

# INSTALLATION INSTRUCTIONS

## ⚠ 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 qualified installer, service agency or the gas supplier

## Humiditrol™ LGA/LCA036H, 048H, & 060H (3, 4, & 5 TON)

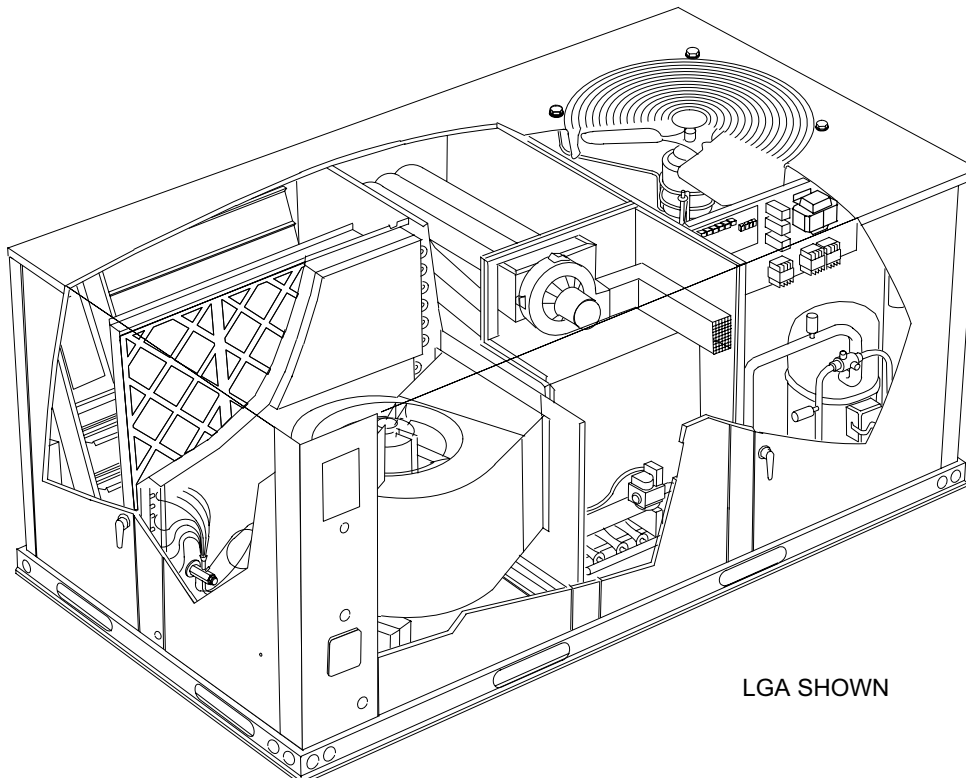
### L SERIES PACKAGED UNITS

504,417M  
8/2001  
Supersedes 4/2001

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**RETAIN THESE INSTRUCTIONS FOR FUTURE REFERENCE**



LGA SHOWN



# LGA/LCA036-072 Unit Dimensions - Inches (mm)

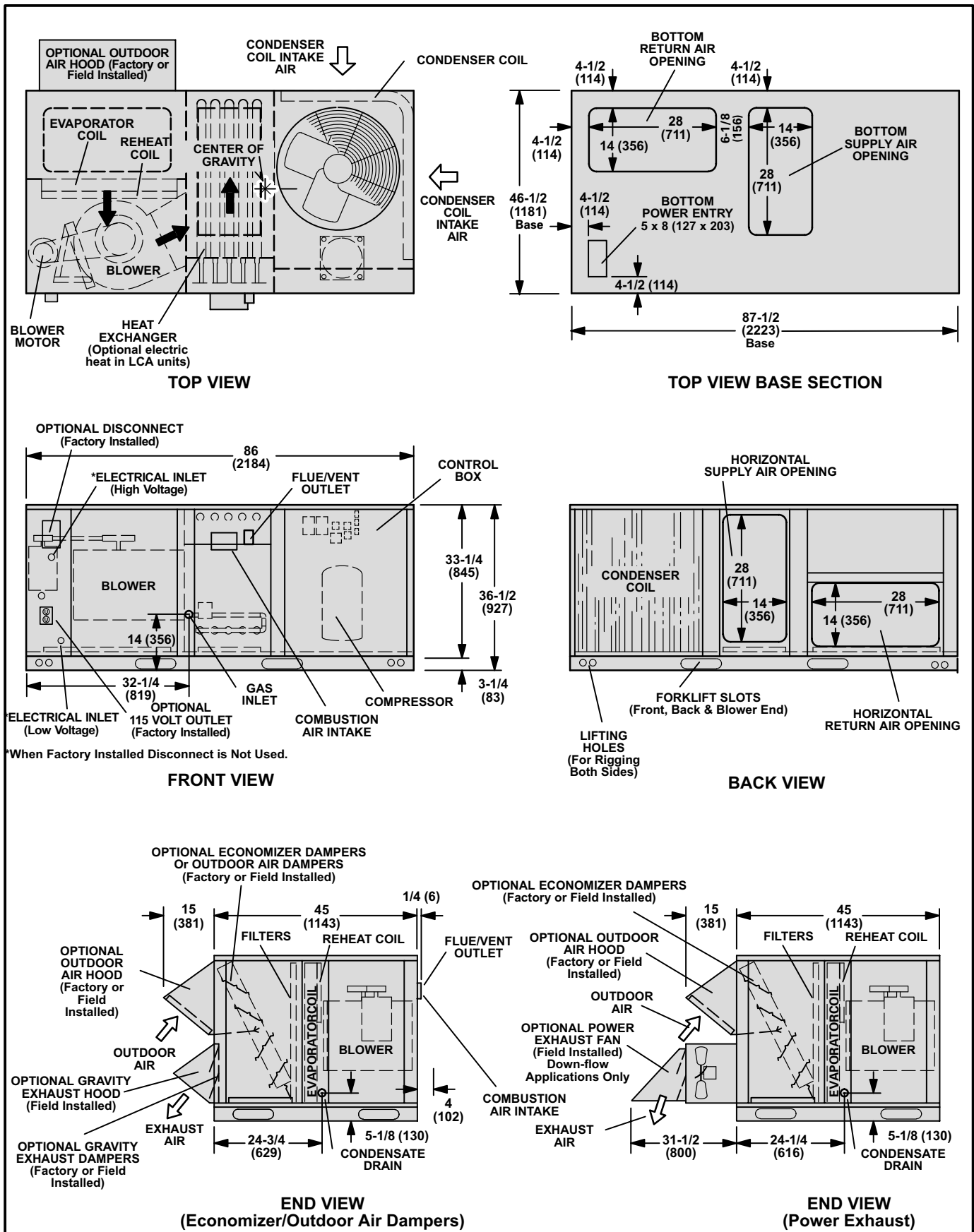


FIGURE 1

# LGA/LCA036-072 Parts Arrangement

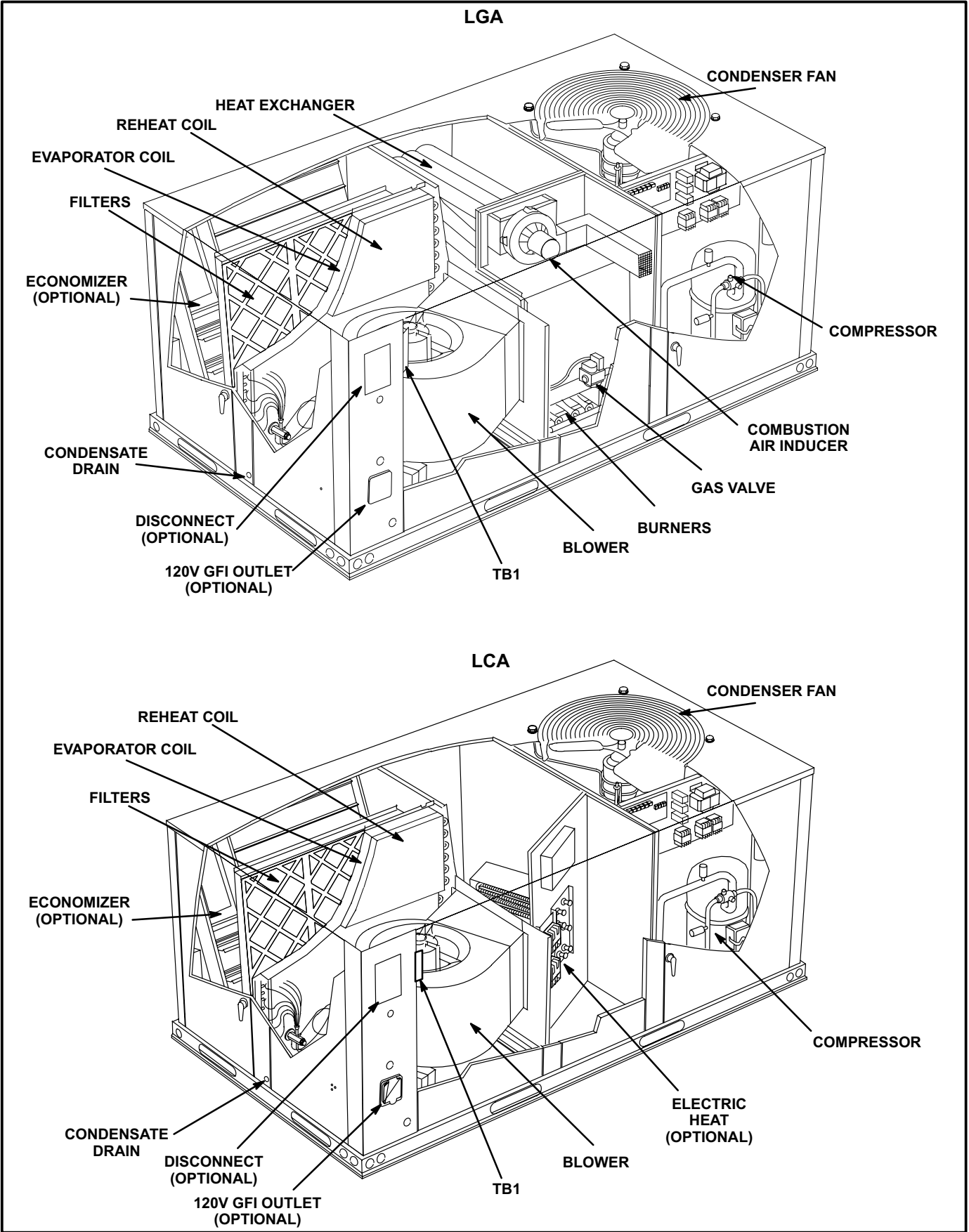


FIGURE 2

## Shipping and Packing List

Package 1 of 1 contains:

1- Assembled unit

**IMPORTANT** - This unit requires a specific field-provided and installed humidity sensor (17M50).

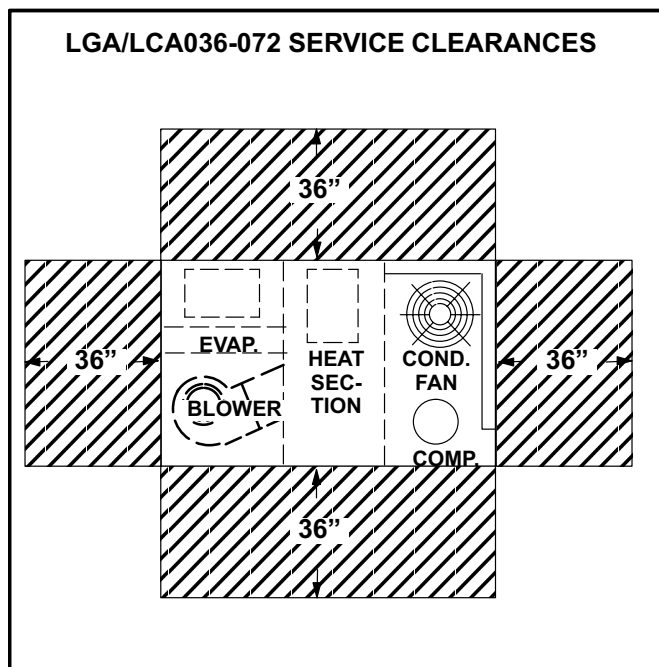
Check unit for shipping damage. Consult last carrier immediately if damage is found.

## General

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

In addition to standard heating and cooling, Humiditrol™ units provide a dehumidifying mode of operation. Refer to Reheat Operation section.

See figure 1 for unit dimensions, figure 2 for parts arrangement and figure 3 for service clearances.



## 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.

## CAUTION

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

## WARNING



Electric shock hazard 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.

## Unit Support

### A-Roof Mounting with LARMF - Downflow Discharge Application

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

### B-Roof Mounting With Installer's Frame - Downflow Applications

Many types of roof frames can be used to mount 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 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 the unit on a combustibile surface for downflow discharge applications, the LARMF roof mounting frame is required.*

**C-Horizontal Discharge Applications**

- 1- Specified installation clearances must be maintained when mounting units. Refer to figure 3.
- 2- Top of support slab should be at least 4" (102mm) above the finished grade and located so no run-off water from higher ground can collect around the unit.
- 3- Units are shipped in downflow position. Convert to horizontal discharge as follows:
  - a-Remove horizontal return air cover and rear heat section panel.
  - b-Secure horizontal return air cover over downflow return air opening.
  - c-Remove horizontal supply air cover from rear heat section panel. Cut insulation to match horizontal supply air opening. Use foil tape to secure cut edges of insulation to supply air opening. Secure horizontal supply air cover over downflow supply air opening. Replace rear heat section panel.
- 4- Units require support along all four sides of unit base. Supports must be constructed of steel or suitably treated wood materials.

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

**Duct Connection**

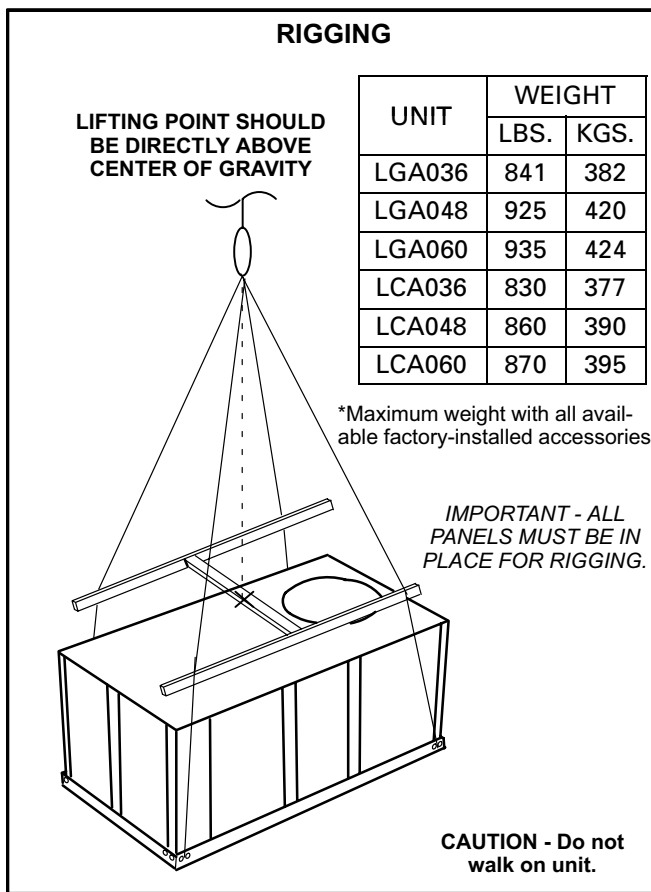
All exterior ducts, joints, openings in roof or building walls must be insulated and weather-proofed with flashing and sealing compounds in accordance with applicable codes. Any duct passing through an unconditioned space must be insulated.

**⚠ 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 4.

- 1- Detach wooden base protection before rigging.
- 2- Connect rigging to the unit base using both holes in each corner.
- 3- All panels must be in place for rigging.
- 4- 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 top of unit).



**FIGURE 4**

## Condensate Drains

Make drain connection to the 3/4" N.P.T. drain nipple provided on unit. A trap must be installed between drain connection and an open vent for proper condensate removal. See figure 5. 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 figures 1 and 2 for condensate drain location.

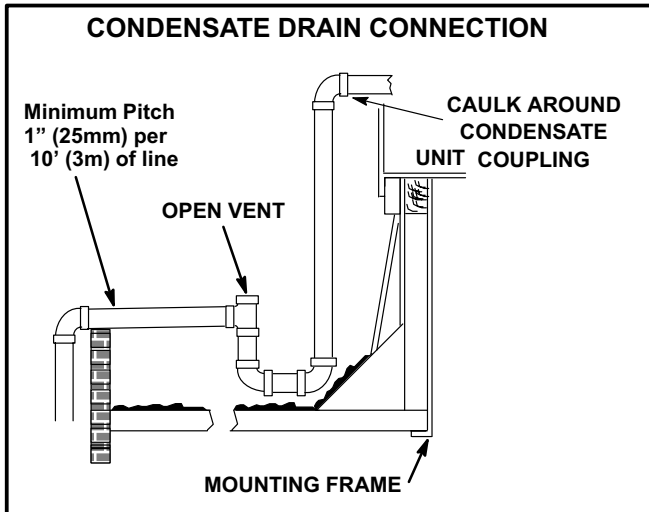


FIGURE 5

## Connect Gas Piping

Before connecting piping, check with gas company or authorities having jurisdiction for local code requirements. When installing gas supply piping, length of run from gas meter must be considered in determining pipe size for 0.5" w.c. maximum pressure drop. Do not use supply pipe smaller than unit gas connection. For natural gas units, operating pressure at the unit gas connection must be a minimum of 5.5" w.c. and a maximum of 10.5" w.c. For propane gas units, operating pressure at the unit gas connection must be a minimum of 11" w.c. and a maximum of 13.0" w.c.

When making piping connections, a drip leg should be installed on vertical pipe runs to serve as a trap for sediment or condensate. A 1/8" N.P.T. plugged tap in field piping accessible for test gauge connection must be provided upstream of gas supply connection to the unit. Install a ground joint union between the gas control manifold and the main manual shut-off valve. See figure 6.

Compounds used on threaded joints of gas piping shall be resistant to the action of liquified petroleum gases.

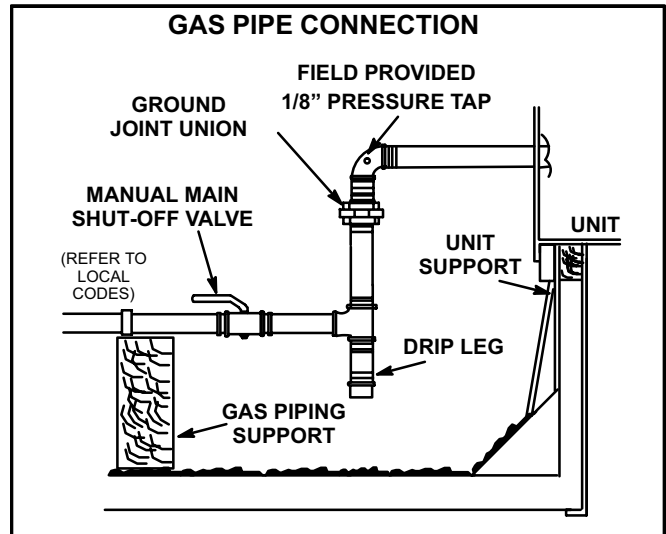


FIGURE 6

## Pressure Test Gas Piping

When pressure testing gas lines, the gas valve must be disconnected and isolated. Gas valves can be damaged if subjected to more than 0.5 psig (14" w.c.). See figure 7.

If the test pressure is equal to or less than 0.5 psig (14" w.c.), use the main manual shut-off valve before pressure testing to isolate the unit from the gas supply system. If necessary, adjust main gas supply pressure in accordance with "Connect Gas Pipe" section.

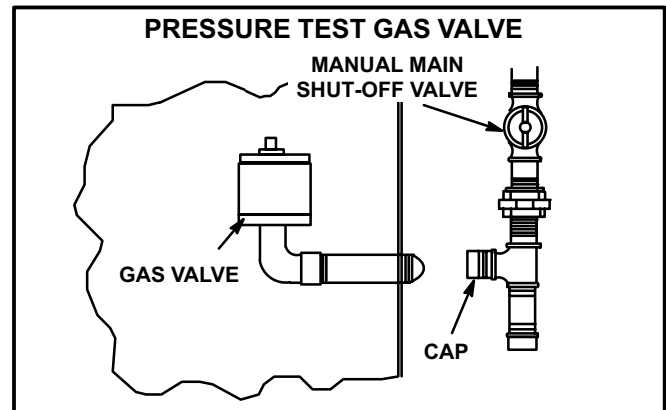


FIGURE 7

*NOTE-Codes may require that manual main shut-off valve and union (furnished by installer) be installed in gas line external to unit. Union must be of the ground joint type.*

After all connections have been made, check all piping connections for gas leaks. Also check existing gas connections up to the gas valve; loosening may occur during installation. Use a soap solution or other preferred means. Do not use matches, candles, or other sources of ignition to check for gas leaks.

*NOTE-In case emergency shut down is required, turn off the main manual shut-off valve and disconnect main power to unit. These devices should be properly labeled by the installer.*

## High Altitude Derate

Units must be derated when installed at altitudes above 4500 feet (610 m) above sea level. At altitudes above 4500 feet (610 m), units must be derated to match the gas manifold pressures shown in table 1.

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

**TABLE 1**

Altitude - ft. (m)	Gas Manifold Pressure-in. w.g. (kPa)	
	Natural	LP (Propane)
4501-5500 (1372-1676)	3.4 (0.85)	10.2 (2.54)
5501-6500 (1676-1981)	3.3 (0.82)	9.8 (2.44)
6501-7500 (1981-2286)	3.2 (0.80)	9.5 (2.36)

## Factory-Installed Options

### A-Economizer

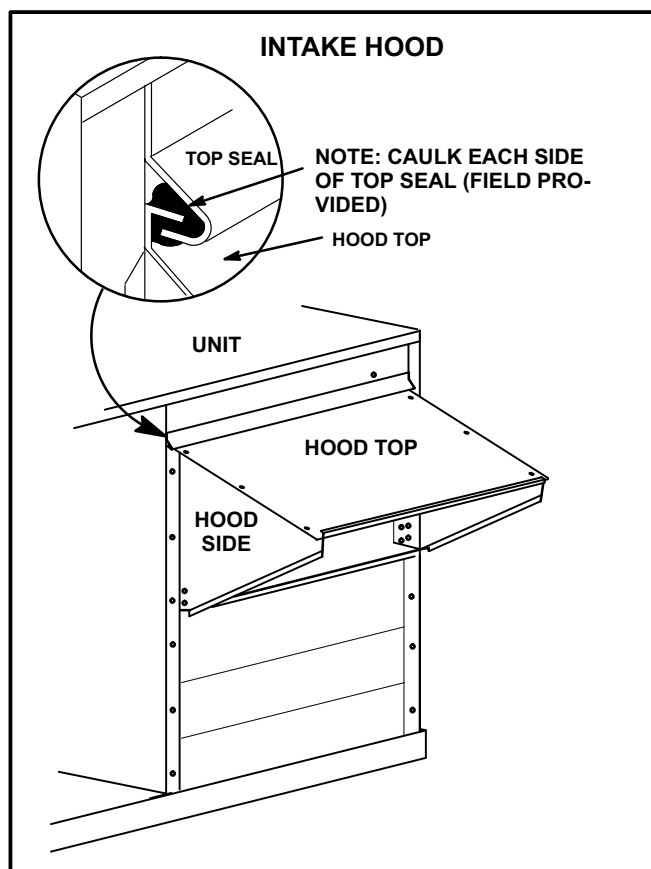
The A56 EM1 economizer board controls economizer operation and provides potentiometers to control minimum damper position and enthalpy control adjustments. The economizer board is positioned on the A55 M1 main control board in the unit control box. See the Integrated Modular Control Guide for economizer operation and adjustments.

Intake hood parts and supply air filters are shipped in the filter section. Remove intake hood package from filter channels. Remove filters from unit and slide into filter channels. If the filters have a metal frame, remove the cardboard shipping pad protecting the evaporator coil.

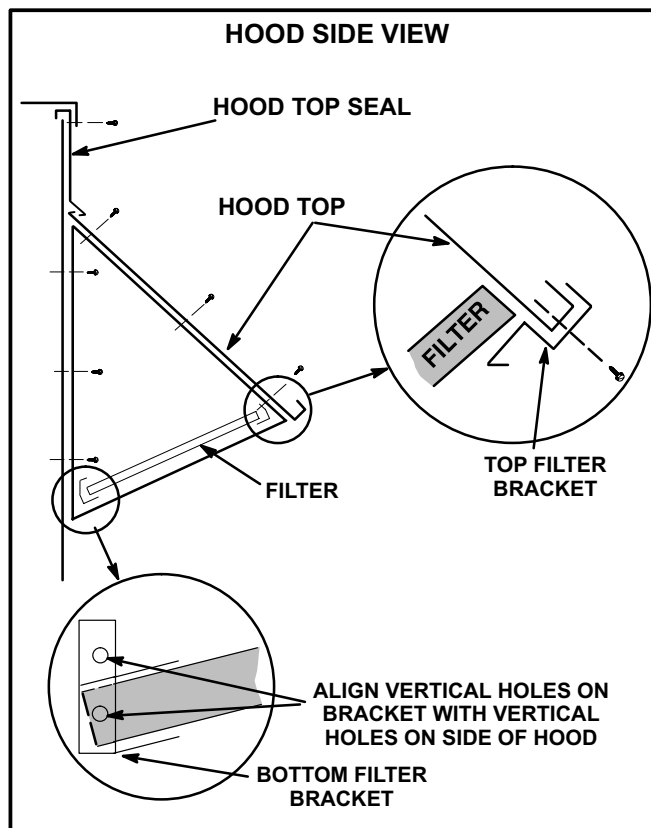
### B-Intake Hood

The intake hood top panel is secured to the unit. The intake hood sides, filters, and three support brackets are shipped unassembled in the filter compartment. Assemble hood and install as follows:

- 1- Remove screws securing side flanges of top hood to unit. See figure 8.
- 2- Pivot top hood open and secure sides of intake hood to top of hood using three sheet metal screws on each side. See figure 8.
- 3- Align two holes on intake hood side panel with two holes on bottom filter bracket. See figure 9. Secure both sides of bottom filter bracket to hood sides with sheet metal screws.
- 4- Secure intake hood sides to unit.
- 5- Secure top filter bracket to hood top flange as shown in figure 9. Slide filter into flanges and install spacers on either side of filter.



**FIGURE 8**



**FIGURE 9**

## 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 overcurrent protection.

- 1- All units are factory wired. For 208V supply, disconnect the orange wire (230V) at control power transformer. Reconnect the red wire (208V). Tape the exposed end of the 230V orange wire.

### Units Without Optional Disconnect

- 1- The unit is provided with power entry knockouts through the base and the blower section mullion (see page 1).
- 2- *Horizontal Power Entry* - Remove necessary electrical knockouts on blower section mullion.  
*Bottom Power Entry* -  
Route wires through knockout on power entry cover.

*NOTE - It may be necessary to punch larger holes for power wiring (refer to current NEC/CEC requirements).*

- 3- Install adequate disconnect switch external to unit in accordance with local or national codes as applicable.

### Units With Factory-Installed GFI

- 1- Remove necessary electrical knockouts in unit.
- 2- Make power wiring connections in bottom power entry box.
- 3- Connect separate 120v wiring to GFCI outlet pigtailed in handy box on front left corner mullion.

## Electrical Connections - Control Wiring

### A-Thermostat Location

Room thermostat mounts vertically on any non-conductive flat surface.

Locate thermostat approximately 5 feet (1.5m) 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 units
- concealed pipes and chimneys

### B-Control Wiring

- 1- Route thermostat cable or wires from subbase through conduit provided in unit. Refer to wiring diagram on unit. For thermostat wire runs up to 60 feet (18m), use 18 gauge wire. For 60 to 90 feet (18 to 27m) runs, use 16 gauge wire.
- 2- Install thermostat and humidity sensor in accordance with instructions provided with thermostat or sensor. See figure 11 to wire units set in local thermostat mode. See figure 12 for units wired in zone sensor mode.
- 2- Install thermostat assembly in accordance with instructions provided with thermostat.

*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.*

### C-Commercial Controls Platform

Units without an optional factory-installed control system may use a variety of different temperature control systems. The unit has a pre-wired jack-plug platform allowing a variety of control systems to “plug-in” to unit jack-plugs. Control systems which have the mating commercial controls platform jack-plug contain a control system wiring diagram “C” section. This diagram section is used with unit and accessory diagram sections for total system operation. Affix diagrams to unit in alpha-numeric order as shown in figure 10. Refer closely to installation instructions provided with each temperature control system for proper unit operation.

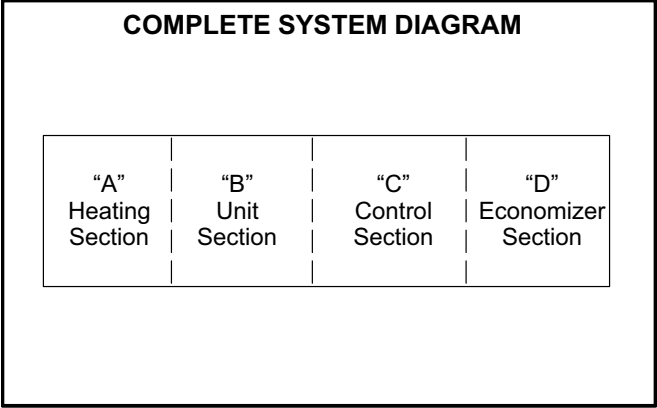
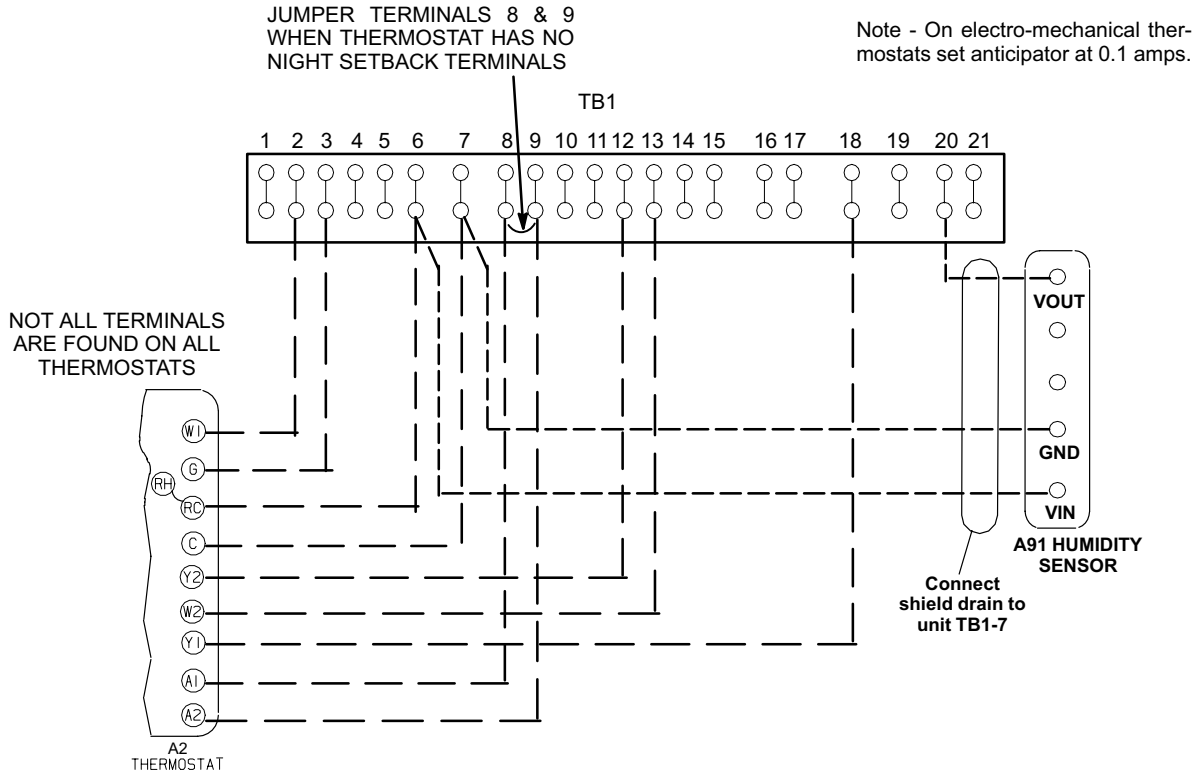


FIGURE 10

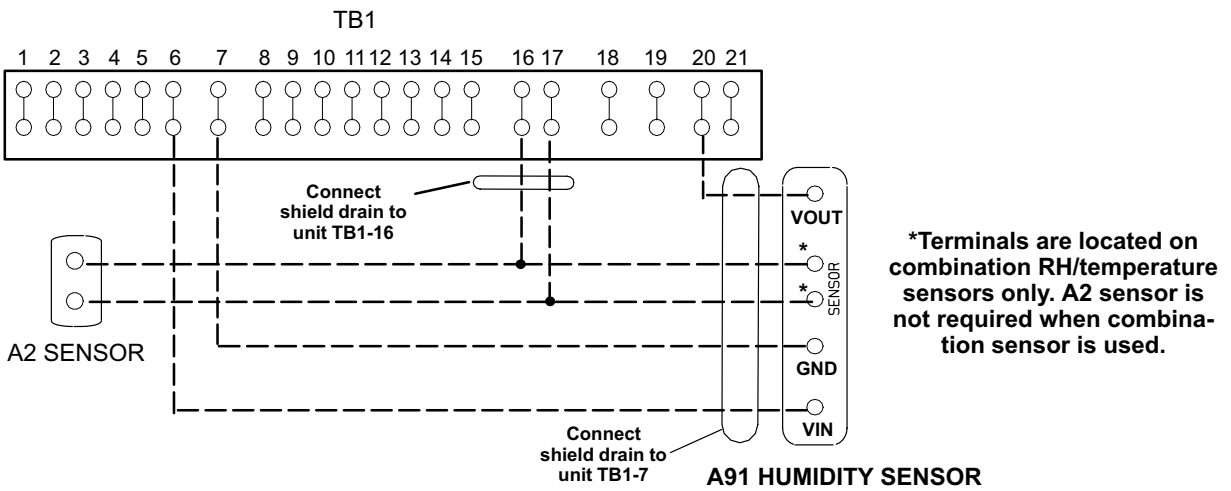


**24 VOLT FIELD WIRING WITH IMC SET IN LOCAL THERMOSTAT MODE (ECTO 6.01 OPTION 0)**



**FIGURE 11**

**24 VOLT FIELD WIRING IN ZONE SENSOR MODE (ECTO 6.01 OPTION 1, 2, OR 3)**



**FIGURE 12**

## Blower Operation and Adjustments

*NOTE - These units must not be used as a "construction heater" at any time during any phase of construction. Very low return air temperatures, harmful vapors, and misplacement of the filters will damage the unit and its efficiency. Additionally, a unit which will be subject to cold temperatures when not in operation must have a vapor barrier installed to seal the duct connections. Failure to protect the unit from moisture laden air or harmful vapors (generated from the construction process and temporary combustion heating equipment) will cause corrosive condensation within the unit. Failure to properly protect the unit in this situation will cause electrical and electronic component failure and could affect the unit warranty status.*

### A-Blower Operation

- 1- Blower operation is manually set at the thermostat subbase fan switch. With fan switch in ON position, blowers will operate continuously.
- 2- With fan switch in AUTO position, the blower will cycle with demand. Blower and entire unit will be off when system switch is in OFF position.

### B-Determining Unit CFM

- 1- The following measurements must be made with a dry indoor coil. Run blower without a cooling demand. Air filters must be in place when measurements are taken.
- 2- Measure static pressure external to unit (from supply to return).
- 3- Measure the indoor blower wheel RPM.
- 4- Refer to unit nameplate to determine the blower motor horse power.
- 5- Referring to table 2 or 3, use the static pressure and RPM readings to determine unit CFM.
- 6- The CFM can be adjusted at the motor pulley (see section C-Blower Belt Adjustment).

### C-Blower Belt Adjustment

Maximum life and wear can be obtained from belts only if proper pulley alignment and belt tension are maintained.

*Important-Tension new belt after a 24-48 hour period of operation. This will allow belts to stretch and seat grooves. To increase belt tension, loosen 2 locking bolts and pull mounting plate. Tighten motor mounting plate in vertical position. See figure 13.*

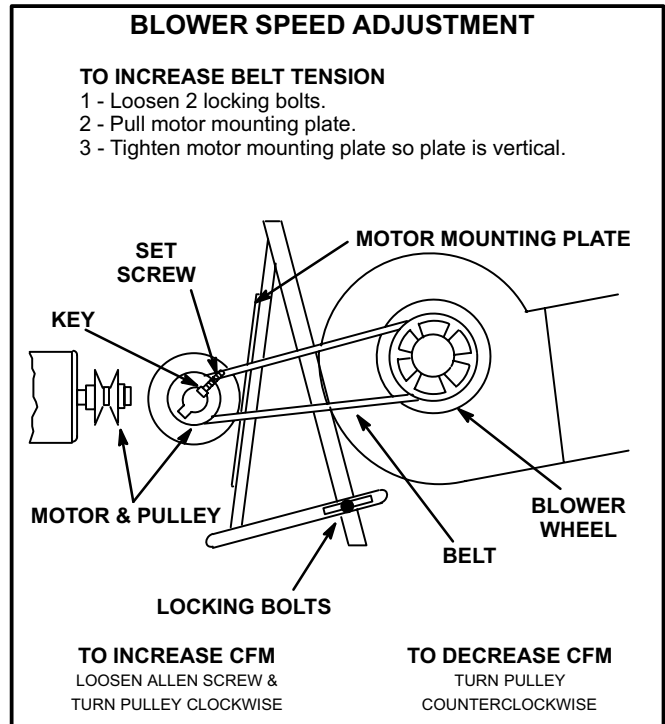


FIGURE 13

### D-Check Belt Tension

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

- 1- Measure span length X. See figure 14.
- 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 overtensioned belt.

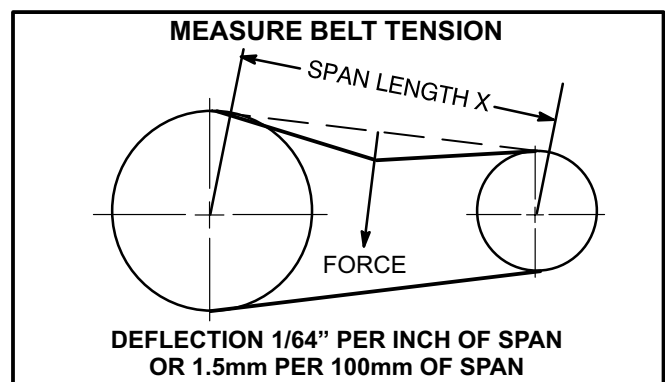


FIGURE 14

**TABLE 2  
LGA036-072 BELT DRIVE BLOWER PERFORMANCE**

Air Volume cfm (L/s)	TOTAL STATIC PRESSURE — Inches Water Gauge (Pa)																			
	.00 (00)		.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
900 (425)	<b>350</b>	<b>0.05</b> <i>(0.04)</i>	<b>495</b>	<b>0.10</b> <i>(0.07)</i>	630	0.20 (0.15)	750	0.30 (0.22)	855	0.40 (0.30)	950	0.60 (0.45)	1035	0.75 (0.56)	1120	1.00 (0.75)	1195	1.25 (0.93)	1270	1.50 (1.12)
1000 (470)	<b>375</b>	<b>0.10</b> <i>(0.07)</i>	<b>515</b>	<b>0.15</b> <i>(0.11)</i>	645	0.20 (0.15)	760	0.30 (0.22)	860	0.45 (0.34)	955	0.60 (0.45)	1040	0.75 (0.56)	1120	1.00 (0.75)	1195	1.20 (0.90)	1270	1.45 (1.08)
1100 (520)	<b>400</b>	<b>0.10</b> <i>(0.07)</i>	<b>535</b>	<b>0.15</b> <i>(0.11)</i>	665	0.25 (0.19)	775	0.35 (0.26)	870	0.45 (0.34)	960	0.60 (0.45)	1045	0.75 (0.56)	1125	0.95 (0.71)	1200	1.20 (0.90)	1270	1.45 (1.08)
1200 (565)	<b>430</b>	<b>0.15</b> <i>(0.11)</i>	<b>560</b>	<b>0.20</b> <i>(0.15)</i>	680	0.25 (0.19)	785	0.35 (0.26)	885	0.50 (0.37)	970	0.65 (0.48)	1055	0.80 (0.60)	1130	1.00 (0.75)	1205	1.20 (0.90)	1275	1.45 (1.08)
1300 (615)	<b>460</b>	<b>0.20</b> <i>(0.15)</i>	590	0.25 (0.19)	700	0.30 (0.22)	805	0.40 (0.30)	895	0.50 (0.37)	985	0.65 (0.48)	1065	0.85 (0.63)	1140	1.00 (0.75)	1210	1.20 (0.90)	1280	1.45 (1.08)
1400 (660)	<b>490</b>	<b>0.20</b> <i>(0.15)</i>	615	0.30 (0.22)	725	0.35 (0.26)	820	0.45 (0.34)	910	0.55 (0.41)	995	0.70 (0.52)	1075	0.85 (0.63)	1150	1.05 (0.78)	1220	1.25 (0.93)	1285	1.45 (1.08)
1500 (710)	<b>525</b>	<b>0.30</b> <i>(0.22)</i>	645	0.35 (0.26)	745	0.40 (0.30)	840	0.50 (0.37)	930	0.65 (0.48)	1010	0.75 (0.56)	1085	0.90 (0.67)	1160	1.10 (0.82)	1225	1.25 (0.93)	1295	1.50 (1.12)
1600 (755)	<b>560</b>	<b>0.35</b> <i>(0.26)</i>	670	0.40 (0.30)	770	0.50 (0.37)	860	0.60 (0.45)	945	0.70 (0.52)	1025	0.80 (0.60)	1100	0.95 (0.71)	1170	1.15 (0.86)	1240	1.30 (0.97)	1305	1.50 (1.12)
1700 (800)	<b>595</b>	<b>0.40</b> <i>(0.30)</i>	700	0.45 (0.34)	795	0.55 (0.41)	885	0.65 (0.48)	965	0.75 (0.56)	1040	0.90 (0.67)	1115	1.05 (0.78)	1185	1.20 (0.90)	1250	1.40 (1.04)	---	---
1800 (850)	630	0.50 (0.37)	730	0.55 (0.41)	820	0.65 (0.48)	905	0.75 (0.56)	985	0.85 (0.63)	1060	1.00 (0.75)	1130	1.10 (0.82)	1200	1.30 (0.97)	1265	1.45 (1.08)	---	---
1900 (895)	665	0.55 (0.41)	760	0.65 (0.48)	850	0.75 (0.56)	930	0.85 (0.63)	1005	0.95 (0.71)	1080	1.05 (0.78)	1150	1.20 (0.90)	1215	1.35 (1.01)	1275	1.55 (1.16)	---	---
2000 (945)	700	0.65 (0.48)	790	0.75 (0.56)	875	0.85 (0.63)	955	0.95 (0.71)	1030	1.05 (0.78)	1100	1.20 (0.90)	1165	1.30 (0.97)	1230	1.45 (1.08)	1295	1.65 (1.23)	---	---
2100 (990)	735	0.75 (0.56)	825	0.85 (0.63)	905	0.95 (0.71)	980	1.05 (0.78)	1050	1.15 (0.86)	1120	1.30 (0.97)	1185	1.45 (1.08)	1250	1.60 (1.19)	1310	1.75 (1.31)	---	---
2200 (1040)	770	0.85 (0.63)	855	0.95 (0.71)	930	1.05 (0.78)	1005	1.15 (0.86)	1075	1.30 (0.97)	1140	1.40 (1.04)	1205	1.55 (1.16)	1265	1.70 (1.27)	---	---	---	---
2300 (1085)	805	1.00 (0.75)	885	1.10 (0.82)	960	1.20 (0.90)	1030	1.30 (0.97)	1100	1.40 (1.04)	1165	1.55 (1.16)	1225	1.70 (1.27)	1285	1.85 (1.38)	---	---	---	---
2400 (1135)	840	1.15 (0.86)	920	1.25 (0.93)	990	1.35 (1.01)	1060	1.45 (1.08)	1125	1.55 (1.16)	1190	1.70 (1.27)	1250	1.85 (1.38)	1305	2.00 (1.49)	---	---	---	---
2500 (1180)	875	1.25 (0.93)	950	1.40 (1.04)	1020	1.50 (1.12)	1085	1.60 (1.19)	1150	1.75 (1.31)	1210	1.85 (1.38)	1270	2.00 (1.49)	---	---	---	---	---	---
2600 (1225)	910	1.45 (1.08)	980	1.55 (1.16)	1050	1.65 (1.23)	1115	1.75 (1.31)	1175	1.90 (1.42)	1235	2.05 (1.53)	1295	2.20 (1.64)	---	---	---	---	---	---
2700 (1275)	945	1.60 (1.19)	1015	1.70 (1.27)	1080	1.85 (1.38)	1145	1.95 (1.45)	1205	2.10 (1.57)	1260	2.20 (1.64)	1320	2.40 (1.79)	---	---	---	---	---	---
2800 (1320)	980	1.80 (1.34)	1050	1.90 (1.42)	1110	2.05 (1.53)	1170	2.15 (1.60)	1230	2.30 (1.72)	1285	2.40 (1.79)	---	---	---	---	---	---	---	---
2900 (1370)	1015	2.00 (1.49)	1080	2.10 (1.57)	1140	2.25 (1.68)	1200	2.35 (1.75)	1260	2.50 (1.87)	1315	2.65 (1.98)	---	---	---	---	---	---	---	---
3000 (1415)	1050	2.20 (1.64)	1115	2.35 (1.75)	1175	2.45 (1.83)	1230	2.60 (1.94)	1285	2.70 (2.01)	---	---	---	---	---	---	---	---	---	---

**Italic indicates field-furnished drive.**

NOTES - 1) Field-installed drive kits are available for RPM ranges listed in table 10. Installer must provide drives for air requirements outside of these ranges. 2) Units are not approved by U.L. for operation above 1325 rpm.

**TABLE 3  
LCA036-072 BELT DRIVE BLOWER PERFORMANCE**

Air Volume cfm (L/s)	TOTAL STATIC PRESSURE — Inches Water Gauge (Pa)																			
	.00 (00)		.20 (50)		.40 (100)		.60 (150)		.80 (200)		1.00 (250)		1.20 (300)		1.40 (350)		1.60 (400)		1.80 (450)	
	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)	RPM	BHP (kW)
900 (427)	<b>310</b>	<b>0.05</b> <i>(0.04)</i>	<b>455</b>	<b>0.10</b> <i>((0.07))</i>	<b>595</b>	<b>0.15</b> <i>(0.11)</i>	720	0.25 (0.19)	825	0.40 (0.30)	925	0.55 (0.41)	1015	0.70 (0.52)	1100	0.90 (0.67)	1180	1.10 (0.82)	1255	1.30 (0.97)
1000 (474)	<b>330</b>	<b>0.05</b> <i>(0.04)</i>	<b>470</b>	<b>0.10</b> <i>(0.07)</i>	<b>605</b>	<b>0.20</b> <i>(0.15)</i>	725	0.30 (0.22)	830	0.40 (0.30)	925	0.55 (0.41)	1015	0.70 (0.52)	1095	0.90 (0.67)	1175	1.10 (0.82)	1250	1.30 (0.97)
1100 (521)	<b>350</b>	<b>0.05</b> <i>((0.04))</i>	<b>485</b>	<b>0.15</b> <i>(0.11)</i>	615	0.20 (0.15)	730	0.30 (0.22)	830	0.40 (0.30)	925	0.55 (0.41)	1015	0.75 (0.56)	1095	0.95 (0.67)	1170	1.10 (0.82)	1245	1.30 (0.97)
1200 (568)	<b>375</b>	<b>0.10</b> <i>(0.07)</i>	<b>505</b>	<b>0.15</b> <i>(0.11)</i>	630	0.25 (0.19)	740	0.35 (0.26)	840	0.45 (0.34)	930	0.60 (0.45)	1015	0.75 (0.56)	1095	0.90 (0.67)	1170	1.10 (0.82)	1240	1.30 (0.97)
1300 (615)	<b>400</b>	<b>0.10</b> <i>(0.07)</i>	<b>525</b>	<b>0.20</b> <i>(0.15)</i>	645	0.25 (0.19)	750	0.35 (0.26)	845	0.50 (0.37)	935	0.60 (0.45)	1020	0.80 (0.60)	1095	0.95 (0.71)	1170	1.10 (0.82)	1240	1.30 (0.97)
1400 (663)	<b>425</b>	<b>0.15</b> <i>(0.11)</i>	<b>545</b>	<b>0.20</b> <i>(0.15)</i>	660	0.30 (0.22)	760	0.40 (0.30)	855	0.50 (0.37)	940	0.65 (0.48)	1020	0.80 (0.60)	1100	0.95 (0.71)	1170	1.10 (0.82)	1240	1.35 (1.01)
1500 (710)	<b>450</b>	<b>0.15</b> <i>(0.11)</i>	<b>570</b>	<b>0.25</b> <i>(0.19)</i>	675	0.35 (0.26)	775	0.45 (0.34)	865	0.55 (0.41)	950	0.70 (0.52)	1030	0.85 (0.63)	1105	1.00 (0.75)	1175	1.20 (0.90)	1245	1.40 (1.04)
1600 (757)	<b>475</b>	<b>0.20</b> <i>(0.15)</i>	<b>590</b>	<b>0.30</b> <i>(0.22)</i>	695	0.40 (0.30)	790	0.50 (0.37)	875	0.60 (0.45)	960	0.75 (0.56)	1035	0.90 (0.67)	1110	1.05 (0.78)	1180	1.25 (0.93)	1245	1.40 (1.04)
1700 (804)	<b>505</b>	<b>0.25</b> <i>(0.19)</i>	615	0.35 (0.26)	715	0.45 (0.34)	805	0.55 (0.41)	890	0.65 (0.48)	970	0.80 (0.60)	1045	0.95 (0.71)	1115	1.10 (0.82)	1185	1.30 (0.97)	1250	1.45 (1.80)
1800 (850)	<b>535</b>	<b>0.30</b> <i>(0.22)</i>	640	0.40 (0.30)	735	0.50 (0.37)	820	0.60 (0.45)	905	0.70 (0.52)	980	0.85 (0.63)	1055	1.00 (0.75)	1125	1.15 (0.86)	1195	1.35 (1.01)	1255	1.50 (1.12)
1900 (899)	<b>565</b>	<b>0.35</b> <i>(0.26)</i>	665	0.45 (0.34)	755	0.55 (0.41)	840	0.65 (0.48)	920	0.80 (0.60)	995	0.90 (0.67)	1065	1.05 (0.78)	1135	1.25 (0.93)	1200	1.40 (1.04)	1265	1.60 (1.19)
2000 (945)	<b>595</b>	<b>0.40</b> <i>(0.30)</i>	690	0.50 (0.37)	775	0.60 (0.45)	860	0.70 (0.52)	935	0.85 (0.63)	1010	1.00 (0.75)	1080	1.15 (0.86)	1145	1.30 (0.97)	1210	1.50 (1.12)	1270	1.65 (1.23)
2100 (993)	625	0.45 (0.34)	715	0.55 (0.41)	800	0.70 (0.52)	875	0.80 (0.60)	950	0.90 (0.67)	1025	1.05 (0.78)	1090	1.20 (0.90)	1155	1.40 (1.04)	1220	1.55 (1.16)	1280	1.75 (1.31)
2200 (1040)	655	0.55 (0.41)	740	0.65 (0.48)	820	0.75 (0.56)	895	0.85 (0.63)	970	1.00 (0.75)	1040	1.15 (0.86)	1105	1.30 (0.97)	1170	1.45 (1.08)	1230	1.65 (1.23)	1290	1.85 (1.38)
2300 (1087)	685	0.60 (0.45)	765	0.70 (0.52)	845	0.85 (0.63)	920	0.95 (0.71)	990	1.10 (0.82)	1055	1.25 (0.93)	1120	1.40 (1.04)	1185	1.55 (1.16)	1245	1.75 (1.31)	1305	1.95 (1.45)
2400 (1135)	710	0.70 (0.52)	790	0.80 (0.60)	870	0.95 (0.71)	940	1.05 (0.78)	1010	1.20 (0.90)	1075	1.35 (1.01)	1135	1.50 (1.12)	1200	1.70 (1.27)	1260	1.85 (1.38)	1315	2.05 (1.53)
2500 (1182)	740	0.80 (0.60)	820	0.90 (0.67)	890	1.05 (0.78)	960	1.15 (0.86)	1030	1.30 (0.97)	1090	1.45 (1.08)	1155	1.60 (1.19)	1215	1.80 (1.34)	1270	1.95 (1.45)	---	---
2600 (1229)	770	0.90 (0.67)	845	1.00 (0.75)	915	1.15 (0.86)	985	1.30 (0.97)	1050	1.40 (1.04)	1110	1.55 (1.16)	1170	1.75 (1.31)	1230	1.90 (1.42)	1285	2.10 (1.57)	---	---
2700 (1276)	800	1.00 (0.75)	875	1.10 (0.82)	940	1.25 (0.93)	1005	1.40 (1.04)	1070	1.55 (1.16)	1130	1.70 (1.27)	1190	1.85 (1.38)	1245	2.05 (1.53)	1300	2.20 (1.64)	---	---
2800 (1323)	830	1.10 (0.82)	900	1.25 (0.93)	965	1.35 (1.01)	1030	1.50 (1.12)	1090	1.65 (1.23)	1150	1.85 (1.38)	1210	2.00 (1.49)	1265	2.20 (1.64)	1320	2.35 (1.75)	---	---
2900 (1371)	860	1.20 (0.90)	930	1.35 (1.01)	990	1.50 (1.12)	1055	1.65 (1.23)	1115	1.80 (1.34)	1170	1.95 (1.45)	1225	2.15 (1.60)	1280	2.30 (1.72)	---	---	---	---
3000 (1418)	890	1.35 (1.01)	955	1.50 (1.12)	1015	1.65 (1.23)	1075	1.80 (1.34)	1135	1.95 (1.45)	1190	2.10 (1.57)	1245	2.30 (1.72)	1300	2.50 (1.87)	---	---	---	---

***Bold italics indicates field-furnished drives.***

NOTES - 1) Field-installed drive kits are available for RPM ranges listed in table10. Installer must provide drives for air requirements outside of these ranges. 2) Units are not approved by U.S. for operation over 1325 rpm.

**E-Blower Table Notes**

Blower tables include resistance for base units only with two-row dry indoor coil and air filters in place. For all other units:

Determine total system design static pressure, then add:

- 1- Wet indoor coil air resistance of selected unit.
- 2- Any factory installed options air resistance (electric heat, economizer, etc.). See table 4.

3- Any field installed accessories air resistance (horizontal roof frame, diffuser, etc.). See tables 5 through 9.

Use the blower table to determine blower motor output and drives required.

**F-Field-Furnished Blower Drives**

For field-furnished blower drives, use tables 2 or 3 to determine BHP and RPM required. Reference table 10 to determine the drive number and table 11 to determine the manufacturer's model number.

**TABLE 4  
ACCESSORY AIR RESISTANCE**

Air Volume		Total Resistance — inches water gauge (Pa)				
		Wet Indoor Coil			Electric Heat (LCA Models)	Economizer
cfm	L/s	LCA/LGA 036S/036H/042S/042H/048S/060S	LCA/LGA 048H/060H/072S	LCA/LGA072H		
800	380	0.02 (4)	0.04 (9)	0.05 (13)	0.04 (10)	0.04 (10)
1000	470	0.02 (4)	0.05 (12)	0.07 (18)	0.06 (15)	0.04 (10)
1200	565	0.03 (8)	0.06 (16)	0.09 (24)	0.09 (22)	0.04 (10)
1400	660	0.04 (10)	0.08 (21)	0.12 (31)	0.12 (30)	0.04 (10)
1600	755	0.05 (13)	0.10 (26)	0.15 (38)	0.16 (40)	0.04 (10)
1800	850	0.06 (16)	0.12 (31)	0.18 (46)	0.21 (52)	0.05 (12)
2000	945	0.07 (18)	0.14 (36)	0.21 (53)	0.25 (62)	0.05 (12)
2200	1040	0.09 (21)	0.17 (42)	0.25 (62)	0.31 (77)	0.05 (12)
2400	1135	0.11 (27)	0.19 (48)	0.28 (70)	0.37 (92)	0.05 (12)
2600	1225	0.013 (32)	0.22 (54)	0.31 (77)	0.43 (107)	0.06 (15)
2800	1320	0.16 (40)	0.25 (63)	0.36 (88)	0.50 (125)	0.06 (15)
3000	1415	0.20 (50)	0.29 (71)	0.41 (101)	0.58 (144)	0.06 (15)

**TABLE 5  
CEILING DIFFUSER AIR RESISTANCE**

Air Volume		Total Resistance — inches water gauge (Pa)							
		RTD9 Step-Down Diffuser			FD9 Flush Diffuser	RTD11 Step-Down Diffuser			FD11 Flush Diffuser
cfm	L/s	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	380	0.15 (37)	0.13 (32)	0.11 (27)	0.11 (27)	----	----	----	----
1000	470	0.19 (47)	0.16 (40)	0.14 (35)	0.14 (35)	----	----	----	----
1200	565	0.25 (62)	0.20 (50)	0.17 (42)	0.17 (42)	----	----	----	----
1400	660	0.33 (82)	0.26 (65)	0.20 (50)	0.20 (50)	----	----	----	----
1600	755	0.43 (107)	0.32 (80)	0.20 (50)	0.24 (60)	----	----	----	----
1800	850	0.56 (139)	0.40 (100)	0.30 (75)	0.30 (75)	0.13 (32)	0.11 (27)	0.09 (22)	0.09 (22)
2000	945	0.73 (182)	0.50 (125)	0.36 (90)	0.36 (90)	0.15 (37)	0.13 (32)	0.11 (27)	0.10 (25)
2200	1040	0.95 (237)	0.63 (157)	0.44 (110)	0.44 (110)	0.18 (45)	0.15 (37)	0.12 (30)	0.12 (30)
2400	1135	----	----	----	----	0.21 (52)	0.18 (45)	0.15 (37)	0.14 (35)
2600	1225	----	----	----	----	0.24 (60)	0.21 (52)	0.18 (45)	0.17 (42)
2800	1320	----	----	----	----	0.27 (67)	0.24 (60)	0.21 (52)	0.20 (50)
3000	1415	----	----	----	----	0.32 (80)	0.29 (72)	0.25 (62)	0.25 (62)

**TABLE 6  
RTD9-65 CEILING DIFFUSER AIR RESISTANCE**

Air Volume		Effective Throw	
cfm	L/s	ft.	m
1000	470	10-17	3-5
1200	565	11-18	3-5
1400	660	12-19	4-6
1600	755	12-20	4-6
1800	850	13-21	4-6
2000	945	14-23	4-7
2200	1040	16-25	5-8

Effective throw based on terminal velocities of 75 ft. (22.9 m) per minute.

**TABLE 8  
FD9-65 CEILING DIFFUSER AIR RESISTANCE**

Air Volume		Effective Throw — ft. (m)	
cfm	L/s	ft.	m
1000	470	15-20	5-6
1200	565	16-22	5-7
1400	660	17-24	5-7
1600	755	18-25	5-7
1800	850	20-28	6-9
2000	945	21-29	6-9
2200	1040	22-30	7-9

Effective throw based on terminal velocities of 75 ft. (22.9 m) per minute.

**TABLE 7  
RTD11-95 CEILING DIFFUSER AIR RESISTANCE**

Air Volume		Effective Throw	
cfm	L/s	ft.	m
2600	1225	24-29	7-9
2800	1320	25-30	8-9
3000	1415	27-33	8-10
3200	1510	28-35	9-11
3400	1605	30-37	9-11

Effective throw based on terminal velocities of 75 ft. (22.9 m) per minute.

**TABLE 9  
FD11-95 CEILING DIFFUSER AIR RESISTANCE**

Air Volume		Effective Throw	
cfm	L/s	ft.	m
2600	1225	19-24	6-7
2800	1320	20-28	6-9
3000	1415	21-29	6-9
3200	1510	22-29	7-9
3400	1605	22-30	7-9

Effective throw based on terminal velocities of 75 ft. (22.9 m) per minute.

**TABLE 10  
FACTORY INSTALLED DRIVE KIT SPECIFICATIONS**

Motor Outputs				RPM Range			
Nominal hp	Maximum hp	Nominal kW	Maximum kW	Drive 1	Drive 2	Drive 3	Drive 4
Standard or High Efficiency - 1.5	1.72	1.1	1.3	615 - 920	800 - 1105	----	----
Standard or High Efficiency - 2	2.3	1.5	1.7	----	----	920 - 1230	----
Standard Efficiency Only - 3	3.45	2.2	2.6	----	----	----	1070 - 1325

**TABLE 11  
MANUFACTURER'S NUMBERS**

DRIVE NO.	DRIVE COMPONENTS					
	ADJUSTABLE SHEAVE		FIXED SHEAVE		BELTS (1 REQUIRED)	
	BROWNING NO.	OEM PART NO.	BROWNING NO.	OEM PART NO.	BROWNING NO.	OEM PART NO.
1	1VP34x7/8	31K6901	AK59x1	31K6801	AX43	73K8201
2	1VP40x7/8	79J0301	AK59x1	31K6801	AX43	73K8201
3	1VP44x7/8	P-8-1488	AK59x1	31K6801	AX44	12L2601
4	1VP44x7/8	P-8-1488	AK51x1	18L2201	AX43	73K8201

## Cooling Start-Up

*IMPORTANT-The crankcase heater (standard on some models) must be energized for 24 hours before attempting to start compressor. Set thermostat so there is no demand to prevent compressor from cycling. Apply power to unit.*

### A-Preliminary Checks

- 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- Refer to unit diagram located on inside of compressor access door for unit wiring.
- 6- Adjust blower belt or blower speed tap according to "Blower Operation and Adjustments" section.
- 7- Make sure filters are in place before start-up.

### B-Start-Up

- 1- Set fan switch to AUTO or ON and move system selection switch to cool. Adjust thermostat to a setting below room temperature to bring on the compressor. Compressor will start and cycle on demand from thermostat.
- 2- The refrigerant circuit is charged with HCFC-22 refrigerant. See unit rating plate for correct amount of charge.
- 3- Refer to Cooling Operation and Adjustment section for proper method to check refrigerant charge.

### C-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

- 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 S48 disconnect or TB2 terminal strip.  
Do not reverse wires at blower contactor.

- 5- Make sure the connections are tight.

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

### D-Charging/Checking Charge

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

This unit is factory charged and should require no further adjustment. If the system requires charge, 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:

### IMPORTANT - Charge unit in standard cooling mode.

- 1- Attach gauge manifolds and operate unit in cooling mode until system stabilizes (approximately five minutes). Make sure all outdoor air dampers are closed.
- 2- Use a thermometer to accurately measure the outdoor ambient temperature.
- 3- Apply the outdoor temperature to tables 12 through 14 to determine normal operating pressures.
- 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 the following subcooling method along with the normal operating pressures to confirm readings.

**TABLE 12**  
**LGA/LCA036H Humiditrol™ Units**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ±5 psig
65°F	153	79
75°F	182	81
85°F	211	82
95°F	240	83
105°F	269	85
115°F	298	86

**TABLE 13**  
**LGA/LCA048H Humiditrol™ Units**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ±5 psig
65°F	157	75
75°F	188	77
85°F	219	79
95°F	249	81
105°F	280	83
115°F	310	85

**TABLE 14**  
**LGA/LCA060H Humiditrol™ Units**

Outdoor Coil Entering Air Temp	Discharge ±10 psig	Suction ±5 psig
65°F	169	72
75°F	201	74
85°F	233	76
95°F	265	79
105°F	297	81
115°F	329	84

**E-Charge Verification - Subcooling Method**

If ambient temperature is above 60°F (15°C), read liquid line temperature. Read liquid line pressure from gauge and convert to condensing temperature using standard R-22 temperature/pressure conversion chart (or conversion scale on gauge). The difference between the condensing temperature and the liquid line temperature is subcooling (subcooling = condensing temperature minus liquid line temperature). The subcooling should approximate the value given in table 15. Add refrigerant to increase subcooling and remove refrigerant to reduce subcooling.

**TABLE 15**  
**SUBCOOLING**

Unit	Temperature
LGA/LCA036H Humiditrol Units	14°F + 1 (7.7°C + 1)
LGA/LCA048H Humiditrol Units	16°F + 1 (9°C + 1)
LGA/LCA060H Humiditrol Units	15°F + 1 (8.3°C + 1)

**F-Compressor Controls**

1- High Pressure Switch (S4)

The compressor circuit is protected by a reset high pressure switch which cuts out at 450 psig ± 10 psig (3103 kPa ± 70 kPa) and automatically resets at 300 psig ± 20 psig (2096 kPa ± 138 kPa).

2- Low Pressure Switch (S87)

The compressor circuit is protected by a loss of charge switch. Switch cuts out at 25 psig (172 kPa) and automatically resets at 55 psig (379 kPa).

3- Freezestat (S49)

The compressor is protected by a freezestat located on the indoor coil. The freezestat opens at 29°F±3 and closes at 58°F±4.

4- 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.

5- Low Ambient Pressure Switch (S11)

Switch maintains adequate discharge pressure by de-energizing condenser fan when liquid pressure falls below 140 psig ± 10 (965 kPa ± 6). S11 is installed in the liquid line.

6- Discharge Line Thermostat (S40)

*Single Phase and High Efficiency Units Only*

Switch opens when discharge line temperature reaches 94°F ±5 and closes when temperature falls below 74°F ±5. Prevents crankcase heater operation in warm weather.



## Heating Start-Up

### FOR YOUR SAFETY READ BEFORE LIGHTING

BEFORE LIGHTING smell all around the unit area for gas. Be sure to smell next to the floor because some gas is heavier than air and will settle on the floor.

Use only your hand to push in or turn the gas control knob. Never use tools. If the knob will not push in or turn by hand do not try to repair it. Call a qualified service technician. Force or attempted repair may result in a fire or explosion.

This unit is equipped with an automatic spark ignition system. There is no pilot. In case of a safety shutdown, move thermostat switch to **OFF** and return the thermostat switch to **HEAT** to reset the ignition control.

**⚠ WARNING**

**SMOKE POTENTIAL**

The heat exchanger in this unit could be a source of smoke on initial firing. Take precautions with respect to building occupants and property. Vent initial supply air outside when possible.

**⚠ WARNING**

Danger of explosion. Can cause injury or product or property damage. If overheating occurs or if gas supply fails to shut off, shut off the manual gas valve to the unit before shutting off electrical supply.

**⚠ WARNING**

Electric shock hazard. Can cause injury or death. Do not use this unit if any part has been under water. Immediately call a qualified service technician to inspect the unit and to replace any part of the control system and any gas control which has been under water.

**⚠ WARNING**

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

**⚠ WARNING**

Danger of explosion and fire. Can cause injury or product or property damage. You must follow these instructions exactly.

### A-Placing Unit In Operation

Gas Valve Operation for White Rodgers 36C (figure 15), White Rodgers 36E (figure 16), Honeywell VR8205M (figure 17), and Honeywell VR8205Q/VR8305Q (figure 18)

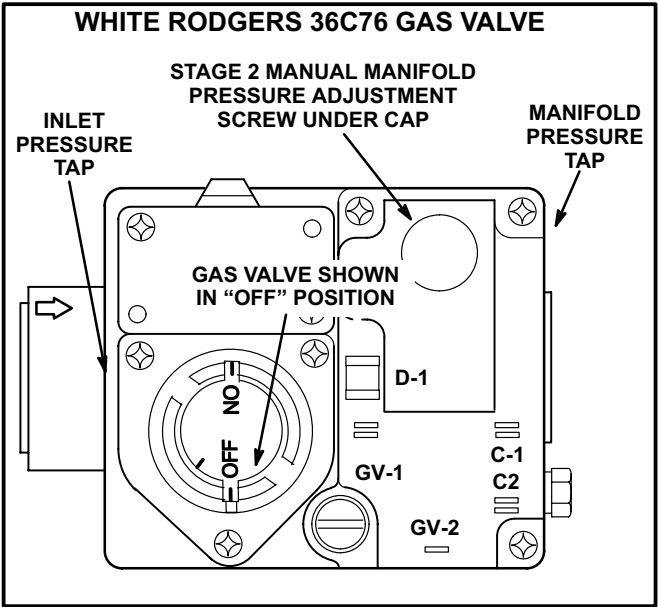


FIGURE 15

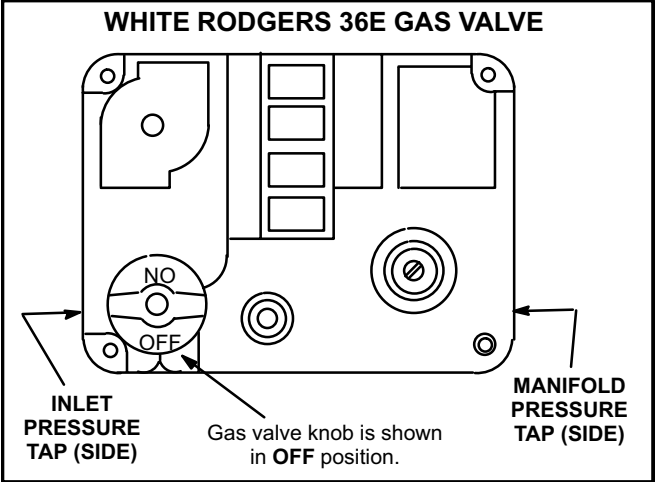


FIGURE 16

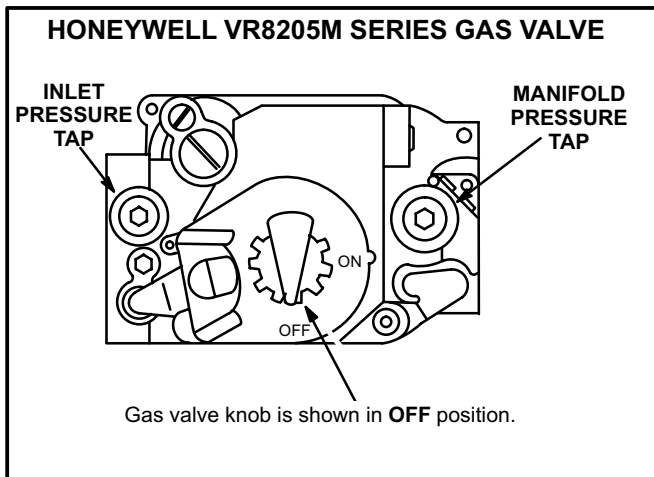


FIGURE 17

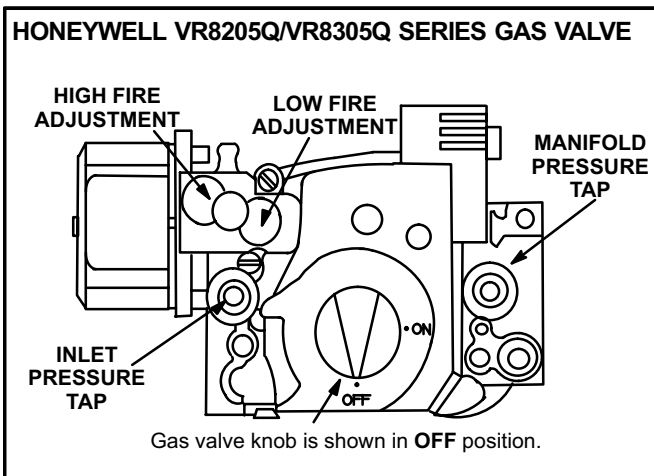




FIGURE 18

- 1- Set thermostat to lowest setting.
- 2- Turn off all electrical power to appliance.
- 3- This appliance is equipped with an ignition device which automatically lights the burner. Do **not** try to light the burner by hand.
- 4- Open or remove the heat section access panel.
- 5- *36C, VR8205, & VR8305* -  
Turn the knob on the gas valve clockwise  to "OFF". Depress 36C knob slightly. Do not force.  
*36E* -  
Turn the knob 180° either way to "OFF".
- 6- Wait five (5) minutes to clear out any gas. If you then smell gas, **STOP!** Immediately call your gassupplier from a neighbor's phone. Follow the gas supplier's instructions. If you do not smell gas, go to the next step.

7- *36C, VR8205, & 8305* -


Turn the knob on the gas valve counterclockwise  to "ON". Do not force.

*36E* -

Turn the knob 180° either way to "ON".

- 8- Close or replace the heat section access panel.
- 9- Turn on all electrical power to appliance.
- 10- Set thermostat to desired setting.
- 11- The combustion air inducer will start. The burners will light within 40 seconds.
- 12- If the appliance does not light the first time (gas line not fully purged), it will attempt up to two more ignitions before locking out.
- 13- If lockout occurs, repeat steps 1 through 10.
- 14- If the appliance will not operate, follow the instructions "Turning Off Gas to Appliance" and call your service technician or gas supplier.

#### Turning Off Gas to Appliance

- 1- If using an electromechanical thermostat, set to the lowest setting.
- 2- Before performing any service, turn off all electrical power to the appliance.
- 3- Open or remove the heat section access panel.
- 4- *36C, VR8205, & VR8305* -  
Turn the knob on the gas valve clockwise  to "OFF". Depress 36C knob slightly. Do not force.  
*36E* -  
Turn the knob 180° either way to "OFF".
- 5- Close or replace the heat section access panel.

## WARNING



**Danger of explosion. Can cause injury or death. Do not attempt to light manually. Unit has a direct spark ignition system.**

## Heating Operation and Adjustments

### A-Heating Sequence of Operation

- 1- When the thermostat calls for heat, the combustion air blower starts immediately.
- 2- The combustion air switch checks for proper blower operation before allowing power to the ignition controller. This switch is factory set and no adjustment is necessary.
- 3- After a pre-purge of 45 seconds, the spark ignitor is energized, and the solenoid valve opens in the gas valve.
- 4- The spark then ignites the gas, the ignition sensor proves the flame and the combustion process continues.
- 5- In the event that the flame is not detected after the first trial for ignition, the controller will repeat steps 3 and 4 up to two more times (depending upon controller model) before locking out.
- 6- For troubleshooting purposes, an ignition attempt after lock out may be re-established manually. Move thermostat "OFF" and return thermostat switch to "HEAT" position.

### B-Limit Control

Limit controls are factory set and not adjustable.

Two primary limits are located on the division panel between the return and supply sections on high heat units. One primary limit is located on the division panel on standard heat units.

A secondary limit is located on the blower transition in both standard and high heat units.

### C-Heating Adjustment

- 1- Main burners are factory adjusted for proper flame. Air shutters are provided for localized areas if necessary.
- 2- Burner flames may be observed through the inspection port in the access panel. Always operate the unit with the access panel in place.

## ⚠ WARNING



**Danger of explosion. Can cause injury or death. Do not overtighten main burner mounting screws. Snug tighten only.**

- 3- The gap on the flame sensing electrode should be between 3/32" and 5/32" (0.094 - 0.156 mm). Remove right burner by removing screw and sliding the burner off the orifice. The carry over slot on all burners is 1/8" (.125 mm) and it must be maintained. Clean the carry over slot using a strip of 16 gauge steel. Check gap with 1/8" (.125mm) twist drill. Replace all burners using mounting screws.
- 4- Gas manifold pressure should be set at 3.5" w.c. for natural gas units and 10.5" w.c. for LP gas units.

Units must be derated when installed at altitudes above 4500 feet (610 m) above sea level. At altitudes above 4500 feet (610 m), units must be derated to match the gas manifold pressures shown in table 16.

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

**TABLE 16**

Altitude - ft. (m)	Gas Manifold Pressure-in. w.g. (kPa)	
	Natural	LP (Propane)
4501-5500 (1372-1676)	3.4 (0.85)	10.2 (2.54)
5501-6500 (1676-1981)	3.3 (0.82)	9.8 (2.44)
6501-7500 (1981-2286)	3.2 (0.80)	9.5 (2.36)

## Humiditrol™ Start-Up And Operation

### General

Humiditrol units provide a dehumidifying mode of operation. These units contain a reheat coil adjacent to and downstream of the evaporator coil. Reheat coil

solenoid valve, L14, routes hot discharge gas from the compressor to the reheat coil. Return air pulled across the evaporator coil is cooled and dehumidified; the reheat coil adds heat to supply air. See figure 19 for reheat refrigerant routing and figure 20 for standard cooling refrigerant routing.

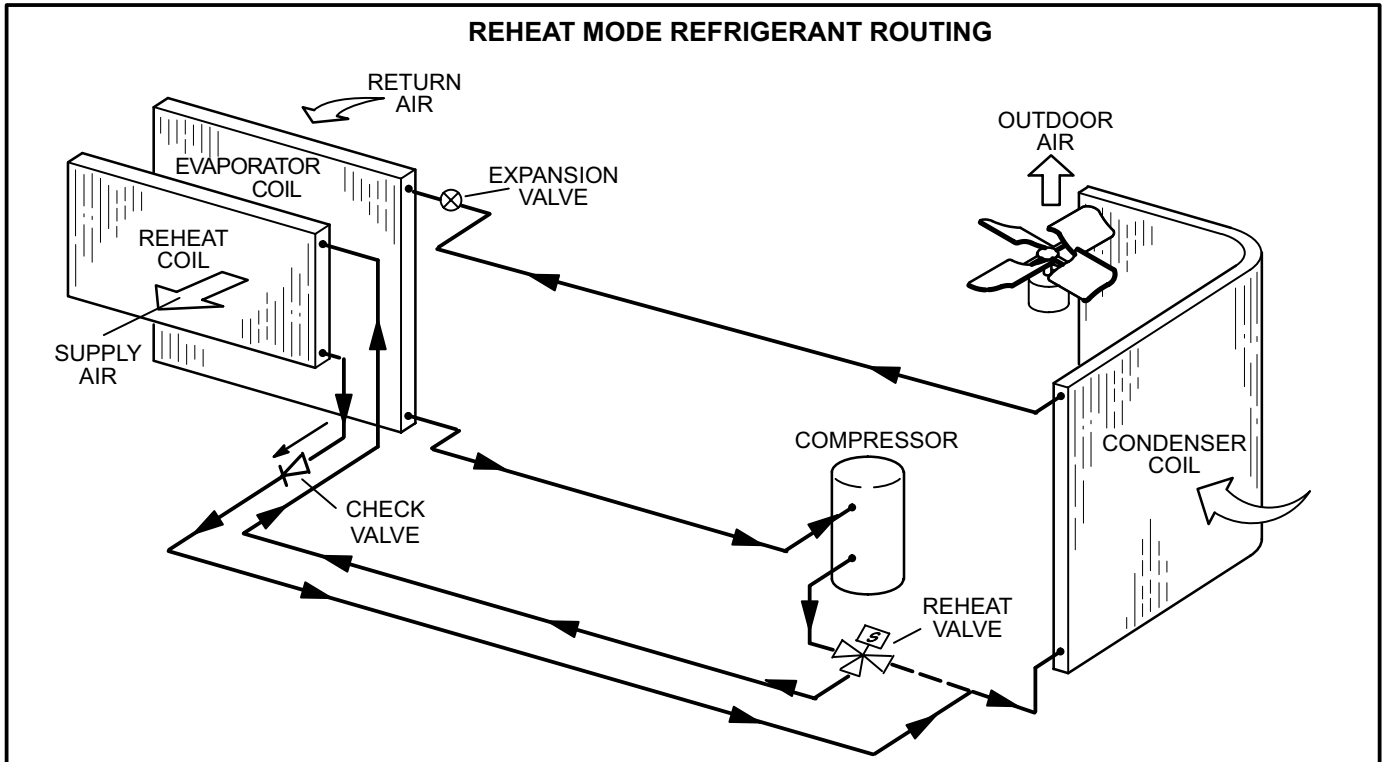


FIGURE 19

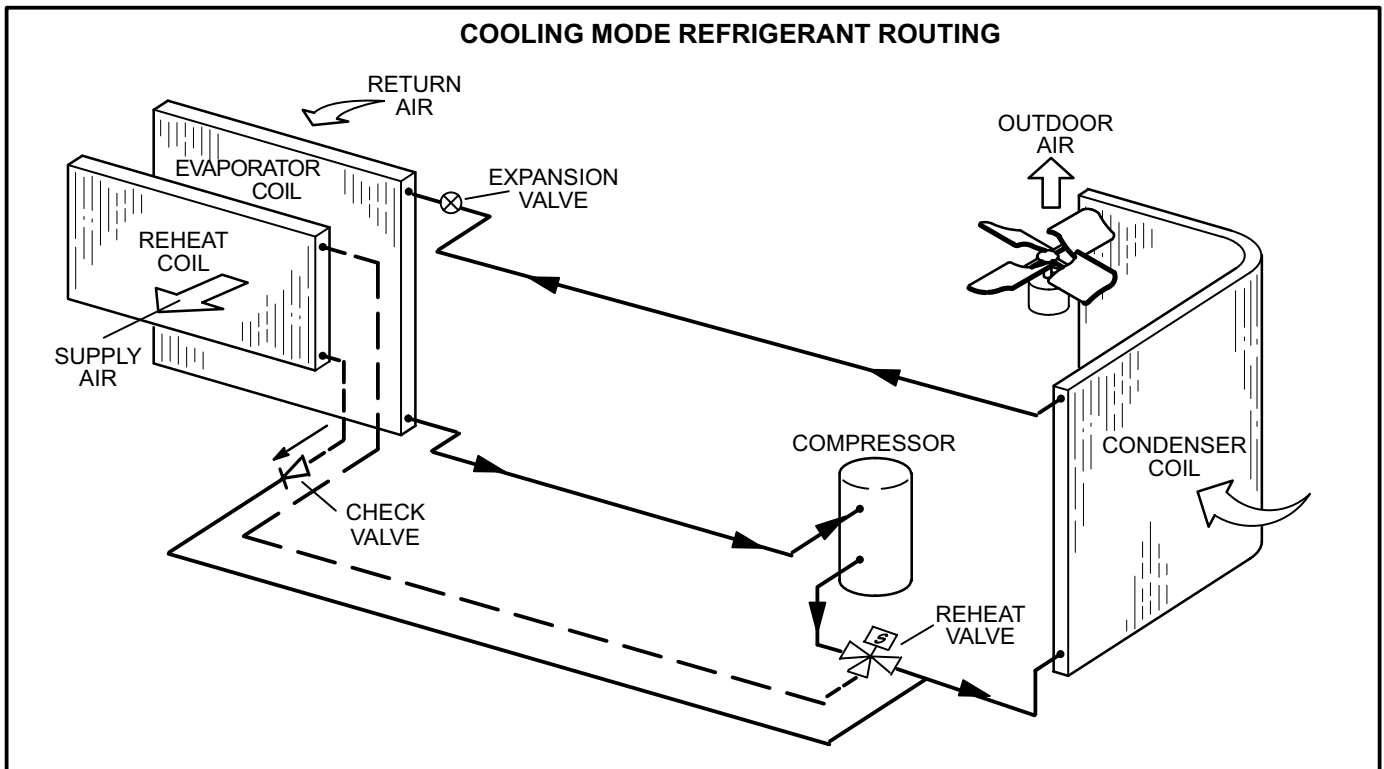


FIGURE 20

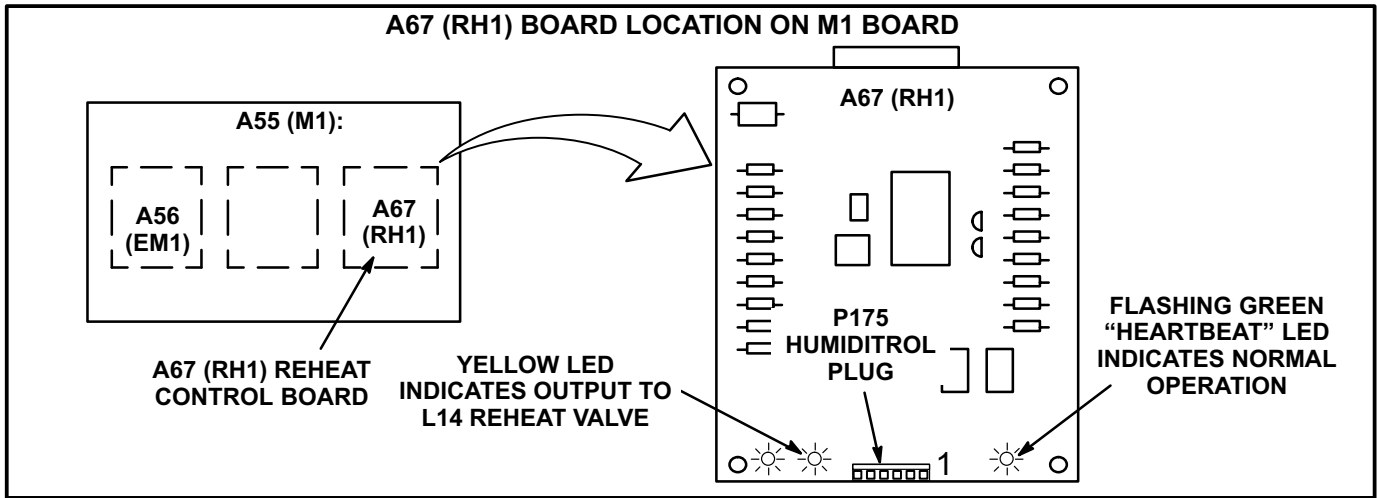


FIGURE 21

### L14 Reheat Coil Solenoid Valve

When IMC board input (P114-10) indicates room conditions require dehumidification, L14 reheat valve is energized (RH1 board P175-3) and refrigerant is routed to the reheat coil.

### RH1 Humiditrol Board

The RH1 add-on board is factory-installed in all Humiditrol units. RH1 is located on the M1 board as shown in figure 21.

### Reheat Setpoint

Reheat is factory-set to energize when indoor relative humidity rises above 60% (default). Reheat will terminate when the indoor relative humidity falls 3% below setpoint, or 57% (default). The reheat setpoint can be adjusted by changing ECTO 4.25. A setting of 100% will disable reheat.

### A91 Humidity Sensor

Install humidity sensor in the conditioned space according to instructions provided with sensor.

Relative humidity should correspond to the sensor (A91) output voltage listed in table 17. For example: if indoor air relative humidity is 80%  $\pm$  3%, the humidity sensor output should read 8.00VDC.

Check the sensor output annually for accuracy. Keep the air intake openings on the sensor clean and free of obstructions and debris.

### Read Relative Humidity At IMC

Turn MODE DIP "TEMP" switch #4 "ON". Display will alternately flash from readout to output. A single push on the pushbutton will toggle the readout upward from .0 to .7 incrementally. A double push will toggle the readout downward from .7 to .0 incrementally. Readout .7 indicates percent relative humidity.

### Check-Out

Test Humiditrol operation using the following procedure.

- 1- Make sure RH sensor is wired as shown in figure 11 or 12.
- 2- Set IMC ECTO system mode parameter 6.01 to option 0 (default local thermostat mode).
- 3- Set IMC ECTO reheat setpoint parameter 4.25 to option 0 (% relative humidity).
- 4- Jumper the following TB1 terminals:
  - 8&9 (occupied mode)
  - 6&3 (blower demand G)
  - 6&18 (Y1 cooling demand)

*The blower and compressor should be operating. L14 LED on the A67 board should be Off, indicating the reheat valve is de-energized.*

- 5- Disconnect the jumper between TB1 terminals 6 & 18 (Y1) to end the cooling demand.

*Compressor should continue to operate and L14 LED should be ON indicating the reheat valve is energized.*

- 6- Disconnect the jumper between TB1 terminals 8&9 (occupied mode).

*Compressor should de-energize, L14 LED should go OFF, blower should still be energized.*

- 7- **When check-out is complete, remove all jumpers, set ECTO 4.25 back to the proper humidity setpoint, and set ECTO 6.01 to the proper setting.**

TABLE 17

Relative Humidity (%RH $\pm$ 3%)	Sensor Output (VDC)
20	2.00
30	3.00
40	4.00
50	5.00
60	6.00
70	7.00
80	8.00
90	9.00

**Reheat Operation - General**

The following conditions must be met before reheat will be energized:

- 1- Blower must be operating.
- 2- System must be in occupied mode.
- 3- System must NOT be operating in heating mode.
- 4- One cooling demand is required if the unit has been in heating mode, the IMC has been reset, or at initial unit start-up.

**Reheat Operation - Default**

Reheat will operate as shown in table 18.

**IMPORTANT - Free cooling does not operate during reheat. Free cooling will operate as shown in the IMC manual.**

**TABLE 18**  
**Reheat Operation**

T'stat and Hu- midity Demands	Operation
Reheat Only	Compressor Reheat
Reheat & Y1	Compressor Cooling*

\*If there is no reheat demand and outdoor air is suitable, free cooling will operate.

**Combination of Demands**

Table 18 shows unit operation at reheat and thermostat demands. The following examples show unit operation when reheat and thermostat demands overlap.

- 1- Compressor is operating (Y1) and a reheat demand is initiated:**  
No change in operation.
- 2- Compressor reheat is operating and a Y1 cooling demand is initiated:**  
Compressor does not de-energize; L14 reheat valve is de-energized for compressor cooling.
- 3- Compressor reheat is in operation and outdoor air is suitable for free cooling; then reheat demand is satisfied:**  
Free cooling is energized and compressor is de-energized.

**Service**

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

**⚠ WARNING**

**Product contains fiberglass wool.**

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

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

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

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

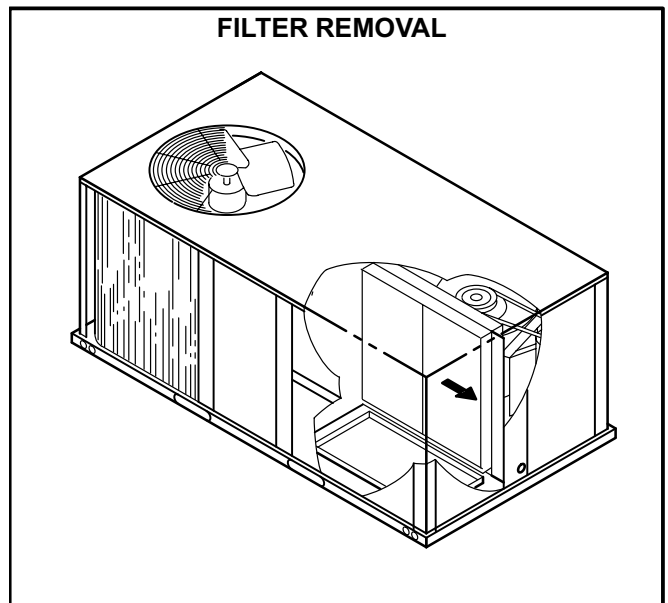
**A-Lubrication**

All motors and blower shaft bearings are prelubricated. No further lubrication is needed.

**B-Filters**

Unit is equipped with two 16 X 25 X 2" pleated throw-away type filters. Filters should be checked and replaced when necessary. See figure 22.

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



**FIGURE 22**

### C-Burners

- 1- Periodically examine burner flames for proper appearance during the heating season. Use inspection port in the front of the burner compartment access panel.
- 2- Before each heating season examine the burners for any deposits or blockage which may have occurred.
- 3- Clean burners as follows:
  - a-Turn off both electrical power and gas supply to unit.
  - b-Remove access panel to burner compartment.
  - c-Remove burner mounting screws and lift burners from orifice.
  - d-Clean as necessary and replace burners and secure with mounting screws. Make sure that burner heads line up correctly. Spark gaps on ignitor and flame sensing electrode must be properly set. Refer to Heating Adjustment section. Replace access panel.

## ⚠ WARNING



**Danger of explosion. Can cause injury or death. Do not overtighten main burner mounting screws. Snug tighten only.**

- e- Restore electrical power and gas supply. Follow lighting instructions located on inside panel. Use inspection port in access panel to check flame.

### D-Combustion Air Inducer

A combustion air blower motor proving switch, S18, checks combustion air inducer operation before allowing power to the gas controller. Gas controller will not operate if inducer is obstructed.

Under normal operating conditions, the combustion air inducer wheel should be checked and cleaned prior to the heating season. However, it should be examined periodically during the heating season to establish an ideal cleaning schedule. With power supply disconnected, the condition of the inducer wheel can be determined by looking through the vent opening.

#### Cleaning Combustion Air Inducer and Vent Cap

- 1- Shut off power supply and gas to unit.
- 2- Remove the heat access panel. Disconnect motor wires & three motor mounting screws.

- 3- Clean inducer wheel with a small brush and wipe off any dust from housing. See figure 23. Clean accumulated dust from front of flue box cover. Inspect flue passageway and flue box when removing the combustion air inducer. If cleaning is necessary use wire brush.

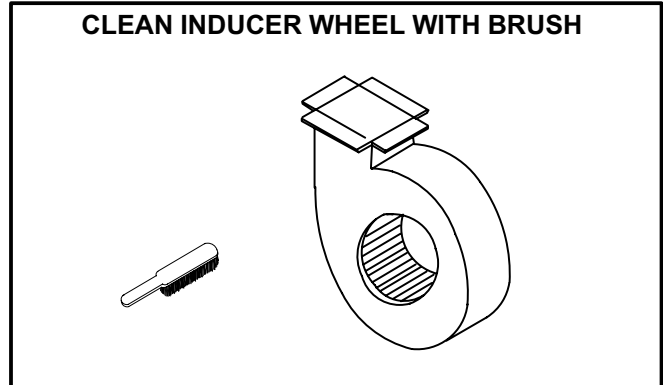


FIGURE 23

- 4- Replace combustion air inducer motor by reversing this procedure. It is recommended that the combustion air inducer gasket be replaced during reassembly.
- 5- Clean combustion air supply (hood located on heat access panel) using a small brush.

### E-Evaporator Coil


## ⚠ 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.**

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

### F-Condenser Coil

<b>⚠ WARNING</b>	
	<b>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.</b>

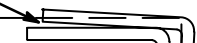
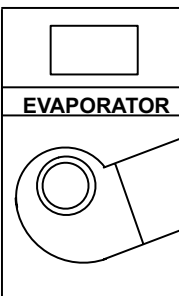
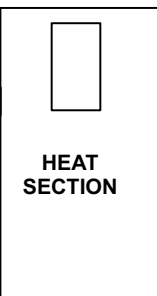
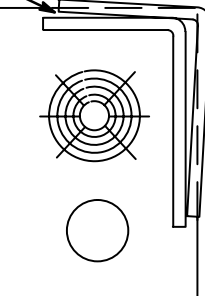
Clean condenser coil annually with detergent or commercial coil cleaner and inspect monthly during the cooling season.

Formed condenser coils are made of individual coil slabs. Dirt and debris may become trapped between the slabs. To clean between slabs, carefully separate coil slabs and wash them thoroughly. See figure 24.

### G-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.

<b>FORMED COIL CLEANING PROCEDURE</b>		
SEPARATE THIS END ONLY 		
 EVAPORATOR	 HEAT SECTION	
<ol style="list-style-type: none"><li>1-Remove rear and corner mullion holding coil.</li><li>2-Remove clips connecting coil slabs and separate slabs 3"-4" (76 mm-102mm).</li><li>3-Clean coils with detergent or commercial coil cleaner.</li><li>4-Rinse thoroughly with water and reassemble.</li></ol>		

**FIGURE 24**