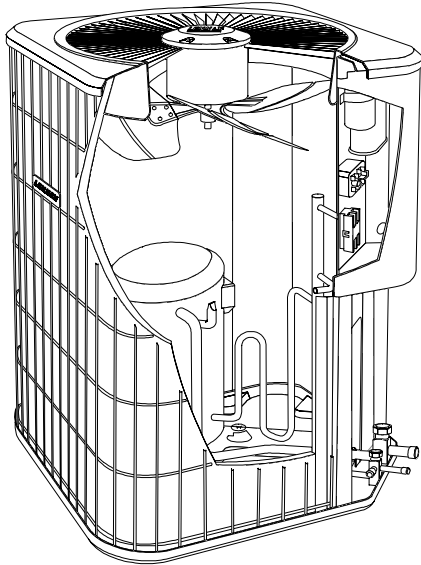




**PRODUCT LITERATURE**

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Dallas, Texas



**VALUE 10™ CONDENSING UNIT**

Value 10 condensing units are designed for expansion valve (TXV) and RFC systems. Refer to Lennox engineering handbook for expansion valve kits which must be ordered separately.

**SHIPPING AND PACKING LIST**

- 1- Assembled 10ACB condensing unit
- 1- 45° copper street elbow
- 1- RFCIV refrigerant metering device (bullet)
- 1- Coupling - 5/16 x 3/8" (18, 24, 30)

Check unit for shipping damage. Consult last carrier immediately if damage is found.

**GENERAL INFORMATION**

These instructions are intended as a general guide and do not supersede national or local codes in any way. Authorities having jurisdiction should be consulted before installation.

**! IMPORTANT**

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HCFC's) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

# INSTALLATION INSTRUCTIONS

## Value™ Series 10ACB Condensing Units

CONDENSING UNITS  
1-1/2 through 5 ton  
503,800M  
2/98  
Supersedes 503,755M

TPD Technical Publications  
Litho U.S.A.

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**RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE**

**! WARNING**

Product contains fiberglass wool.

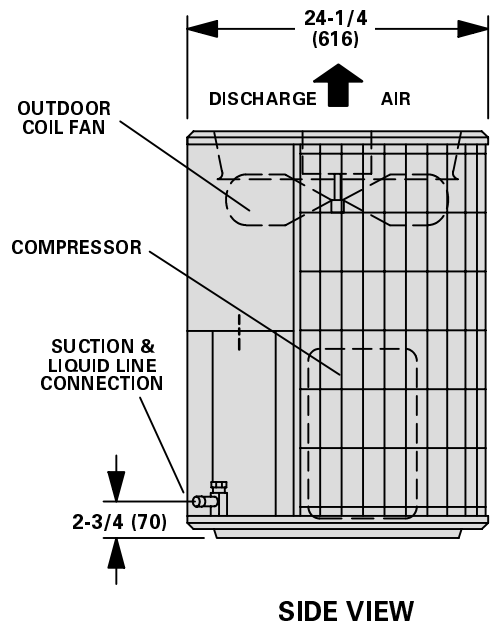
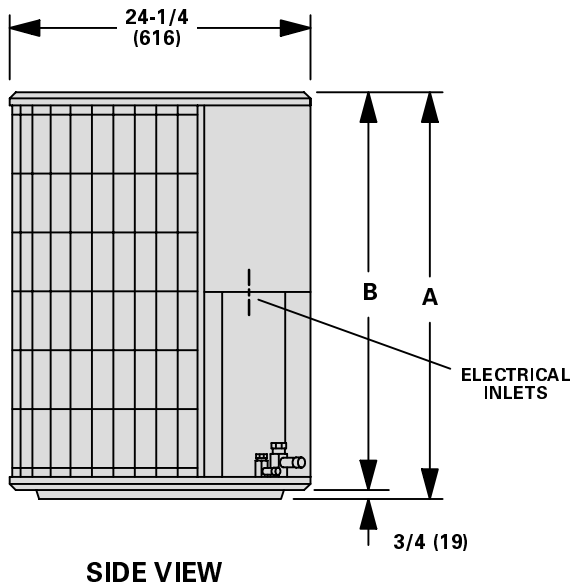
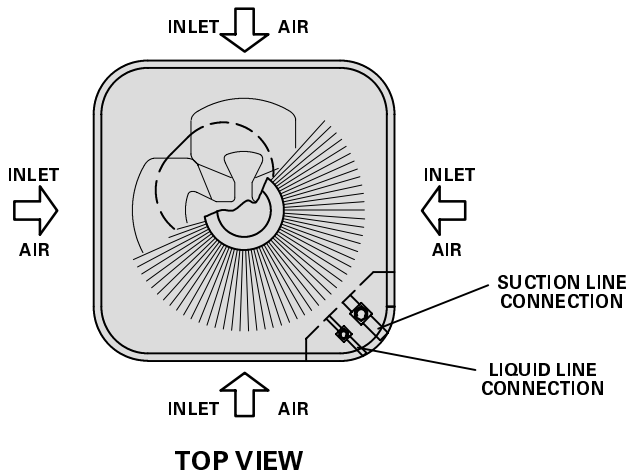
Disturbing the insulation in this product during installation, maintenance, or repair will expose you to fiberglass wool. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown below, or contact your supervisor.

Lennox Industries Inc.  
P.O. Box 799900  
Dallas, TX 75379-9900

**10ACB UNIT DIMENSIONS-INCHES (MM)**



Model No.		A	B
10ACB12	in.	25	$24\text{-}1/4$
10ACB18	mm	635	616
10ACB24			
10ACB30			
10ACB36	in.	33	$32\text{-}1/4$
10ACB42	mm	838	819
10ACB48			
10ACB60			
10ACB62			

## SETTING THE UNIT

Refer to unit dimensions on page 2 for sizing mounting slab, platforms or supports. Refer to figure 1 for installation clearances.

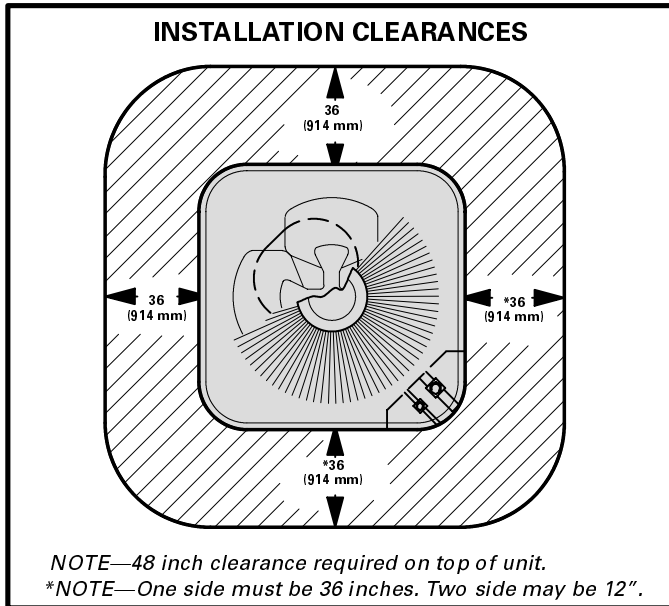


FIGURE 1

## Slab Mounting

When installing unit at grade level, install on a level slab high enough above grade to allow adequate drainage of water. Top of slab should be located so run-off water from higher ground will not collect around unit.

## Roof Mounting

Install unit at a minimum of 4 inches above the surface of the roof. Care must be taken to ensure weight of unit is properly distributed over roof joists and rafters. Either redwood or steel supports are recommended.

## ELECTRICAL

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC). Refer to the furnace or blower coil installation instructions for additional wiring application diagrams and refer to unit rating plate for minimum circuit ampacity and maximum overcurrent protection size.

## ⚠ WARNING

**Unit must be grounded in accordance with national and local codes. Electric Shock Hazard. Can cause injury or death.**

## Line Voltage

To facilitate conduit, a hole is provided in bottom of the control box. Connect conduit to hole in control box with proper conduit fitting.

*NOTE—Units are approved for use with copper conductors only.*

## 24V, Class II Circuit

24V, Class II Circuit connections are made up in the low voltage junction box. Refer to figure 2 for field wiring diagram.

*NOTE—A complete unit wiring diagram is located inside the unit control box cover.*

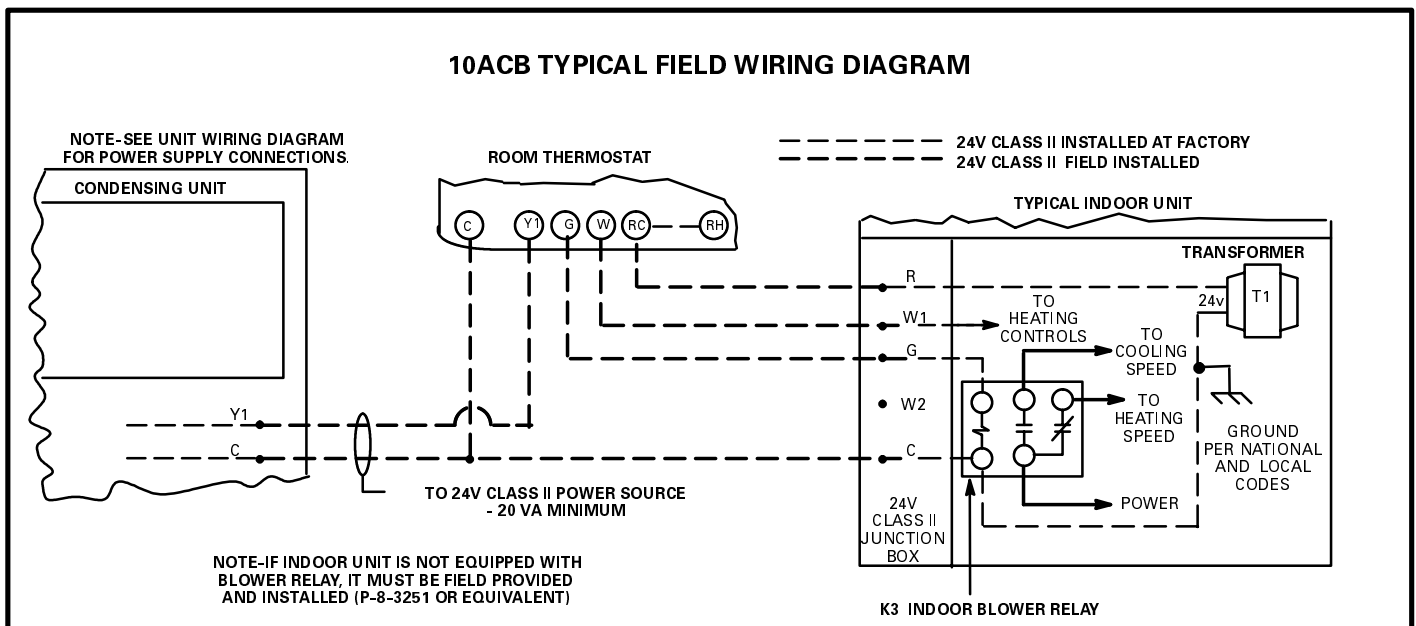


FIGURE 2

## PLUMBING

Field refrigerant piping consists of liquid and suction lines from the condensing unit (sweat connections) to the indoor evaporator coil (flare or sweat connections). Use Lennox L10 (flare) or L15 (sweat, non-flare) series line sets as shown in table 1 or use field-fabricated refrigerant lines. Refer to unit information manual piping section for proper size, type and application of field-fabricated lines.

### Sweat Connection Procedure

- 1- Ends of refrigerant lines must be cut square, free from nicks or dents, deburred. Pipe must remain round, do not pinch end of line.
- 2- Wrap a wet cloth around the liquid line valve body and copper tube stub to protect from heat damage during brazing. Wrap another wet cloth underneath the liquid valve to protect the base paint.
- 3- Quench the joints with a wet cloth to prevent possible heat damage to the valve core and opening port.
- 4- A field provided filter drier should be installed as close as possible to the expansion device.

## REFRIGERANT METERING DEVICE

10ACB units are applicable to either RFCIV or an expansion valve system. See indoor coil installation instructions and the Lennox engineering handbook for approved RFC and TXV match-ups and application information. Table 1 lists 10ACB unit liquid and suction line sizes and corresponding line sets.

**TABLE 1  
REFRIGERANT LINE KITS**

UNIT	LIQUID LINE	SUCTION LINE	L10 LINE SETS	L15 LINE SETS
10ACB18 10ACB24	5/16 in* (8 mm)	5/8 in (16 mm)	L10-21 20 ft. - 50 ft. (6 m - 15 m)	L15-21 20 ft. - 50 ft. (6 m - 15 m)
10ACB30 10ACB36	3/8 in (10 mm)	3/4 in. (19 mm)	L10-41 20 ft. - 50 ft. (6 m - 15 m)	L15-41 20 ft. - 50 ft. (6 m - 15 m)
10ACB42 10ACB48	3/8 in (10 mm)	7/8 in. (22 mm)	L10-65 30 ft. - 50 ft. (9 m - 15 m)	L15-65 30 ft. - 50 ft. (9 m - 15 m)
10ACB60 10ACB62	3/8 in (10 mm)	1-1/8 in. (29 mm)	FIELD FABRICATED	FIELD FABRICATED

\*Use reducer supplied in bag assembly.

**NOTE** - Line length should be no greater than 50 feet (15.2 m). Select line set diameters from table 1 to ensure oil return to compressor.

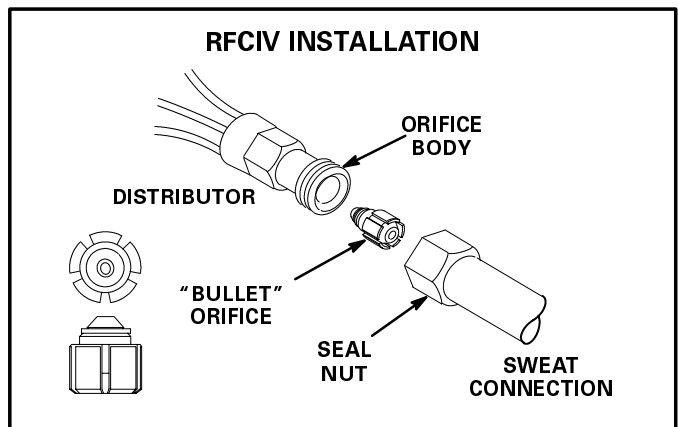
### RFC Systems

10ACB units are shipped with an RFCIV metering device. Replace existing RFCIV in indoor unit with RFCIV supplied with the outdoor unit. Place the supplied RFCIV sticker on indoor cabinet after installation. See table 2 for size of RFCIV bullet shipped in each 10ACB unit. In cases of non-traditional applications, RFCIV bullet shipped may not be appropriate. Refer to the indoor coil installation instructions and the engineering handbook for specific orifice information.

**TABLE 2  
RFCIV DRILL SIZES**

10ACB UNIT	RFCIV PART #	RFCIV DRILL SIZE
10ACB12	42J35	0.047
10ACB18	42J39	0.055
10ACB24	66J87	0.062
10ACB30	42J45	0.067
10ACB36	42J48	0.073
10ACB42	42J52	0.080
10ACB48	42J54	0.084
10ACB60	42J58	0.092

RFCIV bullet is installed as shown in figure 3. Take care not to twist cap tubes when loosening seal nut from orifice body.



**FIGURE 3**

## Expansion Valve Systems

Expansion valves equipped with either "Chatleff" or flare type fittings are available from Lennox. Refer to the indoor coil installation instructions or the engineering handbook for applicable expansion valves for use with specific match-ups.

If an expansion valve application is desired with indoor coil product shipped with an RFCIV orifice, the RFCIV restrictor must be removed before installing the expansion valve.

### **⚠ IMPORTANT**

**Failure to remove RFCIV when installing an expansion valve to the indoor coil will result in improper operation and damage to the system.**

### **MANIFOLD GAUGE SET**

A manifold gauge set equipped with "low loss" hoses should be used when checking unit charge. A manifold gauge set with anything other than "low loss" hose should not be used.

### **LIQUID & SUCTION LINE SERVICE VALVES**

The liquid line and suction line service valves (figures 4 and 5) and gauge ports are accessible from outside the unit. The service ports are used for leak testing, evacuating, charging and checking charge.

The valve is equipped with a service port. A schrader valve is factory installed. A service port cap is supplied to protect the schrader valve from contamination and serve as the primary leak seal.

#### **To Access Schrader Port:**

- 1- Remove service port cap with an adjustable wrench.
- 2- Connect gauge to the service port.
- 3- When testing is completed, replace service port cap. Tighten finger tight, then an additional 1/6 turn.

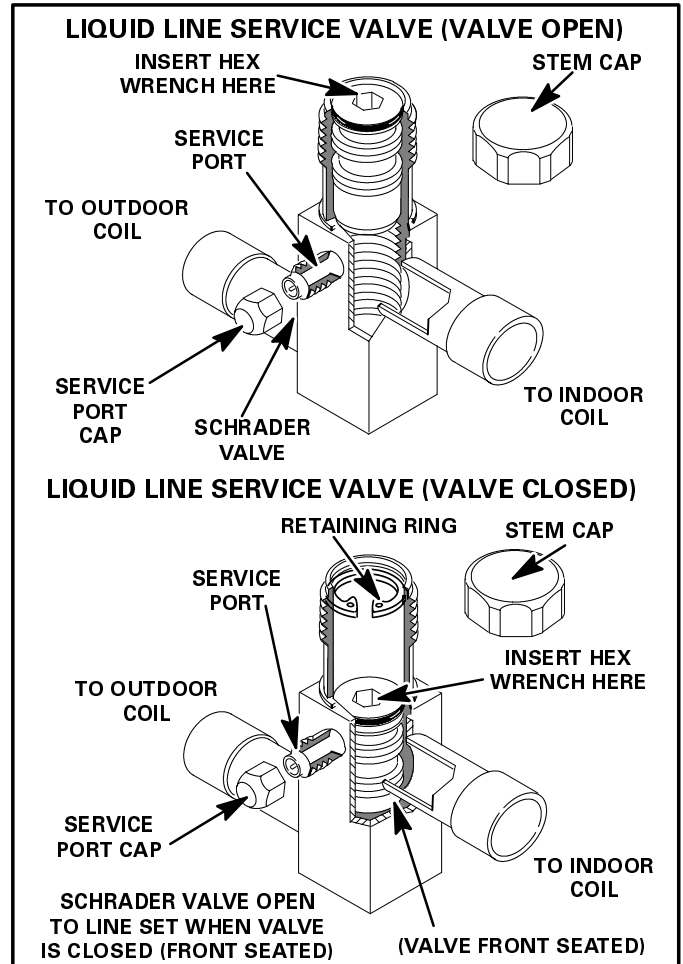
#### **To Open Liquid or Suction Line Service Valve:**

- 1- Remove stem cap with an adjustable wrench.
- 2- Using service wrench and 5/16" hex head extension back the stem out counterclockwise until the valve stem just touches the retaining ring.

### **⚠ DANGER**

**Do not attempt to backseat this valve. Attempts to backseat this valve will cause snap ring to explode from valve body under pressure of refrigerant. Personal injury and unit damage will result.**

- 3- Replace stem cap tighten firmly. Tighten finger tight, then tighten an additional 1/6 turn.



**FIGURE 4**

#### **To Close Liquid or Suction Line Service Valve:**

- 1- Remove stem cap with an adjustable wrench.
- 2- Using service wrench and 5/16" hex head extension, turn stem clockwise to seat the valve. Tighten firmly.

- 3- Replace stem cap. Tighten finger tight, then tighten an additional 1/6 turn.

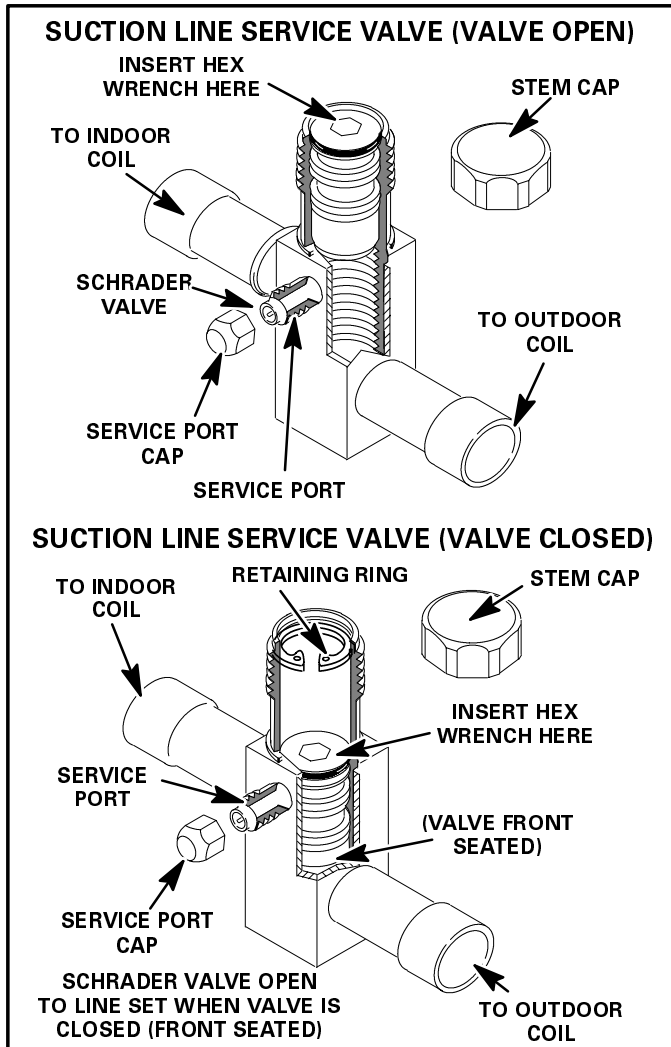


FIGURE 5

### 5-Ton Suction Line (Ball Type) Service Valve

A ball-type full service valve only is used on five ton units (10ACB60/62). These suction line service valves function the same way, differences are in construction. Valves are not rebuildable. If a valve has failed it must be replaced. A ball valve valve is illustrated in figure 6.

The ball valve is equipped with a service port. A schrader valve is factory installed. A service port cap is supplied to protect the schrader valve from contamination and assure a leak free seal.

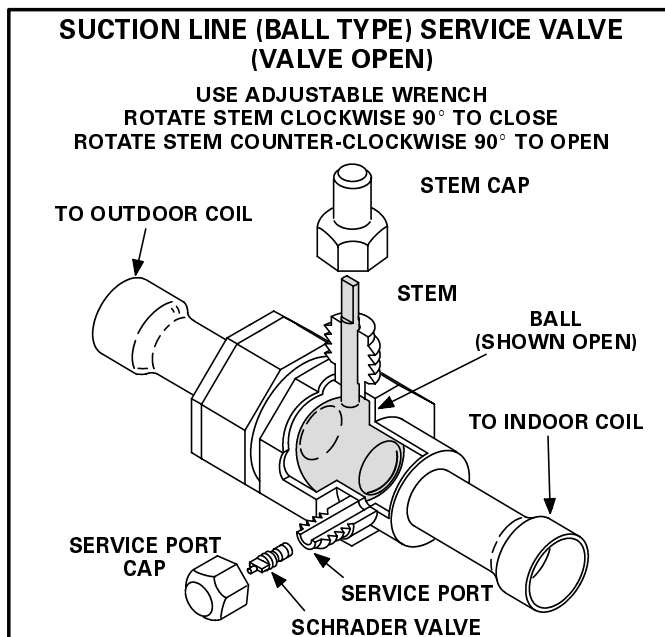


FIGURE 6

### LEAK TESTING

After the line set has been connected to the indoor and outdoor units, the line set connections and indoor unit must be checked for leaks.

### ⚠ WARNING

Never use oxygen to pressurize refrigeration or air conditioning system. Oxygen will explode on contact with oil and could cause personal injury. When using high pressure gas such as nitrogen or CO<sub>2</sub> for this purpose, be sure to use a regulator that can control the pressure down to 1 or 2 psig.

### Using an Electronic Leak Detector or Halide

- 1- Connect cylinder of HCFC-22 to center port of manifold gauge set.
- 2- With both manifold valves closed, open the valve on the HCFC-22 bottle (vapor only).
- 3- Open the high pressure side of the manifold to allow HCFC-22 into the line set and indoor unit. Weigh in a trace amount of HCFC-22. (A trace amount is a maximum of 2 ounces or 3 pounds pressure.) Close the valve on the HCFC-22 bottle and the valve on the high pressure side of the manifold gauge set. Disconnect HCFC-22 bottle.
- 4- Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set.

- 5 - Connect the high pressure hose of the manifold gauge set to the service port of the suction valve. (Normally, the high pressure hose is connected to the liquid line port, however, connecting it to the suction port better protects the manifold gauge set from high pressure damage.)
- 6- Adjust nitrogen pressure to 150 psig. Open the valve on the high side of the manifold gauge set which will pressurize line set and indoor unit.
- 7- After a short period of time, open a refrigerant port to make sure the refrigerant added is adequate to be detected. (Amounts of refrigerant will vary with line lengths.) Check all joints for leaks. Purge nitrogen and HCFC-22 mixture. Correct any leaks and re-check.

## EVACUATING

Evacuating the system of non-condensables is critical for proper operation of the unit. Non-condensables are defined as any gas that will not condense under temperatures and pressures present during operation of an air conditioning system. Non-condensables and water vapor combine with refrigerant to produce substances that corrode copper piping and compressor parts.

- 1- Connect manifold gauge set to the service valve ports as follows: low pressure gauge to suction line service valve; high pressure gauge to liquid line service valve.
- 2- Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set.
- 3- Open both manifold valves and start vacuum pump.
- 4- Evacuate the line set and indoor unit to an **absolute pressure** of 23mm of mercury or approximately 1 inch of mercury. During the early stages of evacuation, it is desirable to close the manifold gauge valve at least once to determine if there is a rapid rise in **absolute pressure**. A rapid rise in pressure indicates a relatively large leak. If this occurs, the leak testing procedure must be repeated.

*NOTE - The term **absolute pressure** means the to-*

*tal actual pressure within a given volume or system, above the absolute zero of pressure. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.*

- 5- When the absolute pressure reaches 23mm of mercury, close the manifold gauge valves, turn off the vacuum pump and disconnect the manifold gauge center port hose from vacuum pump. Attach the manifold center port hose to a nitrogen cylinder with pressure regulator set to 150 psig and purge the hose. Open the manifold gauge valves to break the vacuum in the line set and indoor unit. Close the manifold gauge valves.

## CAUTION

**Danger of Equipment Damage.**  
**Avoid deep vacuum operation. Do not use compressors to evacuate a system.**  
**Extremely low vacuums can cause internal arcing and compressor failure.**  
**Damage caused by deep vacuum operation will void warranty.**

- 6- Shut off the nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the nitrogen from the line set and indoor unit.
- 7- Reconnect the manifold gauge to the vacuum pump, turn the pump on and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above .5mm of mercury within a 20 minute period after shutting off the vacuum pump and closing the manifold gauge valves.
- 8- Depending on the equipment used to determine the vacuum level, the following units are equivalent to absolute pressure of .5mm of mercury or 500 microns.
- 9- When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to an upright bottle of HCFC-22 refrigerant. Open the manifold gauge valves to break the vacuum in the line set and indoor unit. Close manifold gauge valves and shut off HCFC-22 bottle and remove manifold gauge set.

## START-UP

### IMPORTANT

**Crankcase heater (used on 3-1/2, 4 and 5 ton units) should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.**

- 1- Rotate fan to check for frozen bearings or binding.
- 2- Inspect all factory and field-installed wiring for loose connections.
- 3- After evacuation is complete, open liquid line and suction line service valves to release refrigerant charge (contained in condensing unit) into the system.
- 4- Replace stem caps and secure finger tight, then tighten an additional (1/6) one-sixth of a turn.
- 5- Check voltage supply at the disconnect switch. The voltage must be within the range listed on unit nameplate. If not, do not start the equipment until the power company has been consulted and the voltage condition corrected.
- 6- Set the thermostat for cooling demand, turn on power to evaporator blower and close condensing unit disconnect switch to start unit.
- 7- Recheck voltage with unit running. Power must be within range shown on nameplate. Check amperage draw of unit. Refer to unit nameplate for correct running amps.

## CHARGING CONSIDERATIONS

Units are factory charged with the amount of HCFC-22 refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with 20 ft. (6.1m) line set. For varying lengths of line set, refer to table 3 for refrigerant charge adjustment. A blank space is provided on the rating plate to list the actual field charge.

TABLE 3

Liquid Line Set Diameter	Ozs. per 5 ft. (ml per mm) adjust from 20 ft. (6.1m) line set*
5/16 in. (8mm)	2 ounce per 5 ft. (57ml per 1.5m)
3/8 in. (10mm)	3 ounce per 5 ft. (85ml per 1.5m)

*\*If line length is greater than 20 ft. (6.1m), add this amount. If line length is less than 20 ft. (6.1m), subtract this amount.*

If the system is void of refrigerant, the recommended and most accurate method of charging is to weigh the refrigerant into the unit according to the total amount shown on the unit nameplate. This may be done after any leaks have been repaired. If weighing facilities are not available or if unit is just low on charge, use one of the procedures outlined.

Charging a condensing unit is recommended during warm weather. However, applications arise in which charging must occur in the colder months. *The way the unit is charged depends on the unit's refrigerant metering device and the outdoor ambient temperature.*

For RFC systems, **weighing in the charge** and **subcooling** are two acceptable means of charging under certain conditions. For installations of an RFC system where the outdoor ambient is less than 65°F (18°C), weighing in the charge is the best method. However, in installations where the outdoor ambient is 65°F (18°C) or above, subcooling is the best method.

**Weighing in the charge** and the **approach** method are the two recommended procedures for charging the 10ACB using an expansion valve system for refrigerant metering. The difference between the two involves the outdoor ambient temperature. For expansion valve systems where the outdoor ambient temperature is 60°F (16°C) or above, the approach method may be used. For expansion valve systems where the outdoor ambient temperature is below 60°F (16°C), weighing in the charge is recommended.

**TABLE 4**

<b>NORMAL OPERATING PRESSURES IN PSIG (LIQUID AND SUCTION +/- 10 PSIG)*</b>																			
MODE	OUT. COIL ENTERING AIR TEMP. °F (°C)	10ACB12		10ACB18		10ACB24		10ACB30		10ACB36		10ACB42		10ACB48		10ACB60		10ACB62	
		LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.
RFCIV	65 (18.3)	145	71	155	65	160	65	168	63	176	62	162	68	157	69	153	66	159	64
	75 (23.9)	167	77	181	70	188	70	197	68	203	66	185	72	182	72	180	71	188	68
	85 (29.4)	192	81	208	75	216	74	227	73	233	70	210	73	204	73	210	74	219	72
	95 (35.0)	221	84	238	80	247	78	258	77	266	74	252	76	244	76	245	77	253	75
	105 (40.6)	253	87	270	84	280	82	292	80	299	77	287	79	278	79	279	79	287	76
TXV	65 (18.3)	140	79	159	73	164	71	173	71	179	68	157	71	158	70	142	73	151	69
	75 (23.9)	161	80	183	75	189	73	199	73	205	70	187	73	182	72	168	75	179	71
	85 (29.4)	189	81	209	77	217	75	228	75	235	72	217	74	205	73	202	76	211	73
	95 (35.0)	220	83	238	80	247	78	258	77	266	74	255	76	246	76	245	77	249	74
	105 (40.6)	254	84	269	82	279	80	292	79	299	77	289	77	280	79	280	78	286	75

\*These are typical pressures only. Indoor evaporator match up, indoor air quality and evaporator load will cause the pressures to vary.

**! IMPORTANT**

Use table 4 as a general guide for performing maintenance checks. Table 4 is not a procedure for charging the system. Minor variations in these pressures may be expected due to differences in installations. Significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system. Used prudently, table 4 could serve as a useful service guide.

Before charging the unit, follow the procedure below to determine: the liquid line temperature and the outdoor ambient temperature.

- 1 - Connect manifold gauge set to service valves: low pressure gauge to suction valve service port; high pressure gauge to liquid valve service port. Connect the center manifold hose to an upright bottle of HCFC-22. Close manifold gauge set valves.
- 2 - Set the room thermostat to call for heat. This will create the necessary load for properly charging the system in the cooling cycle.
- 3 - Record the outdoor ambient temperature. For greater accuracy, use the same electronic thermometer to measure liquid temperature.

- 4 - When thermostat demand has been satisfied, switch to cooling mode with a set point of 68°F (20°C). When pressures have stabilized, record the liquid line temperature.
- 5 - The outdoor temperature will determine which charging method to use. Proceed with the appropriate charging procedure below.

**CHARGING FOR RFC SYSTEMS**

**Weighing in the Charge Method**

***RFC Systems, < 65° F (18° C) Outdoor Temp***

- 1- Recover the refrigerant from the unit.
- 2- Conduct a leak check, then evacuate as previously outlined.
- 3- Weigh in the factory charge as shown on the outdoor unit's rating plate.

**The Subcooling Method**

***RFC Systems, ≥ 65° F (18° C) Outdoor Temp***

- 1- With the manifold gauge hose still on the liquid service port and the unit operating stably, record the liquid line temperature.
- 2- At the same time, record the liquid line pressure reading.
- 3- Using a temperature/pressure chart for HCFC-22, determine the saturation temperature for the liquid line pressure reading.

- 4- Subtract the liquid line temperature from the saturation temperature (according to the chart) to determine subcooling. (**Saturation temperature - Liquid line temperature = Subcooling**)
- 5- Compare the subcooling value with those in table 5. If subcooling is greater than shown, some refrigerant must be recovered. If subcooling is less than shown, some refrigerant must be added.

**TABLE 5  
SUBCOOLING FOR RFC SYSTEMS**

OUTDOOR TEMP. °F (°C)	LIQUID SUBCOOLING [± 1°F (.6°C)]							
	012	018	024	030	036	042	048	060
60 (16)	14 (7.8)	17 (9.5)	18 (10)	18 (10)	14 (8)	14 (8)	12 (6.7)	14 (8)
65 (18)	13 (7.2)	16 (8.9)	16 (8.9)	17 (9.5)	13 (7.8)	13 (7.8)	11 (6.1)	14 (8)
70 (21)	12 (6.7)	15 (8.3)	14 (7.8)	16 (8.9)	12 (6.7)	13 (7.8)	10 (5.6)	13 (7.8)
75 (24)	10 (5.6)	14 (7.8)	12 (6.7)	15 (8.3)	10 (5.6)	12 (6.7)	9 (5)	13 (7.8)
80 (27)	9 (5)	13 (7.2)	11 (6.1)	14 (8)	9 (5)	11 (6.1)	9 (5)	12 (6.7)
85 (29)	8 (4.5)	12 (6.7)	10 (5.6)	13 (7.8)	8 (4.4)	10 (5.6)	9 (5)	12 (6.7)
90 (32)	7 (3.9)	11 (6.1)	9 (5)	12 (6.7)	7 (3.9)	10 (5.6)	8 (4.5)	12 (6.7)
95 (35)	6 (3.3)	9 (5)	8 (4.5)	11 (6.1)	6 (3.3)	9 (5)	8 (4.5)	12 (6.7)
100 (38)	4 (2.2)	8 (4.5)	7 (3.9)	10 (5.6)	5 (2.8)	9 (5)	8 (4.5)	11 (6.1)
105 (41)	2 (1.1)	7 (3.9)	6 (3.3)	9 (5)	4 (2.2)	9 (5)	7 (3.9)	10 (5.6)
110 (43)	2 (1.1)	6 (3.3)	6 (3.3)	7 (3.9)	3 (1.7)	8 (4.5)	7 (3.9)	9 (5)
115 (45)	1 (0.6)	5 (2.8)	5 (2.8)	5 (2.8)	2 (1.1)	7 (3.9)	6 (3.3)	8 (4.5)

Note - For best results, the same electronic thermometer should be used to check both outdoor ambient and liquid temperatures.

### CHARGING FOR TXV SYSTEMS

#### Weighing in the Charge

##### TXV Systems, < 60° F (16° C) Outdoor Temp

- 1- Recover the refrigerant from the unit.
- 2- Conduct a leak check, then evacuate as previously outlined.
- 3- Weigh in the factory charge as shown on the outdoor unit's rating plate.

#### The Approach Method

##### TXV Systems, ≥ 60° F (16° C) Outdoor Temp

Having taken the outdoor ambient and liquid line temperature readings, subtract the outdoor ambient temperature from the liquid line temperature to determine the Approach temperature. (**Liquid Line °F (°C) - Outdoor Ambient °F (°C) = Approach Temperature.**) The resulting difference (Approach temperature) should

agree with the values given in table 6. If not, add refrigerant to lower the approach temperature or recover refrigerant from the system to increase the approach temperature.

**TABLE 6  
APPROACH METHOD**

MODEL NO.	APPROACH TEMPERATURE LIQUID LINE - OUTDOOR AMBIENT °F (°C)
10ACB12	7 (3.9)
10ACB18	5 (2.8)
10ACB24	9 (5)
10ACB30	10 (5.6)
10ACB36	12 (6.7)
10ACB42	14 (8)
10ACB48	13 (7.2)
10ACB60	12 (6.7)
10ACB62	12 (6.7)

Note - For best results, the same electronic thermometer should be used to check both outdoor ambient and liquid temperatures.

### SYSTEM OPERATION

Condensing unit and indoor blower cycle on demand from room thermostat. When thermostat blower switch is switched to **ON** position, indoor blower operates continuously.

#### Crankcase Heater

Three and one-half, four and five ton units are equipped with internal self-regulating crankcase heaters.

#### Compressor Start Kit

Three and one-half, four and five ton single-phase units have internal start components and do not require field installation of a compressor start kit.

#### Timed-Off Control (Option Units ONLY)

Option units are factory-equipped with a timed-off control which helps equalize system pressures that allows the compressor to start in an unloaded condition as well as preventing compressor short-cycling. The timed-off control delays compressor start-up for five minutes on thermostat demand. Mounted in the control box, the control is wired between thermostat terminal "Y" and the compressor contactor.

#### High and Low Pressure Switches (International and Option Units ONLY)

10ACB international and option units are factory-equipped with both high and low pressure switches. The pressure switches are located on the valve cores in the liquid line to allow easy access. The manually reset high pressure switch protects the system from high pressure conditions as a result of a fan failure or a

blocked or dirty coil. The low pressure switch (SPST, NO) protects the system compressor from damage due to loss of charge. The switch will trip at 15 +/- 5 psig (103 +/- 34 kPa) and automatically resets at 25 +/- 3 psig (172 +/- 21 kPa).

### Refrigerant Sight Glass (Option Units ONLY)

A refrigerant sight glass is provided in the bag assembly for field installation. The sight glass can be installed in the liquid line to help monitor system charge.

## MAINTENANCE

### ⚠ WARNING



**Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.**

At the beginning of each cooling season, the system should be checked as follows:

- 1- Clean and inspect condenser coil. Coil may be flushed with a water hose. Make sure power is off before cleaning.
- 2- Visually inspect connecting lines and coils for evidence of oil leaks.

- 3- Check wiring for loose connections.
- 4- Check for correct voltage at unit (unit operating).
- 5- Check condenser fan motor amp-draw.  
Unit nameplate \_\_\_\_\_ Actual \_\_\_\_\_ .

*NOTE - - If owner complains of insufficient cooling, the unit should be gauged and refrigerant charge checked. Refer to section on refrigerant charging in this instruction.*

### Evaporator Coil

- 1- Clean coil, if necessary.
- 2- Check connecting lines and coils for evidence of oil leaks.
- 3- Check condensate line and clean, if necessary.

### Indoor Unit

- 1- Clean or change filters.
- 2- Adjust blower speed for cooling. The pressure drop over the coil should be measured to determine the correct blower CFM. Refer to the unit information service manual for pressure drop tables and procedure.
- 3- *Belt Drive Blowers* - Check belt for wear and proper tension.
- 4- Check all wiring for loose connections
- 5- Check for correct voltage at unit (blower operating).
- 6- Check amp-draw on blower motor  
Unit nameplate \_\_\_\_\_ Actual \_\_\_\_\_ .

**START-UP AND PERFORMANCE CHECK LIST**

Job Name \_\_\_\_\_ Job No. \_\_\_\_\_ Date \_\_\_\_\_

Job Location \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Installer \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_

Unit Model No. \_\_\_\_\_ Serial No. \_\_\_\_\_ Service technician \_\_\_\_\_

Nameplate Voltage \_\_\_\_\_ Amps: \_\_\_\_\_

Minimum Circuit Ampacity \_\_\_\_\_ Supply \_\_\_\_\_ Condenser Fan \_\_\_\_\_

Maximum Overcurrent Protection Size \_\_\_\_\_ Compressor \_\_\_\_\_

Electrical Connections Tight?  Indoor Filter Clean?

Indoor Blower CFM \_\_\_\_\_

Supply Voltage (Unit Off) \_\_\_\_\_ S.P. Drop Over Evaporator (Dry) \_\_\_\_\_

Refrigerant Lines:

**COOLING SECTION**

Leak Checked?

Condenser Entering Air Temperature \_\_\_\_\_

Service Valves Fully Open?

Discharge Pressure \_\_\_\_\_ Suction Pressure \_\_\_\_\_

Properly Insulated?

Refrigerant Charge Checked?

Service Valve Caps Tight?

Condenser Fan Checked?

Voltage With Compressor Operating \_\_\_\_\_

**THERMOSTAT**

Properly Set?

Level?