

Installation and Start-Up Instructions

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock or other conditions which may cause personal injury or property damage. Consult a qualified installer, service agency or your distributor or branch for information and assistance. The qualified installer or agency must use factory authorized kits or accessories when modifying this product. Refer to the individual instructions packaged with the kits or accessories when installing.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and NEC (National Electrical Code) for special installation requirements.

Recognize safety information: This is the safety-alert symbol Δ . When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury.

Understand the signal words— DANGER, WARNING, CAUTION. These words are used with the safety-alert symbol. Danger identifies the most serious hazards which *will* result in severe personal injury or death. Warning on the other hand *could* result in personal injury or death. Caution is used to identify unsafe practices, which would result in minor personal injury or product and property damage.

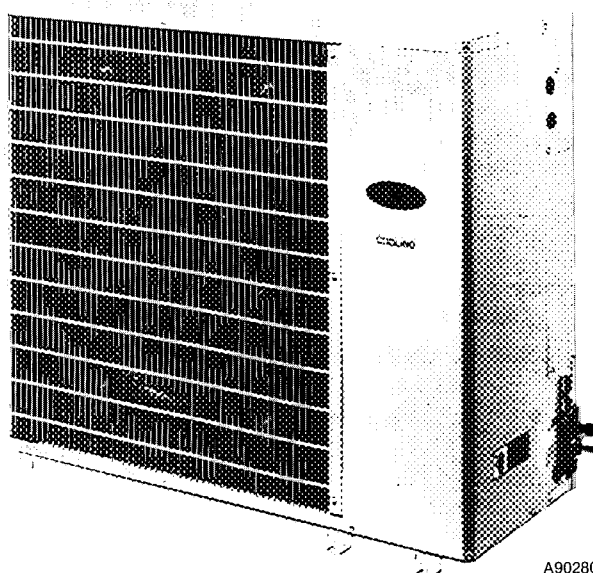


Fig. 1—Model 38HD

Δ WARNING

Before installing or servicing system, always turn off main power to system. There may be more than one disconnect switch. Turn off accessory heater power if applicable. Electrical shock can cause personal injury or death.

Step 1—Check equipment and Jobsite

UNPACK UNIT—See Fig. 1. Move to final location. Remove carton taking care not to damage unit.

INSPECT EQUIPMENT for damage prior to installation. File claim with shipping company if shipment is damaged or incomplete. Locate unit rating plate on electrical access panel (Fig. 4). It contains information needed to properly install unit. Check rating plate to be sure unit matches job specifications.

Step 2—Install on a Solid, Level Mounting Pad

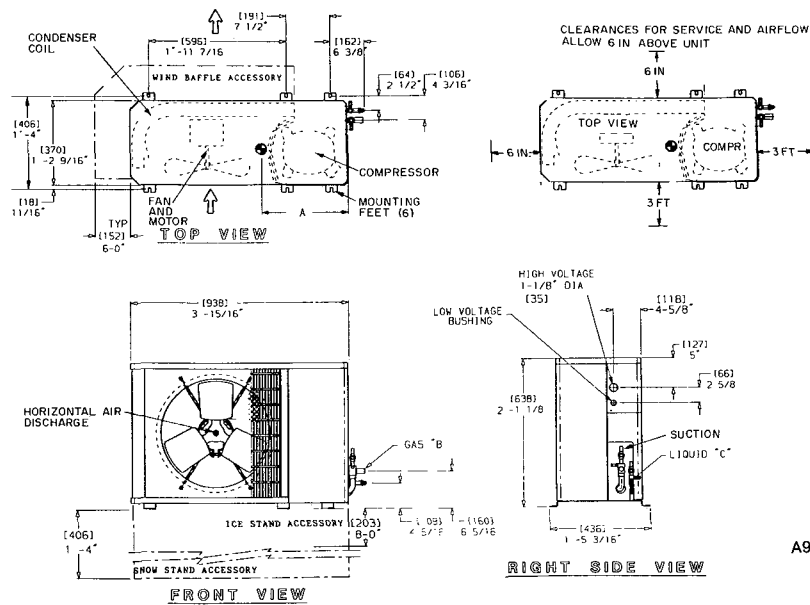
Consult local building codes and the NEC for special installation requirements. Locate unit so that condenser airflow is unrestricted on both sides. Space for wiring, refrigerant piping, and for servicing should be considered. Refer to Fig. 2 and Fig. 3 to determine clearances for service and airflow.

Unit may be mounted on a level pad directly on the base legs or mounted on raised pads at support points. Refer to minimum mounting pad dimensions in Table 1. See Fig. 2 and Fig. 3 for center of gravity. Position so snow and ice from roof or eaves cannot fall directly on unit.

If conditions or local codes require the unit to be attached to the pad, tiedown bolts should be used. Refer to the unit dimensional drawing in Fig. 2 and Fig. 3 to determine the location of the mounting feet. Layout bolts in accordance with Table 1.

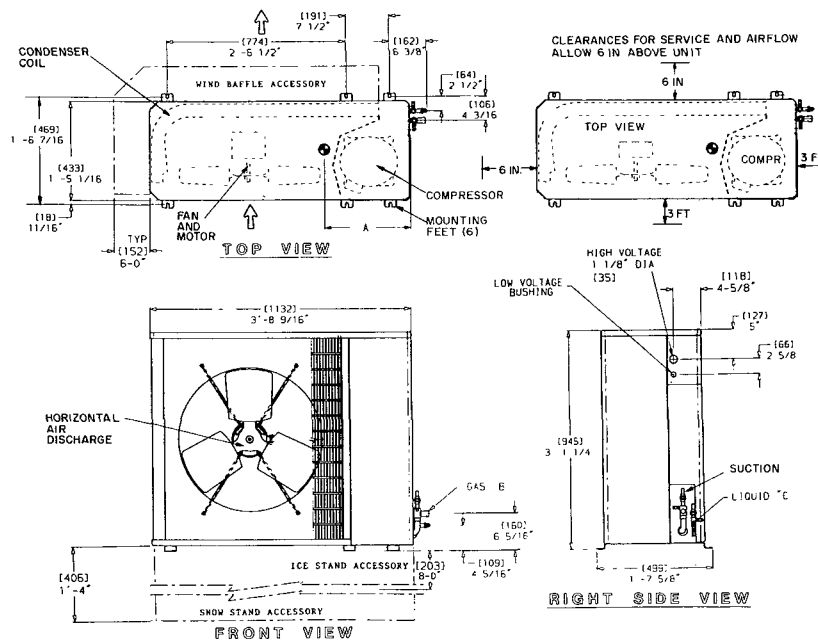
Table 1—Minimum Mounting Pad Dimensions

UNIT SIZE	SUPPORT FEET		SNOW STAND		ICE STAND	
	(IN.)	(mm)	(IN.)	(mm)	(IN.)	(mm)
018, 024, 030	23" x 42"	584.2 x 1066.8	26" x 42"	660.4 x 1066.8	26" x 42"	660.4 x 1066.8
036, 048, 060	24" x 50"	609.6 x 1270	28" x 50"	711.2 x 1270.0	26" x 50"	660.4 x 1270.0



A90304

UNIT	A	B	C
38HD018	(329) 1'-1"	(15.88) 5/8"	(9.53) 3/8"
38HD024			
38HD030		(19.05) 3/4"	(15.88) 5/8"



A90303

UNIT	A	B	C
38HD048	(347) 1'-1-5/8"	(19.05) 3/4"	(9.53) 3/8"
38HD060	(368) 1'-2-1/2"	(22.22) 7/8"	(9.53) 3/8"

NOTES:

- Dimensions in { } are in millimeters
- Air Direction →
- Center of Gravity ●
- Footprint 018-036, 3.7 sq ft (3.4 m²)
- Do not use screws longer than 1/2 in (13) near return air opening.

CARRIER CORP. INDIANAPOLIS, IN 46206			
PRODUCT NO.		SUITABLE FOR OUTDOOR USE	
MODEL NO.		REFRIGERANT: R-22	
DESIGN/TEST PRESSURE GAGE		LBS kg	
HIGH PSI	300	KPa	2068
LOW PSI	150	KPa	1034
VOLTS AC PH/Hz		PISTON	
COMPRESSION		ID OD	
FAN MOTOR		PHI IHz	
POWER SUPPLY VOLTS		PHI IHz	
VOLTAGE RANGE		MAX MIN	
MIN. CKT. AMP		MAX. FUSE/HACR TYPE CB AMP	
CHARGE SYSTEM PER INSTALLATION INSTRUCTIONS			
UL		CERTIFICATION APPLIES ONLY WHEN THE COMPLETE SYSTEM IS LISTED WITH ARI	
SP		A90282	
MADE IN MEXICO		317204-401 REV. A	

Fig. 4—Rating Plate

On rooftop applications, locate unit at least 6 ins. (152mm) above roof surface. Where possible, place unit above a load-bearing wall. Mount on a level platform or frame.

Arrange supporting members to adequately support unit and minimize transmission of vibration to building. Consult local codes governing rooftop applications.

CAUTION

Be sure unit panels are securely in place prior to rigging.

While lifting the unit for rooftop mounting keep equipment upright. Lift the unit using a sling. Use cardboard or padding under sling, and a spreader bars to prevent sling damage to unit. See Fig. 5. The center of gravity is noted in Fig. 2 and Fig. 3. Install unit so that the coil does not face into the prevailing winds. If this cannot be done and constant winds above 25 mph are expected, use Accessory Wind Baffle, P/N 38QR900041 or -051. See instructions provided with accessory kit.

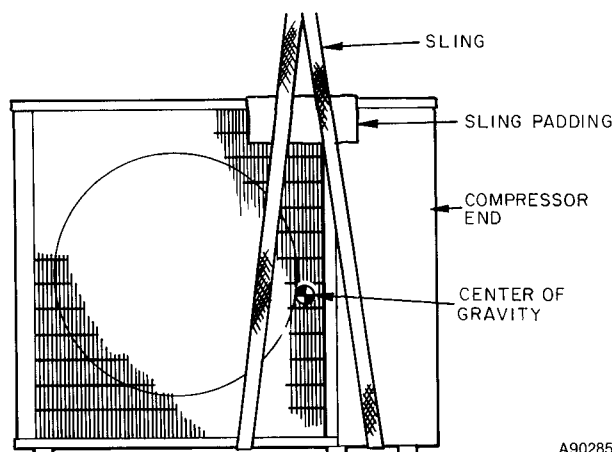


Fig. 5—Rigging For Rooftop Mounting

Step 3—Replace Indoor AccuRater Piston, if Required

Check indoor coil piston to see if it matches the required piston indicated in Table 2. If it does not match, replace indoor coil piston with piston shipped with this unit. The piston shipped with the outdoor unit is correct for any approved indoor coil combination.

Table 2—AccuRater™ Optimization Chart

OUTDOOR UNIT	SERIES	INDOOR PISTON	REQUIRED SYSTEM CHARGE (lb)
38HD018	0	52	4.8
38HD024	0	61	5.5
38HD030	0	70	5.7
38HD036	0	73	11.5
38HD048	1	86	9.7
38HD060	0	88	11.2

*Charge amount is determined with 25 ft of line.

CAUTION

DO NOT BURY MORE THAN 3 FT (.91m) OF REFRIGERANT TUBING IN GROUND. If any section of tubing is buried, there must be a 6-in. (152mm) vertical rise to the valve connections on the outdoor unit. If more than the recommended length is buried, refrigerant may migrate to cooler buried section during extended periods of unit shutdown, causing refrigerant slugging and possibly compressor damage at start-up.

Step 4—Piping Connections

Outdoor units may be connected to indoor sections using an accessory tubing package or field-supplied tubing of refrigerant grade of correct size and condition. The liquid- and vapor-tube diameters can be determined by using Table 3. For tubing requirements beyond 50 ft (15.24m), obtain information from your local distributor.

Table 3—Refrigerant Connections and Recommended Liquid and Vapor Tube Diameters

UNIT SIZE	LIQUID		VAPOR	
	CONNECT. DIAM	REC. TUBE DIAM	CONNECT. DIAM	REC. TUBE DIAM
014-024	3/8	3/8	5/8	5/8
030-036	3/8	3/8	3/4	3/4
048	3/8	3/8	7/8	7/8
060	3/8	3/8	7/8	1-1/8

NOTES: 1. Tube diameters are for lengths up to 50 ft for tube set over 50 ft, consult Long Line Application Guideline
2. Use only 3/8-in. diameter liquid tube on cap-tube indoor coil systems

If either refrigerant tubing or indoor coil is exposed to atmospheric conditions for longer than 5 minutes, it must be evacuated to 1000 microns to eliminate contamination and moisture in the system.

Run refrigerant tubes as directly as possible, avoiding unnecessary turns and bends. Suspend refrigerant tubes so they do not damage insulation on vapor tube and do not transmit vibration to the structure. Also, when passing refrigerant tubes through the wall, seal opening so vibration is not transmitted. Leave some slack in refrigerant tubes between structure and unit to absorb vibration.

OUTDOOR UNITS CONNECTED TO FACTORY APPROVED INDOOR UNITS—Outdoor units contain holding refrigerant charge only. See Table 2 for correct system charge when connected by 25 ft (7.62m) of field-supplied or factory accessory tubing. Add charge of refrigerant as required to achieve correct total.

CONNECT REFRIGERANT TUBING to fittings on outdoor unit vapor and liquid service valves (see Fig. 2 and Fig. 3).

USE FILTER DRIER—The filter drier is factory supplied.

SWEAT CONNECTION—Use refrigerant grade tubing.

⚠ CAUTION

A brazing shield **MUST** be used when tubing sets are being brazed to the service valves to prevent damage to the unit surface.

⚠ CAUTION

To avoid valve damage while brazing, service valves **MUST** be wrapped with a heat-sinking material such as a wet cloth.

Service valves are closed from factory and ready for brazing. After wrapping the service valve with a wet cloth, the tubing set can be brazed to the service valve using either silver bearing or non-silver bearing brazing material. Consult local code requirements.

Refrigerant tubing and indoor coil are now ready for leak testing. This check should include all field and factory wiring joints.

NOTE: Unit is shipped with R-22 factory holding charge indicated on nameplate.

Step 5—Make Electrical Connections

Be sure field wiring complies with local and national fire, safety and electrical codes, and voltage to system is within limits shown on unit rating plate. Contact local power company for correction of improper voltage. See unit rating plate for recommended circuit protection device (see Fig. 4).

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect unit reliability. See unit rating plate. Do not install unit in system where voltage of phase imbalance (3 phase) may fluctuate above or below permissible limits.

NOTE: Use copper wire only between disconnect switch and unit.

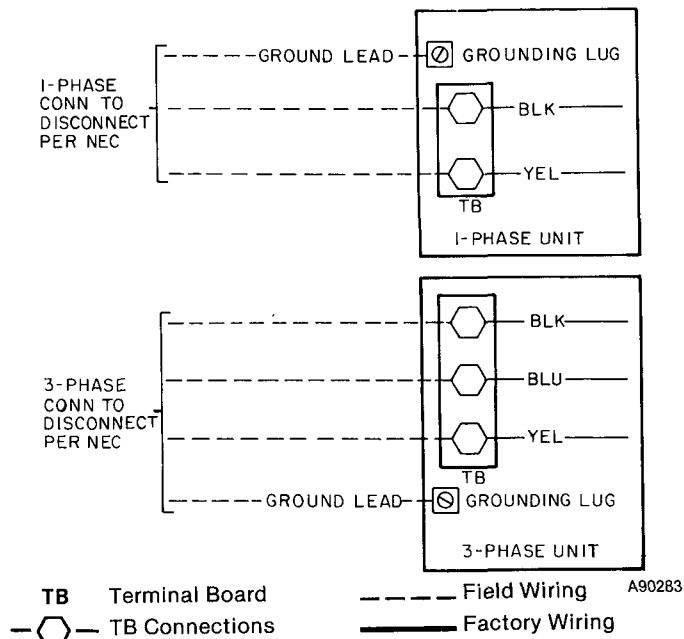
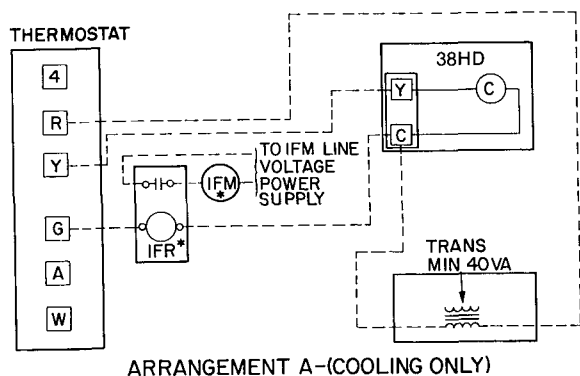


Fig. 6—Line Power Connections

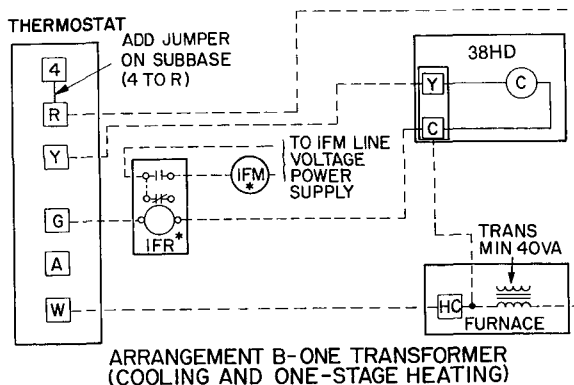
INSTALL BRANCH CIRCUIT DISCONNECT PER NEC of adequate size to handle unit starting current, but not larger than maximum fuse size shown on unit rating plate. Locate disconnect within sight from and readily accessible to unit, per Section 440-14 of NEC.

Use furnace or fan coil transformer as 24 volt supply for system as shown in Fig. 6, or use accessory transformer. Most systems require minimum 40VA; except for 050 and 060 size units, or units installed with liquid line solenoid valves which require 60VA.

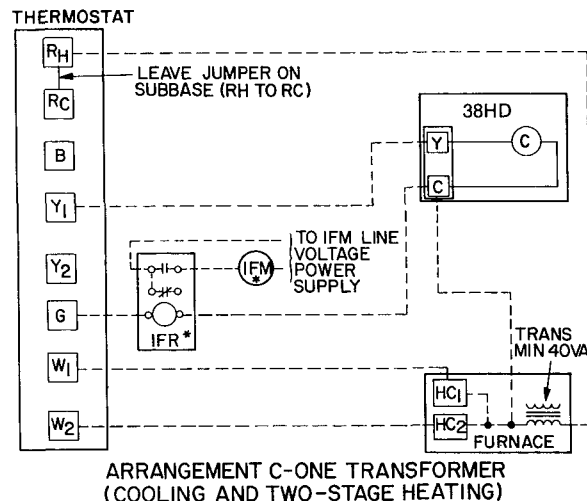
ROUTE GROUND AND POWER WIRES—Route power wires through opening in unit side panel and connect in unit control box as shown on unit label diagram and Fig. 7. Unit must be grounded.



ARRANGEMENT A—(COOLING ONLY)



ARRANGEMENT B—ONE TRANSFORMER (COOLING AND ONE-STAGE HEATING)



ARRANGEMENT C—ONE TRANSFORMER (COOLING AND TWO-STAGE HEATING)

*IFR and IFM are located in furnace on heating-cooling applications. If accessory IFR is required for cooling-only applications, locate (IFR) in fan coil

C — Contactor (12-va) **---** Field Wiring
HC — Heating Control **—** Factory Wiring
IFM — Indoor Fan Motor
IFR — Indoor Fan Relay
Trans — Transformer

NOTE: Refer to unit wiring label for wire colors: C to G and C to Y connections

Fig 7.—Typical Control Circuit Connections

CONTROL CIRCUIT WIRING—Control voltage is 24 volts (40 VA minimum). See Fig. 7 and unit label diagram for field-supplied wiring details. Route control wires through opening in unit side panel to connection in unit control box.

NOTE: Use No. 18AWG color-coded, insulated (35c min) wires. If thermostat is located more than 100 ft from unit (as measured along the control voltage wires), use No. 16AWG color-coded wires to avoid excessive voltage drop.

NOTE: Operation of unit on improper line voltage constitutes abuse and could affect Carrier warranty. Do not install unit in system where voltage may fluctuate above or below permissible limits.

NOTE: The Seasonal Energy Efficiency Ratio (SEER) is obtained with the crankcase heat de-energized. To deenergize the crankcase heater, disconnect the black crankcase heater wires at the contact. After disconnecting, make sure wires are isolated from all other electrical connections and components to prevent electrical shorting.

Step 6—Install Electrical Accessories, if any.

Refer to the individual instructions packaged with the kits or accessories when installing.

Time Delay Relay for Blower (TDR)—The time delay switch is in the low voltage control circuit. When thermostat is satisfied, compressor is turned off and blower runs for 90 seconds to remove residual cooling from indoor coil. The blower delay feature provides improved performance. There are various ways to achieve the time delay feature:

- a. By using a thermostat which has a built-in time delay.
- b. Fan coil unit/electric heater packages which have built-in delay.
- c. Furnaces which have built-in TDR.
- d. If none of the above have built-in TDR, then you must use a separate TDR to achieve the desired performance.

See your local distributor or dealer for specific component information.

NOTE: In most cases, only one of the above should be used to achieve TDR function. More than one of the methods listed above in a system may cause a degradation in performance.

Step 7—Start-up

1. When equipped with a crankcase heater, energize heater a minimum of 24 hours before starting unit. To energize heater only, set thermostat at OFF position and close electrical disconnect to outdoor unit.
2. Fully backseat (open) liquid and vapor tube service valves.
3. Unit is shipped with valve stem(s) frontseated, and caps installed. Replace stem caps after system is opened to refrigerant flow (backseated). Replace caps finger tight.

4. Close electrical disconnects to energize system.
5. Set room thermostat at desired temperature. Be sure set point is below indoor ambient temperature.
6. Set room thermostat at COOL and fan switch at FAN or AUTO, as desired. Operate unit for 15 minutes.

⚠ CAUTION

To prevent personal injury, wear safety glasses and gloves when handling refrigerant. Do not overcharge system. This can cause compressor flooding.

⚠ CAUTION

Service valves must be fully backseated to close service port. There is no Schrader valve at the service port and failure to backseat the valve could result in loss of system charge or personal injury.

Step 8—Refrigerant Charging

To check and adjust charge during cooling season, follow the listed procedure referring to Tables 4 and 5.

1. Operate unit a minimum of 15 minutes before checking charge.
2. Measure suction pressure by attaching a gage to suction valve service port.
3. Measure suction line temperature by attaching a service thermometer to unit suction line near suction valve. Insulate thermometer for accurate readings.
4. Measure outdoor coil inlet air dry-bulb temperature with a second thermometer.
5. Measure indoor coil inlet air wet-bulb temperature with a sling psychrometer.
6. Refer to Table 3. Find air temperature entering outdoor coil and wet-bulb temperature entering indoor coil. At this intersection note the superheat.
7. Refer to Table 4. Find superheat temperature and suction pressure. Note suction line temperature.
8. If unit has higher suction line temperature than charted temperature, add refrigerant until charted temperature is reached.
9. If unit has lower suction line temperature than charted temperature, bleed refrigerant until charted temperature is reached.
10. If air temperature entering outdoor coil or pressure at suction valve changes, charge to new suction line temperature indicated on chart.
11. This procedure is valid, independent of indoor air quantity.

Step 9—Leave User Manual With Homeowner

Explain system operation and maintenance procedures outlined in user manual.

**Table 4—Superheat Charging Table
(Superheat Entering Suction Service Valve)**

OUTDOOR TEMP (F)	INDOOR COIL ENTERING AIR (F) WB															
	50	52	54	56	58	60	62	64	66	68	70	72	74	76		
55	9	12	14	17	20	23	26	29	32	35	37	40	42	45		
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43		
65	—	6	10	13	16	19	21	24	27	30	33	36	38	41		
70	—	—	7	10	13	16	19	21	24	27	30	33	36	39		
75	—	—	—	6	9	12	15	18	21	24	28	31	34	37		
80	—	—	—	—	5	8	12	15	18	21	25	28	31	35		
85	—	—	—	—	—	—	8	11	15	19	22	26	30	33		
90	—	—	—	—	—	—	5	9	13	16	20	24	27	31		
95	—	—	—	—	—	—	—	6	10	14	18	22	25	29		
100	—	—	—	—	—	—	—	—	8	12	15	20	23	27		
105	—	—	—	—	—	—	—	—	5	9	13	17	22	26		
110	—	—	—	—	—	—	—	—	—	6	11	15	20	25		
115	—	—	—	—	—	—	—	—	—	—	8	14	18	23		

—Do not attempt to charge system under these conditions or refrigerant slugging may occur.

Step 10—Care and Maintenance

For continuing high performance, and to minimize possible equipment failure, it is essential that periodic maintenance be performed on this equipment. Consult your servicing contractor or users manual for the proper frequency of maintenance. Frequency of maintenance may vary depending upon geographic areas, such as coastal applications.

**Table 5—Required Suction-Tube Temperature (F)
(Entering Suction Service Valve)**

SUPERHEAT TEMP (F)	SUCTION PRESSURE AT SERVICE PORT (psig)									
	61.5	64.2	67.1	70.0	73.0	76.0	79.2	82.4	85.7	
0	35	37	39	41	43	45	47	49	51	
2	37	39	41	43	45	47	49	51	53	
4	39	41	43	45	47	49	51	53	55	
6	41	43	45	47	49	51	53	55	57	
8	43	45	47	49	51	53	55	57	59	
10	45	47	49	51	53	55	57	59	61	
12	47	49	51	53	55	57	59	61	63	
14	49	51	53	55	57	59	61	63	65	
16	51	53	55	57	59	61	63	65	67	
18	53	55	57	59	61	63	65	67	69	
20	55	57	59	61	63	65	67	69	71	
22	57	59	61	63	65	67	69	71	73	
24	59	61	63	65	67	69	71	73	75	
26	61	63	65	67	69	71	73	75	77	
28	63	65	67	69	71	73	75	77	79	
30	65	67	69	71	73	75	77	79	81	
32	67	69	71	73	75	77	79	81	83	
34	69	71	73	75	77	79	81	83	85	
36	71	73	75	77	79	81	83	85	87	
38	73	75	77	79	81	83	85	87	89	
40	75	77	79	81	83	85	87	89	91	