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Dallas, Texas, USA



INSTALLATION INSTRUCTIONS

15CHAX SERIES UNITS

PACKAGED ELECTRIC UNIT (2-5 TONS)
505,201M (38152A082)
01/08
Supersedes 05/06

TP Technical
Publications
Litho U.S.A.



**RETAIN THESE INSTRUCTIONS
FOR FUTURE REFERENCE**

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Shipping & Packing List

1 - Assembled packaged electric unit

As soon as the unit is received, it should be inspected for possible damage during transit. If you find any damage, immediately contact the last carrier.

⚠ WARNING

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

⚠ WARNING

If this unit is to be installed in a mobile or manufactured home application, the duct system must be sized to achieve static pressures within the manufacturer's guidelines. All other installation guidelines must also be followed. Failure to do so may result in equipment damage, personal injury and improper unit performance.

⚠ CAUTION

Danger of sharp metallic edges. Can cause injury. Take care when servicing unit to avoid accidental contact with sharp edges.

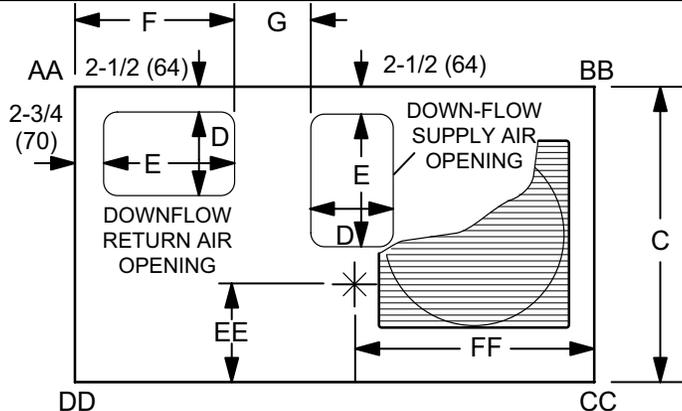
⚠ WARNING



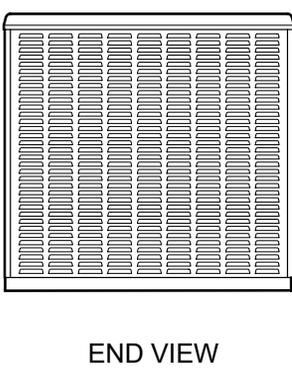
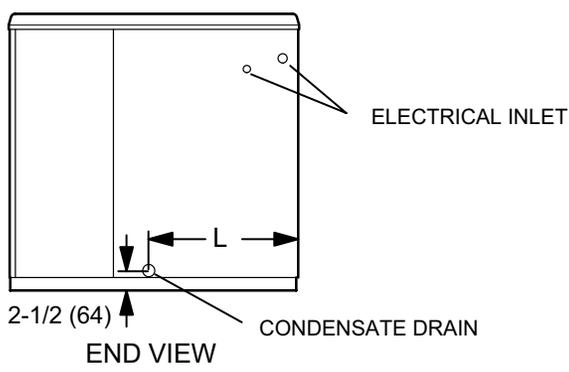
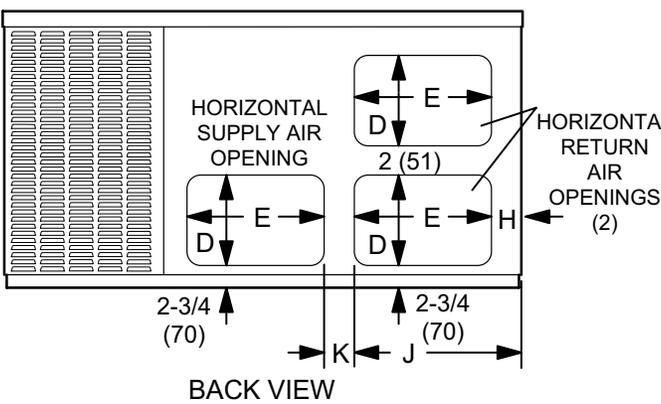
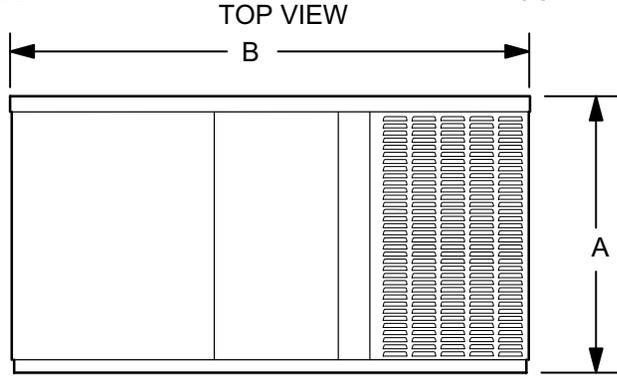
Electric shock hazard. Can cause injury or death. Before attempting to perform any service or maintenance, turn the electrical power to unit OFF at disconnect switch(es). Unit may have multiple power supplies.



15CHAX Unit Dimensions - inches (mm)



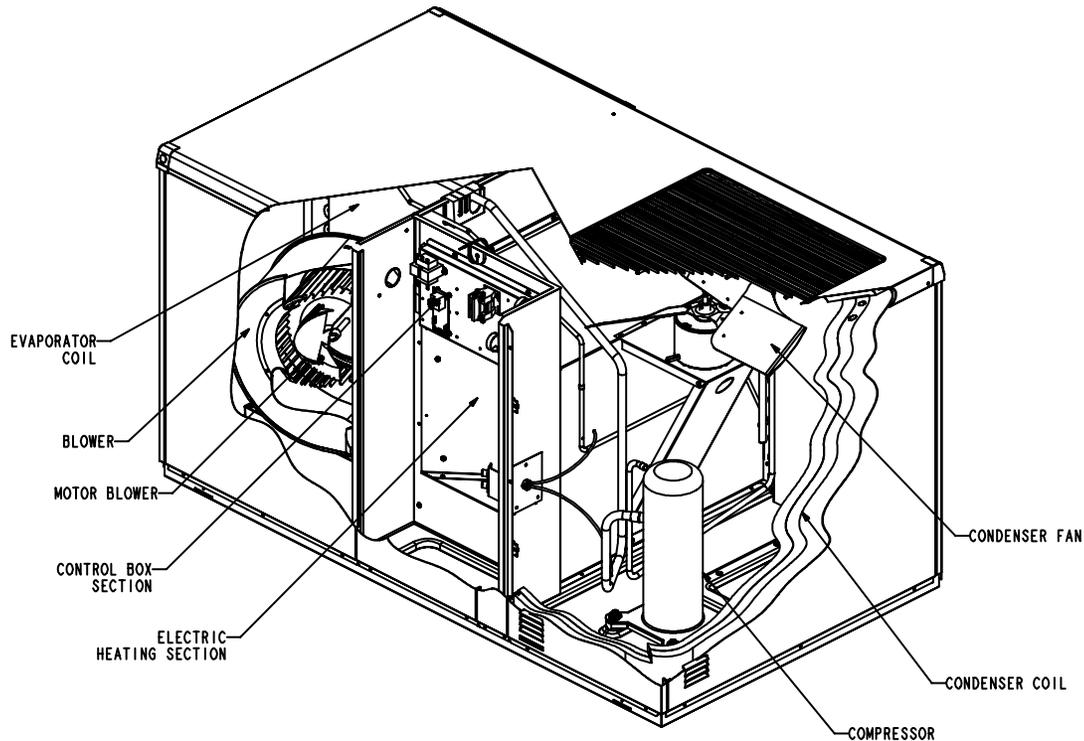
Model Number	Corner Weights				Center Of Gravity	
	AA lbs.	BB lbs.	CC lbs.	DD lbs.	EE in.	FF in.
15CHAX-24	75	94	117	94	16	29
15CHAX-30	75	94	117	94	16	29
15CHAX-36	83	97	121	104	16	30
15XHAX-42	110	138	163	129	21	33
15CHAX-48	114	139	164	134	21	33.5
15CHAX-60	119	145	171	140	21	33.5



Model No.	A		B		C		D		E		F	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
15CHAX-24												
15CHAX-30	34-1/4	870	65-3/8	1661	36-1/2	927	11-1/4	286	17-1/4	438	20	508
15CHAX-36												
15CHAX-42												
15CHAX-48	38-1/4	972	75	1905	46	1168	11-1/4	286	19-1/4	489	22	559
15CHAX-60												

Model No.	F		G		H		J		K		L	
	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm
15CHAX-24												
15CHAX-30	20	508	8-1/2	216	3	76	20-1/4	514	4-1/2	114	19	483
15CHAX-36												
15CHAX-42												
15CHAX-48	22	559	9-1/4	241	3-1/4	83	22-1/4	572	4	102	16-1/4	413
15CHAX-60												

Parts Arrangement



General

These installation instructions are intended as a general guide only, for use by an experienced, licensed contractor (or equivalent).

The 15CHAX units are single-package electric units designed for outdoor installation on a rooftop or a slab. The units are equipped with a transformer and blower control for applications which do not include electric heat. Electric heat sections are available for separate order.

The unit must be sized based on heat loss and heat gain calculations made according to the methods of the Air Conditioning Contractors of America (ACCA).

The units are shipped assembled. All piping, refrigerant charge, and electrical wiring are factory-installed and tested. The units require electric power, condensate drain and duct connections at the point of installation.

Use of this unit as a construction heater or air conditioner is not recommended during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

If this unit has been used for heating or cooling of buildings or structures under construction, the following conditions must be met or the warranty will be void:

- A room thermostat must control the unit. The use of fixed jumpers that will provide continuous heating or cooling is not allowed.

- A pre-filter must be installed at the entry to the return air duct.
- The return air duct must be provided and sealed to the unit.
- Return air temperature range between 55°F (13°C) and 80°F (27°C) must be maintained.
- Air filters must be replaced and pre-filter must be removed upon construction completion.
- The unit components, duct system, air filters and evaporator coil must be thoroughly cleaned following final construction clean-up.
- The unit operating conditions (including airflow, cooling operation, and heating operation) must be verified according to these installation instructions.

Requirements

These units must be installed in accordance with all applicable national and local safety codes.

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

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or customer's expense.

These units are design listed by UL in both the United States and Canada as follows:

- For use as a cooling unit.
- For outdoor installation only.

- For installation on combustible material.

⚠ WARNING

Product contains fiberglass wool.

Disturbing the insulation in this product during installation, maintenance, or repair will expose you to fiberglass wool dust. Breathing this may cause lung cancer. (Fiberglass wool is known to the State of California to cause cancer.)

Fiberglass wool may also cause respiratory, skin, and eye irritation.

To reduce exposure to this substance or for further information, consult material safety data sheets available from address shown below, or contact your supervisor.

Lennox Industries Inc.

**P.O. Box 799900
Dallas, TX 75379-9900**

Location Selection

Use the following guidelines to select a suitable location for these units.

- 1 - Unit is designed for outdoor installation only. Unit must be installed so all electrical components are protected from water.
- 2 - Condenser coils must have an unlimited supply of air.
- 3 - For ground level installation, use a level pre-fabricated pad or use a level concrete slab with a minimum thickness of 4 inches. The length and width should be at least 6 inches greater than the unit base. Do not tie the slab to the building foundation.
- 4 - Maintain level within a tolerance of 1/4 inch maximum across the entire length or width of the unit.

Rigging & Setting Unit

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. An optional lifting lug kit (92M51) may be purchased separately for use in rigging the unit for lifting. Spreaders **MUST** be used across the top of the unit. Recommended spreader length: 2, 2-1/2, 3-ton units -- 44"; 3-1/2, 4, 5-ton units -- 54".

⚠ CAUTION

Before lifting a unit, make sure that the weight is distributed equally on the cables so that it will lift evenly.

Units may also be moved or lifted with a forklift while still in the factory supplied packaging.

NOTE - Length of forks must be a minimum of 42 inches.

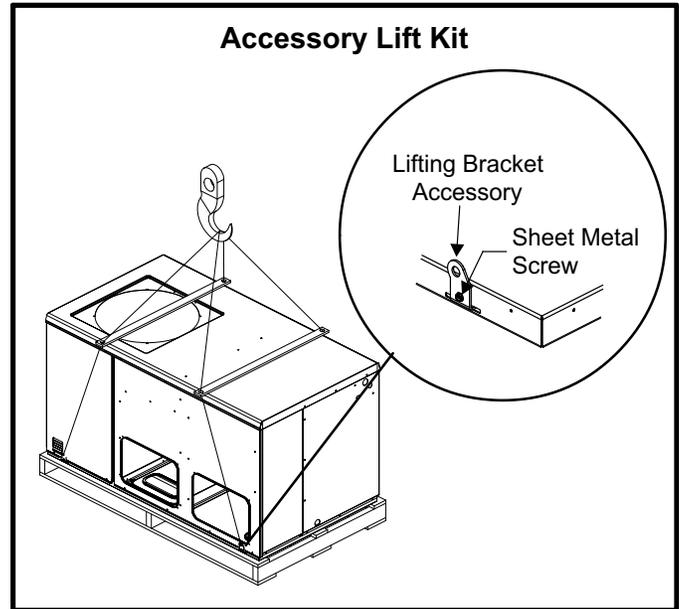


Figure 1

Clearances

All units require certain clearances for proper operation and service. Refer to figure 2 for the clearances required for combustible construction, servicing, and proper unit operation.

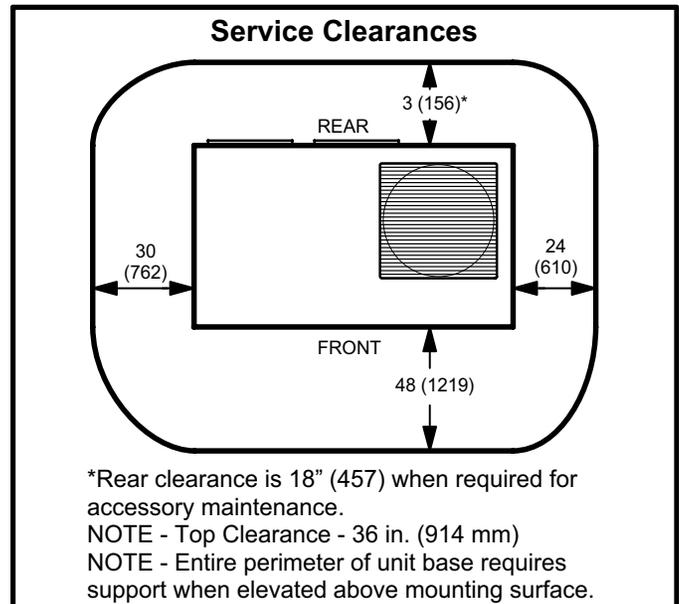


Figure 2

NOTE - Do not permit overhanging structures or shrubs to obstruct condenser air discharge outlet.

In the U.S. units may be installed on combustible floors made from wood or class A, B, or C roof covering material. In Canada, units may be installed on combustible floors.

Existing Common Vent Systems

The 15CHAX packaged cooling units with auxiliary electric heat may replace an existing furnace which is being removed from a venting system commonly run with separate gas appliances. In this case, the existing vent system is likely to be too large to properly vent the remaining attached appliances.

Conduct the following test while each appliance is operating and the other appliances (which are not operating) remain connected to the common venting system. If the venting system has been installed improperly, you **must** correct the system as indicated in the general venting requirements section.

- 1 - Seal any unused openings in the common venting system.
- 2 - Inspect the venting system for proper size and horizontal pitch. Determine that there is no blockage, restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.
- 3 - Close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliances not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- 4 - Follow the lighting instructions. Turn on the appliance that is being inspected. Adjust the thermostat so that the appliance operates continuously.
- 5 - After the main burner has operated for 5 minutes, test for leaks of flue gases at the draft hood relief opening. Use the flame of a match or candle, or smoke from a cigarette, cigar, or pipe.
- 6 - After determining that each appliance connected to the common venting system is venting properly, (step 3) return all doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliances to their previous mode of operation.
- 7 - If a venting problem is found during any of the preceding tests, the common venting system must be modified to correct the problem.

Resize the common venting system to the minimum vent pipe size determined by using the appropriate tables in Appendix G. (These are in the current standards of the National Fuel Gas Code ANSI-Z223.1/NFPA 54 in the USA, and the appropri-

ate Category 1 Natural Gas and Propane appliances venting sizing tables in the current standards of the CSA B149 Natural Gas and Propane Installation Codes in Canada.)

Condensate Drain

The 15CHAX unit is equipped with a 3/4 inch FPT coupling for condensate line connection. Plumbing must conform to local codes. Use a sealing compound on male pipe threads.

The drain line must be properly trapped and routed to a suitable drain. See figure 3 for proper drain arrangement. The drain line must pitch to an open drain or pump a minimum of 1 inch per 10 feet to prevent clogging of the line. Seal around drain connection with suitable material to prevent air leakage into return air system.

NOTE - Drain line connection may not carry the weight of the unsupported drain line. Support the drain line, if necessary.

Drain piping should not be smaller than drain connection at coil. An open vent in drain line will some times be required due to line length, friction and static pressure. Drains should be constructed in a manner to facilitate future cleaning.

NOTE - The condensate drain line MUST be trapped to provide proper drainage.

⚠ CAUTION

Condensate line connection must be hand-tightened. Do not use tools.

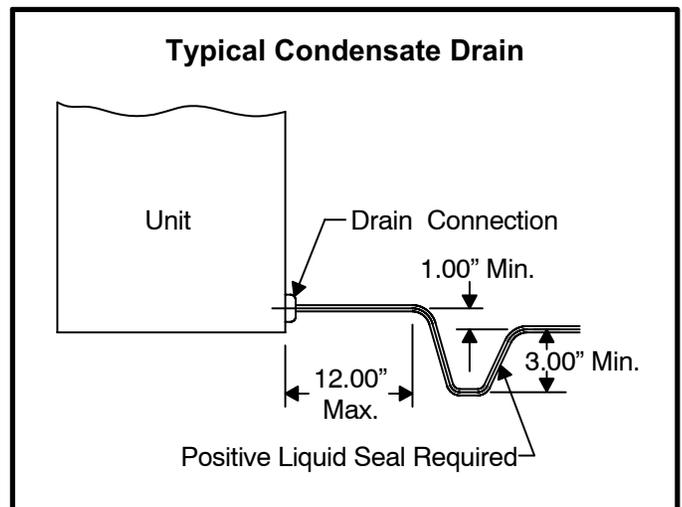


Figure 3

Filters

Filters are not factory-supplied with the unit; however, optional internally installed filter kits are available. Filter kit 92M54 is used with 2, 2-1/2 and 3-ton units. Filter kit 92M55 is used with 3-1/2, 4 and 5-ton units. The filter kits accommodate the use of 1", 2" or 4" filters. If the optional filter kit is not used, a filter must be field-installed.

Filters must always be installed ahead of evaporator coil and must be kept clean or replaced. Dirty filters will reduce the airflow of the unit. Filter sizes are shown in table 1.

**Table 1
Unit Filter Size**

Unit Model	Filter Size	Filter Quantity
-24, -30, -36	20 in. X 25 in.	1
-42, -48, -60	16 in. X 25 in.	2

The Healthy Climate® PureAir® air purification system (PCO20-28) may be used with 15CHAX units installed in horizontal air discharge applications only. Installation hardware kit (Y0629) is required to install the PCO20-28 (X8787) in the packaged unit. The PCO20-28 is designed for universal voltage, and is ready to operate at 208/230V. When used, the PCO should be installed before the unit is set in place and before the duct connections are made.

Supply & Return Duct Connections

The duct system should be designed and sized according to the methods in Manual Q of the Air Conditioning Contractors of America (ACCA).

A closed return duct system shall be used. This shall not preclude use of economizers or outdoor fresh air intake. It is recommended that supply and return duct connections at the unit be made with flexible joints.

The supply and return air duct systems should be designed for the CFM and static requirements of the job. **They should NOT be sized by simply matching the dimensions of the duct connections on the unit.**

Ducting installed outdoors MUST be insulated and waterproofed.

⚠ CAUTION

When fastening duct system to side duct flanges on unit, insert screws through duct flanges only. Do not insert screws through casing. Outdoor duct must be insulated and waterproofed.

The 15CHAX unit is shipped ready for horizontal air discharge (side duct connections). If bottom air discharge is desired, the covers must be removed from the supply and return air openings on the bottom of the unit and re-installed to cover the side openings.

Removing Supply and Return Air Opening Covers

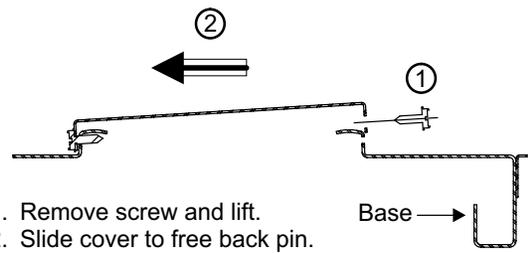


Figure 4

The upper return air opening cover must be removed when the PureAir® air purification system (PCO20-28) is being used. In PCO applications, both upper and lower return air openings must be covered by the return air plenum to ensure proper PCO operation. The upper return air opening is not required in horizontal applications when the PCO is not used.

Compressors

Units are shipped with the compressor mountings factory-adjusted and ready for operation.

⚠ CAUTION

Do not loosen compressor mounting bolts.

Electrical

All wiring should be done in accordance with the current National Electric Code ANSI/NFPA No. 70 in the United States. In Canada, wiring must be done in accordance with the current CSA C22.2 Part 1. Local codes may take precedence.

Use wiring with a temperature limitation of 75°C min.; run the 208 or 230 volt, 60 hertz electric power supply through a fused disconnect switch to control box of unit and connect as shown in the wiring diagram located on the inside of the control access panel. Refer to figure 5 for electrical access.

Electrical Access

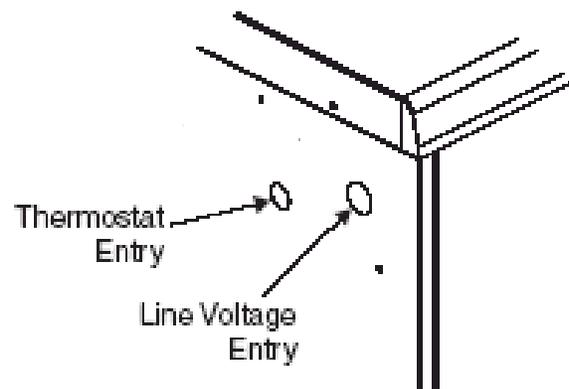


Figure 5

Unit must be electrically grounded in accordance with local codes or in the absence of local codes with the National Electric Code, ANSI/NFPA No. 70 (latest edition) or CSA C22.2 Part 1 (latest edition).

Power supply to the unit must comply with all applicable codes and NEC or CEC. A fused disconnect switch should be field provided for the unit. The switch must be separate from all other circuits. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical wiring must be sized to carry minimum circuit ampacity marked on the unit. **USE COPPER CONDUCTORS ONLY.** Each unit must be wired with a separate branch circuit and be properly fused.

⚠ WARNING

Unit is equipped with a single-pole contactor. Line voltage is present at all components when unit is not in operation. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies. Failure to disconnect all power supplies could result in personal injury or death.

⚠ CAUTION

When connecting electrical power and control wiring to the unit, waterproof type connectors **MUST** be used so that water or moisture cannot be drawn into the unit during normal operation.

⚠ WARNING

Unit must be grounded in accordance with national and local codes. Failure to ground unit properly can result in personal injury or death.

See figure 6 for typical field wiring connections and figure 7 for typical unit wiring diagram.

Optional Electric Heat

Optional electric heat is available and must be purchased separately. Install the electric heat section as outlined in

the installation instructions packaged with the electric heat section.

Thermostat

The room thermostat should be located on an inside wall where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow manufacturer's instructions enclosed with thermostat for general installation procedure. Color coded insulated wires (# 18 AWG) should be used to connect thermostat to unit.

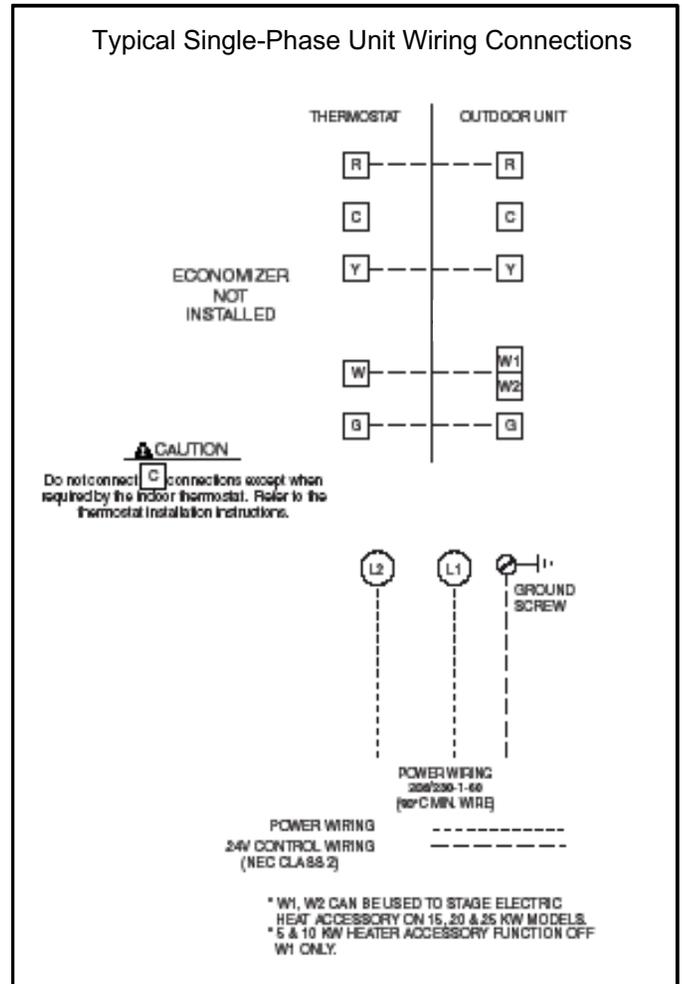


Figure 6

15CHAX Series Packaged Electric Units Typical Wiring Diagram

BLOWER SPEED CHART	
UNIT	FACTORY SHIPPED SETTINGS
	ADJUST HEAT COOL
24	NORM B B
30	NORM A A
36	NORM A A
42	NORM C C
48	NORM B B
60	NORM A A

NOTE:
IF ANY OF THE ORIGINAL WIRE IS REPLACED THE WIRE SIZE AND TYPE WIRE MUST BE USED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.
USE COPPER CONDUCTOR ONLY, MIN 15 C WIRE

LINE VOLTAGE FIELD INSTALLED

WARNING-
ELECTRIC SHOCK HAZARD. UNIT MUST BE GROUNDED IN ACCORDANCE WITH NATIONAL AND LOCAL CODES.

W1 & W2 CAN BE USED TO STAGE ELECTRIC HEAT ACCESSORY ON 15 & 20kW MODELS
E, F & LOW HEATER ACCESSORIES FUNCTION OFF W1 ONLY.

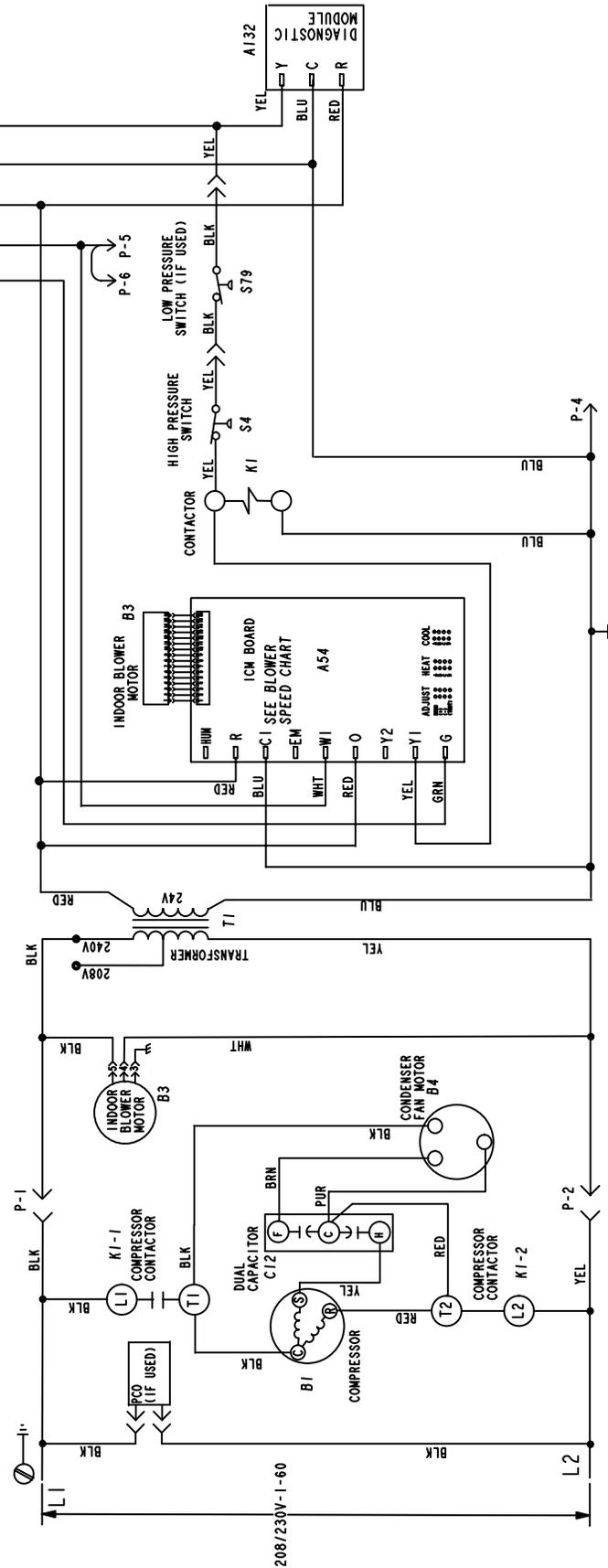


Figure 7

Blower Control Board (A54)

! 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

15CHAX units are equipped with a variable speed motor that is capable of maintaining a specified CFM throughout the external static range. A particular CFM can be obtained by positioning jumpers (**COOL**, **HEAT**, and **ADJUST**) on the blower control board. The HEAT and COOL jumpers are labeled A, B, C and D. Each of the numbers corresponds with an air volume (CFM) setting. The **ADJUST** jumper is labeled Test, -, +, and Norm. The + and - pin settings are used to add or subtract a percentage of the CFM selected. The Test jumper is used to operate the motor in the test mode. See figure 8.

Factory settings for the blower speed jumpers are given in the wiring diagram in figure 7. Figure 8 shows the blower control board. Use tables 2, 3 and 4 to determine the correct air volume for operation in heat and cool mode.

The **CFM** LED located on the blower control board flashes one time per 100 cfm to indicate selected blower speed. For example, if the unit is operating at 1000 CFM, **CFM** LED will flash 10 times. If the CFM is 1150, **CFM** LED will flash 11 full times plus one fast or half flash.

At times the light may appear to flicker or glow. This takes place when the control is communicating with the motor between cycles. This is normal operation.

Read through the jumper settings section before adjusting the jumper to obtain the appropriate blower speed.

To change jumper positions, gently pull the jumper off the pins and place it on the desired set of pins. The following section outlines the different jumper selections available and conditions associated with each one. Refer to figure 8.

After the CFM for each application has been determined, the jumper settings must be adjusted to reflect those given in tables 2, 3 and 4. From the tables, determine which row most closely matches the desired CFM. Once a specific row has been chosen (+, NORMAL, or -), CFM volumes from other rows cannot be used. Below are descriptions of the jumper selections.

The variable speed motor slowly ramps up to and down from the selected air flow during both cooling and heating demand. This minimizes noise and eliminates the initial blast of air when the blower is initially energized.

ADJUST

The **ADJUST** pins allow the motor to run at normal speed, approximately 15 percent higher, or approximately 15 percent lower than normal speed. Tables 2, 3 and 4 give three rows (+, NORMAL, and -) with their respective CFM volumes. Notice that the normal adjustment setting for cool speed position D in table 2 is 900 CFM. The + adjustment setting for that position is 1035 CFM and for the - adjustment setting is 765 CFM. After the adjustment setting has been determined, choose the remaining speed settings from those offered in the table in that row.

The **TEST** pin is available to bypass the blower control and run the motor at approximately 70 percent to make sure that the motor is operational. This is used mainly in troubleshooting. The G terminal must be energized for the motor to run.

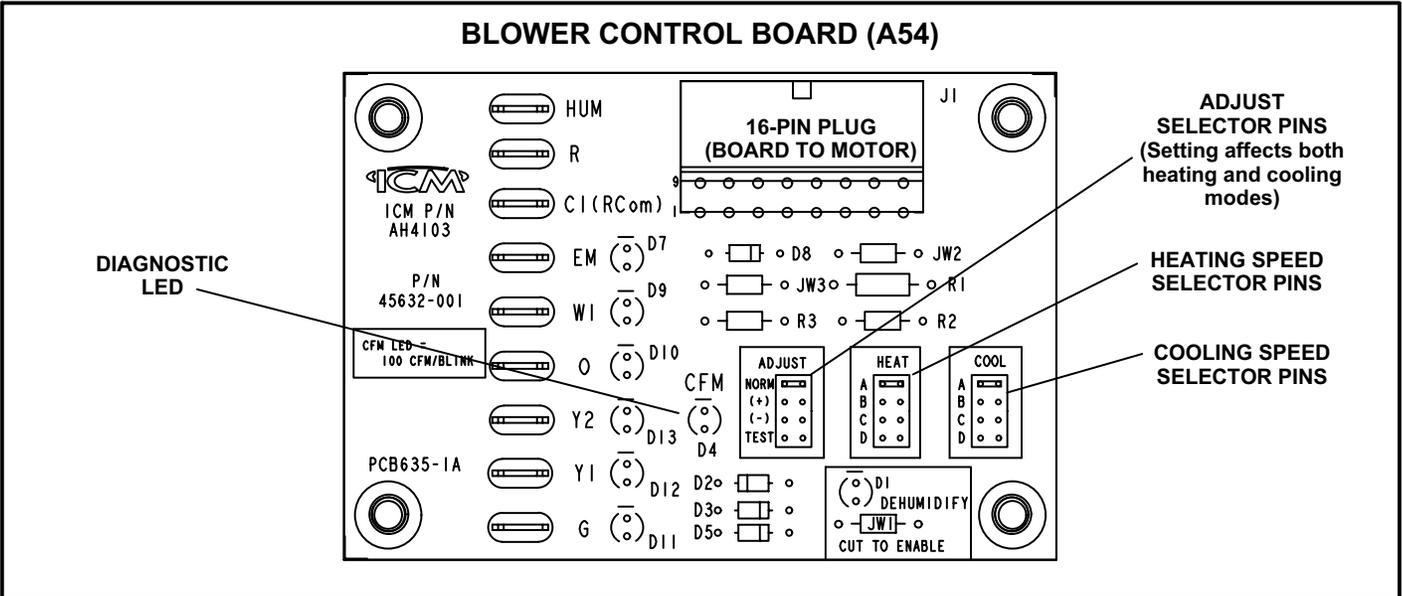


Figure 8

COOL

The **COOL** jumper is used to determine the CFM during cooling operation. This jumper selection is activated for cooling when Y1 is energized.

The blower motor runs at 80 percent of the selected air flow for the first 7-1/2 minutes of each cooling demand. This feature allows for greater humidity removal and saves energy. In the cooling mode, the blower control board delays blower operation for 5 seconds after the compressor starts. The blower continues to operate for 90 seconds after the compressor is de-energized.

HEAT

The **HEAT** jumper is used to determine CFM during back-up electric heat operation only. These jumper selections are activated only when W is energized.

In the backup heat mode, the blower continues to operate for 2 minutes after the heating demand is satisfied.

NOTE - Due to the nature of electric heat, CFM settings are limited.

CONTINUOUS FAN

When the thermostat is set for "Continuous Fan" operation and there is no demand for heating or cooling, the blower control will provide 50 percent of the **COOL** CFM selected.

NOTE - With the proper thermostat and subbase, continuous blower operation is possible by closing the R to G circuit. Cooling blower delay is also functional in this mode.

DEHUMIDIFICATION

The blower control board includes an HUM terminal which provides for connection of a humidistat. The JV1 resistor on the blower control board must be cut to activate the HUM terminal. The humidistat must be wired to open on humidity rise. When the dehumidification circuit is used, the variable speed motor will reduce the selected air flow rate by 25 percent when humidity levels are high. An LED (D1) lights when the blower is operating in the dehumidification mode.

Table 2
15CHAX-24, 15CHAX-30 Blower Performance
0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range

"AD- JUST" Jumper Setting	Jumper Speed Positions																					
	"COOL" Speed				"HEAT" Speed				"CONTINUOUS FAN" Speed													
	A	B	C	D	A	B	C	D	A	B	C	D										
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s				
+	1150	545	920	435	690	325	1035	490	1150	545	1150	545	1150	545	575	270	460	215	345	165	520	245
NORM	1000	470	800	380	600	285	900	425	1000	470	1000	470	1000	470	500	235	400	190	300	140	450	210
-	850	400	680	320	510	240	765	360	1000	470	1000	470	1000	470	425	200	340	160	300	140	385	180

Table 3
15CHAX-36 Blower Performance
0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range

"AD- JUST" Jumper Setting	Jumper Speed Positions																							
	"COOL" Speed				"HEAT" Speed				"CONTINUOUS FAN" Speed															
	A	B	C	D	A	B	C	D	A	B	C	D												
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s				
+	1380	650	1150	545	920	435	1265	575	1380	650	1380	650	1150	545	1150	545	690	325	575	270	460	215	635	300
NORM	1200	565	1000	470	800	380	1100	520	1200	565	1200	565	1000	470	1000	470	600	285	500	235	400	190	550	260
-	1020	480	850	400	680	320	935	440	1200	565	1200	565	1000	470	1000	470	510	240	425	200	350	165	470	220

Table 4
15CHAX-42, 15CHAX-48, 15CHAX-60, Blower Performance
0 through 0.80 in. w.g. (0 through 200 Pa) External Static Pressure Range

"AD- JUST" Jumper Setting	Jumper Speed Positions																					
	"COOL" Speed				"HEAT" Speed				"CONTINUOUS FAN" Speed													
	A	B	C	D	A	B	C	D	A	B	C	D										
	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s	cfm	L/s		
+	2070	975	1840	870	1610	760	1380	650	1610	760	1610	760	1610	760	1035	490	920	435	805	380	690	325
NORM	1800	850	1600	755	1400	660	1200	565	1400	660	1400	660	1400	660	900	425	800	380	700	330	600	285
-	1530	720	1360	640	1190	560	1020	480	1400	660	1400	660	1400	660	765	360	680	320	595	280	510	240

System Operation Monitor (LSOM)

The system operation monitor (A132) detects the most common fault conditions in the air conditioning system. When an abnormal condition is detected, the module communicates the specific condition through its ALERT and TRIP lights. The module is capable of detecting both mechanical and electrical system problems. See figure 9 for the system operation monitor.

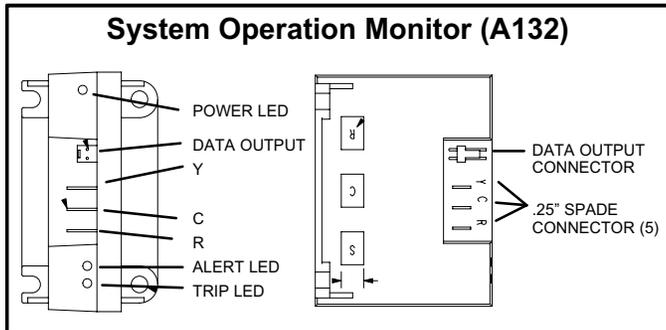


Figure 9

⚠ IMPORTANT

This monitor does not provide safety protection. The monitor is a monitoring device only and cannot control or shut down other devices.

LSOM LED Functions

Power LED (green) -- Voltage within the range of 19-28VAC is present at the system monitor power connection.

Alert LED (yellow) -- Communicates an abnormal system condition through a unique flash code. The alert LED flashes a number of times consecutively; then pauses; then repeats the process. This consecutive flashing corresponds with a particular abnormal condition.

Trip LED (red) -- Indicates a demand signal from the thermostat; but detects no current to the compressor.

Flash code number -- Corresponds to a number of LED flashes, followed by a pause, and then repeated.

Trip & Alert LEDs flashing simultaneously -- Indicates that the control circuit voltage is too low for operation.

Reset ALERT flash code by removing 24VAC power from monitor. Last ALERT flash code will display for 1 minute after monitor is powered on.

LSOM codes are given in table 5.

Table 5

System Operation Monitor LED Troubleshooting Codes		
Status LED Condition	Status LED Description	Status LED Troubleshooting Information
Green “Power” LED ON	Module has power	24VAC control power is present at the module terminal.
Green “Power” LED OFF	Module not powering up	Determine/verify that both R and C module terminals are connected and voltage is present at both terminals.
Red “Trip” LED ON	System and compressor check out OK Thermostat demand signal Y1 is present, but compressor not running	<ol style="list-style-type: none"> 1. Verify Y terminal is connected to 24VAC at contactor coil. 2. Verify voltage at contactor coil falls below 0.5VAC when off. 3. Verify 24VAC is present across Y and C when thermostat demand signal is present; if not present, R and C wires are reversed. <ol style="list-style-type: none"> 1. Compressor protector is open. 2. Outdoor unit power disconnect is open. 3. Compressor circuit breaker or fuse(s) is open. 4. Broken wire or connector is not making contact. 5. Low pressure switch open if present in the system. 6. Compressor contactor has failed to close.
Red “Trip” & Yellow “Alert” LEDs Flashing	Simultaneous flashing.	Indicates that the control circuit voltage is too low for operation.
Yellow “Alert” Flash Code 1*	Long Run Time - Compressor is running extremely long run cycles	<ol style="list-style-type: none"> 1. Low refrigerant charge. 2. Evaporator blower is not running. 3. Evaporator coil is frozen. 4. Faulty metering device. 5. Condenser coil is dirty. 6. Liquid line restriction (filter drier blocked if present). 7. Thermostat is malfunctioning.
Yellow “Alert” Flash Code 2*	System Pressure Trip - Discharge or suction pressure out of limits or compressor overloaded	<ol style="list-style-type: none"> 1. High head pressure. 2. Condenser coil poor air circulation (dirty, blocked, damaged). 3. Condenser fan is not running. 4. Return air duct has substantial leakage. 5. If low pressure switch is present, see Flash Code 1 info.
Yellow “Alert” Flash Code 3*	Short Cycling - Compressor is running only briefly	<ol style="list-style-type: none"> 1. Thermostat demand signal is intermittent. 2. Time delay relay or control board is defective. 3. If high pressure switch is present, see Flash Code 2 info. 4. If low pressure switch is present, see Flash Code 1 info.
Yellow “Alert” Flash Code 4*	Locked Rotor	<ol style="list-style-type: none"> 1. Run capacitor has failed. 2. Low line voltage (contact utility). 3. Excessive liquid refrigerant in the compressor. 4. Compressor bearings are seized.
Yellow “Alert” Flash Code 5*	Open Circuit	<ol style="list-style-type: none"> 1. Outdoor unit power disconnect is open. 2. Unit circuit breaker or fuse(s) is open. 3. Unit contactor has failed to close. 4. High pressure switch is open and requires manual reset. 5. Open circuit in compressor supply wiring or connections. 6. Unusually long compressor protector reset time due to extreme ambient temperature. 7. Compressor windings are damaged.
Yellow “Alert” Flash Code 6*	Open Start Circuit - Current only in run circuit	<ol style="list-style-type: none"> 1. Run capacitor has failed. 2. Open circuit in compressor start wiring or connections. 3. Compressor start winding is damaged.
Yellow “Alert” Flash Code 7*	Open Run Circuit - Current only in start circuit	<ol style="list-style-type: none"> 1. Open circuit in compressor start wiring or connections. 2. Compressor start winding is damaged.
Yellow “Alert” Flash Code 8*	Welded Contactor - Compressor always runs	<ol style="list-style-type: none"> 1. Compressor contactor failed to open. 2. Thermostat demand signal not connected to module.
Yellow “Alert” Flash Code 9*	Low Voltage - Control circuit <17VAC	<ol style="list-style-type: none"> 1. Control circuit transformer is overloaded. 2. Low line voltage (contact utility).

*Flash code number corresponds to a number of LED flashes, followed by a pause, and then repeated. Reset ALERT flash code by removing 24VAC power from monitor; last code will display for 1 minute after monitor is powered on.

Unit Start-Up and Operation

Each 15CHAX packaged cooling unit is factory-charged with R-410A refrigerant. The compressor is hermetically sealed, internally sprung and base-mounted with rubber-insulated hold-down bolts.

Pre-Start Check List:

- 1 - Make sure refrigerant lines do not rub against the cabinet or each other.
- 2 - Inspect all electrical wiring, both factory- and field-installed, for loose connections.
- 3 - Check voltage at the disconnect switch. Voltage must be within the range listed on the unit nameplate. If not, consult power company and have voltage condition corrected before starting unit.
- 4 - Recheck voltage with unit running. If power is not within the range listed on the unit nameplate, stop the unit and consult the power company. Check unit amperage. Refer to unit nameplate for correct running amps.
- 5 - Make sure filter is in place before unit start-up.
- 6 - Before placing the unit into full operation, energize the unit for three false starts. Energize the compressor just long enough for it to make a few revolutions, wait five to seven minutes before repeating a second and third time.

Cooling Sequence of Operation

When the thermostat calls for cooling, the "R" to "Y" circuit is closed to energize the compressor contactor. The contactor brings on both the compressor and outdoor fan. The thermostat also closes the "R" to "G" circuit to energize the circulating air blower. When the cooling demand is satisfied, the thermostat opens the circuits, as well as the compressor contactor. The compressor and outdoor fan

immediately stop. The circulating air blower continues operating through a 90-second delay.

Unit compressors have internal protection. If there is an abnormal rise in the compressor temperature, the protector will open and the compressor will stop.

System Performance

For maximum performance of this cooling system, the operating temperatures and pressure should be checked and subcooling determined at Standard ARI test conditions of 82° F outdoor temperature / 80° F indoor dry bulb / 67° F indoor wet bulb. If subcooling measured deviates from values in table 6, refrigerant charge should be adjusted accordingly for maximum performance.

Table 6
Suction Superheat Values

Unit Model No.	Suction Superheat 82° F OD / 80° F IDDB / 67° F IDWB
15CHAX-24 15CHAX-30	12°
15CHAX-36	15°
15CHAX-42 15CHAX-48 15CHAX-60	10°

Verify system performance using table 7 as a general guide. Table 7 should not be used for charging unit. Minor variations in these pressures may be expected due to differences in installations. Significant differences could mean that the system is not properly charged or that a problem exists with some component in the system.

Used carefully, this table could serve as a useful service guide. Data is based on 80°F dry bulb / 67°F wet bulb return air. Allow unit operation to stabilize before taking pressure readings.

Table 7
Normal Operating Pressures

80°F db / 67°F wb RETURN AIR		Air Temperature Entering Outdoor Coil (°F)											
UNIT	PRESSURE	65	70	75	80	82	85	90	95	100	105	110	115
15CHAX-24	Suction	142	143	144	146	146	147	148	149	150	151	152	153
15CHAX-30		134	136	138	140	141	142	144	146	148	149	151	152
15CHAX-36		143	144	146	147	148	149	151	152	155	155	157	157
15CHAX-42		140	140	140	141	141	141	142	142	143	144	145	147
15CHAX-48		140	141	142	144	144	145	146	147	148	149	150	151
15CHAX-60		143	144	145	146	146	147	147	148	149	150	151	152
15CHAX-24	Liquid	219	242	264	287	296	310	333	355	379	398	430	457
15CHAX-30		232	255	277	300	309	323	345	368	390	408	440	470
15CHAX-36		244	268	292	316	326	340	363	369	410	429	461	493
15CHAX-42		225	247	269	291	300	314	337	357	383	402	434	457
15CHAX-48		243	264	285	307	315	328	349	370	391	408	440	470
15CHAX-60		257	280	303	326	335	349	372	395	418	436	468	497

Condenser Fan Clearances

The top of the condenser fan should be 1-1/2 inches from the bottom of the top grille. This dimension should be checked and the fan should be adjusted accordingly any time servicing of the outdoor fan system is required.

Maintenance

At the start of each cooling season, this equipment should be serviced by a licensed professional technician (or equivalent). Periodic inspection and maintenance normally consists of changing or cleaning filters.

Filters

Not supplied. Inspect once a month. Replace disposable or clean permanent type as necessary. DO NOT replace permanent type with disposable.

Motors

Indoor, outdoor fan and vent motors are permanently lubricated and require no further lubrication. Motors should be cleaned yearly to prevent the accumulation of dust and dirt on the windings or motor exterior.

Coil

Dirt and debris should not be allowed to accumulate on the coil surfaces or other parts in the air conditioning circuit. Cleaning should be performed as often as necessary. Use a brush, vacuum cleaner attachment, or other suitable means. If water is used to clean the coil, be sure the power to unit is shut off prior to cleaning.

NOTE - Care should be used when cleaning the coil so that the coil fins are not damaged.

Do not permit the hot condenser air discharge to be obstructed by overhanging structures or shrubs.

Accessories	
Description	LENNOX Cat. Number
Filter Kit (2-ton to 3-ton capacity units)	92M54
Filter Kit (3-1/2-ton to 5-ton capacity units)	92M55
PCO20-28	X8787
Installation Hardware Kit for PCO20-28	Y0629