60	1.2	1.3	400	15	-	-	-	-
TTM260MA-S4	4	460/1/60	1.2	1.3	400	15	-	-	-	-
TTM295MA-S4	5	460/1/60	1.5	1.6	500	15	-	-	-	-

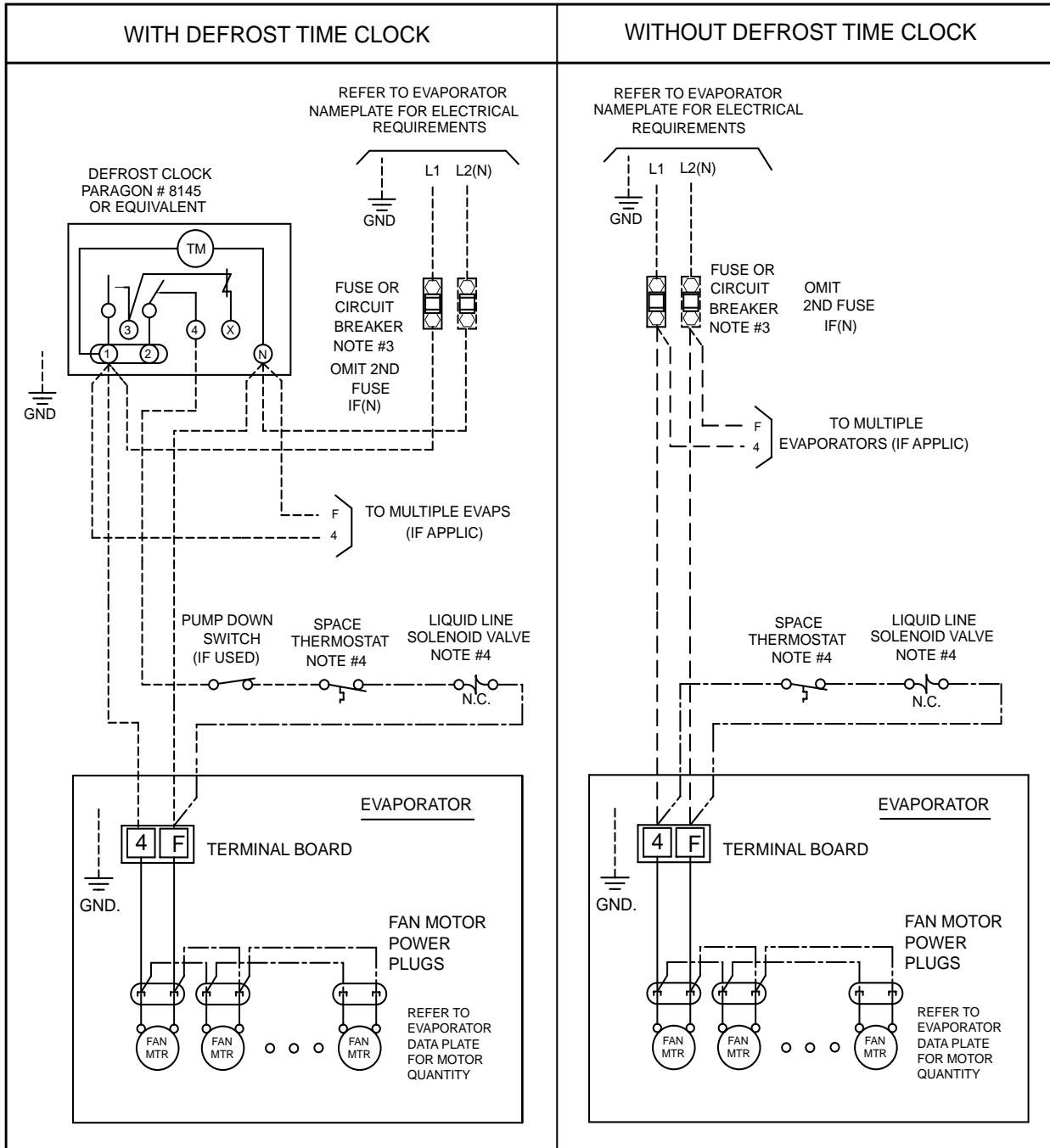
**ELECTRIC DEFROST**

MODEL	No. of FANS	POWER SUPPLY	FAN MOTOR(S)								DEFROST HEATERS				
			PSC-Standard				ECM-Optional				POWER SUPPLY	TOTAL WATTS	TOTAL MOTOR FLA	M.C.A.	M.O.P
			TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P	TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P					
TTM115ME-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	2600	11.3	14.1	15
TTM139ME-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	2600	11.3	14.1	15
TTM172ME-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	3720	16.2	20.3	25
TTM208ME-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	3720	16.2	20.3	25
TTM236ME-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	3720	16.2	20.3	25
TTM260ME-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	4560	19.8	24.8	25
TTM295ME-S2	5	208-230/1/60	2.5	2.6	500	15	5.0	5.3	260	15	208-230/1/60	4560	19.8	24.8	25
TTM105LE-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	2600	11.3	14.1	15
TTM124LE-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	2600	11.3	14.1	15
TTM153LE-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	3720	16.2	20.3	25
TTM188LE-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	3720	16.2	20.3	25
TTM210LE-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	3720	16.2	20.3	25
TTM235LE-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	4560	19.8	24.8	25
TTM265LE-S2	5	208-230/1/60	2.5	2.6	500	15	5.0	5.3	260	15	208-230/1/60	4560	19.8	24.8	25

**HOT GAS DEFROST**

MODEL	No. of FANS	POWER SUPPLY	FAN MOTOR(S)								DRAIN PAN HEATERS				
			PSC-Standard				ECM-Optional				POWER SUPPLY	TOTAL WATTS	TOTAL MOTOR FLA	M.C.A.	M.O.P
			TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P	TOTAL MOTOR FLA	M.C.A.	WATTS	M.O.P					
TTM115MG-S1	2	115/1/60	2.2	2.5	200	15	3.0	3.4	104	15	115/1/60	1300	11.3	14.1	15
TTM139MG-S1	2	115/1/60	2.2	2.5	200	15	3.0	3.4	104	15	115/1/60	1300	11.3	14.1	15
TTM172MG-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15	115/1/60	1860	16.2	20.3	25
TTM208MG-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15	115/1/60	1860	16.2	20.3	25
TTM236MG-S1	4	115/1/60	4.4	4.7	400	15	6.0	6.4	208	15	115/1/60	1860	16.2	20.3	25
TTM260MG-S1	4	115/1/60	4.4	4.7	400	15	6.0	6.4	208	15	115/1/60	2280	19.8	24.8	25
TTM295MG-S1	5	115/1/60	5.5	5.8	500	15	7.5	7.9	260	15	115/1/60	2280	19.8	24.8	25
TTM115MG-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	1300	5.7	7.1	15
TTM139MG-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15	208-230/1/60	1300	5.7	7.1	15
TTM172MG-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	1860	8.1	10.1	15
TTM208MG-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15	208-230/1/60	1860	8.1	10.1	15
TTM236MG-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	1860	8.1	10.1	15
TTM260MG-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15	208-230/1/60	2280	9.9	12.4	15
TTM295MG-S2	5	208-230/1/60	2.5	2.6	500	15	5.0	5.3	260	15	208-230/1/60	2280	9.9	12.4	15

# WIRING DIAGRAM AIR DEFROST - 120V & 208-230V



**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-TM AD 03/08

**TERMINALS**

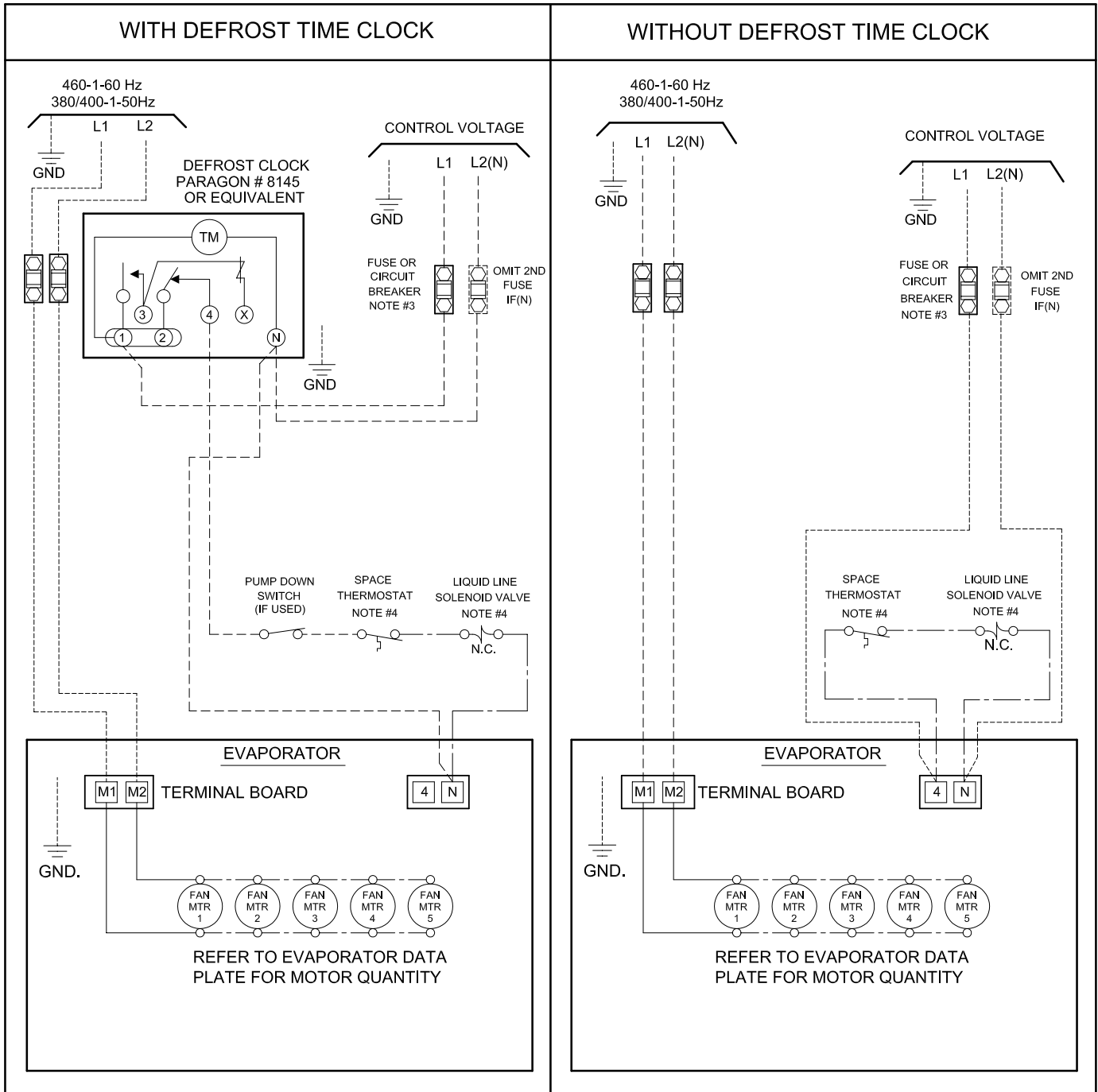
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

**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 AIR DEFROST - 460V



**NOTES**

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

**TERMINALS**

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

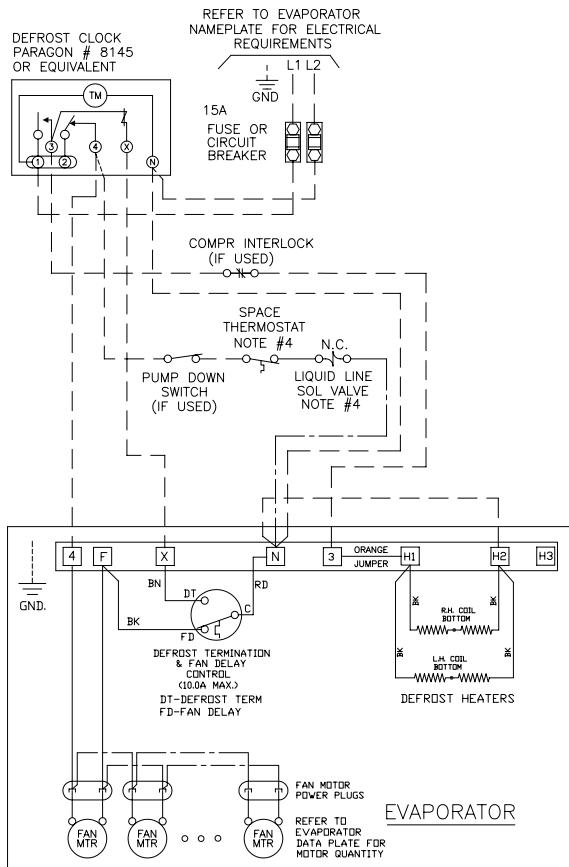
**CONDUCTORS/WIRING**

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

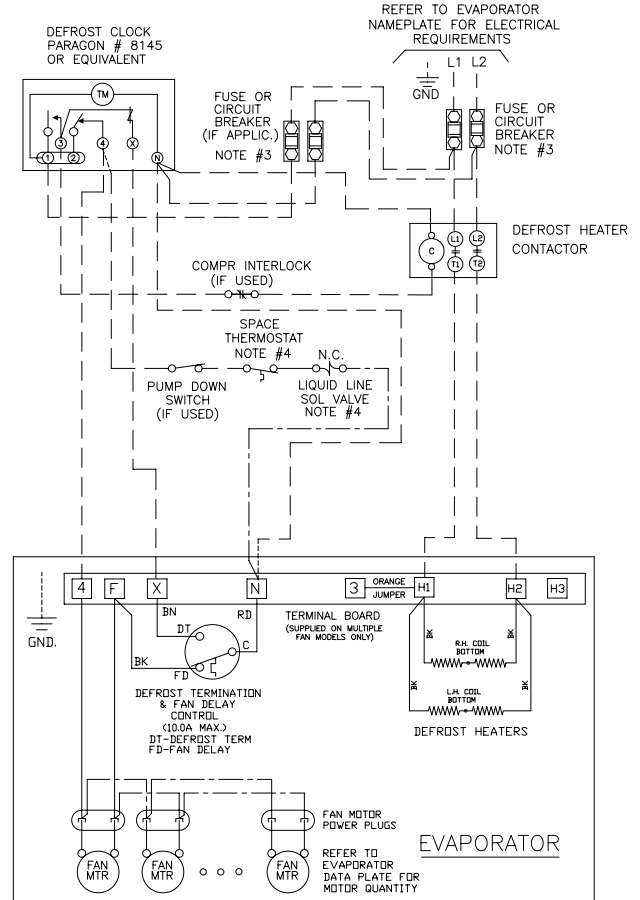
ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

# WIRING DIAGRAM ELECTRIC DEFROST - 208-230V (SINGLE EVAPORATOR)

FOR ALL MODELS WITHOUT DEFROST HEATER CONTACTOR  
USING MAXIMUM 15A HEATER OVERCURRENT PROTECTION



FOR ALL MODELS USING DEFROST HEATER CONTACTOR



NOTES

- 1). USE COPPER CONDUCTORS ONLY
- 2). USE 75°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

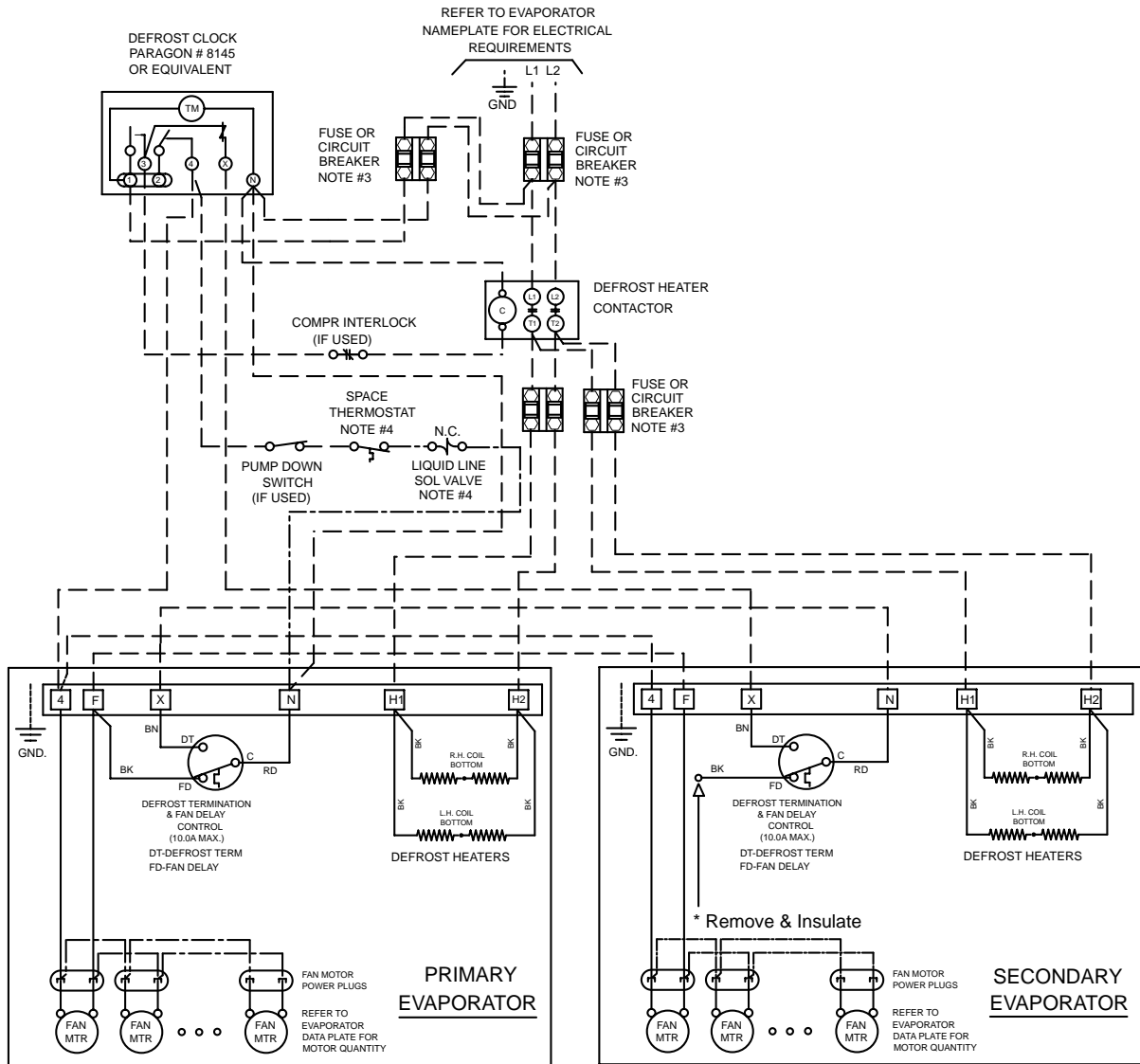
- FACTORY WIRING
- - - - - WIRING BY OTHERS
- OPTIONAL FACTORY OR BY OTHERS

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



# WIRING DIAGRAM ELECTRIC DEFROST - 230V (MULTI EVAPORATOR)

FOR ALL MODELS USING DEFROST HEATER CONTACTOR



\* Fan delay not used on second evap / use fan contactor if total fan amps exceeds 10A

**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

3-TM ED CONTACTOR MULTI 03/08

**TERMINALS**

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

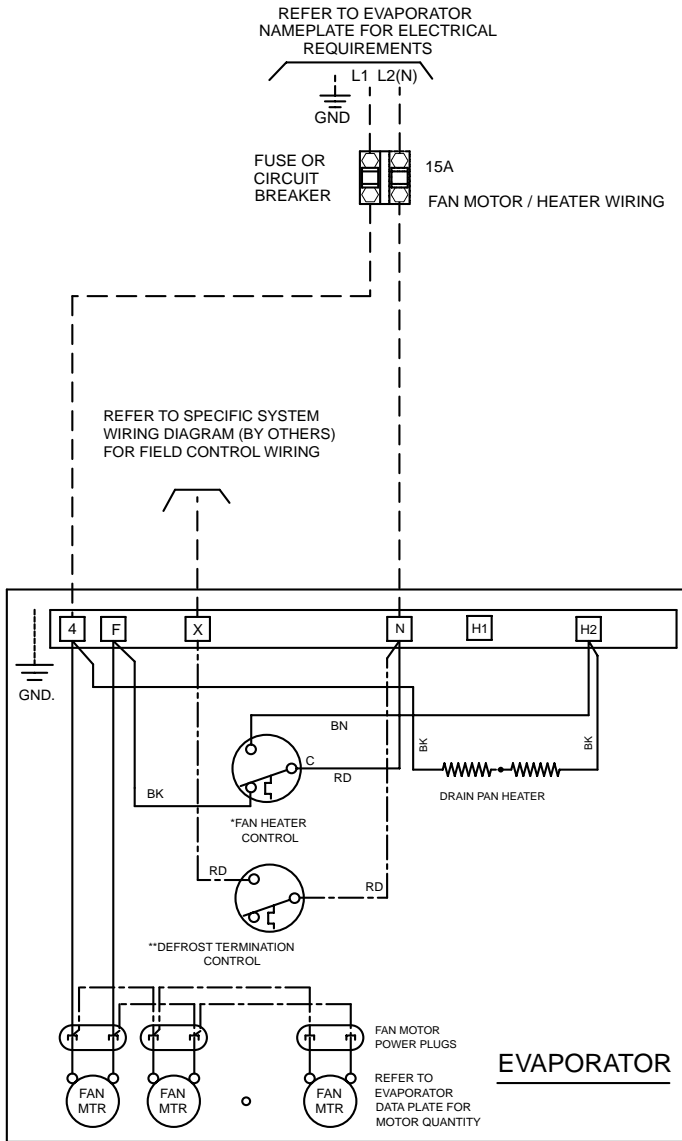
**CONDUCTORS/WIRING**

- 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 REVERSE CYCLE DEFROST - 230V

USING MAXIMUM 15A HEATER OVERCURRENT PROTECTION



\*FAN HEATER CONTROL ON REVERSE CYCLE LOCATED AT SUCTION LINE.  
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 (20 F DIFF)

**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-TM HG 03/08

**TERMINALS**

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

**CONDUCTORS/WIRING**

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

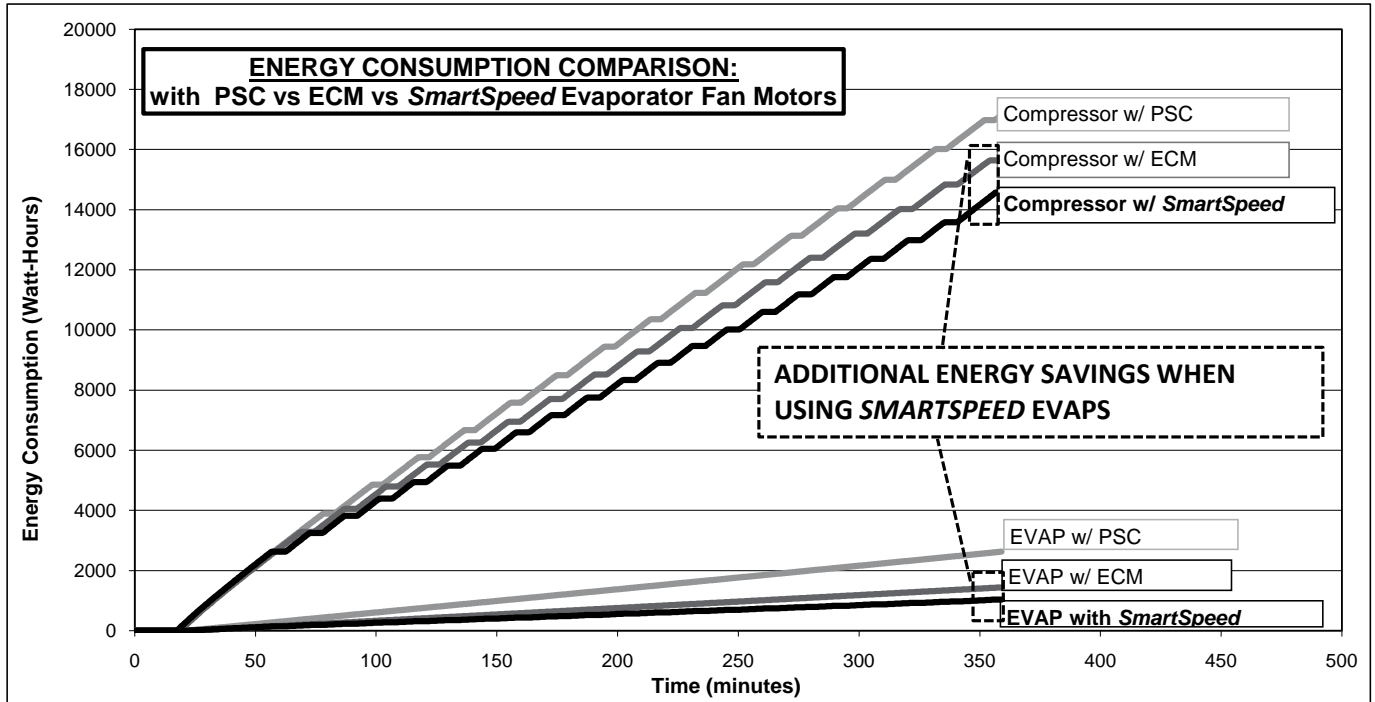
ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

US Patents  
8,635,883 &  
9,151,525

**DESIGN FEATURES**



- Standard on all EC Motors
- NO special controls required.
- Refrigeration mode – EC motor operates at full speed.  
Consumption 52 W per motor
- Off Cycle mode – EC motor operates at reduced speed.  
Consumption 15 W per motor.
- Energy saving benefit on motor and compressor wattage consumption:



Note: Data collected on a typical freezer application with a 3HP low temp condensing unit and a 4 fan TLP evaporator. Similar results can be expected with TTM evaporators.

**INSTALLATION NOTES**

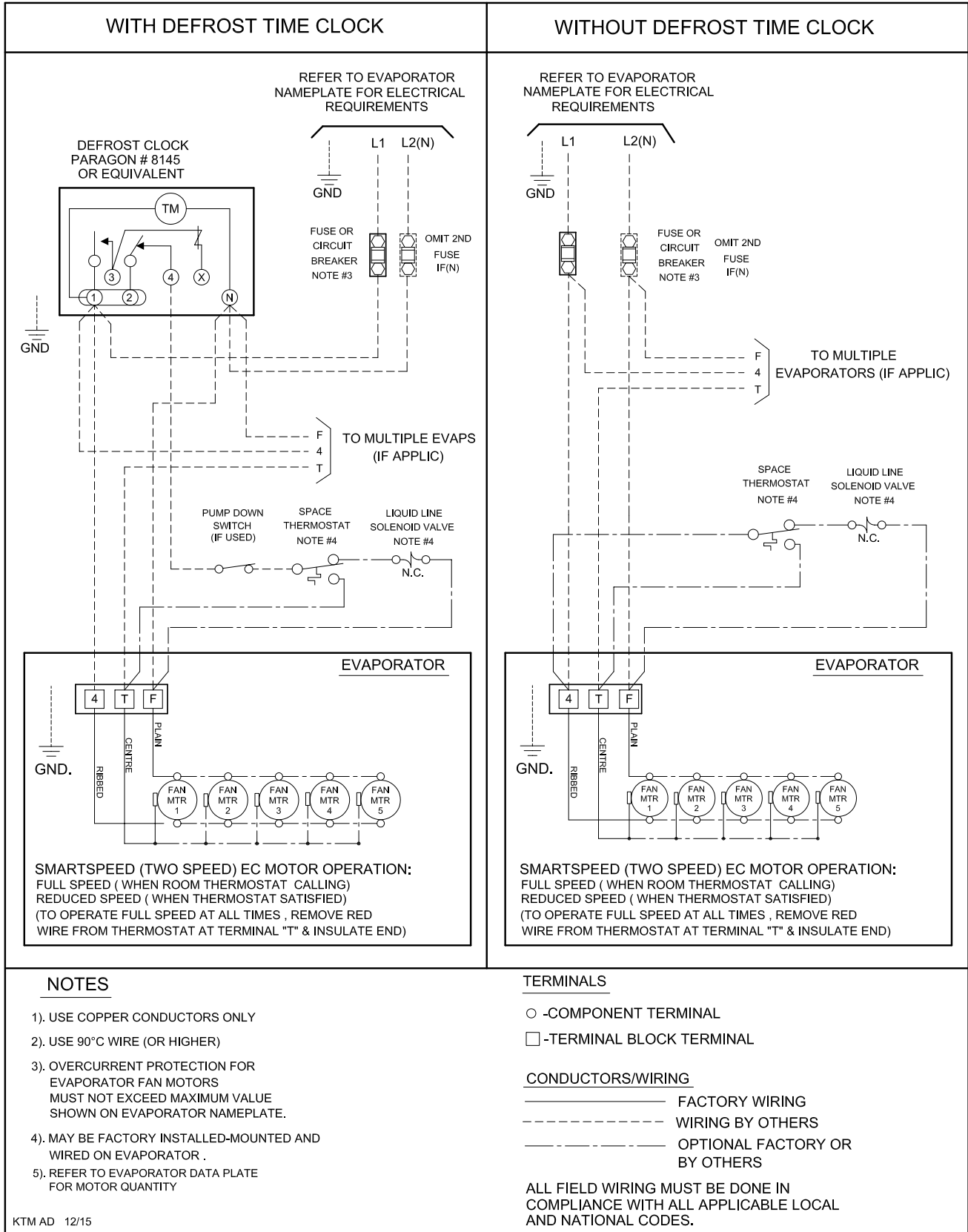
EC motors are factory wired for SmartSpeed operation on evaporators equipped **with** a factory installed thermostat.

For SmartSpeed operation on Evaporators **without** a factory installed thermostat, a field wired SPDT type thermostat is required.

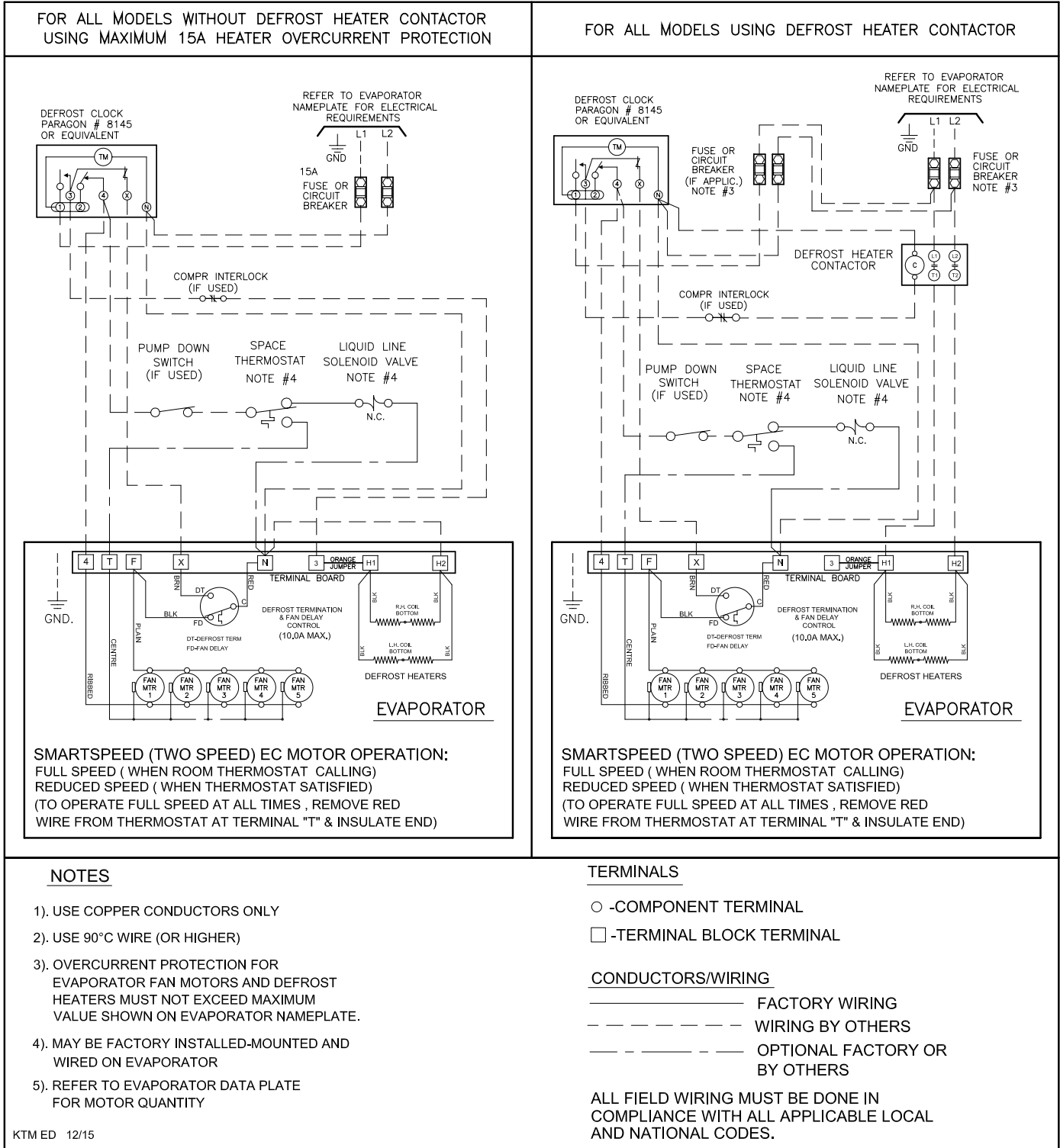
# WIRING DIAGRAM - ALL VOLTAGES

## OPTIONAL EC MOTOR with SMARTSPEED™

### AIR DEFROST MODELS



# WIRING DIAGRAM - 208-230/1/60 OPTIONAL EC MOTOR with SMARTSPEED™ ELECTRIC DEFROST MODELS - SINGLE EVAPORATOR

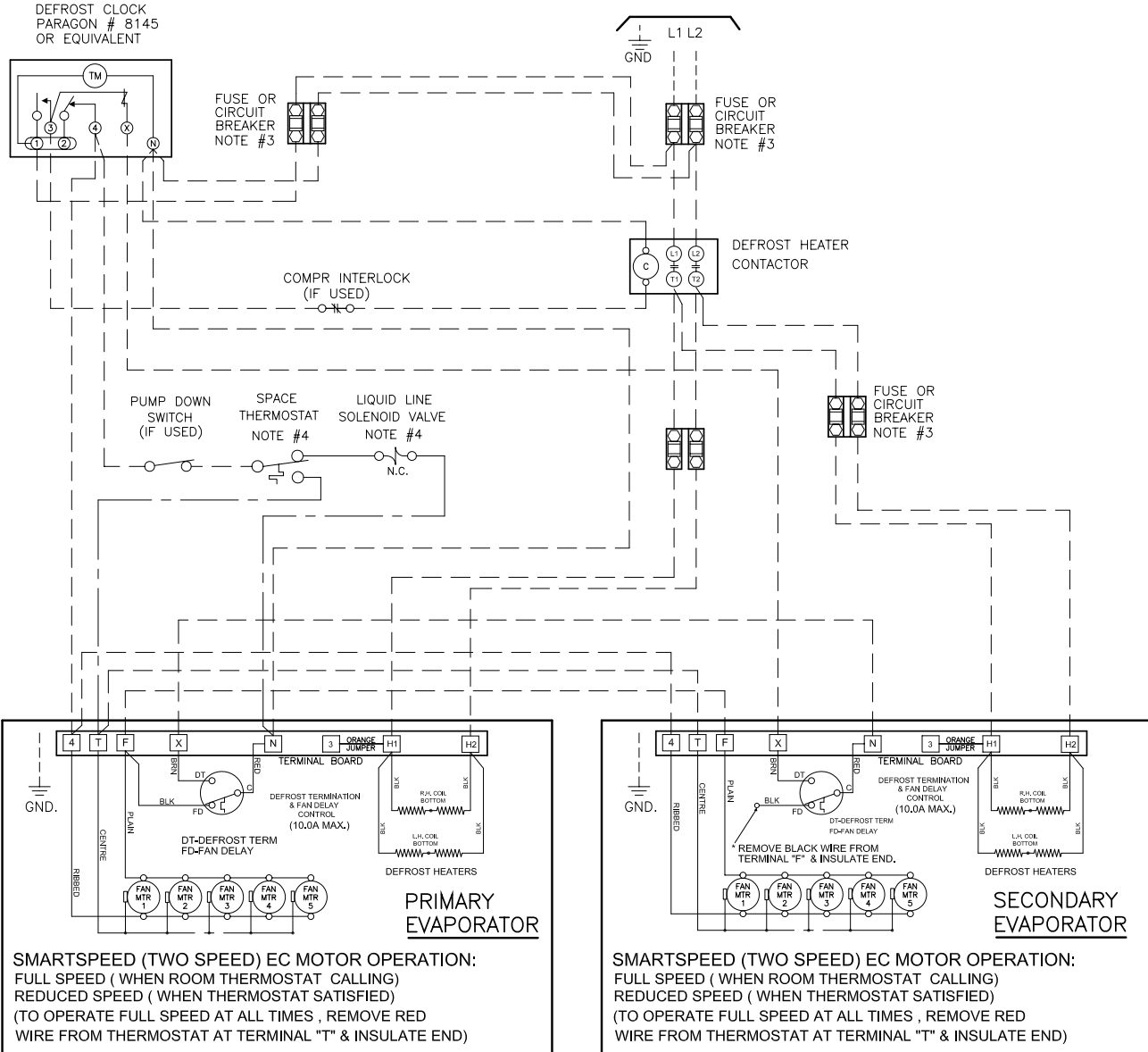


# WIRING DIAGRAM - 208-230/1/60

## OPTIONAL EC MOTOR with SMARTSPEED™

### ELECTRIC DEFROST MODELS - MULTIPLE EVAPORATOR

FOR ALL MODELS USING DEFROST HEATER CONTACTOR  
REFER TO EVAPORATOR NAMEPLATE FOR ELECTRICAL REQUIREMENTS



\* Fan delay not used on second evap / use fan contactor if total fan amps exceeds 10A

**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). REFER TO EVAPORATOR DATA PLATE FOR MOTOR QUANTITY

KTM ED CONTACTOR MULTI 12/15

**TERMINALS**

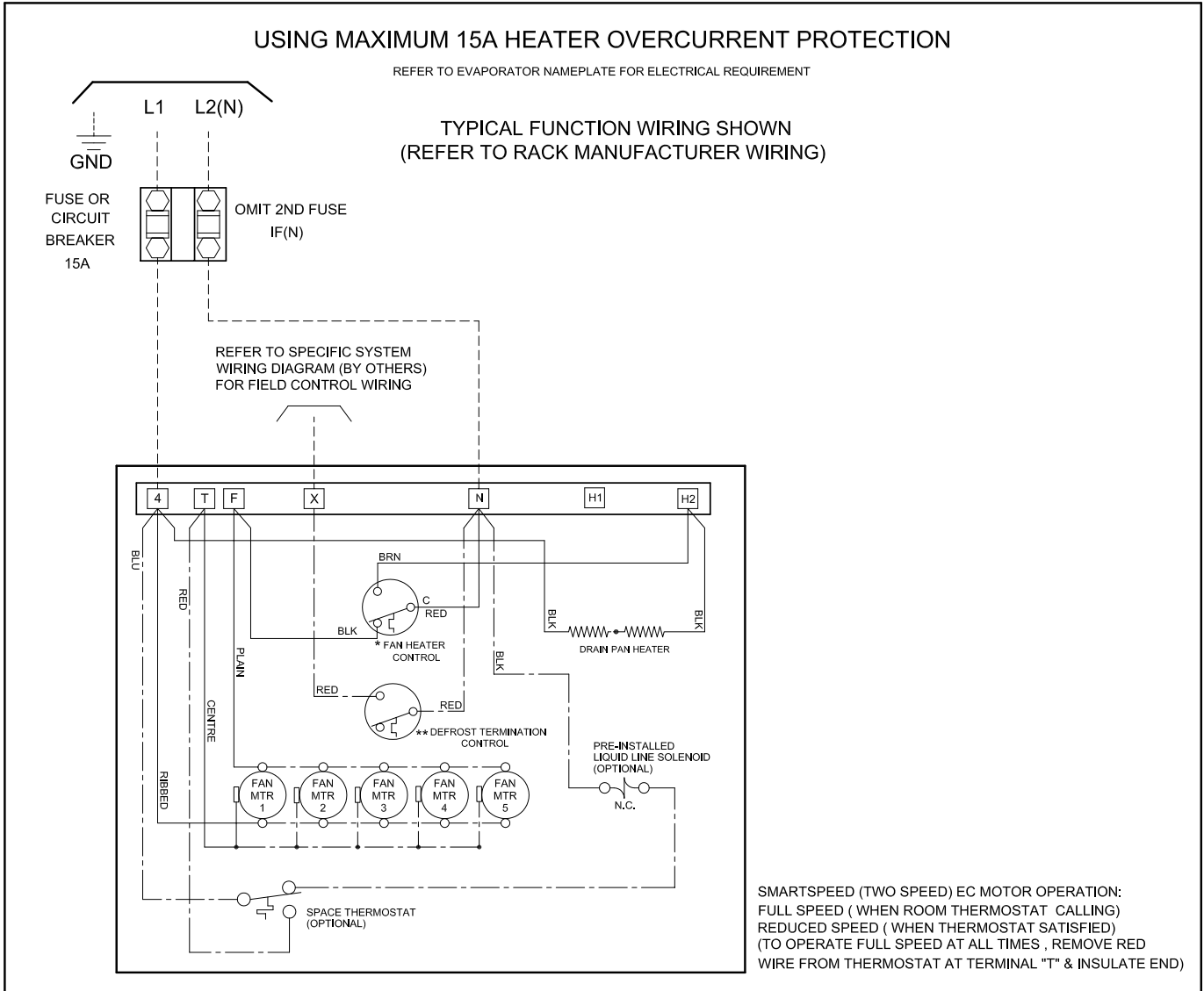
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

**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 - 208-230/1/60 OPTIONAL EC MOTOR with SMARTSPEED™ REVERSE CYCLE DEFROST MODELS



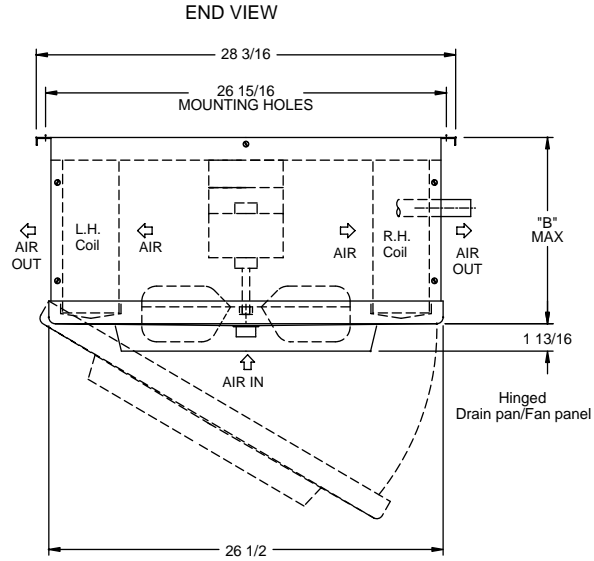
<p>* FAN HEATER CONTROL ON REVERSE CYCLE LOCATED AT SUCTION LINE.</p> <p>** DEFROST TERMINATION CONTROL OPTIONAL FACTORY WIRED OR BY OTHERS LOCATED ON TUBE END SHEET THE CONTROL CLOSES WHEN REACHES 55° F (20 F DIFF)</p>	<p>NOTE: DURING THE HOT GAS DEFROST CYCLE THE FAN/HEATER CONTROL DE-ENERGIZES THE EVAPORATOR FANS AND ENERGIZES THE DRAIN PAN HEATER. (ANYTIME THE TEMPERATURE OF THE INCOMING REFRIGERANT GAS IS ABOVE 50° F).</p>
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- |   |  |
|---|--|
| <p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1). USE COPPER CONDUCTORS ONLY</li> <li>2). USE 90°C WIRE (OR HIGHER)</li> <li>3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE.</li> <li>4). MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR</li> <li>5). REFER TO EVAPORATOR DATA PLATE FOR MOTOR QUANTITY</li> </ol> <p>KTM HG 12/15</p> | <p><b>TERMINALS</b></p> <p>○ -COMPONENT TERMINAL</p> <p>□ -TERMINAL BLOCK TERMINAL</p> <p><b>CONDUCTORS/WIRING</b></p> <p>————— FACTORY WIRING</p> <p>----- WIRING BY OTHERS</p> <p>----- OPTIONAL FACTORY OR BY OTHERS</p> <p>ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.</p> |
|---|--|

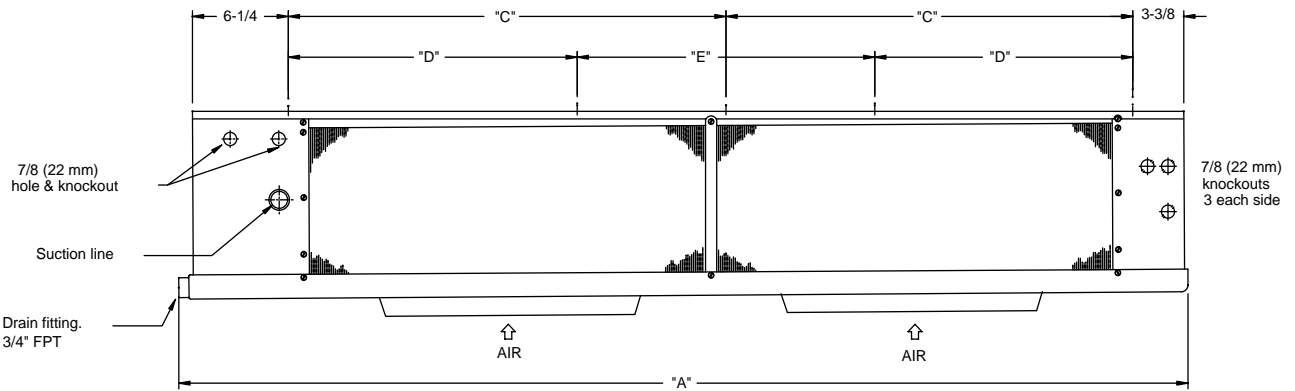
MODEL	TUBE CONNECTIONS						APPROX. SHIPPING WEIGHT	
	SUCTION (OD)		DISTRIBUTOR INLET		HOT GAS SIDE (OD)			
	Inches	mm	Inches	mm	Inches	mm	Lbs.	Kgs
TTM115M	7/8	22	1/2	13	1/2	13	110	50
TTM139M	7/8	22	1/2	13	1/2	13	116	53
TTM172M	7/8	22	1/2	13	1/2	13	150	68
TTM208M	1 1/8	29	1/2	13	1/2	13	157	71
TTM236M	1 1/8	29	1/2	13	1/2	13	164	74
TTM260M	1 1/8	29	7/8	22	5/8	16	191	87
TTM295M	1 1/8	29	7/8	22	5/8	16	198	90
TTM105L	7/8	22	1/2	13	1/2	13	110	50
TTM124L	1 1/8	29	1/2	13	1/2	13	116	53
TTM153L	1 1/8	29	1/2	13	1/2	13	150	68
TTM188L	1 1/8	29	7/8	22	5/8	16	157	71
TTM210L	1 1/8	29	7/8	22	5/8	16	164	74
TTM235L	1 3/8	35	7/8	22	5/8	16	191	87
TTM265L	1 3/8	35	7/8	22	5/8	16	198	90



- NOTES: 1). Dimensions shown are typical for Air defrost, Electric, and Hot Gas defrost
- 2). Electrical connection end is opposite to the piping end on all models.
- 3). 1/4" O.D. external equalizer line and service access fitting included on all suction headers inside end compartment



**SIDE VIEW**  
MOUNTING HOLES (3/8" DIA.) & PIPING CONNECTION  
Unit cooler is to be supported at all mounting points

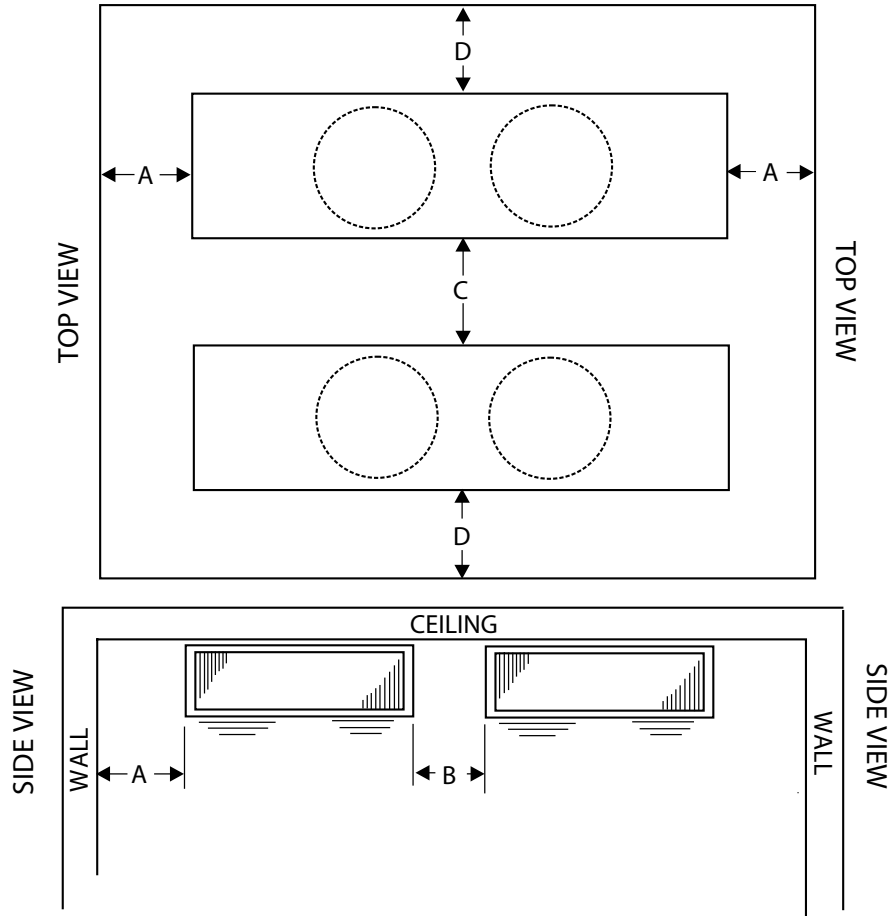


**DIMENSIONS**

MODEL NUMBER	NO. FANS	A		B		C		D		E	
		in	mm	in	mm	in	mm	in	mm	in	mm
TTM115M	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
TTM139M	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
TTM172M	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM208M	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM236M	4	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM260M	4	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
TTM295M	5	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
TTM105L	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
TTM124L	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
TTM153L	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM188L	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM210L	4	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
TTM235L	4	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
TTM265L	5	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508

\* Reducer supplied to accommodate 1/2" or 7/8" TXV outlet connection.

# RECOMENDED INSTALLATION CLEARANCES



DIMENSION		A	B	C	D
MINIMUM	ft.	2	2	6	3
	cm.	61	61	183	92
Maximum	ft.	-	7	40	20
	cm.	-	210	1200	600

**Nozzle Selections (Factory installed)**  
For all applications and refrigerants

Model	Nozzle
TTM115M	L-1
TTM139M	L-1 1/2
TTM172M	L-1 1/2
TTM208M	L-2
TTM236M	L-2
TTM260M	G-2 1/2
TTM295M	G-3

Model	Nozzle
TTM105L	L-1 1/2
TTM124L	L-2
TTM153L	L-2
TTM188L	G-2 1/2
TTM210L	G-3
TTM235L	E-3
TTM265L	E-4

**MEDIUM TEMP - EXPANSION VALVE SELECTION**

**SPORLAN**

MODEL	TD	R404A	R407A
		R507 *	R407C R22
TTM115M	10	SBFSE-A-C	SSE-3-C
	15	SBFSE-B-C	SBFVE-A-C
TTM139M	10	SBFSE-A-C	SBFVE-A-C
	15	SBFSE-B-C	SBFVE-B-C
TTM172M	10	SBFSE-B-C	SBFVE-A-C
	15	SBFSE-C-C	SBFVE-B-C
TTM208M	10	SBFSE-B-C	SBFVE-B-C
	15	SSE-3-C	SBFVE-B-C
TTM236M	10	SBFSE-B-C	SBFVE-B-C
	15	SSE-3-C	SBFVE-C-C
TTM260M	10	SBFSE-C-C	SBFVE-B-C
	15	SSE-4-C	SBFVE-C-C
TTM295M	10	SSE-3-C	SBFVE-B-C
	15	SSE-4-C	SBFVE-C-C

**ALCO**

MODEL	TD	R404A	R22
		R507	R407C
TTM208M	10	HFESC - 1-1/2 - SC	HFESC - 2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
TTM236M	10	HFESC - 2 - SC	HFESC - 2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
TTM260M	10	HFESC - 2 - SC	HFESC - 2-1/2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
TTM295M	10	HFESC - 2 - SC	HFESC - 2-1/2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC

\* For medium temp. R-507, refrigerant designation changes from 'S' to 'P'.

**DANFOSS**

MODEL	TD	R404A	R22
		R507	R407C
TTM115M	10	TUAE-R404A-6-N	TUAE-R22-6-N
	15	TUAE-R404A-8	TUAE-R22-7-N
TTM139M	10	TUAE-R404A-7-N	TUAE-R22-6-N
	15	TUAE-R404A-8-N	TUAE-R22-7-N
TTM172M	10	TUAE-R404A-7-N	TUAE-R22-7-N
	15	TUAE-R404A-9-N	TUAE-R22-8-N
TTM208M	10	TUAE-R404A-8-N	TUAE-R22-7-N
	15	TUAE-R404A-9-N	TUAE-R22-8-N
TTM236M	10	TUAE-R404A-8-N	TUAE-R22-8-N
	15	TCAE-R404A-1-N	TUAE-R22-9-N
TTM260M	10	TUAE-R404A-9-N	TUAE-R22-8-N
	15	TCAE-R404A-2-N	TUAE-R22-9-N
TTM295M	10	TUAE-R404A-9-N	TUAE-R22-8-N
	15	TCAE-R404A-2-N	TUAE-R22-9-N

ALL TXV Selections based on 90-100°F liquid.

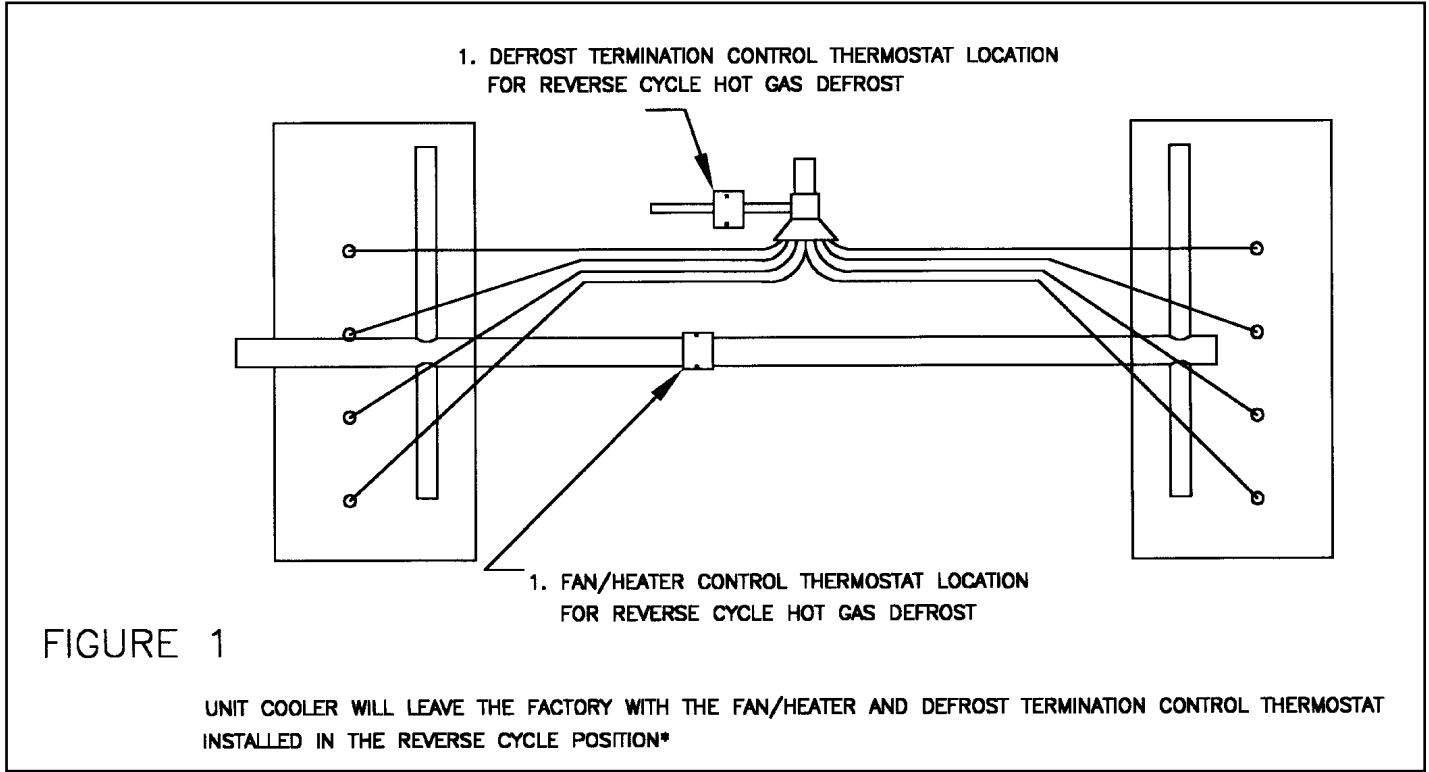
**SPORLAN - R407A**

Model	0°F Evap	-10°F Evap	-20°F Evap
TTM105L	SBFVE-A-C	SBFVE-A-ZP40	SBFVE-A-ZP40
TTM124L	SBFVE-A-C	SBFVE-A-ZP40	SBFVE-B-ZP40
TTM153L	SBFVE-A-C	SBFVE-B-ZP40	SBFVE-B-ZP40
TTM188L	SBFVE-B-C	SBFVE-B-ZP40	SBFVE-B-ZP40
TTM210L	SBFVE-B-C	SBFVE-B-ZP40	SVE-3-ZP40
TTM235L	SBFVE-B-C	SVE-3-ZP40	SVE-4-ZP40
TTM265L	SVE-3-C	SVE-4-ZP40	SVE-4-ZP40

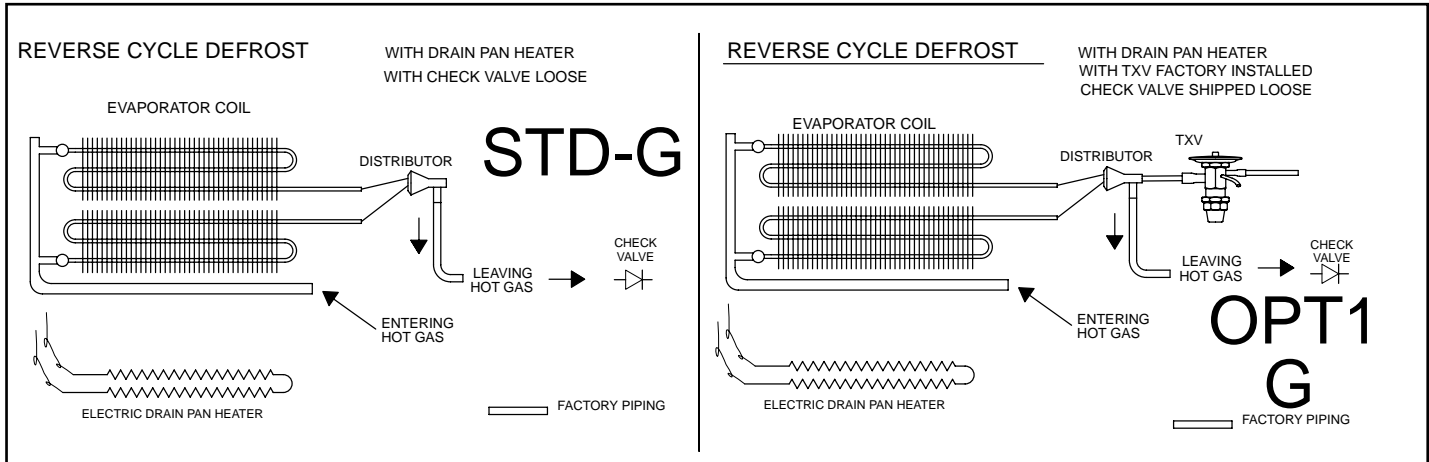
**SPORLAN - R404A R507**

Model	0°F Evap	-10°F Evap	-20°F Evap
TTM105L	SBFSE-A-C	SBFSE-A-ZP	SBFSE-A-ZP
TTM124L	SBFSE-A-C	SBFSE-A-ZP	SBFSE-B-ZP
TTM153L	SBFSE-B-C	SBFSE-B-ZP	SBFSE-B-ZP
TTM188L	SBFSE-B-C	SBFSE-B-ZP	SBFSE-C-ZP
TTM210L	SBFSE-C-C	SBFSE-C-ZP	SSE-3-ZP
TTM235L	SBFSE-C-C	SSE-3-ZP	SSE-3-ZP
TTM265L	SSE-3-C	SSE-3-ZP	SSE-4-ZP

\* For low temp. R-507, refrigerant designation changes from 'SE' to 'PE'.



**HOT GAS DEFROST (REVERSE CYCLE)**



## INSTALLATION

The installation and start-up of Two-Way 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

Two-Way Unit Coolers are designed for use in coolers and freezers such as reach in boxes, walk-in rooms and any other cooler applications where a low velocity, uniform air flow is required. The compact and low height unit provides maximum useable product storage space.

At room temperatures above 34°F (**1.1°C**) and evaporating temperatures no lower than 27°F (**-2.8°C**) the air flowing through the coil will accomplish the defrost (Air Defrost).

At room temperatures 34°F and below (to -10°F) positive defrosting is required (Electric defrost) . These will require the use of:

1. *Time Clock* (to initiate and terminate the defrost cycle),
2. *Defrost termination thermostat* (to prevent unnecessary prolonged heating and steaming of the coil once all the frost and ice has melted). And if a freezer,
3. *Fan delay thermostat* (to prevent evaporator fans starting up right away and blowing water on to the fan blades, guards and floor).

This evaporator coil must not be exposed to any abnormal environments (acidic or caustic) that can result in coil corrosion and leaks. Consult factory for optional baked on phenolic protective coatings. These unit coolers are for use primarily on R407A, R407C, R404A/R507, R22 and R134a refrigerants and their approved alternatives / replacements.

## 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 unit does not draw air in, or blow directly out, through an opened door and that the product does not obstruct the free circulation of air. Allow a minimum of 24" clearance at each end. Two-Way Unit Coolers draw air through the fans and discharge air through both coils.

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 BTUH or KW (thermal).  
The nominal rating is based at 10°F T.D. (**5.5°C**) (Room Temp. minus Evap. Temp.). Note that a higher / lower operating T.D. will increase / decrease this capacity rating by their direct ratio.
2. Determine the pressure drop across the valve by subtracting the suction (evaporating) pressure from the high side liquid pressure. Note: Also subtract the distributor pressure loss (use approx. 25 psig (**1.1 bar**) for R134a and 35 psig (**2.4 bar**) for R407A, R407C, R22, R404A, R507).
3. Estimate entering liquid temperature. Temperatures lower than 100°F (**37.7°C**) increase valve capacity ratings. Refer to valve manufacturer's specs for details.
4. Select valve from the valve manufacturer selection charts for the appropriate refrigerant, evaporating temp and pressure drop.
5. 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 5 to 8°F (**2.7° to 4.4°C**) for a 10 to 12°F (**5.5 to 6.6°C**) T.D. Too high or low a super heat will result in unsatisfactory system performance and possible compressor problems.

## NOZZLE INSTALLATION

All Two-Way unit coolers have nozzles installed at factory. For nozzle selection refer to selection table. In case it is required to install the nozzle at some point in the future, the nozzle retainer clip (in distributor) must be removed before inserting nozzle. Re-install clip ensuring nozzle is properly in place.

**MOUNTING**

Refer to dimensional drawing for recommended mounting arrangements. Formed mounting channels are provided for flush mounting to the ceiling. Ensure adequate clearance (at least 24" (600 mm)) is provided at each end (to enable access to the electrical and refrigerant compartments).

**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 1/4" (6 mm) per foot. A trap in a warm area outside the room will 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 (1.7°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 (-2.2°C) room, is satisfactory. Drain line heaters are not required for constant room temperature above 35°F (1.6°C).

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

**PIPING**

Refrigerant line sizes are important and **may not** be the same size as the coil connections. Consult "Recommended refrigerant line sizes" charts in any standard 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. On Hot Gas Defrost Systems the suction accumulator should be at least 2.5 times the coils operating charge.

See Dimensional data for line locations. Reverse Cycle models include a check valve (unmounted) packaged along with the nozzle in the refrigerant connection compartment end panel.

**WIRING**

Wire system in accordance with governing standards and local codes. See data and wiring diagrams on pages 7 to 12 for wiring arrangement. Electrical wiring is to be sized in accordance with minimum circuit ampacity rating (MCA).

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

**SYSTEM CHECK****Before Start-Up:**

1. All wiring should be in accordance with local codes.
2. Refrigerant lines should be properly sized.
3. Off cycle defrost and electric defrost systems preferably must include a liquid line solenoid valve and suction accumulator.
4. Thorough evacuation and, dehydration has been performed.
5. The suction, discharge, and receiver service valves must be open.
6. The system preferably must include a liquid line 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 35 °F (1.7 °C) on the hot gas coil. Also, it is normal for the fans to cycle a few times until the room temperature is pulled down.
3. Fan/Heater control and defrost termination control is factory installed for reverse cycle defrost operation.
4. In general, evaporators running with a TD of 10 °F should have a superheat reading of 5 to 8°F (2.7°C to 4.4°C). For evaporators with a higher TD, the superheat should be 8 to 12°F (4.4 to 6.6 °C).
5. Heavy moisture loads are usually encountered when starting the system for the first time. This will 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. This may be done by rotating the inner dial on the timer until the pin in the outer dial is directly opposite the timer pointer. (Paragon 8145-20 Timer by others).
6. Observe that the system goes through at least one complete DEFROST CYCLE.

**MAINTENANCE**

The unit should be periodically inspected for any dirt or 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.

**FOR SERVICE PARTS LOOK-UP:  
visit: [http://www.t-rp.com/serv\\_parts.htm](http://www.t-rp.com/serv_parts.htm)  
email: [parts@t-rp.com](mailto:parts@t-rp.com)  
call: 1-844-893-3222 x501**



# 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**



**NATIONAL REFRIGERATION &  
AIR CONDITIONING CANADA CORP.**  
159 Roy Blvd.  
Brantford Ontario Canada N3R 7K1  
PHONE: (519) 751-0444 800-463-9517  
FAX (519) 753-1140 [www.t-rp.com](http://www.t-rp.com)



*Due to the manufacturer's policy of continuous product improvement, we reserve the right to make changes without notice.*