



THP Air Defrost

60
Hz

**HIGH PROFILE
EVAPORATOR**

**PRODUCT DATA &
INSTALLATION**



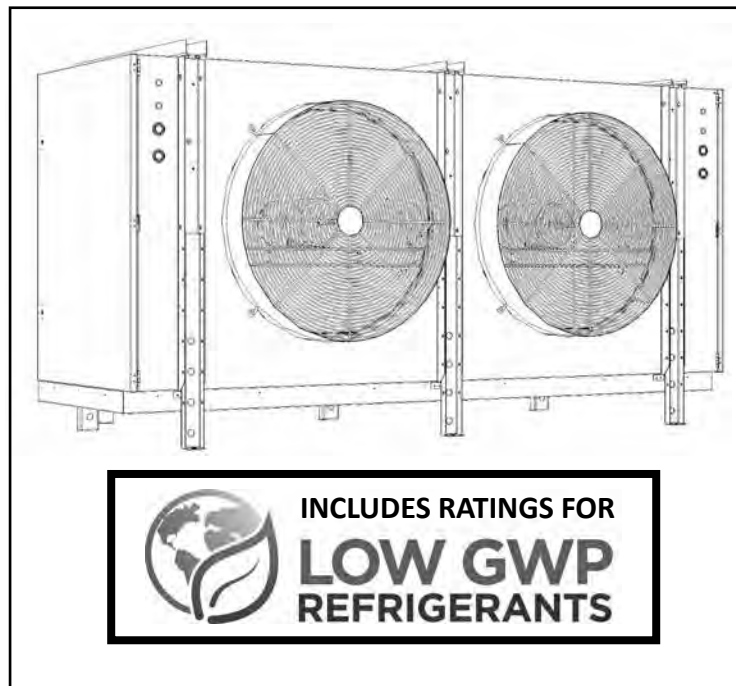
**HIGH & MEDIUM
TEMPERATURE
AIR DEFROST**

**ELECTRICAL POWER:
208-230/3/60, 460/3/60, 575/3/60**

Bulletin T30-THPA-PDI-4

1081586

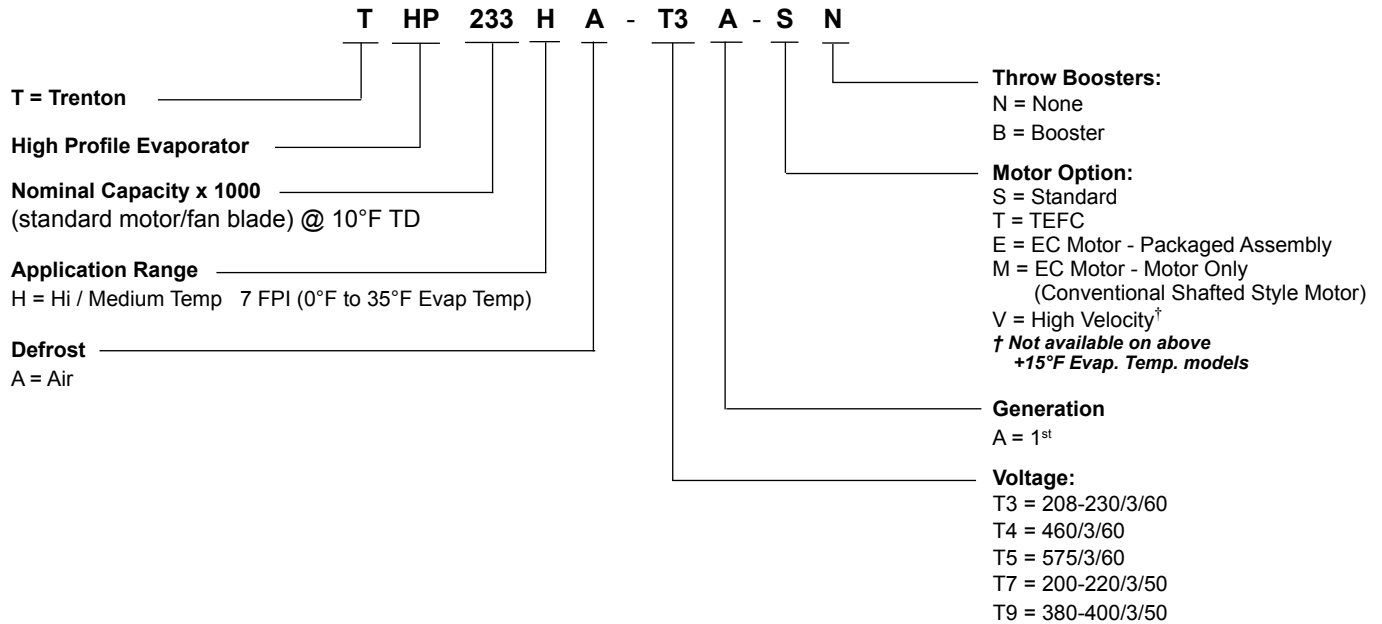
? Questions about this product?
Email: evaps@t-rp.com
Call: 1-844-893-3222 x520 **?**



CONTENTS

	Page
Nomenclature.....	2
Features & Options.....	2
Capacity Data.....	3
Electrical Data.....	4
Wiring Diagrams.....	5 - 7
Dimensional Data.....	8 - 9
Specifications.....	9
Installation Instructions.....	10 - 11
Service Parts	12
Warranty.....	15
Project Information.....	15
“As Built” Service Parts List.....	BACK

NOMENCLATURE



STANDARD FEATURES

- Compatible with Low GWP Refrigerants
- Heavy gauge textured aluminum cabinet with galvanized steel hangers, support channels and end plates
- Hinged access panels with removable hinge pins and captive fasteners.
- Hinged drain pan with removable hinge pins
- Rugged heavy-gauge galvanized steel rail motor mount / support.
- Stackable design
- Schrader fitting and external equalizer line.
- Factory installed solenoid valve wire harness
- Unit shipped upright for convenient handling and quick installation.

OPTIONAL FEATURES

- Factory mounted TX valve, solenoid valve and thermostat
- Throw boosters
- Insulated drain pan
- EC motors (shafted motor only or packaged) available in two speed or variable speed (Title 24) operation, or controls by others
- TEFC motors
- Optional fin spacing
- Optional fin materials
- Optional coil coating

High and Medium Temperature Models - Capacity @ 7 F.P.I.

High / Medium Temp. Models		073HA	086HA	113HA	130HA	154HA	170HA	189HA	233HA	252HA	278HA	
Capacity BTUH (WATTS)	Evap Temp. 25°F (-4°C)	R407A	69350 (20313)	81700 (23930)	107350 (31443)	123500 (36173)	146300 (42852)	161500 (47303)	179600 (52590)	221400 (64834)	239400 (70120)	264100 (77355)
		R407C	65700 (19244)	77400 (22670)	101700 (29788)	117000 (34269)	138600 (40596)	153000 (44814)	170600 (49822)	210300 (61421)	227400 (66430)	250900 (73283)
		R404A	73000	86000	113000	130000	154000	170000	189000	233000	252000	278000
		R507	(21382)	(25189)	(33098)	(38077)	(45107)	(49793)	(55358)	(68246)	(73811)	(81426)
		R22	69350 (20313)	81700 (23930)	107350 (31443)	123500 (36173)	146300 (42852)	161500 (47303)	179600 (52590)	221400 (64834)	239400 (70120)	264100 (77355)
	R134a	65700 (19244)	77400 (22670)	101700 (29788)	117000 (34269)	138600 (40596)	153000 (44814)	170100 (49822)	209700 (61421)	226800 (66430)	250200 (73283)	
Air Flow	CFM (L/S)	16400 (7739)	15200 (7173)	15600 (7362)	22800 (10759)	24700 (11656)	23500 (11090)	25400 (11986)	35600 (16800)	33800 (15950)	31000 (14629)	
Refrigerant ** Charge R407A	LB. (KG)	22 (9.9)	30 (13)	44 (20)	44 (20)	55 (25)	66 (30)	97 (44)	108 (50)	130 (59)	173 (78)	

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.

Derate capacity by 0.92 and CFM by .85 for Throw Booster Option.

** REFRIGERANT CHARGE CONVERSION FACTORS

R407C	R404A	R507	R22	R134a
0.99	0.92	0.93	1.02	1.03

Average Air Throw - ft (m)[†]

STANDARD FAN AND MOTOR	OPTIONAL THROW BOOSTER
110 (33)	150 (46)

[†] Measured in open space. Actual throw may be less in real applications.

208-230/3/60

MODEL	FAN MOTOR QTY	HP	STANDARD				ECM *			
			MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)	MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)
THP073HA-T3A	2	1	9.6	2200	10.8	15	12.4	1740	14	20
THP086HA-T3A	2	1	9.6	2200	10.8	15	12.4	1740	14	20
THP113HA-T3A	2	1.5	11.2	2880	15.1	20	12.4	2560	14	20
THP130HA-T3A	3	1	14.4	3300	15.6	20	18.6	2610	20.2	25
THP154HA-T3A	3	1.5	16.8	4320	20.1	25	18.6	3840	20.2	25
THP170HA-T3A	3	1.5	16.8	4320	20.1	25	18.6	3840	20.2	25
THP189HA-T3A	3+	1.5	16.8	4320	20.1	25	18.6	3840	20.2	25
THP233HA-T3A	4	1.5	22.4	5760	30.1	35	24.8	5120	30.1	35
THP252HA-T3A	4	1.5	22.4	5760	30.1	35	24.8	5120	30.1	35
THP278HA-T3A	4	1.5	22.4	5760	30.1	35	24.8	5120	30.1	35

460/3/60

MODEL	FAN MOTOR QTY	HP	STANDARD				ECM *			
			MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)	MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)
THP073HA-T4A	2	1	4.8	2200	5.4	15	6.2	1740	7	15
THP086HA-T4A	2	1	4.8	2200	5.4	15	6.2	1740	7	15
THP113HA-T4A	2	1.5	5.6	2980	6.3	15	6.2	2560	7	15
THP130HA-T4A	3	1	7.2	3300	7.8	15	9.3	2610	10.1	15
THP154HA-T4A	3	1.5	8.4	4470	9.1	15	9.3	3840	10.1	15
THP170HA-T4A	3	1.5	8.4	4470	9.1	15	9.3	3840	10.1	15
THP189HA-T4A	3+	1.5	8.4	4470	9.1	15	9.3	3840	10.1	15
THP233HA-T4A	4	1.5	11.2	5960	15.1	20	12.4	5120	15.1	20
THP252HA-T4A	4	1.5	11.2	5960	15.1	20	12.4	5120	15.1	20
THP278HA-T4A	4	1.5	11.2	5960	15.1	20	12.4	5120	15.1	20

575/3/60

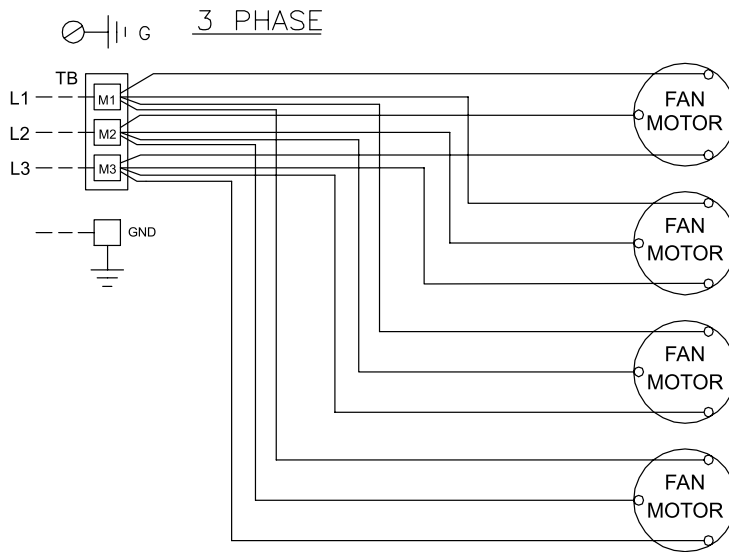
MODEL	FAN MOTOR QTY	HP	STANDARD				ECM *			
			MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)	MOTOR FLA TOTAL	WATTS	MIN. CIRC. AMPACITY (A)	MAX. FUSE (AMPS)
THP073HA-T5A	2	1	4.8	2180	5.4	15	NA	NA	NA	NA
THP086HA-T5A	2	1	4.8	2180	5.4	15	NA	NA	NA	NA
THP113HA-T5A	2	1.5	4.6	2860	5.2	15	NA	NA	NA	NA
THP130HA-T5A	3	1	7.2	3270	7.8	15	NA	NA	NA	NA
THP154HA-T5A	3	1.5	6.9	4290	7.5	15	NA	NA	NA	NA
THP170HA-T5A	3	1.5	6.9	4290	7.5	15	NA	NA	NA	NA
THP189HA-T5A	3+	1.5	6.9	4290	7.5	15	NA	NA	NA	NA
THP233HA-T5A	4	1.5	9.2	5720	9.8	15	NA	NA	NA	NA
THP252HA-T5A	4	1.5	9.2	5720	9.8	15	NA	NA	NA	NA
THP278HA-T5A	4	1.5	9.2	5720	9.8	15	NA	NA	NA	NA

NOTES:

* = data is same for either "E" or "M" models (see nomenclature, page 2)

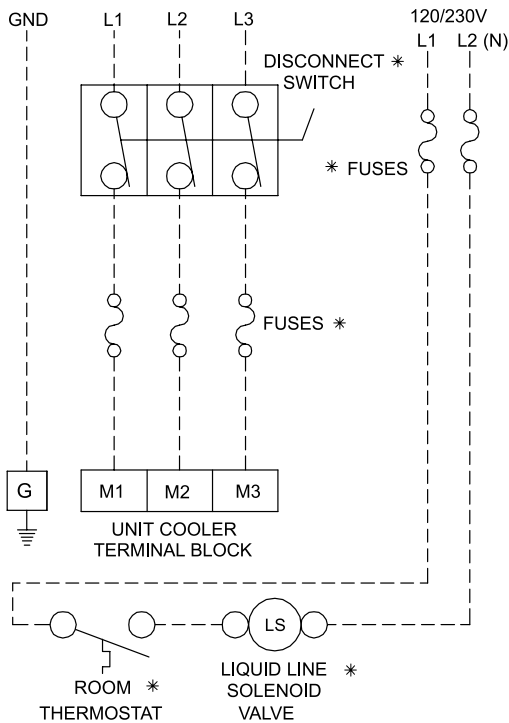
3+ indicates 3-fan "long" configuration (see dimensional data for details)

ENTERING SERVICE * *
SEE DATA PLATE FOR REQUIREMENTS

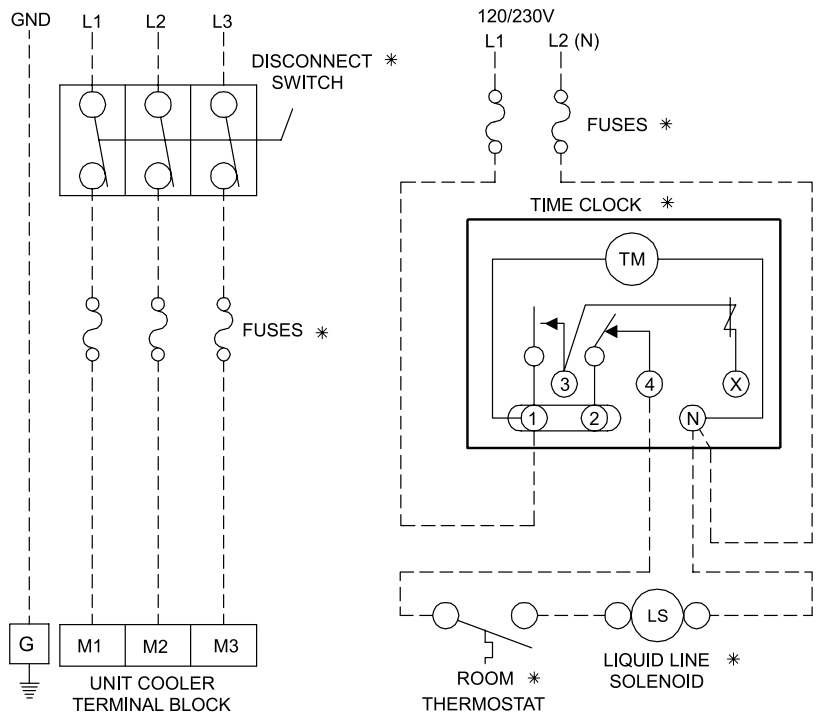


SEE DATA PLATE FOR MOTOR QUANTITY

TYPICAL FIELD WIRING * *
WITHOUT TIME CLOCK (OFF CYCLE AIR DEFROST)



TYPICAL FIELD WIRING * * WITH TIME CLOCK
(AIR DEFROST)



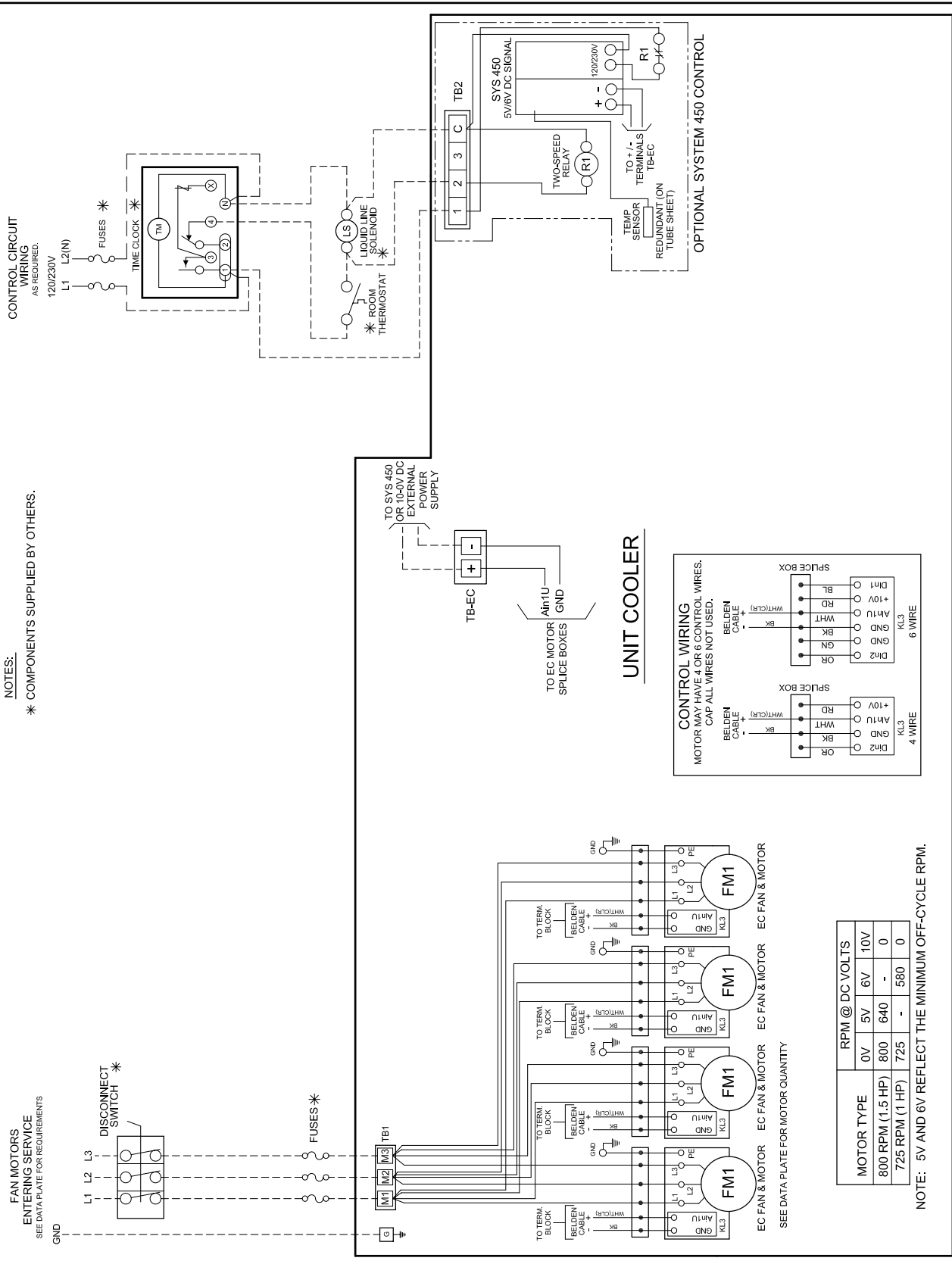
NOTES

- * COMPONENTS BY OTHERS
- FACTORY WIRING
- - - WIRING BY OTHERS
- * * ALL FIELD WIRING TO BE IN COMPLIANCE WITH ALL APPLICABLE LOCAL AND NATIONAL CODES.

1080875-B

E - EC MOTOR - Packages Assembly

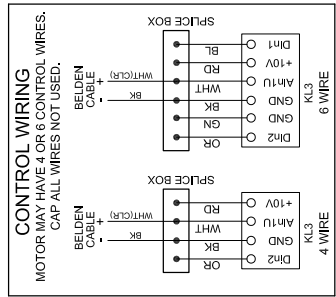
TYPICAL UNIT COOLER WIRING DIAGRAM - AIR DEFROST AND TWO-SPEED WITH SYS 450



FAN MOTORS
ENTERING SERVICE
SEE DATA PLATE FOR REQUIREMENTS

CONTROL CIRCUIT WIRING
AS REQUIRED.
120/230V

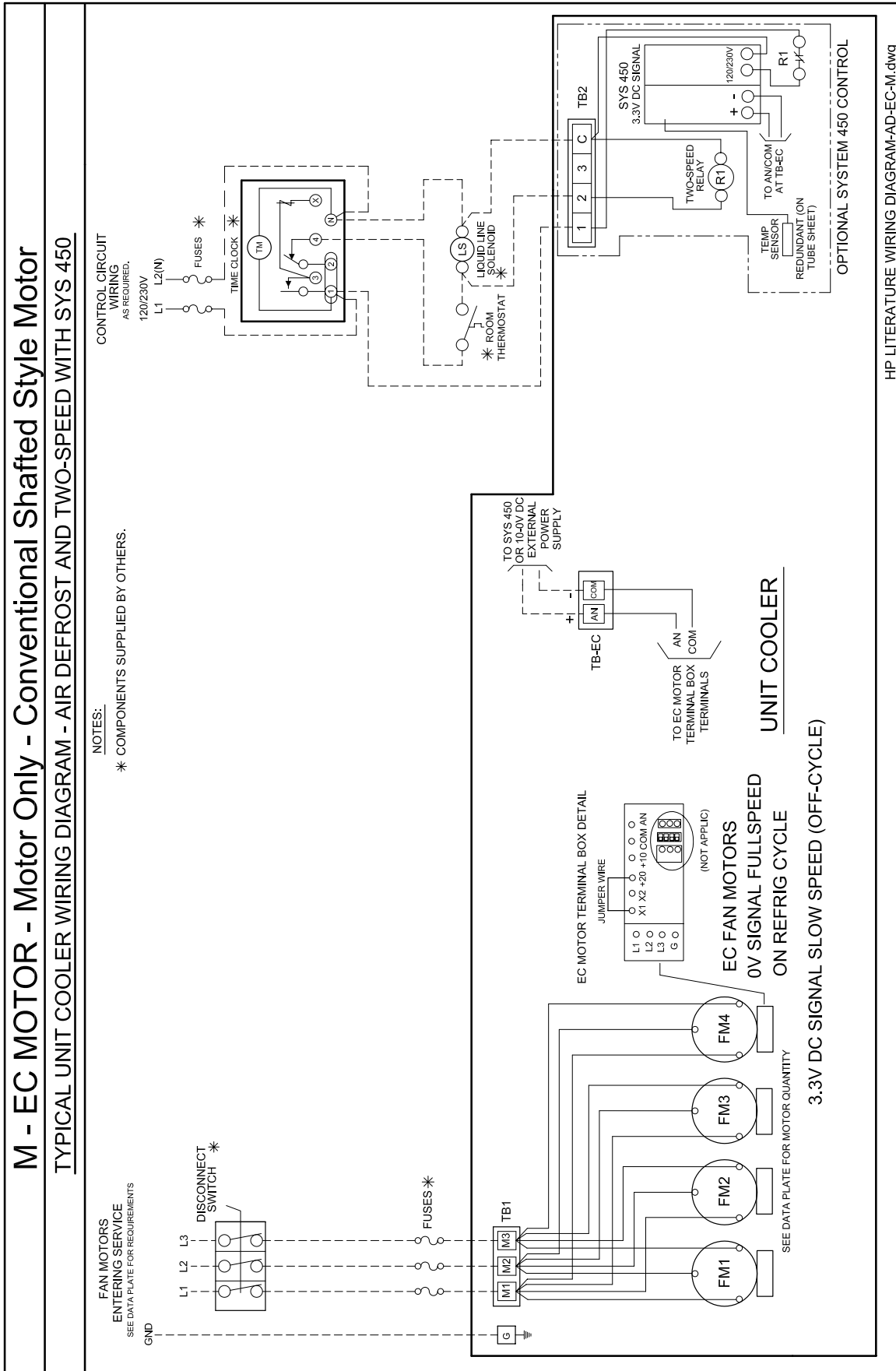
NOTES:
* COMPONENTS SUPPLIED BY OTHERS.



MOTOR TYPE	RPM @ DC VOLTS		
	0V	5V	10V
800 RPM (1.5 HP)	800	640	0
725 RPM (1 HP)	725	-	580
	0		0

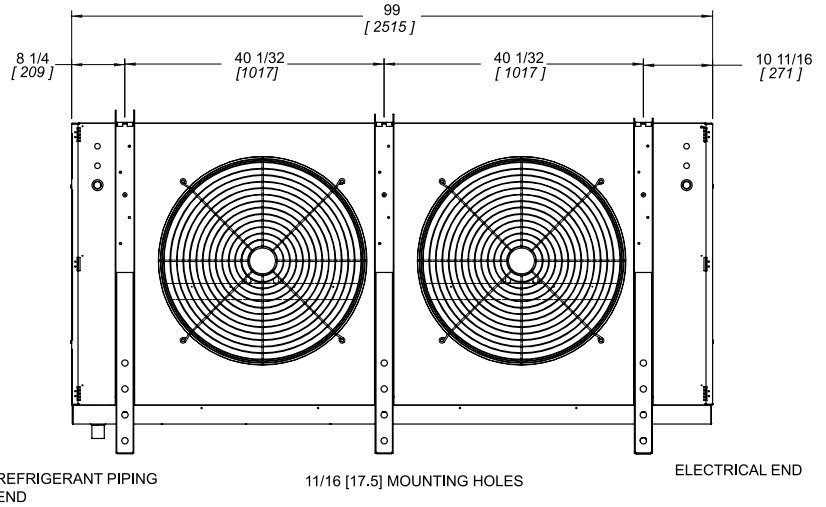
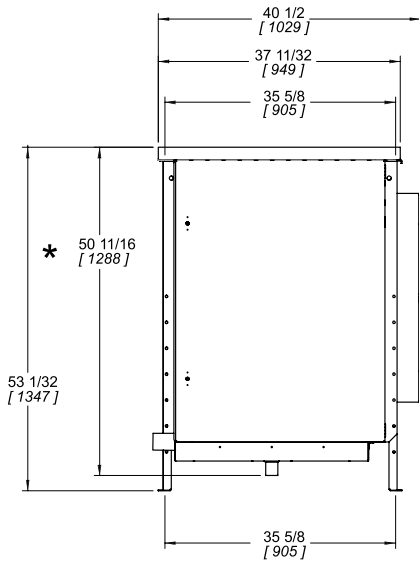
NOTE: 5V AND 6V REFLECT THE MINIMUM OFF-CYCLE RPM.

WIRING DIAGRAM "M" - EC Motor - Motor Only (Conventional Shafted Style Motor)

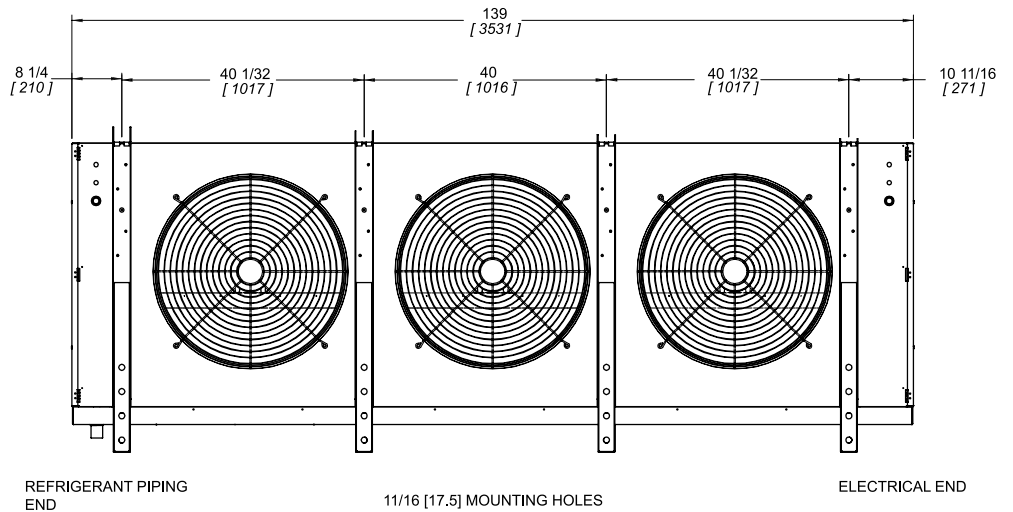
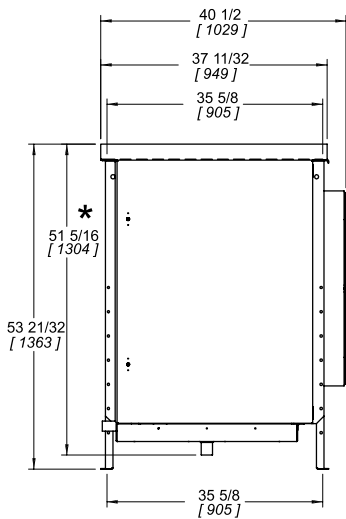


HP LITERATURE WIRING DIAGRAM-AD-EC-M.dwg

2 Fan Models

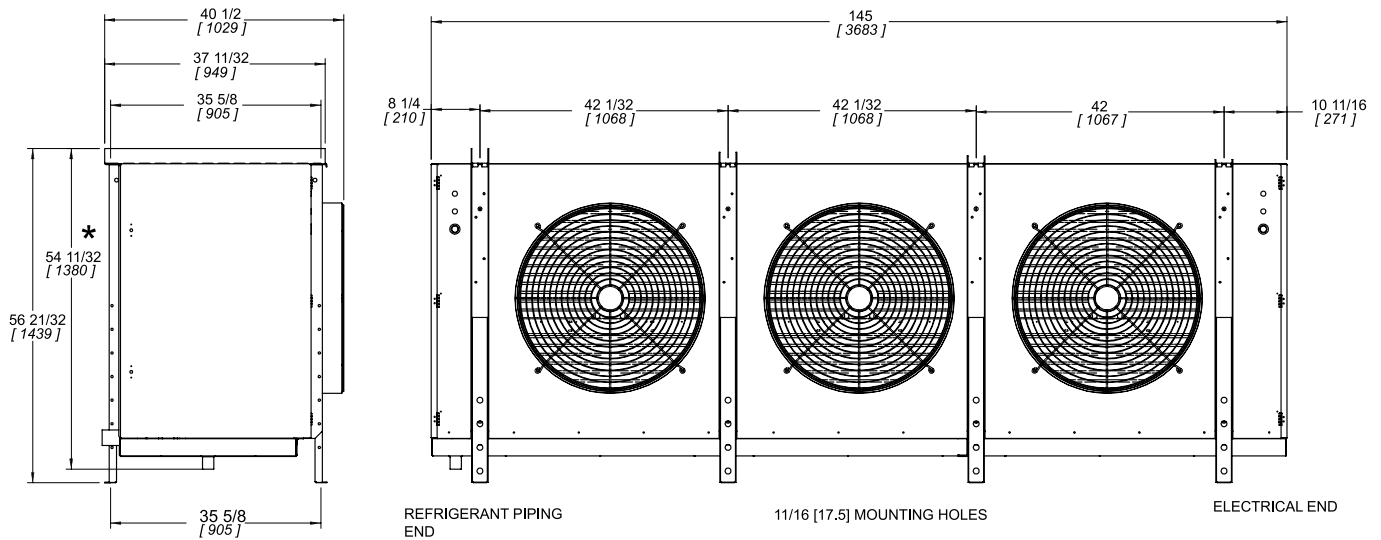


3 Fan Models

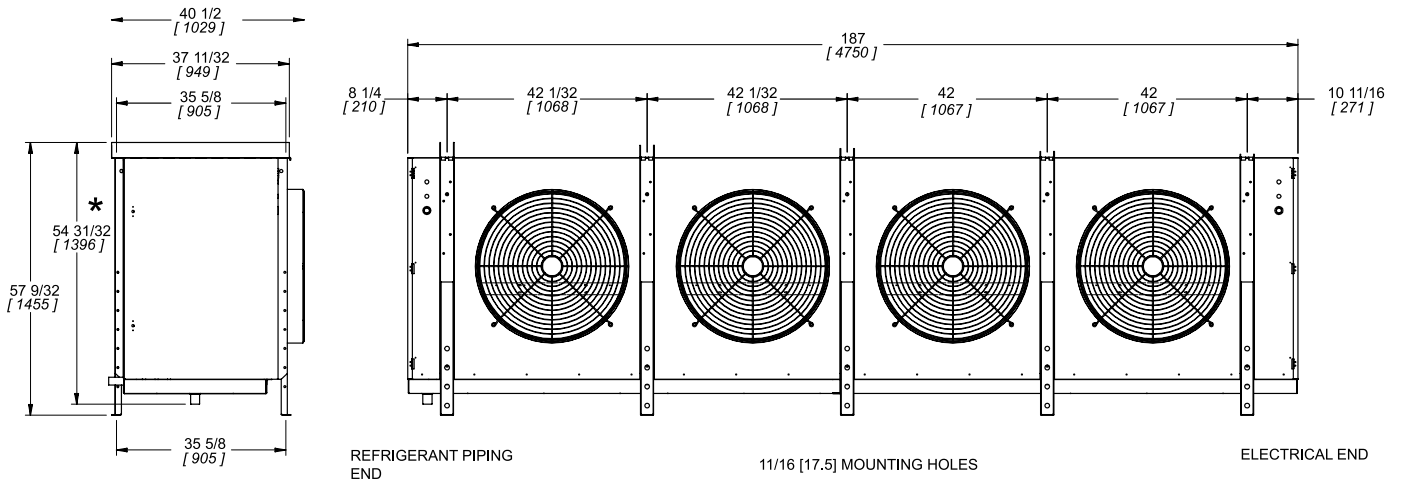


Drain connections 1-1/4" FPT.

3 Fan (Long) Models



4 Fan Models



Drain connections 1-1/4" FPT.

SPECIFICATIONS

High / Medium Temp. Models		073HA	086HA	113HA	130HA	154HA	170HA	189HA	233HA	252HA	278HA
Number Of Fans		2	2	2	3	3	3	3	4	4	4
Distributor Conn. (OD Sweat)	Inches	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8	1-5/8	1-3/8	1-3/8	1-3/8	1-5/8
	(mm)	(29)	(35)	(35)	(35)	(35)	(41)	(35)	(35)	(35)	(41)
Suction Conn. (OD Sweat)	Inches	1-5/8	1-5/8	2-1/8	2-1/8	2-1/8	2-1/8	2-5/8	2-5/8	2-5/8	2-5/8
	(mm)	(41)	(41)	(54)	(54)	(54)	(54)	(67)	(67)	(67)	(67)
Approx. Net Weight	LB. (KG)	770	742	837	1071	1145	1208	1293	1590	1696	1919
		(318)	(337)	(379)	(485)	(519)	(548)	(586)	(721)	(770)	(870)

The installation and start-up of evaporators 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.

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.

Consideration should be given to the coil location in order to minimize the piping run length to the condensing unit and floor drain

CLEARANCES

This evaporator draws air through the coil and discharges air from the fan side, and thus adequate clearance should be made on the entering face of the coil to ensure even unrestricted air flow through the coil. This distance should be equal to the height of the coil or more.

Ensure enough room is left at the ends of the coil for servicing.

MOUNTING

This evaporator is supplied with shipping legs to allow units to be shipped in an upright position. Units can be lifted into place with shipping skid attached to mounting legs.

Hanger brackets take up to 5/8" (15.9 mm) hanger rods. After the evaporator is hung in place, remove the bolts attaching the skid to the legs.

DRAIN LINE

If the evaporator is mounted flush to ceiling, the staggered hanger will provide a positive pitch for drainage.

If units are suspended below the ceiling, the installer must provide adequate pitch to the unit by adjusting the location of the hanger rod nuts.

Note: Check for adequate drainage by pouring water into the drain pan.

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

Insulated copper tube should be run from the drain connection, sloping at least 4" (102mm) per foot. A trap located outside of the room should be provided to prevent warm air entering through the tubing. Connection should be made to proper drainage facilities that comply with local regulations.

If room temperatures are below freezing, it is necessary to heat the drain line to prevent condensate from freezing in the drain line. Electric heating cable or electric tape (by others) is used for this purpose. The drain line heater should be connected for continuous operation; it is also recommended that the drain line be insulated. A heat output of 20 watts per lineal foot of 1" (25mm) drain line in a 0°F (-18 °C) room is usually satisfactory. 115 volt cable and tape is available from your local refrigeration wholesaler. Two 115 volts heaters (by others) of the same wattage may be wired in series for use on 230 volt system

PIPING

Refrigerant line sizes are important and may not be the same size as the coil connections (depends on the length of run). If in doubt, consult "Recommended refrigerant line sizes" charts.

WIRING

Wire system in accordance with governing standards and local codes. Enclosed typical wiring diagrams are for reference only. Refer to unit data plate for operating current, minimum ampacity and maximum fuse sizing for fan motors.

NOTE: Electrical wiring is to be sized in accordance with minimum ampacity rating.

For ease of identifying the proper wiring terminals, unit wiring is colour 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 20°F (-6.7°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 is of an adjustable type, and proper adjustment is required.

The **defrost termination control** is adjustable and may be set at a minimum of 40°F (4.4°C) (fully CW) to a maximum of 75°F (23.8°C) (fully CCW). Normal setting is 55°F (12.8°C). This can be increased if the defrost heaters are terminated too soon (frost still left) or if terminated too long (steaming of coil). Time clock should be set for a fail-safe termination of approximately 45 minutes.

A hinged end panel provides quick access to the electrical compartment.

SYSTEM CHECK**Before Start-Up:**

1. All wiring should be in accordance with local codes.
2. All refrigerant lines should be properly sized.
3. Electric defrost systems should include a liquid line solenoid valve.
4. Thorough evacuation and dehydration has been performed.
5. The suction, discharge and receiver service valves must be open.
6. The system should 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. If necessary, temporarily by-pass fan delay control to run fans until room temp is lowered. (Run jumper wire from terminal N to F on circuit terminal block).
2. Check the compressor oil level to ensure the correct oil charge.
3. Be sure that the expansion valve is properly set to provide the correct amount of superheat (should be around 70% of operating T.D.)
4. Heavy moisture loads are usually encountered when starting the system for the first time. If the coil temperature is below freezing, this will cause a rapid build-up of frost on the coil. During the initial pull down, frost build-up should be watched and defrosted manually as required.
5. Check for proper evaporator fan blade rotation.

MAINTENANCE

1. Periodic checking and cleaning of the coil surface when necessary should be done, using a whisk or brush. Drain pans are hinged to provide convenient access to the inside coil surface (except hot gas loop pans).
2. Ensure coil and pan does not have any excessive ice build-up from improper defrost operation. Any build-up of ice can cause fins and refrigerant tubes to be crushed. When replacing heater elements, first remove heater slot covers and heater clips
3. Motors are permanently lubricated type and require no further lubrication.

**FOR SERVICE PARTS LOOK-UP:
visit: http://www.t-rp.com/serv_parts.htm
email: 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

