

HEAT PUMP OUTDOOR UNITS

ML14XP1

MERIT® Series

Single-Phase - R-410A - 60Hz



RESIDENTIAL
PRODUCT SPECIFICATIONS

Bulletin No. 210761
June 2020
Supersedes January 2020



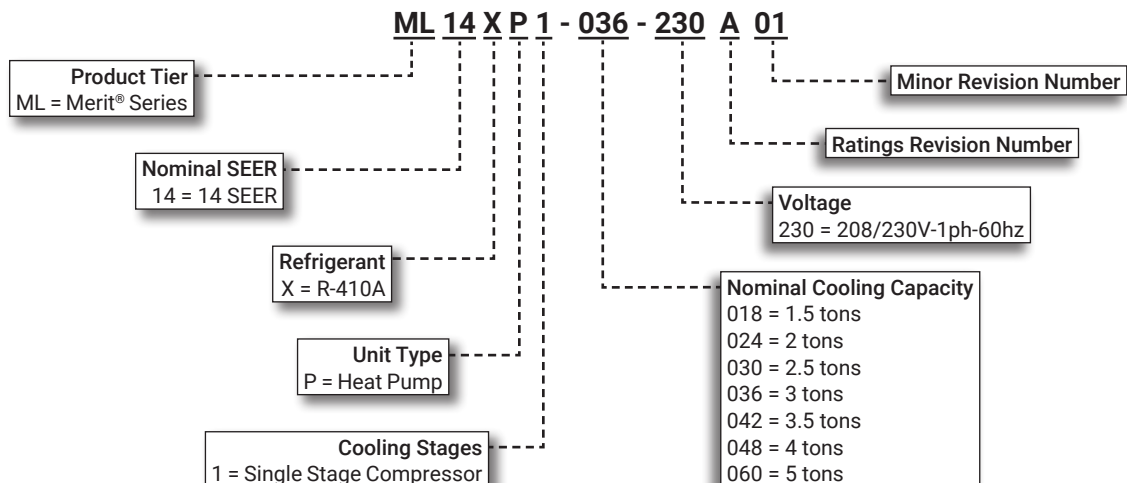
MERIT®
SERIES



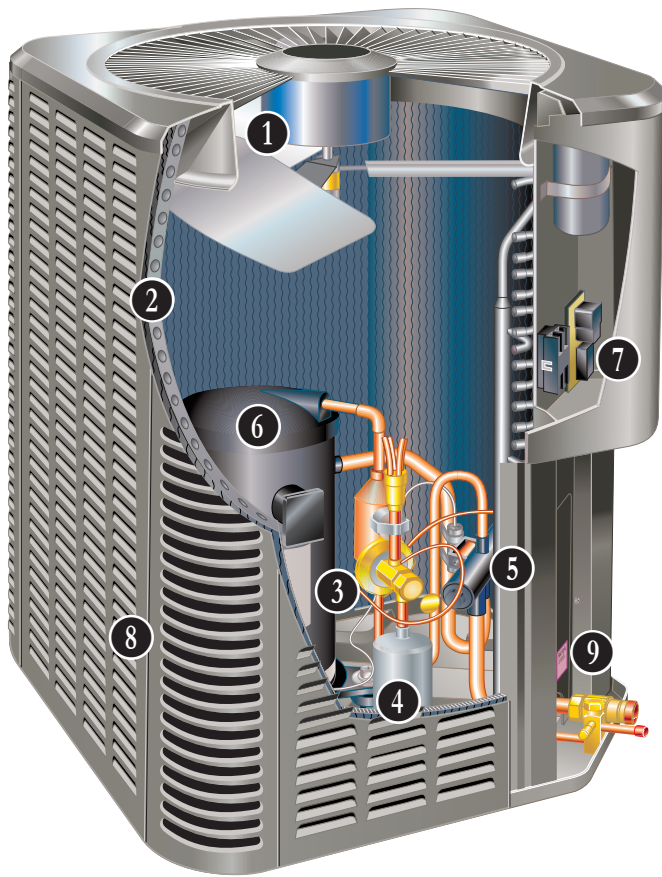
SEER up to 16.00
HSPF up to 9.00
1.5 to 5 Tons

Cooling Capacity - 18,000 to 59,000 Btuh
Heating Capacity - 16,600 to 60,000 Btuh

MODEL NUMBER IDENTIFICATION



FEATURE HIGHLIGHTS



1. Outdoor Coil Fan
2. Quantum™ Coil
3. Expansion Valve - Outdoor Unit
4. High Capacity Liquid Line Drier
5. Four-Way Reversing Valve
6. Scroll Compressor
7. Defrost Control
8. Heavy Gauge Steel Cabinet
9. Refrigerant Line Access

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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
- 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
- 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/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

- 1.5 through 5 tons
- Single phase power supply
- Sound levels low as 76 dBA
- Vertical air discharge
- Applicable to indoor air handlers or gas furnaces with indoor add-on coils
- Shipped completely factory assembled, piped and wired

NOTE - When heat pumps are used with gas furnaces, a dual-fuel compatible thermostat or zone control system with dual-fuel capabilities must be used (order separately).

NOTE - Installer must set outdoor unit, connect refrigerant lines and make electrical connections to complete job.

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.

1 Outdoor Coil Fan

- Direct drive fan
- Vertical air discharge
- Louvered steel top fan guard
- Totally enclosed fan motor
- Ball bearings
- Inherently protected

2 Quantum™ Coil

- Lennox designed and fabricated coil
- Enhanced aluminum alloy tube/enhanced fin coil
- Superior corrosion resistance
- 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 Expansion Valve - Outdoor Unit

- Designed and sized for heat pump systems
- Sensing bulb senses evaporator suction temperature during heating cycle

High Pressure Switch

- Protects the system from high pressure conditions
- Automatic reset

FEATURES

REFRIGERATION SYSTEM (continued)

Low Pressure Switch

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

4 High Capacity Liquid Line Drier

- Factory installed in the liquid line
- Drier traps moisture or dirt
- 100% molecular-sieve, bead type, bi-flow drier

5 Four-Way Reversing Valve

- Rapid changeover of refrigerant flow direction from cooling to heating and vice versa
- Operates on pressure differential between outdoor unit and indoor coil
- Factory installed

Optional Accessories

Check/Expansion Valve Kits

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

Loss of Charge Switch Kit

- Protects compressor from damage from low refrigerant charge conditions
- SPST
- Normally-closed
- Automatic reset

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

6 Scroll Compressor

- High efficiency with uniform suction flow
- Constant discharge flow, high volumetric efficiency and quiet operation
- Low gas pulses during compression reduces operational sound levels
- Compressor motor is internally protected from excessive current and temperature
- Muffler in discharge line reduces operating sound levels
- Compressor is installed in the unit on resilient rubber mounts for vibration free operation



Scroll 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

Compressor Crankcase Heater (Factory installed on -036-042-048-060 models)

- Protects against refrigerant migration that can occur during low ambient operation

Optional Accessories

Compressor Crankcase Heater (Optional for -018-024-030 models)

- Protects against refrigerant migration that can occur during low ambient operation.

Compressor Sound Cover

- Reinforced vinyl compressor cover
- 1-1/2 inch thick batt of fiberglass insulation
- Hook and loop fastening tape on all open edges

FEATURES

CONTROLS

7 Defrost Control

- Time/temperature defrost control
- Defrost cycle every 30, 60 or 90 minutes of compressor "on" time at outdoor coil temperatures below 42°F
- Factory setting - 90 minutes
- Anti-short cycle, timed-off control - 5 minutes
- Compressor delay - 30 seconds (field selectable) cycles the compressor in and out of defrost mode
- High and low pressure switch monitoring (five-trip lockout)
- Two diagnostic LEDs furnished for troubleshooting
- Conveniently located in control box

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 Thermostat
- Outdoor sensor allows thermostat to display outdoor temperature

NOTE - Sensor is required for high and low balance points option.

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



Thermostat

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

Compressor Low Ambient Cut-Off

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

Freezestat

- Senses suction line temperature
- Cycles the compressor off if suction line temperature falls below setpoint
- Opens at 29°F and closes at 58°F

Compressor Hard Start Kit

- Single-phase units are equipped with a PSC compressor motor. This type of motor normally doesn't need a potential relay and start capacitor
- In conditions such as low voltage, this kit may be required to increase the compressor starting torque

Indoor Blower Off Delay Relay Kit

- Delays the indoor blower-off time during the cooling cycle

Low Ambient Kit

- Heat pump can operate in the cooling mode down to 45°F outdoor air temperature without additional controls
- Allows unit to operate properly down to 30°F in the cooling mode

NOTE - Crankcase heater and freezestat should be installed on compressors equipped with a low ambient kit.

NOTE - A compressor lock-out thermostat should be added to terminate compressor operation below recommended operation conditions.

Mild Weather Kit

- Units can operate in the heating mode at outdoor air temperatures up to 75°F
- Field installed kit allows heating operation above 75°F

FEATURES

CONTROLS (continued)

Monitor Kit - Service Light

- Ambient compensating thermistor
- Service light thermostat
- For thermostats requiring indicator light inputs

Outdoor Thermostat Kit

- Outdoor thermostat locks out some of the electric heating elements on indoor units where two-stage control is applicable
- Outdoor thermostat maintains the heating load on low power input as long as possible before allowing the full power load to come on the line
- Thermostat Kit and Mounting Box must be ordered separately

8 CABINET

- Heavy gauge steel cabinet
- Five station metal wash process
- Louvered heavy gauge steel panels
- Powder paint finish for superior rust and corrosion protection
- Control box conveniently located with all controls factory wired
- Corner patch plate allows compressor access
- Drainage holes provided in base section

PermaGuard™ Unit Base

- Durable zinc-coated base section resists rust and corrosion

9 Refrigerant Line Connections, Electrical Inlets, Service Valves

- Sweat connection vapor and liquid lines
- Located on corner of unit cabinet
- Fully serviceable brass service valves
- Vapor 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 cabinet for easy access
- See dimension drawing

Optional Accessories

Unit Stand-Off Kit

- Black high density polyethylene feet
- Raises unit off mounting surface
- Four feet furnished per order number

SPECIFICATIONS

General Data		Model No.	ML14XP1-018-230	ML14XP1-024-230	ML14XP1-030-230	ML14XP1-036-230
	Nominal Tonnage		1.5	2	2.5	3
¹	Sound Rating Number		76	76	76	76
Connections (sweat)	Liquid line o.d. - in.		3/8	3/8	3/8	3/8
	Vapor line o.d. - in.		3/4	3/4	3/4	7/8
²	Refrigerant	R-410A charge furnished	6 lbs. 10 oz.	6 lbs. 2 oz.	6 lbs. 9 oz.	8 lbs. 8 oz.
Outdoor Coil	Net face area - sq. ft.	Outer coil	24.5	24.5	24.5	21.0
		Inner coil	- - -	- - -	- - -	20.3
		Tube diameter - in.	5/16	5/16	5/16	5/16
		No. of rows	1	1	1	2
		Fins per inch	22	22	22	22
Outdoor Fan		Diameter - in.	22	22	22	22
		No. of Blades	3	3	3	3
		Motor hp	1/6	1/6	1/6	1/6
		Cfm	2670	2670	2890	2870
		Rpm	867	867	847	839
		Watts	160	160	200	205
		Shipping Data - lbs. 1 package		213	213	213

ELECTRICAL DATA

Line voltage data - 60 hz - 1ph		208/230V	208/230V	208/230V	208/230V
³ Maximum overcurrent protection (amps)		20	20	25	30
⁴ Minimum circuit ampacity		12.2	13.6	17.0	18.6
Compressor	Rated Load Amps	9.0	10.1	12.8	14.1
	Locked Rotor Amps	48	52	67.8	72.2
	Power Factor	0.98	0.98	0.96	0.99
Outdoor Fan Motor	Full Load Amps	1.0	1.0	1.0	1.0
	Locked Rotor Amps	1.9	1.9	1.9	1.9

CONTROLS - ORDER SEPARATELY

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

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Compressor Crankcase Heater	93M04	•	•	•	
	Factory				•
Compressor Hard Start Kit	Copeland 10J42				•
	LG 88M91	•	•	•	
Compressor Sound Cover	18J42	•	•	•	•
Compressor Low Ambient Cut-Off	45F08	•	•	•	•
Freezestat	3/8 in. tubing 93G35	•	•	•	•
	5/8 in. tubing 50A93	•	•	•	•
Indoor Blower Off Delay Relay	58M81	•	•	•	•
Loss of Charge Kit	84M23	•	•	•	•
⁵ Low Ambient Kit	54M89	•	•	•	•
Mild Weather Kit	11B97	•	•	•	•
Monitor Kit - Service Light	76F53	•	•	•	•
Outdoor Thermostat Kit	Thermostat 10Z23	•			•
	Mounting Box 31461	•			•
Refrigerant Line Sets	L15-41-20 L15-41-40	•	•	•	
	L15-41-30 L15-41-50				
	L15-65-30 L15-65-40				•
	L15-65-50				
Unit Stand-Off Kit	94J45	•	•	•	•

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

¹ Sound Rating Number rated 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 circuit breaker or fuse.

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

⁵ Crankcase Heater and Freezestat are recommended with Low Ambient Kit.

SPECIFICATIONS

General Data		Model No.	ML14XP1-042-230	ML14XP1-048-230	ML14XP1-060-230
		Nominal Tonnage	3.5	4	5
¹ Sound Rating Number			79	80	80
Connections (sweat)	Liquid line o.d. - in.		3/8	3/8	3/8
	Vapor line o.d. - in.		7/8	7/8	1-1/8
² Refrigerant		R-410A charge furnished	9 lbs. 3 oz.	9 lbs. 15 oz.	11 lbs. 4 oz.
Outdoor Coil	Net face area - sq. ft.	Outer coil	24.93	24.93	29.09
		Inner coil	24.13	24.13	28.16
	Tube diameter - in.	5/16	5/16	5/16	
	No. of rows	2	2	2	
	Fins per inch	22	22	22	
Outdoor Fan	Diameter - in.		22	22	22
	No. of Blades		4	4	4
	Motor hp		1/3	1/3	1/3
	Cfm		4347	4347	4500
	Rpm		843	843	830
Watts		299	299	307	
Shipping Data - lbs. 1 package			272	273	295

ELECTRICAL DATA

Line voltage data - 60 hz - 1ph		208/230V	208/230V	208/230V
³ Maximum overcurrent protection (amps)		45	45	50
⁴ Minimum circuit ampacity		25.8	26.2	29.6
Compressor	Rated Load Amps	19.2	19.6	22.2
	Locked Rotor Amps	123.9	130	127.9
	Power Factor	0.99	0.99	0.99
Outdoor Fan Motor	Full Load Amps	1.8	1.8	1.8
	Locked Rotor Amps	2.9	2.9	2.9

CONTROLS - ORDER SEPARATELY

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

OPTIONAL ACCESSORIES - ORDER SEPARATELY

Compressor Hard Start Kit	Copeland	10J42	•	•	
	LG	88M91			•
Compressor Low Ambient Cut-Off		45F08	•	•	•
Compressor Sound Cover		18J42	•	•	•
Freezestat	3/8 in. tubing	93G35	•	•	•
	5/8 in. tubing	50A93	•	•	•
Indoor Blower Off Delay Relay		58M81	•	•	•
Loss of Charge Kit		84M23	•	•	•
⁵ Low Ambient Kit		54M89	•	•	•
Mild Weather Kit		11B97	•	•	•
Monitor Kit - Service Light		76F53	•	•	•
Outdoor Thermostat Kit	Thermostat	10Z23	•	•	•
	Mounting Box	31461	•	•	•
Refrigerant Line Sets	L15-65-30	L15-65-40 L15-65-50	•	•	•
Unit Stand-Off Kit		94J45	•	•	•

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

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

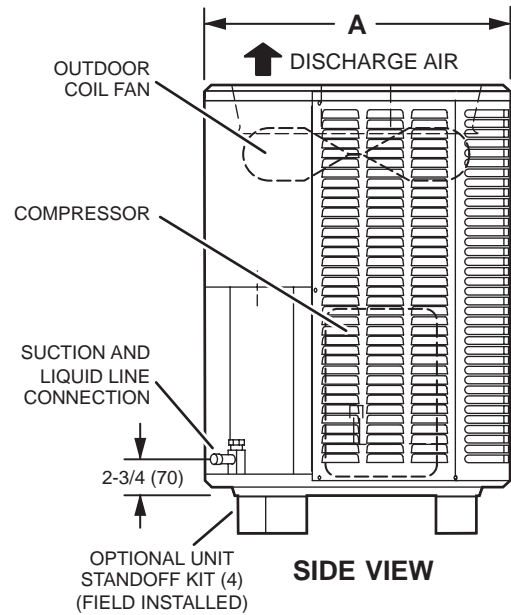
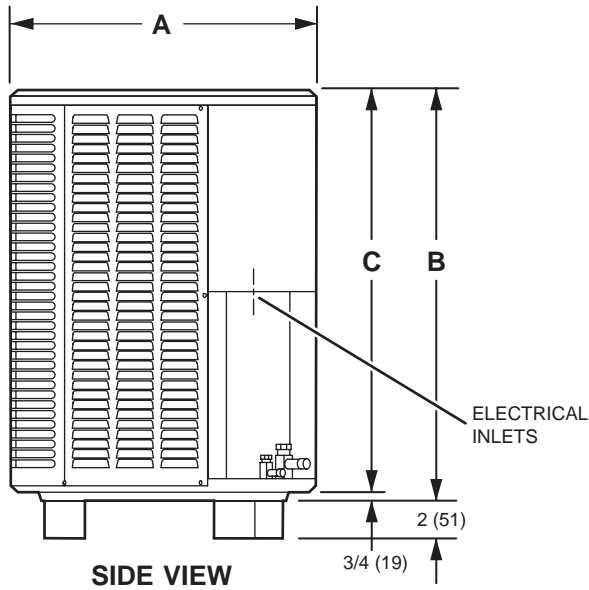
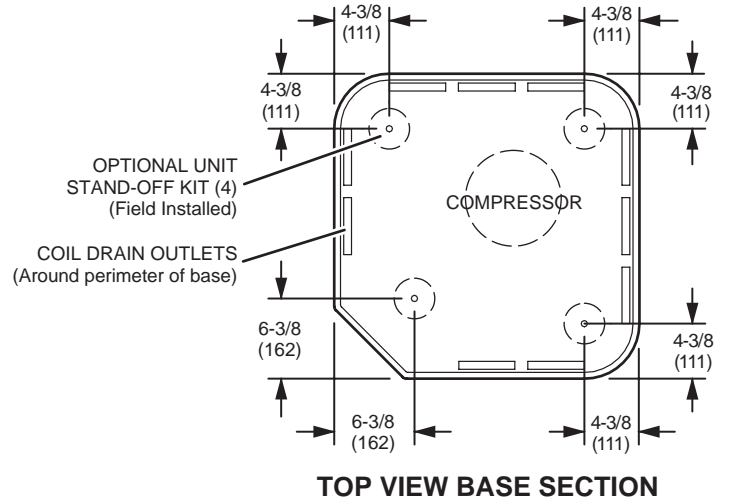
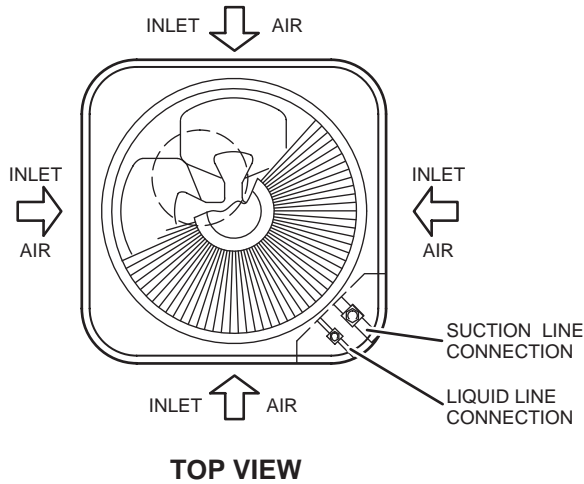
² Refrigerant charge sufficient for 15 ft. length of refrigerant lines.

³ HACR type circuit breaker or fuse.

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

⁵ Crankcase Heater and Freezestat are recommended with Low Ambient Kit.

DIMENSIONS



Model No.	A		B		C	
	inches	mm	inches	mm	inches	mm
ML14XP1-018-230	28-1/4	718	43-1/4	1099	42-1/2	1080
ML14XP1-024-230	28-1/4	718	43-1/4	1099	42-1/2	1080
ML14XP1-030-230	28-1/4	718	43-1/4	1099	42-1/2	1080
ML14XP1-036-230	28-1/4	718	37-1/4	946	36-1/2	927
ML14XP1-042-230	32-1/4	819	37-1/4	946	36-1/2	927
ML14XP1-048-230	32-1/4	819	37-1/4	946	36-1/2	927
ML14XP1-060-230	32-1/4	819	43-1/4	1099	42-1/2	1080

SOUND DATA

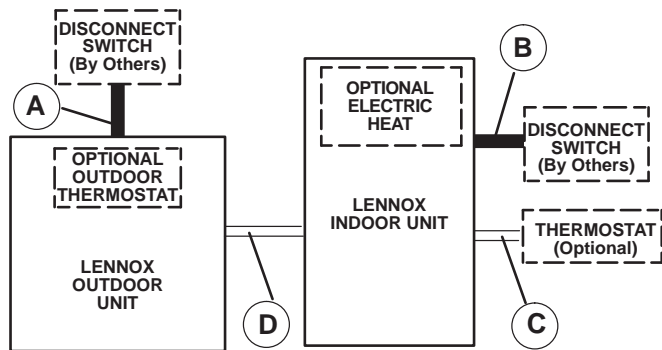
¹ Unit Model	Octave Band Sound Power Levels dBA, re 10 ⁻¹² Watts Center Frequency - HZ							¹ Sound Rating Number (dBA)	² Estimated Sound Pressure Level at Distance From Unit (dBA at distance in ft.)				
	125	250	500	1000	2000	4000	8000		3	5	10	15	50
018	59.5	65	71	70.5	67	63	58.5	76	69	64	58	55	44
024	55	65	73.5	70	66.5	63	57	76	69	64	58	55	44
030	55.5	64.5	71	69.5	66.5	63	56.5	76	69	64	58	55	44
036	55.5	66	70.5	70.5	66.5	61.5	56	76	69	64	58	55	44
042	63	70.5	74.5	73	70	64	56	79	72	67	61	58	47
048	64	72.5	75.5	73	69.5	63.5	56	80	73	68	62	59	48
060	61.5	69	73.5	73.5	70.5	67	62	80	73	68	62	59	48

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 (see Electrical Data)

B - Two or Three Wire Power (size to heater capacity)

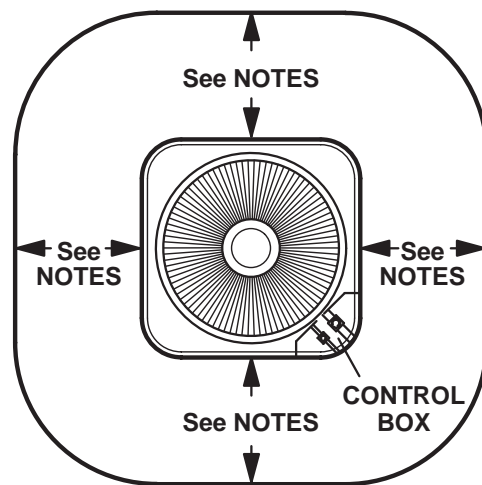
C - Twelve Wire Low Voltage 18 ga. minimum
Fourteen Wire Low Voltage with Optional Outdoor Thermostat

D - Eight Wire Low Voltage 18 ga. minimum
Ten Wire Low Voltage with Optional Outdoor Thermostat

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.

TXV USAGE

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

Model No.	Order No.
ML14XP1-018-230	12J18
ML14XP1-024-230	12J18
ML14XP1-030-230	12J18
ML14XP1-036-230	12J19
ML14XP1-042-230	12J20
ML14XP1-048-230	12J20
ML14XP1-060-230	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.

MOST POPULAR MATCHES

Outdoor Unit Model No.	Indoor Unit Model No
ML14XP1-018-230	CBA25UH-018
ML14XP1-024-230	CBA25UH-024
ML14XP1-030-230	CBA25UH-030
ML14XP1-036-230	CBA25UH-036
ML14XP1-042-230	CBA25UH-042
ML14XP1-048-230	CBA25UH-048
ML14XP1-060-230	CBA25UH-060

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	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.

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.

REVISIONS

Sections	Description of Change
Optional Accessories	Updated optional Compressor Sound Cover.



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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