



PRODUCT DATA & INSTALLATION

Bulletin T30-TTM-PDI-8
Part # 1087841

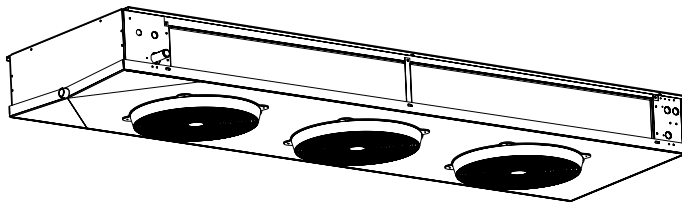
	PRODUCT SUPPORT	scan:
	web: t-rp.com/ttm	
	email: evaps@t-rp.com	
	call: 1-844-893-3222 x520	

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)



SMARTSPEED™

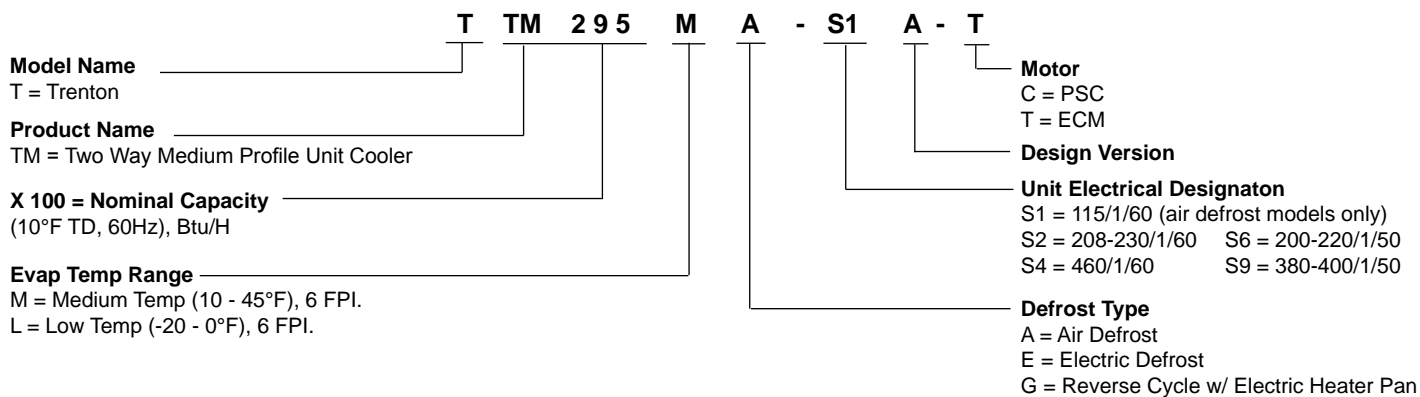
FAN MOTOR TECHNOLOGY
See Page 11 for details



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NOMENCLATURE



STANDARD FEATURES

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

AVAILABLE OPTIONS

- Factory mounted solenoid valve, TXV and Thermostat on air and electric defrost models.
- EC motors with patented SmartSpeed® Technology. (see page 11 for details)
- Corrosion protection: alternate fin materials and coatings
- Additional options available, please consult factory.

MEDIUM TEMPERATURE MODELS - CAPACITY

Model TTM		115M	139M	172M	208M	236M	260M	295M	
Number of Fans		2	2	3	3	4	4	5	
Capacity BTUH (WATTS)	Evap Temp. 25°F (-4°C)	R407A	10930	13210	16340	19760	22420	24700	28000
		R448A	(3202)	(3870)	(4789)	(5791)	(6570)	(7239)	(8214)
		R407C	10350	12510	15480	18720	21240	23400	26600
		R404A	(3033)	(3667)	(4537)	(5486)	(6224)	(6858)	(7781)
		R507	11500	13900	17200	20800	23600	26000	29500
		R22	(3370)	(4074)	(5041)	(6096)	(6916)	(7620)	(8646)
		R22	10930	13210	16340	19760	22400	24700	28000
		R134a	(3202)	(3870)	(4789)	(5791)	(6570)	(7239)	(8214)
		R134a	10350	12510	15480	18720	21240	23400	26550
		R134a	(3033)	(3667)	(4537)	(5486)	(6224)	(6858)	(7781)
Air Flow	CFM (L/s)	2020 (953)	1900 (897)	3030 (1430)	2850 (1345)	3700 (1746)	3780 (1784)	4630 (2185)	
Refrigerant ** Charge R407A	Lbs (Kg)	2.3 (1.0)	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 *

Models		105L	124L	153L	188L	210L	235L	265L	
Number of Fan TTM		2	2	3	3	4	4	5	
Capacity BTUH (WATTS)	Evap Temp. -20°F (-28.9°C)	R407A	9980	11780	14540	17860	19950	22300	25200
		R448A	(2923)	(3452)	(4260)	(5235)	(5846)	(6543)	(7378)
		R407C	9450	11160	13770	16920	18900	21150	23900
		R404A	(2769)	(3271)	(4036)	(4959)	(5539)	(6198)	(6989)
		R507	10500	12400	15300	18800	21000	23500	26500
		R22	(3077)	(3634)	(4484)	(5510)	(6154)	(6887)	(7766)
		R22	9980	11780	14540	17860	20000	22300	25200
		R134a	(2923)	(3452)	(4260)	(5235)	(5846)	(6543)	(7378)
		R134a	9450	11160	13770	16920	18900	21150	23850
		R134a	(2769)	(3271)	(4036)	(4959)	(5539)	(6198)	(6989)
Air Flow	CFM (L/s)	2020 (953)	1900 (897)	3030 (1430)	2850 (1345)	3700 (1746)	3780 (1784)	4630 (2185)	
Refrigerant ** Charge R407A	Lbs (Kg)	2.3 (1.0)	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 R448A, 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.

For R449A, use R448A data.

*** 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**

R448A	R407C	R404A	R507	R22	R134a
0.96	0.99	0.92	0.93	1.02	1.03

NO CORRECTION FACTOR REQUIRED FOR MEDIUM TEMP. UNITS

AIR DEFROST

MODEL TTM	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
115MA-S1	2	115/1/60	2.2	2.5	200	15	3	3.4	104	15
139MA-S1	2	115/1/60	2.2	2.5	200	15	3	3.4	104	15
172MA-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15
208MA-S1	3	115/1/60	3.3	3.6	300	15	4.5	4.9	156	15
236MA-S1	4	115/1/60	4.4	4.7	400	15	6	6.4	208	15
260MA-S1	4	115/1/60	4.4	4.7	400	15	6	6.4	208	15
295MA-S1	5	115/1/60	5.5	5.8	500	15	7.5	7.9	260	15
115MA-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15
139MA-S2	2	208-230/1/60	1.0	1.1	200	15	2.0	2.3	104	15
172MA-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15
208MA-S2	3	208-230/1/60	1.5	1.6	300	15	3.0	3.3	156	15
TM236MA-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15
260MA-S2	4	208-230/1/60	2.0	2.1	400	15	4.0	4.3	208	15
295MA-S2	5	208-230/1/60	2.5	2.6	500	15	5.0	5.3	260	15
115MA-S4	2	460/1/60	0.6	0.7	200	15	-	-	-	-
139MA-S4	2	460/1/60	0.6	0.7	200	15	-	-	-	-
172MA-S4	3	460/1/60	0.9	1.0	300	15	-	-	-	-
208MA-S4	3	460/1/60	0.9	1.0	300	15	-	-	-	-
236MA-S4	4	460/1/60	1.2	1.3	400	15	-	-	-	-
260MA-S4	4	460/1/60	1.2	1.3	400	15	-	-	-	-
295MA-S4	5	460/1/60	1.5	1.6	500	15	-	-	-	-

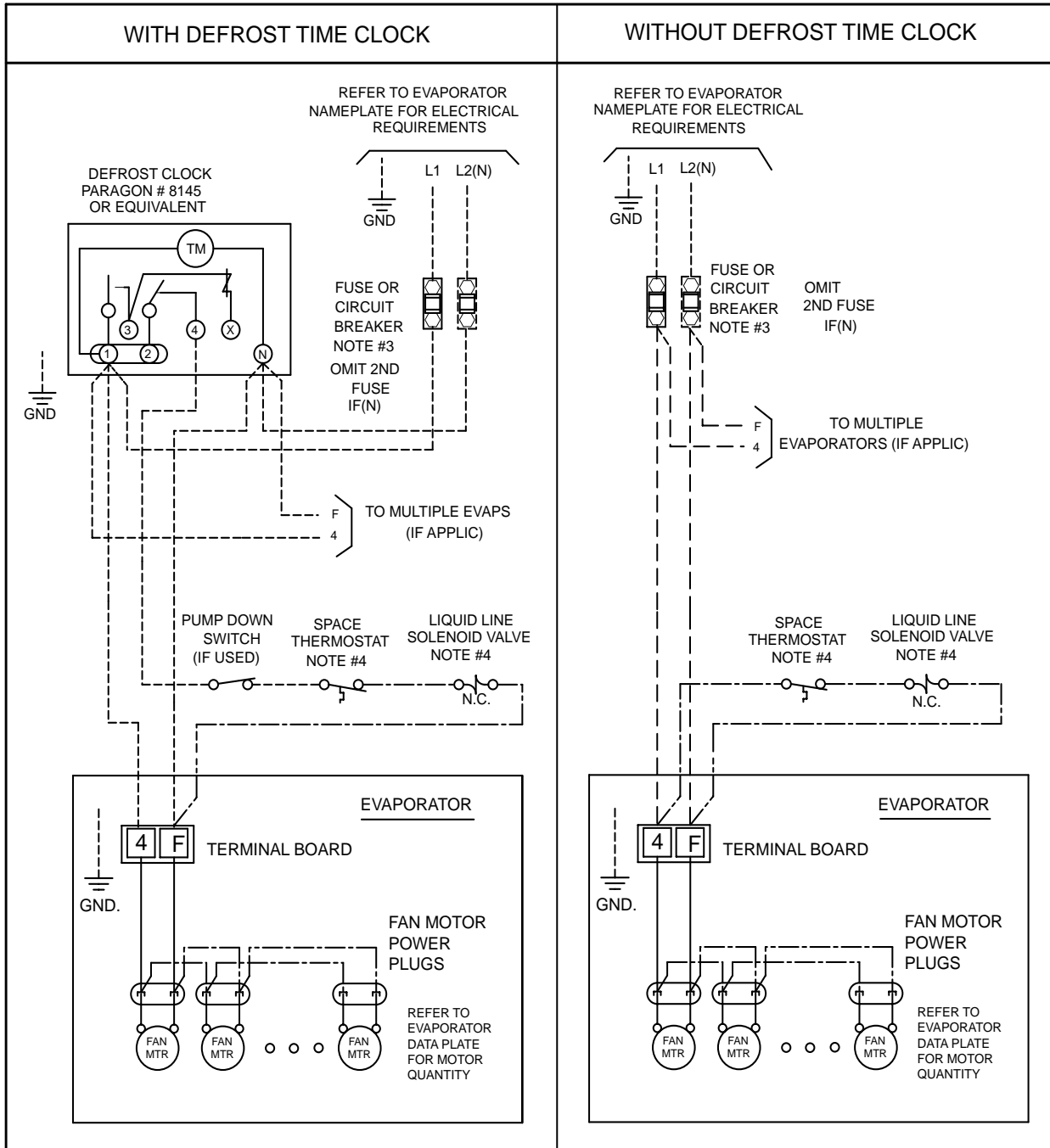
ELECTRIC DEFROST

MODEL TTM	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					
115ME-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
139ME-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
172ME-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
208ME-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
236ME-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
260ME-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
295ME-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
105LE-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
124LE-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
153LE-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
188LE-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
210LE-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
235LE-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
265LE-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 TTM	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					
115MG-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
139MG-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
172MG-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
208MG-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
236MG-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
260MG-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
295MG-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
115MG-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
139MG-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
172MG-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
208MG-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
236MG-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
260MG-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
295MG-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 .

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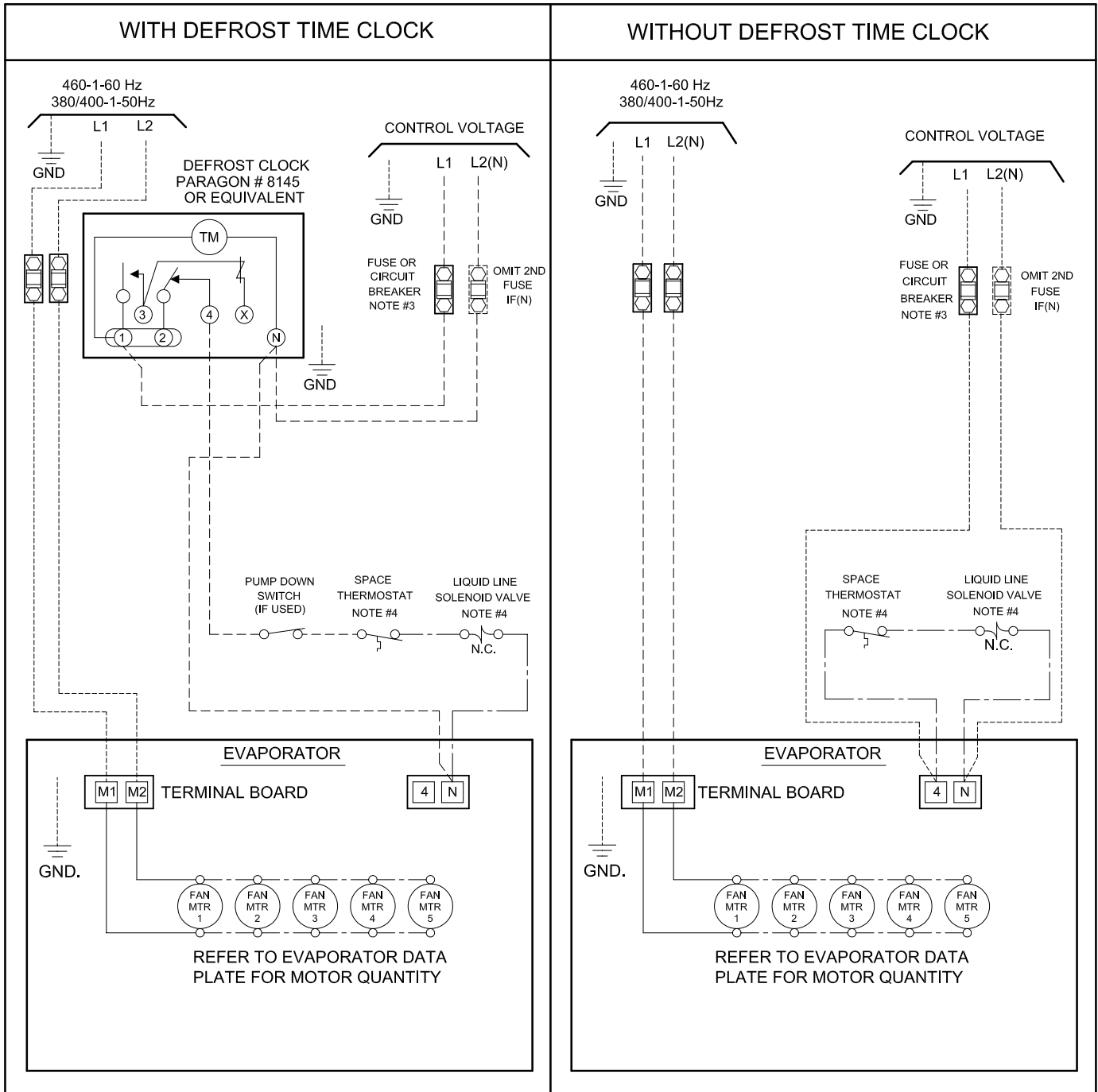
TERMINALS

- -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.



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

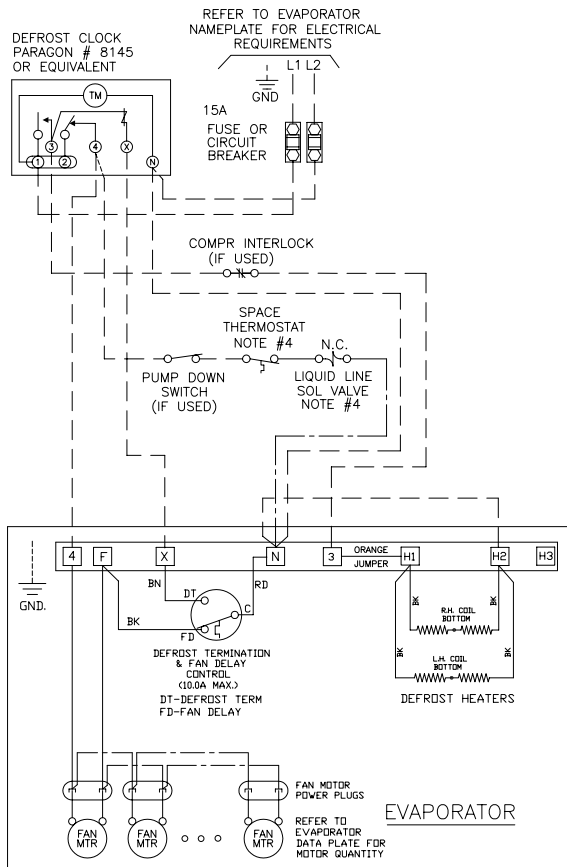
CONDUCTORS/WIRING

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

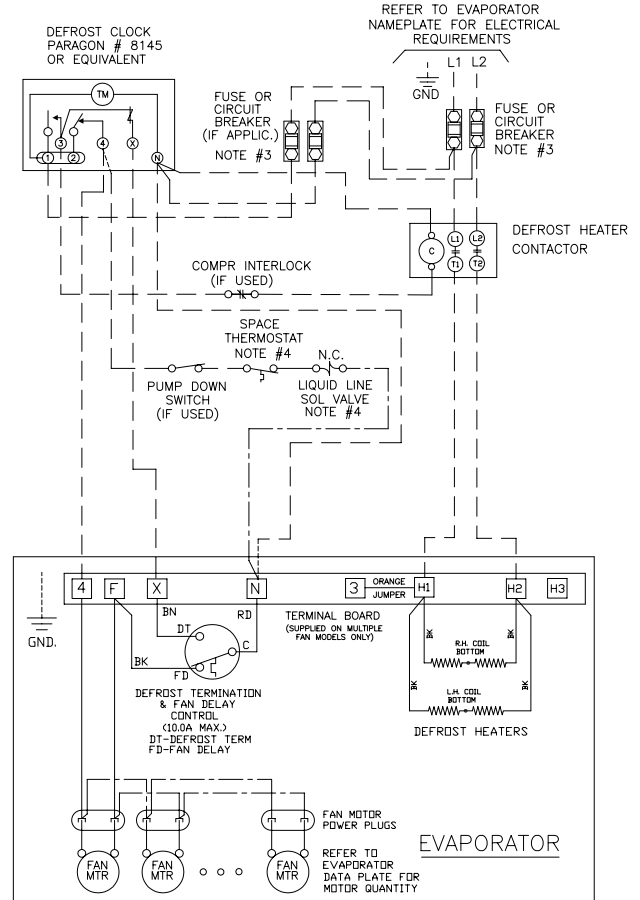
ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

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

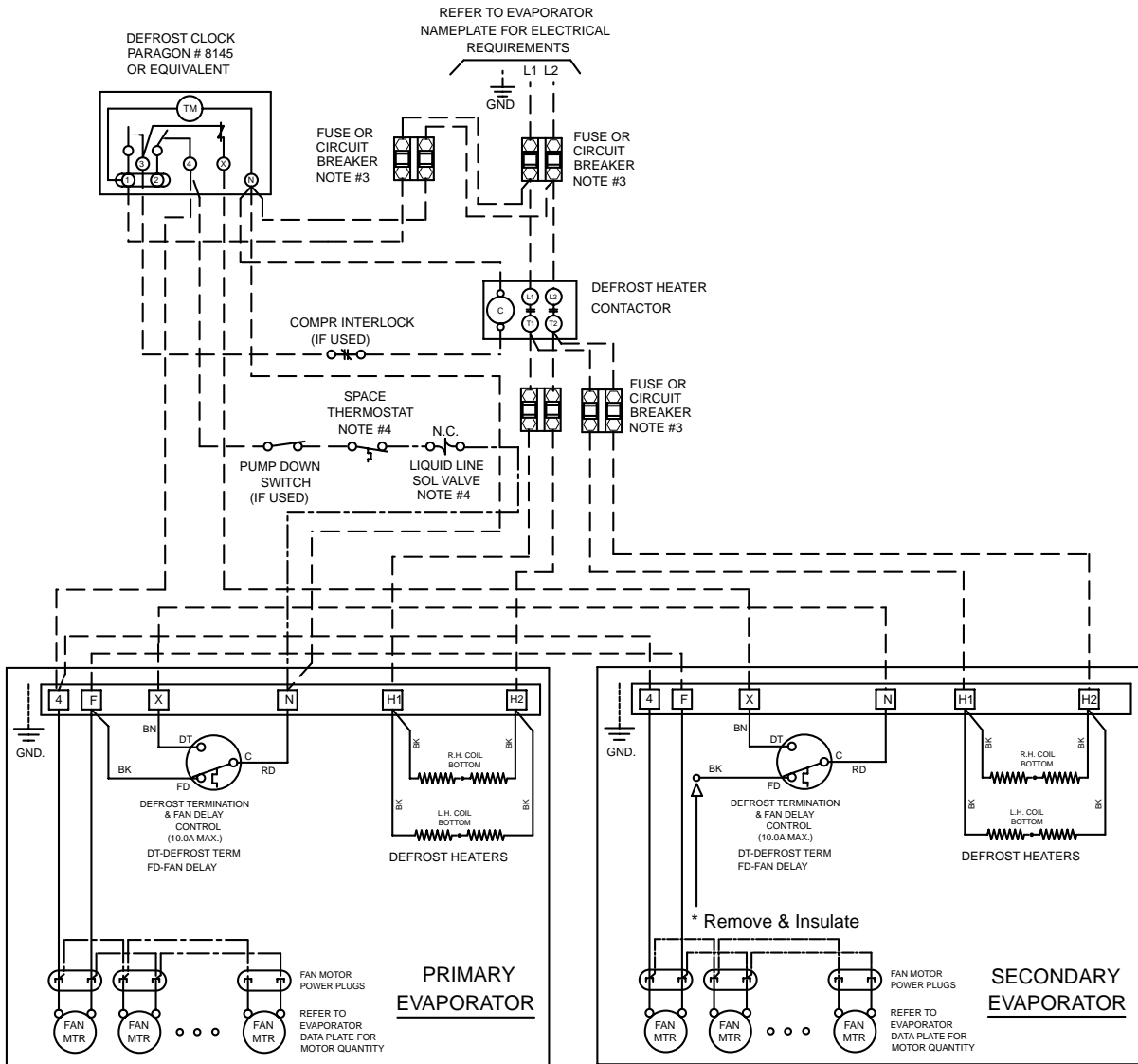
CONDUCTORS/WIRING

- 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

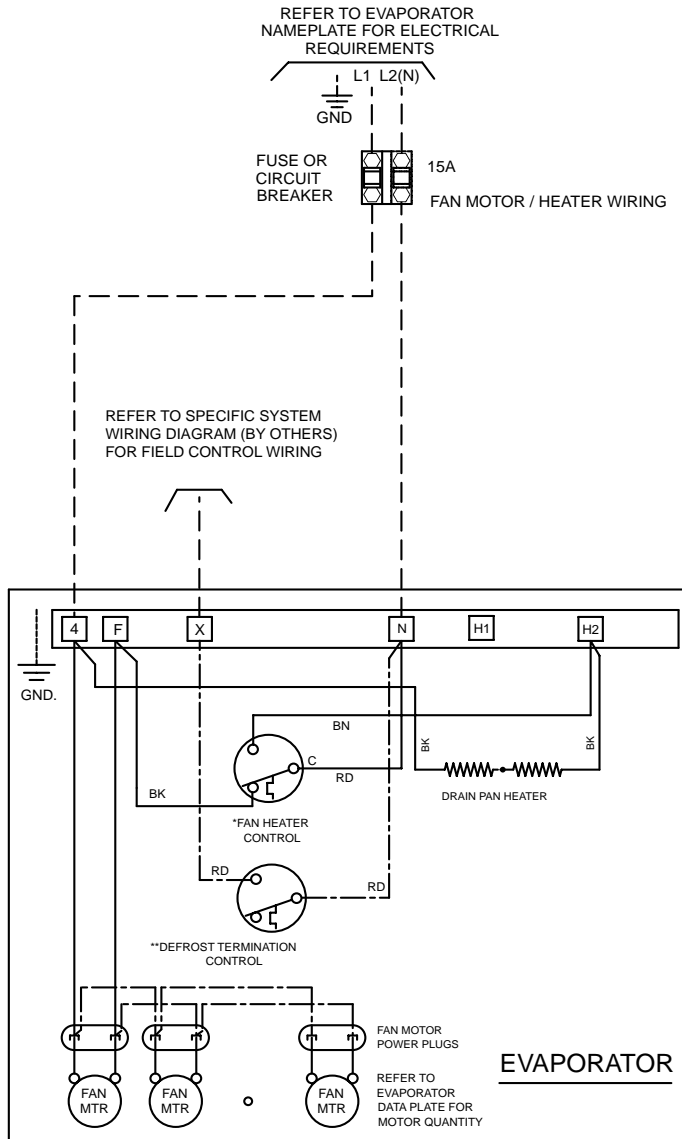
CONDUCTORS/WIRING

- 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

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TERMINALS

- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

CONDUCTORS/WIRING

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

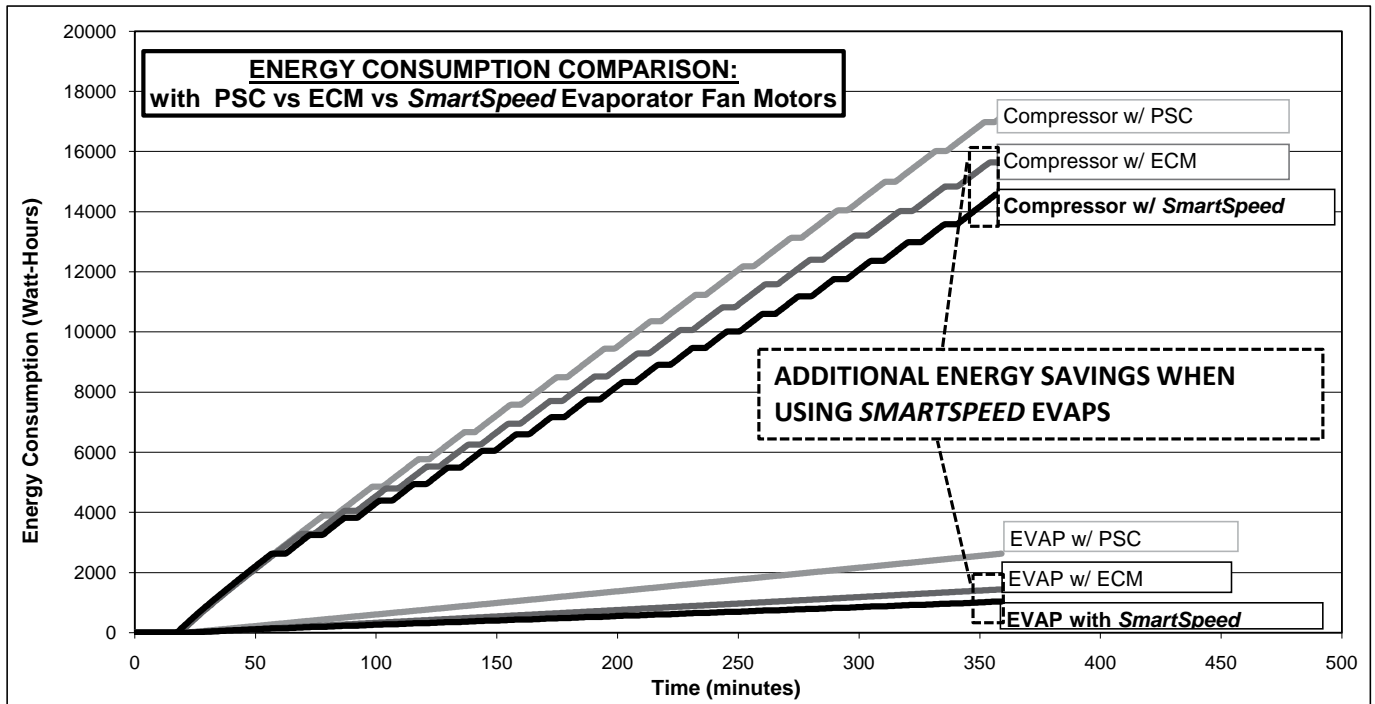
ALL FIELD WIRING MUST BE DONE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

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

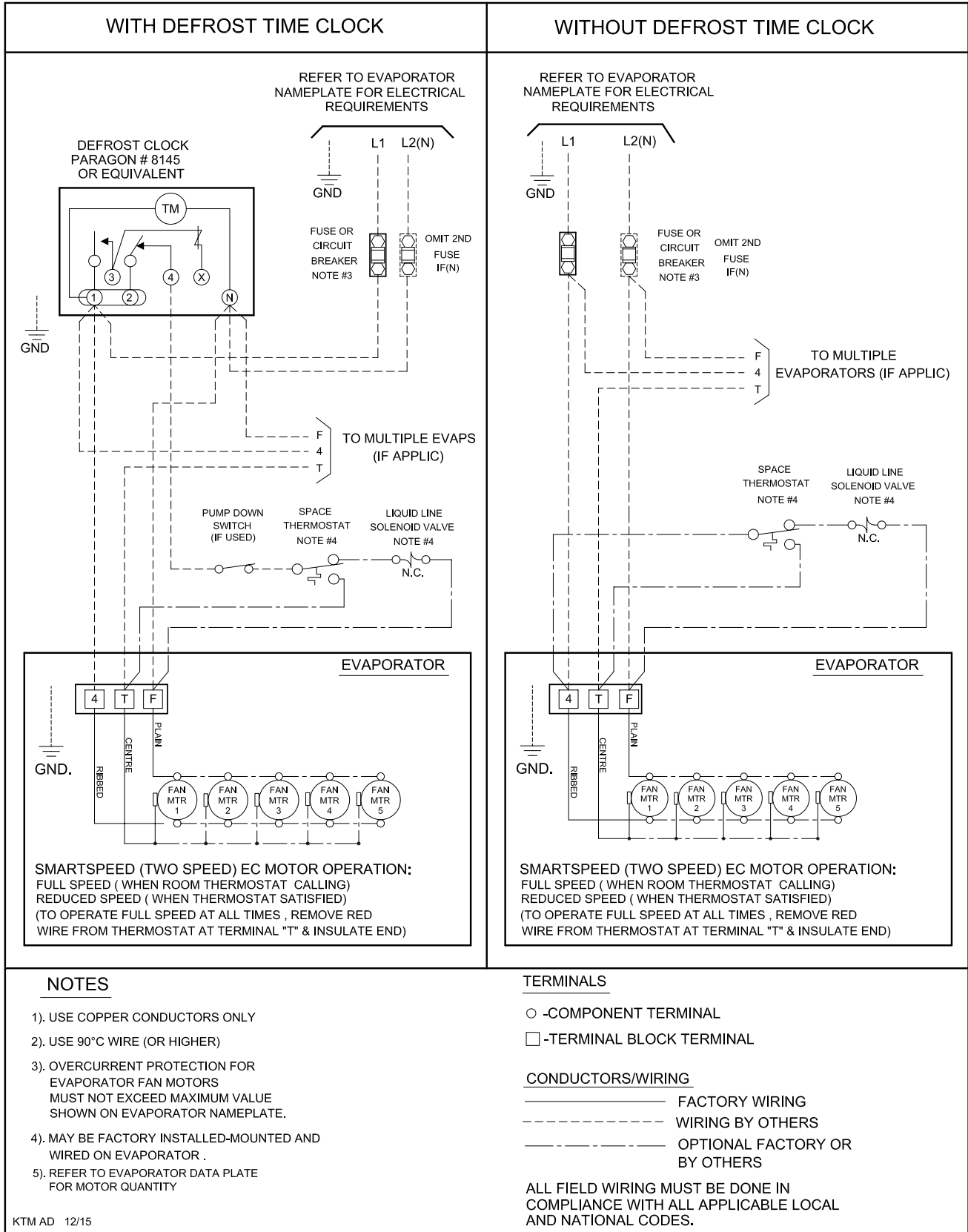
EC motors are factory wired for SmartSpeed operation on evaporators equipped **with** a factory installed thermostat.

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

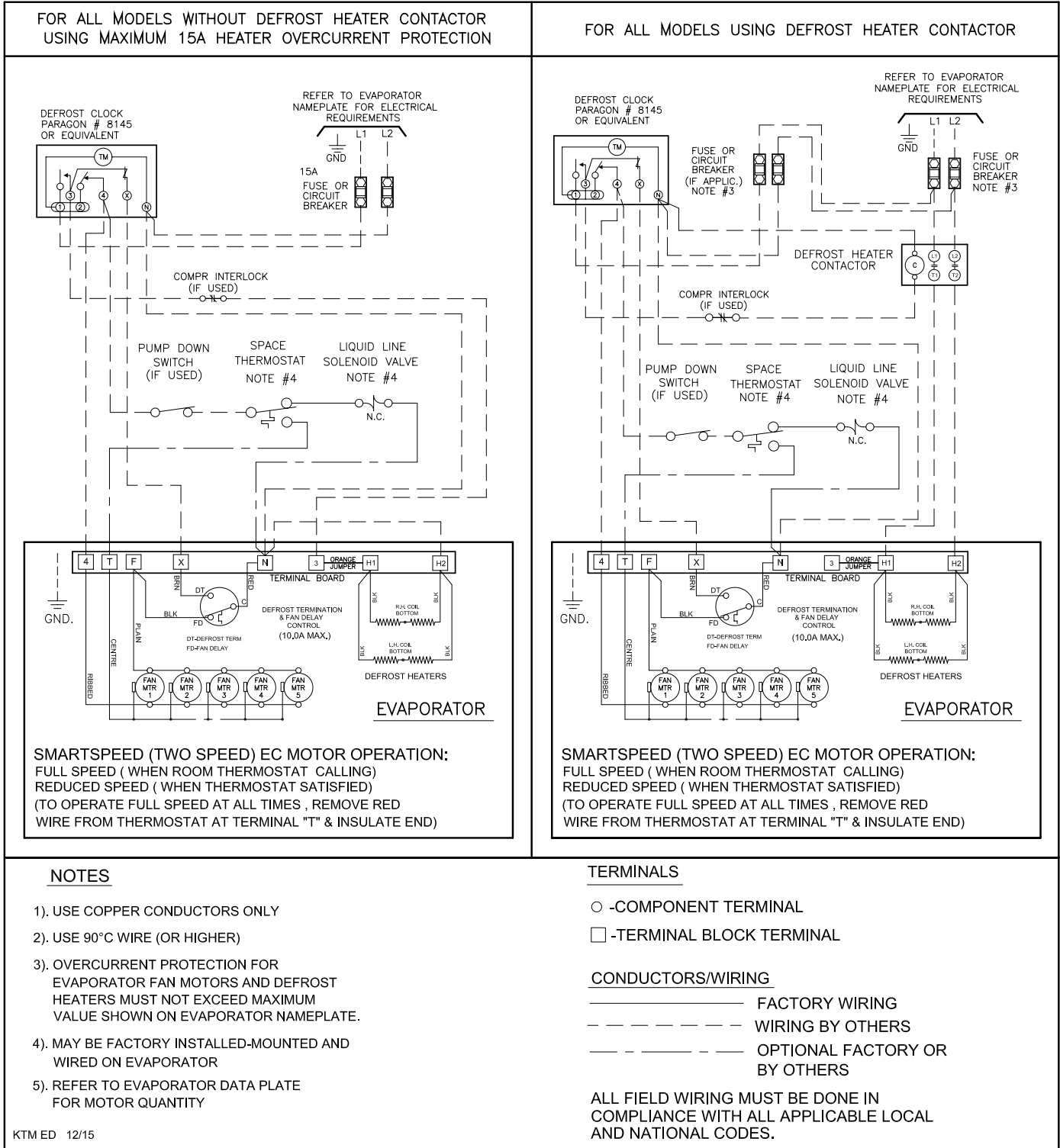
WIRING DIAGRAM - ALL VOLTAGES

OPTIONAL EC MOTOR with SMARTSPEED™

AIR DEFROST MODELS



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

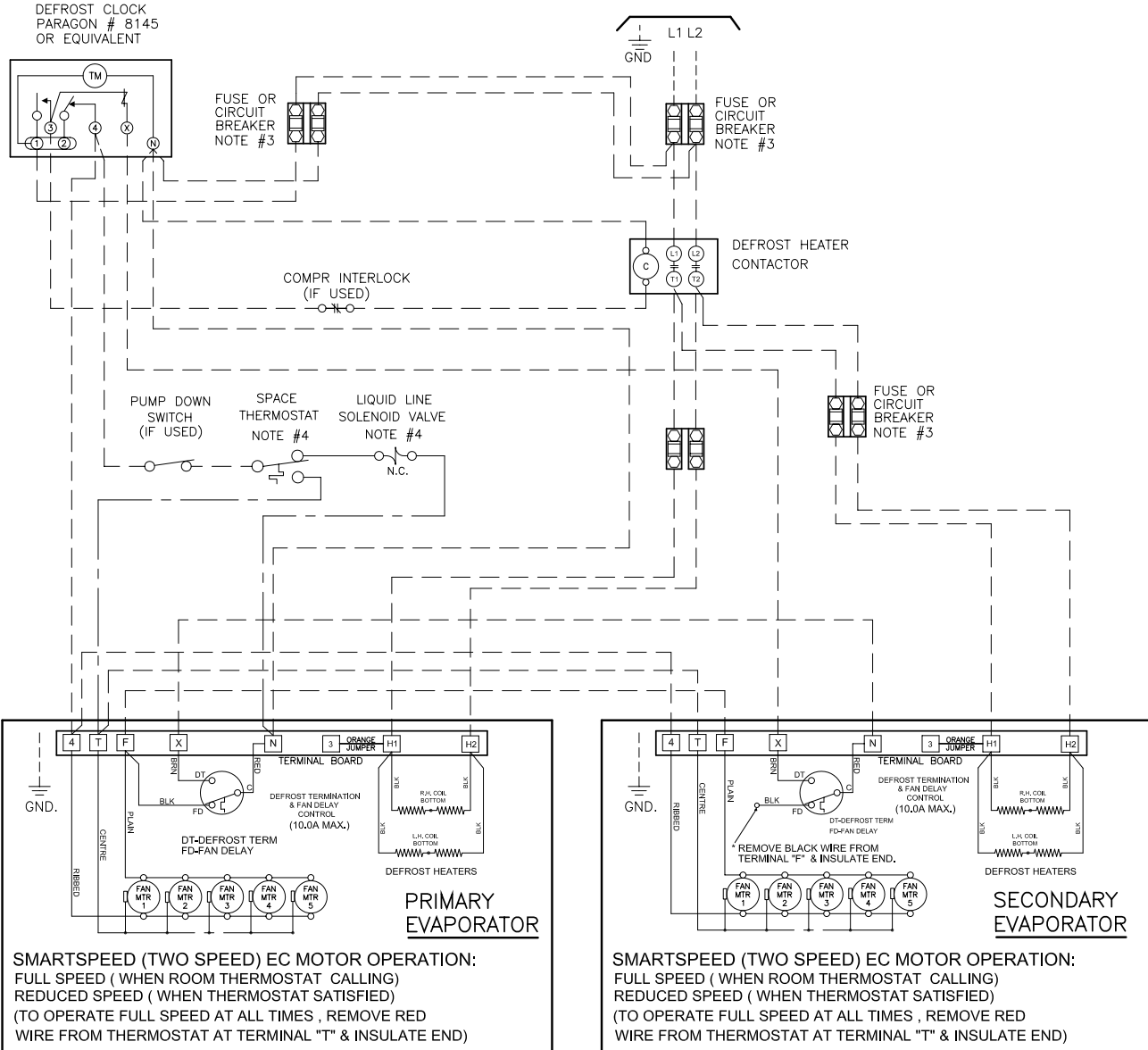


WIRING DIAGRAM - 208-230/1/60

OPTIONAL EC MOTOR with SMARTSPEED™

ELECTRIC DEFROST MODELS - MULTIPLE EVAPORATOR

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



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

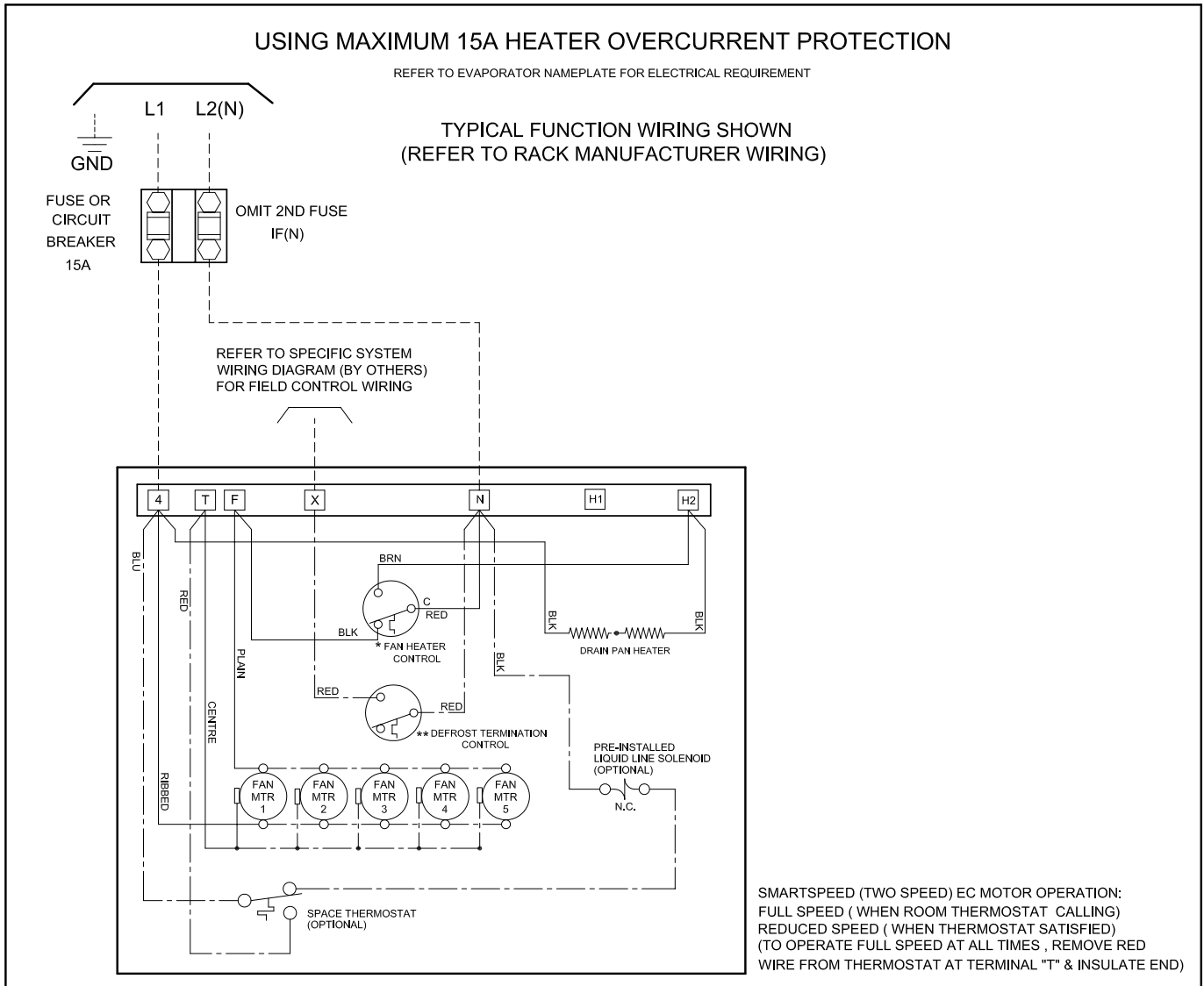
- -COMPONENT TERMINAL
- -TERMINAL BLOCK TERMINAL

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

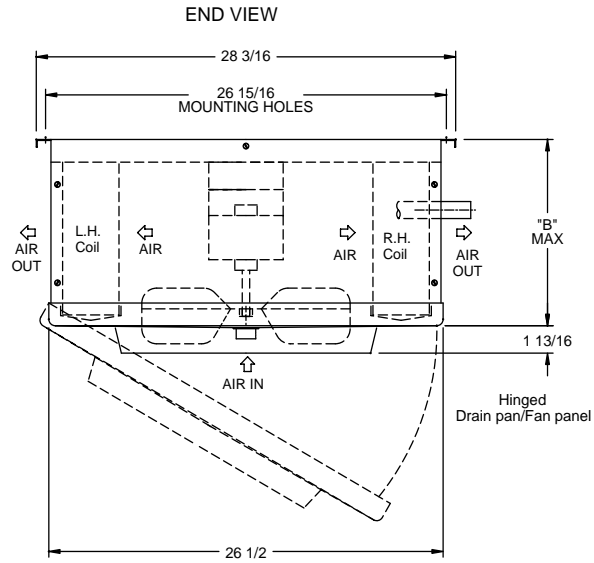


<p>* FAN HEATER CONTROL ON REVERSE CYCLE LOCATED AT SUCTION LINE.</p> <p>** DEFROST TERMINATION CONTROL OPTIONAL FACTORY WIRED OR BY OTHERS LOCATED ON TUBE END SHEET THE CONTROL CLOSURES WHEN REACHES 55° F (20 F DIFF)</p>	<p>NOTE: DURING THE HOT GAS DEFROST CYCLE THE FAN/HEATER CONTROL DE-ENERGIZES THE 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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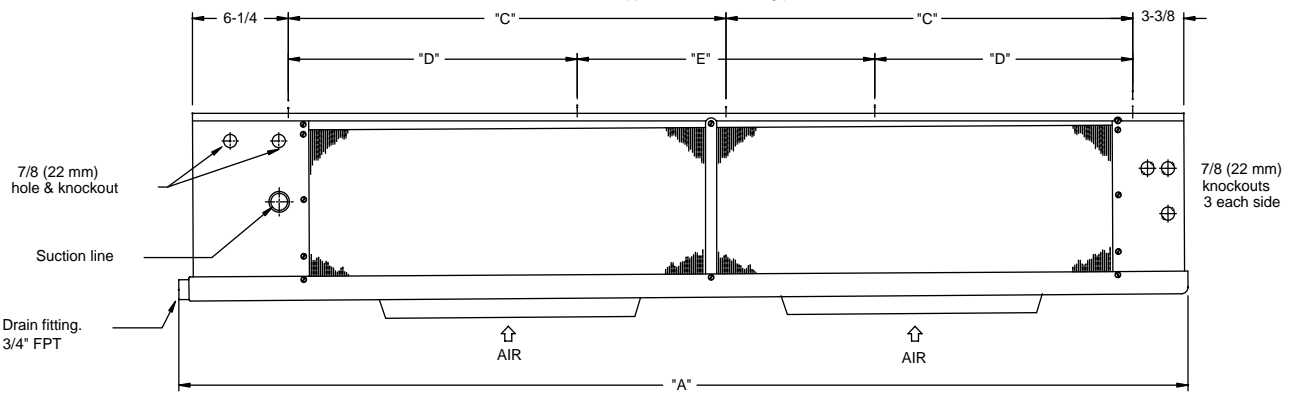
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| <p>NOTES</p> <ol style="list-style-type: none"> 1). USE COPPER CONDUCTORS ONLY 2). USE 90°C WIRE (OR HIGHER) 3). OVERCURRENT PROTECTION FOR EVAPORATOR FAN MOTORS AND DEFROST HEATERS MUST NOT EXCEED MAXIMUM VALUE SHOWN ON EVAPORATOR NAMEPLATE. 4). MAY BE FACTORY INSTALLED-MOUNTED AND WIRED ON EVAPORATOR 5). REFER TO EVAPORATOR DATA PLATE FOR MOTOR QUANTITY <p>KTM HG 12/15</p> | <p>TERMINALS</p> <p>○ -COMPONENT TERMINAL</p> <p>□ -TERMINAL BLOCK TERMINAL</p> <p>CONDUCTORS/WIRING</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> |
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MODEL TTM	TUBE CONNECTIONS						APPROX. SHIPPING WEIGHT	
	SUCTION (OD)		DISTRIBUTOR INLET		HOT GAS SIDE (OD)			
	Inches	mm	Inches	mm	Inches	mm	Lbs.	Kgs
115M	7/8	22	1/2	13	1/2	13	110	50
139M	7/8	22	1/2	13	1/2	13	116	53
172M	7/8	22	1/2	13	1/2	13	150	68
208M	1 1/8	29	1/2	13	1/2	13	157	71
236M	1 1/8	29	1/2	13	1/2	13	164	74
260M	1 1/8	29	7/8	22	5/8	16	191	87
295M	1 1/8	29	7/8	22	5/8	16	198	90
105L	7/8	22	1/2	13	1/2	13	110	50
124L	1 1/8	29	1/2	13	1/2	13	116	53
153L	1 1/8	29	1/2	13	1/2	13	150	68
188L	1 1/8	29	7/8	22	5/8	16	157	71
210L	1 1/8	29	7/8	22	5/8	16	164	74
235L	1 3/8	35	7/8	22	5/8	16	191	87
265L	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

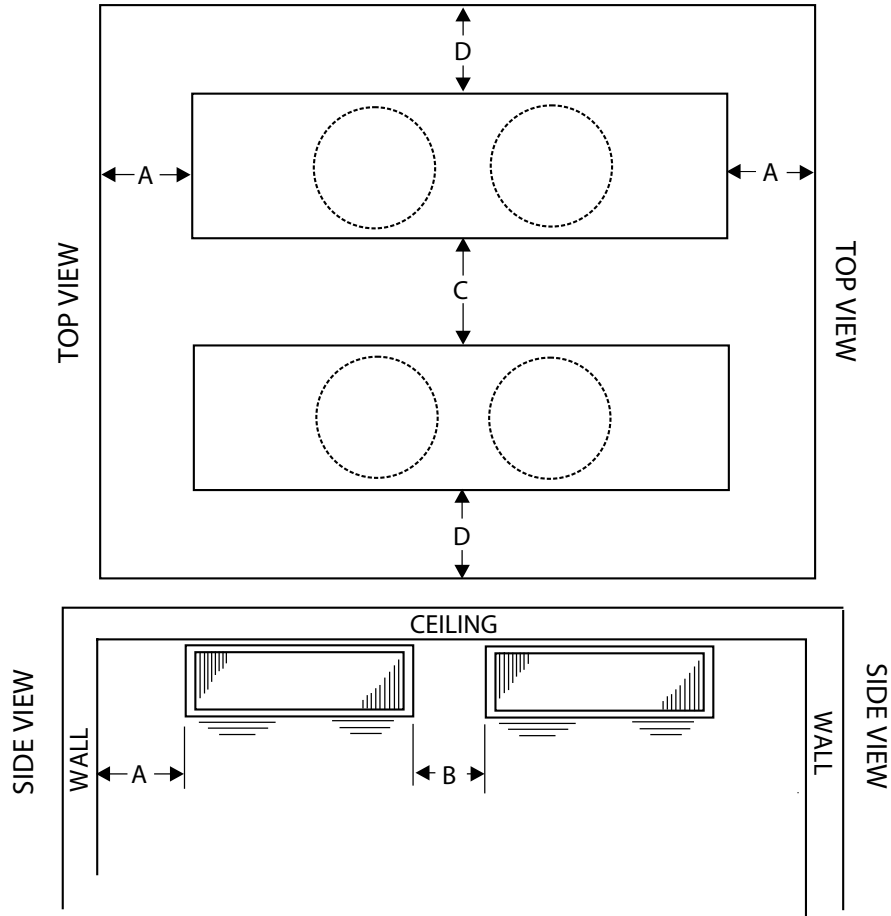


DIMENSIONS

MODEL TTM	# FANS	A		B		C		D		E	
		in	mm	in	mm	in	mm	in	mm	in	mm
115M	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
139M	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
172M	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
208M	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
236M	4	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
260M	4	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
295M	5	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
105L	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
124L	2	67 1/2	1715	8 11/16	221	27 1/2	699	-	-	-	-
153L	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
188L	3	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
210L	4	93 1/2	2375	8 11/16	221	40 1/2	1029	-	-	-	-
235L	4	113 1/2	2883	8 11/16	221	-	-	40 1/2	1029	20	508
265L	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 TTM	Nozzle
115M	L-1
139M	L-1 1/2
172M	L-1 1/2
208M	L-2
236M	L-2
260M	G-2 1/2
295M	G-3

Model TTM	Nozzle
105L	L-1 1/2
124L	L-2
153L	L-2
188L	G-2 1/2
210L	G-3
235L	E-3
265L	E-4

MEDIUM TEMP - EXPANSION VALVE SELECTION

SPORLAN

MODEL TTM	TD	R404A	R448A
		R507 *	R407A R407C R22
115M	10	SBFSE-A-C	SSE-3-C
	15	SBFSE-B-C	SBFVE-A-C
139M	10	SBFSE-A-C	SBFVE-A-C
	15	SBFSE-B-C	SBFVE-B-C
172M	10	SBFSE-B-C	SBFVE-A-C
	15	SBFSE-C-C	SBFVE-B-C
208M	10	SBFSE-B-C	SBFVE-B-C
	15	SSE-3-C	SBFVE-B-C
236M	10	SBFSE-B-C	SBFVE-B-C
	15	SSE-3-C	SBFVE-C-C
260M	10	SBFSE-C-C	SBFVE-B-C
	15	SSE-4-C	SBFVE-C-C
295M	10	SSE-3-C	SBFVE-B-C
	15	SSE-4-C	SBFVE-C-C

ALCO

MODEL TTM	TD	R404A	R22
		R507	R407C
208M	10	HFESC - 1-1/2 - SC	HFESC - 2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
236M	10	HFESC - 2 - SC	HFESC - 2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
260M	10	HFESC - 2 - SC	HFESC - 2-1/2 - HC
	15	HFESC - 3-1/2 - SC	HFESC - 3 - HC
295M	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'.

For R449A, use R448A data.

DANFOSS

MODEL TTM	TD	R404A	R22
		R507	R407C
115M	10	TUAE-R404A-6-N	TUAE-R22-6-N
	15	TUAE-R404A-8	TUAE-R22-7-N
139M	10	TUAE-R404A-7-N	TUAE-R22-6-N
	15	TUAE-R404A-8-N	TUAE-R22-7-N
172M	10	TUAE-R404A-7-N	TUAE-R22-7-N
	15	TUAE-R404A-9-N	TUAE-R22-8-N
208M	10	TUAE-R404A-8-N	TUAE-R22-7-N
	15	TUAE-R404A-9-N	TUAE-R22-8-N
236M	10	TUAE-R404A-8-N	TUAE-R22-8-N
	15	TCAE-R404A-1-N	TUAE-R22-9-N
260M	10	TUAE-R404A-9-N	TUAE-R22-8-N
	15	TCAE-R404A-2-N	TUAE-R22-9-N
295M	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** **R448A**

SPORLAN - **R404A** **R507**

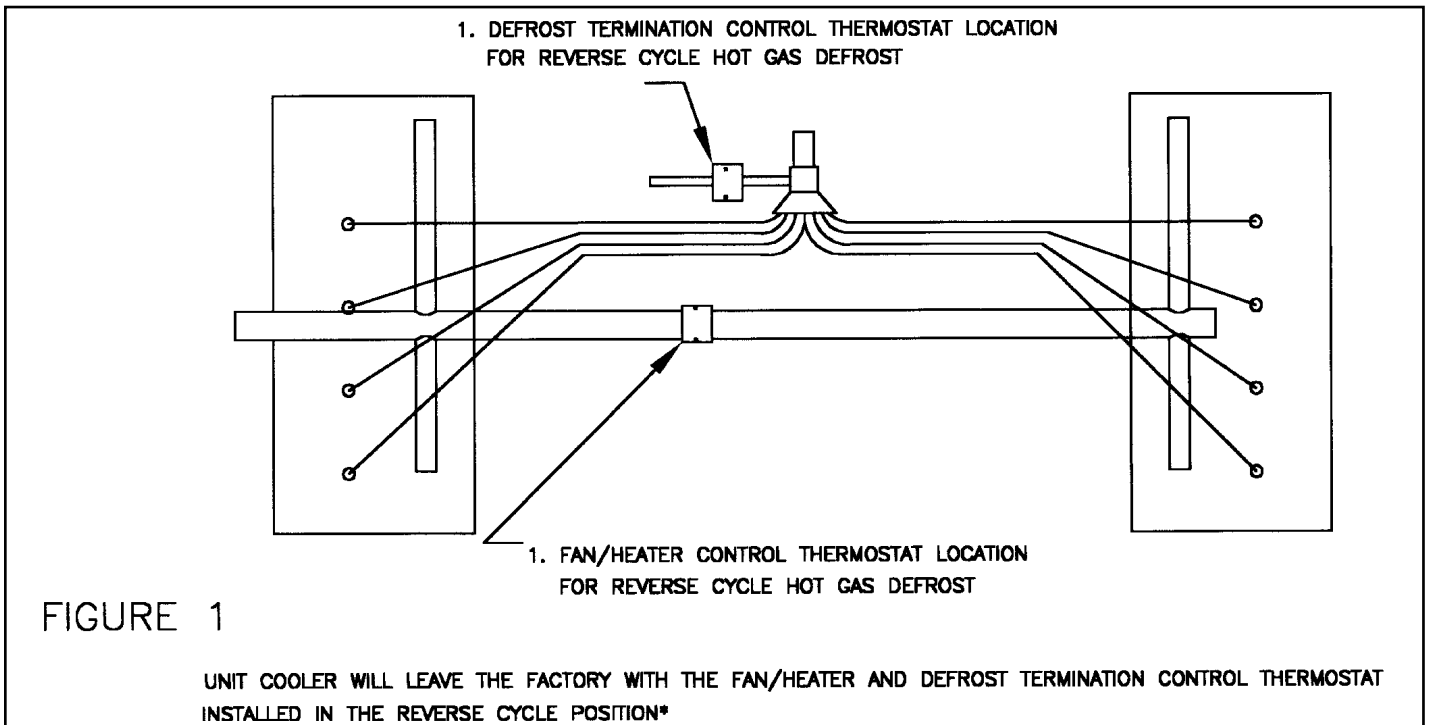
Model TTM	0°F Evap	-10°F Evap	-20°F Evap
105L	SBFVE-A-C	SBFVE-A-ZP40	SBFVE-A-ZP40
124L	SBFVE-A-C	SBFVE-A-ZP40	SBFVE-B-ZP40
153L	SBFVE-A-C	SBFVE-B-ZP40	SBFVE-B-ZP40
188L	SBFVE-B-C	SBFVE-B-ZP40	SBFVE-B-ZP40
210L	SBFVE-B-C	SBFVE-B-ZP40	SVE-3-ZP40
235L	SBFVE-B-C	SVE-3-ZP40	SVE-4-ZP40
265L	SVE-3-C	SVE-4-ZP40	SVE-4-ZP40

Model TTM	0°F Evap	-10°F Evap	-20°F Evap
105L	SBFSE-A-C	SBFSE-A-ZP	SBFSE-A-ZP
124L	SBFSE-A-C	SBFSE-A-ZP	SBFSE-B-ZP
153L	SBFSE-B-C	SBFSE-B-ZP	SBFSE-B-ZP
188L	SBFSE-B-C	SBFSE-B-ZP	SBFSE-C-ZP
210L	SBFSE-C-C	SBFSE-C-ZP	SSE-3-ZP
235L	SBFSE-C-C	SSE-3-ZP	SSE-3-ZP
265L	SSE-3-C	SSE-3-ZP	SSE-4-ZP

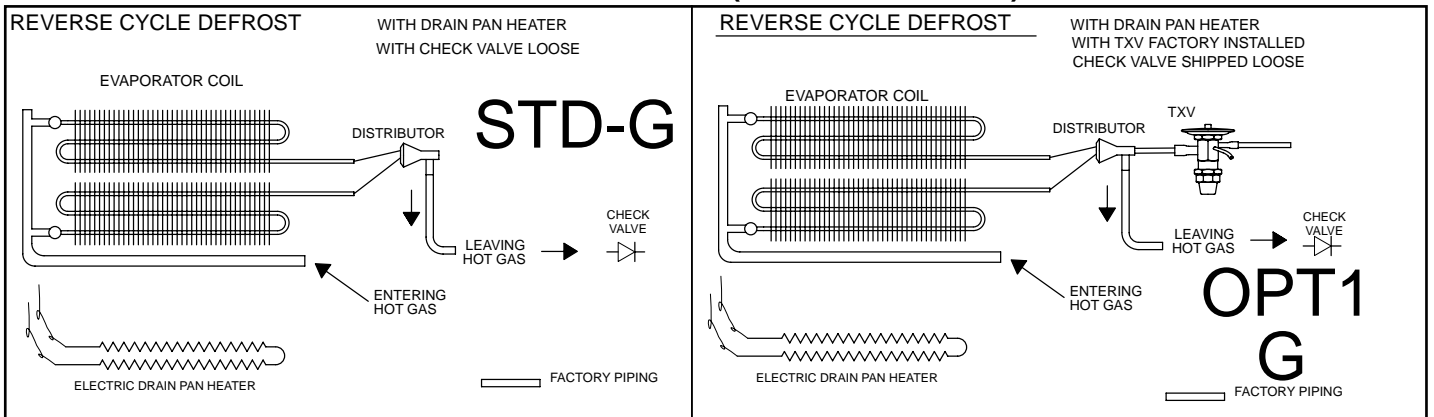
For R449A, use R448A data.

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

FAN/HEATER CONTROL AND DEFROST
TERMINATION CONTROL POSITION



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 R404A/R507/R22/R407A/R448A).
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.

PROJECT INFORMATION


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

 <p>PRODUCT SUPPORT</p>	<p><i>web:</i> t-rp.com/ttm <i>email:</i> evaps@t-rp.com <i>call:</i> 1-844-893-3222 x520</p>
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 <p>TROUBLESHOOTING</p>	<p><i>email:</i> troubleshooting@t-rp.com <i>call:</i> 1-844-893-3222 x529</p>
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 <p>SERVICE PARTS</p>	<p><i>web:</i> t-rp.com/parts <i>email:</i> parts@t-rp.com <i>call:</i> 1-844-893-3222 x501</p>
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 <p>WARRANTY</p>	<p><i>web:</i> t-rp.com/warranty <i>email:</i> warranty@t-rp.com <i>call:</i> 1-844-893-3222 ext. 501</p>
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 <p>ORDERS</p>	<p><i>email:</i> orders@t-rp.com <i>call:</i> 1-844-893-3222 x501</p>
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 <p>SHIPPING</p>	<p><i>email:</i> shipping@t-rp.com <i>call:</i> 1-844-893-3222 x503</p>
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“AS BUILT” SERVICE PARTS LIST

Service Parts List Label To Be Attached HERE



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