INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS

RefPlus®

INDUSTRIAL COOLERS & FREEZERS

WALK-IN COOLERS
SERIES: EK, EM, EH, EI, EB, EF

MODELS:
EKA, EKE, EKR, EKT

EKA, EKE, EKR, EKT
K = Compact Profile

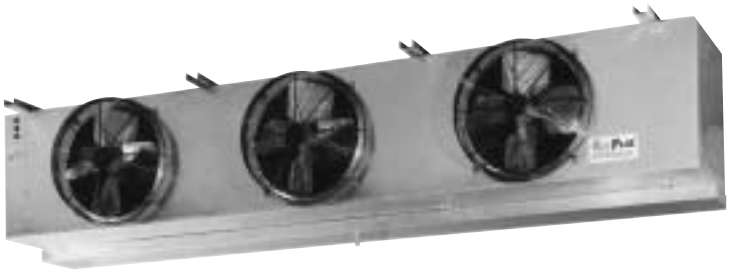
EMA, EME, EMR,
EMG, EMH,EMT
M = Medium Profile

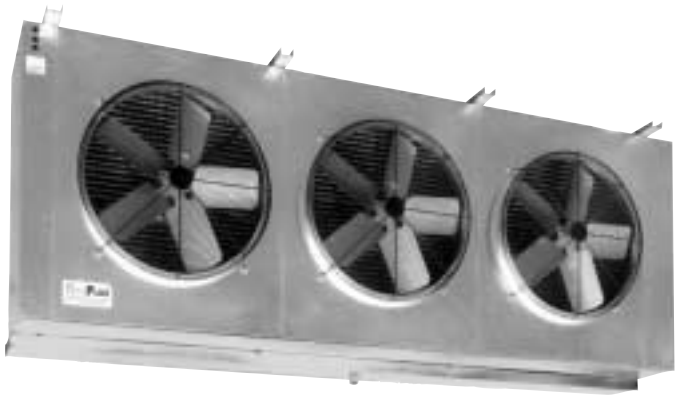
EHA, EHE, EHG,
EHT, EHH,EHR
H = High Profile

EIE, EIG, EIH, EIT, EIR
I = Industrial Type

EBE, EBR, EBT
B = Blast

EFE, EFR, EFT
F = Free Standing





CONTENTS

NOMENCLATURE

E	K	A	1400	1	—	1

E - Evaporator

B - Blast
F - Free Standing Coil
K - Compact Profile
M - Medium Profile
H - High Profile
I - Industrial Type

A = Air Defrost
E = Electric Defrost
G = Reverse Cycle Hot Gas Defrost w/Electric Heated Drain Pan
H = Three Pipe Hot Gas Defrost w/Electric Heated Drain Pan
R = Reverse Cycle Hot Gas Defrost
T = Three Pipe Hot Gas Defrost

Unit Capacity @ 10°F T.D. 14,000 BTU/hr

Product Generation

1 = 120/1/60
2 = 240/1/60
5 = 208-240/3/60
8 = 600/3/60
9 = 480/3/60

SAFETY CONSIDERATIONS

Installing, starting up, and servicing equipment can be hazardous due to system pressures, electrical components and equipment location (roofs, elevated structures, etc.). Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

When working on the equipment, observe precautions in the literature and on the tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep quenching cloths and fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

WARNING

Before installation, always check to be sure main power to systems is OFF. Electrical shock can cause personal injury or death.

INTRODUCTION

These instructions describe installation, start-up, and service for the RefPlus Inc. refrigeration unit coolers.

INSTALLATION

Step 1 - Complete Pre-Installation Checks

Examine for damage incurred during shipment. File a claim immediately with transit company if damage is found. Verify that the nameplate electrical requirements match the available power supply. Check the shipment for completeness.

Step 2 - Location

All unit coolers should be installed flush against the ceiling. The unit cooler must be level in all directions to ensure proper drainage of condensate. Be sure there is sufficient clearance between the ceiling and unit cooler to allow for cleaning the unit cooler top.

When deciding on the location of the unit cooler, consider the following:

- Location of aisle racks
- Location relative to compressor for minimum pipe runs
- Location of condensate drains for minimum run
- The air pattern must cover the entire room
- Never locate unit coolers over doors or door openings
- Allow sufficient space between rear of unit cooler and wall to permit free return of air

NOTE

Avoid placement of the unit cooler directly above doors and door openings where low temperature is being maintained. Position the unit cooler so the discharge air blows above the doors. Install a baffle if door extends above the blower level.

UNIT COOLERS — These unit coolers should be located in a position where the air discharge is toward the door. The coil face on the unit cooler should be away from the wall by at least:

- 12 in. for EK,
- 18 in. for EM,
- 30 in. for EI, EH, EB, EF one-fan wide arrangement, and
- 60 in. for EB, EF two-fan wide arrangement.

NOTE

Unit coolers with electric defrost require a 20 in. clearance at the left end when facing the fans to allow removal of defrost heaters.

Step 3 - Mounting

Most unit coolers can be mounted with either bolts or rod hangers. Use 5/16 in. bolts and washers for unit coolers weighing up to 250 pounds. Use 3/8 in. bolts and washers for unit coolers weighing from 250 to 500 pounds. For unit coolers over 500 pounds, use 5/8 in. bolts and washers.

NOTICE

The unit cooler must be mounted level for proper condensate draining. Adequate support must be provided to hold the weight of the unit cooler.

Note: The area above the unit must be sealed and accessible to facilitate hand cleaning without the use of tools in order to comply with National Sanitation Foundation (NSF) Standard 7.

Step 4 - Connect Drain Line

For all unit coolers, a drain line union is recommended for ease of installation and future servicing and should be located in close proximity to the drain pan.

EK & EM UNIT COOLERS – A 7/8 in. ID removable drain fitting is supplied with each unit. Follow Steps 1 through 4 above for connecting the drain line. EH, EI, EB & EF unit coolers are supplied with 1 1/4" FPT connections.

FOR ALL UNIT COOLERS, connect the drain line as follows:

1. Replace the rubber gasket to prevent condensate leakage.
2. Locate the union as close to the drain pan as possible.
3. Using two wrenches, tighten the drain fitting. The use of two wrenches prevents the drain fitting from twisting and damaging the unit cooler.
4. Sharply pitch the drain line and exit it through the cooler with a short run.
5. Insulate and seal the drain line where it passes through the wall.
6. Locate the drain traps in warm ambient air temperature to prevent freeze-up.

NOTE

If the cooler temperature is below 32ºF, a field supplied drain line heater (15 W per foot) may be required. When installing the heater, be sure to avoid overlapping.

Drain traps on low temperature unit coolers must be outside of refrigerated enclosures. In the instance where traps are subject to freezing temperatures, wrap the traps with heat tape and insulation. Always trap drain lines individually to prevent vapor migration.

Step 5 - Refrigerant Connections

All refrigerant system components must be installed in accordance with applicable local and national codes using proper engineering practices.

Use top quality refrigeration tubing that is internally free of dirt, humidity or other contaminants. Unsealed tubing should not be used. Long radius elbows are recommended.

Dry nitrogen must be swept through the lines while joints are brazed to avoid oxidation and carbon deposits.

IMPORTANT

The use of a calibrated pressure gauge and regulator must always be used with nitrogen gas cylinders.

All external piping must be well supported. The unit cooler will not support external piping or valves.

If the condition arises where the suction line must be raised to a point higher than the suction connection on the unit cooler, a suction line trap must be installed on the unit cooler.

Horizontal suction lines should slope away from the evaporator toward the compressor. Leak check and evacuate the system using a two-stage deep vacuum pump. Pull and hold for 24 hours a 500 micron vacuum.

Step 6 - Expansion Valve Connection

All unit coolers are supplied with a sweat expansion valve connection. Expansion valves are field supplied or may have been installed at the factory (optional).

All unit coolers require the use of an externally equalized expansion valve and are provided with a 1/4 in. OD equalizer line.

The location and installation of the bulb is very important to ensure proper performance of the system. The bulb should be attached to a horizontal suction line at the evaporator outlet. On suction lines 7/8" and larger, the bulb may be mounted at 4 or 8 o'clock on the side of the horizontal line. The bulb must be securely fastened to a clean straight section of the suction line to ensure good thermal contact between the bulb and the suction line for satisfactory expansion valve control.

Check the operation of the expansion valve after the system has reached the desired cooler temperature. If the coil is not receiving enough refrigerant, reduce the superheat setting on the expansion valve.

To ensure unit cooler performance, the expansion valve must be set at the proper superheat and at the lowest temperature in which the system is expected to operate.

Step 7 - Wiring

All systems wiring must be in compliance with all applicable local and national codes.

All internal wiring of fan motors, tubular heaters and combination defrost termination fan delay control have been factory connected. All wiring connections terminate on terminal block(s) in the wiring compartment and are clearly labeled.

START-UP

CAUTION

Before starting unit cooler, be sure wire fan guards are secured in place over each fan.

Leak Testing and Evacuation

Leak testing and evacuation must be done in accordance with local and national codes.

Once all refrigerant connections are made, leak test all joints before charging the system with refrigerant. After leak testing, all moisture and non-condensable gas must be evacuated from the system. Attach high vacuum line pump and gauge on both high and low pressure sides of the system. A minimum vacuum level of 500 micron is required to effectively remove moisture.

Be sure all valves such as compressor, hot gas, receiver, and liquid solenoid valves are open. Break the vacuum in the system with the refrigerant to be used. Always charge the refrigerant into the system through a new 16 cu. in drier (field supplied) in the charging manifold line.

Fan Motor

The fan motor may restart on automatic thermal protection if the coils are frozen. The fan motor may cycle if the coil is blocked. Check the supply voltage at the motor leads if motor is inoperable.

Fan Delay Defrost Termination Control

This control located on the coil plate senses the coil temperature. To provide fan delay, the defrost thermostat must be turned off.

1. Set thermostat between 20ºF and 30ºF or above.
2. Adjust defrost timer up to maximum of 45 minutes.
3. Set the thermostat between 55 to 60ºF to defrost unit coolers operating between –40 to –20ºF. To defrost unit coolers operating between –10 to 10ºF, set the thermostat between 60 to 65ºF.

Fan Delay Drain Pan Control

The fan delay drain pan control senses the general coil temperature.

- With temperature rise, the fan delay thermostat de-energizes the fan and energizes the electric pan heaters.
- After defrost cycle, the coil temperature drops and the fan delay thermostat energizes the motor and de-energizes the heaters.
- Defrost timer must be set long enough to completely melt the ice in the unit cooler. Set the thermostat at 20 to 25ºF and the differential at minimum.

IMPORTANT

After correcting a faulty defrost cycle, it is essential that the coil, drain pan and unit cooler be free and clear of ice before placing the unit cooler back on automatic operation.

Check Superheat

After the temperature has reached the desired temperature, the unit cooler superheat should be checked and adjustments made if necessary. Generally, systems with a design temperature difference (TD) of 10ºF should have a superheat value of 6 to 10ºF for maximum efficiency. For systems operating at higher TD, the superheat can be adjusted to 12 to 15ºF as required.

NOTE

Minimum compressor suction superheat of 20ºF may override these recommendations on some systems with short line runs.

WARNING

If the condensing unit does not have flooded condenser head pressure control, then the condensing unit must have discharge pressure above the equivalent 105ºF condensing pressure.

To properly determine the superheat of the unit cooler, follow the steps below:

1. Measure the temperature of the suction line at the point where the bulb is secured.
2. Determine the suction pressure in the suction line at the bulb location by using one of the following methods :
   - A) Placing a gauge in the external equalized line.
   - B) Placing a gauge directly in the suction line near the unit cooler or directly in the suction header of the unit cooler.
3. Convert the pressure reading to saturated unit cooler temperature by using a temperature pressure table. See table # 1.
4. Subtract the saturated temperature from the actual suction line temperature reading. The difference is superheat.

An alternate method to determine superheat of the unit cooler can be used :

1. Measure the temperature of the suction line at the point where the bulb is secured (outlet).
2. Measure the temperature of one of the distributor tubes close to the unit cooler coil (inlet).
3. Subtract the inlet temperature from the outlet temperature. The difference is superheat.

NOTE

This method will yield accurate results as long as the pressure drop through the unit cooler coil is low.

DEFROST SYSTEM

Air Defrost Unit Coolers:

Fan motors run continuously and a defrost time clock or low-pressure setting stops the compressor when defrost is required.

NOTE

The unit cooler must not be in operation more than 16 hours per day.

Electric Defrost Unit Cooler:

A time clock starts the defrost process by stopping the fan and energizing the heaters. When the defrost thermostat resets the time clock, it de-energizes the heaters and re-starts the fan motors.

Reverse Cycle Hot Gas Defrost Unit Coolers:

Reverse cycle defrost systems introduce compressor discharge gas through the suction line during defrost. The amount of gas introduced is controlled by a solenoid bypass valve and a gas defrost time clock.

Condensed refrigerant is relieved through a check valve. The check valve bypasses the expansion valve leading to the liquid line which has reduced pressure. The drain pan is warmed by the entering hot gas to avoid freezing. Defrost is initiated and terminated by the time clock.

NOTE

Using a suction to liquid heat exchanger is recommended.

Three Pipe Hot Gas Defrost Unit Coolers:

During defrost, compressor discharge gas is introduced in a separate hot gas line. The amount of gas introduced is controlled by a solenoid bypass valve and a gas defrost time clock. To avoid excessive accumulation of liquid in the suction accumulator, a heat exchanger is recommended. The drain pan is warmed by the entering hot gas to avoid freezing. The time clock cycles fan motors, liquid and hot gas solenoids.

NOTE

A field-installed pressure regulating valve may be required on low temperature systems to control compressor crankcase pressure.

SERVICE

Inspection

After one day of operation, check for any vibration in the unit cooler. All unit coolers should be checked at least once a month for proper defrosting. It may be necessary to periodically change the number of defrost cycles or adjust the duration of defrost.

Under normal usage conditions, proper unit cooler maintenance should be done every six months to include the following:

1. Check all wiring and insulators.
2. Check and tighten all electrical connections.
3. Inspect contactors for proper operation and for worn contact points.
4. Check all fan motors. Tighten motor mount bolts/nuts and tighten fan set screws.
5. Clean condenser coil surface.
6. Check refrigerant and oil level in the system.
7. Check operation of the control system ensuring all safety controls are operating properly.
8. Check all defrost controls are functioning properly.
9. Clean the unit cooler coil surface.
10. Clean the drain pan and check the drain pan drain line for proper drainage.
11. Check drain line heater for proper operation, cuts and abrasions.
12. Check and tighten all flare connections.

See troubleshooting chart for troubleshooting information.

IMPORTANT

Do not use alkaline or acidic solutions; they will damage the coils. Remove the fan guard to clean the inner face of the fan coil.

Cleaning

The unit cooler should be checked periodically for dirt accumulation. Grease and dust should be removed from the fan, fan guards, and drain pan.

Occasional cleaning of finned surfaces can be done by dusting the fins and then cleaning with a mild detergent and warm water spray. Always pressure clean in reverse of the air flow.

UNIT SPECIFICATIONS

For All Units:

- For R-134a or R-22 refrigerant charge, multiply R-404 by 1.09.
- Operating charge is based on 30% liquid and 70% vapor at 25ºF suction.
- Use R model for hot gas reverse cycle defrost.
- Use T model for hot gas three pipe defrost with gas drain pan.
- Air throw for EK, EM, EH: 40 to 50 feet.
- Air throw for EI, EB: 60 to 70 feet.
- Use G model for hot gas reverse cycle defrost with electric drain pan.
- Use H model for hot gas three pipe defrost with electrical drain pan.

TROUBLESHOOTING CHART

SYMPTOMS	POSSIBLE CAUSES	POSSIBLE CORRECTIVE STEPS
Fan(s) will not operate	1. Main switch open 2. Blown fuses 3. Defective motor 4. Defective timer or defrost thermostat 5. Unit in defrost cycle 6. Coil does not get cold enough to reset thermostat	1. Close switch 2. Replace fuses. Check for short circuits or overload conditions. 3. Replace motor 4. Replace defective component 5. Wait for completion of cycle 6. Adjust fan delay setting of thermostat
Room temperature too high	1. Room thermostat set too high 2. Superheat too high 3. System low on refrigerant 4. Coil iced-up	1. Adjust thermostat 2. Adjust thermal expansion valve 3. Add refrigerant 4. Manually defrost coil and check defrost controls for malfunctions
Ice accumulating on ceiling around evaporator and/or on fan guards, venturi, or blades	1. Defrost duration is too long 2. Fan delay not delaying fans after defrost period 3. Defective defrost thermostat or timer 4. Too many defrosts	1. Adjust defrost termination thermostat 2. Defective defrost thermostat or not adjusted properly 3. Replace defective components 4. Reduce number of defrost
Coil not clearing of frost during defrost cycle	1. Coil temperature not getting above freezing point during defrost 2. Not enough defrost cycles per day 3. Defrost cycle too short 4. Defective timer or defrost thermostat	1. Check heater operation 2. Adjust timer for more defrost cycles 3. Adjust defrost thermostat or timer for longer cycle 4. Replace defective component
Ice accumulating in drain pan	1. Defective heater 2. Unit not pitched properly 3. Drain line plugged 4. Defective drain line heater 5. Defective timer or thermostat	1. Replace heater 2. Check pitch and adjust if necessary 3. Clean drain line 4. Replace heater 5. Replace defective component

INDUSTRIAL WALK-IN COOLERS EK, EM, EH, EI, EB

MOTOR

MODEL	EK	EM	EH	EI, EB
SUFFIX-2 240/1/60	**RMT 0016** (REC-0006)[1]	**RMT 0022** (REC-0004) [1]	**N/A**	**N/A**
SUFFIX-5 208-240/3/60		**RMT 0031**	**RMT 0041**	**RMT 0051**
SUFFIX-9 480/3/60	**RMT 0015** (REC-0003)[1]			
SUFFIX-8 600/3/60	**RMT 0018** (REC-0006) [1]	**RMT 0032**	**RMT 0042**	**RMT 0052**

[1] Capacitor part number

MOTOR MOUNT

MODEL	EM	EH, EI, EB
SUFFIX-2 240/1/60	**RGR 0140**	**RGR 0180**
SUFFIX-5 208-240/3/60	**RGR 0160**	
SUFFIX-9 480/3/60		
SUFFIX-8 600/3/60		

Note: EK Series motors are mounted in sheet metal base.

FAN GUARD

MODEL	EK	EM	EH, EI, EB
SUFFIX-2 240/1/60	**RGR 0090**[1]	**RGR 0100**	**RGR 0120**
SUFFIX-5 208-240/3/60	**RGR 0089**[2]		
SUFFIX-9 480/3/60			
SUFFIX-8 600/3/60			

Note: [1] Standard plastic guard
[2] Optional steel wire guard

FAN BLADE

MODEL	EK	EM	EH	EI, EB
SUFFIX-2 240/1/60	**RFN 0030**[1]	**RFN 0040**	**RFN 0050**	**RFN 0051**
SUFFIX-5 208-240/3/60		**RFN 0041**		
SUFFIX-9 480/3/60				
SUFFIX-8 600/3/60				

Note: [1] For units manufactured before March 2000 we recommend replacing the existing motor with the current EK series motors.

INDUSTRIAL WALK-IN COOLERS EK, EM, EH, EI, EB, EF

ELECTRIC DEFROST HEATER

MODEL						SUFFIX 2 & 5	SUFFIX 8 & 9
EME	EHE	EIE	EBE	EFE	EKE		
					1300 1500	REH 0020	N/A
2000 2400 2900	4000 4800 6000	4400 5400 6800	3420 4530 5460	3420 4530 5460	1700 2000	REH 0030	REH 0080
					2200 2900	REH 0040	REH 0085
4000 4800 5800	8000 9600 12000	8800 10800 13600	6840 9060 10910 17160 20980	6840 9060 10910 17160 20980	3400 4000	REH 0050	REH 0090
					5000	REH 0060	REH 0097
7200 8700 9600 11600	14000 18000	16200 20400	13600 16370 25730 31460	13600 16370 25730 31460	6000	REH 0070	REH 0100
	24000	27200	18610 22210 35400 42720	18610 22210 35400 42720		REH 0075	REH 0110

DEFROST CONTROL

All Models	R & T	G & H	E
DEFROST TERMINATION	N/A	RTH 0002	RTH 0002
FAN DELAY	RTH 0008	RTH 0008	
PAN HEATER SAFETY	N/A	RTH 0004[1]	N/A
HEATER SAFETY	N/A	N/A	RTH 0004[2]

Note: [1]Since January 2004, supersedes RTH 0002. [2]New component since January 2004.

DRAIN FITTING KIT

EK & EM SERIES	EH, EI, EB, EF SERIES
DFK-2[1]	DFK-3[2]

Note: [1]DFK-2 includes RHW 4007, RHW 2011 & RFT 5135.
[2]DFK-3 includes RHW 4012, RHW 4013 & RFT 8002.

TERMINAL BLOCK

MODEL	PART No.
A, R, T	REM 0004
E	REM 0004 REM 0003

TECHNICAL DATA (EK SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EK(A,R,T)-1400	2.9	108
EK(A,R,T)-1600	4.4	118
EK(A,R,T)-1800	3.6	165
EK(A,R,T)-2100	5.4	180
EK(A,R,T)-2400	5.3	211
EK(A,R,T)-3000	7.9	230
EK(A,R,T)-3600	7	261
EK(A,R,T)-4200	10.5	284
EK(A,R,T)-5400	13	337
EK(A,R,T)-6300	15.6	388
EKE-1300	5.2	110
EKE-1500	7.8	121
EKE-1700	6.4	168
EKE-2000	9.7	184
EKE-2200	9.5	216
EKE-2900	14.2	235
EKE-3400	12.5	267
EKE-4000	18.8	290
EKE-5000	23.3	344
EKE-6000	27.8	397

TECHNICAL DATA (EM SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EMA-2150	3.4	210
EMA-2550	4.5	225
EMA-3000	6.7	245
EMA-4300	6.6	375
EMA-5100	8.7	400
EMA-6000	13.1	440
EMA-7650	13	595
EMA-9000	19.5	640
EMA-10200	18.2	785
EMA-12000	27.3	830
EM(G,H,R,T)-02000	3.4	230
EM(G,H,R,T)-02400	4.5	245
EM(G,H,R,T)-02900	6.7	265
EM(G,H,R,T)-04000	6.6	405
EM(G,H,R,T)-04800	8.7	430
EM(G,H,R,T)-05800	13.1	470
EM(G,H,R,T)-07200	25.8	630
EM(G,H,R,T)-08700	37.1	680
EM(G,H,R,T)-09600	34.6	835
EM(G,H,R,T)-11600	52	900
EME-02000	5.6	255
EME-02400	7.7	265
EME-02900	11.4	295
EME-04000	11.8	455
EME-04800	15	480
EME-05800	22.1	540
EME-07200	22.3	720
EME-08700	32.8	772
EME-09600	30.3	930
EME-11600	45.8	989

TECHNICAL DATA (EH SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EHA-04500	6.7	480
EHA-05400	9	500
EHA-06200	13.5	545
EHA-09000	13.3	805
EHA-10800	17.5	580
EHA-12400	26.2	940
EHA-16200	26	1240
EHA-18600	74.2	1335
EHA-24800	98.5	1880
EH(G,H,R,T)-04000	6.7	500
EH(G,H,R,T)-04800	9	520
EH(G,H,R,T)-06000	13.5	565
EH(G,H,R,T)-08000	13.3	835
EH(G,H,R,T)-09600	17.5	880
EH(G,H,R,T)-12000	26.2	970
EH(G,H,R,T)-14000	26	1280
EH(G,H,R,T)-18000	74.2	1375
EH(G,H,R,T)-24000	98.5	1940
EHE-04000	10.7	560
EHE-04800	15	590
EHE-06000	23	640
EHE-08000	20.8	960
EHE-09600	29.2	1018
EHE-12000	44.6	1125
EHE-14000	43.3	1495
EHE-18000	66.2	1610
EHE-24000	98.5	2036

TECHNICAL DATA (EI SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EIE-04400	10.7	560
EIE-05400	15	590
EIE-06800	23	640
EIE-08800	20.8	960
EIE-10800	29.2	1018
EIE-13600	44.6	1125
EIE-16200	43.3	1495
EIE-20400	66.2	1610
EIE-27200	98.5	2250
EI(G,H,R,T)-04400	6.7	500
EI(G,H,R,T)-05400	9	520
EI(G,H,R,T)-06800	13.5	565
EI(G,H,R,T)-08800	13.1	835
EI(G,H,R,T)-10800	17.5	880
EI(G,H,R,T)-13600	26.2	970
EI(G,H,R,T)-16200	49.5	1280
EI(G,H,R,T)-20400	74.2	1375
EI(G,H,R,T)-27200	98.5	1940

TECHNICAL DATA (EB SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EBE-03420	14.6	750
EBE-04530	23.2	830
EBE-05460	30.5	880
EBE-06840	28.3	1190
EBE-09060	45	1320
EBE-10910	59.2	1430
EBE-13600	66.8	1800
EBE-16370	87.9	1900
EBE-17160	80	2100
EBE-18610	88.6	2180
EBE-20980	107.5	2205
EBE-22210	116.5	2370
EBE-25730	118.8	2700
EBE-31460	159.6	3060
EBE-35400	157.6	3960
EBE-42720	211.7	4410
EB(R,T)-03420	17.2	750
EB(R,T)-04530	25.8	830
EB(R,T)-05460	34.3	880
EB(R,T)-06840	33.3	1190
EB(R,T)-09060	50	1320
EB(R,T)-10910	66.7	1430
EB(R,T)-13600	74.2	1800
EB(R,T)-16370	99	1900
EB(R,T)-17160	90	2100
EB(R,T)-18610	98.6	2180
EB(R,T)-20980	120	2205
EB(R,T)-22210	131.3	2370
EB(R,T)-25730	133.6	2700
EB(R,T)-31460	178.2	3060
EB(R,T)-35400	177.3	3960
EB(R,T)-42720	236.4	4410

TECHNICAL DATA (EF SERIES)

Model	R404A, R507 Operating Charge (lb.)	Shipping Weight (lb.)
EFE-03420	14.6	580
EFE-04530	23.2	650
EFE-05460	30.5	710
EFE-06840	28.3	880
EFE-09060	45	1000
EFE-10910	59.2	1140
EFE-13600	66.8	1380
EFE-16370	87.9	1570
EFE-17160	80	1657
EFE-18610	88.6	1730
EFE-20980	107.5	1810
EFE-22210	116.5	2020
EFE-25730	118.8	1953
EFE-31460	159.6	2322
EFE-35400	157.6	3114
EFE-42720	211.7	3620
EF(R,T)-03420	17.2	580
EF(R,T)-04530	25.8	650
EF(R,T)-05460	34.3	710
EF(R,T)-06840	33.3	880
EF(R,T)-09060	50	1000
EF(R,T)-10910	66.7	1140
EF(R,T)-13600	74.2	1380
EF(R,T)-16370	99	1570
EF(R,T)-17160	90	1657
EF(R,T)-18610	98.6	1730
EF(R,T)-20980	120	1810
EF(R,T)-22210	131.3	2020
EF(R,T)-25730	133.6	1953
EF(R,T)-31460	178.2	2322
EF(R,T)-35400	177.3	3114
EF(R,T)-42720	236.4	3620

Note:
- Operating charges are based on 30% liquid, 70% vapor at 25°F suction
- Use suffix 1 for 120/1/60, suffix 2 for 240/1/60
- For 200-240/1/50 use suffix 2 and multiply capacity by 0.92
- For R134a or R-22 refrigerant charge, multiply R-404A by 1.09
- Air throw for EK series is 40 to 50 feet
- Air throw for EM series is 40 to 50 feet
- Air throw for EH series is 50 to 60 feet
- Air throw for EI series is 60 to 70 feet
- Air throw for EB series is 60 to 70 feet
- Air throw for EF series is specific to each application

1. PRELIMINARY INFORMATION

UNIT COOLER MODEL No.: _____ SERIAL No.: _____

UNIT COOLER MODEL No.: _____ SERIAL No.: _____

CONDENSING UNIT MODEL No.: _____ SERIAL No.: _____

COMPRESSOR MODEL No.: _____ SERIAL No.: _____

COMPRESSOR MODEL No.: _____ SERIAL No.: _____

DATE: _____ TECHNICIAN: _____

2. PRE-START-UP (Check each item when completed)

_____ CHECK ALL ELECTRICAL CONNECTIONS AND TERMINALS FOR TIGHTNESS

_____ VERIFY REFRIGERANT CHARGE USING CHARGING CHART LABEL ON CONDENSING UNIT

_____ CHECK REFRIGERANT AND OIL LEVEL IN SYSTEM

_____ VERIFY THAT ALL DEFROST CONTROLS ARE FUNCTIONING PROPERLY

_____ CHECK ALL FAN MOTORS AND MOTOR MOUNTS FOR TIGHTNESS

_____ CHECK DRAIN LINES AND DRAIN PAN FOR PROPER DRAINAGE

_____ CHECK DRAIN LINE HEATER FOR PROPER OPERATION

_____ CHECK ALL FLARE CONNECTIONS FOR TIGHTNESS

3. START-UP

ELECTRICAL

COMPRESSOR VOLTAGE	L1 - L2		L2 - L3		L3 - L1	
COMPRESSOR AMPS	L1		L2		L3	
COMPRESSOR	VOLTS		PHASE		HERTZ	
UNIT COOLER	VOLTS		PHASE		HERTZ	

TEMPERATURE

	START-UP	AFTER 24 HOURS OF OPERATION
AMBIENT TEMPERATURE	F	F
DESIGN BOX TEMPERATURE	F	F
OPERATING BOX TEMPERATURE	F	F
OPERATING BOX TEMPERATURE	F	F
SUPERHEAT AT COMPRESSOR	F	F
SUCTION LINE TEMP. AT UNIT COOLER	F	F
SUPERHEAT AT UNIT COOLER	F	F

PRESSURES (in cooling mode)

REFRIGERANT SUCTION _____ PSIG TEMP AT COMPRESSOR _____

REFRIGERANT DISCHARGE _____ PSIG TEMP AT COMPRESSOR _____

EVACUATION: NUMBER TIMES _____ FINAL MICRON _____

UNIT COOLER DRAIN LINE TRAPPED OUTSIDE OF BOX: YES OR NO

4. CONTROLS

THERMOSTAT SETTING _____ F _____ F ADJUSTABLE LIMIT DEFROST SETTING: _____ F

DEFROST SETTING _____ /DAY _____ MINUTES FAIL-SAFE ADJUSTABLE FAN DELAY SETTING: _____ F

_____ /DAY _____ MINUTES FAIL-SAFE

5. FIELD INSTALLED EXPANSION VALVE

MANUFACTURER _____

MODEL _____

WARRANTIES

RefPlus Inc. warrants the labeled (Serial No.) new RefPlus Inc. equipment and all parts thereof, to be free from defects in workmanship and at the time of purchase. Applies to original purchaser only (nontransferable).

Under this warranty RefPlus Inc. shall be limited to repairing or exchanging any parts, without charge FOB factory or nearest authorized parts wholesalers, which may prove defective to the satisfaction of RefPlus Inc., within one year from date of start-up, not to exceed eighteen (18) months from date of shipment from the factory.

The warranties to repair or replace as recited, are the only warranties, express, implied, or statutory, made by RefPlus Inc. No express or implied warranties as to merchantability or fitness for a particular purpose or use. RefPlus Inc. neither assumes, nor authorizes any person to assume for it, any other obligation or liability in connection with the sale of said equipment or any part thereof.

REFPLUS INC. SHALL NOT BE LIABLE:

1 - For any repairs or replacement by buyer without the written consent of RefPlus Inc., or when the equipment is installed or operated in a manner contrary to the instructions covering installation and service which accompanied such equipment.

2 - For any damages, delays, or losses, direct or consequential, caused by defects, nor for damages caused by short or reduced supply of materials, fire, flood, strikes, acts of God, or circumstances beyond its control.

3 - When the failure or defect of any part or parts is incidental to ordinary wear, accident, abuse or misuse; or when the serial number of the equipment has been removed, defaced, altered, or tampered with.

4 - When this equipment is operated on low or improper voltages.

5 - For payment of any removal or installation charges of parts or units.

6 - When this equipment is moved to a different location other than the original installation.

EXCLUSIONS

THIS WARRANTY SHALL NOT APPLY TO LOSS OF FOOD OR REFRIGERANT DUE TO FAILURE FOR ANY REASON.

RefPlus Inc. reserves the right to make any changes in the design or specifications of any product at any time without notice.

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