This SL28XCV outdoor air conditioner with all-aluminum coil is designed for use with HFC-410A refrigerant only. These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

**GENERAL**

This unit must be installed with an approved indoor air handler or coil. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com.

**SETTING THE UNIT – Clearances**

**CLEARANCE ON ALL SIDES — INCHES (MILLIMETERS)**

- Clearance to access panel must be 30 inches (762mm).
- Clearance to one of the other three sides must be 36 inches (914mm).
- Clearance to one of the remaining two sides may be 12 inches (305mm) and the final side may be 6 inches (152mm).

**MINIMUM CLEARANCE BETWEEN TWO UNITS**

**MINIMUM CLEARANCE ABOVE UNIT**

**NOTES:**
- Clearance to access panel must be 30 inches (762mm).
- Clearance to one of the other three sides must be 36 inches (914mm).
- Clearance to one of the remaining two sides may be 12 inches (305mm) and the final side may be 6 inches (152mm).

*Note: Dimensions are not to scale.*
DETAIL A
INSTALL UNIT AWAY FROM WINDOWS

Two 90° elbows installed in line set will reduce line set vibration.

Outside Unit Placement

DETAIL B
INSTALL UNIT LEVEL OR, IF ON A SLOPE, MAINTAIN SLOPE TOLERANCE OF 2 DEGREES (OR 2 INCHES PER 5 FEET [50 MM PER 1.5 M]) AWAY FROM BUILDING STRUCTURE.

DETAIL C

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.

Elevated Slab Mounting using Feet Extenders

DETAIL D

Slab Side Mounting
#10 1/2” long self-drilling sheet metal screws
Stabilizing bracket (18 gauge metal — 2” width; height as required)
#10 1-1/4” long hex Hd screw and flat washer

Concrete slab — Use two plastic anchors (hole drill 1/4”)
Wood or plastic slab — no plastic anchor (hole drill 1/8”)

Deck Top Mounting
Stabilizing bracket (18 gauge metal — 2” (50.8MM) width; height as required); bend to form right angle

Same fasteners as slab side mounting.

One bracket per side (min.); for extra stability, two brackets per side, 2” (50.8MM) from each corner.

Stabilizing Unit on Uneven Surfaces

IMPORTANT — 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.
### UNIT DIMENSIONS – INCHES (MM)

**Base with Elongated Legs**

- **UNIT SUPPORT FEET**
  - 3-1/8 (79)
  - 8-3/4 (222)
  - 16-7/8 (429)
- **BASE**
  - 30-3/4 (781)
  - 4-5/8 (117)

**Electrical Suction**

- **UNIT SUPPORT FEET**
  - 8.04
- **LIQUID**
  - 18.59

**Dimensions**

<table>
<thead>
<tr>
<th>UNIT</th>
<th>DIM A</th>
<th>DIM B</th>
<th>DIM C</th>
<th>DIM D</th>
<th>DIM E</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL28XCV-024</td>
<td>47.00</td>
<td>35.50</td>
<td>39.40</td>
<td>35.00</td>
<td>15.97</td>
</tr>
<tr>
<td>SL28XCV-036</td>
<td>47.00</td>
<td>35.50</td>
<td>39.40</td>
<td>35.00</td>
<td>15.97</td>
</tr>
<tr>
<td>SL28XCV-048</td>
<td>47.00</td>
<td>35.50</td>
<td>39.40</td>
<td>35.00</td>
<td>15.97</td>
</tr>
<tr>
<td>SL28XCV-060</td>
<td>47.00</td>
<td>35.50</td>
<td>39.40</td>
<td>35.00</td>
<td>15.97</td>
</tr>
</tbody>
</table>
NOTICE!
Roof Damage!
This system contains both refrigerant and oil. Some rubber roofing material may absorb oil, causing the rubber to degrade. Failure to follow this notice could result in damage to roof surface.

IMPORTANT
This unit must be matched with an indoor coil as specified with AHRI. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com Coils previously charged with HCFC-22 must be flushed.

WARNING
To prevent personal injury, as well as damage to panels, unit or structure, observe the following:
While installing or servicing this unit, carefully stow all removed panels so that the panels will not cause injury to personnel, objects or nearby structures. Also, take care to store panels where they will not be subject to damage (e.g., being bent or scratched).
While handling or stowing the panels, consider any weather conditions (especially wind) that may cause panels to be blown around and damaged.

IMPORTANT
Exhaust vents from dryers, water heaters and furnaces should be directed away from the outdoor unit. Prolonged exposure to exhaust gases and the chemicals contained within them may cause condensation to form on the steel cabinet and other metal components of the outdoor unit. This will diminish unit performance and longevity.

NOTICE!
Charging information is given on the charging procedure sticker on the unit access panel. For more in-depth information, consult the Installation and Service Procedures manual on LennoxPros.com or through the Technical Support department at 800-453-6669.

CAUTION
As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

REFRIGERANT PIPING

IMPORTANT
If this unit is being matched with an approved line set or indoor unit coil that 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. Polyvinyl ether (PVE) 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 system performance and capacity. Failure to properly flush the system per this instruction and the detailed Installation and Service Procedures manual will void the warranty.

Flush the existing line set per the following instructions. For more information, refer to the Installation and Service Procedures manual available on LennoxPros.com. CAUTION - DO NOT attempt to flush and re-use existing line sets or indoor coil when the system contains contaminants (i.e., compressor burn out).

Polyvinyl ether (PVE) oil is used in the SL28XCV compressors. For installations of the SL28XCV unit with refrigerant lines or coils previously charged with R410A and POE oil, Lennox recommends flushing the existing lines and coil with R410A refrigerant to remove excess POE oil that may be in the system.

If a new line set is being installed, size the piping per table 1.

NOTE - For new or replacement line set installation, refer to Service and Application Note - Corp. 9112-L4 (C-91-4).

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.

WARNING
When using a high pressure gas such as 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
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 fire and/or an explosion, that could result in property damage, personal injury or death.

WARNING
Polyvinyl ether (PVE) 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.

IMPORTANT
Some scroll compressors have an internal vacuum protector that will unload scrolls when suction pressure goes below 20 psig. A hissing sound will be heard when the compressor is running unloaded. Protector will reset when low pressure in system is raised above 40 psig. DO NOT REPLACE COMPRESSOR.

The SL28XCV is a variable-capacity cooling system utilizing variable speed compressor technology. With the variable speed compressor and variable pumping capacity, additional consideration must be given to refrigerant piping sizing and application. The guidelines below are to be used exclusively for the SL28XCV systems.

COOLING SYSTEM (HFC410A)
• Total equivalent length equals 180 feet (piping and all fittings included).

NOTE – Length is general guide. Lengths may be more or less, depending on remaining system design factors.
• Maximum linear (actual) length = 150 feet.
• Maximum linear liquid lift = 60 feet.

NOTE – Maximum lifts are dependent on total length, number of elbows, etc. that contribute to total pressure drop.
• Maximum length vapor riser = 60 feet.
• Up to 50 Linear Feet: Use rated line sizes listed in table 1.
• Between 51 and 150 Linear Feet: Crankcase heater and nonbleed port TXV factory installed. No additional components required. Vertical vapor riser must be sized to the vapor riser listed in the table 2 on systems with line sets longer than 51 feet. Use tables 2 and 3 to determine the correct liquid and vapor line sizes.
• Over 150 Linear Feet: not recommended.
• Additional oil is not required for systems with line lengths up to 150 feet.

SUCTION TRAPS
For systems with the outdoor unit 5 - 60 feet above the indoor unit, one trap must be installed at the bottom of the suction riser.

ADDING REFRIGERANT FOR LONG LINE SETS

CHARGING METHOD FOR LONG LINE SETS
64°F (17.7°C) and Below

<table>
<thead>
<tr>
<th>Liquid Line Set Diameter</th>
<th>HFC-410A (ounces per foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/16&quot;</td>
<td>0.40</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>0.60</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>1.00</td>
</tr>
</tbody>
</table>

NOTE — Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

NOTE — The above nameplate is for illustration purposes only. Go to actual nameplate on outdoor unit for charge information.

Charging Formula for Liquid Line Charge Adjustments

\[ \text{Total charge} = \text{Amount specified on nameplate} \pm \text{Adjustment factor} \]

Example: Units are factory-charged for 15 feet (4.6 meters) of 3/8" line set. Factory charge for 3/8" is 0.60 oz/ft x 15 = 9.0 ounces.

FIGURE 1. Using HFC-410A Weigh In Method
### TABLE 1. Standard Refrigerant Line Set – Up to 50 Linear Feet

<table>
<thead>
<tr>
<th>Valve Size Connections</th>
<th>Recommended Line Sets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SL28XCV</strong>*</td>
<td>Liquid Line</td>
</tr>
<tr>
<td>-024</td>
<td>3/8” (10 mm)</td>
</tr>
<tr>
<td>-036</td>
<td>3/8” (10 mm)</td>
</tr>
<tr>
<td>-048</td>
<td>3/8” (10 mm)</td>
</tr>
<tr>
<td>-060</td>
<td>3/8” (10 mm)</td>
</tr>
</tbody>
</table>

* Applicable to all minor revision numbers unless otherwise specified.
** Some applications may require a field-provided 1-1/8” to 7/8” adapter.

### TABLE 2. SL28XCV Line Set Guidelines – Between 51 - 150 Feet Linear Length

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Total Equivalent Length (ft)</th>
<th>Maximum Linear (actual) Length (ft)</th>
<th>Maximum Vapor Riser (ft)</th>
<th>Maximum Linear Liquid Lift (ft)</th>
<th>Preferred Vapor Line Sizes for Horizontal Runs</th>
<th>Required Vapor Riser Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>-024</td>
<td>180</td>
<td>150</td>
<td>60</td>
<td>60</td>
<td>7/8”</td>
<td>5/8”</td>
</tr>
<tr>
<td>-036</td>
<td>180</td>
<td>150</td>
<td>60</td>
<td>60</td>
<td>7/8”</td>
<td>3/4”</td>
</tr>
<tr>
<td>-048</td>
<td>180</td>
<td>150</td>
<td>60</td>
<td>60</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
<tr>
<td>-060</td>
<td>180</td>
<td>150</td>
<td>60</td>
<td>60</td>
<td>7/8”</td>
<td>7/8”</td>
</tr>
</tbody>
</table>

### TABLE 3. Liquid Line Diameter Selection Table

<table>
<thead>
<tr>
<th>Unit</th>
<th>Line Size</th>
<th>Total Linear Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>-024</td>
<td>5/16”</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>3/8”</td>
<td>25</td>
</tr>
<tr>
<td>-036</td>
<td>3/8”</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1/2”</td>
<td>25</td>
</tr>
<tr>
<td>-048</td>
<td>3/8”</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1/2”</td>
<td>25</td>
</tr>
<tr>
<td>-060</td>
<td>3/8”</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>1/2”</td>
<td>25</td>
</tr>
</tbody>
</table>

**NOTE** - Shaded rows indicate rated liquid line size
A. Find your unit on the left side of the table.
B. Start with the rated liquid line size (shaded row) on the outdoor unit
C. Select the actual Total Linear Length of your system shown at the top of the table.
D. The elevation listed in the table is the maximum allowed for the liquid line listed.
E. Select or consider the larger liquid line size shown in the table if the elevation does not meet your requirements.

**NOTE** - For new or replacement line set installation, refer to Service and Application Note - Corp. 9112-L4 (C-91-4).

---

**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.

**WARNING**

Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.
A - On fully cased coils, remove the coil access and plumbing panels.
B - Remove any shipping clamps from the liquid line and distributor assembly.
C - Using two wrenches, disconnect liquid line from liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.
D - Remove and discard fixed orifice, valve stem assembly (if present) and Teflon® washer as illustrated above.
E - Use a field-provided fitting to temporarily reconnect the liquid line to the indoor unit's liquid line orifice housing.

2 CONNECT GAUGES AND EQUIPMENT FOR FLUSHING PROCEDURE

A - HCFC-22 cylinder with clean refrigerant (positioned to deliver liquid refrigerant) to the vapor 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 connected to the gauge set.
D - Connect recovery tank to recovery machine per machine instructions.

3 FLUSHING LINE SET
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.
A - 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.
B - Position the cylinder of clean HCFC-22 for delivery of liquid refrigerant 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 unit coil before it enters the recovery machine.
C - 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 the system down to 0.
D - 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.

FIGURE 2
1. **PIPING PANEL REMOVAL / PREPARING LINE SET**
   Remove piping panel to access service valves. Cut ends of the refrigerant lines square (free from nicks or dents) and debur the ends. The pipe must remain round. Do not crimp end of the line.

2. **CAP AND CORE REMOVAL**
   Remove service cap and core from both the suction / vapor and liquid line service ports.

3. **ATTACH THE MANIFOLD GAUGE SET FOR BRAZING**
   LIQUID AND SUCTION / VAPOR LINE SERVICE VALVES
   A. Connect gauge set low pressure side to liquid line service valve (service port).
   B. Connect gauge set center port to bottle of nitrogen with regulator.
   C. With valve core removed from the suction / vapor line service port, nitrogen flow will have an exit point.

---

**FIGURE 3**
4 WRAP SERVICE VALVES
To help protect service valve seals during brazing, wrap water-saturated cloths around service valve bodies and copper tube stubs. Use additional water-saturated cloths under the valve body to protect the base paint.

5 FLOW NITROGEN
Flow regulated nitrogen (at 1 to 2 psig) through the refrigeration gauge set into the valve stem port connection on the liquid service valve and out of the suction / vapor valve stem port. See steps 3A, 3B and 3C on previous page and below for manifold gauge setup.

6 BRAZE LINE SET
Cloths must remain water-saturated throughout the brazing and cool-down process.
1. Braze liquid line to liquid line service valve.
2. Braze suction / vapor line to suction / vapor service valve.

IMPORTANT!
Use silver alloy brazing rods with 5% minimum silver alloy for copper-to-copper brazing and 45% alloy for copper-to-brass or copper-to-steel brazing.

WARNING
FIRE, PERSONAL INJURY, OR PROPERTY DAMAGE may result if you do not wrap a water-saturated cloth around both liquid and suction line service valve bodies and copper tube stub while brazing the line set! The braze, when complete, must be quenched with water to absorb any residual heat.

Do not open service valves until refrigerant lines and indoor coil have been leak-tested and evacuated. Refer to Installation and Service Procedures manual found on DAVENET.

7 PREPARATION FOR NEXT STEP
After all connections have been brazed, disconnect manifold gauge set from service ports. Apply additional water-saturated cloths to both services valves to cool piping. Once piping is cool, remove all water-saturated cloths.

FIGURE 4
This outdoor unit is designed for use in systems that include an expansion valve metering device (purchased separately) at the indoor coil. See the SL28XCV Product Specifications bulletin (EHB) for approved expansion valve kit match-ups and application information. The expansion valve 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 expansion valve in a manner that will provide access for future field service of the expansion valve. Refer to below illustration for reference during installation of expansion valve unit.

**INDOOR EXPANSION VALVE INSTALLATION**

(Uncased Coil Shown)

1. Align the vapor line sensing bulb in the proper orientation as illustrated to the right using the clamp and screws provided.

**NOTE**

Though it is preferred to have the sensing bulb installed on a horizontal run of the vapor line, installation on a vertical run of piping is acceptable if necessary.

**NOTE**

Confirm proper thermal contact between vapor line and check/expansion bulb before insulating the sensing bulb once installed.

2. Connect the equalizer line from the check expansion valve 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 the figure above or tighten to 20 ft-lb.

**SENSING BULB INSTALLATION**

1. Attach the vapor line sensing bulb in the proper orientation as illustrated to the right using the clamp and screws provided.

**NOTE**

- Though it is preferred to have the sensing bulb installed on a horizontal run of the vapor line, installation on a vertical run of piping is acceptable if necessary.

**NOTE**

- Confirm proper thermal contact between vapor line and check/expansion bulb before insulating the sensing bulb once installed.

2. Connect the equalizer line from the check expansion valve to the vapor line. Finger tighten the flare nut plus 1/8 turn (7 ft-lbs) as illustrated below.

**FIGURE 5**
1 CONNECT GAUGE SET

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

**NOTE** - Normally, the high pressure hose is connected to the liquid line port. However, connecting it to the vapor port better protects the manifold gauge set from high pressure damage.

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

**NOTE** - Later in the procedure, the HFC-410A container will be replaced by the nitrogen container.

2 TEST FOR LEAKS

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

A - With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set. Open the valve on the HFC-410A cylinder (vapor only).

B - 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.]* Close the valve on the HFC-410A cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the HFC-410A cylinder.

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

D - 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 unit.

E - 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.

F - After leak testing, disconnect gauges from service ports.
A - Open both manifold valves and start the vacuum pump.

B - 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. 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 above absolute zero within a given volume or system. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.

C - When the absolute pressure reaches 23,000 microns (29.01 inches of mercury), perform the following:

- Close manifold gauge valves.
- Close valve on vacuum pump.
- Turn off vacuum pump.
- Disconnect manifold gauge center port hose from vacuum pump.
- Attach manifold center port hose to a nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) and purge the hose.
- Open manifold gauge valves to break the vacuum in the line set and indoor unit.
- Close manifold gauge valves.

D - 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.

E - 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.

F - When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to a cylinder of HFC-410A positioned to deliver liquid refrigerant. Open the manifold gauge valve 1 to 2 psig in order to release the vacuum in the line set and indoor unit.

G - Perform the following:

- Close manifold gauge valves.
- Shut off HFC-410A cylinder.
- Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.
- Replace stem caps and finger tighten them, then tighten an additional one-sixth (1/6) of a turn as illustrated.

**WARNING !**

Possible equipment damage. Avoid deep vacuum operation. Do not use compressors to evacuate a system. Extremely low vacuum can cause internal arcing and compressor failure. Damage caused by deep vacuum operation will void warranty.
**ELECTRICAL – Circuit Sizing and Wire Routing**

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 air handler installation instructions for additional wiring application diagrams and refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

**24VAC TRANSFORMER**

Use the transformer provided with the furnace or air handler for low-voltage control power (24VAC - 40 VA minimum)

---

**WARNING**

Electrical Hazard
High Voltage
Wait 5 Minutes
Electrical components may hold charge.
Do not remove this panel or service this area for 5 minutes after the power has been removed.

---

**ELECTROSTATIC DISCHARGE (ESD) Precautions and Procedures**

Electrostatic discharge can affect electronic components. Take care during unit installation and service to protect the unit’s electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Touch hand and all tools on an unpainted unit surface before performing any service procedure to neutralize electrostatic charge.

---

**SIZE CIRCUIT AND INSTALL DISCONNECT SWITCH**

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

![Service Disconnect Switch](image)

**NOTE** — Units are approved for use only with copper conductors. Ground unit at disconnect switch or connect to an earth ground.

**INSTALL THERMOSTAT**

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

![Thermostat](image)

**NOTE** — 24VAC, Class II circuit connections are made in the control box.

---

**WARNING**

Fire Hazard. Use of aluminum wire with this product may result in a fire, causing property damage, severe injury or death. Use copper wire only with this product.

**WARNING**

Failure to use properly sized wiring and circuit breaker may result in property damage. Size wiring and circuit breaker(s) per Product Specifications bulletin (EHB) and unit rating plate.

---

**FIGURE 8**
PUMP DOWN – WHEN UNIT IS IN PUMP DOWN MODE, $P_d$ WILL BE DISPLAYED ON 7-SEGMENT. TO ACTIVATE PUMP DOWN MODE, THE CONTROL MUST BE IN THE IDLE STATE, AND THE PUMP DOWN JUMPER PLACED ACROSS THE TWO PUMP DOWN PINS. TO DEACTIVATE, REMOVE JUMPER.
FIGURE 10. Typical Field Wiring
FIGURE 11. Typical Factory Wiring
OUTDOOR CONTROL WIRES

Maximum length of wiring (18 gauge) for all connections on the RSBus is 1500 feet (457 meters). Wires should be color-coded, with a temperature rating of 95°F (35°C) minimum, and solid-core (Class II Rated Wiring). All low voltage wiring must enter unit through provided field-installed busing installed in electrical inlet.

The iComfort S30 thermostat requires four thermostat wires between the thermostat and the furnace / air handler iComfort™ control and four wires between the outdoor unit and the furnace/air handler iComfort™ control. When a thermostat cable with more than four wires is used, the extra wires must be properly connected to avoid electrical noise (see below).

Use a wire nut to bundle the four unused wires at each end of the cable. Each bundle should also include an additional wire that should be connected on each end to the C terminal as shown in the figure below.

ROUTE HIGH VOLTAGE AND GROUND WIRES

Any excess high voltage field wiring should be trimmed and secured away from any low voltage field wiring. To facilitate a conduit, a cutout is located side panel of the control box. Connect conduit to the control box using a proper conduit fitting. Connect high voltage field wires to the line side of contactor located on the bottom of the contactor. Connect the ground wire to the ground lug in the control box.
FIGURE 12. SL28XCV with iComfort S30 Communicating Thermostat – Field Wiring Diagram
UNIT START-UP

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

1 - Rotate fan to check for 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 valve stems to release the refrigerant charge (contained in outdoor unit) into the system.
4 - Replace the stem caps and tighten to the value listed in table 2.
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 with the power company and the voltage condition has been corrected.
6 - Connect manifold gauge set for testing and charging or use the Lennox Dealer Setup App to monitor the pressures and temperatures of the refrigeration system.
7 - Turn on power to the indoor unit and close the outdoor unit disconnect switch to start the unit. Start-up and testing should be performed with the unit operating at the maximum cooling capacity (100% capacity). The unit can be operated at maximum capacity by entering the test mode at the thermostat or using the Lennox Dealer Setup App. The S30 Test Mode can be selected by going to Menu> Advanced Settings> View Dealer Control Center> Test and then select Cooling - Maximum Rate Test.
8 - Recheck voltage while the unit is running. Power must be within range shown on the unit nameplate.
9 - Check system for sufficient refrigerant using the procedures outlined under Checking Refrigerant Charge.

OPERATING MANIFOLD GAUGE SET AND SERVICE VALVES
The liquid and vapor line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.
Each valve is equipped with a service port which has a factory-installed valve stem. Figures 14 and 15 provide information on how to access and operate both angle- and ball-type service valves.

Torque Requirements
When servicing or repairing heating, ventilating and air conditioning components, ensure the fasteners are appropriately tightened. Table 2 lists torque values for fasteners.

---

### TABLE 1 – TORQUE REQUIREMENTS

<table>
<thead>
<tr>
<th>Parts</th>
<th>Recommended Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service valve cap</td>
<td>8 ft.-lb.</td>
</tr>
<tr>
<td>Sheet-metal screws</td>
<td>16 in.-lb.</td>
</tr>
<tr>
<td>Machine screws #10</td>
<td>28 in.-lb.</td>
</tr>
<tr>
<td>Compressor bolts</td>
<td>90 in.-lb.</td>
</tr>
<tr>
<td>Gauge port seal cap</td>
<td>8 ft.-lb.</td>
</tr>
</tbody>
</table>

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

Using Manifold Gauge Set
When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings.
Manifold gauge set 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 psig on the high side and a low side of 30" vacuum to 250 psig with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psig of pressure with a 4000 psig burst rating.

---

FIGURE 13
Operating Angle-Type Service Valve

1 - Remove stem cap with an appropriately sized wrench.
2 - Use a service wrench with a hex-head extension (3/16" for liquid line valve sizes and 5/16" for vapor line valve sizes) to back the stem out counterclockwise as far as it will go.

When service valve is OPEN, the service port is open to line set, indoor and outdoor unit.

When service valve is CLOSED, the service port is open to the line set and indoor unit.

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

Reinstall Stem Cap

Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follows:

- With torque wrench, finger tighten and then torque cap per table 2.
- Without torque wrench, finger tighten and use an appropriately sized wrench to turn an additional 1/12 turn clockwise.

Charging

The SL28XCV unit is factory-charged with enough HFC-410A refrigerant to accommodate a 15-foot length of refrigerant piping. For refrigerant piping greater than 15 feet, calculate the additional charge using the table below. Then add the additional refrigerant charge to the system.

Charge should be checked and adjusted using the tables provided on the charging procedure sticker on the unit access panel. Detailed information is given in the SL28XCV Installation and Service Procedures manual, which is available on LennoxPros.com.

Refrigerant Charge per Line Set Length

<table>
<thead>
<tr>
<th>LIQUID LINE DIA.</th>
<th>OUNCES PER 5 FEET (G PER 1.5 M)</th>
<th>ADJUST FROM 15 FEET (4.6 M) LINE SET*</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8&quot; (9.5 MM)</td>
<td>3 OUNCES PER 5' (85 G PER 1.5 M)</td>
<td></td>
</tr>
</tbody>
</table>

*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.

NOTE – Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

Alarms

Alarm information is provided on the outdoor unit access panel and in the iComfort S30 Thermostat Installation and Setup Guide. Detail alarm information is also available in the SL28XCV Installation and Service Procedures manual, which is available on LennoxPros.com.

Outdoor Control Seven-Segment Display and Push Button

Information concerning the outdoor control seven-segment display and push button operations are available on the unit access panel and in the SL28XCV Installation and Service Procedures manual.

System Component Configuration (Outdoor Unit)

All configuration of the outdoor unit is completed using the iComfort S30 thermostat. Please refer to the iComfort S30 Thermostat Installation and Setup Guide for complete details on how to integrate this unit into a communicating system.
High Pressure Switch (S4)

This unit is equipped with a high pressure switch which is located on the liquid line. The SPST, normally closed pressure switch opens when liquid line pressure rises above the factory setting of 590 ± 15 psig and automatically resets at 418 ± 15 psig.

Homeowners Information

⚠️ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

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. The system should be inspected and serviced before each cooling and heating season by a licensed professional HVAC service technician (or equivalent).

Homeowner Maintenance

The following maintenance may be performed by the homeowner:

- Contact a licensed professional HVAC technician to schedule inspection and maintenance appointments for your equipment before each heating and cooling season.
- Check the indoor unit filter each month and replace the filter, if necessary.
- Have your Lennox dealer show you where your indoor unit 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. Disposable filters should be replaced with a filter of the same type and size.
- Check the indoor unit drain line for obstructions monthly. The indoor 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.)
- Check the area around the outdoor unit monthly and remove any obstructions that may restrict airflow to the outdoor unit. This would include grass clippings, leaves, or papers that may have settled around the unit.
- Trim shrubbery away from the unit and periodically check for debris which collects around the unit.
- During the winter months, keep the snow level below the louvered panels.

**NOTE** - The filter and all access panels must be in place any time the unit is in operation. If you are unsure about the filter required for your system, call your Lennox dealer for assistance.

⚠️ 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 the steel and aluminum parts, diminish performance and affect longevity of the unit.

Thermostat Operation

See the thermostat homeowner manual for instructions on how to operate your thermostat.

Pre-Service Check

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

- Verify room thermostat settings are correct.
- Verify that all electrical disconnect switches are ON.
- Check for any blown fuses or tripped circuit breakers.
- Verify unit access panels are in place.
- Verify air filter is clean.

If service is needed, locate and write down the unit model number and have it handy before calling.

Professional Maintenance

**NOTICE !**

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, Lennox recommends use of a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

Your heating and air conditioning system should be inspected and maintained twice each year (before the start of the cooling and heating seasons) by a licensed professional HVAC technician. You can expect the technician to check the following items. These checks may only be conducted by a licensed professional HVAC technician.
Outdoor Unit
1 - Inspect component wiring for loose, worn or damaged connections. Also check for any rubbing or pinching of wires. Confirm proper voltage plus amperage of outdoor unit.
2 - Check the cleanliness of outdoor fan and blade condition (cracks) and clean or replace them, if necessary.
3 - Inspect base pan drains for debris and clean as necessary.
4 - Inspect the condition of refrigerant piping and confirm that pipes are not rubbing copper-to-copper. Also, check the condition of the insulation on the refrigerant lines. Repair, correct, or replace as necessary.
5 - Test capacitor. Replace as necessary.
6 - Inspect contactor contacts for pitting or burn marks. Replace as necessary.
7 - Check outdoor fan motor for worn bearings/bushings. Replace as necessary.
8 - Inspect and clean outdoor coils, if necessary and note any damage to coils or signs of leakage.

Indoor Unit (Air Handler or Furnace)
1 - Inspect component wiring for loose, worn or damaged connections. Confirm proper voltage plus amperage of indoor unit.
2 - Inspect and clean or replace air filters in indoor unit.
3 - Check the cleanliness of indoor blower and clean blower, if necessary.
4 - Inspect the indoor coil drain pans and condensate drains for rust, debris, obstructions, leaks or cracks. Pour water in pans to confirm proper drainage from the pan through to the outlet of the pipe. Clean or replace as necessary.
5 - Inspect and clean indoor coil, if necessary.
6 - Inspect the condition of the refrigerant lines and confirm that pipes are not rubbing copper-to-copper. Also, ensure that refrigerant pipes are not being affected by indoor air contamination. Check condition of insulation on the refrigerant lines. Repair, correct, or replace as necessary.
7 - Inspect the duct system for leaks or other problems. Repair or replace as necessary.
8 - Check for bearing/bushing wear on indoor blower motor. Replace as necessary.
9 - If your heat pump is matched with a gas- or oil-fired furnace for auxiliary heating, indoor unit service will also include inspection and cleaning of the burners, and a full inspection of the gas valve, heat exchanger and flue (exhaust) system.

General System Test with System Operating
1 - Your technician should perform a general system test. He will turn on the air conditioner to check operating functions such as the startup and shutoff operation. He will also check for unusual noises or odors, and measure indoor/outdoor temperatures and system pressures as needed. He will check the refrigerant charge per the charging sticker information on the outdoor unit.
2 - Verify that system total static pressure and airflow settings are within specific operating parameters.
3 - Verify correct temperature drop across indoor coil.
## SL28XCV Start-Up and Performance Checklist

<table>
<thead>
<tr>
<th>Customer</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indoor Unit Model</td>
<td>Serial</td>
</tr>
<tr>
<td>Outdoor Unit Model</td>
<td>Serial</td>
</tr>
<tr>
<td>Notes:</td>
<td></td>
</tr>
</tbody>
</table>

### START UP CHECKS

Refrigerant Type: ________________

<table>
<thead>
<tr>
<th>Input Amps:</th>
<th>Actual Amps</th>
<th>Rated Volts</th>
<th>Actual Volts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Condenser Fan Full Load Amps</td>
<td>Actual Amps:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### COOLING MODE

<table>
<thead>
<tr>
<th>Suction Pressure:</th>
<th>Liquid Pressure:</th>
</tr>
</thead>
</table>

Supply Air **Temperature:** _________  Ambient **Temperature:** _________  Return Air: **Temperature:** _________

System Refrigerant Charge (Refer to manufacturer’s information on unit or installation instructions for required subcooling and approach temperatures.)

<table>
<thead>
<tr>
<th>Subcooling:</th>
<th>A — B = SUBCOOLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturated Condensing Temperature (A)</td>
<td>minus Liquid Line Temperature (B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Approach:</th>
<th>A — B = APPROACH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liquid Line Temperature (A)</td>
<td>minus Outdoor Air Temperature (B)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indoor Coil Temperature Drop (18 to 22°F)</th>
<th>A — B = COIL TEMP DROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Air Temperature (A)</td>
<td>minus Supply Air Temperature (B)</td>
</tr>
</tbody>
</table>