LENNOX®

INSTALLATION INSTRUCTIONS

13ACC Series Units

CONDENSING UNITS
504,726M
04/04
Supersedes 02/04

Technical Publications
Litho U.S.A.

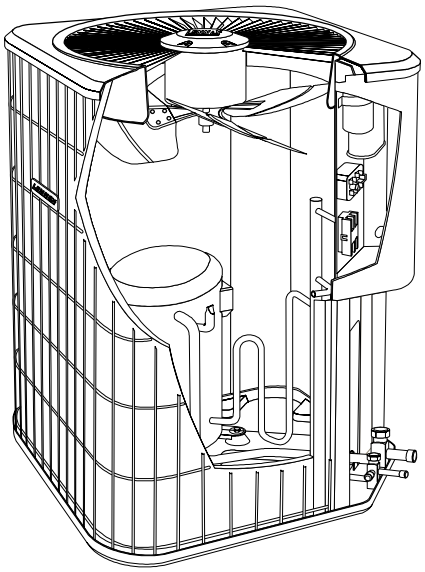


Table of Contents

RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

13ACC Outdoor Units

Lennox' 13ACC Merit® Series outdoor units are designed for use in either fixed orifice or expansion valve (TXV) systems. Refer to the Lennox Engineering Handbook for expansion valve kits which must be ordered separately.

Shipping & Packing List

1 - Assembled outdoor unit

1 - Fixed orifice refrigerant metering device

Check the unit for shipping damage. If you find any damage, immediately contact the last carrier.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a qualified installer or service agency.

⚠ 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 noncompliance.

General Information

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities who have jurisdiction before installation.

⚠ WARNING

This product and/or the indoor unit it is matched with may contain fiberglass wool.

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

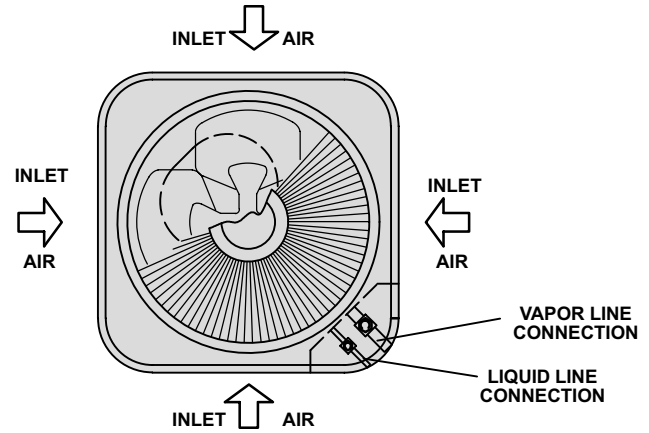
Fiberglass wool may also cause respiratory, skin, and eye irritation.

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

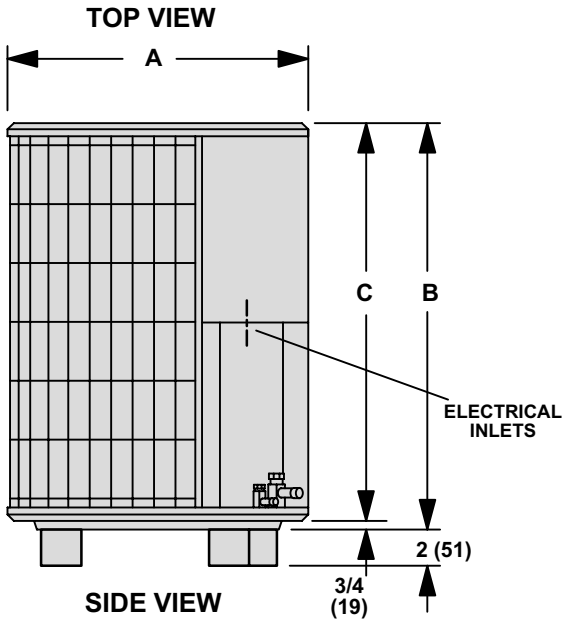
Lennox Industries Inc.

P.O. Box 799900
Dallas, TX 75379-9900

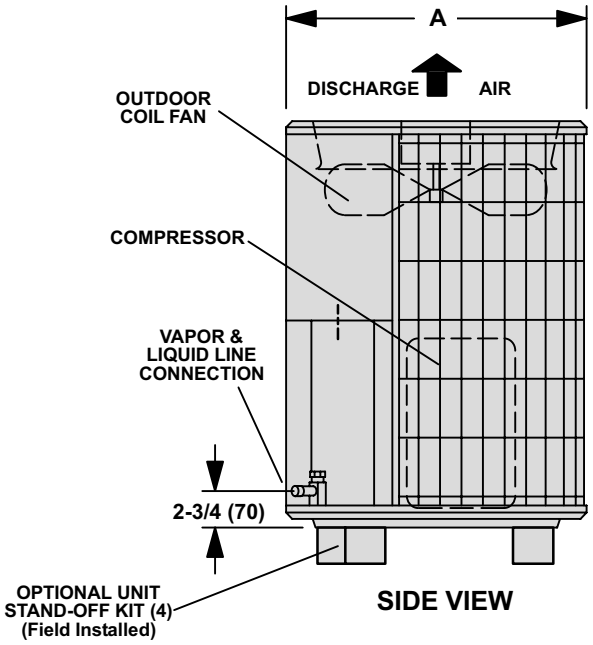
Unit Dimensions - inches (mm)



TOP VIEW



SIDE VIEW



SIDE VIEW

Model No.		A	B	C
13ACC -018 13ACC -024 13ACC -030 13ACC -036	in.	24-1/4	33-1/4	32-1/2
	mm	616	845	826
13ACC-037	in.	24-1/4	43-/14	42-1/2
	mm	616	1099	1080
13ACC-042	in.	24-1/4	33-1/4	32-1/2
	mm	616	845	826
13ACC-047	in.	28-1/4	43-1/4	42-1/2
	mm	718	1099	1080
13ACC-048 13ACC-060	in.	28-1/4	37-1/4	36-1/2
	mm	718	946	927

Setting the Unit

⚠CAUTION

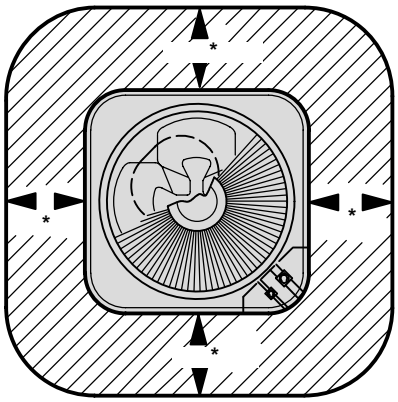
In order to avoid injury, take proper precaution when lifting heavy objects.

⚠CAUTION

Sharp sheet metal edges can cause injury. When installing the unit, avoid accidental contact with sharp edges.

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

Installation Clearances



**NOTE - A service clearance of 30" (762 mm) must be maintained on one of the sides adjacent to the control box. Clearance to one of the other three sides must be 36" (914 mm). Clearance to one of the remaining two sides may be 12" (304 mm) and the final side may be 6" (152 mm).*

NOTE - A clearance of 24" (610 mm) must be maintained between two units.

NOTE - 48" (1219 mm) clearance required on top of unit. Maximum soffit overhang is 36" (914 mm).

Figure 1

Slab Mounting

When installing a unit at grade level, the top of the slab should be high enough above the grade so that water from higher ground will not collect around the unit. See figure 2. Slab should have a slope tolerance away from the building of 2 degrees or 2 inches per 5 feet (51 mm per 1524 mm). Refer to roof mounting section for barrier construction if unit must face prevailing winter winds.

Roof Mounting

Install the unit at a minimum of 4 inches (102 mm) above the surface of the roof. Ensure the weight of the unit is properly distributed over roof joists and rafters. Redwood or steel supports are recommended.

Slab Mounting At Ground Level

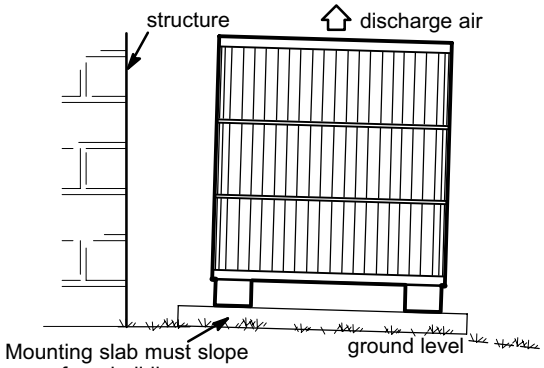


Figure 2

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 nameplate 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.

1 - Install line voltage power supply to unit from a properly sized disconnect switch.

2 - Ground unit at unit disconnect switch or to an earth ground.

NOTE - To facilitate conduit, a hole is located in the bottom of the control box. Connect conduit to the control box using a proper conduit fitting.

NOTE - Units are approved for use only with copper conductors.

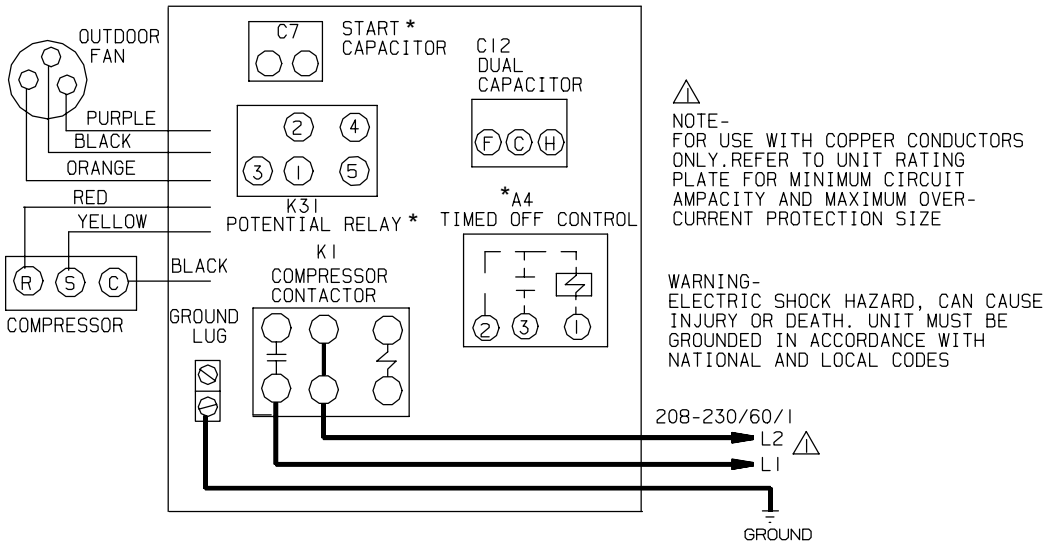
24V, Class II circuit connections are made in the low voltage junction box. Refer to figure 4 for field wiring diagram.

NOTE - A complete unit wiring diagram is located in side the unit control box cover.

3 - Install room thermostat (ordered separately) on an inside wall approximately in the center of the conditioned area and 5 feet (1.5 m) from the floor. It should not be installed on an outside wall or where it can be affected by sunlight, drafts or vibrations.

4 - Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit. See figure 4.

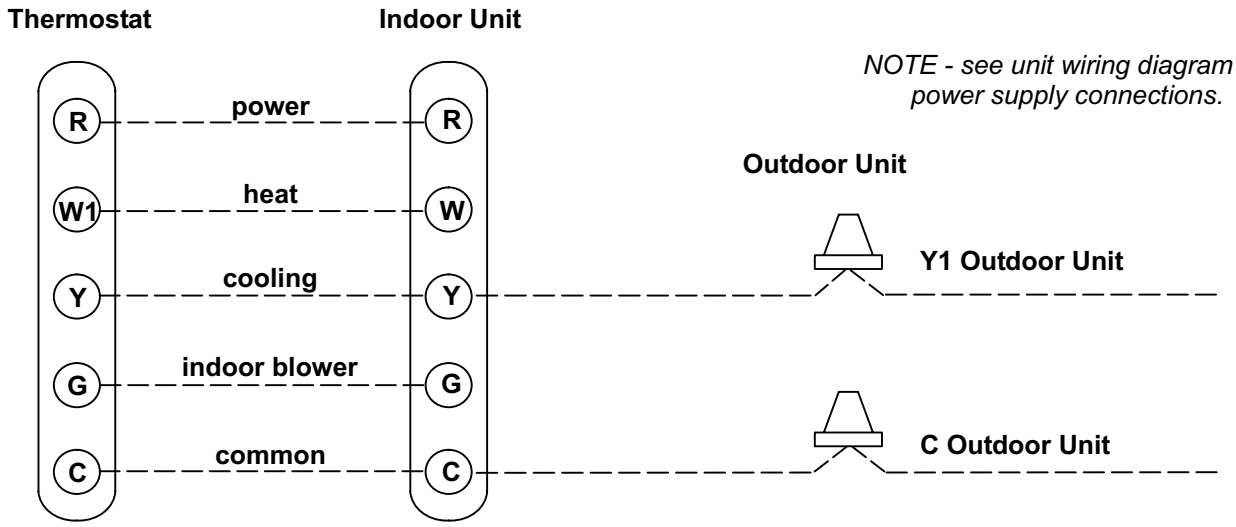
Typical Field Wiring Diagram



*May be optional

Figure 3

Thermostat Designations



NOTE - If the indoor unit is not equipped with blower relay, it must be field-provided and installed (P-8-3251 or equivalent).

Figure 4

Refrigerant Piping

Field refrigerant piping consists of liquid and vapor lines from the outdoor unit (sweat connections) to the indoor coil (flare or sweat connections). Use Lennox L15 (sweat, non-flare) series line sets as shown in table 1 or use field-fabricated refrigerant lines. Refer to Refrigerant Piping Guide (Corp. 9351-L9) for proper size, type, and application of field-fabricated lines. Valve sizes are also listed in table 1.

Table 1
Refrigerant Line Sets

Model No.	Valve Field Size Connections		Recommended Line Set		
	Liquid Line	Vapor Line	Liquid Line	Vapor Line	L15 Line Sets
-018	3/8 in. (10 mm)	3/4 in. (19 mm)	3/8 in (10 mm)	5/8 in. (16 mm)	L15-21 15 ft.- 50 ft. (4.6m - 15m)
-024 -030	3/8 in. (10 mm)	3/4 in. (19 mm)	3/8 in (10 mm)	3/4 in. (19 mm)	L15-41 15 ft.- 50 ft. (4.6m - 15m)
-036 -037 -042 -048	3/8 in. (10 mm)	7/8 in (22 mm)	3/8 in. (10 mm)	7/8in (22 mm)	L15-65 15 ft.- 50 ft. (4.6m - 15m)
-047 -060	3/8 in. (10 mm)	1-1/8 in. (29 mm)	3/8 in (10 mm)	1-1/8 in. (29 mm)	Field Fabricated

NOTE - Units are designed for line sets of up to fifty feet (15 m). For applications longer than fifty feet, consult the Lennox Refrigerant Piping Guide (Corp. 9351-L9). Select line set diameters from table 1 to ensure that oil returns to the compressor.

Installing Refrigerant Line

During the installation of any heat pump or a/c system, it is important to properly isolate the refrigerant lines to prevent unnecessary vibration. Line set contact with the structure (wall, ceiling or floor) causes some objectionable noise when vibration is translated into sound. As a result, more energy or vibration can be expected. Closer attention to line set isolation must be observed.

Following are some points to consider when placing and installing a high-efficiency outdoor unit:

1- **Placement -** Be aware some localities are adopting sound ordinances based on how noisy the unit is at the neighbors' home, not at the original installation. Install the unit as far as possible from the property line. When possible, do not install the unit directly outside a bedroom window. Glass has a very high level of sound transmission.

2- **Line Set Isolation -** The following illustrations demonstrate procedures which ensure proper refrigerant line set isolation. Figure 5 shows how to install line sets on vertical runs. Figure 6 shows how to install line sets on horizontal runs. Figure 7 shows how to make a transition from horizontal to vertical. Finally, figure 8 shows how to place the outdoor unit and line set.

Refrigerant Line Sets
How To Install Vertical Runs
(new construction shown)

NOTE - Similar installation practices should be used if line set is to be installed on exterior of outside wall.

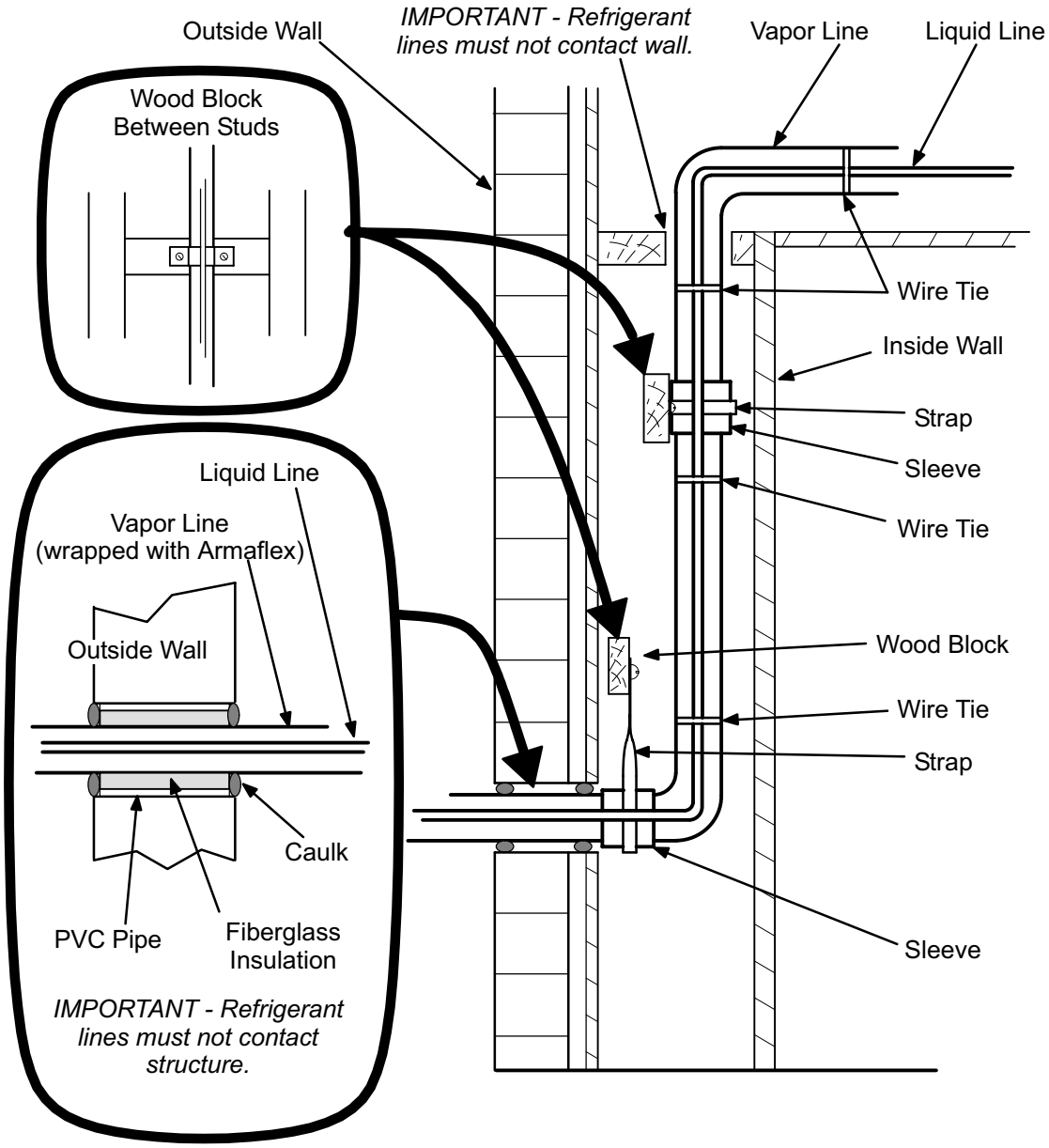


Figure 5

Refrigerant Line Sets:
Installing Horizontal Runs

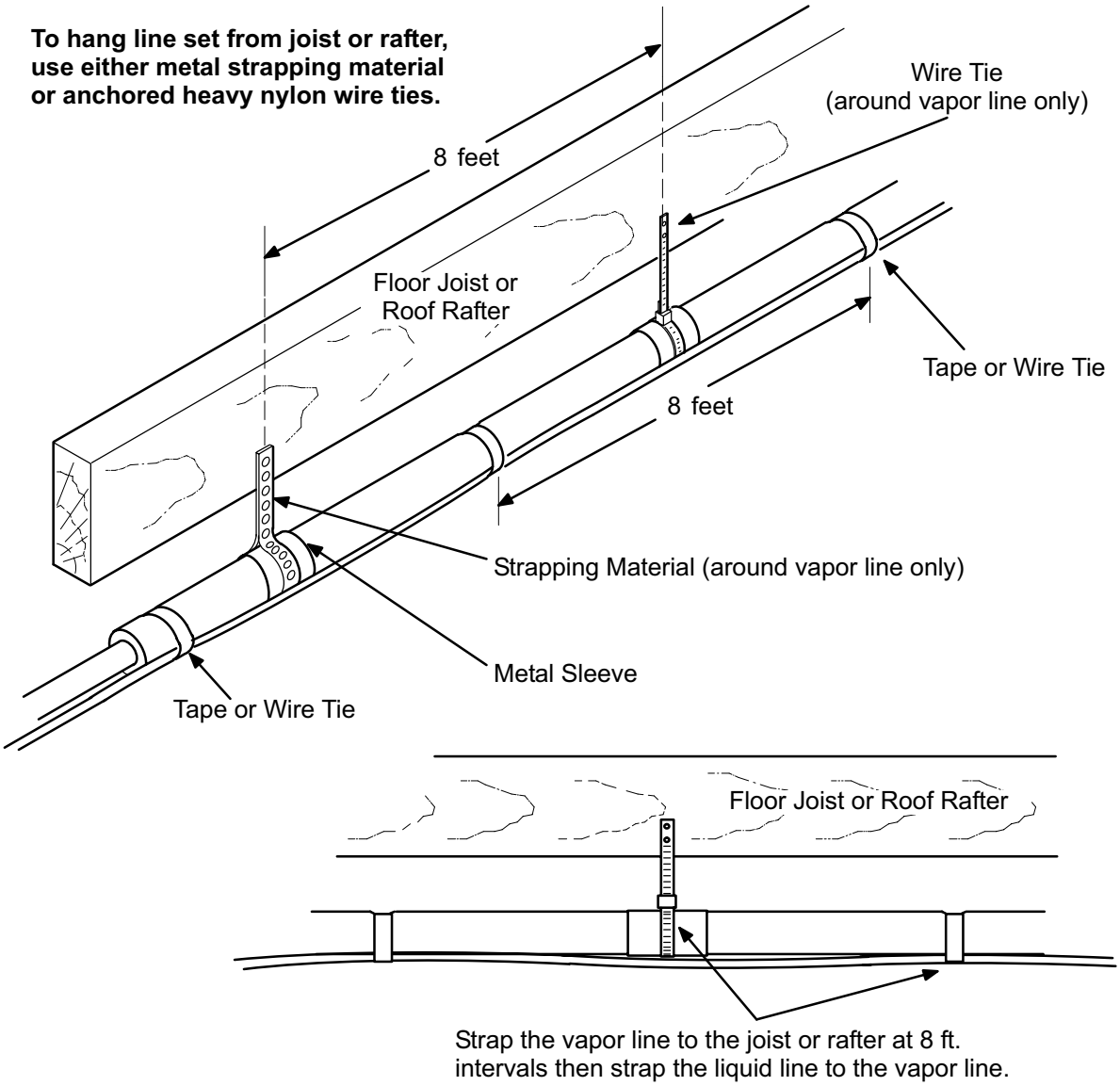


Figure 6

Refrigerant Line Sets:
Transition From Vertical To Horizontal

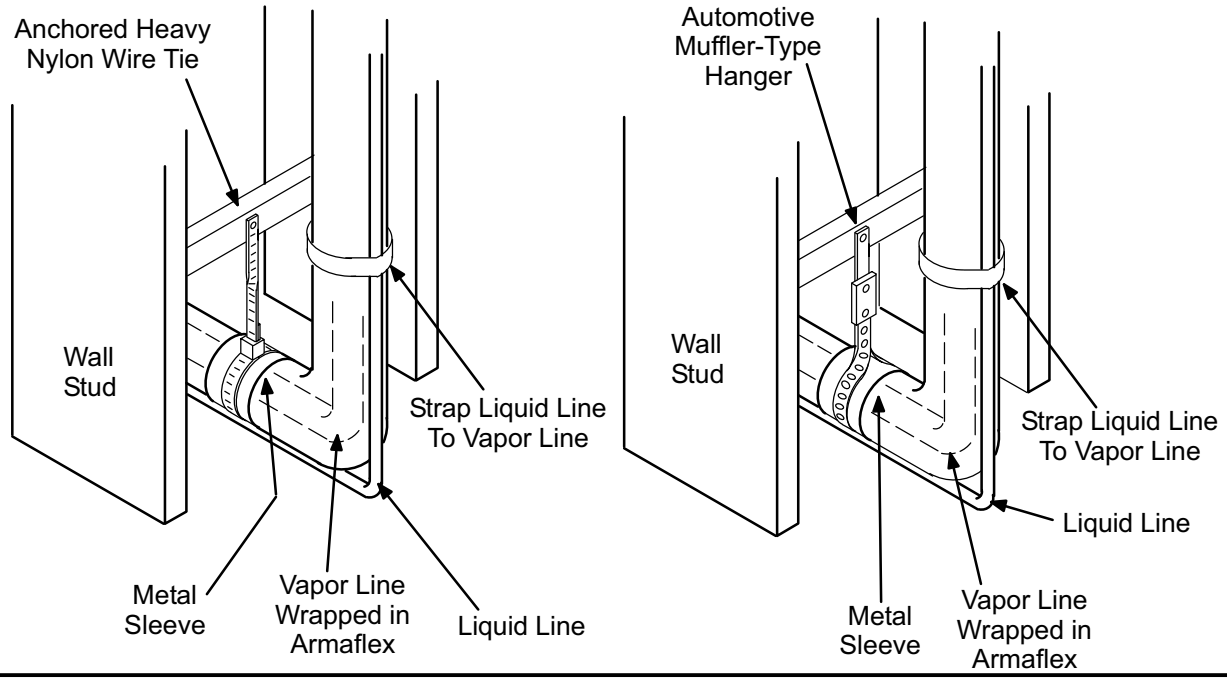


Figure 7

Outside Unit Placement and Installation

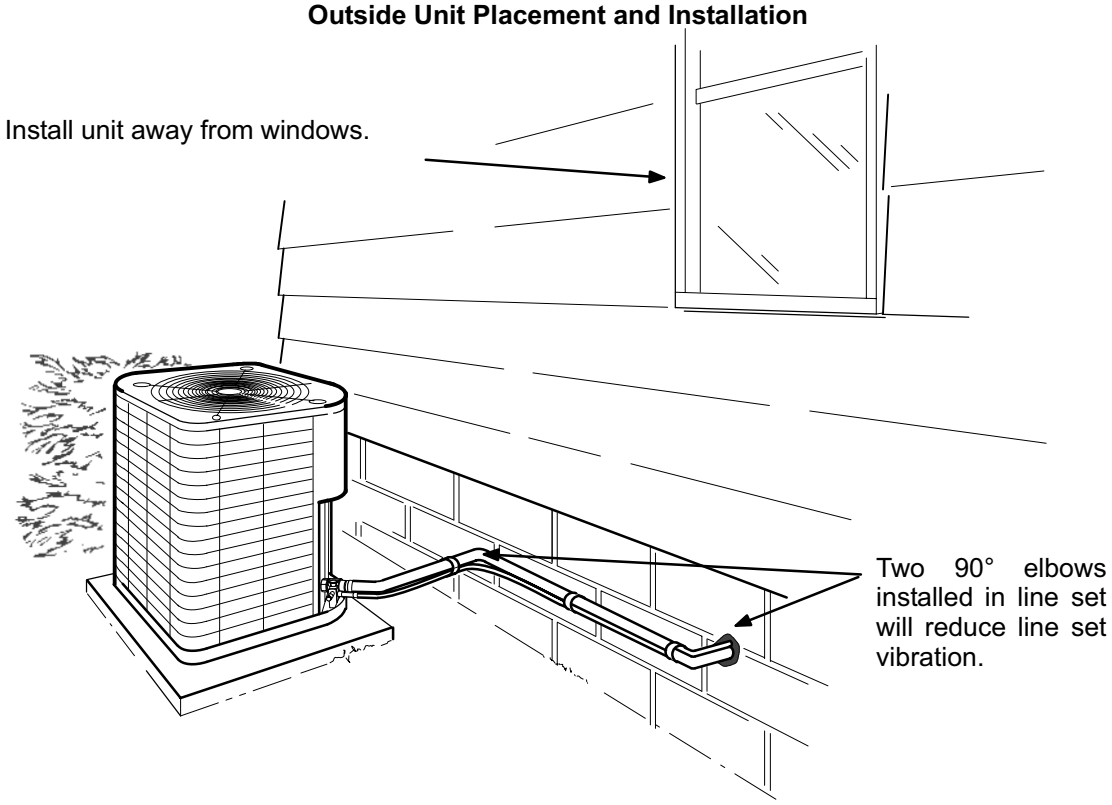


Figure 8

Brazing Connection Procedure

1 - Cut ends of the refrigerant lines square (free from nicks or dents). Debur the ends. The pipe must remain round, do not pinch end of the line.

2 - Before making line set connections, use dry nitrogen to purge the refrigerant piping. This will help to prevent oxidation and the introduction of moisture into the system.

3 - Use silver alloy brazing rods (5 or 6 percent minimum silver alloy for copper-to-copper brazing or 45 percent silver alloy for copper-to-brass or copper-to-steel brazing) which are rated for use with HCFC22 refrigerant. Wrap a wet cloth around the valve body and the copper tube stub. Braze the line set to the service valve.

4 - Wrap a wet cloth around the valve body and copper tube stub to protect it from heat damage during brazing. Wrap another wet cloth underneath the valve body to protect the base paint.

NOTE - The tube end must stay bottomed in the fitting during final assembly to ensure proper seating, sealing and rigidity.

5 - Install a field-provided thermal expansion valve (approved for use with HCFC22 refrigerant) in the liquid line at the indoor coil.

Refrigerant Metering Devices

13ACC units can be used in either TXV systems or fixed orifice systems. See the Lennox Engineering Handbook for approved TXV and fixed orifice match-ups and application information. Table 1 lists the unit liquid and vapor line sizes and corresponding line sets.

Fixed Orifice Systems

Replace the existing indoor unit fixed orifice with the orifice supplied with the outdoor unit. Place the supplied fixed orifice sticker on the indoor cabinet after installation. See table 2 for the fixed orifice size for each unit. In nonstandard applications, the provided fixed orifice may not be appropriately sized. Refer to the Engineering Handbook for specific orifice information.

Table 2
13ACC Fixed Orifice Drill Sizes

Unit	Fixed Orifice Catalog #	Fixed Orifice Drill Size
-018	42J39	.055
-024	42J43	.063
-030	42J47	.071
-036	42J51	.078
-037	42J50	.077
-042	25M56	.079
-047	42J54	.084
-048	78L74	.093
-060	42J62	.099

Install the fixed orifice as shown in figure 9. Do not twist the cap tubes when loosening the seal nut from the orifice housing.

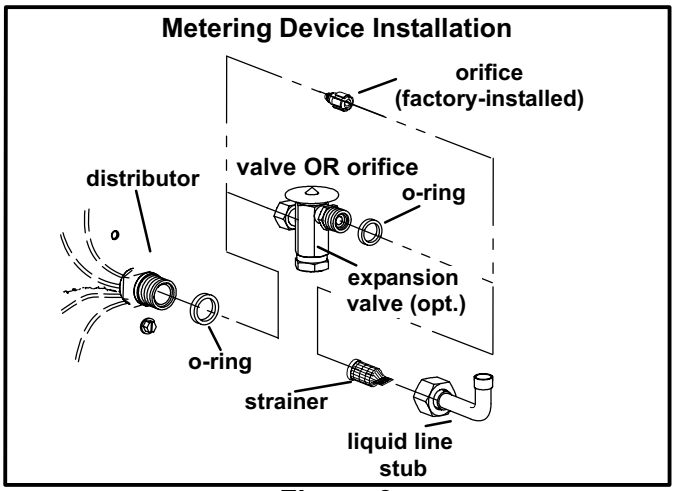


Figure 9

Expansion Valve Systems

Expansion valves equipped with either Chatleff or flare type fittings are available from Lennox. Refer to the Engineering Handbook for expansion valves for use with specific match-ups.

If you install an expansion valve with an indoor coil that includes a fixed orifice, remove the orifice before the expansion valve is installed.

⚠ IMPORTANT

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

Manifold Gauge Set

When checking the unit charge, use a manifold gauge set that is equipped with “low loss” hoses. Do not use a manifold gauge set with anything other than a “low loss” hose.

Service Valves

The service valves (figures 10 and 11) and gauge ports are used for leak testing, evacuating, charging and checking charge. See table 3 for torque requirements

Table 3
Torque Requirements

Part	Recommended Torque	
Service valve cap	8 ft.- lb.	11 NM
Sheet metal screws	16 in.- lb.	2 NM
Machine screws #10	28 in.- lb.	3 NM
Compressor bolts	90 in.- lb.	10 NM
Gauge port seal cap	8 ft.- lb.	11 NM

Each valve is equipped with a service port which has a factory-installed Schrader valve. A service port cap protects the Schrader valve from contamination and serves as the primary leak seal.

NOTE - -018 units are equipped with the same kind of service valve on both the liquid and vapor lines. They do not use the ball-type valve. See figure 10.

To Access Schrader Port:

1 - Remove service port cap with an adjustable wrench.

2 - Connect gauge to the service port.

3 - When testing is complete, replace service port cap. Tighten finger tight, then an additional 1/6 turn.

To Open Service Valve:

1 - Remove the stem cap with an adjustable wrench.

2 - Use a service wrench with a hex-head extension to back the stem out counterclockwise as far as it will go.

NOTE - Use a 3/16” hex head extension for liquid line valves or a 5/16” extension for vapor line valves.

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

To Close Service Valve:

1 - Remove the stem cap with an adjustable wrench.

2 - Use a service wrench with a hex-head extension to turn the stem clockwise to seat the valve. Tighten the stem firmly.

NOTE - Use a 3/16” hex head extension for liquid line valves or a 5/16” extension for vapor line valves.

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

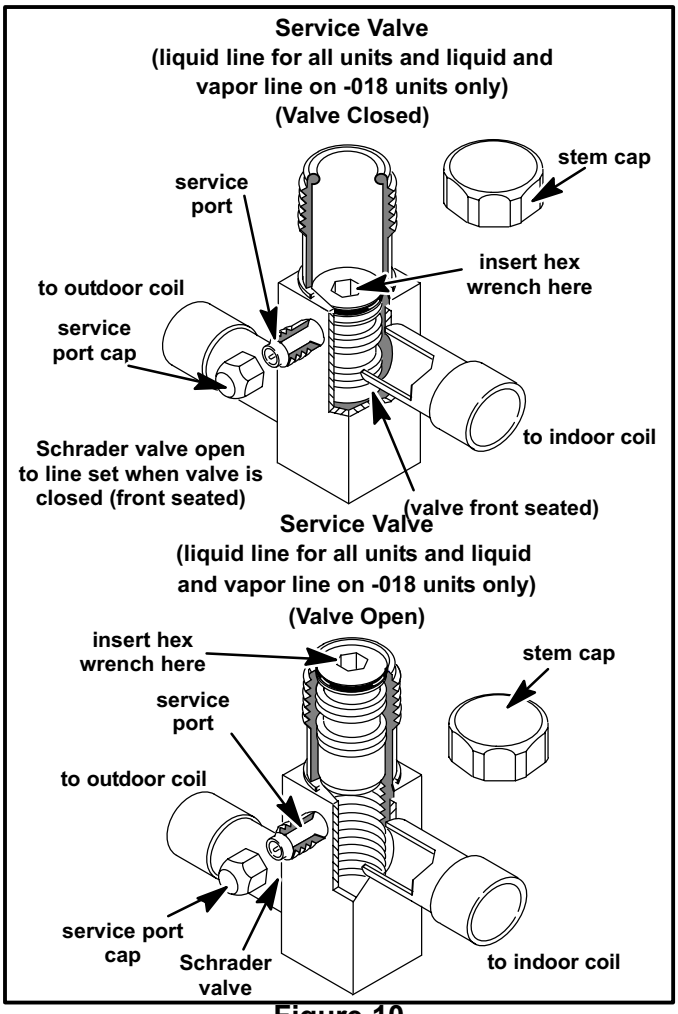


Figure 10

Vapor Line Ball Valve – All Units

A ball-type full-service valve is used on the vapor line on all 13ACC units (except the -018). These vapor line service valves function the same way as the other valves, the differences are in construction. These valves are not rebuildable. If a valve has failed, you must replace it. A ball valve is illustrated in figure 11.

The ball valve is equipped with a service port with a factory-installed Schrader valve. A service port cap protects the Schrader valve from contamination and assures a leak-free seal.

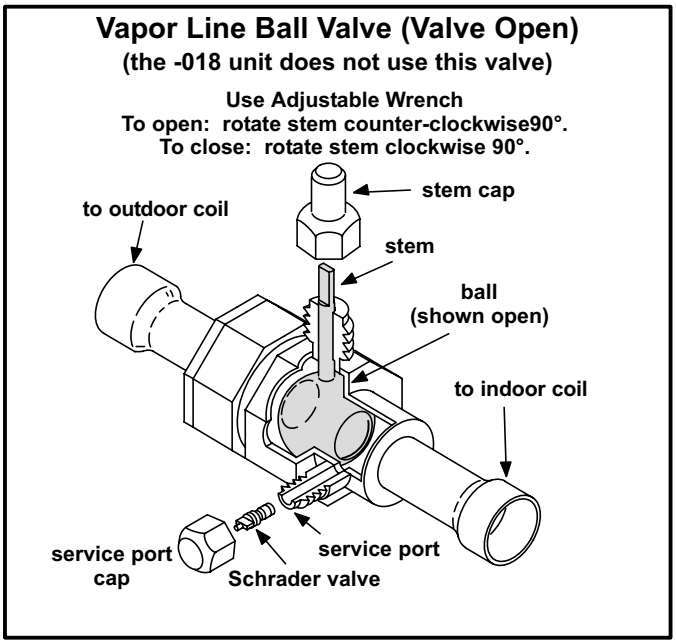


Figure 11

Leak Testing

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

⚠WARNING

Danger of fire. Bleeding the refrigerant charge from only the high side may result in the low side shell and suction tubing being pressurized. Application of a brazing torch while pressurized may result in ignition of the refrigerant and oil mixture - check the high and low pressures before unbrazing.

⚠ WARNING

Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.

Failure to follow this warning may result in personal injury or death.

⚠WARNING

Danger of explosion: Can cause equipment damage, injury or death. Never use oxygen to pressurize a refrigeration or air conditioning system. Oxygen will explode on contact with oil and could cause personal injury.

⚠ WARNING

Danger of explosion: Can cause equipment damage, injury or death. When using a high pressure gas such as dry nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

Using an Electronic Leak Detector or Halide

1 - Connect a cylinder of HCFC-22 to the center port of the manifold gauge set.

2 - With both manifold valves closed, open the valve on the HCFC-22 cylinder (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 (57 g) or 3 pounds (31 kPa) pressure.] Close the valve on the HCFC-22 cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the HCFC-22 cylinder.

4 - Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set.

5 - Connect the manifold gauge set high pressure hose to the vapor valve service port. *(Normally, the high pressure hose is connected to the liquid line port; however, connecting it to the vapor port better protects the manifold gauge set from high pressure damage.)*

6 - Adjust the nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set which will pressurize line set and indoor unit.

7 - After a few minutes, open a refrigerant port to ensure the refrigerant you 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 recheck.

Evacuation

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

⚠ IMPORTANT

Use a thermocouple or thermistor electronic vacuum gauge that is calibrated in microns. Use an instrument that reads from 50 microns to at least 10,000 microns.

1 - Connect manifold gauge set to the service valve ports as follows:
- low pressure gauge to *vapor* line service valve
- high pressure gauge to *liquid* line service valve

2 - Connect micron gauge.

3 - Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set.

4 - Open both manifold valves and start the vacuum pump.

5 - Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29.01 inches 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, repeat the leak testing procedure.

*NOTE - The term **absolute pressure** means the total 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.*

6 - When the absolute pressure reaches 23,000 microns (29.01 inches 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 (1034 kPa) 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.

7 - 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.

8 - 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 500 microns (29.9 inches of mercury) within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.

9 - When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to an upright cylinder of HCFC-22 refrigerant. Open the manifold gauge valves to break the vacuum from 1 to 2 psig positive pressure in the line set and indoor unit. Close manifold gauge valves and shut off the HCFC-22 cylinder and remove the manifold gauge set.

Start-Up

⚠ IMPORTANT

If unit is equipped with crankcase heater, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

2 - Inspect all factory- and field-installed wiring for loose connections.

3 - After evacuation is complete, open the liquid line and vapor line service valves to release refrigerant charge (contained in outdoor unit) into the system.

4 - Replace the stem caps and secure finger tight, then tighten an additional one-sixth (1/6) of a turn.

5 - Check voltage supply at the disconnect switch. The voltage must be within the range listed on the unit's nameplate. If not, do not start the equipment until you have consulted the power company and the voltage condition has been corrected.

6 - Set the thermostat for a cooling demand. Turn on power to the indoor blower and close the outdoor unit disconnect switch to start the unit.

7 - Recheck voltage while the unit is running. Power must be within range shown on the nameplate.

Charging

Units are factory charged with the amount of HCFC-22 refrigerant indicated on the unit nameplate. This charge is based on a matching indoor coil and outdoor coil with a 15 ft. (4.6 m) line set. For varying lengths of line set, refer to table 4 for refrigerant charge adjustment check.

1 - Rotate the fan to check for frozen bearings or binding.

Table 5

Liquid Line Set Diameter	Oz. per 5 ft. (g per 1.5 m) adjust from 15 ft. (4.6 m) line set*
3/8 in. (10 mm)	3 ounce per 5 ft. (85g per 1.5 m)

**If line length is greater than 15 ft. (4.6 m), add this amount. If line length is less than 15 ft. (4.6 m), subtract this amount.*

The outdoor unit should be charged during warm weather. However, applications arise in which charging must occur in the colder months. *The method of charging is determined by the unit's* ***refrigerant metering device*** *and the* ***outdoor ambient temperature****.*

Measure the liquid line temperature and the outdoor ambient temperature as outlined below:

5 - Close manifold gauge set valves. Connect the manifold gauge set to the service valves:
- low pressure gauge to *vapor* valve service port
- high pressure gauge to *liquid* valve service port

Connect the center manifold hose to an upright cylinder of HCFC-22.

6 - Set the room thermostat to call for heat. This will create the necessary load for properly charging the system in the cooling cycle.

7 - Use a digital thermometer to record the outdoor ambient temperature.

8 - When the heating demand has been satisfied, switch the thermostat to cooling mode with a set point of 68°F (20°C). When pressures have stabilized, use a digital thermometer to record the liquid line temperature.

9 - The outdoor temperature will determine which charging method to use. Proceed with the appropriate charging procedure.

Weighing in the Charge Fixed Orifice *or* *TXV Systems – Outdoor Temp < 65°F (18°C)*

If the system is void of refrigerant, or if the outdoor ambient temperature is cool, the refrigerant charge should be weighed into the unit. Do this after any leaks have been repaired.

1 - Recover the refrigerant from the unit.

2 - Conduct a leak check, then evacuate as previously outlined.

3 - Weigh in the unit nameplate charge.

If weighing facilities are not available or if you are charging the unit during warm weather, follow one of the other procedures outlined below.

Charging Using the Subcooling Method Fixed Orifice *Systems – Outdoor Temp. ≥ 65°F (18°C)*

If you charge a fixed orifice system when the outdoor ambient is 65°F (18°C) or above, use the subcooling method to charge the unit.

1 - With the manifold gauge hose still on the liquid service port and the unit operating stably, use a digital thermometer to record the liquid line temperature.

2 - At the same time, record the liquid line pressure reading.

3 - Use a temperature/pressure chart for HCFC-22 to 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 6. If subcooling is greater than shown, recover some refrigerant. If subcooling is less than shown, add some refrigerant.

Table 6
13ACC Subcooling Values
(Fixed Orifice Systems Only)

Outdoor Temp °F (°C)	Liquid Subcooling [± 1°F (.6°C)]								
	018	024	030	036	037	042	047	048	060
65 (18)	15 (8.3)	14 (8)	10 (5.6)	12 (6.7)	10 (5.6)	13 (7)	8 (4.5)	13 (7)	19 (11)
70 (21)	15 (8.3)	14 (8)	10 (5.6)	11 (6)	9 (5)	13 (7)	8 (4.5)	13 (7)	18 (10)
75 (24)	15 (8.3)	13 (7)	10 (5.6)	11 (6)	10 (5.6)	12 (6.7)	7 (4)	13 (7)	18 (10)
80 (27)	14 (8)	12 (6.7)	10 (5.6)	10 (5.6)	9 (5)	11 (6)	7 (4)	13 (7)	17 (9.4)
85 (29)	14 (8)	11 (6)	9 (5)	8 (4.5)	9 (5)	10 (5.6)	7 (4)	12 (6.7)	16 (9)
90 (32)	13 (7)	9 (5)	8 (4.5)	7 (4)	8 (4.5)	9 (5)	6 (3.3)	11 (6)	15 (8.2)
95 (35)	12 (6.7)	8 (4.5)	7 (4)	7 (4)	8 (4.5)	8 (4.5)	6 (3.3)	10 (5.6)	14 (8)
100 (38)	11 (6)	7 (4)	6 (3.3)	5 (3)	8 (4.5)	8 (4.5)	6 (3.3)	10 (5.6)	13 (7)
105 (41)	10 (5.6)	5 (3)	6 (3.3)	4 (2.2)	8 (4.5)	7 (4)	5 (3)	10 (5.6)	13 (7)
110 (43)	9 (5)	4 (2.2)	5 (3)	3 (2)	7 (4)	5 (3)	5 (3)	9 (5)	12 (6.7)
115 (45)	8 (4.5)	4 (2.2)	4 (2.2)	3 (2)	6 (3.3)	4 (2.2)	4 (2.2)	8 (4.5)	10 (5.6)

Charging Using the Approach Method

TXV Systems – Outdoor Temp. ≥ 65°F (18°C)

When you charge an expansion valve system when the outdoor ambient temperature is 65°F (18°C) or above, it is best to charge the unit using the approach method.

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 7. If not, add refrigerant to lower the approach temperature or recover refrigerant from the system to increase the approach temperature.

Table 7
13ACC Approach Temperatures
(TXV Systems Only)

Model No.	Approach Temperature Liquid Line - Outdoor Ambient °F (°C)
-018	4 (2.2) ± 1
-024	9 (5) ± 1
-030	6 (3) ± 1
-036	10 (6) ± 1
-037	12 (7) ± 1
-042	8 (4) ± 1
-048	7 (4) ± 1
-047	10 (6) ± 1
-060	12 (7) ± 1

NOTE - For best results, use the same digital thermometer to check both outdoor ambient and liquid temperatures.

Table 8
Normal Operating Pressures in psig (liquid and vapor +/- 2 psig)*

Unit / Metering Device	Out. Coil Entering Air Temp. °F (°C)	-018		-024		-030		-036		-037		-042		-047		-048		-060	
		Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.	Liq.	Suc.
13ACC TXV	65 (18.3)	139	76	145	79	143	73	148	77	157	78	144	77	146	73	151	69	171	75
	70 (21)	151	77	158	79	154	74	160	78	170	79	156	78	158	74	163	71	184	77
	75 (23.9)	163	77	170	80	167	74	175	79	184	80	170	79	171	74	177	72	197	78
	80 (27)	176	78	184	81	181	75	190	79	198	81	185	79	185	75	191	73	211	79
	85 (29.4)	190	78	198	82	195	75	205	80	213	81	199	80	200	76	206	74	226	79
	90 (32)	205	79	213	82	210	76	221	81	229	82	215	80	215	73	221	75	242	80
	95 (35.0)	220	79	229	83	227	76	237	82	242	82	231	81	231	77	237	796	257	80
	100 (38)	236	80	245	84	242	77	253	82	263	83	249	81	248	77	254	76	276	81
	105 (40.6)	252	80	262	84	259	7	272	82	279	84	266	81	265	78	271	77	294	82
	110 (43)	269	81	279	85	277	79	291	83	296	84	284	81	284	79	289	78	312	83
	115 (45)	287	82	297	86	296	80	310	83	316	85	303	82	303	80	289	78	334	83
13ACC RFC	65 (18.3)	140	62	147	69	140	61	149	68	150	66	147	68	139	59	148	59	169	68
	70 (21)	154	67	160	73	152	64	162	71	165	70	159	71	155	62	163	63	183	71
	75 (23.9)	167	71	173	76	166	68	176	74	180	74	173	74	166	64	177	66	198	74
	80 (27)	182	75	187	78	180	71	190	76	195	77	186	75	177	66	191	68	213	76
	85 (29.4)	196	78	201	80	194	73	204	78	210	79	200	77	190	67	206	71	228	78
	90 (32)	211	80	216	82	209	75	219	80	226	81	214	79	201	68	223	73	245	80
	95 (35.0)	226	81	231	83	224	76	236	81	242	82	231	80	220	70	238	75	261	81
	100 (38)	242	82	246	85	241	77	252	82	260	84	247	81	238	71	257	76	279	82
	105 (40.6)	258	83	262	86	257	78	270	84	279	85	264	83	256	72	274	77	297	83
	110 (43)	275	84	279	86	276	81	288	85	297	86	281	84	271	73	292	79	316	85
	115 (45)	293	85	298	87	294	82	307	86	313	87	300	85	290	74	309	80	336	86

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

Checking the Charging Using Normal Operating Pressures

⚠ IMPORTANT

Use table 8 to perform maintenance checks. Table 8 is not a procedure for charging the system. Minor variations in these pressures may be 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. See table 8.

System Operation

The outdoor unit and indoor blower cycle on demand from the room thermostat.

When the thermostat blower switch is in the **ON** position, the indoor blower operates continuously.

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.

Maintenance and service must be performed by a qualified installer or service agency. At the beginning of each cooling season, the system should be checked as follows:

1 - Clean and inspect the outdoor coil. The coil may be flushed with a water hose. Make sure power is off before cleaning.

2 - Outdoor fan motor is prelubricated and sealed. No further lubrication is needed.

3 - Visually inspect connecting lines and coils for evidence of oil leaks.

4 - Check wiring for loose connections.

5 - Check for correct voltage at unit (unit operating).

6 - Check amp-draw outdoor fan motor.
Unit nameplate _____ Actual _____ .
NOTE - If the owner complains of insufficient cooling, the unit should be gauged and the refrigerant charge should be checked. Refer to the charging section in this instruction.

Indoor Coil

1 - Clean coil, if necessary.

2 - Check connecting lines and coils for evidence of oil leaks.

3 - Check the condensate pan line and clean it 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 _____.

Optional Accessories

Refer to the Engineering Handbook for optional accessories that may apply to this unit. The following may or may not apply:

- Loss of Charge Kit
- High Pressure Switc Kit
- Compressor Monitor
- Compressor Crankcase Heater
- Hail Guards
- Mounting Bases
- Timed Off Control
- Stand-off Kit
- Sound Cover
- Low Ambient Kit

Start-Up & Performance Check List

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 _____
Rated Load Ampacity _____ Compressor _____ Outdoor Fan _____
Maximum Fuse or Circuit Breaker _____
Electrical Connections Tight? ☐ Indoor Filter Clean? ☐ Supply Voltage (Unit Off) _____
Indoor Blower RPM _____ S.P. Drop Over Indoor (Dry) _____ Outdoor Coil Entering Air Temp. _____
Discharge Pressure _____ Vapor Pressure _____ Refrigerant Charge Checked? ☐
Refrigerant Lines: Leak Checked? ☐ Properly Insulated? ☐ Outdoor Fan Checked? ☐
Service Valves Fully Opened? ☐ Service Valve Caps Tight? ☐
Voltage With Compressor Operating _____

Thermostat
Calibrated? ☐ Properly Set? ☐ Level? ☐