LENNOX

INSTALLATION INSTRUCTIONS

HSXA15 SERIES UNITS

CONDENSING UNITS
504,668M
02/04
Supersedes 12/02

Technical Publications
Litho U.S.A.

Table of Contents

Retain These Instructions For Future Reference

HSXA15 Outdoor Unit

HSXA15 outdoor units use R410A which is an ozone friendly HFC refrigerant. This unit must be installed with a matching indoor coil and line set as outlined in the Lennox Engineering Handbook. HSXA15 outdoor units are designed for use in expansion valve systems only. They are not designed to be used with other refrigerant flow control devices. An expansion valve and filter drier approved for use with R410A have been shipped with the unit. These components must be installed prior to unit operation. **Failure to install the provided filter drier will void the warranty.**

Shipping & Packing List

1 - Assembled HSXA15 outdoor unit
1 - Filter/Drier (approved for use with R410A systems)
1 - Expansion valve (approved for use with R410A)
2 - Grommets (for liquid and suction lines)
1 - Bushing (for low voltage wiring)

Check equipment 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

This unit must be matched with an indoor coil as specified in Lennox' Engineering Handbook. Coils previously charged with HCFC-22 must be flushed.

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.

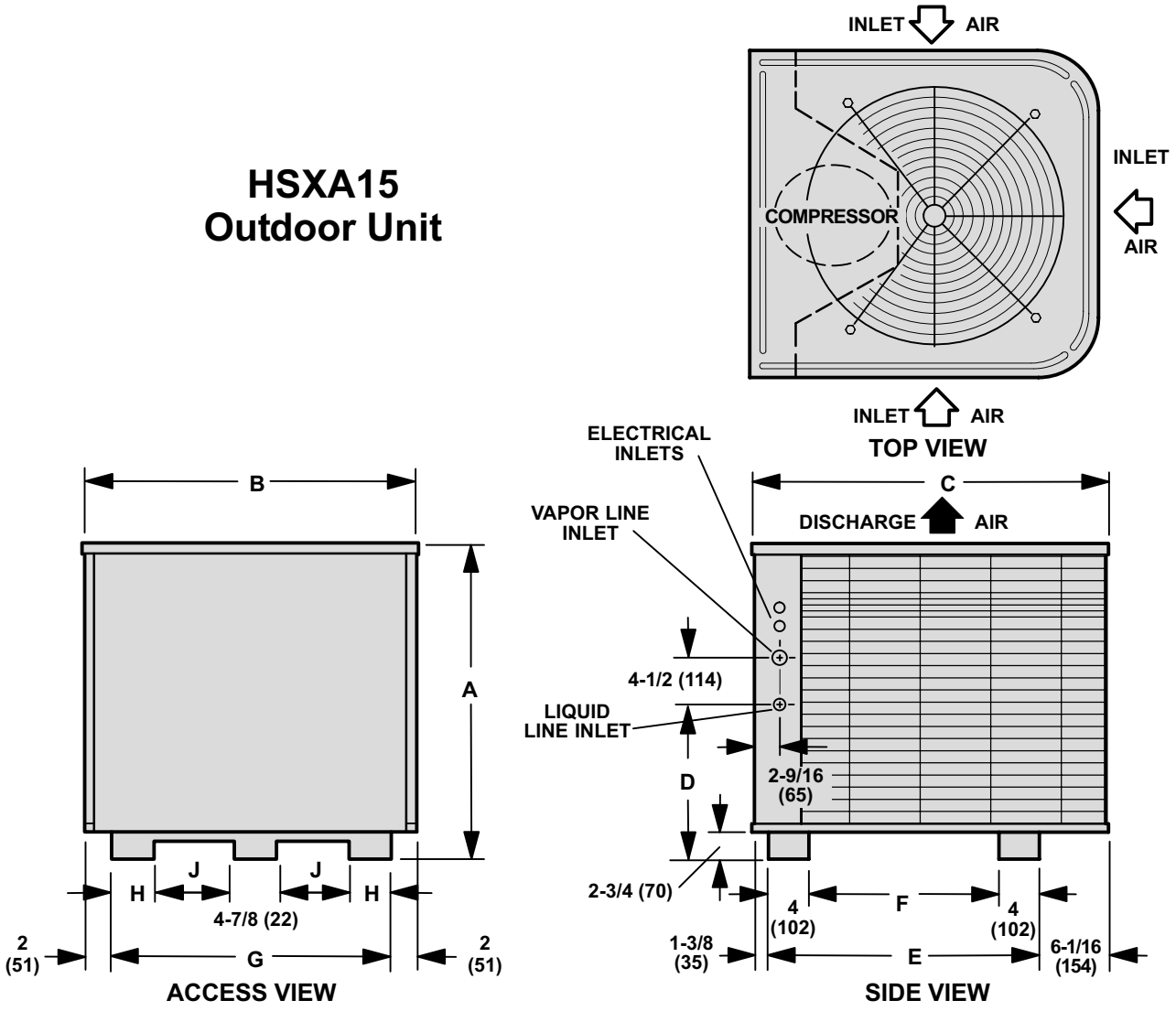
To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown below, or contact your supervisor.

Lennox Industries Inc.

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

Unit Dimensions – Inches (mm)

HSXA15
Outdoor Unit



Model No.		A	B	C	D	E	F	G	H	J
HSXA15-024	in.	27-7/8	25-7/8	29-7/8	12-1/4	22-7/16	14-7/16	22-1/8	2-7/8	5-1/2
	mm	708	657	759	311	570	367	562	73	140
HSXA15-030, HSXA15-036, HSXA15-042	in.	30-7/8	32-1/8	34-1/16	12-3/4	26-5/8	18-5/8	28-1/8	3-7/8	7-1/2
	mm	784	816	865	324	676	473	718	98	191
HSXA15-048	in.	34-7/8	32-1/8	34-1/16	13-3/4	26-5/8	18-5/8	28-1/8	3-7/8	7-1/2
	mm	886	816	865	349	676	473	718	98	191
HSXA15-060	in.	40-7/8	32-1/8	34-1/16	19-3/4	26-5/8	18-5/8	28-1/8	3-7/8	7-1/2
	mm	1038	816	865	502	676	473	718	98	191

Parts Arrangement

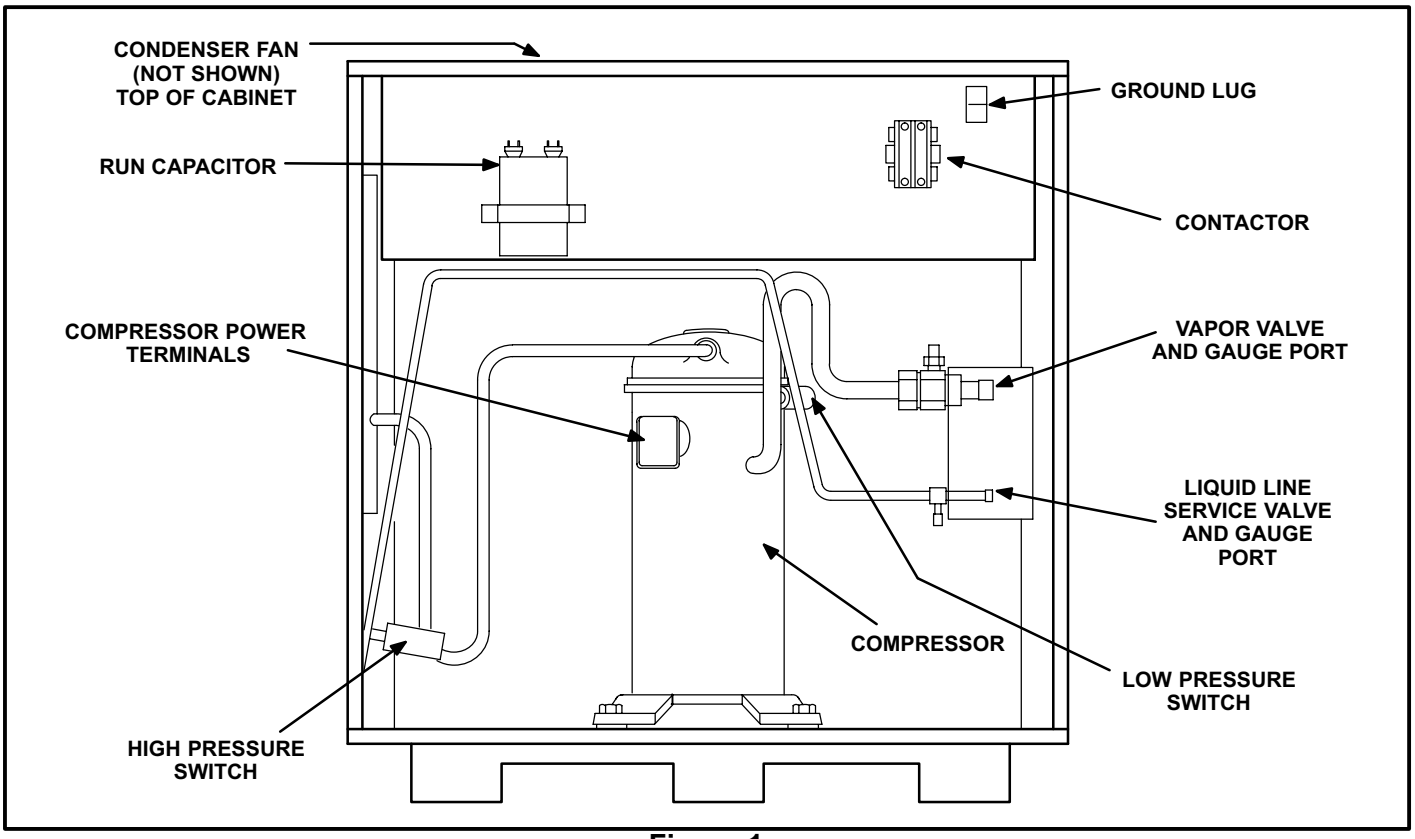


Figure 1

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 2 for installation clearances.

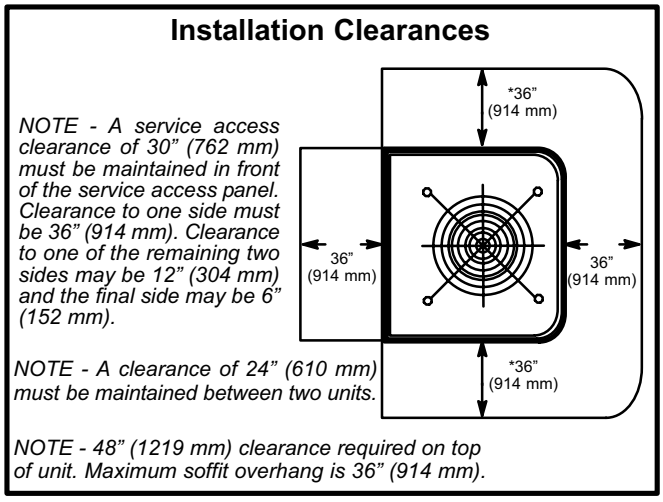


Figure 2

A - Slab Mounting

When you install the 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 3. Slab should have a slope tolerance away from the building of 2 degrees or 2 inches per 5 feet (51 mm per 1.5 m). Refer to the next section (roof mounting) for barrier construction if the unit must face prevailing winter winds.

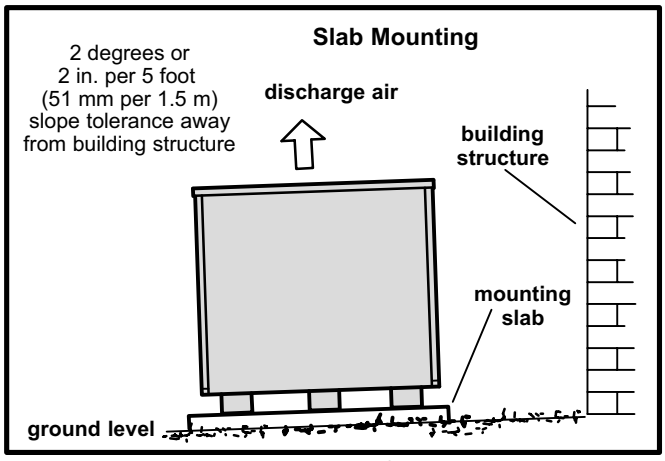


Figure 3

B - Roof Mounting

Install unit at a minimum of 4 inches above 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 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 in the bottom of the control box. Connect conduit to the control box us ing 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 effected by sunlight, drafts or vibrations.

4 - Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit. See figure 5.

Outdoor Unit
Field Wiring Diagram

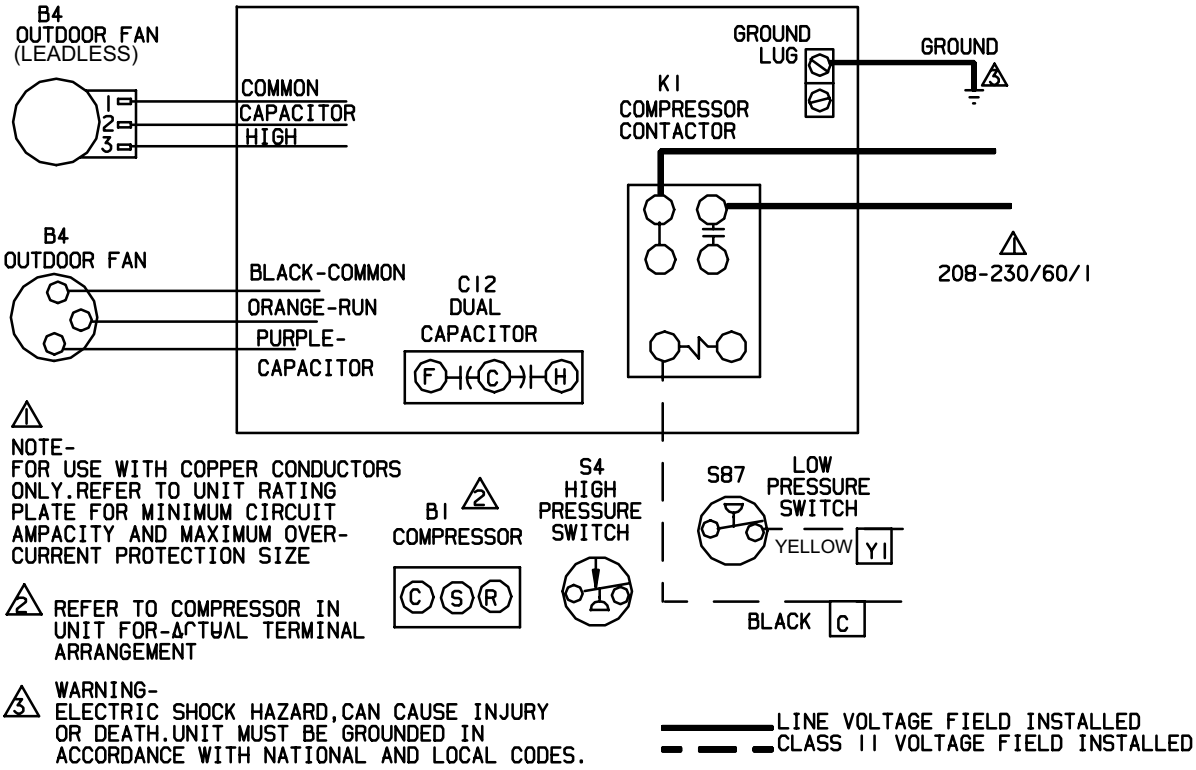
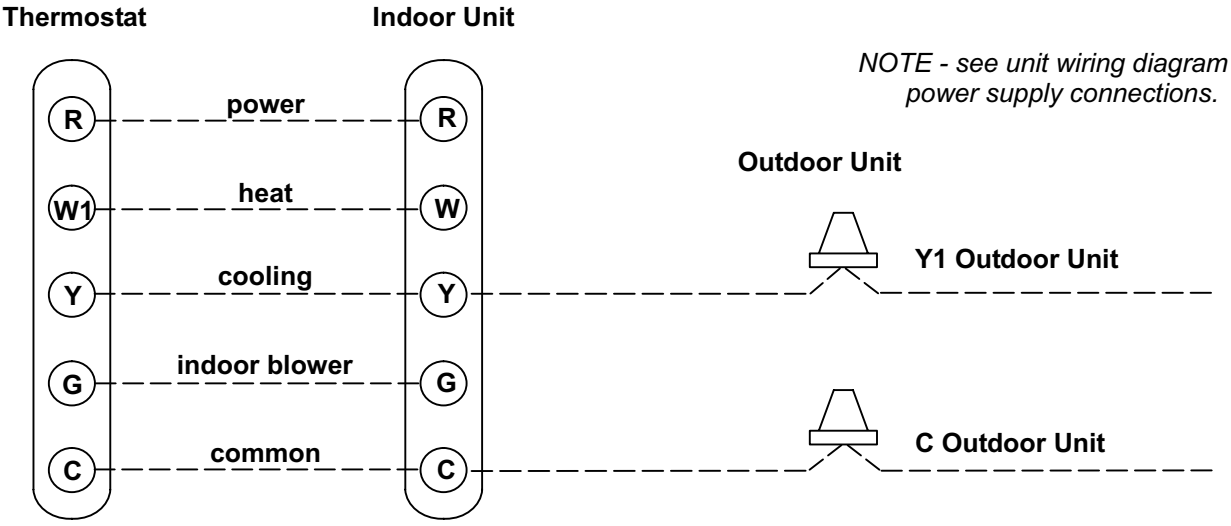


Figure 4

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 5

Refrigerant Piping

If the HSXA15 unit is being installed with a new indoor coil and line set, the connections should be made as outlined in this section. If an existing line set and/or indoor coil (used with mineral oil) is going to be used to complete the HSXA15 system, refer to the following section which includes flushing procedures.

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
-024 -030 -036	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. (4.6 m - 15 m)
-042 -048	3/8 in. (10 mm)	7/8 in. (22 mm)	3/8 in. (10 mm)	7/8 in. (22 mm)	L15-65 15 ft. - 50 ft. (4.6 m - 15 m)
-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 from the adjacent property 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 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 6 shows how to install line sets on vertical runs. Figure 7 shows how to install line sets on horizontal runs. Figure 8 shows how to make a transition from horizontal to vertical. Finally, figure 9 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.

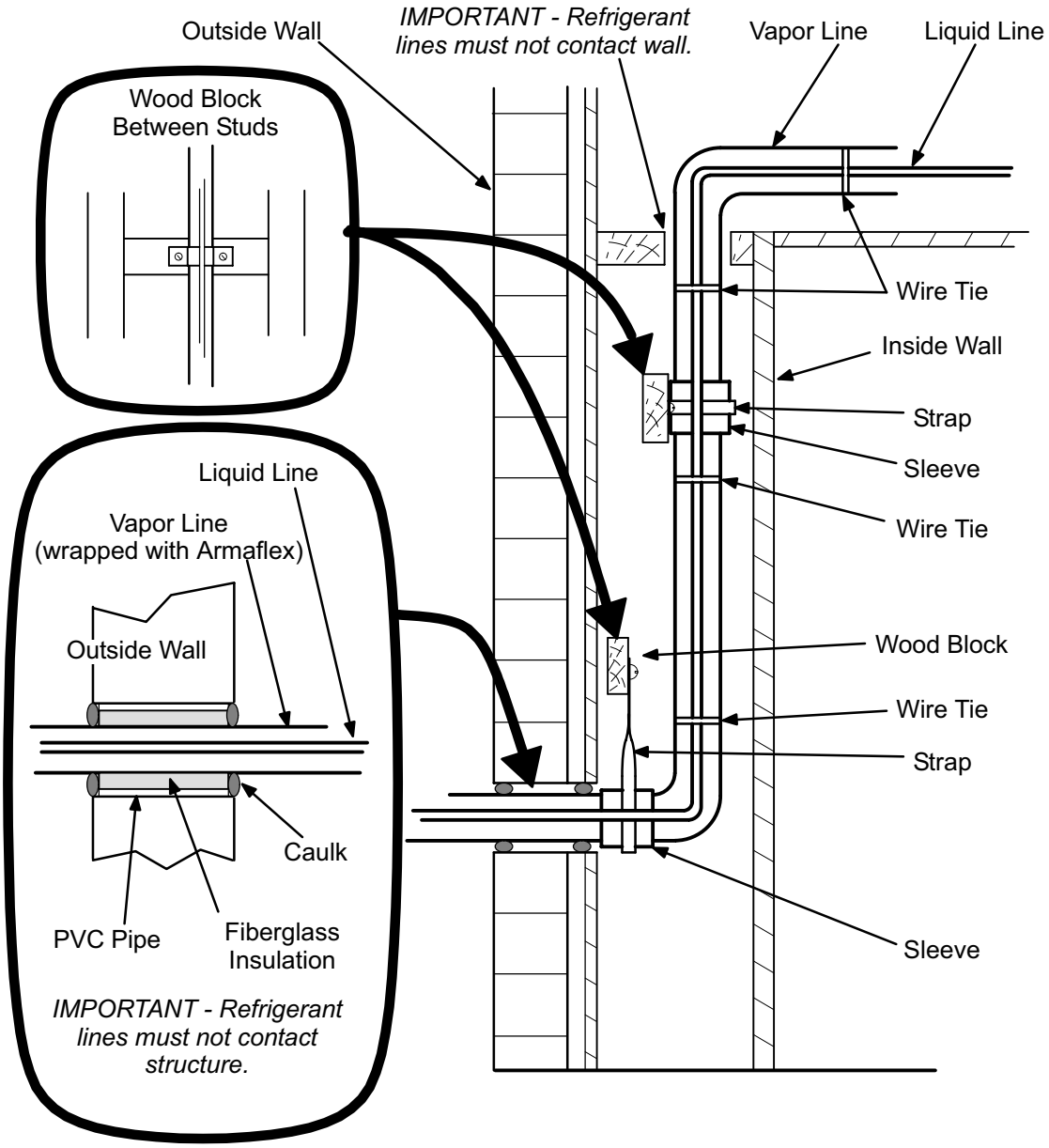


Figure 6

Refrigerant Line Sets:
Installing Horizontal Runs

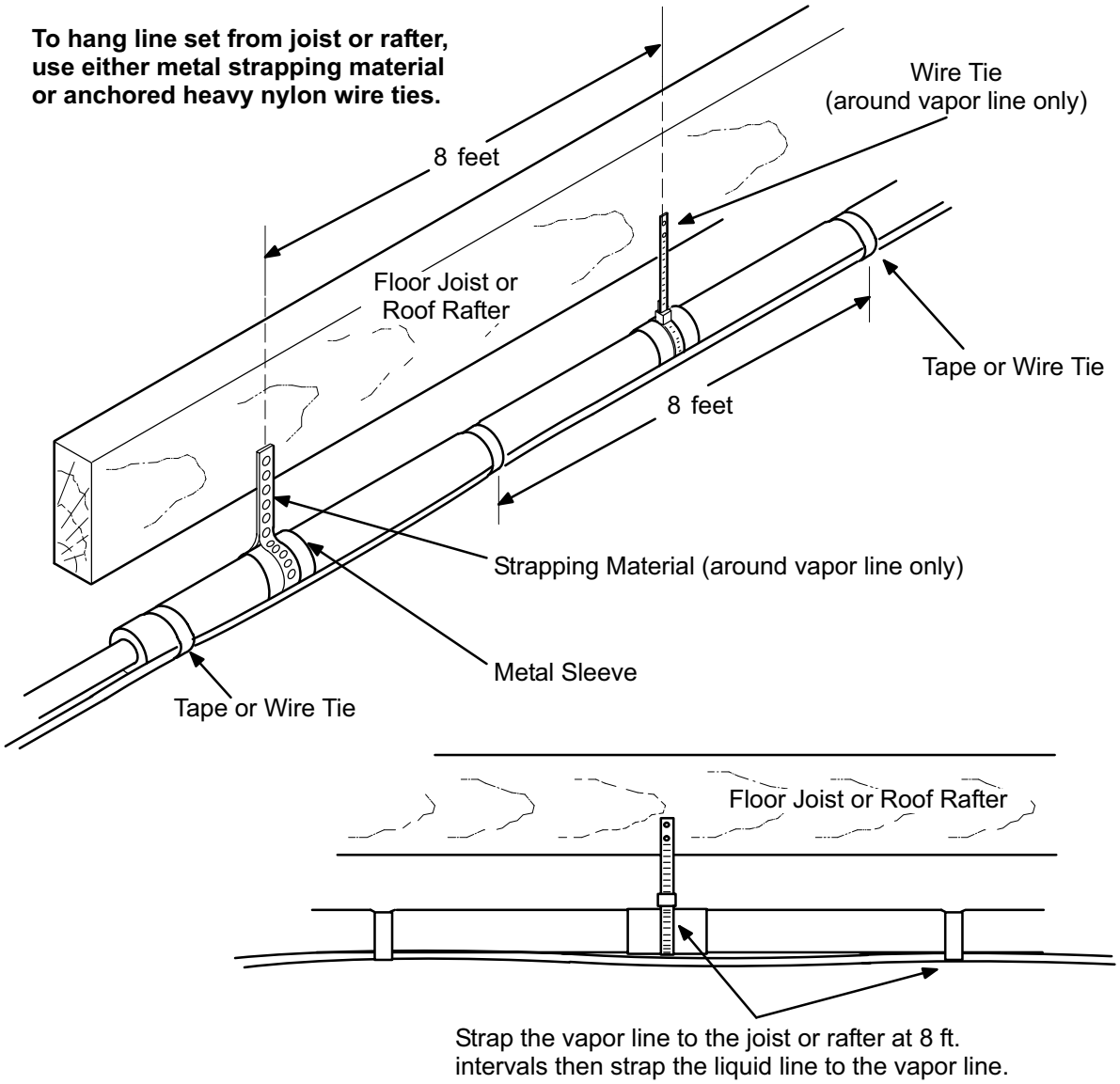


Figure 7

Refrigerant Line Sets:
Transition From Vertical To Horizontal

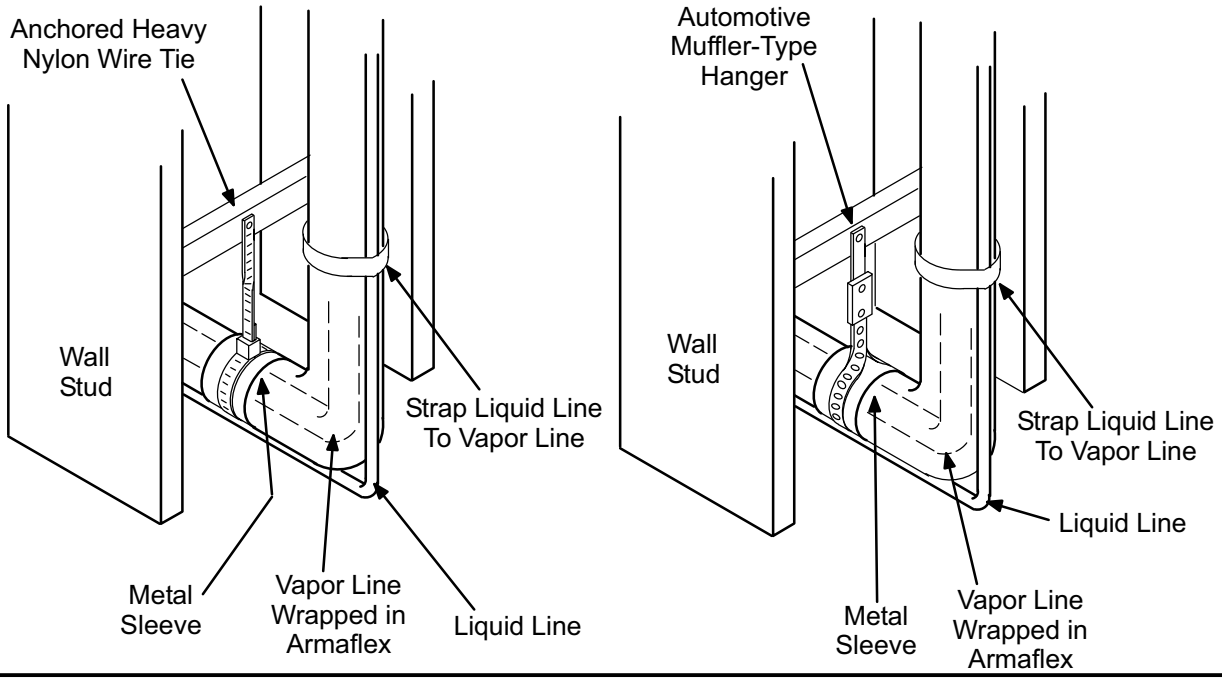


Figure 8

Outside Unit Placement and Installation

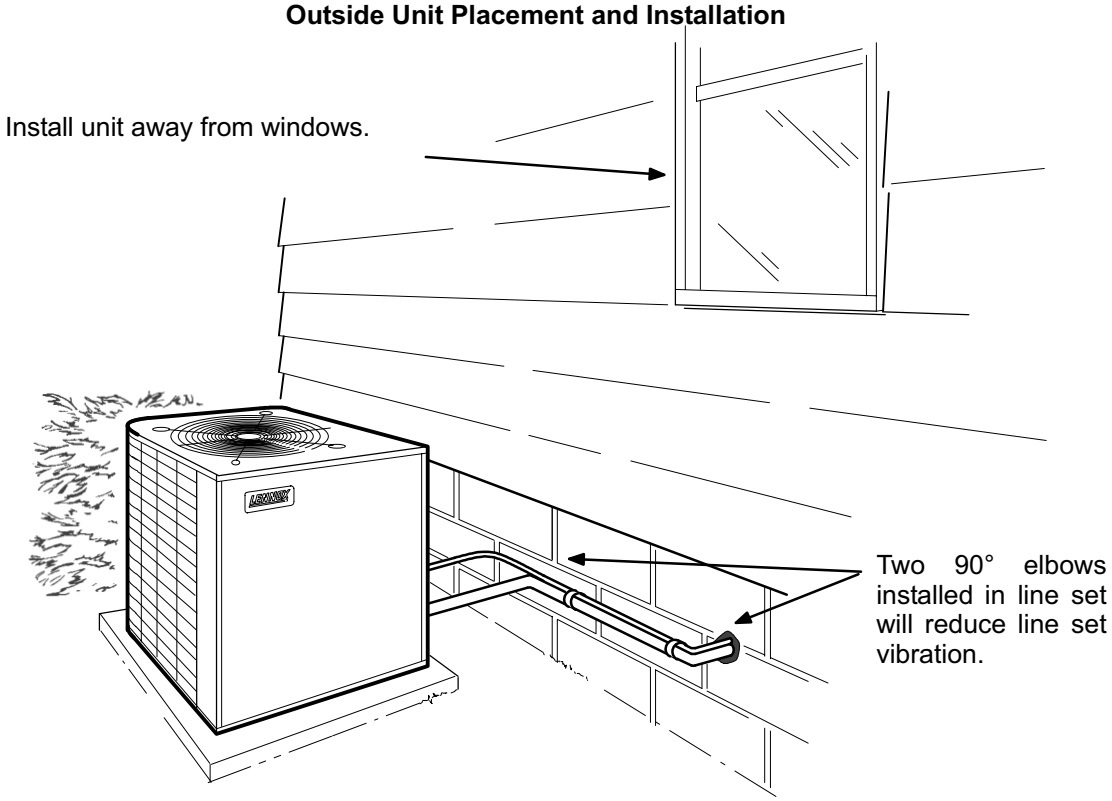


Figure 9

Refrigerant Connections
HSXA15 Matched with New Indoor Coil and Line Set

If an existing indoor coil that was equipped with an RFCI metering device is being replaced, the liquid line must also be replaced prior to the installation of the HSXA15 unit.

If refrigerant lines are routed through a wall, seal and isolate the opening so vibration is not transmitted to the building.

⚠WARNING

Polyol ester (POE) oils used with R410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

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 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 R410A refrigerant. Wrap a wet cloth around the valve body and the copper tube stub. Remove light maroon washers from service valves and shield light maroon stickers in order to protect them during brazing. 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 the provided thermal expansion valve (approved for use with R410A refrigerant) in the liquid line at the indoor coil.

6 - Install the provided filter drier (approved for use with R410A refrigerant) in the liquid line as close as possible to the expansion device. **Do not leave the filter drier uncapped for more than 10 to 15 minutes prior to brazing, evacuation and leak testing.**
Polyol ester oils used in this system absorb moisture quickly. Failure to install the filter drier will void the warranty.

Flushing Existing Line Set & Indoor Coil

⚠IMPORTANT

If this unit is being matched with an approved line set or indoor coil which was previously charged with mineral oil, or if it is being matched with a coil which was manufactured before January of 1999, the coil and line set must be flushed prior to installation. Take care to empty all existing traps. Polyol ester (POE) oils are used in Lennox units charged with R410A refrigerant. Residual mineral oil can act as an insulator, preventing proper heat transfer. It can also clog the thermal expansion valve, reducing system performance and capacity.
Failure to properly flush the system per the instructions below will void the warranty.

⚠CAUTION

This procedure should not be performed on systems which contain contaminants (Example: compressor burn out).

Required Equipment

You will need the following equipment in order to flush the existing line set and indoor coil: two clean HCFC-22 recovery bottles, an oilless recovery machine with a pump down feature, and two sets of gauges (one for use with HCFC-22 and one for use with the R410A).

Flushing Procedure

1 - Remove existing HCFC-22 refrigerant using the appropriate procedure below.

If the existing outdoor unit is not equipped with shut-off valves, or if the unit is not operational AND you plan to use the existing HCFC-22 refrigerant to flush the system – Disconnect all power to the existing outdoor unit. Connect to the existing unit, a **clean** recovery cylinder and the recovery machine according to the instructions provided with the recovery machine. Remove all HCFC-22 refrigerant from the existing system. Refer to gauges after shutdown to confirm that the entire system is completely void of refrigerant. Disconnect the liquid and vapor lines from the existing outdoor unit.

If the existing outdoor unit is equipped with manual shut-off valves AND you plan to use NEW HCFC-22 refrigerant to flush the system – Start the existing HCFC-22 system in the cooling mode and close the liquid line valve. Pump all of the existing HCFC-22 refrigerant back into the outdoor unit. (It may be necessary to bypass the low pressure switches to ensure complete refrigerant evacuation.) When the low side system pressures reach 0 psig, close the va-

por line valve. Disconnect all power to the existing outdoor unit. Refer to gauges after shutdown to confirm that the valves are not allowing refrigerant to flow back into the low side of the system. Disconnect the liquid and vapor lines from the existing outdoor unit.

2 - Remove the existing outdoor unit. Set the new R410A unit and follow the brazing connection procedure which begins on the previous page to make line set connections. **DO NOT install provided R410A check/expansion valve at this time.**

Make low voltage and line voltage connections to the new outdoor unit. **DO NOT turn on power to the unit or open the outdoor unit service valves at this time.**

3 - Remove the existing refrigerant flow control orifice or thermal expansion valve before continuing with flushing procedures. The existing devices are not approved for use with R410A refrigerant and may prevent proper flushing. Use a field-provided fitting to reconnect the lines.

⚠IMPORTANT

The line set and indoor coil must be flushed with at least the same amount of clean refrigerant that previously charged the system. Check the charge in the flushing cylinder before proceeding.

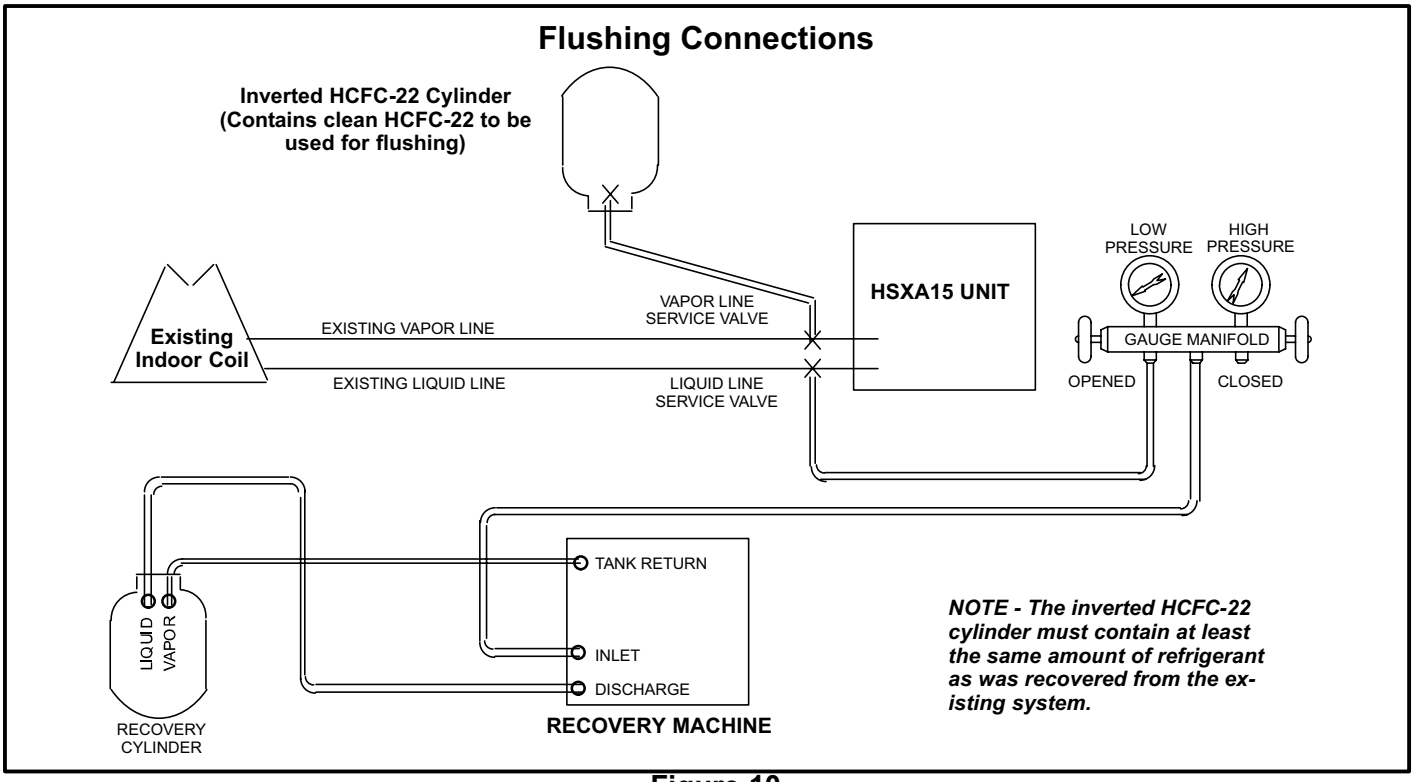


Figure 10

4 - Remove the pressure tap valve cores from the HSXA15 unit's service valves. Connect an HCFC-22 cylinder with clean refrigerant to the vapor service valve. Connect the HCFC-22 gauge set to the liquid line valve and connect a recovery machine with an empty recovery tank to the gauge set.

5 - Set the recovery machine for liquid recovery and start the recovery machine. Open the gauge set valves to allow the recovery machine to pull a vacuum on the existing system line set and indoor coil.

6 - Invert the cylinder of clean HCFC-22 and open its valve to allow liquid refrigerant to flow into the system through the vapor line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor coil before it enters the recovery machine.

7 - After all of the liquid refrigerant has been recovered, switch the recovery machine to vapor recovery so that all of the HCFC-22 vapor is recovered. Allow the recovery machine to pull a vacuum on the system.

NOTE - A single system flush should remove all of the mineral oil from the existing refrigerant lines and indoor coil. A second flushing may be done (using clean refrigerant) if insufficient amounts of mineral oil were removed during the first flush. ***Each time the system is flushed, you must allow the recovery machine to pull a vacuum on the system at the end of the procedure.***

8 - Close the valve on the inverted HCFC-22 drum and the gauge set valves. Pump the remaining refrigerant out of the recovery machine and turn the machine off.

9 - Use nitrogen to break the vacuum on the refrigerant lines and indoor coil before removing the recovery machine, gauges and HCFC-22 refrigerant drum. Reinstall pressure tap valve cores into HSXA15 service valves.

10 - Install the provided expansion valve (approved for use with R410A refrigerant) in the liquid line at the indoor coil.

Refrigerant Metering Devices

Use HSXA15 units in TXV systems systems. See the Lennox Engineering Handbook for approved TXV match-ups and application information.

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. See figure 11 for installation of the expansion valve.

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

Metering Device Installation

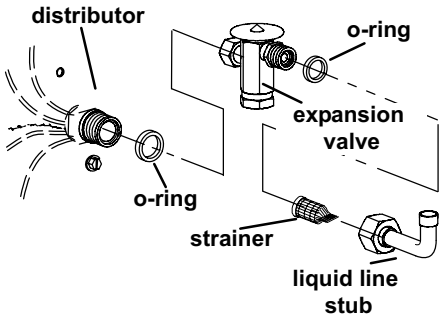


Figure 11

Manifold Gauge Set

Manifold gauge sets used with systems charged with R410A refrigerant must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 0 - 800 on the high side and a low side of 30" vacuum to 250 psi with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psi of pressure with a 4000 psi burst rating.

Service Valves

The liquid line and vapor line service valves (figure 12) and gauge ports are used for leak testing, evacuating, charging and checking charge. See table 2 for torque requirements

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.

Table 2
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

To Access Schrader Port:

1 - Remove access panel.

2 - Remove service port cap with an adjustable wrench.

3 - Connect gauge to the service port.

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

To Open Service Valve:

1 - Remove 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 possible.

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

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

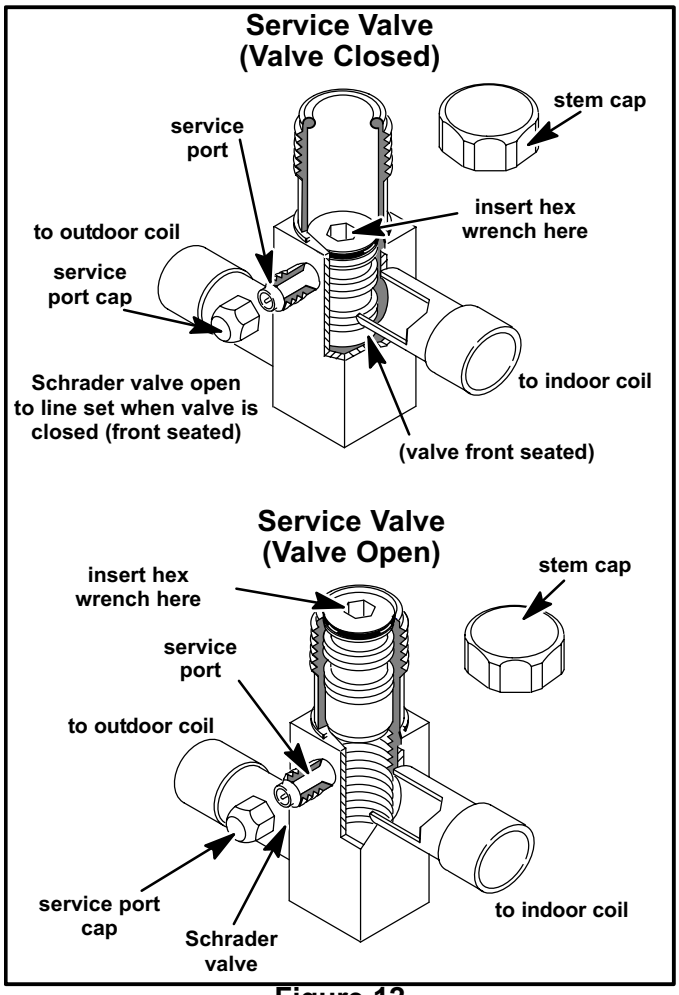


Figure 12

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 it firmly.

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

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

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

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

1 - Connect the high pressure hose of the manifold gauge set 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 helps to protect the manifold gauge set from damage caused by high pressure.)*

2 - With both manifold valves closed, connect the cylinder of R410A refrigerant to the center port of the manifold gauge set. Open the valve on the R410A cylinder (vapor only).

3 - Open the high pressure side of the manifold to allow R410A into the line set and indoor unit. Weigh in a trace amount of R410A. *[A trace amount is a maximum of 2 ounces (57 g) refrigerant or 3 pounds (31 kPa) pressure.]* Close the valve on the R410A cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect R410A cylinder.

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

5 - Adjust nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set in order to pressurize the line set and the indoor coil.

6 - After a few minutes, open a refrigerant port to check that an adequate amount of refrigerant has been added for detection (refrigerant requirements will vary with line lengths). Check all joints for leaks. Purge nitrogen and R410A mixture. Correct any leaks and recheck.

⚠IMPORTANT

Leak detector must be capable of sensing HFC refrigerant.

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 :
- 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.

⚠WARNING

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 R410A 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 R410A cylinder and remove the manifold gauge set.

Start-Up

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 the liquid line and vapor line service valves to release the 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

This system is charged with R410A refrigerant which operates at much higher pressures than HCFC-22. The expansion valve and liquid line filter drier provided with the unit are approved for use with R410A. Do not replace them with components designed for use with HCFC-22. This unit is NOT approved for use with coils which include metering orifices or capillary tubes.

Processing Procedure

Units are factory charged with the amount of R410A refrigerant indicated on the unit rating plate. This charge is based on a matching indoor coil and outdoor coil with 15 feet (4.6 m) line set. For varying lengths of line set, refer to table 3 for refrigerant charge adjustment.

Table 3

Liquid Line Set Diameter	Oz. per 5 ft. (grams per 1.5m) adjust from 15 ft. (4.6 m) line set*
5/16 in (8 mm)	2 ounces per 5 feet (57 g per 1.5 m)
3/8 in. (10 mm)	3 ounces per 5 feet (85 g 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.*

⚠IMPORTANT

Mineral oils are not compatible with R410A. If oil must be added, it must be a polyol ester oil.

The compressor is charged with sufficient polyol ester oil for line set lengths up to 50 feet (15.2 m). If oil must be added in the field, Copeland has approved Mobil EAL™ Arctic 22CC and ICI EMKARATE™ RL32CF for use with these compressors.

If the system is void of refrigerant, clean the system using the procedure described below.

1 - Use nitrogen to pressurize the system and check for leaks. Repair leaks, if possible.
2 - Evacuate the system to remove as much of the moisture as possible.
3 - Use nitrogen to break the vacuum and install the provided filter drier in the system.
4 - Evacuate the system again. Then, weigh the appropriate amount of R410A refrigerant (listed on unit nameplate) into the system.
5 - Monitor the system to determine the amount of moisture remaining in the oil. Use test kit 10N46 to verify that the moisture content is within the kit's dry color range. It may be necessary to replace the filter drier several times to achieve the required dryness level. **If system dryness is not verified, the compressor will fail in the future.**

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:

1 - 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. 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 - Use a digital thermometer to record the outdoor ambient temperature.
4 - 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.
5 - 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 Normal Operating Pressures and the Approach Method
TXV Systems – Outdoor Temp. ≥ 65°F (18°C)

The following procedure is intended as a general guide and is for use on expansion valve systems only. For best results, indoor temperature should be 70°F (21°C) to 80°F (26°C). Monitor system pressures while charging.

1 - Record outdoor ambient temperature using a digital thermometer.
2 - Attach high pressure gauge set and operate unit for several minutes to allow system pressures to stabilize.
3 - Compare stabilized pressures with those provided in table 5, "Normal Operating Pressures." Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system. Pressures higher than those listed indicate that the system is overcharged. Pressures lower than those

listed indicate that the system is undercharged. Verify pressures with the R410A refrigerant pressure chart in table 6. Verify adjusted charge using the approach method.

Approach Method

4 - Use the same digital thermometer you used to check the outdoor ambient temperature to check the liquid line temperature.

5 - The difference between the ambient and liquid temperatures should match values given in table 4. If the values don't agree with the those in table 4, add refrigerant to lower the approach temperature, or recover refrigerant from the system to increase the approach temperature.

Table 4

Model Number	Approach Temperature Liquid Line Temp. - Outdoor Ambient °F (°C)
HSXA15-024	8 ± 1 (4.5 ± .5)
HSXA15-030	8 ± 1 (4.5 ± .5)
HSXA15-036	6 ± 1 (3.3 ± .5)
HSXA15-042	9 ± 1 (5 ± .5)
HSXA15-048	8 ± 1 (4.5 ± .5)
HSXA15-060	12 ± 1 (6.7 ± .5)

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

Table 5
Normal Operating Pressures
(Liquid ±10 and Vapor ±5 psig)

Mode	Outdoor Coil Entering Air Temp. °F (°C)	HSXA15-024		HSXA15-030		HSXA15-036		HSXA15-042		HSXA15-048		HSXA15-060	
		Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor	Liquid	Vapor
TXV	65 (18.3)	239	129	232	130	235	128	241	131	226	130	240	130
	75 (23.9)	278	131	271	132	276	130	282	133	266	132	279	132
	85 (29.4)	321	133	314	135	320	132	326	135	310	135	321	135
	95 (35.0)	368	135	360	137	367	134	373	137	356	137	368	137
	105 (40.6)	420	138	412	140	421	137	424	139	407	139	418	140

Table 6
R410A Temperature/Pressure Chart

Temperature °F	Pressure Psig	Temperature °F	Pressure Psig	Temperature °F	Pressure Psig	Temperature °F	Pressure Psig
32	100.8	63	178.5	94	290.8	125	445.9
33	102.9	64	181.6	95	295.1	126	451.8
34	105.0	65	184.3	96	299.4	127	457.6
35	107.1	66	187.7	97	303.8	128	463.5
36	109.2	67	190.9	98	308.2	129	469.5
37	111.4	68	194.1	99	312.7	130	475.6
38	113.6	69	197.3	100	317.2	131	481.6
39	115.8	70	200.6	101	321.8	132	487.8
40	118.0	71	203.9	102	326.4	133	494.0
41	120.3	72	207.2	103	331.0	134	500.2
42	122.6	73	210.6	104	335.7	135	506.5
43	125.0	74	214.0	105	340.5	136	512.9
44	127.3	75	217.4	106	345.3	137	519.3
45	129.7	76	220.9	107	350.1	138	525.8
46	132.2	77	224.4	108	355.0	139	532.4
47	134.6	78	228.0	109	360.0	140	539.0
48	137.1	79	231.6	110	365.0	141	545.6
49	139.6	80	235.3	111	370.0	142	552.3
50	142.2	81	239.0	112	375.1	143	559.1
51	144.8	82	242.7	113	380.2	144	565.9
52	147.4	83	246.5	114	385.4	145	572.8
53	150.1	84	250.3	115	390.7	146	579.8
54	152.8	85	254.1	116	396.0	147	586.8
55	155.5	86	258.0	117	401.3	148	593.8
56	158.2	87	262.0	118	406.7	149	601.0
57	161.0	88	266.0	119	412.2	150	608.1
58	163.9	89	270.0	120	417.7	151	615.4
59	166.7	90	274.1	121	423.2	152	622.7
60	169.6	91	278.2	122	428.8	153	630.1
61	172.6	92	282.3	123	434.5	154	637.5
62	195.5	93	286.5	124	440.2	155	645.0

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.

High Pressure Switch

HSXA15 units are equipped with a high pressure switch that is located in the liquid line of the compressor. The switch (SPST, manual reset, normally closed) removes power from the compressor when discharge pressure rises above factory setting at 640 ± 10 psi.

Low Pressure Switch

HSXA15 units are also equipped with a low pressure switch that is located in the vapor line of the compressor. The switch (SPST, auto-reset, normally closed) removes power from the compressor when vapor line pressure drops below factory setting at 40 ± 5 psi.

Filter Drier

A filter drier is shipped with each HSXA15 unit. The filter drier must be field installed in the liquid line between the liquid line service valve and the expansion valve. **This filter drier must be installed to ensure a clean, moisture-free system.** A replacement filter drier is available as Lennox part no. 37L5201.

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. Ensure the power is turned off before you clean the coil.

2 - Condenser 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 condenser fan motor.
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.

Indoor 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. Measure the pressure drop over the coil 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 Switch 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? ☐

Thermostat

Voltage With Compressor Operating _____ Calibrated? ☐ Properly Set? ☐ Level? ☐