XC21
DAVE LENNOX *SIGNATURE*® COLLECTION
R-410A - Two-Stage Compressor - SilentComfort™ Technology - 60 Hz

RESIDENTIAL
PRODUCT SPECIFICATIONS

DAVE LENNOX *signature*® **COLLECTION**

iComfort®
So simple. So smart. So comfortable.

ENERGY STAR

SEER up to 21.00
2 to 5 Tons
Cooling Capacity - 23,000 to 58,500 Btuh

MODEL NUMBER IDENTIFICATION

X C 21 - 036 - 230 - 5

Refrigerant Type
X = R-410A

Unit Type
C = Air Conditioner

Nominal SEER

Minor Revision Number

Voltage
230 = 208/230V-1ph-60hz

Nominal Cooling Capacity
024 = 2 tons
036 = 3 tons
048 = 4 tons
060 = 5 tons
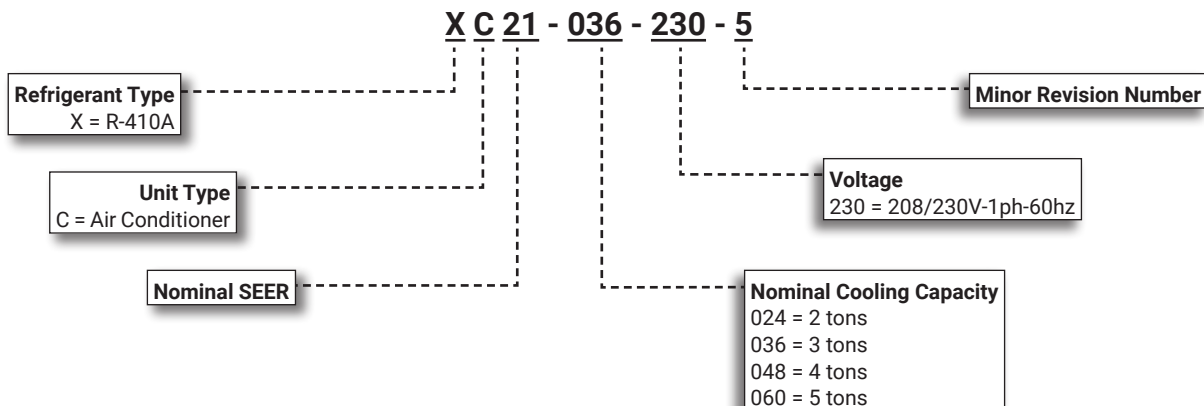
FEATURE HIGHLIGHTS

1. Outdoor Coil Fan with SilentComfort™ Technology
2. Copper Tube/Enhanced Fin Coil
3. Low Pressure Switch
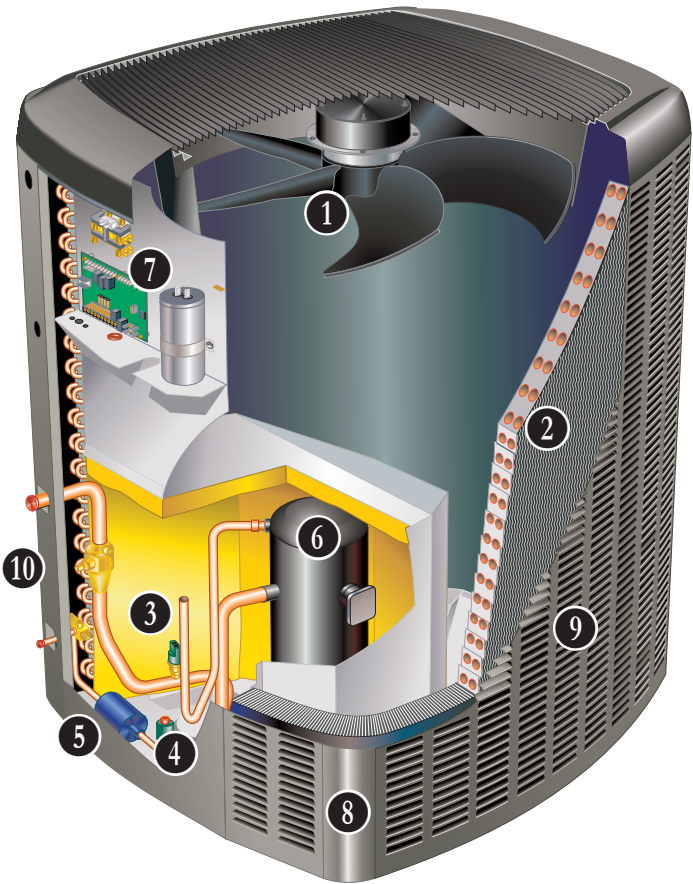4. High Pressure Switch
5. High Capacity Liquid Line Drier
6. Two-Stage Scroll Compressor
7. iComfort® Communicating Control
8. Heavy Gauge Steel Cabinet
9. SmartHinge™ Louvered Coil Protection
10. Refrigerant Line Connections

CONTENTS

APPROVALS AND WARRANTY

APPROVALS
- AHRI Standard 210/240 certified
- AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com
- ENERGY STAR® Certified
- Sound rated to AHRI Standard 270-2008 test conditions
- Tested in Lennox Research Laboratory environmental test room
- Rated According to U.S. Department of Energy (DOE) test procedures
- Region specific models meet the minimum efficiency requirements for U.S DOE Federal Regional Standards in that area
- Unit and components ETL, NEC and CEC bonded for grounding to meet safety standards for servicing
- ETL certified (U.S. and Canada)
- ISO 9001 Registered Manufacturing Quality System

WARRANTY
- Compressor:
  - Limited ten years in residential installations
  - Limited five years in non-residential installations
- All other covered components:
  - Limited ten years in residential installations
  - Limited one year in non-residential installations

NOTE - Refer to Lennox Equipment Limited Warranty certificate included with unit for specific details.

FEATURES

APPLICATIONS
- 2 through 5 ton
- Sound levels as low as 69 dBA
- Single phase power supply
- Applicable to indoor air handlers or gas furnaces with indoor add-on coils
- Factory test operated

REFRIGERATION SYSTEM

R-410A Refrigerant
- Non-chlorine, ozone friendly
- Unit is factory pre-charged

NOTE - Total system refrigerant charge is dependant on outdoor unit size, indoor unit size and refrigerant line length.

NOTE - Refer to the unit-mounted charging sticker to determine correct amount of charge required.

❶ Outdoor Coil Fan with SilentComfort™ Technology
- Specially-designed, SilentComfort™ fan guard uses Passive Vortex Suppression to reduce air noise
- Constructed of corrosion-resistant PVC (polyvinyl chloride) coated steel
- Specially designed fan blades reduce operating sound levels
- Direct drive fan moves large air volumes uniformly through entire condenser coil for high refrigerant cooling capacity
- Vertical air discharge

- Fan motor is inherently protected
- All models have a variable-speed outdoor fan motor for quiet operation.
- Totally enclosed fan motor
- Fan service access accomplished by removal of fan guard

❷ Copper Tube/Enhanced Fin Coil
- Lennox designed and fabricated coil
- Ripple-edged aluminum fins
- Copper tube construction
- Lanced fins for maximum fin surface exposure
- Fin collars grip tubing for maximum contact area
- Flared shoulder tubing connections
- Silver soldering construction
- Factory tested under high pressure
- Entire coil is accessible for cleaning

❸ High Pressure Switch
- Protects the system from high pressure conditions
- Automatic reset

❹ Low Pressure Switch
- Shuts off unit if suction pressure falls below setting
- Provides loss of charge and freeze-up protection
- Automatic reset

FEATURES

REFRIGERATION SYSTEM (continued)

5 Hi-Capacity Liquid Line Drier
- Factory installed in the liquid line, the drier traps moisture or dirt that could contaminate the refrigerant system
- 100% molecular-sieve bead type drier

Optional Accessories

Expansion Valve Kits
- Field installed on certain indoor units
- See TXV Usage table
- Chatleff style fitting

Freezestat
- Senses suction line temperature
- Cycles compressor off when suction line temperature falls below it's setpoint
- Opens at 29°F and closes at 58°F
- Installs on or near the discharge line of the evaporator or on the suction line

Refrigerant Line Kits
- Refrigerant lines are shipped refrigeration clean
- Lines are cleaned, dried, pressurized and sealed at factory
- Suction line fully insulated
- Lines are stubbed at both ends

NOTE - Not available for -060 models. Must be field fabricated.

COMPRESSOR

6 Two-Stage Scroll Compressor
- High volumetric efficiency
- Uniform suction flow
- Constant discharge flow
- Quiet operation

Compressor Operation
- Two involute spiral scrolls matched together generate a series of crescent shaped gas pockets between them
- During compression, one scroll remains stationary while the other scroll orbits around it
- Gas is drawn into the outer pocket, the pocket is sealed as the scroll rotates
- As the spiral movement continues, gas pockets are pushed to the center of the scrolls
- Volume between the pockets is simultaneously reduced
- When the pocket reaches the center, gas is now at high pressure and is forced out of a port located in the center of the fixed scrolls
- During compression, several pockets are compressed simultaneously resulting in a smooth continuous compression cycle

- Continuous flank contact, maintained by centrifugal force, minimizes gas leakage and maximizes efficiency
- Compressor is tolerant to the effects of slugging and contaminants
- If this occurs, scrolls separate, allowing liquid or contaminants to be worked toward the center and discharged
- During the compression process, there are several pockets in the scroll that are compressing gas
- Modulation is achieved by venting a portion of the gas in the first suction pocket back to the low side of the compressor thereby reducing the effective displacement of the compressor
- A 24-volt DC solenoid valve inside the compressor controls staging
- When the 3-way solenoid is energized it moves the lift ring assembly to block the ports and the compressor operates at full-load or 100% capacity
- When the solenoid is de-energized the lift ring assembly moves to unblock the compressor ports and the compressor operates at part-load or approximately 67% of its full-load capacity
- The "loading" and "unloading" of the two stage scroll is done "on the fly" without shutting off the single-speed compressor motor between stages
- Low gas pulses during compression reduces operational sound levels
- Compressor motor is internally protected from excessive current and temperature
- Compressor is installed in the unit on specially formulated, resilient rubber mounts for better sound dampening and vibration free operation
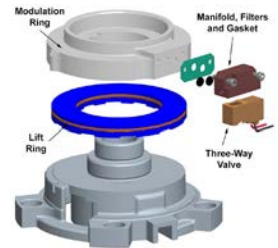
Crankcase Heater
- Crankcase heater prevents migration of liquid refrigerant into compressor and ensures proper compressor lubrication

Optional Accessories

Compressor Hard Start Kit
- A PSC compressor motor does not normally need a potential relay and start capacitor
- In cases of low voltage, kit may be required to increase the compressor starting torque

FEATURES

CONTROLS

7 iComfort® Communicating Control
- Advanced control communicates information about various operating parameters in the air conditioner to to the optional iComfort® Communicating Thermostat to constantly maintain the highest level of comfort, performance and efficiency available

- Auto Configuration - On start-up the control automatically sends a description of the unit to the optional iComfort® Communicating Thermostat to automatically configure the number of stages and features available

Seven-Segment Display
- Seven-segment display shows information about outdoor unit type and capacity and also displays alerts for common fault conditions (electrical and mechanical)
- Control also features:
  - Compressor Anti-Short Cycle Delay
    - User selectable with communicating thermostat - 1, 2, 3, 4 or 5 minutes
    - Default setting is 5 minutes
    - Compressor must operate in first stage a minimum of 5 seconds before second stage operation is permitted
  - Low voltage protection prevents 2nd stage compressor operation when voltage is not within the specified range
  - High and low pressure switch monitoring with provisions for lockout
  - Five-Strike lockout protection protects compressor
  - Discharge line temperature and sensor monitoring
  - Fan cycling operates outdoor fan for 5 minutes when outdoor ambient air temperature is between 15°F and 35°F and the compressor has been off for 25 to 30 minutes to reduce the potential for ice buildup on the fan orifice ring
  - User selectable 5 minutes on or off (default setting)
  - Lennox Humiditrol® Whole Home Dehumidification System (EDA) compatible
  - EEPROM storage of all local configurations

NOTE - Connections for connecting a conventional heating/cooling thermostat are also provided on the control.

Outdoor Air Temperature Sensor
- Used with the iComfort® Communicating Thermostat
- Sensor allows thermostat to display outdoor temperature
- Sensor is auto-detected when connected to thermostat
- Also used for Humiditrol® applications

Optional Accessories

iComfort® S30 Ultra-Smart Wi-Fi Thermostat (part of the iComfort® Residential Communicating Control System)
- Recognizes and connects to all iComfort® Communicating products to automatically configure and control the heating/cooling system (based on user-specified settings) for the highest level of comfort, performance and efficiency

- Recognizes model and serial number information for iComfort® Communicating products to simplify system setup
- Wi-Fi remote temperature monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets
- Smart home automation compatible with Apple HomeKit™, Amazon Alexa®, Google Assistant and IFTTT
- Service alerts and reminders sent via text message or e-mail
- Dealer Dashboard features online real-time monitoring of installed iComfort® Communicating systems
- Simple easy-to-use touchscreen allows complete system configuration
- Scheduled maintenance alerts, system warnings and troubleshooting are also displayed on thermostat screen
- Easy to read 7 inch high definition color display (measured diagonally)
- Installer setup screens allow quick and simple system configuration without a manual, Installer can also run tests on complete system or individual components for easy maintenance and troubleshooting
- Serial communications bus (RSBus), with less wiring than a conventional heating/cooling system, allows system communication
- Uses 4-wire, 18-gauge standard thermostat wiring
- High Definition Color Display with Subbase, Smart Hub Controller, wallplate (for retrofit installations) furnished for easy installation

NOTE - See the iComfort® S30 Thermostat Product Specifications bulletin in the Controls section for more information.

CONTROLS (continued)

Optional Accessories (continued)

Thermostat
- Thermostat is not furnished with unit
- See Lennox Price Book for selection

Blower Relay Kit (for use with furnaces equipped with constant torque blower motors)
- Allows furnace blower speed changes when matched with two-stage air conditioners

Indoor Blower Off Delay Relay
- Delays the indoor blower-off time during the cooling cycle
- Required if outdoor unit is used with a conventional heating-cooling thermostat and furnace or air handler (not iComfort™ control)
- See furnace or air handler specifications to determine if relay is needed

Indoor Blower Speed Relay Kit
- Relay kit provides the option of changing blower speeds on standard permanent split capacitor (PSC) multi-tap blower motors during cooling operation
- Provides optimum humidity control conditions by automatically reducing indoor blower speed during continuous fan operation or low stage compressor operation to reduce humidity levels

Low Ambient Kit
- Air conditioners can operate down to 45°F outdoor air temperature without additional controls
- Allows unit to operate properly down to 30°F

NOTE - A Freezestat should be installed on compressors equipped with a Low Ambient Kit.

NOTE - A Compressor Low Ambient Cut-Off Switch should be added to terminate compressor operation below recommended operation conditions.

CABINET

8 · Heavy-gauge steel construction
- Pre-painted cabinet finish
- Compressor and control box located in a separate compartment, insulated with thick fiberglass insulation
- Compartment provides protection from the weather and keeps sound transmission at a minimum
- Control box is conveniently located with all controls factory wired
- Large removable panel provides service access
- Drainage holes are provided in base section for moisture removal
- High density polyethylene unit support feet raise the unit off of the mounting surface, away from damaging moisture

PermaGuard™ Unit Base
- Durable zinc-coated base section resists rust and corrosion

9 SmartHinge™ Louvered Coil Protection
- Steel louvered panels provides complete coil protection
- Panels are hinged to allow easy cleaning and servicing of coils
- Panels may be completely removed
- Interlocking tabs and slots assure tight fit on cabinet

10 Refrigerant Line Connections, Electrical Inlets and Service Valves
- Sweat connection suction and liquid lines
- Located on corner of unit cabinet
- Suction valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system
- Suction and liquid line service valves and gauge ports are located inside the cabinet
- Refrigerant line connections and field wiring inlets are located in one central area of the cabinet
- See dimension drawing

SPECIFICATIONS

General Data		Model No.	XC21-024	XC21-036	XC21-048	XC21-060
		Nominal Tonnage	2	3	4	5
Connections (sweat)		Liquid line (o.d.) - in.	3/8	3/8	3/8	3/8
		Suction line (o.d.) - in.	7/8	7/8	7/8	1-1/8
Refrigerant		[1] R-410A charge furnished	11 lbs. 12 oz.	12 lbs. 5 oz.	13 lbs. 8 oz.	12 lbs. 8 oz.
Outdoor Coil	Net face area - sq. ft.	Outer coil	27.21	27.21	27.21	27.21
		Inner coil	26.36	26.36	26.36	26.36
		Tube diameter - in.	5/16	5/16	5/16	5/16
		No. of rows	2	2	2	2
		Fins per inch	22	22	22	22
Outdoor Fan		Diameter - in.	26	26	26	26
		No. of blades	5	5	5	5
		Motor hp	1/3	1/3	1/3	1/3
		Cfm - 1st stage	2500	3350	3825	3825
		2nd stage	2900	3845	4230	4230
		Rpm - 1st stage	425	525	600	600
		2nd stage	500	600	675	675
		Watts - 1st stage	50	90	135	135
		2nd stage	75	125	185	185
Shipping Data - lbs. - 1 pkg.			314	331	337	338

ELECTRICAL DATA

	XC21-024	XC21-036	XC21-048	XC21-060
Line voltage data - 60hz	208/230V-1ph	208/230V-1ph	208/230V-1ph	208/230V-1ph
[2] Maximum overcurrent protection (amps)	25	35	45	60
[3] Minimum circuit ampacity	20	21.1	28.5	35.8
Compressor Rated load amps	11.7	15.3	21.2	27.1
Locked rotor amps	58.3	83	104	152.9
Power factor	0.98	0.98	0.98	0.98
Outdoor Fan Motor - Full load amps	2.0	2.0	2.0	2.0

CONTROLS

		XC21-024	XC21-036	XC21-048	XC21-060
iComfort® S30 Ultra-Smart Wi-Fi Thermostat	12U67	•	•	•	•
[4] Discharge Air Temperature Sensor	88K38	•	•	•	•

OPTIONAL ACCESSORIES - ORDER SEPARATELY

		XC21-024	XC21-036	XC21-048	XC21-060
Blower Relay Kit (for constant torque gas furnaces)	85W66	•	•	•	•
Compressor Hard Start Kit - Required in applications with less than 230V	10J42	•	•		
	12J90			•	•
Freezestat 3/8 in. tubing	93G35	•	•	•	•
5/8 in. tubing	50A93	•	•	•	•
Indoor Blower Speed Relay Kit	40K58	•	•	•	•
[5] Low Ambient Kit (Fan Cycling)	68M04	•	•	•	•
Refrigerant Line Sets L15-65-30 L15-65-40 L15-65-50		•	•	•	•
Field Fabricate		•	•	•	•
Indoor Blower Off Delay Relay	58M81	•	•	•	•

NOTE - Extremes of operating range are plus 10% and minus 5% of line voltage.

[1] Refrigerant charge sufficient for 15 ft. length of refrigerant lines.

[2] HACR type breaker or fuse.

[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

[4] Used with the iComfort® Communicating Thermostat for optional service diagnostics.

[5] Freezestat is recommended with Low Ambient Kit.

SOUND DATA

[1] Unit Model	Octave Band Sound Power Levels dBA, re 10^{-12} Watts Center Frequency - HZ							[1] Sound Rating Number (dBA)	[2] Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
024	54.5	61	64	62	60	56	49	69	62	57	51	48	37
036	60	65	66.5	64.5	61.5	56.5	50	71	64	59	53	50	39
048	59.5	66.5	68	67	63	58	52	73	66	61	55	52	41
060	60	65.5	70	68.5	64	57	50.5	73	66	61	55	52	41

NOTE - The octave sound power data does not include tonal correction.

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Estimated sound pressure level at distance based on AHRI Standard 275-2010 method for equipment located on the ground, roof, or on side of building wall with no adjacent reflective surface within 9.8 feet. Sound pressure levels will increase based on changes to assumptions. For other applications, refer to AHRI Standard 275.

FIELD WIRING
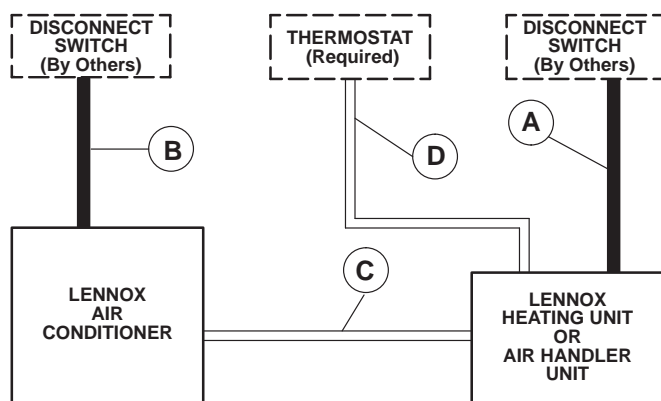
A - Two Wire Power

B - Two Wire Power (see Electrical Data)

C - iComfort® Communicating Thermostat:
- Four Wire, 18AWG (RSBus)

C - Conventional Thermostat:
- Four Wire Low Voltage, 18AWG

D - iComfort® Communicating Thermostat:
- Two Wire, **18AWG** (RSBus) unshielded thermostat cable for low voltage **Smart Hub power terminals** (R, C, + and -)
- Two Wire, **18 to 22AWG** (RSBus) shielded thermostat cable recommended for **Smart Hub communications terminals** (I+, I-, A and B)

D - Conventional Thermostat:
- Six Wire Low Voltage, 18AWG

NOTE - All wiring must conform to NEC or CEC and local electrical codes.

NOTE - Field wiring not furnished.
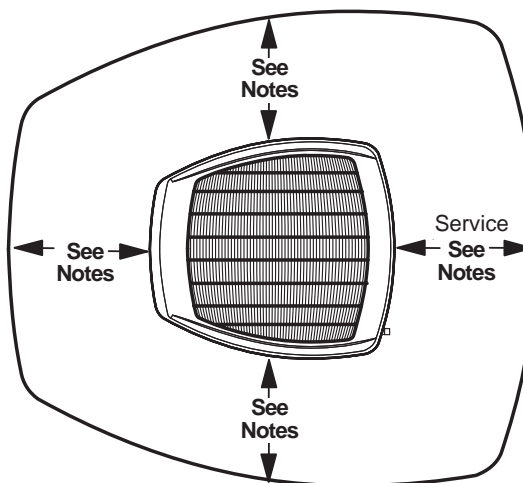
INSTALLATION CLEARANCES

NOTES -
One of these three sides must be 36 in. (914 mm).
One of the two remaining sides may be 12 in. (305 mm).
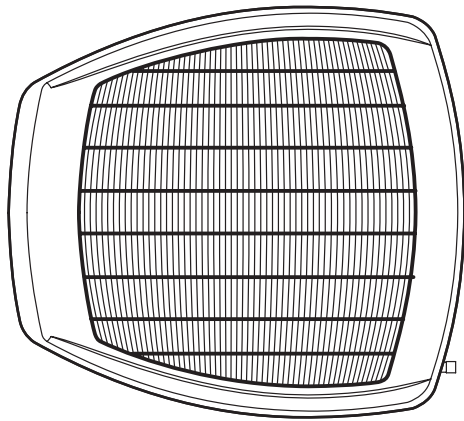The remaining side may be 6 in. (152 mm).

Service Clearance − 30 in. (762 mm)

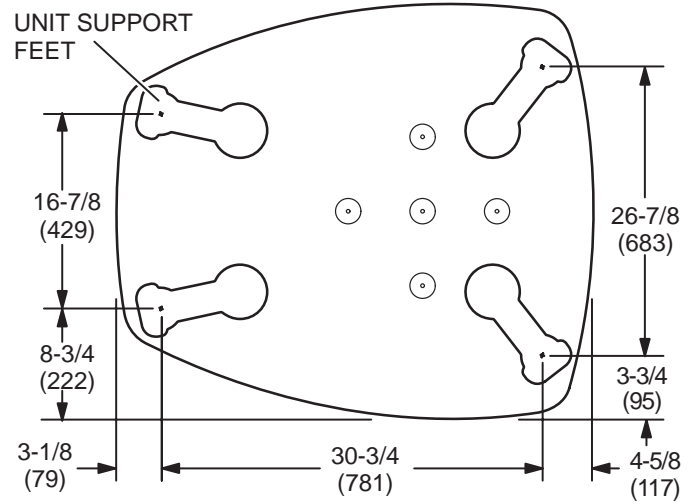48 in. (1219 mm) clearance required on top of unit
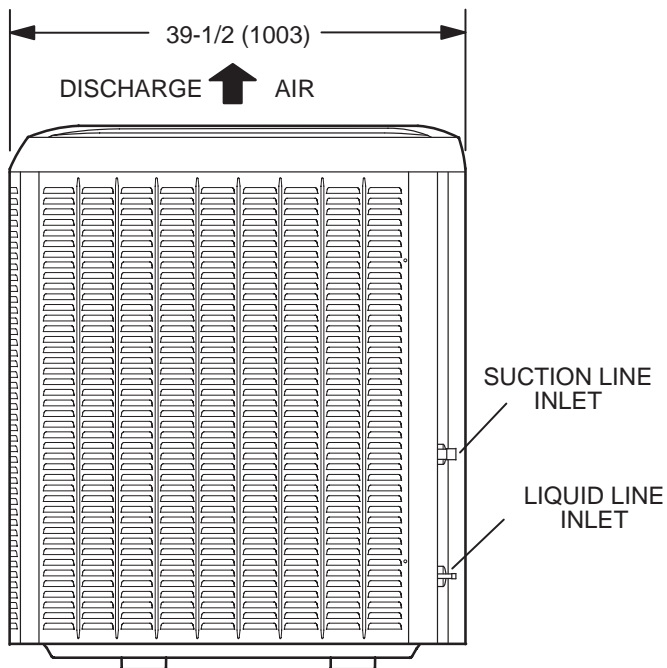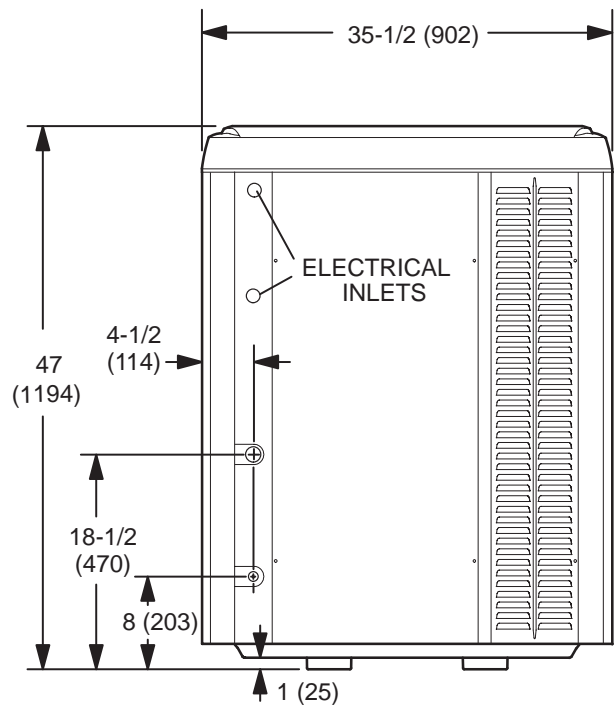24 in. (610 mm) required between two units

DIMENSIONS - UNIT

TOP VIEW

UNIT SUPPORT FEET

16-7/8 (429)

8-3/4 (222)

26-7/8 (683)

3-3/4 (95)

3-1/8 (79)

30-3/4 (781)

4-5/8 (117)

TOP VIEW BASE SECTION
(Large Base)

39-1/2 (1003)

DISCHARGE AIR

SUCTION LINE INLET

LIQUID LINE INLET

SIDE VIEW

35-1/2 (902)

ELECTRICAL INLETS

4-1/2 (114)

47 (1194)

18-1/2 (470)

8 (203)

1 (25)

ACCESS VIEW

TXV USAGE

Use this table for C35, CH23, CH35 and CR33 Field Installed TXV Match-Ups.

Outdoor Unit Model No.	Order No.
XC21-024	**12J18**
XC21-036	**12J19**
XC21-048	**12J20**
XC21-060	**12J20**

CX35 and CHX35 coils and all Lennox air handlers are shipped with a factory installed TXV. In most cases, no change out of the valve is needed.

If a change out is required it will be listed in the "TXV SUBSTITUTIONS" table by size. The correct TXV must be ordered separately and field installed.

C35 and CH35 coils - Replace the factory installed RFC orifice with the expansion valve listed.

CH23 and CR33 - Use the expansion valve listed.

TXV SUBSTITUTION

A general guide for replacing the factory installed TXV if the indoor unit (coil/air handler) is larger than the outdoor unit.

Outdoor Unit		Indoor Unit		TXV Furnished	TXV Replacement
Size	Tons	Size	Tons		
024	2	42	3.5	**12J20**	**12J18**
024	2	48	4	**12J20**	**12J18**

TXV Ranges:

12J18 - 1.5 to 2.5 ton systems - Use on 2.5 ton and lower systems.

12J19 - 3 ton systems - Use down to 2 ton systems.

12J20 - 3.5 to 5 ton systems - Use down to 3 ton systems.

AHRI STANDARD 210/240

Cooling or heating capacities are net values, including the effects of blower motor heat, and do not include supplementary heat. Power input is the total power input to the compressor(s) and fan(s), plus any controls and other items required as part of the system for normal operation.

Units which do not have an indoor air-circulating blower furnished as part of the model, i.e., split system with indoor coil only, is established by subtracting from the total cooling capacity 1250 Btu/h per 1,000 cfm, and by adding the same amount to the heating capacity. Total power input for both heating and cooling is increased by 365 W per 1,000 cfm of indoor air circulated.

AHRI CERTIFIED™
C
www.ahridirectory.org
Unitary Small AC
AHRI Standard 210/240
Certification applies only when the complete system is listed with AHRI.

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