RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a service agency.

⚠ CAUTION

Physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Be aware of, and use caution when working near these areas during installation or while servicing this equipment.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

⚠ IMPORTANT

This unit must be matched with an indoor coil as specified in *Lennox XC14* Engineering Handbook. Coils previously charged with HCFC-22 must be flushed.

INSTALLATION INSTRUCTIONS

Elite® Series XC14 Units

AIR CONDITIONER
506121-01
07/09
Supersedes 07/08

Technical Publications
Litho U.S.A.

Table of Contents

Shipping and Packing List

Check the unit for shipping damage and listed times below are intact. If damaged, or if parts are missing, immediately contact the last shipping carrier.

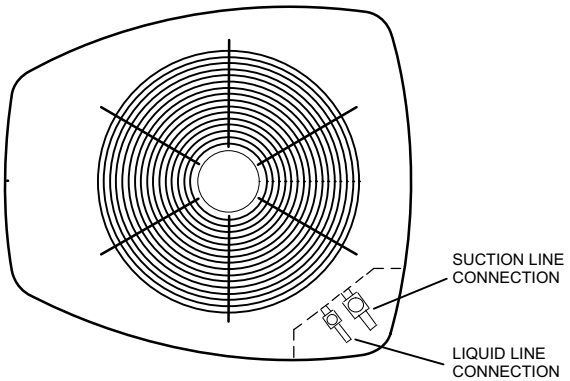
1 — Assembled outdoor unit.

1 — Refrigerant flow control (RFC) kit (Fixed Orifice)

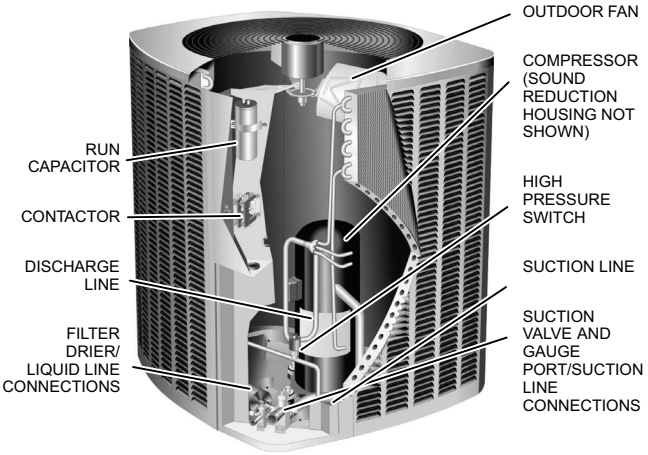
XC14 Air Conditioner Units

The XC14 Air Conditioners, which will also be referred to in this instruction as the outdoor unit, uses HFC-410A refrigerant. This outdoor unit must be installed with a matching indoor unit and line set as outlined in the *Lennox XC14 Engineering Handbook*.

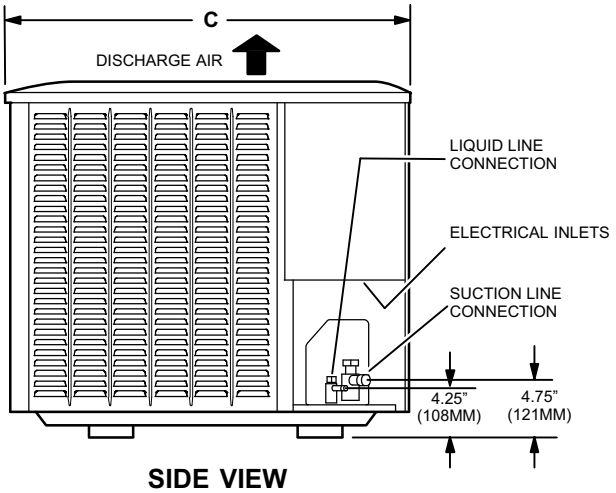
Unit Dimensions - Inches (mm)



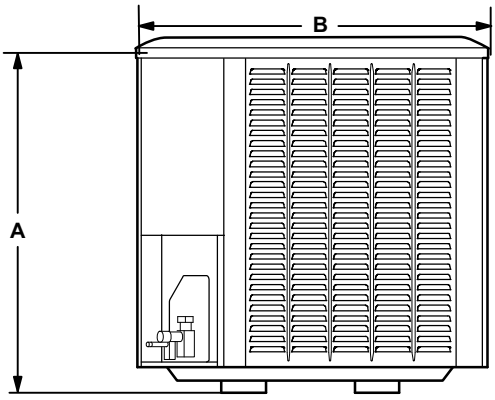
TOP VIEW



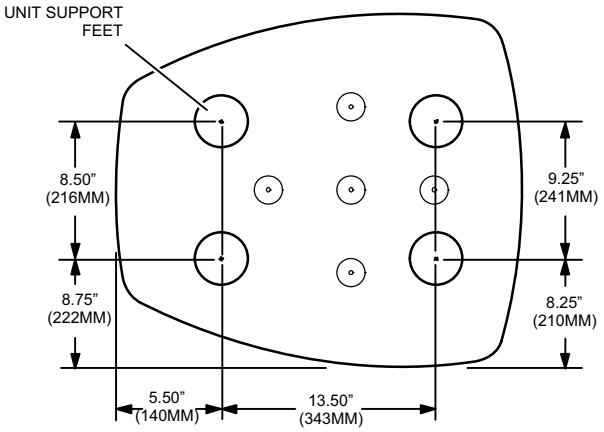
PARTS ARRANGEMENT



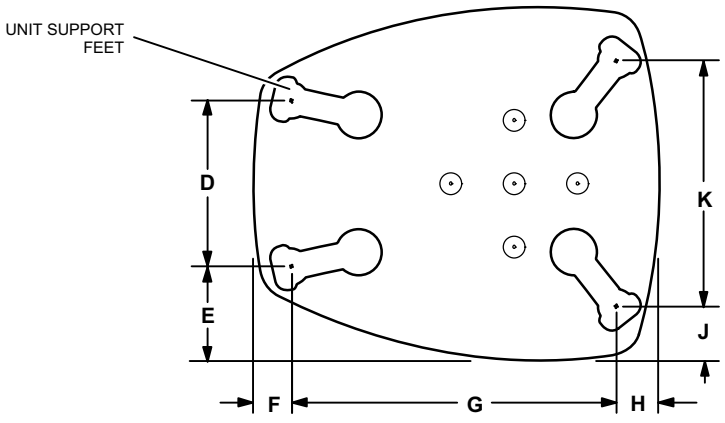
SIDE VIEW



SIDE VIEW



XC14-018 AND -024 BASE SECTIONS



XC14-030 TO -060 BASE WITH ELONGATED LEGS

Model	XC14 Dimensions - in. (mm)									
	A	B	C	D	E	F	G	H	J	K
-018	31 (787)	27 (686)	28 (711)	—	—	—	—	—	—	—
-024	35 (889)									
-030	39 (991)	30.50 (775)	35 (889)	13.875 (352)	7.75 (197)	3.25 (83)	27.125 (689)	3.625 (92)	4.50 (114)	20.625 (524)
-036										
-042	31 (787)									
-048	39 (991)	30.50 (775)	35 (889)							
-060	35 (889)	35.50 (902)	39.50 (1003)	16.875 (429)	8.75 (222)	3.125 (79)	30.75 (781)	4.625 (117)	3.75 (95)	26.875 (683)

506121-01 07/09

⚠ 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

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.

When servicing or repairing HVAC components, ensure caps and fasteners are appropriately tightened. Table 1 lists torque values for typical service and repair items.

TORQUE OR TIGHTENING REQUIREMENTS

Use a torque wrench and the Table 1 when tighten various components. In the absence of a torque wrench, use figures 1 and 23 for tightening distances.

Table 1. 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

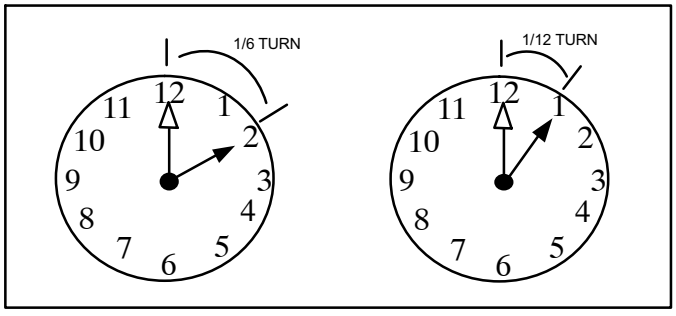


Figure 1. Tightening Distances

USING MANIFOLD GAUGE SETS

When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings. See *Charging Procedures*, step 1 for a typical manifold gauge connection setup.

Manifold gauge sets used with HFC-410A refrigerant systems 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.

OPERATING SERVICE VALVES

The liquid and suction line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.

Each service valve is equipped with a service port which has a factory-installed valve stem.

⚠ IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued (from 9 ft-lbs for small valves, to 25 ft-lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

NOTE - A label with specific tightening requirements may be affixed to the stem cap. If the label is present, use the specified torque stated.

⚠ IMPORTANT

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

To Access Angle-Type Service Port:

A service port cap protects the service port core from contamination and serves as the primary leak seal.

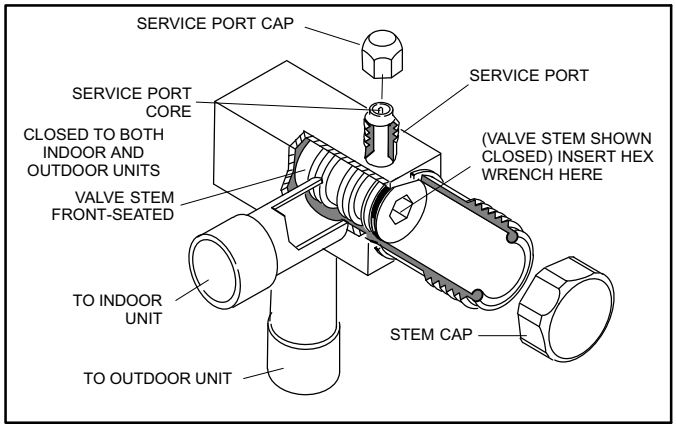


Figure 2. Angle-Type Service Valve (Font-Seated Closed)

1. Remove service port cap with an appropriately sized wrench.
2. Connect gauge to the service port.
3. When testing is completed, replace service port cap and tighten as follows:
   - *With Torque Wrench*: Finger tighten and then tighten per table 1.
   - *Without Torque Wrench*: Finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise as illustrated in figure 1.

To Open and Close Angle-Type Service Valve:

A valve stem cap protects the valve stem from contamination and assures a leak-free seal.

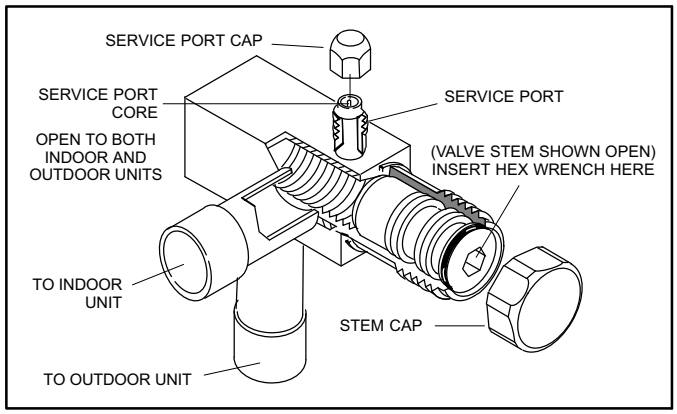


Figure 3. Angle-Type Service Valve (Back-Seated Opened)

1. Remove stem cap with a wrench.
2. Use a service wrench with a hex-head extension (3/16" for liquid-line valve sizes and 5/16" for suction-line valve sizes) to back the stem out counterclockwise as far as it will go.
3. Replace the stem cap and tighten as follows:
   - *With Torque Wrench*: Tighten finger tight and then tighten per table 1.
   - *Without Torque Wrench*: Finger tighten and use an appropriately sized wrench to turn an additional 1/12 turn clockwise as illustrated in figure 1.

To Access Ball-Type Service Port:

A service port cap protects the service port core from contamination and serves as the primary leak seal.

1. Remove service port cap with an appropriately sized wrench.
2. Connect gauge to the service port.
3. When testing is completed, replace service port cap and tighten as follows:
   - *With Torque Wrench*: Finger tighten and then tighten per table 1.
   - *Without Torque Wrench*: Finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise as illustrated in figure 1.

To Open and Close Ball-Type Service Valve:

A valve stem cap protects the valve stem from contamination and assures a leak-free seal.

1. Remove stem cap with a wrench.
2. Use an appropriately sized wrench to open. To open valve, rotate stem counterclockwise 90°. To close rotate stem clockwise 90°.
3. Replace the stem cap and tighten as follows:
   - *With Torque Wrench*: Finger tighten and then tighten per table 1.
   - *Without Torque Wrench*: Finger tighten and use an appropriately sized to wrench turn an additional 1/12 turn clockwise as illustrated in figure 1.

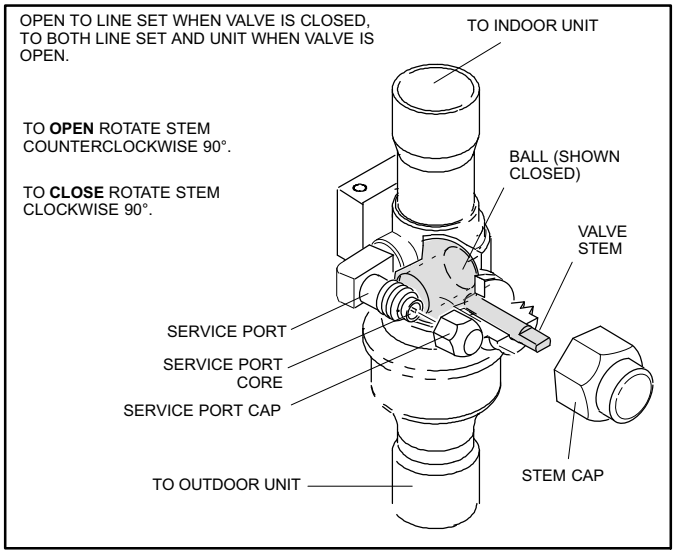


Figure 4. Ball-Type Service Valve

Recovering Refrigerant from Existing System

Remove existing refrigerant using one of the following methods:

METHOD 1:

Use this method if the existing outdoor unit is not equipped with manual shut-off valves, and plan on using existing HCFC-22 refrigerant to flush the system.

Perform the following task:

1. Disconnect all power to the existing outdoor unit.
2. Connect to the existing unit a gauge set, clean recovery cylinder and a recovery machine. Use the instructions provided with the recover machine on how to setup the connections.
3. Remove all HCFC-22 refrigerant from the existing system. Check gauges after shutdown to confirm that the entire system is completely void of refrigerant.

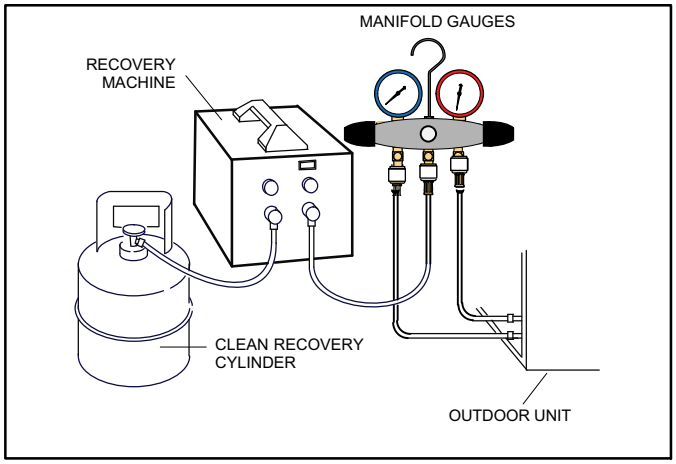


Figure 5. Typical Refrigerant Recovery (Method 1)

NOTE - Use recovery machine instructions for specific setup requirements.

METHOD 2:

Use this method if the existing outdoor unit is equipped with manual shut-off valves, and plan on using new HCFC-22 refrigerant to flush the system.

IMPORTANT: Some system configurations may contain higher than normal refrigerant charge due to either large internal coil volumes, and/or long line sets. The following conditions may cause the compressor to stop functioning:

The following devices could prevent full system charge recovery into the outdoor unit:

- Outdoor unit's high or low-pressure switches (if applicable) when tripped can cycled the compressor **OFF**.
- Compressor can stop pumping due to tripped internal pressure relief valve.
- Compressor has internal vacuum protection that is designed to unload the scrolls (compressor stops pumping) when the pressure ratio meets a certain value or when the suction pressure is as high as 20 psig. (Compressor suction pressures should never be allowed to go into a vacuum. Prolonged operation at low suction pressures will result in overheating of the scrolls and permanent damage to the scroll tips, drive bearings and internal seals).

Once the compressor can not pump down to a lower pressure due to one of the above system conditions, shut off the suction valve. Turn OFF the main power to unit and use a recovery machine to recover any refrigerant left in the indoor coil and line set.

Perform the following task:

1. Start the existing HCFC-22 system in the cooling mode and close the liquid line valve.
2. Pump as much of the existing HCFC-22 refrigerant with the compressor back into the outdoor unit until you have reached the limitations of the outdoor system. Turn the outdoor unit main power **OFF** and use a recovery machine to remove the remaining refrigerant in the system.

NOTE - It may be necessary to bypass the low pressure switches if equipped to ensure complete refrigerant evacuation.

3. When the low side system pressures reach 0 psig, close the suction line valve.
4. Check gauges after shutdown to confirm that the valves are not allowing refrigerant to flow back into the low side of the system.

Removing Existing Outdoor Unit

Perform the following task at the existing outdoor unit:

- Disconnect line set at service valves.
- Disconnect electrical service at disconnect switch.
- Remove old outdoor unit.

New Outdoor Unit Installation

See *Unit Dimensions* on page 2 for sizing mounting slab, platforms or supports.

INSTALLATION CLEARANCES

Refer to figure 6 for mandatory installation clearance requirements.

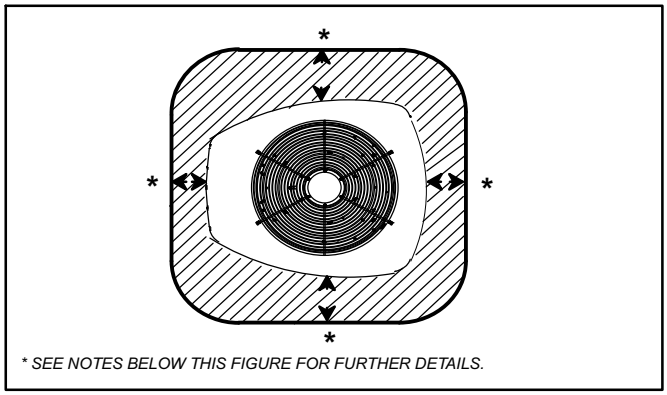


Figure 6. Installation Clearances

NOTES:

- Service clearance of 30 in. (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 in. (914 mm)·
- Clearance to one of the remaining two sides may be 12 in. (305 mm) and the final side may be 6 in. (152 mm)·
- 48 in. (1219 mm) clearance required on top of unit.
- A clearance of 24 in. (610 mm) must be maintained between two units.

POSITIONING CONSIDERATIONS

⚠ CAUTION

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

Consider the following when positioning the unit:

- Some localities are adopting sound ordinances based on the unit's sound level registered from the adjacent property, not from the installation property. 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. For proper placement of unit in relation to a window see the provided illustration in figure 7.

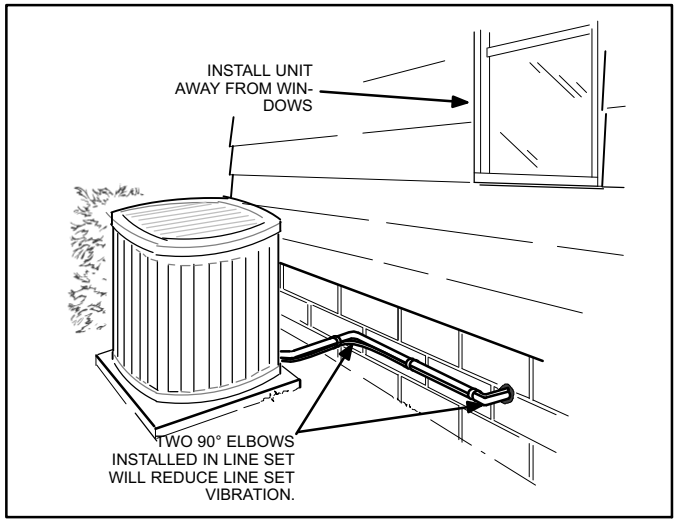


Figure 7. Outside Unit Placement

PLACING OUTDOOR UNIT ON SLAB

When installing unit at grade level, the top of the slab should be high enough above grade so that water from higher ground will not collect around the unit. The slab should have a slope tolerance as described in figure 8.

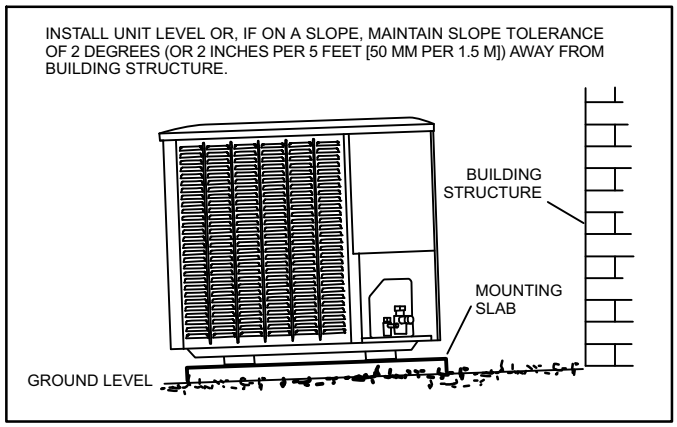


Figure 8. Slab Mounting at Ground Level

NOTE - If necessary for small base unit stability, anchor unit to slab as described in Stabilizing Small Base Unit on Uneven Surfaces.

ELEVATING AND STABILIZING SMALL-BASE UNIT

Use the following instructions to elevate and stabilize the small base units with the round support feet.

Elevating Small-Base Unit

If additional elevation is necessary, raise the unit by extending the length of the unit support feet. This may be done by cutting four equal true-cut lengths of Schedule (SCH) 40, 4" (101.6mm) piping to the height required as illustrated in figure 9.

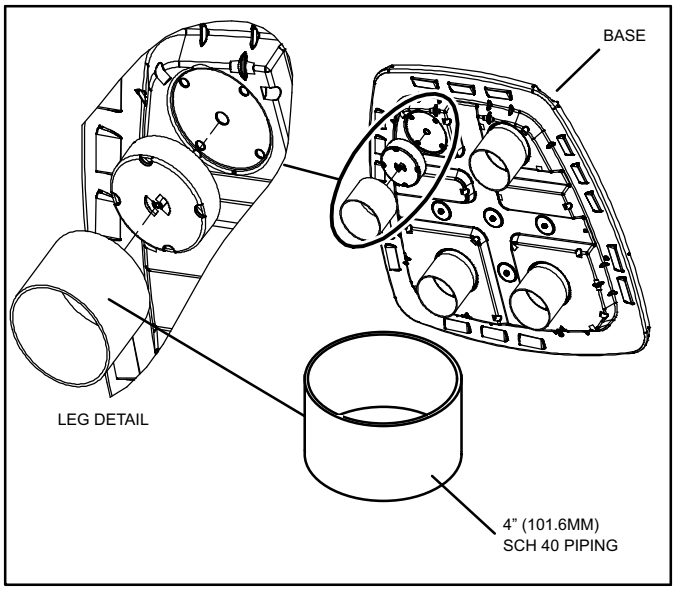


Figure 9. Elevated Slab Mounting using Feet Extenders (Small-Base Units)

NOTE - Keep the height of extenders short enough to ensure a sturdy installation. If it is necessary to extend further, consider a different type of field-fabricated framework that is sturdy enough for greater heights.

The inside diameter of the 4" (101.6mm) piping is approximately 0.25" (6.35mm) greater than the pre-installed feet on the unit. Devise a shim that will take up the space and hold the extenders onto the feet during this procedure. Small strips of 0.125" (3.175mm) thick adhesive foam may be used. One or two small 1" (25.4mm) square strips should be adequate to hold the extender in place.

Stabilizing Small-Base Unit on Uneven Surfaces

To help stabilize an outdoor unit, some installations may require strapping the unit to the pad using brackets and anchors commonly available in the marketplace.

With unit positioned at installation site, remove two side louvered panels to expose the unit base pan. Install the brackets as illustrated in figure 10 using conventional practices; replace the panels after installation is complete.

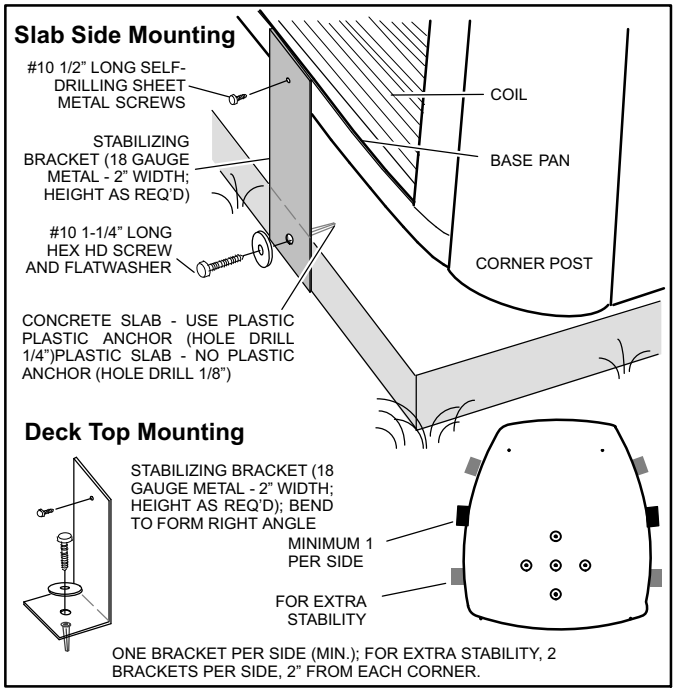


Figure 10. Installing Stabilizer Brackets

⚠ IMPORTANT

Unit Stabilizer Bracket Use (field-provided):

Always use stabilizers when unit is raised above the factory height. (Elevated units could become unstable in gusty wind conditions).

Stabilizers may be used on factory height units when mounted on unstable an uneven surface.

ELEVATING LARGER-BASE UNITS

Unlike the small-base units which use round support feet, the larger-base units are outfitted with elongated support feet as illustrated in figure 11 which uses a similar method for elevating the unit.

If additional elevation is necessary, raise the unit by extending the length of the unit support feet. This may be achieved by using a 2" SCH 40 female threaded adapter.

The specified coupling will fit snuggly into the recessed portion of the feet. Use additional 2" SCH 40 male threaded adapters which can be threaded into the female threaded adapters to make additional adjustments to the level of the unit.

NOTE - Keep the height of extenders short enough to ensure a sturdy installation. If it is necessary to extend further, consider a different type of field-fabricated framework that is sturdy enough for greater heights.

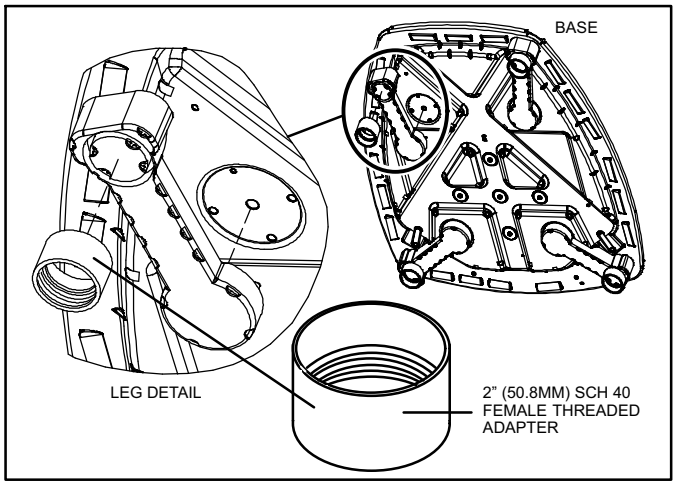


Figure 11. Elevated Slab Mounting using Feet Extenders (Larger Base Units)

ROOF MOUNTING OF OUTDOOR UNIT

Install unit at a minimum of four 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, steel supports, or roofed in equipment platform is recommended.

Removing and Installing *SmartHinge*™ Panels

⚠ CAUTION

To prevent personal injury, or damage to panels, unit or structure, be sure to observe the following:

While installing or servicing this unit, carefully stow all removed panels out of the way, so that the panels will not cause injury to personnel, nor cause damage to objects or structures nearby, nor will the panels be subjected to damage (e.g., being bent or scratched).

While handling or stowing the panels, consider any weather conditions, especially windy conditions, that may cause panels to be blown around and battered.

REMOVING PANELS

Remove the louvered panels as follows:

1. Remove two screws, allowing the panel to swing open slightly as illustrated in figure 12.

NOTE - Hold the panel firmly throughout this procedure

2. Rotate bottom corner of panel away from hinge corner post until lower three tabs clear the slots as illustrated in figure 12, detail B.
3. Move panel down until lip of upper tab clears the top slot in corner post as illustrated in figure 12, detail A.

INSTALLING PANELS

Install the louvered panels as follows:

1. Position the panel almost parallel with the unit as illustrated in figure 13, detail D with the screw side as close to the unit as possible.

2. With a continuous motion slightly rotate and guide the lip of top tab inward as illustrated in figure 12, details A and C, then upward into the top slot of the hinge corner post.
3. Rotate panel to vertical to fully engage all tabs.
4. Holding the panel's hinged side firmly in place, close the right-hand side of the panel, aligning the screw holes.

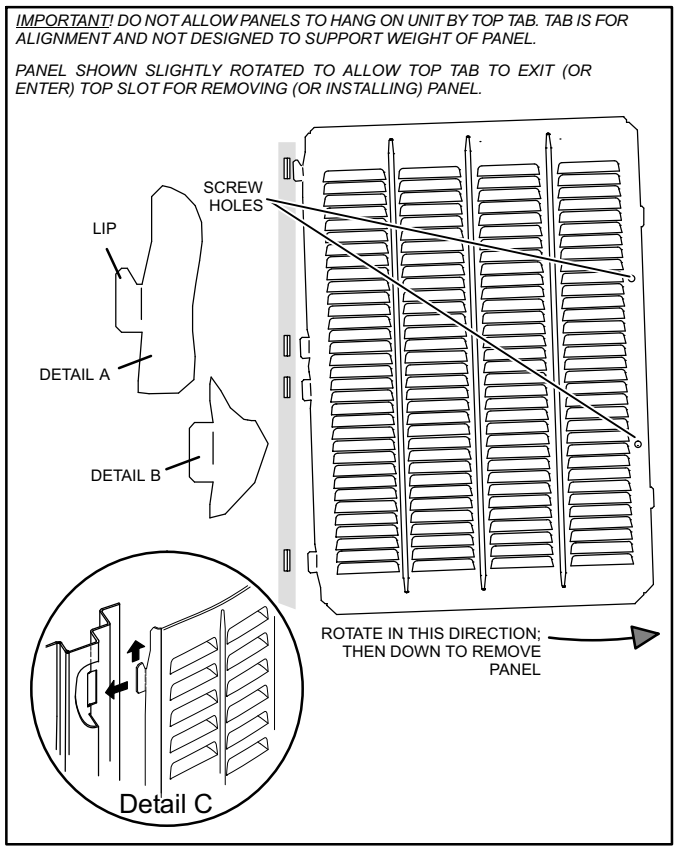


Figure 12. Removing/Installing *SmartHinge*™ Panels (Details A, B and C)

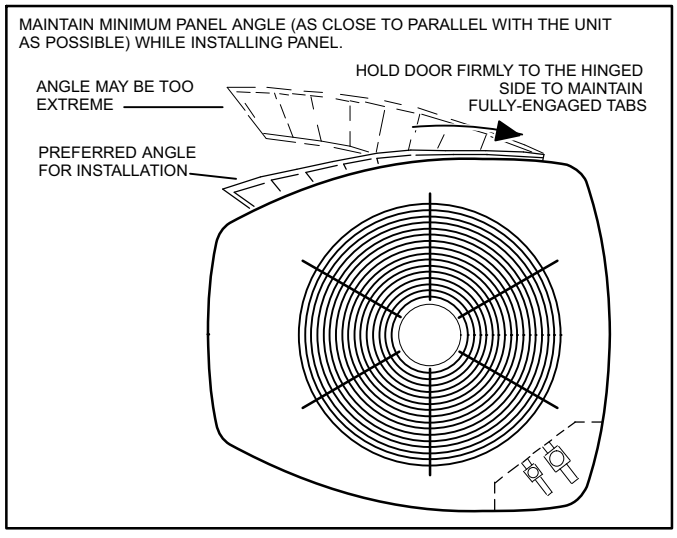


Figure 13. Removing/Installing *SmartHinge*™ Panels (Detail D)

5. When panel is correctly positioned and aligned, insert the screws and tighten.

New or Replacement Line Set

This section provides information on installation or replacement of existing line set. If line set are not being installed then proceed to *Brazing Connections* on page 10.

If refrigerant lines are routed through a wall, seal and isolate the opening so vibration is not transmitted to the building. Pay close attention to line set isolation during installation of any HVAC system. When properly isolated from building structures (walls, ceilings. floors), the refrigerant lines will not create unnecessary vibration and subsequent sounds. Also, consider the following when placing and installing a high-efficiency air conditioner.

REFRIGERANT LINE SET

Field refrigerant piping consists of liquid and suction lines from the outdoor unit (braze connections) to the indoor unit coil (flare or sweat connections). Use Lennox L15 (sweat, non-flare) series line set, or use field-fabricated refrigerant lines as listed in table 2.

Table 2. Refrigerant Line Set

Model	Field Connections		Recommended Line Set		
	Liquid Line	Suction Line	Liquid Line	Suction Line	L15 Line Set
-018 -024 -030	3/8". (10 mm)	3/4" (19 mm)	3/8" (10 mm)	3/4" (19 mm)	L15-41 15 ft. - 50 ft. (4.6 m - 15 m)
-036 -042 -048	3/8". (10 mm)	7/8" (22 mm)	3/8" (10 mm)	7/8" (22 mm)	L15-65 15 ft. - 50 ft. (4.6 m - 15 m)
-060	3/8". (10 mm)	1-1/8". (29 mm)	3/8" (10 mm)	1-1/8" (29 mm)	Field Fabricated

NOTE - When installing refrigerant lines longer than 50 feet, see the Lennox Refrigerant Piping Design and Fabrication Guidelines, or contact Lennox Technical Support Product Applications for assistance. To obtain the correct information from Lennox, be sure to communicate the following points:

- Model (XC14) and size of unit (e.g. -060).
- Line set diameters for the unit being installed as listed in table 2 and total length of installation.
- Number of elbows and if there is a rise or drop of the piping.

MATCHING WITH NEW OR EXISTING INDOOR COIL AND LINE SET

The RFC1-metering line consisted of a small bore copper line that ran from condenser to evaporator coil. Refrigerant was metered into the evaporator by utilizing temperature/pressure evaporation effects on refrigerant in the small RFC line. The length and bore of the RFC line corresponded to the size of cooling unit.

If the XC14 is being used with either a new or existing indoor coil which is equipped with a liquid line which served as a metering device (RFCI), the liquid line must be

replaced prior to the installation of the XC14 unit. Typically a liquid line used to meter flow is 1/4” in diameter and copper.

INSTALLING LINE SET

Line Set Isolation—This reference illustrates procedures, which ensure proper refrigerant line set isolation:

- Installation of **line set on horizontal runs** is illustrated in figure 14.
- Installation of **line set on vertical runs** is illustrated in figure 15.
- Installation of **transition from vertical to horizontal** is illustrated in figure 16.

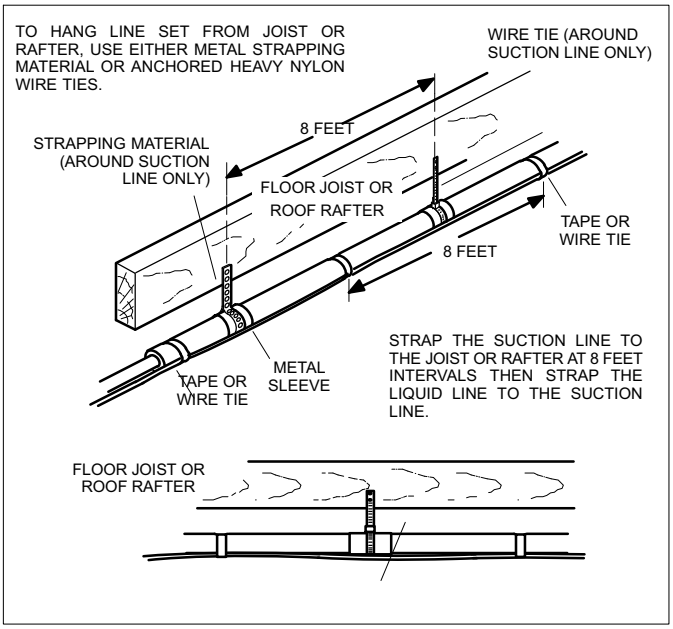


Figure 14. Refrigerant Line Set: Installing Horizontal Runs

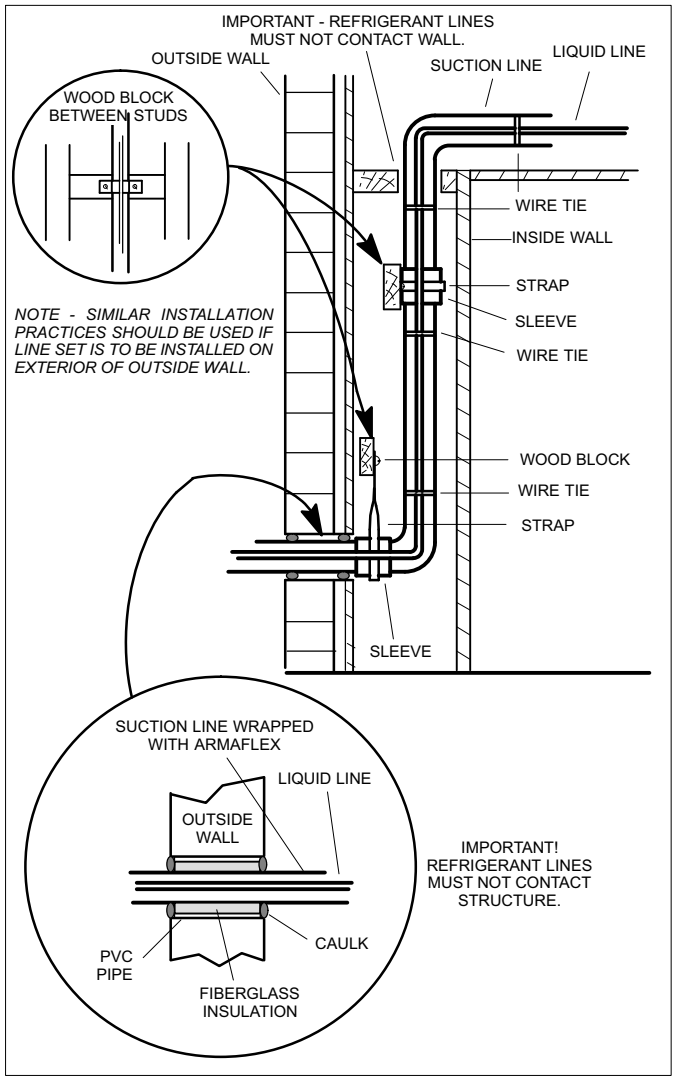


Figure 15. Refrigerant Line Set: Installing Vertical Runs (New Construction Shown)

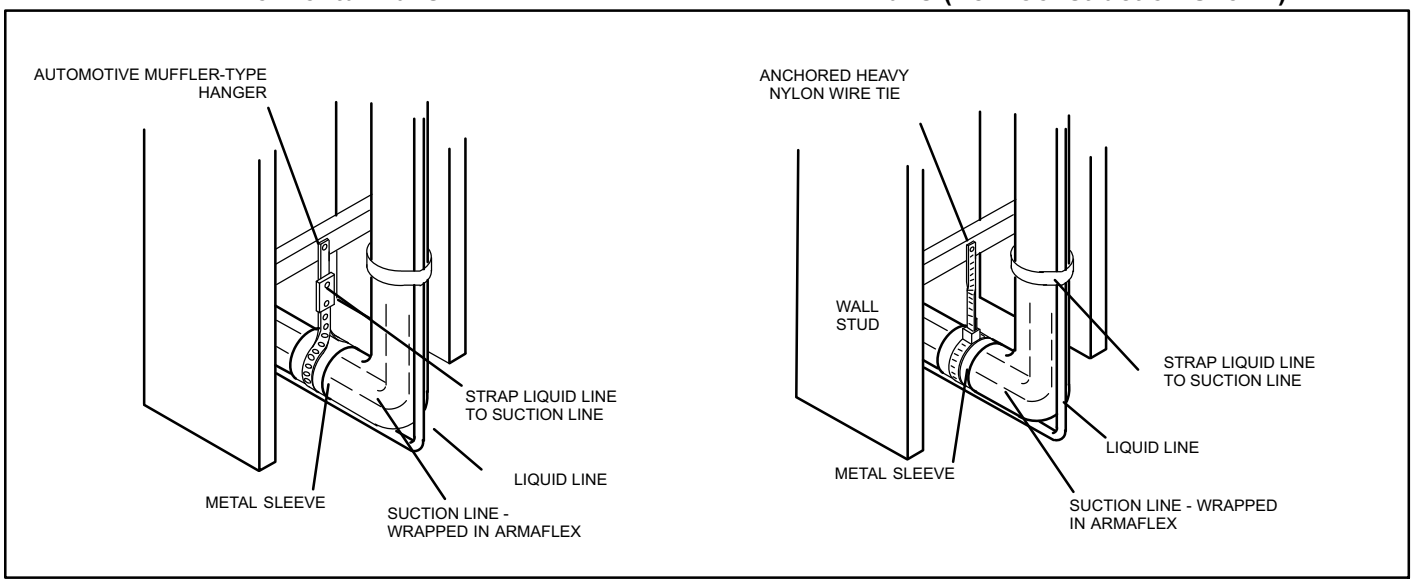


Figure 16. Refrigerant Line Set: Transition from Vertical to Horizontal

Brazing Connections

⚠ WARNING

Polyol ester (POE) oils used with HFC-410A 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.

⚠ WARNING

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).

⚠ 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.

⚠ CAUTION

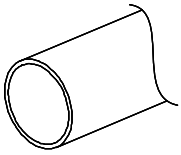
Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

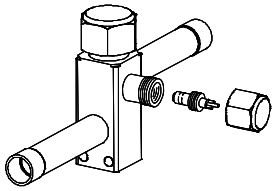
1 CUT AND DEBUR



Cut ends of the refrigerant lines square (free from nicks or dents). Debur the ends.

NOTE - THE PIPE MUST REMAIN ROUND, DO NOT PINCH END OF THE LINE.

2 CAP AND CORE REMOVAL

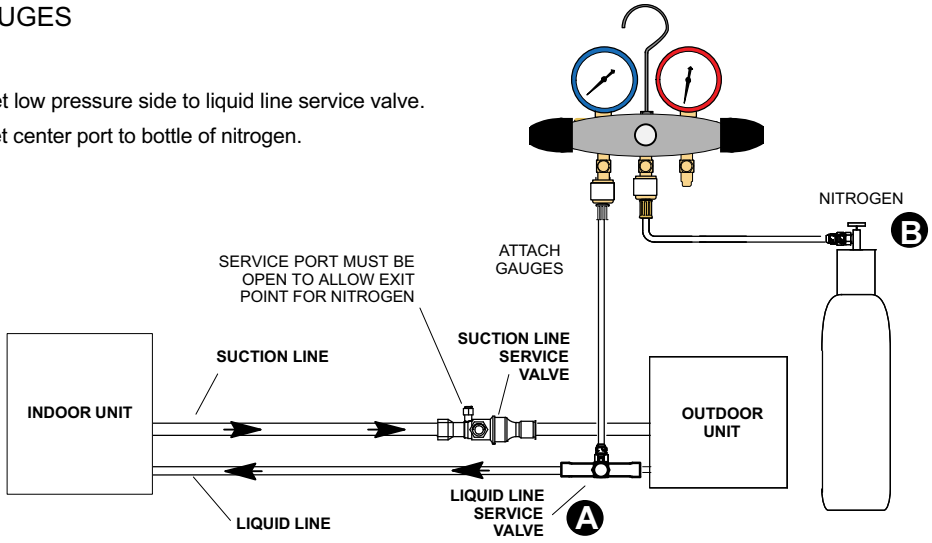


Remove service cap and core from both the suction and liquid line service ports.

3 ATTACHED GAUGES

A Connect gauge set low pressure side to liquid line service valve.

B Connect gauge set center port to bottle of nitrogen.



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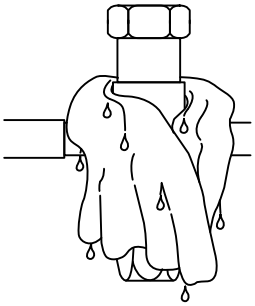
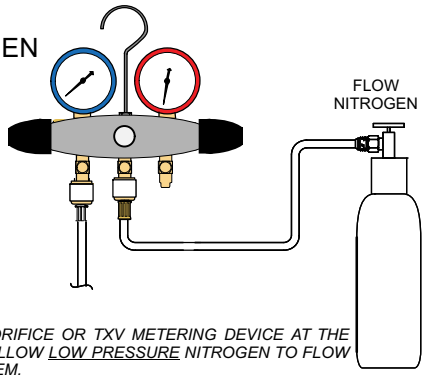
4 WRAP SERVICE VALVE



To protect components during brazing, wrap a wet cloth around the liquid line service valve body and copper tube stub and use another wet cloth underneath the valve body to protect the base paint. Also, shield the light maroon R-410A sticker.

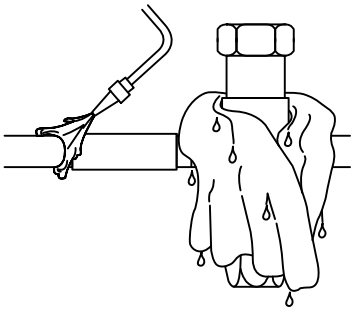
5 FLOW NITROGEN



NOTE - THE FIXED ORIFICE OR TXV METERING DEVICE AT THE INDOOR UNIT WILL ALLOW LOW PRESSURE NITROGEN TO FLOW THROUGH THE SYSTEM.

Flow regulated nitrogen (at 1 to 2 psig) through the refrigeration gauge set into the valve stem port connection on the liquid line service valve and out of the valve stem port connection on the suction service valve.

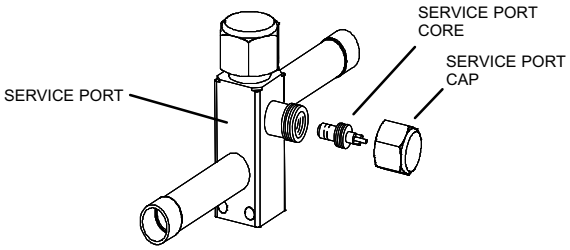
6 BRAZE LINE SET



Braze the liquid line to the liquid line service valve. Turn off nitrogen flow.

IMPORTANT - REPEAT PROCEDURE STARTING AT PARAGRAPH 4 FOR BRAZING THE SUCTION LINE TO SERVICE PORT VALVE.

7 INSTALL SERVICE PORT CAPS ONLY



After all connections have been brazed, disconnect manifold gauge set from service ports, cool down piping with wet rag and remove all wrappings.

NOTE - DO NOT REINSTALL CORES UNTIL AFTER EVACUATION PROCEDURE. REINSTALL SERVICE CAPS IF DESIRED TO CLOSE OFF REFRIGERANT PORTS.

Removing Indoor Unit Metering Device

Remove the existing HCFC-22 fixed orifice or TXV from the indoor coil. The existing indoor unit HCFC-22 metering device is not approved for use with HFC-410A refrigerant and may prevent proper flushing.

REPLACEMENT PARTS

If replacement liquid line parts are necessary for the indoor unit, order kit 69J46 (LB-95325A). The kit includes:

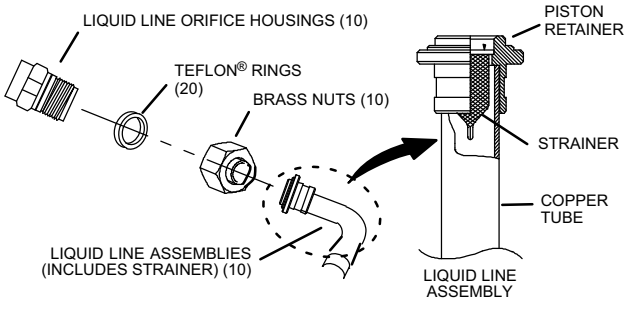


Figure 17. Liquid Line Kit Components

TYPICAL FIXED ORIFICE REMOVAL PROCEDURE

Use the following procedure to remove the indoor unit's fixed orifice and install a temporary field provided fitting.

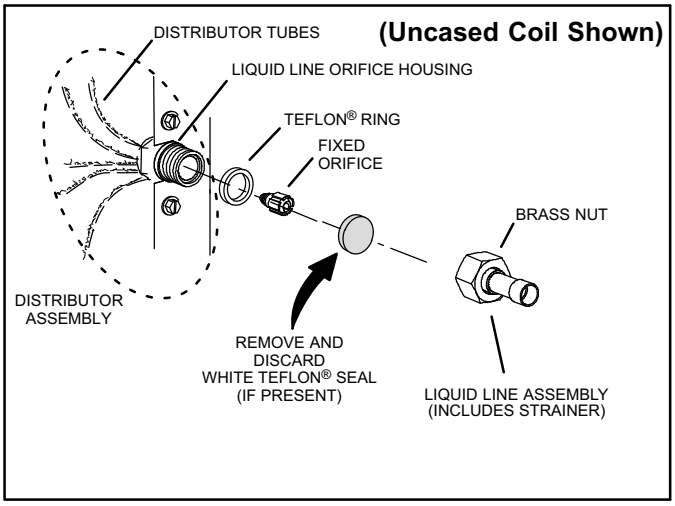


Figure 18. Typical Fixed Orifice Removal

1. On fully cased coils, remove the coil access and plumbing panels.
2. Remove any shipping clamps holding the liquid line and distributor assembly.

3. Using two wrenches, disconnect liquid line from liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.
4. Remove and discard fixed orifice, valve stem assembly if present and Teflon® ring as illustrated in figure 18.
5. Use a field-provided fitting to temporary reconnect the liquid line to the indoor unit's liquid line orifice housing.

TYPICAL TXV REMOVAL PROCEDURE

Use the following procedure to remove the indoor unit's TXV and install a temporary field provided fitting.

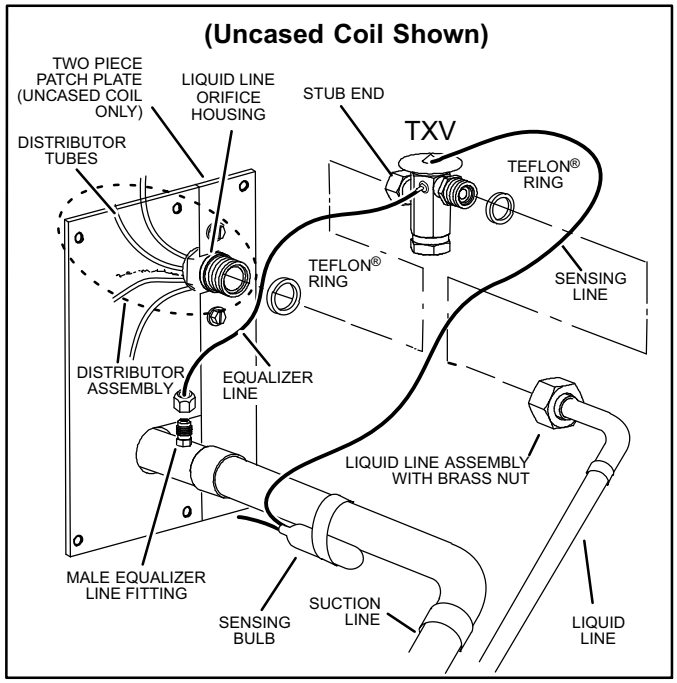


Figure 19. Typical TXV Removal

1. On fully cased coils, remove the coil access and plumbing panels.
2. Remove any shipping clamps holding the liquid line and distributor assembly.
3. Disconnect the equalizer line from the TXV equalizer line fitting on the suction line.
4. Remove the suction line sensing bulb as illustrated in figure 19.
5. Disconnect the liquid line from the TXV at the liquid line assembly.
6. Disconnect the TXV from the liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.
7. Remove and discard TXV and the two Teflon® rings as illustrated in figure 19.
8. Use a field-provided fitting to temporary reconnect the liquid line to the indoor unit's liquid line orifice housing.

Flushing the System

If the original system used:

- HCFC-22 refrigerant, then flush the system using the procedure provided in this section.
- HFC-410A refrigerant, then proceed to *Refrigerant Metering Device Kits*.

⚠ IMPORTANT

The line set and indoor unit 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.

⚠ IMPORTANT

If this unit is being matched with an approved line set or indoor unit 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 HFC-410A refrigerant. Residual mineral oil can act as an insulator, preventing proper heat transfer. It can also clog the expansion device, and reduce the system performance and capacity.

Failure to properly flush the system per the instructions below will void the warranty.

⚠ IMPORTANT

The Environmental Protection Agency (EPA) prohibits the intentional venting of HFC refrigerants during maintenance, service, repair and disposal of appliance. Approved methods of recovery, recycling or reclaiming must be followed.

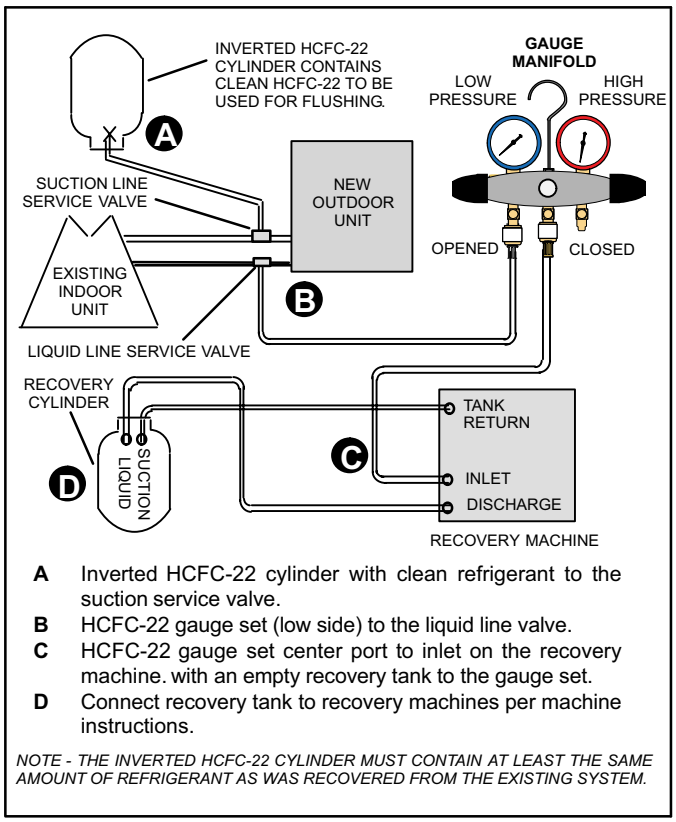
⚠ CAUTION

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

REQUIRED EQUIPMENT

Equipment required to flush the existing line set and indoor unit coil:

- Two clean HCFC-22 recovery bottles,
- Oilless recovery machine with pump-down feature,
- Two gauge sets (one for HCFC-22; one for HFC-410A).



A Inverted HCFC-22 cylinder with clean refrigerant to the suction service valve.
B HCFC-22 gauge set (low side) to the liquid line valve.
C HCFC-22 gauge set center port to inlet on the recovery machine. with an empty recovery tank to the gauge set.
D Connect recovery tank to recovery machines per machine instructions.

NOTE - THE INVERTED HCFC-22 CYLINDER MUST CONTAIN AT LEAST THE SAME AMOUNT OF REFRIGERANT AS WAS RECOVERED FROM THE EXISTING SYSTEM.

Figure 20. Typical Flushing Connection

NOTE - Use recovery machine instructions for specific setup requirements.

PROCEDURE

1. 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 unit coil.
2. Invert the cylinder of clean HCFC-22 and open its valve to allow liquid refrigerant to flow into the system through the suction line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor unit coil before it enters the recovery machine.
3. After all of the liquid refrigerant has been recovered, switch the recovery machine to suction recovery so that all of the HCFC-22 suction is recovered. Allow the recovery machine to pull a vacuum on the system.
4. 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.
5. Use dry nitrogen to break the vacuum on the refrigerant lines and indoor unit coil before removing the recovery machine, gauges and refrigerant drum.

Refrigerant Metering Device Kits

This outdoor unit is designed for use in systems that use one of the following refrigerant metering devices:

- Thermal expansion valve (TXV)
- Fixed orifice

See the XC14 Engineering Handbook for approved indoor/outdoor match-ups, applicable refrigerant metering device kits and application information.

FIXED ORIFICE KITS

The indoor unit fixed orifice kit (included with outdoor unit) contains the following parts:

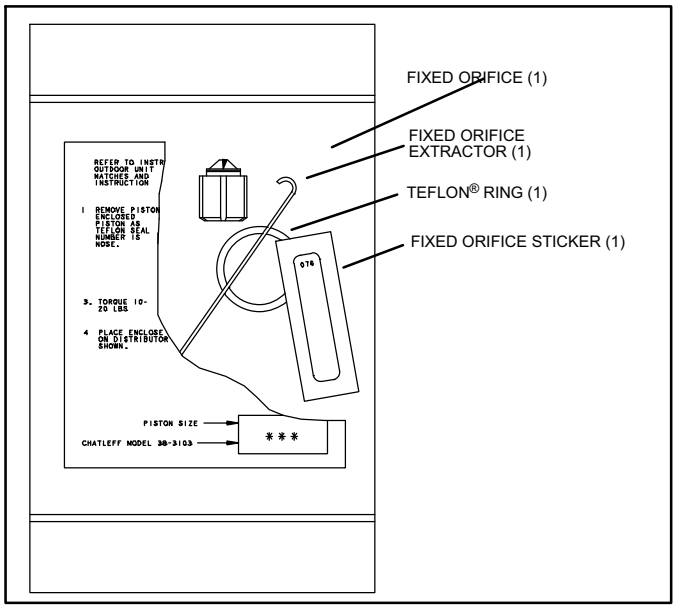


Figure 21. Fixed Orifice Kit Components

TXV KITS

The indoor unit TXV kit (ordered separately) includes the following parts:

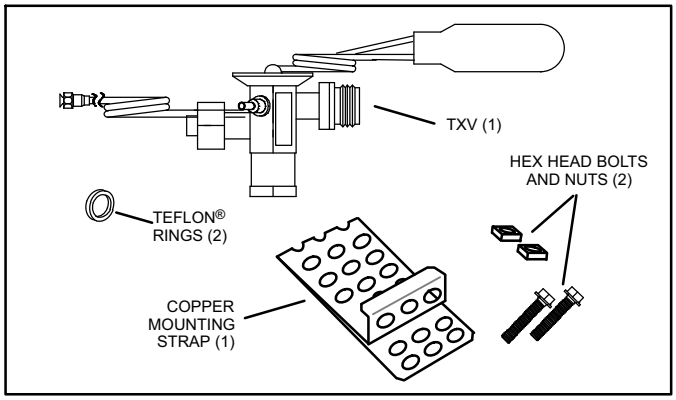


Figure 22. TXV Kit Components

Installing New Indoor Unit Metering Device

XC14 units can be configured for use in with either a HFC-410A fixed orifice or TXV metering devices. This section provides instructions on installing either a fixed orifice or TXV refrigerant metering device.

TIGHTENING DISTANCES

Use figure 23 to tighten fasteners and caps when a torque wrench is not available.

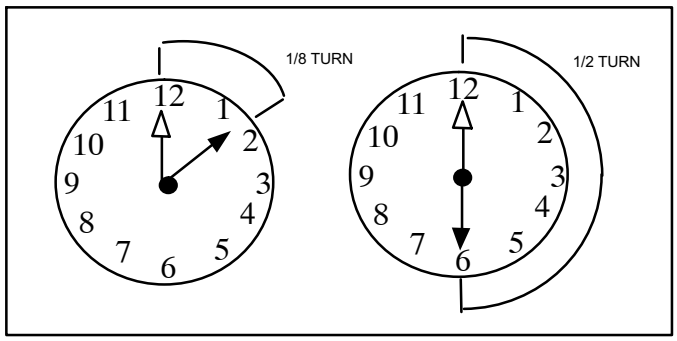


Figure 23. Tightening Distances

TYPICAL FIXED ORIFICE INSTALLATION PROCEDURE

Use the following procedure along with figure 24 to install a fixed orifice kit.

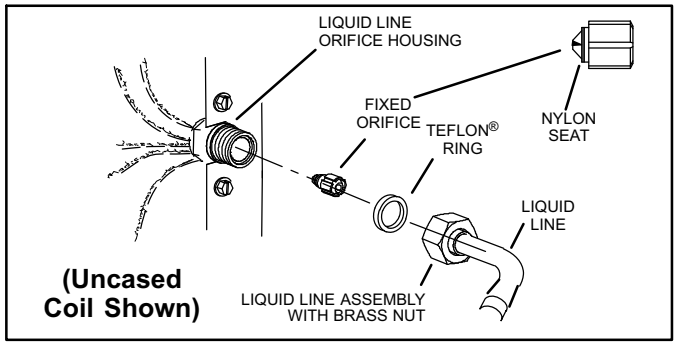


Figure 24. Typical Fixed Orifice Installation

1. Remove the field-provided fitting that temporary reconnected the liquid line to the indoor unit's liquid line orifice housing.
2. Ensure that the fixed orifice supplied with the outdoor unit is installed with the nylon seat pointing toward the distributor assembly.
3. Apply a small amount of refrigerant oil on the Teflon® ring and insert the Teflon® ring securely into the orifice housing.
4. Attached the liquid line assembly to the liquid line orifice housing. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in figure 23, or 20 ft-lb.
5. Place the supplied fixed orifice sticker on the indoor cabinet after installation.

TYPICAL TXV INSTALLATION PROCEDURE

The TXV unit can be installed internal or external to the indoor coil. In applications where an uncased coil is being installed in a field-provided plenum, install the TXV in a manner that will provide access for field servicing of the TXV. Refer to Figure 25 for reference during installation of TXV unit.

To prevent any possibility of water damage, properly insulate all parts of the TXV assembly that may sweat due to temperature differences between the valve and its surrounding ambient temperatures.

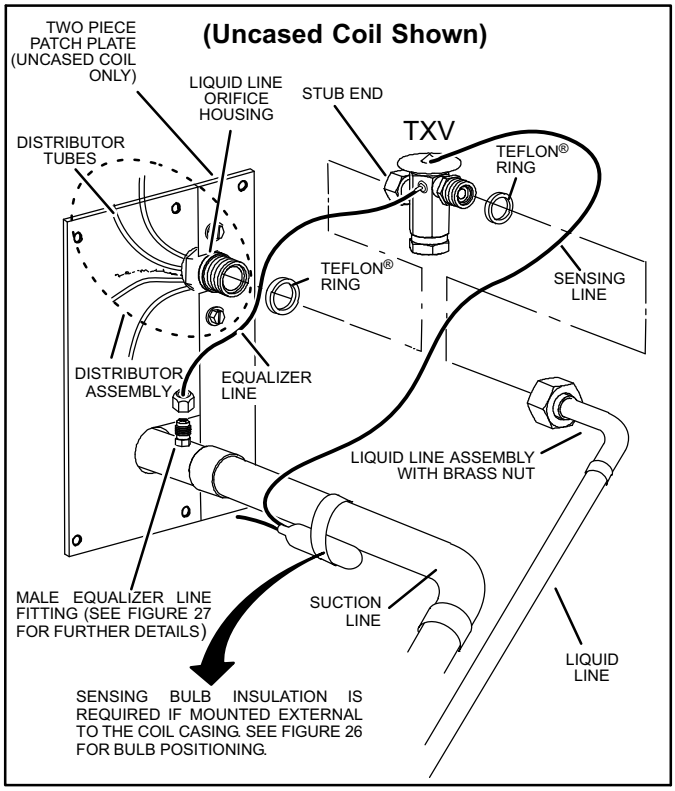


Figure 25. Typical TXV Installation

1. Remove the field-provided fitting that temporary reconnected the liquid line to the indoor unit's distributor assembly.
2. Install one of the provided Teflon® rings around the stubbed end of the TXV and lightly lubricate the connector threads and expose surface of the Teflon® ring with refrigerant oil.
3. Attach the stubbed end of the TXV to the liquid line orifice housing. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in figure 23, or 20 ft-lb.
4. Place the remaining Teflon® ring around the other end of the TXV. Lightly lubricate connector threads and expose surface of the Teflon® ring with refrigerant oil.
5. Attach the liquid line assembly to the TXV. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in figure 23, or 20 ft-lb.
6. Attach the suction line sensing bulb in the proper orientation as illustrated in figure 26 using the clamp and screws provided.

NOTE - Insulating the sensing bulb once installed may be required when the bulb location is external to the coil casing.

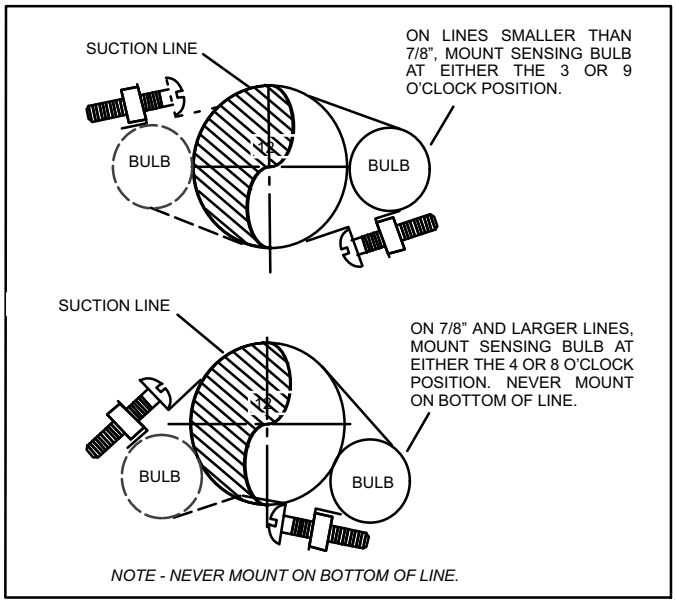


Figure 26. TXV Sensing Bulb Installation

7. Remove and discard either the flare seal cap or flare nut with copper flare seal bonnet from the equalizer line port on the suction line as illustrated in figure 27.

⚠ IMPORTANT

When removing the flare nut, ensure that the copper flare seal bonnet is removed.

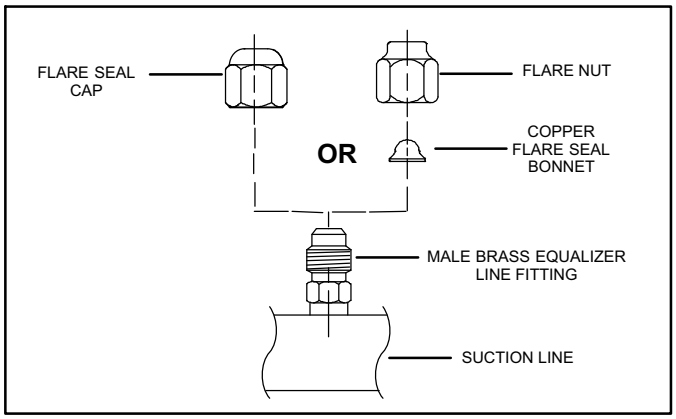


Figure 27. Copper Flare Seal Bonnet Removal

8. Connect the equalizer line from the TXV to the equalizer suction port on the suction line. Finger tighten the flare nut plus 1/8 turn (7 ft-lbs) as illustrated in figure 23.

See the XC14 Engineering Handbook for approved TXV indoor/outdoor unit match-ups and application information. Figure 22 illustrates the kit components and quantities.

Leak Testing the System

After the line set has been connected to both the indoor and outdoor units, check the line set connections and indoor unit for leaks. Use the following procedure to test for leaks:

⚠ IMPORTANT

Leak detector must be capable of sensing HFC refrigerant.

⚠ 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

Fire, Explosion and Personal Safety Hazard.

Failure to follow this warning could result in damage, personal injury or death.

Never use oxygen to pressurize or purge refrigeration lines. Oxygen, when exposed to a spark or open flame, can cause damage by fire and/or an explosion, that could result in personal injury or death.

1. Connect an HFC-410A manifold gauge set as illustrated in figure 28.
2. Open the valve on the HFC-410A cylinder (suction only).
3. Open the high pressure side of the manifold to allow HFC-410A into the line set and indoor unit. Weigh in a trace amount of HFC-410A. *[A trace amount is a maximum of two ounces (57 g) refrigerant or three pounds (31 kPa) pressure].*
4. Close the valve on the HFC-410A cylinder and the valve on the high pressure side of the manifold gauge set.
5. Disconnect the HFC-410A cylinder.

A Connect an HFC-410A manifold gauge set high pressure hose to the suction valve service port.

B With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set. Note:

NOTE - LATER IN THE PROCEDURE, THE HFC-410A CONTAINER WILL BE REPLACE BY THE NITROGEN CONTAINER.

NOTE - 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.

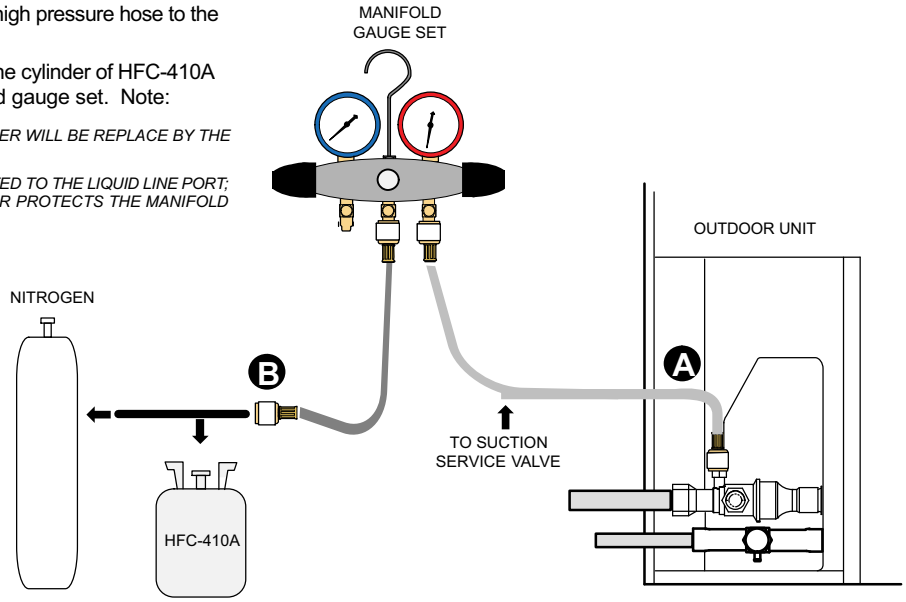


Figure 28. Typical Leak Testing Manifold Gauge Set Connections

6. Connect a cylinder of dry nitrogen with a pressure regulating valve to the center port of the manifold gauge set.
7. Adjust dry 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 unit.
8. After a few minutes, open one of the service valve ports and verify that the refrigerant added to the system earlier is measurable with a leak detector.

NOTE - Amounts of refrigerant will vary with line lengths.

9. Check all joints for leaks.
10. Purge dry nitrogen and HFC-410A mixture.
11. Correct any leaks and recheck.
12. After leak testing disconnect gauges from service ports.

Evacuating the System

⚠ 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.

⚠ IMPORTANT

Use a thermocouple or thermistor electronic vacuum gauge that is calibrated in microns. Use an instrument capable of accurately measuring down to 50 microns.

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 suction combine with refrigerant to produce substances that corrode copper piping and compressor parts.

NOTE - Remove cores from service valves if not already done.

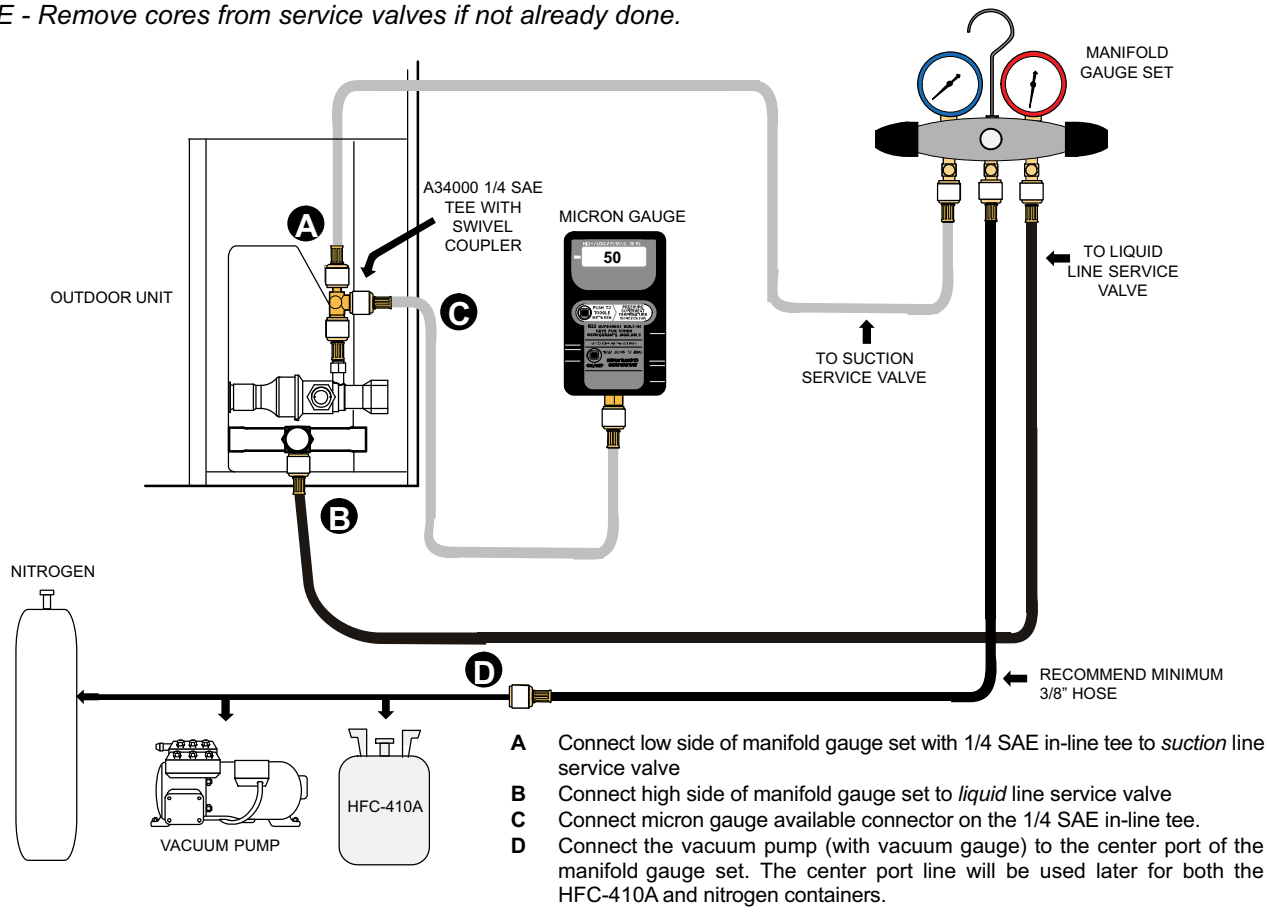
1. Connect an HFC-410A manifold gauge set as illustrated in figure 29.
2. Open both manifold valves and start the vacuum pump.
3. Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29.01 inches of mercury).

*NOTE - 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 pressure this 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.*

4. 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 dry 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.

NOTE - Remove cores from service valves if not already done.



A Connect low side of manifold gauge set with 1/4 SAE in-line tee to *suction* line service valve

B Connect high side of manifold gauge set to *liquid* line service valve

C Connect micron gauge available connector on the 1/4 SAE in-line tee.

D Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set. The center port line will be used later for both the HFC-410A and nitrogen containers.

Figure 29. Typical Evacuation Manifold and Micron Gauges Connections

5. Shut off the dry nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release dry nitrogen from the line set and indoor unit.
6. Reconnect the manifold gauge to vacuum pump, turn pump on, and continue to evacuate 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 vacuum pump and closing the manifold gauge valves.
7. 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 HFC-410A refrigerant. Open the manifold gauge valve pressure line set to break vacuum with 2 to 5 psi.
8. Perform the following:
   - A Close manifold gauge valves
   - B Shut off HFC-410A cylinder
   - C Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.
   - D Replace the stem caps and secure finger tight, then tighten an additional one-sixth (1/6) of a turn as illustrated in figure 1.

Electrical Connections

In the United States, 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).

TRANSFORMER - 24VAC

Use the transformer provided with the furnace or coil blower for low-voltage control power (24 - 40VAC minimum)

NOTE - The addition of accessories to the system could exceed the 40VAC power requirement of the factory-provided transformer. Measure the system's current and voltage after installation is complete to determine transformer loading. If loading exceeds the factory-provided transformer capacity, a larger field-provided transformer will need to be installed in the system.

⚠ WARNING

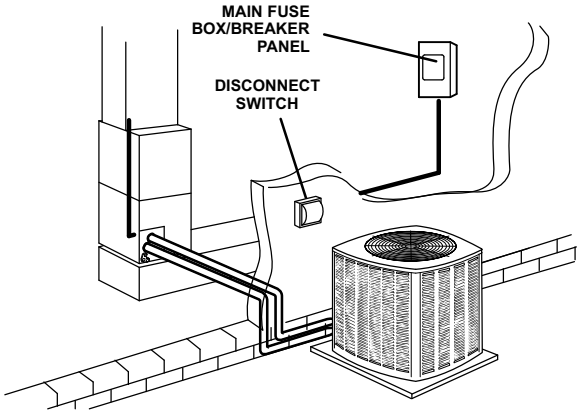
Electric Shock Hazard. Can cause injury or death.

Line voltage is present at all components on units with single-pole contactors, even when unit is not in operation!

Unit may have multiple power supplies. Disconnect all remote electric power supplies before opening access panel.

Unit must be grounded in accordance with national and local codes.

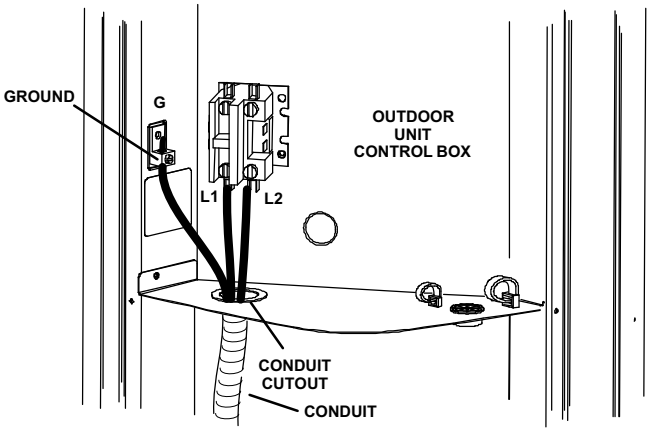
1 CIRCUIT SIZING AND DISCONNECT SWITCH



Refer to the unit nameplate for minimum circuit ampacity amperage minimum, and maximum fuse or circuit breaker fusible (HACR per NEC). Install power wiring and properly sized disconnect switch.

NOTE - UNITS ARE APPROVED FOR USE ONLY WITH COPPER CONDUCTORS. GROUND UNIT AT DISCONNECT SWITCH OR TO AN EARTH GROUND.

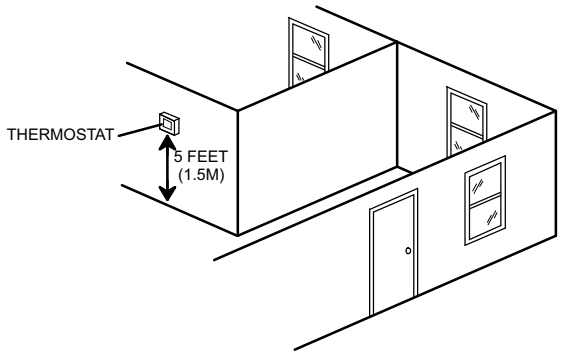
2 HIGH VOLTAGE POWER SUPPLY CONNECTIONS



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

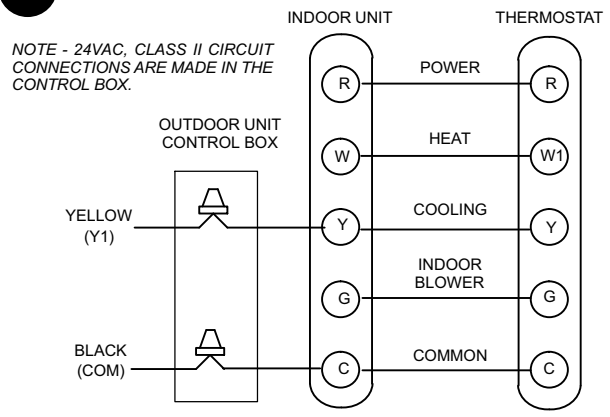
NOTE - ANY EXCESS HIGH VOLTAGE FIELD WIRING SHOULD BE TRIMMED AND SECURED AWAY FROM ANY LOW VOLTAGE FIELD WIRING.

3 INSTALL THERMOSTAT



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

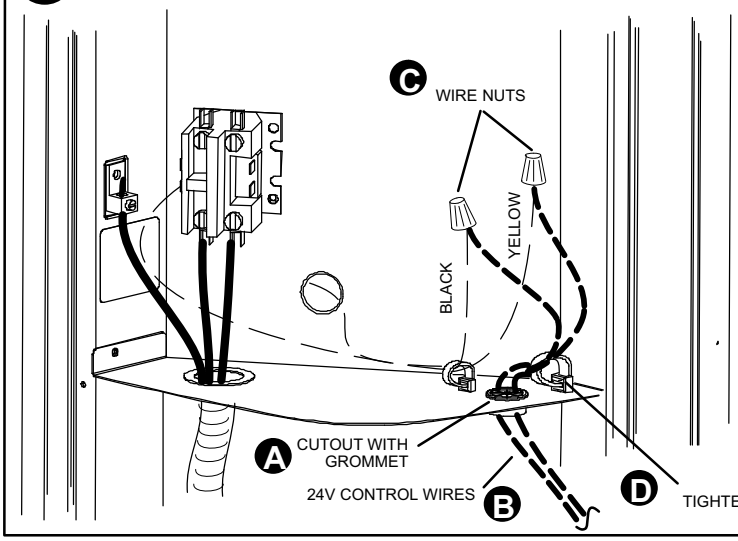
4 CONTROL WIRING



Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit as illustrated.

NOTE - SEE FIGURE 30 FOR ADDITIONAL FURNACE AND BLOWER COIL APPLICATION DIAGRAMS.

5 UNIT LOW VOLTAGE CONNECTIONS



HIGH VOLTAGE FIELD WIRING
FACTORY WIRING
LOW VOLTAGE (24V) FIELD WIRING

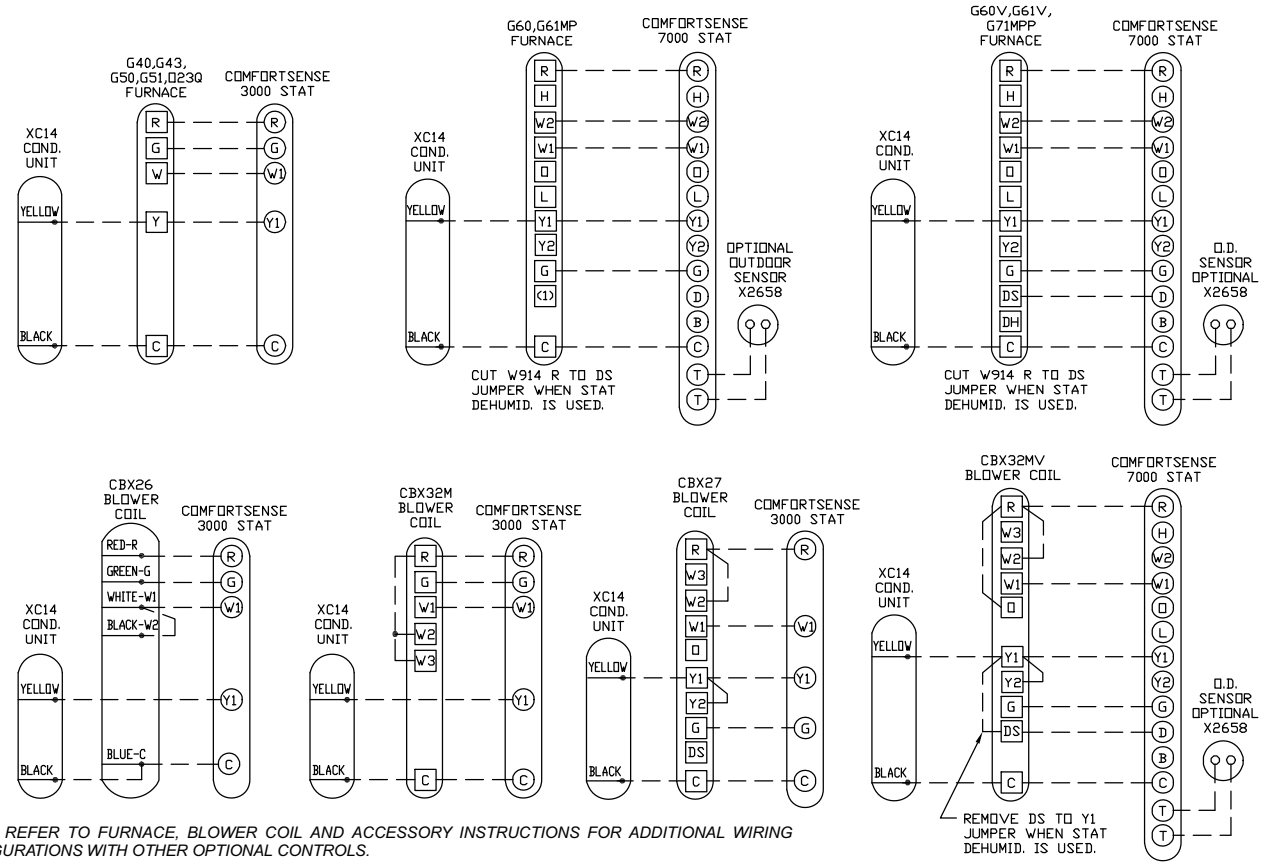
WIRE RUN LENGTH	AWG#	INSULATION TYPE
LESS THAN 100' (30 METERS)	18	TEMPERATURE RATING
MORE THAN 100' (30 METERS)	16	35ºC MINIMUM.

A Run 24VAC control wires through cutout with grommet.
B Run 24VAC control wires through wire tie.
C Make 24VAC control wire connections using field provided wire nuts.
D Tighten wire tie to security 24V control wiring.

NOTE - FOR PROPER VOLTAGES, SELECT THERMOSTAT WIRE (CONTROL WIRES) GAUGE PER TABLE ABOVE.

NOTE - WIRE TIE PROVIDES LOW VOLTAGE WIRE STRAIN RELIEF AND TO MAINTAIN SEPARATION OF FIELD INSTALLED LOW AND HIGH VOLTAGE CIRCUITS.

NOTE - DO NOT BUNDLE ANY EXCESS 24VAC CONTROL WIRES INSIDE CONTROL BOX.



NOTE - REFER TO FURNACE, BLOWER COIL AND ACCESSORY INSTRUCTIONS FOR ADDITIONAL WIRING CONFIGURATIONS WITH OTHER OPTIONAL CONTROLS.

Figure 30. 24VAC Control Wiring Diagrams (Field Installed)

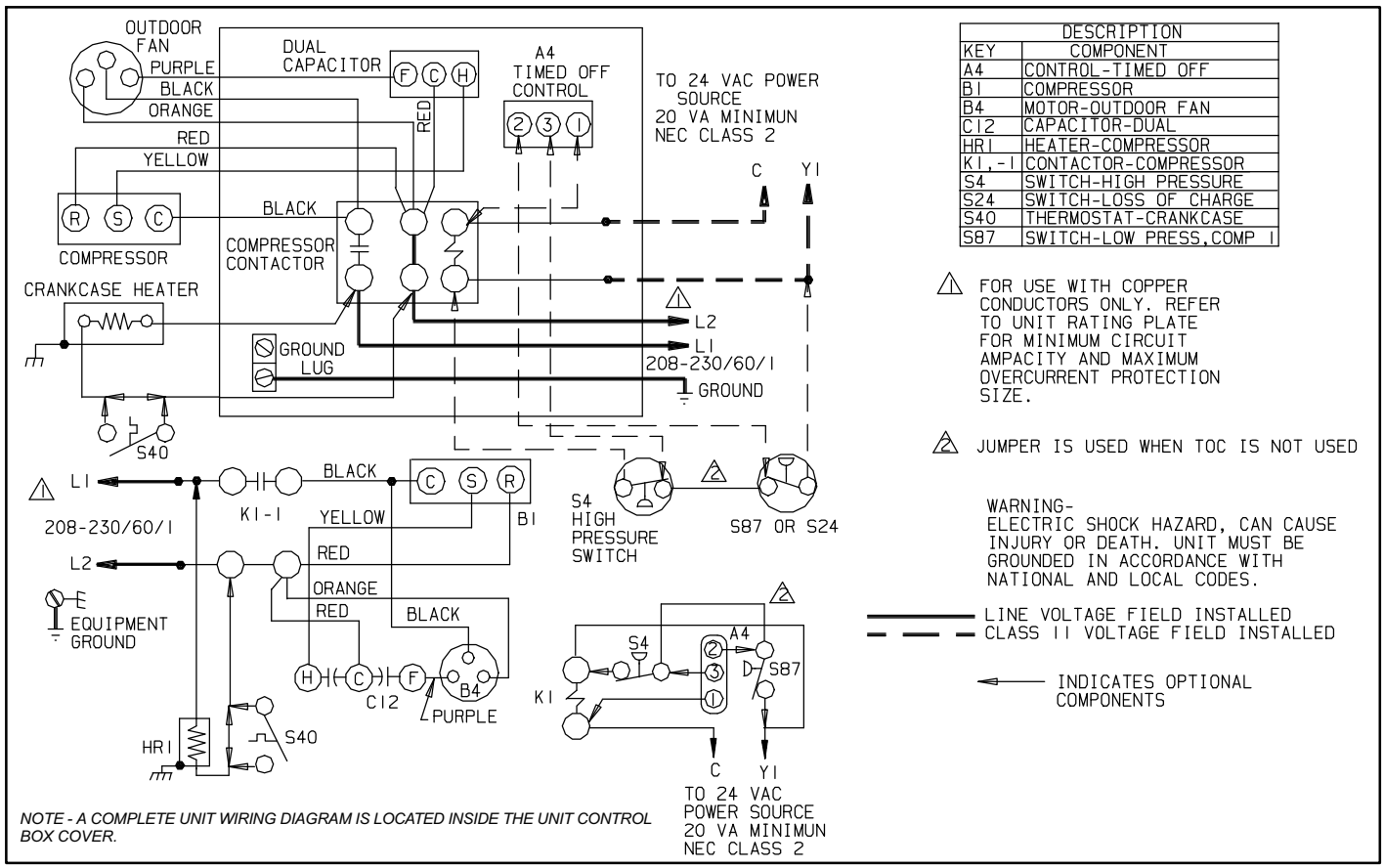


Figure 31. XC14 Unit Wiring Diagram

Servicing Outdoor Unit Delivered Void of Charge

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

1. Use nitrogen to pressurize the system and check for leaks as described in *Testing for Leaks* on page 15.
2. Repair all leaks.
3. Evacuate the system to remove as much of the moisture as possible as described in *Evacuating the System* on page 16.
4. Use nitrogen to break the vacuum and install a new filter drier in the system.
5. Evacuate the system again. Then, weigh the appropriate amount of HFC-410A refrigerant as listed on unit nameplate into the system using *Charging System* on page 22.
6. Monitor the system to determine the amount of moisture remaining in the oil. 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.**

Start-Up Procedure

Use the following procedure prior to starting up the unit for the first time.

1. Rotate fan to check for binding.
2. Inspect all factory- and field-installed wiring for loose connections.
3. Open the liquid line and suction 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 as illustrated in figure 1.
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.

⚠ IMPORTANT

If unit is equipped with a crankcase heater and the outdoor ambient air is 50ºF (10ºC) or below, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

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.
8. Check system for sufficient refrigerate using the procedures outlined in *Charging System* on page 22.

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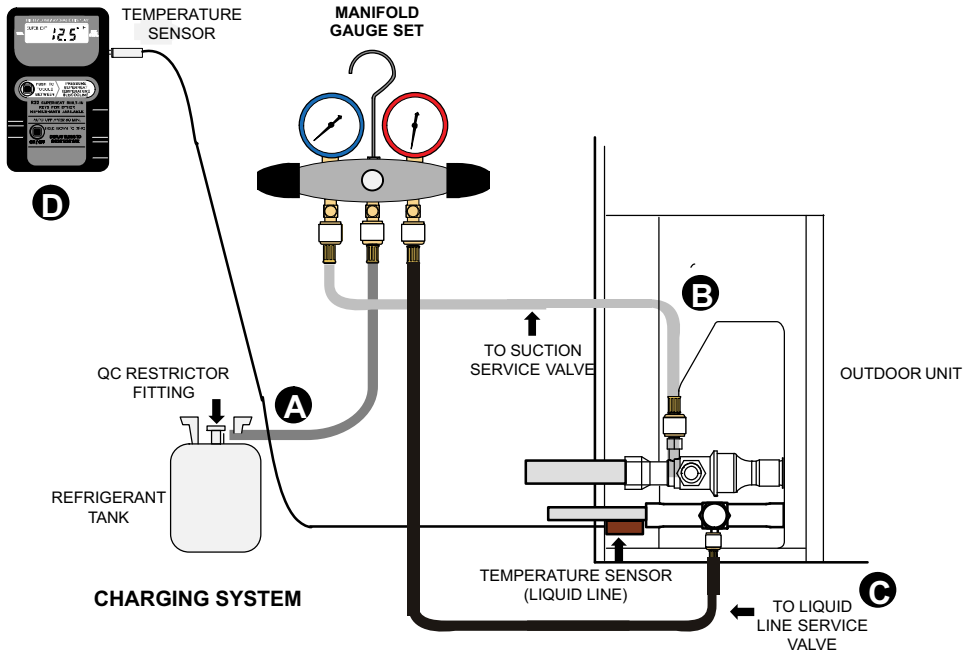
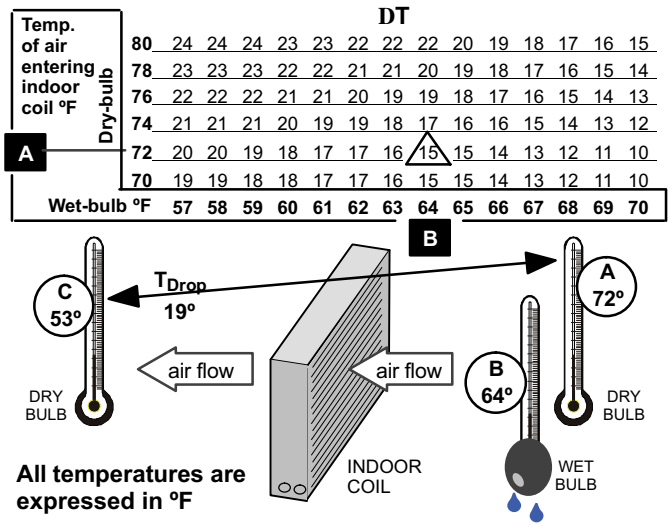
Testing Charge Procedure



A Close manifold gauge set valves and connect the center hose to an upright cylinder of HFC-410A.
B Connect the manifold gauge set's low pressure side to the suction line service port.
C Connect the manifold gauge set's high pressure side to the liquid line service port.
D Position temperature sensor on liquid line near liquid line service port.

Figure 32. Connecting Gauge Set for Testing and Charging

INDOOR COIL AIRFLOW CHECK



1. Determine the desired DT—Measure entering air temperature using dry bulb (**A**) and wet bulb (**B**). **DT** is the intersecting value of **A** and **B** in the table (see triangle).

2. Find temperature drop across coil—Measure the coil's dry bulb entering and leaving air temperatures (**A** and **C**). Temperature Drop Formula: (T_{Drop}) = **A** minus **C**.

3. Determine if fan needs adjustment—If the difference between the measured T_{Drop} and the desired **DT** (T_{Drop}–**DT**) is within ±3°, no adjustment is needed. See examples: Assume **DT** = 15 and **A** temp. = 72°, these **C** temperatures would necessitate stated actions:

C°	T_{Drop}	–	DT	=	°F	*ACTION*
53°	19	–	15	=	4	*Increase the airflow*
58°	14	–	15	=	-1	*(within ±3° range) no change*
62°	10	–	15	=	-5	*Decrease the airflow*

4. Adjust the fan speed—See indoor unit instructions to increase/decrease fan speed.

Changing air flow affects all temperatures; recheck temperatures to confirm that the temperature drop and DT are within ±3°.

Check indoor coil airflow using the Delta-T (DT) process as illustrated.

Figure 33. Indoor Coil Airflow Check

Charging System

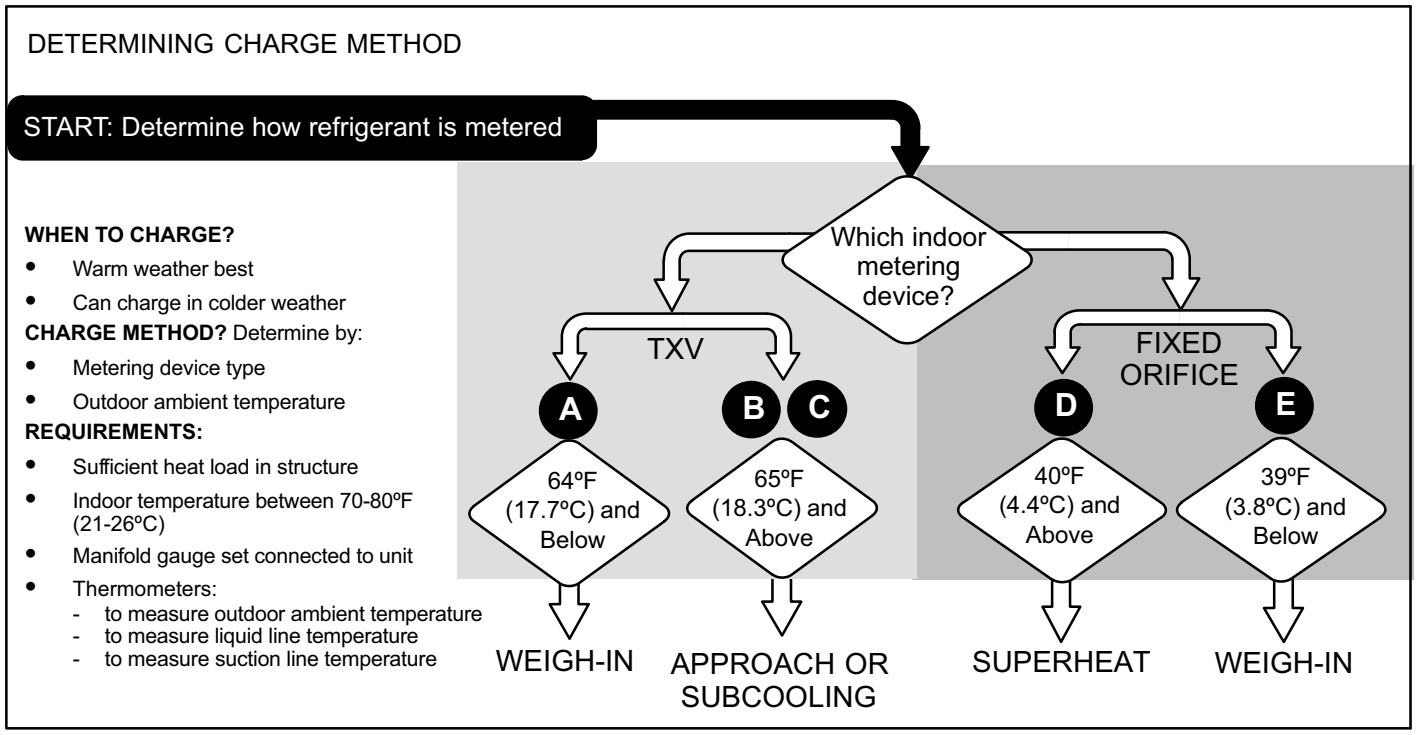


Figure 34. Determining Charge Method

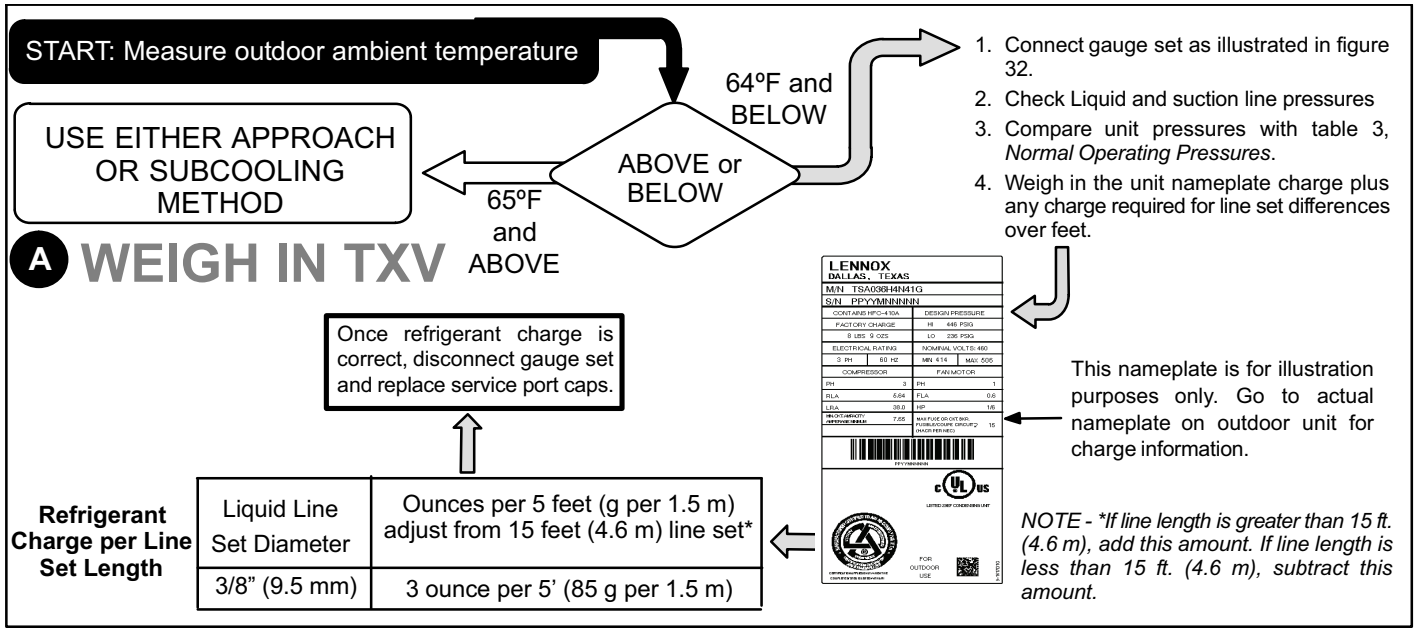


Figure 35. Using HFC-410A Weigh In (TXV) Charge Method

START: Measure outdoor ambient temperature

65ºF and ABOVE

ABOVE or BELOW

64ºF and BELOW

USE WEIGH-IN METHOD
Weigh-in or remove refrigerant based upon line length

B APPROACH TXV

1. Connect gauge set as illustrated in figure 32.
2. Confirm proper airflow across coil using figure 33.
3. Compare unit pressures with table 3, *Normal Operating Pressures*.
4. Set thermostat to call for heat (must have a cooling load between 70-80ºF (21-26ºC).
5. When heat demand is satisfied, set thermostat to call for cooling.
6. Allow temperatures and pressures to stabilize.
7. Record outdoor ambient temperature:
   AMBº =_____
8. Record liquid line temperature:
   LIQº = _____
9. Subtract to determine approach (APPº):
   LIQº_____ - AMBº _____ = APPº_____
10. Compare results with table below.

APPº (Approach) Values(F:+/-1.0° [C: +/-0.6°])

ºF (ºC)*	-018	-024	-030	-036	-042	-048	-060
65 (18)	4 (2.2)	2 (1.1)	2 (1.1)	2 (1.1	6 (3.3)	7 (3.9)	8 (4.4)
75 (24)	5 (2.8)	4 (2.2)	4 (2.2)	5 (2.8)	8 (4.4)	8 (4.4)	9 (5.0)
85 (29)	6 (3.3)	4 (2.2)	6 (3.3)	8 (4.4)	8 (4.4)	8 (4.4)	9 (5.0)
95 (35)	5 (2.8)	4 (2.2)	5 (2.8)	7 (3.9)	8 (4.4)	8 (4.4)	9 (5.0)
105 (41)	3 (1.7)	4 (2.2)	5 (2.8)	6 (3.3)	8 (4.4)	8 (4.4)	9 (5.0)
115 (45)	3 (1.7)	3 (1.7)	4 (2.2)	6 (3.3)	8 (4.4)	9 (5.0)	9 (5.0)

*Temperature of air entering outdoor coil

If value is greater than shown (high approach), add refrigerant; if less than shown (liquid temperature too close to ambient temperature, low approach), remove refrigerant.

If refrigerant is added or removed, retest to confirm that unit is properly charged.

Figure 36. Using HFC-410A Approach (TXV) Charge Method

START: Measure outdoor ambient temperature

65ºF and ABOVE

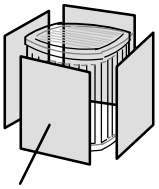
ABOVE or BELOW

64ºF and BELOW

USE WEIGH-IN METHOD
Weigh-in or remove refrigerant based upon line length

C SUBCOOLING TXV

BLOCK OUTDOOR COIL: [sometimes necessary with lower temperatures] Use cardboard or plastic sheet to restrict the airflow through the outdoor coil to achieve pressures from 325-375 psig (2240-2585 kPa). Higher pressures are needed to check charge. Block equal sections of air intake panels and move coverings sideways until the liquid pressure is in the above noted ranges.



CARDBOARD OR PLASTIC SHEETS

1. Connect gauge set as illustrated in figure 32.
2. Confirm proper airflow across coil using figure 33.
3. Compare unit pressures with table 3, *Normal Operating Pressures*.
4. Set thermostat to call for heat (must have a cooling load between 70-80ºF (21-26ºC)
5. Measure outdoor ambient temperature
6. When heat demand is satisfied, set thermostat to call for cooling
7. Allow temperatures and pressures to stabilize.
   NOTE - If necessary, block outdoor coil to maintain 325 - 375 psig.
8. Record liquid line temperature:
   LIQº = _____
9. Measure liquid line pressure and use the value to determine saturation temperature (see table 4):
   SATº = _____
10. Subtract to determine subcooling (SCº):
    SATº_____ - LIQº _____ = SCº _____
11. Compare results with table below.

SCº (Subcooling) Values (F:+/-1.0° [C: +/-0.6°])

ºF (ºC)*	-018	-024	-030	-036	-042	-048	-060
65 (18)	10 (5.6)	10 (5.6)	11 (6.1)	13 (7.2)	10 (5.6)	8 (4.4)	8 (4.4)
75 (24)	6 (3.3)	7 (3.9)	8 (4.4)	9 (5.0)	7 (3.9)	8 (4.4)	7 (3.9)
85 (29)	6 (3.3)	8 (4.4)	6 (3.3)	7 (3.9)	7 (3.9)	8 (4.4)	8 (4.4)
95 (35)	6 (3.3)	9 (5.0)	6 (3.3)	8 (4.4)	7 (3.9)	8 (4.4)	7 (3.9)
105 (41)	10 (5.6)	9 (5.0)	7 (3.9)	9 (5.0)	7 (3.9)	8 (4.4)	6 (3.3)
115 (45)	10 (5.6)	10 (5.6)	8 (4.4)	10 (5.6)	7 (3.9)	7 (3.9)	6 (3.3)

*Temperature of air entering outdoor coil

MORE or **LESS**

If value is **MORE** than shown, remove refrigerant.

If value is **LESS** than shown, add refrigerant.

If refrigerant is added or removed, verify charge using the **Approach Method**.

Once refrigerant charge is correct, disconnect gauge set and replace service port caps.

Figure 37. Using HFC-410A Subcooling (TXV) Charge Method

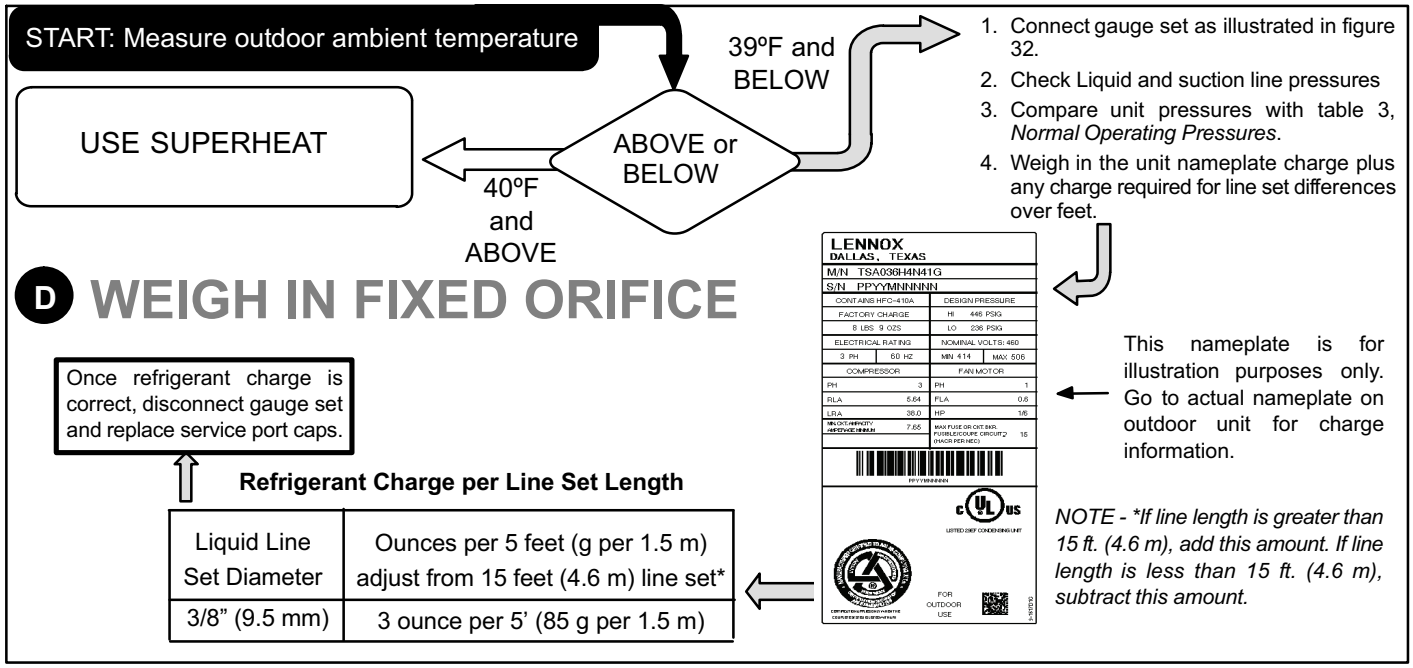
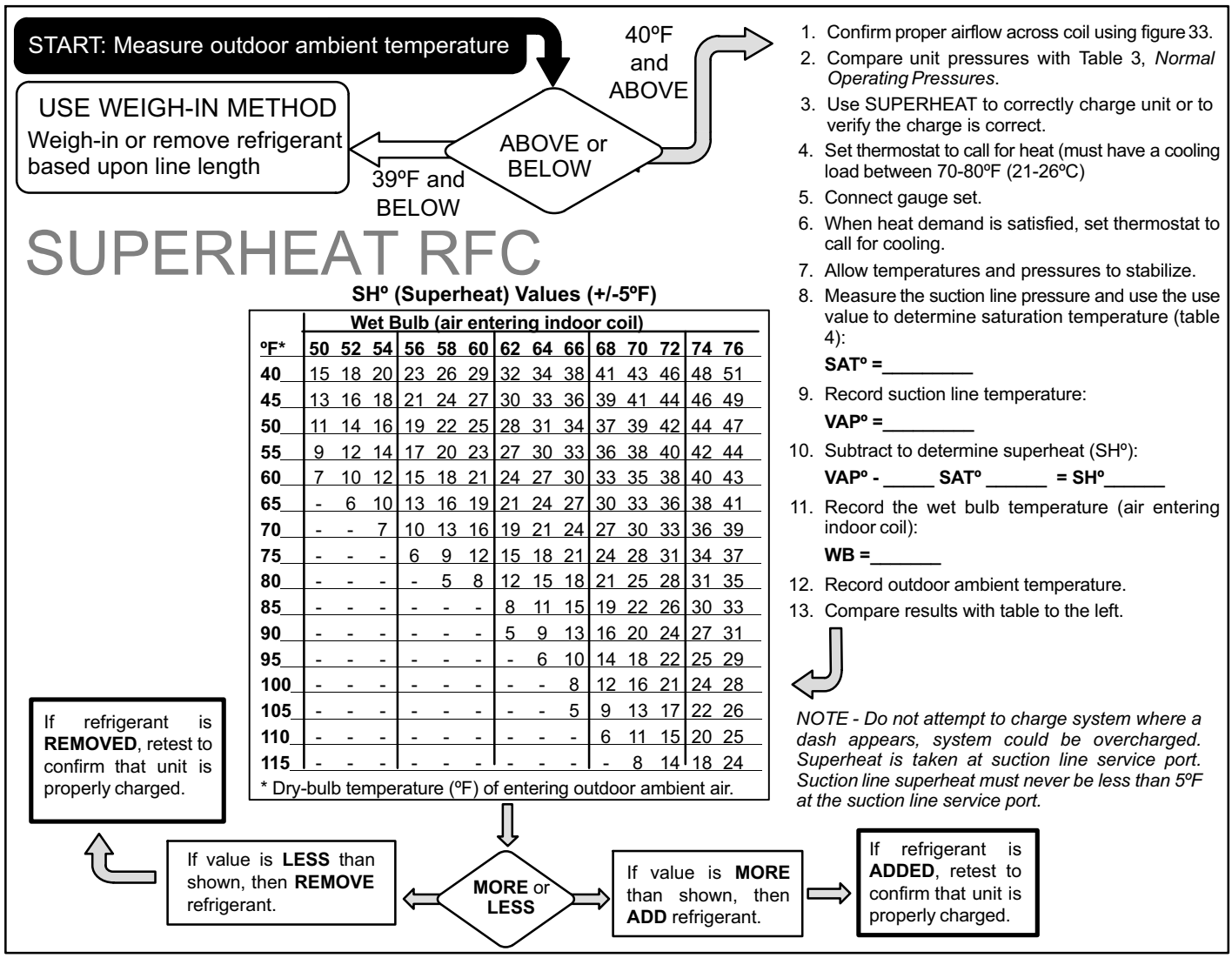


Figure 38. Using HFC-410A Weigh In (Fixed Orifice) Charge Method



SHº (Superheat) Values (+/-5ºF)

	Wet Bulb (air entering indoor coil)													
ºF*	50	52	54	56	58	60	62	64	66	68	70	72	74	76
40	15	18	20	23	26	29	32	34	38	41	43	46	48	51
45	13	16	18	21	24	27	30	33	36	39	41	44	46	49
50	11	14	16	19	22	25	28	31	34	37	39	42	44	47
55	9	12	14	17	20	23	27	30	33	36	38	40	42	44
60	7	10	12	15	18	21	24	27	30	33	35	38	40	43
65	-	6	10	13	16	19	21	24	27	30	33	36	38	41
70	-	-	7	10	13	16	19	21	24	27	30	33	36	39
75	-	-	-	6	9	12	15	18	21	24	28	31	34	37
80	-	-	-	-	5	8	12	15	18	21	25	28	31	35
85	-	-	-	-	-	-	8	11	15	19	22	26	30	33
90	-	-	-	-	-	-	5	9	13	16	20	24	27	31
95	-	-	-	-	-	-	-	6	10	14	18	22	25	29
100	-	-	-	-	-	-	-	-	8	12	16	21	24	28
105	-	-	-	-	-	-	-	-	5	9	13	17	22	26
110	-	-	-	-	-	-	-	-	-	6	11	15	20	25
115	-	-	-	-	-	-	-	-	-	-	8	14	18	24

* Dry-bulb temperature (ºF) of entering outdoor ambient air.

Figure 39. Using HFC-410A Superheat (Fixed Orifice) Charge Method

Table 3. Normal Operating Pressures (Liquid +10 and Suction +5 psig)

⚠ IMPORTANT	**Use this table to perform maintenance checks; it 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.**

Model	-018	-024	-030	-036	-042	-048	-060
**Temp. °F (°C)	Liquid / Vapor	Liquid / Suction	Liquid / Suction	Liquid / Suction	Liquid / Vapor	Liquid / Vapor	Liquid / Vapor
Expansion Valve (TXV)							
65 (18)	230 / 138	225 / 135	226 / 129	238 / 132	236 / 138	238 / 136	239 / 133
70 (21)	244 / 139	242 / 137	241 / 131	254 / 135	253 / 140	256 / 138	258 / 135
75 (24)	265 / 140	260 / 138	259 / 134	273 / 138	273 / 141	277 / 139	278 / 136
80 (27)	286 / 140	282 / 140	281 / 138	293 / 140	296 / 142	299 / 140	300 / 137
85 (29)	307 / 142	304 / 141	301 / 140	316 / 142	318 / 143	320 / 139	323 / 138
90 (32)	330 / 143	326 / 142	324 / 141	340 / 143	341 / 144	343 / 140	346 / 139
95 (35)	351 / 144	351 / 142	348 / 142	366 / 144	366 / 146	369 / 141	370 / 140
100 (38)	380 / 144	376 / 144	372 / 143	392 / 145	392 / 147	395 / 142	396 / 142
105 (41)	407 / 145	403 / 145	399 / 144	420 / 147	417 / 148	422 / 144	415 / 143
110 (43)	436 / 146	433 / 145	428 / 145	449 / 148	445 / 149	450 / 146	449 / 145
115 (45)	466 / 147	463 / 147	456 / 146	480 / 149	475 / 151	481 / 148	476 / 147
Fixed Orifice (RFC)							
65 (18)	232 / 124	228 / 125	229 / 128	241 / 131	248 / 135	240 / 126	244 / 125
70 (21)	248 / 127	244 / 127	243 / 129	258 / 134	266 / 138	260 / 129	263 / 128
75 (24)	267 / 131	261 / 131	261 / 132	277 / 136	285 / 141	281 / 133	281 / 131
80 (27)	286 / 135	284 / 134	284 / 135	298 / 139	305 / 143	301 / 135	303 / 134
85 (29)	307 / 138	303 / 137	305 / 138	321 / 141	327 / 145	324 / 138	324 / 136
90 (32)	328 / 141	325 / 140	327 / 140	342 / 143	349 / 147	346 / 140	347 / 139
95 (35)	351 / 143	347 / 142	349 / 142	366 / 145	372 / 149	371 / 142	370 / 141
100 (38)	375 / 146	370 / 144	372 / 144	392 / 147	396 / 150	395 / 144	394 / 143
105 (41)	400 / 148	394 / 146	396 / 146	416 / 149	421 / 152	420 / 146	418 / 145
110 (43)	426 / 150	420 / 148	422 / 148	446 / 151	447 / 153	447 / 148	444 / 146
115 (46)	457 / 153	447 / 150	449 / 150	480 / 152	476 / 154	473 / 150	471 / 147

**Values shown are typical pressures; indoor unit match up, indoor air quality equipment, and indoor load will cause the pressures to vary.*

***Temperature of the air entering the outside coil.*

Table 4. HFC-410A Temperature (°F) - Pressure (Psig)

°F	Psig	°F	Psig	°F	Psig	°F	Psig	°F	Psig	°F	Psig	°F	Psig	°F	Psig
32	100.8	48	137.1	63	178.5	79	231.6	94	290.8	110	365.0	125	445.9	141	545.6
33	102.9	49	139.6	64	181.6	80	235.3	95	295.1	111	370.0	126	451.8	142	552.3
34	105.0	50	142.2	65	184.3	81	239.0	96	299.4	112	375.1	127	457.6	143	559.1
35	107.1	51	144.8	66	187.7	82	242.7	97	303.8	113	380.2	128	463.5	144	565.9
36	109.2	52	147.4	67	190.9	83	246.5	98	308.2	114	385.4	129	469.5	145	572.8
37	111.4	53	150.1	68	194.1	84	250.3	99	312.7	115	390.7	130	475.6	146	579.8
38	113.6	54	152.8	69	197.3	85	254.1	100	317.2	116	396.0	131	481.6	147	586.8
39	115.8	55	155.5	70	200.6	86	258.0	101	321.8	117	401.3	132	487.8	148	593.8
40	118.0	56	158.2	71	203.9	87	262.0	102	326.4	118	406.7	133	494.0	149	601.0
41	120.3	57	161.0	72	207.2	88	266.0	103	331.0	119	412.2	134	500.2	150	608.1
42	122.6	58	163.9	73	210.6	89	270.0	104	335.7	120	417.7	135	506.5	151	615.4
43	125.0	59	166.7	74	214.0	90	274.1	105	340.5	121	423.2	136	512.9	152	622.7
44	127.3	60	169.6	75	217.4	91	278.2	106	345.3	122	428.8	137	519.3	153	630.1
45	129.7	61	172.6	76	220.9	92	282.3	107	350.1	123	434.5	138	525.8	154	637.5
46	132.2	62	175.4	77	224.4	93	286.5	108	355.0	124	440.2	139	532.4	155	645.0
47	134.6			78	228.0			109	360.0			140	539.0		

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

XC14 units are equipped with a high-pressure switch that is located in the liquid line of the compressor as illustrated in *Unit Dimensions* on page 2. The switch is a Single Pole, Single Throw (SPST), manual-reset switch with red cap that is normally closed and removes power from the compressor when discharge pressure rises above factory setting at 590 ± 10 psi.

DISCHARGE THERMOSTAT

Each XC14 unit is equipped with a discharge thermostat located in the discharge line of the compressor. The switch (SPST, auto-reset, normally closed) and removes power from the compressor when discharge temperature exceeds the factory setting of 220°F ±5°F.

FILTER DRIER

A filter drier is factory-installed as illustrated in *Unit Dimensions* on page 2, with each XC14 unit to ensure a clean, moisture-free system. A replacement filter drier is available from Lennox. Refer to Lennox Repair Part Program.

Maintenance

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause personal injury, loss of life, or damage to property.

Installation and service must be performed by a licensed professional installer (or equivalent) or a 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. 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 the unit (with the unit operating).
6. Check amp-draw outdoor fan motor.

UNIT NAMEPLATE: _____ ACTUAL: _____

NOTE - If owner reports insufficient cooling, the unit should be gauged and refrigerant charge checked.

INDOOR COIL

1. Clean coil, if necessary.
2. Check connecting lines and coils for signs 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. Check blower drive 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: _____

Homeowner Information

MAINTENANCE

In order to ensure peak performance, your system must be properly maintained. Clogged filters and blocked airflow prevent your unit from operating at its most efficient level.

1. **Air Filter—**Ask your Lennox dealer to show you where your indoor unit's filter is located. It will be either at the indoor unit (installed internal or external to the cabinet) or behind a return air grille in the wall or ceiling. Check the filter monthly and clean or replace it as needed.
2. **Disposable Filter—**Disposable filters should be replaced with a filter of the same type and size.
   NOTE - If you are unsure about the filter required for your system, call your Lennox dealer for assistance.
3. **Reusable Filter—**Many indoor units are equipped with reusable foam filters. Clean foam filters with a mild soap and water solution; rinse thoroughly; allow filter to dry completely before returning it to the unit or grille.
   NOTE - The filter and all access panels must be in place any time the unit is in operation.
4. **Electronic Air Cleaner—**Some systems are equipped with an electronic air cleaner, designed to remove airborne particles from the air passing through the cleaner. If your system is so equipped, ask your dealer for maintenance instructions.
5. **Indoor Unit—**The indoor unit's evaporator coil is equipped with a drain pan to collect condensate formed as your system removes humidity from the inside air. Have your dealer show you the location of the drain line and how to check for obstructions. *(This would also apply to an auxiliary drain, if installed.)*

⚠ IMPORTANT

Sprinklers and soaker hoses should not be installed where they could cause prolonged exposure to the outdoor unit by treated water. Prolonged exposure of the unit to treated water (i.e., sprinkler systems, soakers, waste water, etc.) will corrode the surface of steel and aluminum parts and diminish performance and longevity of the unit.

6. **Outdoor Unit—**Make sure no obstructions restrict airflow to the outdoor unit. Leaves, trash or shrubs crowding the unit cause the outdoor unit to work harder

and use more energy. Keep shrubbery trimmed away from the unit and periodically check for debris which collects around the unit. When removing debris from around the unit, be aware of metal edges on parts and screws. Although special care has been taken to keep exposed edges to a minimum, physical contact with metal edges and corners while applying excessive force or rapid motion can result in personal injury. Cleaning of the outdoor unit's coil should be performed by a trained service technician. Contact your dealer and set up a schedule (preferably twice a year, but at least once a year) to inspect and service your air conditioning or heat pump system.

THERMOSTAT OPERATION

Thermostat operations vary from one thermostat to another. The following provides general operation procedures. Refer to the user's information manual provided with your thermostat for specific operation details.

- **Temperature Setting Levers** - Set the lever or dial to the desired temperature setpoints for both heating and cooling. Avoid frequent temperature adjustment; turning the unit off—then back on—before pressures can equalize will put unusual stress on the unit's compressor.
- **Fan Switch** - In AUTO or INT (intermittent) mode, the blower operates only when the thermostat calls for heating or cooling. This mode is generally preferred when humidity control is a priority. The ON or CONT mode provides continuous indoor blower operation, regardless of whether the compressor or furnace is operating. This mode is required when constant air circulation or filtering is desired.
- **System Switch** - Set the system switch for heating, cooling or auto operation. The auto mode allows the system to automatically switch from heating mode to cooling mode to maintain predetermined comfort settings.
- **Temperature Indicator** - The temperature indicator displays the actual room temperature.

PROGRAMMABLE THERMOSTATS

Your Lennox system may be controlled by a programmable thermostat. These thermostats provide the added feature of programmable time-of-day set points for both heating and cooling. Refer to the user's information manual provided with your thermostat for operation details.

PRESERVICE CHECK

If your system fails to operate, check the following before calling for service:

- Make sure all electrical disconnect switches are ON.
- Make sure the room thermostat Temperature Selector and System Switch (Heat, Cool, Auto) are properly set.
- Check for and replace any blown fuses, or reset any tripped circuit breakers.
- Make sure unit access panels are in place.
- Make sure air filter is clean.
- Write down the unit model number and have it handy before calling.

OPTIONAL ACCESSORIES

Refer to the *Lennox XC14 Engineering Handbook* for the latest available accessories for this unit.

Start-Up and Performance Checklist

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 _____ Suction Pressure _____ Refrigerant Charge Checked? ❑

Refrigerant Lines: - Leak Checked? ❑ Properly Insulated? ❑	Outdoor Fan Checked? ❑
Service Valves: --- Fully Opened? ❑ Caps Tight? ❑	**Thermostat**
Voltage With Compressor Operating _____	Calibrated? ❑ Properly Set? ❑ Level? ❑