HEAT PUMP OUTDOOR UNITS



ML16XP1

Merit® Series R-410A - 60 Hz

> Bulletin No. 210881 November 2020 Supersedes June 2020

RESIDENTIAL PRODUCT SPECIFICATIONS





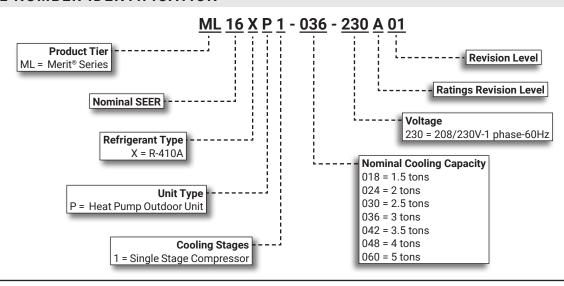




SEER up to 17.00 HSPF up to 9.80 1.5 to 5 Tons

Cooling Capacity - 18,000 to 58,500 Btuh Heating Capacity - 16,900 to 56,000 Btuh

MODEL NUMBER IDENTIFICATION



FEATURE HIGHLIGHTS



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

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APPROVALS AND WARRANTY

APPROVALS

- AHRI Certified to AHRI Standard 210/240
- · For 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 the Lennox Research Laboratory environmental test room
- Rated according to U.S. Department of Energy (DOE) test procedures
- · Units and components UL, 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

- 1.5 through 5 ton
- · Sound levels as low as 76 dBA
- · Single phase power supply
- Vertical air discharge
- Applicable to indoor air handlers or gas furnaces with indoor add-on coils
- · Shipped completely factory assembled, piped, and wired
- · Factory tested operated
- **NOTE** When heat pumps are used with gas furnaces, a dual-fuel compatible thermostat or a zone control system with dual-fuel capabilities must be used (order separately).
- **NOTE** Installer must set heat pump, 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 dependent 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
- Fan motor is inherently protected
- Totally enclosed motor
- Louvered steel top fan guard

2 Quantum™ Coil

- · Lennox designed and fabricated coil
- Enhanced aluminum alloy tube/enhanced fin 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

High Pressure Switch

- Protects the system from high pressure conditions that can be a result of fan failure or a blocked/dirty coil
- · Automatic reset

Low Pressure Switch

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

3 Expansion Valve - Outdoor Unit

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

FEATURES

REFRIGERATION SYSTEM (continued)

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 unit of the system
- Factory installed

High-Capacity Liquid Line Drier

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

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

- Installs on or near the vapor line of the indoor coil or on the suction line
- · 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 model and must be field fabricated.

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

Optional Accessories

Crankcase Heater

 Protects against refrigerant migration that can occur during low ambient operation

Compressor Sound Cover

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

FEATURES

CONTROLS

Defrost Control

- · Control furnished as standard
- Gives a demand defrost cycle whenever system heating performance falls below optimum levels
- · Sensing element on coil determines when defrost cycle is required and when to terminate cycle
- Anti-short cycle (5 minutes) incorporated into the board
- · Diagnostic LEDs furnished as an aid in 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

7:28 pm

∷

outside 65°

LENNOX

- 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 İFTTT
- Service Dashboard features online real-time monitoring of installed iComfort® thermostats

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
- · See Lennox Price Book for selection

Compressor Low Ambient Cut-Off Switch

- Non-adjustable switch (low ambient cut-out) prevents compressor operation when outdoor temperature is below 35°F
- Freezestat Installs on or near the vapor line of the indoor coil or on the suction line
- · Senses suction line temperature and cycles the compressor off when suction line temperature falls below it's 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
- For conditions such as low voltage kit may be required to increase the compressor starting torque

Indoor Blower Off Delay Relay

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

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 should be added to terminate compressor operation below recommended operation conditions.

Monitor Kit - Service Light

- · Ambient compensating thermistor
- Service light thermostat
- For thermostats requiring indicator light inputs
- For use with thermostats requiring input for indicator lights

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)

Optional Accessories (continued)

Outdoor Thermostat Kit

- · An outdoor thermostat can be used to lock out some of the electric heating elements on indoor units where twostage control is applicable
- Outdoor thermostat maintains the heating load on the 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

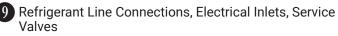
CABINET



- 8 Heavy gauge steel construction
 - Louvered heavy gauge steel panels surround unit on all four sides
 - Five station metal wash process
 - Powder paint finish
 - 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

PermaGuard™ Unit Base

 Durable zinc-coated base section resists rust and corrosion



- · 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
- · Raises unit off of mounting surface
- Four feet are furnished per order number

SPECIFICATIONS					
General	Model N	o. ML16XP1-018	ML16XP1-024	ML16XP1-030	ML16XP1-036
Data	Nominal Tonnaç	ge 1.5	2	2.5	3
¹ Sound Rating Number (c	IBA)	76	76	76	76
Connections	Liquid line (o.d.) - i	n. 3/8	3/8	3/8	3/8
(sweat)	Vapor (Suction) line (o.d.) - i	n. 3/4	3/4	3/4	7/8
Refrigerant	² R-410A charge furnishe	ed 6 lbs. 6 oz.	6 lbs. 11 oz.	7 lbs. 10 oz.	8 lbs. 7 oz.
	Net face area - sq. ft. Outer c	oil 24.5	18.7	18.7	22.2
Coil	Inner c	oil	18.0	18.0	21.5
	Tube diameter - i	n. 5/16	5/16	5/16	5/16
	No. of rov	vs 1	2	2	2
	Fins per inc	ch 22	22	22	22
Outdoor	Diameter - i	n. 22	22	22	26
Fan	No. of blade	es 3	3	3	3
	Motor I	np 1/6	1/6	1/6	1/3
	Cf	m 2670	2575	2575	3700
	Rp	m 867	866	866	820
	Wat	ts 160	163	163	200
Shipping Data - lbs. 1 pkg.		180	188	188	214
ELECTRICAL DATA		•		•	•
Line voltage data - 60 Hz	· 1 ph	208/230V-1ph	208/230V-1ph	208/230V-1ph	208/230V-1ph
³ Maximum overcurrent pr		20	20	25	35
⁴ Minimum circuit ampacit		12.2	13.6	16.4	20.9
Compressor	Rated load am	os 9	10.1	12.3	14.7
-	Locked rotor am		52	63	75
	Power fact		0.98	0.96	0.99
Outdoor Fan Motor	Full load am		1.0	1.0	2.6
	Locked rotor am		1.9	1.9	
OPTIONAL ACCES	SORIES - ORDER SEF				1
iComfort® M30 Smart Wi-F	Ti Thermostat 15Z	69 •	•		•
Remote Outdoor Tempera			•	•	•
Compressor Crankcase H			•	•	
, , , , , , , , , , , , , , , , , , ,	93M				•
Compressor Hard Start K			•	•	•
Compressor Sound Cover			•	•	•
Compressor Low Ambien			•	•	•
Freezestat	3/8 in. tubing 93G	_	•	•	•
	5/8 in. tubing 50A 9		•	•	•
Indoor Blower Off Delay R			•	•	•
Loss of Charge Switch Ki		_	•	•	•
⁵ Low Ambient Kit	54M		•	•	•
Mild Weather Kit	11B		•	•	•
Monitor Kit - Service Ligh			•	•	•
Outdoor	Thermostat 10Z		•	•	•
Thermostat Kit	Mounting Box 314		•	•	•
Refrigerant Line Sets	L15-41-20 L15-41-4		•	•	
	L15-41-30 L15-41-				
_	L15-65-30 L15-65-4	10			•
	L15-65-	50			
Unit Stand-Off Kit	94J4	· •	•	•	•

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 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

SPECIFICATION	S			
General	Model No	. ML16XP1-042	ML16XP1-048	ML16XP1-060
Data	Nominal Tonnage	e 3.5	4	5
Sound Rating Numbe	r (dBA)	79	80	80
Connections	Liquid line (o.d.) - in	. 3/8	3/8	3/8
(sweat)	Vapor (Suction) line (o.d.) - in	. 7/8	7/8	1-1/8
Refrigerant	² R-410A charge furnished	10 lbs. 12 oz.	10 lbs. 7 oz.	10 lbs. 4 oz.
Outdoor	Net face area- sq. ft. Outer co	il 29.1	29.1	29.1
Coil	Inner co	il 28.2	28.2	28.2
	Tube diameter - in	. 5/16	5/16	5/16
	No. of row	s 2	2	2
	Fins per incl	n 22	22	22
Outdoor	Diameter - in	. 26	26	26
an	No. of blade	3	3	4
	Motor h	1/3	1/3	1/3
	Cfn		4150	4250
	Rpn	n 820	820	820
	Watt		216	245
Shipping Data - lbs. 1 p	ka.	263	263	268
ELECTRICAL DA				
ine voltage data - 60 h		208/230V-1ph	208/230V-1ph	208/230V-1ph
	t protection (MOCP) amps	40	40	50
Minimum circuit ampa	· · · · · · · · · · · · · · · · · · ·	25	25.8	30.4
Compressor	Rated load amp		18.5	22.2
ompressor	Locked rotor amp		124	127.9
	Power facto		0.99	0.99
Outdoor Fan Motor	Full load amp		2.6	2.6
	ESSORIES - ORDER SEP		2.0	2.0
Comfort® M30 Smart W				
Remote Outdoor Temp			•	•
Compressor Crankcas			•	•
Compressor Hard Start				•
ompressor naru Stari		_		•
Compressor Sound Co	Copeland 10J4: over 18J4:		•	•
Compressor Sound Co			•	•
reezestat			•	•
Teezesiai	3/8 in. tubing 93G3 : 5/8 in. tubing 50A9 :		•	•
ndoor Blower Off Dela			•	•
	<u> </u>	+		·
oss of Charge Switch Low Ambient Kit	Kit 84M2 54M8		•	•
Aild Weather Kit				
	11B9 ight 76F5		•	•
lonitor Kit - Service Li	<u> </u>		•	•
Outdoor Thermostat Kit	Thermostat 10Z2		•	•
	Mounting Box 3146		•	•
Refrigerant Line Sets	L15-65-30 L15-65-40 L15-65-50)	•	
	Field Fabricate			•
Unit Stand-Off Kit	94J4	•	•	•

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 breaker or fuse.

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

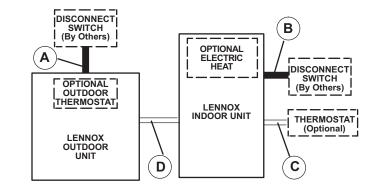
⁵ Crankcase Heater and Freezestat are recommended with Low Ambient Kit

SOUND DATA Octave Band Sound Power Levels dBA, re 10-12 Watts ¹Sound ² Estimated Sound Pressure Level at ¹ Unit Center Frequency - HZ Rating Distance From Unit (dBA at distance in ft.) Model Number (dBA) 70.5 59.5 58.5 71.5 67.5 63.5 71.5 67.5 63.5 68.5 62.5 55.5 68.5 68.5 62.5 55.5 65.5 70.5

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:

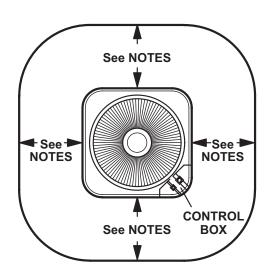
Service clearance of 30 in. (762 mm) must be maintained on one of the sides adjacent to the control box.

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.

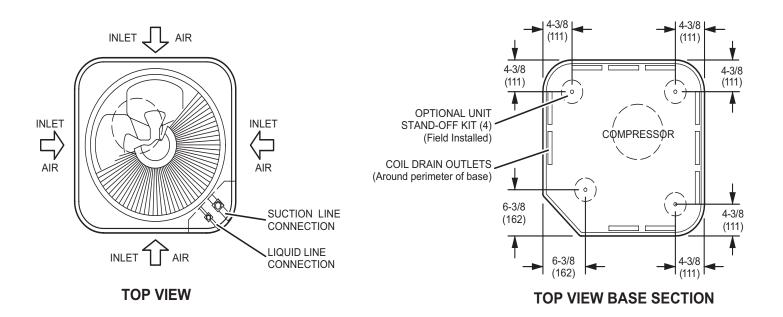
48 in. (1219 mm) clearance required on top of unit.

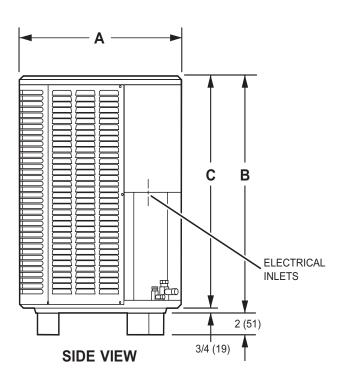


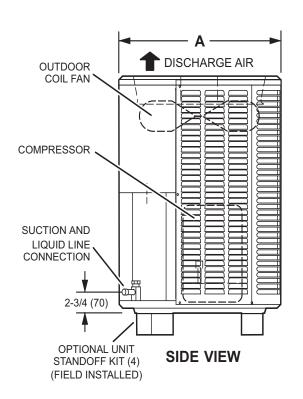
NOTE - the octave sound power data does not include tonal correction.

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.







Model No.	Α		В		С	
woder No.	in.	mm	in.	mm	in.	mm
ML16XP1-018	28-1/4	718	43-1/4	1099	42-1/2	1080
ML16XP1-024	28-1/4	718	33-1/4	845	32-1/2	826
ML16XP1-030	28-1/4	718	33-1/4	845	32-1/2	826
ML16XP1-036	32-1/4	817	33-1/4	845	32-1/2	826
ML16XP1-042	32-1/4	817	43-1/4	1099	42-1/2	1080
ML16XP1-048	32-1/4	817	43-1/4	1099	42-1/2	1080
ML16XP1-060	32-1/4	817	43-1/4	1099	42-1/2	1080

TXV USAGE

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

Model No.	Order No.
ML16XP1-018	12J18
ML16XP1-024	12J18
ML16XP1-030	12J18
ML16XP1-036	12J19
ML16XP1-042	12J20
ML16XP1-048	12J20
ML16XP1-060	12J20

CX35 and CHX35 coils and all Lennox air handlers are shipped with a factory installed TXV.

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		
ML16XP1-018	CBA27UHE-018		
ML16XP1-024	CBA27UHE-024		
ML16XP1-030	CBA27UHE-030		
ML16XP1-036	CBA27UHE-036		
ML16XP1-042	CBA27UHE-048		
ML16XP1-048	CBA27UHE-048		
ML16XP1-060	CBA27UHE-060		

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 or smaller than the outdoor unit.

Outdo	Outdoor Unit		Indoor Unit		TXV
Size	Tons	Size	Tons	Furnished	Replacement
018	1.5	30/36	2.5/3	12J19	12J18
018	1.5	36	3	12J19	12J18
018	1.5	42	3.5	12J20	12J18
018	1.5	48	4	12J20	12J18
018	1.5	49	4	12J20	12J18
018	1.5	50/60	4/5	12J20	12J18
018	1.5	51/61	4/5	12J20	12J18
018	1.5	60	5	12J20	12J18
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
030	2.5	42	3.5	12J20	12J18
030	2.5	43	3.5	12J20	12J18
030	2.5	48	4	12J20	12J18
030	2.5	49	4	12J20	12J18
036	3	24	2	12J18	12J19
036	3	30	2.5	12J18	12J19
042	3.5	24	2	12J18	12J20
042	3.5	30	2.5	12J18	12J20
042	3.5	30/36	3	12J19	12J20
042	3.5	36	3	12J19	12J20
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.

REVISIONS	
Section	Description
TXV Substitution	Updated.









Visit us at www.lennox.com
For the latest technical information, www.LennoxPros.com
Contact us at 1-800-4-LENNOX