# INSTALLATION INSTRUCTIONS

**LHX024** (2 TON)
**LHX036** (3 TON)
**LHX048** (4 TON)
**LHX060** (5 TON)
**LHX072** (6 TON)

**HEAT PUMP PACKAGED UNITS**

508512-02
8/2025
Supersedes 508512-01

**R-454B**

## ⚠ WARNING

To prevent serious injury or death:

1- Lock-out/tag-out before performing maintenance.

2- If system power is required (e.g., smoke detector maintenance), disable power to blower, remove fan belt where applicable, and ensure all controllers and thermostats are set to the “OFF” position before performing maintenance.

3- Always keep hands, hair, clothing, jewelry, tools, etc., away from moving parts.

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## ⚠ WARNING

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

## RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCES

Attention!

Use this QR code to download the mobile service app. Follow the prompts to pair the app with the Unit Controller. Refer to the “Mobile Service App” section in this manual. The QR code is also available in the unit control area.

## ⚠ CAUTION

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

## ⚠ WARNING

Only manufacturer approved auxiliary devices are permitted to be installed in this unit.

## ⚠ WARNING

If this appliance is conditioning a space with an area smaller than TAmin or stored in a space with an area smaller than Amin as defined by this instruction, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest system.

## ⚠ WARNING

•Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

•The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance, or an operating electric heater).

•Do not pierce or burn.

•Be aware that refrigerants may not contain an odor.

## ⚠ CAUTION

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

## ⚠ CAUTION

Any personnel installing, decommissioning, or performaing maintenance on the unit must be properly trained with A2L refrigerants.

## ⚠ CAUTION

Leak Detection System installed. Unit must be powered except for service.

## ⚠ CAUTION

Servicing shall be performed only as recommended by the manufacturer.

## ⚠ WARNING

•This appliance must be installed in accordance with local and national wiring regulations.

•If the appliance is not fitted with an option for full disconnection from power, a means of disconnection must be incorporated in the fixed wiring in accordance with national and local wiring regulations.

## ⚠ WARNING

**Ducts connected to an appliance shall not contain a potential ignition source.**

## ⚠ CAUTION

The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction

## ⚠ CAUTION

Children should be supervised not to play with the appliance.

## ⚠ IMPORTANT

Pipe work, including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

## ⚠ IMPORTANT

Refrigerant sensors for refrigerant detection systems shall only be replaced with sensors specified by the appliance manufacture.

## ⚠ CAUTION

This unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

**A2L Refrigerant Considerations**

Ensure that the work area is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects, taking into account the effects of aging or continual vibration from sources such as compressors or fans.

Under no circumstances shall potential sources of ignition be used when searching for or detecting refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work. If a leak is suspected, all naked flames shall be removed/ extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practices be followed since flammability is a consideration. The following procedure shall be adhered to:

-Safely remove refrigerant following local and national regulations.

-Evacuate the circuit.

-Purge the circuit with inert gas.

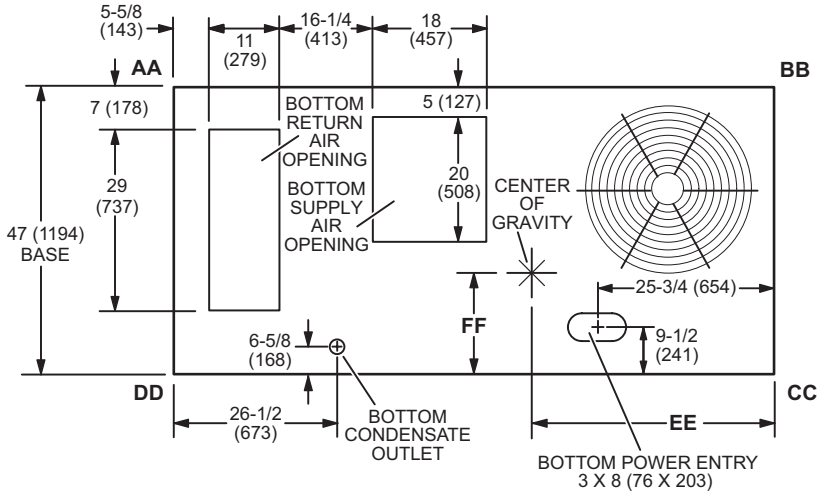
-Evacuate.

-Purge the circuit with inert gas.

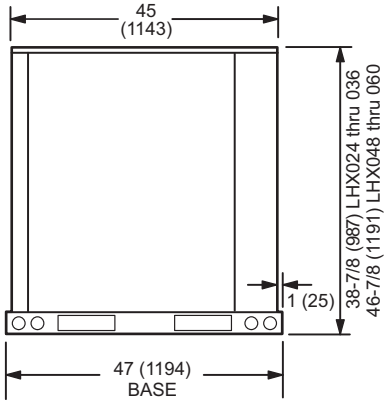
-Open the circuit

The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems. Refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be vented down to atmospheric pressure to enable work to take place. Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

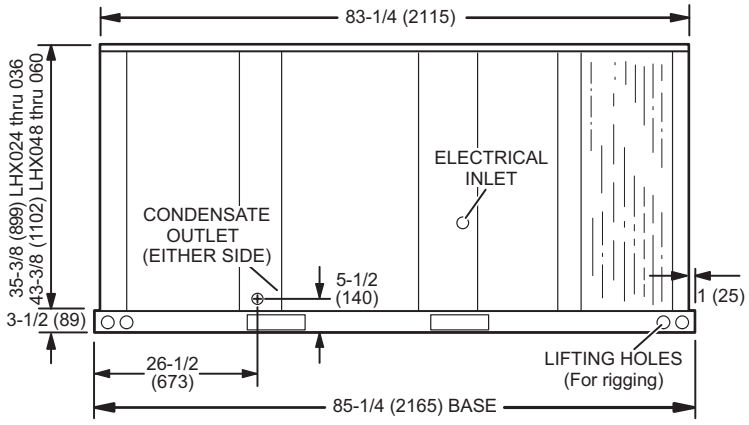
## LHX024, 036, 048, 060, 072 Dimensions in.



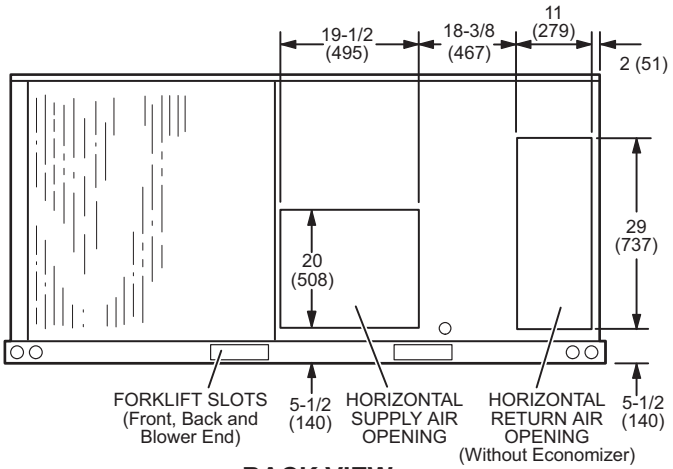

**TOP VIEW (Base)**




**END VIEW**

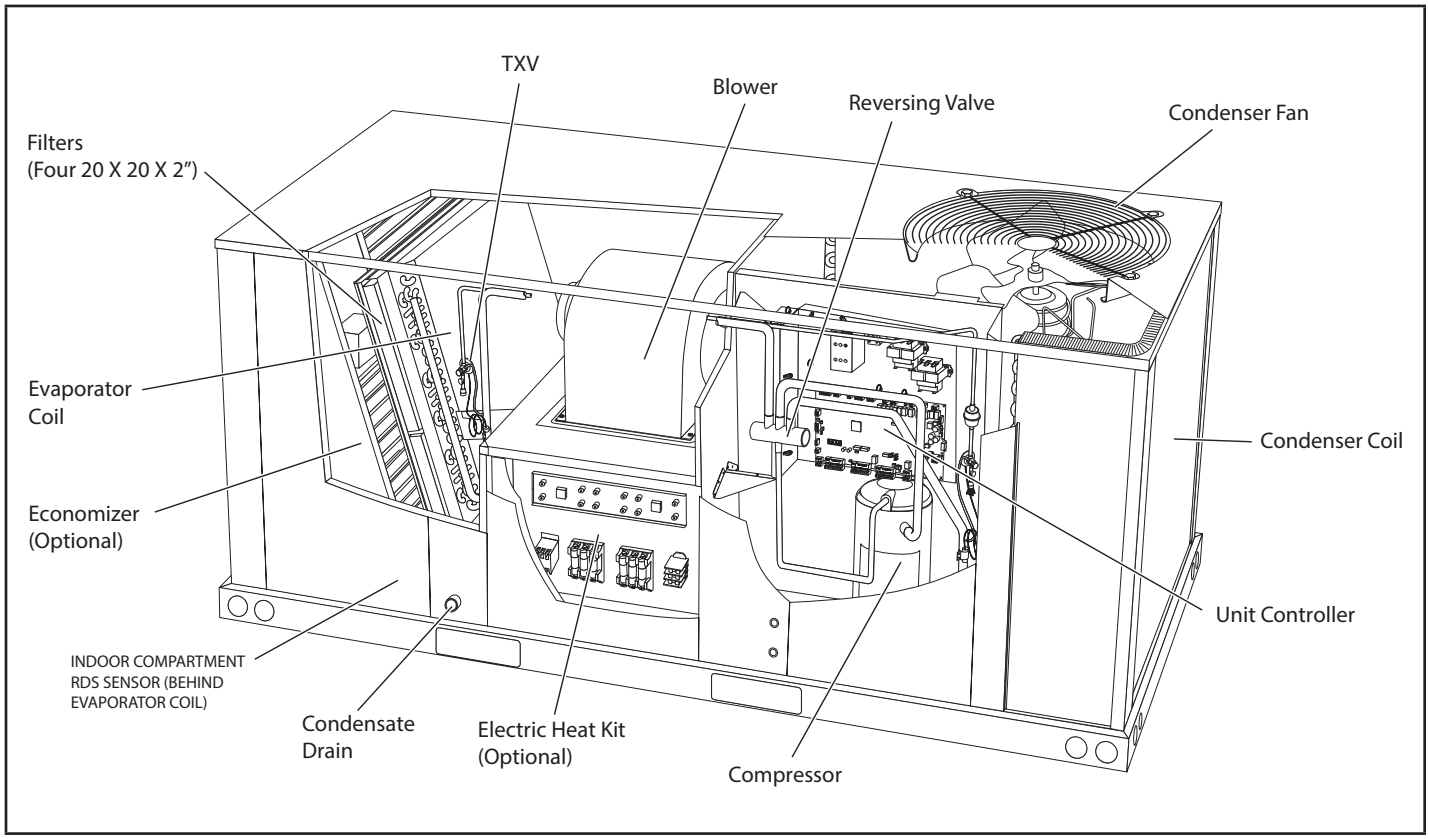



**SIDE VIEW**




**BACK VIEW**

## LHX024, 036, 048, 060, 072 Parts Arrangement



## Shipping and Packing List

**Package 1 of 1 contains:**

1 - Assembled unit

Check unit for shipping damage. Receiving party should contact last carrier immediately if shipping damage is found.

## General

These instructions are intended as a general guide and do not supersede local codes in any way. Authorities having jurisdiction should be consulted before installation. Optional electric heat is available.

The LHX units have 2, 3, 4, 5, and 6-ton cooling capacities.

Units are equipped with fin/tube condenser coils, two speed compressors, and variable speed, direct drive blowers. Compressor and supply air speeds adjust to system demand.

Availability of units and options varies by brand.

## Requirements

See FIGURE 1 for unit clearances.

The LHX unit is ETL/CSA certified as a heat pump with cooling and with or without auxiliary electric heat for outdoor installations only at the clearances to combustible materials as listed on the unit nameplate and in FIGURE 1.

Installation of LHX units must conform with standards in National Fire Protection Association (NFPA) “Standard for Installation of Air Conditioning and Ventilating Systems NFPA No. 90A,” “Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems NFPA No. 90B,” local municipal building codes and manufacturer’s installation instructions.

## ⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC’s and HCFC’s) as of July 1, 1992. Approved methods of recovery, recycling or reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

## ⚠ WARNING

Electric shock hazard and danger of explosion. Can cause injury, death or product or property damage. Turn off gas and electrical power to unit before performing any maintenance or servicing operations on the unit. Follow lighting instructions attached to unit when putting unit back into operation and after service or maintenance.

## ⚠ NOTICE

**Roof Damage!**

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

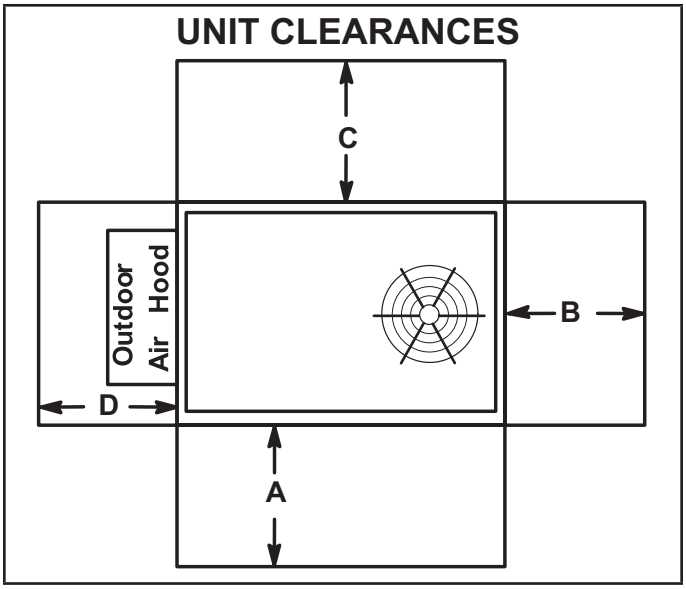



**FIGURE 1**

| [1] Unit Clearance | A in-.(mm) | B in-.(mm) | C in-.(mm) | D in-.(mm) | Top Clearance |
|---|---|---|---|---|---|
| Service Clearance | 48 (1219) | 36 (916) | 36 (916) | 36 (916) | Unobstructed |
| Clearance to Combustibles | 36 (916) | 1 (25) | 1 (25) | 1 (25) | Unobstructed |
| Minimum Operation Clearance | 36 (916) | 36 (916) | 36 (916) | 36 (916) | Unobstructed |

***NOTE -*** *Entire perimeter of unit base requires support when elevated above mounting surface.*

[1] **Service Clearance** - Required for removal of serviceable parts.
**Clearance to Combustibles** - Required clearance to combustible material (gas units). On LCT units, see clearance to combustible materials as outlined on heater rating plate.
**Minimum Operation Clearance** - Required clearance for proper unit operation.

## Minimum R454B Space and CFM Requirements

| Minimum Airflow[1] | | |
|---|---|---|
| Unit | $Q_{min}$(CFM) | $Q_{min}$($m^3h$) |
| LHX024 | 371 | 629 |
| LHX036 | 344 | 584 |
| LHX048 | 444 | 753 |
| LHX060 | 414 | 703 |
| LHX072 | 390 | 661 |

| Refrigerant Charge R-454B | | |
|---|---|---|
| Unit | $M_c$(lbs) | $M_c$(kg) |
| LHX024 | 14.00 | 6.35 |
| LHX036 | 13.00 | 5.90 |
| LHX048 | 16.75 | 7.60 |
| LHX060 | 15.65 | 7.10 |
| LHX072 | 14.70 | 6.70 |

*[1] **NOTE -** The minimum airflow is the lowest CFM allowed during venting operation (leak mitigation).*

| Minimum Room Area of Conditioned Space[2] | | |
|---|---|---|
| Unit | $TA_{min}$($ft^2$) | $TA_{min}$($m^2$) |
| LHX024 | 206 | 19.1 |
| LHX036 | 191 | 17.7 |
| LHX048 | 246 | 22.8 |
| LHX060 | 230 | 21.3 |
| LHX072 | 216 | 20.0 |

*[2] NOTE - The minimum room area of conditioned space is the smallest area the unit can service.*

| Altitude Adjustment Factor[3] | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Halt | 0 | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 |
| AF | 1 | 1 | 1 | 1 | 1.02 | 1.05 | 1.07 | 1.1 | 1.12 |
| Halt | 1600 | 1800 | 2000 | 2200 | 2400 | 2600 | 2800 | 3000 | 3200 |
| AF | 1.12 | 1.15 | 1.18 | 1.21 | 1.25 | 1.28 | 1.32 | 1.36 | 1.40 |

*[3] **NOTE -** Use the Altitude Adjustment Factor to adjust the values in the tables above to different altitudes. Find the relevant altitude above sea level in the two "Halt" rows and then multiply the value needed from the tables above by the altitude factor number. Example: For the minimum airflow in CFM for an LHX024 at 1000 ft. above see level, multiply 371 by 1.05 to get 389.55 CFM as the new $Q_{min}$.*

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-filters must be removed upon construction completion.
- The input rate and temperature rise must be set per the unit rating plate.
- The heat exchanger, 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, ignition, input rate, temperature rise and venting) must be verified according to these installation instructions.

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

## Unit Support

In downflow discharge installations, install the unit on a non-combustible surface only. Unit may be installed on combustible surfaces when used in horizontal discharge applications or in downflow discharge applications when installed on an T1CURB / C1CURB / E1CURB roof mounting frame.

***NOTE -*** *Securely fasten roof frame to roof per local codes.*

**⚠ CAUTION**

To reduce the likelihood of supply / return air bypass and promote a proper seal with the RTU, duct work / duct drops / diffuser assemblies must be supported independently to the building structure.

**A-Downflow Discharge Application**

**Roof Mounting with T1CURB / C1CURB / E1CURB**

1 - The roof mounting frame must be installed, flashed and sealed in accordance with the instructions provided with the frame.

2 - The roof mounting frame should be square and level to 1/16” per linear foot (5mm per linear meter) in any direction.

3 - Duct must be attached to the roof mounting frame and not to the unit; supply and return plenums must be installed before setting the unit.

**Installer’s Roof Mounting Frame**

Many types of roof frames can be used to install the unit depending upon different roof structures. Items to keep in mind when using the building frame or supports are:

1 - The base is fully enclosed and insulated, so an enclosed frame is not required.

2 - The frames or supports must be constructed with non-combustible materials and should be square and level to 1/16” per linear foot (5mm per linear meter) in any direction.

3 - Frame or supports must be high enough to prevent any form of moisture from entering unit. Recommended minimum frame height is 14” (356mm).

4 - Duct must be attached to the roof mounting frame and not to the unit. Supply and return plenums must be installed before setting the unit.

5 - Units require support along all four sides of unit base. Supports must be constructed of steel or suitably treated wood materials.

***NOTE -*** *When installing a unit on a combustible surface for downflow discharge applications, a T1CURB / C1CURB / E1CURB roof mounting frame is required.*

**B-Horizontal Discharge Applications**

1 - Units which are equipped with an optional economizer and installed in horizontal airflow applications must use a horizontal conversion kit.

2 - Specified installation clearances must be maintained when installing units. Refer to FIGURE 1.

3 - Top of support slab should be approximately 4” (102mm) above the finished grade and located so no run-off water from higher ground can collect around the unit.

4 - Units require support along all four sides of unit base. Supports must be constructed of steel or suitably treated wood materials.

## Duct Connection

All exterior ducts, joints and openings in roof or building walls must be insulated and weather-proofed with flashing and sealing compounds in accordance with applicable codes. Any duct passing through an unconditioned space must be insulated.

**⚠ CAUTION**

In downflow applications, do not drill or punch holes in base of unit. Leaking in roof may occur if unit base is punctured.

## Rigging Unit for Lifting

Rig unit for lifting by attaching four cables to holes in unit base rail. See FIGURE 2.

1 - Detach wooden base protection before rigging.

2 - Remove all six base protection brackets before setting unit.

3 - Connect rigging to the unit base using both holes in each corner.

4 - All panels must be in place for rigging.

5 - Place field-provided H-style pick in place just above top edge of unit. Frame must be of adequate strength and length. (H-style pick prevents damage to unit.)

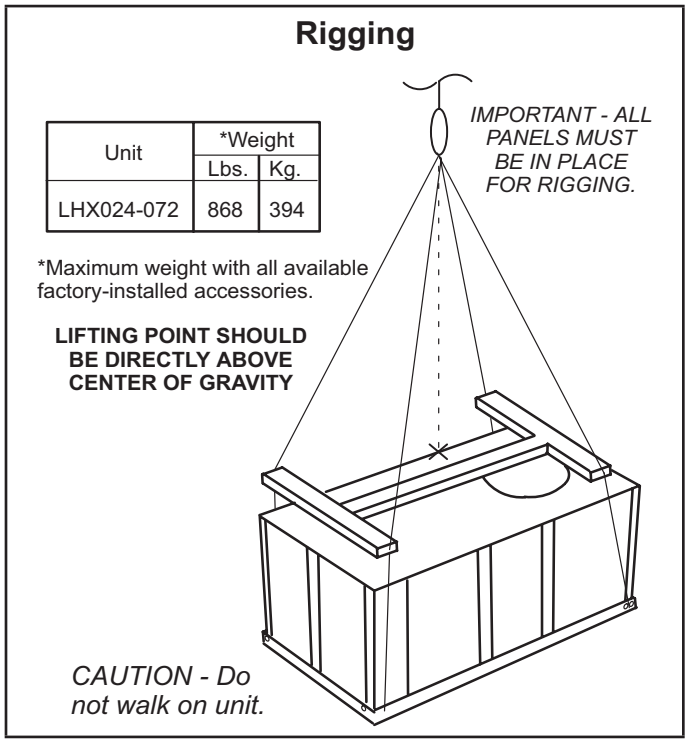



**FIGURE 2**

## Horizontal Air Discharge

Unit is shipped with panels covering the horizontal supply and return air openings. Remove horizontal covers and place over downflow openings for horizontal air discharge. See FIGURE 3. Secure in place with sheet metal screws.

**Units Equipped With An Optional Economizer**

1 - Remove the horizontal supply air cover and position over the downflow supply air opening. Secure with sheet metal screws.

2 - Leave the horizontal return air cover in place.

3 - Locate the separately ordered horizontal air discharge kit. Place the kit panel over the downflow return air opening.

4 - Remove and retain the barometric relief dampers and lower hood.

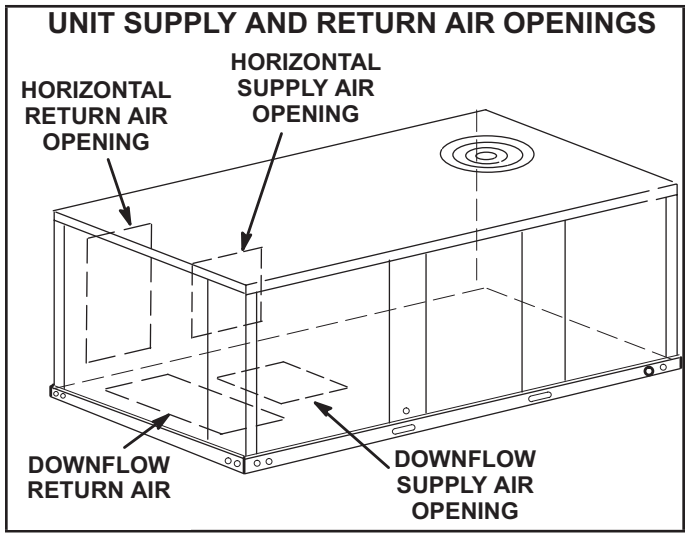



**FIGURE 3**

5 - Install return air duct beneath outdoor air intake. See FIGURE 4. Install barometric relief damper in lower hood and install in ductwork as shown in FIGURE 4.

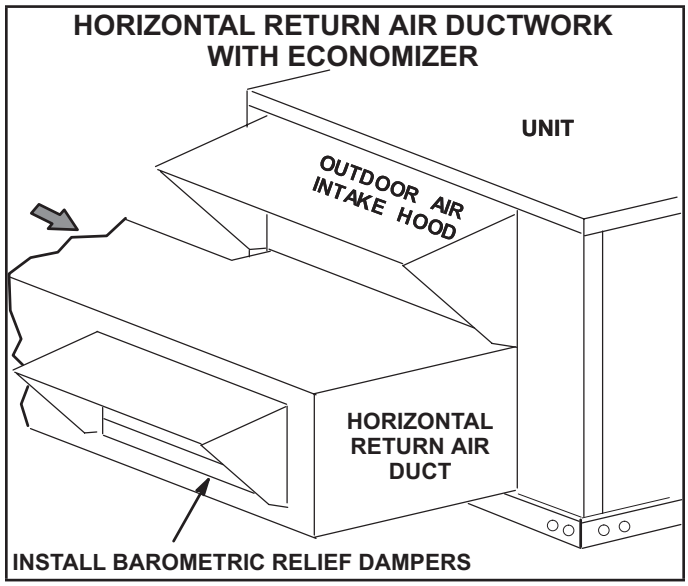



**FIGURE 4**

## Condensate Drains

Make drain connection to the drain coupling provided on unit. Older model units have a 3/4" N.P.T. coupling and newer model units have a 1" N.P.T. coupling.

***NOTE -*** *The drain pan is made with a glass reinforced engineered plastic capable of withstanding typical joint torque but can be damaged with excessive force. Tighten pipe nipple hand tight and turn an additional quarter turn.*

A trap must be installed between drain connection and an open vent for proper condensate removal. See FIGURE 5 or FIGURE 6. It is sometimes acceptable to drain condensate onto the roof or grade; however, a tee should be fitted to the trap to direct condensate downward. The condensate line must be vented. Check local codes concerning condensate disposal. Refer to page 4 and page 5 for condensate drain location.

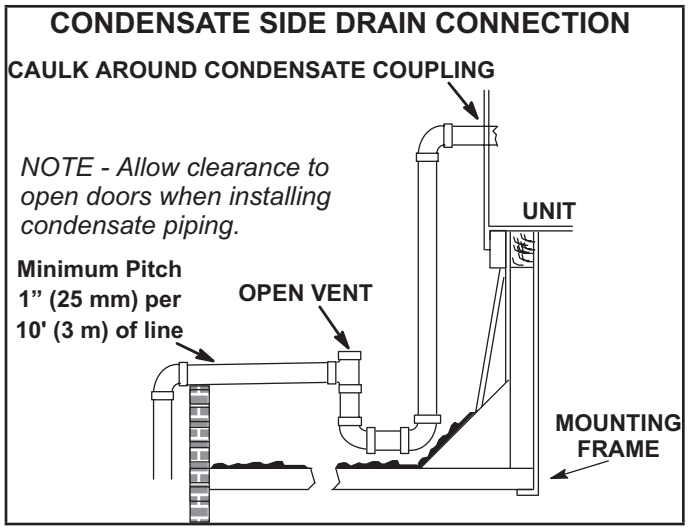



**FIGURE 5**

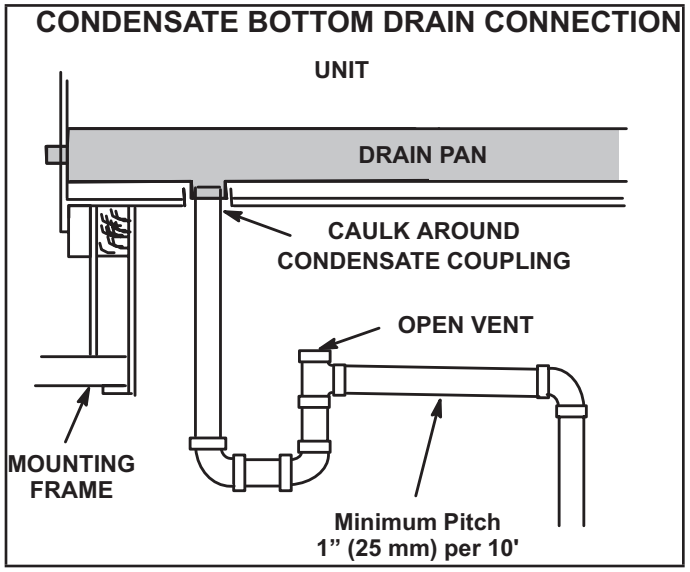



**FIGURE 6**

Units are shipped with the drain coupling facing the front of the unit. Condensate can be drained from the back or bottom of the unit with the following modifications. The unit can be installed in either downflow or horizontal air discharge regardless of condensate drain location.

**Rear Drain Connection**

1 - Remove the condensate drain mullion. See FIGURE 7. Remove the two panels on each side of the mullion.

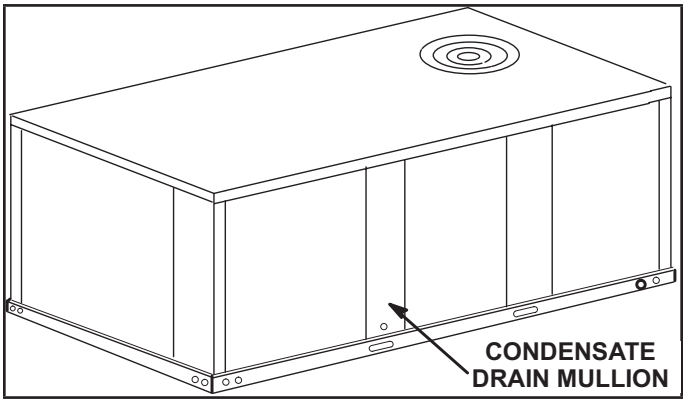



**FIGURE 7**

Two hinge screws must be removed in addition to the mullion screws. See FIGURE 8.

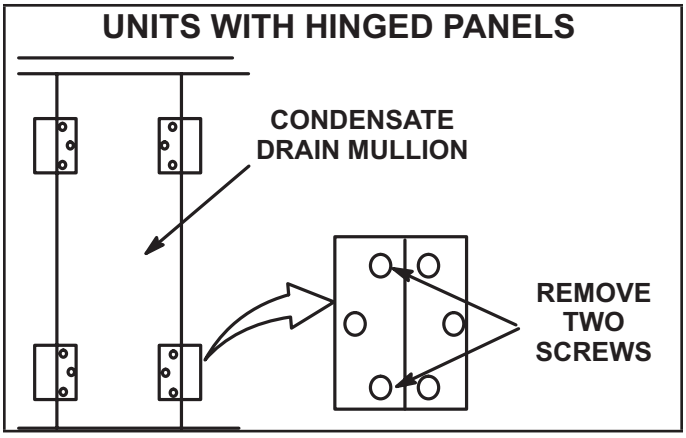



**FIGURE 8**

2 - Lift the front edge of the drain pan and slide pan out of unit. See FIGURE 9.

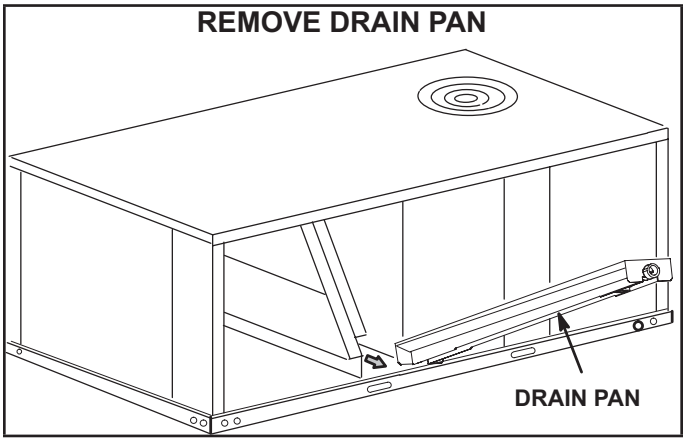



**FIGURE 9**

3 - Make sure the cap over the unit bottom drain hole is secure.

4 - Rotate the drain pan until the downward slope is toward the back of the unit. Slide the drain pan back into the unit. Be careful not to dislodge the cap over the bottom drain hole.

5 - From the back side of the unit, pull the drain pan coupling through the rear condensate opening.

6 - Replace the condensate drain mullion.

**Bottom Drain Connection**

1 - Remove the condensate drain mullion. See FIGURE 7.

2 - Lift the front edge of the drain pan and slide pan out of unit. See FIGURE 9.

3 - Turn the drain pan upside down and drill a pilot hole through the bottom of the drain pan in the center of the coupling. See FIGURE 10.

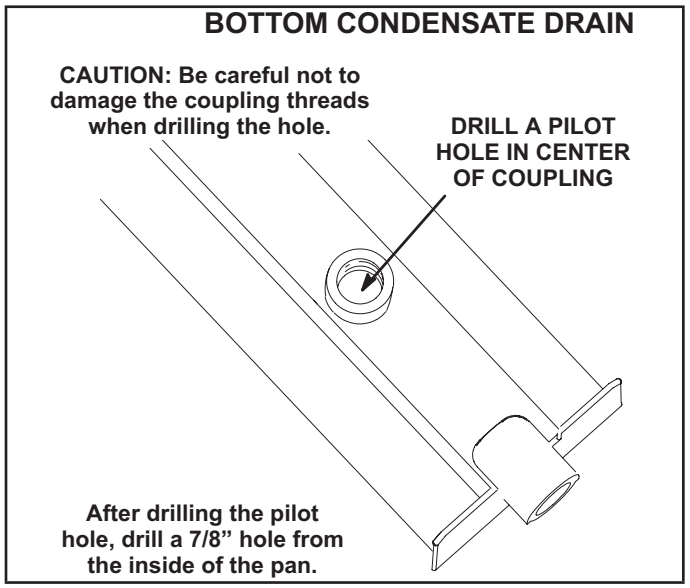



**FIGURE 10**

4 - From the inside of the pan, use a Vari-Bit® bit to enlarge the hole to 7/8". Do not damage coupling threads.

5 - Remove the cap over the unit bottom drain hole.

6 - Slide the drain pan back into the unit.

7 - From the back side of the unit, pull the drain pan coupling through the rear condensate opening.

8 - From the front side of the unit, move the drain pan until the bottom coupling settles into the unit bottom drain opening. Once in place, check to make sure the coupling is still positioned through the rear condensate drain hole.

9 - Use a field-provided 3/4" plug to seal side drain connection.

10 - Replace the condensate drain mullion.

## High Altitude Derate

Locate the high altitude conversion sticker in the unit literature bag. Fill out the conversion sticker and affix next to the unit nameplate. High altitude kits are available for field-installation.

Refer to TABLE 1 for high altitude adjustments.

**TABLE 1**
**HIGH ALTITUDE DERATE**

| Altitude Ft.* | Gas manifold Pressure |
|---|---|
| 2000-4500 | See Unit Nameplate |
| 4500 and Above | Derate 2% / 1000 Ft. above Sea Level |

*Units installed at 0-2000 feet do not need to be modified.

***NOTE -*** *This is the only permissible derate for these units.*

## Electrical Connections - Power Supply

Do not apply power or close disconnect switch until installation is complete. Refer to start-up directions. Refer closely to unit wiring diagram.

Refer to unit nameplate for minimum circuit ampacity and maximum fuse size.

1 - Units are factory-wired for 230 / 460 / 575 volt supply. For 208V supply, remove the insulated terminal cover from the 208V terminal on the control transformer.

2 - Move the wire from the transformer 240V terminal to the 208V terminal. Place the insulated terminal cover on the unused 240V terminal.

Route power through the bottom power entry area and connect to L1, L2, and L3 on the top of K1 in control area above compressor. Secure power wiring with factory-installed wire ties provided in control box. Route power to TB2 on units equipped with electric heat. Route power to S48 or CB10 If unit is equipped with the optional disconnect switch or circuit breaker. See unit wiring diagram.

## Electrical Connections - Control Wiring

Connect either a thermostat, room/zone sensor, or direct digital controller; one of the three are required for unit function. Refer to the literature provided with each device and the following information.

***NOTE -*** *Optional wireless sensors are available for use with this unit. Refer to the instructions provided with each sensor.*

## ⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during unit installation and service to protect the electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the unit, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hands and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

### A-Thermostat Location

Room thermostat mounts vertically on a standard 2” X 4” handy box or on any non-conductive flat surface.

Locate thermostat approximately 5 feet (1524mm) above the floor in an area with good air circulation at average temperature. Avoid locating the room thermostat where it might be affected by:

- drafts or dead spots behind doors and in corners
- hot or cold air from ducts
- radiant heat from sun or appliances
- concealed pipes and chimneys

### B-Control Wiring

The Unit Controller will operate the unit from a thermostat or zone sensor based on the System Mode. The default System Mode is the thermostat mode. Refer to the Unit Controller Setup Guide to change the System Mode. Use the mobile service app menu and select *Settings* > *Install.*

#### Thermostat Mode

1 - Route thermostat cable or wires from subbase to control area above compressor (refer to unit dimensions to locate bottom and side power entry).

*IMPORTANT - Unless field thermostat wires are rated for maximum unit voltage, they must be routed away from line voltage wiring. Use wire ties located near the lower left corner of the controls mounting panel to secure thermostat cable.*

Use18 AWG wire for all applications using remotely installed electro-mechanical and electronic thermostats.

2 - Install thermostat assembly in accordance with instructions provided with thermostat.

3 - Connect thermostat wiring to Unit Controller on the lower side of the controls hat section.

4 - Wire as shown in FIGURE 11 for electro-mechanical and electronic thermostats. If using other temperature control devices or energy management systems see instructions and wiring diagram provided by manufacturer.

*IMPORTANT - Terminal connections at the wall plate or subbase must be made securely. Loose control wire connections may allow unit to operate but not with proper response to room demand.*

#### Zone Sensor Mode

The Unit Controller will operate heating and cooling based on the Unit Controller internal setpoints and the temperature from the A2 zone sensor. An optional Network Control Panel (NCP) can also be used to provide setpoints. A thermostat or return air sensor can be used as a back-up mode. Make zone sensor wiring connections as shown in FIGURE 12.

**FIELD WIRING WITH ELECTRONIC AND ELECTRO-MECHANICAL THERMOSTATS**
**(Thermostat Mode)**

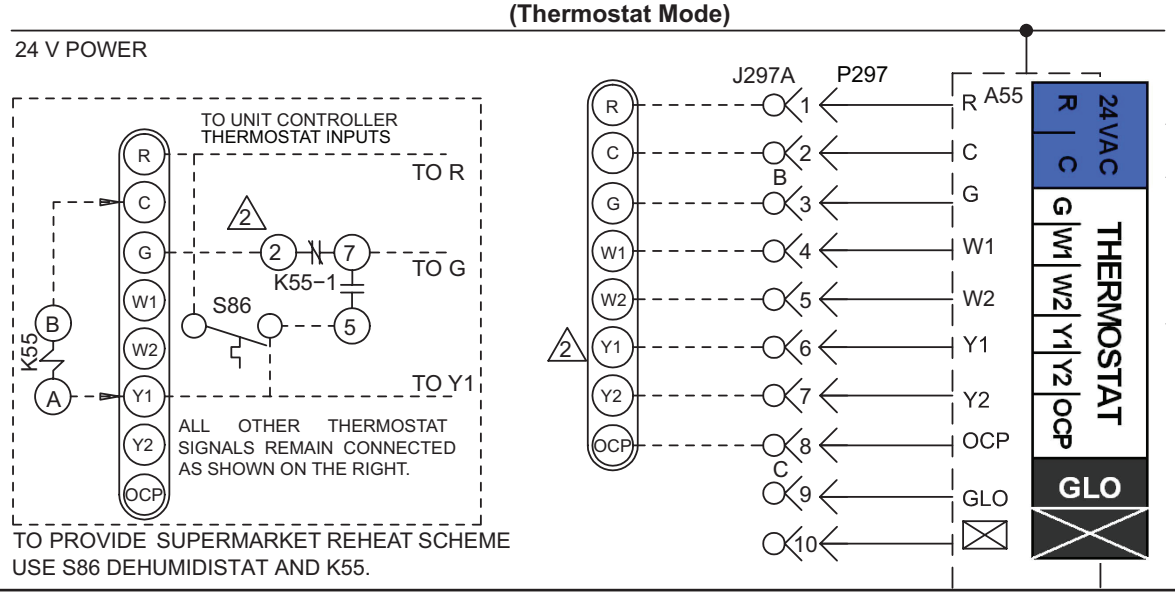



**FIGURE 11**

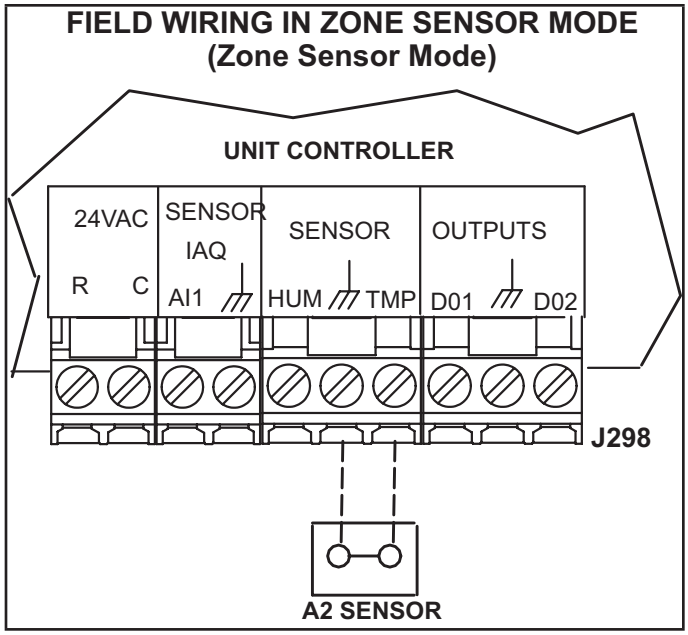



**FIGURE 12**

## Balance Point Setpoint

When outdoor air temperature is above setpoint (35°F default), the unit will operate in heat pump mode. When outdoor air temperature falls below setpoint, the unit will operate in gas heat mode.

***NOTE -*** *Only stage one is used; stage 2 is not used.*

Although the recommended balance point setpoint is 35°F, the setpoint can be adjusted. Weigh the comfort / cost benefit when increasing the setpoint.

## Unit Power-Up

**A-General**

1 - Make sure that unit is installed in accordance with the installation instructions and applicable codes.

2 - Inspect all electrical wiring, both field and factory installed, for loose connections. Tighten as required.

3 - Check to ensure that refrigerant lines do not rub against the cabinet or against other refrigerant lines.

4 - Check voltage at main unit power connection. Voltage must be within range listed on nameplate. If not, consult power company and have voltage condition corrected before starting unit.

5 - Make sure filters are in place before start-up.

6 - Make sure there is no heating, cooling, or blower demand from thermostat. Apply power to unit.

## Mobile Service App

Setup and configure each rooftop unit using the mobile service app (Android or iOS devices supported).

**A-Mobile Device Requirements**

- Bluetooth connection.
- Android hardware requires 2GB RAM and a 2Ghz core processor. Tablets are supported.
- The app is available for both iOS 11.0 or higher (App Store) and Android 9.0 or higher (Google Play).

**B-Download the App**

Use your mobile device to scan the QR code from the cover page and download the mobile service app to your mobile device.

**C-Pair the App to the Unit Controller**

1 - Apply power to the unit and wait until the Unit Controller has booted-up (approximately two minutes).

2 - Press and hold the pair button for five seconds.

3 - The unit (or list of units) will appear; select the appropriate unit. When the app code matches the four-character code on the Unit Controller display, the unit is paired (within 10 seconds). Note the following:

- The app will list the units by signal strength; the RTU name will be displayed.
- Once paired, the RTU name, model number, serial number and firmware version will be displayed.

Please refer to the manufacturer's website for additional technical information and self-help support.

**D-App Menus**

See FIGURE 13 for the menu overview. Follow the app prompts in the Install, Network Integration, and Test and Balance menus. Verify the app is setup properly for the unit application (including the date and time). Refer to FIGURE 14, FIGURE 15, and FIGURE 16.

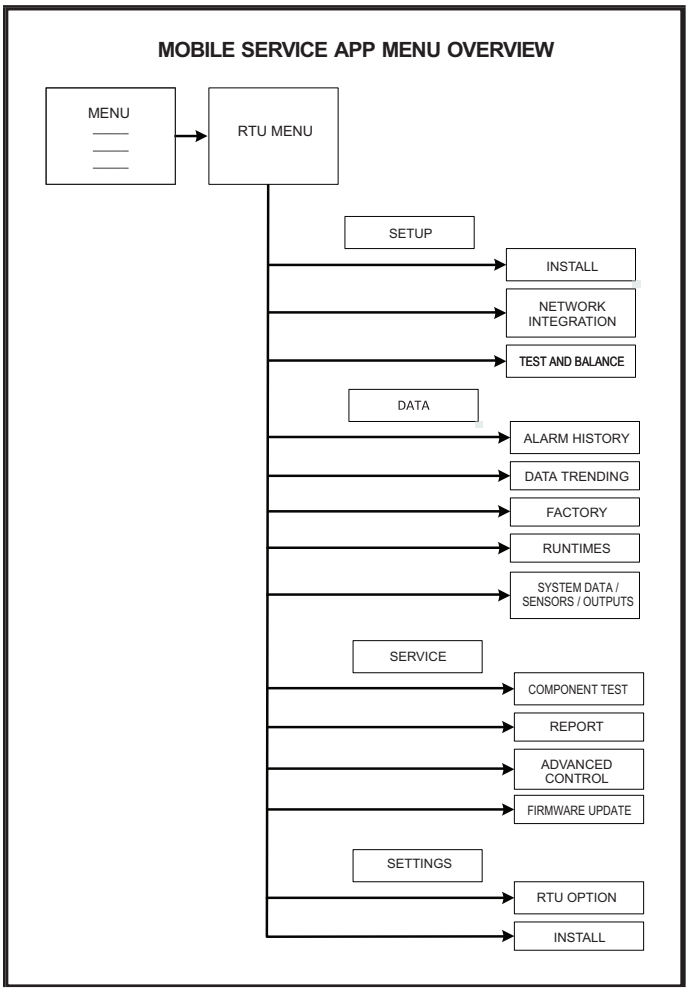



**FIGURE 13**

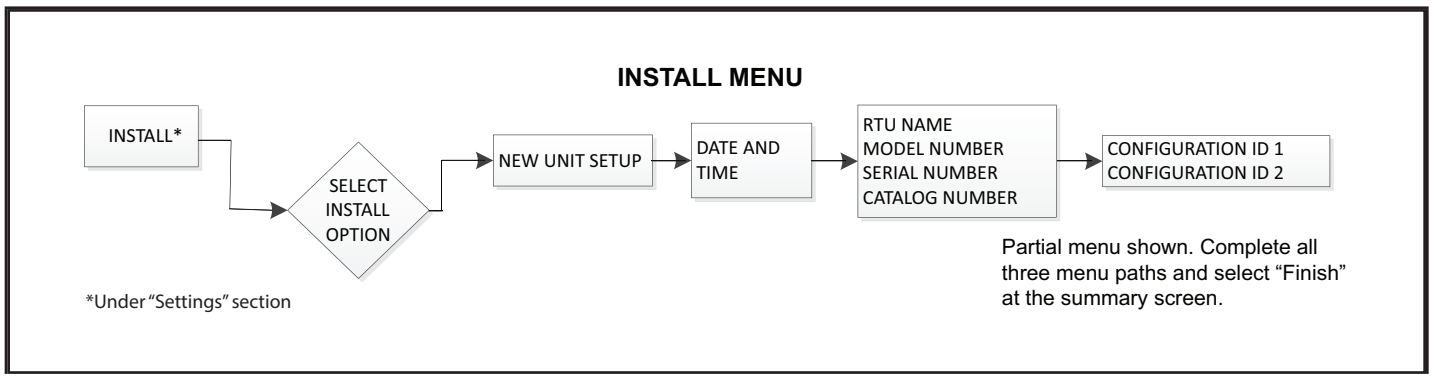



**FIGURE 14**

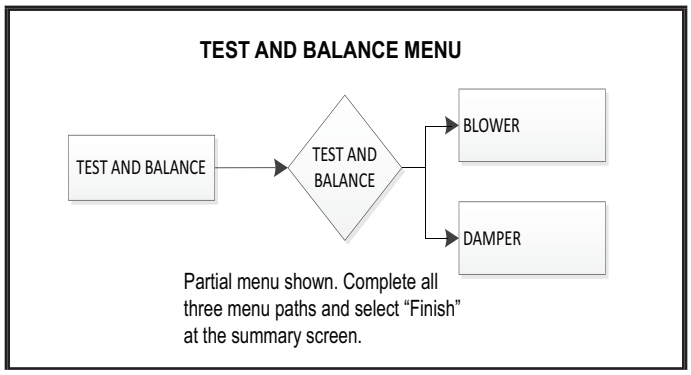



**FIGURE 15**

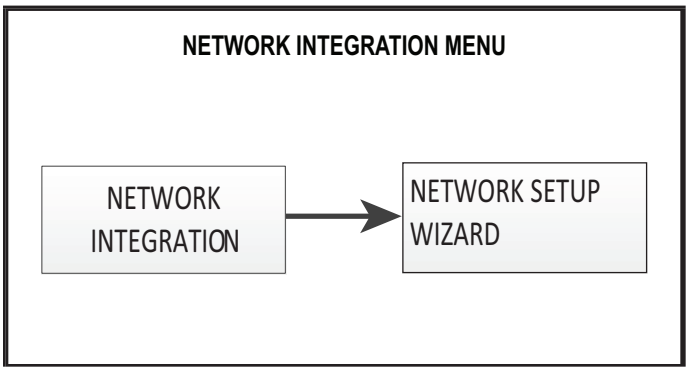



**FIGURE 16**

### E-Unit Controller Components

See FIGURE 17 for Unit Controller components. See FIGURE 18 and TABLE 2 for pushbutton and LED functions.

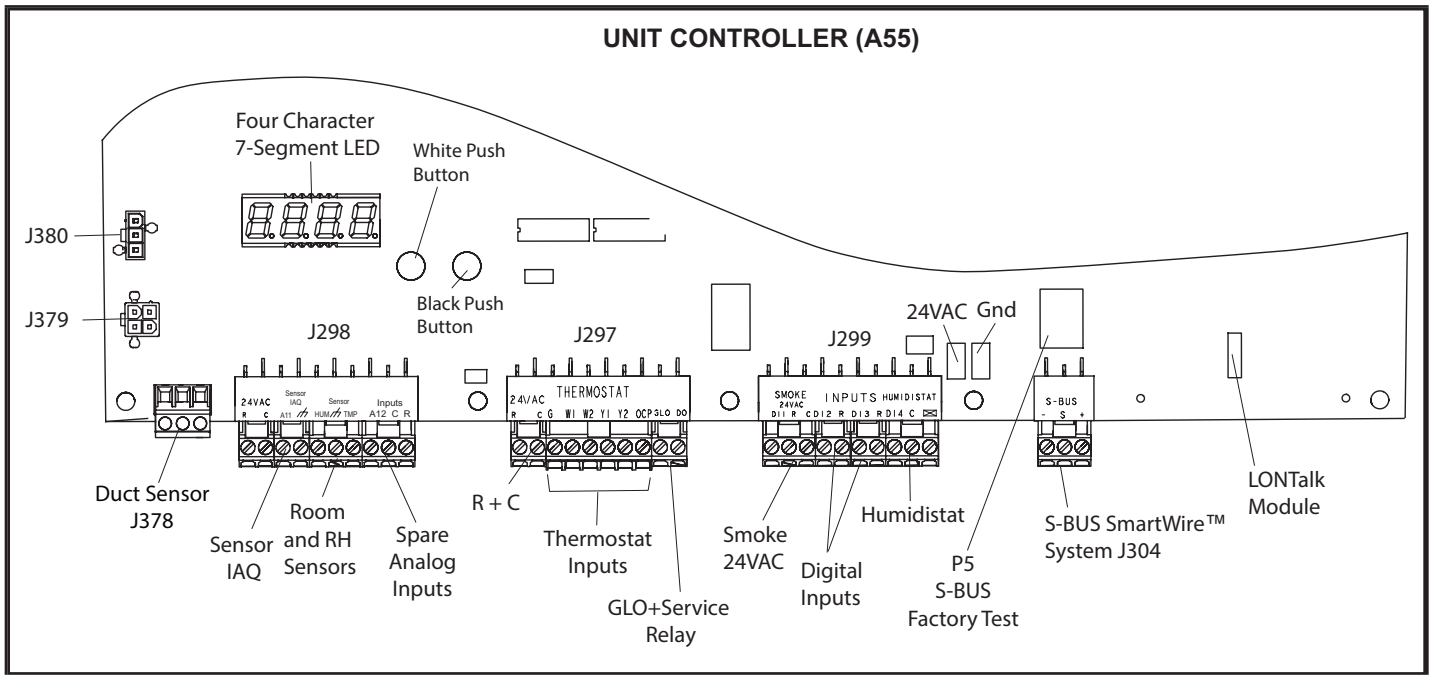
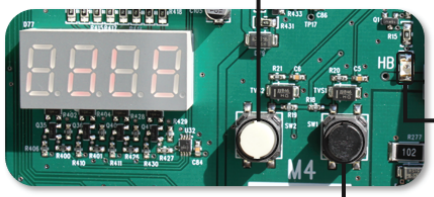



**FIGURE 17**




**TEST BUTTON**

* Short press will put the unit into test mode - tESt
* Long press will put the unit into setup mode for two-stage thermostate - StAt

HB LED – blinks while M4 is powered

**RESET BUTTON**

* Short press will clear unit delays (lockouts) - CLdL
* Long press will reset the M4 Unit Controller - rSt

* Short press is about 2 to 5 seconds in duration.
* Long press is about 5 to 8 seconds in duration

**Short Press (2 – 5 Seconds), Long Press (5 – 10 seconds)*

**FIGURE 18**

## TABLE 2

**UNIT CONTROLLER PUSHBUTTON CODES**

| Code | Cause | Action |
|---|---|---|
| CLdL | Black Button: Short Press | Clear Delays |
| rSt | Black Button: Long Press | Reset |
| tESt | White Button: Short Press | TSTAT Test |
| StAt | White Button: Long Press (In Pre-Install state) | TSTAT Override |
| tESt | White Button: Long Press (NOT in Pre-Install State) | TSTAT Test |
| Short Press : 2 to 5 seconds.<br>Long Press : 5 to 8 seconds. | | |

## Blower Operation and Adjustments

LHX072S5T units are equipped with two-stage blowers. The blower will operate at high speed with a Y2 thermostat demand and low speed with a Y1 thermostat demand. Low speed operation delivers approximately 2/3 of the air volume of high speed. Two-speed blower operation results in lower energy consumption.

**TABLE 3**

**BLOWER OPTIONS**

| | |
|---|---|
| **Single Phase LHX 024, 036, 048, 060** | Single Speed or Variable Speed, Direct Drive |
| **Three Phase LHX 036, 048, 060** | Single Speed or Variable Speed, Direct Drive or Single Speed Belt Drive |
| **Three Phase LHX 072** | Two-Speed Belt Drive |

**⚠ IMPORTANT**

Three phase scroll compressors must be phased sequentially for correct compressor and blower rotation. Follow "COOLING START-UP" section of installation instructions to ensure proper compressor and blower operation.

**A-Blower Operation**

Refer to the Unit Controller Setup Guide to energize blower. Use the mobile service app menu; see:

**RTU MENU>COMPONENT TEST>BLOWER> START TEST**

**⚠ WARNING**

1- Make sure that unit is installed in accordance with the installation instructions and applicable codes.

2- Inspect all electrical wiring, both field and factory-installed, for loose connections. Tighten as required.

3- Check to ensure that refrigerant lines do not rub against the cabinet or against other refrigerant lines.

4- Check voltage at disconnect switch. Voltage must be within range listed on nameplate. If not, consult power company and have voltage condition corrected before starting unit.

5- Make sure filters are new and in place before start-up.

Direct-drive motor may not immediately stop when power is interrupted to the Unit Controller. Disconnect unit power before opening the blower compartment. The Controller's digital inputs must be used to shut down the blower. See Unit Controller manual for operation sequences.

**B-Determining Unit CFM - Direct Drive Blower**

1 - The following measurements must be made with air filters in place.

2 - With all access panels in place, measure static pressure external to unit (from supply to return). Blower performance data is based on static pressure readings taken in locations shown in FIGURE 20.

***NOTE -*** *Static pressure readings can vary if not taken where shown.*

3 - Use FIGURE 19 to determine the factory set blower speed.

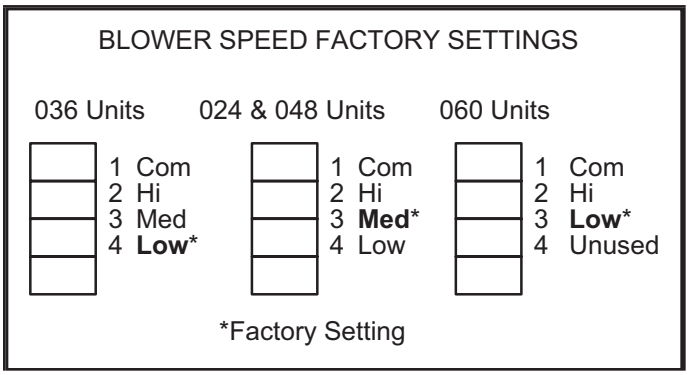



**FIGURE 19**

Use direct drive blower tables, the measured static pressure and the factory-set blower speed to determine CFM. If CFM is lower or higher than the design specified CFM, move the leads as shown in FIGURE 21 for 208/230 volt units and FIGURE 22 for 460/575 volt units.

Use the Accessory Air Resistance tables when installing units with any of the options or accessories listed. Refer to TABLE 5 for minimum airflow when electric heat is installed.

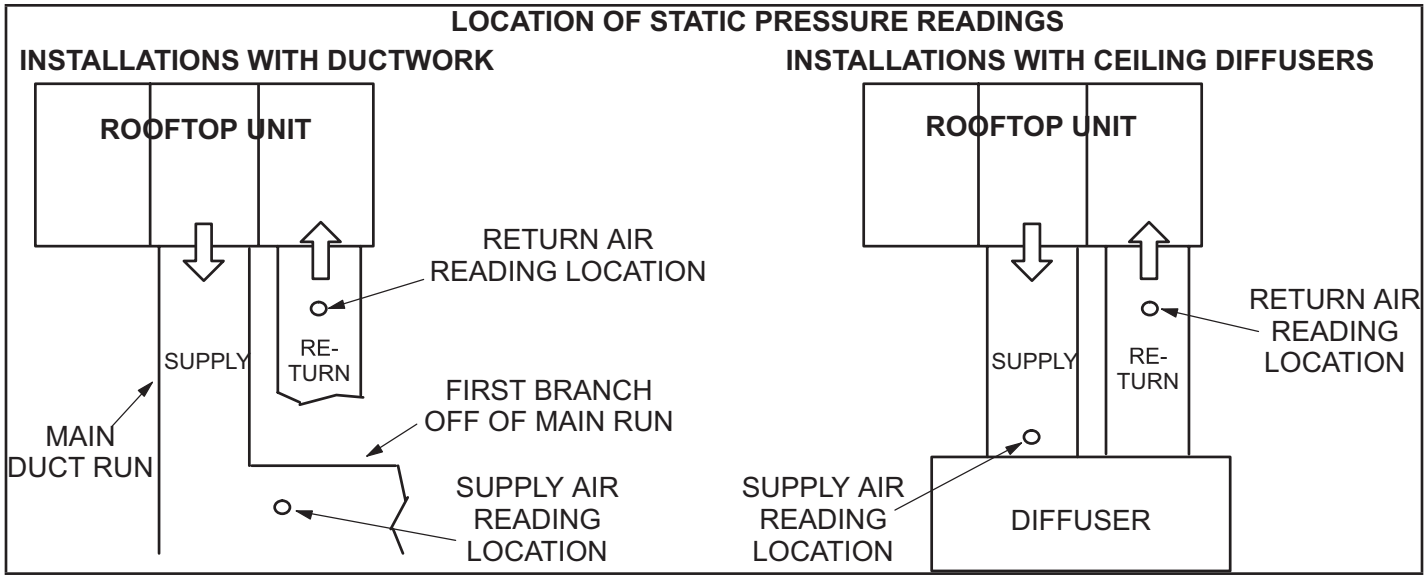



**FIGURE 20**

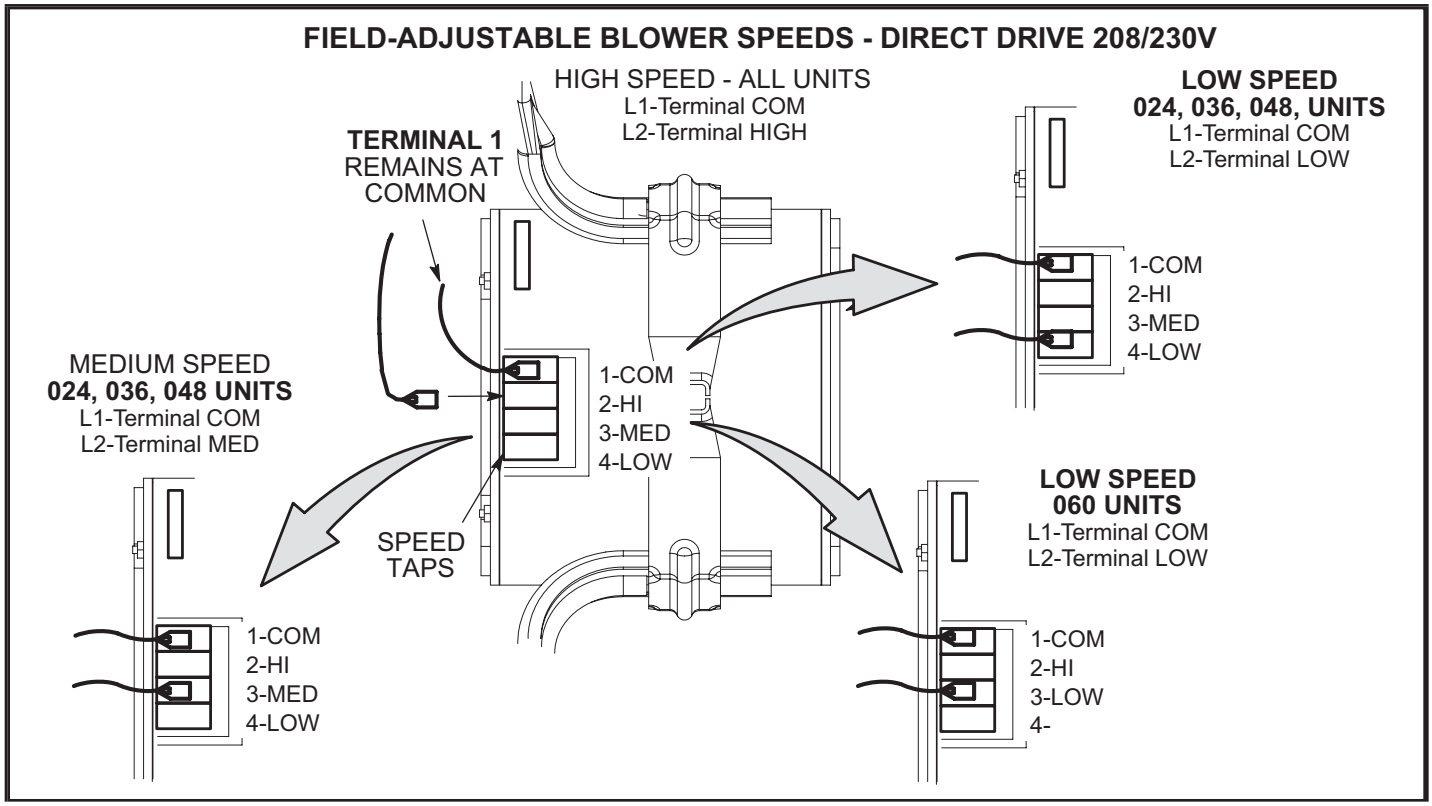



**FIGURE 21**

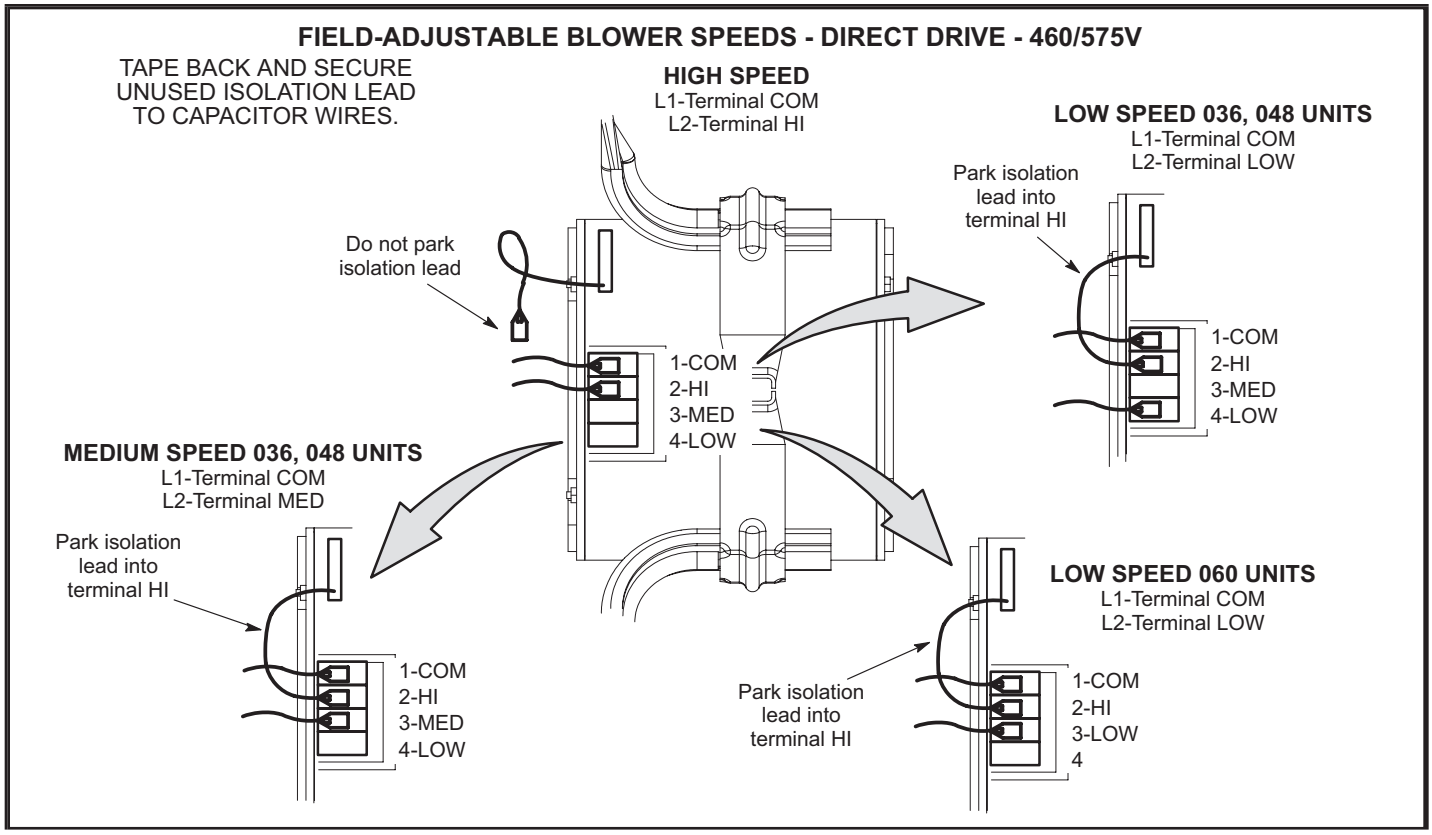



**FIGURE 22**

From the mobile service app, use **TEST & BALANCE > BLOWER** menu to modify the following blower parameters:

- HEATING HIGH CFM

  This is the percentage of torque for blower heating speed.

- HEATING LOW CFM

  This is the percentage of torque for blower heating low speed on single phase gas heating units only.

- COOLING HIGH CFM

  This is the percentage of torque for blower cooling high speed. For 024 units, this is the only cooling speed.

- COOLING LOW CFM

  This is the percentage of torque for blower cooling low speed (036, 048, and 060 units only) and vent speed for standard static blowers (all units).

- VENTILATION CFM

  This is the percentage of torque for high static blower ventilation speed.

**TABLE 4**

**MINIMUM AND MAXIMUM PULLEY ADJUSTMENT**

| Belt | Min Turns Open | Max Turns Open |
|---|---|---|
| A-Section | No Minimum | 5 |

**TABLE 5**

**Minimum Airflow for Electric Heat**

| Size | kW Size | Minimum CFM | | |
|---|---|---|---|---|
| | | Direct Drive | Belt Drive Downflow | Belt Drive Horizontal |
| All Models | 5 | 600 | N/A | N/A |
| | 7.5 | 600 | 1,050 | 1200 |
| | 10 | 600 | N/A | N/A |
| | 15 | 1100 | 1250 | 1350 |
| | 22.5 | 1600 | 1750 | 1800 |

**C-Determining Unit CFM - Belt Drive Blower**

1 - The following measurements must be made with air filters in place and no cooling demand.

2 - With all access panels in place, measure static pressure external to unit (from supply to return).

3 - Measure the indoor blower wheel RPM.

4 - Referring to the blower tables use static pressure and RPM readings to determine unit CFM. Use air resistance table on when installing units with any of the options or accessories listed.

5 - The blower RPM can be adjusted at the motor pulley. Loosen Allen screw and turn adjustable pulley clockwise to increase CFM. Turn counterclockwise to decrease CFM. See FIGURE 25. Do not exceed minimum and maximum number of pulley turns as shown in TABLE 4.

**D-Blower Belt Adjustment**

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained. Tension new belts after a 24-48 hour period of operation. This will allow belt to stretch and seat grooves. Make sure blower and motor pulley are aligned as shown in FIGURE 24.

1 - Loosen four bolts securing motor base to mounting frame. See FIGURE 25.

*2 - To increase belt tension* - Slide blower motor downward to tighten the belt. This increases the distance between the blower motor and the blower housing.

3 - *To loosen belt tension* - Slide blower motor upward to loosen the belt. This decreases the distance between the blower motor and the blower housing.

4 - Tighten four bolts securing motor base to the mounting frame.

**E-Check Belt Tension**

Overtensioning belts shortens belt and bearing life. Check belt tension as follows:

1 - Measure span length X. See FIGURE 23.

2 - Apply perpendicular force to center of span (X) with enough pressure to deflect belt 1/64" for every inch of span length or 1.5mm per 100mm of span length. Example: Deflection distance of a 40" span would be 40/64" or 5/8". Example: Deflection distance of a 400mm span would be 6mm.

3 - Measure belt deflection force. For a used belt, the deflection force should be 5 lbs. (35kPa). A new belt deflection force should be 7 lbs. (48kPa). A force below these values indicates an undertensioned belt. A force above these values indicates an over-tensioned belt.

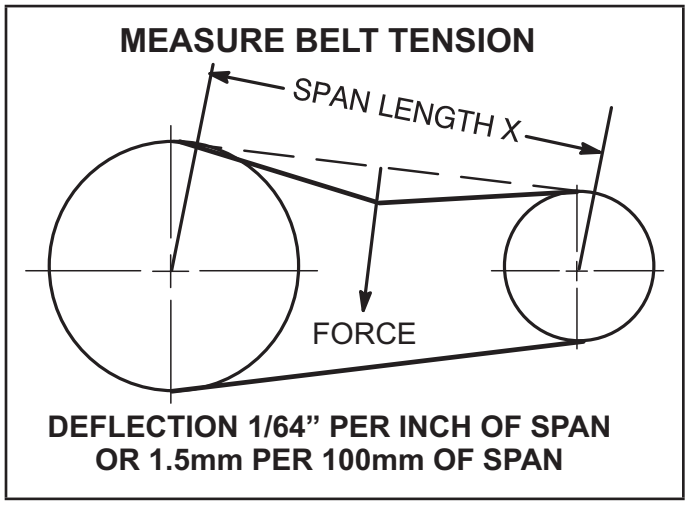



**FIGURE 23**

**F-Field-Furnished Blower Drives**

See blower data tables for field-furnished blower drives to determine BHP and RPM required. See drive kit on TABLE 6 to determine the drive kit number.

**G-Adjusting Unit CFM**

The supply CFM can be adjusted by changing Unit Controller settings. Refer to TABLE 7 for menu paths and default settings. Record any CFM changes on the parameter settings label located on the inside of the compressor access panel.

*IMPORTANT - The default value for Cooling Low CFM is lower than a traditional single- or two-speed blower. If operating the unit with a 2 or 3-stage controller (2 or 3-stage thermostat, DDC controller, etc.), it is recommended to increase the Cooling Low CFM default value to a suitable level for part load cooling (typically 60% of full load CFM).*

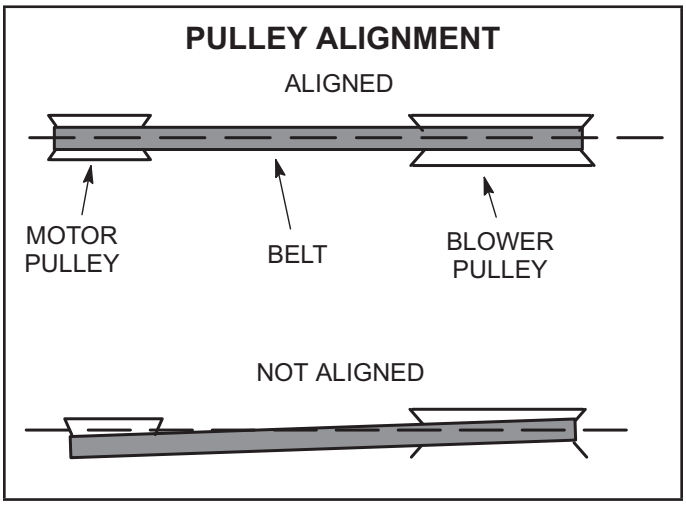



**FIGURE 24**

**TABLE 6**

**DRIVE COMPONENT MANUFACTURER'S NUMBERS**

| Drive No. | DRIVE COMPONENTS | | | | | |
|---|---|---|---|---|---|---|
| | Motor Pulley | | Blower Pulley | | Belts | |
| | Browning No. | OEM Part No. | Browning No. | OEM Part No. | Browning No. | OEM Part No. |
| A04 | 1VP40 X 7/8 | 79J0301 | AK49 X 1 | 100244-18 | A41 | 100245-18 |
| A07 | 1VP50 X 7/8 | 53J1501 | AK54 X 1 | 100244-19 | AX43 | 73K8201 |
| A08 | 1VP44 X 7/8 | P-8-1488 | AK46 X 1 | 100244-17 | A40 | 73K8201 |

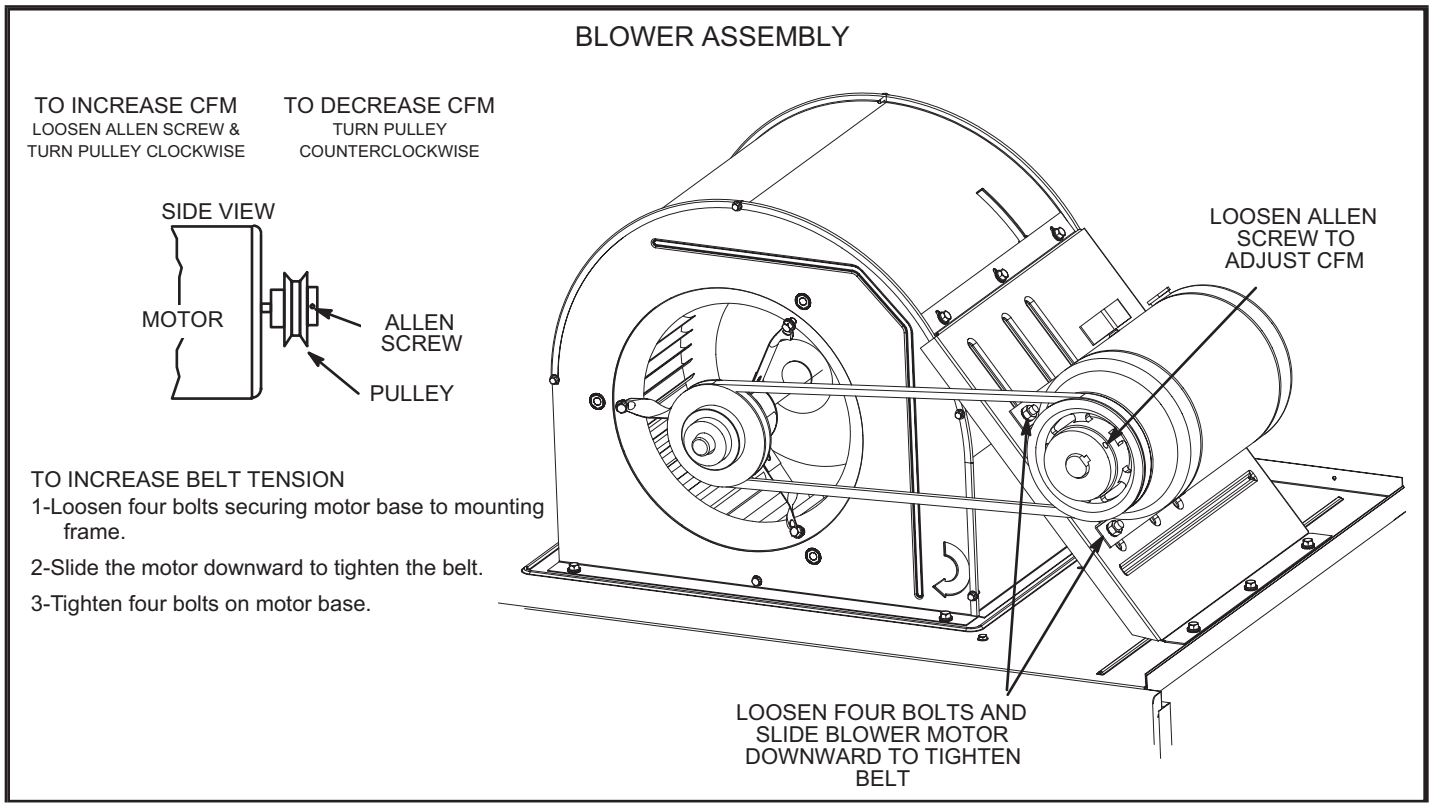



**FIGURE 25**

## TABLE 7
## BLOWER PERFORMANCE SETTINGS - 581102-01

| 024-072 Parameter Settings | | |
|---|---|---|
| **Parameter** | **Field Setting** | **Description** |
| ***NOTE -*** *Any changes to Smoke CFM setting must be adjusted before the other CFM settings. Use SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 12 for EBM, 6 for ECM* | | |
| BLOWER SMOKE CFM | % | Percentage of torque for blower smoke speed |
| **SETUP > TEST & BALANCE > BLOWER** | | |
| BLOWER HEATING HIGH CFM | % | Percentage of torque for blower heating high speed. |
| BLOWER HEATING LOW CFM | % | Percentage of torque for blower heating low speed (P volt gas heat only). |
| BLOWER COOLING HIGH CFM | % | Percentage of torque for blower cooling high speed. |
| BLOWER COOLING LOW CFM | % | Percentage of torque for blower cooling low speed and vent speed for standard static blowers. |
| BLOWER VENTILATION CFM | % | Percentage of torque for high static blower ventilation speed. |
| **SETUP > TEST & BALANCE > DAMPER** | | |
| BLOWER HIGH CFM DAMPER POS % | % | Minimum damper position for high speed blower operation. Default 0%. |
| BLOWER LOW CFM DAMPER POS % | % | Minimum damper position for low speed blower operation. Default 0%. |
| POWER EXHAUST DAMPER POS % | % | Minimum damper position for low power exhaust operation. Default 50%. |
| **SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 216** | | |
| POWER EXHAUST DEADBAND | % | Deadband % for power exhaust operation. Default 10%. |
| **SETTINGS > RTU OPTIONS > EDIT PARAMETERS = 10 (Applies to Thermostat Mode ONLY)** | | |
| FREE COOLING STAGE-UP DELAY | % | Number of seconds to hold blower at low speed before switching to blower at high speed. Default 300 seconds. |

**Installer -** Record any parameter changes under “Field Setting” column. Settings need to be recorded by installer for use when Unit Controller is replaced or reprogrammed.

## BLOWER DATA — 0.25 HP Direct Drive 2 Ton [PSC]

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (economizer, wet coil, etc.)
2 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

| External Static Pressure (in. w.g.) | Air Volume (cfm) at Various Blower Speeds | | | | | |
|---|---|---|---|---|---|---|
| | 208 VOLTS | | | 230 VOLTS | | |
| | High | Medium | Low | High | Medium | Low |
| **2 ton Standard Efficiency (Downflow)** | | | | | | **LHX024S** |
| 0.0 | 1199 | 928 | 838 | 1379 | 1085 | 877 |
| 0.1 | 1229 | 926 | 813 | 1409 | 1086 | 872 |
| 0.2 | 1206 | 928 | 782 | 1367 | 1094 | 850 |
| 0.3 | 1183 | 881 | 742 | 1350 | 1047 | 820 |
| 0.4 | 1159 | 843 | 686 | 1321 | 1009 | 783 |
| 0.5 | 1136 | 812 | 643 | 1282 | 981 | 762 |
| 0.6 | 1103 | 766 | 569 | 1242 | 921 | 705 |
| 0.7 | 1046 | 728 | 496 | 1195 | 888 | 625 |
| 0.8 | 953 | 648 | 432 | 1134 | 792 | 583 |
| 0.9 | 909 | 584 | 335 | 1037 | 738 | 492 |
| 1.0 | 783 | 465 | 247 | 926 | 592 | 411 |
| **2 Standard Efficiency (Horizontal)** | | | | | | **LHX024S** |
| 0.0 | 1152 | 909 | 801 | 1325 | 1063 | 838 |
| 0.1 | 1152 | 893 | 770 | 1321 | 1048 | 826 |
| 0.2 | 1136 | 866 | 734 | 1288 | 1021 | 798 |
| 0.3 | 1104 | 826 | 697 | 1260 | 982 | 771 |
| 0.4 | 1072 | 787 | 643 | 1222 | 942 | 734 |
| 0.5 | 1041 | 747 | 589 | 1175 | 903 | 698 |
| 0.6 | 1009 | 707 | 534 | 1137 | 850 | 662 |
| 0.7 | 946 | 654 | 467 | 1081 | 797 | 588 |
| 0.8 | 861 | 588 | 396 | 1024 | 718 | 535 |
| 0.9 | 798 | 508 | 319 | 911 | 642 | 468 |
| 1.0 | 715 | 443 | 237 | 846 | 564 | 394 |

## BLOWER DATA — 0.5 HP DIRECT DRIVE 3 TON | 4 TON [PSC]

**LHX036S5D | LHX048S5D**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (larger gas heat section, economizer, wet coil, etc.)
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.)

**Minimum Air Volume Required For Different Gas Heat Sizes:**

Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

| External Static Pressure (in. w.g.) | Air Volume (cfm) at Various Blower Speeds | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 208 VOLTS | | | 230 VOLTS | | | 460/575 VOLTS | | |
| | High | Medium | Low | High | Medium | Low | High | Medium | Low |
| **3 and 4 Ton Standard Efficiency (Downflow)** | | | | | | | | | **LHX036S and LHX048S** |
| 0.0 | 1873 | 1561 | 1123 | 2094 | 1783 | 1321 | 2064 | 1727 | 1216 |
| 0.1 | 1993 | 1601 | 1148 | 2168 | 1797 | 1338 | 2105 | 1744 | 1229 |
| 0.2 | 1913 | 1601 | 1137 | 2098 | 1803 | 1308 | 2050 | 1694 | 1198 |
| 0.3 | 1858 | 1527 | 1078 | 2036 | 1725 | 1261 | 1987 | 1638 | 1167 |
| 0.4 | 1801 | 1496 | 1046 | 1973 | 1679 | 1219 | 1905 | 1598 | 1148 |
| 0.5 | 1763 | 1467 | 987 | 1910 | 1647 | 1177 | 1862 | 1559 | 1108 |
| 0.6 | 1709 | 1414 | 897 | 1830 | 1560 | 1080 | 1781 | 1509 | 1057 |
| 0.7 | 1617 | 1368 | 806 | 1727 | 1519 | 986 | 1698 | 1449 | 982 |
| 0.8 | 1472 | 1269 | 730 | 1604 | 1419 | 918 | 1614 | 1389 | 920 |
| 0.9 | 1359 | 1162 | 487 | 1478 | 1363 | 706 | 1488 | 1346 | 792 |
| 1.0 | 961 | 922 | 370 | 1093 | 1083 | 590 | 1167 | 1099 | 703 |
| **3 and 4 Ton Standard Efficiency (Horizontal)** | | | | | | | | | **LHX036S and LHX048S** |
| 0.0 | 1799 | 1530 | 1073 | 2012 | 1747 | 1263 | 2015 | 1756 | 1251 |
| 0.1 | 1868 | 1544 | 1088 | 2032 | 1733 | 1268 | 2071 | 1760 | 1279 |
| 0.2 | 1802 | 1494 | 1068 | 1976 | 1682 | 1228 | 2014 | 1700 | 1226 |
| 0.3 | 1735 | 1432 | 1014 | 1900 | 1618 | 1185 | 1937 | 1634 | 1187 |
| 0.4 | 1666 | 1397 | 980 | 1825 | 1568 | 1142 | 1878 | 1597 | 1174 |
| 0.5 | 1615 | 1350 | 904 | 1750 | 1516 | 1078 | 1801 | 1558 | 1124 |
| 0.6 | 1564 | 1305 | 842 | 1675 | 1440 | 1014 | 1743 | 1479 | 1060 |
| 0.7 | 1462 | 1228 | 758 | 1562 | 1364 | 928 | 1664 | 1415 | 982 |
| 0.8 | 1330 | 1151 | 670 | 1449 | 1287 | 842 | 1512 | 1335 | 865 |
| 0.9 | 1194 | 1011 | 464 | 1298 | 1185 | 671 | 1393 | 1297 | 733 |
| 1.0 | 878 | 878 | 355 | 998 | 1032 | 565 | 1060 | 1063 | 618 |

**BLOWER DATA** **1 HP DIRECT DRIVE 3 TON | 4 TON | 5 TON [ECM]**

**LHX024S5E | LHX036S5E**

BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.

FOR ALL UNITS ADD:
1 - Any factory installed options air resistance (larger gas heat section, economizer, wet coil, etc.)
2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.)

**DOWNFLOW**

| External Static Press. in. w.g | Percentage of Total Motor Torque | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20% | | | 30% | | | 40% | | | 50% | | | 60% | | | 70% | | | 80% | | | 90% | | | 100% | | |
| | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM |
| 0 | 1067 | 112 | 488 | 1325 | 196 | 573 | 1583 | 279 | 657 | 1759 | 381 | 726 | 1934 | 482 | 794 | 2046 | 579 | 845 | 2157 | 676 | 896 | 2285 | 816 | 956 | 2358 | 925 | 989 |
| 0.1 | 984 | 97 | 537 | 1249 | 184 | 616 | 1513 | 270 | 695 | 1697 | 376 | 760 | 1881 | 481 | 825 | 2002 | 584 | 873 | 2123 | 686 | 921 | 2273 | 838 | 978 | 2352 | 947 | 1008 |
| 0.2 | 912 | 91 | 587 | 1183 | 180 | 661 | 1453 | 268 | 735 | 1644 | 377 | 796 | 1835 | 486 | 856 | 1964 | 593 | 902 | 2093 | 700 | 947 | 2264 | 863 | 1001 | 2349 | 973 | 1030 |
| 0.3 | 851 | 92 | 636 | 1126 | 183 | 706 | 1400 | 273 | 775 | 1597 | 385 | 832 | 1794 | 497 | 889 | 1931 | 607 | 932 | 2067 | 717 | 974 | 2256 | 891 | 1026 | 2348 | 1001 | 1053 |
| 0.4 | 797 | 100 | 687 | 1075 | 192 | 751 | 1353 | 283 | 815 | 1555 | 397 | 869 | 1757 | 511 | 922 | 1901 | 625 | 962 | 2044 | 738 | 1002 | 2248 | 919 | 1051 | 2347 | 1031 | 1077 |
| 0.5 | 752 | 114 | 737 | 1032 | 206 | 796 | 1312 | 298 | 855 | 1518 | 413 | 905 | 1724 | 528 | 955 | 1873 | 644 | 993 | 2021 | 760 | 1030 | 2239 | 948 | 1078 | 2345 | 1061 | 1102 |
| 0.6 | 712 | 132 | 787 | 994 | 224 | 842 | 1275 | 316 | 896 | 1484 | 432 | 942 | 1692 | 548 | 988 | 1845 | 666 | 1024 | 1998 | 783 | 1059 | 2228 | 977 | 1104 | --- | --- | --- |
| 0.7 | 678 | 155 | 836 | 960 | 246 | 886 | 1242 | 336 | 936 | 1452 | 452 | 979 | 1662 | 568 | 1021 | 1818 | 687 | 1055 | 1974 | 806 | 1088 | 2214 | 1004 | 1131 | --- | --- | --- |
| 0.8 | 648 | 180 | 885 | 929 | 269 | 931 | 1210 | 358 | 976 | 1421 | 474 | 1016 | 1632 | 589 | 1055 | 1790 | 709 | 1086 | 1948 | 828 | 1117 | 2195 | 1028 | 1158 | --- | --- | --- |
| 0.9 | 621 | 207 | 933 | 900 | 294 | 974 | 1179 | 381 | 1015 | 1390 | 495 | 1051 | 1600 | 609 | 1087 | 1760 | 728 | 1117 | 1919 | 847 | 1146 | 2170 | 1049 | 1185 | --- | --- | --- |
| 1.0 | 596 | 235 | 981 | 872 | 319 | 1017 | 1148 | 403 | 1053 | 1357 | 516 | 1086 | 1566 | 628 | 1119 | 1725 | 746 | 1147 | 1884 | 864 | 1174 | 2139 | 1066 | 1212 | --- | --- | --- |
| 1.1 | --- | --- | --- | --- | --- | --- | 1115 | 424 | 1090 | 1322 | 534 | 1120 | 1528 | 643 | 1150 | 1686 | 760 | 1176 | 1844 | 876 | 1201 | 2100 | 1078 | 1238 | --- | --- | --- |
| 1.2 | --- | --- | --- | --- | --- | --- | 1080 | 443 | 1126 | 1283 | 549 | 1153 | 1485 | 655 | 1180 | 1641 | 770 | 1204 | 1797 | 884 | 1228 | 2052 | 1083 | 1264 | --- | --- | --- |
| 1.3 | --- | --- | --- | --- | --- | --- | 1040 | 458 | 1161 | 1238 | 561 | 1185 | 1436 | 663 | 1209 | 1589 | 775 | 1231 | 1742 | 886 | 1253 | 1993 | 1081 | 1288 | --- | --- | --- |
| 1.4 | --- | --- | --- | --- | --- | --- | 996 | 469 | 1194 | 1189 | 567 | 1215 | 1381 | 665 | 1236 | 1530 | 773 | 1257 | 1678 | 881 | 1277 | 1923 | 1071 | 1311 | --- | --- | --- |

**HORIZONTAL**

| External Static Press. in. w.g | Percentage of Total Motor Torque | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20% | | | 30% | | | 40% | | | 50% | | | 60% | | | 70% | | | 80% | | | 90% | | | 100% | | |
| | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM | Cfm | Watts | RPM |
| 0 | 1087 | 111 | 493 | 1304 | 184 | 579 | 1520 | 257 | 665 | 1689 | 368 | 738 | 1857 | 478 | 810 | 1972 | 588 | 864 | 2087 | 698 | 918 | 2196 | 844 | 975 | 2283 | 925 | 1000 |
| 0.1 | 1021 | 104 | 537 | 1246 | 180 | 618 | 1470 | 255 | 699 | 1646 | 368 | 768 | 1821 | 480 | 837 | 1941 | 592 | 888 | 2061 | 704 | 938 | 2179 | 852 | 992 | 2255 | 926 | 1017 |
| 0.2 | 961 | 102 | 582 | 1193 | 181 | 658 | 1425 | 259 | 734 | 1607 | 373 | 799 | 1789 | 487 | 864 | 1914 | 601 | 912 | 2039 | 714 | 960 | 2163 | 864 | 1012 | 2231 | 932 | 1034 |
| 0.3 | 906 | 106 | 628 | 1145 | 186 | 699 | 1384 | 266 | 769 | 1572 | 382 | 831 | 1759 | 498 | 892 | 1889 | 613 | 938 | 2018 | 728 | 984 | 2149 | 879 | 1033 | 2209 | 941 | 1053 |
| 0.4 | 855 | 113 | 674 | 1101 | 196 | 740 | 1347 | 278 | 806 | 1540 | 396 | 864 | 1732 | 513 | 921 | 1866 | 629 | 965 | 1999 | 744 | 1008 | 2134 | 896 | 1054 | --- | --- | --- |
| 0.5 | 808 | 125 | 720 | 1060 | 209 | 781 | 1312 | 293 | 842 | 1509 | 412 | 896 | 1706 | 530 | 950 | 1843 | 646 | 992 | 1980 | 762 | 1033 | 2119 | 915 | 1077 | --- | --- | --- |
| 0.6 | 764 | 139 | 766 | 1022 | 225 | 823 | 1279 | 310 | 879 | 1481 | 430 | 930 | 1682 | 549 | 980 | 1821 | 666 | 1019 | 1960 | 782 | 1058 | 2102 | 935 | 1101 | --- | --- | --- |
| 0.7 | 722 | 155 | 812 | 984.5 | 242 | 864 | 1247 | 328 | 916 | 1452 | 449 | 964 | 1657 | 569 | 1011 | 1799 | 686 | 1048 | 1940 | 803 | 1084 | 2084 | 955 | 1125 | --- | --- | --- |
| 0.8 | 682 | 172 | 858 | 949 | 260 | 906 | 1216 | 348 | 953 | 1424 | 469 | 997 | 1632 | 589 | 1041 | 1776 | 706 | 1076 | 1919 | 823 | 1111 | 2063 | 974 | 1150 | --- | --- | --- |
| 0.9 | 643 | 191 | 903 | 914 | 279 | 946 | 1185 | 367 | 989 | 1396 | 489 | 1030 | 1606 | 610 | 1071 | 1751 | 727 | 1104 | 1895 | 843 | 1137 | 2039 | 992 | 1175 | --- | --- | --- |
| 1.0 | --- | --- | --- | --- | --- | --- | 1153 | 386 | 1024 | 1366 | 508 | 1062 | 1579 | 629 | 1100 | 1724 | 745 | 1132 | 1869 | 861 | 1163 | 2011 | 1008 | 1201 | --- | --- | --- |
| 1.1 | --- | --- | --- | --- | --- | --- | 1120 | 404 | 1059 | 1334 | 525 | 1095 | 1548 | 646 | 1130 | 1694 | 761 | 1160 | 1839 | 876 | 1189 | 1979 | 1021 | 1226 | --- | --- | --- |
| 1.2 | --- | --- | --- | --- | --- | --- | 1085 | 420 | 1093 | 1300 | 541 | 1126 | 1515 | 661 | 1158 | 1660 | 775 | 1186 | 1805 | 889 | 1214 | 1941 | 1031 | 1250 | --- | --- | --- |
| 1.3 | --- | --- | --- | --- | --- | --- | 1047 | 433 | 1126 | 1263 | 553 | 1156 | 1478 | 672 | 1186 | 1622 | 785 | 1213 | 1766 | 898 | 1239 | 1897 | 1037 | 1275 | --- | --- | --- |
| 1.4 | --- | --- | --- | --- | --- | --- | 1005 | 442 | 1158 | 1221 | 561 | 1185 | 1436 | 680 | 1212 | 1579 | 792 | 1238 | 1721 | 903 | 1263 | 1847 | 1037 | 1298 | --- | --- | --- |

# BLOWER DATA — 2 HP BELT DRIVE (SINGLE SPEED) - 5 TON

**LHX060S5B**

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (larger gas heat section, economizer, wet coil, etc.)

2 - Any field installed accessories air resistance (duct resistance, diffuser, etc.)

See page 23 for blower motors and drives.

**Minimum Air Volume Required For Different Gas Heat Sizes:**

Standard Heat - 1075 cfm; Medium Heat - 1150 cfm; High Heat - 1500 cfm

**DOWNFLOW**

| Air Volume cfm | External Static - in. w.g. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | | 0.20 | | 0.30 | | 0.40 | | 0.50 | | 0.60 | | 0.70 | | 0.80 | | 0.90 | | 1.00 | | 1.10 | | 1.20 | | 1.30 | | 1.40 | | 1.50 | | 1.60 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 1600 | 720 | 0.28 | 769 | 0.33 | 819 | 0.37 | 871 | 0.41 | 926 | 0.44 | 975 | 0.47 | 1016 | 0.51 | 1054 | 0.55 | 1093 | 0.60 | 1133 | 0.63 | 1173 | 0.67 | 1214 | 0.70 | 1253 | 0.73 | 1288 | 0.77 | 1318 | 0.81 | 1351 | 0.85 |
| 1700 | 779 | 0.30 | 822 | 0.35 | 864 | 0.39 | 908 | 0.44 | 953 | 0.48 | 995 | 0.52 | 1034 | 0.57 | 1072 | 0.61 | 1111 | 0.65 | 1150 | 0.69 | 1190 | 0.72 | 1230 | 0.76 | 1268 | 0.79 | 1301 | 0.83 | 1331 | 0.87 | 1363 | 0.92 |
| 1800 | 828 | 0.34 | 864 | 0.39 | 901 | 0.43 | 938 | 0.48 | 977 | 0.53 | 1015 | 0.58 | 1053 | 0.63 | 1091 | 0.67 | 1130 | 0.71 | 1169 | 0.75 | 1208 | 0.78 | 1247 | 0.82 | 1285 | 0.86 | 1317 | 0.90 | 1345 | 0.94 | 1377 | 0.98 |
| 1900 | 858 | 0.41 | 892 | 0.45 | 927 | 0.50 | 962 | 0.55 | 999 | 0.60 | 1036 | 0.65 | 1074 | 0.69 | 1112 | 0.73 | 1150 | 0.77 | 1188 | 0.81 | 1227 | 0.85 | 1267 | 0.88 | 1303 | 0.92 | 1333 | 0.97 | 1361 | 1.02 | 1392 | 1.06 |
| 2000 | 879 | 0.47 | 913 | 0.52 | 948 | 0.56 | 984 | 0.61 | 1020 | 0.67 | 1058 | 0.72 | 1096 | 0.76 | 1134 | 0.80 | 1172 | 0.84 | 1210 | 0.88 | 1248 | 0.92 | 1286 | 0.96 | 1321 | 1.00 | 1350 | 1.05 | 1377 | 1.10 | 1409 | 1.14 |
| 2100 | 900 | 0.53 | 935 | 0.58 | 970 | 0.63 | 1007 | 0.69 | 1044 | 0.74 | 1081 | 0.79 | 1119 | 0.84 | 1157 | 0.88 | 1195 | 0.91 | 1233 | 0.95 | 1269 | 1.00 | 1306 | 1.04 | 1339 | 1.09 | 1367 | 1.14 | 1395 | 1.19 | 1426 | 1.23 |
| 2200 | 922 | 0.60 | 958 | 0.65 | 994 | 0.71 | 1031 | 0.76 | 1068 | 0.82 | 1106 | 0.87 | 1143 | 0.91 | 1180 | 0.95 | 1218 | 0.99 | 1255 | 1.03 | 1290 | 1.09 | 1324 | 1.14 | 1356 | 1.19 | 1385 | 1.24 | 1413 | 1.28 | 1444 | 1.32 |
| 2300 | 947 | 0.67 | 983 | 0.73 | 1020 | 0.79 | 1057 | 0.85 | 1094 | 0.90 | 1131 | 0.95 | 1168 | 1.00 | 1205 | 1.03 | 1242 | 1.07 | 1277 | 1.13 | 1310 | 1.20 | 1343 | 1.26 | 1374 | 1.30 | 1403 | 1.34 | 1432 | 1.38 | 1464 | 1.42 |
| 2400 | 974 | 0.76 | 1010 | 0.82 | 1047 | 0.88 | 1084 | 0.94 | 1120 | 0.99 | 1157 | 1.04 | 1193 | 1.08 | 1230 | 1.12 | 1267 | 1.16 | 1300 | 1.23 | 1332 | 1.31 | 1364 | 1.37 | 1394 | 1.41 | 1423 | 1.45 | 1453 | 1.48 | 1484 | 1.53 |

**HORIZONTAL**

| Air Volume cfm | External Static - in. w.g. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | | 0.20 | | 0.30 | | 0.40 | | 0.50 | | 0.60 | | 0.70 | | 0.80 | | 0.90 | | 1.00 | | 1.10 | | 1.20 | | 1.30 | | 1.40 | | 1.50 | | 1.60 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 1600 | 654 | 0.28 | 712 | 0.32 | 769 | 0.36 | 825 | 0.39 | 879 | 0.43 | 933 | 0.47 | 982 | 0.50 | 1024 | 0.54 | 1063 | 0.58 | 1101 | 0.61 | 1141 | 0.64 | 1181 | 0.67 | 1222 | 0.70 | 1261 | 0.73 | 1298 | 0.77 | 1333 | 0.81 |
| 1700 | 703 | 0.31 | 756 | 0.35 | 807 | 0.39 | 858 | 0.43 | 906 | 0.47 | 955 | 0.51 | 999 | 0.55 | 1039 | 0.59 | 1078 | 0.63 | 1117 | 0.66 | 1156 | 0.69 | 1196 | 0.72 | 1235 | 0.75 | 1273 | 0.79 | 1309 | 0.83 | 1344 | 0.87 |
| 1800 | 752 | 0.34 | 798 | 0.38 | 844 | 0.43 | 889 | 0.48 | 933 | 0.52 | 977 | 0.57 | 1017 | 0.61 | 1056 | 0.65 | 1094 | 0.68 | 1133 | 0.72 | 1172 | 0.75 | 1211 | 0.78 | 1250 | 0.81 | 1287 | 0.85 | 1322 | 0.90 | 1355 | 0.94 |
| 1900 | 796 | 0.38 | 837 | 0.43 | 878 | 0.48 | 918 | 0.53 | 958 | 0.58 | 997 | 0.62 | 1036 | 0.67 | 1074 | 0.71 | 1112 | 0.74 | 1151 | 0.77 | 1190 | 0.81 | 1228 | 0.84 | 1265 | 0.88 | 1301 | 0.92 | 1335 | 0.97 | 1367 | 1.01 |
| 2000 | 833 | 0.43 | 870 | 0.48 | 907 | 0.54 | 943 | 0.59 | 980 | 0.64 | 1018 | 0.69 | 1055 | 0.73 | 1093 | 0.77 | 1131 | 0.80 | 1170 | 0.83 | 1208 | 0.87 | 1245 | 0.91 | 1281 | 0.96 | 1316 | 1.00 | 1349 | 1.04 | 1380 | 1.09 |
| 2100 | 864 | 0.50 | 897 | 0.55 | 931 | 0.60 | 966 | 0.65 | 1002 | 0.71 | 1038 | 0.76 | 1075 | 0.80 | 1113 | 0.83 | 1151 | 0.87 | 1189 | 0.90 | 1227 | 0.94 | 1263 | 0.99 | 1298 | 1.04 | 1331 | 1.08 | 1363 | 1.13 | 1394 | 1.17 |
| 2200 | 887 | 0.57 | 920 | 0.62 | 953 | 0.67 | 988 | 0.73 | 1024 | 0.78 | 1060 | 0.83 | 1097 | 0.87 | 1135 | 0.90 | 1173 | 0.94 | 1210 | 0.98 | 1246 | 1.02 | 1281 | 1.07 | 1315 | 1.12 | 1347 | 1.17 | 1379 | 1.22 | 1409 | 1.26 |
| 2300 | 909 | 0.64 | 942 | 0.70 | 976 | 0.75 | 1011 | 0.81 | 1046 | 0.86 | 1083 | 0.91 | 1120 | 0.95 | 1157 | 0.98 | 1195 | 1.02 | 1231 | 1.06 | 1266 | 1.11 | 1300 | 1.16 | 1333 | 1.22 | 1364 | 1.27 | 1395 | 1.32 | 1424 | 1.36 |
| 2400 | 931 | 0.72 | 965 | 0.78 | 999 | 0.83 | 1035 | 0.89 | 1071 | 0.94 | 1108 | 0.99 | 1144 | 1.03 | 1181 | 1.07 | 1217 | 1.10 | 1252 | 1.15 | 1286 | 1.20 | 1319 | 1.26 | 1351 | 1.32 | 1382 | 1.38 | 1411 | 1.43 | 1440 | 1.48 |

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (economizer, wet coil, etc.)

2 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

See page 29 for wet coil and options/accessory air resistance data.

**DOWNFLOW** **LHX072S5T**

| Air Volume CFM | External Static - in. w.g. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | | 0.20 | | 0.30 | | 0.40 | | 0.50 | | 0.60 | | 0.70 | | 0.80 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 1900 | 826 | 0.36 | 859 | 0.41 | 894 | 0.45 | 928 | 0.50 | 964 | 0.56 | 1000 | 0.61 | 1036 | 0.66 | 1072 | 0.70 |
| 2000 | 857 | 0.42 | 889 | 0.47 | 920 | 0.52 | 952 | 0.57 | 986 | 0.62 | 1020 | 0.68 | 1055 | 0.73 | 1091 | 0.77 |
| 2100 | 878 | 0.49 | 909 | 0.54 | 940 | 0.59 | 973 | 0.64 | 1006 | 0.70 | 1041 | 0.75 | 1076 | 0.80 | 1112 | 0.85 |
| 2200 | 897 | 0.55 | 929 | 0.61 | 961 | 0.66 | 994 | 0.72 | 1028 | 0.78 | 1063 | 0.83 | 1099 | 0.89 | 1134 | 0.93 |
| 2300 | 918 | 0.62 | 950 | 0.68 | 983 | 0.74 | 1017 | 0.80 | 1052 | 0.86 | 1087 | 0.92 | 1122 | 0.97 | 1157 | 1.02 |
| 2400 | 941 | 0.70 | 974 | 0.77 | 1008 | 0.83 | 1042 | 0.90 | 1077 | 0.96 | 1111 | 1.01 | 1146 | 1.06 | 1181 | 1.11 |
| 2500 | 966 | 0.79 | 1000 | 0.86 | 1034 | 0.93 | 1068 | 1.00 | 1103 | 1.06 | 1137 | 1.11 | 1171 | 1.16 | 1205 | 1.20 |
| 2600 | 994 | 0.90 | 1028 | 0.97 | 1062 | 1.04 | 1096 | 1.10 | 1130 | 1.16 | 1164 | 1.21 | 1197 | 1.26 | 1231 | 1.30 |
| 2700 | 1023 | 1.01 | 1057 | 1.08 | 1091 | 1.15 | 1125 | 1.22 | 1159 | 1.27 | 1192 | 1.32 | 1225 | 1.37 | 1258 | 1.41 |
| 2800 | 1053 | 1.13 | 1088 | 1.21 | 1122 | 1.27 | 1155 | 1.33 | 1188 | 1.39 | 1221 | 1.43 | 1253 | 1.48 | 1286 | 1.53 |
| 2900 | 1085 | 1.26 | 1119 | 1.33 | 1153 | 1.40 | 1186 | 1.45 | 1218 | 1.51 | 1250 | 1.55 | 1281 | 1.61 | 1313 | 1.66 |
| **Air Volume CFM** | **External Static - in. w.g.** | | | | | | | | | | | | | | | |
| | **0.10** | | **0.20** | | **0.30** | | **0.40** | | **0.50** | | **0.60** | | **0.70** | | **0.80** | |
| | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** | **RPM** | **BHP** |
| 1900 | 1109 | 0.75 | 1146 | 0.79 | 1183 | 0.82 | 1221 | 0.86 | 1260 | 0.90 | 1294 | 0.94 | 1323 | 0.98 | 1349 | 1.02 |
| 2000 | 1128 | 0.82 | 1164 | 0.86 | 1201 | 0.89 | 1239 | 0.93 | 1276 | 0.97 | 1310 | 1.01 | 1336 | 1.06 | 1362 | 1.10 |
| 2100 | 1148 | 0.89 | 1185 | 0.93 | 1221 | 0.97 | 1258 | 1.01 | 1294 | 1.05 | 1325 | 1.09 | 1351 | 1.14 | 1376 | 1.19 |
| 2200 | 1170 | 0.97 | 1206 | 1.01 | 1242 | 1.05 | 1277 | 1.09 | 1311 | 1.14 | 1341 | 1.18 | 1365 | 1.23 | 1390 | 1.28 |
| 2300 | 1193 | 1.06 | 1228 | 1.09 | 1262 | 1.14 | 1295 | 1.19 | 1327 | 1.24 | 1355 | 1.29 | 1380 | 1.33 | 1406 | 1.37 |
| 2400 | 1216 | 1.15 | 1250 | 1.19 | 1282 | 1.24 | 1313 | 1.30 | 1343 | 1.36 | 1371 | 1.40 | 1396 | 1.44 | 1423 | 1.48 |
| 2500 | 1240 | 1.24 | 1273 | 1.29 | 1302 | 1.36 | 1331 | 1.42 | 1360 | 1.48 | 1388 | 1.52 | 1414 | 1.55 | 1441 | 1.58 |
| 2600 | 1265 | 1.34 | 1296 | 1.40 | 1324 | 1.47 | 1352 | 1.54 | 1381 | 1.60 | 1408 | 1.64 | 1434 | 1.67 | 1460 | 1.70 |
| 2700 | 1291 | 1.46 | 1321 | 1.52 | 1347 | 1.60 | 1374 | 1.67 | 1403 | 1.72 | 1429 | 1.76 | 1455 | 1.79 | 1481 | 1.82 |
| 2800 | 1317 | 1.58 | 1346 | 1.66 | 1372 | 1.74 | 1399 | 1.80 | 1426 | 1.85 | 1451 | 1.89 | 1477 | 1.92 | 1503 | 1.95 |
| 2900 | 1343 | 1.72 | 1371 | 1.80 | 1397 | 1.88 | 1424 | 1.95 | 1450 | 1.99 | 1475 | 2.02 | 1500 | 2.05 | 1526 | 2.08 |

**BLOWER TABLE INCLUDES RESISTANCE FOR BASE UNIT ONLY WITH DRY INDOOR COIL AND AIR FILTERS IN PLACE.**

FOR ALL UNITS ADD:

1 - Any factory installed options air resistance (economizer, wet coil, etc.)

2 - Any field installed accessories air resistance (electric heat, duct resistance, diffuser, etc.)

See page 29 for wet coil and options/accessory air resistance data.

**HORIZONTAL** **LHX072S5T**

| Air Volume CFM | External Static - in. w.g. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | | 0.20 | | 0.30 | | 0.40 | | 0.50 | | 0.60 | | 0.70 | | 0.80 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 1900 | 853 | 0.41 | 886 | 0.46 | 919 | 0.50 | 952 | 0.55 | 986 | 0.60 | 1021 | 0.64 | 1056 | 0.69 | 1091 | 0.73 |
| 2000 | 883 | 0.48 | 913 | 0.53 | 944 | 0.57 | 976 | 0.62 | 1009 | 0.67 | 1043 | 0.71 | 1078 | 0.76 | 1112 | 0.80 |
| 2100 | 906 | 0.56 | 936 | 0.60 | 967 | 0.65 | 999 | 0.70 | 1033 | 0.75 | 1067 | 0.79 | 1101 | 0.84 | 1135 | 0.88 |
| 2200 | 930 | 0.64 | 960 | 0.68 | 991 | 0.73 | 1024 | 0.78 | 1058 | 0.83 | 1092 | 0.88 | 1126 | 0.92 | 1160 | 0.96 |
| 2300 | 954 | 0.72 | 985 | 0.77 | 1017 | 0.82 | 1051 | 0.87 | 1085 | 0.92 | 1119 | 0.96 | 1152 | 1.00 | 1186 | 1.04 |
| 2400 | 981 | 0.81 | 1013 | 0.86 | 1046 | 0.91 | 1079 | 0.96 | 1113 | 1.00 | 1146 | 1.05 | 1180 | 1.09 | 1213 | 1.13 |
| 2500 | 1010 | 0.91 | 1042 | 0.96 | 1075 | 1.00 | 1109 | 1.05 | 1142 | 1.09 | 1175 | 1.14 | 1207 | 1.18 | 1239 | 1.23 |
| 2600 | 1040 | 1.01 | 1073 | 1.05 | 1106 | 1.10 | 1139 | 1.14 | 1171 | 1.19 | 1203 | 1.23 | 1235 | 1.28 | 1266 | 1.33 |
| 2700 | 1072 | 1.10 | 1104 | 1.15 | 1137 | 1.20 | 1169 | 1.24 | 1201 | 1.29 | 1232 | 1.34 | 1263 | 1.40 | 1293 | 1.46 |
| 2800 | 1105 | 1.21 | 1137 | 1.25 | 1168 | 1.30 | 1200 | 1.35 | 1231 | 1.40 | 1261 | 1.46 | 1291 | 1.52 | 1321 | 1.59 |
| 2900 | 1138 | 1.32 | 1169 | 1.37 | 1200 | 1.42 | 1231 | 1.47 | 1261 | 1.53 | 1291 | 1.60 | 1321 | 1.66 | 1350 | 1.73 |

| Air Volume CFM | External Static - in. w.g. | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.10 | | 0.20 | | 0.30 | | 0.40 | | 0.50 | | 0.60 | | 0.70 | | 0.80 | |
| | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP | RPM | BHP |
| 1900 | 853 | 0.41 | 886 | 0.46 | 919 | 0.50 | 952 | 0.55 | 986 | 0.60 | 1021 | 0.64 | 1056 | 0.69 | 1091 | 0.73 |
| 2000 | 883 | 0.48 | 913 | 0.53 | 944 | 0.57 | 976 | 0.62 | 1009 | 0.67 | 1043 | 0.71 | 1078 | 0.76 | 1112 | 0.80 |
| 2100 | 906 | 0.56 | 936 | 0.60 | 967 | 0.65 | 999 | 0.70 | 1033 | 0.75 | 1067 | 0.79 | 1101 | 0.84 | 1135 | 0.88 |
| 2200 | 930 | 0.64 | 960 | 0.68 | 991 | 0.73 | 1024 | 0.78 | 1058 | 0.83 | 1092 | 0.88 | 1126 | 0.92 | 1160 | 0.96 |
| 2300 | 954 | 0.72 | 985 | 0.77 | 1017 | 0.82 | 1051 | 0.87 | 1085 | 0.92 | 1119 | 0.96 | 1152 | 1.00 | 1186 | 1.04 |
| 2400 | 981 | 0.81 | 1013 | 0.86 | 1046 | 0.91 | 1079 | 0.96 | 1113 | 1.00 | 1146 | 1.05 | 1180 | 1.09 | 1213 | 1.13 |
| 2500 | 1010 | 0.91 | 1042 | 0.96 | 1075 | 1.00 | 1109 | 1.05 | 1142 | 1.09 | 1175 | 1.14 | 1207 | 1.18 | 1239 | 1.23 |
| 2600 | 1040 | 1.01 | 1073 | 1.05 | 1106 | 1.10 | 1139 | 1.14 | 1171 | 1.19 | 1203 | 1.23 | 1235 | 1.28 | 1266 | 1.33 |
| 2700 | 1072 | 1.10 | 1104 | 1.15 | 1137 | 1.20 | 1169 | 1.24 | 1201 | 1.29 | 1232 | 1.34 | 1263 | 1.40 | 1293 | 1.46 |
| 2800 | 1105 | 1.21 | 1137 | 1.25 | 1168 | 1.30 | 1200 | 1.35 | 1231 | 1.40 | 1261 | 1.46 | 1291 | 1.52 | 1321 | 1.59 |
| 2900 | 1138 | 1.32 | 1169 | 1.37 | 1200 | 1.42 | 1231 | 1.47 | 1261 | 1.53 | 1291 | 1.60 | 1321 | 1.66 | 1350 | 1.73 |

## BLOWER DATA

**FACTORY INSTALLED OPTIONS/FIELD INSTALLED ACCESSORY AIR RESISTANCE - in. w.g.**

| Air Volume cfm | Wet Indoor Coil | | Economizer | Electric Heat | Filters | | |
|---|---|---|---|---|---|---|---|
| | 024, 036, 048 | 060 | | | MERV 8 | MERV 13 | MERV 16 |
| 800 | 0.01 | 0.01 | 0.04 | 0.01 | 0.04 | 0.05 | 0.04 |
| 1000 | 0.02 | 0.01 | 0.04 | 0.03 | 0.04 | 0.07 | 0.05 |
| 1200 | 0.02 | 0.01 | 0.04 | 0.06 | 0.04 | 0.07 | 0.05 |
| 1400 | 0.03 | 0.02 | 0.04 | 0.09 | 0.04 | 0.07 | 0.06 |
| 1600 | 0.04 | 0.03 | 0.04 | 0.12 | 0.04 | 0.07 | 0.08 |
| 1800 | 0.05 | 0.04 | 0.05 | 0.15 | 0.05 | 0.07 | 0.09 |
| 2000 | 0.06 | 0.05 | 0.05 | 0.18 | 0.05 | 0.08 | 0.10 |
| 2200 | 0.08 | 0.06 | 0.05 | 0.20 | 0.05 | 0.08 | 0.11 |
| 2400 | 0.09 | 0.07 | 0.05 | 0.22 | 0.05 | 0.08 | 0.12 |

**POWER EXHAUST FAN PERFORMANCE**

| Return Air System Static Pressure in. w.g. | Air Volume Exhausted cfm |
|---|---|
| 0.00 | 2000 |
| 0.05 | 1990 |
| 0.10 | 1924 |
| 0.15 | 1810 |
| 0.20 | 1664 |
| 0.25 | 1507 |
| 0.30 | 1350 |
| 0.35 | 1210 |

**CEILING DIFFUSERS AIR RESISTANCE (in. w.g.)**

| Air Volume - cfm | RTD9-65S Step-Down Diffuser | | | FD9-65S Flush Diffuser | RTD11-95S Step-Down Diffuser | | | FD11-95S Flush Diffuser |
|---|---|---|---|---|---|---|---|---|
| | 2 Ends Open | 1 Side & 2 Ends Open | All Ends & Sides Open | | 2 Ends Open | 1 Side & 2 Ends Open | All Ends & Sides Open | |
| 800 | 0.15 | 0.13 | 0.11 | 0.11 | - - - | - - - | - - - | - - - |
| 1000 | 0.19 | 0.16 | 0.14 | 0.14 | - - - | - - - | - - - | - - - |
| 1200 | 0.25 | 0.20 | 0.17 | 0.17 | - - - | - - - | - - - | - - - |
| 1400 | 0.33 | 0.26 | 0.20 | 0.20 | - - - | - - - | - - - | - - - |
| 1600 | 0.43 | 0.32 | 0.20 | 0.24 | - - - | - - - | - - - | - - - |
| 1800 | 0.56 | 0.40 | 0.30 | 0.30 | 0.13 | 0.11 | 0.09 | 0.09 |
| 2000 | 0.73 | 0.50 | 0.36 | 0.36 | 0.15 | 0.13 | 0.11 | 0.10 |
| 2200 | 0.95 | 0.63 | 0.44 | 0.44 | 0.18 | 0.15 | 0.12 | 0.12 |
| 2400 | - - - | - - - - | - - - | - - - | 0.21 | 0.18 | 0.15 | 0.14 |
| 2600 | - - - | - - - - | - - - | - - - | 0.24 | 0.21 | 0.18 | 0.17 |
| 2800 | - - - | - - - - | - - - | - - - | 0.27 | 0.24 | 0.21 | 0.20 |
| 3000 | - - - | - - - - | - - - | - - - | 0.32 | 0.29 | 0.25 | 0.25 |

**CEILING DIFFUSER AIR THROW DATA**

| Air Volume - cfm | [1] Effective Throw - ft. | |
|---|---|---|
| **Model** | **RTD9-65S** | **FD9-65S** |
| 800 | 10 - 17 | 14 - 18 |
| 1000 | 10 - 17 | 15 - 20 |
| 1200 | 11 - 18 | 16 - 22 |
| 1400 | 12 - 19 | 17 - 24 |
| 1600 | 12 - 20 | 18 - 25 |
| 1800 | 13 - 21 | 20 - 28 |
| 2000 | 14 - 23 | 21 - 29 |
| 2200 | 16 - 25 | 22 - 30 |
| **Model** | **RTD11-95S** | **FD11-95S** |
| 2600 | 24 - 29 | 19 - 24 |
| 2800 | 25 - 30 | 20 - 28 |
| 3000 | 27 - 33 | 21 - 29 |

[1] Effective throw based on terminal velocities of 75 ft. per minute.

**CEILING DIFFUSER AIR THROW DATA**

| Air Volume - cfm | 1 Effective Throw - ft. | | | |
|---|---|---|---|---|
| | **RTD9-65S** | **FD9-65S** | **RTD11-95S** | **FD11-95S** |
| 800 | 10 - 17 | 14 - 18 | --- | --- |
| 1000 | 10 - 17 | 15 - 20 | --- | --- |
| 1200 | 11 - 18 | 16 - 22 | --- | --- |
| 1400 | 12 - 19 | 17 - 24 | --- | --- |
| 1600 | 12 - 20 | 18 - 25 | --- | --- |
| 1800 | 13 - 21 | 20 - 28 | --- | --- |
| 2000 | 14 - 23 | 21 - 29 | --- | --- |
| 2200 | 16 - 25 | 22 - 30 | --- | --- |
| 2600 | --- | --- | 24 - 29 | 19 - 24 |
| 2800 | --- | --- | 25 - 30 | 20 - 28 |
| 3000 | --- | --- | 27 - 33 | 21 - 29 |

[1] Effective throw based on terminal velocities of 75 ft. per minute.

## Refrigerant Leak Detection System

**A-System Test**

1 - Initiate Refrigerant Leak Detection System Test by using the following mobile service app menu path:

**RTU MENU > COMPONENT TEST > LEAK DETECTION > START TEST**

2 - Ensure that indoor blower, outdoor fan, and combustion air blower (LGT only) are energized.

## Start-Up

**⚠ IMPORTANT**

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

**A-Start-Up**

**Heating - LHX024 Unit Only**

In heat pump heating, 024 units will automatically stage-up for outdoor temperatures below 40°F (for increased performance and efficiency). No external demand is required, this operation is completely automatic. At temperatures above 40°F, compressor will automatically stage-down to maintain operational efficiency.

**Heating**

1 - Set thermostat or temperature control device to initiate a first-stage heating demand.

2 - A first-stage heating demand (W1) will energize compressor 1 and outdoor fan.

***NOTE -*** *L1 Reversing Valve is de-energized in the heating mode.*

**LH Units With Optional Electric Heat**

An increased heating demand (W2) will energize electric heat. Electric heat is also energized during the defrost cycle to maintain discharge air temperature.

**Cooling**

***NOTE -*** *024 units are single-speed cooling operation only.*

1 - Initiate full load cooling operation using the following mobile service app menu path:

**RTU MENU > COMPONENT TEST > COOLING > COOLING STAGE 2**

2 - Units contain one refrigerant circuit.

***NOTE -*** *Units are equipped with two-stage compressors.*

3 - Unit is charged with R-454B refrigerant. See unit rating plate for correct amount of charge.

4 - Refer to Refrigerant Charge and Check section for proper method to check refrigerant charge.

**B-Three Phase Scroll Compressor Voltage Phasing**

Three phase scroll compressors must be phased sequentially to ensure correct compressor and blower rotation and operation. Compressor and blower are wired in phase at the factory. Power wires are color-coded as follows: line 1-red, line 2-yellow, line 3-blue.

1 - Observe suction and discharge pressures and blower rotation on unit start-up.

2 - Suction pressure must drop, discharge pressure must rise, and blower rotation must match rotation marking.

If pressure differential is not observed or blower rotation is not correct:

3 - Disconnect all remote electrical power supplies.

4 - Reverse any two field-installed wires connected to the line side of K1 contactor. Do not reverse wires at blower contactor.

Make sure the connections are tight.

Discharge and suction pressures should operate at their normal start-up ranges.

**C-Refrigerant Charge and Check - Fin/Tube Coil**

**WARNING - Do not exceed nameplate charge under any condition.**

This unit is factory charged and should require no further adjustment. If the system requires additional refrigerant, reclaim the charge, evacuate the system, and add required nameplate charge.

***NOTE -*** *System charging is not recommended below 60°F (15°C). In temperatures below 60°F (15°C), the charge must be weighed into the system.*

If weighing facilities are not available, or to check the charge, use the following procedure:

1 - Attach gauge manifolds and operate unit in cooling mode on HIGH SPEED with economizer disabled until system stabilizes (approximately five minutes). Make sure outdoor air dampers are closed.

***NOTE -*** *Use mobile service app menu path:*

**RTU MENU > COMPONENT TEST > COOLING > COOLING STAGE 2**

2 - Use a thermometer to accurately measure the outdoor ambient temperature.

3 - Apply the outdoor temperature to TABLE 8 through TABLE 11 to determine normal operating pressures. Pressures are listed for sea level applications at 80°F dry bulb and 67°F wet bulb return air.

4 - Compare the normal operating pressures to the pressures obtained from the gauges. 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. **Correct any system problems before proceeding.**

5 - If discharge pressure is high, remove refrigerant from the system. If discharge pressure is low, add refrigerant to the system.

- Add or remove charge in increments.

- Allow the system to stabilize each time refrigerant is added or removed.

6 - Use one of the following charge verification methods along with the normal operating pressures to confirm readings.

**Charge Verification - Approach Method - AHRI Testing**

1 - Using the same thermometer, compare liquid temperature to outdoor ambient temperature.

Approach Temperature = Liquid temperature (at condenser outlet) minus ambient temperature.

2 - Approach temperature should be 3.8°F +/- 1 (2.1°C +/- 0.5). An approach temperature greater than this value indicates an under-charge. An approach temperature less than this value indicates an over-charge.

The approach method is not valid for grossly over or undercharged systems. Use TABLE 13 as a guide for typical approach temperatures.

**TABLE 8 581329-01**
**024 NORMAL OPERATING PRESSURES**

| Outdoor Coil Entering Air Temp | Discharge ± 10 psig | Suction ± 5 psig |
|---|---|---|
| 65°F | 222 | 140 |
| 75°F | 259 | 68 |
| 85°F | 301 | 140 |
| 95°F | 349 | 141 |
| 100°F | 402 | 143 |
| 115°F | 464 | 145 |

**TABLE 9 581330-01**
**036 NORMAL OPERATING PRESSURES**

| Outdoor Coil Entering Air Temp | Discharge ± 10 psig | Suction ± 5 psig |
|---|---|---|
| 65°F | 242 | 137 |
| 75°F | 281 | 138 |
| 85°F | 325 | 140 |
| 95°F | 374 | 141 |
| 100°F | 428 | 143 |
| 115°F | 489 | 145 |

**TABLE 10 581331-01**
**048 NORMAL OPERATING PRESSURES**

| Outdoor Coil Entering Air Temp | Discharge ± 10 psig | Suction ± 5 psig |
|---|---|---|
| 65°F | 232 | 133 |
| 75°F | 269 | 135 |
| 85°F | 310 | 136 |
| 95°F | 354 | 138 |
| 100°F | 404 | 140 |
| 115°F | 457 | 142 |

**TABLE 11 581332-01**
**060 NORMAL OPERATING PRESSURES**

| Outdoor Coil Entering Air Temp | Discharge ± 10 psig | Suction ± 5 psig |
|---|---|---|
| 65°F | 247 | 132 |
| 75°F | 284 | 133 |
| 85°F | 324 | 134 |
| 95°F | 371 | 135 |
| 100°F | 422 | 137 |
| 115°F | 476 | 139 |

**TABLE 12 581407-01**
**072 NORMAL OPERATING PRESSURES**

| Outdoor Coil Entering Air Temp | Discharge ± 10 psig | Suction ± 5 psig | Appr. Temp +/-1°F |
|---|---|---|---|
| 65°F | 254 | 126 | 9 |
| 75°F | 293 | 128 | 10 |
| 85°F | 335 | 131 | 10 |
| 95°F | 383 | 134 | 12 |
| 100°F | 434 | 136 | 12 |
| 115°F | 490 | 138 | 12 |

**TABLE 13**
**APPROACH TEMPERATURES**

| Unit | Liquid Temperature (At Condenser Outlet) Minus Ambient Temperature |
|---|---|
| LHX024 | 5°F +/- 1 (2.8°C +/- 0.5) |
| LHX036 | 9°F +/- 1 (5.0°C +/- 0.5) |
| LHX048 | 6°F +/- 1 (3.3°C +/- 0.5) |
| LHX060 | 8°F +/- 1 (4.4°C +/- 0.5) |
| LHX072 | See TABLE 12 |

| Refrigerant Charge R-454B | | |
|---|---|---|
| Unit | $M_c$(lbs) | $M_c$(kg) |
| LHX024 | 12.50 | 5.67 |
| LHX036 | 12.00 | 5.44 |
| LHX048 | 16.75 | 7.60 |
| LHX060 | 15.63 | 7.09 |
| LHX072 | 14.70 | 6.67 |

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the unit is earth grounded prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the unit.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

***NOTE -*** *System charging is not recommended below 60°F (15°C). In temperatures below 60°F (15°C), the charge must be weighed into the system.*

If weighing facilities are not available, or to check the charge, use the following procedure:

1 - Make sure outdoor coil is clean. Attach gauge manifolds and operate unit at full CFM in cooling mode with economizer disabled until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.

2 - Compare the normal operating pressures to the pressures obtained from the gauges. Check unit components if there are significant differences.

3 - Measure the outdoor ambient temperature and the suction pressure. Refer to the charging curve to determine a target liquid temperature.

***NOTE -*** *Pressures are listed for sea level applications.*

4 - Use the same thermometer to accurately measure the liquid temperature (in the outdoor section).

- If measured liquid temperature is higher than the target liquid temperature, add refrigerant to the sytem.
- If measured liquid temperature is lower than the target liquid temperature, recover some refrigerant from the system..

5 - Add or remove charge in increments. Allow the system to stabilize each time refrigerant is added or removed.

6 - Continue the process until measured liquid temperature agrees with the target liquid temperature. Do not go below the target liquid temperature when adjusting charge. Note that suction pressure can change as charge is adjusted.

7 - Example: At 95°F outdoor ambient and a measured suction pressure of 130psig, the target liquid temperature is 97°F. For a measured liquid temperature of 106°F, add charge in increments until measured liquid temperature agrees with the target liquid temperature.

**C-Compressor Controls**

See unit wiring diagram to determine which controls are used on each unit. Optional controls are identified on wiring diagrams by arrows at junction points.

1 - High Pressure Switch (S4)

The compressor circuit is protected by a high pressure switch which opens at 640 psig $\pm$ 20 psig (4413 kPa $\pm$ 138 kPa) and automatically resets at 475 psig $\pm$ 20 psig (3275kPa $\pm$ 138 kPa).

2 - Low Pressure Switch (S87)

The compressor circuit is protected by a loss of charge switch. Switch opens at 40 psig $\pm$ 5 psig (276 $\pm$ 34 kPa) and automatically resets at 90 psig $\pm$ 5 psig (621 kPa $\pm$ 34 kPa).

3 - Diagnostics Sensors (RT46, RT48)

Two thermistors are located on specific points in the refrigeration circuit. The thermistors provide constant temperature feedback to the Unit Controller to protect the compressor. Thermistors take the place of the freezestat and low ambient pressure switch.

4 - Defrost Controls (RT48, RT17)

Both sensors provide input to the defrost control which cycles defrost. The ambient sensor is located on the inside of the corner mullion on the back of the outdoor coil section. The coil sensor is located on a return bend on the front of the outdoor coil.

5 - Compressor Crankcase Heater (HR1)

Crankcase heater must be energized at all times to prevent compressor damage due to refrigerant migration. Energize crankcase heater 24 hours before unit start-up by setting thermostat so that there is no cooling demand (to prevent compressor from cycling) and apply power to unit.

## Defrost Control

The defrost control ensures that the heat pump outdoor coil does not ice excessively during the heating mode. The defrost control uses input from the coil and ambient sensor to issue demand defrost controls from the Unit Controller. If the system fails to calibrate or obtain readings for demand defrost, defrost will run-time at field setting.

**Defrost Test or Forced Defrost Option**

A TEST option is provided for troubleshooting. The TEST mode may be started at any time using the mobile service app. Defrost mode may be started by entering the Defrost Mode in the Component Test Menu. When defrost is started, unit will run in Defrost Mode for a maximum of 5 minutes or when the outdoor coil reaches 100°F, whichever occurs first.

## Diagnostic Sensors

Units are equipped with two factory-installed thermistors (RT46 and RT48) located on different points on the refrigerant circuit.

The thermistors provide the Unit Controller with constant temperature readings of two specific locations on the refrigeration circuit. These temperatures are used as feedback in certain modes of unit operation. In addition, the Unit Controller uses these temperatures to initiate alarms such as loss of condenser or evaporator airflow and loss of charge.

Each thermistor must be specifically placed for proper unit operation and to initiate valid alarms. See TABLE 14 for proper locations.

**TABLE 14**
**THERMISTOR LOCATION**

| Unit | Sensor Yellow | Figure |
|---|---|---|
| 024, 036, 048, 060, 072 Indoor Coil | RT46 | FIGURE 26 |
| 024, 036 Outdoor Coil | RT48 | FIGURE 27 |
| 048, 060, 072 Outdoor Coil | RT48 | FIGURE 28 |

**LHX024, 036, 048, 060, 072**
**EVAPORATOR COIL**
**RT46**

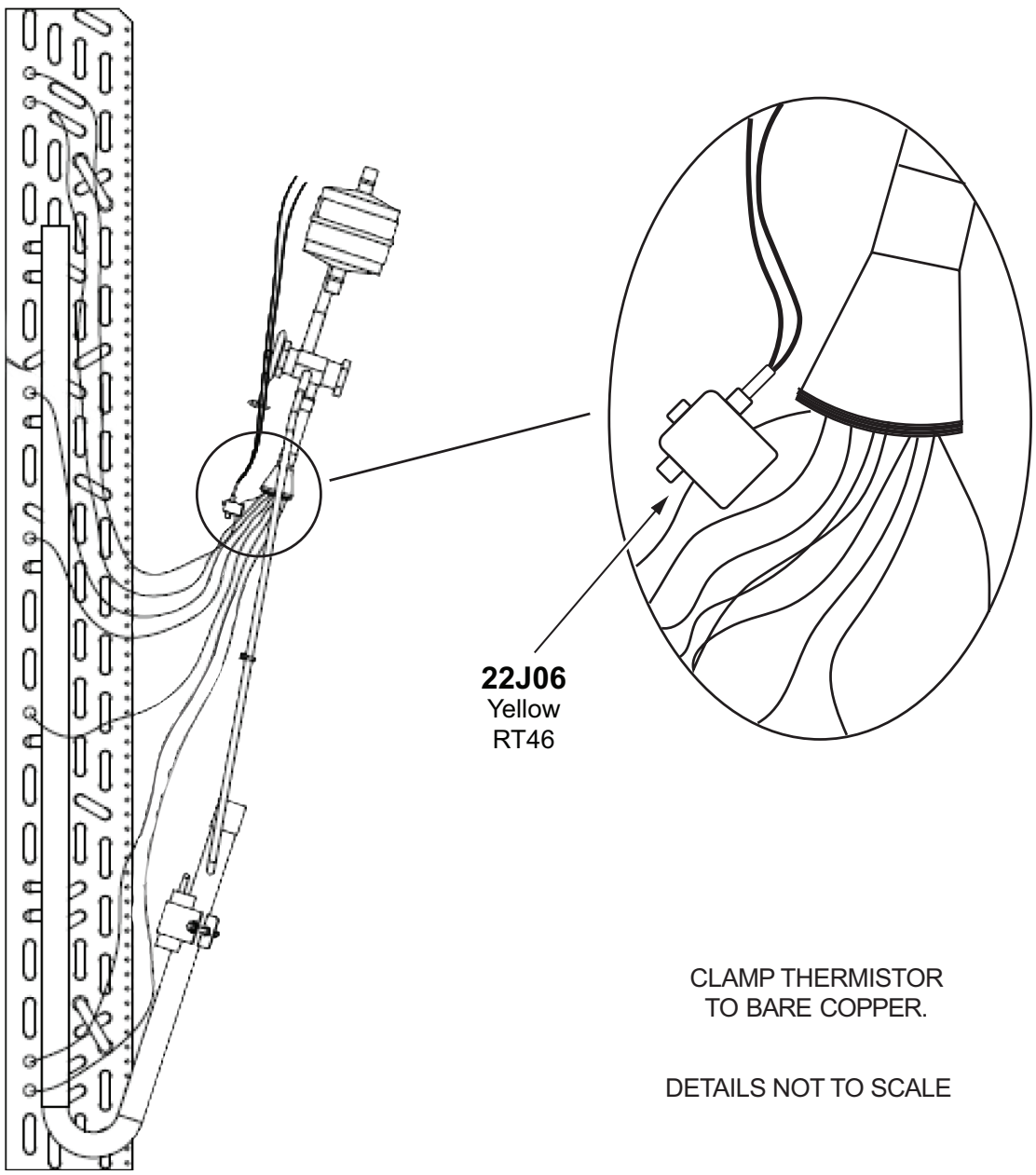



**FIGURE 26**

**LHX024, 036**
**CONDENSER COIL**
**RT48**

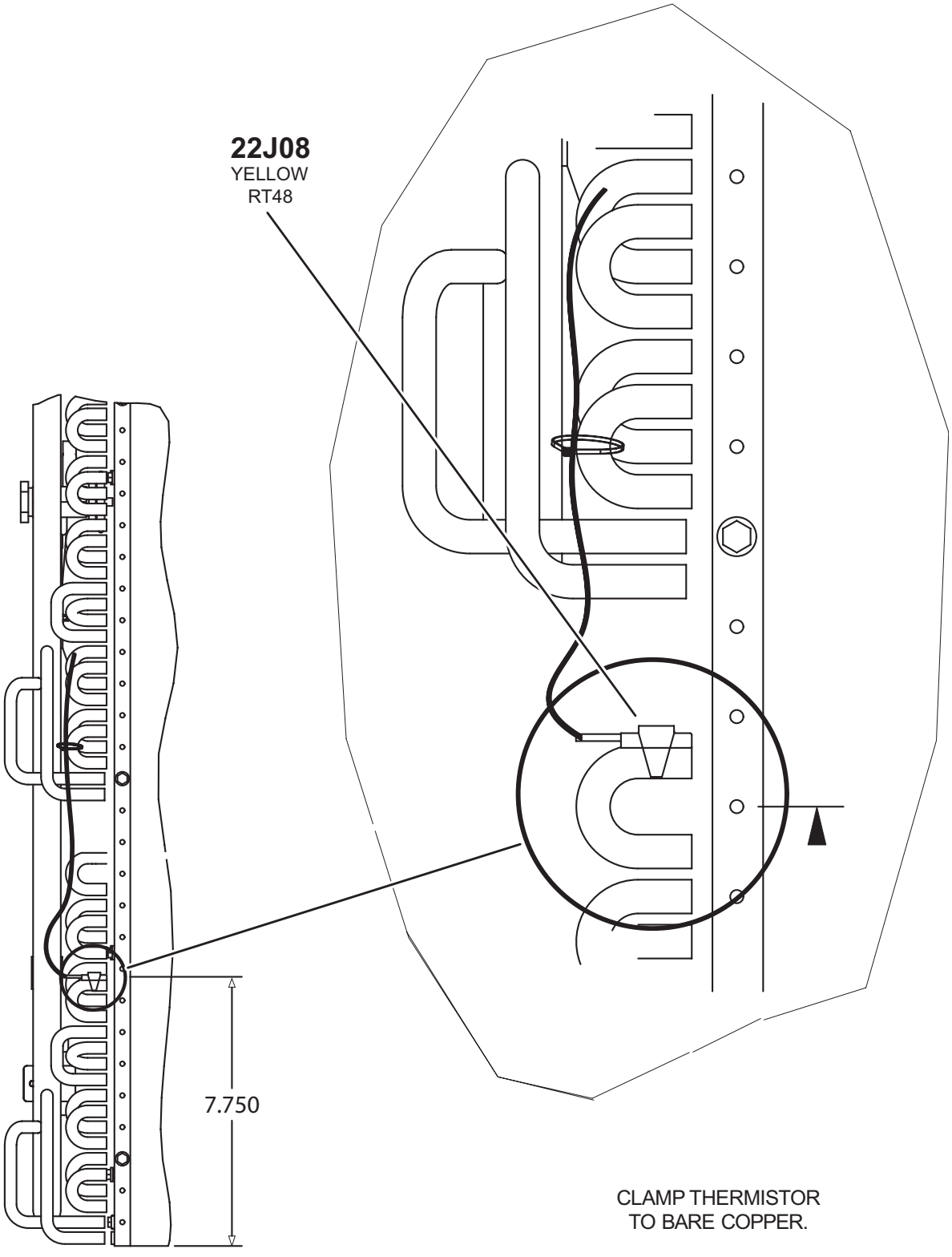



**FIGURE 27**

**LHX048, 060, 072**
**CONDENSER COIL**
**RT48**

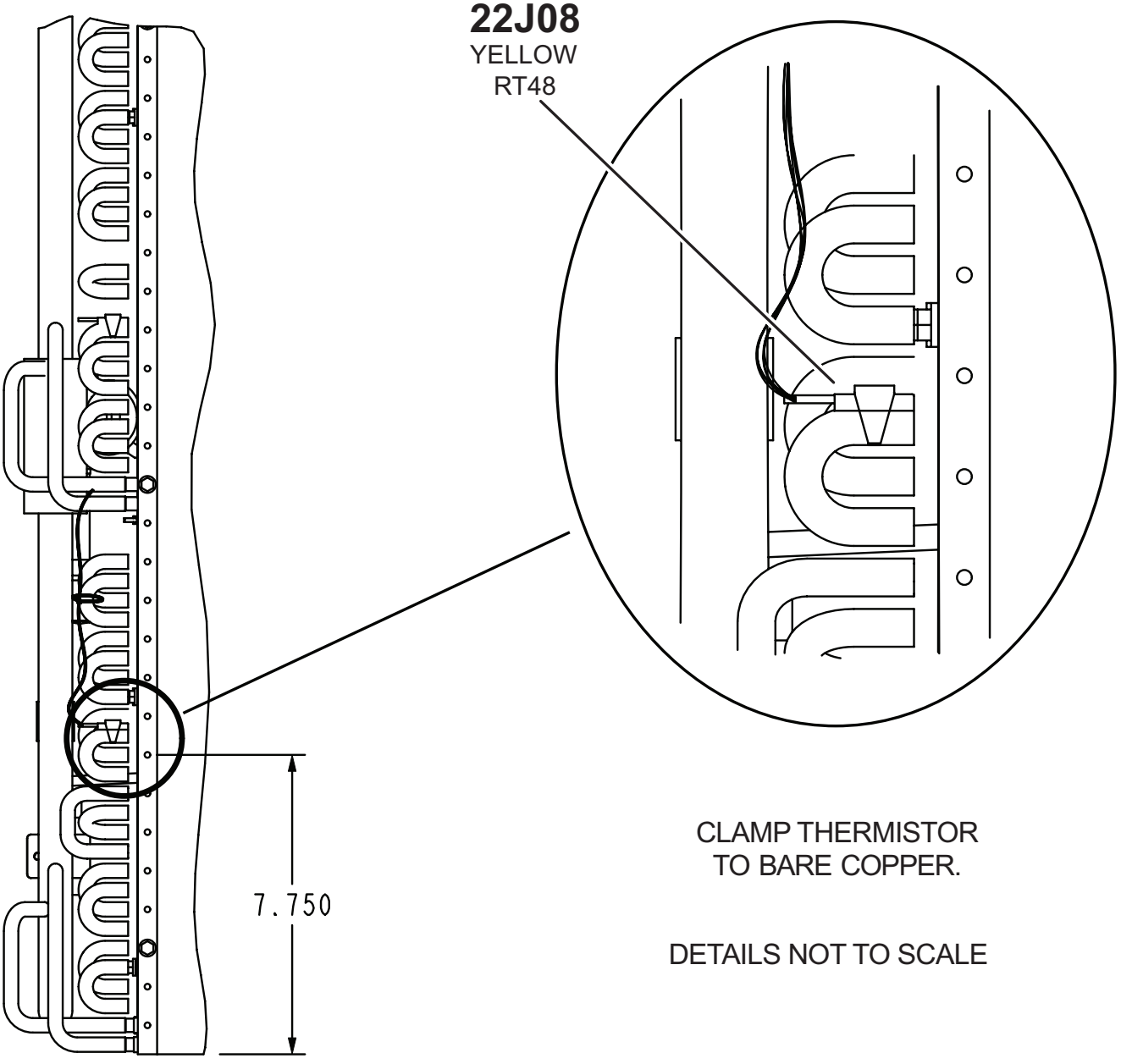



**FIGURE 28**

## RDS Sensors

Units are equipped with factory-installed RDS Sensors located on different points on the unit. The RDS sensors provide the Unit Controller with continuous readings for leaked refrigerant concentration levels and sensor health status (Good or Fault). These readings are used to modify unit operation to disperse the leaked refrigerant and to remove possible ignition sources. In addition, the Unit Controller uses these readings to initiate alarms to alert the operator of a refrigerant leak or faulty sensor(s).

Each sensor must be specifically placed for proper unit operation and to initiate valid alarms. To identify sensor locations see TABLE 15.

**TABLE 15**

**RDS Sensor Figures**

| Model | Qty. | Type | Figure |
|---|---|---|---|
| LHX024-072 | 1 sensor | INDOOR SENSOR | FIGURE 29 |

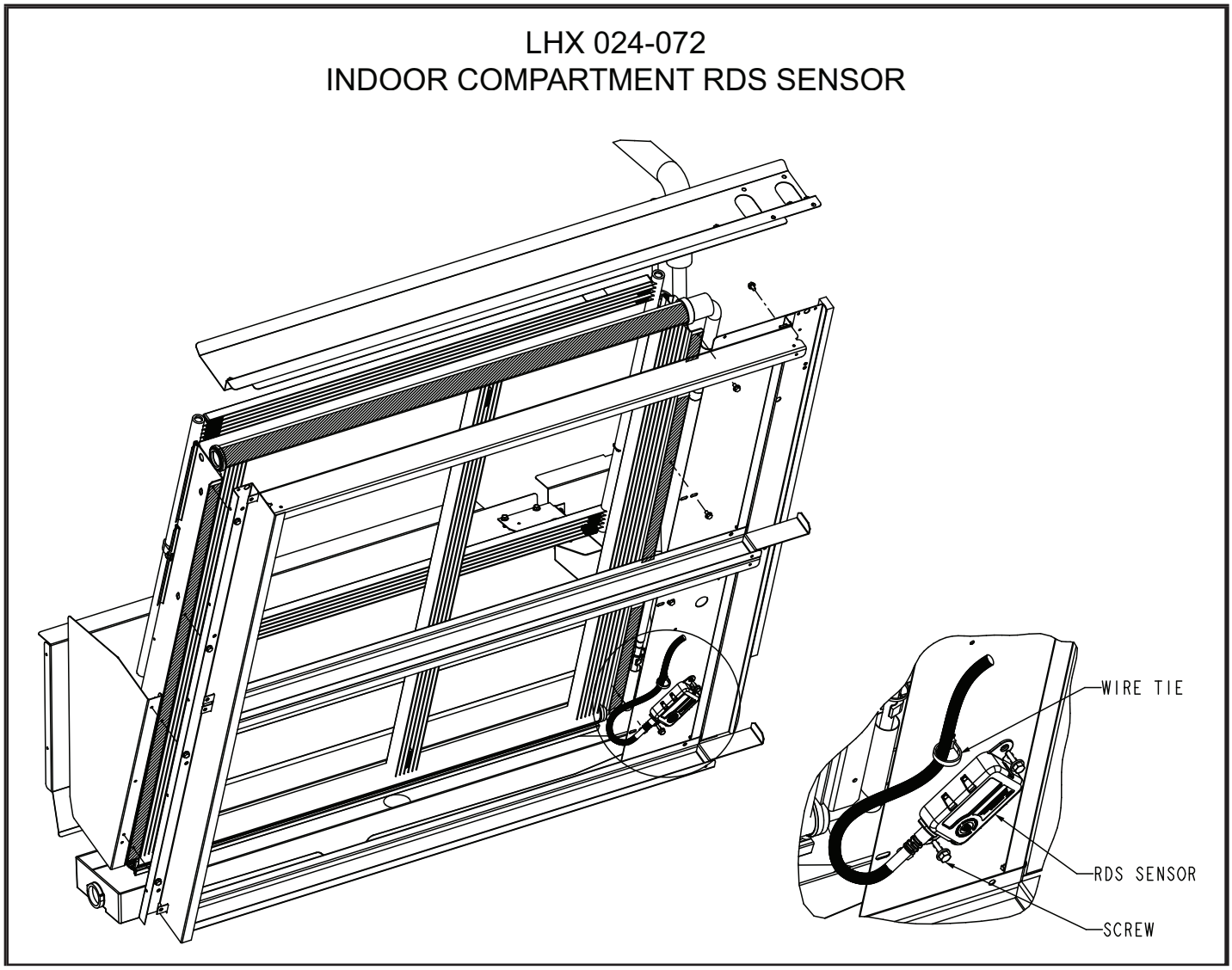



**FIGURE 29**

## Cooling Operation

**A-Two-Stage Thermostat**

1 - Economizer With Outdoor Air Suitable

Y1 Demand -

Compressor Off
Blower Low
Dampers Modulate

Y2 Demand -

Compressor On (024 units only)
Compressor Low (036-072)
Blower High
Dampers Full Open

***NOTE -*** *Compressor is energized after damper has been at full open for three minutes.*

2 - No Economizer or Outdoor Air Not Suitable

Y1 Demand -

Compressor On (024 units only)
Compressor Low (036-072)
Blower Low
Dampers Minimum Position

Y2 Demand -

Compressor On (024 units only)
Compressor High (036-072)
Blower High
Dampers Minimum Position

**B-Three-Stage Thermostat OR Room Sensor**

1 - Economizer With Outdoor Air Suitable

Y1 Demand -

Compressors Off
Blower Low
Dampers Modulate

Y2 Demand -

Compressor On (024 units only)
Compressor Low (036-072)
Blower High
Dampers Full Open

***NOTE -*** *Compressor is energized after damper has been at full open for three minutes.*

Y3 Demand -

Compressor On (024 units only)
Compressor High (036-072)
Blower High
Dampers Full Open

2 - No Economizer or Outdoor Air Not Suitable

Y1 Demand -

Compressor On (024 units only)
Compressor Low (036-072)
Blower Low
Dampers Minimum Position

Y2 Demand -

Compressor On (024 units only)
Compressor High (036-072)
Blower High
Dampers Minimum Position

Y3 Demand -

Compressor On (024 units only)
Compressor High (036-072)
Blower High
Dampers Minimum Position

High speed compressor cooling operation:

**RTU MENU > COMPONENT TEST > COOLING > COOLING STAGE 2**

Low speed compressor cooling operation:

**RTU MENU > COMPONENT TEST > COOLING > COOLING STAGE 1**

***NOTE -*** *For 024 units, either menu path will result in single-speed output.*

## Heating Operation

**A-Heat Pump Operation**

W1 Demand -

Compressor High
Blower Heating Speed
Reversing Valve De-Energized

W2 Demand (Optional Electric Heat) -

Compressor High Speed
Blower Heating Speed
Reversing Valve De-Energized
Optional Electric Heat Energized

***NOTE -*** *Electric heat is also energized during the defrost cycle.*

**B-Gas Heat Operation**

1 - Outdoor Temperature ABOVE Balance Point Setpoint

W1 Demand -

Compressor High
Blower Heating Speed
Reversing Valve De-Energized

W2 Demand -

Compressor Off
Blower Heating Speed
Low Gas Heat Energized

***NOTE -*** *Gas heat is also energized during the defrost cycle.*

2 - Outdoor Temperature BELOW Balance Point Setpoint

W1 Demand -

Compressor Off
Blower Heating Speed
Low Gas Heat Energized

W2 Demand -

Compressor Off
Blower Heating Speed
High Gas Heat Energized

***NOTE -*** *Gas heat is also energized during the defrost cycle.*

High speed compressor heating operation:

**RTU MENU > COMPONENT TEST > HEATING**

Defrost Operation Test:

**RTU MENU > COMPONENT TEST > DEFROST**

**C-Heat Pump Heating - 024 Units Only**

In heat pump heating, 024 units will automatically stage-up for outdoor temperatures below 40°F (for increased performance and efficiency). No external demand is required, this operation is completely automatic. At temperatures above 40°F, compressor will automatically stage-down to maintain operational efficiency.

## Heat Start-Up

Optional electric heat will stage on and cycle with thermostat demand. See electric heat wiring diagram on unit for sequence of operation.

## Preventative Maintenance / Repair

**IMPORTANT MAINTENANCE / REPAIR SAFETY INSTRUCTIONS**

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized.

Work shall be undertaken under a controlled procedure to minimize the risk of a flammable gas or vapor being present while the work is being performed.

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times, the manufacturer’s maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer’s technical department for assistance.

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

– that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking

– that no live electrical components and wiring are exposed while charging, recovering or purging the system

– that there is continuity of earth bonding

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

– the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant

containing parts are installed;

– the ventilation machinery and outlets are operating adequately and are not obstructed;

– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;

– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;

– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

During repairs to sealed electrical components, the components shall be replaced. Replacement parts shall be in accordance with the manufacturer's specifications.

During repairs to intrinsically safe components, the components must be replaced. Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

The unit should be inspected once a year by a qualified service technician.

## ⚠ 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.

## ⚠ CAUTION

Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

**A-Filters**

Units are equipped with temporary filters which must be replaced prior to building occupation. See TABLE 16 for correct filter size. Refer to local codes or appropriate jurisdiction for approved filters.

**TABLE 16**

| Unit | Qty. | Filter Size - in. (mm) |
|---|---|---|
| LHX 024, 036 | 4 | 16 x 20 x 2 (406 x 508 x 51) |
| LHX 048, 060, 072 | 4 | 20 x 20 x 2 (508 x 508 x 51) |

## ⚠ WARNING

Units are shipped from the factory with temporary filters. Replace filters before building is occupied. Damage to unit could result if filters are not replaced with approved filters. Refer to appropriate codes.

Approved filters should be checked monthly and replaced when necessary. Take note of air flow direction marking on filter frame when reinstalling filters. See FIGURE 30.

***NOTE -*** *Filters must be U.L.C. certified or equivalent for use in Canada.*

**B-Lubrication**

All motors are lubricated at the factory. No further lubrication is required.

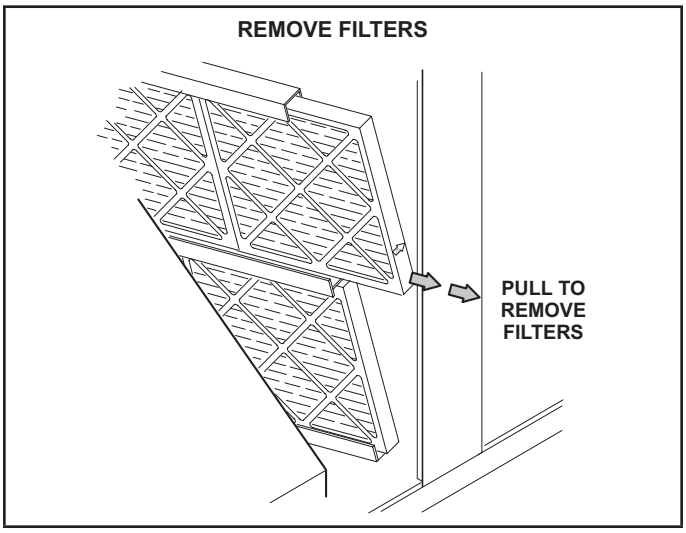



**FIGURE 30**

**C-Evaporator Coil**

Inspect and clean coil at beginning of each cooling season. Clean using mild detergent or commercial coil cleaner. Flush coil and condensate drain with water taking care not to get insulation, filters and return air ducts wet.

**D-Condenser Coil**

Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season.

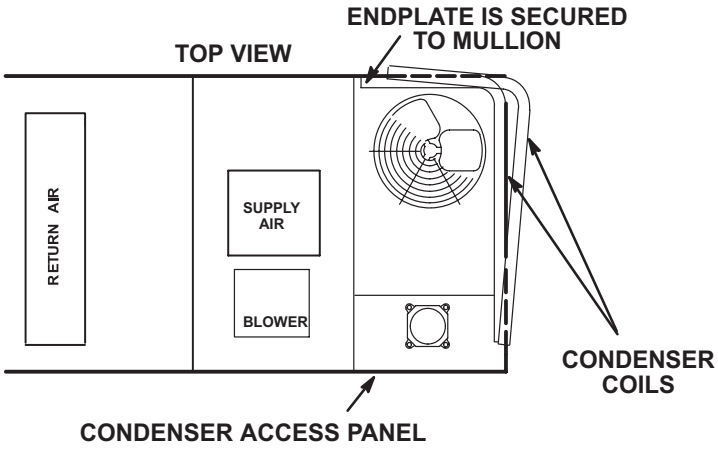
Condenser coils are made of single and two formed slabs. On units with two slabs, dirt and debris may become trapped between the slabs. To clean between slabs, carefully separate coil slabs and wash them thoroughly. See FIGURE 31. Flush coils with water following cleaning.

***NOTE -*** *Remove all screws and gaskets prior to cleaning procedure and replace upon completion.*

**E-Supply Air Blower Wheel**

Annually inspect supply air blower wheel for accumulated dirt or dust. Turn off power before attempting to remove access panel or to clean blower wheel.

**CLEAN CONDENSER COIL - UNITS WITH FIN/TUBE COILS**




1- Remove unit top panel and condenser section access panel.

2- Remove screws securing coil end plate to mullion.

3- Remove wire ties connecting coils slabs and separate slabs 3-4" (76-102mm).

4- Clean coils with detergent or commercial coil cleaner.

5- Rinse thoroughly with water and reassemble. Use field-provided wire ties to connect coil slabs.

**FIGURE 31**

**F-Needlepoint Bipolar Ionizer (Optional)**

The optional, brush-type ionizer produces positive and negative ions to clean air and reduce airborne contaminants. The ionizer was designed to be low maintenance. The device should be checked semi-annually to confirm the brushes are clean for maximum output. The ionizer is located behind on the blower deck to the left of the blower. See FIGURE 33.

1 - On the back side of the unit, remove the screw securing the back of the ionizer bracket. See FIGURE 32. Retain the screw to secure the back side of the ionizer bracket.

2 - Remove two screws securing the front side of the ionizer bracket and pull out of unit and clean brushes.

3 - Replace ionizer in the reverse order it was removed.

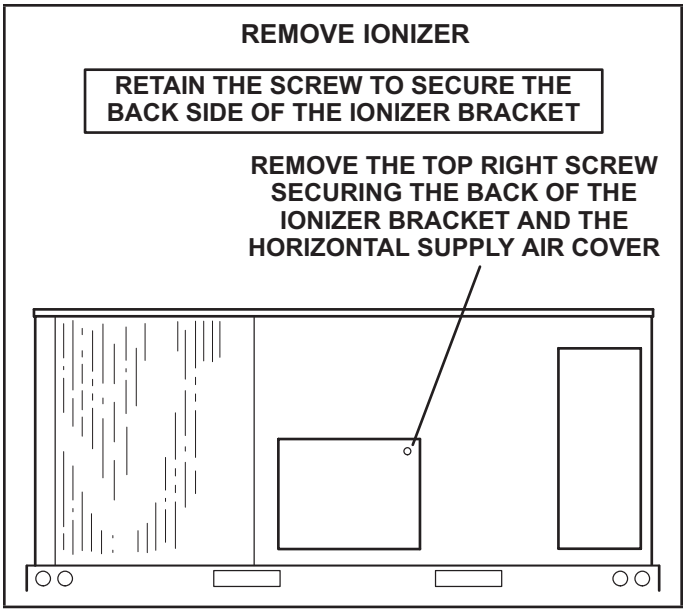



**FIGURE 32**

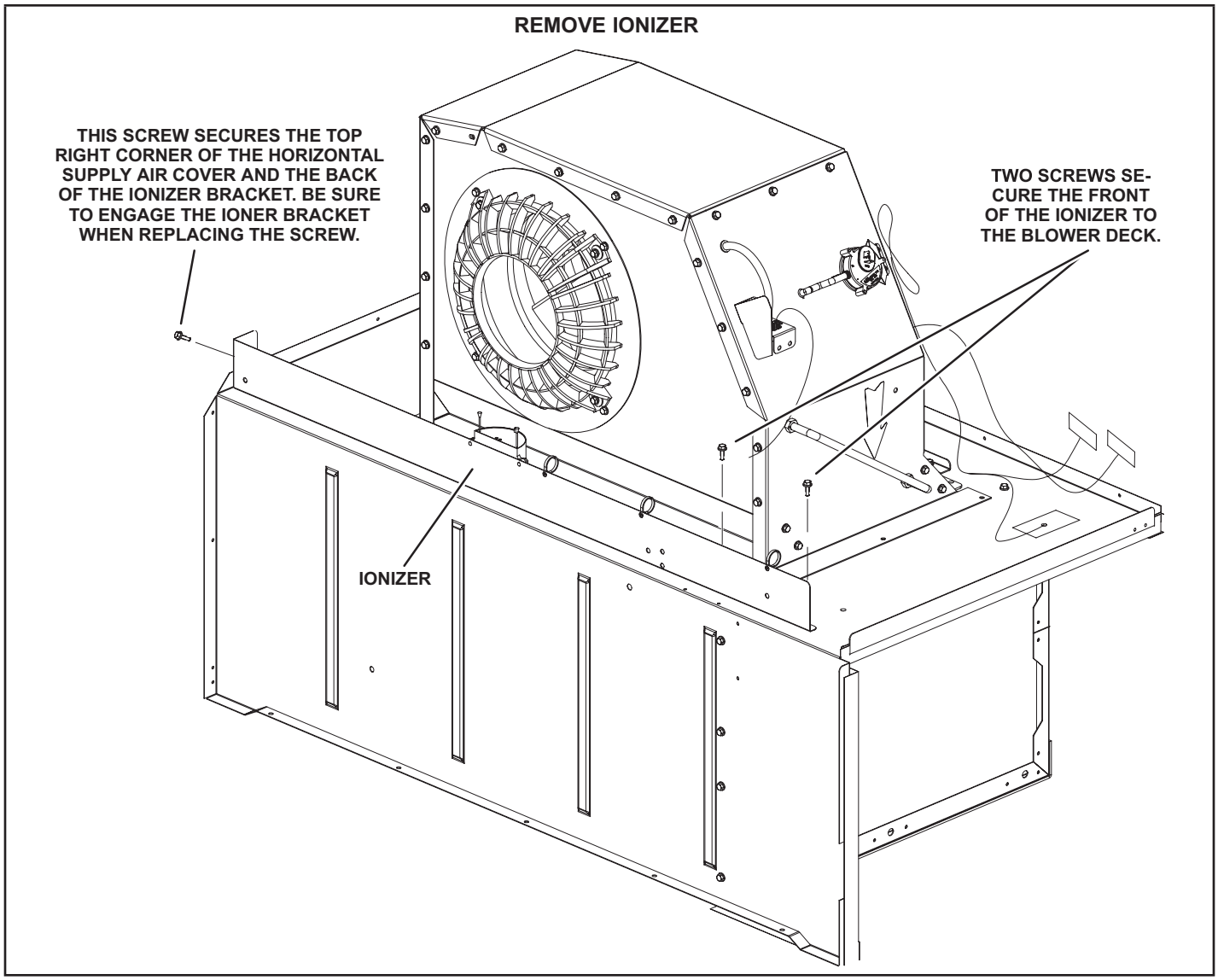



**FIGURE 33**

**G-UVC Light (Optional)**

When field-installed, use only UVC Light Kit assembly 106881-01 (21A92) with this appliance.

Factory-Installed UVC Light

When the UVC light is factory installed, the lamp is shipped attached to the filter rack. Remove the lamp and install into the UVC light assembly as shown in steps 2 through 11.

1 - Cut wire ties and remove the UVC lamp attached to the filter rack. See FIGURE 34.

**FACTORY-INSTALLED UVC LAMP LOCATION**

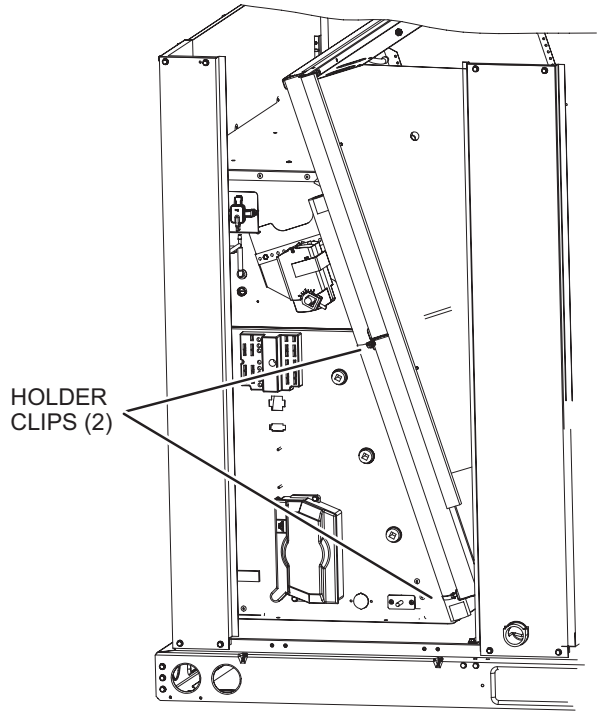



**FIGURE 34**

**Annual Lamp Replacement**

**⚠ WARNING**

**Personal Burn Hazard.**

Personal injury may result from hot lamps. During replacement, allow lamp to cool for 10 minutes before removing lamp from fixture.

The lamp should be replaced every 12 months, as UVC energy production diminishes over time.

1 - Obtain replacement lamp 102337-01 for your germicidal light model.

2 - Disconnect power to the rooftop unit before servicing the UVC kit.

3 - Open the blower access door.

4 - Remove the screw in wire tie from the UVC assembly and disconnect the 4-pin connector from the lamp end.

5 - Remove the (2) mounting screws of the UVC assembly. Carefully slide the complete UVC assembly out through the blower access door.

6 - Allow 10 minutes before touching the lamps. Then, carefully remove the old lamp from the lamp holder clips.

7 - Wear cotton gloves or use a cotton cloth when handling the new lamp. Place the new lamp in the holder clips of the UVC assembly. Verify that the lamp flange at the connector end is sandwiched between the lamp holder clip and the sheet-metal end stop (see FIGURE 35).

8 - Carefully place the UVC assembly on the blower deck. Line up the mounting holes on the UVC assembly with the mounting holes on the blower deck See FIGURE 36. Use the #10 screws provided to attach the UVC assembly in place.

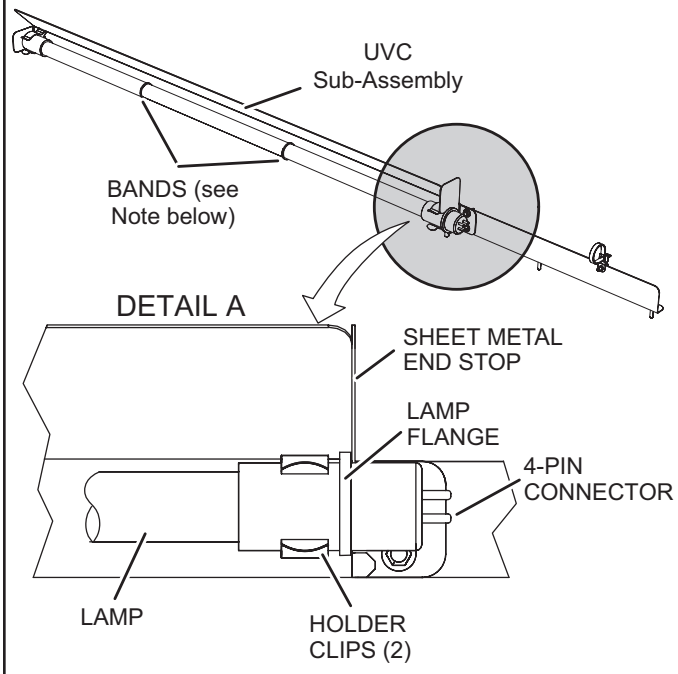
9 - Make sure to reapply the black convoluted tubing used to shield electrical wiring in the rooftop unit. Convoluted tubing is provided when the ionizer is factory- or field-installed. However, if there is any concern, aluminum foil tape (not provided) can also be used to cover any exposed component.

10 - Close the blower access door.

11 - Reconnect power to the rooftop unit.

12 - Open the filter access door and look through the view port in the triangular sheet-metal panel to verify that the UVC light is on.

**INSTALL LAMP IN HOLDER CLIPS**




*NOTE - The bands around the lamp should be evenly spaced as shown in **the diagram**.*

**FIGURE 35**

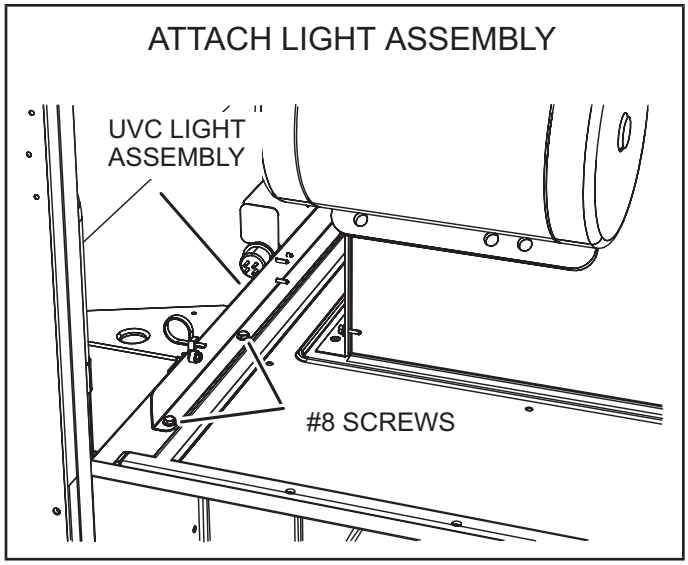



**FIGURE 36**

### Lamp Disposal

**Hg-LAMP Contains Mercury** - Manage in accordance with local, state and federal disposal laws. Refer to www.lamprecycle.org or call 800-953-6669.

**Proper Clean-up Technique in Case of Lamp Breakage**

Wear protective gloves, eye wear and mask.

Sweep the broken glass and debris into a plastic bag, seal the bag, and dispose of properly. Contact your local waste management office for proper disposal.

**Do not use a vacuum cleaner. Do not incinerate.**

### Maintenance

- For all maintenance, contact a qualified HVAC technician.
- Read the maintenance instructions before opening unit panels.
- Unintended use of the unit or damage to the unit housing may result in the escape of dangerous UVC radiation. UVC radiation may, even in small doses, cause harm to the eyes and skin.
- Do not operate units that are obviously damaged.
- Do not discard the triangular UVC light shield or any barriers with an ultraviolet radiation symbol.
- Do not override the door interlock switch that interrupts power to the UVC light.
- Do not operate the UVC light outside of the unit.

### H-Replacement Fuses

See the following tables for the proper replacement fuse sizes.

| ELECTRIC HEAT REPLACEMENT FUSES | | | | |
|---|---|---|---|---|
| | Electric Heat | Qty. | Rating | |
| | | | Amp | Volt |
| 1 | E1EH0050N-1P | 2 | 30 | 250 |
| 2 | T1/E1EH0075AN1Y | 3 | 25 | 250 |
| 3 | E1EH0100N-1P | 4 | 30 | 250 |
| 4 | T1/E1EH0150AN1Y | 3 | 50 | 250 |
| 5 | T1/E1EH0225AN1Y | 6 | 45 | 250 |
| 6 | T1/E1EH0300N-1Y | 6 | 60 | 250 |
| 7 | E2EH0300N-1Y | 6 | 60 | 250 |
| 8 | K1EH0050A-1P | 2 | 30 | 250 |
| 9 | T1/E1EH0075AN1P | 2 | 40 | 250 |
| 10 | T1EH0100A-1P | 4 | 30 | 250 |
| 11 | T1/E1EH0150AN1P | 4 | 40 | 250 |
| 12 | T1/E1EH0225AN1P | 6 | 40 | 250 |
| 13 | T1/E1EH0075AN1J | 3 | 15 | 600 |
| 14 | T1/E1EH0150AN1J | 3 | 20 | 600 |
| 15 | T1/E1EH0225AN1J | 3 | 30 | 600 |
| 16 | T1/E1EH0300N-1J | 3 | 40 | 600 |
| 17 | T1/E1EH0075AN1G | 3 | 15 | 600 |
| 18 | T1/E1EH0150AN1G | 3 | 25 | 600 |
| 19 | T1/E1EH0225AN1G | 3 | 35 | 600 |
| 20 | T1/E1EH0300N-1G | 3 | 50 | 600 |

| LHX024 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 5 KW | | 7.5 KW | | 10 KW | | |
| Unit Voltage | | | 208/230V - 1 Ph | | 208/230V - 1 Ph | | 208/230V - 1 Ph | | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | |
| Diagram Key | Class | Blower HP | Amps | | | | | | |
| F4 | RK or K | 0.25 | 25 | 25 | 25 | 25 | 25 | 25 | |

| LHX036 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 7.5 KW | | | | | | | | 15 KW | | | | | | | |
| Unit Voltage | | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. |
| Diagram Key | Class | Blower HP | Amps | | | | | | | | | | | | | | | |
| F4 | RK or K | 0.5 | 35 | 35 | 25 | 25 | 15 | 15 | 15 | 15 | 35 | 35 | 25 | 25 | 15 | 15 | 15 | 15 |
| F4 | RK or K | 1.0 | 40 | 40 | 30 | 25 | 15 | 15 | 15 | 15 | 40 | 40 | 30 | 25 | 15 | 15 | 15 | 15 |
| F57 | CC | 1.0 | - | - | - | - | 10 | 10 | 10 | 10 | - | - | - | - | 10 | 10 | 10 | 10 |

| LHX048 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 7.5 KW | | | | | | | | 15 KW | | | | | | | |
| Unit Voltage | | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. |
| Diagram Key | Class | Blower HP | Amps | | | | | | | | | | | | | | | |
| F4 | RK or K | 0.5 | 50 | 45 | 30 | 30 | 15 | 15 | 15 | 15 | 50 | 45 | 30 | 30 | 15 | 15 | 15 | 15 |
| F4 | RK or K | 1.0 | 50 | 50 | 35 | 35 | 20 | 15 | 15 | 15 | 50 | 50 | 35 | 35 | 20 | 15 | 15 | 15 |
| F57 | CC | 1.0 | - | - | - | - | 10 | 10 | 10 | 10 | - | - | - | - | 10 | 10 | 10 | 10 |

| LHX060 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 7.5 KW | | | | | | | | 15 KW | | | | | | | |
| Unit Voltage | | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. |
| Diagram Key | Class | Blower HP | Amps | | | | | | | | Amps | | | | | | | |
| F4 | RK or K | 1.0 | 60 | 60 | 45 | 45 | 20 | 20 | 15 | 15 | 60 | 60 | 45 | 45 | 20 | 20 | 15 | 15 |
| F4 | RK or K | 2.0 | - | - | 45 | 45 | 20 | 20 | 15 | 15 | - | - | 45 | 45 | 20 | 20 | 15 | 15 |
| F57 | CC | 1.0 | - | - | - | - | 10 | 10 | 10 | 10 | - | - | - | - | 10 | 10 | 10 | 10 |

| LHX060 (continued) | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 22.5 KW | | | | | | | | | | | | | | | |
| Unit Voltage | | | 208/230V - 1 Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | | | | | | | | | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | | | | | | | | |
| Diagram Key | Class | Blower HP | Amps | | | | | | | | | | | | | | | |
| F4 | RK or K | 1.0 | 60 | 60 | 45 | 45 | 20 | 20 | 15 | 15 | | | | | | | | |
| F4 | RK or K | 2.0 | - | - | 45 | 45 | 20 | 20 | 15 | 15 | | | | | | | | |
| F57 | CC | 1.0 | - | - | - | - | 10 | 10 | 10 | 10 | | | | | | | | |

| LHX072 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 7.5 KW | | | | | | 15 KW | | | | | |
| Unit Voltage | | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. |
| Diagram Key | Class | Blower HP | Amps | | | | | | Amps | | | | | |
| F4 | RK or K | 2.0 | 50 | 50 | 25 | 25 | 15 | 15 | 50 | 50 | 25 | 25 | 15 | 15 |

| LHX072 (continued) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Electric Heat Size | | | 22.5 KW | | | | | |
| Unit Voltage | | | 208/230V - 3 Ph | | 460V - 3Ph | | 575V - 3Ph | |
| Power Exhaust Option | | | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. | W / P.E. | W / O P.E. |
| Diagram Key | Class | Blower HP | Amps | | | | | |
| F4 | RK or K | 2.0 | 50 | 50 | 25 | 25 | 15 | 15 |

## Factory Unit Controller Settings

Use the mobile service app to adjust parameters; menu paths are shown in each table. Refer to the Unit Controller manual provided with each unit.

TABLE 17 and TABLE 18 show factory settings. Record adjusted settings on the label located inside the compressor access panel.

When field installing optional kits and accessories, the Unit Controller must be configured to identify the option before it will function. Refer to FIGURE 37 and FIGURE 38 to determine whether the Unit Controller configuration I.D. must change. To configure the option, use MAIN MENU > SETUP > INSTALL menu path. Press SAVE until CONFIGURATION ID 1 or 2 appears depending on the option installed. Change the appropriate character in the configuration I.D. For example, when an economizer is installed using a single enthalpy sensor, change configuration I.D. 1, the second character, to “S”.

**TABLE 17**
**581038**

| Units With BACnet Settings |
|---|
| **RTU Menu > Network Integration > Network Setup Wizard > BACnet MS/TP > See BACnet MAC Address** |
| BACNET MAC ADDRESS: |
| **Units With Room Sensor, CPC/LSE Gateway Settings** |
| **RTU Menu > Network Integration > Network Setup Wizard > SBUS > Set SBUS Address** |
| LCONN ADDRESS: |

**TABLE 18**
**581037-01**

| Units With LonTalk Settings |
|---|
| **Use menu RTU Menu > Network Integration > Network Setup Wizard** |
| **> Set “LONTALK”** |

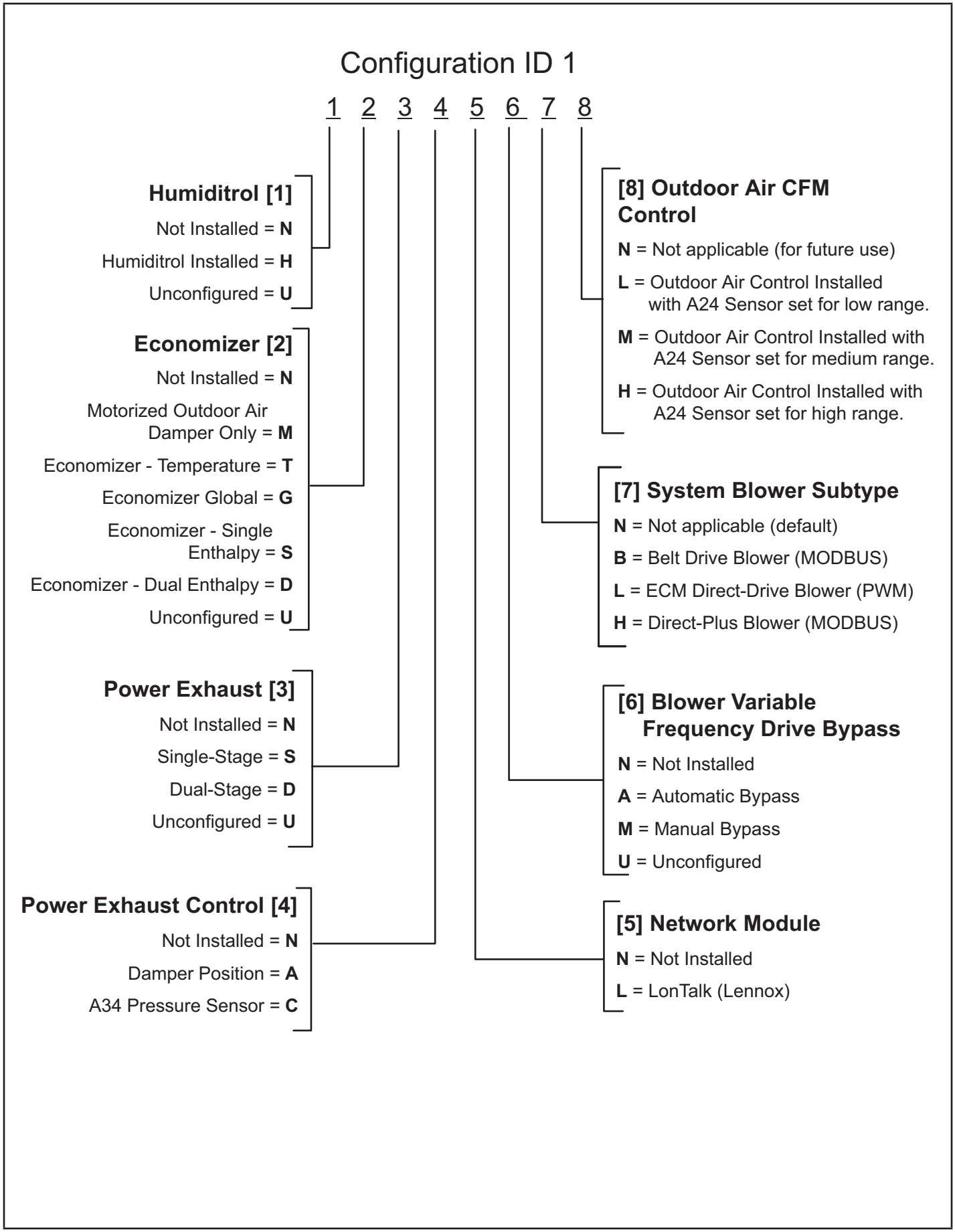
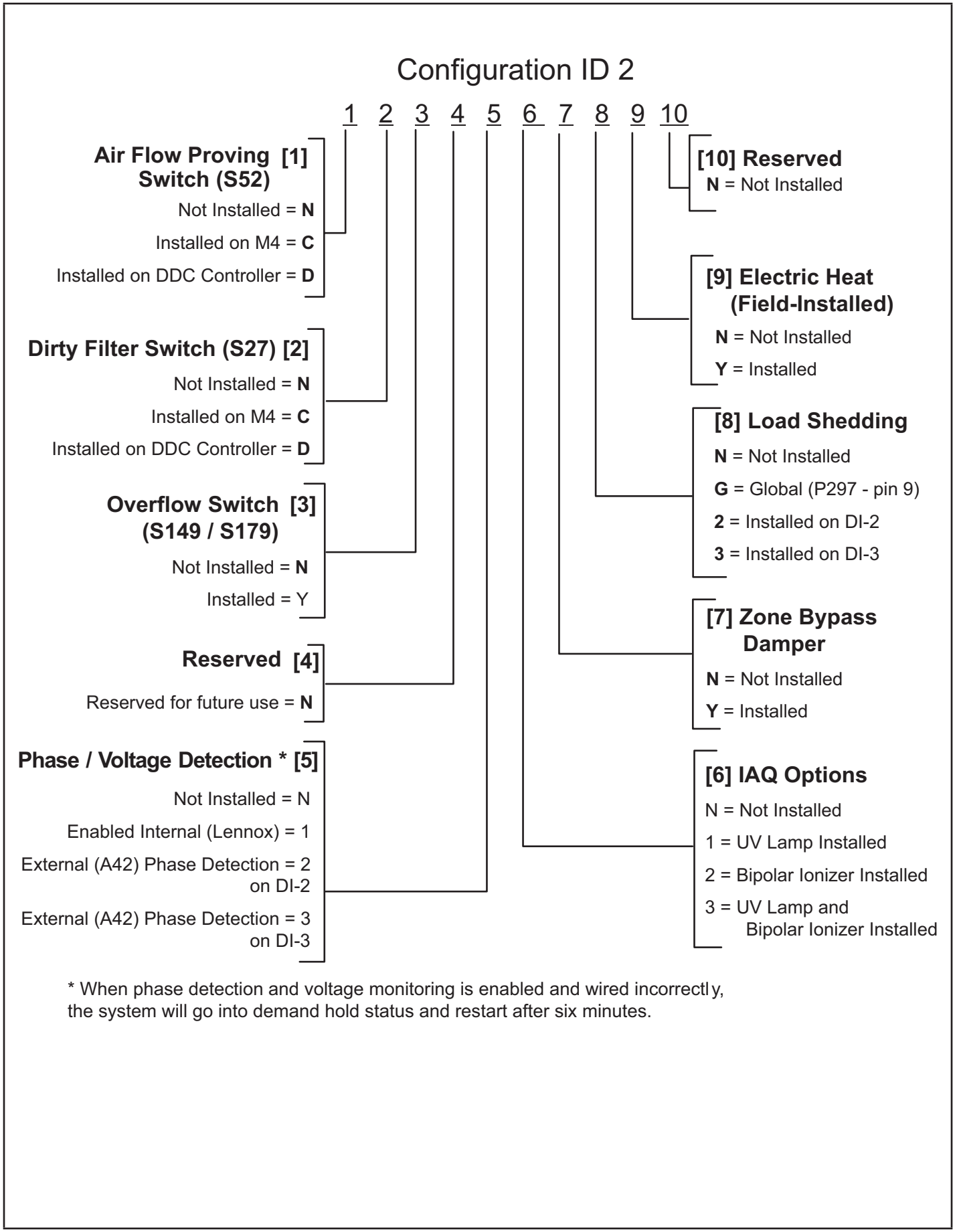

Configuration ID 1
1 2 3 4 5 6 7 8
Humiditrol [1]
Not Installed = N
Humiditrol Installed = H
Unconfigured = U
Economizer [2]
Not Installed = N
Motorized Outdoor Air Damper Only = M
Economizer - Temperature = T
Economizer Global = G
Economizer - Single Enthalpy = S
Economizer - Dual Enthalpy = D
Unconfigured = U
Power Exhaust [3]
Not Installed = N
Single-Stage = S
Dual-Stage = D
Unconfigured = U
Power Exhaust Control [4]
Not Installed = N
Damper Position = A
A34 Pressure Sensor = C
[8] Outdoor Air CFM Control
N = Not applicable (for future use)
L = Outdoor Air Control Installed with A24 Sensor set for low range.
M = Outdoor Air Control Installed with A24 Sensor set for medium range.
H = Outdoor Air Control Installed with A24 Sensor set for high range.
[7] System Blower Subtype
N = Not applicable (default)
B = Belt Drive Blower (MODBUS)
L = ECM Direct-Drive Blower (PWM)
H = Direct-Plus Blower (MODBUS)
[6] Blower Variable Frequency Drive Bypass
N = Not Installed
A = Automatic Bypass
M = Manual Bypass
U = Unconfigured
[5] Network Module
N = Not Installed
L = LonTalk (Lennox)

**FIGURE 37**




* When phase detection and voltage monitoring is enabled and wired incorrectly, the system will go into demand hold status and restart after six minutes.

**FIGURE 38**

## Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely.

Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before starting decommissioning.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

c) Before attempting the procedure, ensure that:

- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- all personal protective equipment is available and being used correctly;
- the recovery process is supervised at all times by a competent person;
- recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.

e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f) Make sure that cylinder is situated on the scales before recovery takes place.

g) Start the recovery machine and operate in accordance with instructions.

h) Do not overfill cylinders (no more than 80% volume liquid charge).

i) Do not exceed the maximum working pressure of the cylinder, even temporarily.

j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

**⚠ IMPORTANT**

Equipment shall be labelled stating that it has been decommissioned and emptied of refrigerant. The label shall be signed and dated. Ensure that there are labels on the equipment that state the flammability of the refrigerant used.

# START-UP REPORT

Job Name:_____

Store No._____Start-Up Date:_____

Address:_____

City:_____State:_____

Start-Up Contractor:_____

Technician:_____

Model No.:_____

Serial No.:_____

RTU No.:_____ Catalog No.:_____

## Inspections and Checks

Damage? Yes No R454B ☐

If yes, reported to:_____

_____

Verify factory and field-installed accessories.

Check electrical connections. Tighten if necessary.

Supply voltage: L1-L2_____L1-L3_____L2-L3_____

If unit contains a 208-230/240 volt transformer:
Check primary transformer tap ☐
Transformer secondary voltage: _____

## Cooling Checks

Compressor Rotation ☐ Ambient Temp._____Return Air Temp._____ Supply Air Temp._____

| | Compressor Amps | | | Compressor Volts | | | Pressures | | Condenser Fan Amps | | | CC Heater Amps |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | L1 | L2 | L3 | L1-L2 | L1-L3 | L2-L3 | Disch. | Suct. | L1 | L2 | L3 | L1 |
| 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

## Blower Checks

Pulley/Belt Alignment ☐ Blower Rotation ☐
Set Screws Tight ☐ Belt Tension ☐

Nameplate Amps:_____ Volts:_____

| Motor | Amps | Volts |
|---|---|---|
| | L1_____ | L1-L2_____ |
| | L2_____ | L1-L3_____ |
| | L3_____ | L2-L3_____ |

## Heating Checks - Gas

Fuel type: Nat. ☐ LP ☐ Inlet Pressure:_____in. w.c.

Return Air Temp.:_____ Supply Air Temp.:_____

Altitude:_____ Primary Limits Operate: ☐

$CO_2$%:

| Gas Valve | Manifold Pressure | |
|---|---|---|
| | Low Fire | High Fire |
| GV1 | | |
| GV2 | | |

## Control Type

## Heating Checks - Electric

Return Air Temp.:_____ Supply Air Temp.:_____
Limits Operate: ☐

| | Amps | | | | | | |
|---|---|---|---|---|---|---|---|
| | L1 | L2 | L3 | | L1 | L2 | L3 |
| 1 | | | | 10 | | | |
| 2 | | | | 11 | | | |
| 3 | | | | 12 | | | |
| 4 | | | | 13 | | | |
| 5 | | | | 14 | | | |
| 6 | | | | 15 | | | |
| 7 | | | | 16 | | | |
| 8 | | | | 17 | | | |
| 9 | | | | 18 | | | |

## Accessory Checks

Power Exhaust Amps

1 _____ 2 _____ None ☐

Economizer Operation

Min. Pos. ☐ Motor travel full open/close ☐