Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 3/9/2023
Return Request: 3/19/2023
Project: Ritz Theater – Phase 3
Supplier: Harrison Energy
Submittal: Air Cooled Condensing Units
Submittal Number: 23 62 13-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
SCM Architects
1400 Kirk Road, Suite 220
Little Rock, AR 72223
501-224-3055

ENGINEER
Pettit & Pettit
201 E. Markham St, #400
Little Rock, AR 72201
501-374-3731

GENERAL CONTRACTOR
Clark Contractors
15825 Cantrell Rd.
Little Rock, AR 72223
501-868-3133

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
23-1004
jon@comfortar.com

Quality People. Building Solutions.

Comfort Systems USA (Arkansas), Inc.
P.O. Box 16620
Little Rock, AR 72231
Phone 501-834-3320
Fax 501-834-5416

Date: 3/9/2023
Return Request: 3/19/2023
Project: Ritz Theater – Phase 3
Supplier: Harrison Energy
Submittal: Air Cooled Condensing Units
Submittal Number: 23 62 13-01
Drawing # and Installation: Mechanical Drawings

ARCHITECT
SCM Architects
1400 Kirk Road, Suite 220
Little Rock, AR 72223
501-224-3055

ENGINEER
Pettit & Pettit
201 E. Markham St, #400
Little Rock, AR 72201
501-374-3731

GENERAL CONTRACTOR
Clark Contractors
15825 Cantrell Rd.
Little Rock, AR 72223
501-868-3133

MECHANICAL SUBCONTRACTOR
Comfort Systems USA (Arkansas), Inc.
9924 Landers Rd.
N. Little Rock, AR 72117
501-834-3320

Notes:

CSUSA PROJECT NO.
23-1004
jon@comfortar.com

LENNOX Service Literature

UNIT INFORMATION

Corp. 100049
June 22, 2023

ML17XC1

ML17XC1 (HFC-410A) SERIES UNITS WITH ALL-ALUMINUM COIL

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

⚠ WARNING

To prevent serious injury or death:

1. Lock-out/tag-out before performing maintenance.
2. If system power is required (e.g., smoke detector maintenance), disable power to blower, remove fan belt where applicable, and ensure all controllers and thermostats are set to the “OFF” position before performing maintenance.
3. Always keep hands, hair, clothing, jewelry, tools, etc. away from moving parts.

Table of Contents

Model Number Identification....2
Typical Serial Number Identification....2
Specifications....3
Unit Dimensions – Inches (mm)....5
Typical Unit Parts Arrangement....6
Component Specifications....7
Refrigerant Metering Device – Indoor Coil....7
Operating Gauge Set and Service Valves....7
Installation....9
Unit Placement....9
Removing and Installing Louvered Panels....11
New or Replacement Line Set....11
Brazing Connections....14
Flushing Line Set and Indoor Coil....17
Installing Indoor Metering Device....18
Leak Testing the System....19
Evacuating Line Set and Indoor Coil....20
Electrical – Circuit Sizing and Wire Routing....21
Maintenance....25
Typical Field Wiring....27
Servicing Units Delivered Void of Charge....28
Unit Start-Up....29
System Refrigerant....29

⚠ IMPORTANT

This unit must be matched with an indoor coil as specified with AHRI. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com. Coils previously charged with HCFC-22 must be flushed.

General Information

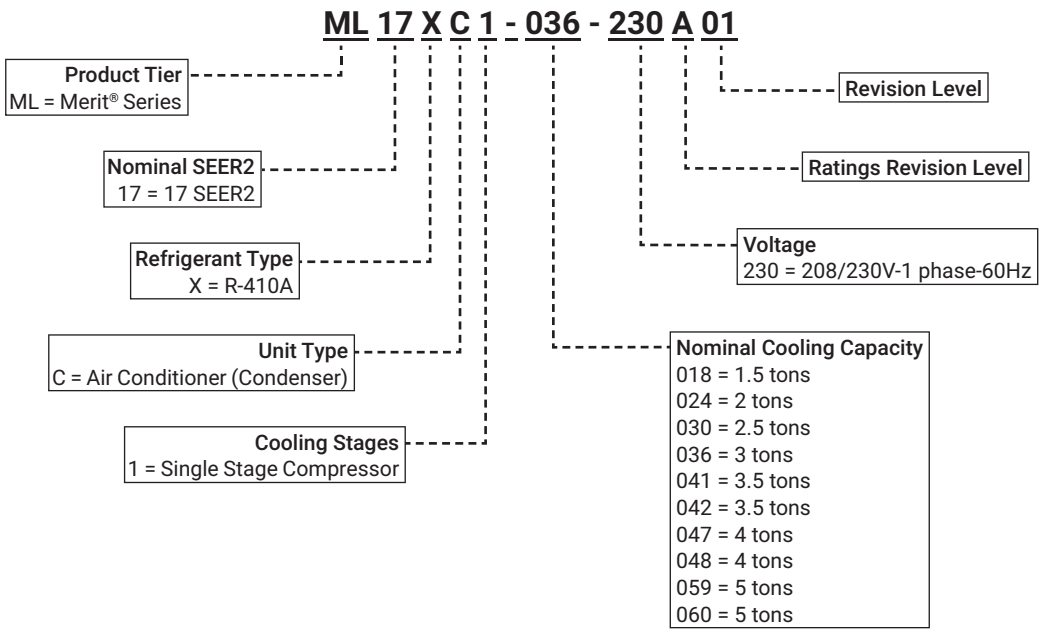
This ML17XC1 outdoor air conditioner **with all-aluminum coil** is designed for use with HFC-410A refrigerant only. This unit must be installed with an approved indoor air handler or coil. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com. These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

This outdoor unit is designed for use in systems that use the following refrigerant metering device:

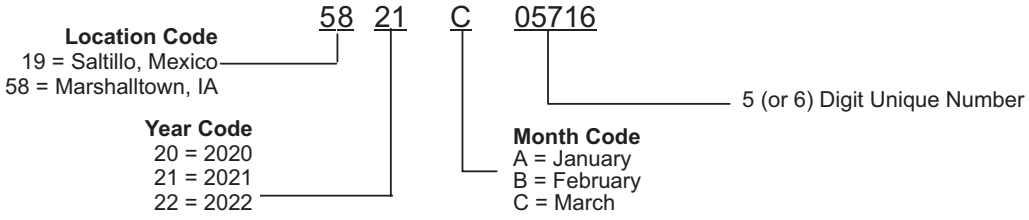
- Thermal expansion valve (TXV)
- Fixed orifice

IMPORTANT: Special procedures are required for cleaning the aluminum coil in this unit. See page 25 in this manual for information.

Model Number Identification



Typical Serial Number Identification



Specifications

General Data			Model No.	ML17XC1-018	ML17XC1-024	ML17XC1-030	ML17XC1-036	ML17XC1-041
			Nominal Tonnage	1.5	2	2.5	3	3.5
			Indoor Unit Expansion Valve (TXV) (If needed)	**12J18**	**12J18**	**12J18**	**12J19**	**12J20**
			RFCIV Metering Orifice Usage	0.051	0.059	0.067	0.072	N/A
Connections (sweat)			Liquid line o.d. - in.	3/8	3/8	3/8	3/8	3/8
			Suction line o.d. - in.	3/4	3/4	3/4	7/8	7/8
[1] **Refrigerant (R-410A) furnished**				4 lbs. 8 oz.	5 lbs. 2 oz.	6 lbs. 8 oz.	8 lbs. 8 oz.	8 lbs. 12 oz.
Outdoor Coil	Net face area sq. ft.		Outer coil	16.33	21.00	16.33	21.00	22.17
			Inner coil	- - -	- - -	15.75	20.25	21.33
			Tube diameter - in.	5/16	5/16	5/16	5/16	5/16
			Number of rows	1	1	2	2	2
			Fins per inch	26	26	22	22	22
Outdoor Fan			Diameter - in.	22	22	22	22	26
			Number of blades	2	3	3	3	3
			Motor hp	1/6	1/8	1/8	1/6	1/3
			Cfm	2610	2990	2820	3040	3920
			Rpm	825	825	825	825	825
			Watts	160	160	160	190	180
Shipping Data - lbs. 1 package				155	170	180	200	225
ELECTRICAL DATA								
			Line voltage data - 60 Hz - 1ph	208/230V	208/230V	208/230V	208/230V	208/230V
			[2] Maximum overcurrent protection (MOCP) amps	15	20	25	30	35
			[3] Minimum circuit ampacity (MCA)	12	15.4	18.4	17.4	21.9
Compressor			Rated load amps	8.8	11.7	14.1	13.1	15.4
			Locked rotor amps	42.6	59.5	71.3	83.1	92.1
Condenser Fan Motor			Full load amps	1	0.74	0.74	1	2.6
			Locked rotor amps	1.9	1.65	1.65	1.9	3.2
CONTROLS - ORDER SEPARATELY								
M30 Smart Thermostat			**15Z69**	•	•	•	•	•
OPTIONAL ACCESSORIES - ORDER SEPARATELY								
Compressor Crankcase Heater			**93M04**	•	•	•	•	
Compressor Hard Start Kit		Copeland	**10J42**	•	•	•		
		LG	**88M91**	•	•	•	•	•
Compressor Low Ambient Cut-Off Switch			**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**	•	•	•	•	•
Low Ambient Kit (Fan Cycling)			**34M72**	•	•	•	•	•
Refrigerant Line Sets		L15-41-20, L15-41-30, L15-41-40, 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] 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.

[2] HACR type circuit breaker or fuse.

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

[4] Crankcase Heater and Freezestat are recommended with Low Ambient Kit.

Specifications

General Data	Model No.	ML17XC1-042	ML17XC1-047	ML17XC1-048	ML17XC1-059	ML17XC1-060
	Nominal Tonnage	3.5	4	4	5	5
	Indoor Unit Expansion Valve (TXV) (If needed)	**12J20**	**12J20**	**12J20**	**12J20**	**12J20**
	RFCIV Metering Orifice Usage	0.081	- - -	0.084	- - -	0.092
Connections (sweat)	Liquid line o.d. - in.	3/8	3/8	3/8	3/8	3/8
	Suction line o.d. - in.	7/8	7/8	7/8	1-1/8	1-1/8
[1] **Refrigerant (R-410A) furnished**		9 lbs. 2 oz.	9 lbs. 13 oz.	9 lbs. 8 oz.	11 lbs. 14 oz.	12 lbs. 8 oz.
Outdoor Coil	Net face area sq. ft. Outer coil	22.17	22.17	24.93	29.09	29.09
	Net face area sq. ft. Inner coil	21.33	21.33	24.13	28.16	28.16
	Tube diameter - in.	5/16	5/16	5/16	5/16	5/16
	Number of rows	2	2	2	2	2
	Fins per inch	22	22	22	22	22
Outdoor Fan	Diameter - in.	26	26	22	26	26
	Number of blades	3	3	4	4	4
	Motor hp	1/4	1/3	1/4	1/3	¼
	Cfm	4060	3920	3700	4050	4180
	Rpm	825	825	825	825	825
	Watts	260	180	290	220	290
Shipping Data - lbs. 1 package		225	225	235	260	260
ELECTRICAL DATA						
	Line voltage data - 60 Hz - 1ph	208/230V	208/230V	208/230V	208/230V	208/230V
	[2] Maximum overcurrent protection (MOCP) amps	35	35	50	50	50
	[3] Minimum circuit ampacity (MCA)	24.6	27.5	33	35.5	31.3
Compressor	Rated load amps	18.6	19.9	25	26.3	23.9
	Locked rotor amps	110	110	120	140.6	124.5
Condenser Fan Motor	Full load amps	1.4	2.6	1.7	2.6	1.4
	Locked rotor amps	3.2	- - -	3.2	- - -	3.2
CONTROLS - ORDER SEPARATELY						
M30 Smart Thermostat	**15Z69**	•	•	•	•	•
Remote Outdoor Temperature Sensor	**X2658**	•	•	•	•	•
OPTIONAL ACCESSORIES - ORDER SEPARATELY						
Compressor Hard Start Kit	Copeland **10J42**	•	•	•	•	
	LG **88M91**	•	•	•	•	•
Compressor Low Ambient Cut-Off Switch	**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**	•	•	•	•	•
Low Ambient Kit (Fan Cycling)	**34M72**	•	•	•	•	•
Refrigerant Line Sets	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.

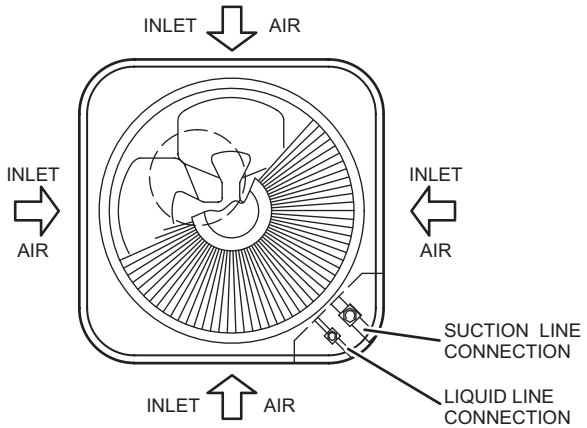
[1] Refrigerant charge sufficient for 15 ft. length of refrigerant lines. For longer line set requirements see the Installation Instructions for information about line set length and additional refrigerant charge required.

[2] HACR type circuit breaker or fuse.

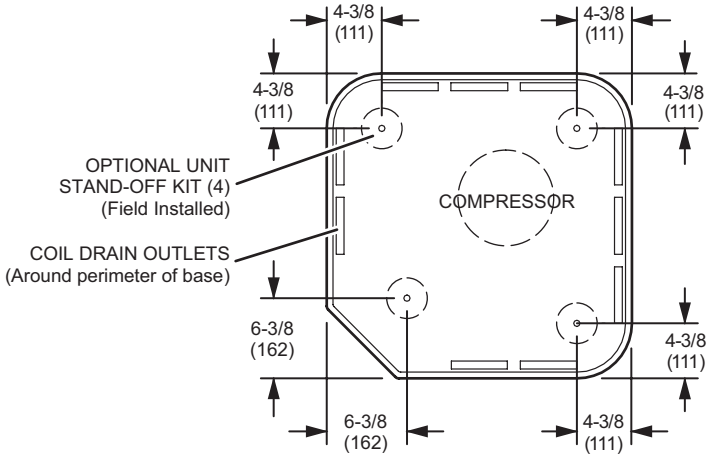
[3] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

[4] Crankcase Heater and Freezestat are recommended with Low Ambient Kit.

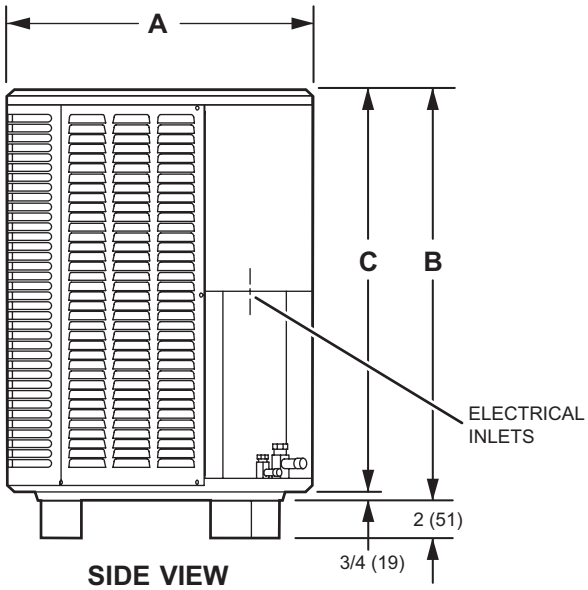
Unit Dimensions – Inches (mm)



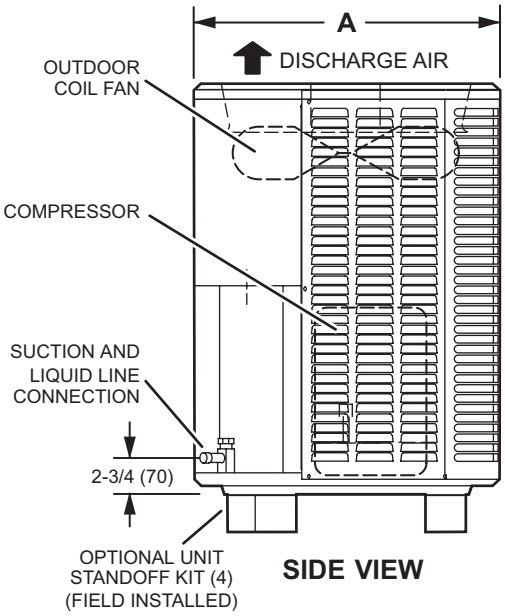
TOP VIEW



TOP VIEW BASE SECTION



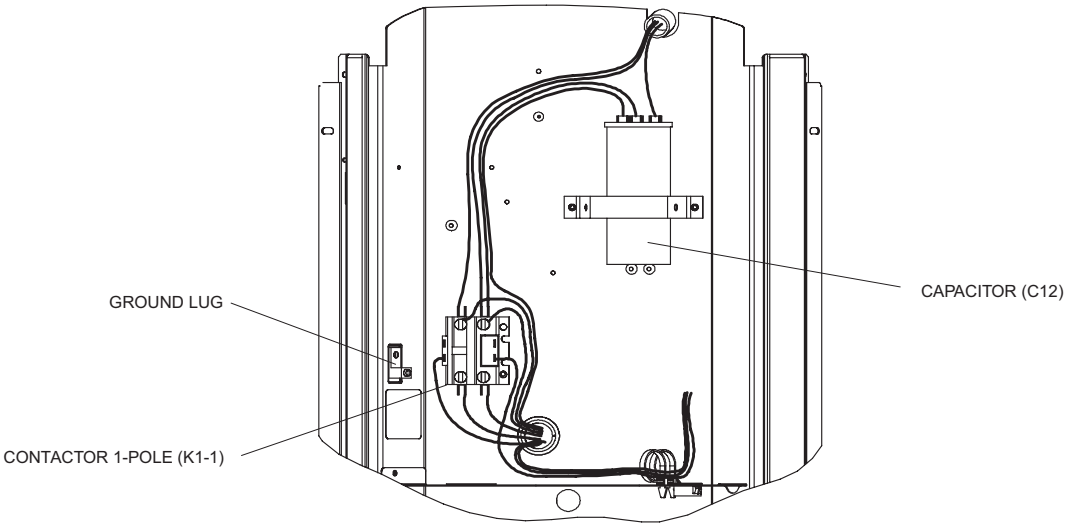
SIDE VIEW



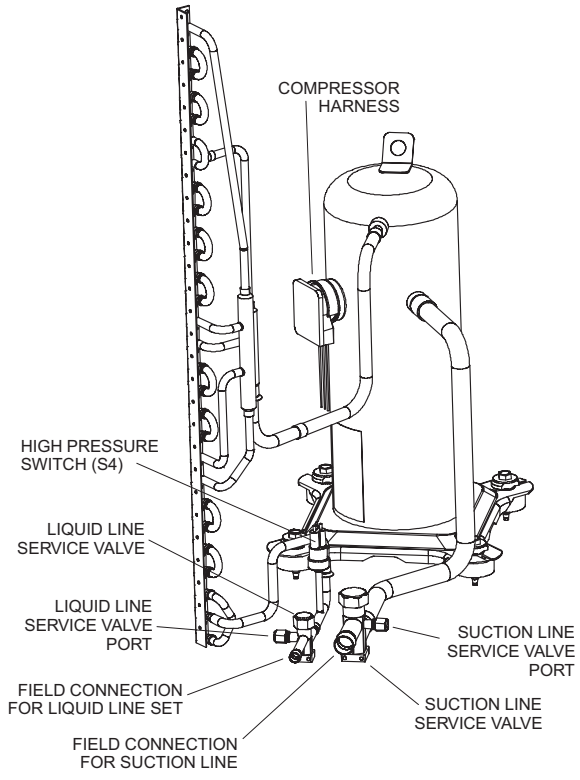
SIDE VIEW

Model	A		B		C	
	inches	mm	inches	mm	inches	mm
018	28-1/4	718	29-1/4	743	28-1/2	724
024	28-1/4	718	37-1/4	946	36-1/2	927
030	28-1/4	718	29-1/4	743	28-1/2	724
036	28-1/4	718	37-1/4	946	36-1/2	927
041	32-1/4	819	33-1/4	845	32-1/2	927
042	32-1/4	819	33-1/4	845	32-1/2	826
047	32-1/4	819	33-1/4	845	32-1/2	826
048	28-1/4	718	43-1/4	1099	42-1/2	1080
059	32-1/4	819	43-1/4	1099	42-1/2	1080
060	32-1/4	819	43-1/4	1099	42-1/2	1080

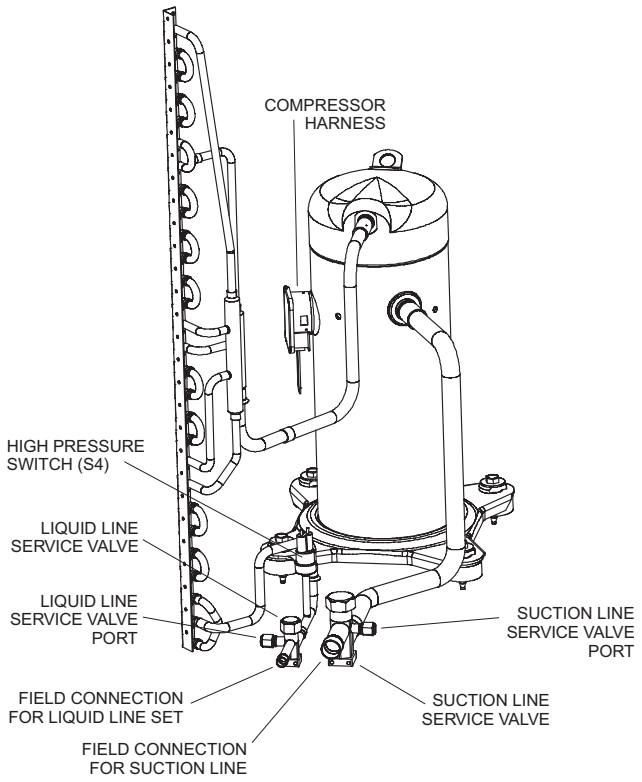
Typical Unit Parts Arrangement



CONTROL BOX



TYPICAL PLUMBING (EMERSON COMPRESSOR)



TYPICAL PLUMBING (LG COMPRESSOR)

FIGURE 1.

Component Specifications

TABLE 1. Service Valve Sizes and Refrigerant Line Set Recommendations

Model	Service Valve Sizes		Recommended Line Set		
	Liquid Line	Suction Line	Liquid Line	Suction Line	L15 Series Line Sets
-018, -024, -030	3/8 in. (10 mm)	3/4 in. (19 mm)	3/8 in. (10 mm)	3/4 in. (19 mm)	L15-41 — 15 feet to 50 feet (4.6 meters to 15 meters)
-036, -041, -042, -047, -048	3/8 in. (10 mm)	7/8 in. (22 mm)	3/8 in. (10 mm)	7/8 in. (22 mm)	L15-65 — 15 feet to 50 feet (4.6 meters to 15 meters)
-059, -060	3/8 in. (10 mm)	1-1/8 in. (22 mm)	3/8 in. (10 mm)	1-1/8 in. (22 mm)	
NOTE — Some applications may require a field provided 7/8” to 1-1/8” adapter					

Refrigerant Metering Device – Indoor Coil

FIXED ORIFICE (RFC) METERING

The following table lists the indoor coil orifice sizes required for the specific outdoor unit listed. Refer to any of the publications listed in this section to obtain the required catalog number for a specific orifice size.

TABLE 2. Fixed Orifice Sizes

Model	Refrigerant Metering Orifice (RFC)	
	Order No.	Orifice Size
018	10W93	0.051
024	10W96	0.059
030	11W00	0.067
036	10W85	0.072
041	N/A	N/A
042	N/A	N/A
047	N/A	N/A
048	N/A	N/A
059	N/A	N/A
060	N/A	N/A

EXPANSION VALVE (TXV) METERING

This unit is also compatible with systems that use an expansion valve. Refer to any of the publications listed below to obtain the required catalog number for a specific expansion valve.

- Lennox ML17XC1 Product Specification (EHB)
- Lennox Product Catalog

Operating Gauge Set and Service Valves

TORQUE REQUIREMENTS

When servicing or repairing heating, ventilating, and air conditioning components, ensure the fasteners are appropriately tightened. Table 3 lists torque values for fasteners.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

⚠ IMPORTANT

Only use Allen wrenches of sufficient hardness (50Rc - Rockwell Harness Scale minimum). Fully insert the wrench into the valve stem recess.

Service valve stems are factory-torqued (from 9 ft-lbs for small valves, to 25 ft-lbs for large valves) to prevent refrigerant loss during shipping and handling. Using an Allen wrench rated at less than 50Rc risks rounding or breaking off the wrench, or stripping the valve stem recess.

See the Lennox Service and Application Notes #C-08-1 for further details and information.

⚠ IMPORTANT

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

TABLE 3. Torque Requirements

Parts	Recommended Torque	
Service valve cap	8 ft.- lb.	11 NM
Sheet metal screws	16 ft.- lb.	2 NM
Machine screws #10	28 ft.- lb.	3 NM
Compressor bolts	90 in.- lb.	10 NM
Gauge port seal cap	8 ft.- lb.	11 NM

USING MANIFOLD GAUGE SET

When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings.

Manifold gauge set used with HFC-410A refrigerant systems must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 0 - 800 psig on the high side and a low side of 30” vacuum to 250 psig with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psig of pressure with a 4000 psig burst rating.

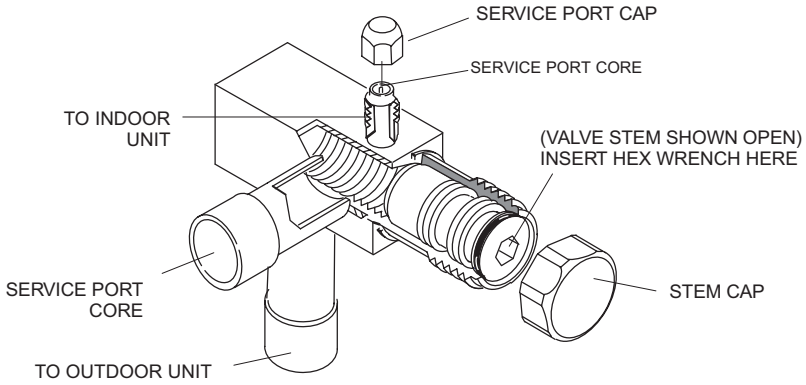
OPERATING SERVICE VALVES

The liquid and vapor line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging. Each valve is equipped with a service port which has a factory-installed valve stem. Figure 2 provides information on access and operation of both angle and ball service valves

SERVICE VALVES ANGLE AND BALL

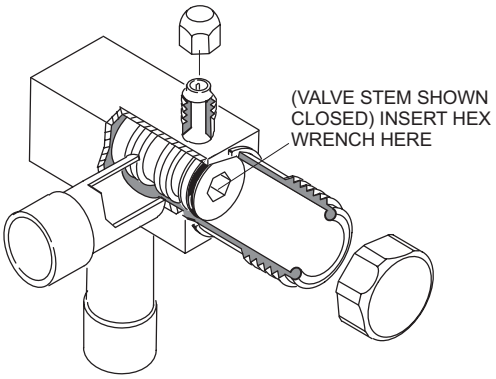
Operating Angle Type Service Valve:

1. Remove stem cap with an appropriately sized wrench.
2. Use a service wrench with a hex-head extension (3/16" for liquid line valve sizes and 5/16" for vapor line valve sizes) to back the stem out counterclockwise as far as it will go.



ANGLE-TYPE SERVICE VALVE (BACK-SEATED OPENED)

When service valve is **OPEN**, the service port is open to linE set, indoor and outdoor unit.

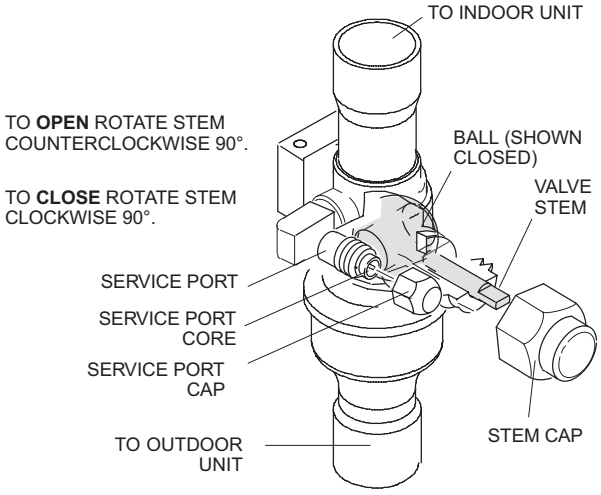


ANGLE-TYPE SERVICE VALVE (FRONT-SEATED CLOSED)

WHEN SERVICE VALVE IS **CLOSED**, THE SERVICE PORT IS OPEN TO THE LINE SET AND INDOOR UNIT.

Operating Ball Type Service Valve:

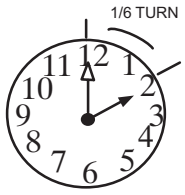
1. Remove stem cap with an appropriately sized wrench.
2. Use an appropriately sized wrenched to open. To open valve, roate stem counterclockwise 90°. To close rotate stem clockwise 90°.



To Access Service Port:

A service port cap protects the service port core from contamination and serves as the primary leak seal.

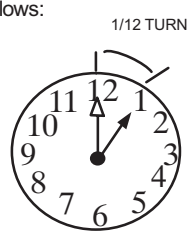
1. Remove service port cap with an appropriately sized wrench.
2. Connect gauge set to service port.
3. When testing is completed, replace service port cap and tighten as follows:
   - With torque wrench: Finger tighten and torque cap per table 3.
   - Without torque wrench: Finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise.



Reinstall Stem Cap:

Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follows:

- With Torque Wrench: Finger tighten and then torque cap per table 3.
- Without Torque Wrench: Finger tighten and use an appropriately sized wrench to turn an additional 1/12 turn clockwise.



NOTE — A label with specific torque requirements may be affixed to the stem cap. If the label is present, use the specified torque.

FIGURE 2. Angle and Ball Service Valves

Unit Placement

See Unit Dimensions on page 5 for sizing mounting slab, platforms or supports.

⚠ CAUTION

In order to avoid injury, take proper precaution when lifting heavy objects..

POSITIONING CONSIDERATIONS

Consider the following when positioning the unit:

- Some localities are adopting sound ordinances based on the unit's sound level registered from the adjacent property, not from the installation property. Install the unit as far as possible from the property line.
- When possible, do not install the unit directly outside a window. Glass has a very high level of sound transmission. For proper placement of unit in relation to a window see the provided illustration in figure 6, detail A.

PLACING UNIT ON SLAB

When installing unit at grade level, the top of the slab should be high enough above grade so that water from higher ground will not collect around the unit.

The slab should have a slope tolerance as described in figure 4, detail B.

***NOTE** – If necessary for stability, anchor unit to slab as described in figure 4, detail B.*

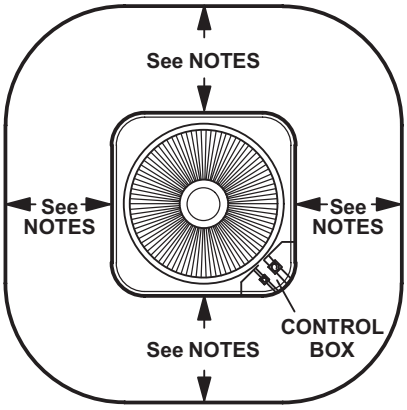
ROOF MOUNTING

Install the unit a minimum of 6 inches (152 mm) above the roof surface to avoid ice build-up around the unit. Locate the unit above a load bearing wall or area of the roof that can adequately support the unit. Consult local codes for rooftop applications. If unit coil cannot be mounted away from prevailing winter winds, a wind barrier should be constructed. Size barrier at least the same height and width as outdoor unit. Mount barrier 24 inches (610 mm) from the sides of the unit in the direction of prevailing winds.

⚠ NOTICE

Roof Damage!

This system contains both refrigerant and oil. Some rubber roofing material may absorb oil, causing the rubber to swell. Bubbles in the rubber roofing material can cause leaks. Protect the roof surface to avoid exposure to refrigerant and oil during service and installation. Failure to follow this notice could result in damage to roof surface.



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).

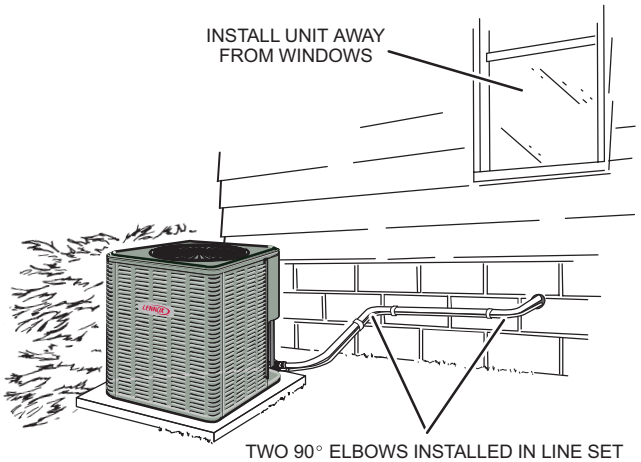
A clearance of 24 in. must be maintained between two units.

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

NOTICE: Specific applications may require adjustment of the listed installation clearances to provide protection for the unit from physical damage or to avoid conditions which limit operating efficiency. (Example: Clearances may have to be increased to prevent snow or ice from falling on the top of the unit. Additional clearances may also be required to prevent air recirculation when the unit is installed under a deck or in another tight space.)

FIGURE 3. Installation Clearances

DETAIL A



DETAIL B

Install unit level or, if on a slope, maintain slope tolerance of 2 degrees (or 2 inches per 5 feet [50 mm per 1.5 m]) away from building structure.

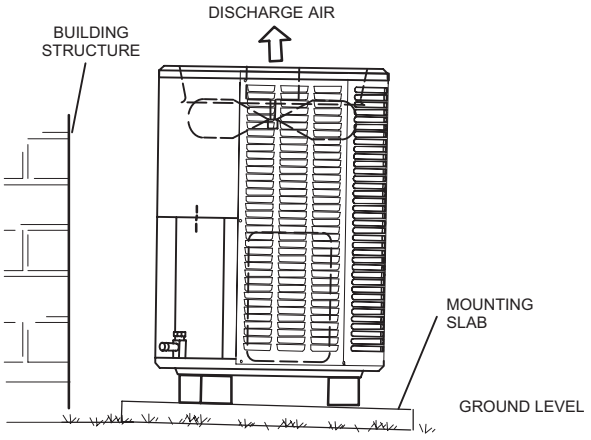


FIGURE 4. Placement and Slab Mounting

Removing and Installing Louvered Panels

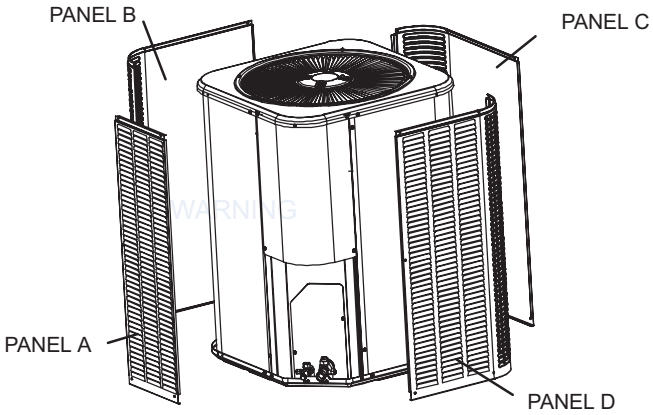
WARNING

To prevent personal injury, or damage to panels, unit or structure, be sure to observe the following:

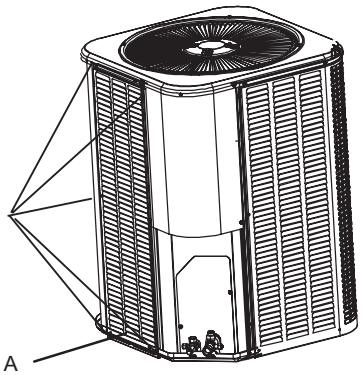
While installing or servicing this unit, carefully stow all removed panels out of the way, so that the panels will not cause injury to personnel, nor cause damage to objects or structures nearby, nor will the panels be subjected to damage (e.g., being bent or scratched).

While handling or stowing the panels, consider any weather conditions, especially windy conditions, that may cause panels to be blown around and battered.

When removing the unit panels. Remove panel **A** first, then **B**, **C** and finally **D**. When reinstalling panels, reverse that order starting with panel **D**, **C**, **B** and finally **A**.



REMOVAL



STEP 1

To remove panel, remove mounting screws securing panel to the unit.

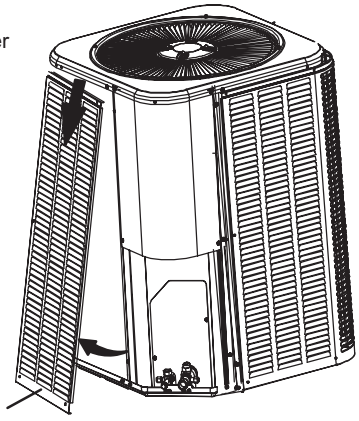
STEP 2

Slightly lift panel **A** in order to clear side lips of panel from base of unit.

STEP 3

Tilt panel out slightly and pull downward to remove.

Repeat steps 1, 2 and 3 to remove panels **B**, **C** and **D**.



INSTALLATION

STEP 1

Starting with panel D. Insert panel unit unit top cap lip and lift slightly to clear side lip of panel from base.

STEP 2

Move panel in towards unit. Align left / right side lips of panel with groove inserts along left / right side of unit.

STEP 3

Secure panel with mounting screws.

Repeat steps 1 and 2 when installing panels **C**, **B** and **A**.

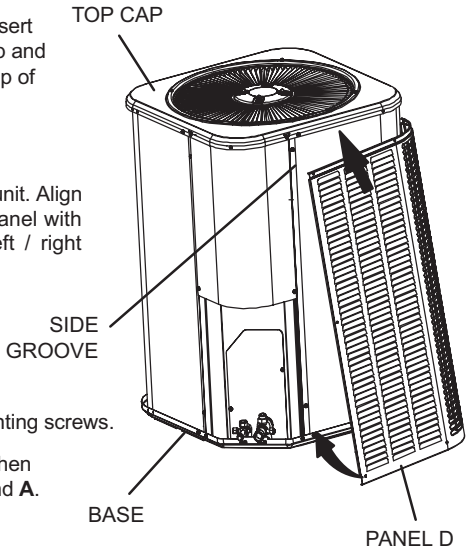


FIGURE 5. Removing and Installing Panels

New or Replacement Line Set

This section provides information on new installation or replacement of existing line set. If a new or replacement line set is not required, then proceed to Brazing Connections on page 13.

Field refrigerant piping consists of liquid and suction lines from the outdoor unit (braze connections) to the indoor unit coil (flare or braze connections). Use Lennox L15 (braze, non-flare) series line set, or use field-fabricated refrigerant lines as listed in table 4.

TABLE 4

REFRIGERANT LINE SET – INCHES (MM)					
Model	Valve Field Connections		Recommended Line Set		
	Liquid Line	Suction Line	Liquid Line	Suction Line	L15 Line Sets
-036	3/8 in. (10 mm)	7/8 in. (22 mm)	3/8 in. (10 mm)	7/8 in. (22 mm)	L15-65 15 ft. - 50 ft. (4.6 m - 15 m)
-042					
-048					
-060	3/8 in. (10 mm)	1-1/8 in. (28 mm)	3/8 in. (10 mm)	1-1/8 in. (28 mm)	Field Fabricated
NOTE - Some applications may require a field-provided 7/8" to 1-1/8" adapter.					

***NOTE** - When installing refrigerant lines longer than 50 feet, refer to the Refrigerant Piping Design and Fabrication Guidelines manual available on LennoxPros.com (Corp. 9351-L9), or contact the Technical Support Department Product Application group for assistance.*

***NOTE** - For new or replacement line set installation, refer to Service and Application Note - Corp. 9112-L4 (C-91-4).*

⚠ WARNING

When using a high pressure gas such as nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

⚠ WARNING

Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.

Failure to follow this warning may result in personal injury or death.

To obtain the correct information from Lennox, be sure to communicate the following points:

- Model (ML17XC1) and size of unit (e.g. -060).
- Line set diameters for the unit being installed as listed in table 1 and total length of installation.
- Number of elbows and if there is a rise or drop of the piping.

⚠ WARNING

Fire, Explosion and Personal Safety hazard. Failure to follow this warning could result in damage, personal injury or death.

Never use oxygen to pressurize or purge refrigeration lines. Oxygen, when exposed to a spark or open flame, can cause fire and/or an explosion, that could result in property damage, personal injury or death.

If refrigerant lines are routed through a wall, seal and isolate the opening so vibration is not transmitted to the building. Pay close attention to line set isolation during installation of any HVAC system. When properly isolated from building structures (walls, ceilings. floors), the refrigerant lines will not create unnecessary vibration and subsequent sounds.

The compressor is charged with sufficient Polyol ester oil for line set lengths up to 50 feet. Recommend adding oil to system based on the amount of refrigerant charge in the system. No need to add oil in a system with 20 pounds of refrigerant or less. For systems over 20 pounds - add one ounce for every five pounds of refrigerant over 20 pounds. Recommended topping-off POE oils are Mobil EAL ARCTIC 22 CC or ICI EMKARATE RL32CF.

MATCHING WITH NEW OR EXISTING INDOOR COIL AND LINE SET

The RFC1-metering line consisted of a small bore copper line that ran from condenser to evaporator coil. Refrigerant was metered into the evaporator by utilizing temperature/pressure evaporation effects on refrigerant in the small RFC line. The length and bore of the RFC line corresponded to the size of cooling unit.

If the ML17XC1 is being used with either a new or existing indoor coil which is equipped with a liquid line which served as a metering device (RFCI), the liquid line must be replaced prior to the installation of the ML17XC1 unit. Typically a liquid line used to meter flow is 1/4” in diameter and copper.

LIQUID LINE FILTER DRIER INSTALLATION

The filter drier (one is shipped with each ML17XC1 unit) must be field installed in the liquid line between the outdoor unit's liquid line service valve and the indoor coil's metering device as illustrated in figure 6. This filter drier must be installed to ensure a clean, moisture-free system. Failure to install the filter drier will void the warranty. A replacement filter drier is available from Lennox. See Brazing Connections on page for special procedures on brazing filter drier connections to the liquid line.

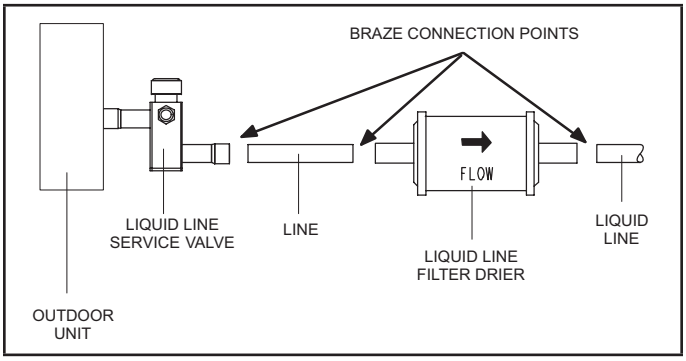


FIGURE 6. Typical Liquid Line Filter Drier Installation

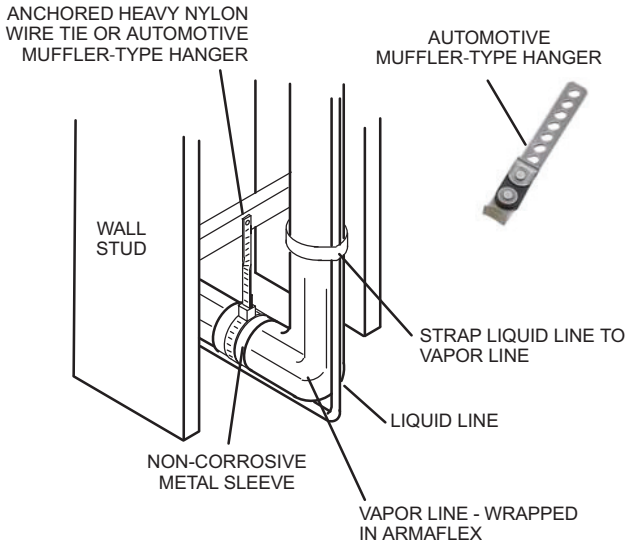
LINE SET

IMPORTANT — Refrigerant lines must not contact structure.

INSTALLATION

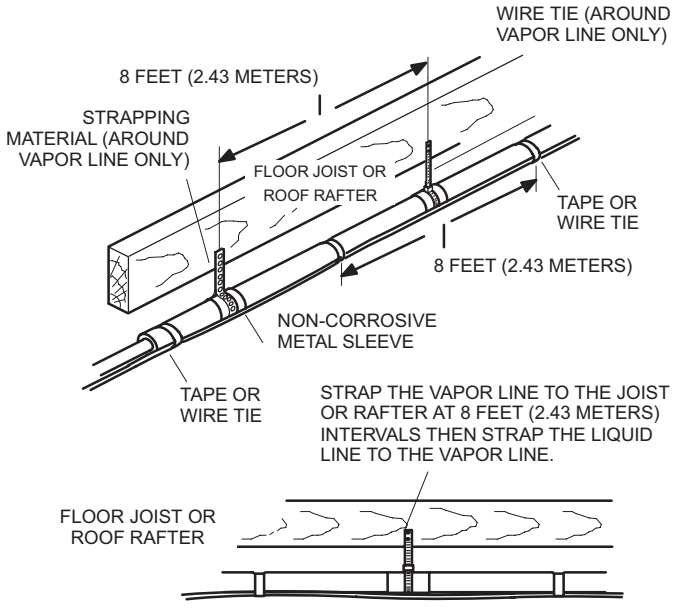
Line Set Isolation — The following illustrations are examples of proper refrigerant line set isolation:

REFRIGERANT LINE SET — TRANSITION FROM VERTICAL TO HORIZONTAL



REFRIGERANT LINE SET — INSTALLING HORIZONTAL RUNS

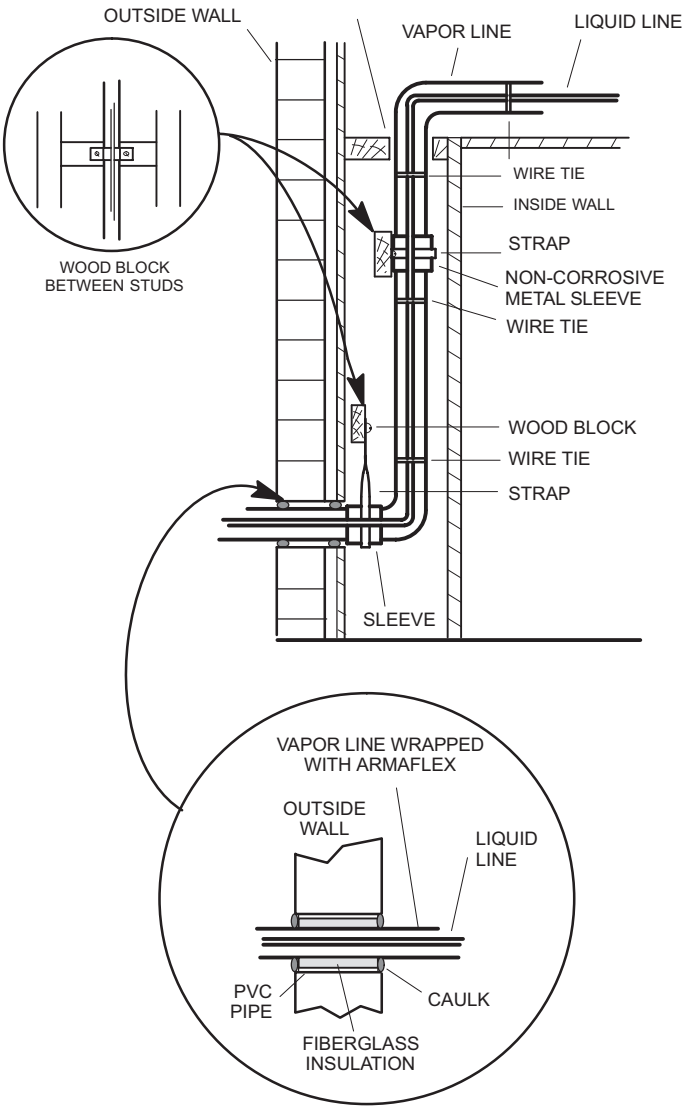
To hang line set from joist or rafter, use either metal strapping material or anchored heavy nylon wire ties.



REFRIGERANT LINE SET — INSTALLING VERTICAL RUNS (NEW CONSTRUCTION SHOWN)

NOTE — Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

IMPORTANT — Refrigerant lines must not contact wall



***NOTE** — Similar installation practices should be used if line set is to be installed on exterior of outside wall.*

WARNING — Polyol ester (POE) oils used with HFC-410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

FIGURE 7. Line Set Installation

Brazing Connections

Use the procedures outlined in figures 8 and 9 for brazing line set connections to service valves.

⚠ WARNING

Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

⚠ CAUTION

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

⚠ IMPORTANT

Allow braze joint to cool before removing the wet rag from the service valve. Temperatures above 250ºF can damage valve seals.

⚠ IMPORTANT

Use silver alloy brazing rods with 5% minimum silver alloy for copper-to-copper brazing. Use 45% minimum alloy for copper-to-brass and copper-to-steel brazing.

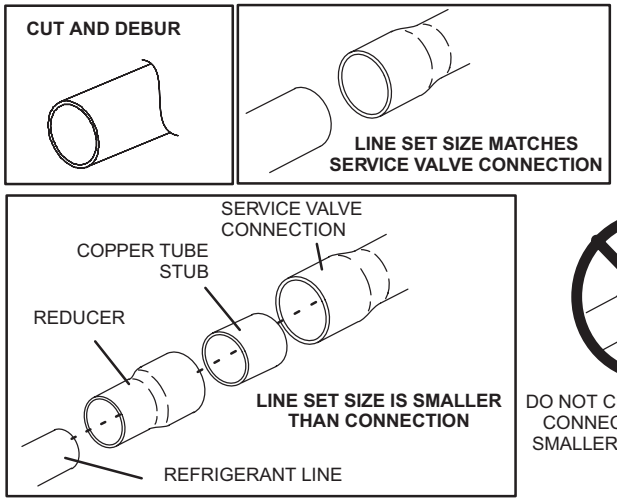
⚠ IMPORTANT

If this unit is being matched with an approved line set or indoor unit coil that was previously charged with mineral oil, or if it is being matched with a coil which was manufactured before January of 1999, the coil and line set must be flushed prior to installation. Take care to empty all existing traps. Polyol ester (POE) oils are used in Lennox units charged with HFC-410A refrigerant. Residual mineral oil can act as an insulator, preventing proper heat transfer. It can also clog the expansion device and reduce system performance and capacity.

Failure to properly flush the system, per this instruction and the detailed Installation and Service Procedures manual will void the warranty.

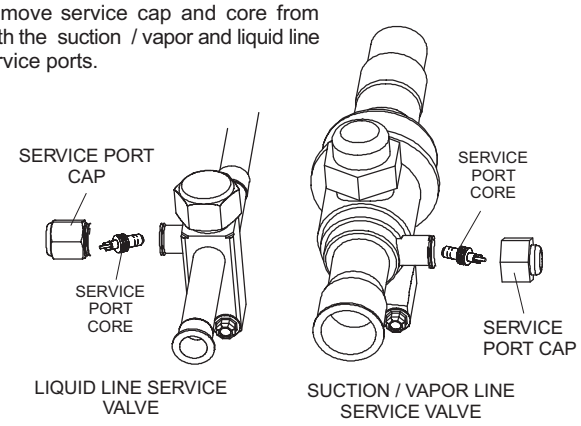
1 CUT AND DEBUR

Cut ends of the refrigerant lines square (free from nicks or dents) and debur the ends. The pipe must remain round. Do not crimp end of the line.



2 CAP AND CORE REMOVAL

Remove service cap and core from both the suction / vapor and liquid line service ports.



3 ATTACH THE MANIFOLD GAUGE SET FOR BRAZING LIQUID AND SUCTION / VAPOR LINE SERVICE VALVES

Flow regulated nitrogen (at 1 to 2 psig) through the low-side refrigeration gauge set into the liquid line service port valve, and out of the suction / vapor line service port valve.

- **A** Connect gauge set low pressure side to liquid line service valve (service port).
- **B** Connect gauge set center port to bottle of nitrogen with regulator.
- **C** Remove core from valve in suction / vapor line service port to allow nitrogen to escape.

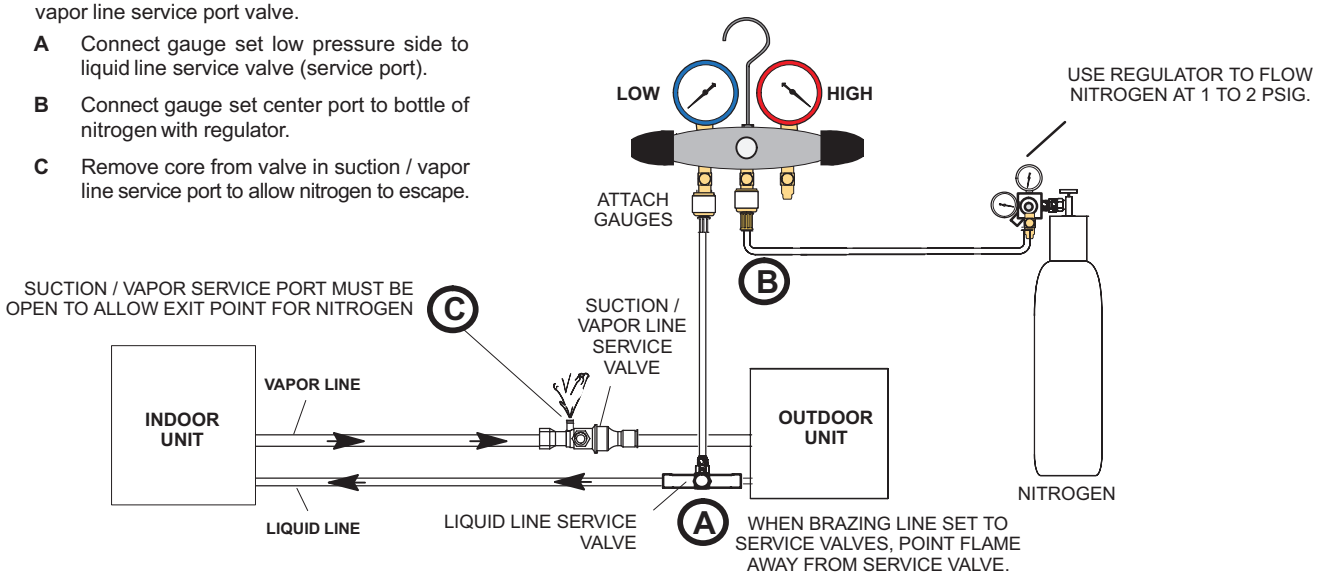


FIGURE 8. Brazing Procedures

4 WRAP SERVICE VALVES

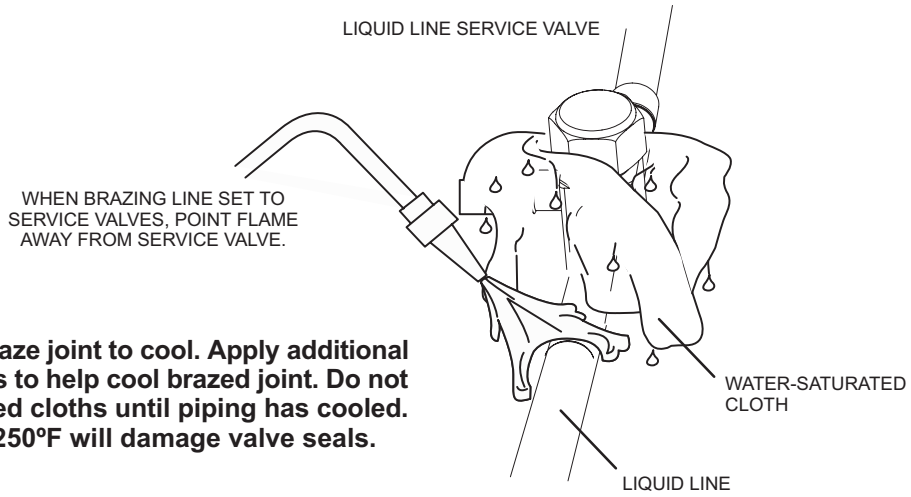
To help protect service valve seals during brazing, wrap water-saturated cloths around service valve bodies and copper tube stubs. Use additional water-saturated cloths underneath the valve body to protect the base paint.

5 FLOW NITROGEN

Flow regulated nitrogen (at 1 to 2 psig) through the refrigeration gauge set into the valve stem port connection on the liquid service valve and out of the suction / vapor valve stem port. See steps **3A, 3B** and **3C** on manifold gauge set connections.

6 BRAZE LINE SET

Wrap both service valves with water-saturated cloths as illustrated here and as mentioned in step 4, before brazing to line set. Cloths must remain water-saturated throughout the brazing and cool-down process.

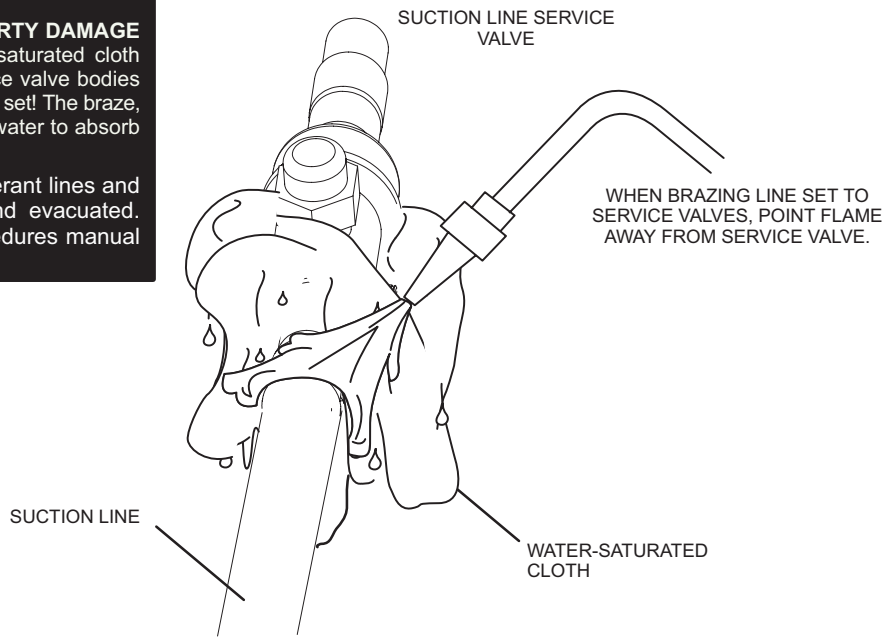


IMPORTANT - Allow braze joint to cool. Apply additional water-saturated cloths to help cool brazed joint. Do not remove water-saturated cloths until piping has cooled. Temperatures above 250ºF will damage valve seals.

WARNING

FIRE, PERSONAL INJURY, OR PROPERTY DAMAGE may result if you do not wrap a water-saturated cloth around both liquid and suction line service valve bodies and copper tube stub while brazing the line set! The braze, when complete, must be quenched with water to absorb any residual heat.

Do not open service valves until refrigerant lines and indoor coil have been leak-tested and evacuated. Refer to Installation and Service Procedures manual found on LennoxPros.com.



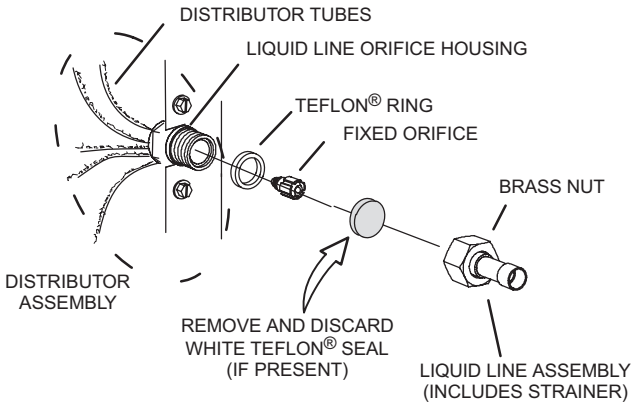
7 PREPARATION FOR NEXT STEP

Disconnect manifold gauge set from service ports after all connections have been brazed. Apply additional water-saturated cloths to both service valves to cool piping. Once piping is cool, remove all water-saturated cloths.

FIGURE 9. Brazing Procedures (Cont'd)

Flushing Line Set and Indoor Coil

1A TYPICAL EXISTING FIXED ORIFICE REMOVAL PROCEDURE (UNCASED COIL SHOWN)



A On fully cased coils, remove the coil access and plumbing panels.

B Remove any shipping clamps holding the liquid line and distributor assembly.

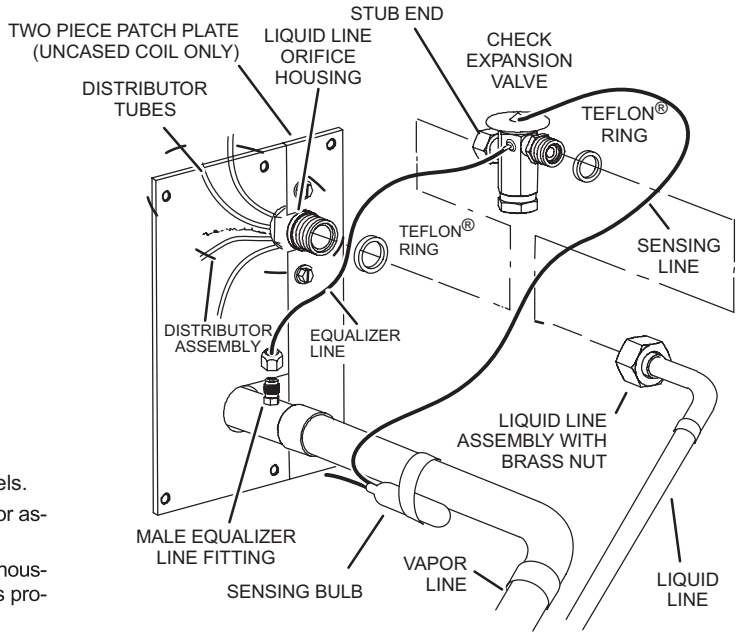
C Using two wrenches, disconnect liquid line from liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.

D Remove and discard fixed orifice, valve stem assembly if present and Teflon® washer as illustrated above.

E Use a field-provided fitting to temporarily reconnect the liquid line to the indoor unit's liquid line orifice housing.

OR

1B TYPICAL EXISTING EXPANSION VALVE REMOVAL PROCEDURE (UNCASED COIL SHOWN)



A On fully cased coils, remove the coil access and plumbing panels.

B Remove any shipping clamps holding the liquid line and distributor assembly.

C Disconnect the equalizer line from the check expansion valve equalizer line fitting on the vapor line.

D Remove the vapor line sensing bulb.

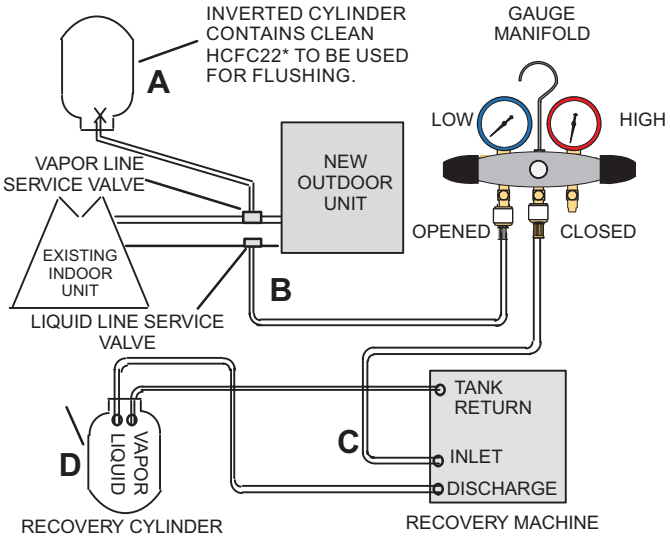
E Disconnect the liquid line from the check expansion valve at the liquid line assembly.

F Disconnect the check expansion valve from the liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.

G Remove and discard check expansion valve and the two Teflon® rings.

H Use a field-provided fitting to temporary reconnect the liquid line to the indoor unit's liquid line orifice housing.

2 CONNECT GAUGES AND EQUIPMENT FOR FLUSHING PROCEDURE



A Inverted HCFC-22 cylinder with clean refrigerant* to the vapor service valve.

B HCFC-22 gauge set (low side) to the liquid line valve.

C HCFC-22 gauge set center port to inlet on the recovery machine with an empty recovery tank to the gauge set.

D Connect recovery tank to recovery machines per machine instructions.

3 FLUSHING LINE SET

The line set and indoor unit coil must be flushed with at least the same amount of clean refrigerant* that previously charged the system. Check the charge in the flushing cylinder before proceeding.

A Set the recovery machine for liquid recovery and start the recovery machine. Open the gauge set valves to allow the recovery machine to pull a vacuum on the existing system line set and indoor unit coil.

B Invert the cylinder of clean HCFC-22* and open its valve to allow liquid refrigerant to flow into the system through the vapor line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor unit coil before it enters the recovery machine.

C After all of the liquid refrigerant has been recovered, switch the recovery machine to vapor recovery so that all of the HCFC-22 vapor is recovered. Allow the recovery machine to pull the system down to 0.

D Close the valve on the inverted HCFC-22 drum and the gauge set valves. Pump the remaining refrigerant out of the recovery machine and turn the machine off.

***IMPORTANT - Clean refrigerant is any refrigerant in a system that has not had compressor burn out. If the system has experienced burn out, it is recommended that the existing line set and indoor coil be replaced.**

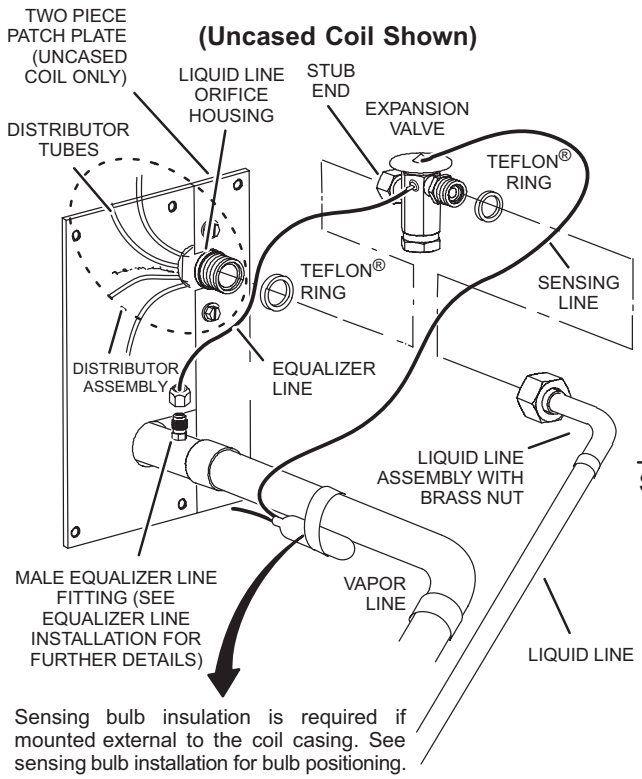
FIGURE 10. Removing Metering Device and Flushing

Installing Indoor Metering Device

This outdoor unit is designed for use in systems that use either a fixed orifice (RFC) (included with outdoor unit), or expansion valve metering device (purchased separately) at the indoor coil. See the ML17XC1 Product Specifications bulletin (EHB) for approved expansion valve kit match ups.

The expansion valve unit can be installed internal or external to the indoor coil. In applications where an uncased coil is being installed in a field-provided plenum, install the expansion valve in a manner that will provide access for field servicing of the expansion valve. Refer to below illustration for reference during installation of expansion valve unit.

INDOOR EXPANSION VALVE INSTALLATION



Sensing bulb insulation is required if mounted external to the coil casing. See sensing bulb installation for bulb positioning.

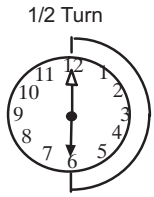
A Remove the field-provided fitting that temporary reconnected the liquid line to the indoor unit's distributor assembly.

B Install one of the provided Teflon® rings around the stubbed end of the expansion valve and lightly lubricate the connector threads and expose surface of the Teflon® ring with refrigerant oil.

C Attach the stubbed end of the expansion valve to the liquid line orifice housing. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above, or 20 ft-lb.

D Place the remaining Teflon® washer around the other end of the expansion valve. Lightly lubricate connector threads and expose surface of the Teflon® ring with refrigerant oil.

E Attach the liquid line assembly to the expansion valve. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above or 20 ft-lb.

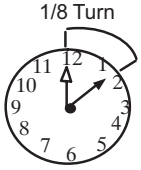


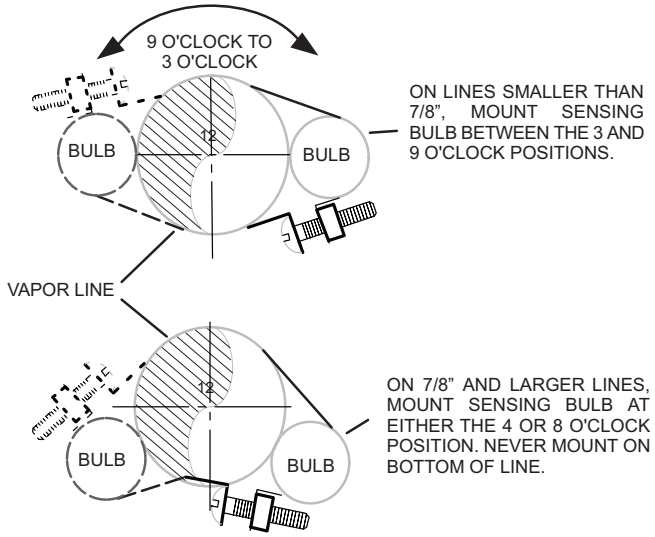
SENSING BULB INSTALLATION

A Attach the vapor line sensing bulb in the proper orientation as illustrated to the right using the clamp and screws provided.

NOTE — Confirm proper thermal contact between vapor line and expansion bulb before insulating the sensing bulb once installed.

B Connect the equalizer line from the expansion valve to the equalizer vapor port on the vapor line. Finger tighten the flare nut plus 1/8 turn (7 ft-lbs) as illustrated below.





NOTE — NEVER MOUNT ON BOTTOM OF LINE.

EQUALIZER LINE INSTALLATION

A Remove and discard either the flare seal cap or flare nut with copper flare seal bonnet from the equalizer line port on the vapor line as illustrated in the figure to the right.

B Remove and discard either the flare seal cap or flare nut with copper flare seal bonnet from the equalizer line port on the vapor line as illustrated in the figure to the right.

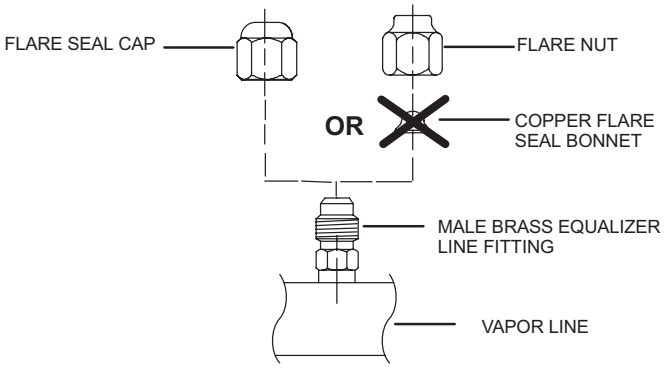


FIGURE 11

Leak Testing the System

⚠ IMPORTANT

Leak detector must be capable of sensing HFC refrigerant.

⚠ IMPORTANT

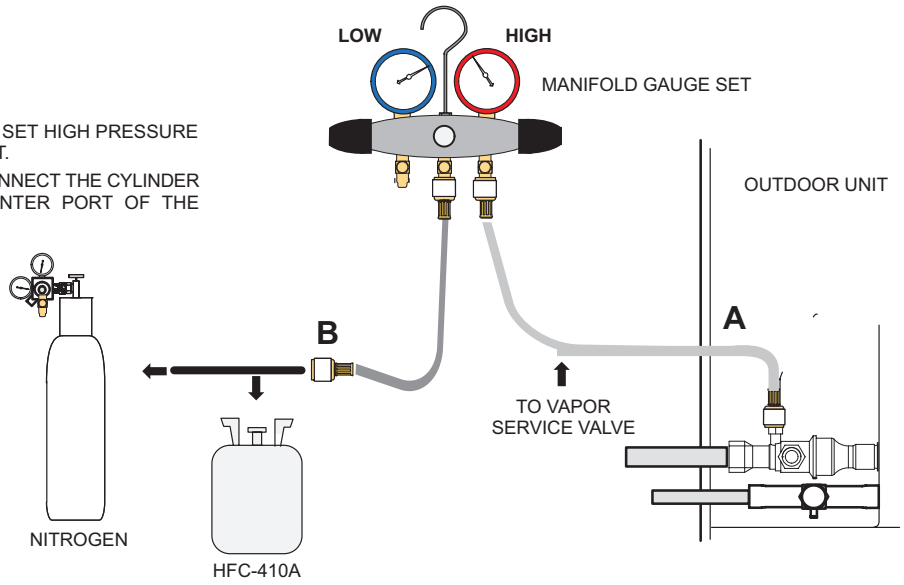
The Environmental Protection Agency (EPA) prohibits the intentional venting of HFC refrigerants during maintenance, service, repair and disposal of appliance.

Approved methods of recovery, recycling or reclaiming must be followed.

LEAK TEST

LINE SET AND INDOOR COIL

***NOTE** - NORMALLY, THE HIGH PRESSURE HOSE IS CONNECTED TO THE LIQUID LINE PORT. HOWEVER, CONNECTING IT TO THE VAPOR PORT BETTER PROTECTS THE MANIFOLD GAUGE SET FROM HIGH PRESSURE DAMAGE.*



1 CONNECT GAUGE SET

A. CONNECT AN HFC-410A MANIFOLD GAUGE SET HIGH PRESSURE HOSE TO THE VAPOR VALVE SERVICE PORT.

B. WITH BOTH MANIFOLD VALVES CLOSED, CONNECT THE CYLINDER OF HFC-410A REFRIGERANT TO THE CENTER PORT OF THE MANIFOLD GAUGE SET.

NOTE - LATER IN THE PROCEDURE, THE HFC-410A CONTAINER WILL BE REPLACED BY THE NITROGEN CONTAINER.

2 TEST FOR LEAKS

AFTER THE LINE SET HAS BEEN CONNECTED TO THE INDOOR AND OUTDOOR UNITS, CHECK THE LINE SET CONNECTIONS AND INDOOR UNIT FOR LEAKS. USE THE FOLLOWING PROCEDURE TO TEST FOR LEAKS:

A. WITH BOTH MANIFOLD VALVES CLOSED, CONNECT THE CYLINDER OF HFC-410A REFRIGERANT TO THE CENTER PORT OF THE MANIFOLD GAUGE SET. OPEN THE VALVE ON THE HFC-410A CYLINDER (VAPOR ONLY).

B. OPEN THE HIGH PRESSURE SIDE OF THE MANIFOLD TO ALLOW HFC-410A INTO THE LINE SET AND INDOOR UNIT. WEIGH IN A TRACE AMOUNT OF HFC-410A *[A TRACE AMOUNT IS A MAXIMUM OF TWO OUNCES (57 G) REFRIGERANT OR THREE POUNDS (31 KPA) PRESSURE]*. CLOSE THE VALVE ON THE HFC-410A CYLINDER AND THE VALVE ON THE HIGH PRESSURE SIDE OF THE MANIFOLD GAUGE SET. DISCONNECT THE HFC-410A CYLINDER.

C. CONNECT A CYLINDER OF DRY NITROGEN WITH A PRESSURE REGULATING VALVE TO THE CENTER PORT OF THE MANIFOLD GAUGE SET.

D. ADJUST DRY NITROGEN PRESSURE TO 150 PSIG (1034 KPA). OPEN THE VALVE ON THE HIGH SIDE OF THE MANIFOLD GAUGE SET IN ORDER TO PRESSURIZE THE LINE SET AND THE INDOOR UNIT.

E. AFTER A FEW MINUTES, OPEN ONE OF THE SERVICE VALVE PORTS AND VERIFY THAT THE REFRIGERANT ADDED TO THE SYSTEM EARLIER IS MEASURABLE WITH A LEAK DETECTOR.

F. AFTER LEAK TESTING, DISCONNECT GAUGES FROM SERVICE PORTS.

FIGURE 12. System Leak Test

Evacuating Line Set and Indoor Coil

1 CONNECT GAUGE SET

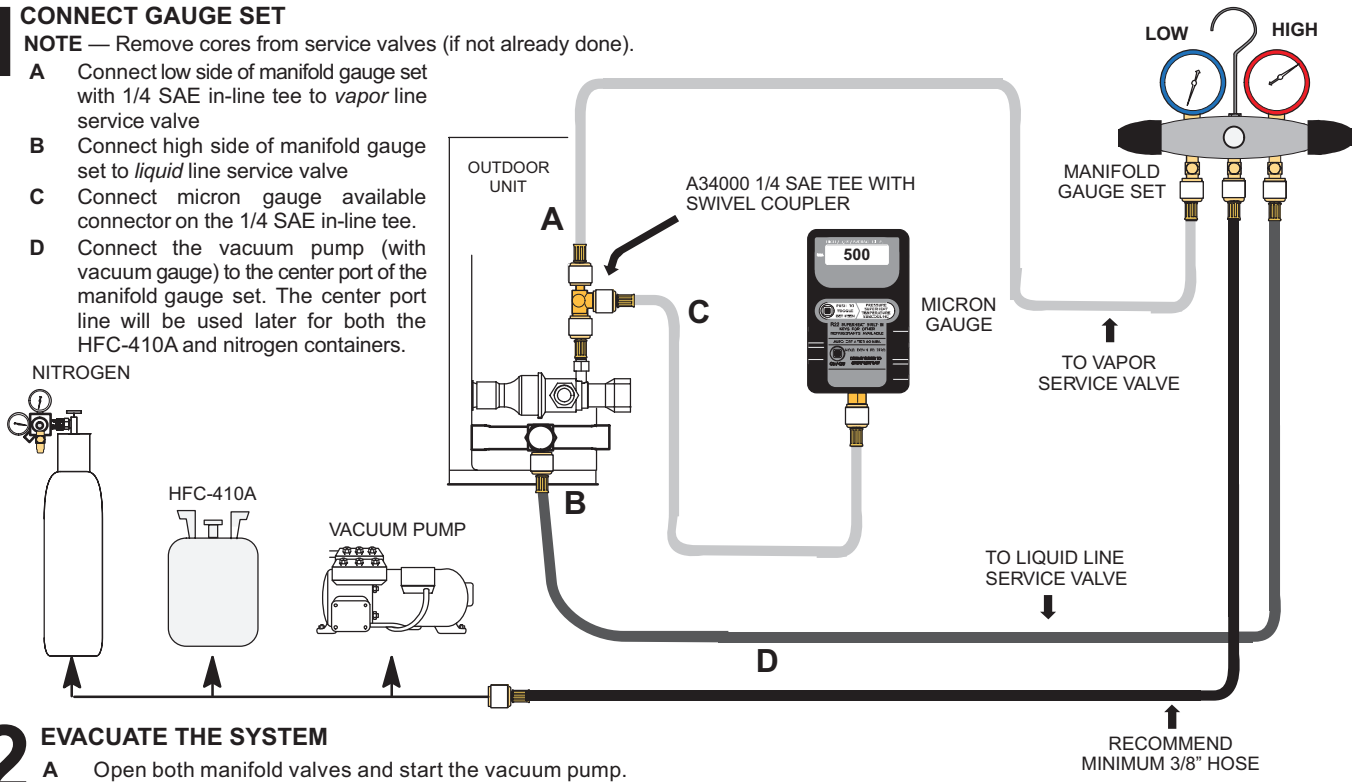
NOTE — Remove cores from service valves (if not already done).

A Connect low side of manifold gauge set with 1/4 SAE in-line tee to *vapor* line service valve

B Connect high side of manifold gauge set to *liquid* line service valve

C Connect micron gauge available connector on the 1/4 SAE in-line tee.

D Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set. The center port line will be used later for both the HFC-410A and nitrogen containers.



2 EVACUATE THE SYSTEM

A Open both manifold valves and start the vacuum pump.

B Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29.01 inches of mercury).

NOTE *— During the early stages of evacuation, it is desirable to close the manifold gauge valve at least once. A rapid rise in pressure indicates a relatively large leak. If this occurs,* ***repeat the leak testing procedure****.*

NOTE *— The term* ***absolute pressure*** *means the total actual pressure within a given volume or system, above the absolute zero of pressure. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.*

C When the absolute pressure reaches 23,000 microns (29.01 inches of mercury), perform the following:

- Close manifold gauge valves
- Close valve on vacuum pump
- Turn off vacuum pump
- Disconnect manifold gauge center port hose from vacuum pump
- Attach manifold center port hose to a dry nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) and purge the hose.
- Open manifold gauge valves to break the vacuum in the line set and indoor unit.
- Close manifold gauge valves.

D Shut off the dry nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the dry nitrogen from the line set and indoor unit.

E Reconnect the manifold gauge to the vacuum pump, turn the pump on, and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above 500 microns (29.9 inches of mercury) within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.

F When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to an upright cylinder of HFC-410A refrigerant. Open the manifold gauge valve 1 to 2 psig in order to release the vacuum in the line set and indoor unit.

G Perform the following:

- Close manifold gauge valves.
- Shut off HFC-410A cylinder.
- Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.
- Replace stem caps and secure finger tight, then tighten an additional one-sixth (1/6) of a turn as illustrated.

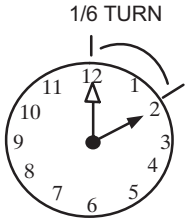


FIGURE 13. Evacuating the System

⚠ IMPORTANT

Use a thermocouple or thermistor electronic vacuum gauge that is calibrated in microns. Use an instrument capable of accurately measuring down to 50 microns.

⚠ WARNING

Possible equipment damage.

Avoid deep vacuum operation. Do not use compressors to evacuate a system. Extremely low vacuum can cause internal arcing and compressor failure. Damage caused by deep vacuum operation will void warranty.

Evacuating the system of non-condensables is critical for proper operation of the unit. Non-condensables are defined as any gas that will not condense under temperatures and pressures present during operation of an air conditioning system. Non-condensables and water suction combine with refrigerant to produce substances that corrode copper piping and compressor parts.

Electrical – Circuit Sizing and Wire Routing

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

Refer to the furnace or air handler installation instructions for additional wiring application diagrams and refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

24VAC TRANSFORMER

Use the transformer provided with the furnace or air handler for low-voltage control power (24VAC - 40 VA minimum).

⚠ WARNING

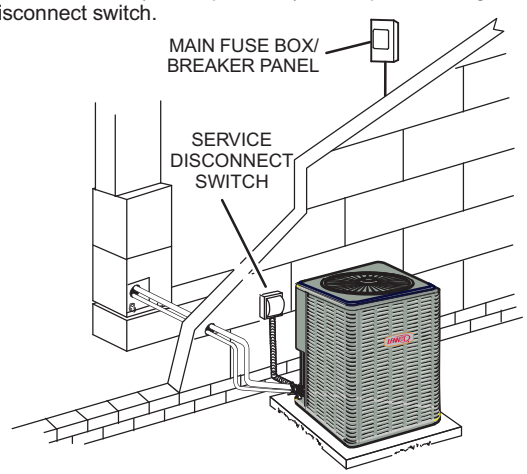
Fire Hazard. Use of aluminum wire with this product may result in a fire, causing property damage, severe injury or death. Use copper wire only with this product.

⚠ WARNING

Failure to use properly sized wiring and circuit breaker may result in property damage. Size wiring and circuit breaker(s) per Product Specifications bulletin (EHB) and unit rating plate.

SIZE CIRCUIT AND INSTALL SERVICE DISCONNECT SWITCH

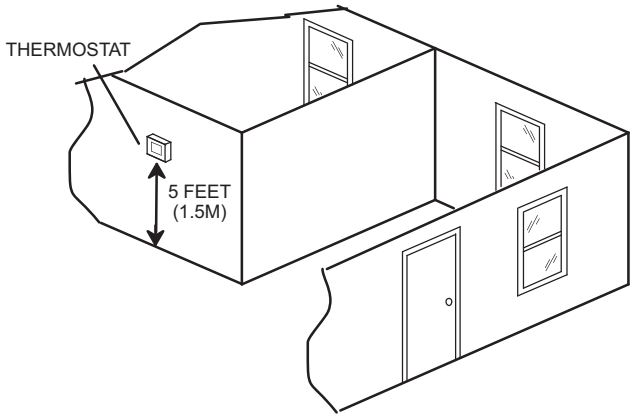
Refer to the unit nameplate for minimum circuit ampacity, and maximum fuse or circuit breaker (HACR per NEC). Install power wiring and properly sized disconnect switch.



NOTE — Units are approved for use only with copper conductors. Ground unit at disconnect switch or to an earth ground.

INSTALL THERMOSTAT

Install room thermostat (ordered separately) on an inside wall approximately in the center of the conditioned area and 5 feet (1.5m) from the floor. It should not be installed on an outside wall or where it can be affected by sunlight or drafts.



NOTE — 24VAC, Class II circuit connections are made in the control panel.

ROUTING HIGH VOLTAGE/ GROUND AND CONTROL WIRING

HIGH VOLTAGE / GROUND WIRES

Any excess high voltage field wiring should be trimmed and secured away from any low voltage field wiring. To facilitate a conduit, a cutout is located in the bottom of the control panel. Connect conduit to the control panel using a proper conduit fitting.

HIGH VOLTAGE FIELD WIRING
LOW VOLTAGE FIELD WIRING
FACTORY WIRING

CONTROL WIRING

NOTE — Wire tie provides low voltage control wire strain relief and to maintain separation of field installed low and high voltage circuits.

NOTE — For proper voltages, select thermostat wire (control wires) gauge per table below.

NOTE — Do not bundle any excess 24VAC control wires inside control panel.

Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit as illustrated.

A Run 24VAC control wires through hole with grommet and secure with provided wire tie.

B Make 24VAC thermostat wire connections. Locate the two wires from the contactor and make connection using field provided wire nuts:

- Yellow to Y1
- Black to C (common)

WIRE RUN LENGTH	AWG#	INSULATION TYPE
LESS THAN 100' (30 METERS)	18	TEMPERATURE RATING
MORE THAN 100' (30 METERS)	16	35ºC MINIMUM.

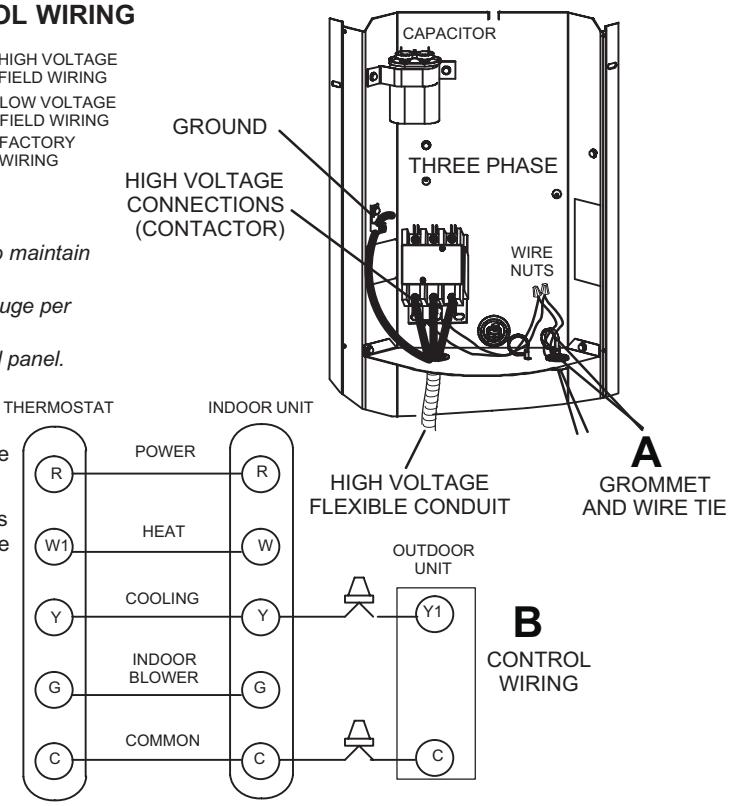


FIGURE 14. Typical Wiring

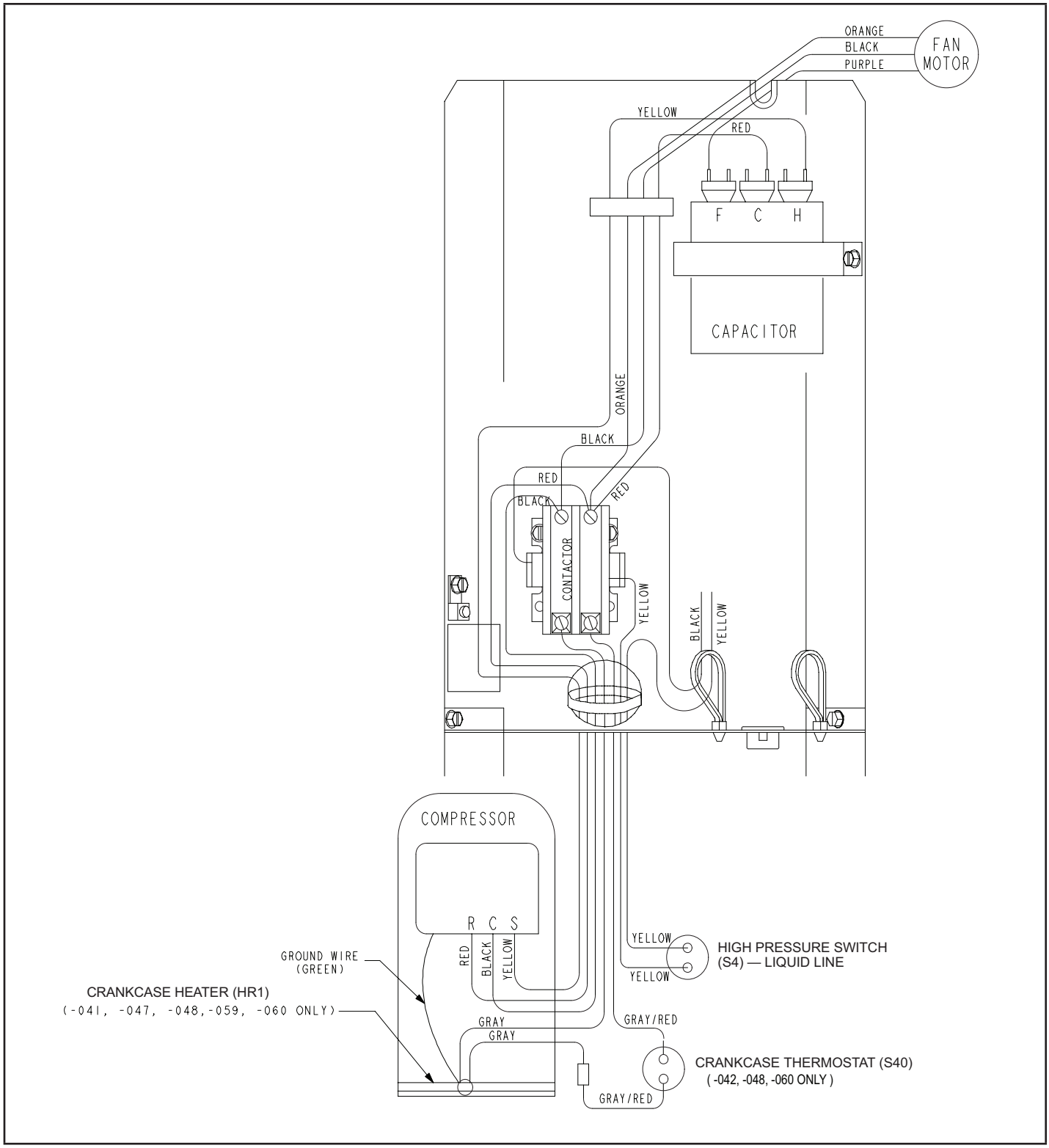


FIGURE 15. Typical Factory Wiring Diagram – -018, -036, -042, -048 and -060 Units Only

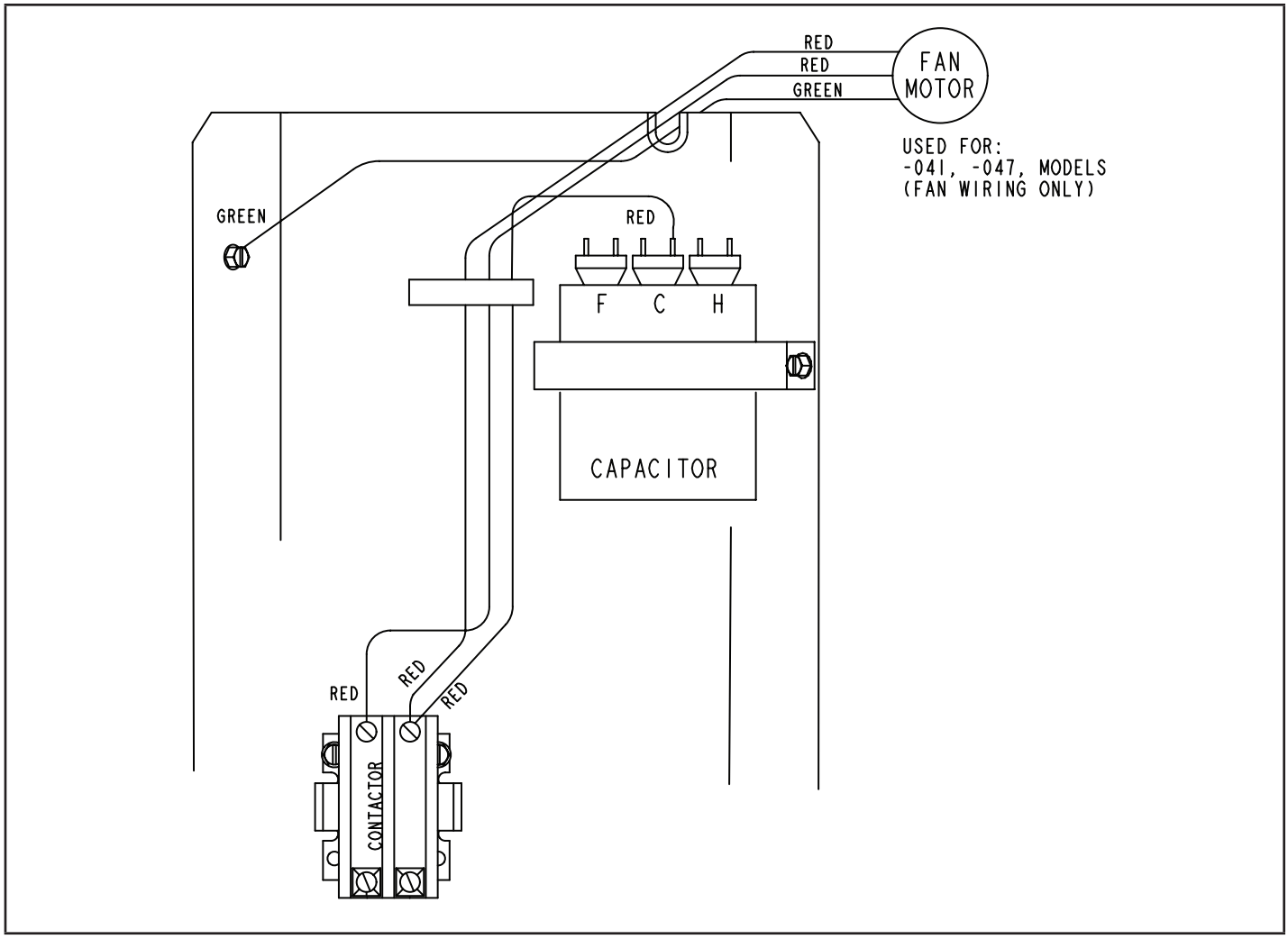


FIGURE 16. Typical Factory Wiring – -041, -047 and -059 Units Only

System Operation

⚠ IMPORTANT

Some scroll compressors have an internal vacuum protector that will unload scrolls when suction pressure goes below 20 psig. A hissing sound will be heard when the compressor is running unloaded. Protector will reset when low pressure in system rises above 40 psig. DO NOT REPLACE COMPRESSOR.

The outdoor unit and indoor blower will cycle on and off as dictated by demands from the room thermostat. When the thermostat's blower switch is in the **ON** position, the indoor blower will operate continuously.

HIGH PRESSURE SWITCH (S4)

ML17XC1 units are equipped with a high-pressure switch that is factory-wired and located in the liquid line.

The switch is a Single Pole, Single Throw (SPST), auto-reset switch which is normally closed and removes power from the compressor when discharge pressure rises above factory setting at 590 ± 10 psig; resets at 418 ± 5 psig.

CRANKCASE HEATER (HR1) AND THERMOSTAT (S40)

Compressors in some models are equipped with a 40 watt or 70 watt, belly band type crankcase heater. HR1 prevents liquid from accumulating in the compressor. HR1 is controlled by a single pole, single through thermostat switch (S40) located on the liquid line (see figure 1 for location).

When liquid line temperature drops below 50° F the thermostat closes energizing HR1. The thermostat will open, de-energizing HR1 once liquid line temperature reaches 70° F.

Maintenance

Your heating and air conditioning system should be inspected and maintained yearly (before the start of the cooling and heating seasons) by a licensed professional HVAC technician. You can expect the technician to check the following items. **These checks may only be conducted by a licensed professional HVAC technician.**

Outdoor Unit

1. Inspect component wiring for loose, worn or damaged connections. Also check for any rubbing or pinching of wires. Confirm proper voltage plus amperage of outdoor unit.
2. Check the cleanliness of outdoor fan and blade assemblies. Check condition of fan blades (cracks). Clean or replace them, if necessary.
3. Inspect base pan drains for debris and clean as necessary.
4. Inspect the condition of refrigerant piping and confirm that pipes are not rubbing copper-to-copper. Also, check the condition of the insulation on the refrigerant lines. Repair, correct, or replace as necessary.
5. Test capacitor. Replace as necessary.
6. Inspect contactor contacts for pitting or burn marks. Replace as necessary.
7. Check outdoor fan motor for worn bearings/bushings. Replace as necessary.
8. Inspect and clean outdoor coils, if necessary and note any damage to coils or signs of leakage.

NOTICE !

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, Lennox recommends use of a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

Indoor Unit (Air Handler or Furnace)

1. Inspect component wiring for loose, worn or damaged connections. Confirm proper voltage plus amperage indoor unit.
2. Inspect and clean or replace air filters in indoor unit.
3. Check the cleanliness of indoor blower and clean blower, if necessary.
4. Inspect the evaporator coil (Indoor) drain pans and condensate drains for rust, debris, obstructions, leaks or cracks. Pour water in pans to confirm proper drainage from the pan through to the outlet of the pipe. Clean or replace as necessary.
5. Inspect and clean evaporator (indoor) coil, if necessary.
6. Inspect the condition of the refrigerant lines and confirm that pipes are not rubbing copper-to-copper. Also, ensure that refrigerant pipes are not being affected by indoor air contamination. Check condition of insulation on the refrigerant lines. Repair, correct, or replace as necessary.
7. Inspect the duct system for leaks or other problems. Repair or replace as necessary.
8. Check for bearing/bushing wear on indoor blower motor. Replace as necessary.
9. Indoor unit inspections of gas- or oil-fired furnaces will also include inspection and cleaning of the burners, and a full inspection of the gas valve, heat exchanger and flue (exhaust) system.

General System Test with System Operating

1. Your technician should perform a general system test. He will turn on the air conditioner to check operating functions such as the startup and shutoff operation. He will also check for unusual noises or odors, and measure indoor/outdoor temperatures and system pressures as needed.
2. The technician will check the refrigerant charge per the charging sticker information on the outdoor unit.
3. Verify that system total static pressure and airflow settings are within specific operating parameters.
4. Verify correct temperature drop across indoor coil.

Start-Up and Performance Checklist

Job Name _____ Job no. _____ Date _____

Job Location _____ City _____ State _____

Installer _____ City _____ State _____

Unit Model No. _____ Serial No. _____ Service Technician _____

Nameplate Voltage _____

Rated Load Ampacity _____ Compressor _____ Outdoor Fan _____

Maximum Fuse or Circuit Breaker _____

Electrical Connections Tight? ❑ Indoor Filter clean? ❑ Supply Voltage (Unit Off) _____

Indoor Blower RPM _____ S.P. Drop Over Indoor (Dry) _____ Outdoor Coil Entering Air Temp. _____

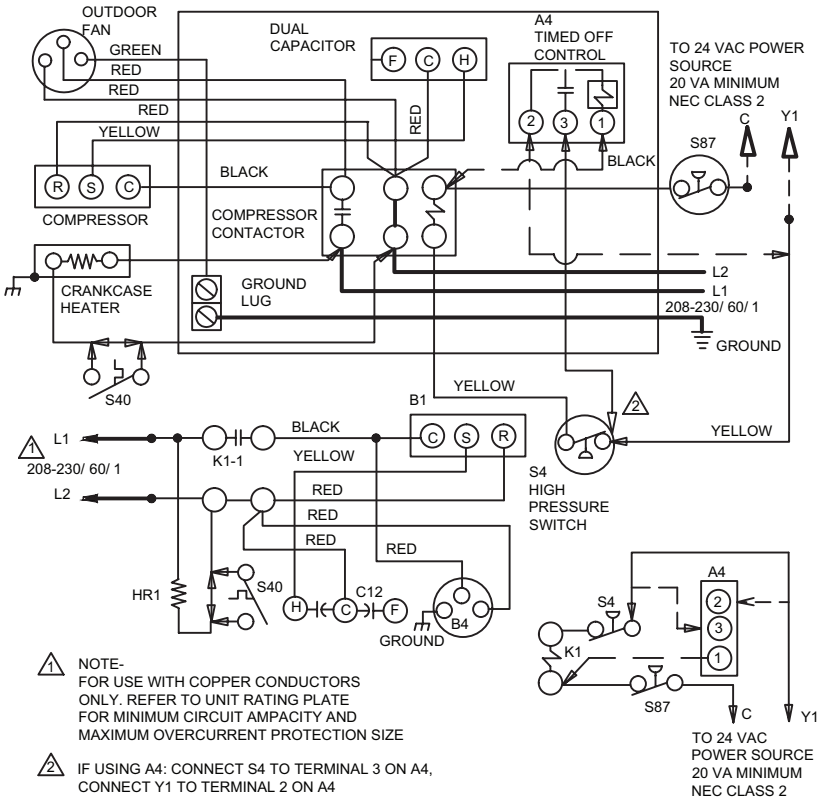
Discharge Pressure _____ Suction Pressure _____ Refrigerant Charge Checked? ❑

Refrigerant Lines: - Leak Checked? ❑ Properly Insulated? ❑ Outdoor Fan Checked? ❑

Service Valves: --- Fully Opened? ❑ Caps Tight? ❑ **Thermostat**

Voltage With Compressor Operating _____ Calibrated? ❑ Properly Set? ❑ Level? ❑

Typical Field Wiring



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C12	CAPACITOR-DUAL
HR1	HEATER-COMPRESSOR
K1,-1	CONTACTOR-COMPRESSOR
S4	SWITCH-HIGH PRESSURE
S24	SWITCH-LOSS OF CHARGE
S40	TERMOSTAT-CRANKCASE
S87	SWITCH-LOW PRESS, COMP 1

NOTE-
IF ANY WIRE IN THIS APPLIANCE IS REPLACED,IT MUST BE REPLACED WITH WIRE OF LIKE SIZE, RATING, INSULATION THICKNESS, AND TERMINATION.

LINE VOLTAGE FIELD INSTALLED
CLASS II VOLTAGE FIELD WIRING
DENOTES OPTIONAL COMPONENTS

SINGLE SPEED COOLING MODELS

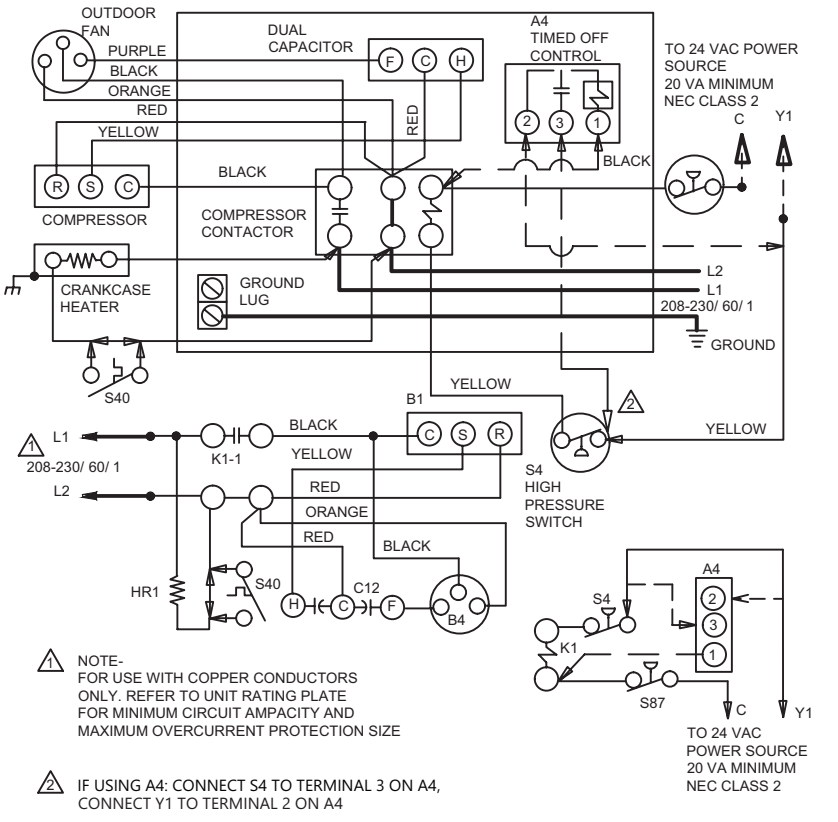
Supersedes

03/22

Form No. 538239-01

Litho U.S.A.

FIGURE 17. Typical Field Wiring – All Units Except -041, -047 and -059



DESCRIPTION	
KEY	COMPONENT
A4	CONTROL-TIMED OFF
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C12	CAPACITOR-DUAL
HR1	HEATER-COMPRESSOR
K1,-1	CONTACTOR-COMPRESSOR
S4	SWITCH-HIGH PRESSURE
S24	SWITCH-LOSS OF CHARGE
S40	TERMOSTAT-CRANKCASE
S87	SWITCH-LOW PRESS, COMP 1

FIGURE 18. Typical Field Wiring – -018, -024, -030, -036, -042, -048, -060 Units Only

***NOTE** – The thermostat used may be electromechanical or electronic.*

***NOTE** – Transformer in indoor unit supplies power (24 VAC) to the thermostat and outdoor unit controls.*

COOLING*:*

1. Cooling demand initiates at Y1 in the thermostat.
2. 24VAC from indoor unit (Y1) energizes the TOC timed off control (if used) which energizes contactor K1 (provided S4 high pressure switch is closed).
3. K1-1 N.O. closes, energizing compressor (B1) and outdoor fan motor (B4).
4. Compressor (B1) and outdoor fan motor (B4) begin immediate operation..

END OF COOLING DEMAND:

5. Cooling demand is satisfied. Terminal Y1 is de-energized.
6. Compressor contactor K1 is de-energized.
7. K1-1 opens and compressor (B1) and outdoor fan motor (B4) are de-energized and stop immediately

Servicing Units Delivered Void of Charge

If the outdoor unit is void of refrigerant, clean the system using the procedure described below.

1 - Leak test the system using the procedure outlined on page 18.

2 - Evacuate the system using procedure outlined on page 19.

3 - Use nitrogen to break the vacuum and install a new filter drier in the system.

4 - Evacuate the system again using procedure outlined on page 19.

5 - Weigh in refrigerant using procedure outlined in figure 20.

Unit Start-Up

⚠ IMPORTANT

If unit is equipped with a crankcase heater, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

1 - Rotate fan to check for binding.

2 - Inspect all factory- and field-installed wiring for loose connections.

3 - After evacuation is complete, open both the liquid and vapor line service valves to release the refrigerant charge (contained in outdoor unit) into the system.

4 - Replace the stem caps and tighten to the value listed in table 1.

5 - Check voltage supply at the disconnect switch. The voltage must be within the range listed on the unit's nameplate. If not, do not start the equipment until you have consulted with the power company and the voltage condition has been corrected.

6 - Set the thermostat for a cooling demand. Turn on power to the indoor unit and close the outdoor unit disconnect switch to start the unit.

7 - Recheck voltage while the unit is running. Power must be within range shown on the nameplate.

8 - Check system for sufficient refrigerant by using the procedures that follow.

System Refrigerant

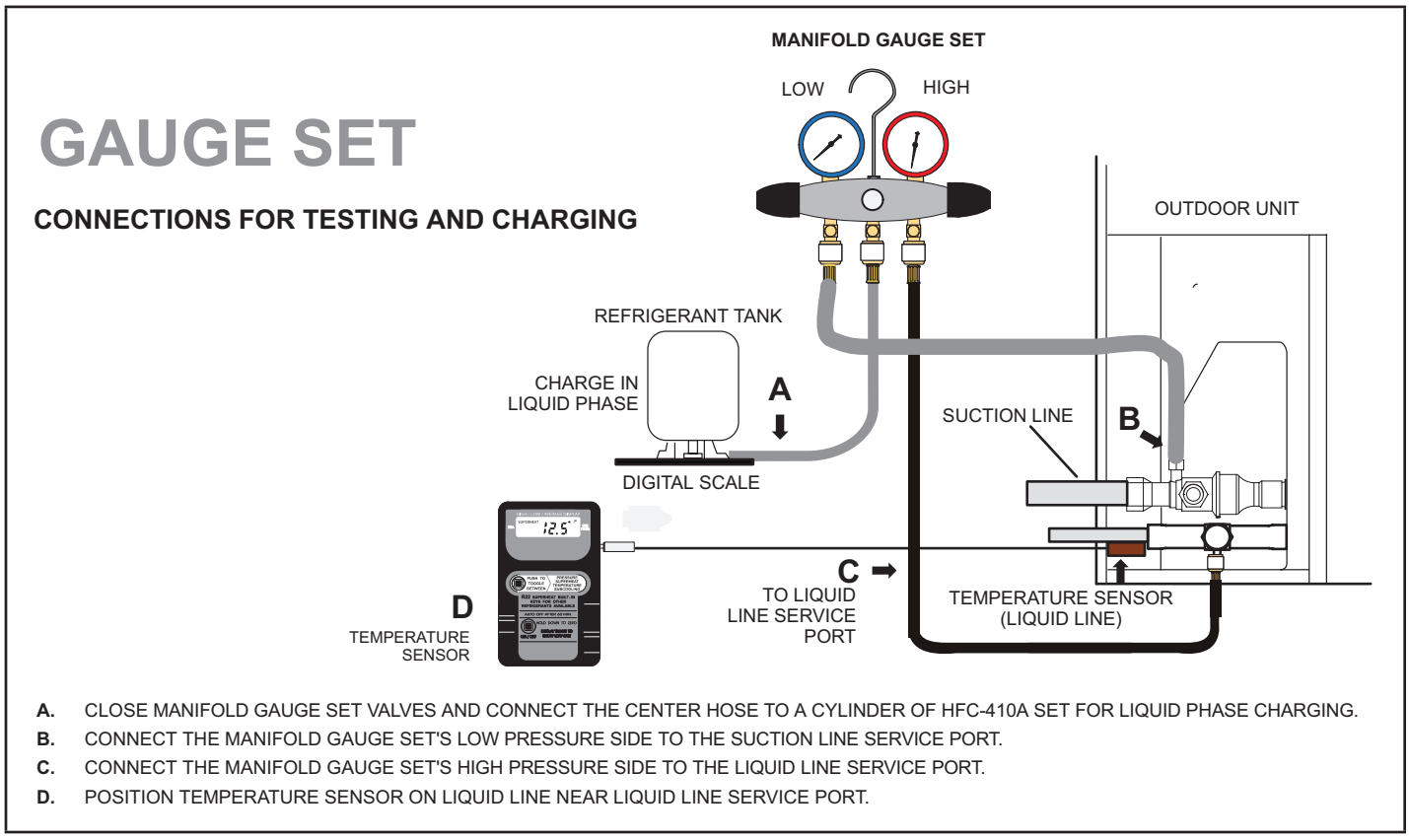
This section outlines procedures for:

1 - Connecting gauge set for testing and charging;

2 - Checking and adjusting indoor airflow;

3 - Adding or removing refrigerant.

NOTE - System fault and lockout codes take precedence over system status codes (cooling, heating operating percentages or defrost/dehumidification).



A. CLOSE MANIFOLD GAUGE SET VALVES AND CONNECT THE CENTER HOSE TO A CYLINDER OF HFC-410A SET FOR LIQUID PHASE CHARGING.
B. CONNECT THE MANIFOLD GAUGE SET'S LOW PRESSURE SIDE TO THE SUCTION LINE SERVICE PORT.
C. CONNECT THE MANIFOLD GAUGE SET'S HIGH PRESSURE SIDE TO THE LIQUID LINE SERVICE PORT.
D. POSITION TEMPERATURE SENSOR ON LIQUID LINE NEAR LIQUID LINE SERVICE PORT.

FIGURE 19. Gauge Set Setup and Connections

ADDING OR REMOVING REFRIGERANT

This system uses HFC-410A refrigerant which operates at much higher pressures than HCFC-22. The pre-installed liquid line filter drier is approved for use with HFC-410A only. Do not replace it with components designed for use with HFC-22. Check airflow using the Delta-T (DT) process using the illustration in figure 20.

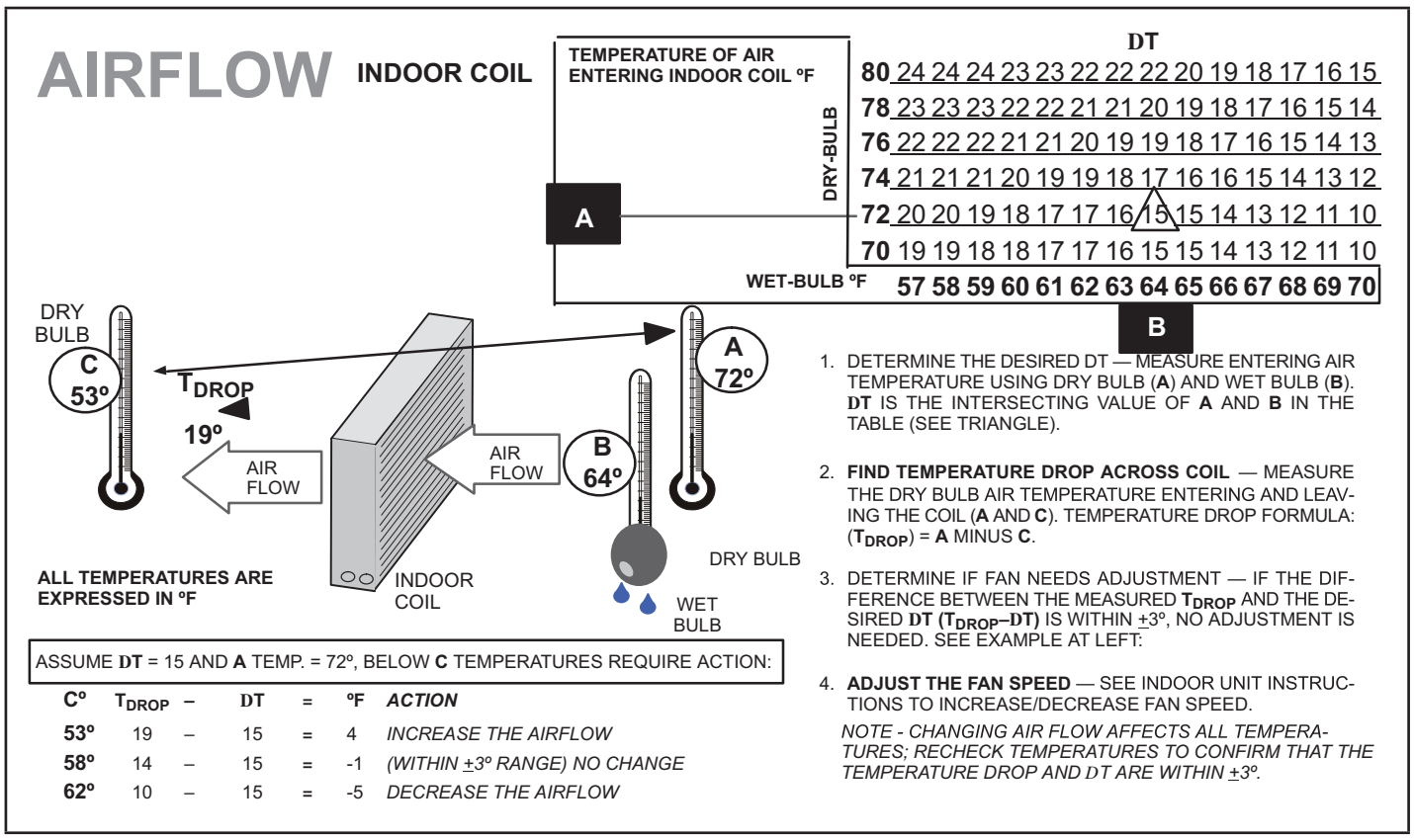


FIGURE 20. Checking Indoor Airflow over Evaporator Coil using Delta-T Chart

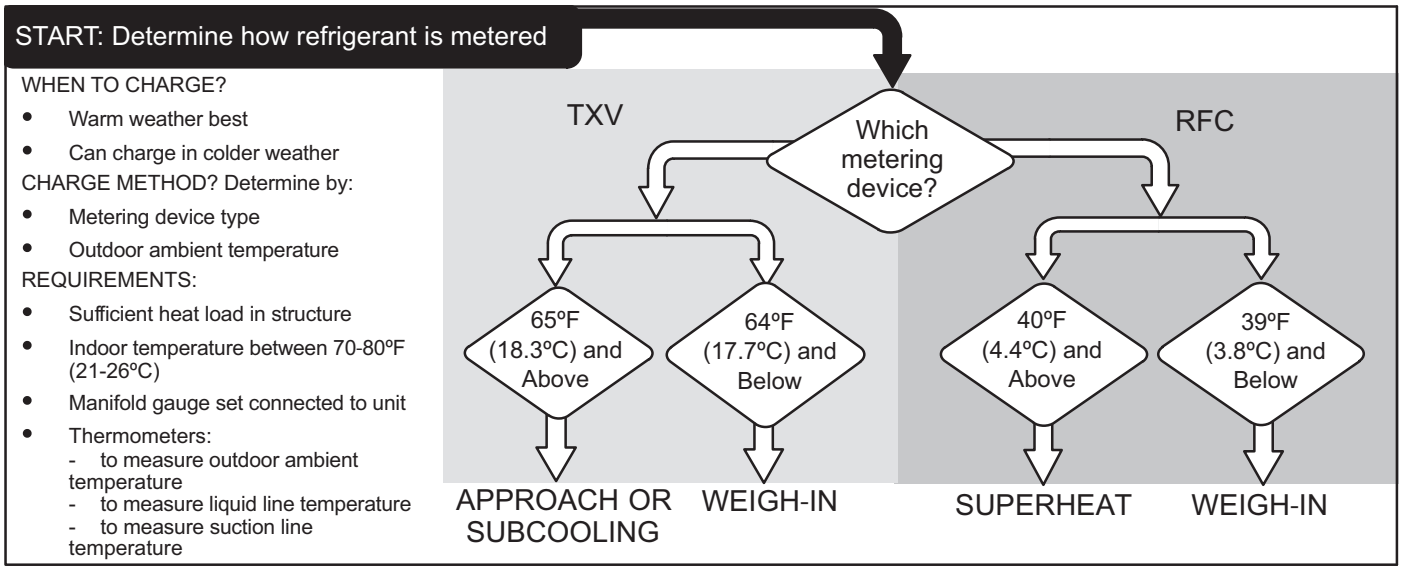


FIGURE 21. Determining Charge Method

WEIGH IN (RFC AND TXV)

CALCULATING SYSTEM CHARGE FOR OUTDOOR UNIT VOID OF CHARGE

If the system is void of refrigerant, first, locate and repair any leaks and then weigh in the refrigerant charge into the unit. To calculate the total refrigerant charge:

Amount specified on nameplate _____ ± Adjust amount. for variation in line set length listed on line set length table below. _____ = Total charge _____

NOTE — The above nameplate is for illustration purposes only. Go to actual nameplate on outdoor unit for charge information.

Refrigerant Charge per Line Set Length

Liquid Line Set Diameter	Ounces per 5 feet (g per 1.5 m) adjust from 15 feet (4.6 m) line set*
3/8” (9.5 mm)	3 ounce per 5' (85 g per 1.5 m)

NOTE — Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

FIGURE 22. Using HFC-410A Weigh-In Method

START: Measure outdoor ambient temperature

ABOVE or BELOW

65ºF (18.3ºC) and Above

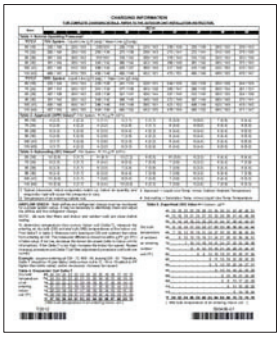
64ºF (17.7ºC) and Below

USE WEIGH-IN METHOD
Weigh-in or remove refrigerant based upon line length

APPROACH TXV

If refrigerant is added or removed, retest to confirm that unit is properly charged.

If value is greater than shown (high approach), add refrigerant; if less than shown (liquid temperature too close to ambient temperature, low approach), remove refrigerant.



1. Confirm proper airflow across coil using figure 19.
2. Compare unit pressures with normal operating pressures provided on applicable charging sticker as reference in table 1.
3. Set thermostat to call for heat (must have a cooling load between 70-80ºF (21-26ºC).
4. Connect gauge set.
5. When heat demand is satisfied, set thermostat to call for cooling.
6. Allow temperatures and pressures to stabilize.
7. Record outdoor ambient temperature:
   AMBº =_____
8. Record liquid line temperature:
   LIQº = _____
9. Subtract to determine approach (APPº):
   LIQº_____ - AMBº _____ = APPº_____
10. Compare results with applicable charging sticker located on unit access panel or copy located at the end of this manual. See table 2 for to determine applicable charging information for specific model.

FIGURE 23. HFC-410A Approach TXV Charge

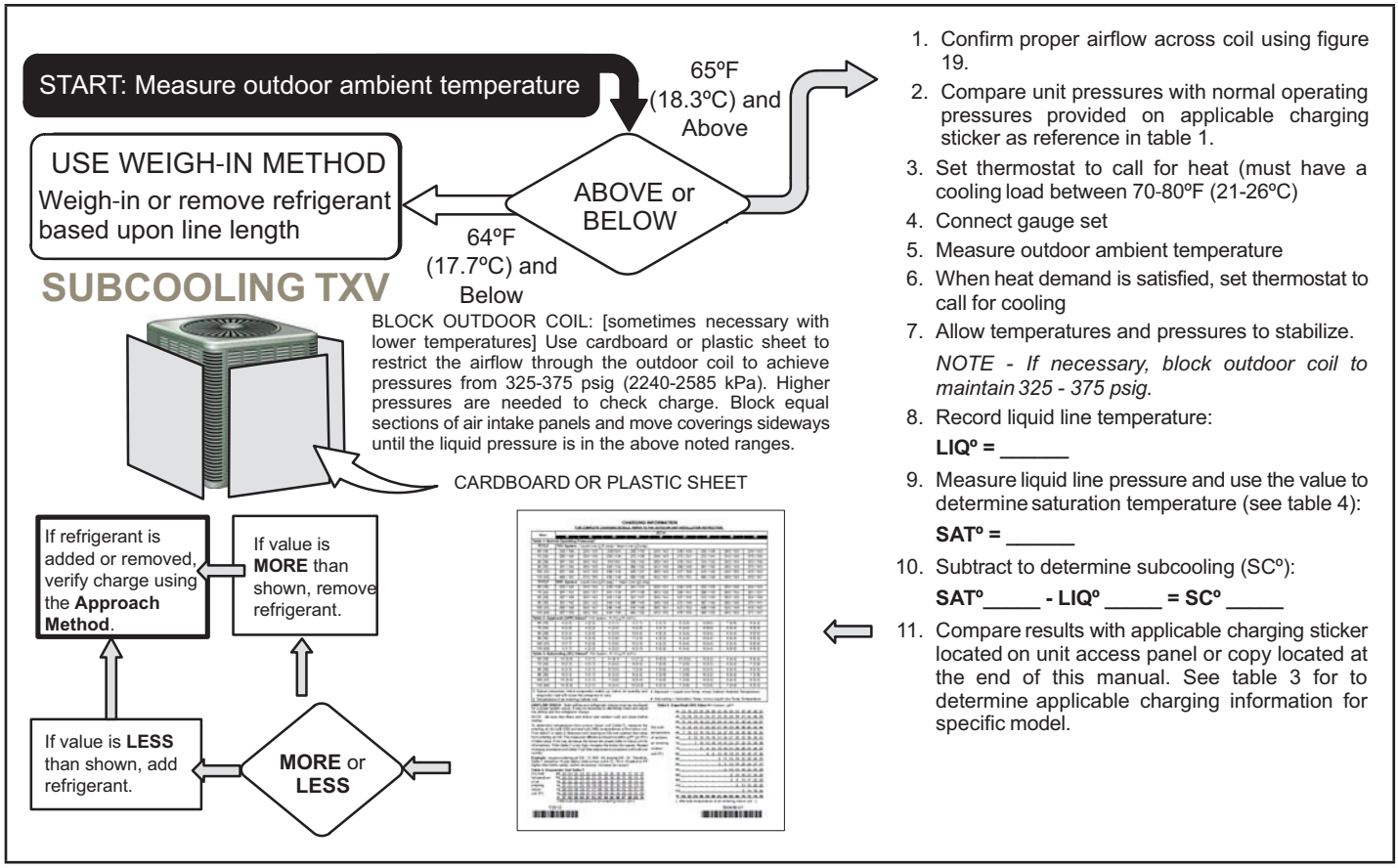


FIGURE 24. HFC-410A Subcooling TXV Charge

TABLE 5. HFC-410A Temperature – Pressure (Psig)

°F	°C	Psig	°F	°C	Psig
-40	-40.0	11.6	**60**	15.6	170
-35	-37.2	14.9	**65**	18.3	185
-30	-34.4	18.5	**70**	21.1	201
-25	-31.7	22.5	**75**	23.9	217
-20	-28.9	26.9	**80**	26.7	235
-15	-26.1	31.7	**85**	29.4	254
-10	-23.3	36.8	**90**	32.2	274
-5	-20.6	42.5	**95**	35.0	295
0	-17.8	48.6	**100**	37.8	317
5	-15.0	55.2	**105**	40.6	340
10	-12.2	62.3	**110**	43.3	365
15	-9.4	70.0	**115**	46.1	391
20	-6.7	78.3	**120**	48.9	418
25	-3.9	87.3	**125**	51.7	446
30	-1.1	96.8	**130**	54.4	476
35	1.7	107	**135**	57.2	507
40	4.4	118	**140**	60.0	539
45	7.2	130	**145**	62.8	573
50	10.0	142	**150**	65.6	608
55	12.8	155			

AIR CONDITIONER CHARGING INFORMATION

FOR COMPLETE CHARGING PROCEDURES, REFER TO THE APPLICABLE INSTALLATION AND SERVICE MANUAL AVAILABLE ONLINE

Capacity	-018	-024	-030	-036	-041	-042	-047	-048	-059	-060
°F(°C)[2]	Table 1. Normal Operating Pressures[1] – TXV System – Liquid (± 10 psig) / Suction (± 5 psig)									
65 (18)	222 / 139	228 / 137	223 / 136	225 / 135	216 / 139	218 / 135	223 / 136	228 / 136	225 / 129	228 / 126
75 (24)	258 / 142	261 / 141	260 / 138	263 / 138	252 / 141	253 / 138	261 / 140	264 / 138	260 / 134	264 / 130
85 (29)	301 / 145	303 / 144	303 / 140	305 / 139	293 / 143	295 / 141	304 / 142	307 / 140	302 / 137	307 / 135
95 (35)	348 / 147	349 / 146	350 / 142	352 / 142	339 / 146	340 / 145	351 / 146	353 / 143	349 / 140	355 / 138
105 (41)	400 / 149	399 / 149	401 / 144	402 / 144	389 / 148	391 / 146	402 / 148	404 / 145	399 / 144	407 / 139
115 (45)	457 / 152	455 / 151	457 / 147	458 / 147	445 / 151	447 / 149	459 / 151	459 / 148	455 / 146	464 / 142
°F(°C)[2]	Table 2. Approach (APP) Values[3] – TXV System – ºF(ºC) ± 1ºF (0.5ºC)									
65 (18)	2 (1.1)	4 (2.2)	6 (3.3)	5 (2.8)	5 (2.8)	5 (2.8)	4 (2.2)	7 (3.9)	5 (2.8)	5 (2.8)
75 (24)	3 (1.7)	6 (3.3)	7 (3.9)	6 (3.3)	5 (2.8)	5 (2.8)	5 (2.8)	8 (4.4)	6 (3.3)	5 (2.8)
85 (29)	3 (1.7)	7 (3.9)	7 (3.9)	6 (3.3)	5 (2.8)	5 (2.8)	5 (2.8)	8 (4.4)	6 (3.3)	6 (3.3)
95 (35)	3 (1.7)	7 (3.9)	7 (3.9)	6 (3.3)	5 (2.8)	5 (2.8)	6 (3.3)	8 (4.4)	6 (3.3)	5 (2.8)
105 (41)	2 (1.1)	7 (3.9)	7 (3.9)	5 (2.8)	5 (2.8)	5 (2.8)	6 (3.3)	7 (3.9)	6 (3.3)	5 (2.8)
115 (45)	2 (1.1)	7 (3.9)	7 (3.9)	5 (2.8)	6 (3.3)	5 (2.8)	5 (2.8)	7 (3.9)	5 (2.8)	5 (2.8)
°F(°C)[2]	Table 3. Subcooling (SC) Values[4] – TXV System – ºF (ºC) ± 1ºF (0.5ºC)									
65 (18)	10 (5.6)	9 (5.0)	5 (2.8)	6 (3.3)	5 (2.8)	6 (3.3)	7 (3.9)	6 (3.3)	7 (3.9)	8 (4.4)
75 (24)	9 (5.0)	6 (3.3)	5 (2.8)	6 (3.3)	4 (2.2)	5 (2.8)	7 (3.9)	5 (2.8)	6 (3.3)	7 (3.9)
85 (29)	9 (5.0)	5 (2.8)	5 (2.8)	6 (3.3)	4 (2.2)	5 (2.8)	7 (3.9)	5 (2.8)	6 (3.3)	7 (3.9)
95 (35)	9 (5.0)	5 (2.8)	5 (2.8)	6 (3.3)	4 (2.2)	5 (2.8)	7 (3.9)	5 (2.8)	6 (3.3)	8 (4.4)
105 (41)	9 (5.0)	4 (2.2)	5 (2.8)	7 (3.9)	4 (2.2)	5 (2.8)	7 (3.9)	5 (2.8)	6 (3.3)	8 (4.4)
115 (45)	10 (5.6)	5 (2.8)	5 (2.8)	6 (3.3)	4 (2.2)	5 (2.8)	7 (3.9)	5 (2.8)	6 (3.3)	8 (4.4)

[1] Typical pressures; indoor evaporator match-up, indoor air quantity and evaporator load will cause the pressures to vary.

[2] Temperature of air entering outside coil.

[3] Approach = Liquid Line Temperature minus Outdoor Ambient Temperature.

[4] Subcooling = Saturation Temperature minus Liquid Line Temperature

AIRFLOW CHECK - Both airflow and refrigerant charge must be monitored for proper system set-up. It may be necessary to alternately check and adjust the airflow and the refrigerant charge.

NOTE *– Be sure that filters and indoor and outdoor coils are clean before testing.*

To determine temperature drop across indoor coil (Delta-T), measure the entering air dry bulb (DB) and wet bulb (WB) temperatures at the indoor coil. Find Delta-T in table 4. Measure coil's leaving air DB and subtract that value from entering air DB. The measured difference should be within ±3ºF (±1.8ºC) of table value; if too low, decrease the indoor fan speed (refer to indoor unit for information). If the Delta-T is too high, increase the indoor fan speed. Repeat charging procedure and Delta-T (air flow adjustment) procedure until both are correct.

Example: Assume entering air DB - 72, WB - 64, leaving DB - 53. Therefore, Delta-T should be 15 (per table); delta across coil is 72 - 53 or 19 (which is 4ºF higher than table value). Action necessary: increase fan speed.

Table 4. Evaporator Coil Delta-T

Dry bulb temperature of air entering indoor coil (°F)															
80	24	24	24	23	23	22	22	22	20	19	18	17	16	15	
78	23	23	23	22	22	21	21	20	19	18	17	16	15	14	
76	22	22	22	21	21	20	19	19	18	17	16	15	14	13	
74	21	21	21	20	19	19	18	17	16	16	15	14	13	12	
72	20	20	19	18	17	17	16	15	15	14	13	12	11	10	
70	19	19	18	18	17	17	16	15	15	14	13	12	11	10	
ºF	**57**	**58**	**59**	**60**	**61**	**62**	**63**	**64**	**65**	**66**	**67**	**68**	**69**	**70**	

[Wet bulb temperature of air entering indoor coil]

Capacity	-018	-024	-030	-036	-041	-042	-047	-048	-059	-060
	Table 5. RFC Sizes									
RFC Size	0.051	0.059	0.067	0.072	TXV	0.081	TXV	0.084	TXV	0.092
°F(°C)[2]	Table 6. Normal Operating Pressures[1] – RFC System – Liquid (± 10 psig) / Suction (± 5 psig)									
65 (18)	225 / 135	232 / 135	226 / 124	224 / 120	- - -	219 / 127	- - -	231 / 126	- - -	231 / 119
75 (24)	256 / 139	265 / 139	261 / 132	264 / 129	- - -	252 / 135	- - -	267 / 134	- - -	266 / 127
85 (29)	296 / 144	305 / 143	302 / 138	307 / 138	- - -	292 / 141	- - -	308 / 140	- - -	307 / 134
95 (35)	340 / 149	349 / 148	348 / 143	353 / 143	- - -	337 / 145	- - -	353 / 144	- - -	352 / 138
105 (41)	390 / 152	397 / 152	397 / 147	404 / 146	- - -	385 / 149	- - -	403 / 148	- - -	401 / 142
115 (45)	445 / 157	449 / 156	451 / 151	458 / 150	- - -	439 / 152	- - -	455 / 154	- - -	455 / 149
°F(°C)[2]	Table 7. Superheat Values* (RFC) ± 1ºF (0.5ºC)									
65 (18)	19 (10.6)	18 (10.0)	24 (13.3)	28 (15.6)	- - -	27 (15.0)	- - -	25 (13.9)	- - -	28 (15.6)
75 (24)	20 (11.1)	18 (10.0)	21 (11.7)	24 (13.3)	- - -	23 (12.8)	- - -	24 (13.3)	- - -	24 (13.3)
85 (29)	18 (10.0)	15 (8.3)	16 (8.9)	19 (10.6)	- - -	18 (10.0)	- - -	21 (11.7)	- - -	18 (10.0)
95 (35)	13 (7.2)	12 (6.7)	11 (6.1)	11 (6.1)	- - -	12 (6.7)	- - -	17 (9.4)	- - -	11 (6.1)
105 (41)	8 (4.4)	7 (3.9)	4 (2.2)	3 (1.7)	- - -	3 (1.7)	- - -	11 (6.1)	- - -	4 (2.2)
115 (45)	1 (0.6)	1 (0.6)	2 (1.1)	2 (1.1)	- - -	2 (1.1)	- - -	12 (6.7)	- - -	3 (1.7)

*Suction line saturation temperature minus suction line temperature. All measurements are at the service valves and are based on 80db / 67wb indoor temperature.

0322

581069-01

THIS MANUAL MUST BE LEFT WITH THE HOMEOWNER FOR FUTURE REFERENCE

INSTALLATION INSTRUCTIONS

Merit® Series ML17XC1 Units

AIR CONDITIONER
508254-01
4/2022

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, or service agency.

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

IMPORTANT: Special procedures are required for cleaning the all-aluminum coil in this unit. See page 15 in this instruction for information.

General

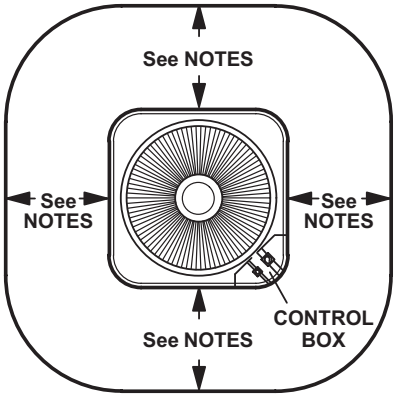
This ML17XC1 outdoor air conditioner **with all-aluminum coil** is designed for use with HFC-410A refrigerant only. This unit must be installed with an approved indoor air handler or coil. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com.

These instructions are intended as a general guide and do not supersede local codes in any way. Consult authorities having jurisdiction before installation.

NOTICE!

Charging information is given on the charging procedure sticker on the unit access panel. For more in-depth information, consult the Installation and Service Procedures manual on LennoxPros.com or through the Technical Support department at 800-453-6669.

STEP 1 – SETTING THE UNIT – 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).

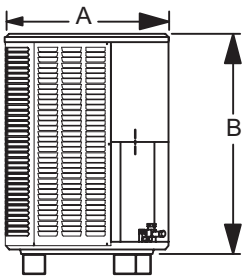
A clearance of 24 in. must be maintained between two units.

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

NOTICE: Specific applications may require adjustment of the listed installation clearances to provide protection for the unit from physical damage or to avoid conditions which limit operating efficiency. (Example: Clearances may have to be increased to prevent snow or ice from falling on the top of the unit. Additional clearances may also be required to prevent air recirculation when the unit is installed under a deck or in another tight space.)

FIGURE 1

UNIT DIMENSIONS - INCHES (MM)



SIDE VIEW

FIGURE 2

TABLE 1
UNIT DIMENSIONS

Model Numbers	A	B
ML17XC1-018-230A	28.25 (718)	29.25 (743)
ML17XC1-024-230A	28.25 (718)	37.25 (946)
ML17XC1-030-230A	28.25 (718)	29.25 (743)
ML17XC1-036-230A	28.25 (718)	37.25 (946)
ML17XC1-041-230A	32.25 (817)	33.25 (845)
ML17XC1-042-230A	32.25 (817)	33.25 (845)
ML17XC1-047-230A	32.25 (817)	33.25 (845)
ML17XC1-048-230A	28.25 (718)	43.25 (1099)
ML17XC1-059-230A	32.25 (817)	43.25 (1099)
ML17XC1-060-230A	32.25 (817)	43.25 (1099)

STEP 1 – SETTING THE UNIT (Continued) – Unit Placement

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

⚠ WARNING

To prevent personal injury, as well as damage to panels, unit or structure, observe the following:

While installing or servicing this unit, carefully stow all removed panels so that the panels will not cause injury to personnel, objects or nearby structures. Also, take care to store panels where they will not be subject to damage (e.g., being bent or scratched).

While handling or stowing the panels, consider any weather conditions (especially wind) that may cause panels to be blown around and damaged.

NOTICE!

Roof Damage!

This system contains both refrigerant and oil. Some rubber roofing material may absorb oil, causing the rubber to degrade. Failure to follow this notice could result in damage to roof surface.

⚠ IMPORTANT

This unit must be matched with an indoor coil as specified with AHRI. For AHRI Certified system match-ups and expanded ratings, visit www.LennoxPros.com Coils previously charged with HCFC-22 must be flushed.

⚠ IMPORTANT

Exhaust vents from dryers, water heaters and furnaces should be directed away from the outdoor unit. Prolonged exposure to exhaust gases and the chemicals contained within them may cause condensation to form on the steel cabinet and other metal components of the outdoor unit. This will diminish unit performance and longevity.

PLACEMENT

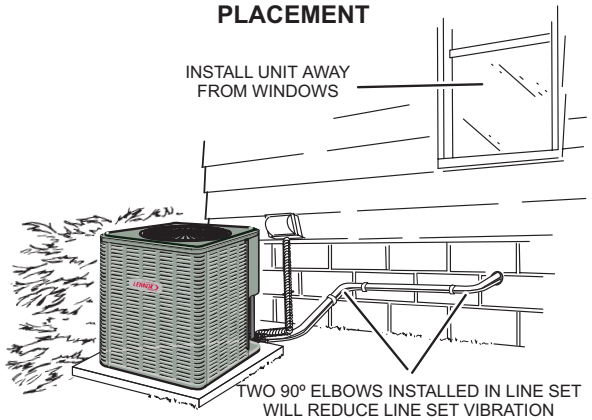


FIGURE 3

SLAB MOUNTING

Install unit level or, if on a slope, maintain slope tolerance of 2 degrees (or 2 inches per 5 feet [50 mm per 1.5 m]) away from building structure.

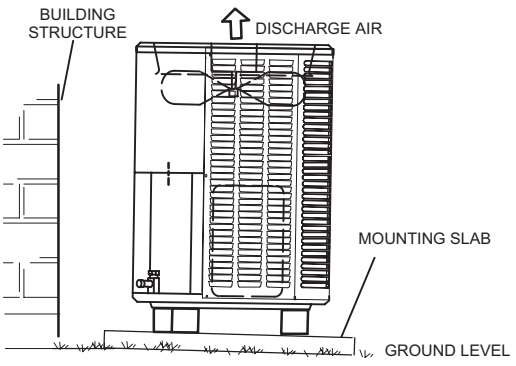


FIGURE 4

STEP 2 – REFRIGERANT PIPING – Flushing Existing Line Set & Indoor Coil

⚠ WARNING

Refrigerant can be harmful if it is inhaled. Refrigerant must be used and recovered responsibly.

Failure to follow this warning may result in personal injury or death.

⚠ IMPORTANT

If this unit is being matched with an approved line set or indoor unit coil that was previously charged with mineral oil, or if it is being matched with a coil which was manufactured before January of 1999, the coil and line set must be flushed prior to installation. Take care to empty all existing traps. Polyvinyl ether (PVE) oils are used in Lennox variable-capacity units charged with HFC-410A refrigerant. Residual mineral oil can act as an insulator, preventing proper heat transfer. It can also clog the expansion device and reduce system performance and capacity. Failure to properly flush the system per this instruction and the detailed Installation and Service Procedures manual will void the warranty.

Flush the existing line set per the following instructions. For more information, refer to the Installation and Service Procedures manual available on LennoxPros.com. CAUTION - DO NOT attempt to flush and re-use existing line sets or indoor coil when the system contains contaminants (i.e., compressor burn out).

If a new line set is being installed, size the piping per table 2.

⚠ WARNING

When using a high pressure gas such as nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

⚠ WARNING

Polyol ester (POE) oils used with HFC-410A refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

⚠ WARNING

Fire, Explosion and Personal Safety hazard. Failure to follow this warning could result in damage, personal injury or death.

Never use oxygen to pressurize or purge refrigeration lines. Oxygen, when exposed to a spark or open flame, can cause fire and/or an explosion, that could result in property damage, personal injury or death.

LIQUID LINE FILTER DRIER INSTALLATION

The provided filter drier must be field installed in the liquid line between the outdoor unit's liquid line service valve and the indoor coil's metering device (fixed orifice or TXV) as illustrated in figure 5. This filter drier must be installed to ensure a clean, moisture-free system. Failure to install the filter drier will void the warranty. A replacement filter drier is available from Lennox. See *Brazing Connections* page 6 for special procedures on brazing filter drier connections to the liquid line.

Typical Liquid Line Filter Drier Installation

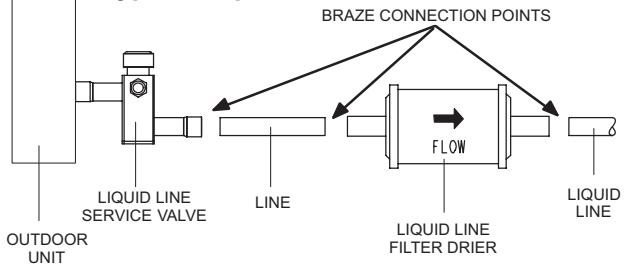


FIGURE 5

TABLE 2
REFRIGERANT LINE SET – INCHES (MM)

Model Number	Valve Size Connections		Recommended Line Sets		
	Liquid Line	Suction Line	L15 Line Set Model	Line Set Length	Catalog Number
ML17XC1-018-230 ML17XC1-024-230 ML17XC1-030-230	3/8" (10 mm)	3/4" (19 mm)	L15-41-20	20 feet (6.1 m)	89J56
			L15-41-30	30 feet (9.1 m)	89J57
			L15-41-40	40 feet (12.2 m)	89J58
			L15-41-50	50 feet (15.2 m)	89J59
ML17XC1-036-230 ML17XC1-041-230 ML17XC1-042-230 ML17XC1-047-230 ML17XC1-048-230	3/8" (10 mm)	7/8" (22 mm)	L15-65-30	30 feet (9.1 m)	89J60
			L15-65-40	40 feet (12.2 m)	89J61
			L15-65-50	50 feet (15.2 m)	89J62
ML17XC1-060-230	3/8" (10 mm)	1-1/8" (29 mm) *	Field-fabricated	N/A	N/A
* Some applications may require a field-provided 1-1/8" to 7/8" adapter.					

***NOTE** - When installing refrigerant lines longer than 50 feet, refer to the Refrigerant Piping Design and Fabrication Guidelines manual available on LennoxPros.com (Corp. 9351-L9), or contact the Technical Support Department Product Application group for assistance.*

***NOTE** - For new or replacement line set installation, refer to Service and Application Note - Corp. 9112-L4 (C-91-4).*

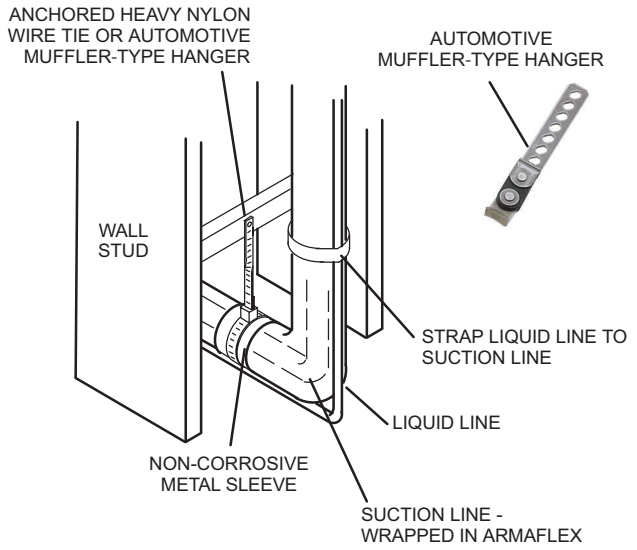
LINE SET

IMPORTANT — Refrigerant lines must not contact structure.

INSTALLATION

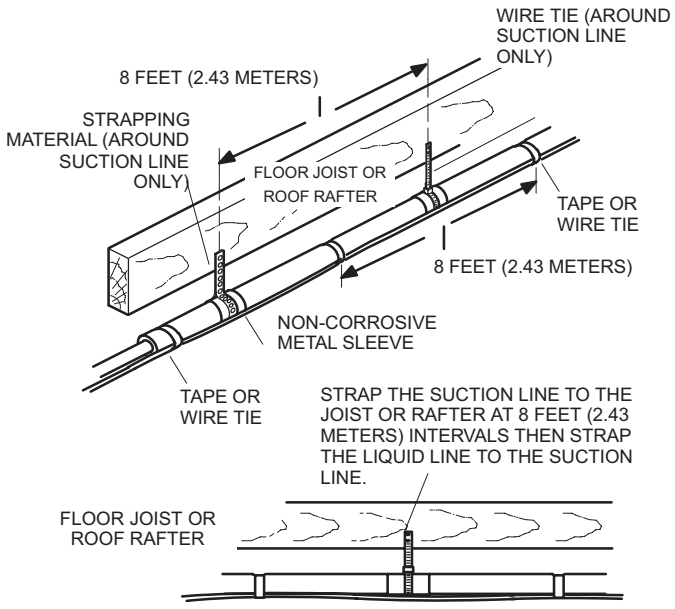
Line Set Isolation - The following illustrations are examples of proper refrigerant line set isolation:

REFRIGERANT LINE SET — TRANSITION FROM VERTICAL TO HORIZONTAL



REFRIGERANT LINE SET — INSTALLING HORIZONTAL RUNS

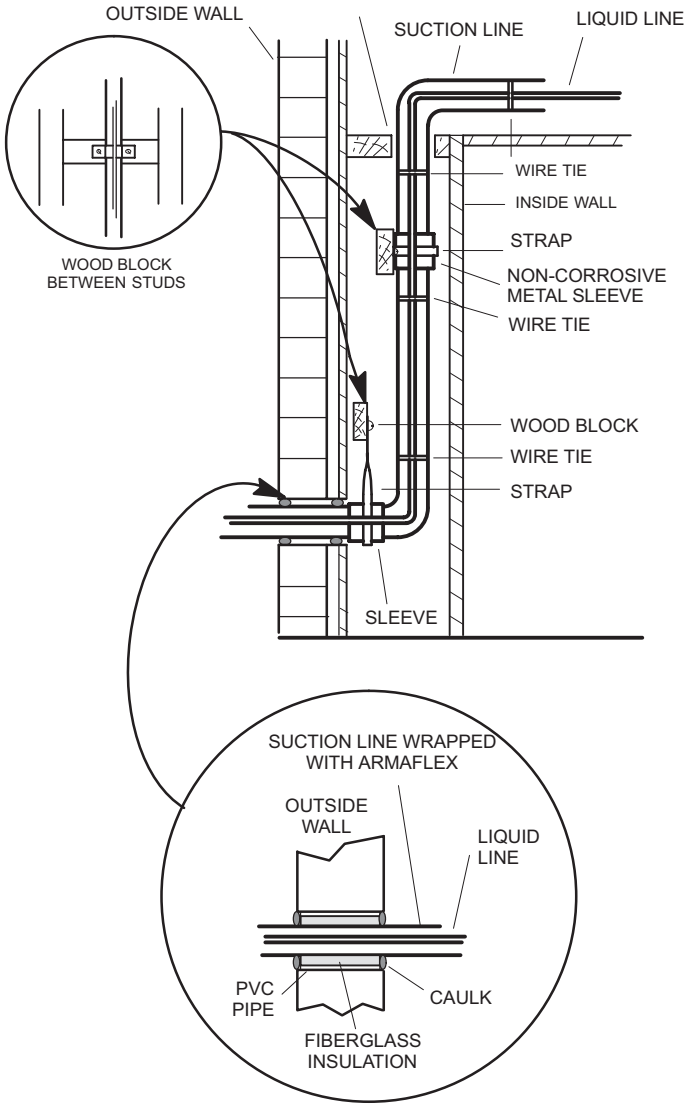
To hang line set from joist or rafter, use either metal strapping material or anchored heavy nylon wire ties.



REFRIGERANT LINE SET — INSTALLING VERTICAL RUNS (NEW CONSTRUCTION SHOWN)

***NOTE** - Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.*

IMPORTANT - Refrigerant lines must not contact wall



***NOTE** - Similar installation practices should be used if line set is to be installed on exterior of outside wall.*

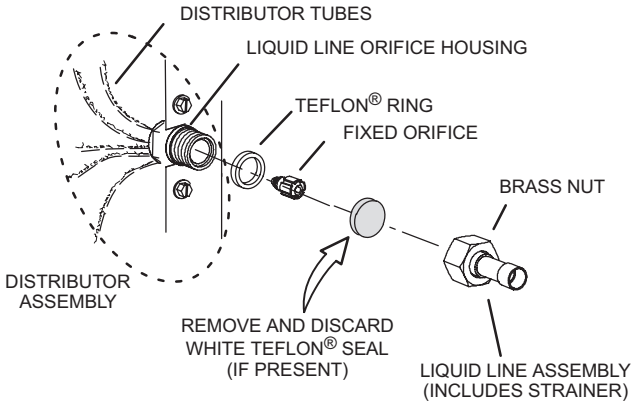
FIGURE 6

STEP 2 – REFRIGERANT PIPING – Removing Existing Indoor Metering Device

1A TYPICAL EXISTING FIXED ORIFICE REMOVAL PROCEDURE (UNCASED COIL SHOWN)

OR

1B TYPICAL EXISTING EXPANSION VALVE REMOVAL PROCEDURE (UNCASED COIL SHOWN)



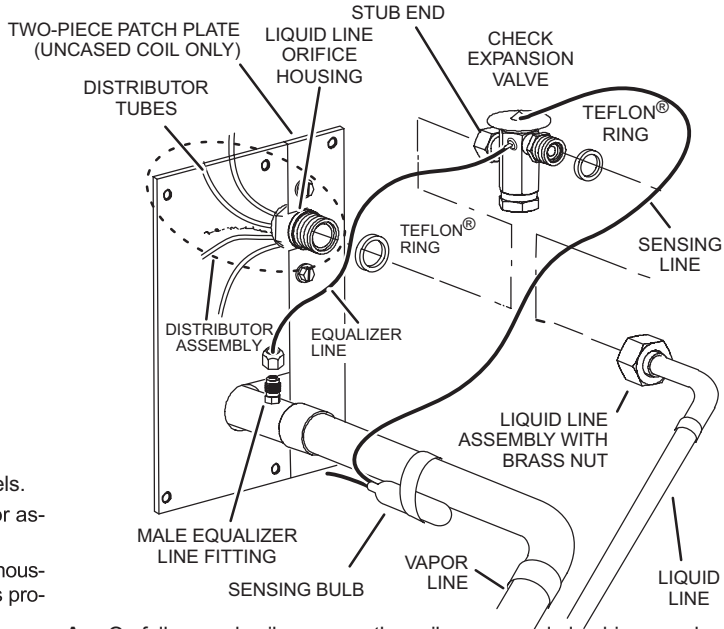
A - On fully cased coils, remove the coil access and plumbing panels.

B - Remove any shipping clamps from the liquid line and distributor assembly.

C - Using two wrenches, disconnect liquid line from liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.

D - Remove and discard fixed orifice, valve stem assembly (if present) and Teflon® washer as illustrated above.

E - Use a field-provided fitting to temporarily reconnect the liquid line to the indoor unit's liquid line orifice housing.



A - On fully cased coils, remove the coil access and plumbing panels.

B - Remove any shipping clamps from the liquid line and distributor assembly.

C - Disconnect the equalizer line from the check expansion valve equalizer line fitting on the vapor line.

D - Remove the vapor line sensing bulb.

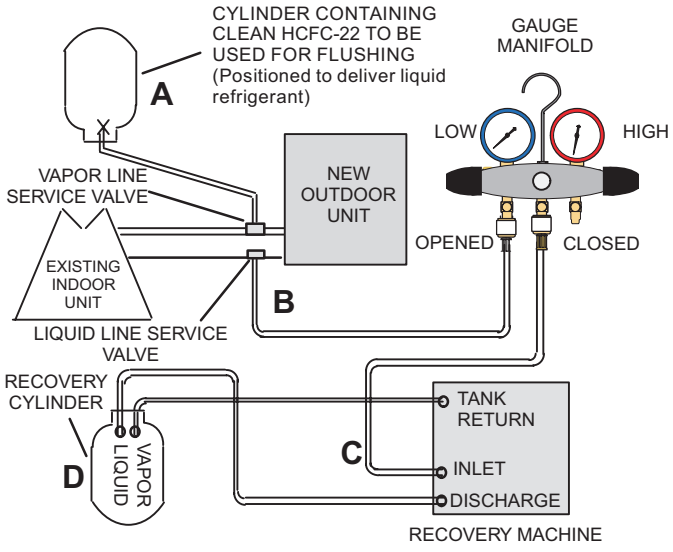
E - Disconnect the liquid line from the check expansion valve at the liquid line assembly.

F - Disconnect the check expansion valve from the liquid line orifice housing. Take care not to twist or damage distributor tubes during this process.

G - Remove and discard check expansion valve and the two Teflon® rings.

H - Use a field-provided fitting to temporarily reconnect the liquid line to the indoor unit's liquid line orifice housing.

2 CONNECT GAUGES AND EQUIPMENT FOR FLUSHING PROCEDURE



A - HCFC-22 cylinder with clean refrigerant (positioned to deliver liquid refrigerant) to the vapor service valve.

B - HCFC-22 gauge set (low side) to the liquid line valve.

C - HCFC-22 gauge set center port to inlet on the recovery machine with an empty recovery tank connected to the gauge set.

D - Connect recovery tank to recovery machine per machine instructions.

3 FLUSHING LINE SET

The line set and indoor unit coil must be flushed with at least the same amount of clean refrigerant that previously charged the system. Check the charge in the flushing cylinder before proceeding.

A - Set the recovery machine for liquid recovery and start the recovery machine. Open the gauge set valves to allow the recovery machine to pull a vacuum on the existing system line set and indoor unit coil.

B - Position the cylinder of clean HCFC-22 for delivery of liquid refrigerant and open its valve to allow liquid refrigerant to flow into the system through the vapor line valve. Allow the refrigerant to pass from the cylinder and through the line set and the indoor unit coil before it enters the recovery machine.

C - After all of the liquid refrigerant has been recovered, switch the recovery machine to vapor recovery so that all of the HCFC-22 vapor is recovered. Allow the recovery machine to pull the system down to 0.

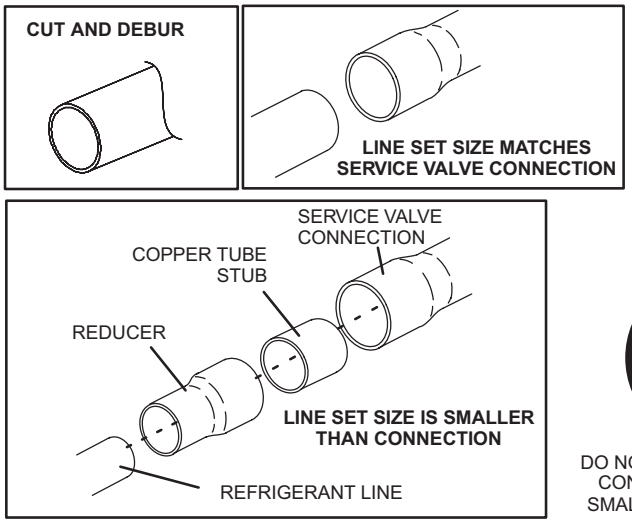
D - Close the valve on the inverted HCFC-22 drum and the gauge set valves. Pump the remaining refrigerant out of the recovery machine and turn the machine off.

FIGURE 7

STEP 2 – REFRIGERANT PIPING – Brazing Procedures

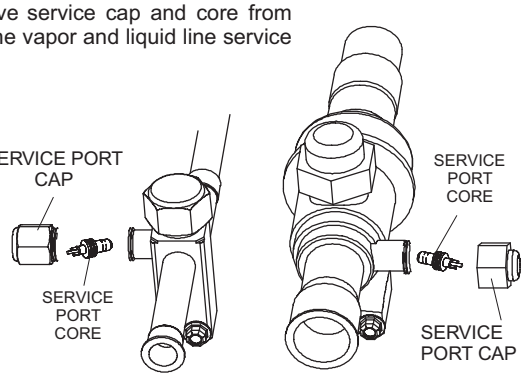
1 CUT AND DEBUR

Cut ends of the refrigerant lines square (free from nicks or dents) and debur the ends. The pipe must remain round. Do not crimp end of the line.



2 CAP AND CORE REMOVAL

Remove service cap and core from both the vapor and liquid line service ports.



DO NOT CRIMP SERVICE VALVE CONNECTOR WHEN PIPE IS SMALLER THAN CONNECTION

3 ATTACH THE MANIFOLD GAUGE SET FOR BRAZING LIQUID AND VAPOR LINE SERVICE VALVES

Flow regulated nitrogen (at 1 to 2 psig) through the low-side refrigeration gauge set into the liquid line service port valve, and out of the vapor line service port valve.

- **A -** Connect gauge set low pressure side to liquid line service valve (service port).
- **B -** Connect gauge set center port to bottle of nitrogen with regulator.
- **C -** Remove core from valve in vapor line service port to allow nitrogen to escape.

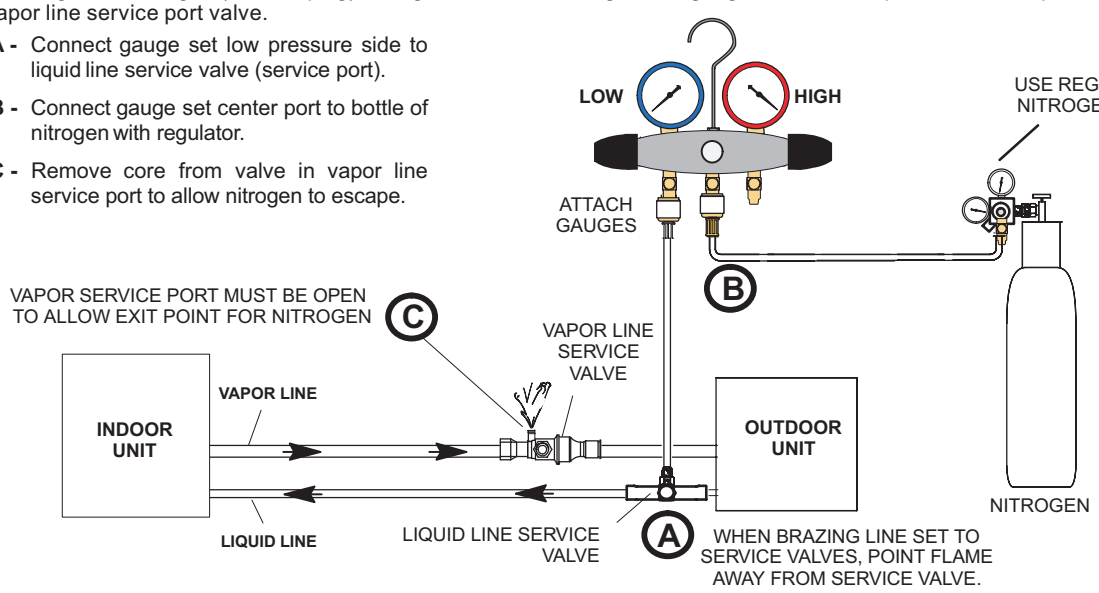


FIGURE 8

⚠ CAUTION

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

⚠ WARNING

Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

4 WRAP SERVICE VALVES

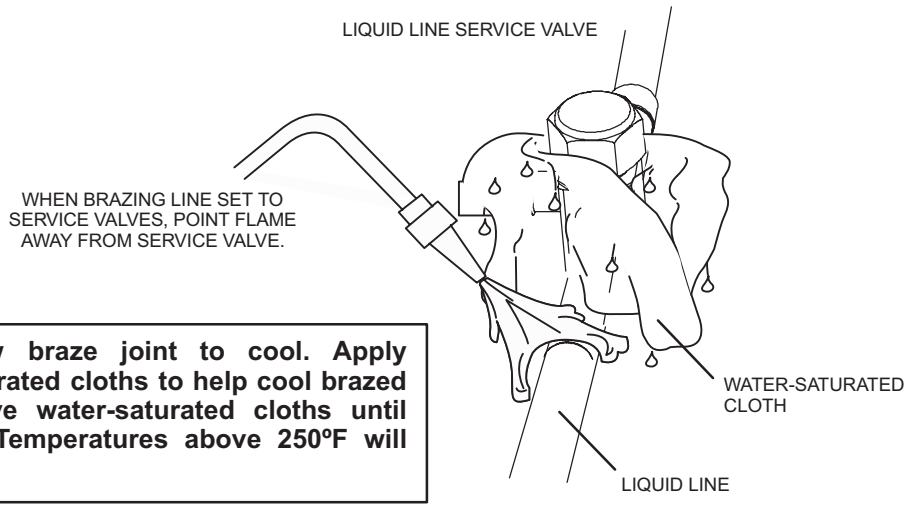
To help protect service valve seals during brazing, wrap water-saturated cloths around service valve bodies and copper tube stubs. Use additional water-saturated cloths underneath the valve body to protect the base paint.

5 FLOW NITROGEN

Flow regulated nitrogen (at 1 to 2 psig) through the refrigeration gauge set into the valve stem port connection on the liquid service valve and out of the vapor valve stem port. See steps **3A, 3B** and **3C** on manifold gauge set connections.

6 BRAZE LINE SET

Wrap both service valves with water-saturated cloths as illustrated here and as mentioned in step 4, before brazing to line set. Cloths must remain water-saturated throughout the brazing and cool-down process.

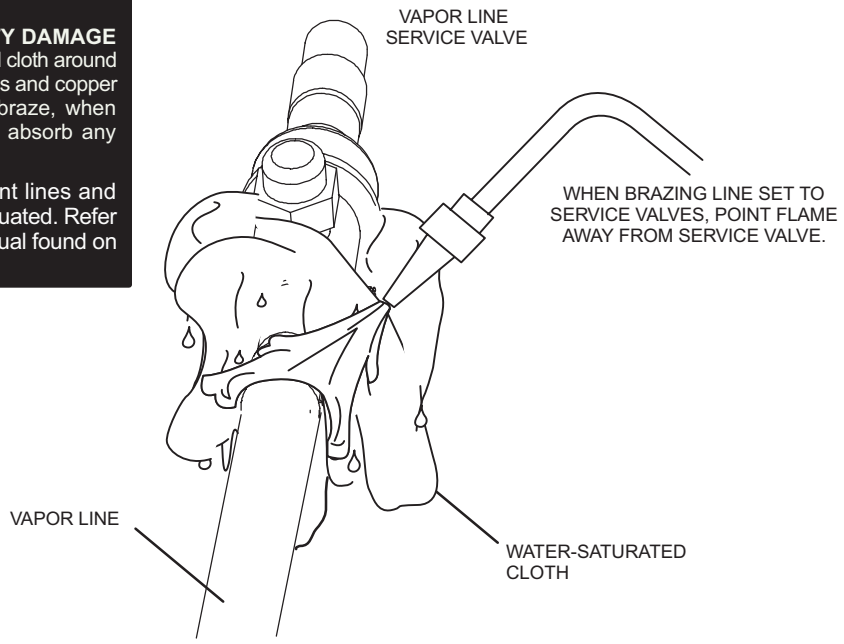


IMPORTANT — Allow braze joint to cool. Apply additional water-saturated cloths to help cool brazed joint. Do not remove water-saturated cloths until piping has cooled. Temperatures above 250ºF will damage valve seals.

WARNING

FIRE, PERSONAL INJURY, OR PROPERTY DAMAGE may result if you do not wrap a water-saturated cloth around both liquid and suction line service valve bodies and copper tube stub while brazing the line set! The braze, when complete, must be quenched with water to absorb any residual heat.

Do not open service valves until refrigerant lines and indoor coil have been leak-tested and evacuated. Refer to Installation and Service Procedures manual found on LennoxPros.com.



7 PREPARATION FOR NEXT STEP

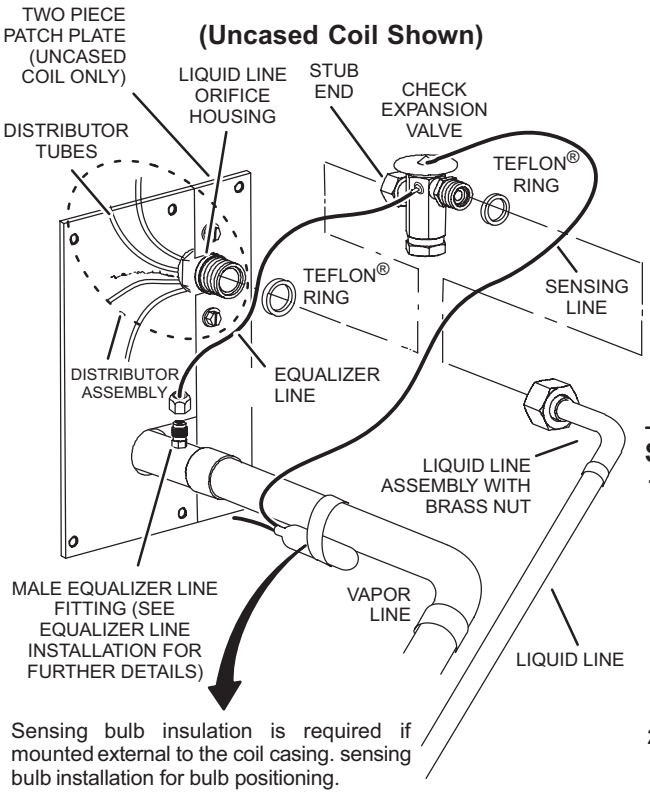
After all connections have been brazed, disconnect manifold gauge set from service ports. Apply additional water-saturated cloths to both services valves to cool piping. Once piping is cool, remove all water-saturated cloths.

FIGURE 8 (CONTINUED)

STEP 2 – REFRIGERANT PIPING – Install Indoor Expansion Valve

This outdoor unit is designed for use in systems that use either a fixed orifice (RFC) (included with outdoor unit), or expansion valve metering device (purchased separately) at the indoor coil. See the ML17XC1 Product Specifications bulletin (EHB) for approved expansion valve kit match ups. The expansion valve unit can be installed internal or external to the indoor coil. In applications where an uncased coil is being installed in a field-provided plenum, install the expansion valve in a manner that will provide access for field servicing of the expansion valve. Refer to below illustration for reference during installation of expansion valve unit.

INDOOR EXPANSION VALVE INSTALLATION

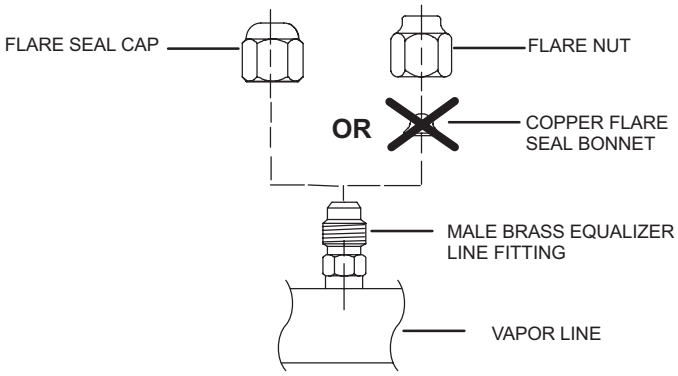


Sensing bulb insulation is required if mounted external to the coil casing. sensing bulb installation for bulb positioning.

EQUALIZER LINE INSTALLATION

1 - Remove and discard either the flare seal cap or flare nut with copper flare seal bonnet from the equalizer line port on the vapor line as illustrated in the figure below.

2 - Remove the field-provided fitting that temporarily reconnected the liquid line to the indoor unit's distributor assembly.

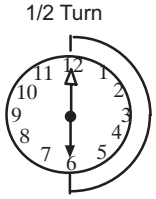


3 - Install one of the provided Teflon® rings around the stubbed end of the check expansion valve and lightly lubricate the connector threads and expose surface of the Teflon® ring with refrigerant oil.

4 - Attach the stubbed end of the check expansion valve to the liquid line orifice housing. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above, or tighten to 20 ft-lb.

5 - Place the remaining Teflon® washer around the other end of the check expansion valve. Lightly lubricate connector threads and expose surface of the Teflon® ring with refrigerant oil.

6 - Attach the liquid line assembly to the check expansion valve. Finger tighten and use an appropriately sized wrench to turn an additional 1/2 turn clockwise as illustrated in the figure above or tighten to 20 ft-lb.

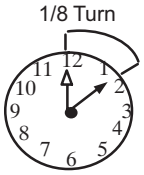


SENSING BULB INSTALLATION

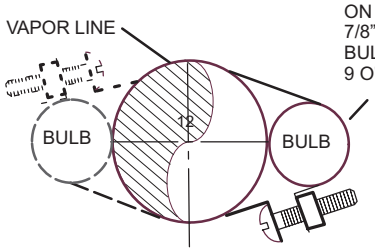
1 - Attach the vapor line sensing bulb in the proper orientation as illustrated to the right using the clamp and screws provided.

***NOTE** - Though it is preferred to have the sensing bulb installed on a horizontal run of the vapor line, installation on a vertical run of piping is acceptable if necessary.*

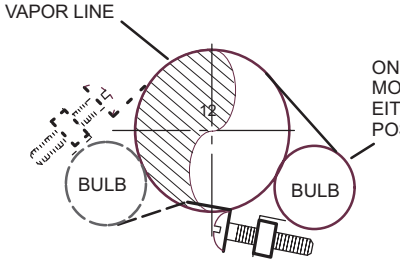
***NOTE** - Confirm proper thermal contact between vapor line and check/expansion bulb before insulating the sensing bulb once installed.*



2 - Connect the equalizer line from the check expansion valve to the equalizer vapor port on the vapor line. Finger tighten the flare nut plus 1/8 turn (7 ft-lbs) as illustrated below.



ON LINES SMALLER THAN 7/8", MOUNT SENSING BULB AT EITHER THE 3 OR 9 O'CLOCK POSITION.



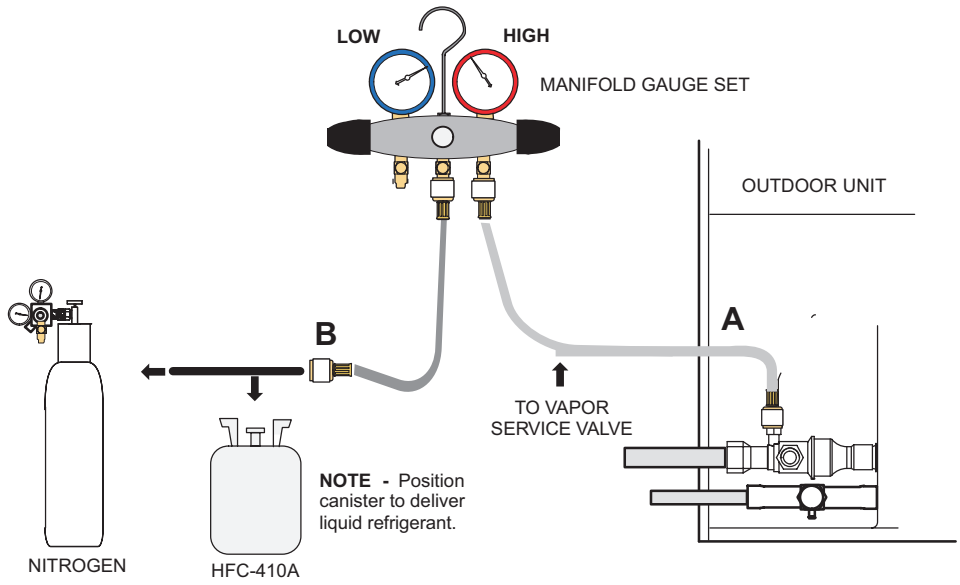
ON 7/8" AND LARGER LINES, MOUNT SENSING BULB AT EITHER THE 4 OR 8 O'CLOCK POSITION.

***NOTE -** NEVER MOUNT THE SENSING BULB ON BOTTOM OF LINE.*

FIGURE 9

STEP 3 – LEAK TEST AND EVACUATION

LEAK TEST



1 CONNECT GAUGE SET

A - Connect the high pressure hose of an HFC-410A manifold gauge set to the vapor valve service port.

NOTE *- Normally, the high pressure hose is connected to the liquid line port. However, connecting it to the vapor port better protects the manifold gauge set from high pressure damage.*

B - With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set.

NOTE *- Later in the procedure, the HFC-410A container will be replaced by the nitrogen container.*

2 TEST FOR LEAKS

After the line set has been connected to the indoor and outdoor units, check the line set connections and indoor unit for leaks. Use the following procedure to test for leaks:

A - With both manifold valves closed, connect the cylinder of HFC-410A refrigerant to the center port of the manifold gauge set. Open the valve on the HFC-410A cylinder (vapor only).

B - Open the high pressure side of the manifold to allow HFC-410A into the line set and indoor unit. Weigh in a trace amount of HFC-410A. *[A trace amount is a maximum of two ounces (57 g) refrigerant or three pounds (31 kPa) pressure.]* Close the valve on the HFC-410A cylinder and the valve on the high pressure side of the manifold gauge set. Disconnect the HFC-410A cylinder.

C - Connect a cylinder of nitrogen with a pressure regulating valve to the center port of the manifold gauge set.

D - Adjust nitrogen pressure to 150 psig (1034 kPa). Open the valve on the high side of the manifold gauge set in order to pressurize the line set and the indoor unit.

E - After a few minutes, open one of the service valve ports and verify that the refrigerant added to the system earlier is measurable with a leak detector.

F - After leak testing, disconnect gauges from service ports.

FIGURE 10

STEP 3 – LEAK TEST AND EVACUATION (Continued)

EVACUATION

3 CONNECT GAUGE SET

NOTE *- Remove cores from service valves (if not already done).*

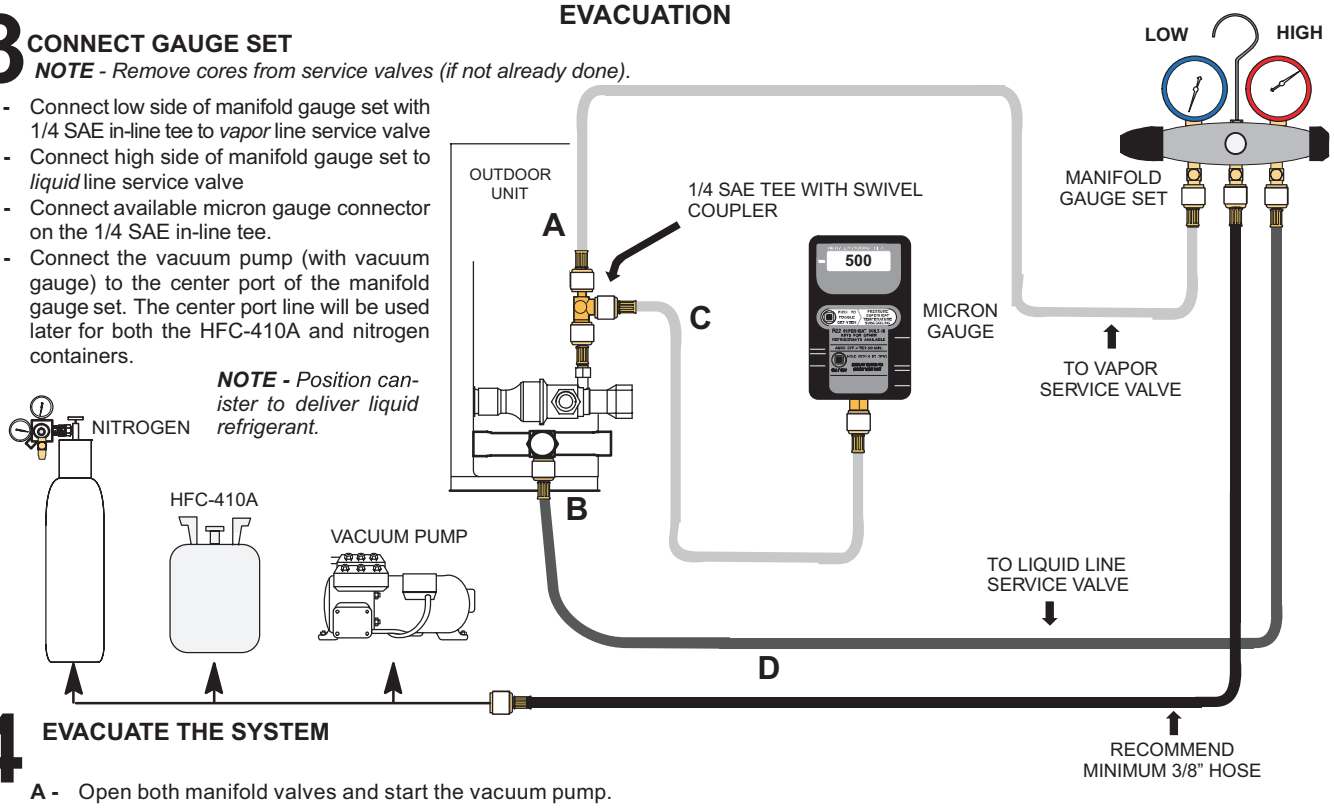
A - Connect low side of manifold gauge set with 1/4 SAE in-line tee to *vapor* line service valve

B - Connect high side of manifold gauge set to *liquid* line service valve

C - Connect available micron gauge connector on the 1/4 SAE in-line tee.

D - Connect the vacuum pump (with vacuum gauge) to the center port of the manifold gauge set. The center port line will be used later for both the HFC-410A and nitrogen containers.

NOTE - *Position canister to deliver liquid refrigerant.*



4 EVACUATE THE SYSTEM

A - Open both manifold valves and start the vacuum pump.

B - Evacuate the line set and indoor unit to an **absolute pressure** of 23,000 microns (29.01 inches of mercury).

NOTE *- During the early stages of evacuation, it is desirable to close the manifold gauge valve at least once. A rapid rise in pressure indicates a relatively large leak. If this occurs,* ***repeat the leak testing procedure****.*

NOTE *- The term* ***absolute pressure*** *means the total actual pressure above absolute zero within a given volume or system. Absolute pressure in a vacuum is equal to atmospheric pressure minus vacuum pressure.*

C - When the absolute pressure reaches 23,000 microns (29.01 inches of mercury), perform the following:

- Close manifold gauge valves.
- Close valve on vacuum pump.
- Turn off vacuum pump.
- Disconnect manifold gauge center port hose from vacuum pump.
- Attach manifold center port hose to a nitrogen cylinder with pressure regulator set to 150 psig (1034 kPa) and purge the hose.
- Open manifold gauge valves to break the vacuum in the line set and indoor unit.
- Close manifold gauge valves.

WARNING !

Possible equipment damage.

Avoid deep vacuum operation. Do not use compressors to evacuate a system. Extremely low vacuum can cause internal arcing and compressor failure. Damage caused by deep vacuum operation will void warranty.

D - Shut off the nitrogen cylinder and remove the manifold gauge hose from the cylinder. Open the manifold gauge valves to release the nitrogen from the line set and indoor unit.

E - Reconnect the manifold gauge to the vacuum pump, turn the pump on, and continue to evacuate the line set and indoor unit until the absolute pressure does not rise above 500 microns (29.9 inches of mercury) within a 20-minute period after shutting off the vacuum pump and closing the manifold gauge valves.

F - When the absolute pressure requirement above has been met, disconnect the manifold hose from the vacuum pump and connect it to a cylinder of HFC-410A positioned to deliver liquid refrigerant. Open the manifold gauge valve 1 to 2 psig in order to release the vacuum in the line set and indoor unit.

G - Perform the following:

- Close manifold gauge valves.
- Shut off HFC-410A cylinder.
- Reinstall service valve cores by removing manifold hose from service valve. Quickly install cores with core tool while maintaining a positive system pressure.
- Replace stem caps and finger tighten them, then tighten an additional one-sixth (1/6) of a turn as illustrated.

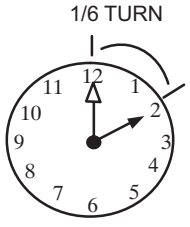


FIGURE 11

STEP 4 – ELECTRICAL – Circuit Sizing and Wire Routing

In the U.S.A., wiring must conform with current local codes and the current National Electric Code (NEC). In Canada, wiring must conform with current local codes and the current Canadian Electrical Code (CEC).

Refer to the furnace or air handler installation instructions for additional wiring application diagrams and refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

24VAC TRANSFORMER

Use the transformer provided with the furnace or air handler for low-voltage control power (24VAC - 40 VA minimum).

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be properly grounded in accordance with national and local codes.

Line voltage is present at all components when unit is not in operation on units with single-pole contactors. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies.

⚠ IMPORTANT

If unit is equipped with a crankcase heater, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

⚠ WARNING

Fire Hazard. Use of aluminum wire with this product may result in a fire, causing property damage, severe injury or death. Use copper wire only with this product.

⚠ WARNING

Failure to use properly sized wiring and circuit breaker may result in property damage. Size wiring and circuit breaker(s) per Product Specifications bulletin (EHB) and unit rating plate.

⚠ WARNING

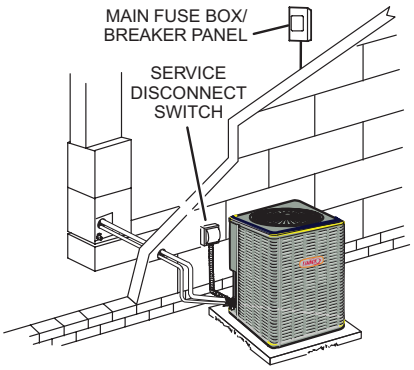
ELECTROSTATIC DISCHARGE (ESD)

Precautions and Procedures

Electrostatic discharge can affect electronic components. Take care during unit installation and service to protect the unit's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Touch hand and all tools on an unpainted unit surface before performing any service procedure to neutralize electrostatic charge.

SIZE CIRCUIT AND INSTALL SERVICE DISCONNECT SWITCH

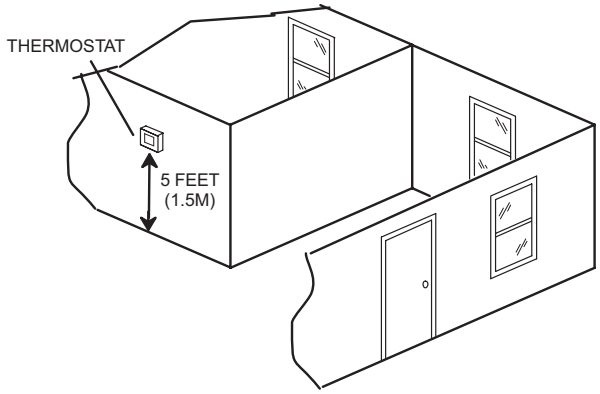
Refer to the unit nameplate for minimum circuit ampacity, and maximum fuse or circuit breaker (HACR per NEC). Install power wiring and properly sized disconnect switch.



***NOTE** - Units are approved for use only with copper conductors. Ground unit at disconnect switch or connect to an earth ground.*

INSTALL THERMOSTAT

Install room thermostat (ordered separately) on an inside wall approximately in the center of the conditioned area and 5 feet (1.5m) from the floor. It should not be installed on an outside wall or where it can be affected by sunlight or drafts.



***NOTE** - 24VAC, Class II circuit connections are made in the control panel.*

FIGURE 12

STEP 4 – ELECTRICAL (CONTINUED) – High Voltage and Field Control Wiring

The following illustration provides an example of control wiring connections when using a standard thermostat.

ROUTING HIGH VOLTAGE, GROUND AND CONTROL WIRING

HIGH VOLTAGE / GROUND WIRES

Any excess high voltage field wiring should be trimmed and secured away from any low voltage field wiring. To facilitate a conduit, a cutout is located in the bottom of the control panel. Connect conduit to the control panel using a proper conduit fitting.

***NOTE** - Wire tie provides low voltage control wire strain relief and maintains separation of field-installed low and high voltage circuits.*

***NOTE** - For proper voltages, select thermostat wire (control wires) gauge per table above.*

***NOTE** - Do not bundle any excess 24VAC control wires inside control panel.*

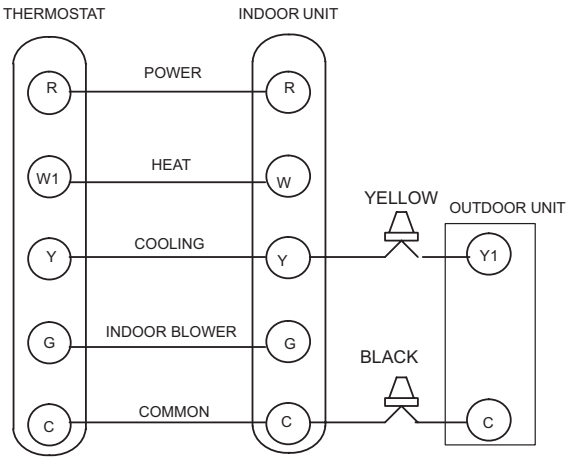
Install low voltage wiring from outdoor to indoor unit and from thermostat to indoor unit as illustrated.

A - Run 24VAC control wires through hole with grommet and secure with provided wire tie.

B - Make 24VAC thermostat wire connections. Locate the two wires from the contactor and make connection using field-provided wire nuts:

- **Yellow to Y1**
- **Black to C (common)**

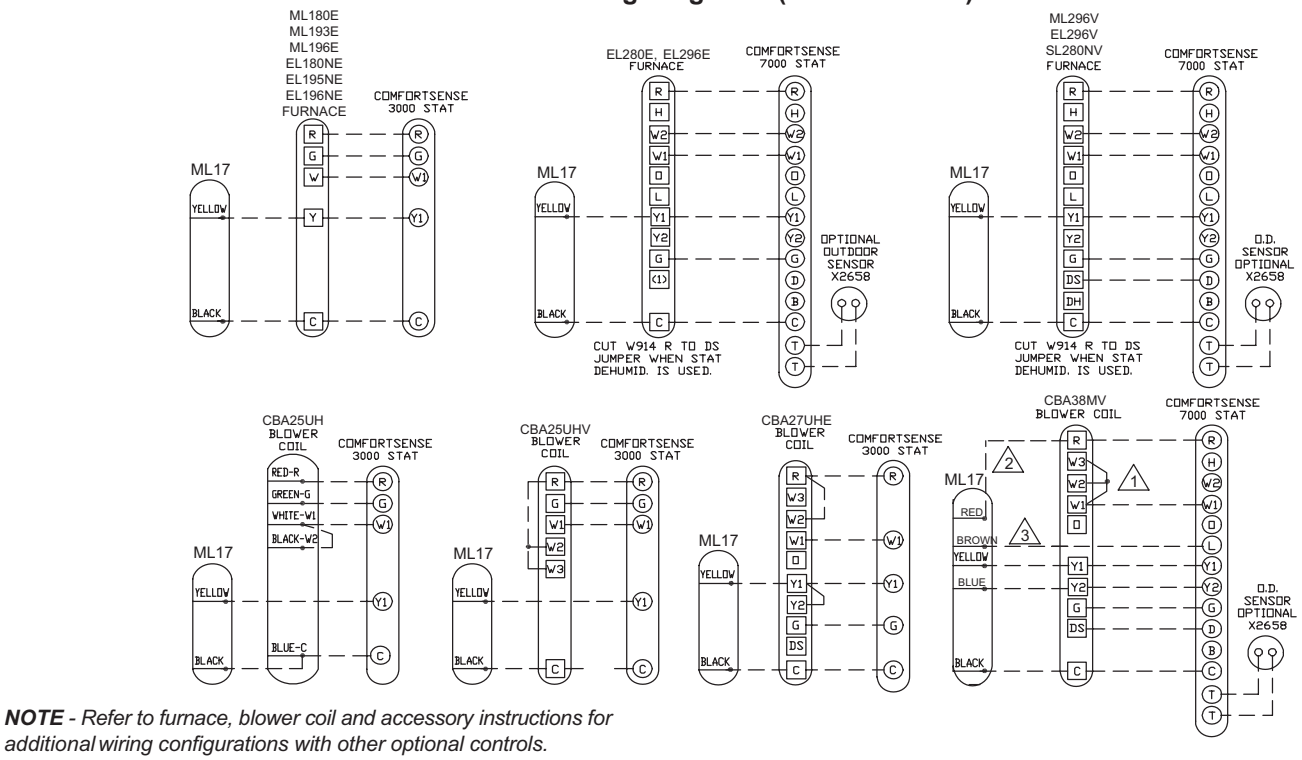
FIELD CONTROL WIRING



WIRE RUN LENGTH	AWG#	INSULATION TYPE
LESS THAN 100' (30 METERS)	18	TEMPERATURE RATING
MORE THAN 100' (30 METERS)	16	35ºC MINIMUM.

FIGURE 13

24VAC Control Wiring Diagrams (Field Installed)



***NOTE** - Refer to furnace, blower coil and accessory instructions for additional wiring configurations with other optional controls.*

1. Air handler shipped with jumpers installed between W1 and W2 and W2 and W3.
2. R connection required for air conditioner with LSOM. Resistor kit (CAT #47W97) required when connection ComfortSense 7000 with LSOM 2.
3. L connection wired on units with LSOM.

FIGURE 14

STEP 5 – UNIT START-UP

⚠ IMPORTANT

If unit is equipped with a crankcase heater, it should be energized 24 hours before unit start-up to prevent compressor damage as a result of slugging.

1 - Rotate fan to check for binding.

2 - Inspect all factory- and field-installed wiring for loose connections.

3 - After evacuation is complete, open the liquid line and vapor line service valve stems to release the refrigerant charge (contained in outdoor unit) into the system.

4 - Replace the stem caps and tighten to the value listed in table 2.

5 - Check voltage supply at the disconnect switch. The voltage must be within the range listed on the unit's nameplate. If not, do not start the equipment until you have consulted with the power company and the voltage condition has been corrected.

6 - Connect manifold gauge set for testing and charging.

7 - Set the thermostat for a cooling demand. Turn on power to the indoor indoor unit and close the outdoor unit disconnect switch to start the unit.

8 - Recheck voltage while the unit is running. Power must be within range shown on the unit nameplate.

9 - Check system for sufficient refrigerant using the procedures outlined under *Checking Refrigerant Charge.*

OPERATING MANIFOLD GAUGE SET AND SERVICE VALVES

The liquid and vapor line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.

Each valve is equipped with a service port which has a factory-installed valve stem. Figures 14 and 15 provide information on how to access and operate both angle- and ball-type service valves.

Torque Requirements

When servicing or repairing heating, ventilating and air conditioning components, ensure the fasteners are appropriately tightened. Table 3 lists torque values for fasteners.

TABLE 3 – TORQUE REQUIREMENTS

Parts	Recommended Torque	
Service valve cap	8 ft.-lb.	11 NM
Sheet-metal screws	16 in.-lb.	2 NM
Machine screws #10	28 in.-lb.	3 NM
Compressor bolts	90 in.-lb.	10 NM
Gauge port seal cap	8 ft.-lb.	11 NM

⚠ IMPORTANT

To prevent stripping of the various caps used, the appropriately sized wrench should be used and fitted snugly over the cap before tightening.

Using Manifold Gauge Set

When checking the system charge, only use a manifold gauge set that features low loss anti-blow back fittings.

Manifold gauge set used with HFC-410A refrigerant systems must be capable of handling the higher system operating pressures. The gauges should be rated for use with pressures of 0 - 800 psig on the high side and a low side of 30" vacuum to 250 psig with dampened speed to 500 psi. Gauge hoses must be rated for use at up to 800 psig of pressure with a 4000 psig burst rating.

OPERATING BALL-TYPE SERVICE VALVE

1 - Remove stem cap with an appropriately sized wrench.

2 - Use an appropriately sized wrench to open. To open valve, rotate stem counterclockwise 90°. To close, rotate stem clockwise 90°.

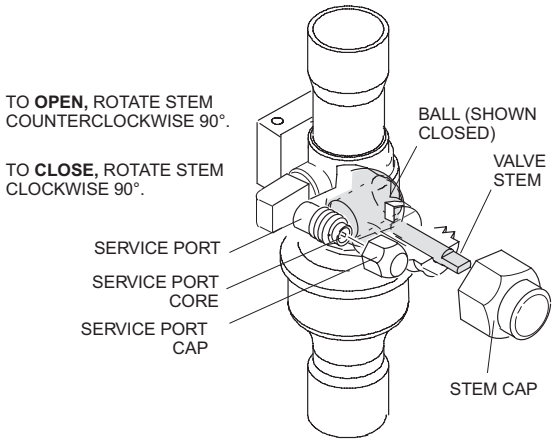
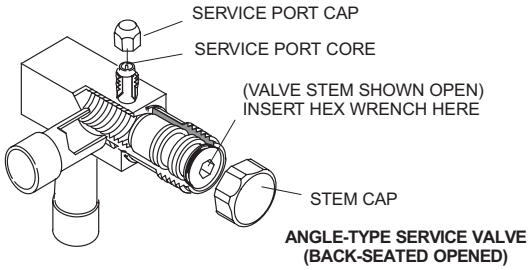


FIGURE 15

OPERATING ANGLE-TYPE SERVICE VALVE

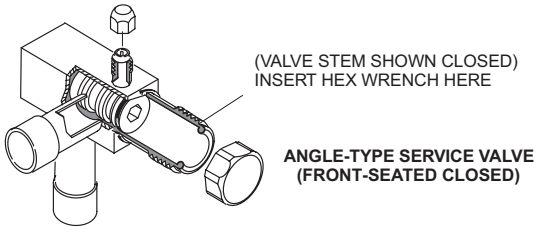
1 - Remove stem cap with an appropriately sized wrench.

2 - Use a service wrench with a hex-head extension (3/16" for liquid line valve sizes and 5/16" for vapor line valve sizes) to back the stem out counterclockwise as far as it will go.



ANGLE-TYPE SERVICE VALVE (BACK-SEATED OPENED)

When service valve is **OPEN**, the service port is open to line set, indoor and outdoor unit.



ANGLE-TYPE SERVICE VALVE (FRONT-SEATED CLOSED)

When service valve is **CLOSED**, the service port is open to the line set and indoor unit.

NOTE - *A label with specific torque requirements may be affixed to the stem cap. If the label is present, use the specified torque.*

FIGURE 16

ACCESS SERVICE PORT

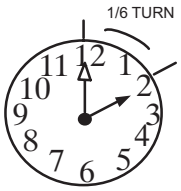
A service port cap protects the service port core from contamination and serves as the primary leak seal.

1 - Remove service port cap with an appropriately sized wrench.

2 - Connect gauge set to service port.

3 - When testing is completed, replace service port cap and tighten as follows:

- With torque wrench, finger tighten and torque cap per table 2.
- Without torque wrench, finger tighten and use an appropriately sized wrench to turn an additional 1/6 turn clockwise.



Reinstall Stem Cap

Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follows:

- With torque wrench, finger tighten and then torque cap per table 2.
- Without torque wrench, finger tighten and use an appropriately sized wrench to turn an additional 1/12 turn clockwise.

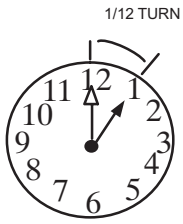


FIGURE 17

Checking and Adding System Charge

The ML17XC1 unit is factory-charged with enough HFC-410A refrigerant to accommodate a 15-foot length of refrigerant piping. For refrigerant piping greater than 15 feet, calculate the additional charge using the table below. Then add the additional charge specified for the specific indoor coil match-up listed on the unit charging sticker.

Charge should be checked and adjusted using the tables provided on the charging procedure sticker on the unit access panel. Detailed information is given in the ML17XC1 Installation and Service Procedures manual, which is available on LennoxPros.com.

Refrigerant Charge per Line Set Length

LIQUID LINE DIA.	OUNCES PER 5 FEET (G PER 1.5 M) ADJUST FROM 15 FEET (4.6 M) LINE SET*
3/8" (9.5 MM)	3 OUNCES PER 5' (85 G PER 1.5 M)

*If line length is greater than 15 ft. (4.6 m), add this amount. If line length is less than 15 ft. (4.6 m), subtract this amount.

NOTE – Insulate liquid line when it is routed through areas where the surrounding ambient temperature could become higher than the temperature of the liquid line or when pressure drop is equal to or greater than 20 psig.

High Pressure Switch (S4)

This unit is equipped with a high pressure switch which is located on the liquid line. The SPST, normally closed pressure switch opens when liquid line pressure rises above the factory setting of 590 + 15 psig and automatically resets at 418 + 15 psig.

Low Pressure Switch

This unit is equipped with a low pressure switch which is located on the compressor suction line. The SPST, normally closed pressure switch opens when suction line pressure drops below the factory setting of 40 ± 5 psig and automatically resets at 95 ± 5 psig.

Homeowners Information

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

In order to ensure peak performance, your system must be properly maintained. Clogged filters and blocked airflow prevent your unit from operating at its most efficient level. The system should be inspected and serviced before each cooling and heating season by a licensed professional HVAC service technician (or equivalent).

Homeowner Maintenance

The following maintenance may be performed by the homeowner.

- Contact a licensed professional HVAC technician to schedule inspection and maintenance appointments for your equipment before each heating and cooling season.
- Check the indoor unit filter each month and replace the filter, if necessary.
- Have your Lennox dealer show you where your indoor unit filter is located. It will be either at the indoor unit (installed internal or external to the cabinet) or behind a return air grille in the wall or ceiling. Check the filter monthly and clean or replace it as needed. Disposable filters should be replaced with a filter of the same type and size.
- Check the indoor unit drain line for obstructions monthly. The indoor coil is equipped with a drain pan to collect condensate formed as your system removes humidity from the inside air. Have your dealer show you the location of the drain line and how to check for obstructions. (This would also apply to an auxiliary drain, if installed.)
- Check the area around the outdoor unit monthly and remove any obstructions that may restrict airflow to the outdoor unit. This would include grass clippings, leaves, or papers that may have settled around the unit.
- Trim shrubbery away from the unit and periodically check for debris which collects around the unit.
- During the winter months, keep the snow level below the louvered panels.

***NOTE** - The filter and all access panels must be in place any time the unit is in operation. If you are unsure about the filter required for your system, call your Lennox dealer for assistance.*

⚠ IMPORTANT

Sprinklers and soaker hoses should not be installed where they could cause prolonged exposure to the outdoor unit by treated water. Prolonged exposure of the unit to treated water (i.e., sprinkler systems, soakers, waste water, etc.) will corrode the surface of the steel and aluminum parts, diminish performance and affect longevity of the unit.

Thermostat Operation

See the thermostat homeowner manual for instructions on how to operate your thermostat.

Pre-Service Check

If your system fails to operate, check the following before calling for service:

- Verify room thermostat settings are correct.
- Verify that all electrical disconnect switches are ON.
- Check for any blown fuses or tripped circuit breakers.
- Verify unit access panels are in place.
- Verify air filter is clean.

If service is needed, locate and write down the unit model number and have it handy before calling.

Professional Maintenance

NOTICE !

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, Lennox recommends use of a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

Your heating and air conditioning system should be inspected and maintained twice each year (before the start of the cooling and heating seasons) by a licensed professional HVAC technician. You can expect the technician to check the following items. **These checks may only be conducted by a licensed professional HVAC technician**.

Outdoor Unit

1 - Inspect component wiring for loose, worn or damaged connections. Also check for any rubbing or pinching of wires. Confirm proper voltage plus amperage of outdoor unit.

2 - Check the cleanliness of outdoor fan and blade condition (cracks) and clean or replace them, if necessary.

3 - Inspect base pan drains for debris and clean as necessary.

4 - Inspect the condition of refrigerant piping and confirm that pipes are not rubbing copper-to-copper. Also, check the condition of the insulation on the refrigerant lines. Repair, correct, or replace as necessary.

5 - Test capacitor. Replace as necessary.

6 - Inspect contactor contacts for pitting or burn marks. Replace as necessary.

7 - Check outdoor fan motor for worn bearings/ bushings. Replace as necessary.

8 - Inspect and clean outdoor coils, if necessary and note any damage to coils or signs of leakage.

Indoor Unit (Air Handler or Furnace)

1 - Inspect component wiring for loose, worn or damaged connections. Confirm proper voltage plus amperage of indoor unit.

2 - Inspect and clean or replace air filters in indoor unit.

3 - Check the cleanliness of indoor blower and clean blower, if necessary.

4 - Inspect the indoor coil drain pans and condensate drains for rust, debris, obstructions, leaks or cracks. Pour water in pans to confirm proper drainage from the pan through to the outlet of the pipe. Clean or replace as necessary.

5 - Inspect and clean indoor coil, if necessary.

6 - Inspect the condition of the refrigerant lines and confirm that pipes are not rubbing copper-to-copper. Also, ensure that refrigerant pipes are not being affected by indoor air contamination. Check condition of insulation on the refrigerant lines. Repair, correct, or replace as necessary.

7 - Inspect the duct system for leaks or other problems. Repair or replace as necessary.

8 - Check for bearing/bushing wear on indoor blower motor. Replace as necessary.

9 - Indoor unit service will also include inspection and cleaning of the burners, and a full inspection of the gas valve, heat exchanger and flue (exhaust) system.

General System Test with System Operating

1 - Your technician should perform a general system test. They will turn on the air conditioner to check operating functions such as the startup and shutoff operation. They will also check for unusual noises or odors, and measure indoor/outdoor temperatures and system pressures as needed. They will check the refrigerant charge per the charging sticker information on the outdoor unit.

2 - Verify that system total static pressure and airflow settings are within specific operating parameters.

3 - Verify correct temperature drop across indoor coil.

ML17XC1 Start-Up and Performance Checklist

Customer _____ Address _____

Indoor Unit Model _____ Serial _____

Outdoor Unit Model _____ Serial _____

Notes: _____

_____

START UP CHECKS

Refrigerant Type: _____

Rated Load Amps: _____ Actual Amps___ Rated Volts_____ Actual Volts_____

Condenser Fan Full Load Amps_____ Actual Amps:__

COOLING MODE

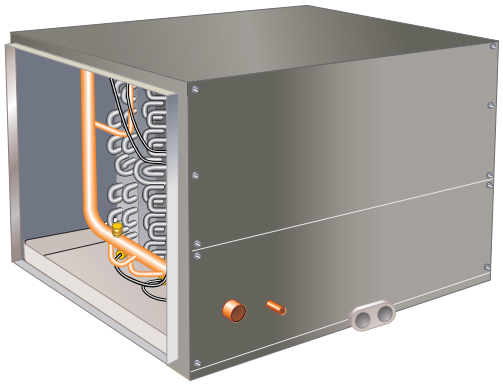
Suction Pressure: _____ **Liquid Pressure:**____

Supply Air **Temperature:**_____ Ambient **Temperature:** Return Air: **Temperature:**_____

_____

System Refrigerant Charge (Refer to manufacturer's information on unit or installation instructions for required subcooling and approach temperatures.)

Subcooling: Saturated Condensing Temperature (A) *minus* Liquid Line Temperature (B)	A	—	B	=	SUBCOOLING
Approach: Liquid Line Temperature (A) *minus* Outdoor Air Temperature (B)	A	—	B	=	APPROACH
Indoor Coil Temperature Drop (18 to 22°F) Return Air Temperature (A) *minus* Supply Air Temperature (B)	A	—	B	=	COIL TEMP DROP



THIS MANUAL MUST BE LEFT WITH THE HOMEOWNER FOR FUTURE REFERENCE

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFCs, HCFCs and HFCs) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for noncompliance.

⚠ CAUTION

As with any mechanical equipment, contact with sharp sheet metal edges can result in personal injury. Take care while handling this equipment and wear gloves and protective clothing.

IMPORTANT: Special procedures are required for cleaning the aluminum coil in this unit. See page 7 in this instruction for information.

Shipping and Packing List

Package 1 of 1 contains:

1 – Evaporator coil

Check the components for shipping damage; if found, immediately contact the last carrier.

INSTALLATION INSTRUCTIONS

CHX35 Series Coils

INDOOR COILS
507835-01 (067198001)
7/2023

Table of Contents

Model Number Identification....2
Specifications....2
Releasing Air Charge....3
Installation....3
Refrigerant Line Connections....4
Leak Testing, Evacuating and Charging....5
Sealing Ducts....5
Condensate Drain Connections....5
Blower Speed Selection....6
Maintenance....7

General Information

CHX35 **all-aluminum coil** horizontal evaporator coils are designed for use with air conditioners and heat pumps and are supplied with a factory-installed HFC-410A check/expansion valve.

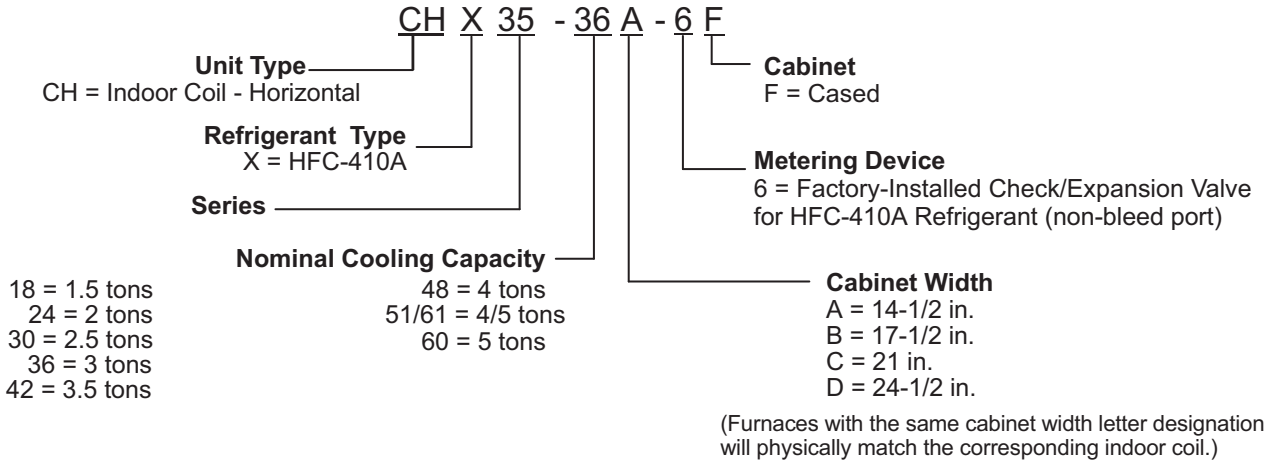
The coil drain pan has a maximum service temperature of 500°F. The drain pan must be at least 2" away from a standard gas-fired furnace heat exchanger and at least 4" away from any drum-type or oil-fired furnace heat exchanger. Closer spacing may damage the drain pan and cause a leak.

Refer to the Product Specification bulletin (EHB) for the proper use of these coils with specific furnaces, outdoor units and line sets.

These instructions are intended as a general guide and do not supersede local or national codes in any way. Authorities who have jurisdiction should be consulted before installation.

0723
507835-01

Model Number Identification



Specifications

1.5 TO 3 TON

General Data	Model No.	CHX35 -18A-6F	CHX35 -24A-6F	CHX35 -24B-6F	CHX35 -30A-6F	CHX35 -30B-6F	CHX35 -36A-6F	CHX35 -36B-6F
	Nominal size - tons	1.5	2	2	2.5	2.5	3	3
	Factory installed expansion valve	**12J18**	**12J18**	**12J18**	**12J18**	**12J18**	**12J19**	**12J19**
Line connections in.	Suction o.d. - sweat	7/8	7/8	7/8	7/8	7/8	7/8	7/8
	Liquid o.d. - sweat	3/8	3/8	3/8	3/8	3/8	3/8	3/8
	Condensate drain (fpt)	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4
Indoor Coil	Net face area sq. ft.	3.5	3.5	4.67	4.33	4.67	3.5	4.67
	Tube diameter - in.	3/8	3/8	3/8	3/8	3/8	3/8	3/8
	Number of rows	2	3	2	3	3	3	2
	Fins per inch	19	13	19	16	13	13	18
Matching Lennox Furnace - Cabinet Width Designation		A	A	B	A	B	A	B
Coil & Furnace Cabinet Height - in.		14-1/2	14-1/2	17-1/2	14-1/2	17-1/2	14-1/2	17-1/2
Shipping Data - lbs.		44	46	50	56	54	48	49

3 TO 5 TON

General Data	Model No.	CHX35 -36C-6F	CHX35 -42B-6F	CHX35 -42C-6F	CHX35 -48B-6F	CHX35 -48C-6F	CHX35 -51/61C-6F	CHX35 -60D-6F
	Nominal size - Tons	3	3.5	3.5	3.5/4	3.5/4	4/5	5
	Factory installed expansion valve	**12J19**	**12J20**	**12J20**	**12J20**	**12J20**	**12J20**	**12J20**
Line connections in.	Suction o.d. - sweat	7/8	7/8	7/8	7/8	7/8	7/8	7/8
	Liquid o.d. - sweat	3/8	3/8	3/8	3/8	3/8	3/8	3/8
	Condensate drain (fpt)	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4	(2) 3/4
Indoor Coil	Net face area sq. ft.	5.83	5.78	5.83	5.78	5.83	7.22	7.94
	Tube diameter - in.	3/8	3/8	3/8	3/8	3/8	3/8	3/8
	Number of rows	2	4	3	3	3	3	3
	Fins per inch	18	13	13	13	13	13	13
Matching Lennox Furnace - Cabinet Width Designation		C	B	C	B	C	C	D
Coil & Furnace Cabinet Height - in.		21	17-1/2	21	17-1/2	21	21	24-1/2
Shipping Data - lbs.		56	67	67	61	60	70	79

Releasing Air Charge

⚠ CAUTION

The coil is shipped from the factory pressurized with dry air. Pierce a hole in the rubber plug that seals the vapor line to relieve the pressure before removing the plugs.

NOTE - *If there is no pressure released when the vapor line rubber plug is pierced, check the coil for leaks before continuing with the installation.*

The CHX35 coils are shipped with a 9 ± 2 psi dry air holding charge. Puncture the suction line rubber plug to release the charge. Remove the rubber plug. Ensure that the coil is void of pressure.

Installation

⚠ WARNING

Risk of explosion or fire.

Can cause injury or death.

Recover all refrigerant to relieve pressure before opening the system.

Install the furnace or air handler according to the installation instructions provided with the unit.

NOTE *– In areas of high humidity, use foam tape to insulate the suction line section in the cabinet as shown in figure 1.*

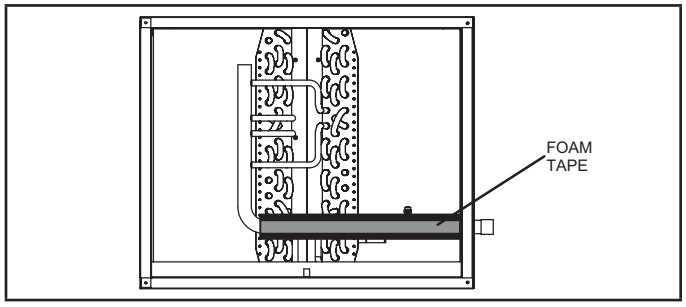


FIGURE 1. Insulate Suction Line Inside Cabinet

1 - **Left-Hand and Right-Hand Discharge – The coil must have a 1/2" slope from the rear of the cabinet to the drain.** Position the coil adjacent to the furnace cabinet and align the six screw clearance holes in the coil casing with the furnace engagement holes. Use six field-provided #8 X 1” screws to secure the coil casing to the furnace (see figures 3 and 4).

2 - **Right-Hand Air Discharge with Field-Provided Spacer – The coil must have a 1/2" slope from the rear of the cabinet to the drain.** Position the coil in the left-to-right configuration on the service access side of the furnace. Insert a field-provided spacer between the furnace and the coil. Use field-provided screws to secure the coil casing, spacer and the furnace together. The spacer should be long enough to allow room for proper installation (approximately 6 inches minimum). See figure 5.

NOTE *– When the coil is connected directly with a condensing furnace, the coil must be level from return end to supply end. The front (access side) of the furnace may be pitched downward up to 1 inch to accommodate a ½-inch pitched coil.*

3 - Secure the supply duct to the coil cabinet.

4 - Refer to the instructions provided with the condensing unit for leak testing, evacuating and charging procedures. **Always check the entire system for leaks before charging.**

5 - **Applications using CHX35-60 D-width unit with C-width furnace** – Figure 2 shows an application that includes a D-width coil and a C-width furnace. This application requires construction of an insulated, field-supplied block-off plate to cover the open space on the coil housing

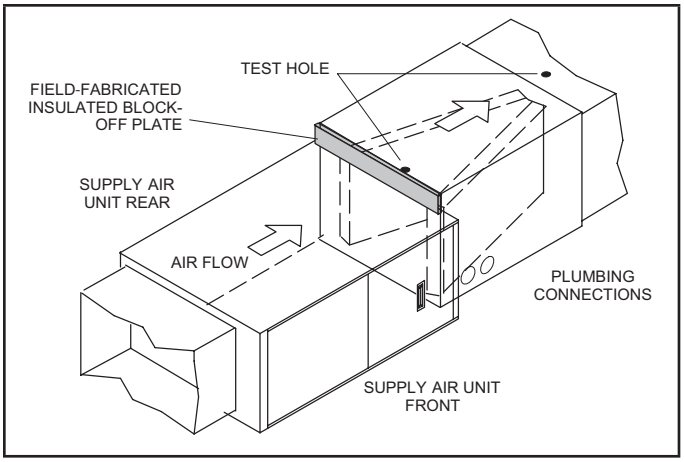


FIGURE 2. D-Width Coil with C-Width Furnace

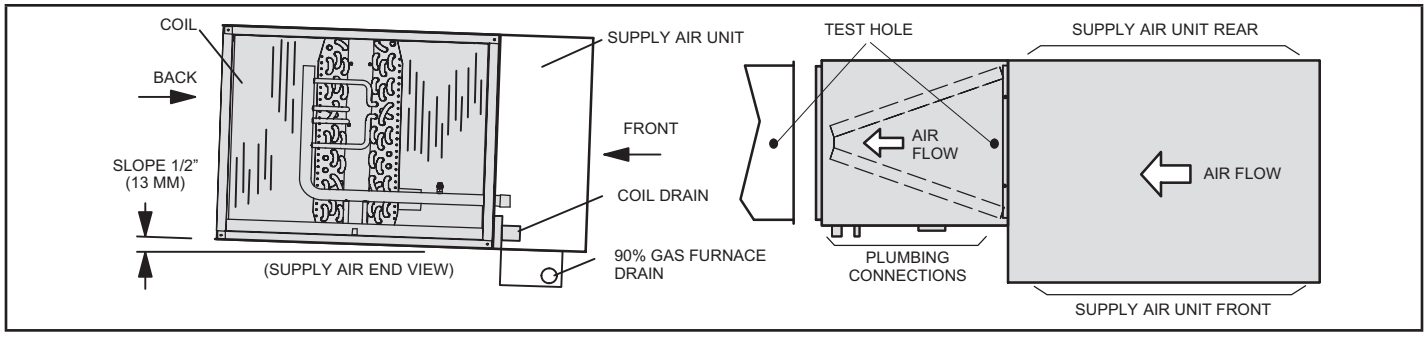
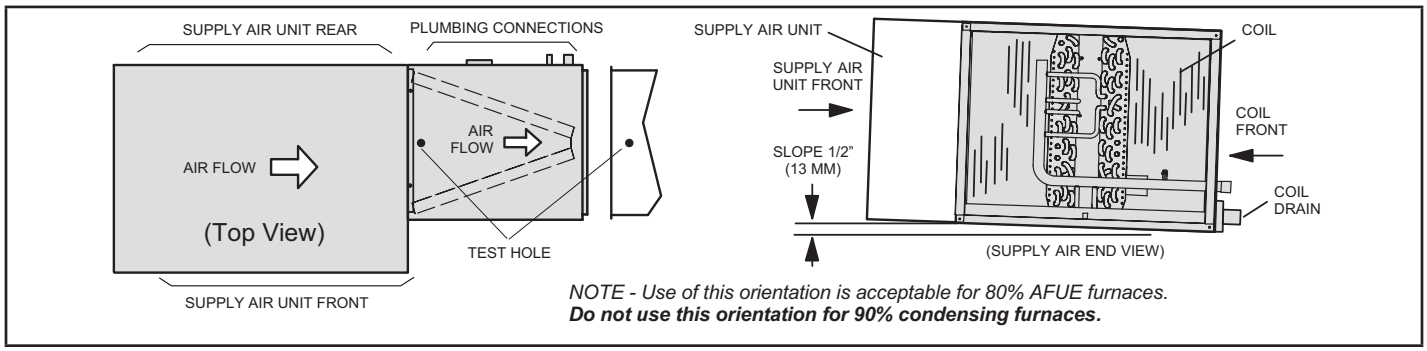


FIGURE 3. Left-Hand Air Discharge



NOTE - Use of this orientation is acceptable for 80% AFUE furnaces.
Do not use this orientation for 90% condensing furnaces.

FIGURE 4. Right-Hand Air Discharge

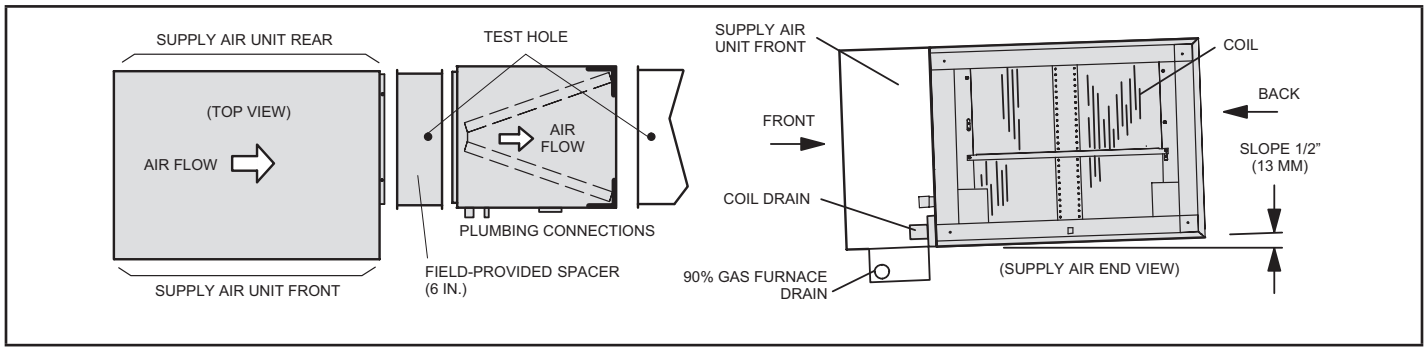


FIGURE 5. Right-Hand Air Discharge with Spacer

Refrigerant Line Connections

LINE SIZES

The refrigerant line sets should be sized according to the recommendations given in the air conditioner or heat pump unit installation instructions. Use table 1 to determine correct braze connection sizes. A field-provided adapter may be required to match line set connections.

TABLE 1 Refrigerant Line Connections – Model CHX35

Model Number	Suction	Liquid
18-6F	7/8 Inch	3/8 Inch
24-6F		
30-6F		
36-6F		
42-6F		
48-6F		
51/61-6F		
60-6F		

REPLACEMENT PARTS

If replacement parts are necessary, order kit 69J46. The kit includes:

- 10 – Brass nuts for liquid line assemblies
- 20 – Teflon rings
- 10 – Liquid line orifice housings
- 10 – Liquid line assemblies

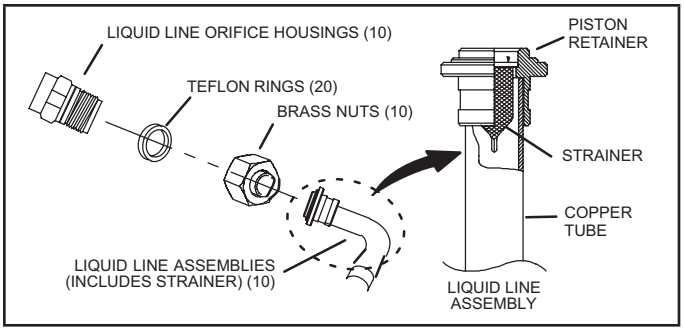


FIGURE 6. 69J46 Kit Components

BRAZING GUIDELINES

Use a silver alloy brazing rod (5 or 6 percent silver alloy for copper-to-copper connections or 45 percent silver alloy for copper-to-brass or copper-to-steel connections).

Before making brazed connections, place a field-provided heat shield, such as a wet rag, against the unit cabinet and around the piping stubs, expansion valve and sensing bulb (or remove the sensing bulb temporarily). The heat shield must be in place to prevent heat damage during brazing. See figure 7.

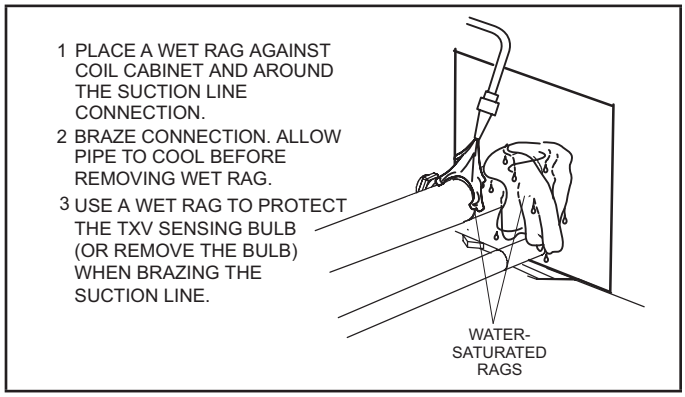


FIGURE 7. Braze Refrigerant Lines

SUCTION LINE CONNECTION

Use the following procedure to connect the suction line to the indoor coil:

1 - Remove rubber plug from the stubbed connection.

2 - Position the properly sized refrigerant piping and make the brazed connection following the brazing guidelines.

3 - Do not remove the water-saturated rags from the cabinet and piping until the piping has cooled completely.

LIQUID LINE CONNECTION

Use the following procedure to connect the liquid line to the indoor coil:

1 - Remove rubber plug from the stubbed connection.

2 - Position the properly sized refrigerant piping and make the brazed connection following the brazing guidelines.

3 - Do not remove the water-saturated rags from the cabinet and piping until the piping has cooled completely.

Leak Testing, Evacuating and Charging

Refer to the outdoor unit instruction for leak testing, evacuating and charging procedures. Always leak check entire system before charging.

Sealing Ducts

The coil cabinet MUST be sealed after installation to ensure against air leaks, which can impact system performance. The material, and method, used should be capable of enduring the range of temperature and humidity levels expected in the specific install location.

Ensure the duct is secured and all joints are properly sealed to the coil cabinet flanges.

⚠ WARNING

There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, caulking, or equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal. Return air must not be drawn from a room where this air handler or any gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

⚠ IMPORTANT

DUCT SYSTEM SIZING - The duct system should be properly sized and installed according to the ASHRAE Standard Manual D. The supply and return air duct systems should be designed for the cfm and static requirements of the job. Consult the blower performance chart in the unit installation instructions to verify that the blower meets the application requirements.

Condensate Drain Connections

⚠ IMPORTANT

After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to make sure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

MAIN DRAIN

Connect the main drain and route downward to drain line or sump. Do not connect drain to a closed waste system. See figure 9 for typical drain trap configuration.

OVERFLOW DRAIN

It is recommended that the overflow drain is connected to a overflow drain line for all units. If overflow drain is not connected, it must be plugged with provided cap.

BEST PRACTICES

The following practices are recommended to ensure better condensate removal:

- Main and overflow drain lines should NOT be smaller than drain connections at drain pan.
- Overflow drain line should run to an area where homeowner will notice drainage.
- It is recommended that the overflow drain line be vented and a trap installed. Refer to local codes.

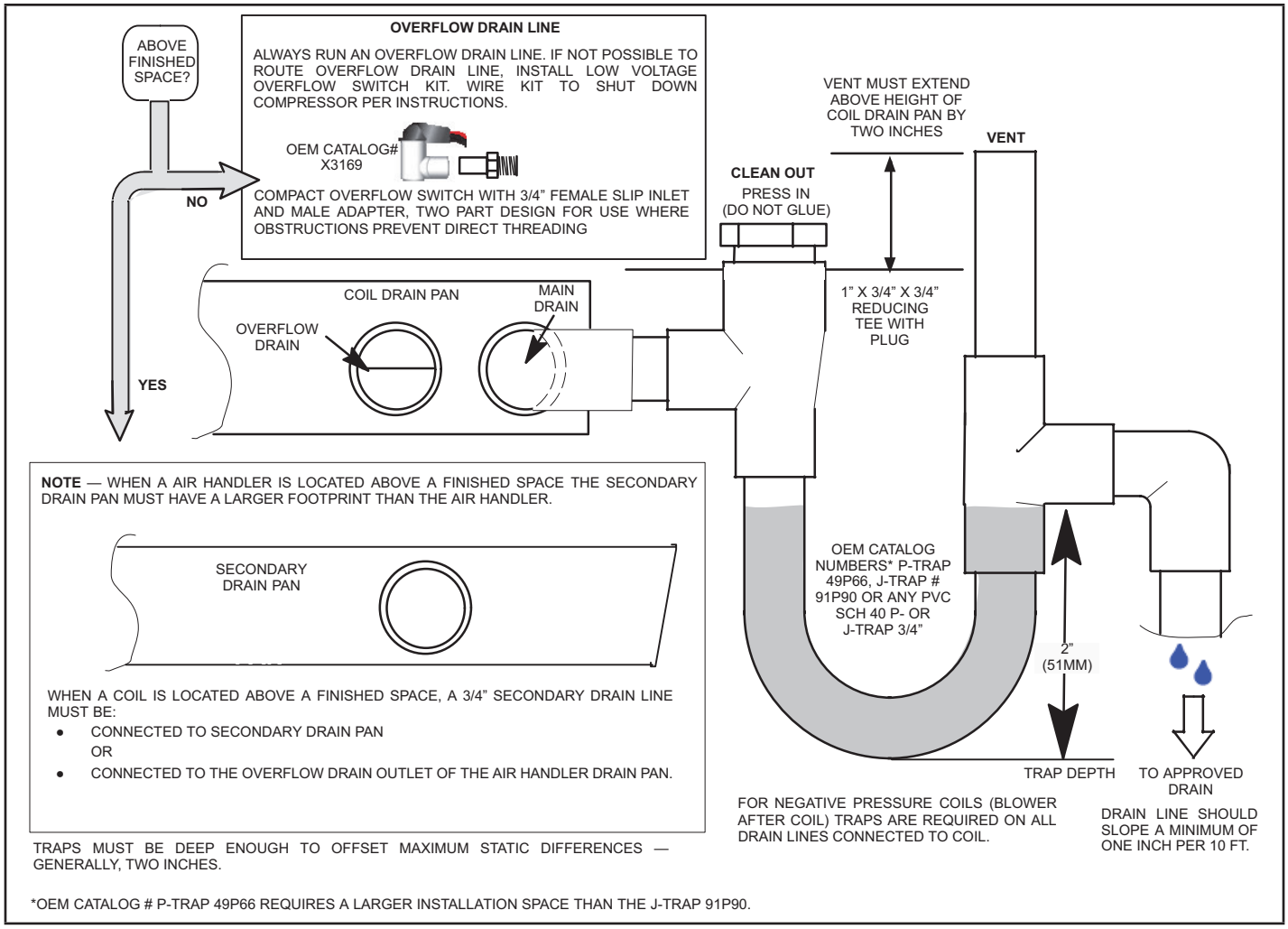


FIGURE 8. Typical Main and Overflow Drain Installations

Blower Speed Selection

Proper air volume must be provided over the evaporator coil. Select a blower motor speed tap that will provide 400 ± 50 CFM per 12,000 Btuh of cooling capacity (wet coil). A static pressure reading must be taken to see if the pressure drop falls within the proper range.

To ensure accuracy, static pressure must be read from the air entry side of the coil to the air exit side of the coil. See figure 9 for an example to obtain an accurate reading.

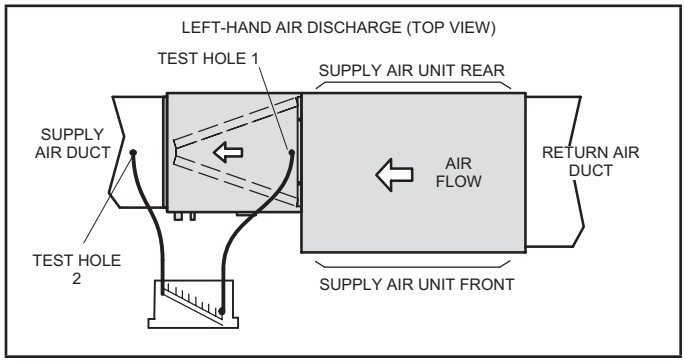


FIGURE 9. Static Pressure Test

⚠ CAUTION

Take care when drilling test holes into the furnace flange and the duct. Drill holes away from refrigerant piping. Test holes should be drilled where specified in order to avoid unit damage.

1 - Drill a 5/16" test hole in the coil case 1" from the furnace flange (test hole 1, figure 9).

2 - Drill a 5/16" test hole into the supply air duct (test hole 2, figure 9).

3 - Connect the zero end of the draft gauge scale to the furnace end of the coil. Insert the hoses so that 1/4" extends inside the duct or end seal. Seal around holes with Permagum.

4 - Turn on electrical power to the furnace and set the thermostat to initiate a cooling demand.

5 - Table 2 lists the range of air volumes and equivalent draft gauge readings for this unit. Observe the draft gauge reading. If the reading is below the required air volume, increase the blower speed; if the reading is above the required air volume, decrease the blower speed. Refer to the furnace wiring diagram for blower speed settings.

6 - When the required draft gauge readings are obtained, remove the draft gauge lines and insert snaphole plugs into the test holes.

TABLE 2. Air Volume / Static Pressure Drop Across Coil

Cabinet		Vol: CFM	Drop: in. w.g.	
CHX35 Model	Width in.		Dry	Wet
-18A-6F	14-1/2	600	.09	.11
-24A-6F -24B-6F	14-1/2 17-1/2	800 800	.15 .09	.19 .11
-30A-6F -30B-6F	14-1/2 17-1/2	1000 1000	.24 .14	.27 .16
-36A-6F -36B-6F -36C-6F	14-1/2 17-1/2 21	1200 1200 1200	.30 .16 .15	.39 .21 .18
-42B-6F -42C-6F	17-1/2 21	1400 1400	.26 .18	.31 .21
-48B-6F	17-1/2	1400	.25	.29
-48C-6F	21	1600	.27	.30
-51/61C-6F	21	1600	.25	.29
-60D-6F	24-1/2	2000	.24	.30

Maintenance

NOTICE !

Failure to follow instructions will cause damage to the unit.

This unit is equipped with an aluminum coil. Aluminum coils may be damaged by exposure to solutions with a pH below 5 or above 9. The aluminum coil should be cleaned using potable water at a moderate pressure (less than 50psi). If the coil cannot be cleaned using water alone, Lennox recommends use of a coil cleaner with a pH in the range of 5 to 9. The coil must be rinsed thoroughly after cleaning.

A trained technician or service agency must perform maintenance and service on equipment. At the beginning of each heating or cooling season, indoor coils should be inspected to determine whether the coil requires cleaning.

CLEANING THE COIL

1 - Remove the coil from the cabinet or plenum, and take the coil to an appropriate place to clean it.

2 - Vacuum or brush the coil to remove matted and surface debris from the fins. Use vacuum attachments and/or brushes that are non-destructive to fins.

3 - If oil deposits are present, spray the coil with a mild coil cleaner with a pH in the range of 5 to 9 to soften deposits. Do not leave the coil cleaner on the coil for more than 10 minutes. Flush the coil thoroughly with potable water.

4 - Spray the coil at a vertical angle of 30 to 45 degrees with a constant stream of water at moderate pressure. A pressure washer with a fan nozzle will work best. Do not spray the coil from a horizontal direction.

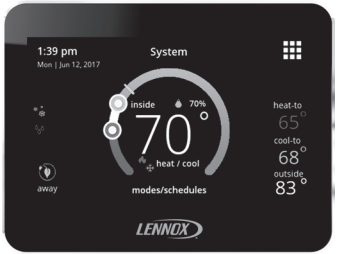
5 - Direct the spray so that any debris is washed out of the coil. For most residential units, hot water is not necessary.

NOTE - *Attempting to back flush from the inside of the coil will require removing parts from the unit, and it may be very difficult to flush the whole coil surface. Attempting to blow water through a coil will slow the water stream and reduce the flushing action of the outer fin surface.*

6 - Replace the coil into the cabinet or plenum. Ensure that you have followed the proper procedure for routing and securing the refrigerant tubing.

⚠ IMPORTANT

Ensure that the distributor lines are not rubbing together or kinked. All tubes must have enough clearance from other metal parts. Use wire ties to secure tubes to prevent movement that could cause the refrigerant tubing to fail.



Disponible en español en www.LennoxPros.com.

Lennox® M30

Smart Thermostat

Installation and Setup Guide

507739-02 3/2023
Supersedes 6/2021

Tables of Contents

Shipping and Packing List **3**

Thermostat **3**

Unit Dimensions (H x W x D) *3*

Wall Plate Dimensions (H x W) *3*

Compressor Short-Cycle Protection (Compressor Protect) *3*

Installation Considerations **4**

Outdoor Air Temperature Sensor Installation (Optional) **4**

Thermostat Installation **5**

New Installation *5*

Replacement Installation *6*

Common Installation Practices *6*

Thermostat Terminal Information *7*

System Wiring Diagrams *8*

Connecting Thermostat Wiring *8*

Supported Configurations *8*

Install Thermostat to Backplate *11*

Commissioning and Advanced Settings **11**

Commissioning *12*

Advanced Settings *14*

Advanced Settings Parameter Descriptions *22*

Stage Control **26**

Wi-Fi Connection **30**

Connecting to Visible Home Wi-Fi Access Point ... *31*

Connecting to Hidden Home Wi-Fi Access Point .. *32*

Wireless Terminology *32*

Wireless Connectivity Troubleshooting Tips *32*

Determining Wireless Connection Signal Strength *33*

Alert Codes **34**

Service Urgent *34*

Service Soon *34*

Service Soon / Service Urgent *34*

Maintenance *34*

Dealer Information only *34*

System Test Modes **40**

Save Energy Default **41**

Dehumidification Control **41**

Normal and Max *41*

Humiditrol *42*

Auxiliary Dehumidifier *42*

Humidification Control **43**

Normal and Max *43*

Normal and Max Dew Point Control *44*

Ventilation Control **45**

Ventilation Rates *45*

Energy Recovery Ventilator (ERV) *45*

Heat Recovery Ventilator (HRV) *45*

Fresh Air Damper *45*

Ventilation Wiring *46*

Ventilation Control Modes *47*

Installer Checklist **47**

Shipping and Packing List

Item	Quantity
M30 Thermostat with backplate attached	1
Wall plate	1
Mounting screws (M3.5x25mm self-tapping screws)	2
Wall anchors	2
Warranty sheet	1
Installation & setup guide	1
User guide	1
System Wiring Diagrams Fold-Out Sheet	1

Thermostat

Unit Dimensions (H x W x D)

Dimensions: 3-5/16 x 4-5/16 x 7/8 in. (84 x 110 x 22mm)

Wall Plate Dimensions (H x W)

Dimensions: 4-1/2" x 5-3/4" (114 x 146mm)

Compressor Short-Cycle Protection (Compressor Protect)

This thermostat is equipped with automatic compressor protection to prevent potential damage due to short cycling or extended power outages.

The non-adjustable short-cycle protection provides a 5-minute delay between heating or cooling cycles to prevent the compressor from being damaged.

NOTE: *There is an option in advanced settings that will allow this safety feature to be disabled. By default it is set to ON. Short Cycle protection is disabled during testing of the outdoor unit. It is automatically reset once the test is completed.*

⚠WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life.

Installation and service must be performed by a licensed professional HVAC installer (or equivalent) or a service agency.

⚠WARNING

Always turn off power at the main power source by switching the circuit breaker to the OFF position before installing or removing this thermostat.

All wiring must conform to local and national building and electrical codes and ordinances.

⚠IMPORTANT

In all applications, the M30 thermostat can only be used with all residential units and approved commercial split-system matches, and those which meet the following installation criteria:

Installation uses 18 gauge thermostat wire or larger and wire run length DOES NOT EXCEED 300 feet (91 meters).

Load from any thermostat connection is 1 AMP or less.

When using the outdoor sensor and connecting to the To and Tc outdoor temperature terminal connections we suggest using a separate 2-wire thermostat wire cable to the sensor.

⚠CAUTION

This is a 24VAC low-voltage thermostat. Do not install on voltages higher than 30VAC.

Do not short (jumper) across terminals on the gas valve or at the system control to test installation.

This will damage the thermostat and void the warranty.

Installation Considerations

Before beginning installation, note the type of equipment, number of stages, and any accessories being installed. This thermostat is a 24VAC low-voltage thermostat and requires a common wire to the thermostat to operate.

- Shut off all power to system components before installing thermostat.
- Make sure that all wiring conforms to local and national building and electrical codes and ordinances.
- Never short (jumper) across terminals on the gas valve or at the system control to test installation. This will damage the thermostat and void the warranty.
- Never install thermostat on outside walls or in direct sunlight.

Outdoor Air Temperature Sensor Installation (Optional)

The optional outdoor air (temperature) sensor (OATS) (X2658) wiring distance to iComfort M30 should not exceed 150 feet (45 meters) when wired with minimum 22 #AWG (recommend 18 #AWG) dedicated 2-conductor thermostat cable. Installation of OATS must comply with the following requirements:

The sensor is required for:

- Outdoor temperature displays on the home

screen if enabled
- Balance point adjustment and control. The sensor enables optimal heating equipment operation via programmable balance points.
- Dew point humidity control
- Humiditrol EDA operation (required)
- Connects to **To** and **Tc** terminals on thermostat

NOTE: *If alert code 108 appears on the screen, check your wiring connections to terminals* ***To*** *and* ***Tc*** *on the thermostat. Check resistances using the resistance table provided in the outdoor sensor instruction.*

Thermostat Installation

New Installation

The following procedure is for new installation or installing the M30 to a new location in an existing home.

1. Unpacked the thermostat and open the case with a thin-blade screwdriver. Place between wall base and unit and twist to separate unit from base.
2. Select a location for the thermostat about 5 feet (1.5 meters) above the floor in an area with good air circulation at average temperature.
3. Do not install the thermostat where it can be affected by:
   - Drafts or dead spots behind doors and in corners.
   - Building entrances or automatic doors
   - Heat generating equipment such as kitchen equipment
   - Hot or cold air from ducts.
   - Radiant heat from sun or appliances.
   - Concealed pipes and chimneys.
   - Non-heated (non-cooled) areas such as an outside wall behind the thermostat.
4. Run thermostat wiring from indoor unit to location where thermostat will be installed.
5. Drill or make opening through wall for thermostat wiring 3/4” x 3/4” (19mm x 19mm).
6. Pull about three inches (76mm) of thermostat wire through the opening and removed outer thermostat wire jacket. This will help in routing the thermostat wiring to the proper thermostat terminals.

NOTE: *Thermostat wires and outdoor sensor wire can be run in the same bundle of wires if needed.*

7. Seal the hole in the wall with a suitable material to prevent drafts from entering the thermostat case. Not doing so could affect the thermostat’s internal temperature sensor.
8. Trim 1/4 inch (6 mm) insulation from end of each thermostat wire lead.

Replacement Installation

Use the following two steps to replace an existing thermostat.

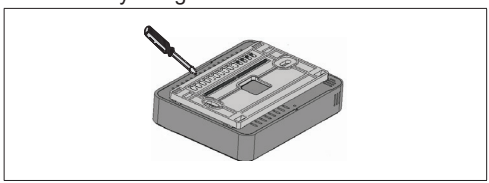
1. Remove existing thermostat.
2. Note the wire colors and what terminals they are connected for future reference.

Common Installation Practices

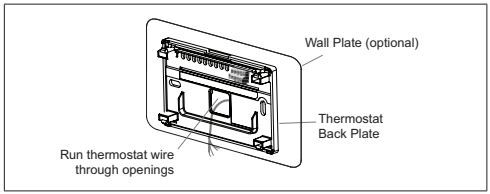
Use the provided wall plate as a template on where to drill the mounting holes.

NOTE: *Installation of wall plate is optional. Use a field-provided level to allow for proper alignment.*

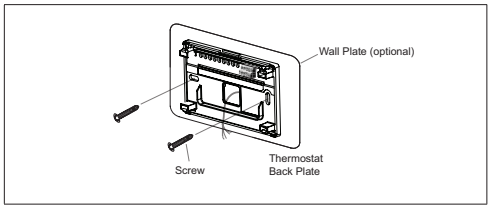
3. Drill 3/16” (5 mm) holes in wall for provided wall anchors. Insert provided wall anchors into drilled holes.
4. Remove back plate from main thermostat assembly using a flat-head screw driver.



5. Route thermostat and outdoor temperature sensor (optional) wiring from wall through center openings on wall plate (use is optional) and back plate.



6. Secure back plate and wall plate (optional) to wall with the two provided mounting screws.



Thermostat Terminal Information

Table 1. Terminal Designations

Terminal	Purpose
Tc and To	Used for connection to an optional outdoor temperature sensor. Use only dedicated 2-conductor thermostat wire.
ACC1 and ACC2	Default factory software setting for ACC (Accessory) is off. Terminal function setting can be changed by going to **settings > advanced settings > terminal settings**. Available settings are off, humidify and dehumidify. Connect accessory to terminal ACC2 and change software setting to the applicable type of accessory. Power is supplied by R2 to ACC1 factory jumper. ***NOTE:*** *The ACC1 is intended to be the voltage input terminal for the ACC relay. If the ACC relay is configured as a Dehumidifier and Humidifier, the ACC1 terminal needs to be jumpered to "R2" to supply the 24VAC from the HVAC system's 24V source. A jumper between R2 and ACC1 will be shipped installed by the factory.* ***NOTE:*** *If the ACC terminal is used for ventilator devices which have their own voltage supply and need a set of "dry relay contacts" then the jumper will need to be removed from R2-ACC1.*
R2	This is the secondary 24VAC power source for ACC (Accessory). The R2 terminal is connected to the ACC1 terminal by factory provided jumper.

Table 1. Terminal Designations

Terminal	Purpose
D/H	This terminal is for an optional dehumidifier or humidifier. The D/H terminal is powered using the HVAC system's 24VAC source ("R"). Factory default software setting is for dehumidify. Terminal settings can be changed by going to **settings** > **advanced settings > terminal settings**. Available settings are off, humidify and dehumidify. ***NOTE:*** *The user interface refers to the terminal as H/D.*
W2	Second-stage heating (non-heat pump) or 4th stage (heat pump).
Y2	Second-stage heating or cooling.
O/B	Heat pump reversing valve operations. When O (default) is selected under **settings** > **advanced settings > terminal settings**, the relay is ON during cooling and OFF during heating. When B is selected, the relay is ON during heating and OFF during cooling.
C	Common 24VAC
G	Fan relay
W1	First-stage heating (non-heat pump or emergency heat) or third-stage heating (heat pump)
Y1	First-stage heating or cooling
R	24VAC power

Table 2. O/B Terminal Relationship States

State	O/B Terminal Control
Power ON	O terminal : ON (If O terminal selected) B terminal : OFF (If B terminal selected
Heat only or emergency heat mode	O terminal : always OFF B terminal : always ON
Cool mode only	O terminal : always ON B terminal : always OFF
Heat/Cool mode	During heating O terminal : OFF B terminal : ON During cooling O terminal : ON B terminal : OFF No Demand The terminal continues the previous ON / OFF state
Off mode	The terminal state continues the state before entering off mode

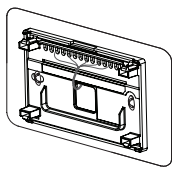
System Wiring Diagrams

For system diagrams, see the included fold-out iComfort® M30 Smart Thermostat System Diagrams sheet.

Connecting Thermostat Wiring

Use “Table 1. Terminal Designations” on page 7 for connecting the thermostat wiring to the back plate terminals.

If this is a replacement thermostat, connect to terminals as noted when removing the old thermostat. If terminals were different on old thermostat, use “Table 1. Terminal Designations” on page 7 and wiring diagrams provided in the kit.



NOTE: *Remember to seal the hole in the wall with a suitable material to prevent drafts from entering the thermostat case. Not doing so could affect the thermostat’s internal temperature sensor.*

Supported Configurations

See “Table 3. Supported Configurations” on page 9.

Table 3. Supported Configurations

Outdoor unit setting	Indoor unit setting	Comp. Stages	Indoor Heat Stages	Heat Stages	Cool Stages	Heat Stage				EM Heat Stage		Cool Stage	
						1st	2nd	3rd	4th	1st	2nd	1st	2nd
HP	No Heat	1	0	1	1	Y1	-	-	-	-	-	Y1	-
		2	0	2	2	Y1	Y1+Y2	-	-	-	-	Y1	Y1+Y2
	Gas / Oil	1	1	2	1	Y1	W1	-	-	W1	-	Y1	-
		1	2	3	1	Y1	W1	W1+W2	-	W1	W1+W2	Y1	-
		2	1	3	2	Y1	Y1+Y2	W1	-	W1	-	Y1	Y1+Y2
		2	2	4	2	Y1	Y1+Y2	W1	W1+ W2	W1	W1+W2	Y1	Y1+Y2
	Elec	1	1	2	1	Y1	Y1+W1	-	-	W1	-	Y1	-
		1	2	3	1	Y1	Y1+W1	Y1+W1+W2	-	W1	W1+W2	Y1	-
		2	1	3	2	Y1	Y1+Y2	Y1+Y2+W1	-	W1	-	Y1	Y1+Y2
		2	2	4	2	Y1	Y1+Y2	Y1+Y2+W1	Y1+Y2+W1 +W2	W1	W1+W2	Y1	Y1+Y2

Table 3. Supported Configurations

Outdoor unit setting	Indoor unit setting	Comp. Stages	Indoor Heat Stages	Heat Stages	Cool Stages	Heat Stage				EM Heat Stage		Cool Stage	
						1st	2nd	3rd	4th	1st	2nd	1st	2nd
A/C	No Heat	1	0	-	1	-	-	-	-	-	-	Y1	-
		2	0	-	2	-	-	-	-	-	-	Y1	Y1+Y2
	Gas / Oil or Elect	1	1	1	1	W1	-	-	-	-	-	Y1	-
		1	2	2	1	W1	W1+W2	-	-	-	-	Y1	-
		2	1	1	2	W1	-	-	-	-	-	Y1	Y1+Y2
		2	2	2	2	W1	W1+W2	-	-	-	-	Y1	Y1+Y2
No OU	Gas / Oil or Elect	0	1	1	0	W1	-	-	-	-	-	-	-
		0	2	2	0	W1	W1+W2	-	-	-	-	-	-

OU = Outdoor Unit
Elect = Electrical Heat

Install Thermostat to Backplate

The thermostat assembly simply snaps onto the back plate. Once secure to the back plate apply power to the system. Thermostat should boot up and go into the commissioning process.

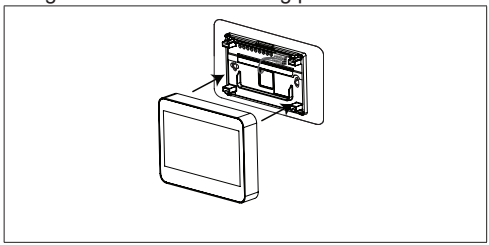


Figure 1. Installing Thermostat

If power is applied and the thermostat screen remains off, inspect and verify all wire connections.

Commissioning and Advanced Settings

After power is applied to the thermostat for the first time it displays the Lennox® “splash screen”.

The Installer is then presented with the several Setup Screens to configure the system prior to operation.

Commissioning

“Table 4. Commissioning Screens” on page 12 list all of the screens and parameters that can be configured during the commissioning phase.

Table 4. Commissioning Screens

MENU		SETTING (default is bold)		Notes:
DEALER INFO	**Dealer ID Number**	Enter id		Installer can add the dealer number and phone number using the keyboard tool.
	Dealer Phone Number	Enter phone		
	Name, email, website, dealer address (address1, address2, city, state and zip/postal code			
GENERAL	**Language**	**English**		
		Français		
		Español		
	Country/Region	**United States**		
		Canada		
		Australia		
	Date and Time	Time		Adjust the date and time using the set date and set time tools.
		Date		
		Time Zone\	Atlantic	
			Eastern	
			Central	
			Mountain	
			Pacific	

Table 4. Commissioning Screens

MENU		SETTING (default is bold)		Notes:
GENERAL	Date and Time	Time Zone\	Alaska	
			Hawaii	
			Samoa	
			Chamorro (Guam)	
		Daylight Savings	On or Off	
		Temperature Units	°F or °C	
TERMINAL SETTINGS	(See Terminal Settings on page 21)			
SYSTEM SETUP	(See System Setup on page 14)			
OUTDOOR SENSOR	(See Outdoor Sensor on page 16)			
HUMIDITY	Humidity Control	**Off**		
		Humidify		
		Dehumidify		
	Dehumidification Control Center	Normal or Max		Displayed if Dehumidify is selected
	Overcooling	2F		Display if Max is enabled
	Dehumidification Set-Point	50%		Displayed if Dehumidify is selected adjustable (40 to 60%)

Table 4. Commissioning Screens

MENU		SETTING (default is bold)	Notes:
NOTIFICATIONS (Reminders)	Replace Filter 1	Disabled	Adjustable 3, 6, 12, 24 months or custom date, can be set to calendar time or run-time. Touch custom to access the Set date Tool screen to input custom date settings.
	Replace Filter 2	Disabled	
	Replace UV Bulb	Disabled	
	Replace Humidifier Pad	Disabled	
	PureAir Maintenance	Disabled	
	Maintenance Reminder	Disabled	

Advanced Settings

"Table 5. Advanced Settings" on page 14 list the menu options and parameters that can be set under the Advance Settings menu option.

Table 5. Advanced Settings

MENU		SETTING (default is bold)	Notes:
SYSTEM SETUP	Ventilator Type	**None**	
		Fresh Air Damper	
		HRV	
		ERV	

Table 5. Advanced Settings

MENU		SETTING (default is bold)	Notes:
SYSTEM SETUP	Outdoor Unit Type	**Not Installed**	
		1 Stage A/C Unit	
		2 Stage A/C Unit	
		1 Stage HP Unit	
		2 Stage HP Unit	
		Outdoor Unit Capacity - 36 kBtu	Adjustable 18 to 60 kBu
		Outdoor Unit 1st Stage Capac (capacity)	Adjustable 30 to 100%. Default is 70%. (This setting is only available if outdoor unit is 2-stage.)
	Indoor Unit Type	**Not Installed**	
		1 Stage Electric	
		2 Stage Electric	
		1 Stage Oil	
		2 Stage Oil	
		1 Stage Gas	
		2 Stage Gas	

Table 5. Advanced Settings

MENU		SETTING (default is **bold**)	Notes:
SYSTEM SETUP	**Humidifier**	**Not Installed**	These options only appear under System Setup if the H/D and ACC terminals have been enabled for the specific type of accessory. Go to Terminal Settings to enabled attached accessory for the specific terminal being used.
		Humidification	
	Dehumidifier	**Not Installed**	
		Humiditrol - Min	
		Humiditrol - Mid	
		Humiditrol - Max	
		Auxiliary Dehumidifier	
		The Humiditrol settings provides adjustment of Humiditrol overcooling operation. Overcooling from two degrees below the cooling set point down to two degrees above the heating set point is provided. The minimum overcooling of two degrees below the cooling set point is represented by “MIN”. The maximum overcooling of two degrees above the heating set point or 65°F is represented by “MAX”. Halfway between is represented by “MID”. The default is “MAX”.	
OUTDOOR SENSOR		Yes or **No**	Required for high and low balance points options.
RESIDUAL COOL		**0**, 30, 60, 90, 120 seconds, -300 (5 minute delayed)	
BALANCE POINT		**Disabled** or Enabled Setting used to prevent the heat pump from heating the structure. The outdoor temperature is below the level where the heat pump is programmed to heat the home). ***NOTE:*** *Balance point option will not appear on the menu until system is configured correctly and a outdoor temperature sensor is installed and enabled in the thermostat.*	When enabled: Low Balance Point: 25°F (-20 to 72°F) Adjustments are in increments of 1°F (0.56°C). Setting used to prevent the heat pump from heating the structure. (Alert 18 - Minor - Notification only - The outdoor temperature is below the level where the heat pump is programmed to heat the home).

Table 5. Advanced Settings

MENU	SETTING (default is bold)	Notes:
		High Balance Point: 50°F (-17 to 75°F). Adjustments are in increments of 1°F (0.56°C). This setting is used to prevent the furnace or electric heat from heating the structure. (Alert 19 - Minor - Notification only - The outdoor temperature is higher than the level where the furnace or electric heat is programmed to heat the home.)
TEMPERATURE CONTROL MODE	Normal and **Comfort**	The Feels-Like feature factors in the outdoor temperature and indoor humidity for a more accurate control of the temperature in the home. Either an outdoor temperature sensor is used or Internet Weather is enabled for this feature to operate. Modifying this setting here will also change the feature status on the user settings screen. • Normal - This setting cools or heats the home to the desired temperature setting (Feels Like is OFF. • Comfort - This setting cools or heats the home to the desired temperature setting (Feels Like) is ON. When set to ON, other parameters are modified to optimal settings for this feature. Those setting changes will be listed on-screen when Comfort is enabled. Default is Comfort.
WALL INSULATION	Poor, **Average** and Good	Poor, Average and Good represents the insulation form factor value considered for temperature anticipation value
DEADBAND	Adjustable (3 to 8 degrees)	Prevents the Heating and Cooling from being set closer together than 3 degrees or greater than 8 degrees (Dead- band). Default is 3ºF.

Table 5. Advanced Settings

MENU	SETTING (default is bold)	Notes:
SMOOTH SETBACK RECOVERY	**Enabled** or Disabled	When enabled, smooth set back begins recovery up to two hours before the programmed time so that the programmed temperature is reached at the corresponding programmed event time. Assume 12°F (6.72°C) per hour for first-stage gas/electric heating and 6°F (3.36°C) per hour for first-stage compressor based heating or cooling. With Smooth Set Back disabled, the system will start a recovery at the programmed time. Options are enabled or disabled. Default is enabled.
OFFSET	Temperature Offset - 0°F	Adjustable (-5 to 5°F)
	Humidity Offset - 0%	Adjustable (-10 to 10%)
STAGE DIFFERENTIAL	Stage 1 - 1.0°F	Adjustable (0.5 to 8.0°F)
	Stage 2 - 1.0°F	Adjustable (0.5 to 8.0°F)
	Stage 3 - 0.5°F	Adjustable (0.5 to 8.0°F)
	Stage 4 - 0.5°F	Adjustable (0.5 to 8.0°F)
STAGE DELAY	On or **Off**	
	Stage 2 through 4 - 20 min.	Adjustable (5 to 120 minutes). Default is 20 min.
H/C STAGES LOCKED IN	Enable or **Disable**	Turns heating stages off separately

Table 5. Advanced Settings

MENU	SETTING (default is bold)	Notes:
VENTILATION SETTINGS	**Ventilator Type: ERV or HRV**	
	VENTILATION CONTROL MODE (VCM): ASHRAE or Timed	
NOTE: *Thermostat ventilation rate parameter are to be adjusted only after the HRV/ERV set up is completed and the CFMs are known. Once the thermostat's CFMs are adjusted they are used with the thermostat's timer algorithm to determine how long to run the HRV/ERV.*		
VCM = TIMED	Ventilation Minutes Per Hour	Default is 20 minutes. Range is 0 to 60 minutes
	Ventilation Rate	Default is 130 CFM. Range is 20 to 500 CFM
	Ventilation High Outdoor Temperature Limit	Default is 100ºF. Range is 60ºF to 115ºF.
	Ventilation Low Outdoor Temperature Limit	Default is 0ºF. Range is -20ºF to 55ºF.
	Ventilation High Outdoor Dew Point Limit	Default is 55ºF. Range is 45ºF to 80ºF.
VCM = ASHRAE and Ventilation Outdoor Condition Override is set to ENABLED.	Ventilation Rate	Default is 500 CFM. Range is 20 to 500 CFM.
	Ventilation High Outdoor Temperature Limit	Default is 100ºF. Range is 60ºF to 115ºF.
	Ventilation Low Outdoor Temperature Limit	Default is 0ºF. Range is -20ºF to 55ºF.
	Ventilation High Outdoor Dew Point Limit	Default is 55ºF. Range is 45ºF to 80ºF.
NOTE: *In this mode the thermostat can assist the installer by validating the ventilation CFMs are capable of meeting the ASHRAE required ventilation volumes, but the thermostat has no ability to control CFM from the HRV/ERV.*	ASHRAE Compliance Check	YES or No: Current settings comply with ASHRAE 62.2.
	ASHRAE Infiltration Credit	Default is 0 CFM. Range is 0 to 200 CFM.
	ASHRAE house floor area serviced by this ventilator	Default is 2500 square feet. Range is 500 to 5000 square feet.
	ASHRAE Number of Bedrooms	Default is 3. Range is 1 to 10.

Table 5. Advanced Settings

MENU	SETTING (default is bold)	Notes:
VENTILATION SETTINGS	**Ventilator Type: Fresh Air Damper**	
	VENTILATION CONTROL MODE (VCM): ASHRAE or Timed	
VCM = TIMED	Relay Setting to Work Fresh Air Damper	Closed or Open. Default is Closed.
	Ventilation Minutes Per Hour	Default is 20 minutes. Range is 0 to 60 minutes
	Ventilation High Outdoor Temperature Limit	Default is 100ºF. Range is 60ºF to 115ºF.
	Ventilation Low Outdoor Temperature Limit	Default is 0ºF. Range is -20ºF to 55ºF.
	Ventilation High Outdoor Dew Point Limit	Default is 55ºF. Range is 45ºF to 80ºF.
VCM = ASHRAE and Ventilation Outdoor Condition Override is set to DISABLED.	Relay Setting to Work Fresh Air Damper	Closed or Open. Default is Closed.
	ASHRAE Compliance Check	YES or No: Current settings comply with ASHRAE 62.2.
	ASHRAE Infiltration Credit	Default is 0 CFM. Range is 0 to 200 CFM.
	ASHRAE house floor area serviced by this ventilator	Default is 2500 square feet. Range is 500 to 5000 square feet.
	ASHRAE Number of Bedrooms	Default is 3. Range is 1 to 10.
	Fresh Air Damper Ventilation CFM	Default is 75 CFM. Range is 20 to 250 CFM.
VCM = ASHRAE and Ventilation Outdoor Condition Override is set to ENABLED.	Ventilation High Outdoor Temperature Limit	Default is 100ºF. Range is 60ºF to 115ºF.
	Ventilation Low Outdoor Temperature Limit	Default is 0ºF. Range is -20ºF to 55ºF.
	Ventilation High Outdoor Dew Point Limit	Default is 55ºF. Range is 45ºF to 80ºF.
	ASHRAE Compliance Check	YES or No: Current settings comply with ASHRAE 62.2.
	ASHRAE Infiltration Credit	Default is 0 CFM. Range is 0 to 200 CFM.
	ASHRAE house floor area serviced by this ventilator	Default is 2500 square feet. Range is 500 to 5000 square feet.
	ASHRAE Number of Bedrooms	Default is 3. Range is 1 to 10.

Table 5. Advanced Settings

MENU		SETTING (default is bold)	Notes:
VCM = ASHRAE and Ventilation Outdoor Condition Override is set to ENABLED		Fresh Air Damper Ventilation CFM	Default is 75 CFM. Range is 20 to 250 CFM
STAGE 2 HP LOCK TEMP		**Off**, 40°F, 45°F, 50°F, 55°F	Heat Pump - for dual-fuel applications (locks out 2nd stage compressor)
COMPRESSOR PROTECT		**On** or Off	This feature prevents the compressor from being short cycled any time the compressor is turned “OFF”.
DISPLAY PERFORMANCE REPORT		**On** or Off	
TERMINAL SETTINGS	**H/D**	Off	
		Humidify	
		Dehumidify	
	ACC	Off	
		Humidify	
		Dehumidify	
		Ventilation	
	O/B	**O (energized during cooling)**	
		B (energized during heating)	
SYSTEM TEST MODE		Confirm Button	Installer run tests to check all output relays. Tests confirm signals between thermostat/unit are being sent/received. Stops system to run system tests
RESET SETTING		Confirm Button	Resets all parameters to factory settings
RESTART		Confirm Button	Reboot the thermostat.

Advanced Settings Parameter Descriptions

Table 6. Parameter Descriptions

Parameter Name	Definition
Smooth Setback Recovery (SSR)	SSR is an algorithm designed to smoothly" reach a occupied program schedule setpoint. The algorithm looks 2 hours ahead for the occupied program schedule period's setpoint. If the occupied setpoint requires the system to turn on (present temperature below the heat setpoint or above the cool setpoint), then SSR will calculate a new setpoint. Once initiated, SSR monitors the change in room temperature and calculates a new setpoint every 30 seconds. Then SSR provides this new setpoint for the heating and cooling algorithms; the new setpoint will be displayed on the User Interface. **SSR Rules:** • SSR is enabled when both Smooth Setback Recovery" is set to enabled (default) and the program schedule is turned on. • SSR does NOT turn off stage delay timers. • SSR will NOT change the dead band between heating and cooling modes. • SSR will not overshoot the target set point. • SSR will reset if the user updates the program schedule during the active SSR period. Smooth Setback Recovery - default is enabled . ***NOTE:*** *SSR aims to bring the sensor temperature (room temperature) to the value of the next active set point at the exact time the next active set point is associated with. This means that conditioning to reach the next active set point starts before the currently active set point period expires.*
Offset	This is a feature that lets you adjust the room temperature reading +/- 5°F. This helps if your thermostat is in a slightly warm or cold spot, or if the room temperature does not match your old thermostat. The other option setting in our thermostat is humidity offset which is basically the same as temperature, but works on a humidity percentage instead.

Table 6. Parameter Descriptions

Parameter Name	Definition
Stage Differential	There are four options for stage differential: • 1st Stage Differential: The default is 1.0°F. The first stage differential is the difference between the equipment activation and deactivation temperatures. The first stage differential is used in all models. It can be programmed between 0.5 and 8.0°F in 0.5°F steps. • 2nd Stage Differential: The default is determined by the system setup. The second stage differential is used in the multi-stage model only. The second stage differential is the difference in temperature between the second stage activation and the first stage activation. It can be programmed between 0.5 and 8.0°F in 0.5°F steps. If system has only 1st stage equipment, this item is hidden from installer screen. • 3rd Stage Differential: This setting is used with the multi-stage model, in heat pump applications only. The default is determined by the system setup. The third stage differential is the difference in temperature between the third stage activation and the second stage activation. It can be programmed between 0.5 and 8.0°F in 0.5°F steps. If system has no more than three stages equipment, this item is hidden from installer screen. • 4th Stage Differential: This setting is used with the multi-stage model, in heat pump applications only. The default is determined by the system setup. The fourth stage differential is the difference in temperature between the fourth stage activation and the third stage activation. It can be programmed between 0.5 and 8.0°F in 0.5°F steps. If system does not have fourth stage equipment, this item is hidden from installer screen.

Table 6. Parameter Descriptions

Parameter Name	Definition
Stage Delays	There are four settings for this option: • Stage Delay Timer: The user shall be able to select ON (default) or OFF for stage delay timers. When OFF is selected all STG DELAYS timers (STG 2 DELAY, STG 3 DELAY, STG 4 DELAY) are disabled. This means that the stages are changed based on the temperature and not the timer delays. When ON is selected all STG DELAYS timers are enabled and set to their default values (20min). If system has only first stage equipment, this item is hidden from installer screen. • 2nd Stage Delays: The Stage Delay option is enabled when ON is selected from STG Delay Timers. The second stage delay is used in the multi-stage model only. The default is 20 minutes. If the first stage fails to advance the ambient temperature toward the setpoint by 1.0°F during each consecutive programmed time delay, then the second stage is activated until demand is satisfied. It can be programmed from 5 to 120 minutes in 5-minute steps. If system has only first stage equipment, this item is hidden from installer screen. • 3rd Stage Delays: The Stage Delay option is enabled when ON is selected from STG Delay Timers. This setting is used with the multi-stage model, in heat pump applications only. The default is 20 minutes. If the second stage fails to advance the ambient temperature toward the setpoint by 1.0°F during each consecutive programmed time delay, then the third stage is activated until demand is satisfied. It can be programmed from 5 to 120 minutes in 5-minute steps. If the system has no more than three stages, this item is hidden from the installer screen. • 4th Stage Delays: The Stage Delay option is enabled when ON is selected from STG Delay Timers. This setting is used with the multistage model, in heat pump applications only. The default is 20 minutes. If the third stage fails to advance the ambient temperature toward the set point by 1.0°F during each consecutive programmed time delay, then the fourth stage is activated until demand is satisfied. It can be programmed from 5 to 120 minutes in 5-minute increments. If the system does not have a fourth stage, this item is hidden from installer screen. If temperature is stuck at a value lower than the set point and multiple stages have been turned on because of the delay timers expired (not because of the temperature), all these stages shall stay on until the required temperature (set point + 0.5) is reached.
H/C STGS Locked In	The user shall be able to select disable or enable for H/C STGS LOCKED IN mode. In disable, mode different stages of heat or cool are turned off separately. In enable mode, different stages of heat or cool are turned off together.

Table 6. Parameter Descriptions

Parameter Name	Definition
Stage 2 HP Lock Temp	The User shall be able to select the STG 2 HP lock temp from 40F, 45F, 50F, 55F or OFF. The value is used in dual fuel algorithm to lock the second stage of compressor .The default is OFF which means it is disabled and is not used in dual fuel algorithm. If system has only 1st stage equipment, this item is hidden from installer screen. For more information see “Stage 2 HP Lock Temp” on page 28.
Feels Like	This feature will display the home temperature based on a combination of inputs. Feels Like uses outdoor temperature, indoor temperature, and indoor humidity to determine the “feels like” condition of the home.
Wider Set Point Range	By default your thermostat operates within a range of 60-90°F. Enabling this options changes the range to 44-99°F.
Heating Mode: Normal or Comfort	Options are Normal and Comfort. Default is Normal. When changing to Comfort Mode, several parameters are automatically modified for optimal system operations. The changed parameters are listed on the screen when set to Comfort. • Normal - This setting cools the home to the desired temperature setting. Once second-stage is activated by timer or differential, it will not stage down to first-stage until the next heating cycle demand. • Comfort - This is when the system could automatically stage up or down based on the current load demand.
Smart Away	This setting when enabled controls the temperature in the home when no one is home. For this to function, the Lennox Mobile app needs to be installed on a mobile device.
Low Balance Point	(Multistage Heat Pump Model only) -The default is 25°F. This option will only be available if an outdoor sensor is installed. If the outside temperature is below the programmed Low Balance Point, then the compressor stage operation is disallowed. This protects the compressor from operation and damage in cold outdoor temperatures. Also, if the heat pump is not effective at a low outdoor temperature, then it is more comfortable and efficient to go directly to the second stage. Low Balance Point can be disable in this screen. When this is enable, the options are from –40°F to (the High Balance Point temperature -2) in 1.0°F steps.
High Balance Point	The default is 50°F. This option is only available if an outdoor sensor is installed. If the outside temperature is above the High Balance point, then the auxiliary heat stage is disallowed. This prevents the more expensive auxiliary heat stage from operating, and forces the more efficient heat pump to satisfy the demand. High Balance Point can be disable in this screen. When this is enable, the high balance point range is from (the low balance point + 2) up to 75°F.
Deadband	The deadband setting is the minimum difference between the cooling and heating setpoints. This setting is used in auto-changeover to ensure smooth equipment operation. It also allows for flexibility of Humiditrol operation. The default deadband is 3 and the deadband is adjustable from 3 to 9°F degrees.

Table 6. Parameter Descriptions

Parameter Name	Definition
Offset	There are two options for offset which are: • Temperature offset can be used to offset the displayed space temperature by up to +/- 5 degrees. The default temperature offset is zero. This offset also applies to the control temperature. • Humidity offset can be used to offset the displayed room humidity by up to +/- 10%, the default offset is 0.

Stage Control

The following figures list typical configurations.

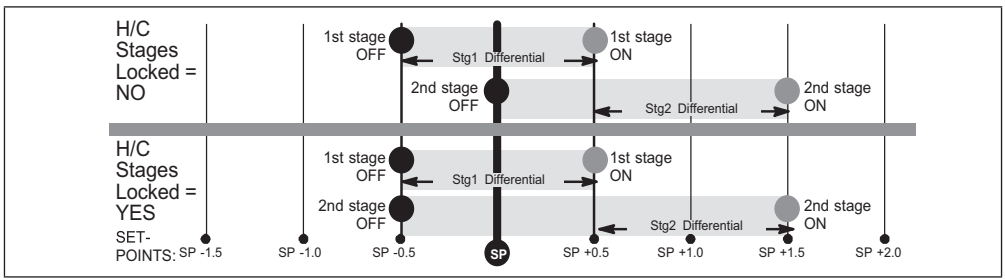


Figure 2. Cooling - 1 or 2 stages

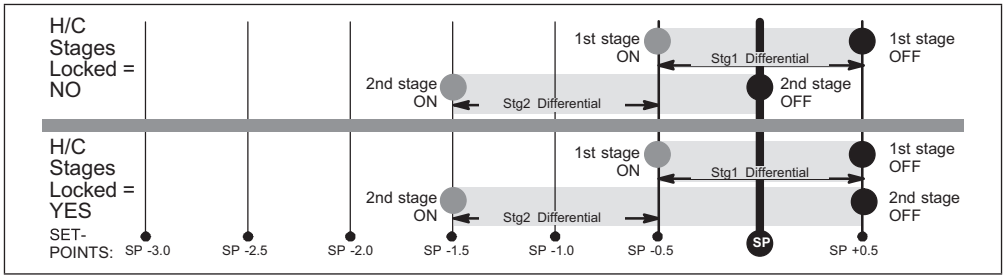


Figure 3. Heating - Non-Heat Pump or Heat Pump w/o backup heat - 1 or 2 stages

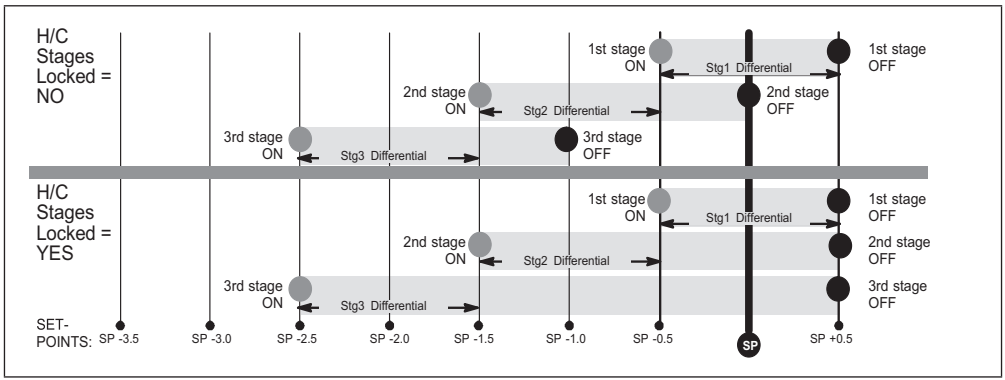


Figure 4. Heating - Heat Pump w/electric - 3 stage (2 compressor / 1 backup OR 1 compressor / 2 backup)

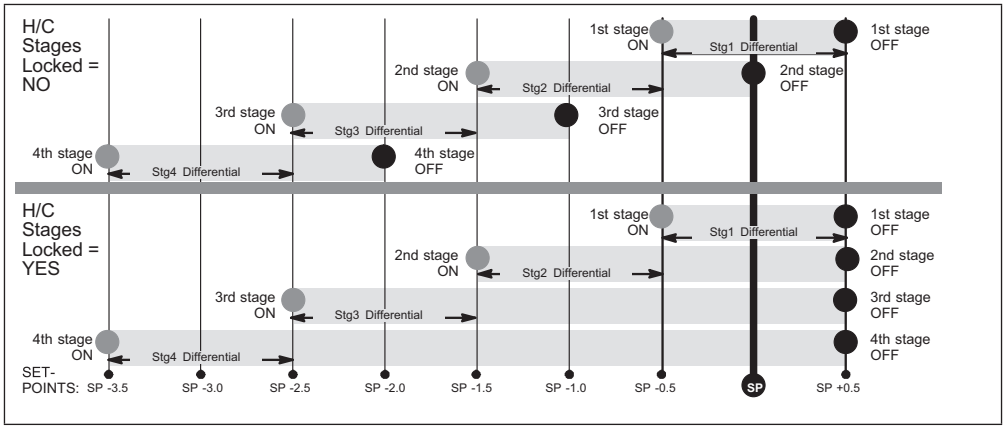


Figure 5. Heating - Heat Pump w/electric - 4 stage (2 compressor / 2 backup)

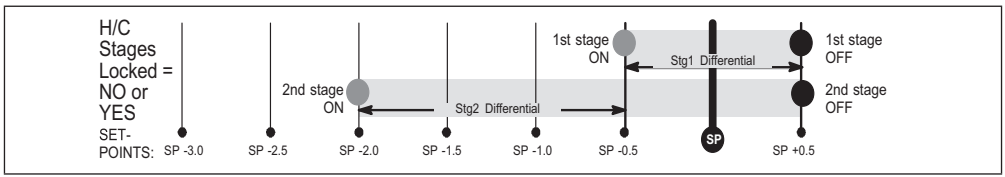


Figure 6. Heating - dual fuel - 2 stage (1 compressor / 1 backup)

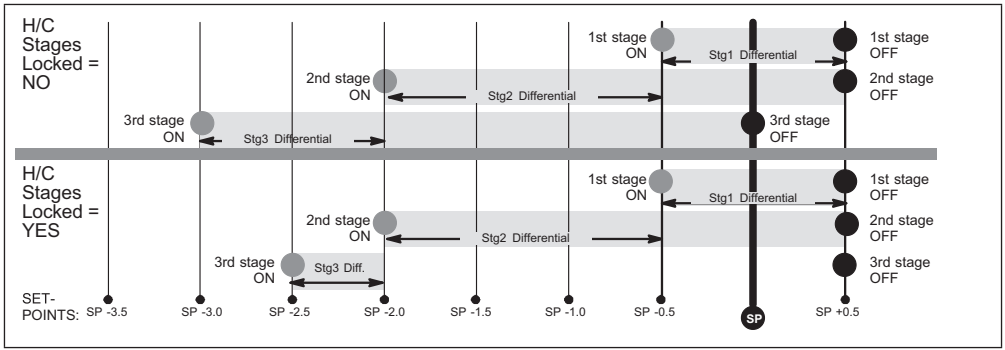


Figure 7. Heating - dual fuel - 3 stage (1 compressor / 2 backup)

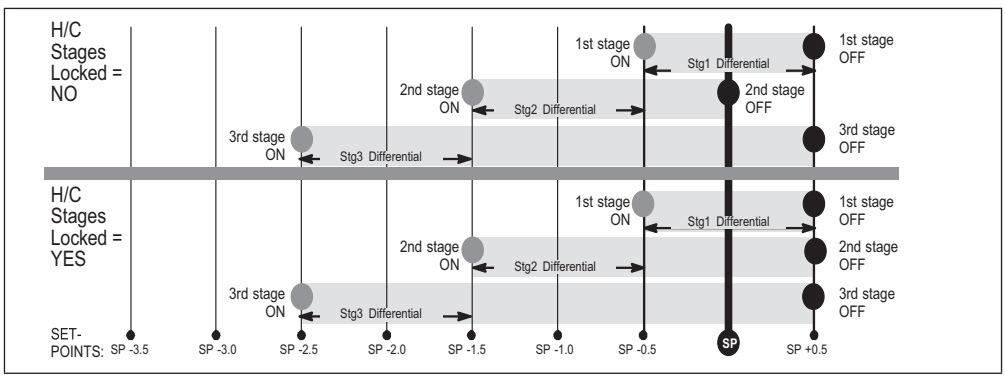


Figure 8. Heating - dual fuel - 3 stage (2 compressor / 1 backup)

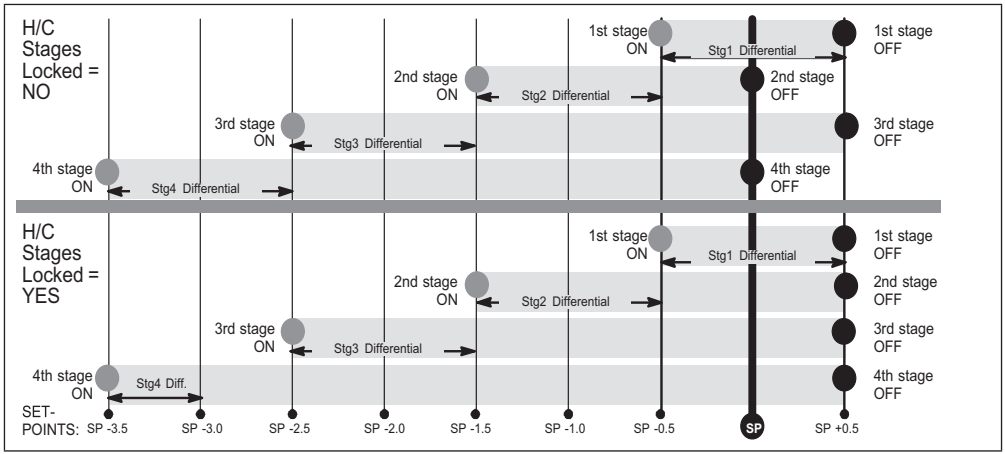


Figure 9. Heating - dual fuel - 4 stage (2 compressor / 2 backup)

Wi-Fi Connection

Wireless networks supported by this system are:

- 802.11b is 2.4Ghz band (max 11 Mbit/s)
- 802.11g is 2.4Ghz band (max 54 Mbit/s)
- 802.11n is 2.4Ghz band (max 130 Mbit/s)

This is for connecting the thermostat to a secure home wireless network.

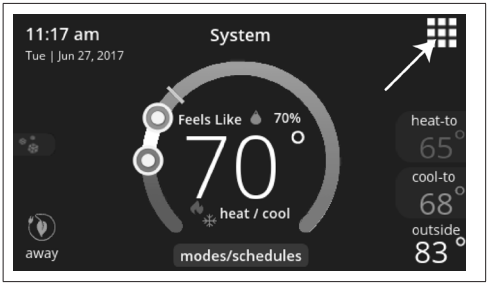
NOTE: *A router with Bonjour capabilities is required for this function. Check the router functions if the thermostat does not connect. Apple Bonjour® is an implementation of zero-configuration networking (Zeroconf), a group of technologies that includes service discovery, address assignment, and host name resolution.*

NOTE: *Never use a home guest account and never use an open router connection (non-secure).*

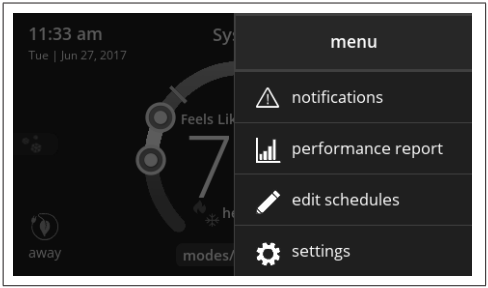
NOTE: *Always use a secure connection physically located in the home where the thermostat is located.*

NOTE: *If thermostat will not connect to the home router, then try using a hot spot to check thermostat Wi-Fi connectivity. A Wi-Fi extender may be required or move the router closer to thermostat for connection.*

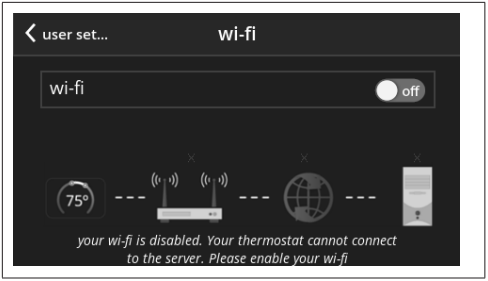
1. Touch the Menu icon in the upper right-hand corner of the display.



2. Touch the settings option on the menu.



3. If Wi-Fi is set to disabled, touch the > icon to enabled. The Wi-Fi screen will appear where you can toggle it to ON.



Connecting to Visible Home Wi-Fi Access Point

1. Touch Wi-Fi network. This will display a list of visible Wi-Fi networks within range of the thermostat.

2. Select the homeowner network and type in the password. Touch **join** to continue.

NOTE: *The thermostat can connect to a home wireless router that uses up to 32 characters in the access point name (visible or hidden).*

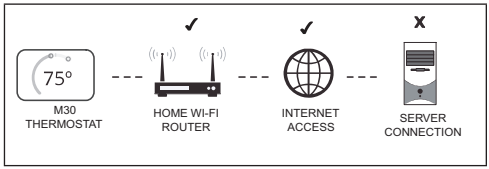
NOTE: *If you wish to see the characters you are typing, check show password.* The thermostat will support up to a 63 character password. The password cannot contain the % or # symbols.

3. If joining the network was successful, the access point name will appear next to Wi-Fi networks.

Connecting to Hidden Home Wi-Fi Access Point

1. Touch Wi-Fi network. Scroll down to others.
2. Enter new network information. You will need the name of the access point and the type of security being used. Select Security. Options are: none, WEP, WPA and WPA2. If your home Wi-Fi connection is unsecured, then Wi-FI security must be enabled using WEP, WPA or WPA2 via the router before proceeding. Consult your router documentation on how to enable Wi-Fi security.
3. Enter the password.
4. Touch join to complete.
5. If joining the hidden network was successful, the access point name will appear next to wi-fi networks.

Whether connecting to a visible or hidden network, if successful, a check mark will appear above both the router and Internet icons.



Wireless Terminology

The following terminology is used:

- Received Signal Strength Indication (RSSI). This indicates the signal strength of the Wi-Fi router being received by the scanning device (i.e., smart phone). So the higher the RSSI number (or less negative in some devices), the stronger the signal.
- Internet Protocol Address (IP address). This is an address assigned by your home router for each network device (e.g., computer, printer, thermostat).

Wireless Connectivity Troubleshooting Tips

Locate the thermostat and router away from other devices that could possibility interfere with wireless communications. Some examples of other devices that could interfere are:

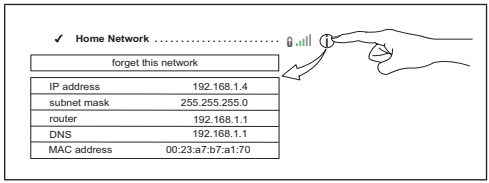
- Microwave ovens
- Wireless cameras
- Portable phones and bases
- Baby monitors
- Wireless speakers
- Bluetooth devices
- Garage door openers
- Neighbor's wireless devices

To eliminate a possible source of interference, temporally disable any nearby 2.4Ghz band devices in the home and see if Wi-Fi performance has improved.

Determining Wireless Connection Signal Strength

The ideal signal strength range for the thermostat is -1 to -69 Received Signal Strength Indication (RSSI). The signal strength can be viewed from the thermostat interface.

1. Press **NETWORK SETTINGS**; This screen shows a graphical view of buttons representing OPEN and SECURE wireless networks, along with button for adding a network.
2. Select the access point that has already been established and connected.
3. When selecting the info icon, a screen will appear which will display an option to forget the network and IP address assigned to the thermostat by your router, sub-net mask, router, DNS and RSSI.
4. If the RSSI signal strength is anywhere between -9 to -69, then the signal strength is sufficient. If outside this range, then either relocate the router closer to the thermostat, add a repeater, or move the thermostat. Adjusting antenna on router may resolve the issue.



Alert Codes

The following is a priority condition descriptions:

Service Urgent

- No Heat / No Cool.
- No ventilation or could cause equipment or property damage.
- Requires a service call within 24 hours.

Service Soon

- Not meeting set point / Homeowner perception of comfort not being met.
- Have partial heat/cool operation.
- Requires a service call within 24-48 hours.

Service Soon / Service Urgent

Codes that can escalate to a higher level after a set parameter of cycles or time.

Maintenance

Items the Dealer sets / plans intervals for (replace filter, uv bulbs) or will require ‘tune–up/cleaning’ a piece of equipment.

Dealer Information only

- System is operating within normal parameters.
- Data accessible to Dealer for example would be system history.

Table 1. Alert Codes and Troubleshooting

Alert Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
29	Service Urgent	Over Temperature Protection	The thermostat is reading an indoor temperature that is higher than 90ºF (factory default). The thermostat will not allow any heating operation to begin until it senses an indoor temperature lower than 90ºF. Indoor temperature rose above 90ºF during a heating or cooling demand. • Heating operation is not allowed. • Check to ensure that heating equipment is not stuck ON (reversing valve, etc.) • Check the accuracy of the thermostat temperature sensor. • Select cooling system mode to cool the indoor space below 90ºF.	Automatically clears when the system detects that the issue no longer exists.
30	Service Soon / Service Urgent	Low Temperature Protection	The thermostat will not allow any cooling operation to begin until it senses a temperature higher than 40ºF. • Cooling operation is not allowed. • Check to ensure that cooling equipment is not stuck ON. • Check accuracy of the thermostat temperature sensor. • Select heating system mode to heat the indoor space to above 40ºF.	Automatically clears when the system detects that the issue no longer exists.

Table 1. Alert Codes and Troubleshooting

Alert Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
180	Service Soon	Outdoor Temperature Sensor Problem	The thermostat has found a problem with the outdoor sensor in the outdoor unit or the optional outdoor sensor connected to the indoor unit. In normal operation after system component control recognizes sensors, the alert code will be sent if valid temperature reading is lost. • Compare outdoor sensor resistance to temperature / resistance charts in unit installation instructions. • Replace sensor pack or stand alone outdoor sensor. • At the beginning of (any) configuration, furnace, air-handler control or equipment interface module will detect the presence of the sensor(s). • If detected (reading in range), appropriate feature will be set as 'installed' and shown in the 'About' screen.	Automatically clears upon configuration, or sensing normal values.

Table 1. Alert Codes and Troubleshooting

Alert Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
610	Service Urgent	Low Room Temperature Detected	This alert will automatically notified the user that a low room temperature condition exist. A notification is displayed on the HD display and email notification sent to homeowner and dealer. The freeze alert protection parameter range is 30°F to 50°F (-1.11 to 10.0°C). Default is 40°F (4.44°C). ***NOTE:*** *Notification is dependent on the thermostat having a active Wi-Fi connection and the user account has been setup and includes a valid email address.*	Automatically clears when condition is resolved.
611	Service Urgent	High Room Temperature Detected	This alert will automatically notified the user that a high room temperature condition exist. A notification is displayed on the HD display and email notification sent to homeowner and dealer. The heat alert protection parameter range is 80°F to 100°F (26.67 to 37.78°C). Default is 90°F (32.22°C). ***NOTE:*** *Notification is dependent on the thermostat having a active Wi-Fi connection and the user account has been setup and includes a valid email address.*	Automatically clears when condition is resolved.

Table 1. Alert Codes and Troubleshooting

Alert Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
700	Service Urgent	Thermostat Temp Sensor Problem	The HD display's internal temperature sensor is not operating correctly. To resolve this issue, try the following: • Remove HD display from mag-mount and reattaching. • Seal hole in wall behind mag-mount to minimize exposure to unconditioned air from inside the wall. • Run "**reset all**" under dealer control center. • If issue persist, then replace the HD display.	Automatically clears when the system detects that the issue no longer exists.
703	Service Soon	Thermostat Humid Sensor Problem	Thermostat Humid Sensor Problem. Sensor is damaged or data is corrupted possibly..	First try a system reset, then if persists the thermostat would need replacement.
3000	Maintenance	Replace Filter 1	Not Applicable	Reset filter reminder for both
3001	Maintenance	Replace Filter 2	Not Applicable	

Table 1. Alert Codes and Troubleshooting

Alert Code	Priority Condition	Actual Displayed Alert Text Under dealer control center > Notifications	Component or System Operational State and Troubleshooting Tip	How to clear alert code
3002	Maintenance	Replace Humidifier Pad	Not Applicable	Reset Humidifier pad reminder
3003	Maintenance	Replace UV Bulb	Not Applicable	Reset UV Light reminder
3004	Maintenance	Maintenance Reminder	Not Applicable	Make service appointment with dealer and reset reminder
3005	Maintenance	Pure Air Maintenance	Not Applicable	Make service appointment for Pure Air maintenance with dealer and reset reminder

System Test Modes

After the thermostat has been installed and set-up, the installer may run a system test function (accessed through the installer settings menu), to test all cooling, heating, emergency heating stages and FAN outputs.

Select system test mode. A pop-up will be displayed indicating all equipment will be stopped. Touch confirm to continue.

Pressing the OFF button next to the desired option will change the status to ON and will enable the relay for that terminal. Pressing again will turn OFF the relay. Touch the left arrow (<) to exit the system test mode.

⚠IMPORTANT

The thermostat System Test Mode provides the technician the ability to test the thermostat relay outputs and can be used to assist in the testing and troubleshooting of the equipment. Important information related to thermostat System Test Mode are outlined in “Table 7. Thermostat Test Modes”.

Table 7. Thermostat Test Modes

Test	Description
Blower	Test will provide a relay output on “G” and the equipment will operate on the equipment continuous fan speed. Equipment continuous fan speed may not be full cooling air volume.
Cooing - 1st Stage	Test will provide a relay output on “Y1” for the compressor, “G” for the blower and “O” Reversing Valves (heat pump units). If the dehumidification mode option was selected during thermostat setup, the thermostat will not provide a 24Vac Output on “D” during the system test mode and the equipment will operate at the dehumidification air volume. The dehumidification air volume is typically 70% of the cooling air volume. If testing requires 100% of the cooling air volume, a jumper will need to be installed between “R” and “DS” at in the indoor equipment.
Cooling - 2nd Stage	Test will provide a relay output on “Y1” for first stage compressor “Y2” for second stage compressor, “G” for the blower and “O” Reversing Valves (heat pump units). If the dehumidification mode option was selected during thermostat setup, the thermostat will not provide a 24Vac Output on “D” during the system test mode and the equipment will operate at the dehumidification air volume. The dehumidification air volume is typically 70% of the cooling air volume. If testing requires 100% of the cooling air volume, a jumper will need to be installed between “R” and “DS” at in the indoor equipment.

Save Energy Default

Energy saving recommended set points for heating and cooling can help save energy. The time and temperatures reference in the following table are pre-programmed into the thermostat to achieve energy savings.

Scroll to **ENERGY SAVING DEFAULT**; touch to select. Read the message on the screen and to continue, touch **CONFIRM**.

Table 8. Energy Saving Set Points

Time	Heating	Cooling
Wake	70°F (21°C)	78°F (25°C)
Leave	62°F (17°C)	85°F (29°C)
Return	70°F (21°C)	78°F (25°C)
Sleep	62°F (17°C)	82°F (28°C)

NOTE: *Humidification and dehumidification are not part of the energy savings program. A higher utility bill may occur when not using the setpoints in this table.*

Dehumidification Control

Normal and Max

Dehumidification options are listed at **menu** > **settings** > **humidity**. Under **Humidity Control,** select **dehumidify** to enable dehumidification. By default it is **disabled**.

There are four setting options which are Normal, Max, Humiditrol* and Aux Dehumidifier (requires hardware accessory installed). Slide bar adjust with a range of 40% to 60% RH.

Table 9. Dehumidification Modes

Option	Description
Normal	• Activate: If RH measured is >= (RH set point + 2%), and, Cool is ON, then D is inactive (open circuit), and G is ON (if not already ON), and Y2 (if available) is ON. • Deactivate: If RH measured is <= (RH set point - 2%) or Cool is OFF, then D is active (24VAC present). G returns to the state determined by the thermostat control, either ON, Auto, or CIRC. (OR) If there is no more cool demand, then D is active (24VAC present). G returns to the state determined by the thermostat control, either ON, Auto, or CIRC, and Y2 (if available) is OFF. ***NOTE:*** *Note that H is inactive (open circuit) during dehumidification.*

Table 9. Dehumidification Modes

Option	Description
Max	• Activate: IF RH measured is >= (RH set point + 2%), and if T measured >= T set point – 0°F to 4°F)AND unit is in Cool mode (O = ON), then D is inactive (open circuit), and G, Y1, and Y2 (if available) are ON. • Deactivate: IF RH measured is <= (RH set point - 2%), or if T measured < T set point - 0°F to 4°F) or unit isn't in Cool mode(B = ON), then D is active. Y1 and Y2 are OFF and G returns to the state determined by the thermostat control, either ON, Auto, or CIRC. ***NOTE:*** *H is inactive (open circuit) during dehumidification.*

Humiditrol

This option is available if the Humiditrol accessory is present and enabled in the Advanced Settings > System Setup. Under **Advanced Settings** > **Terminal Settings**, verify that the H/D or ACC terminals are configured correctly for dehumidify control. In this mode, the H/D terminal (if selected for dehumidify) is always ON (24VAC) when the outdoor temperature is greater than 95°F. This prevents the system blower from running at reduced speed if the outdoor temperature is greater than 95°F.

NOTE: *The outdoor temperature sensor MUST be attached to the unit in order to use this mode.*

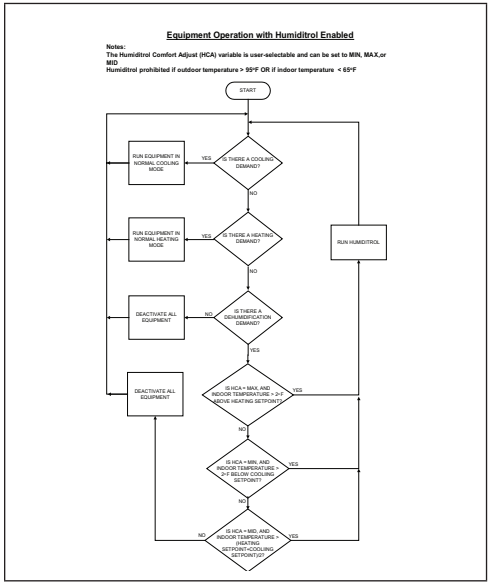


Figure 10. Equipment Operation with Humiditrol Enabled

Auxiliary Dehumidifier

This option is available if the Auxiliary Dehumidifier accessory is present and enabled in the **Advanced Settings > System Setup. Under Advanced Settings > Terminal Settings**, verify that the

H/D or ACC terminals are configured correctly for dehumidify control.

Cooling demand only: Y1 and Y2 come on initiating the conventional cooling only demand.

Dehumidification demand only: D is de-energized (G should also be energized) but with out Y1 or Y2. D remains off until the demand is satisfied or if a true cooling demand comes on (unit must be in cooling mode).

Both cooling and dehumidification demands: Y1 and Y2 are ON (G must be ON and D is also 0 volts) When cooling is satisfied , D is still 0 volts and G must stay ON until dehumidification demand is satisfied.

Table 10. Auxiliary Dehumidifier Option

Option	Description
Normal	• Activate: If RH measured is >= (RH set point + Activate: IF RH measured is >= (RH set point + 2%), and AND unit is in Cool mode (O = ON),, THEN D is inactive (open circuit), AND G is ON. • Deactivate: IF RH measured is <= (RH set point - 2%), or unit isn't in Cool mode(B = ON), THEN D is active. G returns to the state determined by the thermostat control, either ON, Auto, or CIRC.

Humidification Control

This option is available if the humidifier accessory is present and enabled in the **Advanced Settings** > **System Setup**.

Under **Advanced Settings** > **Terminal Settings**, verify that the H/D or ACC terminals are configured correctly for humidify control.

Humidification is provided only when both a humidification accessory is installed and the thermostat is in heat mode.

- Setpoint Range: 15 – 45% RH
- Relative Humidity Controlled to 2% of Setpoint (1% resolution)
- "H/D" Terminal to Humidifier (deactivated during cooling)
- This behavior changes based on H/D terminal or ACC terminal

Normal and Max

The following table describes the function of normal and max humidification settings.

Table 11. Humidification Modes

Option	Description
Normal	(Humidification only with Heat Demand) • Activate: If RH measured is <= (RH setpoint - 2%), and, heat is ON, then H is ON, and G is ON (if not already ON). ***NOTE:*** *In Normal humidification mode, thermostat should not activate G when used with Gas/Oil systems* • Deactivate: If RH measured is >= (RH set point + 2%) or Heat is OFF then H is Off. G returns to the state determined by the thermostat control, either ON, Auto, or CIRC. (OR) If there is no more heat demand, then H is Off. G returns to the state determined by the thermostat control, either ON, Auto, or CIRC. ***NOTE:*** *The D terminal is active during humidification.*
Max	(Humidification with or without Heat Demand) • Activate: IF RH measured is <= (RH set point - 2%), and unit is in heat mode (regardless of whether a heating demand exists), then H is ON, and G is ON (if not already ON). • Deactivate: IF RH measured is >= (RH set point + 2%) or unit is not in Heat mode (O = ON), then H is Off. G returns to the state determined by the thermostat control, either ON , Auto, or CIRC. ***NOTE:*** *The D terminal is active during humidification. Following is the table that shows status of FAN for different humidity modes and system outputs.*

Normal and Max Dew Point Control

To set the system to Normal Dew Point Control, select normal and dew point options under settings humidity option.

To set the system for Max Dew Point Control, select **Max** and **Dew Point Control**.

NOTE: *Outdoor air temperature sensor is required for this feature.*

Table 12. Dew Point Control Modes

Option	Description
Normal	Normal Dew Point Control mode is useful in colder climates where moisture can collect on interior window surfaces. Normal dew point control helps to minimize this condensation. In this mode the activation and deactivation of H/D terminal is controlled as follows. RH set point= .5*Outdoor Temp + 25 + RH user dew point adjustment where: RH user dew point adjustment is user-selectable and cannot exceed +/-15%, default RH user dew point adjustment = 0 The RH set point cannot exceed 45% The minimum RH set point is 15%

Table 12. Dew Point Control Modes

Option	Description
Max	Max Dew Point Control mode is also useful in colder climates where moisture can collect on interior window surfaces. Max Dew point control helps to minimize this condensation. In this mode the activation and deactivation of H terminal is controlled as it is done in the Max. RH set point= .5*Outdoor Temp + 25 + RH user dew point adjustment where: RH user dew point adjustment is user-selectable and cannot exceed +/-15%, default RH user dew point adjustment = 0 The RH set point cannot exceed 45%

Ventilation Control

This equipment is designed to provide fresh air while exhausting an equal amount of stale air.

Ventilation Rates

The S30 ventilation function is only a turn on - turn off feature. All CFMs must be adjusted from the HRV/ERV unit. The ventilation function can be controlled by outdoor temperatures and by timers in the thermostat. The ventilation feature can also control 1 and 2 stages of ventilation operation.

Thermostat ventilation CFM parameters are to be adjusted only after the HRV/ERV set up is completed and the CFMs are known. Once the thermostat's CFMs are adjusted they are used with the thermostat's timer algorithm to determine how long to run the HRV/ERV.

Energy Recovery Ventilator (ERV)

The ERV unit is equipped with an enthalpic core. This device is designed for use in warm, humid climates with heavy air conditioning loads. The ERV unit transfers both sensible (temperature) and latent (moisture) heat from incoming fresh air to the stale air as it is being exhausted; thus, reducing the air conditioning load.

Heat Recovery Ventilator (HRV)

The HRV unit is equipped with an aluminum core. The device uses the stale air that is being exhausted to condition the fresh air as it is being brought in.

Parameter settings and descriptions are listed in "Table 5. Advanced Settings" on page 14. The table below list which parameters are available for the Fresh Air Damper, ERV and HRV equipment.

Fresh Air Damper

This option is used to control a damper connecting outside air to the return plenum of the system. When a fresh air damper style of ventilation is added to the system, and ventilation is required, the ventilation demand is serviced by energizing one relay to close or open the relay contacts connected to the fresh air damper and commanding the blower to run at a rate of at least the continuous fan speed.

Operation of Fresh Air Dampers with Environmental Overrides

- When the Non-ASHRAE Compliant mode is selected (Timed), the system first checks for the outdoor temperature and dew point to be within the set parameter range before allowing ventilation to occur.
- When the ventilation changes states (on/off) due to an environmental override, it will remain in that state for a minimum of 10 minutes before again changing states due to an environmental override.
- Operation is otherwise the same as the ASHRAE compliant method.
- Terminals ACC1 and ACC2 are dry contacts in this mode.

Ventilation Wiring

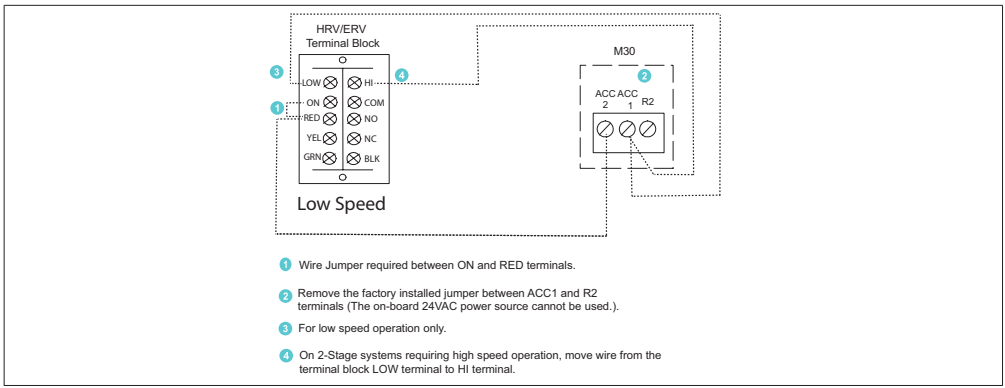


Figure 11. ERV / HRV Wiring

See “Table 1. Terminal Designations” on page 7 for further details on each terminal.

Ventilation Control Modes

Parameter settings and descriptions are listed in “Table 5. Advanced Settings” on page 14. The table below list which parameters are available for the Fresh Air Damper, ERV and HRV equipment.

Installer Checklist

Table 13. Installation Checklist

Item	Description	Yes	No
1	Is the thermostat properly mounted to either a wall stud or wall? (Do not mount on exterior wall or near any ventilation outputs, doorways or location that could be directly exposed to sunlight)		
2	Are all terminals wiring properly connected and tight?		
3	When required, is the outdoor air temperature sensor (OATS) properly connected and isolated when used? Is the input enabled using the user interface? Go to **advanced settings > outdoor sensor** and set to **YES** if not done so already. Then go to **settings > display** and make sure the outdoor temperature display setting is configured for sensor. If OATS is not used, leave the setting on Internet.		
4	Have all the Thermostat Features been explained to the Home Owner?		
5	Has User manual been given to Home Owner?		
6	Has additional Alexa information not in user manual been given to Home Owner and shown where to find answers to additional questions? Go to www.myicomfort.com Support page & FAQ.		
7	Is the Wi-Fi connected?		
8	Can the homeowner access the consumer portal (www.myicomfort.com) from either a PC or tablet?		

Table 13. Installation Checklist

Item	Description	Yes	No
9	Has the homeowner downloaded the Lennox Thermostat application from either Google Play or IOS App Store to their mobile devices?		
10	Is the Lennox Dealer account number or your main shop phone number been added to the dealer information screen? This will tie the homeowners system to your LennoxPROS account.		
11	If applicable, has the air handler's electric heat strips been commissioned? If not, commissioning of heat strips must be performed.		
12	Has a complete system test been run? If not, from the HD Display home screen go to **settings > advanced settings > view dealer control center >** and select **tests**.		

Index

A

Advanced Settings 14
Alert Codes 34
Alert Codes and Troubleshooting 35

B

Backplate 11
Balance Points 16

C

Commissioning 11
Common Practices 6
Compressor Protection 21
Compressor Short Cycle 3

D

Deadband 25
Deadband Adjustment 17
Dehumidification Control 41
Auxiliary Dehumidifier 42
Humiditrol 42
Normal and Max 41
Dimensions 3
Display Performance Report 21

E

Energy Recovery Ventilator (ERV) 45
Energy Saving Defaults 41

F

Feels Like 25

H

H/C Stage Locked In 24
Heat / Cool Stages Locked In 18
Heating Mode 25
Heat Recovery Ventilator (HRV) 45
High Balance Point 25
Humidification Control 43, 45
Normal and Max 42
Normal and Max Dew Point Control 44

I

Installer Checklist 47

L

Low Balance Point 25

N

New Installation 5

O

Offset 22, 26
Outdoor Air Temperature Sensor (OATS) 4
Outdoor Sensor 16

P

Parameter Descriptions 22

R

Received Signal Strength Indication (RSSI) 33
Replacement Installation 6
Reset Settings 21
Residual Cooling 16
Restart Thermostat 21

S

Smart Away 25
Smooth Setback Recovery 18, 22
Stage 2 Heat Pump Lock Temp 21
Stage 2HP Lock Temp 25
Stage Control 26
Stage Delays 18, 24
Stage Differential 18, 23
System Configurations 8
System Setup 14, 15
Dehumidifier 16
Humidifier 16
Indoor Unit Type 15
Outdoor Unit Type 15
Ventilator Settings 14
System Test Mode 21, 40

T

Temperature Control Mode 17
Temperature Offset 18
Terminal Descriptions 7
Terminal Settings 21

V

Ventilation 19, 20
Ventilation Wiring 46

W

Wall Insulation 17
Wider Set Point Range 25
Wi-Fi Connection 30
Hidden 32
Visible 31
Wi-Fi Signal Strength 33
Wi-Fi Troubleshooting 32
Wireless Terminology 32
Wiring Diagrams 8

USER GUIDE

AC System Information
For Homeowner / User

HOMEOWNER INFORMATION

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

In order to ensure peak performance, your system must be properly maintained. Clogged filters and blocked airflow prevent your unit from operating at its most efficient level.

Homeowner Maintenance

The following maintenance may be performed by the homeowner:

- Check the indoor unit filter each month and replace the filter, if necessary. Have your Lennox dealer show you where your indoor unit filter is located. It will be either at the indoor unit (installed internal or external to the cabinet) or behind a return air grille in the wall or ceiling. Check the filter monthly and clean or replace it as needed. Disposable filters should be replaced with a filter of the same type and size.
- The indoor coil is equipped with a drain pan and drain line to collect and eliminate condensate formed as your system removes humidity from the inside air. Have your dealer show you the location of the drain line and how to check for obstructions. Check the indoor unit drain line for obstructions monthly. (This would also apply to an auxiliary drain, if installed.)
- Check the outdoor unit monthly and remove any obstructions that may restrict airflow through the unit. This would include grass clippings, leaves, or papers that have been pulled against or into the cooling fins of the unit.
- Trim shrubbery away from the unit and periodically check for debris which may have collected around the unit.

NOTE - The filter and all access panels must be in place any time the unit is in operation. If you are unsure about the filter required for your system, call your Lennox dealer for assistance.

IMPORTANT !

Sprinklers and soaker hoses should not be installed where they could cause prolonged exposure to the outdoor unit by treated water. Prolonged exposure of the unit to treated water (i.e., sprinkler systems, soakers, waste water, etc.) will corrode the surface of steel and aluminum parts, diminish performance and affect longevity of the unit.

Thermostat Operation

See the thermostat homeowner manual for instructions on how to operate your thermostat.

Pre-Service Check

If your system fails to operate, check the following before calling for service:

- Verify room thermostat settings are correct.
- Verify that all electrical disconnect switches are ON.
- Check for any blown fuses or tripped circuit breakers.
- Verify unit access panels are in place.
- Verify air filter is clean.
- If service is needed, locate and write down the unit model number and have it handy before calling.

Professional Maintenance

Your heating and air conditioning system should be inspected and maintained twice each year (before the start of the cooling and heating seasons) by a licensed professional HVAC technician.

0716
507658-01

USER GUIDE

AC System Information
For Homeowner / User

HOMEOWNER INFORMATION

⚠ CAUTION

Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch.

In order to ensure peak performance, your system must be properly maintained. Clogged filters and blocked airflow prevent your unit from operating at its most efficient level.

Homeowner Maintenance

The following maintenance may be performed by the homeowner:

- Check the indoor unit filter each month and replace the filter, if necessary. Have your Lennox dealer show you where your indoor unit filter is located. It will be either at the indoor unit (installed internal or external to the cabinet) or behind a return air grille in the wall or ceiling. Check the filter monthly and clean or replace it as needed. Disposable filters should be replaced with a filter of the same type and size.
- The indoor coil is equipped with a drain pan and drain line to collect and eliminate condensate formed as your system removes humidity from the inside air. Have your dealer show you the location of the drain line and how to check for obstructions. Check the indoor unit drain line for obstructions monthly. (This would also apply to an auxiliary drain, if installed.)
- Check the outdoor unit monthly and remove any obstructions that may restrict airflow through the unit. This would include grass clippings, leaves, or papers that have been pulled against or into the cooling fins of the unit.
- Trim shrubbery away from the unit and periodically check for debris which may have collected around the unit.

NOTE - The filter and all access panels must be in place any time the unit is in operation. If you are unsure about the filter required for your system, call your Lennox dealer for assistance.

IMPORTANT !

Sprinklers and soaker hoses should not be installed where they could cause prolonged exposure to the outdoor unit by treated water. Prolonged exposure of the unit to treated water (i.e., sprinkler systems, soakers, waste water, etc.) will corrode the surface of steel and aluminum parts, diminish performance and affect longevity of the unit.

Thermostat Operation

See the thermostat homeowner manual for instructions on how to operate your thermostat.

Pre-Service Check

If your system fails to operate, check the following before calling for service:

- Verify room thermostat settings are correct.
- Verify that all electrical disconnect switches are ON.
- Check for any blown fuses or tripped circuit breakers.
- Verify unit access panels are in place.
- Verify air filter is clean.
- If service is needed, locate and write down the unit model number and have it handy before calling.

Professional Maintenance

Your heating and air conditioning system should be inspected and maintained twice each year (before the start of the cooling and heating seasons) by a licensed professional HVAC technician.

0716
507658-01

ADDENDUM

Addendum to Installation Instructions For ML180UHE, ML180DFE, ML193UHE, ML193DFE, ML196UHE & ML196DFE

This document supersedes any similar/conflicting instructions found in this bag assembly.

Application

This furnace is designed for single stage heating and single stage cooling/heat pump application only. Although equipped with two stage ignition control, wiring on this unit is strictly configured for single stage application. Unless allowed by this document, do not change wiring connections and never cut 2 stage compressor jumper W915 on the ignition control.

Indoor Blower Speeds (Diagram Figure 1)

For heating operation, control uses indoor blower motor speed tap connected to “Low Heat” terminal on the ignition control. See table 2 for allowable heating speed taps to meet DOE requirements for Fan Energy Rating and OEM recommended temperature rise range.

Speed tap connected to “high heat” terminal is used for heating operation only if control finds indoor blower motor already running when heat is called upon. Therefore, there must always be an allowable heating motor speed tap connected to the “High Heat” terminal of the ignition control.

For Cooling/Heat Pump operation, control uses indoor blower motor speed tap connected to the “High Cool” terminal.

Indoor blower motor speed tap connected to “Low Cool” terminal is used only for continuous air. Control energizes “Low Cool” terminal for continuous air only when dip switches are appropriately set to do so (6 “OFF”, & 7 “ON”).

In order to meet DOE issued July 2019 indoor blower requirements to meet Fan Energy Ratings, following motor speed taps must be connected to "Low Cool" terminal located on Ignition Control. Additionally, per table 7, Dip Switch 6 located on Ignition Control must be in "OFF" and Dip Switch 7 must be in "ON" position. See table 1 for speed tap allowed for continuous air.

TABLE 1

Units	Model	Allowed Continuous Air Speed Tap
ML180UHE	All	Red
ML180DFE	All	Red
ML193UHE	All	Red
ML193DFE	All	Red
ML196UHE	All	Red
ML196DFE	All	Red

On-Board Links and Diagnostic Push Button (Figure 2)

On-Board Link W914 Dehum - DO NOT CUT

On-board link W914, the connection between R & DS, must NOT be cut, as this furnace is strictly designed for 1 stage compressor application only and is NOT designed to operate in dehumidification mode.

On-Board Link W951 Heat Pump (R to O)

On-board link W951 is a clippable connection between terminals R and O on the integrated control. W951 must be cut when the furnace is installed in applications which include a heat pump unit and a thermostat which features dual fuel use. If the link is left intact, terminal “O” will remain energized eliminating the HEAT MODE in the heat pump.

On-Board Link W915 2 Stage Compr (Y1 to Y2)

[DO NOT CUT]

On-board link W915 is a connection between terminals Y1 and Y2 on the integrated control. W915 must NOT be cut, as this furnace is strictly designed for 1 stage compressor application.

TABLE 2

Model No.	Allowable Heating Speed Taps (For "Low Heat" terminal at Ignition Control)				
	Black	Brown	Blue	Yellow	Red
ML180UH045E36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH045XE36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH070E36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH070XE36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH070E36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH070XE36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH090E48B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH090XE48B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH090E60C	Not Allowed	Allowed	Allowed	Allowed	Allowed
ML180UH110E60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH110XE60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180UH135E60D	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML193UH030XE36B	Not Allowed	Allowed	Allowed	Allowed	Allowed
ML193UH045XE36B	Not Allowed	Allowed	Allowed	Allowed	Allowed
ML193UH070XE36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML193UH090XE36C	Not Allowed	Allowed	Allowed	Not Allowed	Not Allowed
ML193UH090XE48C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML193UH110XE48C	Allowed	Allowed	Allowed	Not Allowed	Not Allowed
ML193UH110XE60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML193DF045XE36B	Not Allowed	Allowed	Allowed	Allowed	Allowed
ML193DF070XE36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML193DF090XE48C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196UH030XE36B	Allowed	Allowed	Allowed	Allowed	Allowed
ML196UH045XE36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196UH070XE36B	Not Allowed	Not Allowed	Allowed	Allowed	Not Allowed
ML196UH070XE48B	Not Allowed	Not Allowed	Not Allowed	Allowed	Allowed
ML196UH090XE36C	Not Allowed	Allowed	Allowed	Not Allowed	Not Allowed
ML196UH090XE48C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196UH090XE60C	Not Allowed	Not Allowed	Allowed	Allowed	Not Allowed
ML196UH110XE60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196UH135XE60D	Not Allowed	Not Allowed	Allowed	Allowed	Not Allowed
ML196DF045XE36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196DF070XE48B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196DF090XE48C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML196DF110XE60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180DF045E36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180DF070E36A	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180DF070E36B	Not Allowed	Allowed	Allowed	Allowed	Not Allowed
ML180DF090E48B	Not Allowed	Allowed	Allowed	Allowed	Allowed
ML180DF110E60C	Not Allowed	Allowed	Allowed	Allowed	Not Allowed

Wiring Diagram ML180UHE, ML193UHE, ML193DFE, ML196UHE, ML196DFE

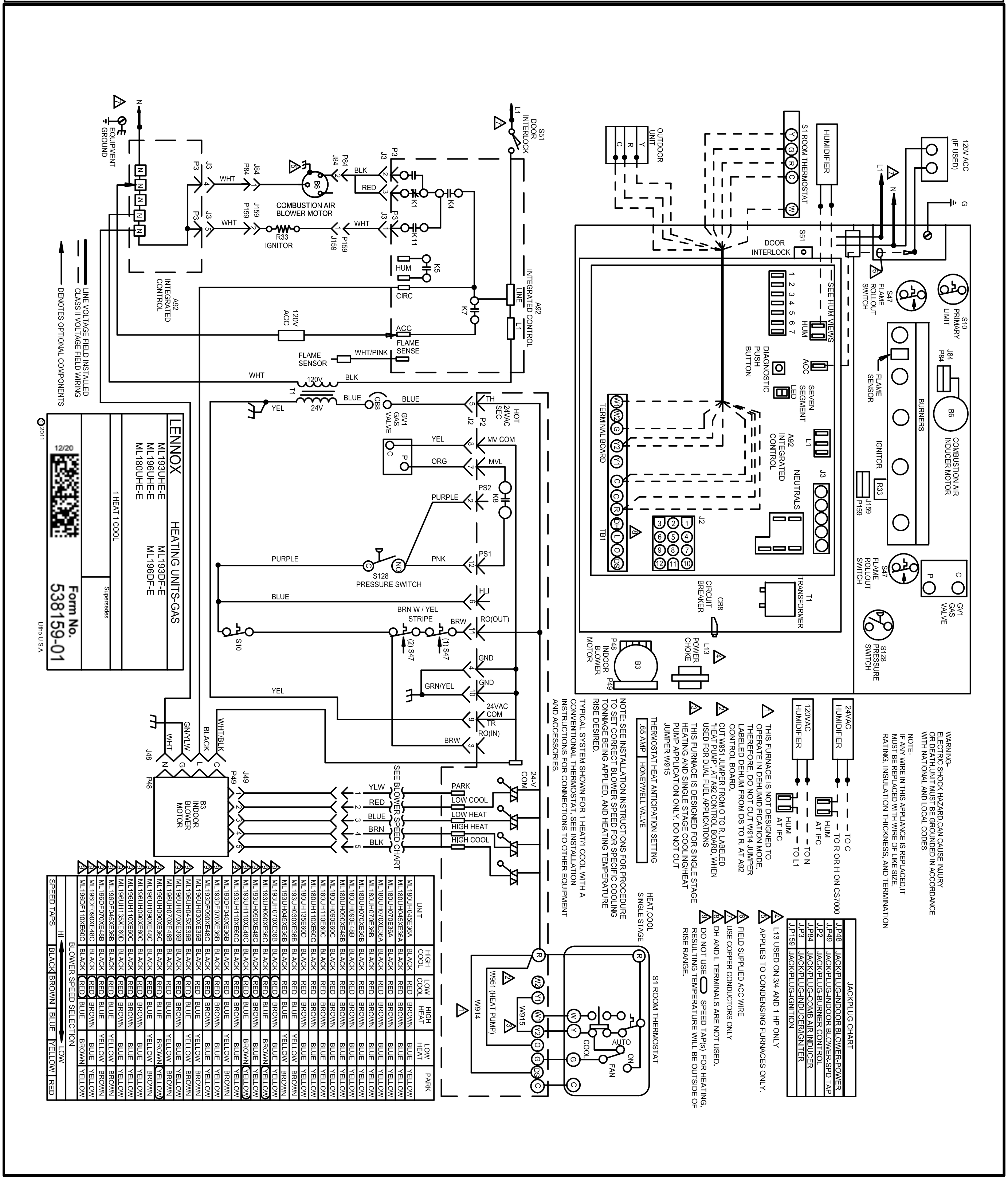


FIGURE 1

Wiring Diagram ML180DFE

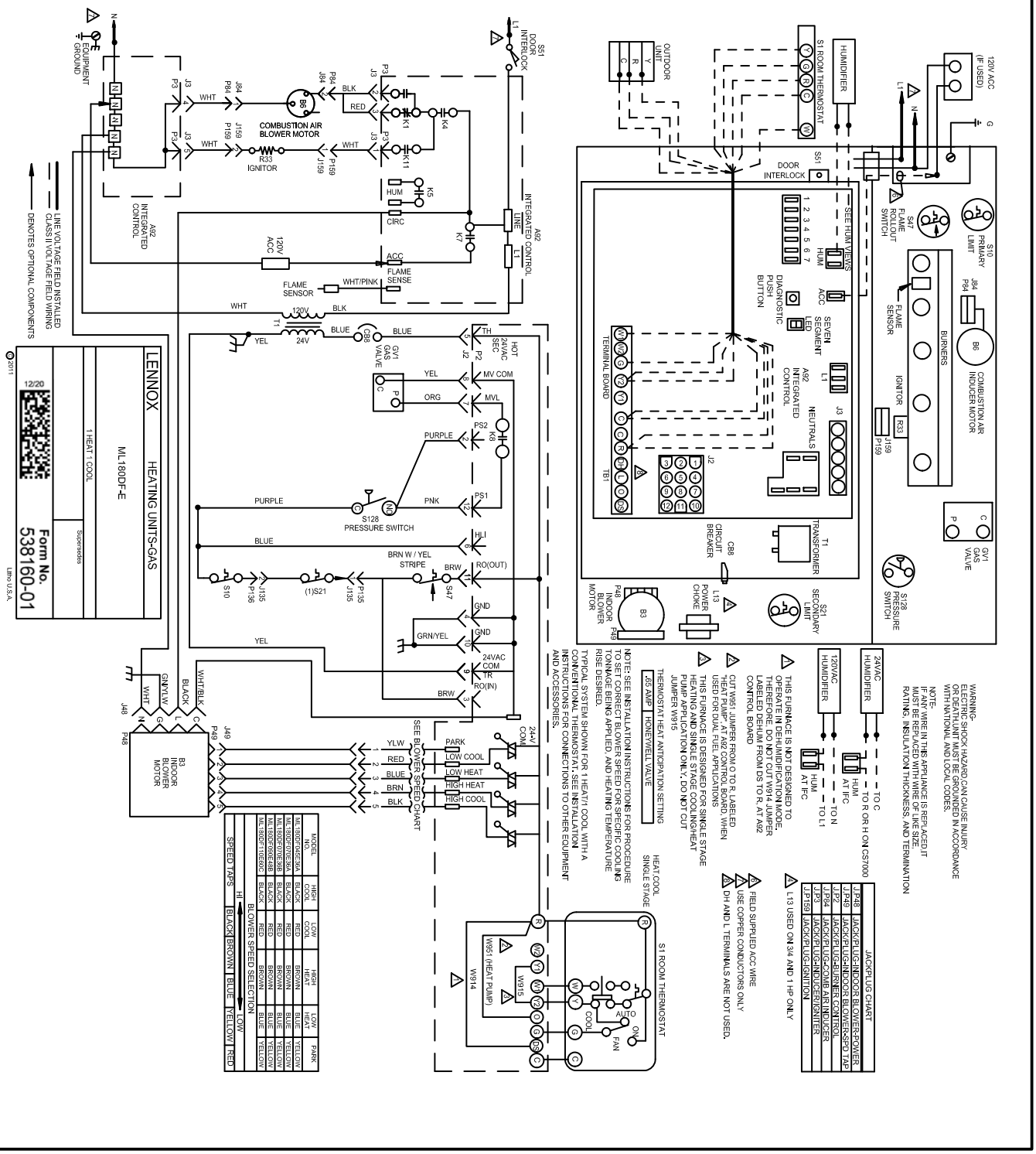
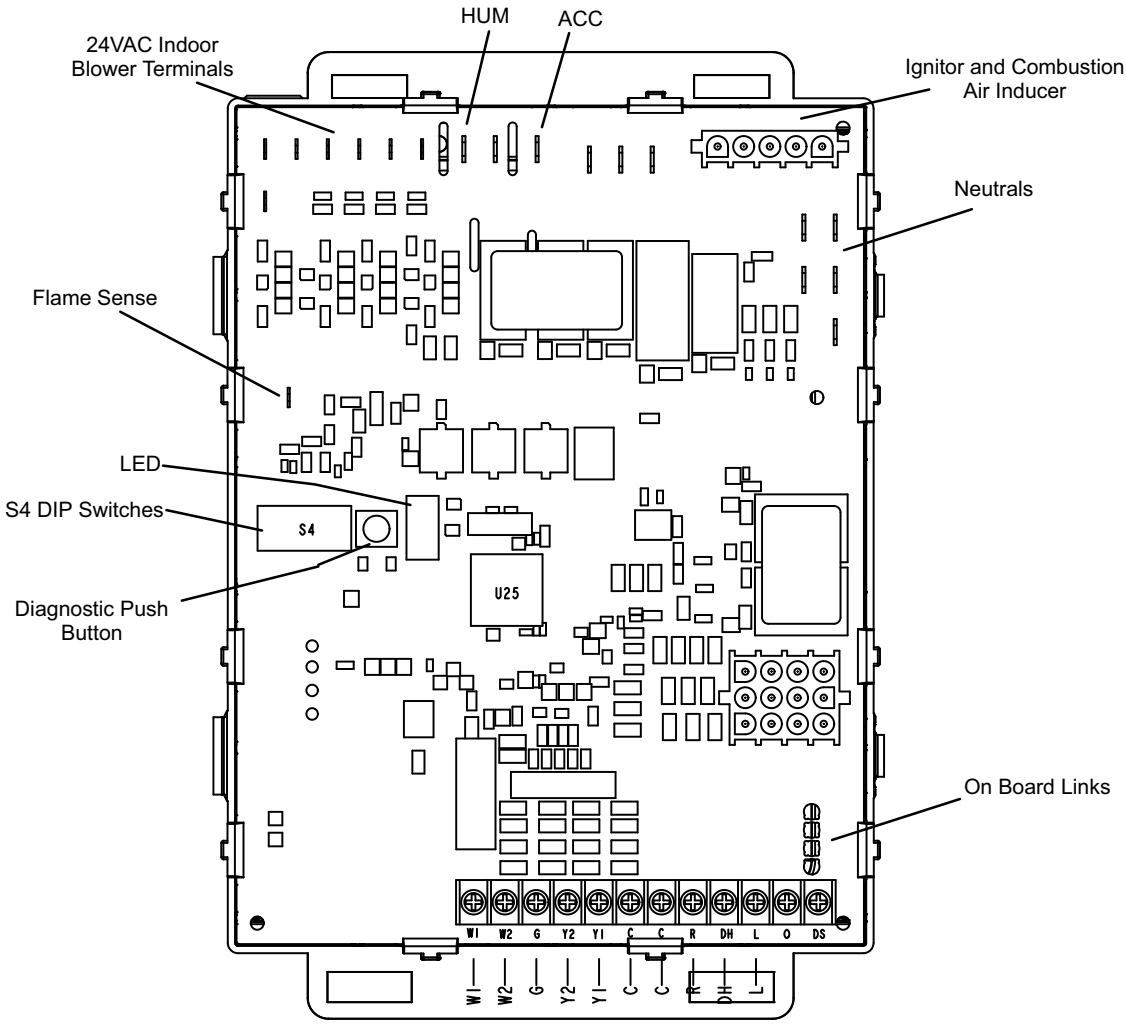


FIGURE 2

Integrated Ignition Control



3/16" QUICK CONNECT TERMINALS

FLAME SENSE SIGNAL
HI COOL 24VAC - Used for normal cooling operation
HI HEAT 24VAC - Used for 60 second heating operation if indoor blower is running during heat demand
LO COOL 24VAC - Continuous fan see table 7
LO HEAT 24VAC - Used for normal heat operation
PARK
PARK
COMMON 24VAC

1/4" QUICK CONNECT TERMINALS

NEUTRALS = 120 VAC NEUTRAL
HUM = UNPOWERED NORMALLY OPEN (DRY) CONTACTS
LI = 120 VAC INPUT TO CONTROL
ACC = 120 VAC OUTPUT TO OPTIONAL ACCESSORY

THERMOSTAT CONNECTIONS (TB1)

W1 = Heat Signal From Single Stage T-Stat
W2 = Not Used
Y1 = Not Used
Y2 = Cool Signal From Single Stage T-Stat
G = Manual Fan From T-Stat
C = T-Stat Signal Ground Connected To Transformer Ground (TR) And Chasis Ground (GRD)
R = Class 2 Voltage To T-Stat
L = Not Used
DH = Not Used
DS = Not Used

FIGURE 3

Diagnostic LED (Figure 3)

The seven-segment diagnostic LED displays operating status, error codes and other information. Table 4 lists diagnostic LED codes.

Diagnostic Push Button (Figure 3)

The diagnostic push button is located adjacent to the seven-segment diagnostic LED. This button is used to enable the Error Code Recall "E" mode and the Flame Signal "F" mode. Press the button and hold it to cycle through a menu of options. Every five seconds a new menu item will be displayed. When the button is released, the displayed item will be selected. Once all items in the menu have been displayed, the menu resumes from the beginning until the button is released.

Error Code Recall Mode

Select "E" from the menu to access the most recent 10 error codes. Select "c" from the Error Code Recall menu to clear all error codes. Button must be pressed a second time while "c" is flashing to confirm command to delete codes. Press the button until a solid "≡" is displayed to exit the Error Code Recall mode.

Flame Signal Mode

Select "F" from the menu to access the flame signal mode. The integrated control will display the flame current on seven-segment LED in in micro amps (uA).

Flame signal mode is exited after any of the following:

- Power is reset
- Pressing and holding push button until 3 horizontal lines "≡" are displayed
- 10 minutes after entering the flame sense mode.

TABLE 3
Integrated Control Diagnostic Modes

Display	Action (when button released)
No change (idle)*	Remain in idle mode
Solid "E"	Enter diagnostic recall mode
Solid "F"	Enter flame signal mode

TABLE 4
Integrated Diagnostic Codes / Status of Equipment

Code	Diagnostic Codes/Status of Equipment	Action Required to Clear and Recover
.	Idle mode (Decimal blinks at 1 Hertz -- 0.5 second ON, 0.5 second OFF).	
C	Cooling stage (1 second ON, 0.5 second OFF) 1 or 2 displayed / Pause / Repeat codes.	
d	Dehumidification mode (1 second ON, 1 second OFF) / Pause / Repeat Codes).	
H	Gas Heat Stage (1 second ON, 0.5 second OFF) 1 or 2 displayed / Pause / Repeat codes. Blinking during ignition.	
h	Heat pump stage.	
E 110	Low line voltage.	Line Voltage Low (Voltage lower than nameplate rating). Check power line voltage and correct. Alarm clears 5 seconds after fault recovered.
E 111	Line voltage polarity reversed.	Reverse line power voltage wiring. System resumes normal operation 5 seconds after fault recovered.
E 112	Ground not detected	System shuts down. Provide proper earth ground. System resumes normal operation 5 seconds after fault recovered.
E 113	High line voltage.	Line Voltage High (Voltage higher than nameplate rating). Provide power voltage within proper range. System resumes normal operation 5 seconds after fault recovered.
E 114	Line voltage frequency out-of-range.	No 60 Hertz Power. Check voltage and line power frequency. Correct voltage and frequency problems. System resumes normal operation 5 seconds after fault recovered.
E 115	Low 24V - Control will restart if the error recovers.	24-Volt Power Low (Range is 18 to 30 volts). Check and correct voltage. Check for additional power-robbing equipment connected to system. May require installation of larger VA transformer to be installed in furnace / air handler. Clears after fault recovered.
E 117	Poor ground detected (Warning only)	Provide proper grounding for unit. Check for proper earth ground to the system. Warning only will clear 30 seconds after fault recovered.

* No change implies the display will continue to show whatever is currently being displayed for normal operation (blinking decimal, active error code, heat state, etc..)

TABLE 4 Continued

E 125	Control failed self-check, internal error, failed hardware. Will restart if error recovers. Integrated control not communicating. Covers hardware errors (flame sense circuit faults, pin shorts, etc.).	Hardware problem on the control. Cycle power on control. Replace if problem prevents service and is persistent. Critical alert. Cleared 300 seconds after fault recovered.
E 200	Hard lockout - Rollout circuit open or previously open.	Correct cause of rollout trip, or replace flame rollout switch. Test furnace operation. Cleared after fault recovered.
E 204	Gas valve mis-wired.	Check gas valve operation and wiring. Clears when repaired.
E 205	Gas valve control relay contact shorted.	Check wiring on control and gas valve. If wiring is correct, replace control.
E 207	Hot surface ignitor sensed open	Measure resistance of hot surface ignitor. Replace if open or not within specified range found in IOM. Resumes normal operation after fault is cleared.
E 223	Pressure switch failed open.	Check pressure (inches w.c.) of low pressure switch closing on heat call. Measure operating pressure (inches w.c.). Inspect vent and combustion air inducer for correct operation and restriction. Resumes normal operation after fault is cleared
E 224	Pressure switch failed closed.	Check operation of low pressure switch to see if it is stuck closed on heat call longer than 150 seconds. Measure operating pressure (inches w.c.). Inspect vent and combustion air inducer for correct operation and restriction. Resumes normal operation after fault is cleared.
E 227	Pressure switch open during trial for ignition or run mode.	Check pressure (inches w.c.) of low pressure switch closing on heat call. Measure operating pressure (inches w.c.). Inspect vent and combustion air inducer for correct operation and restriction. Resumes normal operation after fault is cleared.
E 229	Ignition occurred with indoor blower operating	This code is information only
E 240	Low flame current - Run mode.	Check micro-amperes of flame sensor using control diagnostics or field-installed mode. Clean or replace sensor. Measure voltage of neutral to ground to ensure good unit ground. Alert clears after current heat call has been completed.
E 241	Flame sensed out of sequence - Flame still present.	Shut off gas. Check for gas valve leak. Replace, if necessary. Alert clears when fault is recovered.
E 250	Limit switch circuit open.	Check for proper firing rate on furnace. Ensure there is no blockage in heater. Check for proper air flow. If limit not closed within 3 minutes, unit will go into 1-hour soft lockout. Resumes normal operation after fault is cleared.

TABLE 4 Continued

Code	Diagnostic Codes/Status of Equipment	Action Required to Clear and Recover
E 270	Soft lockout - Exceeded maximum number of retries. No flame current sensed.	Check for proper gas flow. Ensure that ignitor is lighting burner. Check flame sensor current. Clears when heat call finishes successfully.
E 271	Soft lockout - Exceeded maximum number of retries. Last retry failed due to the pressure switch opening.	Check pressure (inches w.c.) of low pressure switch closing on heat call. Measure operating pressure (inches w.c.). Inspect vent and combustion air inducer for correct operation and restriction. Clears when heat call finishes successfully.
E 272	Soft lockout - Exceeded maximum number of recycles. Last recycle due to the pressure switch opening.	Check operation of low pressure switch to see if it is stuck closed on heat call. Check pressure (inches w.c.) of high pressure switch closing on heat call. Measure operating pressure (inches w.c.). Inspect vent and combustion air inducer for correct operation and restriction. Clears when heat call finishes successfully.
E 273	Soft lockout - Exceeded maximum number of recycles. Last recycle due to flame failure.	Check micro-amperes of flame sensor using control diagnostics or field-installed mode. Clean or replace sensor. Measure voltage of neutral to ground to ensure good unit ground. Clears when heat call finishes successfully.
E 274	Soft lockout - Exceeded maximum number of recycles. Last recycle failed due to the limit circuit opening or limit remained open longer than 3 minutes.	Shut down system. 1-hour soft lockout. Check firing rate and air flow. Check for blockage. Clears when heat call finishes successfully.
E 275	Soft lockout - Flame sensed out of sequence. Flame signal is gone.	Shut off gas. Check for gas valve leak. 1-hour soft lockout. Clears when flame has been proven stable.
E 290	Ignitor circuit fault - Failed ignitor or triggering circuitry.	Measure resistance of hot surface ignitor. Replace if open or not within specifications. 1-hour soft lockout. Clears when flame has been proven stable.

Integrated Control DIP Switch Settings

This special edition of ML196E, ML193Eand ML180E units are equipped with a two-stage integrated control. This control manages ignition timing, heating mode fan off delays and indoor blower speeds based on selections made using the control dip switches and jumpers. The control includes an internal watchguard feature which automatically resets the ignition control when it has been locked out. After one hour of continuous thermostat demand for heat, the watchguard will break and remake thermostat demand to the furnace and automatically reset the control to relight the furnace.

Heating Operation DIP Switch Settings

Switch 1 -- Thermostat Selection --

This unit must be used with a single -stage thermostat only. Ignition control is factory set with DIP switch 1 in the "OFF" position, and must be left in "OFF" position. This allows unit to use motor speed tap connected to "Low Heat" terminal of ignition control for heating application.

Switch 2 -- Second Stage Delay

This furnace is designed for single stage heating and cooling only in a heat pump. The second stage delay DIP switch SW2 must be in the "OFF"' position.

Indoor Blower Operation DIP Switch Settings

Switches 3 and 4 -- Heating Mode Blower-Off Delay -- The blower-on delay of 30 seconds is not adjustable. The blower-off delay (time that the blower operates after the heating demand has been satisfied) can be adjusted by moving switches 3 and 4 on the integrated control. The unit is shipped from the factory with a blower-off delay of 90 seconds. The blower off delay affects comfort and is adjustable to satisfy individual applications. Adjust the blower off delay to achieve a supply air temperature between 90° and 110°F at the exact moment that the blower is de-energized. Longer off delay settings provide lower supply air temperatures; shorter settings provide higher supply air temperatures.Table 5 provides the blower off timings that will result from different switch settings.

TABLE 5
Blower Off Heating Mode Delay Switch Settings

Blower Off Delay (Seconds)	Switch 3	Switch 4
60	On	Off
90 (Factory)	Off	Off
120	Off	On
180	On	On

Switch 5 -- Cooling Mode Blower-Off Delay-- The unit is shipped from the factory with the dip switch positioned *OFF* for a 45 second delay. Table 6 provides the cooling mode off delay settings.

TABLE 6
Blower Off Cooling Mode Delay Switch Settings

Blower Off Delay (Seconds)	Switch 5
45 (Factory)	Off
2	On

Switches 6 and 7 -- Continuous Fan Mode -- Continuous fan speed can be controlled by changing DIP switch positions. Table 7 below provides DIP switch settings for continuous fan mode. See page 1 "Indoor Blower Speeds" for speed tap selection for optimum continuous fan performance.

TABLE 7
Continuous Fan Mode

Selection For Continuous Fan	Switch 6	Switch 7
Low Heat Speed	OFF	OFF
Low Cool Speed	OFF	ON
High Heat Speed	ON	OFF
High Cool Speed	ON	ON

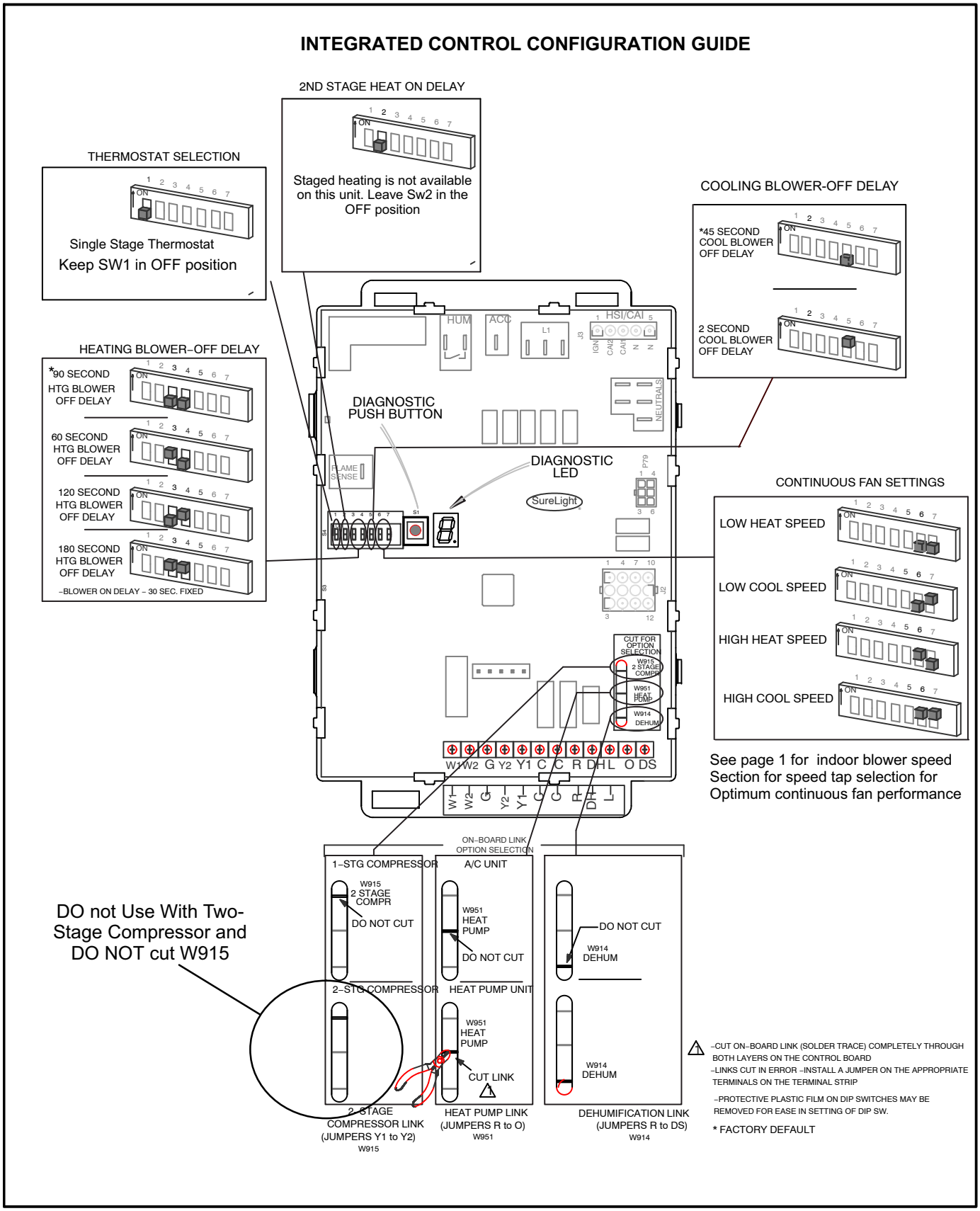
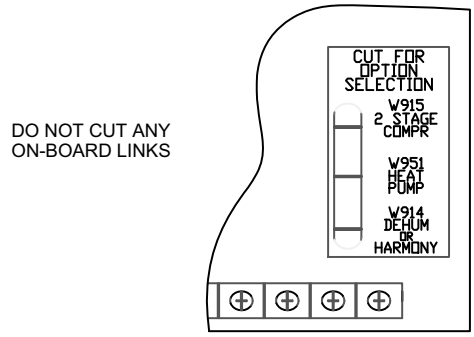
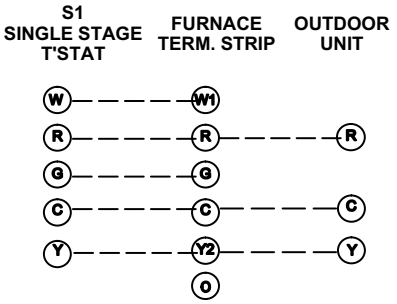
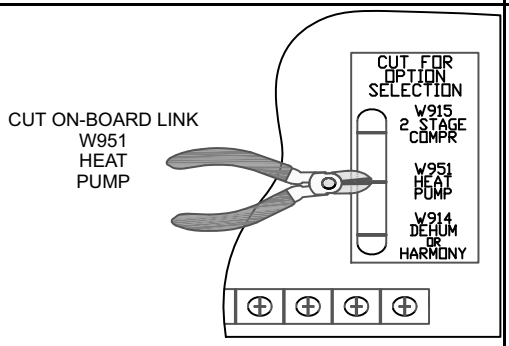
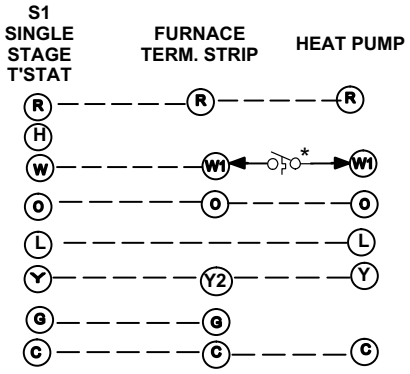

INTEGRATED CONTROL CONFIGURATION GUIDE
2ND STAGE HEAT ON DELAY
Staged heating is not available on this unit. Leave Sw2 in the OFF position
THERMOSTAT SELECTION
Single Stage Thermostat
Keep SW1 in OFF position
COOLING BLOWER-OFF DELAY
*45 SECOND COOL BLOWER OFF DELAY
2 SECOND COOL BLOWER OFF DELAY
HEATING BLOWER-OFF DELAY
*90 SECOND HTG BLOWER OFF DELAY
60 SECOND HTG BLOWER OFF DELAY
120 SECOND HTG BLOWER OFF DELAY
180 SECOND HTG BLOWER OFF DELAY
-BLOWER ON DELAY - 30 SEC. FIXED
DIAGNOSTIC PUSH BUTTON
DIAGNOSTIC LED
SureLight
CONTINUOUS FAN SETTINGS
LOW HEAT SPEED
LOW COOL SPEED
HIGH HEAT SPEED
HIGH COOL SPEED
See page 1 for indoor blower speed Section for speed tap selection for Optimum continuous fan performance
W1 W2 G Y2 Y1 C C R DHL O DS
ON-BOARD LINK OPTION SELECTION
1-STG COMPRESSOR
A/C UNIT
W915 2 STAGE COMPR
DO NOT CUT
W951 HEAT PUMP
DO NOT CUT
DO NOT CUT
W914 DEHUM
2-STG COMPRESSOR
HEAT PUMP UNIT
W951 HEAT PUMP
CUT LINK
W914 DEHUM
DO not Use With Two-Stage Compressor and DO NOT cut W915
2-STAGE COMPRESSOR LINK (JUMPERS Y1 to Y2) W915
HEAT PUMP LINK (JUMPERS R to O) W951
DEHUMIFICATION LINK (JUMPERS R to DS) W914
-CUT ON-BOARD LINK (SOLDER TRACE) COMPLETELY THROUGH BOTH LAYERS ON THE CONTROL BOARD
-LINKS CUT IN ERROR -INSTALL A JUMPER ON THE APPROPRIATE TERMINALS ON THE TERMINAL STRIP
-PROTECTIVE PLASTIC FILM ON DIP SWITCHES MAY BE REMOVED FOR EASE IN SETTING OF DIP SW.
* FACTORY DEFAULT

FIGURE 4

TABLE 8
Field Wiring Applications With Conventional Single Stage Thermostat

Thermostat	DIP Switch Settings and On-Board Links		Wiring Connections
	DIP Switch 1 Thermostat Heating Stages	On Board Links	
1 Heat / 1 Cool	OFF		

Thermostat	DIP Switch Settings and On-Board Links		Wiring Connections
	DIP Switch 1 Thermostat Heating Stages	On Board Links Must Be Cut To Select System Options	
Dual Fuel Single Stage Heat Pump	OFF		

** Connect W1 to W1 ONLY if using defrost tempering kit 67M41*

*NOTE - **Do NOT** make a wire connection between the room thermostat L terminal and the L terminal of the integrated control.*

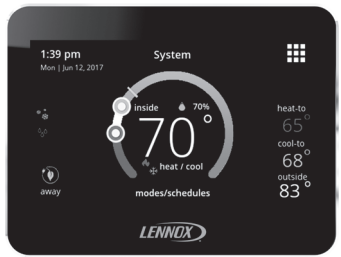
LENNOX

WORKS WITH amazon alexa

works with the Google Assistant

Works with IFTTT

CONNECTS WITH Control4



iComfort® M30 Smart Thermostat

User Guide

507740-02
6/2021
Supersedes 12/2019

Table of Contents

Thermostat 3
Home Automation 4
Energy Efficient Settings 4
Applications 4
Home Screen 4
Temperature Settings 4
Cool Only Temperature Adjustment Screen 5
Heat Only Temperature Adjustment Screen 5
Current Outside Temperature 6
Time and Date Display 6
Humidity Display 6
Modes / Schedules 6
Away 7
Home Screen and System Event Icons 8
Menu 14
Menu 14
Notifications 14
Performance Report 15
Graph Colors 15
Edit Schedules 15
Settings 17
Wi-Fi 17
Name 18
Away 18
Feels Like 20
Fan 20
Heat / Cool 21
Ventilation 22
Menu Selection 23
What is ASHRAE? 23
Notification 23
Energy Savings 24
Advanced Settings 25
General 25
Display 26
Home Info 28
Account 28
Wi-Fi Connection and Troubleshooting 29
Visible Home Wi-Fi Access Point 29
Hidden Home Wi-Fi Access Point 30
Wireless Terminology 30
Troubleshooting Tips 30
Determining Wireless Connection Signal Strength . 31
Connecting to Lennox Server using Alternate Method 31
iComfort Mobile App (Applications) 31
Amazon Alexa Enabled Devices 32
Setup 32
Alexa Voice Commands for Lennox Skill 33
Changing to Celsius 33
Heat and Cool Mode 34
Google Home and Assistant 34
Schedule Mode Functions 34
Heat / Cool Mode (Auto-Changeover) 34
Additional Help 35
IFTTT 35
Control4® Smart Home | Operating System 35
FCC Statements 36
FCC Interference Statement — PART 15.105 (B)... 36
RF Exposure Information 36
Index 40

Thermostat

The iComfort® M30 *smart thermostat* is an electronic, color display touchscreen with a 7-day programmable interface. After on-line registration is completed, the system may then be accessed by the homeowner from anywhere via computer or mobile device (Internet connection required).

Comfort Features include:

- Three languages supported (English, Français and Español)
- Wi-Fi Connected
- ***Smart Away***® - Uses the thermostat to control the home temperature while unoccupied (geo-fencing)
- ***FEELS LIKE***® - Controls the system using outdoor / indoor temperatures and indoor humidity to create the optimal comfortable conditions in the home
- ***Schedule IQ*** feature, you only need to program the thermostat once. Whenever there's a change in your routine, the thermostat adapts heating and cooling to match
- Easy to read 4.3 inch color screen (measured diagonally).
- LCD display with back light shows the current and set temperature, time, inside relative humidity, system status (operating mode and schedules) and outside temperature (optional outdoor sensor required).
- Humidification measurement and control
- Dew point adjustment control
- Equipment maintenance reminders
- Heat/Cool mode -- Permits control of heating, cooling, humidification, and dehumidification without user involvement
- Performance reports are available through the homeowner web portal
- Provides temperature control for gas, oil, electric and heat pumps for up to 4 heat / 2 cool multistage systems (includes dual-fuel operation)
- Compliant with California Title 24 Open ADR 2.0

This thermostat works with:

- Amazon® Alexa
- Google Assistant
- IFTTT
- PureAir™ Air Purification Systems - Indoor air quality with time or sensor based notification of consumables including media filters, UVC bulbs, humidifier pads, and PureAir® system catalyst service / replacement
- Humiditrol® *Enhanced Dehumidification Accessory* (EDA)
- Ventilation Control for ERV, HRV and Fresh Air Damper

Home Automation

The iComfort® M30 smart thermostat is an Amazon® Alexa-enabled, smart-home-compatible thermostat. It works with Amazon Echo devices allowing the homeowner to ask Alexa to adjust the temperature.

Energy Efficient Settings

Factory preset program settings conform to EPA Energy Star® recommended set points.

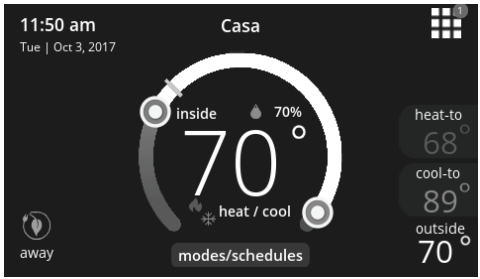
Applications

Fully programmable thermostat provides universal system compatibility, precise comfort control and easy programmability.

Provides temperature control for gas, oil, electric and heat pumps for up to 4 heat / 2 cool multi-stage systems (includes dual-fuel operation).

Home Screen

	If screen is dark (screen saver on), touch screen to turn on the back light.



Temperature Settings

- Large display of current inside temperature (°F or °C)
- Heating and Cooling set point indicators on the round animated temperature band
- Current cooling set point temperature (cool-to)
- Current heating set point temperature (heat-to)

	Touching the heat or cool set point indicators on the round temperature band, or touching the **heat-to** or **cool-to** option displays the heat or cool menu screens.

	Both heating and cooling set point indicators on the round temperature band and the **heat-to** and **cool-to** options are displayed if System is set to Heat/Cool mode.

Cool Only Temperature Adjustment Screen

	On the Home Screen, touching the cool set point indicators on the round temperature band, or touching the **cool-to** option displays the cool menu screen.

- Cooling set point display
- Cooling set point indicator on the round temperature band
- Plus (+) and Minus (–) option
- Home (return to Home Screen)

	Touch the blue cool set point indicator on the round temperature band, or touch the **plus** or **minus** to change the cooling set point in one degree increments.

	During a scheduled time period, touching either the set point indicator on the temperature band or the cool-to will initiate a **schedule hold** (see .

Heat Only Temperature Adjustment Screen

	On the Home Screen, touching the heat set point indicators on the round temperature band, or touching the **heat-to** displays the heat menu screen.

- Heating set point display
- Heating set point indicator on the round temperature band
- Plus (+) and Minus (–) options
- Home (return to Home Screen)

	Touch the red heat set point indicator on the round temperature band, or touch the **plus** or **minus** to change the heating set point in one degree increments.

	During a scheduled time period, touching either the set point indicator on the temperature band or the heat-to will initiate a **schedule hold**.

Current Outside Temperature

Displays current outside temperature in °F or °C (optional Remote Outdoor Temperature Sensor required). If no sensor is used, then once connected to the Internet and login to your account through the thermostat, the option to get your outside temperature can obtained using the Internet option . Go to **menu > settings > display** and set **outdoor temperature display** to **Internet**.

Time and Date Display

Displays current time and date (supports daylight savings time changes). When connected to the Internet, time and date are automatically set.

Humidity Display

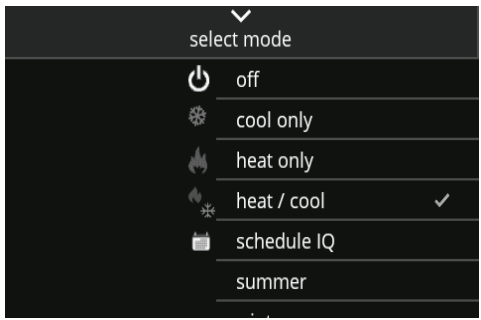
Displays current inside relative humidity above current indoor temperature.

The icon next to the indoor humidity percentage also represents the humidity level in the home.

Modes / Schedules

Displays current system operating mode below current indoor temperature (heat/cool, heat only, cool only, active schedule or off)

	Touch to access **Modes/Schedules** screen.



	Touch **modes/schedules** on home screen under current operating mode to access screen.

Select to operate a specific mode or schedule.

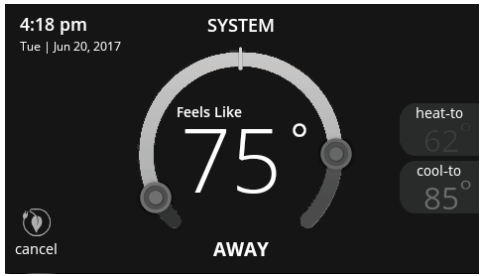
- **Off**
- Cool Only
- Heat Only
- Heat/Cool
- Emergency Heat (heat pump systems only)
- Schedule IQ, summer, winter, spring/fall and save energy
- On
- **Auto**
- Circulate

	A check mark indicates which mode is active.

	Scroll down to see all modes available on the screen.

AWAY

	Touch to display **away** screen.



Set heating or cooling set points during unoccupied periods.

- System status indicators which are located along the left side of the home screen. See “Table 1. System and Event Icons” on page 8 for details for each icon.
- Heating and Cooling set point indicators on the round temperature band. Yellow line indicates current room temperature.
- Current cooling set point temperature (cool-to). Cooling is always represented by the color blue.
- Current heating set point temperature (heat-to). Heating is always represented by the color red.
- Cancel Away Mode

	Touch **cancel away** to end away mode and return to current system operation.

Home Screen and System Event Icons

The following icons are located on home screen and will appear during applicable operations or tasks.

NOTE: *The system status icons located along the left-side of the screen will display a text description when touching the icon.*

Table 1. System and Event Icons

Icon	Function	Screen Text	Purpose
	**Navigation**	**Menu**	Selecting this icon will bring up user and installer menus. A red circle with a number inside of it indicates a notification is active.
	**Function**	**Away**	When the away icon is touched, the system will automatically use energy saving settings - heat-to 62 (16.5) and cool-to 85 (29.5). Temperatures can be adjusted by pressing on the available temperature setting (i.e., heat-to or cool-to). To exit away, press the cancel icon. In a zoning system, all zones are set to a single heat-to and cool-too setting. Note that when manually selecting Away from the home screen, the Smart Away feature (if enabled under settings) will be temporally disabled until Away is canceled.
	**System Status**	**Heating**	System is heating the home.
	**System Status**	**Cooling**	System is cooling the home.
	**System Status**	**Humidifying**	If humidification equipment is installed and configured, the system will display this message when adding humidity to the air in the home.

Table 1. System and Event Icons

Icon	Function	Screen Text	Purpose
	**System Status**	**Dehumidifying**	The system can be used in cooling mode to help remove excessive humidity as determined by the user setting. Go to menu > settings > humidity > and turn on dehumidify. Then adjust the acceptable low and high humidity levels in the home with the dehumidification set-point slider.
	**System Status**	**Defrosting**	The system is defrosting the outdoor unit coil (only when required). Heat pump only.
	**System Status**	**Emerg. Heat**	All heat pumps operating in northern climates below 35°F (1.6°C) normally need a supplemental heating source. Usually it is in the form of electric heating provided by the indoor unit. Other sources could be gas, oil, or hot-water back-up systems as well. The supplemental heat is also referred to as “second-stage” or “back-up” heating, with “first-stage” being the heat pump only. Emergency heat is when you use your supplemental heat (2nd stage) by itself, without the use of your heat pump (1st stage heat). Not available for non-heat pump systems.
	**System Status**	**Aux. Heat**	Is only available with heat pump system. If outdoor temperature is above the high balance point, only the heat pump will operate - default 50°F (10°C) high. If outdoor temperature is below the low balance point, only auxiliary heating will operate - default 25°F (-4.0°C) low. If outdoor temperature is in-between the high and low balance point, both the heat pump and auxiliary heat sources can operate.

Table 1. System and Event Icons

Icon	Function	Screen Text	Purpose
	**System Status**	**Will start soon**	A five minute safety delay prevents the compressor from operating too soon after shut-down to allow internal pressures to equalize. This delay icon will also appear when immediately changing demand. For example immediately changing from cooling to heating (gas, electric or heat pump heating).
	**System Status**	**Ambient lockout**	This indicates that either the outdoor temperature is above or below the balance point temperature settings. The low balance point setting prevents heat pump heating below the set point and back up heat will be used. Typically the default is 25°F (-4.0°C), but that setting can be adjusted by your dealer. At 25°F (-4.0°C) or below for example, only auxiliary heating (electric or gas) is used. If the high balance point is set to 50°F (10°C) for example, which is also adjustable by your dealer, then auxiliary heat will not be allowed. Only heat pump heating will be used. Anytime the outdoor temperature is below or above the balance point temperature settings, the ambient lockout notice will appear on the home screen.
	**Function**	**Transitioning to next schedule**	The system is following an active schedule and is transitioning to the next temperature setting based on a time indicator.

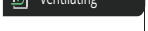
Table 1. System and Event Icons

Icon	Function	Screen Text	Purpose
Fan is running			Displayed whenever the system is heating or cooling.
	Function	**Fan is running**	Fan set to ON. Blower fan is always running. Can enable or disable by going to modes/schedules from the home screen.
			Fan set to Auto. Blower fan following demand operation. Only comes on for mode operation (cooling or heating). Auto can be set by going to modes/schedules from the home screen.
			Fan set to circulate. Can enable or disable by going to modes/schedules from the home screen. Fan duration can be set by going to menu > settings > fan. Use the adjustment bar tool to set duration.
	**Function**	**System Under Test**	Typically occurs when the system has had a power interruption. The thermostat starts to look for the indoor and outdoor controls. Sometimes the outdoor control takes longer to boot up and therefore does not respond to inquiry by the thermostat. Recycle power to system may resolve issue.

Table 1. System and Event Icons

Icon	Function	Screen Text	Purpose
	**Function**	**Load shedding, wait time 45 min**	Load shedding is where the utility company turns off you outdoor unit in peak times for a specified period of time to help spread the electrical system load for the area. Your system will resume operation in 45 minutes.
	**Function**	**Changing set point range**	Temperature is being adjusted. These two symbols together also indicate the mode of operation. As displayed here would indicate heat/cool mode (auto-changeover).
	**Function**	**Turning feels like on**	Indicating the system is transitioning to “feels like” mode.
	**Notification**		This notification icon indicates there are more than two events active in the system.
	**Function**	**Schedule hold until next period**	The **schedule hold** screen is displayed after changing the temperatures on the heating or cooling screens while a schedule is running. Preset 1, 2, 4, 8, 24 hours or custom setting (using the Time Tool) sets and hold the temperature for a preset or custom time period until the next time period setting. **Cancel schedule hold** on Home Screen cancels the held setting.
	**Function**	**Energy savings 1:00 pm - 5:00 pm**	For California residents enrolled in a utility company energy savings program, this indicates a energy savings event is scheduled for a specific time range.

Table 1. System and Event Icons

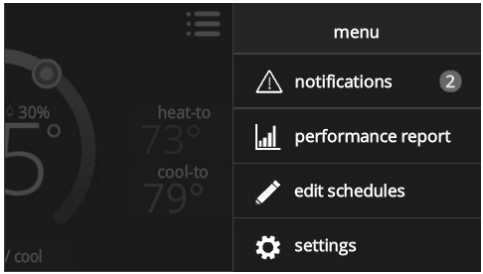
Icon	Function	Screen Text	Purpose
	**Function**	**Indoor humidity level**	This symbol indicates the humidity level in the home. The indicator can display humidity levels from 10 to 100%.
	**Function**	**Smart Away is Canceled for Now**	If you are enrolled in Energy Savings with your utility company (California only), this will appear if your system is in Smart Away mode and a energy savings event is started.
	**Away**	**Away**	When the away icon is touched, the system will automatically use energy saving settings - heat-to 62 (16.5) and cool-to 85 (29.5). Temperatures can be adjusted by pressing on the available temperature setting (i.e., heat-to or cool-to). To exit away, press the cancel icon. In a zoning system, all zones are set to a single heat-to and cool-too setting. Note that when manually selecting Away from the home screen, the Smart Away feature (if enabled under settings) will be temporally disabled until Away is canceled. See page 10 for additional information.
	**Ventilating**	**Ventilating**	Indicates the system is actively ventilating.
	**Function**	**Service Urgent**	**Service Urgent** means that a service call is needed to get the system running.

NOTE: *Smart away will be canceled when the system is enrolled in energy savings with a utility provider and a energy saving event is active.*

Menu

MENU

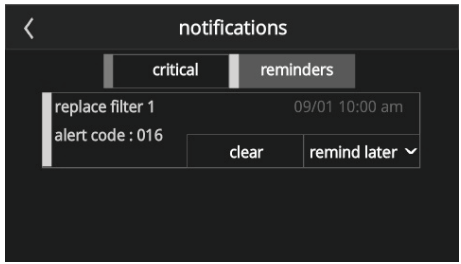
	Touch to display **menu** screen



	Touch each item to display the selected screen

NOTIFICATIONS

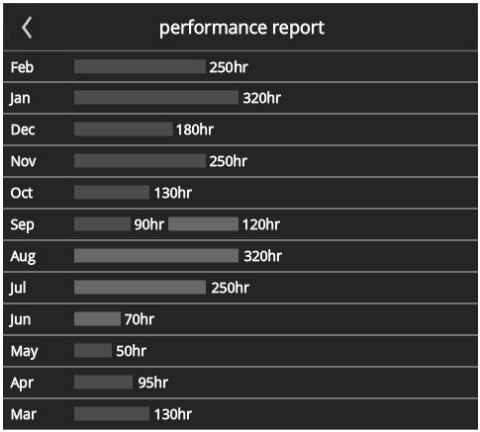
Displays system operating and service reminder messages.



Displays faults, errors and service information.

	If any faults, errors, or service information appears, options are displayed underneath the notification, **remind, clear, service,** or **reset**. Touch to select the desired action.

Performance Report

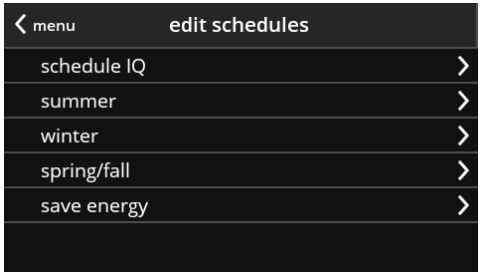


Displays the number of hours each month the system has been operating in heating mode (red) or cooling mode (blue) in an easy-to-read graph.

Graph Colors

- Orange indicates heat pump heating
- Red indicates either air handler (electric) or furnace heating
- Blue indicates cooling
- Pale green indicates fan runtime.

Edit Schedules



Set schedules for specific times of the year or edit to create custom schedules.

	Touch the Menu icon on the Home Screen and select **Edit Schedules** to access the schedules screen.

- Schedule IQ™
- Summer
- Winter
- Spring/Fall
- Save Energy

	**Schedule IQ™** schedule determines when to operate the system based on individual “home day”, “home night”, “away” times and temperature settings. Schedule is controlled by the Smart Away™ (geo-fencing) (when enabled) in the thermostat and the iComfort® M30 mobile App. Multiple Apps on multiple devices can control one system.

	Touch a schedule name to edit individual schedule.

- Select Days
  - > Individual Days (Monday, Tuesday, etc.)
  - > Week/Weekend (Monday-Friday and Saturday-Sunday)
  - > All Days
- Select Mode
  - > Heat/Cool
  - > Heat Only
  - > Cool Only

	Touch days selected to adjust individual times and temperatures.

	Touch each time period and select **delete period** if you want to remove a time period. You can remove all time periods except one if desired.

	Using **all days** follows the same schedule for each day.

- Set Time (4 time periods per day)
- Individual Sliders to adjust cooling (blue) and heating (red) temperatures for each time period *(Adjustable 60 to 90°F)*
- Fan Icon
  - > On
  - > Auto
  - > Circulate
- Rename

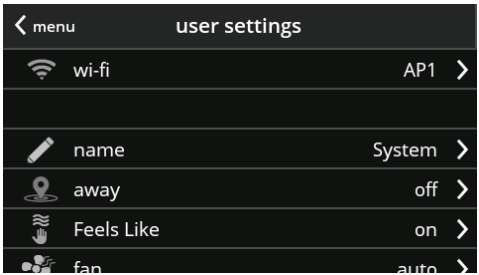
	Rename a schedule with the keyboard tool (maximum 16 characters).

- Restore Defaults resets schedules to factory settings

Settings

Displays various user settings (fan, heat/cool, humidity, reminders, general, display). Factory default settings are highlighted in **bold**.

	Touch left side of screen to return to the Home Screen.

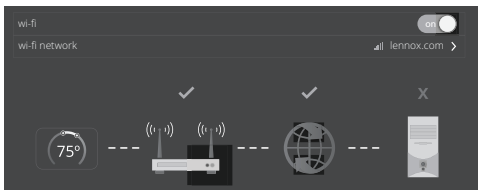


Access to all user settings

- Wi-Fi
- Name
- Away
- Feels Like™
- Fan
- Heat/Cool
- Ventilation
- Humidity
- Notifications
- Energy Savings
- Advanced Settings (Installer Settings)
- General
- Display
- Home Info
- Account

	Touch a parameter on the left side of the screen to display that particular screen.

Wi-Fi



A graphical representation of the home network showing the connection status from the High Definition Display to the Smart Hub to the Internet to the Lennox server.

- Wi-Fi (on/off)
- Wi-Fi Network

	Touch **wi-fi network** to see a list of available networks or to add a network connection not shown (other). Also displays network status (secured/unsecured), strength.

	Do not use a guest account. Do not use a unsecured connection. Do not use your neighbor's Wi-Fi. Satellite provider network may cause issues as well.

	Touch the **i** for additional information about a particular network (name, SSID, security, RSSI, etc.).

	Touch a particular network ID to connect to that network. Enter password to connect.

	A red "X" means that there is an issue with a connection point that must be resolved.

Name

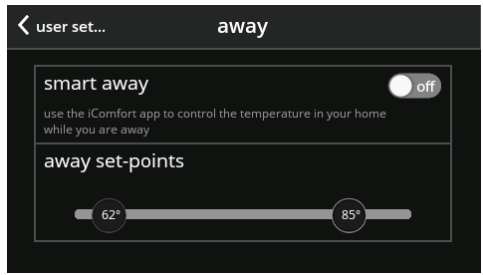
Enter system name (Home 1, Home 2, etc) using the keyboard tool.

Away

NOTE: *Most of the procedures listed in this section can be accomplished at the thermostat or using the Lennox iComfort Thermostat App or consumer web portal.*

Manual Away

The user can manually put the system into away mode by pressing the "away" icon. When the system is in away mode, the horseshoe is grayed-out and shows the "away" status text. In order to exit away mode, the user can press the "cancel" icon. In away mode, the away set points are used to control the system. The user can modify the away set points from the default values in **menu** > **settings** > **away**.



Smart Away

Smart Away is a feature that can be enabled once you have created and registered your account. Both Home Info and Account options must be completed before this option can be enabled.

Smart Away is a feature that can be enabled once you have created and registered your account. Both Home Info and Account options must be completed before this option can be enabled.

The Smart Away feature depends on the iComfort Thermostat App running on your mobile device (smart phone or tablet) and being logged in to your account. It is also required for Wi-Fi and location settings to be enabled on your mobile device. Android devices must also have the location mode set to “high accuracy.” Consult your mobile device user guide for instructions.

Smart Away can also be enabled from your mobile device once you have installed the Lennox iComfort Thermostat App and logged in. Go to the **menu** > **settings** > **away** and turn ON **Smart Away**. To allow the mobile device you are on to use this feature, turn ON participate. The away fence option will appear and by default, the setting is two miles (3 km). The range for this setting is 2 to 6 miles (3.00 to 9.50 km).

Inner and Outer Away Fences

The inner away fence is set by the user anywhere between 2 to 6 miles (3.00 to 9.50 km) on the mobile app. This setting can be different for each participating mobile device. When any of the participating mobile devices are located inside of its inner away fence, the system will not be in Smart Away; the system will use the temperature set points defined by the schedule or what was manually set.

Once the inner away fence is set, the outer fence for each participating mobile device will be automatically calculated by the Smart Away algorithm.

Transition Set Points

When the closest participating mobile device is between the inner and outer away fences, the thermostat will show the Smart Away indicator. The system will use transition set points to heat or cool the home. The transition temperature set points are automatically calculated by the Smart Away algorithm using a combination of the home and away set points.

Away Set Points

Once all participating mobile devices have moved outside the transition range, the thermostat will continue to show the Smart Away indicator, and the user-set away set points will be used to control the system.

Example: Away set points are 65ºF (18.5ºC) for heating and 85ºF (29.5ºC) for cooling. When the away fence is set to two miles for all participating mobile devices, and the closest participating mobile device is within the 0-2 mile (0 to 3.22 km) range of the home, the system is considered home; the system will use the set points from the schedule or what was manually set. If the closest participating mobile device moves into the 2.1 to 8 miles (3.40 to 13.04 km) range, the system is considered in tran-

sition, and the system will start to either increase or reduce the heating or cooling set point. Once all participating mobile devices have moved beyond the 8.1 mile (9.50 km) range from the house, the system sets the set points to the away set points (65ºF for heating and 85ºF for cooling).

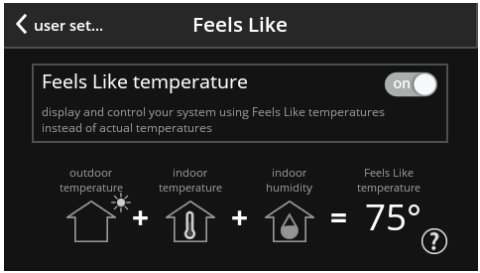
Multiple Devices

It is possible to have more than one mobile device participating in Smart Away for this system. The away fence can be set to the same value or different values for each mobile device. The thermostat will not show the Smart Away indication until all devices have moved past their inner away fence, and the system will not reach the user-set away set points until all devices have moved past their outer fence.

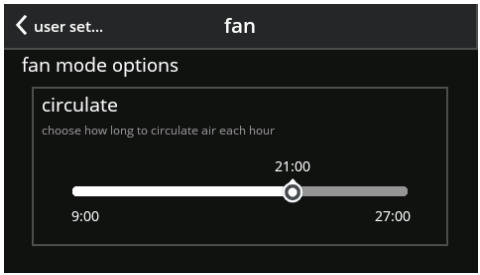
NOTE: *Starting with Android version 10, when allowing the mobile app access to device location, you must select "Allow all the time" for the Smart Away feature to work correctly.*

Feels Like

Accurately controls temperature in the home by determining the "feels like" temperature based on outdoor temperature, indoor temperature plus indoor relative humidity. On/Off:



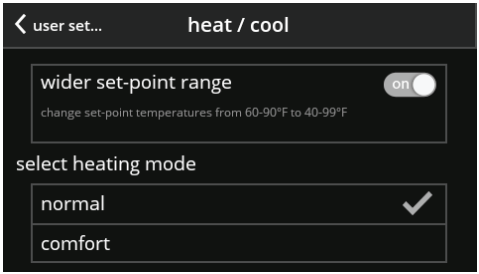
Fan



Set how long to circulate the air each hour.

- Circulate *(9 to 27 minutes, default is 21 minutes)*

Heat / Cool



Adjustments for heating and cooling set points, auxiliary heat, safety protection and other settings.

	Depending on system mode setting, **heat/cool, heat only or cool only** is displayed under Settings (user).

Wider Set Point Range

Controls heating and cooling temperatures with a wider set point range

- On/Off - Changes temperature range from 60-90°F (15.5 to 32°C) to 40-99°F (4.5 to 37°C).

Select Heating Mode (Heat Pump Systems Only)

The following options are not available if the outdoor unit is not a heat pump.

- Normal (heats home to desired temperature).
- Comfort (2-stage heating or cooling, second stage is locked in until demand is satisfied)

Auxiliary Heat (Heat Pump Systems Only)

- On/Off.
- Allows auxiliary heat operation if temperature drops below set balance point -20 to 75°F (-29 to 24°C), adjustable).

	Selecting **Auxiliary Heat** displays a slider to adjust balance point levels. The optional outdoor temperature sensor is required for balance point operation.

Safety Protection and Notifications

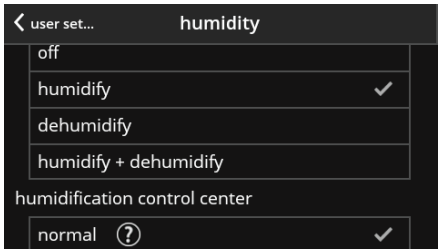
- Safety Protection - 30 to 100°F (-1 to 38°C), adjustable). Default when enable is 40 to 90°F (4.5 to 32°C). If a situation arises when either the low or high set points are exceeded, either Alarm 29 or 30 will be raised.

	Safety Protection alerts the homeowner if the house is too cold or hot.

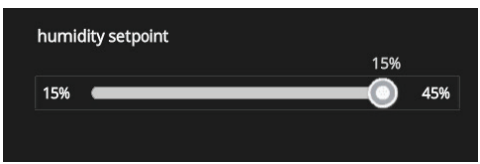
Humidity Screen

Options on the following screen are dependent on whether humidity control has been enabled and both humidification and dehumidification has been enabled.

Humidity control can be set during initial commissioning of the system or changed later by a technician. Options available on the below screen depends on system configuration settings.

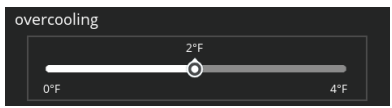


- **Off**
- Humidify
  > Set point - **45%** adjustable RH (15 to 45%)
- Dehumidify
  > Set point - **50%** adjustable RH (35 to 60%)
- Humidify + Dehumidify



	Selecting **humidify** or **dehumidify** displays a slider to adjust the desired levels. Selecting **humidify + dehumidify** displays a slider to adjust both levels (humidification-left, dehumidification-right).

	Dew point setting is only available with optional remote Outdoor Temperature Sensor (-15 to 15%, adjustable, **0%**).

	Humidification Control Center **Normal** setting is recommended for moderate climates. Operates the humidifier when there is a call for heating and humidification. **Max** setting is recommended for drier climates. Operates the humidifier when there is a call for humidification only. Overcooling range is 0 to 4° degrees. For dehumidification, the **max** setting will overcool the space based on overcool slider adjustment tool setting.
	

Ventilation

This option will only appear if a fresh air damper, ERV or HRV is installed and configured by your installer.

Menu Selection

When selecting this menu option, selections will be either:

- Timed or ASHRAE (either Timed or ASHRAE is set by your installer during setup of your thermostat).
- On (always)
- Off (always).

Factory default is ASHRAE. Your installer will need to change it to Timed if that mode is desired.

You can also select “ventilate now” to start a ventilation function immediately. Those menu options are 10, 20, 30, 40 and 50 minutes, 1 hour, 1-1/2 hours, 2 hours, 2-1/2 hours, 3 hours, 3-1/2 hours and 4 hours and custom. Custom will allow to set a specific time to run too.

NOTE: *On two-speed ventilators, when **ventilate now** is selected, the ventilator will come on at high speed.*

NOTE: *Once ventilation is started, a notification appears on the right-side of the home screen indicating a time when that specific cycle will end and the option to cancel the demand.*

What is ASHRAE?

ASHRAE 62.2 is a national standard that provides methods for achieving acceptable indoor air quality in typical residences. It was developed and is maintained by the American Society of Heating and Air-Conditioning Engineers (ASHRAE). One of the standard three main components is Whole House Ventilation which is exhausting stale indoor air and replacing it with fresh outdoor air.

The exhaust fan dilutes the air in the main living spaces with outside air to remove unavoidable contaminants from people, pets, cleaning, off gassing, etc. The whole house fan flow rate is determined based on the floor space and the number of bedrooms. The whole house fan provides multiple air exchanges within the home each day. The operation can be continuous or intermittent (much higher airflow cycled by a timer) if 1 zone or less.

For more information about ASHRAE, go to https://www.ashrae.org.

Notification

- Replace Filter 1
- Replace Filter 2
- Replace UV Bulb
- Replace Humidifier Pad
- PureAir™ Maintenance
- Maintenance Reminder Settings
- Pending utility company peak load event
- Settings for all Reminders:
  - > **Disabled**
  - > 3, 6, 12, 24 Months or Custom date
  - > Set for Calendar Time or Runtime

	Touch **custom** to access the **Set Date Tool** screen to input custom date settings.

Energy Savings

NOTE: *This feature require XX.XX.xxx or higher. Go to **menu** > **settings** > **general** > about to verify your thermostat firmware version.*

Energy Savings feature is currently a feature requirement for the State of California. Enrolling into the energy saving program will allow your utility company to control your thermostat during peak energy events. An icon on the home page will indicate when the system is in an active energy savings event. Enrollment is a two-step process for consumers. The first step requires the consumer to register with their utility provider before the thermostat settings can be enabled to take advantage of the Energy Savings feature.

Enable Energy Savings

Go to **Menu** > **Settings** > **Energy Settings** and turn on enable energy savings. This will automatically get the required certification for your thermostat.

If enabling energy savings is successful or not successful a pop-up screen will appear indicating either.

NOTE: *The thermostat will continue to try and retrieve the certificate, if a failure is error is given, we recommend you wait and try again after 5-10 minutes.*

Enroll in Energy Savings

The next screen will allow you to enroll in energy savings. Follow the on-screen prompts to continue. Detail on-screen instructions are provided.

Energy Savings Settings

This screen will allow you to use your energy provider's default temperature or pricing set points. You can also customize these settings by selecting

1. Peak load event active set-points with the following options:
   - Default
   - Offset.
   - Custom set-points
   - Peak Price event Threshold
2. Peak Price Event Active Set-points with the following options:
   - Default
   - Offset.
   - Custom set-points
   - Energy Savings Events Filter
3. Energy Savings Settings Factory Reset

Canceling Energy Savings Event

The option to cancel will appear along the right side of the home screen. When in an active energy savings event and you attempt to update any of the following settings, a pop-up window will appear confirming you wish to exit the active energy savings event which could result in higher energy consumption during the event period:

- Adjusting the temperature set point manually,
- Selecting a schedule
- Changing the mode of operations
- Manually canceling the event from the home screen indicator.

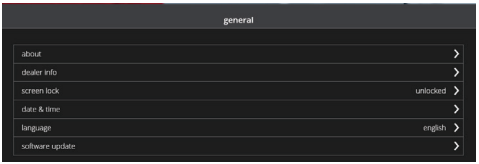
Canceling Energy Savings Enrollment

The option to cancel enrollment in Energy Savings can be found by going to Menu > Settings > Energy Savings > Energy Savings Settings > Factory Reset Energy Savings Settings

Advanced Settings

See included installation instructions for details. Changes made under Advanced Settings should be made by your HVAC installer or technician.

General



- About
  - > Thermostat model number
  - > Control model number
  - > Control serial number
  - > Control hardware revision
  - > Control software revision

- Software revision
- Last updated

> Software Update
- Automatic Updates (on/off)
- Check for Updates Now

- Dealer Info
  > Dealer ID
  > Name
  > Country/Region
  > Address 1
  > Address 2
  > City
  > State
  > Zip/Postal Code
  > Phone
  > Email
  > Website

	Input dealer information using the keyboard tool. Dealer can also input information during installer setup.

  > Dealer Access
  - Remote View (on/off)
  - Alerts and Notifications (on/off)

	Homeowner can allow/disallow dealer access to system information, alerts and notifications for troubleshooting.

- Screen Lock (Prevents tampering with thermostat settings).
  > Unlocked (no security).
  > Partially Locked (prevents tampering with the menu settings, set points can be adjusted).
  > Locked (prevents tampering with the thermostat).

	Lock icon on Home Screen indicates a locked or partially locked screen. To unlock, touch and hold the lock icon for 5-6 seconds.

- Date & Time
  > 12 or 24 Hour setting

	Date and time is automatically set if there is a wi-fi connection to the thermostat.

- Language
  > **English**
  > Français
  > Español

Display

- Outdoor Temperature Display
  > Off
  > Internet (requires Internet connection)
  > Sensor (requires that an outdoor air temperature sensor is installed and enabled under **Advanced Settings** > **Outdoor Sensor**).
- Indoor Humidity
  > On
  > Off
- Screen Saver
  > On
  > Off

	Default screen saver blanks the screen display (if enabled). Touch the screen to display.

- Screen Brightness

	Slide control allows screen brightness adjustment (0 to 100%).

- Temperature Unit
  > **°F**
  > °C
- Clean Screen

	Thirty (30) Second Countdown timer without affecting settings to allow cleaning of the display.

Home Info

	This section can only be completed once a secure Wi-Fi connection is established and the thermostat is connected to the Lennox server.

Once connected to the Lennox Server, you may enter the following information for your thermostat.

- Home
- Country / region
- Address 1
- Address 2
- City
- Zip / postal code

Account

	This section can only be completed once a Wi-Fi connection is established and the thermostat is connected to the Lennox server.

Once connected to the Lennox Server, you may enter the following information for your thermostat.

Your options are:

- Sign in
- Create New Account
- Generate Pin

Sign In

Use this option if you have already created an user account and your thermostat is already associated with that account.

	If your have forgotten your password, there is an option on the **Account Info** screen to have the Lennox server email your password to you.

Create New Account

If you do not have an account with Lennox, you can create an account now. Fields to complete are:

- First name
- Last Name
- Phone
- Login Name
- Set Password
- Receive Alerts and Reminders via Email
- Allow dealer to receive set alerts and remotely fix your system,
- Agree to the Lennox End User License Agreement (EULA).

Once you have received confirmation that your account has been created, then you will need to associate your system with your account.

Generate Pin

Select the generate pin option. A five digit pin will be displayed. Make note of the pin.

NOTE: *Pin number is only active for 15 minutes if time expires you have to generate another pin number.*

Go to **https://www.lennoxicomfort.com:**

1. Click on your **login name** in the upper right-hand corner.
2. Click on **add icomfort**.
3. Enter the five digit pin you recorded earlier and select **add**.

Wi-Fi Connection and Troubleshooting

Wireless networks supported by this system are:

- 802.11b is 2.4Ghz band (max 11 Mbit/s)
- 802.11g is 2.4Ghz band (max 54 Mbit/s)
- 802.11n is 2.4Ghz band (max 130 Mbit/s)

This is for connecting the thermostat to a secure home wireless network.

If having problems with your router connection make sure your router is set up for 802.11 b, g, or n. Some newer router have this connection turned off.

A router with Bonjour capabilities is required for this function. Check the router functions if the thermostat does not connect. Apple Bonjour® is an implementation of zero-configuration networking (Zeroconf), a group of technologies that includes service discovery, address assignment, and host name resolution.

Never use a home guest account.

Never use an open router connection (non-secure).

Always use a secure connection physically located in the home where the thermostat is located.

Touch the Menu icon in the upper left-hand corner of the display.

1. Touch the settings option on the menu.
2. If Wi-Fi is set to disabled, touch the > icon to enabled. The Wi-Fi screen will appear where you can toggle it to ON.

Visible Home Wi-Fi Access Point

1. Touch wi-fi network. This will display a list of visible Wi-Fi networks within range of the thermostat.
2. Select the homeowner network and type in the password. Touch join to continue.

NOTE: *The thermostat can connect to a home wireless router that uses up to 32 characters in the access point name (visible or hidden).*

NOTE: *If you wish to see the characters you are typing, check show password. The thermostat will support up to a 63 character password. The password cannot contain the % or # symbols.*

3. If joining the network was successful, the access point name will appear next to wi-fi networks.

Hidden Home Wi-Fi Access Point

1. Touch wi-fi network. Scroll down to others.
2. Enter new network information. You will need the name of the access point and the type of security being used. Select Security. Options are: none, WEP, WPA and WPA2. If your home Wi-Fi connection is unsecured, then Wi-FI security must be enabled using WEP, WPA or WPA2 via the router before proceeding. Consult your router documentation on how to enable Wi-Fi security.
3. Enter the password.

NOTE: *If you wish to see the characters you are typing, check show password. The thermostat will support up to a 63 character password.*

4. Touch join to complete.
5. If joining the hidden network was successful, the access point name will appear next to wi-fi networks.

Whether connecting to a visible or hidden network, if successful, a check mark will appear above both the router and Internet icons.

Wireless Terminology

The following terminology is used:

- Received Signal Strength Indication (RSSI). This indicates the signal strength of the Wi-Fi router being received by the scanning device (i.e., smart phone). So the higher the RSSI number (or less negative in some devices), the stronger the signal.
- Internet Protocol Address (IP address). This is an address assigned by your home router for each network device (e.g., computer, printer, thermostat).

	Connection to Lennox server from your Internet provider may take up to 4-5 minutes depending on your Wi-Fi speed connection speed and how busy the server may be.

Troubleshooting Tips

Locate the thermostat and router away from other devices that could possibility interfere with wireless communications. Some examples of other devices that could interfere are:

- Microwave ovens
- Wireless cameras
- Portable phones and bases
- Baby monitors
- Wireless speakers
- Bluetooth devices

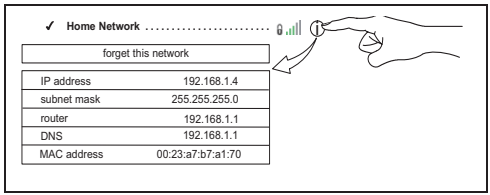
- Garage door openers
- Neighbor's wireless devices

To eliminate a possible source of interference, temporally disable any devices and see if Wi-Fi performance has improved.

Determining Wireless Connection Signal Strength

The ideal signal strength range for the thermostat is -1 to -69 Received Signal Strength Indication (RSSI). The signal strength can be viewed from the thermostat interface.

1. Press **NETWORK SETTINGS**; This screen shows a graphical view of options representing OPEN and SECURE wireless networks, along with options for adding a network.
2. Select the access point that has already been established and connected.
3. When selecting the info icon, a screen will appear which will display an option to forget the network and IP address assigned to the thermostat by your router, sub-net mask, router, DNS and RSSI.
4. Scroll down to the last entry on this screen. There the Wi-Fi signal strength will be displayed (RSSI). If the RSSI signal strength is anywhere between -9 to -69, then the signal strength is sufficient. If outside the reference range, then either relocate the router closer to the thermostat, add a repeater, or move the thermostat. Adjusting antenna on router may resolve the issue.



Connecting to Lennox Server using Alternate Method

An additional test method is with your cell phone.

1. Enabled the mobile hot spot option on your phone.

NOTE: *Not all data plans allow this function. Check with your service provider for this option.*

2. Connect the thermostat to your hot spot.
3. Allow up to five minutes for the connection to the Lennox Server.
4. If you are able to connect then you have verified that the thermostat's Wi-Fi is functional.

iComfort Mobile App (Applications)

The iComfort® Thermostat App (homeowner app) is available for use on iPhone®, iPad® and Android™ devices.

Apple, the Apple logo, iPhone and iPad are trademarks of Apple Inc. registered in the US and other countries.

Android is a trademark of Google Inc. Use of this trademark is subject to Google permission.

Amazon, Echo, Alexa and all related logos are trademarks of Amazon.com, Inc. or its affiliates.

Amazon Alexa Enabled Devices

This section provides basic information on how to connect your Amazon device utilizing Alexa speech-recognition technology for your thermostat. Also provided are the voice commands that controls your thermostat.

Setup

First you must have a *Amazon Alexa enabled device* installed and connected to your home Wi-Fi network. Use the following procedure to enable the iComfort S30 Ultra Smart Thermostat Skill using the *Amazon Alexa* mobile app.

1. Download and install the Amazon Alexa app on your mobile device.
2. Start the Amazon Alexa app.
3. Search for “Lennox” in the Skills or Smart Home Skills section of the Amazon Alexa app and ‘Enable Skill’ for the Lennox iComfort Skill.
4. Login with your Lennox iComfort user name and password
5. Your Lennox account should now be successfully linked with Amazon Alexa.
6. You can now add your iComfort thermostat to Alexa by either of the following options:
   - Clicking on “Discover Devices” in the Smart Home section in the Alexa app OR
   - Ask Alexa to discover your iComfort Thermostat by saying, “Alexa, discover my devices”.

Under “Smart Home” in your Alexa app, you should see a list of discovered devices with your thermostat or zone names. You can see your system or zone names on the thermostat home screen above the indoor temperature display.

Only use the exact name(s) you see on the thermostat screen when speaking your command. For example, “Alexa, change the “Hallway” to 68 degrees” will work, but “Alexa, change the “Hallway thermostat” to 68 degrees” will not.

In a situation when you may have two or more thermostats in your home, each thermostat must have a unique name. In addition, each zone must also have a unique name like bedroom, kitchen, den, etc.

If your thermostat is using the “Feels Like” feature, Alexa supports that mode of operation as well.

NOTE: *You can change your system name by going to the thermostat home screen, select* **menu** > **settings** > **name**. *To change the name of a specific zone, go to*

the home screen, select **menu** > **settings** > **iHarmony** *and select the specific zone you wish to rename.*

Alexa Voice Commands for Lennox Skill

1. Set your device to a specific temperature:

   "Alexa, set (thermostat name) to 75 degrees"

   "Alexa, set (thermostat name) temperature to 75"

   "Alexa, set (thermostat name) to 75"

   "Alexa, change temperature to 75". Alexa will ask you to confirm which device, just say your thermostat's name.

   "Alexa, turn temperature to 75". Alexa will ask you to confirm which device, just say your thermostat's name.

2. Turn UP the temperature a set amount:

   "Alexa, increase (thermostat name) by 3 degrees"

   "Alexa, increase (thermostat name) temperature by 3 degrees"

   "Alexa, raise (thermostat name) by three degrees"

3. Turn UP the temperature by two degrees:

   "Alexa, increase (thermostat name) temperature"

   "Alexa, heat up (thermostat name)"

4. Turn DOWN the temperature a set amount:

   "Alexa, decrease (thermostat name) by three degrees"

   "Alexa, lower (thermostat name) temperature by three degrees"

   "Alexa, decrease (thermostat name) temperature by three degrees"

5. Turn DOWN the temperature by two degrees:

   "Alexa, lower (thermostat name) temperature",

   "Alexa, cool down (thermostat name)"

   "Alexa, make (thermostat name) colder"

6. Ask for the current temperature:

   "Alexa, what is the temperature of (thermostat name)" Alexa will reply with current temperature.

7. Ask for thermostat set points:

   "Alexa, what is the (thermostat name) set to?" Alexa will reply with the current thermostat set points and the thermostat mode (heat, cool or auto).

If you ask Alexa to raise or lower the temperature without specifying by how much, it will change the temperature by two degrees.

Changing to Celsius

Using your Amazon Alexa mobile app, select the three bar icon in the upper left-hand of the screen.

1. Select **Settings**.
2. Choose your Amazon device
3. Select **Measurement Units** from the menu.
4. Toggle **ON** Temperature Units - Use metric measurements for temperature units.

NOTE: *Even though your Lennox thermostat supports half degree settings in Celsius, Alexa only supports whole degrees. The first temperature adjustment that gets made will set the temperature to a whole degree, if it was not already.*

Heat and Cool Mode

Alexa will control your thermostat a bit differently when it's in Heat • Cool mode. In Heat and Cool mode the system can automatically switch between heating and cooling as needed.

For instance, if you ask Alexa to set the hallway temperature to 70 degrees, your thermostat will use this as a midpoint temperature, setting the Heat set point to 69 and Cool set point to 72. Alexa will confirm your request, saying "Hallway is in auto mode, aiming for 70 degrees".

NOTE:

1. You cannot change the mode (heat only, cool only, etc.) of your thermostat using Alexa.
2. If your thermostat is in 'away' or 'smart away' mode, any Alexa commands to change thermostat temperature will not work in this mode.
3. Currently, you can pair only one home that is listed in your Lennox iComfort Account with Alexa. In the situation where you have multiple homes associated with your iComfort account, you will not have a choice to choose the home for Alexa. You can check the homes associated your account by visiting:

https://www.lennoxicomfort.com

Google Home and Assistant

Download the Google Home app from Google Play or the App Store™ on a compatible phone or tablet. Then follow the on-screen steps to finish setup.

Once you have added the thermostat to your Google Home app, then install the Google Assistant app (Android and IOS) to enable voice control.

NOTE: *Google Assistant app may be already installed on your Android device.*

Schedule Mode Functions

Raising or lowering the temperature is not supported when using a schedule feature.

When attempting to change the temperature when in either reference mode, Google Assistant will respond with "mode not supported".

Heat / Cool Mode (Auto-Changeover)

Although Google Assistant supports heat / cool mode temperature adjustments, it will do so only by maintaining the currently established temperature ranged.

For example, if you set your heat set point to 60ºF and your cooling set point to 80ºF at the thermostat itself, then you have established a temperature range of 20 degrees. Any adjustment using Google Assistant, either through the app or by voice will maintain a 20 degree range differential as well. Let's say you change your heat set point to 65ºF.

Now your thermostat will indicate the heating is at 65ºF and cooling is set at 85ºF. Adjusting the cooling set point will result in the range being maintained as well. In the Google Home app, the thermostat image will only display the approximate center temperature between the current heating and cooling

set points. In this example it would display 75ºF.

Additional Help

To learn more, go to either the Lennox consumer help at:

http://http://www.support.lennoxicomfort.com/help/lennox-google-assistant/lennox-google-assistant.html

or Google's online help at:

http://g.co/home/help.

IFTTT

Download the IFTTT app from Google Play or the Apple App Store™ on a compatible phone or tablet. Then follow the on-screen stops to finish setup.

To learn more, go to the Lennox consumer web portal at:

https://www.lennoxicomfort.com

http://www.support.lennoxicomfort.com/help/index.html

To IFTTT's online help at: **https://help.ifttt.com/hc/en-us.**

Control4® Smart Home | Operating System

Control4 is a leading control and automation platform which works with thousands of smart devices integrating audio, video, lighting, security, intercom, and climate control into a seamless customer experience

Control4 gives the customer an easy-to-use interface to control the iComfort® thermostat.

Settings include:

- Display all systems in the home and select a system
- Display all zones in the system and select a zone
- Turn system or zones on or off
- Change manual modes (heat, cool, off)
- Change heating/cooling setpoints for each zone/system
- Change fan mode (on, auto, circulate)

For additional information please visit the iComfort® Support Website for Control4 Integration.

FCC Statements

FCC Compliance Statement — PART 15.19: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement — PART 15.105 (B)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

RF Exposure Information

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. In order to avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antenna shall not be less than 20cm during normal operation.

Index

A

Account 28
Account Creation 28
Advanced Settings 25
Alexa 32
Alexa Voice Commands for Lennox Skills 33
ASHRAE 23
Auxiliary Heat 21
Away 18

B

Bonjour 29

C

Clean Screen 27
Cool only Temperature Adjustment Screen 5

D

Display 27

E

Edit Schedules 15
Energy Savings 24
Canceling an Event 25
Canceling Enrollment 25

F

Fan 20
FCC Statements 35
Feels Like 20
Forgot Password 28

G

Generate Pin 28, 29
Google Home and Assistant 34
Guest Accounts 29

H

Heat / Cool 21
Heat Only Temperature Adjustment Screen 5
Hidden Access Point 30
Home Information 28
Humidification Control Center 22
Humidity Display 6
Humidity Display (Indoor) 27
Humidity Screen 21

I

Icons (Home Screen)
Auxiliary Heat 8
Away 8
Changing Set Point Range 12
Cooling 8
Defrosting 8
Dehumidifying 8
Emergency Heat 8
Fan is running 10
Heating 8
Humidifying 8
Load shedding wait time 45 min 10
Menu 8
Smart Away is Canceled for Now 13
System Under Test 10
Transitioning to next schedule 10
Will Start Soon 10
Icons (screen)
Away 13
IFTTT 35

L

Language Selection 27

M

Menu 14
Mobile Applications 31
Modes 6

N

Notifications 14, 23

O

Outdoor Temp Display 27
Outside Temperature 6
Overcooling 22

P

Performance Report 15

R

Received Signal Strength Indication (RSSI) 31

S

Safety Protection and Notifications 21
Schedule IQ 16
Schedules 6
Screen Brightness 27
Screen Lock 26
Screen Saver 27
Signal Strength Indicator 30
Sign In 28
Smart Away
Energy Savings 13
System Status Icons 8

T

Temperature Settings 4
Troubleshooting Tips 30

V

Ventilation
ASHRAE 23
Timed 23
Visible Access Point 29

W

Wider Temperature (Setpoint) Range) 21
Wi-Fi Settings 17
Wi-Fi Testing 31
Wi-Fi Troubleshooting 29
Wireless Signal Strength 31

pettitpettit CONSULTING ENGINEERS, INC

REVIEW OF MECHANICAL SUBMITTALS

Project: ASU 3 Rivers Ritz Theater Renovation
Location: Malvern, Arkansas
P&P Job No. 22-024
Date of Receipt: Friday, March 10, 2023
Date of Review: Tuesday, March 28, 2023
Reviewed by: Adam Kelly
Email: akelly@pettitinc.com

Signed: Adam Kelly

Checking is for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

Item	Approval Status		Comments
Section 23 23 00 - 02 – Firestopping	Approved as Corrected	o	- Contractor to verify all sizes, quantities, and coordinate the use of firestopping materials in all fire rated separations. Coordinate fire barriers with architectural drawings. - Coordinate the use of appropriate fire stopping materials for the applications and ensure that the UL listed materials are installed per manufacturer's specifications.
Section 23 23 00 - 03 – Gravity Roof Ventilator	Approved as Corrected	o	- Coordinate installation with roofing contractor. - Verify unit is provided with backdraft damper and birdscreen.
Section 23 05 29 - 01 – Hangers and Supports	Approved as Corrected	o	- Contractor to verify all sizes and quantities.
Section 23 05 53 - 01 – HVAC Identification	Approved as Corrected	o	- Contractor to coordinate all tags with most recent construction documents. If changes are made, record deviation on "as built" documents provided to owner.
Section 23 05 93 – 01 – Testing, Adjustment, and Balancing	Approved	✓	- Approved as submitted.
Section 23 07 13 – 01 – HVAC Duct Insulation	Approved	✓	- Approved as submitted
Section 23 07 19 – 01 – HVAC Duct Insulation	Approved as Corrected	o	- Contractor to coordinate minimum thickness of closed cell insulation required for refrigerant piping to meet equipment manufacturer's requirements. - Provide protection for all exterior piping insulation, see specifications.
Section 23 23 00-	Approved	o	- Contractor to verify all sizes and quantities.

01 – Refrigerant Piping	as Corrected		- Coordinate refrigerant piping installation with equipment manufacturer's recommendations and piping diagrams. - Coordinate all natural gas piping and piping accessories with plumbing contractor.
Section 23 31 00-01 – HVAC Ducts & Casings.	Approved as Corrected	o	- Contractor to verify all sizes and quantities. - Contractor to coordinate routing of ductwork with all trades in space provided by architects. Ductwork to recessed in pathway to minimize visibility. - Contractor to limit flex duct runout to a total length of 3 ft.
Section 23 33 00-01 – Air Duct Accessories	Approved as Corrected	o	- Contractor to verify all sizes and quantities.
Section 23 34 23-01 – Power Ventilators	Approved as Corrected	o	- Coordinate location of fan with architect's RCP and coordinate location of gooseneck terminations with plumbing vents and roof equipment / structure.
Section 23 37 00 – Air Duct Accessories	Approved as Corrected	o	- Contractor shall verify all sizes and quantities. - Final finish shall be as per architect. Provide manufacture's color chip chart to architect for final color selection prior to ordering. - Contractor to provide continuous insulation blanket a top of all supply air and return air devices. - Contractor shall coordinate exact placement with architect's plans. - Contractor to coordinate with architectural RCP, to verify the correct border and mounting type is provided.
Section 23 54 00-01 – High Efficiency Gas Fired Furnace	Approved as Corrected	o	- Refer to refrigerant piping diagrams provided by manufacturer for refrigerant piping size and additional refrigerant required. - Field coordinate clearances required for service with other trades. - Provide all seismic bracing as required. - Coordinate all electrical requirements with electrical contractor. - Field coordinate final smoke detector requirements with other trades. - Provide one set of spare filters and (drive belts; if necessary). - Coordinate placement of condensing unit on equipment pad with additional HVAC equipment and structural.
Section 23 00 00-01 – Electric Unit Heaters	Approved as Corrected	o	- Field coordinate clearances required for service with other trades. - Coordinate all electrical requirements with electrical contractor.

  o 

Note:

Submittal Review Comment Transmittal

Date: 3/10/2023
Project Name: Phase II Restoration of the Ritz Theater
Project No.: 19114.02
Owner: Arkansas State University Three Rivers

Contractor: Clark Contractors, LLC
Attn: Terry Jacks

Submittal: Div. 23 (various, see below)

☐ Accepted

☐ Accepted as Noted

☐ Revise and Resubmit

☐ Not Accepted

By: Ryan Biles, AIA

Items Specified:

A. 23 00 00 Firestopping
B. 23 00 10 Gravity Roof Ventilator
C. 23 05 29 Hangers and Supports
D. 23 05 53 Identification for HVAC
E. 23 05 93 TAB
F. 23 07 13 Duct Insulation
G. 23 07 19 Piping Insulation
H. 23 23 00 Refrigerant Piping
I. 23 31 00 Ducts & Casing
J. 23 33 00 Air Duct Accessories
K. 23 34 23 Power Ventilators
L. 23 37 00 Air Inlets & Outlets
M. 23 54 00 High Efficiency Gas Fired Furnace
N. 23 62 13 Air Cooled Condensing
O. 23 00 00 Electric Unit Heater

Acceptance is subject to the provisions of the General Conditions of the Contract for Construction AIA Document A201.

Submittal Comments:

- **Please review for compliance with Div. 23 specifications and Plumbing Drawings and return to SCM via email**

Attachments:
23-0310 Division 23 submittals not yet reviewed by architect

By: **Ryan Biles, AIA**

J:\2019\19114.02 Ritz Theater Phase III\1800 Submittals\DIV 23\TO MEP\23-0310_RitzTheaterPh3_SUBMITTAL_Div23_TO PETTIT.docx

Submittal

Harrison
Energy Partners

Prepared For:
Pettit & Pettit

Date:
March 06, 2023

Sold To:
CSUSA

Job Name:
Ritz Theater Phase III

Harrison Energy Partners is pleased to provide the enclosed submittal for your review and approval.

Qty.	Product Summary
1	Split System (F/CU-1)

Bill Simpson, New Systems Sales Team Leader
p. 501.661.0621 • m. 501.539.0578
f. 501.661.9109 • harrisonenergy.com
Harrison Energy Partners • Commercial HVAC Excellence
1501 Westpark Dr., Ste. 9 • Little Rock, AR 72204

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Horizontal Split System (F/CU-1)

- 3 Ton Nominal Capacity
- 208-230/1 V/Ph Outdoor Unit
- Furnace
- 120/1 V/Ph Furnace
- Multi-Speed Blower
- 96% AFUE
- 30 MBh Input Heating Capacity
- Concentric Vent Kit (Field Installed)
- Horizontal Coil
- TXV
- Programmable Thermostat (Field Installed)

Table of Contents

Tag	Qty	Model	Description
	1	23A67	ML17XC1-036-230 Condenser/3 Ton/230
F/CU-1	1	16Y06	CHX35-30B-6F-1 COIL/2.5 Ton/Cased
	1	19V16	ML196UH030XE36B Furnace-Gas/30Btuh/3Ton

Project Submittal

Tag: F/CU-1
Condenser: ML17XC1-036-230
Evaporator Coil: CHX35-30B-6F
Furnace: ML196UH030XE36B

UNIT OVERVIEW

AHRI Reference - 208804477

Voltage	SEER2 EER2	Tons	Gross Cooling Ttl/Sens (MBH)	Net Cooling Ttl/Sens (MBH)	Supply Air Flow (cfm)	ESP/TSP (in.WC)	EAT DB/WB (°F)	LAT DB/WB (°F)
208 Volt 1 Phase / 60Hz	15.8 13	3.0	34.3 / 25.2	32.7 / 23.6	941	0.5 / 0.7	77.8 / 65.4	53.0 / 53.0

COOLING

Cooling Performance		Temperatures (DB/WB °F)		
Gross Cooling (Ttl/Sens)	34.3 / 25.2 MBH	Ambient	95.0	
Net Cooling (Ttl/Sens)	32.7 / 23.6 MBH	Entering	77.8	65.4
Coil Moisture Removal	8.62 lb/hr	Leaving – (Coil)	53.0	53.0
		Leaving – (Unit)	54.6	53.9

ARI Performance		Compressors		Refrigerant		Condensate Drain	
ARI Cooling	36.0 MBH	Cooling Stages	Single	Type	R-410A	Qty	2
		Compressor Qty	1	Cond Suction Line	7/8	Size	0.75 in.
				Cond Liquid Line	3/8	Pipe Thread	fpt
				Coil Suction Line	3/4		
				Coil Liquid Line	3/8		

HEATING

Heating Performance		Temperatures (DB/WB °F)		Specifications	
Output	29.0 / MBH	Entering	70.0	Thermal Efficiency	96.0%
(High/Low)	30.0 / MBH	Leaving	98.5	Gas Line Size	0.5 in.
Input (High/Low)	28.5 °F			Heat Exchange Type	Aluminum
Heat Rise					

VENTILATION

Air Flow (cfm)		Supply Fan		Air Resistance (in.WC)	
Supply	941	Nominal Power	0.5hp	Total	0.66
		Drive Type	ECM Multi Speed Constant Torque	Ext Supply	0.50
		Speed	Medium-Low	Wet Coil	0.15
		Orientation	Upflow/Horizontal		

ELECTRICAL

Condenser		Furnace	
Voltage	208 Volt 1 Phase / 60Hz	Voltage	120V / 1Ph / 60Hz
MCA	17 amp	MCA	
MOCP	30 amp	MOCP	15 amp
Condenser Oper Range-Nom Volt	+/- 10%		
Oper Range-Nom Volt	+/- 10%		

ADDITIONAL DATA

Condenser		Furnace		Evaporator Coil	
Dimensions	28.25 in. x 28.25 in. x 37.25 in.	Dimensions	28.75 in. x 17.50 in. x 33.00 in.	Dimensions	26.50 in. x 21.50 in. x 17.50 in.
Total Weight	200 lb	Total Weight	120 lb	Total Weight	54 lb

Tag: F/CU-1

Field Installed Accessories

Catalog Number	Qty	Description
15Z69	1	iComfort M30 Smart Thermostat Field Installed
71M80	1	1.5 Inch Concentric Vent Kit Field Installed

Product Features

Cabinet

Heavy gauge galvanized steel cabinet
Non-corrosive drain pan
Fully Insulated heavy gauge steel cabinet
Heavy Gauge Cold Rolled Steel Cabinet
PermaGuard™ Unit Base

Cooling System

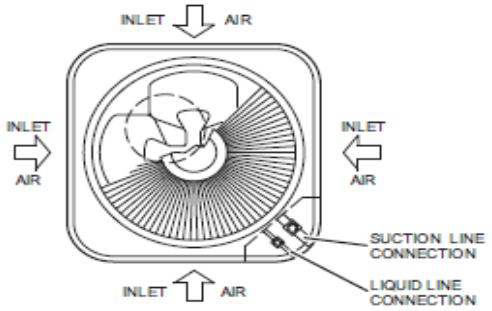
Non Chlorine, Ozone Friendly Refrigerant, R410A
RFC IV Metering Device furnished (easily removed for expansion valve use)
High Pressure Switch (Manual Reset)
Scroll Compressor
Quantum Coil / Fortified aluminum allow tube/enhanced fin coil
Hi-Capacity Drier factory installed in liquid line
Low Pressure Switch
Twin Coils assembled in an "A" configuration
Check and Expansion Valve is factory installed

Heating System

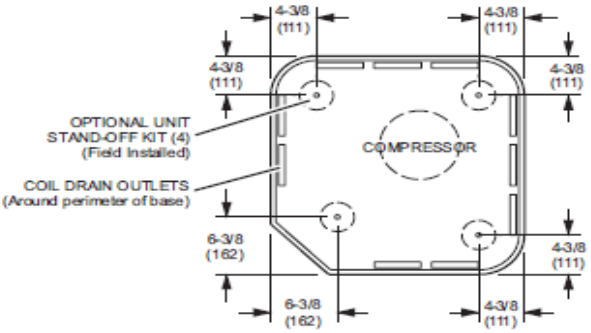
Aluminized Steel Inshot Burners
Aluminized Steel Tubular Heat Exchanger
SureLight(R) Hot Surface Ignition
Furnace Liminted Warranty 10 Years Comm

Warranty

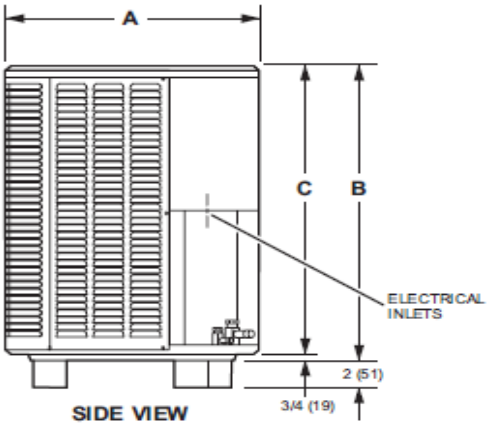
Condenser Limited compressor warranty of 5 years for Residential Installations
Condenser See Limited Warranty Certificate included with unit for details
Condenser Limited compressor warranty of 5 years for Non-Residential Installations
Condenser Limited warranty on all covered components of 1 year in Non-Residential Installations
Coil See Limited Warranty Certificate included with unit for details
Coil Limited warranty on all other covered components of 1 year (Comm Use)
Furnace See Limited Warranty Certificate included with unit for details
Furnace Limited warranty on heat exchanger of 20 years
Furnace Limited warranty on all other covered components of 1 year (Comm Use)
Furnace Limited warranty on Surelight ignition control system of 1 Year (Comm Use)



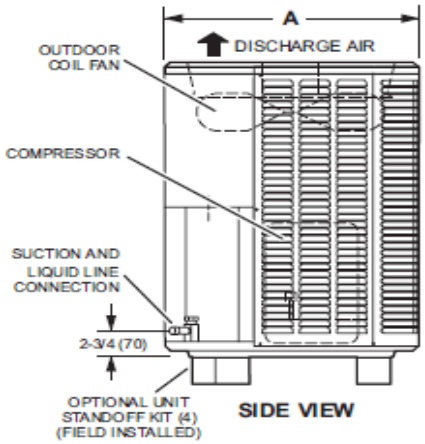
TOP VIEW



TOP VIEW BASE SECTION



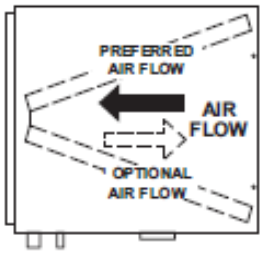
SIDE VIEW



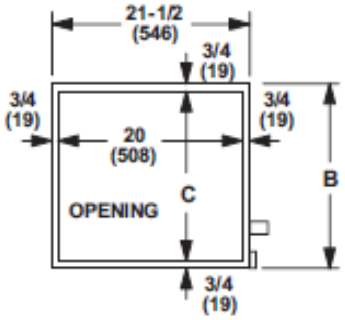
SIDE VIEW

Model	A		B		C	
	inches	mm	inches	mm	inches	mm
018	28-1/4	718	29-1/4	743	28-1/2	724
024	28-1/4	718	37-1/4	946	36-1/2	927
030	28-1/4	718	29-1/4	743	28-1/2	724
036	28-1/4	718	37-1/4	946	36-1/2	927
041	32-1/4	819	33-1/4	845	32-1/2	927
042	32-1/4	819	33-1/4	845	32-1/2	826
047	32-1/4	819	33-1/4	845	32-1/2	826
048	28-1/4	718	43-1/4	1099	42-1/2	1080
059	32-1/4	819	43-1/4	1099	42-1/2	1080
060	32-1/4	819	43-1/4	1099	42-1/2	1080

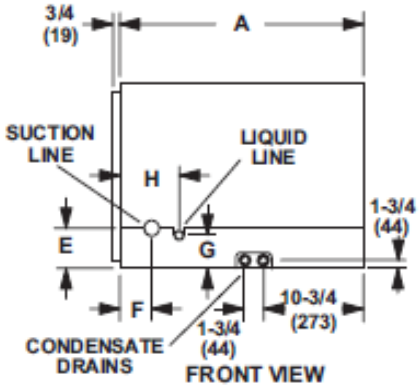
[1] Optional right-hand airflow requires a field fabricated 6 in. (152 mm) spacer in-between the furnace and coil.



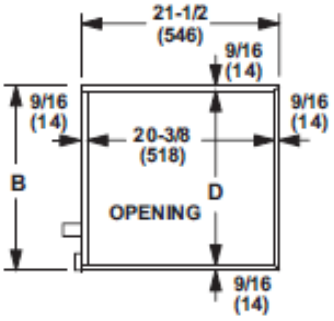
TOP VIEW



END VIEW



FRONT VIEW



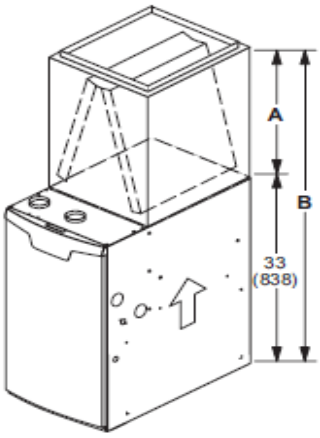
END VIEW

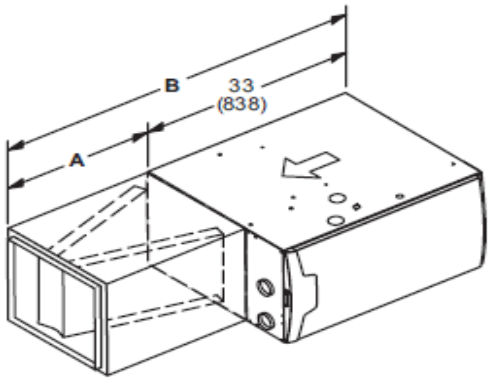
Model No.	A		B		C		D		E		F		G		H	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHX35-18A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-24A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-24B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-30A-6F	31-1/2	800	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-30B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-42B-6F	31-1/2	800	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-42C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-48B-6F	31-1/2	800	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-48C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-51/61C-6F	31-1/2	800	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-60D-6F	31-1/2	800	24-1/2	622	23	584	23-3/8	594	4	102	2-1/8	54	3	76	4-7/8	124

DIMENSIONS - FURNACE/COIL COMBINED DIMENSIONS

UPFLOW POSITION

Model Number	C35/CX35 Cased				C35 Uncased			
	A		B		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm
C35/CX35-18/24B	16-1/2	419	49-1/2	1257	14-1/8	359	47-1/8	1197
C35/CX35-24B	18-1/2	470	51-1/2	1308	16-3/8	416	49-3/8	1254
C35/CX35-30B	22-1/2	572	55-1/2	1410	20-3/4	527	53-3/4	1365
C35/CX35-30/36B C35/CX35-30/36C	24-1/2	622	57-1/2	1461	22-1/4	565	55-1/4	1403
C35/CX35-36B	24-1/2	622	57-1/2	1461	22-3/8	568	55-3/8	1407
C35/CX35-48B C35/CX35-48C	27-1/2	699	60-1/2	1537	26-1/4	667	59-1/4	1505
C35/CX35-49C	29-1/2	749	62-1/2	1588	28-1/2	724	61-1/2	1562
C35/CX35-50/60C	27-1/2	699	60-1/2	1537	25-7/8	657	58-7/8	1495
C35/CX35-60C	31-1/2	800	64-1/2	1638	30-5/8	778	63-5/8	1616
C35/CX35-60D	29-1/2	749	62-1/2	1588	28	711	61	1549



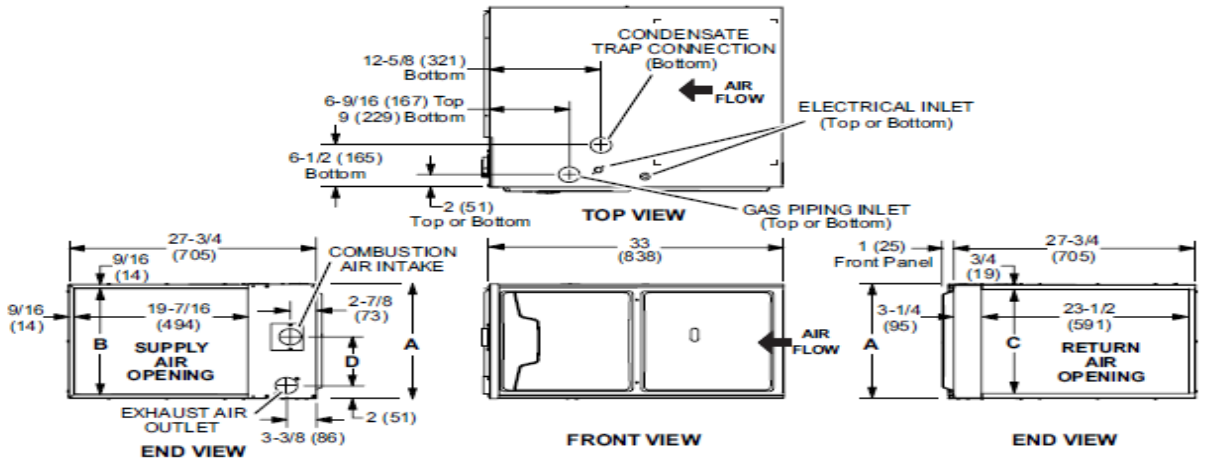


HORIZONTAL POSITION

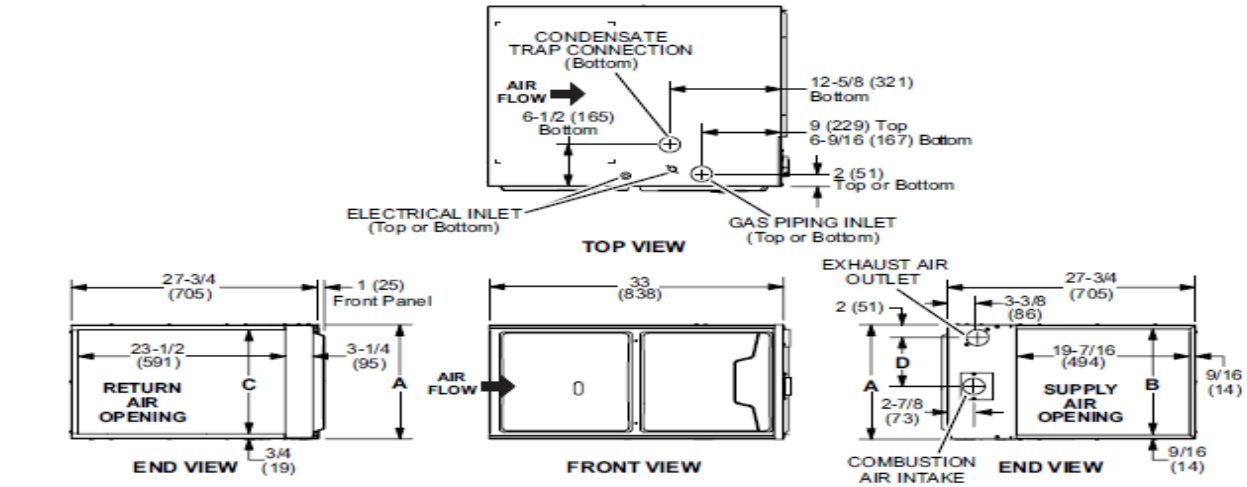
Model Number	CH35/CHX35			
	A		B	
	in.	mm	in.	mm
CH35/CHX35-24B CH35/CHX35-30B CH35/CHX35-36B CH35/CHX35-36C CH35/CHX35-42C CH35/CHX35-48C	26-1/2	673	59-1/2	1511
CH35/CHX35-42B CH35/CHX35-48B CH35/CHX35-51C CH35/CHX35-60D	31-1/2	880	64-1/2	1638

DIMENSIONS - UNIT - HORIZONTAL POSITION

LEFT-HAND AIR DISCHARGE



RIGHT-HAND AIR DISCHARGE



Model No.	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
ML196UH030XE36B ML196UH045XE36B ML196UH070XE36B ML196UH070XE48B	17-1/2	446	16-3/8	416	16	406	7-5/8	194
ML196UH090XE36C ML196UH090XE48C ML196UH090XE60C ML196UH110XE60C	21	533	19-7/8	505	19-1/2	495	9-3/8	238
ML196UH135XE60D	24-1/2	622	23-3/8	594	23	584	11-1/8	283

pettitpettit CONSULTING ENGINEERS, INC

REVIEW OF MECHANICAL SUBMITTALS

Project: ASU 3 Rivers Ritz Theater Renovation
Location: Malvern, Arkansas
P&P Job No. 22-024
Date of Receipt: Friday, March 10, 2023
Date of Review: Tuesday, March 28, 2023
Reviewed by: Adam Kelly
Email: akelly@pettitinc.com

Signed: Adam Kelly

Checking is for conformance with the design concept of the Project and compliance with the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site; for information that pertains solely to the fabrication processes or to techniques of construction; and for coordination of the work of all trades.

Item	Approval Status		Comments
Section 23 23 00 - 02 – Firestopping	Approved as Corrected	o	- Contractor to verify all sizes, quantities, and coordinate the use of firestopping materials in all fire rated separations. Coordinate fire barriers with architectural drawings. - Coordinate the use of appropriate fire stopping materials for the applications and ensure that the UL listed materials are installed per manufacturer's specifications.
Section 23 23 00 - 03 – Gravity Roof Ventilator	Approved as Corrected	o	- Coordinate installation with roofing contractor. - Verify unit is provided with backdraft damper and birdscreen.
Section 23 05 29 - 01 – Hangers and Supports	Approved as Corrected	o	- Contractor to verify all sizes and quantities.
Section 23 05 53 - 01 – HVAC Identification	Approved as Corrected	o	- Contractor to coordinate all tags with most recent construction documents. If changes are made, record deviation on "as built" documents provided to owner.
Section 23 05 93 – 01 – Testing, Adjustment, and Balancing	Approved	✓	- Approved as submitted.
Section 23 07 13 – 01 – HVAC Duct Insulation	Approved	✓	- Approved as submitted
Section 23 07 19 – 01 – HVAC Duct Insulation	Approved as Corrected	o	- Contractor to coordinate minimum thickness of closed cell insulation required for refrigerant piping to meet equipment manufacturer's requirements. - Provide protection for all exterior piping insulation, see specifications.
Section 23 23 00-	Approved	o	- Contractor to verify all sizes and quantities.

01 – Refrigerant Piping	as Corrected		- Coordinate refrigerant piping installation with equipment manufacturer's recommendations and piping diagrams. - Coordinate all natural gas piping and piping accessories with plumbing contractor.
Section 23 31 00-01 – HVAC Ducts & Casings.	Approved as Corrected	o	- Contractor to verify all sizes and quantities. - Contractor to coordinate routing of ductwork with all trades in space provided by architects. Ductwork to recessed in pathway to minimize visibility. - Contractor to limit flex duct runout to a total length of 3 ft.
Section 23 33 00-01 – Air Duct Accessories	Approved as Corrected	o	- Contractor to verify all sizes and quantities.
Section 23 34 23-01 – Power Ventilators	Approved as Corrected	o	- Coordinate location of fan with architect's RCP and coordinate location of gooseneck terminations with plumbing vents and roof equipment / structure.
Section 23 37 00 – Air Duct Accessories	Approved as Corrected	o	- Contractor shall verify all sizes and quantities. - Final finish shall be as per architect. Provide manufacture's color chip chart to architect for final color selection prior to ordering. - Contractor to provide continuous insulation blanket a top of all supply air and return air devices. - Contractor shall coordinate exact placement with architect's plans. - Contractor to coordinate with architectural RCP, to verify the correct border and mounting type is provided.
Section 23 54 00-01 – High Efficiency Gas Fired Furnace	Approved as Corrected	o	- Refer to refrigerant piping diagrams provided by manufacturer for refrigerant piping size and additional refrigerant required. - Field coordinate clearances required for service with other trades. - Provide all seismic bracing as required. - Coordinate all electrical requirements with electrical contractor. - Field coordinate final smoke detector requirements with other trades. - Provide one set of spare filters and (drive belts; if necessary). - Coordinate placement of condensing unit on equipment pad with additional HVAC equipment and structural.
Section 23 00 00-01 – Electric Unit Heaters	Approved as Corrected	o	- Field coordinate clearances required for service with other trades. - Coordinate all electrical requirements with electrical contractor.

  o 

Note:

Submittal Review Comment Transmittal

Date: 3/10/2023
Project Name: Phase II Restoration of the Ritz Theater
Project No.: 19114.02
Owner: Arkansas State University Three Rivers

Contractor: Clark Contractors, LLC
Attn: Terry Jacks

Submittal: Div. 23 (various, see below)

☐ Accepted

☐ Accepted as Noted

☐ Revise and Resubmit

☐ Not Accepted

By: Ryan Biles, AIA

Items Specified:

A. 23 00 00 Firestopping
B. 23 00 10 Gravity Roof Ventilator
C. 23 05 29 Hangers and Supports
D. 23 05 53 Identification for HVAC
E. 23 05 93 TAB
F. 23 07 13 Duct Insulation
G. 23 07 19 Piping Insulation
H. 23 23 00 Refrigerant Piping
I. 23 31 00 Ducts & Casing
J. 23 33 00 Air Duct Accessories
K. 23 34 23 Power Ventilators
L. 23 37 00 Air Inlets & Outlets
M. 23 54 00 High Efficiency Gas Fired Furnace
N. 23 62 13 Air Cooled Condensing
O. 23 00 00 Electric Unit Heater

Acceptance is subject to the provisions of the General Conditions of the Contract for Construction AIA Document A201.

Submittal Comments:

- **Please review for compliance with Div. 23 specifications and Plumbing Drawings and return to SCM via email**

Attachments:
23-0310 Division 23 submittals not yet reviewed by architect

By: **Ryan Biles, AIA**

J:\2019\19114.02 Ritz Theater Phase III\1800 Submittals\DIV 23\TO MEP\23-0310_RitzTheaterPh3_SUBMITTAL_Div23_TO PETTIT.docx

Submittal

Harrison
Energy Partners

Prepared For:
Pettit & Pettit

Date:
March 06, 2023

Sold To:
CSUSA

Job Name:
Ritz Theater Phase III

Harrison Energy Partners is pleased to provide the enclosed submittal for your review and approval.

Qty.	Product Summary
1	Split System (F/CU-1)

Bill Simpson, New Systems Sales Team Leader
p. 501.661.0621 • m. 501.539.0578
f. 501.661.9109 • harrisonenergy.com
Harrison Energy Partners • Commercial HVAC Excellence
1501 Westpark Dr., Ste. 9 • Little Rock, AR 72204

The attached information describes the equipment we propose to furnish for this project, and is submitted for your approval.

Horizontal Split System (F/CU-1)

- 3 Ton Nominal Capacity
- 208-230/1 V/Ph Outdoor Unit
- Furnace
- 120/1 V/Ph Furnace
- Multi-Speed Blower
- 96% AFUE
- 30 MBh Input Heating Capacity
- Concentric Vent Kit (Field Installed)
- Horizontal Coil
- TXV
- Programmable Thermostat (Field Installed)

Table of Contents

Tag	Qty	Model	Description
	1	23A67	ML17XC1-036-230 Condenser/3 Ton/230
F/CU-1	1	16Y06	CHX35-30B-6F-1 COIL/2.5 Ton/Cased
	1	19V16	ML196UH030XE36B Furnace-Gas/30Btuh/3Ton

Project Submittal

Tag: F/CU-1
Condenser: ML17XC1-036-230
Evaporator Coil: CHX35-30B-6F
Furnace: ML196UH030XE36B

UNIT OVERVIEW

AHRI Reference - 208804477

Voltage	SEER2 EER2	Tons	Gross Cooling Ttl/Sens (MBH)	Net Cooling Ttl/Sens (MBH)	Supply Air Flow (cfm)	ESP/TSP (in.WC)	EAT DB/WB (°F)	LAT DB/WB (°F)
208 Volt 1 Phase / 60Hz	15.8 13	3.0	34.3 / 25.2	32.7 / 23.6	941	0.5 / 0.7	77.8 / 65.4	53.0 / 53.0

COOLING

Cooling Performance		Temperatures (DB/WB °F)		
Gross Cooling (Ttl/Sens)	34.3 / 25.2 MBH	Ambient	95.0	
Net Cooling (Ttl/Sens)	32.7 / 23.6 MBH	Entering	77.8	65.4
Coil Moisture Removal	8.62 lb/hr	Leaving – (Coil)	53.0	53.0
		Leaving – (Unit)	54.6	53.9

ARI Performance		Compressors		Refrigerant		Condensate Drain	
ARI Cooling	36.0 MBH	Cooling Stages	Single	Type	R-410A	Qty	2
		Compressor Qty	1	Cond Suction Line	7/8	Size	0.75 in.
				Cond Liquid Line	3/8	Pipe Thread	fpt
				Coil Suction Line	3/4		
				Coil Liquid Line	3/8		

HEATING

Heating Performance		Temperatures (DB/WB °F)		Specifications	
Output	29.0 / MBH	Entering	70.0	Thermal Efficiency	96.0%
(High/Low)	30.0 / MBH	Leaving	98.5	Gas Line Size	0.5 in.
Input (High/Low)	28.5 °F			Heat Exchange Type	Aluminum
Heat Rise					

VENTILATION

Air Flow (cfm)		Supply Fan		Air Resistance (in.WC)	
Supply	941	Nominal Power	0.5hp	Total	0.66
		Drive Type	ECM Multi Speed Constant Torque	Ext Supply	0.50
		Speed	Medium-Low	Wet Coil	0.15
		Orientation	Upflow/Horizontal		

ELECTRICAL

Condenser		Furnace	
Voltage	208 Volt 1 Phase / 60Hz	Voltage	120V / 1Ph / 60Hz
MCA	17 amp	MCA	
MOCP	30 amp	MOCP	15 amp
Condenser Oper Range-Nom Volt	+/- 10%		
Oper Range-Nom Volt	+/- 10%		

ADDITIONAL DATA

Condenser		Furnace		Evaporator Coil	
Dimensions	28.25 in. x 28.25 in. x 37.25 in.	Dimensions	28.75 in. x 17.50 in. x 33.00 in.	Dimensions	26.50 in. x 21.50 in. x 17.50 in.
Total Weight	200 lb	Total Weight	120 lb	Total Weight	54 lb

Tag: F/CU-1

Field Installed Accessories

Catalog Number	Qty	Description
15Z69	1	iComfort M30 Smart Thermostat Field Installed
71M80	1	1.5 Inch Concentric Vent Kit Field Installed

Product Features

Cabinet

Heavy gauge galvanized steel cabinet
Non-corrosive drain pan
Fully Insulated heavy gauge steel cabinet
Heavy Gauge Cold Rolled Steel Cabinet
PermaGuard™ Unit Base

Cooling System

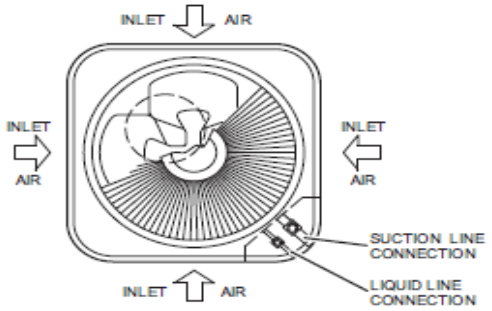
Non Chlorine, Ozone Friendly Refrigerant, R410A
RFC IV Metering Device furnished (easily removed for expansion valve use)
High Pressure Switch (Manual Reset)
Scroll Compressor
Quantum Coil / Fortified aluminum allow tube/enhanced fin coil
Hi-Capacity Drier factory installed in liquid line
Low Pressure Switch
Twin Coils assembled in an "A" configuration
Check and Expansion Valve is factory installed

Heating System

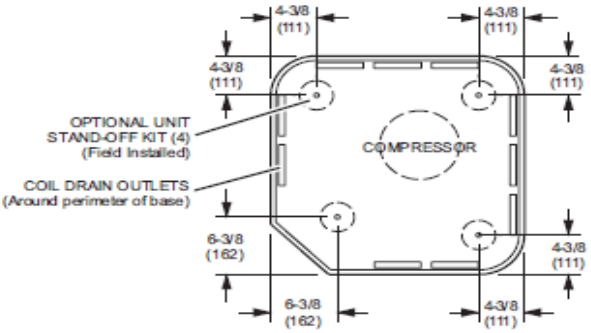
Aluminized Steel Inshot Burners
Aluminized Steel Tubular Heat Exchanger
SureLight(R) Hot Surface Ignition
Furnace Liminted Warranty 10 Years Comm

Warranty

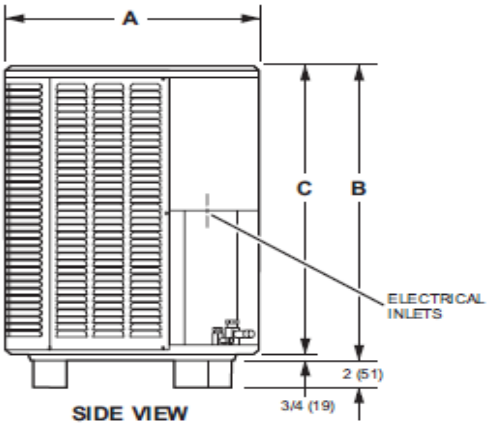
Condenser Limited compressor warranty of 5 years for Residential Installations
Condenser See Limited Warranty Certificate included with unit for details
Condenser Limited compressor warranty of 5 years for Non-Residential Installations
Condenser Limited warranty on all covered components of 1 year in Non-Residential Installations
Coil See Limited Warranty Certificate included with unit for details
Coil Limited warranty on all other covered components of 1 year (Comm Use)
Furnace See Limited Warranty Certificate included with unit for details
Furnace Limited warranty on heat exchanger of 20 years
Furnace Limited warranty on all other covered components of 1 year (Comm Use)
Furnace Limited warranty on Surelight ignition control system of 1 Year (Comm Use)



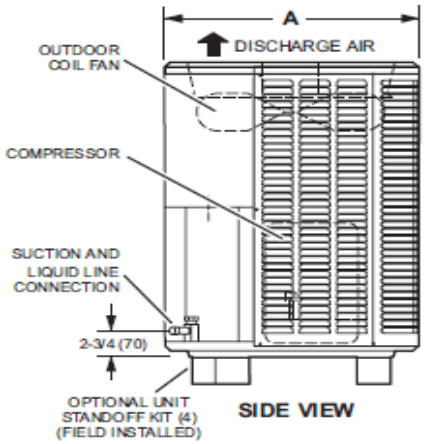
TOP VIEW



TOP VIEW BASE SECTION



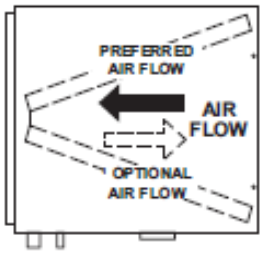
SIDE VIEW



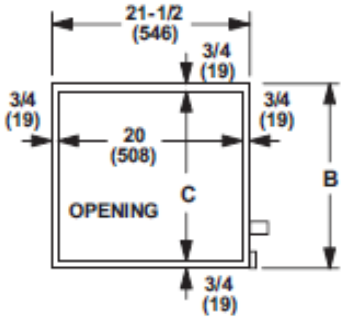
SIDE VIEW

Model	A		B		C	
	inches	mm	inches	mm	inches	mm
018	28-1/4	718	29-1/4	743	28-1/2	724
024	28-1/4	718	37-1/4	946	36-1/2	927
030	28-1/4	718	29-1/4	743	28-1/2	724
036	28-1/4	718	37-1/4	946	36-1/2	927
041	32-1/4	819	33-1/4	845	32-1/2	927
042	32-1/4	819	33-1/4	845	32-1/2	826
047	32-1/4	819	33-1/4	845	32-1/2	826
048	28-1/4	718	43-1/4	1099	42-1/2	1080
059	32-1/4	819	43-1/4	1099	42-1/2	1080
060	32-1/4	819	43-1/4	1099	42-1/2	1080

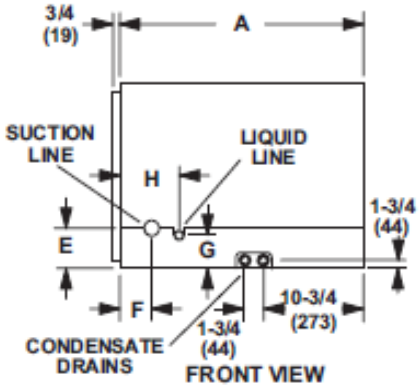
[1] Optional right-hand airflow requires a field fabricated 6 in. (152 mm) spacer in-between the furnace and coil.



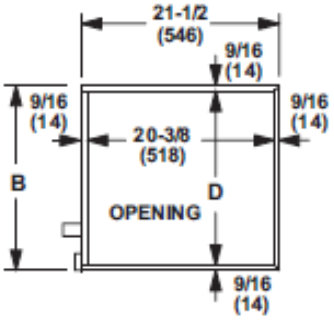
TOP VIEW



END VIEW



FRONT VIEW



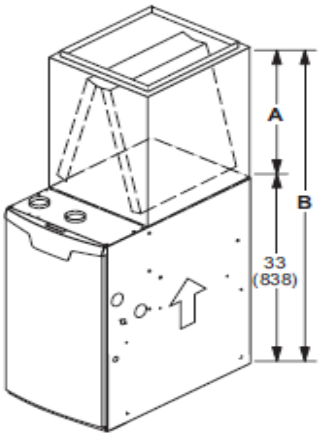
END VIEW

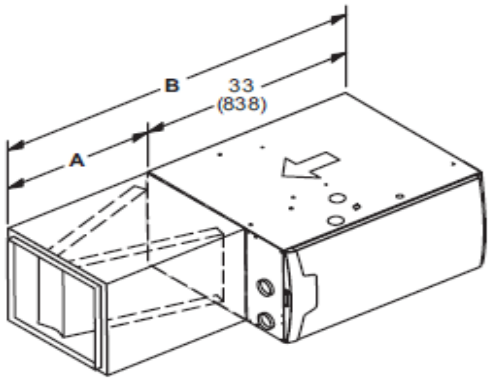
Model No.	A		B		C		D		E		F		G		H	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
CHX35-18A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-24A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-24B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-30A-6F	31-1/2	800	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-30B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36A-6F	26-1/2	673	14-1/2	368	13	330	13-3/8	340	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36B-6F	26-1/2	673	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-36C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-42B-6F	31-1/2	800	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-42C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-48B-6F	31-1/2	800	17-1/2	444	16	406	16-3/8	416	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-48C-6F	26-1/2	673	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-51/61C-6F	31-1/2	800	21	533	19-1/2	495	19-7/8	505	4	102	2-1/8	54	3	76	4-7/8	124
CHX35-60D-6F	31-1/2	800	24-1/2	622	23	584	23-3/8	594	4	102	2-1/8	54	3	76	4-7/8	124

DIMENSIONS - FURNACE/COIL COMBINED DIMENSIONS

UPFLOW POSITION

Model Number	C35/CX35 Cased				C35 Uncased			
	A		B		A		B	
	in.	mm	in.	mm	in.	mm	in.	mm
C35/CX35-18/24B	16-1/2	419	49-1/2	1257	14-1/8	359	47-1/8	1197
C35/CX35-24B	18-1/2	470	51-1/2	1308	16-3/8	416	49-3/8	1254
C35/CX35-30B	22-1/2	572	55-1/2	1410	20-3/4	527	53-3/4	1365
C35/CX35-30/36B C35/CX35-30/36C	24-1/2	622	57-1/2	1461	22-1/4	565	55-1/4	1403
C35/CX35-36B	24-1/2	622	57-1/2	1461	22-3/8	568	55-3/8	1407
C35/CX35-48B C35/CX35-48C	27-1/2	699	60-1/2	1537	26-1/4	667	59-1/4	1505
C35/CX35-49C	29-1/2	749	62-1/2	1588	28-1/2	724	61-1/2	1562
C35/CX35-50/60C	27-1/2	699	60-1/2	1537	25-7/8	657	58-7/8	1495
C35/CX35-60C	31-1/2	800	64-1/2	1638	30-5/8	778	63-5/8	1616
C35/CX35-60D	29-1/2	749	62-1/2	1588	28	711	61	1549



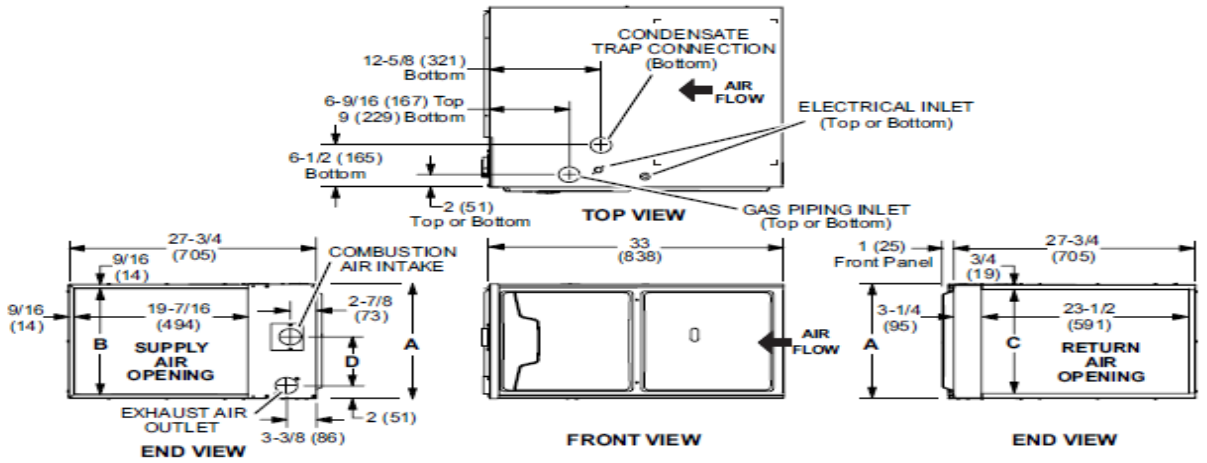


HORIZONTAL POSITION

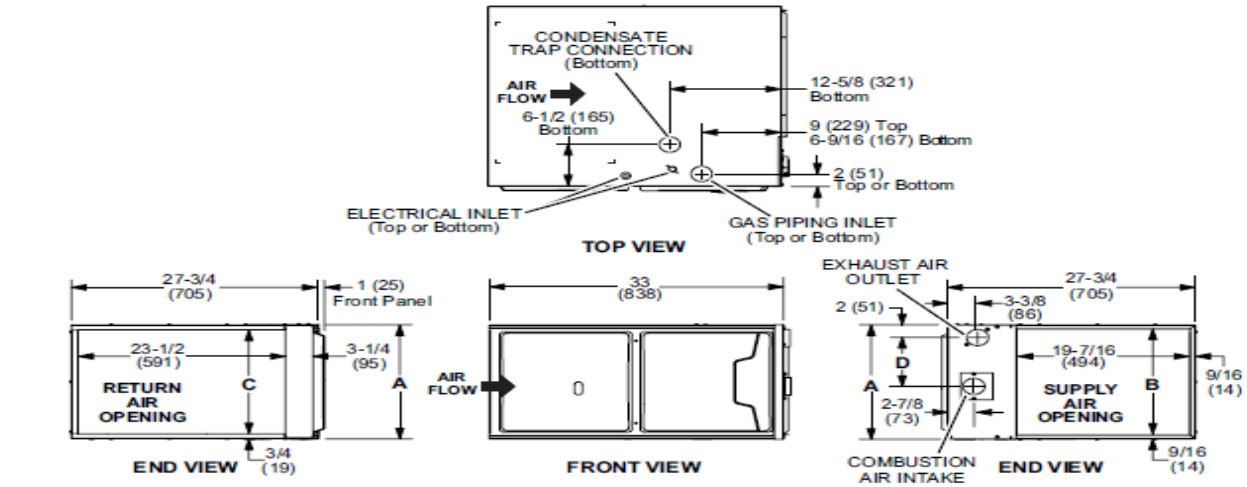
Model Number	CH35/CHX35			
	A		B	
	in.	mm	in.	mm
CH35/CHX35-24B CH35/CHX35-30B CH35/CHX35-36B CH35/CHX35-36C CH35/CHX35-42C CH35/CHX35-48C	26-1/2	673	59-1/2	1511
CH35/CHX35-42B CH35/CHX35-48B CH35/CHX35-51C CH35/CHX35-60D	31-1/2	880	64-1/2	1638

DIMENSIONS - UNIT - HORIZONTAL POSITION

LEFT-HAND AIR DISCHARGE



RIGHT-HAND AIR DISCHARGE



Model No.	A		B		C		D	
	in.	mm	in.	mm	in.	mm	in.	mm
ML196UH030XE36B ML196UH045XE36B ML196UH070XE36B ML196UH070XE48B	17-1/2	446	16-3/8	416	16	406	7-5/8	194
ML196UH090XE36C ML196UH090XE48C ML196UH090XE60C ML196UH110XE60C	21	533	19-7/8	505	19-1/2	495	9-3/8	238
ML196UH135XE60D	24-1/2	622	23-3/8	594	23	584	11-1/8	283