



16ACX

MERIT® Series

R-410A - Two-Stage Compressor - 60 Hz

**RESIDENTIAL
PRODUCT SPECIFICATIONS**

Bulletin No. 210873
May 2020
Supersedes March 2019



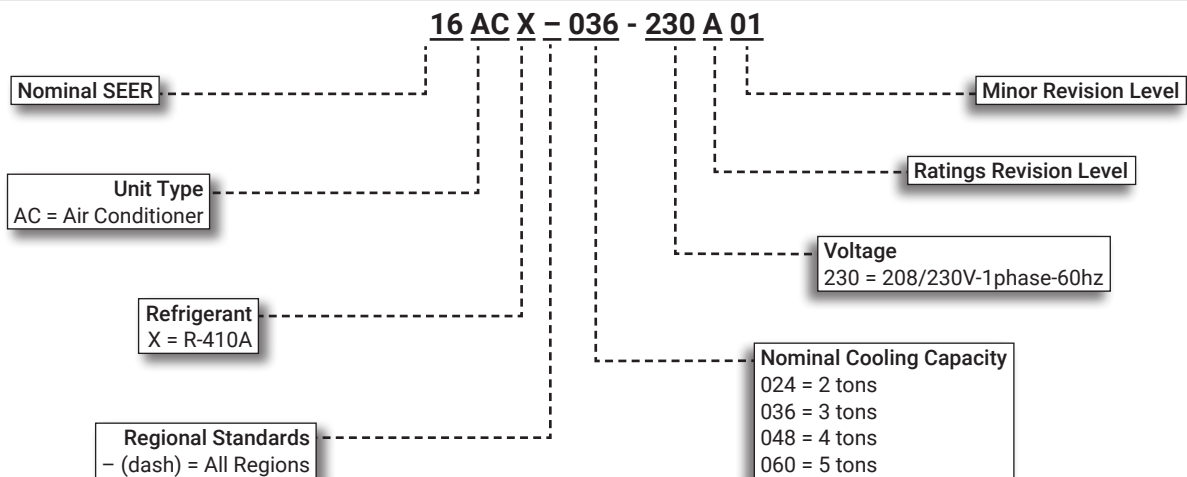
**MERIT®
SERIES**



**SEER up to 18.00
2 to 5 Tons**

Cooling Capacity - 23,000 to 59,000 Btuh

MODEL NUMBER IDENTIFICATION



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APPROVALS AND WARRANTY

APPROVALS

- AHRI Standard 210/240 certified
- AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com
- ENERGY STAR® Certified (certain units)
- 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 five years in residential installations
 - Limited five years in non-residential installations
- All other covered components:
 - Limited five 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 76 dBA
- Single phase power supply
- Applicable to indoor air handlers or gas furnaces with indoor add-on coils
- Shipped completely factory assembled, piped and wired

REFRIGERATION SYSTEM

R-410A Refrigerant

- Non-chlorine, ozone friendly
- Unit is factory pre-charged

Outdoor Coil Fan

- Direct drive fan
- Vertical air discharge

- Sleeve bearings
- Inherently protected
- Totally enclosed fan motor
- Louvered steel top fan guard

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
- Steel louvered panels provide complete coil protection
- Panels can be completely removed for servicing

FEATURES

REFRIGERATION SYSTEM (continued)

High Pressure Switch

- Protects the system from high pressure conditions
- Automatic reset

Low Pressure Switch

- Shuts off unit if suction pressure falls below setting
- Provides loss of charge and freeze-up protection
- Auto-reset

Hi-Capacity Liquid Line Drier

- Furnished for field installation.
- Approved for use with R-410A systems
- Traps any moisture or dirt that could contaminate the system

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 its 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

Two-Stage Scroll Compressor

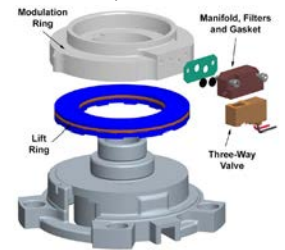
- High volumetric efficiency
- Uniform suction flow
- Constant discharge flow
- Quiet operation

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 (048-060 models only)

- Prevents liquid refrigerant migration into compressor and ensures proper compressor lubrication

FEATURES

COMPRESSOR (continued)

Optional Accessories

Crankcase Heater (Optional for 024-036 models)

- Crankcase heater prevents migration of liquid refrigerant into compressor and ensures proper compressor lubrication.

Compressor Hard Start Kit

- Single-phase units are equipped with a PSC compressor motor. This type of motor normally does not need a potential relay and start capacitor.
- In conditions such as low voltage, kit may be required to increase the compressor starting torque.
- Hard start kit is required in applications where the supply voltage is less than 230V.

Compressor Sound Cover

- A reinforced vinyl compressor cover containing a 1-1/2 inch thick batt of fiberglass insulation.
- All open edges are sealed with a one-inch wide hook and loop fastening tape.

CONTROLS

Optional Accessories

iComfort® M30 Smart Wi-Fi Thermostat

- Wi-Fi-enabled, electronic 7-day, universal, multi-stage, programmable, touchscreen thermostat
- 4 Heat/2 Cool
- Auto-changeover
- Dual-fuel control with optional outdoor sensor
- Controls dehumidification during cooling mode and humidification during heating mode
- Offers enhanced capabilities including humidification / dehumidification / dewpoint measurement and control, Humiditrol® control, and equipment maintenance reminders
- Easy to read 4.3 in. color touchscreen (measured diagonally)
- LCD display with backlight shows the current and set temperature, time, inside relative humidity, system status (operating mode and schedules) and outside temperature (optional outdoor sensor required)
- Smooth Setback Recovery starts system early to achieve setpoint at start of program period
- Compressor short-cycle protection (5 minutes)
- Up to four separate schedules are available plus Schedule IQ™
- One-Touch Away Mode - A quick and easy way to set the cooling and heating setpoints while away
- Smart Away™ - Uses geo-fencing technology to determine when the homeowner is within a predetermined distance from the home to operate the system when leaving, away and arriving



- Wi-Fi remote monitoring and adjustment through a home wireless network for desktop PCs, laptops and apps for smartphones or tablets

- Smart home automation compatible with Amazon Alexa®, Google Assistant and IFTTT

NOTE - See the iComfort® M30 Smart Wi-Fi Thermostat Product Specifications bulletin in the Controls section for more information.

Remote Outdoor Temperature Sensor

- Used with the iComfort® M30 Smart Wi-Fi Thermostat
- Outdoor sensor allows thermostat to display outdoor temperature

NOTE - Sensor is required for the Enhanced Dehumidification Accessory (EDA).



Thermostat

- Thermostat is not furnished with unit
- 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

Indoor Blower Speed Relay

- 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 - Crankcase heater and 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.

FEATURES

CABINET

- Heavy-gauge steel construction
- Pre-painted cabinet finish
- Louvered heavy gauge steel panels surround unit on all four sides
- Control box is conveniently located with all controls factory wired
- Corner patch plate allows access to compressor components
- 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

Refrigerant Line Connections, Electrical Inlets and Service Valves

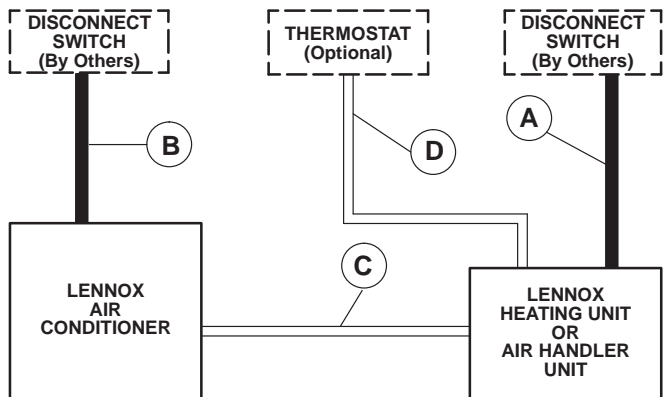
- Sweat connection suction and liquid lines
- Located on corner of unit cabinet
- Suction valve can be fully shut off, while liquid valve may be front seated to manage refrigerant charge while servicing system
- Refrigerant line connections and field wiring inlets are located in one central area of the cabinet
- See dimension drawing

Optional Accessories

Unit Stand-Off Kit

- Black high density polyethylene feet are available to raise unit off of mounting surface away from damaging moisture
- Four feet are furnished per order number

FIELD WIRING



A - Two Wire Power

B - Two Wire Power (See Electrical Data)

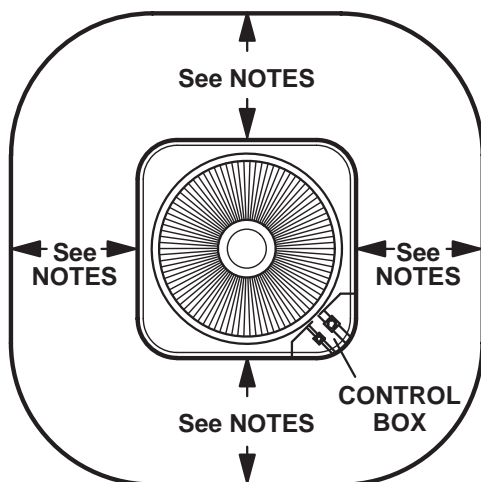
C - Four Wire Low Voltage (18 ga. minimum)

D - Five Wire Low Voltage (18 ga. minimum)

NOTE - Field Wiring Not Furnished

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

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).

A clearance of 24 in. must be maintained between two units. 48 in. (1219 mm) clearance required on top of unit.

SPECIFICATIONS

General Data	Model No.	All Regions Nominal Tonnage	16ACX-024	16ACX-036	16ACX-048	16ACX-060
¹ Sound Rating Number (dB)			77	76	78	75
Connections (sweat)	Liquid line (o.d.) - in.		3/8	3/8	3/8	3/8
	Suction line (o.d.) - in.		3/4	7/8	7/8	1-1/8
Refrigerant	² R-410A charge furnished		7 lbs. 2 oz.	9 lbs. 0 oz.	10 lbs. 6 oz.	13 lbs. 2 oz.
Outdoor Coil	Net face area - sq. ft.		24.50	16.33	21.00	29.09
	Outer coil		- - -	15.76	20.27	28.24
	Inner coil					
Outdoor Fan	Tube diameter - in. and No. of rows		5/16 - 1	5/16 - 2	5/16 - 2	5/16 - 2
	Fins per inch		26	22	22	22
	Diameter - in. and No. of blades		22 - 3	22 - 3	22 - 3	26 - 3
Fan	Motor hp		1/6	1/4	1/4	1/4
	Cfm		3260	3450	3800	4375
	Rpm		825	825	825	825
	Watts		220	290	305	270
Shipping Data - lbs. 1 pkg.			190	190	235	285

ELECTRICAL DATA

Line voltage data - 60hz	⁵ 230V-1ph	⁵ 230V-1ph	⁵ 230V-1ph	⁵ 230V-1ph		
³ Maximum overcurrent protection (amps)	20	30	40	50		
⁴ Minimum circuit ampacity	15.6	20.8	29.2	35.7		
Compressor	Rated load amps		10.2	14.2	17	23.5
	Locked rotor amps		55	78	109	118
	Power factor		0.98	0.95	0.97	0.95
Outdoor Fan Motor	Full load amps		1.0	1.7	1.7	1.4
	Locked Rotor amps		1.9	3.2	3.2	3.2

CONTROLS - ORDER SEPARATELY

iComfort® M30 Smart Wi-Fi Thermostat	15Z69	•	•	•	•
Remote Outdoor Temperature Sensor	X2658	•	•	•	•

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Blower Relay Kit (for constant torque gas furnaces)	85W66	•	•	•	•
Compressor Crankcase Heater	93M04	•	•	Factory	Factory
⁵ Compressor Hard Start Kit - Required in applications with less than 230V	63W22	•			
	10J42		•	•	
	63W24				•
Compressor Low Ambient Cut-Off	45F08	•	•	•	•
Compressor Sound Cover	18J42	•	•	•	•
Compressor Time-Off Control	47J27	•	•	•	•
Freezestat	3/8 in. tubing	93G35	•	•	•
	5/8 in. tubing	50A93	•	•	•
Indoor Blower Off Delay Relay	58M81	•	•	•	•
Indoor Blower Speed Relay Kit	40K58	•	•	•	•
⁶ Low Ambient Kit (Fan Cycling)	34M72	•	•	•	•
Refrigerant Line Sets	L15-41-20	L15-41-40	•		
	L15-41-30	L15-41-50			
	L15-65-30	L15-65-40		•	•
		L15-65-50			
	Field Fabricate				•
Unit Stand-Off Kit	94J45	•	•	•	•

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

¹ Sound Rating Number in accordance with test conditions included in AHRI Standard 270.

² Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the Installation Instructions for information about line set length and additional refrigerant charge required.

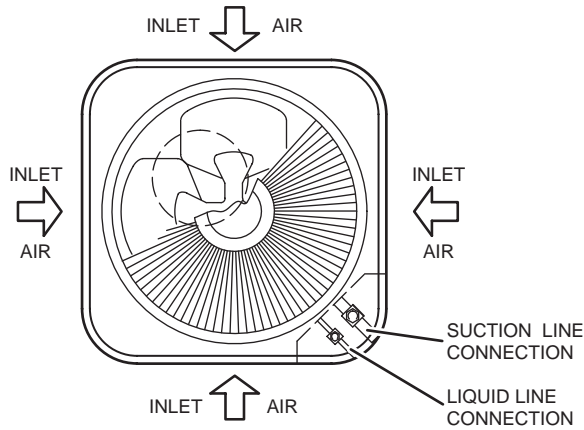
³ HACR type breaker or fuse.

⁴ Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

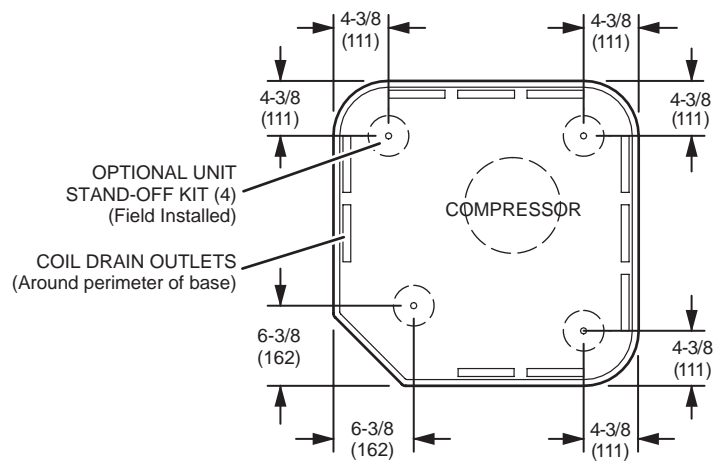
⁵ Hard Start Kit is required in applications where the supply voltage is less than 230V.

⁶ Freezestat is recommended with Low Ambient Kit.

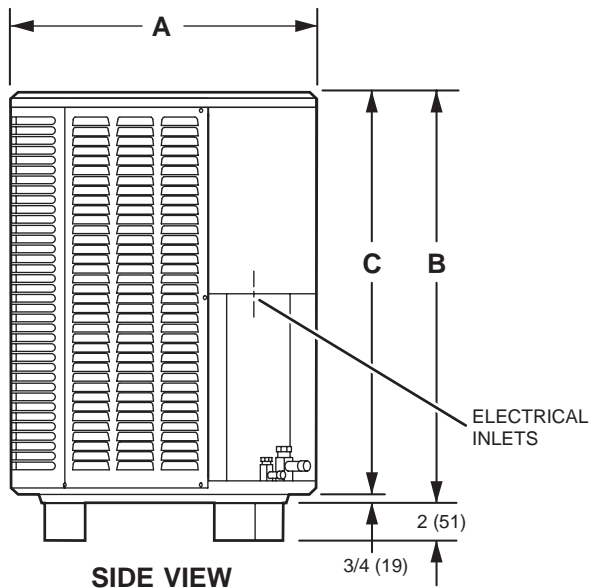
DIMENSIONS - UNIT



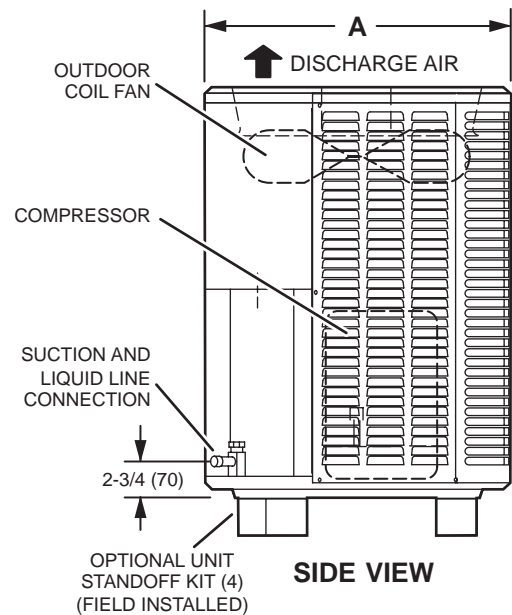
TOP VIEW



TOP VIEW BASE SECTION



SIDE VIEW



SIDE VIEW

Model	A		B		C	
	inches	mm	inches	mm	inches	mm
16ACX-024	28-1/4	718	43-1/4	1099	42-1/4	1073
16ACX-036	28-1/4	718	29-1/4	743	28-1/2	724
16ACX-048	28-1/4	718	37-1/4	946	36-1/2	927
16ACX-060	32-1/4	819	43-1/4	1099	42-1/4	1073

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	54.9	64.3	70.7	74.5	67.3	64.4	57.6	77	70	65	59	56	45
036	58.5	67	70.7	71.1	67.6	64.6	57.7	76	69	64	58	55	44
048	63	66.9	72.5	73.7	70	68.7	60.3	78	71	66	60	57	46
060	60.6	65.7	69.2	64.2	66.6	65.4	56.5	75	68	63	57	54	43

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.

TXV USAGE

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

Outdoor Unit Model No.	Order No.
16ACX-024	12J18
16ACX-036	12J19
16ACX-048	12J20
16ACX-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.

CR33 and CH23 coils - Use the expansion valve listed.

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.

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	TXV
Size	Tons	Size	Tons	Furnished	Replacement
024	2	38	3.5	12J19	12J18
024	2	42	3.5	12J20	12J18
024	2	48	4	12J20	12J18
024	2	49	4	12J20	12J18
030	2.5	38	3.5	12J19	12J18
030	2.5	42	3.5	12J20	12J18
030	2.5	43	3.5	12J20	12J18
030	2.5	44/48	4	12J20	12J18
030	2.5	48	4	12J20	12J18
030	2.5	50/60	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.

REVISIONS

Sections	Description of Change
Most Popular Matches	Section removed.
Optional Accessories	Sound Cover updated.



Visit us at www.lennox.com

For the latest technical information, www.LennoxPros.com

Contact us at 1-800-4-LENNOX

NOTE - Due to Lennox' ongoing commitment to quality, Specifications, Ratings and Dimensions subject to change without notice and without incurring liability. Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury. Installation and service must be performed by a qualified installer and servicing agency.

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