



# ML18XC2

MERIT® Series

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

RESIDENTIAL  
PRODUCT SPECIFICATIONS

Bulletin No. 211009  
January 2023  
Supersedes September 2022



## MERIT® SERIES



SEER2 up to 17.8 / SEER up to 18.0  
2 to 5 Tons  
Cooling Capacity - 22,400 to 59,000 Btuh

### MODEL NUMBER IDENTIFICATION

**ML 18 X C 2 - 036 - 230 A 01**

Product Tier  
ML = Merit® Series

Nominal Efficiency

Refrigerant  
X = R-410A

Unit Type  
C = Air Conditioner

Cooling Stages  
2 = Two-Stage Compressor

Minor Revision Level

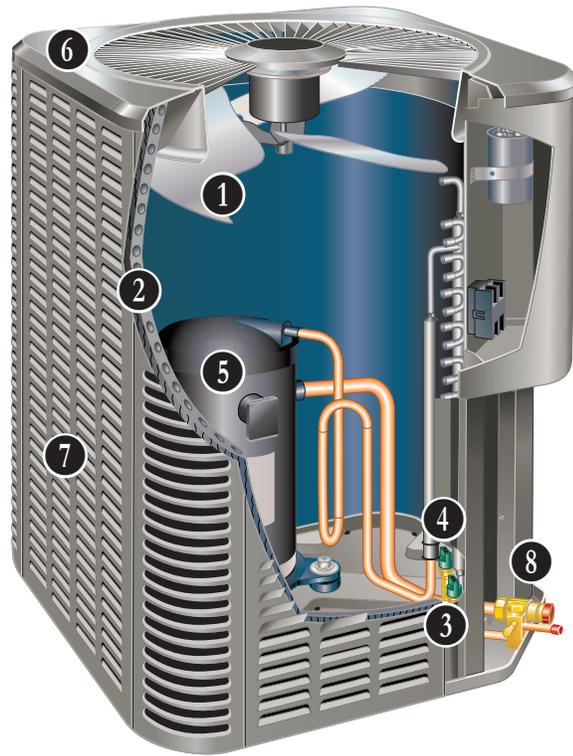
Ratings Revision Level

Voltage  
230 = 208/230V-1phase-60Hz

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

## FEATURE HIGHLIGHTS

1. Outdoor Coil Fan
2. Quantum™ Coil
3. High Pressure Switch
4. Low Pressure Switch
5. Two-Stage Scroll Compressor
6. Heavy Gauge Steel Cabinet
7. Louvered Steel Panels
8. Refrigerant Line Connections and Access



## CONTENTS

Approvals And Warranty . . . . .	3
Dimensions - Unit . . . . .	8
Electrical Data . . . . .	7
Features . . . . .	3
Field Wiring . . . . .	9
Installation Clearances . . . . .	6
Model Number Identification. . . . .	1
Optional Accessories - Order Separately . . . . .	7
Sound Data . . . . .	6
Specifications . . . . .	7
TXV Substitution . . . . .	9
TXV Usage. . . . .	9

## APPROVALS AND WARRANTY

### APPROVALS

- AHRI Standard 210/240-2023 certified
- AHRI Certified system match-ups and expanded ratings, visit [www.LennoxPros.com](http://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 US 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® Basic Limited Warranty at [www.Lennox.com](http://www.Lennox.com) for additional details.

## FEATURES

### APPLICATIONS

- 2 through 5 ton
- Sound levels as low as 75 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

#### 1 Outdoor Coil Fan

- Direct drive fan
- Vertical air discharge
- Sleeve bearings
- Inherently protected
- Totally enclosed fan motor
- ECM motor (060 model)
- Louvered steel top fan guard

#### 2 Quantum™ Coil

- Enhanced aluminum alloy tube/enhanced fin coil
- Superior corrosion resistance
- Lennox designed and fabricated coil
- Ripple-edged aluminum fins
- Aluminum tube construction
- Lanced fins for maximum fin surface exposure
- Fin collars grip tubing for maximum contact area
- Flared shoulder tubing connections
- Factory tested under high pressure
- Entire coil is accessible for cleaning

#### 3 High Pressure Switch

- Protects the system from high pressure conditions
- Automatic reset

#### 4 Low Pressure Switch

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

## FEATURES

### REFRIGERATION SYSTEM (continued)

#### 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

### COMPRESSOR

#### 5 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

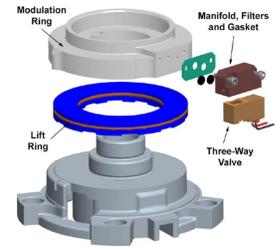


- Modulation is achieved by venting a portion of the gas in the first suction pocket back to the low side of the compressor thereby reducing the effective displacement of the compressor

- 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)

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

#### Optional Accessories

##### Compressor Low Ambient Cut-Off

- Non-adjustable switch (low ambient cut-out)
- Prevents compressor operation when outdoor temperature is below 35°F

##### 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

**NOTE** - 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

##### Crankcase Heater (024-036 models)

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

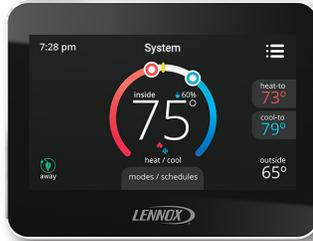
## FEATURES

### CONTROLS

#### Optional Accessories

##### 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
- Service Dashboard features online real-time monitoring of installed Lennox® smart thermostats



##### Remote Outdoor Temperature Sensor

- Used with the Lennox® 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 freestat 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.

**NOTE** - See the Lennox® M30 Smart Wi-Fi Thermostat Product Specifications bulletin for more information.

## FEATURES

### CABINET

- 6 • Heavy-gauge steel construction
- Pre-painted cabinet finish
- 7 • 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

- 8 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

## SOUND DATA

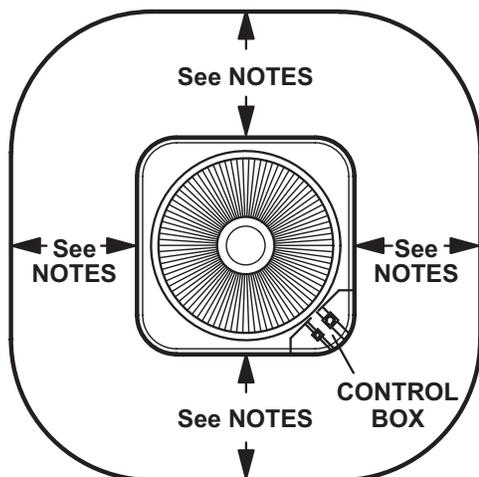
<sup>1</sup> Unit Model	Octave Band Sound Power Levels dBA, re 10 <sup>-12</sup> Watts Center Frequency - HZ							<sup>1</sup> Sound Rating Number (dBA)	<sup>2</sup> Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
024	57.3	64.6	67.9	72.0	69.2	60.7	56.7	75	67	63	57	54	43
036	57.1	63.6	68.9	73.0	63.1	58.6	53.7	76	68	64	58	55	44
048	59.7	66.9	72.4	73.0	68.3	62.1	55.3	77	69	65	59	56	45
060	57.8	64.0	70.4	71.7	66.7	63.1	55.5	76	68	64	58	55	44

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

<sup>1</sup> Tested according to AHRI Standard 270-2008 test conditions.

<sup>2</sup> 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.

## 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	ML18XC2-024	ML18XC2-036	ML18XC2-048	ML18XC2-060
		Nominal Tonnage	2	3	4	5
	Indoor Unit Expansion Valve (TXV) (If needed)		<b>12J18</b>	<b>12J19</b>	<b>12J20</b>	<b>12J20</b>
<b>Connections (sweat)</b>	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
<b>Refrigerant</b>	<sup>1</sup> R-410A charge furnished		7 lbs. 1 oz.	8 lbs. 0 oz.	11 lbs.1 oz.	12 lbs. 0 oz.
<b>Outdoor Coil</b>	Net face area - sq. ft.	Outer coil	16.33	18.67	22.17	29.09
		Inner coil	15.71	17.96	21.23	27.87
	Tube diameter - in. and No. of rows		5/16 - 2	5/16 - 2	5/16 - 2	5/16 - 2
		Fins per inch	22	22	22	22
<b>Outdoor Fan</b>	Diameter - in. and No. of blades		22 - 3	22 - 3	26 - 3	26 - 3
		Motor hp	1/6	1/6	1/4	1/3
	Cfm	3160	3160	4100	3900	
	Rpm	825	825	825	825	
	Watts	190	190	275	190	
	<b>Shipping Data - lbs. 1 pkg.</b>			166	187	231

## ELECTRICAL DATA

<b>Line voltage data - 60 Hz</b>	208/230V-1ph	208/230V-1ph	208/230V-1ph	208/230V-1ph	
<b><sup>1</sup> Maximum Overcurrent Protection (MOCP) amps</b>	25	35	45	50	
<b><sup>1</sup> Minimum circuit ampacity (MCA)</b>	14.6	20.2	26.2	32.2	
<b>Compressor</b>	Rated load amps	10.9	15.4	19.9	23.7
	Locked rotor amps	61	92	127	151
	Power factor	0.97	0.94	0.93	0.92
<b>Outdoor Fan Motor</b>	Full load amps	1	1	1.4	2.6
	Locked Rotor amps	1.9	1.9	3.2	---

## CONTROLS - ORDER SEPARATELY

<b>M30 Smart Wi-Fi Thermostat</b>	<b>15Z69</b>	•	•	•	•
<b>Remote Outdoor Temperature Sensor</b>	<b>X2658</b>	•	•	•	•

## OPTIONAL ACCESSORIES - ORDER SEPARATELY

<b>Blower Relay Kit</b> (for constant torque gas furnaces)	<b>85W66</b>	•	•	•	•
<b>Compressor Crankcase Heater</b>	<b>93M04</b>	•	•		
<b>Compressor Hard Start Kit</b> Required if voltage is less than 230V	<b>10J42</b> <b>12J90</b>	•	•	•	•
<b>Compressor Low Ambient Cut-Off</b>	<b>45F08</b>	•	•	•	•
<b>Compressor Sound Cover</b>	<b>18J42</b>	•	•	•	•
<b>Compressor Time-Off Control</b>	<b>47J27</b>	•	•	•	•
<b>Freezestat</b>	3/8 in. tubing	<b>93G35</b>	•	•	•
	5/8 in. tubing	<b>50A93</b>	•	•	•
<b>Indoor Blower Off Delay Relay</b>	<b>58M81</b>	•	•	•	•
<b>Indoor Blower Speed Relay Kit</b>	<b>40K58</b>	•	•	•	•
<b><sup>4</sup> Low Ambient Kit (Fan Cycling)</b>	<b>34M72</b>	•	•	•	•
<b>Refrigerant Line Sets</b> (Liq. x Suc. OD x Insulation Thickness - Length)	3/8 x 3/4 x 3/8 - 20 ft.	<b>89J56</b>			
	3/8 x 3/4 x 3/8 - 30 ft.	<b>89J57</b>			
	3/8 x 3/4 x 3/8 - 40 ft.	<b>89J58</b>	•		
	3/8 x 3/4 x 3/8 - 50 ft.	<b>89J59</b>			
	3/8 x 7/8 x 3/8 - 30 ft.	<b>89J60</b>			
	3/8 x 7/8 x 3/8 - 40 ft.	<b>89J61</b>		•	
	3/8 x 7/8 x 3/8 - 50 ft.	<b>89J62</b>		•	
	3/8 x 1-1/8 x 3/8 - 30 ft.	<b>X0570</b>			•
	3/8 x 1-1/8 x 3/8 - 50 ft.	<b>73P91</b>			•
<b>Unit Stand-Off Kit</b>	<b>94J45</b>	•	•	•	•

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

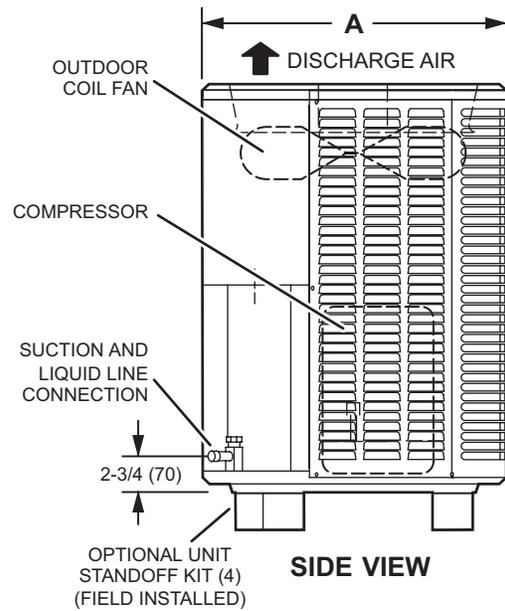
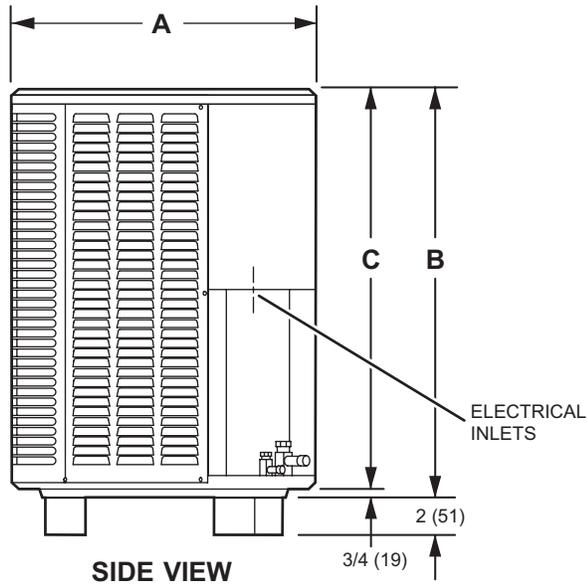
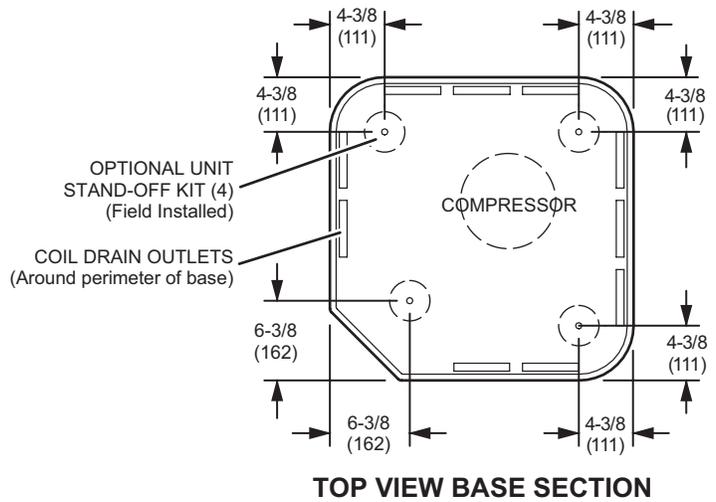
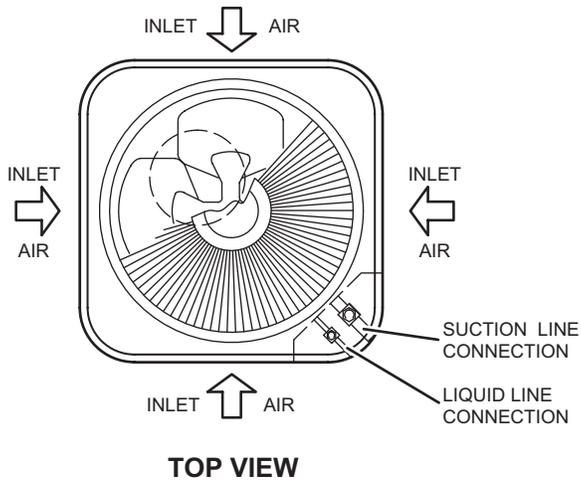
<sup>1</sup> Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the Installation Instructions for information about line set length and additional refrigerant charge required.

<sup>2</sup> HACR type breaker or fuse.

<sup>3</sup> Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

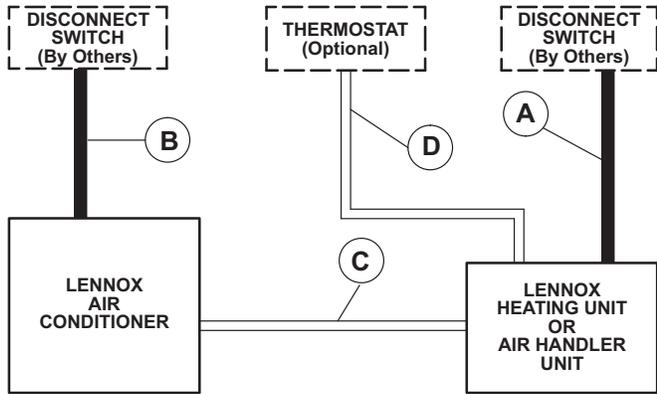
<sup>4</sup> Freezestat is recommended with Low Ambient Kit

# DIMENSIONS - UNIT



Model	A		B		C	
	inches	mm	inches	mm	inches	mm
ML18XC2-024	28-1/4	718	29-1/4	743	28-1/4	718
ML18XC2-036	28-1/4	718	33-3/4	857	33	838
ML18XC2-048	32-1/4	718	33-3/4	857	33	838
ML18XC2-060	32-1/4	819	43-1/4	1099	42-1/4	1073

## 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.*

## TXV USAGE

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

Outdoor Unit	Order Number
ML18XC2-024	12J18
ML18XC2-036	12J19
ML18XC2-048	12J20
ML18XC2-060	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 coils - Replace the factory installed RFC orifice with the expansion valve listed.

CR33 and CH23 coils - 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 or smaller 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
024	2	49	4	12J20	12J18
024	2	50/60	5	12J20	12J18
024	2	51/61	5	12J20	12J18
024	2	60	5	12J20	12J18
036	3	24	2	12J18	12J19
036	3	30	2.5	12J18	12J19
048	4	30/36	2.5/3	12J19	12J20
048	4	36	3	12J19	12J20

### TXV Ranges:

**12J18** - 1.5 to 2.5 ton systems - Use on 2.5 ton (030) and lower systems.

**12J19** - 3 ton systems - Use down to 2 ton (024) systems.

**12J20** - 3.5 to 5 ton systems - Use down to 3 ton (036) systems.

## AHRI STANDARD 210/240-2023

Standard Ratings relating to cooling or heating capacities shall be net values, including the effects of circulating-fan heat, but not including supplementary electric heat. Power input used for calculating efficiency shall be the Total Power.

Standard Ratings of units which do not have indoor air-circulating fans furnished as part of the model, i.e., Coil-only System, shall be established by subtracting from the total cooling capacity 1,505 Btu/h per 1,000 SCFM, and by adding the same amount to the heating capacity for non-mobile-home, non-Space Constrained units. Total Power for both heating and cooling shall be increased by 441 W per 1,000 SCFM of indoor air circulated.

## REVISIONS

Sections	Description of Change
Optional Accessories	Updated Line Sets available.



Visit us at [www.Lennox.com](http://www.Lennox.com)

For the latest technical information, [www.LennoxPros.com](http://www.LennoxPros.com)

Contact us at 1-800-9-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.

©2022 Lennox Industries, Inc.