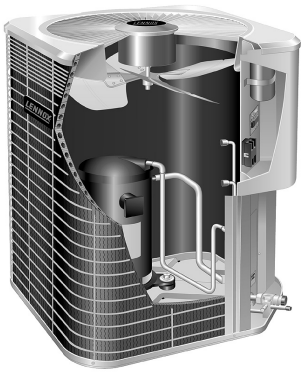
LENNOX Service Literature®

INSTALLATION AND SERVICE PROCEDURE

14HPX

Corp. 0719-L5
Revised April, 2017

LOUVERED



NON-LOUVERED

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⚠ WARNING

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

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

⚠ IMPORTANT

This unit must be matched with an indoor coil as specified in Lennox Product Specification bulletin. Coils previously charged with HCFC-22 must be flushed.

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be 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.

The Merit® 14HPX model is designed for use with HFC-410A refrigerant only. This unit must be installed with an approved indoor air handler or coil. See the Lennox 14HPX Product Specification bulletin (EHB) for approved indoor component matchups.

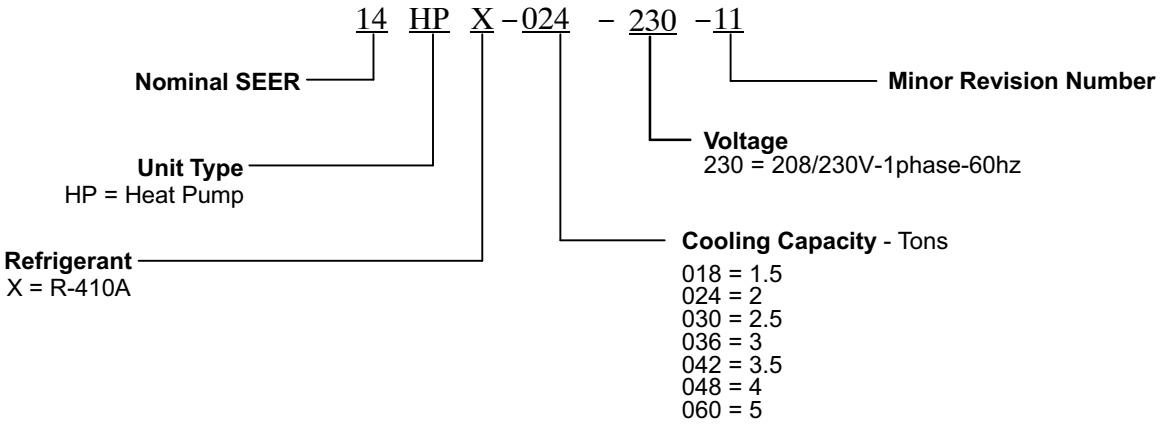
This outdoor unit is designed for use in systems that use the following refrigerant metering device:

- Check thermal expansion valve (CTXV)

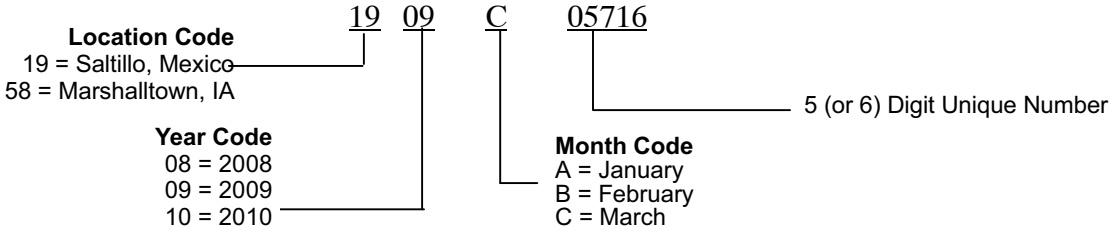
⚠ IMPORTANT

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.

Model Number Identification



Typical Serial Number Identification



Specifications

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-018-230-01, 10, -11, 12, -13, -14, -15	76	8 lbs. 4 oz.	3	18
14HPX-018-230-17, -18	76	6 lbs. 11 oz. or 5 lbs. 11 oz.[3]	3	22

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-024-230-01, -10, -11, -12, -13, -14, -15	76	8 lbs. 0 oz.	3	18
14HPX-024-230-17	76	6 lbs. 4 oz.	3	22
14HPX-024-230-18	76	6 lbs. 4 oz. or 5 lbs. 14 oz.[3]	3	22

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-030-230-01, -10, -11, -13, -14	76	7 lbs. 2 oz.	3	18
14HPX-030-230-17	76	6 lbs. 0 oz.	3	22
14HPX-030-230-18	76	6 lbs. 0 oz. or 5 lbs. 10 oz.[3]	3	22

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-036-230-01, -10, -11, -12	76	9 lbs. 12 oz.	4	26
14HPX-036-230-17	76	9 lbs. 12 oz.	3	22
14HPX-036-230-18	76	9 lbs. 12 oz. or 9 lbs. 6 oz.[3]	3	22

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-042-230-01, -10, -11, -12	76	12 lbs. 7 oz.	4	26
14HPX-042-230-17	76	11 lbs. 14 oz.	4	26
14HPX-042-230-18	76	11 lbs. 14 oz.	4	26

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-048-230-01, -10, -11, -12	76	12 lbs. 10 oz.	4	26
14HPX-048-230-17	76	10 lbs. 07 oz.	4	26
14HPX-048-230-18	76	10 lbs. 07 oz.	4	26

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Model Number	Unit		Outdoor Fan	
	Sound Rating Number (dB)[1]	Factory Refrigerant Charge[2]	Number of Blades	Diameter - inches.
14HPX-060-230-01, -10, -11, -12	76	16 lbs. 0 oz.	4	26
14HPX-060-230-17	76	12 lbs. 11 oz.	4	26
14HPX-060-230-18	76	12 lbs. 11 oz.	4	26

[1] Tested according to AHRI Standard 270-2008 test conditions.

[2] Refrigerant charge sufficient for 15 feet of line set.

[3] Later models employed a smaller filter drier resulting in less refrigerant charge required. Verify factory charge from unit nameplate.

Electrical Data

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-018-230-01	1.0	20	12.3	8.97	48.0	1/5	1075	1.1	1.4
	2.0. 3,0 & 4.0	20	11.9	8.97	48.0	1/10	1075	.70	1.4
14HPX-018-230-10	1.0	20	11.9	8.97	48.0	1/10	1075	.70	1.4
14HPX-018-230-11	1.0	20	11.9	8.97	48.0	1/10	1075	.70	1.4
14HPX-018-230-12	1.0	20	11.9	10.18	48.0	1/10	1075	.70	1.4
14HPX-018-230-13	1.0	20	11.9	10.18	48.0	1/10	1075	.70	1.4
14HPX-018-230-14	1.0	20	11.9	10.18	48.0	1/10	1075	.70	1.4
14HPX-018-230-15	1.0	20	11.9	10.18	48.0	1/10	1075	.70	1.4
14HPX-018-230-17	1.0, 2.0 & 3.0	20	12.3	8.96	48.0	1/6	825	1.1	1.87
14HPX-018-230-18	1.0	20	12.3	8.96	48.0	1/6	825	1.1	1.87
	2.0	20	12.2	9.0	48.0	1/6	825	1.0	1.87

[1] HACR type circuit breaker or fuse.

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

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-024-230-01	1.0	30	17.9	13.46	58.0	1/5	1075	1.1	1.4
	2.0 & 3.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-10	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-11	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-12	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-13	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-14	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-15	1.0	30	17.5	13.46	58.0	1/10	1075	.70	1.4
14HPX-024-230-17	1.0, 2.0, 3.0 & 4.0	30	17.9	13.44	58.0	1/6	825	1.1	1.87
14HPX-024-230-18	1.0	30	17.9	13.44	58.0	1/6	825	1.1	1.87
	2.0	30	17.9	17.9	58.0	1/6	825	1.1	1.87

[1] HACR type circuit breaker or fuse.

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

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-030-230-01	1.0	30	17.2	12.9	64.0	1/5	825	1.1	1.4
	2.0, 3.0, 4.0 & 5.0	30	17.0	13.1	64.0	1/10	1075	.70	1.3
14HPX-030-230-10	1.0	30	17.0	13.1	64.0	1/10	1075	.70	1.3
14HPX-030-230-11	1.0	30	17.0	13.1	64.0	1/10	1075	.70	1.3
14HPX-030-230-13	1.0	30	17.0	13.1	64.0	1/10	1075	.70	1.3
14HPX-030-230-14	1.0	30	17.0	13.1	64.0	1/10	1075	.70	1.3
14HPX-030-230-17	1.0	25	17.1	12.8	64.0	1/6	825	1.1	1.9
14HPX-030-230-18	1.0	25	17.1	12.8	64.0	1/6	825	1.1	1.9

[1] HACR type circuit breaker or fuse.

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

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-036-230-01	1.0, 2.0, 3.0, 4.0 & 5.0	30	19.4	14.1	77.0	1/3	825	1.8	2.9
14HPX-036-230-10	1.0	30	19.4	14.1	77.0	1/3	825	1.8	2.9
14HPX-036-230-11	1.0	30	19.4	14.1	77.0	1/3	825	1.8	2.9
14HPX-036-230-12	1.0	30	19.4	14.1	77.0	1/3	825	1.8	2.9
14HPX-036-230-17	1.0 & 2.0	30	18.7	14.08	77.0	1/6	825	1.1	1.87
14HPX-036-230-18	1.0	30	18.7	14.08	77.0	1/6	825	1.1	1.87
	2.0	30	18.7	14.1	77.0	1/6	825	1.1	1.87

[1] HACR type circuit breaker or fuse.

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

208/230V-60 Hz-1 Ph

Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-042-230-01	1.0	40	23.9	17.69	07.0	1/3	825	1.8	2.9
	2.0 & 3.0	40	24.2	17.94	112.0	1/3	825	1.8	2.9
14HPX-042-230-10	1.0	40	24.2	17.94	112.0	1/3	825	1.8	2.9
14HPX-042-230-11	1.0	40	24.2	17.94	112.0	1/3	825	1.8	2.9
14HPX-042-230-12	1.0	40	24.2	17.94	112.0	1/3	825	1.8	2.9
14HPX-042-230-17	1.0, 2.0, 3.0 & 4.0	40	24.2	17.92	112.0	1/3	825	1.8	2.9
14HPX-042-230-18	1.0	40	24.2	17.92	112.0	1/3	825	1.8	2.9
	2.0	40	24.2	18.0	112.0	1/3	825	1.8	2.9

[1] HACR type circuit breaker or fuse.

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

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-048-230-01	1.0, 2.0, 3.0 & 4.0	50	29.0	21.79	117.0	1/3	825	1.8	2.9
14HPX-048-230-10	1.0	50	29.0	21.79	117.0	1/3	825	1.8	2.9
14HPX-048-230-11	1.0	50	29.0	21.79	117.0	1/3	825	1.8	2.9
14HPX-048-230-12	1.0	50	29.0	21.79	117.0	1/3	825	1.8	2.9
14HPX-048-230-17	1.0, 2.0 & 3.0	50	29.0	21.76	117.0	1/3	825	1.8	2.9
14HPX-048-230-18	1.0	50	29.0	21.76	117.0	1/3	825	1.8	2.9
	2.0	50	29.0	21.8	117.0	1/3	825	1.8	2.9

[1] HACR type circuit breaker or fuse.

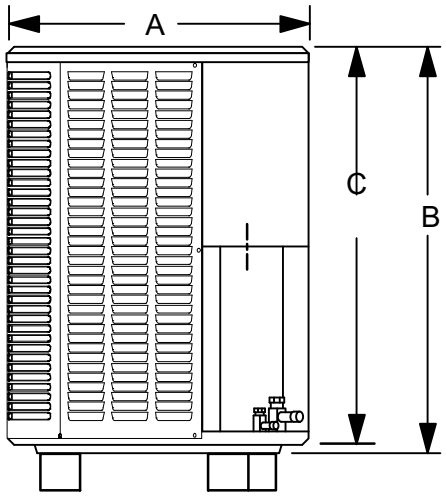
[2] Refer to National or Canadian Electrical Code manual to determine wire, fuse and disconnect size requirements.

208/230V-60 Hz-1 Ph									
Model Number	Label Rev.	Unit		Compressor		Condenser Fan			
		Maximum Over-current Protection (amps)[1]	Minimum Circuity Ampacity[2]	Rated Load Amps (RLA)	Locked Rotor Amps (LRA)	Motor HP	Nominal RPM	Full Load Amps (FLA)	Locked Rotor Amps (LRA)
14HPX-060-230-01	1.0, 2.0 & 3.0	60	34.8	26.41	134.0	1/3	825	1.8	2.9
14HPX-060-230-10	1.0	60	34.8	26.41	134.0	1/3	825	1.8	2.9
14HPX-060-230-11	1.0	60	34.8	26.41	134.0	1/3	825	1.8	2.9
14HPX-060-230-12	1.0	60	34.8	26.41	134.0	1/3	825	1.8	2.9
14HPX-060-230-17	1.0, 2.0, 3.0 & 4.0	50	29.4	22.10	125.0	1/3	825	1.8	2.9
14HPX-060-230-18	1.0	50	29.4	22.10	125.0	1/3	825	1.8	2.9

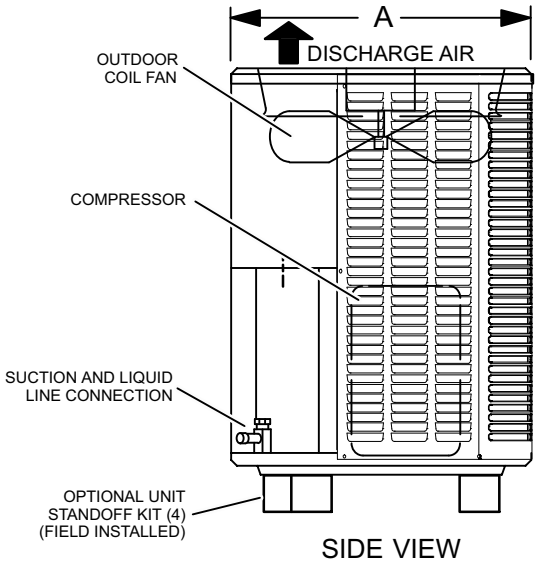
[1] HACR type circuit breaker or fuse.

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

Unit Dimensions - inches (mm)



SIDE VIEW



SIDE VIEW

Table 1. Unit Dimensions (14HPX-XXX-230-01 through -012)

Model Number	A	B	C
14HPX-018-230	24-1/4 (616)	29-1/4 (743)	28-1/2 (724)
14HPX-024-230	24-1/4 (616)	29-1/4 (743)	28-1/2 (724)
14HPX-030-230	24-1/4 (616)	33-1/4 (845)	32-1/2 (826)
14HPX-036-230	32-1/4 (819)	29-1/4 (743)	28-1/2 (724)
14HPX-042-230	32-1/4 (819)	37-1/4 (946)	36-1/2 (927)
14HPX-048-230	32-1/4 (819)	37-1/4 (946)	36-1/2 (927)
14HPX-060-230	32-1/4 (819)	43-1/4 (1099)	42-1/4 (1073)

Table 2. Unit Dimensions (14HPX-XXX-230-017)

Model Number	A	B	C
14HPX-018-230	28-1/4 (718)	37-1/4 (946)	36-1/2 (927)
14HPX-024-230	28-1/4 (718)	37-1/4 (946)	36-1/2 (927)
14HPX-030-230	28-1/4 (718)	37-1/4 (946)	36-1/2 (927)
14HPX-036-230	28-1/4 (718)	33-1/4 (845)	32-1/2 (826)
14HPX-042-230	32-1/4 (819)	37-1/4 (946)	36-1/2 (927)
14HPX-048-230	32-1/4 (819)	37-1/4 (946)	36-1/2 (927)
14HPX-060-230	32-1/4 (819)	43-1/4 (1099)	42-1/4 (1073)

Typical Unit Parts Arrangement

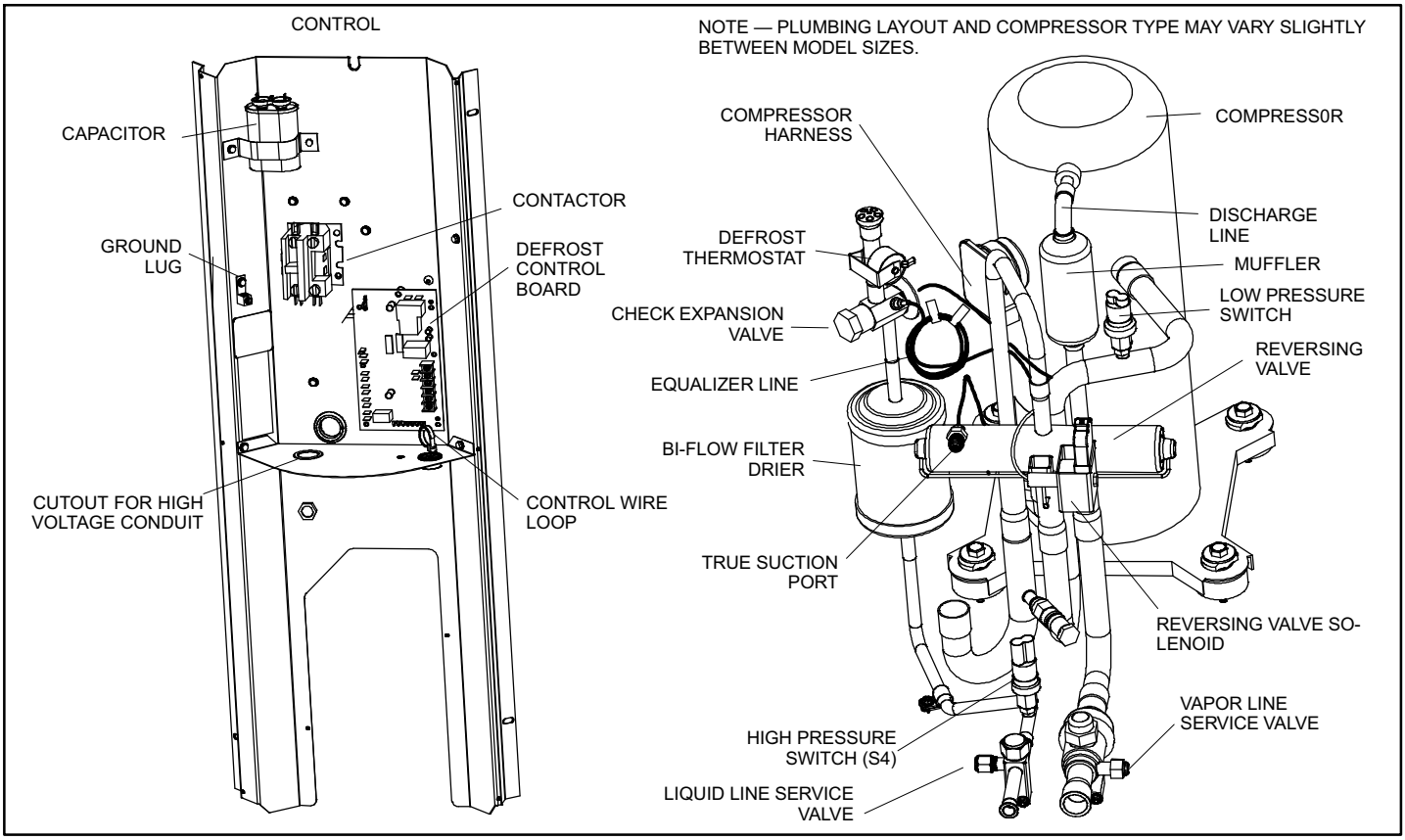


Figure 1. Typical Unit Parts Arrangement (14HPX-XXX-230-01 through -012)

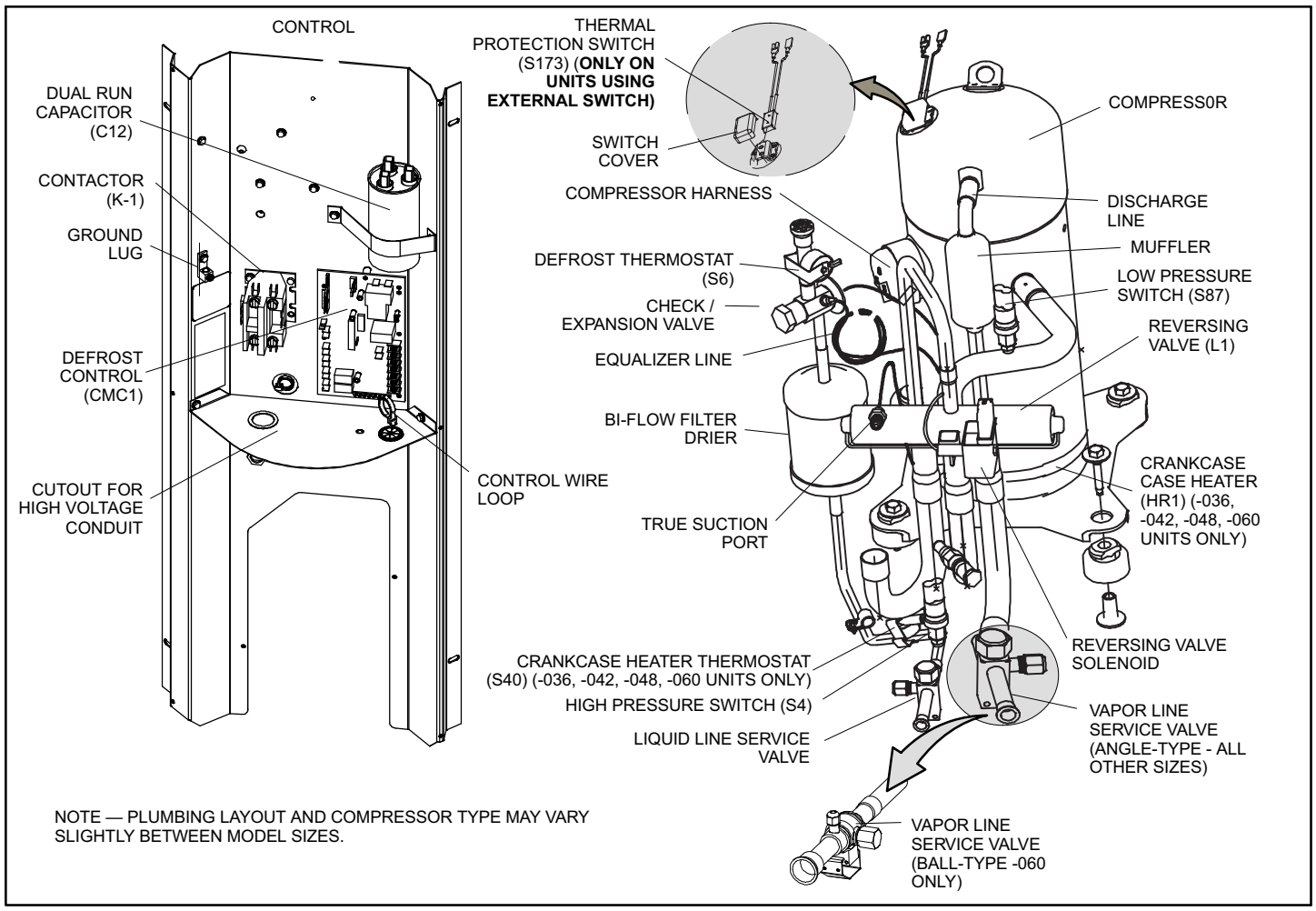


Figure 2. Typical Unit Parts Arrangement (14HPX-XXX-230-017)

General Information

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

⚠WARNING

This product contains a chemical known to the State of California to cause cancer, birth defects, or other reproductive harm.

Operating Gauge Set and Service Valves

⚠ 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.

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

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.

When servicing or repairing HVAC components, ensure the fasteners are appropriately tightened. Table 3 provides 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

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

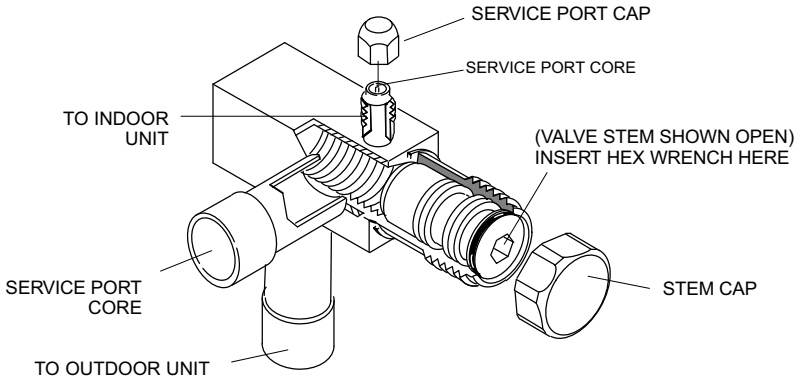
The liquid and vapor line service valves are used for removing refrigerant, flushing, leak testing, evacuating, checking charge and charging.

Each valve is equipped with a service port which has a factory-installed valve stem. Figure 3 provides information on how to access and operating both angle and ball service valves.

SERVICE VALVES ANGLE AND BALL

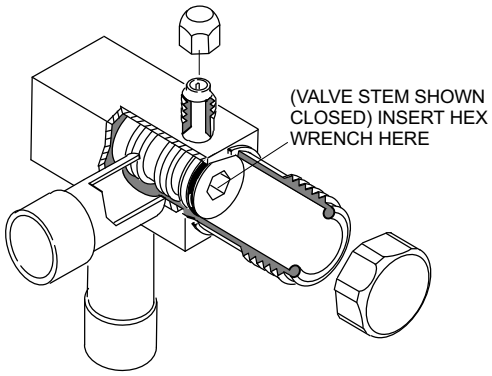
Operating Angle Type Service Valve:

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.

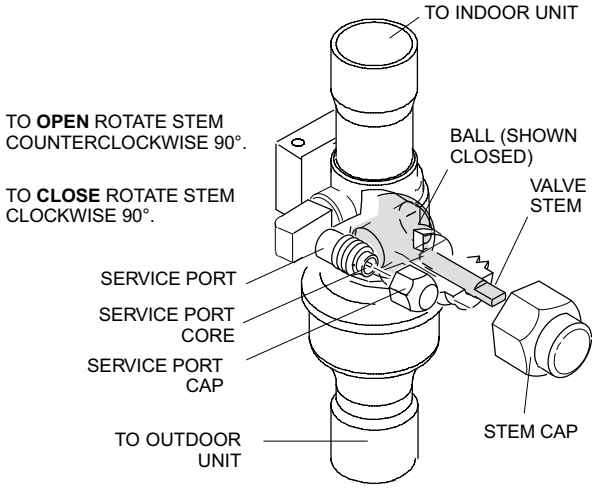


ANGLE-TYPE SERVICE VALVE (FRONT-SEATED CLOSED)

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

Operating Ball Type Service Valve:

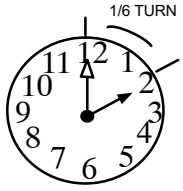
1. Remove stem cap with an appropriately sized wrench.
2. Use an appropriately sized wrenched to open. To open valve, roate stem counterclockwise 90°. To close rotate stem clockwise 90°.



To Access Service Port:

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

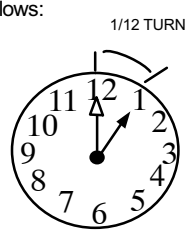
1. Remove service port cap with an appropriately sized wrench.
2. Connect gauge set to service port.
3. When testing is completed, replace service port cap and tighten as follows:
   - With torque wrench: Finger tighten and torque cap per table 3.
   - Without torque wrench: Finger tighten and use an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



Reinstall Stem Cap:

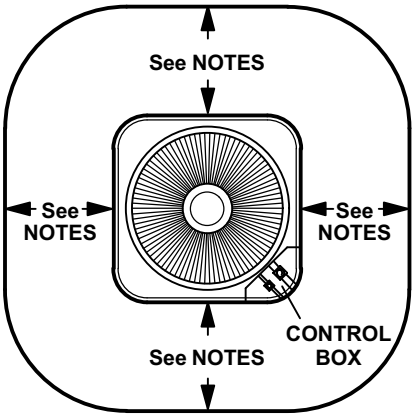
Stem cap protects the valve stem from damage and serves as the primary seal. Replace the stem cap and tighten as follows:

- 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 3. Angle and Ball Service Valves



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 4. Installation Clearances

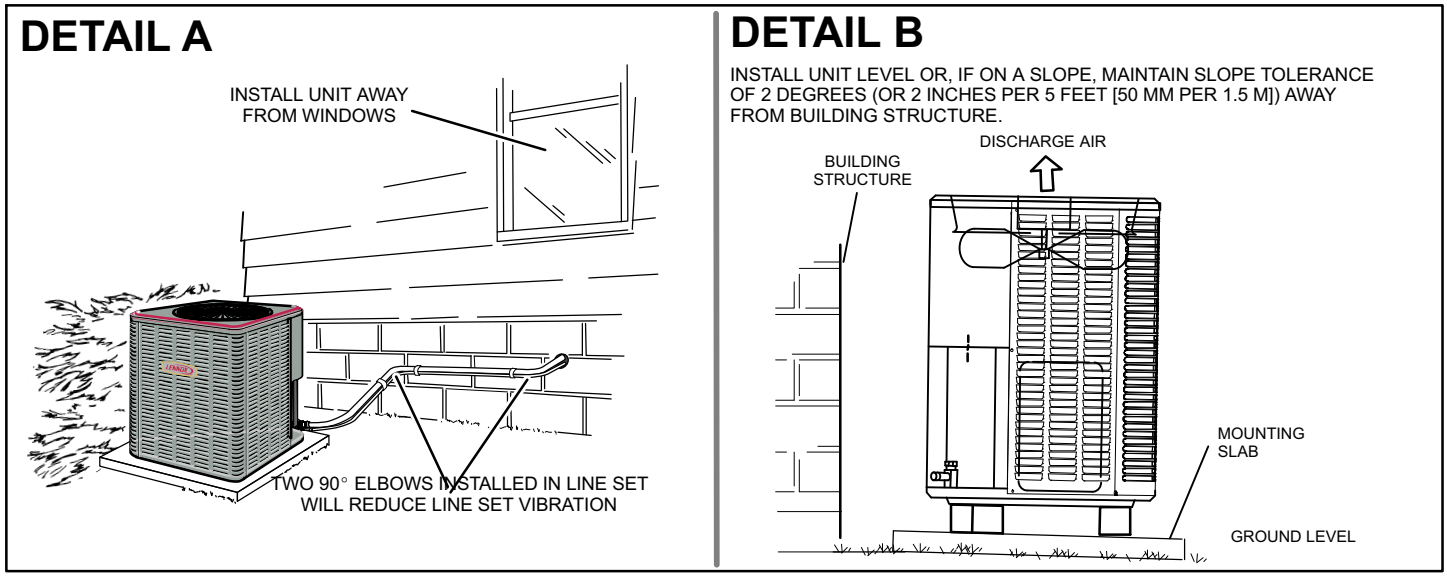


Figure 5. Placement, and Slab Mounting

Unit Placement

See *Unit Dimensions* on page 4 for sizing mounting slab, platforms or supports. Refer to figure 4 for mandatory installation clearance requirements.

⚠ 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 5, 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 5, 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 and cause the rubber to swell when it comes into contact with oil. The rubber will then bubble and could 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.

Removing and Installing Louvered Panels – Initial Builds

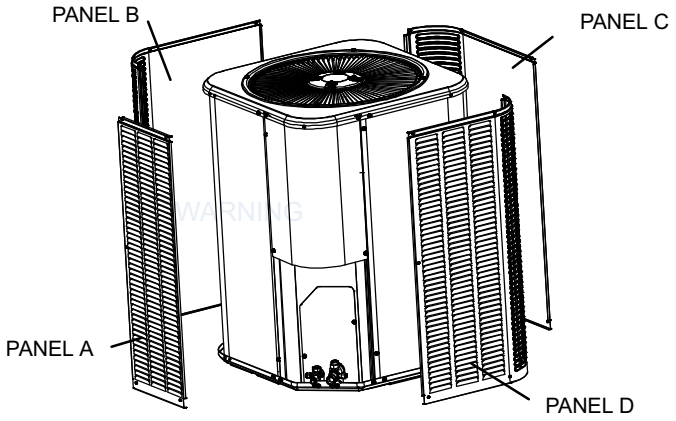
WARNING

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

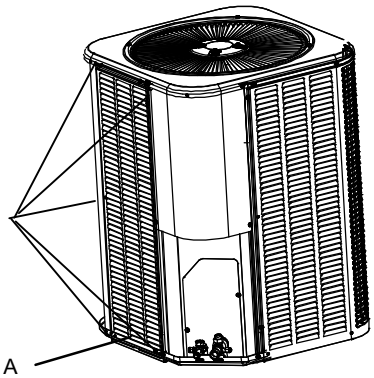
While installing or servicing this unit, carefully stow all removed panels out of the way, so that the panels will not cause injury to personnel, nor cause damage to objects or structures nearby, nor will the panels be subjected to damage (e.g., being bent or scratched).

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.

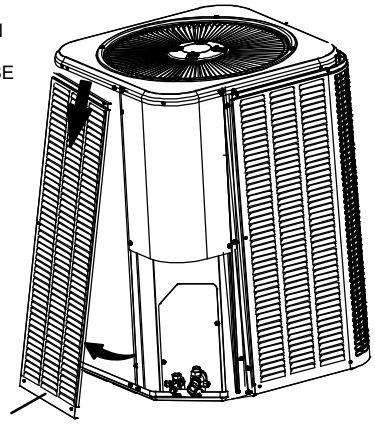
STEP 2

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 FINALLY **D**.



INSTALLATION

STEP 1

STARTING WITH PANEL **D**, INSERT PANEL UNDER 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 TO INSTALL PANELS **C**, **B** AND FINALLY **A**.

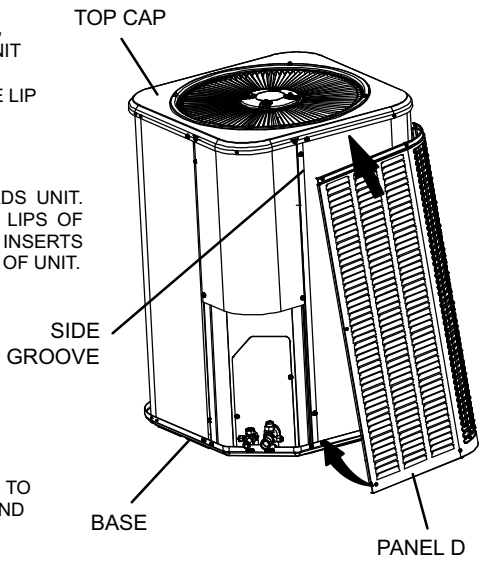


Figure 6. Louvered Panels

Removing and Installing Louvered Panels – Later Builds

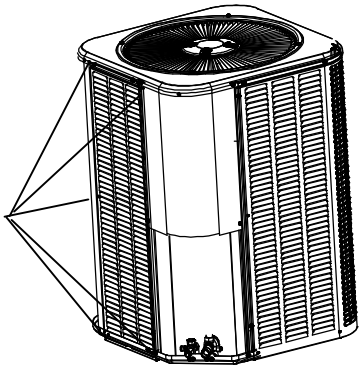
WARNING

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.

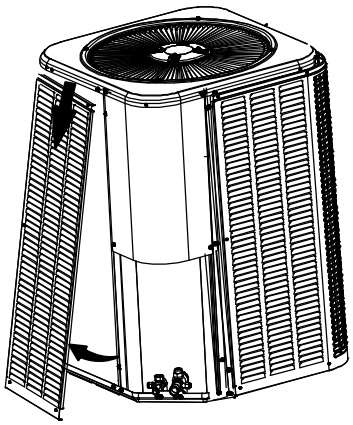
REMOVAL

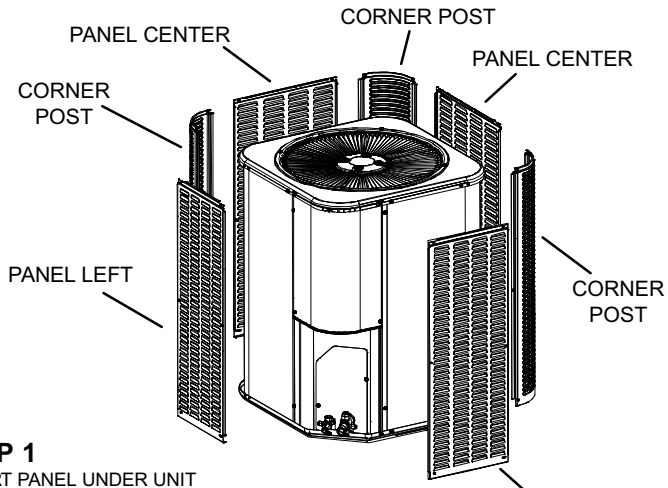


STEP 1
TO REMOVE PANEL, REMOVE MOUNTING SCREWS SECURING PANEL TO THE UNIT.

STEP 2
SLIGHTLY LIFT PANEL IN ORDER TO CLEAR SIDE LIPS OF PANEL FROM BASE OF UNIT.

STEP 3
TILT PANEL OUT SLIGHTLY AND PULL DOWNWARD TO REMOVE.

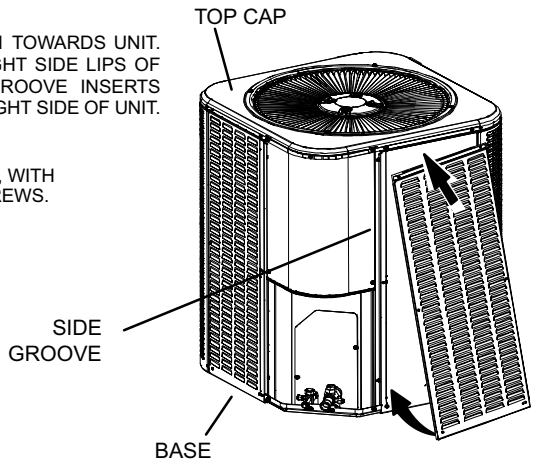




STEP 1
INSERT PANEL UNDER UNIT TOP CAP LIP AND LIFT SLIGHTLY TO CLEAR SIDE LIP OF PANEL FROM BASE.

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.



PANEL INSTALLATION

Figure 7. Louvered 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 .

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.

Also, consider the following when placing and installing a high-efficiency air conditioner:

REFRIGERANT LINE SET

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 (MM)

Model	Field Connections		Recommended Line Set		
	Liquid Line	Vapor Line	Liquid Line	Vapor Line	L15 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 ft. - 50 ft. (4.6 m - 15 m)
-036 -042 -048	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)
-060	3/8 in. (10 mm)	7/8 in. (22 mm)	3/8 in. (10 mm)	7/8 in. (22 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, contact Lennox Technical Support Product Applications for assistance or Lennox piping manual. To obtain the correct information from Lennox, be sure to communicate the following points:

- Model (14HPX) and size of unit (e.g. -060).
- Line set diameters for the unit being installed as listed in table 4 and total length of installation.
- Number of elbows and if there is a rise or drop of the piping.

⚠ IMPORTANT

Mineral oils are not compatible with HFC-410A If oil must be added, it must be a Polyol ester oil.

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 system with 20 pounds of refrigerant or less. For systems over 20 pounds - add one ounce for every five pounds of refrigerant.

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 14HPX 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 14HPX unit. Typically a liquid line used to meter flow is 1/4” in diameter and copper.

LINE SET ISOLATION

⚠ 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

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.

⚠ IMPORTANT

If this unit is being matched with an approved line set or indoor unit coil which 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 the system performance and capacity.
Failure to properly flush the system per the instructions below will void the warranty.

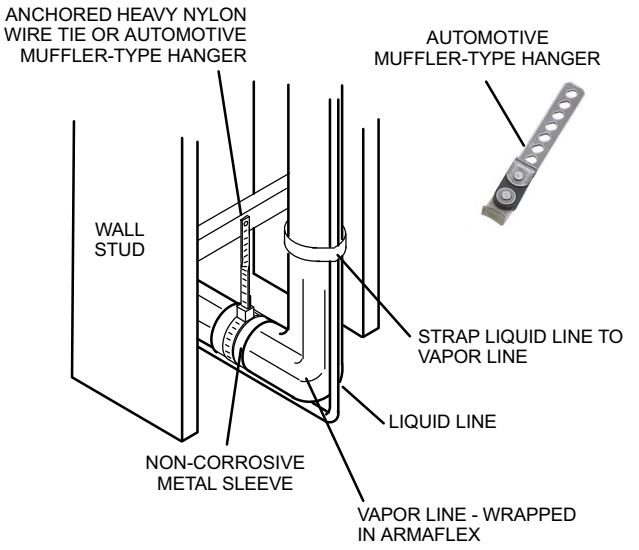
LINE SET

IMPORTANT — Refrigerant lines must not contact structure.

INSTALLATION

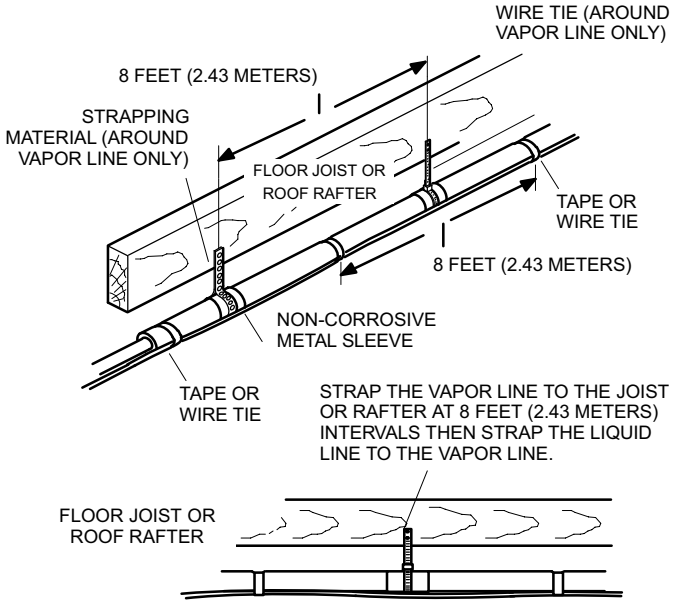
Line Set Isolation — The following illustrations are examples of proper refrigerant line set isolation:

REFRIGERANT LINE SET — TRANSITION FROM VERTICAL TO HORIZONTAL



REFRIGERANT LINE SET — INSTALLING HORIZONTAL RUNS

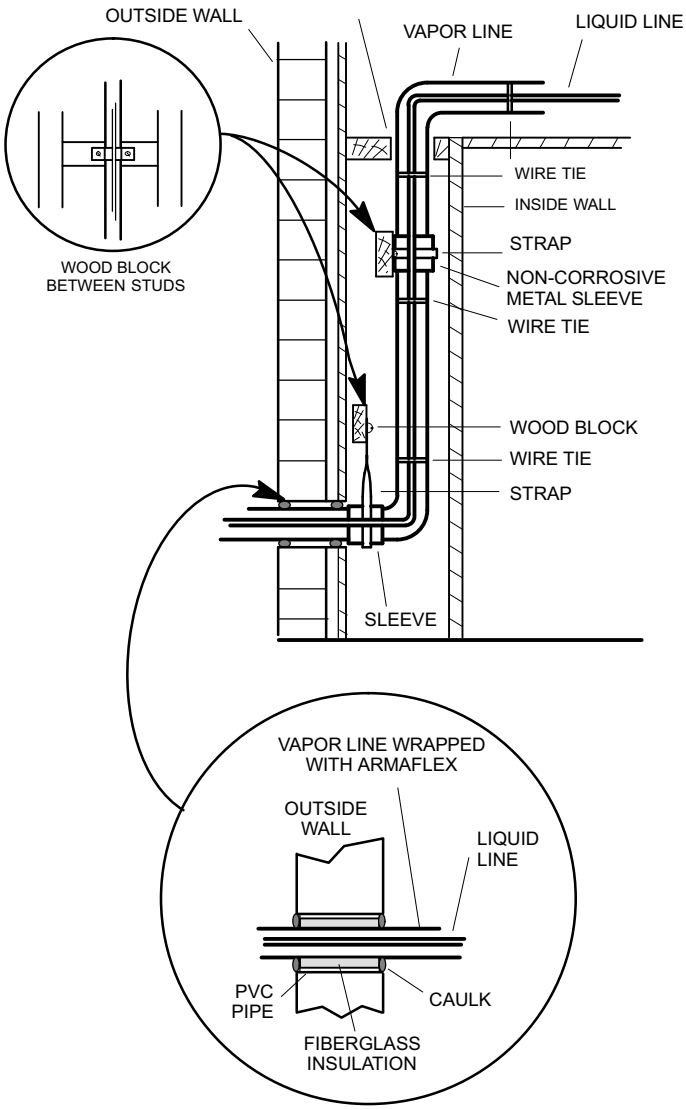
To hang line set from joist or rafter, use either metal strapping material or anchored heavy nylon wire ties.



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 8. Line Set Installation

Brazing Connections

Use the procedures outline in figures 9 and 10 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.

⚠ WARNING

When using a high pressure gas such as dry 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).

⚠ 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

Connect gauge set low pressure side to vapor line service valve and repeat procedure starting at paragraph 4 for brazing the liquid line to service port valve.

⚠ 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.

⚠ WARNING

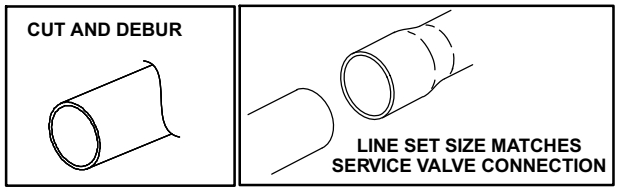
Fire, Explosion and Personal Safety Hazard.

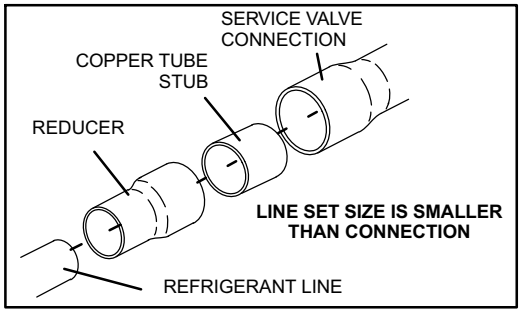
Failure to follow this warning could result in damage, personal injury or death.

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.

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.

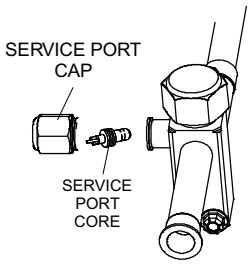




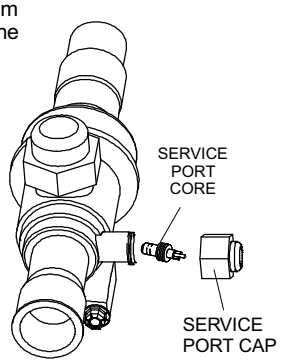
DO NOT CRIMP SERVICE VALVE CONNECTOR WHEN PIPE IS SMALLER THAN CONNECTION

2 CAP AND CORE REMOVAL

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



LIQUID LINE SERVICE VALVE



SUCTION / VAPOR LINE SERVICE VALVE

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.

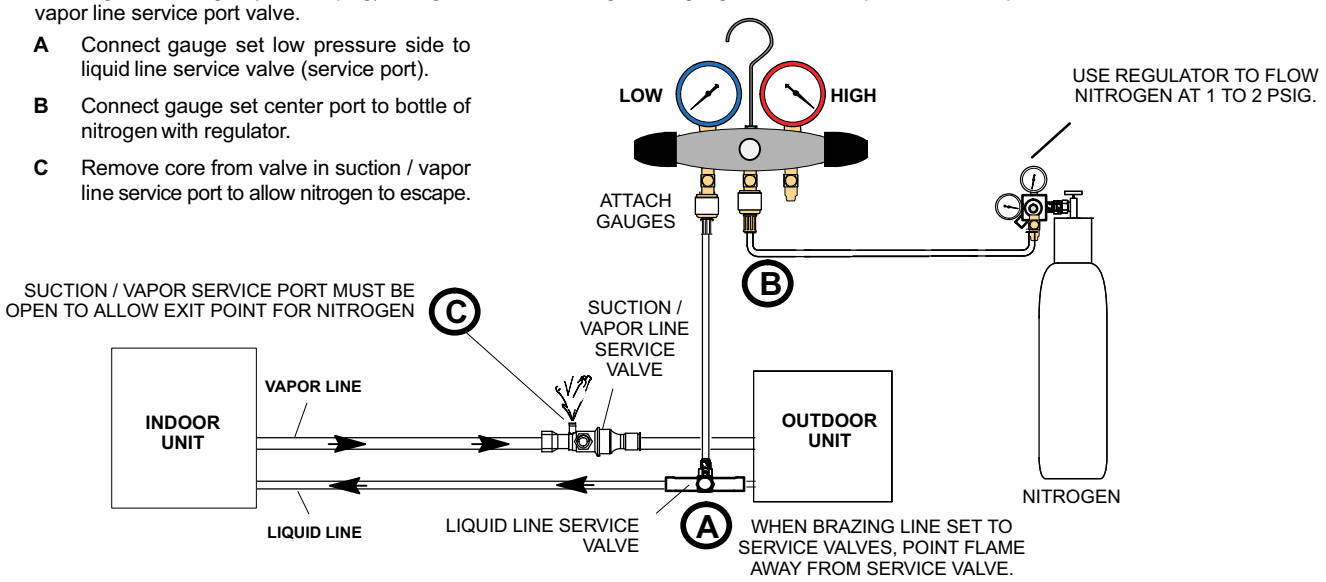


Figure 9. Brazing Procedures

4 WRAP SERVICE VALVES

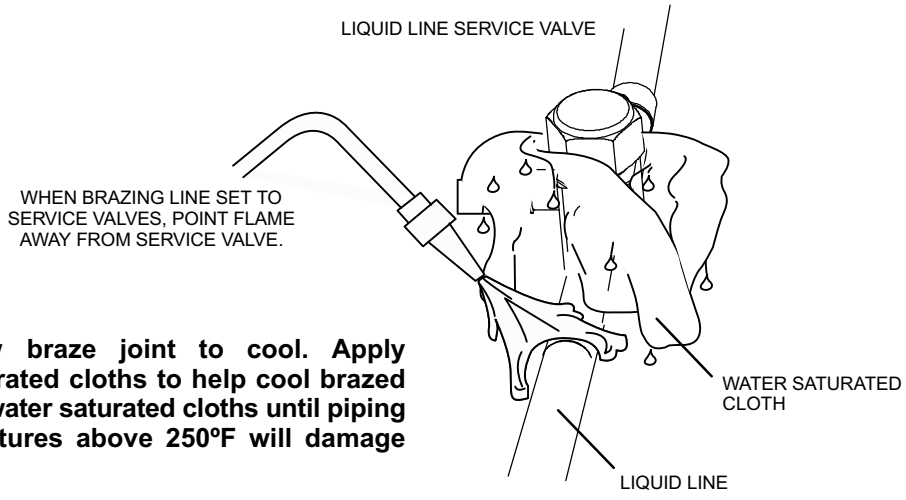
To help protect service valve seals during brazing, wrap water saturated cloths around service valve bodies and copper tube stubs. Use additional water saturated cloths underneath the valve body to protect the base paint.

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

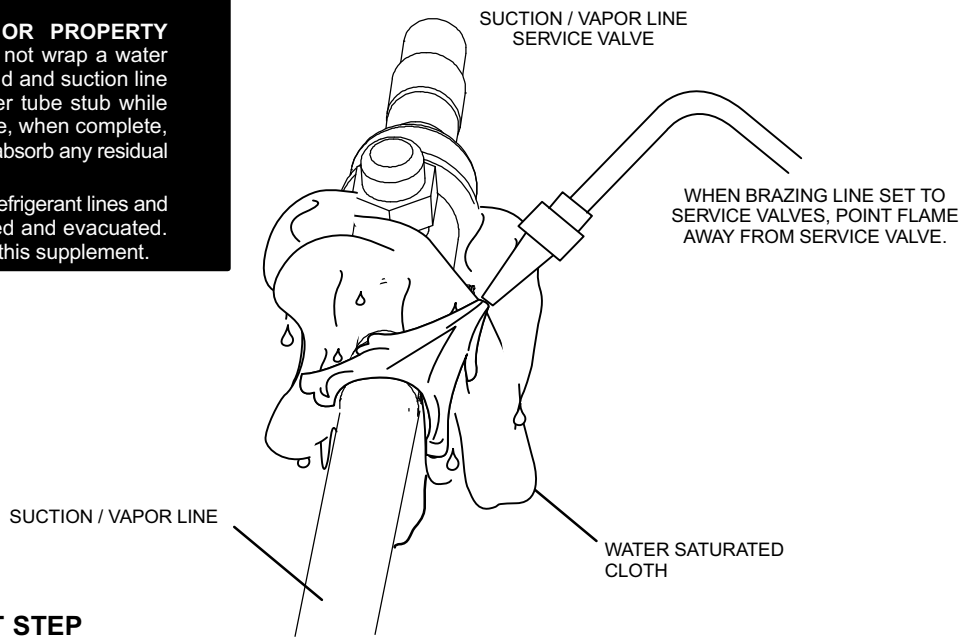
Wrap both service valves with water saturated cloths as illustrated here and as mentioned in step 4, before brazing to line set. Water saturated cloths must remain water saturated throughout the brazing and cool-down process.



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

1. **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 in the line set! The braze, when complete, must be quenched with water to absorb any residual heat.
2. Do not open service valves until refrigerant lines and indoor coil have been leak-tested and evacuated. Refer to procedures provided in this supplement.



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. Refer to the unit installation instructions for the next step in preparing the unit.

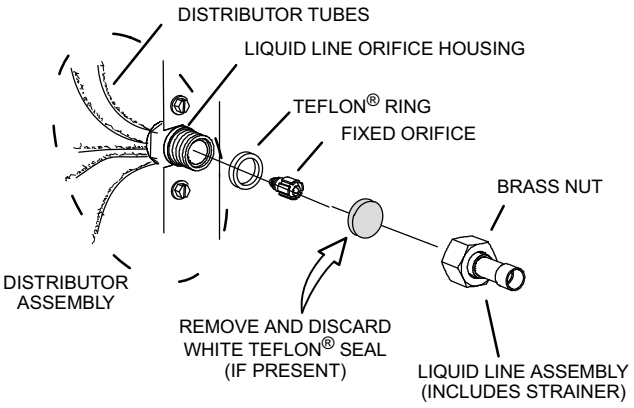
Figure 10. Brazing Procedures (continued)

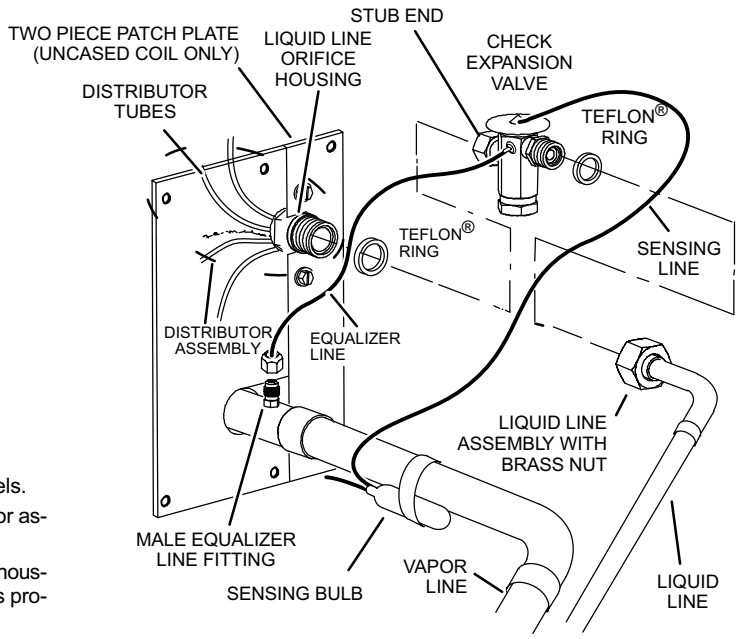
Flushing Line Set and Indoor Coil

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 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.

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.

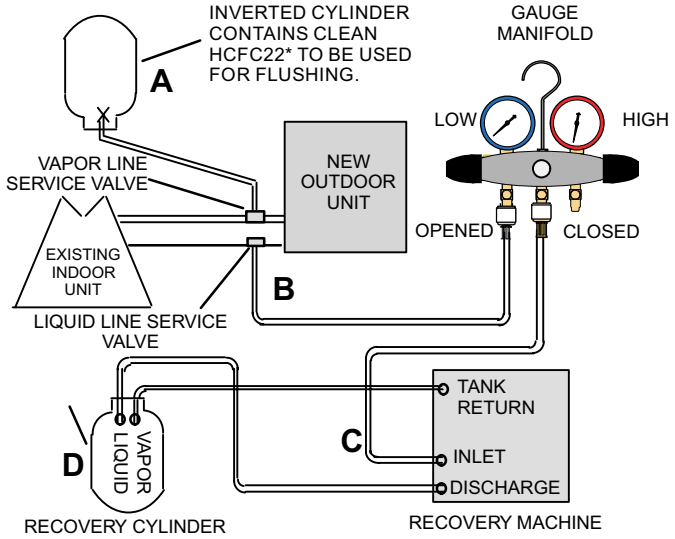
E Disconnect the liquid line from the check expansion valve at the liquid line assembly.

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.**

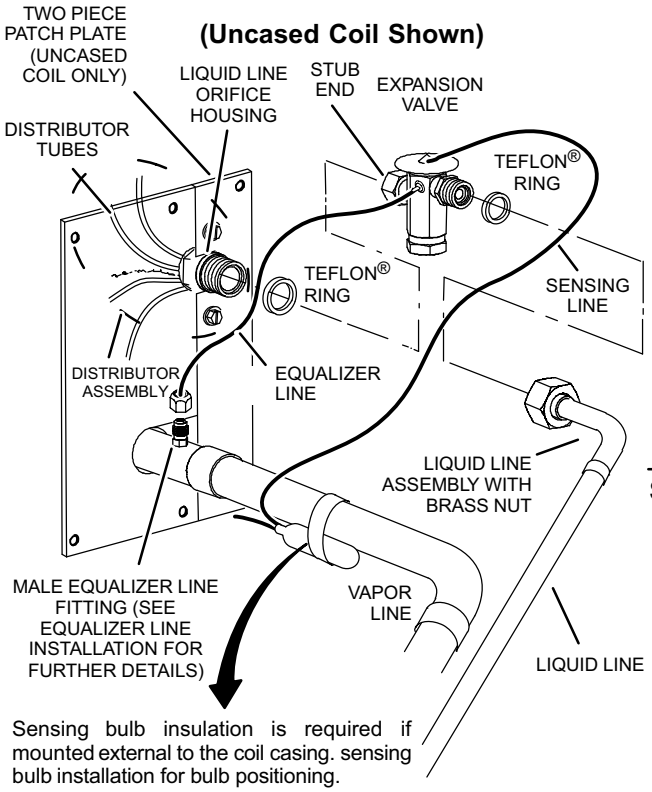
Figure 11. Removing Metering Device and Flushing

Installing Indoor Metering Device

This outdoor unit is designed for use in systems that use a check expansion valve metering device at the indoor coil.

See the *Lennox 14HPX Product Specification bulletin* 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.

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

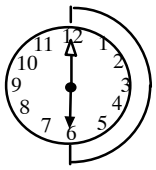
B Install one of the provided Teflon® rings around the stubbed end of the expansion valve and lightly lubricate the connector threads and expose surface of the Teflon® ring with refrigerant oil.

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.

1/2 Turn



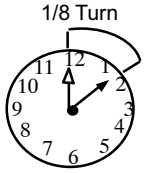
SENSING BULB INSTALLATION

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.

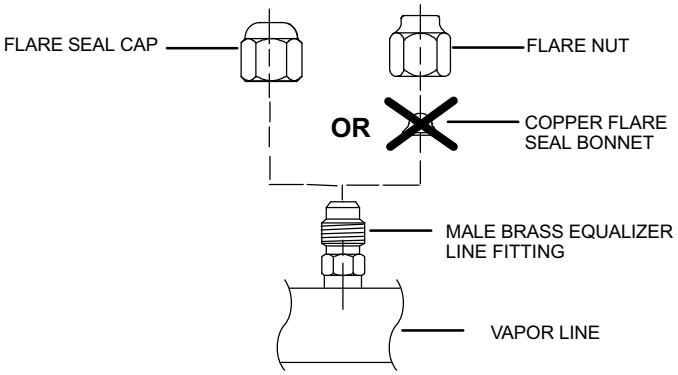
1/8 Turn

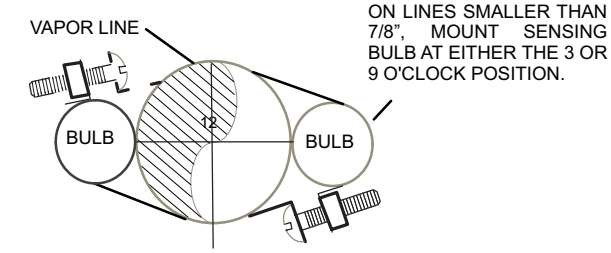


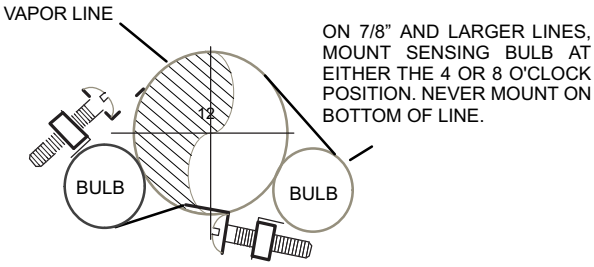
EQUALIZER LINE INSTALLATION

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.







NOTE — NEVER MOUNT ON BOTTOM OF LINE.

Figure 12. Installing Indoor Expansion Valve

⚠ 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.

⚠ IMPORTANT

If this unit is being matched with an approved line set or indoor unit coil which 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 the system performance and capacity.

Failure to properly flush the system per the instructions below will void the warranty.

Leak Test Line Set and Indoor Coil

⚠ WARNING

When using a high pressure gas such as dry 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).

⚠ IMPORTANT

Leak detector must be capable of sensing HFC refrigerant.

⚠ 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.

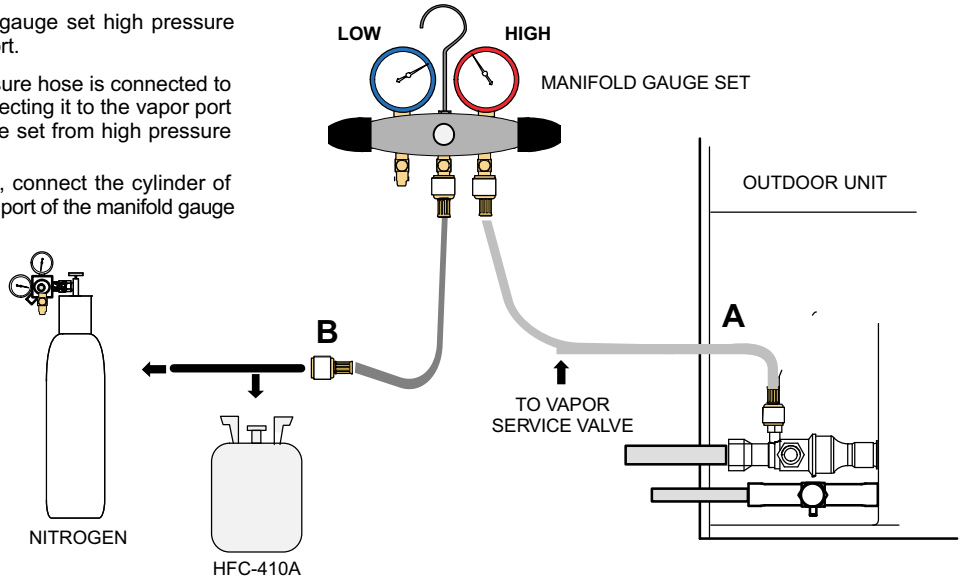
1 CONNECT GAUGE SET

A Connect an HFC-410A manifold gauge set high pressure hose 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 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 13. Leak Test

Evacuating Line Set and Indoor Coil

1 CONNECT GAUGE SET

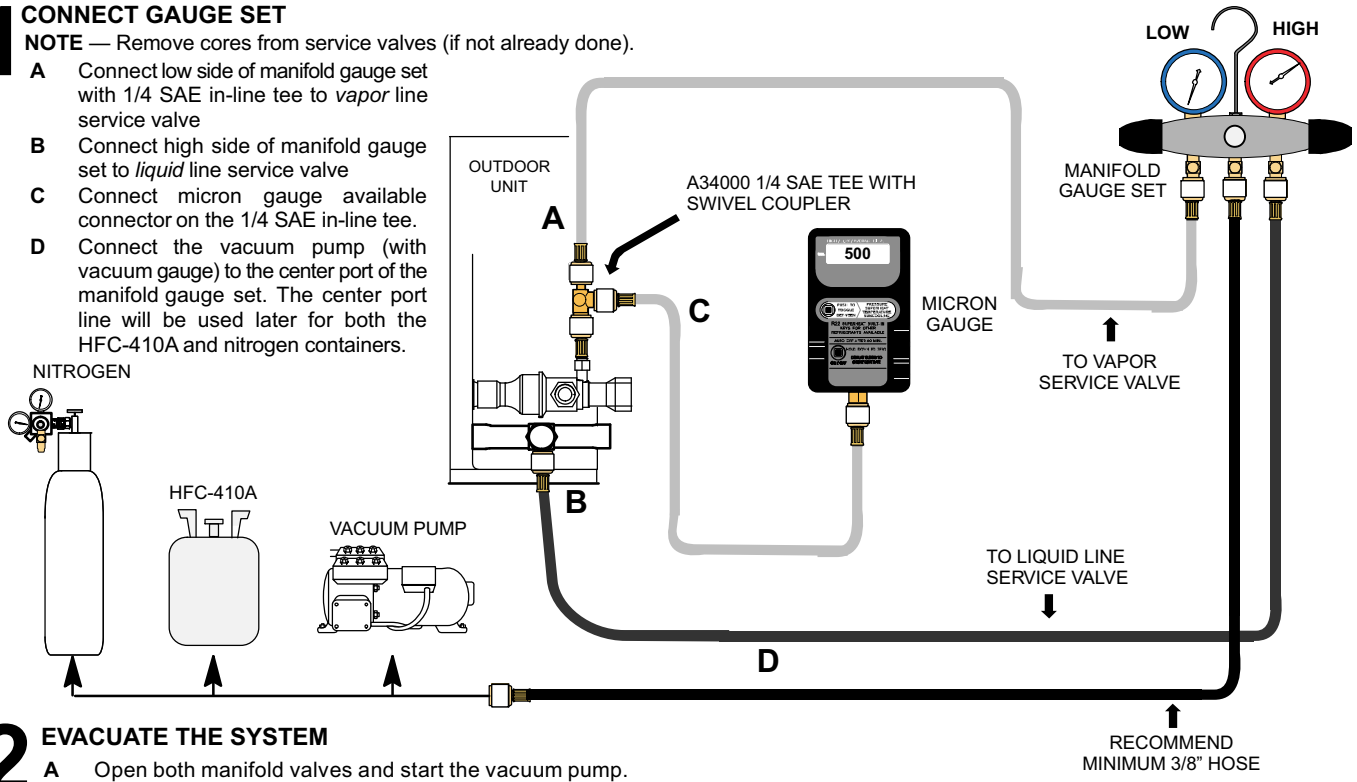
NOTE — Remove cores from service valves (if not already done).

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.

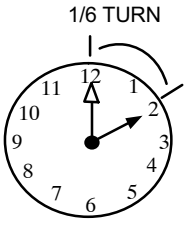


Figure 14. Evacuating System

⚠ 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

Danger of Equipment Damage. Avoid deep vacuum operation. Do not use compressors to evacuate a system. Extremely low vacuums 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

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).

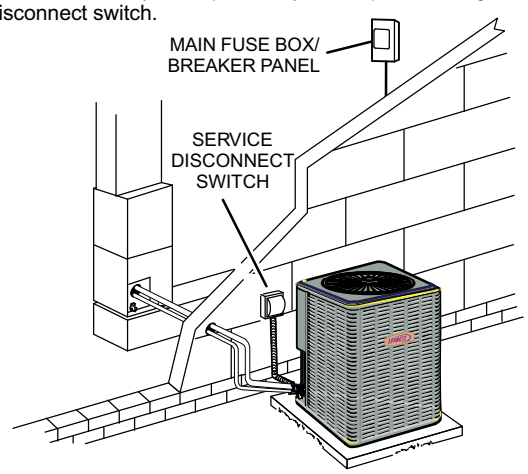
Refer to the furnace or air handler installation instructions for additional wiring application diagrams and refer to unit nameplate for minimum circuit ampacity and maximum overcurrent protection size.

24VAC TRANSFORMER

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

SIZE CIRCUIT AND INSTALL SERVICE DISCONNECT SWITCH

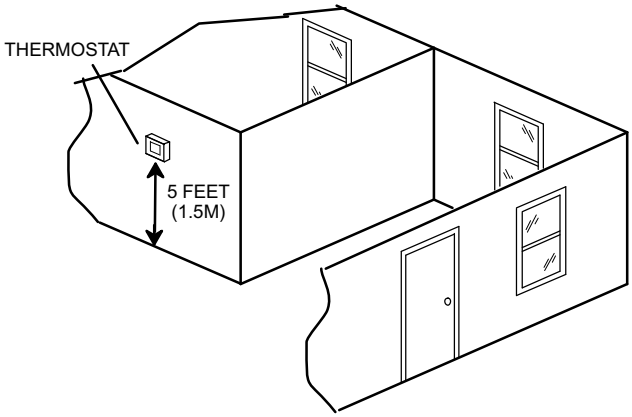
Refer to the unit nameplate for minimum circuit ampacity, and maximum fuse or circuit breaker (HACR per NEC). Install power wiring and properly sized disconnect switch.



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.

⚠ WARNING

Electric Shock Hazard. Can cause injury or death. Unit must be 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.

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.

CONTROL WIRING

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.

B Make 24VAC thermostat wire connections to CMC1.

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

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

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

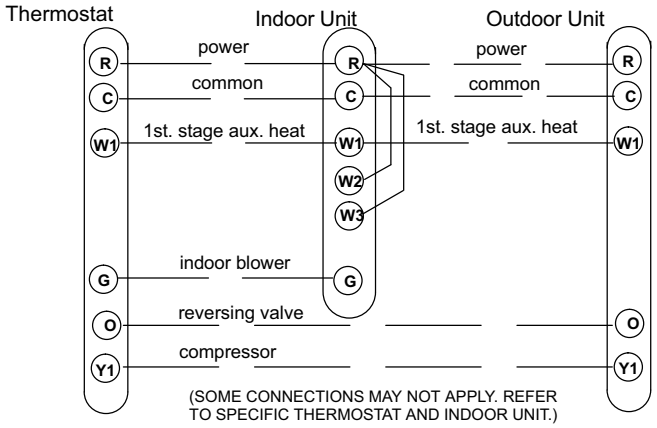
HIGH VOLTAGE FIELD WIRING

LOW VOLTAGE FIELD WIRING

FACTORY WIRING

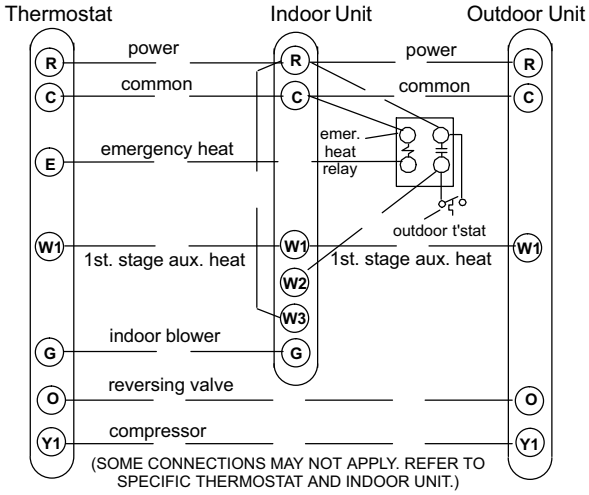
TYPICAL CONTROL WIRING

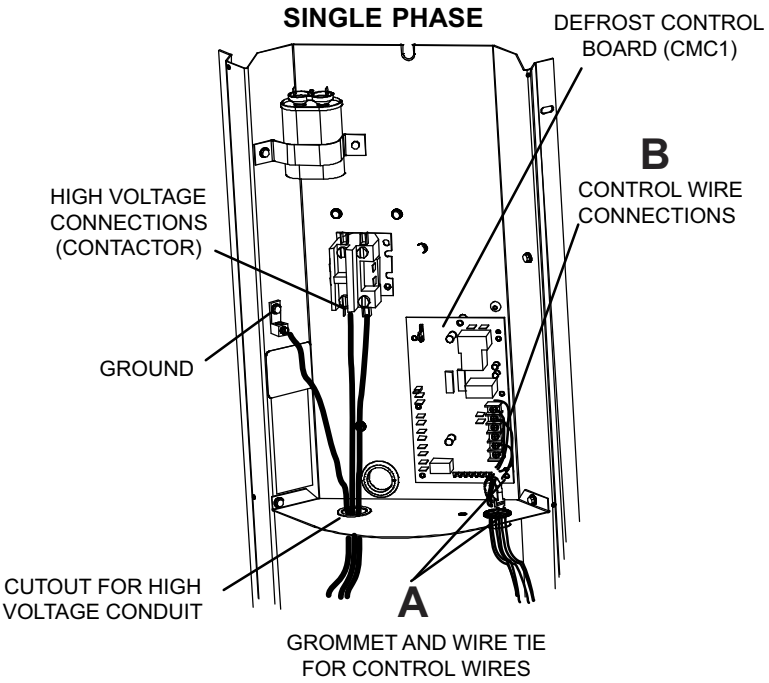
Low Voltage Wiring



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

Low Voltage Wiring (with Auxiliary Heat)





System Operation (14HPX-XXX-230-01 through -012)

⚠ IMPORTANT

Some scroll compressors have 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 is raised above 40 psig. DO NOT REPLACE COMPRESSOR.

The outdoor unit and indoor blower cycle on demand from the room thermostat. If the thermostat blower switch is in the **ON** position, the indoor blower operates continuously.

FILTER DRIER

The unit is equipped with a large-capacity biflow filter drier which keeps the system clean and dry. If replacement is necessary, order another of the same design and capacity. The replacement filter drier must be suitable for use with HFC-410A refrigerant.

LOW PRESSURE SWITCH (OPTIONAL)

The 14HPX may be equipped with an optional auto-reset low pressure switch which is located on the vapor line. The switch shuts off the compressor when the vapor pressure falls below the factory setting. This switch, which is ignored during defrost operation, closes at pressures at or above 55 psig and opens at 25 psig. It is not adjustable.

HIGH PRESSURE SWITCH

The 14HPX is equipped with an auto-reset high pressure switch (single-pole, single-throw) which is located on the liquid line. The switch shuts off the compressor when discharge pressure rises above the factory setting. The switch is normally closed and is permanently adjusted to trip (open) at 590 ± 10 psig (4412 ± 69 kPa).

NOTE - A Schrader core is under the pressure switches.

Defrost System (14HPX-XXX-230-01 through -016)

DEFROST SYSTEM DESCRIPTION

The demand defrost controller measures differential temperatures to detect when the system is performing poorly because of ice build-up on the outdoor coil. The controller “self-calibrates” when the defrost system starts and after each system defrost cycle. The defrost control board components are shown in figure 15.

The control monitors ambient temperature, outdoor coil temperature, and total run time to determine when a defrost cycle is required. The coil temperature probe is designed with a spring clip to allow mounting to the outside coil tubing. The location of the coil sensor is important for proper defrost operation.

NOTE - The demand defrost board accurately measures the performance of the system as frost accumulates on the outdoor coil. This typically will translate into longer running time between defrost cycles as more frost accumulates on the outdoor coil before the board initiates defrost cycles.

DIAGNOSTIC LEDS

The state (Off, On, Flashing) of two LEDs on the defrost board (DS1 [Red] and DS2 [Green]) indicate diagnostics conditions that are described in table 6.

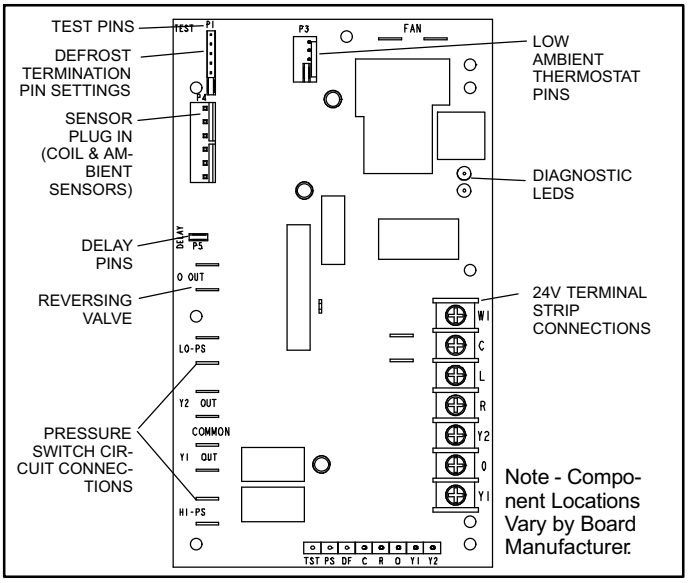


Figure 15. Defrost Control Board

DEFROST BOARD PRESSURE SWITCH CONNECTIONS

The unit's automatic reset pressure switches (LO PS - S87 and HI PS - S4) are factory-wired into the defrost board on the LO-PS and HI-PS terminals, respectively.

(OPTIONAL) Low Pressure Switch (LO-PS)—When the low pressure switch trips, the defrost board will cycle off the compressor, and the strike counter in the board will count one strike. The low pressure switch is ignored under the following conditions:

- during the defrost cycle and 90 seconds after the termination of defrost
- when the average ambient sensor temperature is below 15° F (-9°C)
- for 90 seconds following the start up of the compressor
- during ”test” mode

High Pressure Switch (HI-PS)—When the high pressure switch trips, the defrost board will cycle off the compressor, and the strike counter in the board will count one strike.

DEFROST BOARD PRESSURE SWITCH SETTINGS

High Pressure (auto reset) - trip at 590 psig; reset at 418.

Low Pressure (auto reset) - trip at 25 psig; reset at 40.

5-STRIKE LOCKOUT FEATURE

The internal control logic of the board counts the pressure switch trips only while the Y1 (Input) line is active. If a pressure switch opens and closes four times during a Y1 (Input), the control logic will reset the pressure switch trip counter to zero at the end of the Y1 (Input). If the pressure switch opens for a fifth time during the current Y1 (Input), the control will enter a lockout condition.

The 5-strike pressure switch lockout condition can be reset by cycling OFF the 24-volt power to the control board or by shorting the TEST pins between 1 and 2 seconds. All timer functions (run times) will also be reset.

If a pressure switch opens while the Y1 Out line is engaged, a 5-minute short cycle will occur after the switch closes.

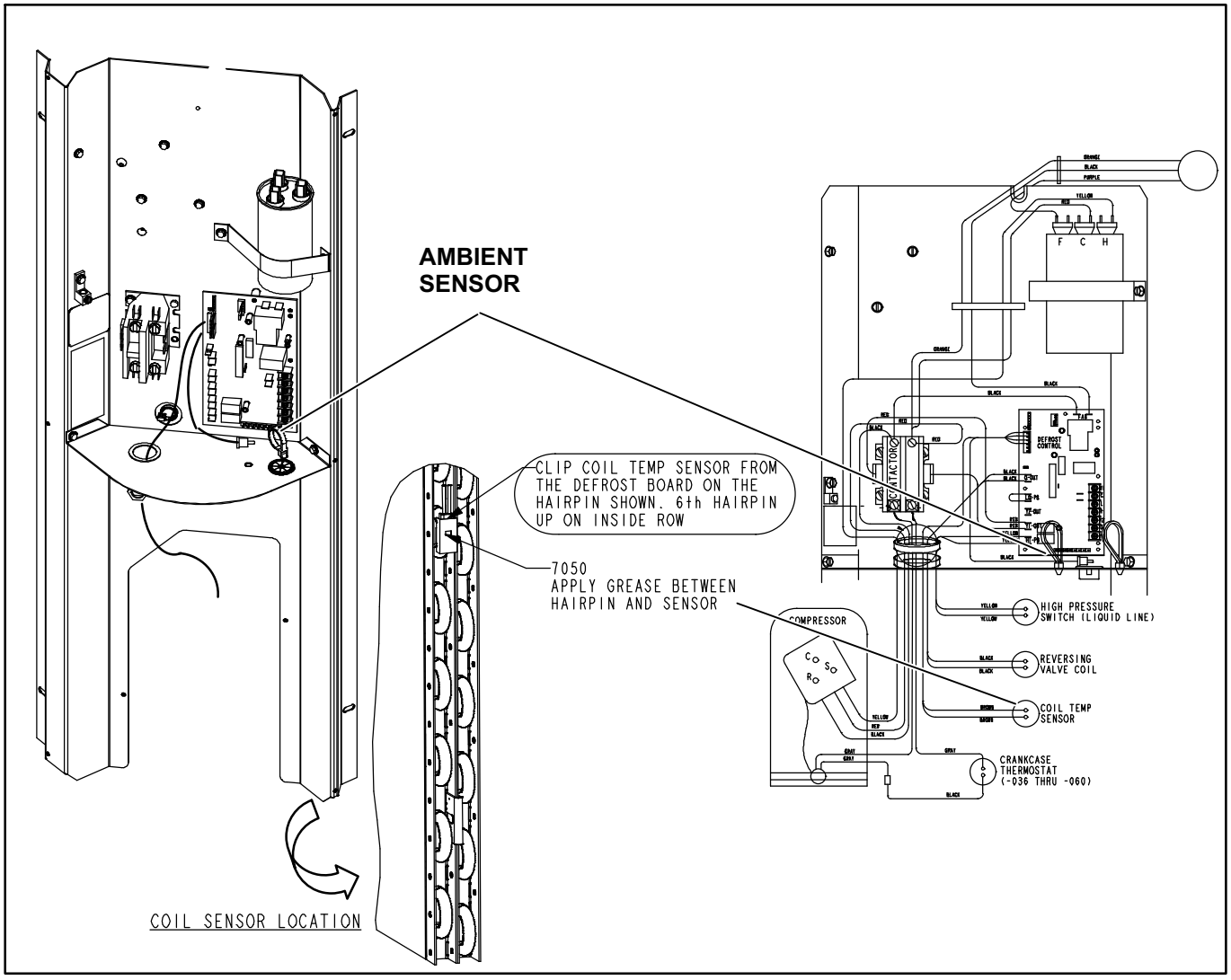


Figure 16. Sensor Locations

DEFROST SYSTEM SENSORS

Sensors connect to the defrost board through a field-replaceable harness assembly that plugs into the board. Through the sensors, the board detects outdoor ambient, coil, and discharge temperature fault conditions. As the detected temperature changes, the resistance across the sensor changes. Figure 17 shows how the resistance varies as the temperature changes for both type of sensors. Sensor resistance values can be checked by ohming across pins shown in table 5.

NOTE - When checking the ohms across a sensor, be aware that a sensor showing a resistance value that is not within the range shown in table 5, may be performing as designed. However, if a shorted or open circuit is detected, then the sensor may be faulty and the sensor harness will needs to be replaced.

Table 5. Sensor Temp. / Resistance Range

Sensor	Temperature Range °F (°C)	Resistance values range (ohms)	Pins/Wire Color
Outdoor (Ambient)	-35 (-37) to 120 (48)	280,000 to 3750	3 & 4 (Black)
Coil	-35 (-37) to 120 (48)	280,000 to 3750	5 & 6 (Brown)
Discharge (if applicable)	24 (-4) to 350 (176)	41,000 to 103	1 & 2 (Yellow)
Note: Sensor resistance decreases as sensed temperature increases (see figure 17).			

Coil Sensor—The coil temperature sensor (shown in figure 16) considers outdoor temperatures below -35°F (-37°C) or above 120°F (48°C) as a fault. If the coil temperature sensor is detected as being open, shorted or out of the temperature

range of the sensor, the board will not perform demand or time/temperature defrost operation and will display the appropriate fault code. Heating and cooling operation will be allowed in this fault condition.

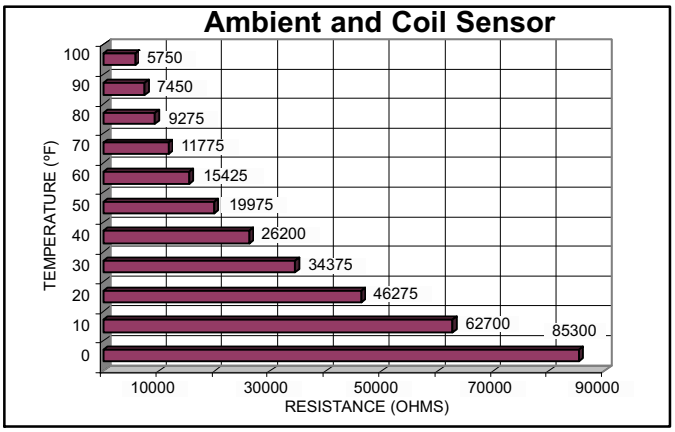


Figure 17. Temperature/Resistance Chart

Ambient Sensor—The ambient sensor (shown in figure 16) considers outdoor temperatures below -35°F (-37°C) or above 120°F (48°C) as a fault. If the ambient sensor is detected as being open, shorted or out of the temperature range of the sensor, the board will not perform demand defrost operation. The board will revert to time/temperature defrost operation and will display the appropriate fault code. Heating and cooling operation will be allowed in this fault condition.

NOTE - Within a single room thermostat demand, if 5-strikes occur, the board will lockout the unit. Defrost board 24 volt power "R" must be cycled "OFF" or the "TEST" pins on board must be shorted between 1 to 2 seconds to reset the board.

Defrost Temperature Termination Shunt (Jumper) Pins—The defrost board selections are: 50, 70, 90, and 100°F (10, 21, 32 and 38°C). The shunt termination pin is factory set at 50°F (10°C). If the temperature shunt is not installed, the default termination temperature is 90°F (32°C).

DELAY MODE

The defrost board has a field-selectable function to reduce occasional sounds that may occur while the unit is cycling in and out of the defrost mode. When a jumper is installed on the DELAY pins, the compressor will be cycled off for 30 seconds going in and out of the defrost mode. Units are shipped with jumper installed on DELAY pins.

NOTE - The 30 second off cycle is NOT functional when jumpering the TEST pins.

OPERATIONAL DESCRIPTION

The defrost control board has three basic operational modes: normal, calibration, and defrost.

Normal Mode—The demand defrost board monitors the O line, to determine the system operating mode (heat/cool), outdoor ambient temperature, coil temperature (outdoor coil) and compressor run time to determine when a defrost cycle is required.

Calibration Mode—The board is considered uncalibrated when power is applied to the board, after cool mode operation, or if the coil temperature exceeds the termination temperature when it is in heat mode.

Calibration of the board occurs after a defrost cycle to ensure that there is no ice on the coil. During calibration, the temperature of both the coil and the ambient sensor are measured to establish the temperature differential which is required to allow a defrost cycle.

Defrost Mode—The following paragraphs provide a detailed description of the defrost system operation.

DETAILED DEFROST SYSTEM OPERATION

Defrost Cycles—The demand defrost control board initiates a defrost cycle based on either frost detection or time.

- **Frost Detection**—If the compressor runs longer than 30 minutes and the actual difference between the clear coil and frosted coil temperatures exceeds the maximum difference allowed by the control, a defrost cycle will be initiated.

  IMPORTANT - The demand defrost control board will allow a greater accumulation of frost and will initiate fewer defrost cycles than a time/temperature defrost system.

- **Time**—If 6 hours of heating mode compressor run time has elapsed since the last defrost cycle while the coil temperature remains below 35°F (2°C), the demand defrost control will initiate a defrost cycle.

Actuation—When the reversing valve is de-energized, the Y1 circuit is energized, and the coil temperature is below 35°F (2°C), the board logs the compressor run time. If the board is not calibrated, a defrost cycle will be initiated after 30 minutes of heating mode compressor run time. The control will attempt to self-calibrate after this (and all other) defrost cycle(s).

Calibration success depends on stable system temperatures during the 20-minute calibration period. If the board fails to calibrate, another defrost cycle will be initiated after 45 minutes of heating mode compressor run time. Once the defrost board is calibrated, it initiates a demand defrost cycle when the difference between the clear coil and frosted coil temperatures exceeds the maximum difference allowed by the control OR after 6 hours of heating mode compressor run time has been logged since the last defrost cycle.

NOTE - If ambient or coil fault is detected, the board will not execute the "TEST" mode.

Termination — The defrost cycle ends when the coil temperature exceeds the termination temperature or after 14 minutes of defrost operation. If the defrost is terminated by the 14-minute timer, another defrost cycle will be initiated after 30 minutes of run time.

Test Mode — A TEST option is provided for troubleshooting. See figure 18 for this function.

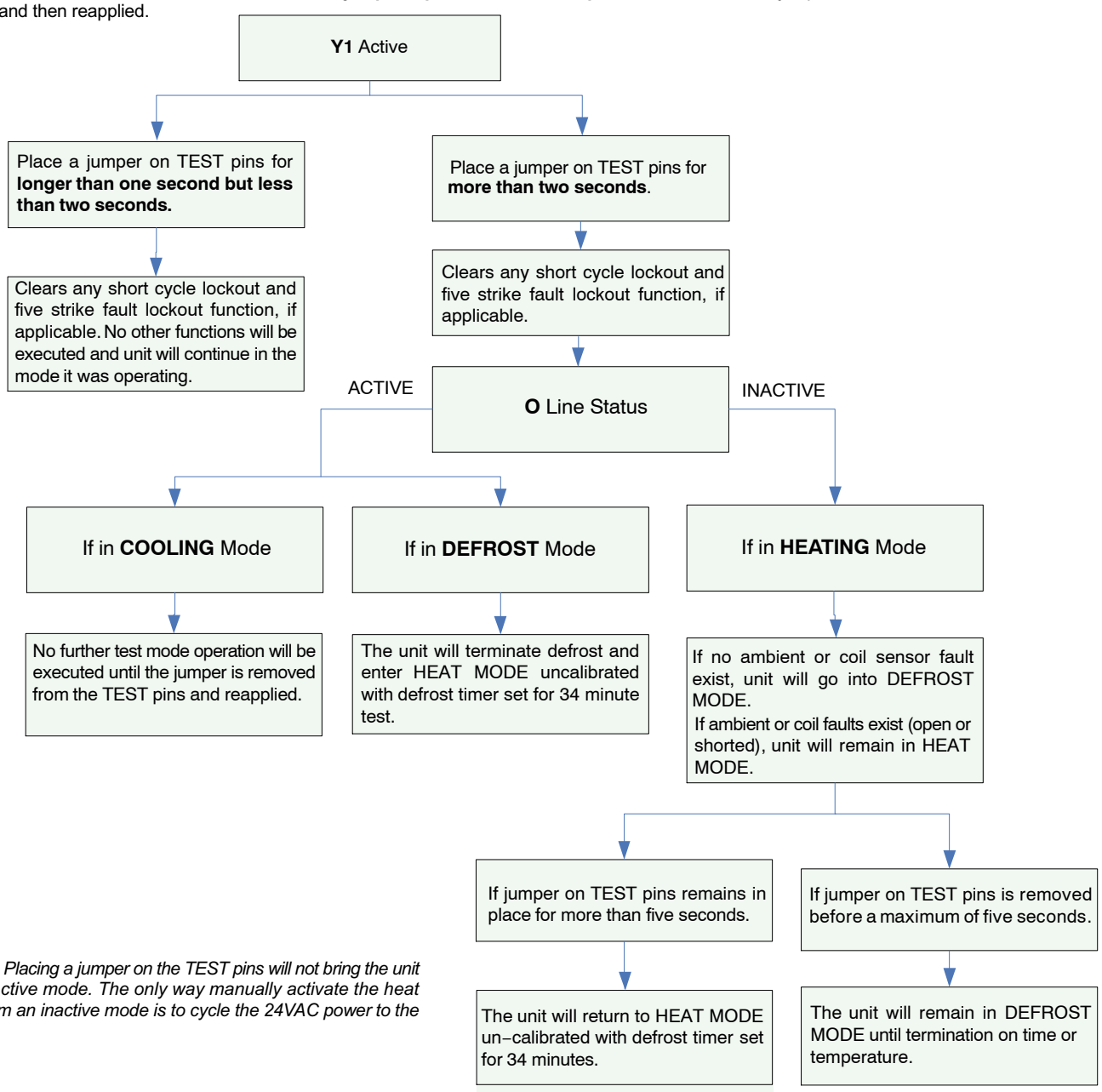
TEST

Placing the jumper on the field test pins allows the technician to:

- Clear short cycle lockout
- Clear five-strike fault lockout
- Cycle the unit in and out of defrost mode
- Place the unit in defrost mode to clear the coil

When **Y1** is energized and 24V power is being applied to the Control, a test cycle can be initiated by placing a jumper on the Control's **TEST** pins for 2 to 5 seconds. If the jumper remains on the **TEST** pins for longer than five seconds, the Control will ignore the jumpered TEST pins and revert to normal operation.

The Control will initiate one test event each time a jumper is placed on the TEST pins. For each TEST the jumper must be removed for at least one second and then reapplied.



NOTE — Placing a jumper on the TEST pins will not bring the unit out of inactive mode. The only way manually activate the heat pump from an inactive mode is to cycle the 24VAC power to the Control.

Figure 18. Test Mode

DEFROST BOARD DIAGNOSTICS

See table 6 to determine defrost board operational conditions and to diagnose cause and solution to problems.

Table 6. Defrost Control Board Diagnostic LEDs

DS2 Green	DS1 Red	Condition/Code	Possible Cause(s)	Solution
OFF	OFF	Power problem	No power (24V) to board terminals R & C or board failure.	[1] Check control transformer power (24V). [2] If power is available to board and LED(s) do not light, replace board.
Simultaneous SLOW Flash		Normal operation	Unit operating normally or in standby mode.	None required.
Alternating SLOW Flash		5-minute anti-short cycle delay	Initial power up, safety trip, end of room thermostat demand.	None required (Jumper TEST pins to override)
Simultaneous FAST Flash		Ambient Sensor Problem	Sensor being detected open or shorted or out of temperature range. Board will revert to time/temperature defrost operation. (System will still heat or cool).	
Alternating FAST Flash		Coil Sensor Problem	Sensor being detected open or shorted or out of temperature range. Board will not perform demand or time/temperature defrost operation. (System will still heat or cool).	
ON	ON	Circuit Board Failure	Indicates that board has internal component failure. Cycle 24 volt power to board. If code does not clear, replace board.	
FAULT & LOCKOUT CODES (Each fault adds 1 strike to that code's counter; 5 strikes per code = LOCKOUT)				
OFF	SLOW Flash	Low Pressure Fault	[1] Restricted air flow over indoor or outdoor coil. [2] Improper refrigerant charge in system. [3] Improper metering device installed or incorrect operation of metering device. [4] Incorrect or improper sensor location or connection to system.	[1] Remove any blockages or restrictions from coils and/or fans. Check indoor and outdoor fan motor for proper current draws. [2] Check system charge using approach & subcooling temperatures. [3] Check system operating pressures and compare to unit charging charts. [4] Make sure all pressure switches and sensors have secure connections to system to prevent refrigerant leaks or errors in pressure and temperature measurements.
OFF	ON	Low Pressure ***LOCKOUT***		
SLOW Flash	OFF	High Pressure Fault		
ON	OFF	High Pressure ***LOCKOUT***		
SLOW Flash	ON	Discharge Line Temperature Fault	This code detects shorted sensor or high discharge temperatures. If the discharge line temperature exceeds a temperature of 300ºF (148ºC) during compressor operation, the board will de-energize the compressor contactor output (and the defrost output if active). The compressor will remain off until the discharge temperature has dropped below 225ºF (107ºC).	
FAST Flash	ON	Discharge Line Temperature ***LOCKOUT***		
OFF	Fast Flash	Discharge Sensor Fault	The board detects open sensor or out of temperature sensor range. This fault is detected by allowing the unit to run for 90 seconds before checking sensor resistance. If the sensor resistance is not within range after 90 seconds, the board will count one fault. After 5 faults, the board will lockout.	
Fast Flash	OFF	Discharge Sensor ***LOCKOUT***		

System Operation (14HPX-XXX-230-017)

UNIT COMPONENTS

⚠ IMPORTANT

Some scroll compressor have 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 is raised above 40 psig. DO NOT REPLACE COMPRESSOR.

The outdoor unit and indoor blower cycle on demand from the room thermostat. If the thermostat blower switch is in the **ON** position, the indoor blower operates continuously.

Bi-Flow Liquid line Filter Drier

The unit is equipped with a large-capacity bi-flow filter drier which keeps the system clean and dry. If replacement is necessary, order another of the same design and capacity. The replacement filter drier must be suitable for use with HFC-410A refrigerant.

Low Pressure Switch (S87)

The 14HPX is equipped with an auto-reset low pressure switch which is located on the vapor line. The switch shuts off the compressor when the vapor pressure falls below the factory setting. This switch, which is ignored during defrost operation, closes at pressures at or above 40 ± 5 psig (276 ± 34 kPa) and opens at 25 ± 5 psig (172 ± 34 kPa). It is not adjustable.

Low Pressure Switch Bypass (S41) (Optional)

For use in applications where the heat pump is operated in outdoor ambient temperatures below 15°F.

- Prevents nuisance trips form the low pressure switch
- Wired in parallel with the low pressure switch

High Pressure Switch (S4)

The 14HPX is equipped with an auto-reset high pressure switch (single-pole, single-throw) which is located on the liquid line. The switch shuts off the compressor when discharge pressure rises above the factory setting. The switch is normally closed and is permanently adjusted to trip (open) at 590 ± 15 psig (4068 ± 103 kPa).

NOTE — A Schrader core is under the pressure switches.

Defrost Thermostat (S6)

The defrost thermostat is located on the liquid line between the check/expansion valve and the distributor. When defrost thermostat senses 42°F (5.5°C) or cooler, the thermostat contacts close and send a signal to the defrost control to start the defrost timing. It also terminates defrost when the liquid line warms up to 70°F (21°C).

Crankcase Heater (HR1) and Thermostat Switch (S40) (-60 model only)

All models sizes are equipped with a belly band type crankcase heater. HR1 prevents liquid from accumulating in the compressor. The HR1 is controlled by a single pole, single throw thermostat switch (S40) located on the liquid line (see figure 2 for location). On all other units, the heater is on when there is no compressor operation.

Thermal Protection Switch (S173) — Compressor Mounted

Some 14HPX units are equipped with a compressor mounted normally closed temperature switch that prevents compressor damage due to overheating caused by internal friction. The switch is located on top of the compressor casing (see figure 1). This switch senses the compressor casing temperature and opens at 239-257°F (115°C-125°C) to shut off compressor operation. The auto-reset switch closes when the compressor casing temperature falls to 151-187°F (66°C-86°C), and the compressor is re-energized. This single-pole, single-throw (SPST) bi-metallic switch is wired in series with the 24V Y input signal to control compressor operation.

Defrost System (14HPX-XXX-230-017)

The defrost system includes a defrost thermostat (S6) and a defrost control (CMC1).

DEFROST CONTROL (CMC1)

This defrost control includes the combined functions of a time/temperature defrost control, defrost relay, time delay, diagnostic LEDs, and a terminal strip for field wiring connections.

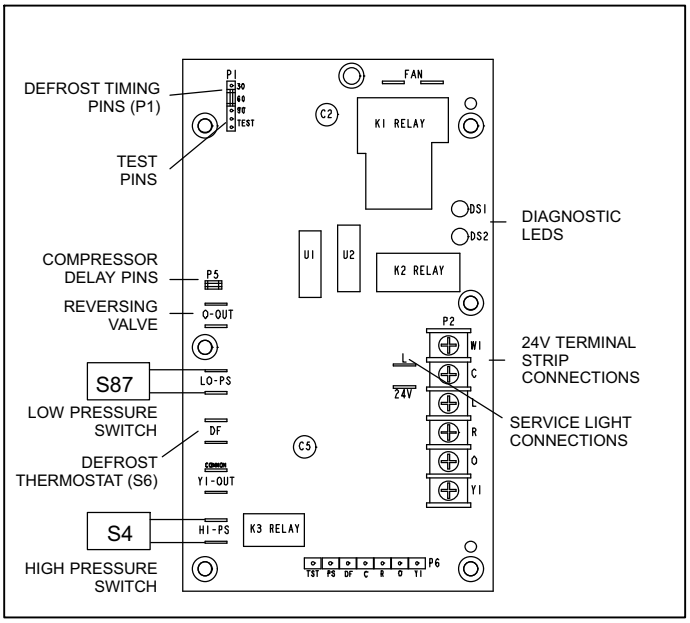


Figure 19. Defrost Control (CMC1)

Defrost Control Timing Pins (P1)

Each timing pin selection provides a different accumulated compressor run time period for one defrost cycle. This time period must occur before a defrost cycle is initiated. The defrost interval can be adjusted to 30 (T1), 60 (T2), or 90 (T3) minutes (see figure 19). The maximum defrost period is 14 minutes and cannot be adjusted.

*NOTE — Defrost control part number is listed near the **P1** timing pins.*

- Units with defrost control **100269-02**: Factory default is 60 minutes
- Units with defrost control **100269-04**: Factory default is 90 minutes

If the timing selector jumper is missing, the defrost control defaults to a 90-minute defrost interval.

Compressor Delay (P5)

The defrost control has a field-selectable function to reduce occasional sounds that may occur while the unit is cycling in and out of the defrost mode.

- Units with defrost control **100269-02**: The compressor will be cycled off for 30 seconds going in and out of the defrost mode when the compressor delay jumper is removed.
- Units with defrost control **100269-04**: The compressor will be cycled off for 30 seconds going in and out of the defrost mode when the compressor delay jumper is installed.

NOTE — The 30-second compressor feature is ignored when jumpering the TEST pins.

Time Delay

The timed-off delay is five minutes long. The delay helps to protect the compressor from short-cycling in case the power to the unit is interrupted or a pressure switch opens. The delay is bypassed by placing the timer select jumper across the TEST pins for 0.5 seconds.

Test Mode (P1-TEST)

A TEST option is provided for troubleshooting. The TEST mode may be started any time the unit is in the heating mode and the defrost thermostat is closed or jumpered. If the jumper is in the TEST position at power-up, the control will ignore the test pins. When the jumper is placed across the TEST pins for two seconds, the control will enter the defrost mode. If the jumper is removed before an additional 5-second period has elapsed (7 seconds total), the unit will remain in defrost mode until the defrost thermostat opens or 14 minutes have passed. If the jumper is not removed until after the additional 5-second period has elapsed, the defrost will terminate and the test option will not function again until the jumper is removed and re-applied.

Diagnostic LEDs (DS1 and DS2)

The defrost control uses two LEDs for diagnostics. The LEDs flash a specific sequence according to the diagnosis. See table 7.

Table 7. Defrost Control Diagnostic LEDs

DS2 Green	DS1 Red	Condition
OFF	OFF	Power problem
Simultaneous Slow Flash		Normal operation
Alternating Slow Flash		5-minute anti-short cycle delay
Fault and Lockout Codes		
OFF	Slow Flash	Low Pressure Fault
OFF	ON	Low Pressure Lockout
Slow Flash	OFF	High Pressure Fault
ON	OFF	High Pressure Lockout
Shaded entries apply to demand defrost controls only.		

Time Delay

The timed-off delay is five minutes long. The delay helps protect the compressor from short-cycling in case the power to the unit is interrupted or a pressure switch opens. The delay is bypassed by placing the timer select jumper across the TEST pins for 0.5 seconds.

NOTE — The defrost control must have a thermostat demand for the bypass function.

During a single thermostat cycle, the defrost control will lock out the unit after the fifth time that the circuit is interrupted by any pressure switch that is wired to the defrost control. In addition, the diagnostic LEDs will indicate a pressure switch lockout after the fifth occurrence of an open pressure switch (see table 7). The unit will remain locked out until power is broken then remade to the control or until the jumper is applied to the TEST pins for 0.5 seconds.

NOTE — The defrost control ignores input from the low pressure switch terminals during the TEST mode, during the defrost cycle, during the 90-second start-up period, and for the first 90 seconds each time the reversing valve switches heat/cool modes. ***If the TEST pins are jumpered and the 5-minute delay is being bypassed, the LO PS terminal signal is not ignored during the 90-second start-up period.***

Service Light Connection

The defrost control includes terminal connections for a service light which provides a signal that activates the room thermostat service light during periods of inefficient operation.

⚠ IMPORTANT

After testing has been completed, properly reposition test jumper across desired timing pins.

Maintenance

DEALER

⚠ WARNING

Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.

⚠ WARNING

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

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

Maintenance and service must be performed by a qualified installer or service agency. At the beginning of each cooling season, the system should be checked as follows:

Outdoor Unit

1. Clean and inspect outdoor coil (may be flushed with a water hose). Ensure power is off before cleaning.
2. Outdoor unit fan motor is pre-lubricated and sealed. No further lubrication is needed.
3. Visually inspect all connecting lines, joints and coils for evidence of oil leaks.
4. Check all wiring for loose connections.

5. Check for correct voltage at unit (unit operating).
6. Check amp draw on outdoor fan motor.

   Motor Nameplate:_____ **Actual**:_____.

7. Inspect drain holes in coil compartment base and clean if necessary.

NOTE - If insufficient heating or cooling occurs, the unit should be gauged and refrigerant charge should be checked.

Outdoor Coil

It may be necessary to flush the outdoor coil more frequently if it is exposed to substances which are corrosive or which block airflow across the coil (e.g., pet urine, cottonwood seeds, fertilizers, fluids that may contain high levels of corrosive chemicals such as salts)

- Outdoor Coil — The outdoor coil may be flushed with a water hose.
- Outdoor Coil (Sea Coast) — Moist air in ocean locations can carry salt, which is corrosive to most metal. Units that are located near the ocean require frequent inspections and maintenance. These inspections will determine the necessary need to wash the unit including the outdoor coil. Consult your installing contractor for proper intervals/procedures for your geographic area or service contract.

Indoor Unit

1. Clean or change filters.
2. Lennox blower motors are prelubricated and permanently sealed. No more lubrication is needed.
3. Adjust blower speed for cooling. Measure the pressure drop over the coil to determine the correct blower CFM. Refer to the unit information service manual for pressure drop tables and procedure.
4. *Belt Drive Blowers* - Check belt for wear and proper tension.
5. Check all wiring for loose connections.
6. Check for correct voltage at unit. (blower operating)
7. Check amp draw on blower motor.

   Motor Nameplate:_____ **Actual**:_____.

Indoor Coil

1. Clean coil if necessary.
2. Check connecting lines, joints and coil for evidence of oil leaks.
3. Check condensate line and clean if necessary.

HOMEOWNER

Cleaning of the outdoor unit's coil should be performed by a trained service technician. Contact your dealer and set up a schedule (preferably twice a year, but at least once a year) to inspect and service your outdoor unit. The following maintenance may be performed by the homeowner.

⚠ 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 and diminish performance and longevity of the unit.

Outdoor Coil

The outdoor unit must be properly maintained to ensure its proper operation.

- Please contact your dealer to schedule proper inspection and maintenance for your equipment.
- Make sure no obstructions restrict airflow to the outdoor unit.
- Grass clippings, leaves, or shrubs crowding the unit can cause the unit to work harder and use more energy.
- Keep shrubbery trimmed away from the unit and periodically check for debris which collects around the unit.

Routine Maintenance

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.

1. **Air Filter —** Ask your Lennox dealer to show you where your indoor unit's 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.
2. **Disposable Filter —** Disposable filters should be replaced with a filter of the same type and size.

NOTE — If you are unsure about the filter required for your system, call your Lennox dealer for assistance.

3. **Reusable Filter —** Many indoor units are equipped with reusable foam filters. Clean foam filters with a mild soap and water solution; rinse thoroughly; allow filter to dry completely before returning it to the unit or grille.

NOTE — The filter and all access panels must be in place any time the unit is in operation.

4. **Electronic Air Cleaner —** Some systems are equipped with an electronic air cleaner, designed to remove airborne particles from the air passing through the cleaner. If your system is so equipped, ask your dealer for maintenance instructions.
5. **Indoor Unit —** The indoor unit's evaporator 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.)

Thermostat Operation

See the ComfortSense® 7000 thermostat homeowner manual for instructions on how to operate your thermostat.

Heat Pump Operation

Your new Lennox heat pump has several characteristics that you should be aware of:

- Heat pumps satisfy heating demand by delivering large amounts of *warm* air into the living space. This is quite different from gas- or oil-fired furnaces or an electric furnace which deliver lower volumes of considerably *hotter* air to heat the space.
- Do not be alarmed if you notice frost on the outdoor coil in the winter months. Frost develops on the outdoor coil during the heating cycle when temperatures are below 45°F (7°C). An electronic control activates a defrost cycle lasting 5 to 15 minutes at preset intervals to clear the outdoor coil of the frost.
- During the defrost cycle, you may notice steam rising from the outdoor unit. This is a normal occurrence. The thermostat may engage auxiliary heat during the defrost cycle to satisfy a heating demand; however, the unit will return to normal operation at the conclusion of the defrost cycle.

Extended Power Outage

The heat pump is equipped with a compressor crankcase heater which protects the compressor from refrigerant *slugging* during cold weather operation.

If power to your unit has been interrupted for several hours or more, set the room thermostat selector to the EMERGENCY HEAT setting to obtain temporary heat without the risk of serious damage to the heat pump.

In EMERGENCY HEAT mode, all heating demand is satisfied by auxiliary heat; heat pump operation is locked out. After a six-hour compressor crankcase warm-up period, the thermostat can be switched to the HEAT setting and normal heat pump operation may resume.

Preservice 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.

Accessories

For update-to-date information, see any of the following publications:

- Lennox 14HPX Product Specification bulletin
- Lennox Product Catalog
- Lennox Price Book

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 _____ Vapor 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? ❑

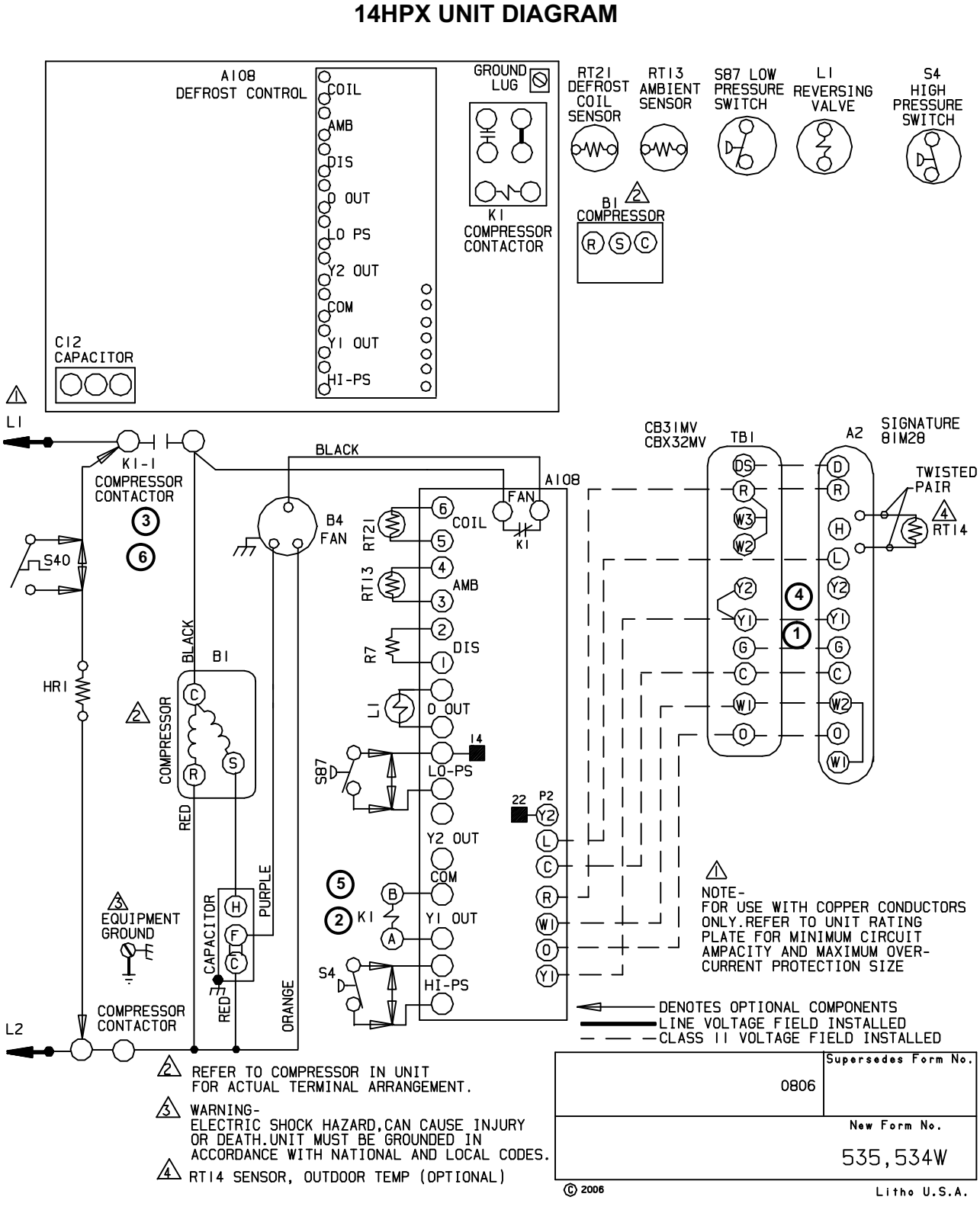
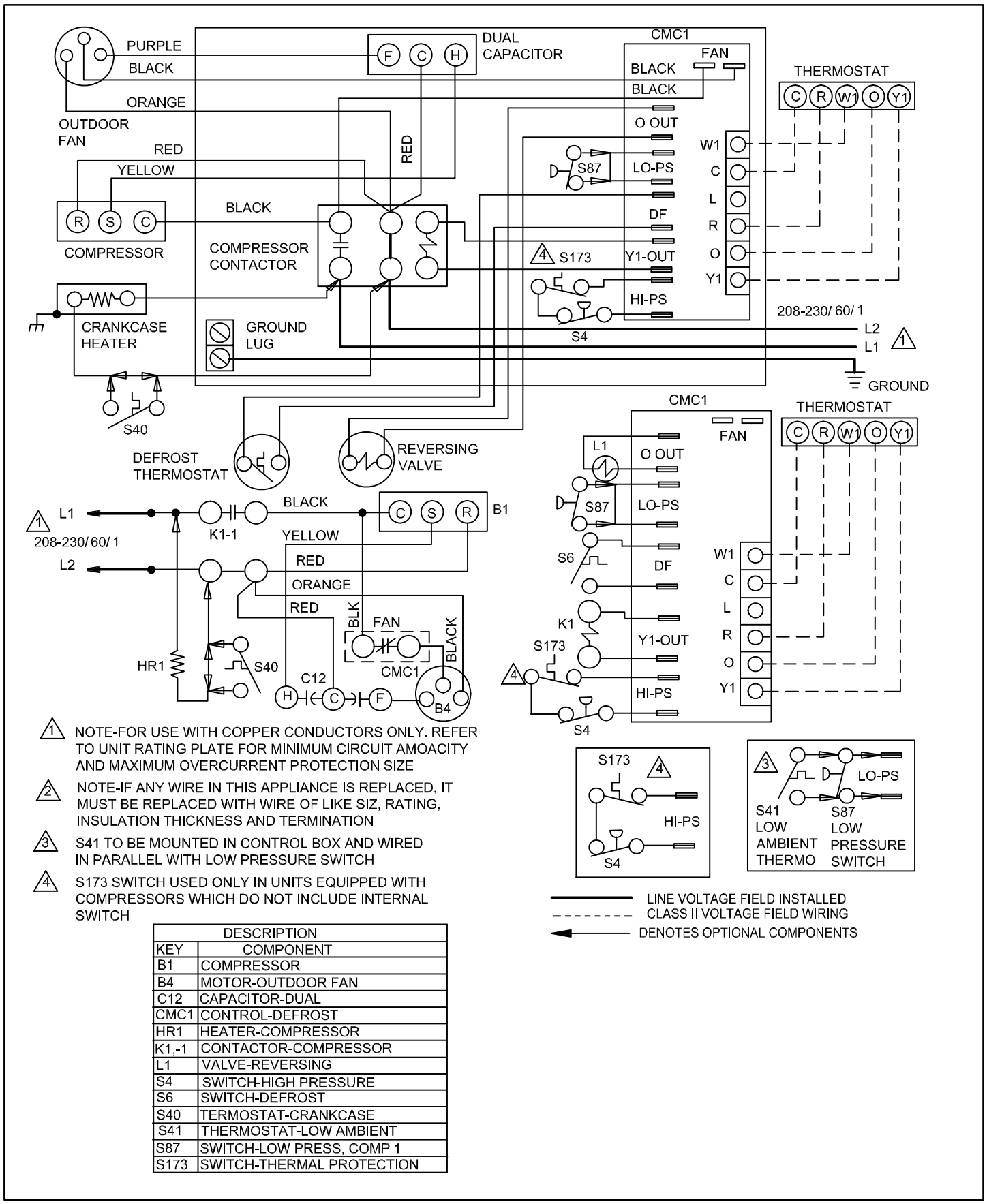


Figure 20. Typical Unit Wiring Diagram (14HPX-XXX-230-01 through -012)



1. NOTE-FOR USE WITH COPPER CONDUCTORS ONLY. REFER TO UNIT RATING PLATE FOR MINIMUM CIRCUIT AMOACITY AND MAXIMUM OVERCURRENT PROTECTION SIZE
2. NOTE-IF ANY WIRE IN THIS APPLIANCE IS REPLACED, IT MUST BE REPLACED WITH WIRE OF LIKE SIZ, RATING, INSULATION THICKNESS AND TERMINATION
3. S41 TO BE MOUNTED IN CONTROL BOX AND WIRED IN PARALLEL WITH LOW PRESSURE SWITCH
4. S173 SWITCH USED ONLY IN UNITS EQUIPPED WITH COMPRESSORS WHICH DO NOT INCLUDE INTERNAL SWITCH

DESCRIPTION	
KEY	COMPONENT
B1	COMPRESSOR
B4	MOTOR-OUTDOOR FAN
C12	CAPACITOR-DUAL
CMC1	CONTROL-DEFROST
HR1	HEATER-COMPRESSOR
K1,-1	CONTACTOR-COMPRESSOR
L1	VALVE-REVERSING
S4	SWITCH-HIGH PRESSURE
S6	SWITCH-DEFROST
S40	TERMOSTAT-CRANKCASE
S41	THERMOSTAT-LOW AMBIENT
S87	SWITCH-LOW PRESS, COMP 1
S173	SWITCH-THERMAL PROTECTION

Figure 21. Typical Unit Wiring Diagram (14HPX-XXX-230-017)

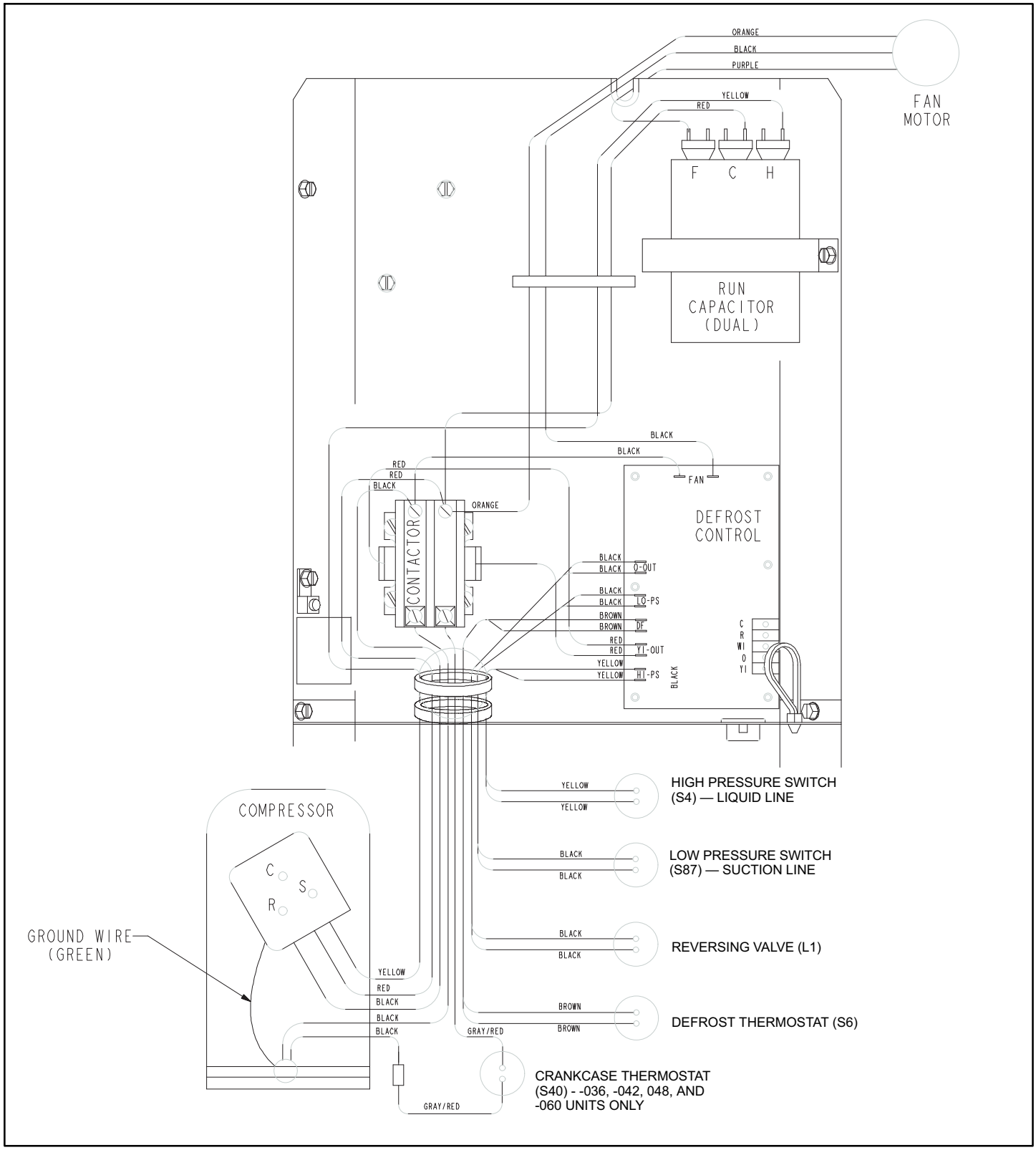


Figure 22. Typical Unit Factory Wiring (14HPX-XXX-230-017)

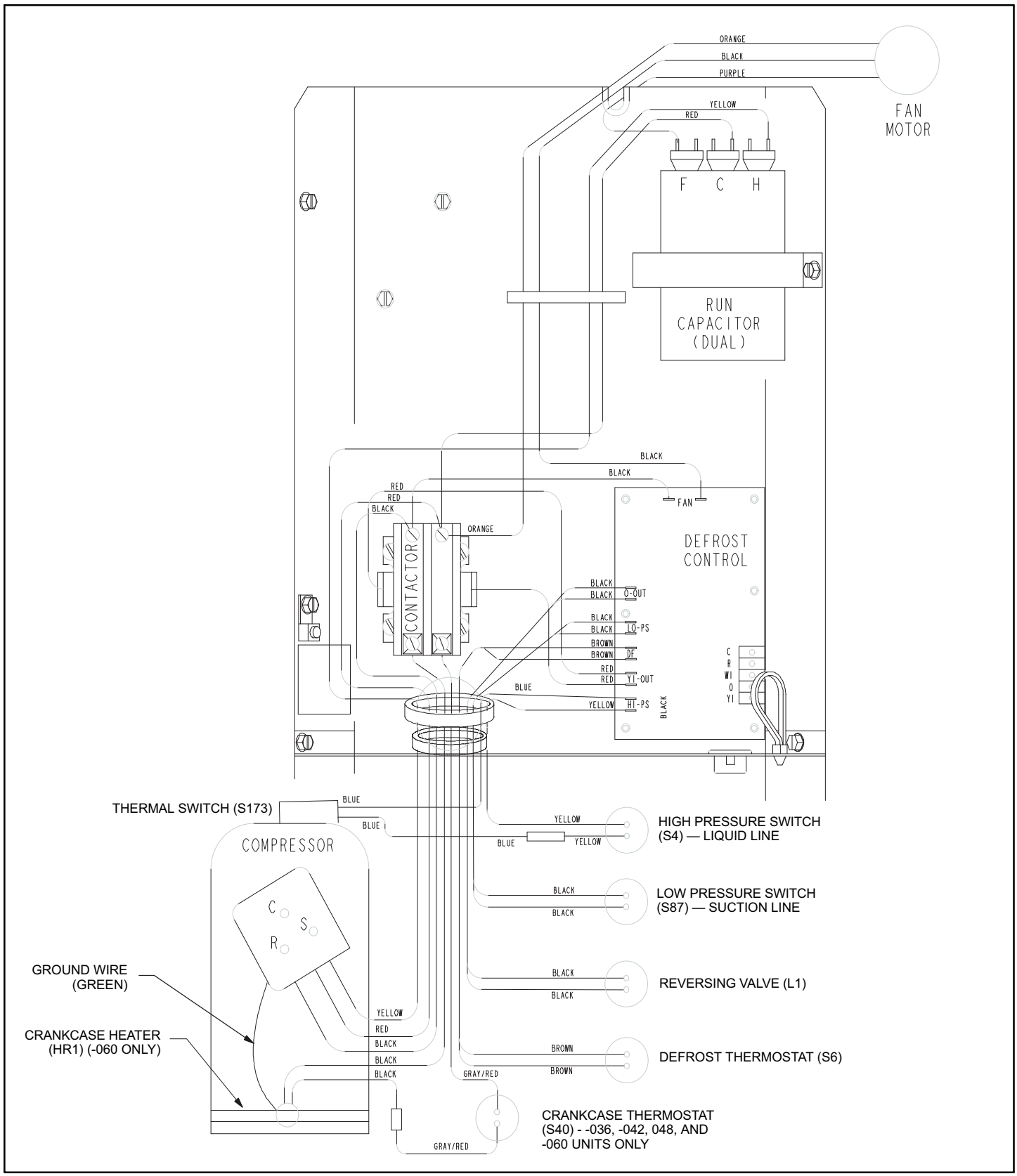


Figure 23. Typical Unit Factory Wiring — Compressor with Thermal Protection Switch (S173) (14HPX-XXX-230-017)

14HPX OPERATING SEQUENCE

This is the sequence of operation for 14HPX series units. The sequence is outlined by numbered steps which correspond to circled numbers on the adjacent diagram. The steps are identical for both cooling and first stage heating demand with the exception reversing valve L1 is energized during cooling demand and de-energized during heating demand.

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

COOLING:

Internal thermostat wiring energizes terminal O by cooling mode selection, energizing the reversing valve L1.

1 - Demand initiates at Y1 in the thermostat.

2 - 24VAC energizes compressor contactor K1.

3 - K1-1 N.O. closes, energizing compressor (B1) and outdoor fan motor (B4).

END OF COOLING DEMAND:

4 - Demand is satisfied. Terminal Y1 is de-energized.

5 - Compressor contactor K1 is de-energized.

6 - K1-1 opens and compressor (B1) and outdoor fan motor (B4) are de-energized and stop immediately.

FIRST STAGE HEAT:

Internal thermostat wiring de-energizes terminal O by heating mode selection, de-energizing the reversing valve L1.

See steps 1, 2 and 3.

End of FIRST STAGE HEAT:

See steps 4, 5 and 6.

DEFROST MODE:

When a defrost cycle is initiated, the control energizes the reversing valve solenoid and turns off the condenser fan. The control will also put 24VAC on the "W1" (auxiliary heat) line. The unit will stay in this mode until either the coil sensor temperature is above the selected termination temperature, the defrost time of 14 minutes has been completed, or the room thermostat demand cycle has been satisfied. (If the temperature select shunt is not installed, the default termination temperature will be 90°F.) If the room thermostat demand cycle terminates the cycle, the defrost cycle will be held until the next room thermostat demand cycle. If the coil sensor temperature is still below the selected termination temperature, the control will continue the defrost cycle until the cycle is terminated in one of the methods mentioned above. If a defrost is terminated by time and the coil temperature did not remain above 35°F (2°C) for 4 minutes the control will go to the 30-minute Time/Temperature mode.

Servicing Units Void of Charge

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

1. Leak check system using procedure outlined on page 22.
2. Evacuate the system using procedure outlined on page 23.
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 23.
5. Weigh in refrigerant using procedure outlined under figure 26.

Start-Up

⚠ IMPORTANT

Crankcase heater (if applicable) 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 suction line service valves to release the refrigerant charge (contained in outdoor unit) into the system.
4. Replace the stem caps and tighten as specified in *Operating Service Valves* on page 9.
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 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 refrigerate by using the procedures listed under *Start-Up and Charging Procedures*.
9. Recheck voltage while the unit is running. Power must be within range shown on the nameplate.

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.

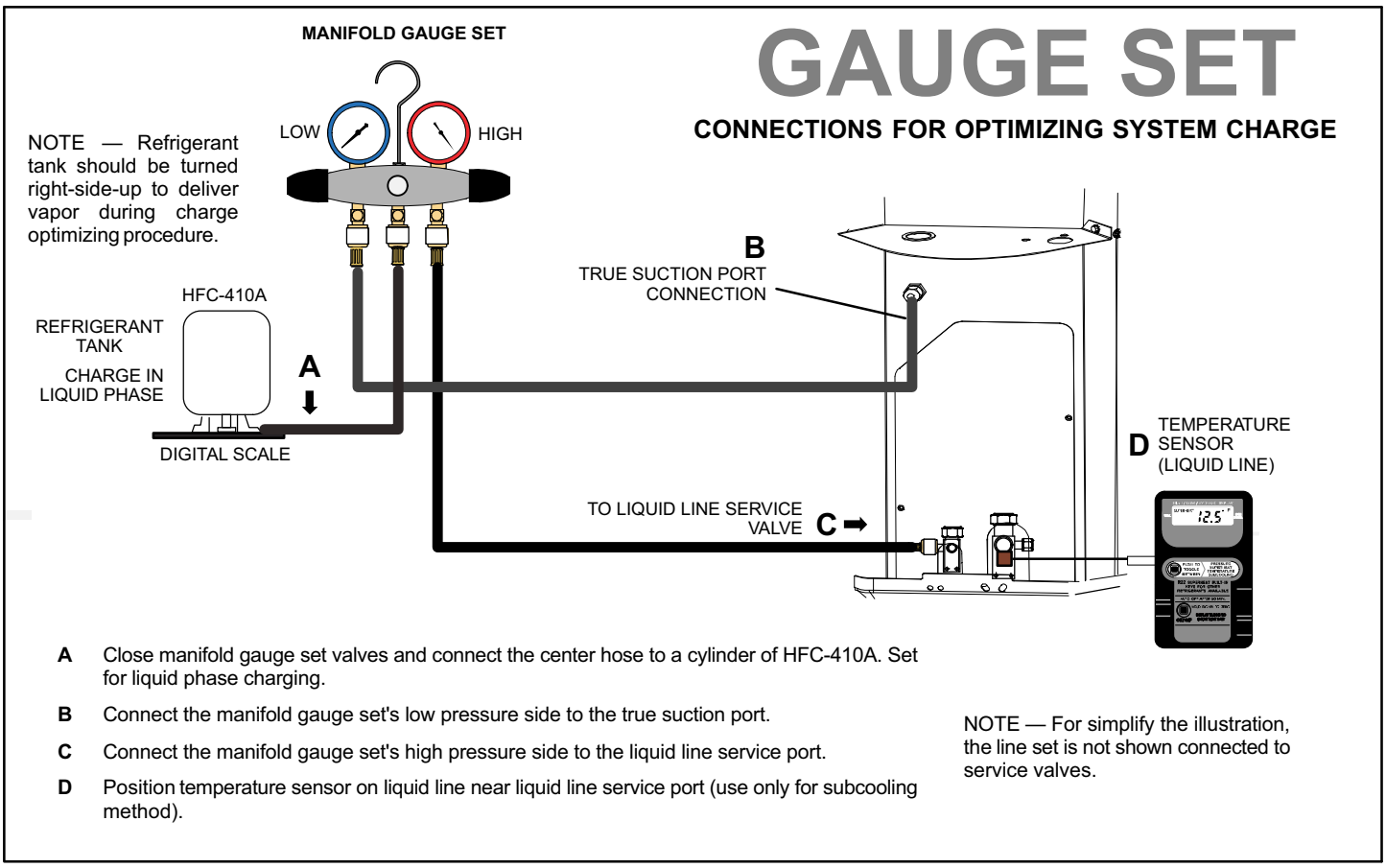
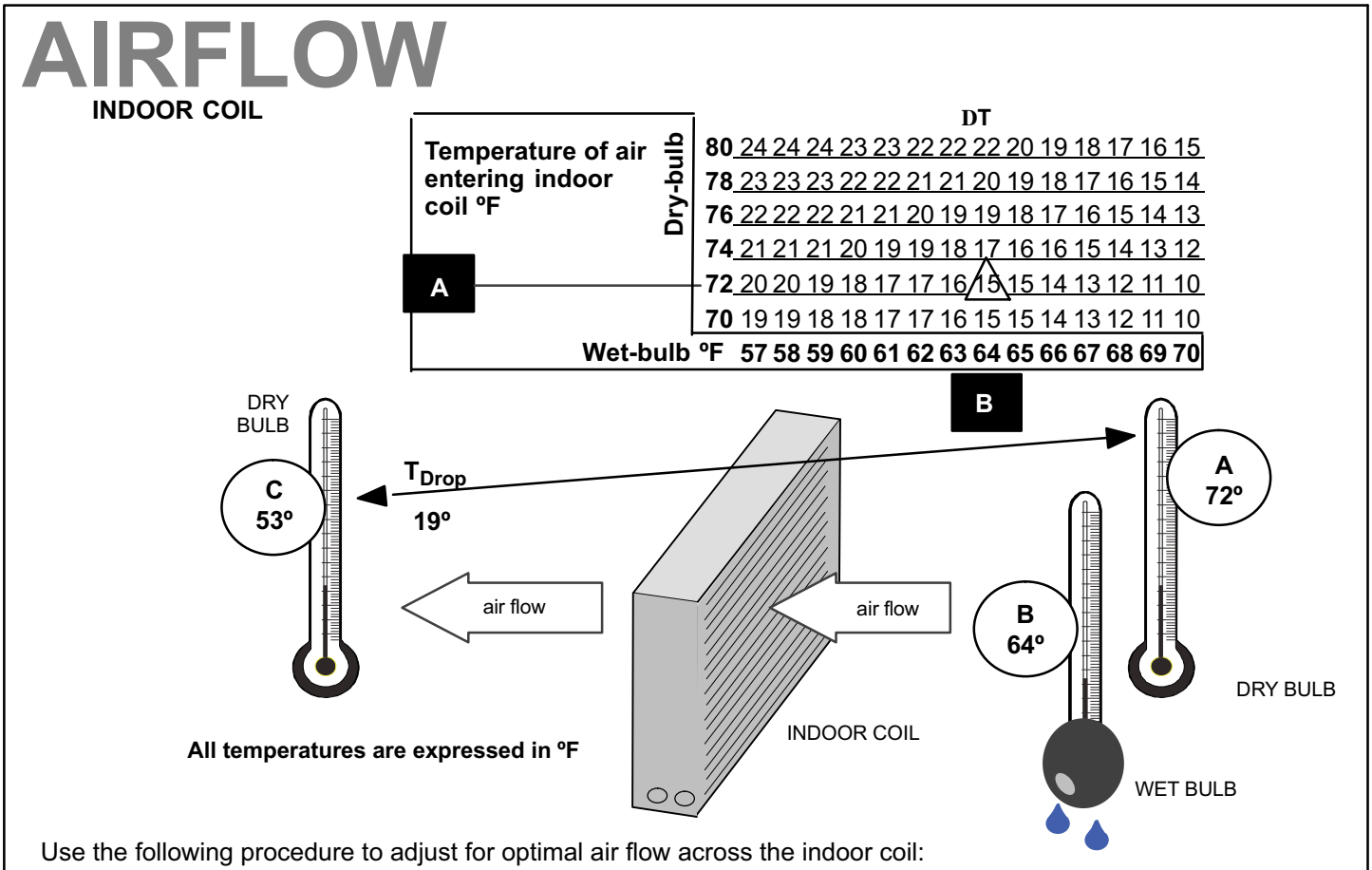


Figure 24. Gauge Set Connections

ADDING OR REMOVING REFRIGERANT

This system uses HFC-410A refrigerant which operates at much higher pressures than HFC-410A. 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-410A. This unit is NOT approved for use with coils which use capillary tubes or fixed orifices as a refrigerant metering device.

Check airflow using the Delta-T (DT) process using the illustration in figure 25.



Use the following procedure to adjust for optimal air flow across the indoor coil:

1. **Determine the desired DT** — Measure entering air temperature using dry bulb (**A**) and wet bulb (**B**). **DT** is the intersecting value of **A** and **B** in the table (see triangle).
2. **Find temperature drop across coil** — Measure the coil's dry bulb entering and leaving air temperatures (**A** and **C**). Temperature Drop Formula: (T_{Drop}) = **A** minus **C**.
3. **Determine if fan needs adjustment** — If the difference between the measured T_{Drop} and the desired **DT** (T_{Drop}–**DT**) is within ±3º, no adjustment is needed. See example below:

Assume **DT** = 15 and **A** temp. = 72º, these **C** temperatures would necessitate stated actions:

Cº	T_{Drop}	–	DT	=	ºF	*ACTION*
53º	19	–	15	=	4	*Increase the airflow*
58º	14	–	15	=	-1	*(within ±3º range) no change*
62º	10	–	15	=	-5	*Decrease the airflow*

Changing air flow affects all temperatures; recheck temperatures to confirm that the temperature drop and DT are within ±3º.

4. **Adjust the fan speed** — See indoor unit instructions to increase/decrease fan speed.

Figure 25. Checking Indoor Airflow over Evaporator Coil using Delta-T Chart

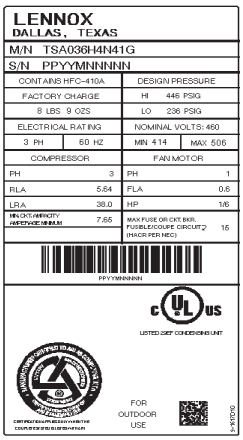
Use **WEIGH IN** method for adding initial refrigerant charge, and then use **SUBCOOLING** method for verifying refrigerant charge.

WEIGH IN

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. _____ + Additional charge specified per indoor unit match-ups (see applicable charging sticker) _____ = Total charge _____



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)

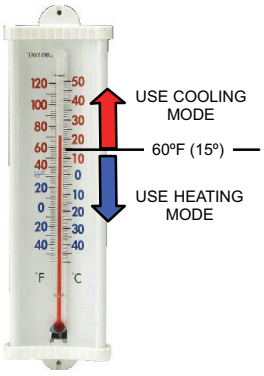
*If line length is greater than 15 ft. (4.6 m), add this amount. If line length is less than 15 ft. (4.6 m), subtract this amount.

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.

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

Figure 26. Weigh In Method

SUBCOOLING



SATº _____
LIQº – _____
SCº = _____

1 Check the airflow as illustrated in figure 25 to be sure the indoor airflow is as required. (Make any air flow adjustments before continuing with the following procedure.)

2 Measure outdoor ambient temperature; determine whether to use **cooling mode** or **heating mode** to check charge.

3 Connect gauge set.

4 Check Liquid and Vapor line pressures. Compare pressures with Normal Operating Pressures on applicable charging sticker. (*The reference table is a general guide. Expect minor pressure variations. Significant differences may mean improper charge or other system problem.*)

5 Set thermostat for heat/cool demand, depending on mode being used:

Using cooling mode—When the outdoor ambient temperature is 60°F (15°C) and above. Target subcooling values in table below are based on 70 to 80°F (21-27°C) indoor return air temperature; if necessary, operate heating to reach that temperature range; then set thermostat to cooling mode setpoint to 68ºF (20ºC). When pressures have stabilized, continue with step 6.

Using heating mode—When the outdoor ambient temperature is below 60°F (15°C). Target subcooling values in table below are based on 65-75°F (18-24°C) indoor return air temperature; if necessary, operate cooling to reach that temperature range; then set thermostat to heating mode setpoint to 77ºF (25ºC). When pressures have stabilized, continue with step 6.

6 Read the liquid line temperature; record in the LIQº space.

7 Read the liquid line pressure; then find its corresponding temperature in the temperature/ pressure chart listed in table 8 and record it in the SATº space.

8 Subtract LIQº temp. from SATº temp. to determine subcooling; record it in SCº space.

9 Compare SCº results with table below, being sure to note any additional charge for line set and/or match-up.

10 If subcooling value is greater than shown on applicable charging sticker for the unit, remove refrigerant; if less than shown, add refrigerant.

11 If refrigerant is added or removed, repeat steps 5 through 10 to verify charge.

Figure 27. Subcooling Method

Table 8. 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			

Table 9. Applicable Charging Sticker by Unit Model Number

Unit Model Number	Unit Charging Sticker Numbers	
	401241S	**580381-01**
	Referenced charging stickers above are located at the end of this manual.	
14HPX-018-230-XX	-01, -02, -03, -10, -11, -12, -13, -14, -15	-17, -18
14HPX-024-230-XX	-01, -02, -10, -11, -12, -13, -14, -15	-17, -18
14HPX-030-230-XX	-01, -02, -10, -11, -12, -13, -14	-17, -18
14HPX-036-230-XX	-01, -02, -10, -11, -12	-17, -18
14HPX-042-230-XX	-01, -02, -10, -11, -12	-17, -18
14HPX048-230-XX	-01, -02, -10, -11, -12	-17, -18
14HPX-060-230-XX	-01, -02, -10, -11, -12	-17, -18

HFC-410A CHARGING INFORMATION

Maintenance checks using the Normal Operating Pressures table

Table 1 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Matchups/Charge Levels and Line Set Lengths

Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 2, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 2 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 2 are based on 65-75°F (18-24°C) indoor return air temperature.

Table 1 - Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

The values in this table are "most-popular-match-up" pressures; indoor match up, indoor air quantity, and indoor load will cause the pressures to vary.

Model	-018	-024	-030	-036	-042	-048	-060
°F (°C)*	Liquid Line Pressure / Vapor Line Pressure						
COOLING							
65 (18)	226 / 140	233 / 137	238 / 138	220 / 138	223 / 125	231 / 136	243 / 136
70 (21)	244 / 141	252 / 138	263 / 139	236 / 140	241 / 130	248 / 139	263 / 137
75 (24)	263 / 142	271 / 140	279 / 139	256 / 141	261 / 134	271 / 140	282 / 138
80 (27)	283 / 143	292 / 141	299 / 140	276 / 142	282 / 138	291 / 142	306 / 139
85 (29)	302 / 144	314 / 142	324 / 141	298 / 143	302 / 139	312 / 143	327 / 140
90 (32)	328 / 145	338 / 143	340 / 142	321 / 144	326 / 140	335 / 144	351 / 141
95 (35)	351 / 146	361 / 145	375 / 145	344 / 144	349 / 141	359 / 145	376 / 142
100 (38)	376 / 147	387 / 146	397 / 145	369 / 146	374 / 142	384 / 146	401 / 143
105 (41)	402 / 148	412 / 147	424 / 147	394 / 147	399 / 143	411 / 148	426 / 145
110 (38)	430 / 149	441 / 148	454 / 150	421 / 148	428 / 145	439 / 149	452 / 146
115 (45)	465 / 150	471 / 151	485 / 150	449 / 149	455 / 146	468 / 150	484 / 148
HEATING							
60 (15)	346 / 139	352 / 138	338 / 137	350 / 134	373 / 139	355 / 130	351 / 117
50 (10)	323 / 117	331 / 114	334 / 112	331 / 117	363 / 117	336 / 113	333 / 105
40 (4)	306 / 98	304 / 99	312 / 93	313 / 97	348 / 97	315 / 88	316 / 88
30 (-1)	278 / 84	299 / 80	302 / 74	298 / 83	336 / 74	296 / 72	308 / 70
20 (-7)	273 / 66	283 / 66	280 / 53	284 / 66	322 / 64	286 / 64	300 / 61
***Temperature of the air entering the outdoor coil.**							

Table 2 - Indoor Units Matchups and Subcooling Charge Levels

INDOOR MATCHUPS	Target Subcooling Heating (±5°F)	Target Subcooling Cooling (±1°F)	*Add charge lb	*Add charge oz
14HPX/XP14–018			**lb**	**oz**
CBX27UH-018/024	13	7	0	8
CBX32MV-018/024	15	7	0	0
CBX40UHV-024	15	7	0	0
14HPX/XP14–024			**lb**	**oz**
CBX26UH-024	25	7	0	0
CBX27UH-018/024	15	8	1	2
CBX32M-018/024	16	8	0	14
CBX32M-030	15	8	1	3
CBX32MV-018/024	16	8	0	14
CBX32MV-024/030	15	8	1	2
CBX40UHV-024	16	8	0	14
CBX40UHV-030	15	8	1	2
CH23-41	16	8	0	2
CH33-25A	16	6	0	7
CH33-42B	14	11	1	10
CH33-36A	16	8	1	0
CH33-36C	16	8	0	4
CR33-30/36A/B/C	25	7	0	2
CX34-25A/B	16	8	0	14
CX34-31A/B	15	8	1	3
CX34-36A/B/C	16	8	1	8
CX34-38A/B S/N# 6007 and after	11	11	2	2
CX34-38A/B before S/N# 6007	14	11	2	2
14HPX/XP14–030			**lb**	**oz**
CH23-41	11	6	0	8
CH23-51	6	6	1	12
CBX26UH-024	30	8	0	6
CBX26UH-030	29	8	2	3
CBX27UH-030	11	6	2	4
CBX32M-030	11	6	1	6
CBX32M-036, CBX27UH-036	11	6	2	4
CBX32MV-024/030	11	6	1	6
CBX32MV-036	15	7	3	0
CBX40UHV-024 and -030	11	6	1	6
CBX40UHV-036	15	7	3	0
C33-44C	11	6	2	3
CH33-36C	11	3	0	0

INDOOR MATCHUPS	Target Subcooling Heating (±5°F)	Target Subcooling Cooling (±1°F)	*Add charge lb	*Add charge oz
14HPX/XP14–030 (Continued)			**lb**	**oz**
CH33-42B	6	6	1	12
CR33-30/36A/B/C	30	8	0	8
CX34-31A/B	11	6	1	6
CX34-38A/B S/N# 6007 and after	6	6	2	3
CX34-38A/B Before S/N# 6007	11	6	2	3
14HPX/XP14/TPA*H4–036			**lb**	**oz**
C33-44C	13	6	0	0
CBX26UH-036	26	5	0	0
CBX26UH-037	25	4	1	9
CBX27UH-036	13	6	0	3
CBX32M-036	13	6	0	2
CBX32M-042	13	6	0	3
CBX32MV-036	13	6	0	3
CBX32MV-048	11	8	2	5
CBX40UHV-036	13	6	0	3
CBX40UHV-042 and -048	11	8	2	5
CH33-50/60C	11	8	2	5
CH33-48B	13	6	1	8
CR33-50/60C	25	4	1	15
CR33-48B/C	25	5	0	9
CX34-49C	13	6	2	4
CX34-43B/C and -50/60C	13	6	1	8
CX34-38A/B S/N# 6007 and after and -44/48	6	6	0	0
CX34-38A/B before S/N# 6007	13	6	0	0
14HPX/XP14/TPA*H4–042			**lb**	**oz**
CH23-68	20	9	0	13
CBX26UH-042	27	6	0	0
CBX27UH-042	12	6	0	8
CBX32M-048	12	6	0	7
CBX32MV-048	12	6	0	8
CBX40UHV-042 and -048	12	6	0	8
CH33-43	12	6	0	7
CH33-62D	12	6	0	10
CH33-50/60C	12	6	0	7
CH33-60D	12	6	0	4

INDOOR MATCHUPS	Target Subcooling Heating (±5°F)	Target Subcooling Cooling (±1°F)	*Add charge lb	*Add charge oz
14HPX/XP14/TPA*H4–042 (Continued)			**lb**	**oz**
CR33-50/60C and -60D	26	6	0	4
CX34-62C and -62D	12	6	0	9
CX34-49C	12	6	0	7
CX34-60D	12	6	0	4
14HPX/XP14/TPA*H4–048			**lb**	**oz**
CBX26UH-048	8	7	1	9
CBX27UH-048	11	8	1	2
CBX32M-048 and -060	11	8	1	2
CBX32MV-048	25	8	0	0
CBX32MV-060	11	8	1	2
CBX40UHV-048	25	8	0	0
CBX40UHV-060	11	8	1	2
CBX32MV-068	10	7	1	12
CH23-68	20	9	2	9
CH33-50/60C	11	8	1	1
CH33-62D	10	7	1	14
CH33-60D	11	8	0	0
CR33-50/60C	35	5	0	0
CR33-60D	37	6	0	0
CX34-62C and -62D	10	7	1	7
CX34-49C	11	8	0	14
CX34-60D	11	8	0	0
14HPX/XP14/TPA*H4–060			**lb**	**oz**
CBX26UH-048	12	7	1	0
CBX26UH-060	13	7	0	0
CBX27UH-060	12	5	0	0
CBX32M-048 and -060	12	5	0	0
CBX32MV-048 and -060	12	5	0	0
CBX40UHV-048 and -060	12	5	0	0
CBX32MV-068	12	7	1	0
CH23-68	12	5	0	0
CH33-50/60C	12	5	0	0
CH33-62D	12	5	0	0
CX34-62C and -62D	12	7	1	0

*Add charge = Extra matchup amount required in addition to charge indicated on Heat Pump nameplate (remember to also add any charge required for line set differences from 15 feet). **SN** indicates serial number.

HFC-410A CHARGING INFORMATION

Maintenance checks using the Normal Operating Pressures table

Table 2 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matchups/Charge Levels and Line Set Lengths

Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Table 1 - Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 - Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP SIZE	Indoor Coil or Air Handler	Subcool		Additional Charge		HP SIZE	Indoor Coil or Air Handler	Subcool		Additional Charge		HP SIZE	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat	Cool					Heat	Cool					Heat	Cool		
-018	CBX27UH-018	13	14	1	9	-030	CH33-42B	16	18	2	6	-042	CH33-60D	12	8	0	9
	CBX27UH-024	13	14	1	9		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CBX32MV-018/024	12	14	0	0		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
	CH33-25A	14	14	0	7		CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CH33-25B	14	13	0	5		CX34-36	25	6	0	10		CX34-49	11	6	1	4
	CR33-30/36	12	5	0	7		CX34-38	10	19	2	14		CX34-50, -60	25	8	1	15
	CX34-25	15	15	1	1		CX34-42	25	6	0	10		CX34-60	8	8	1	4
	CX34-31	14	24	1	12		CX34-43	13	17	2	14		CX34-62C	8	11	3	10
-024	CBX25UH-024	6	6	0	9		CX34-44, -48	9	21	2	12		CX34-62D	11	7	1	15
	CBX25UH-030	17	3	0	15	-036	CBX25UH-036	31	3	0	4	-048	CBX25UH-048	15	6	2	5
	CBX26UH-024	17	3	0	15		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-024	12	12	1	2		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX32M-018, -024	14	11	0	4		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-030	12	12	1	2		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32MV-018/024	14	11	0	4		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-024/030	12	12	1	2		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-036	11	11	2	1		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX40UHV-024	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-030	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
	CH23-41	10	3	0	0		CBX40UHV-048	11	4	0	1		CBX40UHV-060	20	8	1	0
	CH33-25A	20	10	1	1		CBX40UHV-036	18	3	0	5		CH23-68	24	6	2	8
	CH33-25B	19	8	1	2		CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-31A	15	11	1	15		CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-36C	10	12	0	0		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36A	20	10	1	1		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CX34-25	15	9	0	15		CH33-50/60C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-31	15	16	0	9		CR33-48	38	5	0	0		CX34-60	28	7	3	14
	CX34-36	26	6	0	9		CR33-50, -60	15	5	1	4		CX34-62C	10	6	3	12
	CX34-38	10	18	1	14		CX34-38	15	4	0	9		CX34-62D	14	7	3	12
-030	CBX25UH-030	9	3	0	8		CX34-43	23	8	2	8	-060	CBX25UH-060	15	6	2	0
	CBX25UH-036	19	11	1	5		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX26UH-030	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX27UH-030	10	16	1	14		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-036	10	16	1	14	-042	CBX25UH-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX32M-030	15	4	2	7		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-036	10	16	1	14		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32MV-024, -030	15	4	2	7		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-036	10	16	1	14		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX40UHV-030	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2
	CH33-36B	6	3	0	0		CH33-49C	16	6	1	6						
	CH33-36C	10	11	1	5		CH33-50, -60C	10	9	3	4						

The values in this table are "most-popular-match-up" pressures; indoor match up, indoor air quantity, and indoor load will cause the pressures to vary.
**Amount of charge required in additional to charge shown on unit nameplate.*

HFC-410A CHARGING INFORMATION — FOR COMPLETE CHARGING DETAILS, REFER TO THE OUTDOOR UNIT INSTALLATION AND SERVICE PROCEDURE

Maintenance checks using the Normal Operating Pressures table

Table 2 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matchups/Charge Levels and Line Set Lengths

Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Table 1 - Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 - Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat Heat	Cool Cool	lbs	oz			Heat	Cool	lbs	oz			Heat	Cool	lbs	oz
	CBX27UH-018	13	14	1	9		CH33-36C	10	11	1	5						
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-60D	12	8	0	9
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CH33-25A	14	14	0	7		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
-018	CH33-25B	14	13	0	5	-030	CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CR33-30/36	12	5	0	7		CX34-36	25	6	0	10	-042	CX34-49	11	6	1	4
	CX34-25	15	15	1	1		CX34-38	10	19	2	14		CX34-50, -60	25	8	1	15
	CX34-31	14	24	1	12		CX34-42	25	6	0	10		CX34-60	8	8	1	4
							CX34-43	13	17	2	14		CX34-62C	8	11	3	10
	CBX25UH-024	6	6	0	9		CX34-44, -48	9	21	2	12		CX34-62D	11	7	1	15
	CBX25UH-030	17	3	0	15		CBX25UH-036	31	3	0	4		CBX25UH-048	15	6	2	5
	CBX26UH-024	17	3	0	15		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-024	12	12	1	2		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX27UH-030	11	11	2	1		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-018, -024	14	11	0	4		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32M-030	12	12	1	2		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-018/024	14	11	0	4		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-024/030	12	12	1	2		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX32MV-036	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-024	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
-024	CBX40UHV-030	11	11	2	1		CBX40UHV-048	11	4	0	1	-048	CBX40UHV-060	20	8	1	0
	CH23-41	10	3	0	0		CBX40UHV-036	18	3	0	5		CH23-68	24	6	2	8
	CH33-25A	20	10	1	1		CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-25B	19	8	1	2	-036	CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-31A	15	11	1	15		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36C	10	12	0	0		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CH33-36A	20	10	1	1		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-50/60C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-25	15	9	0	15		CR33-48	38	5	0	0		CX34-60	28	7	3	14
	CX34-31	15	16	0	9		CR33-50, -60	15	5	1	4		CX34-62C	10	6	3	12
	CX34-36	26	6	0	9		CX34-38	15	4	0	9		CX34-62D	14	7	3	12
	CX34-38	10	18	1	14		CX34-43	23	8	2	8		CBX25UH-060	15	6	2	0
	CBX25UH-030	9	3	0	8		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX25UH-036	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX26UH-030	19	11	1	5		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-030	10	16	1	14		CBX25UH-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX27UH-036	10	16	1	14		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-030	15	4	2	7		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32M-036	10	16	1	14		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-024, -030	15	4	2	7		CBX32MV-048	13	5	2	2	-060	CBX40UHV-060	17	5	1	4
-030	CBX32MV-036	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-030	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CBX40UHV-036	10	16	1	14	-042	CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-41	11	4	0	8		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH23-51	11	6	0	14		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31A	16	18	2	8		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-31B	16	18	2	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2
	CH33-36A	10	6	0	6		CH33-49C	16	6	1	6						
	CH33-36B	6	3	0	0		CH33-50, -60C	10	9	3	4						

The values in this table are *most popular match-up* pressures; indoor match-up, indoor air quantity, and indoor load will cause the pressures to vary. **Amount of charge required in addition to charge shown on unit nameplate.*

HFC-410A CHARGING INFORMATION — FOR COMPLETE CHARGING DETAILS, REFER TO THE OUTDOOR UNIT INSTALLATION AND SERVICE PROCEDURE

Maintenance checks using the Normal Operating Pressures table

Table 2 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matchups/Charge Levels and Line Set Lengths

Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Table 1 - Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 - Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool(±1ºF)	lbs	oz			Heat (±5ºF)	Cool(±1ºF)	lbs	oz
-018	CBX27UH-018	13	14	1	9	-030	CH33-36C	10	11	1	5	-042	CH33-60D	12	8	0	9
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-62D	19	7	1	7
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CR33-50, -60	29	5	0	4
	CH33-25A	14	14	0	7		CR33-30, -36	22	5	1	0		CR33-60D	29	5	0	4
	CH33-25B	14	13	0	5		CX34-31	17	15	2	10		CX34-49	11	6	1	4
	CR33-30/36	12	5	0	7		CX34-36	25	6	0	10		CX34-50, -60	25	8	1	15
	CX34-25	15	15	1	1		CX34-38	10	19	2	14		CX34-60	8	8	1	4
	CX34-31	14	24	1	12		CX34-42	25	6	0	10		CX34-62C	8	11	3	10
-024	CBX25UH-024	6	6	0	9		CX34-43	13	17	2	14		CX34-62D	11	7	1	15
	CBX25UH-030	17	3	0	15		CX34-44, -48	9	21	2	12	-048	CBX25UH-048	15	6	2	5
	CBX26UH-024	17	3	0	15	-036	CBX25UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-024	12	12	1	2		CBX26UH-036	31	3	0	4		CBX27UH-048	16	6	0	0
	CBX27UH-030	11	11	2	1		CBX27UH-036	18	3	0	5		CBX27UH-060	12	6	1	4
	CBX32M-018, -024	14	11	0	4		CBX27UH-042	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32M-030	12	12	1	2		CBX27UH-048	11	4	0	1		CBX32M-060	20	8	1	0
	CBX32MV-018/024	14	11	0	4		CBX32M-036	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-024/030	12	12	1	2		CBX32M-042	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX32MV-036	11	11	2	1		CBX32MV-036	18	3	0	5		CBX32MV-068	10	8	4	5
	CBX40UHV-024	11	11	2	1		CBX32MV-048	11	4	0	1		CBX40UHV-048	16	6	0	0
	CBX40UHV-030	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-060	20	8	1	0
	CH23-41	10	3	0	0		CBX40UHV-048	11	4	0	1		CH23-68	24	6	2	8
	CH33-25A	20	10	1	1		CBX40UHV-036	18	3	0	5		CH33-50, -60C	17	6	1	5
	CH33-25B	19	8	1	2		CH33-43B	14	8	2	1		CH33-60D	18	6	0	13
	CH33-31A	15	11	1	15		CH33-43C	26	9	2	10		CH33-62D	13	7	3	6
	CH33-36C	10	12	0	0		CH33-44/48B	24	8	2	3		CR33-50/60	19	6	1	1
	CH33-36A	20	10	1	1		CH33-48C	26	9	2	10		CR33-60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-49C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-25	15	9	0	15		CH33-50/60C	15	8	2	12		CX34-60	28	7	3	14
	CX34-31	15	16	0	9		CR33-48	38	5	0	0		CX34-62C	10	6	3	12
	CX34-36	26	6	0	9		CR33-50, -60	15	5	1	4		CX34-62D	14	7	3	12
	CX34-38	10	18	1	14		CX34-38	15	4	0	9						
-030	CBX25UH-030	9	3	0	8		CX34-43	23	8	2	8	-060	CBX25UH-060	15	6	2	0
	CBX25UH-036	19	11	1	5		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX26UH-030	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX27UH-030	10	16	1	14		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-036	10	16	1	14	-042	CBX25UH-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX32M-030	7	10	1	3		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-036	10	16	1	14		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32MV-024/030	7	10	1	3		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-036	10	16	1	14		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX40UHV-030	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2
	CH33-36B	6	3	0	0		CH33-49C	16	6	1	6						
							CH33-50, -60C	10	9	3	4						

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Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Table 1 - Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 - Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz
-018	CBX25UHV-018	18	5	0	0	-030	CH33-36B	6	3	0	0	-042	CH33-49C	16	6	1	6
	CBX27UH-018	13	14	1	9		CH33-36C	10	11	1	5		CH33-50, -60C	10	9	3	4
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-60D	12	8	0	9
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CH33-25A	14	14	0	7		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
	CH33-25B	14	13	0	5		CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CR33-30/36	12	5	0	7		CX34-36	25	6	0	10		CX34-49	11	6	1	4
	CX34-25	15	15	1	1		CX34-38	10	19	2	14		CX34-50, -60	25	8	1	15
	CX34-31	14	24	1	12		CX34-42	25	6	0	10		CX34-60	8	8	1	4
-024	CBX25UH-024 CBX25UHV-024	6	6	0	9		CX34-43	13	17	2	14		CX34-62C	8	11	3	10
	CBX25UH-030 CBX25UHV-030	17	3	0	15		CX34-44, -48	9	21	2	12		CX34-62D	11	7	1	15
	CBX26UH-024	17	3	0	15		CBX25UH-036 CBX25UHV-036	31	3	0	4		CBX25UH-048 CBX25UHV-048	15	6	2	5
	CBX27UH-024	12	12	1	2		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-030	11	11	2	1		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX32M-018, -024	14	11	0	4		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-030	12	12	1	2		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32MV-018/024	14	11	0	4		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-024/030	12	12	1	2		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-036	11	11	2	1		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX40UHV-024	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-030	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
	CH23-41	10	3	0	0		CBX40UHV-048	11	4	0	1	-048	CBX40UHV-060	20	8	1	0
	CH33-25A	20	10	1	1		CBX40UHV-036	18	3	0	5		CH23-68	24	6	2	8
	CH33-25B	19	8	1	2	-036	CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-31A	15	11	1	15		CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-36C	10	12	0	0		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36A	20	10	1	1		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CX34-25	15	9	0	15		CH33-50/60C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-31	15	16	0	9		CR33-48	38	5	0	0		CX34-60	28	7	3	14
	CX34-36	26	6	0	9		CR33-50, -60	15	5	1	4		CX34-62C	10	6	3	12
	CX34-38	10	18	1	14		CX34-38	15	4	0	9		CX34-62D	14	7	3	12
-030	CBX25UH-030 CBX25UHV-030	9	3	0	8		CX34-43	23	8	2	8		CBX25UH-060 CBX25UHV-060	15	6	2	0
	CBX25UH-036	19	11	1	5		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX26UH-030	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX27UH-030	10	16	1	14		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-036	10	16	1	14	-042	CBX25UH-042 CBX25UHV-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX32M-030	7	10	1	3		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-036	10	16	1	14		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32MV-024/030	7	10	1	3		CBX32M-048	13	5	2	2	-060	CBX40UHV-048	20	6	0	0
	CBX32MV-036	10	16	1	14		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX40UHV-030	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2

The values in this table are *most popular match-up* pressures; indoor match-up, indoor air quantity, and indoor load will cause the pressures to vary. **Amount of charge required in addition to charge shown on unit nameplate.*

HFC-410A CHARGING INFORMATION — FOR COMPLETE CHARGING DETAILS, REFER TO THE OUTDOOR UNIT INSTALLATION AND SERVICE PROCEDURE

Maintenance checks using the Normal Operating Pressures table

Table 2 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matchups/Charge Levels and Line Set Lengths

Table 2 lists all the Lennox recommended indoor unit matchups along with the charge levels for the various sizes of outdoor units. ***Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; be sure to consider any difference in line set length (see Installation Instructions for more details).***

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available use the Subcooling method.

Table 1 – Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 – Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz
-018	CBX25UH-018 CBX25UHV-018	18	5	0	0	-030	CH33-36B	6	3	0	0	-042	CH33-49C	16	6	1	6
	CBX27UH-018	13	14	1	9		CH33-36C	10	11	1	5		CH33-50, -60C	10	9	3	4
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-60D	12	8	0	9
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CH33-25A	14	14	0	7		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
	CH33-25B	14	13	0	5		CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CR33-30/36	12	5	0	7		CX34-36	25	6	0	10		CX34-49	11	6	1	4
	CX34-25	15	15	1	1		CX34-38	10	19	2	14		CX34-50, -60	25	8	1	15
	CX34-31	14	24	1	12		CX34-42	25	6	0	10		CX34-60	8	8	1	4
-024	CBX25UH-024 CBX25UHV-024	6	6	0	9		CX34-43	13	17	2	14		CX34-62C	8	11	3	10
	CBX25UH-030 CBX25UHV-030	17	3	0	15		CX34-44, -48	9	21	2	12		CX34-62D	11	7	1	15
	CBX26UH-024	17	3	0	15	-036	CBX25UH-036 CBX25UHV-036	31	3	0	4	-048	CBX25UH-048 CBX25UHV-048	15	6	2	5
	CBX27UH-024	12	12	1	2		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-030	11	11	2	1		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX32M-018, -024	14	11	0	4		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-030	12	12	1	2		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32MV-018/024	14	11	0	4		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-024/030	12	12	1	2		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-036	11	11	2	1		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX40UHV-024	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-030	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
	CH23-41	10	3	0	0		CBX40UHV-048	11	4	0	1		CBX40UHV-060	20	8	1	0
	CH33-25A	20	10	1	1		CBX40UHV-036	18	3	0	5		CH23-68	24	6	2	8
	CH33-25B	19	8	1	2		CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-31A	15	11	1	15		CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-36C	10	12	0	0		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36A	20	10	1	1		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CX34-25	15	9	0	15		CH33-50/60C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-31	15	16	0	9		CR33-48	38	5	0	0		CX34-60	28	7	3	14
	CX34-36	26	6	0	9		CR33-50, -60	15	5	1	4		CX34-62C	10	6	3	12
	CX34-38	10	18	1	14		CX34-38	15	4	0	9		CX34-62D	14	7	3	12
-030	CBX25UH-030 CBX25UHV-030	9	3	0	8		CX34-43	23	8	2	8		CBX25UH-060 CBX25UHV-060	15	6	2	0
	CBX25UH-036	19	11	1	5		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX26UH-030	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX27UH-030	10	16	1	14		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-036	10	16	1	14	-042	CBX25UH-042 CBX25UHV-042	42	5	0	8	-060	CBX32MV-048	20	6	0	0
	CBX32M-030	7	10	1	3		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-036	10	16	1	14		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32MV-024/030	7	10	1	3		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-036	10	16	1	14		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX40UHV-030	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2

The values in this table are *most popular match-up* pressures; indoor match-up, indoor air quantity, and indoor load will cause the pressures to vary. **Amount of charge required in addition to charge shown on unit nameplate.*

HFC-410A CHARGING INFORMATION — FOR COMPLETE CHARGING PROCEDURES, REFER TO THE APPLICABLE INSTALLATION OR SERVICE MANUAL

Maintenance checks using the Normal Operating Pressures table

Table 1 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matched System Components/Charge Levels/Line Set Lengths/Liquid Line Sizing

Table 2 lists all the Lennox recommended indoor unit matches along with the charge levels for the various sizes of outdoor units. Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; consider line set length and liquid line sizing differences when calculating charge adjustments. For each additional foot of 3/8" liquid line set, add 0.6 ounces or for 1/2" liquid lines, add 1.0 ounces of additional charge.

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available, use the Subcooling method.

Table 1 – Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 – Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz
-018	CBX25UH-018 CBX25UHV-018	18	5	0	0	-030	CH33-36B	6	3	0	0	-042	CH33-49C	16	6	1	6
	CBX27UH-018	13	14	1	9		CH33-36C	10	11	1	5		CH33-50, -60C	10	9	3	4
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-60D	12	8	0	9
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CH33-25A	14	14	0	7		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
	CH33-25B	14	13	0	5		CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CR33-30/36	12	5	0	7		CX34-36	25	6	0	10		CX34-49	11	6	1	4
	CX34-25	15	15	1	1		CX34-38	10	19	2	14		CX34-50, -60	25	8	1	15
	CX34-31	14	24	1	12		CX34-42	25	6	0	10		CX34-60	8	8	1	4
-024	CBX25UH-024 CBX25UHV-024	6	6	0	9		CX34-43	13	17	2	14		CX34-62C	8	11	3	10
	CBX25UH-030 CBX25UHV-030	17	3	0	15		CX34-44, -48	9	21	2	12		CX34-62D	11	7	1	15
	CBX26UH-024	17	3	0	15	-036	CBX25UH-036 CBX25UHV-036	31	3	0	4	-048	CBX25UH-048 CBX25UHV-048	15	6	2	5
	CBX27UH-024	12	12	1	2		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-030	11	11	2	1		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX32M-018, -024	14	11	0	4		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-030	12	12	1	2		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32MV-018/024	14	11	0	4		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-024/030	12	12	1	2		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-036	11	11	2	1		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX40UHV-024	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-030	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
	CH23-41	10	3	0	0		CBX40UHV-048	11	4	0	1		CBX40UHV-060	20	8	1	0
	CH33-25A	20	10	1	1		CBX40UHV-036	18	3	0	5		CH23-68	24	6	2	8
	CH33-25B	19	8	1	2		CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-31A	15	11	1	15		CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-36C	10	12	0	0		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36A	20	10	1	1		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CX34-25	15	9	0	15		CH33-50/60C	15	8	2	12		CX34-49C	10	6	1	9
	CX34-31	15	16	0	9		CR33-48	38	5	0	0		CX34-60	28	7	3	14
	CX34-36	26	6	0	9		CR33-50, -60	15	5	1	4		CX34-62C	10	6	3	12
	CX34-38	10	18	1	14		CX34-38	15	4	0	9		CX34-62D	14	7	3	12
-030	CBX25UH-030 CBX25UHV-030	9	3	0	8		CX34-43	23	8	2	8	-060	CBX25UH-060 CBX25UHV-060	15	6	2	0
	CBX25UH-036	19	11	1	5		CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX26UH-030	19	11	1	5		CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX27UH-030	10	16	1	14		CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-036	10	16	1	14	-042	CBX25UH-042 CBX25UHV-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX32M-030	7	10	1	3		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-036	10	16	1	14		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32MV-024/030	7	10	1	3		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-036	10	16	1	14		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX40UHV-030	10	16	1	14		CBX40UHV-042	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBX40UHV-048	13	5	2	2		CH33-50, -60C	11	4	0	0
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CH33-62D	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-50/60	19	6	2	4
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CR33-60	23	6	1	3
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX34-62C	10	7	2	14
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0		CX34-62D	19	7	3	2

The values in this table are *most popular match-up* pressures; indoor match-up, indoor air quantity, and indoor load will cause the pressures to vary. **Amount of charge required in addition to charge shown on unit nameplate.*

HFC-410A CHARGING INFORMATION — FOR COMPLETE CHARGING PROCEDURES, REFER TO THE APPLICABLE INSTALLATION OR SERVICE MANUAL

Maintenance checks using the Normal Operating Pressures table

Table 1 may be used to help perform maintenance checks. This table is not a procedure for charging the system and any minor variations in the pressures may be expected due to differences in installations. However, significant deviations could mean that the system is not properly charged or that a problem exists with some component in the system.

Charge Using the Subcooling Method

Cooling Mode—When the outdoor ambient temperature is 60°F (15°C) and above, use the cooling mode to adjust the charge using the subcooling method. Target subcooling values in table 1 are based on 70 to 80°F (21-27°C) indoor return air temperature.

Heating Mode—When the outdoor ambient temperature is below 60°F (15°C), use the heating mode to adjust the charge using the subcooling charge levels (table). Target subcooling values in table 1 are based on 65-75°F (18-24°C) indoor return air temperature.

Matched System Components/Charge Levels/Line Set Lengths/Liquid Line Sizing

Table 2 lists all the Lennox recommended indoor unit matches along with the charge levels for the various sizes of outdoor units. Charge levels on the unit nameplate are based on installations with 15' (4.6m) line sets; consider line set length and liquid line sizing differences when calculating charge adjustments. For each additional foot of 3/8" liquid line set, add 0.6 ounces or for 1/2" liquid lines, add 1.0 ounces of additional charge.

Charge Using the Weigh-in Method

If the system is void of refrigerant, locate and repair any leaks and then weigh in the refrigerant charge into the unit. For charge adjustments, be sure to consider line set length differences and, referring to table 1, adjust for the matchup difference.

1 - Recover the refrigerant from the unit.
2 - Conduct leak check; evacuate as previously outlined.
3 - Weigh in the unit nameplate charge, adjusting for matchup and line set length differences. If weighing facilities are not available, use the Subcooling method.

Table 1 – Normal Operating Pressures (Liquid ±10 and Suction ±5 psig)

	Heating Mode					Cooling Mode										
°F (°C)*	20	30	40	50	60	65	70	75	80	85	90	95	100	105	110	115
SIZE	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ	VAP/LIQ
-018	67/ 272	83/ 287	100/305	118/321	137/339	145/242	145/259	146/279	147/302	148/326	149/351	151/376	151/406	153/433	154/462	155/498
-024	58/ 281	72/ 295	88/ 309	105/324	123/340	139/243	140/262	142/281	143/302	144/325	145/348	145/373	146/399	147/426	147/454	148/483
-030	55/ 274	69/ 286	84/ 299	102/313	122/327	135/250	136/268	138/288	140/308	141/330	143/352	144/376	145/400	147/426	148/452	149/480
-036	62/ 287	76/ 304	91/ 322	106/342	124/365	135/230	137/248	139/268	141/288	143/311	145/334	146/359	148/385	150/412	151/441	153/471
-042	58/ 293	73/ 335	89/ 368	108/394	130/411	127/215	129/234	131/254	132/275	134/298	136/321	137/346	139/371	140/398	141/426	142/455
-048	60/ 282	75/ 299	90/ 316	105/334	121/353	136/219	137/237	138/256	139/277	140/298	141/321	142/344	143/369	144/395	146/422	147/450
-060	56/ 266	70/ 285	84/ 309	99/ 337	114/369	132/222	133/241	134/262	135/283	137/306	138/330	139/354	141/380	142/406	143/434	144/463

**Temperature of the air entering the outside coil.*

Table 2 – Indoor Unit Matches and Subcooling Charge Levels and Additional Charge

HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge		HP Size	Indoor Coil or Air Handler	Subcool		Additional Charge	
		Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz			Heat (±5ºF)	Cool (±1ºF)	lbs	oz
-018	CBX25UH-018 CBX25UHV-018	18	5	0	0	-030	CH33-36B	6	3	0	0	-042	CH33-49C	16	6	1	6
	CBX27UH-018	13	14	1	9		CH33-36C	10	11	1	5		CH33-50, -60C	10	9	3	4
	CBX27UH-024	13	14	1	9		CH33-42B	16	18	2	6		CH33-60D	12	8	0	9
	CBX32MV-018/024	12	14	0	0		CH33-43C	4	9	1	12		CH33-62D	19	7	1	7
	CBA27UHE-018/024	12	10	1	2		CR33-30, -36	22	5	1	0		CR33-50, -60	29	5	0	4
	CH33-25A	14	14	0	7		CX38/CX34-31	17	15	2	10		CR33-60D	29	5	0	4
	CH33-25B	14	13	0	5		CX38/CX34-36	25	6	0	10		CX38/CX34-49	11	6	1	4
	CR33-30/36	12	5	0	7		CX38/CX34-38	10	19	2	14		CX38/CX34-50, -60	25	8	1	15
	CX38/CX34-25	15	15	1	1		CX38/CX34-42	25	6	0	10		CX38/CX34-60	8	8	1	4
	CX38/CX34-31	14	24	1	12		CX38/CX34-43	13	17	2	14		CX38/CX34-62C	8	11	3	10
-024	CBX25UH-024 CBX25UHV-024	6	6	0	9		CX38/CX34-44, -48	9	21	2	12		CX38/CX34-62D	11	7	1	15
	CBX25UH-030 CBX25UHV-030	17	3	0	15	-036	CBX25UH-036 CBX25UHV-036	31	3	0	4	-048	CBX25UH-048 CBX25UHV-048	15	6	2	5
	CBX26UH-024	17	3	0	15		CBX26UH-036	31	3	0	4		CBX26UH-048	20	10	3	11
	CBX27UH-024	12	12	1	2		CBX27UH-036	18	3	0	5		CBX27UH-048	16	6	0	0
	CBX27UH-030	11	11	2	1		CBX27UH-042	11	4	0	1		CBX27UH-060	12	6	1	4
	CBX32M-018, -024	14	11	0	4		CBX27UH-048	11	4	0	1		CBX32M-048	16	6	0	0
	CBX32M-030	12	12	1	2		CBX32M-036	18	3	0	5		CBX32M-060	20	8	1	0
	CBX32MV-018/024	14	11	0	4		CBX32M-042	18	3	0	5		CBX32MV-048	16	6	0	0
	CBX32MV-024/030	12	12	1	2		CBX32MV-036	18	3	0	5		CBX32MV-060	20	8	1	0
	CBX32MV-036	11	11	2	1		CBX32MV-048	11	4	0	1		CBX32MV-068	10	8	4	5
	CBX40UHV-024	11	11	2	1		CBX40UHV-042	11	4	0	1		CBX40UHV-048	16	6	0	0
	CBX40UHV-030	11	11	2	1		CBX40UHV-048	11	4	0	1		CBX40UHV-060	20	8	1	0
	CBA27UHE-024	16	11	1	7		CBX40UHV-036	18	3	0	5		CBA27UHE-048	16	6	1	6
	CBA27UHE-030	13	11	1	3		CBA27UHE-036	20	5	0	0		CBA27UHE-060	12	7	2	3
	CH23-41	10	3	0	0		CBA27UHE-042	16	6	0	11		CH23-68	24	6	2	8
	CH33-25A	20	10	1	1		CH33-43B	14	8	2	1		CH33-50, -60C	17	6	1	5
	CH33-25B	19	8	1	2		CH33-43C	26	9	2	10		CH33-60D	18	6	0	13
	CH33-31A	15	11	1	15		CH33-44/48B	24	8	2	3		CH33-62D	13	7	3	6
	CH33-36C	10	12	0	0		CH33-48C	26	9	2	10		CR33-50/60	19	6	1	1
	CH33-36A	20	10	1	1		CH33-49C	15	8	2	12		CR33-60	19	6	1	1
	CR33-30, -036	17	4	0	14		CH33-50/60C	15	8	2	12		CX38/CX34-49C	10	6	1	9
	CX38/CX34-25	15	9	0	15		CR33-48	38	5	0	0		CX38/CX34-60	28	7	3	14
	CX38/CX34-31	15	16	0	9		CR33-50, -60	15	5	1	4		CX38/CX34-62C	10	6	3	12
	CX38/CX34-36	26	6	0	9		CX38/CX34-38	15	4	0	9		CX38/CX34-62D	14	7	3	12
	CX38/CX34-38	10	18	1	14		CX38/CX34-43	23	8	2	8	-060	CBX25UH-060 CBX25UHV-060	15	6	2	0
-030	CBX25UH-030 CBX25UHV-030	9	3	0	8		CX38/CX34-44/48	40	4	0	15		CBX26UH-060	31	6	3	0
	CBX25UH-036	19	11	1	5		CX38/CX34-49	11	7	3	9		CBX27UH-060	13	7	0	8
	CBX26UH-030	19	11	1	5		CX38/CX34-50/60	23	8	2	8		CBX32M-060	17	5	1	4
	CBX27UH-030	10	16	1	14	-042	CBX25UH-042 CBX25UHV-042	42	5	0	8		CBX32MV-048	20	6	0	0
	CBX27UH-036	10	16	1	14		CBX26UH-042	42	5	0	8		CBX32MV-060	17	5	1	4
	CBX32M-030	7	10	1	3		CBX27UH-042, -048	13	5	2	2		CBX32MV-068	11	8	2	12
	CBX32M-036	10	16	1	14		CBX32M-048	13	5	2	2		CBX40UHV-048	20	6	0	0
	CBX32MV-024/030	7	10	1	3		CBX32MV-048	13	5	2	2		CBX40UHV-060	17	5	1	4
	CBX32MV-036	10	16	1	14		CBX40UHV-042	13	5	2	2		CBA27UHE-060	11	6	1	1
	CBX40UHV-030	10	16	1	14		CBX40UHV-048	13	5	2	2		CH23-68	27	7	0	13
	CBX40UHV-036	10	16	1	14		CBA27UHE-042	19	5	0	1		CH33-50, -60C	11	4	0	0
	CBA27UHE-030/036	10	11	1	8		CBA27UHE-048	18	6	1	6		CH33-62D	19	6	2	4
	CH23-41	11	4	0	8		CH23-68	20	9	1	5		CR33-50/60	19	6	2	4
	CH23-51	11	6	0	14		CH33-43B	7	9	3	2		CR33-60	23	6	1	3
	CH33-31A	16	18	2	8		CH33-43C	22	5	1	0		CX38/CX34-62C	10	7	2	14
	CH33-31B	16	18	2	6		CH33-44/48B	18	4	0	0		CX38/CX34-62D	19	7	3	2
	CH33-36A	10	6	0	6		CH33-48C	22	5	1	0						

The values in this table are *most popular match-up* pressures; indoor match-up, indoor air quantity, and indoor load will cause the pressures to vary. **Amount of charge required in addition to charge shown on unit nameplate.*