

# Installation, Start-Up and Service Instructions

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## SAFETY CONSIDERATIONS

Installation and servicing of air conditioning equipment can be hazardous due to system pressure and electrical components. Only trained and qualified service personnel should install, repair or service air conditioning equipment.

Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters. All other operations should be performed by trained service personnel. When working on air conditioning equipment, observe precautions in the literature, tags and labels attached to the unit and other safety precautions that apply.

Follow all safety codes. Wear safety glasses and work gloves. Use quenching cloth for unbrazing operations. Have fire extinguishers available for all brazing operations.

### ▲ WARNING



Disconnect gas piping from unit when leak testing at pressure greater than ½ psig. Pressures greater than ½ psig will cause gas valve damage resulting in hazardous condition. If gas valve is subjected to pressure greater than ½ psig, it *must* be replaced before use. When pressure testing field-supplied gas piping at pressures of ½ psig or less, a unit connected to such piping must be isolated by manually closing the gas valve(s).

### ▲ WARNING

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury.

## INSTALLATION

Unit is shipped in the vertical discharge configuration. To convert to horizontal discharge application, cut imprint area from front panels using sheet-metal cutters. See Fig. 1. Duct openings in basepan must be covered by panels provided in the Accessory Duct Cover Package (part number 50LJ900186). Using screws provided in accessory package, install covers on duct openings in basepan of unit with insulation side down. Seals around openings must be tight.

**IMPORTANT:** It is recommended that either an external filter kit be used or the filters be field-installed outside the unit on horizontal discharge applications with accessory economizer or two-position damper. The area of the field-installed filters should be equal to the area of the factory-installed filters.

### Step 1 — Provide Unit Support

**ROOF CURB** — Assemble and install accessory roof curb in accordance with instructions shipped with curb. See Fig. 2. Install insulation, cant strips, roofing and flashing as shown. *Ductwork must be attached to curbs, not to the unit.* If gas, electric power or control power are to be routed through the curb, attach the accessory thru-the-curb service connection plates to the roof curb in accordance with the accessory installation instructions. Connection plates must be installed before unit can be set on roof curb.

**IMPORTANT:** The gasketing of the unit to the roof curb is critical for water integrity. Install gasketing material supplied with the roof curb as shown in Fig. 2. Improperly applied gasketing can result in air leaks and poor unit performance.

Curb should be level. Unit leveling tolerances are shown in Fig. 3. This is necessary for unit drain to function properly. Refer to Accessory Roof Curb Installation Instructions for additional information as required.

**SLAB MOUNT (Horizontal Units Only)** — Provide a level concrete slab that extends a minimum of 6 in. beyond unit cabinet. The slab should be 8 in. thick with 4 in. above grade. Install a gravel apron in front of condenser air inlet to prevent grass and foliage from obstructing airflow.

**NOTE:** Horizontal units may be installed on a roof curb if required.

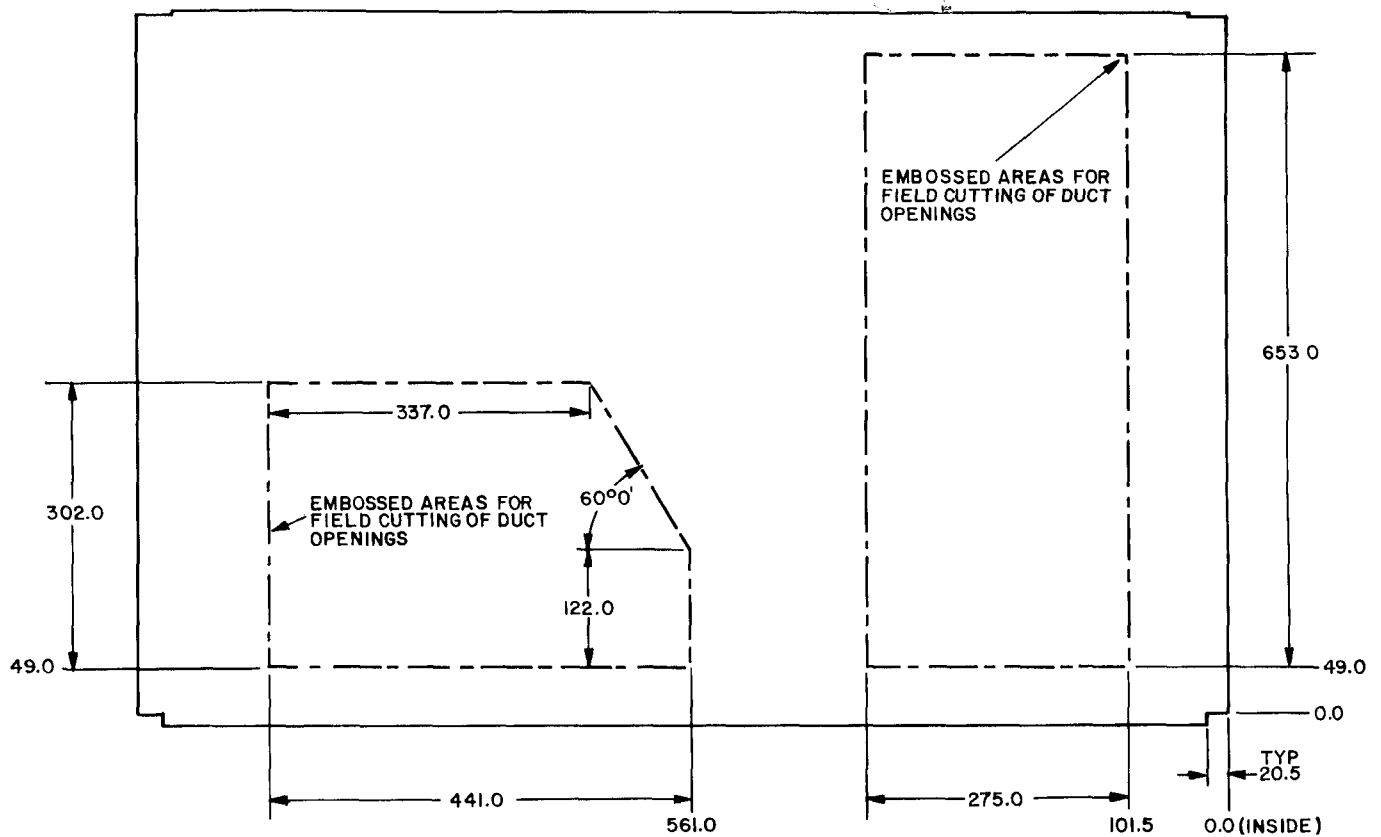


Fig. 1 — Horizontal Conversion Imprint Dimensions

**Step 2 — Field Fabricate Ductwork —** On vertical units secure all ducts to roof curb and building structure. *Do not connect ductwork to unit* For horizontal applications, field-supplied flanges should be attached to horizontal discharge openings and all ductwork should be secured to the flanges. Insulate and weatherproof all external ductwork, joints and roof openings with flashing and mastic in accordance with applicable codes.

Ducts passing through an unconditioned space must be insulated and covered with a vapor barrier.

If a plenum return is used on a vertical unit, the return should be ducted through the roof deck to comply with applicable fire codes.

A minimum clearance is not required around ductwork. Cabinet return air static shall not exceed  $-.35$  in. wg with economizer or  $-.45$  in. wg without economizer.

### Step 3 — Determine Location of Drain Connection for Internally Trapped Condensate Drain

Units have internally trapped condensate drains. The condensate may be drained through a drain in the bottom of the condensate pan. A drain plug is shipped installed in the basepan drain connection. See Fig. 4. If condensate is to be drained through the bottom of unit, the factory-installed drain plug must be relocated to the end drain connection before the unit is placed on the roof curb. The piping for the condensate can be completed after the unit is in place. Unit discharge connections do not determine the location of drain connections. Either drain connection may be used with either vertical or horizontal discharge units

NOTE: Be sure drain plug is tight before installing unit.

**IMPORTANT:** The condensate pan is internally trapped. An external trap is not required and should not be installed. If an external trap is attached, water may leak into building.

**Step 4 — Rig and Place Unit —** Inspect unit for transportation damage. File any claim with transportation agency. Keep upright and do not drop. Spreader bars are not required if top crating is left on unit. Rollers may be used to move unit across a roof. Level by using unit frame as a reference. See Table 1 and Fig. 5 for additional information. Weight is shown in Table 1 and Fig. 5.

Lifting holes are provided in base rails as shown in Fig. 6. Refer to rigging instructions on unit.

### CAUTION

All panels must be in place when rigging.

**POSITIONING —** Maintain clearance around and above unit to provide minimum distance from combustible materials, proper airflow and service access. See Fig. 6 and 7. A properly positioned unit will have the following clearances between unit and roof curb:  $\frac{1}{4}$ -in. clearance between roof curb and base rails on each side and front of unit;  $\frac{3}{4}$ -in. clearance between roof curb and rear of unit. (See Fig. 2, section C-C.)

Do not install unit in an indoor location. Do not locate unit air inlets near exhaust vents or other sources of contaminated air.

Be sure that unit is installed such that snow will not block the combustion intake or flue outlet.

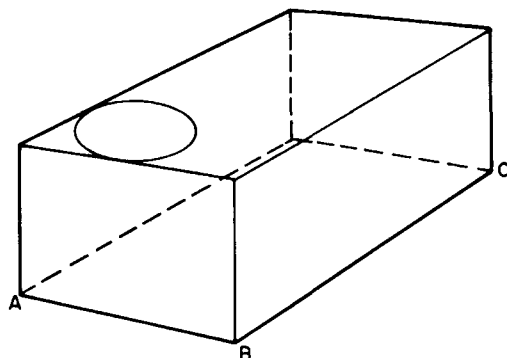


Unit may be installed directly on wood flooring or on Class A, B, or C roof-covering material when roof curb is used.

Although unit is weatherproof, guard against water from higher level runoff and overhangs.

Locate mechanical draft system flue assembly at least 48 in. from any opening through which combustion products could enter the building, and at least 48 in. from an adjacent building. When unit is located adjacent to public walkways, flue assembly must be at least 7 ft above grade.

Flue vent discharge must have a minimum horizontal clearance of 4-ft. from electric meters, gas meters, gas regulators and gas relief equipment.



MAXIMUM ALLOWABLE DIFFERENCE (in.)

| A-B | B-C | A-C |
|-----|-----|-----|
| 0.5 | 1.0 | 1.0 |

Fig. 3 – Unit Leveling Tolerances

Flue gas can deteriorate building materials. Orient unit such that flue gas will not affect building materials

Adequate combustion air space must be provided for proper operation of this equipment. Be sure that installation complies with all local codes and Section 5.3, Air for Combustion and Ventilation, National Fuel Gas Code, ANSI Z223.1-1984 and addendum Z223.1a-1987. In Canada, installation must be in accordance with the CAN1.B149.1 and CAN1.B149.2 installation codes for gas burning appliances.

After unit is in position, remove polyethylene shipping wrapper and rigging skids.

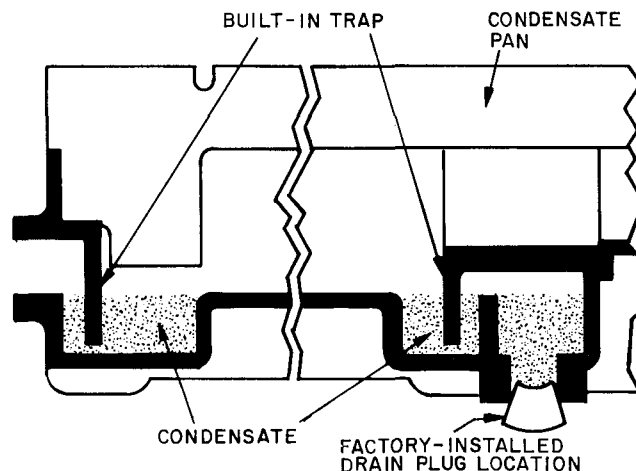
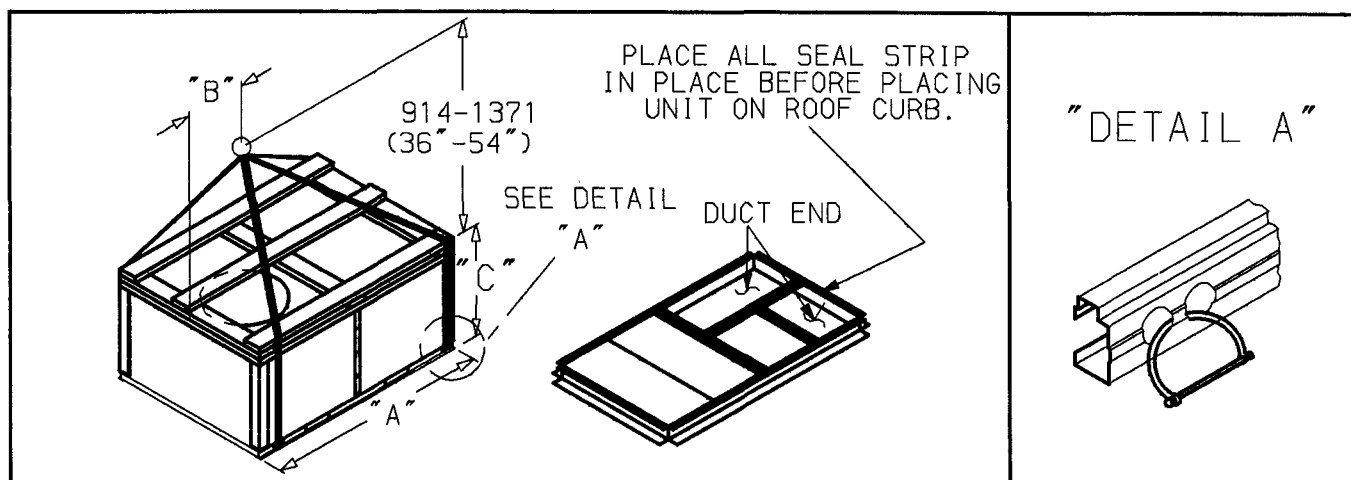


Fig. 4 – Internally Trapped Condensate Drain



NOTES:

1. Dimensions in parentheses are in millimeters
2. Hook rigging shackles through holes in base rail, as shown in detail "A". Holes in base rails are centered around the unit center of gravity. Use wooden top skid when rigging, to prevent rigging straps from damaging unit.

**CAUTION**

All panels must be in place when rigging

| UNIT         | MAX WEIGHT |     | A     |      | B    |     | C     |     |
|--------------|------------|-----|-------|------|------|-----|-------|-----|
|              | Lb         | Kg  | in.   | mm   | in.  | mm  | in.   | mm  |
| 48LJE004     | 580        | 263 | 73.69 | 1872 | 35.5 | 902 | 32.52 | 826 |
| 48LJD/LJE005 | 590        | 268 |       |      |      |     |       |     |
| 48LJD/LJE006 | 610        | 277 |       |      |      |     |       |     |
| 48LJD/LJE007 | 665        | 302 |       |      |      |     |       |     |

Fig. 5 – Rigging Details

| UNIT         | STD. UNIT WEIGHT |     | ECONOMIZER WEIGHT |      | CORNER WEIGHT (A) |      | CORNER WEIGHT (B) |      | CORNER WEIGHT (C) |      | CORNER WEIGHT (D) |      | "H"       |     |
|--------------|------------------|-----|-------------------|------|-------------------|------|-------------------|------|-------------------|------|-------------------|------|-----------|-----|
|              | LBS.             | KG. | LBS.              | KG.  | LBS.              | KG.  | LBS.              | KG.  | LBS.              | KG.  | LBS.              | KG.  | FT.-IN.   | MM  |
| 48LJE004     | 530              | 240 | 34                | 15.4 | 104               | 47.2 | 97                | 44.0 | 159               | 72.1 | 171               | 77.6 | 3'-1 1/4" | 947 |
| 48LJE/LJD005 | 540              | 245 |                   |      | 106               | 48.1 | 98                | 44.5 | 162               | 73.5 | 174               | 78.9 | 1'-2 1/4" | 362 |
| 48LJE/LJD006 | 560              | 254 |                   |      | 110               | 49.9 | 102               | 46.3 | 168               | 76.2 | 180               | 81.6 | 1'-2 1/4" | 362 |
| 48LJE/LJD007 | 615              | 279 |                   |      | 120               | 54.4 | 112               | 50.8 | 185               | 83.9 | 198               | 89.8 | 1'-2 1/4" | 362 |

NOTES:

1. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. ⬤ CENTER OF GRAVITY
3. ➡ DIRECTION OF AIR FLOW.
4. DUCTWORK TO BE ATTACHED TO ACCESSORY ROOF CURB ONLY
5. OPERATIONAL CLEARANCE 4 FEET ON ALL FIVE SIDES.
6. MINIMUM CLEARANCE FROM CONDENSER COIL FOR PROPER AIR FLOW; 36 INCHES OPPOSITE ONE COIL, 12 INCHES OPPOSITE OTHER COIL (OPTIONAL AS TO WHICH COIL); 60 INCHES OVERHEAD.
7. MINIMUM CLEARANCE TO COMBUSTIBLES: 36 INCHES FLUE SIDE; ZERO INCHES ALL OTHER SIDES.

| CONNECTION SIZES |                                           |
|------------------|-------------------------------------------|
| A                | 1 3/8" DIA. [135] FIELD POWER SUPPLY HOLE |
| B                | 2" DIA. [51] POWER SUPPLY KNOCK-OUT       |
| C                | 1 3/4" DIA. [44] CHARGING PORT HOLE       |
| D                | 7/8" DIA. [22] FIELD CONTROL WIRING HOLE  |
| E                | 3/4" -14 NPT CONDENSATE DRAIN             |
| F                | 1/2" -14 NPT GAS CONNECTION               |
| G                | 2 1/2" DIA. [64] POWER SUPPLY KNOCK-OUT   |

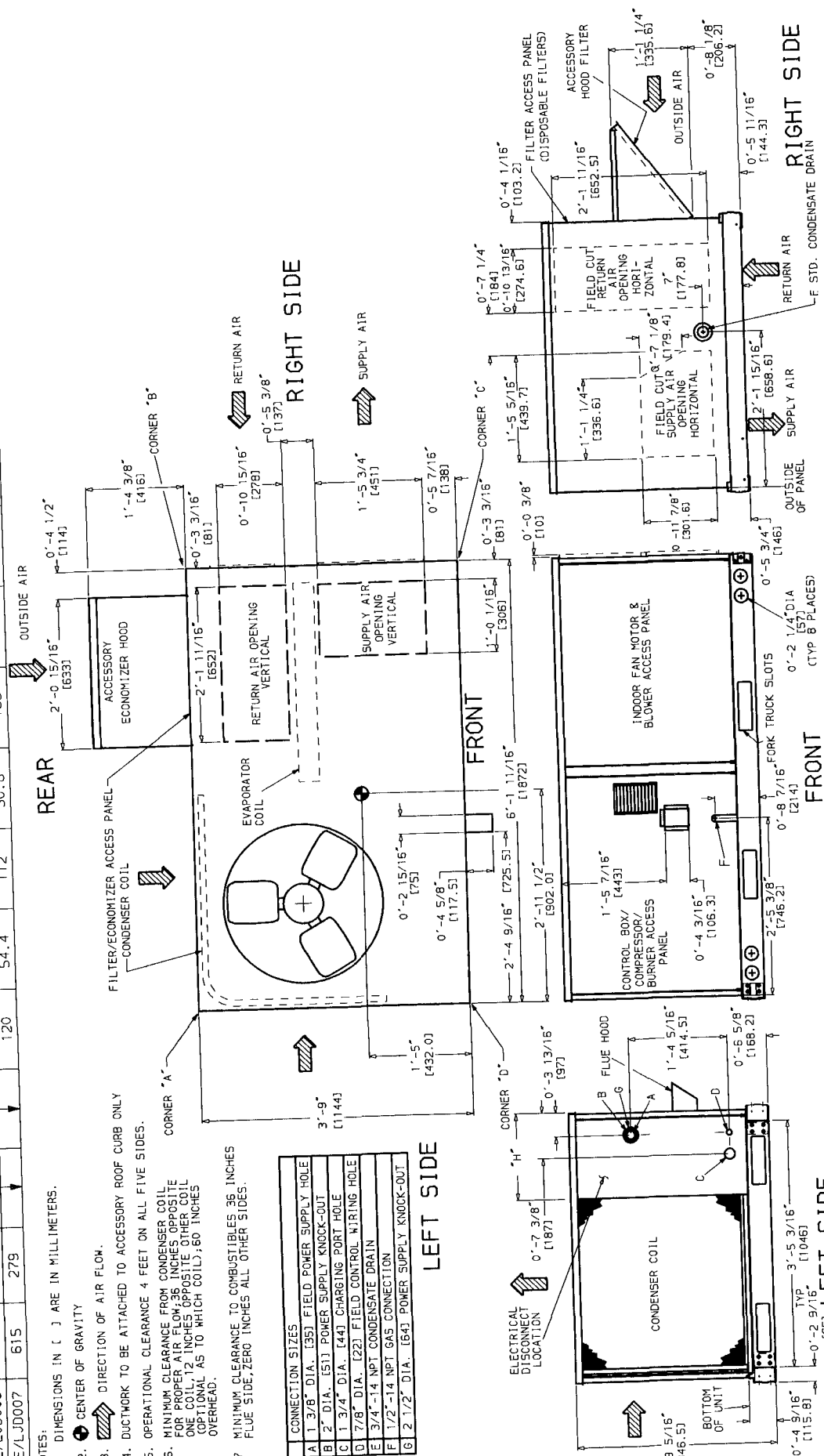


Fig. 6 — Base Unit Dimensions

Table 1 — Physical Data

| BASE UNIT 48                                 | LJE004  | LJD/LJE005                                      | LJD/LJE006      | LJD/LJE007     |
|----------------------------------------------|---------|-------------------------------------------------|-----------------|----------------|
| NOMINAL CAPACITY                             | 3       | 4                                               | 5               | 6              |
| OPERATING WEIGHT (lb)                        |         |                                                 |                 |                |
| Unit                                         | 530     | 540                                             | 560             | 615            |
| With Economizer                              | 564     | 574                                             | 594             | 649            |
| Roof Curb                                    | 115     | 115                                             | 115             | 115            |
| COMPRESSOR                                   |         |                                                 | Hermetic        |                |
| Quantity                                     | 1       | 1                                               | 1               | 1              |
| REFRIGERANT                                  |         |                                                 | R-22            |                |
| Operating Charge (lb-oz)                     | 3-13    | 5-8                                             | 6-11            | 9-0            |
| CONDENSER FAN                                |         |                                                 | Propeller       |                |
| Quantity                                     | 1       | 1                                               | 1               | 1              |
| Nominal Cfm                                  | 3500    | 4100                                            | 4100            | 3800           |
| Motor Hp                                     | 1/3     | 1/3                                             | 1/3             | 1/3            |
| CONDENSER COIL                               |         | Enhanced Copper Tubes, Aluminum Lanced Fin      |                 |                |
| Rows...Fins/in.                              | 1.. 17  | 1.. 17                                          | 1.. 17          | 2.. 17         |
| Total Face Area (sq ft)                      | 7 78    | 12 25                                           | 12 25           | 12 25          |
| EVAPORATOR FAN                               |         |                                                 | Centrifugal     |                |
| Size (in.)                                   | 10 x 10 | 10 x 10                                         | 10 x 10         | 10 x 10        |
| Type Drive                                   | Direct  | Direct                                          | Belt            | Belt           |
| Nominal Cfm                                  | 1200    | 1600                                            | 2000            | 2400           |
| Motor Hp                                     | 1/3     | 1/2                                             | 1 0             | 1 5            |
| Motor Frame                                  | 48      | 48                                              | 56              | 56             |
| Nominal Rpm High/Low Speed                   | 860/845 | 1080/970                                        | —               | —              |
| Fan Rpm Range                                | —       | —                                               | 875-1190        | 1040-1435      |
| Maximum Fan Rpm                              | 2100    | 2100                                            | 2100            | 2100           |
| Motor Pulley Pitch Diameter (in.)            | —       | —                                               | 2 8-3 8         | 2 8-3 8        |
| Fan Pulley Pitch Diameter (in.)              | —       | —                                               | 5 5             | 4 5            |
| Belt — Type...Length (in.)                   | —       | —                                               | A.. 43          | A.. 41         |
| Pulley Center Line Distance (in.)            | —       | —                                               | 14 7-15 5       | 14 7-15 5      |
| Speed Change Per Full Turn of                | —       | —                                               | 63              | 79             |
| Movable Pulley Flange (rpm)                  | —       | —                                               | —               | —              |
| Movable Pulley Maximum Full                  | —       | —                                               | 5               | 5              |
| Turns from Closed Position                   | —       | —                                               | —               | —              |
| Factory Setting — Full Turns Open            | —       | —                                               | 5               | 5              |
| Factory Speed Setting (rpm)                  | —       | —                                               | 875             | 1040           |
| Fan Shaft Diameter at Pulley (in.)           | —       | —                                               | 5/8             | 5/8            |
| EVAPORATOR COIL                              |         | Enhanced Copper Tubes, Aluminum Double Wavy Fin |                 |                |
| Rows...Fins/in.                              | 2.. 15  | 2.. 15                                          | 3.. 15          | 4.. 15         |
| Total Face Area (sq ft)                      | 4 17    | 5 5                                             | 5 5             | 5 5            |
| FURNACE SECTION                              |         |                                                 |                 |                |
| Burner Orifice Diameter (in. ...drill size)* |         |                                                 |                 |                |
| Natural Gas — Std                            | 113 33  | 113 .33                                         | 113 .33         | 113 33         |
| Liquid Propane — Alt                         | 089 43  | 089.. 43                                        | 089 43          | 089 43         |
| Thermostat Heat Anticipator Setting (amps)   |         |                                                 |                 |                |
| 208/230/460 v                                | 1 0     | 1 0                                             | 1 0             | 1 0            |
| Gas Input                                    | 74,000  | 74,000/115,000                                  | 74,000/115,000  | 74,000/115,000 |
| Efficiency (AGA Steady State) (%)            | 80      | 80                                              | 80              | 80             |
| Temperature Rise Range                       | 25-55   | 25-55/35-65                                     | 25-55/35-65     | 25-55/35-65    |
| Manifold Pressure (in. wg)                   |         |                                                 |                 |                |
| Natural Gas — Std                            | 3 5     | 3 5                                             | 3 5             | 3 5            |
| Liquid Propane — Alt                         | 3.5     | 3.5                                             | 3.5             | 3.5            |
| Maximum Static Pressure (in. wg)             | 75      | 75                                              | 75              | 75             |
| Field Gas Connection Size (in.)              | 5       | 5                                               | .5              | 5              |
| OUTSIDE AIR INLET SCREENS                    |         |                                                 | Cleanable       |                |
| Quantity...Size (in.)                        |         |                                                 | 1.. 20 x 24 x 1 |                |
| RETURN AIR FILTERS                           |         |                                                 | Disposable      |                |
| Quantity...Size (in.)                        |         |                                                 | 2.. 16 x 25 x 2 |                |

\*48LJD005-007 and 48LJE004 (74,000 Btuh) units have 2 burners  
 48LJE005-007 (115,000 Btuh) units have 3 burners

**Step 5 — Install Flue Hood —** Flue hood and screen are shipped screwed to the burner compartment access panel. Remove from shipping location and using screws provided, install flue hood and screen in location shown in Fig. 6 and 7. On Canadian units only, install a 40-mph wind baffle as shown in Fig. 7.

**Step 6 — Install Gas Piping —** Unit is equipped for use with type of gas shown on nameplate. Refer to local building codes, or in the absence of local codes, to ANSI Z223.1-1984 and addendum Z223.1A-1987 entitled National Fuel Gas Code. In Canada, installation must be in accordance with the CAN1.B149.1 and CAN1.B149.2 installation codes for gas burning appliances.

Gas pressure at unit gas connection must not be less than 5 in. wg or greater than 13.0 in. wg while unit is operating.

Size gas supply piping for 0.5 in. wg maximum pressure drop. Do not use supply pipe smaller than unit gas connection. Support gas piping as shown in the table in Fig. 8. For example, a 3/4-in. gas pipe must have one field-fabricated support beam every 8 ft. Therefore, an 18-ft long gas pipe would have a minimum of 2 support beams, a 48-ft long pipe would have a minimum of 6 support beams.

See Fig. 8 for typical pipe guide and locations of external manual main shutoff valve.

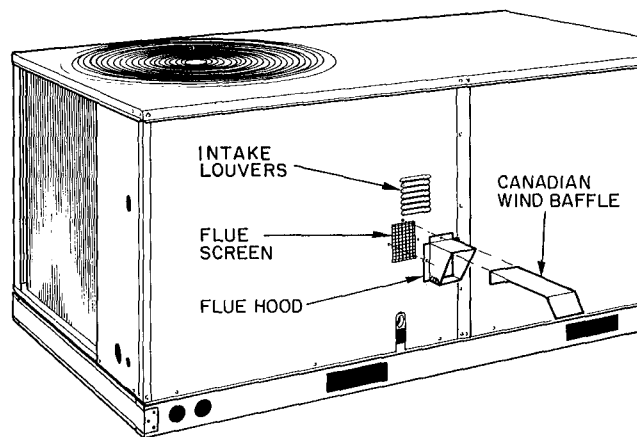


**Fig. 7 — Flue Hood Details**

## Step 7 — Make Electrical Connections

### ⚠ WARNING

Unit cabinet must have an uninterrupted, unbroken electrical ground to minimize the possibility of personal injury if an electrical fault should occur. This ground may consist of electrical wire connected to unit ground lug in control compartment, or conduit approved for electrical ground when installed in accordance with National Electric Code ANSI/NFPA 70-1987 and local electrical codes. *Do not use gas piping as an electrical ground.* Failure to follow this warning could result in the installer being liable for personal injury of others.

**FIELD POWER SUPPLY —** All units except 208/230-v units are factory wired for the voltage shown on the nameplate. If the 208/230-v unit is to be connected to a 208-v power supply, the transformer *must* be rewired by moving the black wire from the 230-v orange wire on the transformer and connecting it to the 200-v red wire from the transformer. The end of the orange wire must then be insulated.

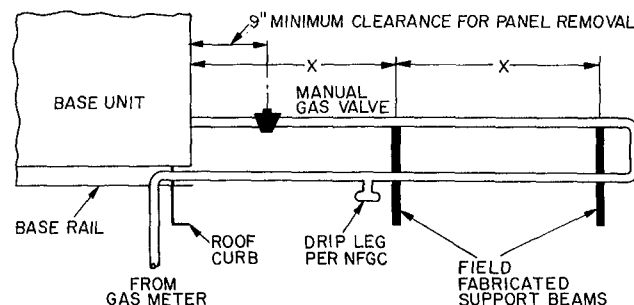
Refer to unit label diagram for additional information. Wiring leads are provided for field service. Use factory-supplied splices or UL-approved copper/aluminum connector.

When installing units, provide a disconnect per NEC.

All field wiring must comply with National Electrical Code and local requirements. In Canada, electrical connections must be in accordance with CSA C22.1 Canadian Electrical Code Part 1.

Install conduit through side panel openings indicated in Fig. 6. Route power lines through connector to terminal connections as shown in Fig. 9.

Voltage to compressor terminals during operation must be within voltage range indicated on unit nameplate (also see Table 2). On 3-phase units, voltages between phases must be balanced within 2% and the current within 10%. Use the formula shown in Table 2, Note 2 to determine the % voltage imbalance. Operation on improper line voltage or excessive phase imbalance constitutes abuse and may cause damage to electrical components. Such operation would invalidate any applicable warranty.



**NFGC —** National Fuel Gas Code  
NOTE: Follow all local codes.

### SPACING OF SUPPORTS

| STEEL PIPE<br>NOMINAL<br>DIAMETER<br>(in.) | X<br>DIMENSION<br>(feet) |
|--------------------------------------------|--------------------------|
| 1/2                                        | 6                        |
| 3/4 or 1                                   | 8                        |
| 1 1/4 or larger                            | 10                       |

**Fig. 8 — Gas Piping Guide (with accessory thru-the-curb service connections)**

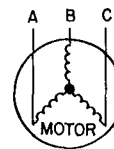
Table 2 – Electrical Data

| UNIT                         | NOMINAL<br>VOLTS-PH-HZ | VOLTAGE<br>RANGE |     | COMPR<br>(each) |      | OFM | IFM |      | COMBUSTION<br>FAN MOTOR | POWER SUPPLY |       |
|------------------------------|------------------------|------------------|-----|-----------------|------|-----|-----|------|-------------------------|--------------|-------|
|                              |                        | Min              | Max | RLA             | LRA  | FLA | Hp  | FLA  | FLA                     | MCA          | MOCP* |
| 48LJE004<br>(3 Tons)         | 208-230-1-60           | 197              | 254 | 17.9            | 93   | 1.9 | 1/3 | 2.8  | .16                     | 27.1-27.1    | 35-35 |
|                              | 208/230-3-60           | 187              | 254 | 11.2            | 80   | 1.9 | 1/3 | 2.8  | .16                     | 18.7/18.7    | 25/25 |
|                              | 460-3-60               | 414              | 508 | 6.1             | 40   | 1.0 | 1/3 | 1.5  | .08                     | 10.1         | 15    |
|                              | 575-3-60               | 518              | 632 | 4.5             | 29   | 1.9 | 1/3 | 2.8  | .16                     | 7.5          | 15    |
| 48LJD/LJE<br>005<br>(4 Tons) | 208-230-1-60           | 197              | 254 | 24.8            | 127  | 1.9 | 1/2 | 3.8  | .16                     | 36.7-36.7    | 45-45 |
|                              | 208/230-3-60           | 187              | 254 | 15.7            | 99   | 1.9 | 1/2 | 3.8  | .16                     | 25.3/25.3    | 30/30 |
|                              | 460-3-60               | 414              | 508 | 7.8             | 50   | 1.0 | 1/2 | 1.9  | .08                     | 12.6         | 15    |
|                              | 575-3-60               | 518              | 632 | 5.8             | 40   | 1.9 | 1/2 | 3.8  | .16                     | 9.5          | 15    |
| 48LJD/LJE<br>006<br>(5 Tons) | 230-1-60               | 197              | 254 | 27.8            | 140  | 1.9 | 1.0 | 8.0  | .16                     | 44.7         | 60    |
|                              | 208/230-3-60           | 187              | 254 | 19.2            | 105  | 1.9 | 1.0 | 4.0  | .16                     | 29.9/29.9    | 40/40 |
|                              | 460-3-60               | 414              | 508 | 9.6             | 55.0 | 1.0 | 1.0 | 1.8  | .08                     | 14.8         | 20    |
|                              | 575-3-60               | 518              | 632 | 8.3             | 45   | 1.9 | 1.0 | 8.0  | .16                     | 14.3         | 15    |
| 48LJD/LJE<br>007<br>(6 Tons) | 208/230-3-60           | 187              | 254 | 22.6            | 137  | 1.9 | 1.5 | 5.8  | .16                     | 36.0/36.0    | 40/40 |
|                              | 460-3-60               | 414              | 508 | 10.4            | 69   | 1.0 | 1.5 | 2.6  | .08                     | 16.6         | 20    |
|                              | 575-3-60               | 518              | 632 | 9.6             | 55   | 1.9 | 1.5 | 10.0 | .16                     | 16.8         | 20    |

**FLA** — Full Load Amps  
**HACR** — Heating, Air Conditioning and Refrigeration  
**Hp** — Nominal Horsepower  
**IFM** — Indoor Fan Motor  
**LRA** — Locked Rotor Amps  
**MCA** — Minimum Circuit Amps  
**MOCP** — Maximum Overcurrent Protection  
**OFM** — Outdoor Fan Motor  
**RLA** — Rated Load Amps



Example: Supply voltage is 460-3-60



AB = 452 volts  
 BC = 464 volts  
 AC = 455 volts

$$\text{Average Voltage} = \frac{452 + 464 + 455}{3} = \frac{1371}{3} = 457$$

NOTE: 575 volt units are CGA only.

\*Fuse or HACR circuit breaker

NOTES:

- In compliance with NEC requirements for multimotor and combination load equipment (ref NEC Articles 430 and 440), the overcurrent protective device for the unit shall be fuse or HACR breaker. CGA units may be fuse or circuit breaker.

2. **Unbalanced 3-Phase Supply Voltage**

Never operate a motor where a phase imbalance in supply voltage is greater than 2%. Use the following formula to determine the % voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

Determine maximum deviation from average voltage.

(AB) 457 - 452 = 5 volts  
 (BC) 464 - 457 = 7 volts  
 (AC) 457 - 455 = 2 volts

Maximum deviation is 7 volts.

Determine % voltage imbalance.

$$\% \text{ Voltage Imbalance} = 100 \times \frac{7}{457} = 1.53\%$$

This amount of phase imbalance is satisfactory as it is below the maximum allowable 2%.

**IMPORTANT:** If the supply voltage phase imbalance is more than 2%, contact your local electric utility company immediately.

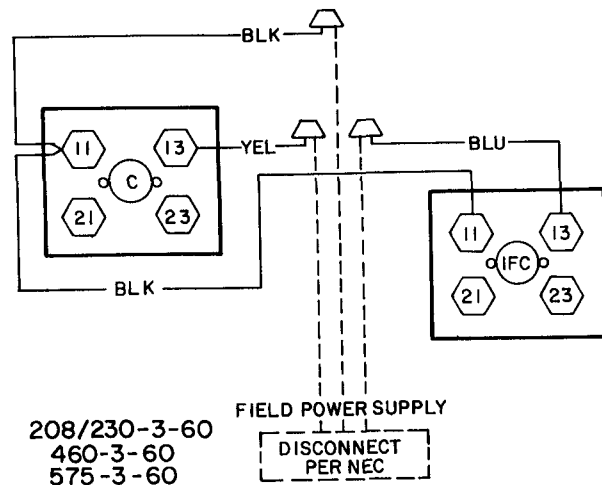
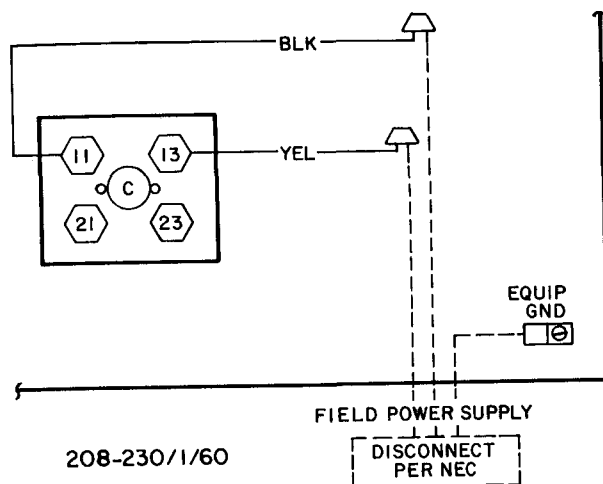


Fig. 9 – Power Wiring Connections

**FIELD CONTROL WIRING** — Install a Carrier approved accessory thermostat assembly according to installation instructions included with the accessory. Locate thermostat assembly on a solid wall in the conditioned space to sense average temperature in accordance with thermostat installation instructions. Connect thermostat wires to terminal board.

**NOTE:** For wire runs up 50 ft, use no. 18 AWG insulated wire (35 C minimum). For 50 to 75 ft, use no. 16 AWG insulated wire (35 C minimum). For over 75 feet, use no. 14 AWG insulated wire (35 C minimum).

Pass the control wires through the hole provided in the end panel; then feed wires through the raceway built into the corner post to the 24-v barrier located on the left side of the control box. See Fig. 10. The raceway provides the U.L. required clearance between high and low voltage wiring.

**HEAT ANTICIPATOR SETTINGS** — Set heat anticipator settings at 1.0 amp.

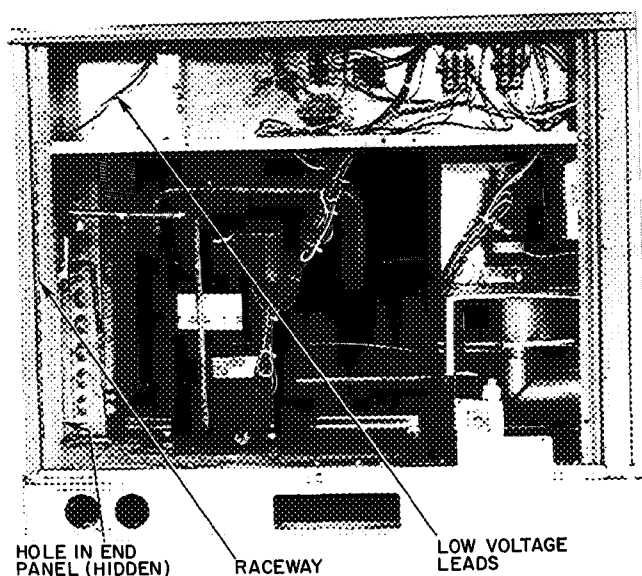


Fig. 10 – Field Control Wiring Raceway

**Step 8 – Adjust Evaporator Fan Speed** — Adjust evaporator fan speed to meet jobsite conditions. Table 3 shows fan rpm at motor pulley settings. Refer to Tables 4 through 11 to determine fan speed settings.

**DIRECT DRIVE MOTORS** — The evaporator fan motor factory speed setting is shown on label diagram affixed to base unit. If other than factory setting is desired, refer to label diagram for motor reconnection.

**BELT DRIVE MOTORS** — Fan motor pulleys are factory set for speed shown in Table 1.

**NOTE:** Before adjusting fan speed, make sure the new fan speed will provide an air temperature rise range as shown in Table 1.

To change fan speed:

1. Shut off unit power supply.
2. Loosen belt by loosening fan motor mounting nuts. See Fig. 11.
3. Loosen movable pulley flange setscrew (see Fig. 12).
4. Screw movable flange toward fixed flange to increase speed and away from fixed flange to decrease speed. Increasing fan speed increases load on motor. Do not exceed maximum speed specified in Table 1.
5. Set movable flange at nearest keyway of pulley hub and tighten setscrew. (See Table 1 for speed change for each full turn of pulley flange.)

To align fan and motor pulleys, loosen fan pulley setscrews and slide fan pulley along fan shaft. Make angular alignment by loosening motor from mounting.

To adjust belt tension: Loosen fan motor bolts. Move motor sideways for proper belt tension (1/2-in. deflection with one finger) and tighten motor mount bolts. Adjust lock bolt and nut on motor to secure in fixed position.

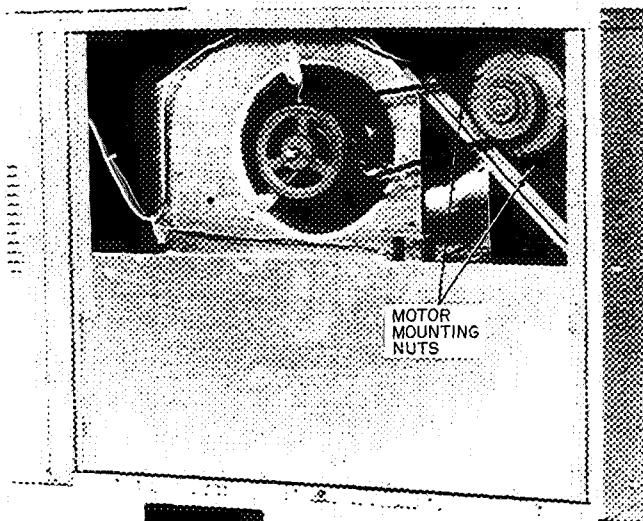


Fig. 11 - Belt Drive Motor Mounting

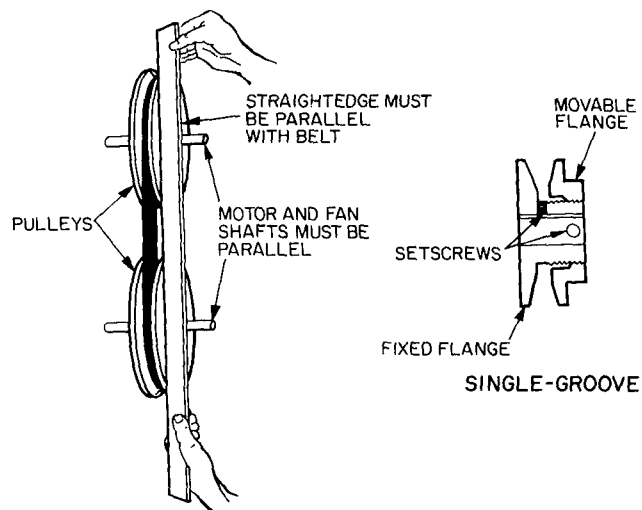


Fig. 12 - Indoor Air Fan Pulley Adjustment

Table 3 - Fan Rpm at Motor Pulley Settings

| UNIT<br>48LJ | MOTOR PULLEY TURNS OPEN |      |      |       |      |       |      |       |      |       |      |
|--------------|-------------------------|------|------|-------|------|-------|------|-------|------|-------|------|
|              | 0                       | 1/2  | 1    | 1 1/2 | 2    | 2 1/2 | 3    | 3 1/2 | 4    | 4 1/2 | 5    |
| 006          | 1190                    | 1159 | 1127 | 1096  | 1064 | 1033  | 1001 | 970   | 938  | 907   | 875  |
| 007          | 1435                    | 1396 | 1356 | 1317  | 1277 | 1238  | 1198 | 1159  | 1119 | 1080  | 1040 |

Table 4 - Fan Performance, 48LJ004 Vertical Discharge Units

| AIRFLOW<br>(Cfm) | LOW SPEED |      |              |      | HIGH SPEED |      |              |      |
|------------------|-----------|------|--------------|------|------------|------|--------------|------|
|                  | 208       |      | 230/460, 575 |      | 208        |      | 230/460, 575 |      |
|                  | ESP       | Bhp  | ESP          | Bhp  | ESP        | Bhp  | ESP          | Bhp  |
| 900              | 0.46      | 0.21 | 0.48         | 0.24 | 0.49       | 0.26 | 0.51         | 0.29 |
| 1000             | 0.44      | 0.24 | 0.45         | 0.27 | 0.47       | 0.28 | 0.48         | 0.32 |
| 1100             | 0.40      | 0.25 | 0.42         | 0.29 | 0.44       | 0.29 | 0.45         | 0.33 |
| 1200             | 0.32      | 0.27 | 0.37         | 0.30 | 0.38       | 0.31 | 0.40         | 0.35 |
| 1300             | 0.28      | 0.29 | 0.32         | 0.31 | 0.32       | 0.32 | 0.34         | 0.36 |
| 1400             | 0.22      | 0.30 | 0.25         | 0.32 | 0.26       | 0.33 | 0.28         | 0.37 |
| 1500             | 0.16      | 0.31 | 0.18         | 0.33 | 0.20       | 0.35 | 0.21         | 0.38 |

ESP - External Static Pressure

NOTE: Values include losses for filters, unit casing and wet coils.

Table 5 – Fan Performance, 48LJ005 Vertical Discharge Units

| AIRFLOW<br>(Cfm) | LOW SPEED |      |              |      | HIGH SPEED |      |              |      |
|------------------|-----------|------|--------------|------|------------|------|--------------|------|
|                  | 208       |      | 230/460, 575 |      | 208        |      | 230/460, 575 |      |
|                  | ESP       | Bhp  | ESP          | Bhp  | ESP        | Bhp  | ESP          | Bhp  |
| 1200             | 0.53      | 0.50 | 0.58         | 0.57 | 0.72       | 0.59 | 0.84         | 0.69 |
| 1300             | 0.44      | 0.54 | 0.50         | 0.59 | 0.64       | 0.64 | 0.75         | 0.71 |
| 1400             | 0.35      | 0.57 | 0.42         | 0.62 | 0.56       | 0.67 | 0.67         | 0.75 |
| 1500             | 0.25      | 0.62 | 0.33         | 0.65 | 0.47       | 0.69 | 0.58         | 0.77 |
| 1600             | 0.16      | 0.65 | 0.24         | 0.68 | 0.38       | 0.71 | 0.50         | 0.79 |
| 1700             | 0.09      | 0.67 | 0.15         | 0.69 | 0.30       | 0.74 | 0.40         | 0.82 |
| 1800             | 0.00      | 0.68 | 0.06         | 0.71 | 0.22       | 0.77 | 0.32         | 0.83 |
| 1900             | —         | —    | —            | —    | 0.12       | 0.78 | 0.24         | 0.85 |
| 2000             | —         | —    | —            | —    | 0.03       | 0.81 | 0.15         | 0.87 |

ESP — External Static Pressure

NOTE: Values include losses for filters, unit casing and wet coils

Table 6 – Fan Performance, 48LJ006 Vertical Discharge Units

| AIRFLOW<br>(Cfm) | EXTERNAL STATIC PRESSURE (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                  | 0.1                               |      | 0.2  |      | 0.4  |      | 0.6  |      | 0.8  |      | 1.0  |      | 1.2  |      | 1.4  |      | 1.6  |      |
|                  | Rpm                               | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  |
| 1500             | 750                               | 0.37 | 808  | 0.43 | 914  | 0.57 | 1001 | 0.70 | 1084 | 0.85 | 1168 | 1.02 | 1199 | 1.11 | 1126 | 1.02 | —    | —    |
| 1600             | 794                               | 0.44 | 846  | 0.50 | 950  | 0.65 | 1034 | 0.78 | 1111 | 0.93 | 1194 | 1.11 | 1263 | 1.28 | 1275 | 1.35 | —    | —    |
| 1700             | 839                               | 0.52 | 884  | 0.58 | 983  | 0.73 | 1068 | 0.88 | 1145 | 1.04 | 1218 | 1.20 | 1295 | 1.40 | 1351 | 1.57 | 1352 | 1.62 |
| 1800             | 885                               | 0.61 | 924  | 0.67 | 1018 | 0.82 | 1105 | 0.99 | 1179 | 1.15 | 1246 | 1.32 | 1319 | 1.51 | 1389 | 1.72 | 1435 | 1.88 |
| 1900             | 932                               | 0.72 | 965  | 0.77 | 1057 | 0.94 | 1143 | 1.12 | 1212 | 1.27 | 1280 | 1.45 | 1343 | 1.63 | 1415 | 1.85 | 1478 | 2.06 |
| 2000             | 979                               | 0.83 | 1008 | 0.88 | 1096 | 1.06 | 1177 | 1.24 | 1247 | 1.41 | 1314 | 1.59 | 1374 | 1.78 | 1438 | 1.98 | 1505 | 2.21 |
| 2100             | 1026                              | 0.96 | 1051 | 1.01 | 1136 | 1.19 | 1210 | 1.37 | 1284 | 1.57 | 1347 | 1.74 | 1409 | 1.94 | 1465 | 2.13 | 1528 | 2.36 |
| 2200             | 1074                              | 1.10 | 1095 | 1.15 | 1173 | 1.33 | 1245 | 1.51 | 1322 | 1.73 | 1390 | 1.93 | 1442 | 2.11 | 1498 | 2.31 | —    | —    |
| 2300             | 1122                              | 1.25 | 1140 | 1.30 | 1210 | 1.47 | 1284 | 1.67 | 1356 | 1.90 | 1418 | 2.09 | 1475 | 2.29 | —    | —    | —    | —    |
| 2400             | 1170                              | 1.42 | 1185 | 1.46 | 1249 | 1.64 | 1323 | 1.85 | 1389 | 2.06 | 1456 | 2.30 | —    | —    | —    | —    | —    | —    |
| 2500             | 1218                              | 1.61 | 1231 | 1.64 | 1289 | 1.84 | 1363 | 2.04 | 1424 | 2.24 | —    | —    | —    | —    | —    | —    | —    | —    |

## NOTES:

1. **Boldface** indicates field-supplied drive required (See note 6.)
2. **Shaded** indicates field-supplied motor and drive required
3. Maximum usable bhp is 1.7 Extensive motor and electrical testing on the Weathermaker® I units has ensured that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horsepower ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
4. Values include losses for filters, unit casing and wet coils.
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Motor drive range: 875-1190. All other rpms require field-supplied drive.

Table 7 – Fan Performance, 48LJ007 Vertical Discharge Units

| AIRFLOW<br>(Cfm) | EXTERNAL STATIC PRESSURE (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                  | 0.1                               |      | 0.2  |      | 0.4  |      | 0.6  |      | 0.8  |      | 1.0  |      | 1.2  |      | 1.4  |      | 1.6  |      |
|                  | Rpm                               | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  |
| 1800             | 935                               | 0.67 | 983  | 0.75 | 1069 | 0.91 | 1152 | 1.08 | 1226 | 1.26 | 1294 | 1.45 | 1358 | 1.64 | 1420 | 1.85 | 1486 | 2.11 |
| 1900             | 982                               | 0.78 | 1027 | 0.86 | 1111 | 1.03 | 1190 | 1.20 | 1263 | 1.40 | 1330 | 1.59 | 1392 | 1.79 | 1452 | 2.00 | 1511 | 2.23 |
| 2000             | 1029                              | 0.90 | 1072 | 0.98 | 1154 | 1.16 | 1228 | 1.34 | 1301 | 1.54 | 1367 | 1.75 | 1428 | 1.96 | 1486 | 2.17 | 1542 | 2.39 |
| 2100             | 1076                              | 1.03 | 1117 | 1.12 | 1197 | 1.31 | 1267 | 1.49 | 1338 | 1.69 | 1403 | 1.91 | 1464 | 2.13 | 1521 | 2.35 | 1575 | 2.57 |
| 2200             | 1124                              | 1.18 | 1163 | 1.27 | 1240 | 1.47 | 1307 | 1.66 | 1376 | 1.86 | 1440 | 2.08 | 1500 | 2.31 | 1557 | 2.54 | 1610 | 2.77 |
| 2300             | 1171                              | 1.33 | 1209 | 1.43 | 1283 | 1.64 | 1350 | 1.84 | 1414 | 2.04 | 1478 | 2.27 | 1537 | 2.51 | 1593 | 2.75 | 1646 | 2.99 |
| 2400             | 1219                              | 1.51 | 1255 | 1.61 | 1326 | 1.82 | 1392 | 2.03 | 1453 | 2.24 | 1516 | 2.47 | 1574 | 2.72 | 1629 | 2.97 | —    | —    |
| 2500             | 1267                              | 1.70 | 1301 | 1.80 | 1370 | 2.02 | 1435 | 2.25 | 1493 | 2.46 | 1554 | 2.69 | 1612 | 2.94 | —    | —    | —    | —    |
| 2600             | 1315                              | 1.90 | 1348 | 2.00 | 1414 | 2.23 | 1479 | 2.47 | 1535 | 2.69 | 1592 | 2.92 | —    | —    | —    | —    | —    | —    |
| 2700             | 1363                              | 2.12 | 1395 | 2.23 | 1458 | 2.46 | 1521 | 2.71 | 1577 | 2.94 | —    | —    | —    | —    | —    | —    | —    | —    |
| 2800             | 1411                              | 2.36 | 1445 | 2.47 | 1503 | 2.71 | 1564 | 2.96 | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |
| 2900             | 1459                              | 2.61 | 1493 | 2.72 | 1549 | 2.97 | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |

## NOTES:

1. **Boldface** indicates field-supplied drive required. (See note 6.)
2. **Shaded** indicates field-supplied motor and drive required
3. Maximum usable bhp is 2.4 with standard motor. Extensive motor and electrical testing on the Weathermaker I units has ensured that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horsepower ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected
4. Values include losses for filters, unit casing and wet coils
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify
6. Motor drive range: 1040-1435. All other rpms require field-supplied drive.

**Table 8 – Fan Performance, 48LJ004 Horizontal Discharge Units**

| AIRFLOW<br>(Cfm) | LOW SPEED |      |              |      | HIGH SPEED |      |              |      |
|------------------|-----------|------|--------------|------|------------|------|--------------|------|
|                  | 208       |      | 230/460, 575 |      | 208        |      | 230/460, 575 |      |
|                  | ESP       | Bhp  | ESP          | Bhp  | ESP        | Bhp  | ESP          | Bhp  |
| 900              | 0.53      | 0.24 | 0.55         | 0.26 | 0.63       | 0.29 | 0.64         | 0.32 |
| 1000             | 0.48      | 0.26 | 0.51         | 0.27 | 0.57       | 0.30 | 0.60         | 0.34 |
| 1100             | 0.43      | 0.27 | 0.45         | 0.30 | 0.52       | 0.32 | 0.54         | 0.35 |
| 1200             | 0.36      | 0.29 | 0.40         | 0.31 | 0.47       | 0.33 | 0.47         | 0.37 |
| 1300             | 0.28      | 0.30 | 0.32         | 0.32 | 0.38       | 0.36 | 0.41         | 0.39 |
| 1400             | 0.20      | 0.33 | 0.24         | 0.36 | 0.31       | 0.38 | 0.32         | 0.40 |
| 1500             | 0.11      | 0.36 | 0.14         | 0.38 | 0.21       | 0.40 | 0.22         | 0.43 |

ESP — External Static Pressure

NOTE: Values include losses for filters, unit casing and wet coils.

**Table 9 – Fan Performance, 48LJ005 Horizontal Discharge Units**

| AIRFLOW<br>(Cfm) | LOW SPEED |      |              |      | HIGH SPEED |      |              |      |
|------------------|-----------|------|--------------|------|------------|------|--------------|------|
|                  | 208       |      | 230/460, 575 |      | 208        |      | 230/460, 575 |      |
|                  | ESP       | Bhp  | ESP          | Bhp  | ESP        | Bhp  | ESP          | Bhp  |
| 1200             | 0.78      | 0.47 | 0.85         | 0.49 | 0.92       | 0.54 | 1.01         | 0.58 |
| 1300             | 0.70      | 0.50 | 0.76         | 0.52 | 0.84       | 0.57 | 0.94         | 0.61 |
| 1400             | 0.62      | 0.55 | 0.68         | 0.56 | 0.78       | 0.59 | 0.87         | 0.64 |
| 1500             | 0.52      | 0.57 | 0.59         | 0.58 | 0.69       | 0.62 | 0.78         | 0.67 |
| 1600             | 0.44      | 0.59 | 0.50         | 0.60 | 0.61       | 0.66 | 0.70         | 0.69 |
| 1700             | 0.34      | 0.62 | 0.40         | 0.63 | 0.53       | 0.68 | 0.62         | 0.71 |
| 1800             | 0.22      | 0.66 | 0.30         | 0.68 | 0.45       | 0.72 | 0.54         | 0.75 |
| 1900             | 0.10      | 0.68 | 0.20         | 0.69 | 0.37       | 0.76 | 0.48         | 0.78 |
| 2000             | —         | —    | 0.09         | 0.72 | 0.29       | 0.78 | 0.39         | 0.81 |

ESP — External Static Pressure

NOTE: Values include losses for filters, unit casing and wet coils.

**Table 10 – Fan Performance, 48LJ006 Horizontal Discharge Units**

| AIRFLOW<br>(Cfm) | EXTERNAL STATIC PRESSURE (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                  | 0.1                               |      | 0.2  |      | 0.4  |      | 0.6  |      | 0.8  |      | 1.0  |      | 1.2  |      | 1.4  |      | 1.6  |      |
|                  | Rpm                               | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  |
| 1500             | 720                               | 0.34 | 776  | 0.39 | 886  | 0.53 | 978  | 0.66 | 1059 | 0.80 | 1142 | 0.96 | 1207 | 1.11 | 1245 | 1.20 | 1251 | 1.21 |
| 1600             | 760                               | 0.40 | 814  | 0.46 | 915  | 0.59 | 1010 | 0.74 | 1089 | 0.89 | 1165 | 1.04 | 1240 | 1.22 | 1296 | 1.37 | 1329 | 1.46 |
| 1700             | 801                               | 0.47 | 853  | 0.54 | 950  | 0.68 | 1044 | 0.84 | 1120 | 0.99 | 1190 | 1.14 | 1266 | 1.33 | 1331 | 1.50 | 1381 | 1.65 |
| 1800             | 842                               | 0.55 | 891  | 0.62 | 985  | 0.77 | 1075 | 0.94 | 1151 | 1.09 | 1221 | 1.26 | 1287 | 1.42 | 1358 | 1.63 | 1417 | 1.81 |
| 1900             | 883                               | 0.64 | 931  | 0.72 | 1019 | 0.87 | 1103 | 1.03 | 1184 | 1.21 | 1252 | 1.38 | 1315 | 1.55 | 1380 | 1.74 | 1446 | 1.95 |
| 2000             | 924                               | 0.74 | 970  | 0.82 | 1054 | 0.97 | 1134 | 1.14 | 1217 | 1.34 | 1283 | 1.51 | 1346 | 1.69 | 1405 | 1.87 | 1469 | 2.06 |
| 2100             | 965                               | 0.85 | 1010 | 0.93 | 1090 | 1.09 | 1170 | 1.27 | 1247 | 1.47 | 1315 | 1.65 | 1377 | 1.84 | 1435 | 2.03 | 1492 | 2.22 |
| 2200             | 1007                              | 0.97 | 1050 | 1.06 | 1128 | 1.22 | 1205 | 1.40 | 1275 | 1.59 | 1345 | 1.81 | 1409 | 1.99 | 1466 | 2.22 | 1521 | 2.40 |
| 2300             | 1049                              | 1.10 | 1090 | 1.19 | 1166 | 1.36 | 1239 | 1.55 | 1306 | 1.74 | 1380 | 1.98 | 1440 | 2.16 | 1497 | 2.37 | —    | —    |
| 2400             | 1090                              | 1.24 | 1131 | 1.34 | 1204 | 1.51 | 1273 | 1.70 | 1342 | 1.91 | 1409 | 2.13 | 1474 | 2.36 | —    | —    | —    | —    |
| 2500             | 1132                              | 1.39 | 1172 | 1.49 | 1243 | 1.68 | 1309 | 1.87 | 1377 | 2.09 | 1438 | 2.29 | —    | —    | —    | —    | —    | —    |

**NOTES**

1. **Boldface** indicates field-supplied drive required. (See note 6)

2. **Shading** indicates field-supplied motor and drive required

3. Maximum usable bhp is 1.7. Extensive motor and electrical testing on the Weathermaker® I units has ensured that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horsepower ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.

4. Values include losses for filters, unit casing and wet coils.

5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.

6. Motor drive range: 875-1190. All other rpms require field-supplied drive.

**Table 11 – Fan Performance, 48LJ007 Horizontal Discharge Units**

| AIRFLOW<br>(Cfm) | EXTERNAL STATIC PRESSURE (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                  | 0.1                               |      | 0.2  |      | 0.4  |      | 0.6  |      | 0.8  |      | 1.0  |      | 1.2  |      | 1.4  |      | 1.6  |      |
|                  | Rpm                               | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  | Rpm  | Bhp  |
| 1800             | 852                               | 0.55 | 905  | 0.62 | 1002 | 0.78 | 1084 | 0.93 | 1163 | 1.10 | 1235 | 1.29 | 1303 | 1.48 | 1371 | 1.69 | 1433 | 1.90 |
| 1900             | 894                               | 0.64 | 945  | 0.72 | 1037 | 0.88 | 1119 | 1.04 | 1194 | 1.21 | 1266 | 1.40 | 1330 | 1.59 | 1396 | 1.81 | 1450 | 2.03 |
| 2000             | 936                               | 0.74 | 984  | 0.82 | 1072 | 0.98 | 1154 | 1.16 | 1226 | 1.33 | 1297 | 1.53 | 1362 | 1.73 | 1422 | 1.94 | 1485 | 2.16 |
| 2100             | 978                               | 0.85 | 1024 | 0.93 | 1108 | 1.10 | 1190 | 1.29 | 1255 | 1.47 | 1327 | 1.66 | 1393 | 1.87 | 1452 | 2.08 | 1510 | 2.31 |
| 2200             | 1021                              | 0.97 | 1064 | 1.05 | 1145 | 1.22 | 1225 | 1.43 | 1294 | 1.62 | 1359 | 1.81 | 1423 | 2.02 | 1483 | 2.24 | 1538 | 2.46 |
| 2300             | 1064                              | 1.10 | 1104 | 1.18 | 1183 | 1.36 | 1260 | 1.57 | 1330 | 1.78 | 1392 | 1.97 | 1454 | 2.18 | 1515 | 2.41 | 1569 | 2.64 |
| 2400             | 1107                              | 1.24 | 1145 | 1.32 | 1222 | 1.52 | 1296 | 1.73 | 1365 | 1.94 | 1426 | 2.15 | 1485 | 2.36 | 1544 | 2.59 | 1601 | 2.84 |
| 2500             | 1150                              | 1.39 | 1186 | 1.48 | 1262 | 1.68 | 1331 | 1.89 | 1400 | 2.12 | 1461 | 2.34 | 1518 | 2.55 | 1575 | 2.78 | —    | —    |
| 2600             | 1193                              | 1.56 | 1228 | 1.65 | 1301 | 1.86 | 1367 | 2.07 | 1435 | 2.31 | 1493 | 2.54 | 1552 | 2.76 | 1607 | 2.99 | —    | —    |
| 2700             | 1237                              | 1.74 | 1269 | 1.83 | 1341 | 2.05 | 1404 | 2.26 | 1471 | 2.51 | 1530 | 2.75 | 1587 | 2.98 | —    | —    | —    | —    |
| 2800             | 1280                              | 1.94 | 1311 | 2.03 | 1381 | 2.25 | 1442 | 2.47 | 1500 | 2.72 | 1557 | 2.96 | —    | —    | —    | —    | —    | —    |
| 2900             | 1324                              | 2.15 | 1354 | 2.24 | 1420 | 2.47 | 1473 | 2.69 | 1542 | 2.94 | —    | —    | —    | —    | —    | —    | —    | —    |
| 3000             | 1368                              | 2.37 | 1398 | 2.46 | 1455 | 2.68 | 1521 | 2.93 | —    | —    | —    | —    | —    | —    | —    | —    | —    | —    |

**NOTES:**

1. **Boldface** indicates field-supplied drive required (See note 6.)
2. **Shaded** indicates field-supplied motor and drive required
3. Maximum usable bhp is 2.4 with standard motor. Extensive motor and electrical testing on Weathermaker I units has ensured that the full horsepower range of the motor can be utilized with confidence. Using your fan motors up to the horsepower ratings shown will not result in nuisance tripping or premature motor failure. Unit warranty will not be affected.
4. Values include losses for filters, unit casing and wet coils.
5. Use of a field-supplied motor may affect wire sizing. Contact Carrier representative to verify.
6. Motor drive range: 1040-1435 All other rpms require field-supplied drive.

## START-UP

**IMPORTANT:** Energize crankcase heater(s) 24 hours prior to base unit start-up to remove absorbed refrigerant from oil to prevent damage to compressor. Heaters are energized as long as there is power to the unit.

**Unit Preparation** — Make sure that unit has been installed in accordance with installation instructions and applicable codes

**Return Air Filters** — Make sure correct filters are installed in filter tracks. See Table 1. Do not operate unit without return air filters.

**Compressor Mounting** — Compressors are internally spring mounted. Do not loosen or remove compressor hold-down bolts.

**Internal Wiring** — Check all electrical connections in unit control boxes. Tighten as required.

**Refrigerant Service Ports** — Each unit system has 3 Schrader type service ports, one on the suction line, one on the liquid line, and one on the compressor discharge line. Be sure that caps on the ports are tight

**Cooling** — Set space thermostat to off position. To start unit, turn on main power supply. Set system selector switch at COOL and fan switch at AUTO. Adjust thermostat to a setting below room temperature. Compressor starts on closure of contactor.

Check cooling effects at a setting above room temperature. Check unit charge. Refer to Refrigerant Charge in Service section.

Reset thermostat at a position above room temperature. Compressor will shut off.

**TO SHUT OFF UNIT** — Set system selector switch at OFF position. Resetting thermostat at a position above room temperature shuts unit off temporarily until space temperature exceeds thermostat setting.

**Main Burners** — Main burners are factory set and should require no adjustment.

**TO CHECK** ignition of main burners and heating controls, move thermostat dial above room temperature and verify that the burners light and indoor fan is energized. After ensuring that the unit continues to heat the building, lower the thermostat setting below the room temperature and verify that the burners and indoor fan turn off. (Fan will turn off only if fan selector switch is in the AUTO. position.)

Refer to Table 12 for the correct orifice to use at high altitudes.

**Table 12 – Altitude Compensation\***

| ELEVATION | NATURAL GAS<br>Orifice Size† | LIQUID PROPANE<br>Orifice Size |
|-----------|------------------------------|--------------------------------|
| 0-2,000   | 33                           | 43                             |
| 2,000     | 34                           | 43                             |
| 3,000     | 35                           | 44                             |
| 4,000     | 36                           | 44                             |
| 5,000     | 36                           | 44                             |
| 6,000     | 37                           | 45                             |
| 7,000     | 37                           | 45                             |
| 8,000     | 38                           | 46                             |
| 9,000     | 39                           | 47                             |
| 10,000    | 41                           | 48                             |
| 11,000    | 43                           | 48                             |
| 12,000    | 44                           | 49                             |
| 13,000    | 44                           | 49                             |
| 14,000    | 45                           | 50                             |

\*As the height above sea level increases, there is less oxygen per cubic foot of air. Therefore, heat input rate should be reduced at higher altitudes.

†Orifices available through your Carrier distributor

## Heating

1. Purge gas supply line of air by opening union ahead of gas valve. If gas odor is detected, tighten union and wait 5 minutes before proceeding.
2. Turn on electrical supply and manual gas valve.
3. Set system switch selector at HEAT and fan switch at AUTO. or ON Set heating temperature lever above room temperature.
4. The induced draft motor will start

5. After a call for heating, the main burners should light within 4 seconds (on some models a 45-second pre-purge is provided). If the burner does not light, then there is a 60 second delay before another 4 second try. If the burner still does not light, the time delay is repeated. If the burner does not light on the third attempt, there is a lockout. To recover, break the 24-v power to W1.
6. The indoor fan will turn on after a call for heating.
7. The indoor fan will turn off after thermostat temperature is satisfied.
8. Adjust airflow to obtain a temperature rise within the range specified on the unit nameplate.

**TO SHUT OFF UNIT** — Set system selector switch at OFF. Resetting heating selector lever below room temperature will temporarily shut unit off until space temperature falls below thermostat setting.

**Safety Relief** — A soft solder joint at the suction service Schrader port provides pressure relief under abnormal temperature and pressure conditions.

**Ventilation (Continuous Fan)** — Set fan and system selector switches at ON and OFF, respectively. Indoor air fan operates continuously to provide constant air circulation.

## SERVICE

### ⚠ CAUTION

When servicing unit, shut off all electrical power to unit to avoid shock hazard or injury from rotating parts.

**Cleaning** — Inspect unit interior at the beginning of heating and cooling season or as operating conditions require.

#### EVAPORATOR COIL

1. Turn unit power off. Remove evaporator coil access panel.
2. If accessory economizer is installed, remove economizer by disconnecting Molex plug and removing economizer mounting screws. Refer to accessory economizer installation instructions for greater detail.
3. Slide filters out of unit
4. Clean coil using a commercial coil cleaner or dishwasher detergent in a pressurized spray canister. Wash both sides of coil and flush with clean water. For best results, backflush toward return air section to remove foreign material. Flush condensate pan after completion.
5. Reinstall economizer and filters, reconnect wiring and replace access panels.

**CONDENSER COIL** — Inspect coil monthly. Clean condenser coil annually, or as required by location or outdoor air conditions.

One row coils — Wash coil with commercial coil cleaner. It is not necessary to remove top cover.

#### 2-row coils

Clean coil as follows:

1. Turn off unit power.
2. Remove top cover screws on condenser end of unit.
3. Remove condenser coil corner post. See Fig. 13. To hold top cover open, place coil corner post between top cover and center post. See Fig. 14.
4. Remove device holding coil sections together at return end of condenser coil. Carefully separate the outer coil

section 3 to 4 in. from the inner coil section. See Fig. 15.

5. Use a water hose or other suitable equipment to flush down between the 2 coil sections to remove dirt and debris. Clean the outer surfaces with a stiff brush in the normal manner.
6. Reposition the outer coil section, remove the coil corner post from between the top cover and center post. Secure the sections together. Install the coil corner post, coil center post and replace all screws.

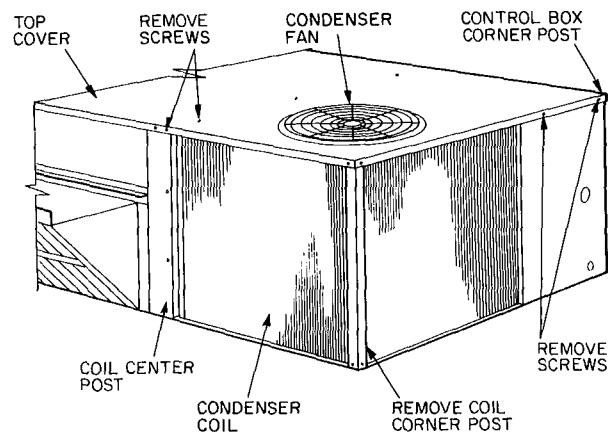


Fig. 13 — Cleaning Condenser Coil

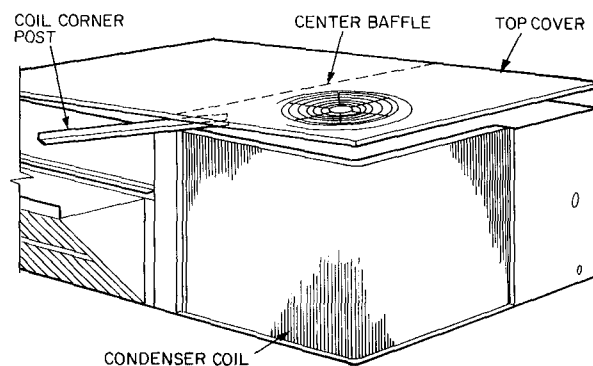


Fig. 14 — Propping Up Top Panel

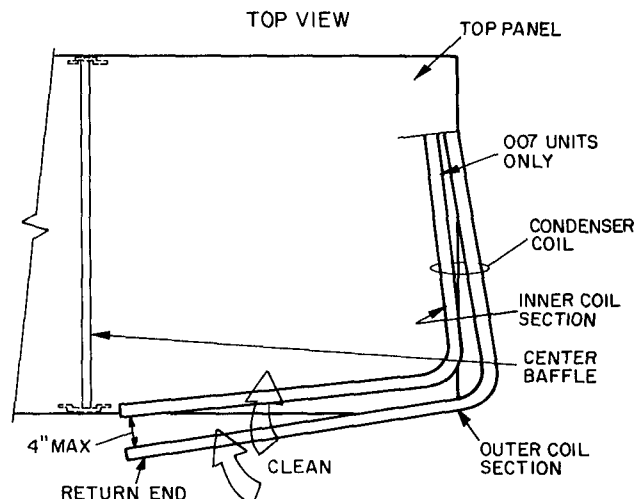


Fig. 15 — Separating Coil Sections

**CONDENSATE DRAIN** — Check and clean each year at start of cooling season. In winter, keep drain dry or protect against freeze-up.

**FILTERS** — Clean or replace at start of each heating and cooling season, or more often if operating conditions require it. Replacement filters must be same dimensions as original filters.

## Lubrication

**COMPRESSORS** — Each compressor is charged with correct amount of oil at the factory.

**FAN MOTOR BEARINGS** — Fan motor bearings are of the permanently lubricated type. No further lubrication is required. No lubrication of condenser or evaporator fan motors is required.

**Condenser Air Fan Adjustment** (Fig. 16) — Shut off unit power supply. Remove condenser fan assembly (grille, motor, motor cover and fan) and loosen fan hub setscrews. Adjust fan height as shown in Fig. 16. Tighten setscrews and replace condenser fan assembly.

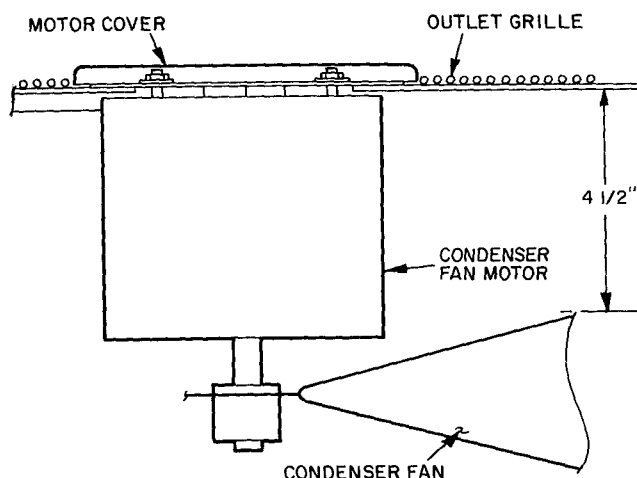


**Fig. 16 — Condenser Air Fan Adjustment**

**Refrigerant Charge** — Amount of refrigerant charge is listed on unit nameplate (also refer to Table 1). Refer to Carrier Standard Service Techniques Manual, Chapter 1, Refrigerants.

Unit panels must be in place when unit is operating during charging procedure.

**NO CHARGE** — Use standard evacuating techniques. After evacuating system, weigh in the specified amount of refrigerant. (Refer to Table 1.)

**LOW CHARGE COOLING** — Using Cooling Charging Chart, Fig. 17 through 19, vary refrigerant until the conditions of the chart are met. Note the charging chart is different from type normally used. Chart is based on charging the units to the correct superheat for the various operating conditions. Accurate pressure gage and temperature sensing device are required. Connect the pressure gage to the service port on the suction line. Mount the temperature sensing device on the suction line and insulate it so that outdoor ambient temperature does not affect the reading. Indoor air cfm must be within the normal operating range of the unit.

**TO USE COOLING CHARGING CHART** — Take the outdoor ambient temperature and read the suction pressure gage. Refer to chart to determine what suction temperature should be. If suction temperature is high, add refrigerant. If suction temperature is low, carefully blow some of the charge. Recheck the suction pressure as charge is adjusted.

Example: (Fig. 19)

Outdoor Temperature . . . . . 85 F

Suction Pressure . . . . . 70 psig

Suction Temperature should be . . . . . 44 F

(Suction Temperature may vary  $\pm 5$  F.)

If Chargemaster® charging device is used, temperature and pressure readings must be accomplished using the charging chart.

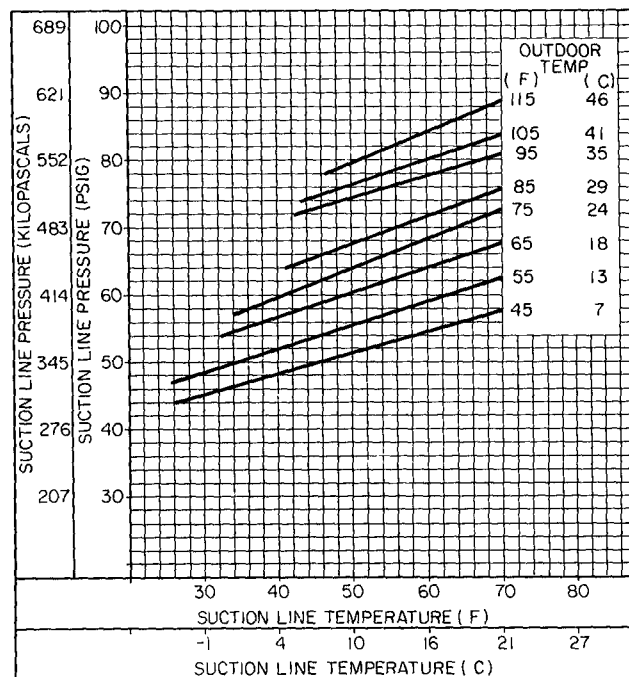


**Fig. 17 — Cooling Charging Chart  
48LJE004, 48LJD/LJE005**

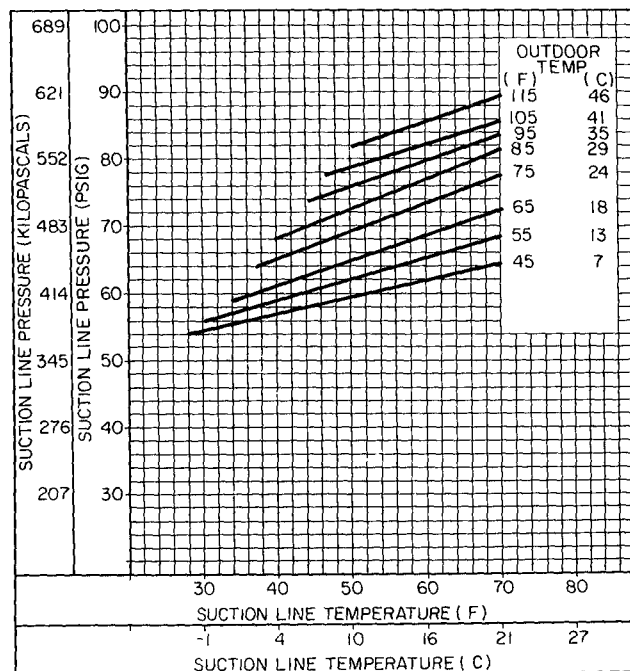


**Fig. 18 — Cooling Charging Chart  
48LJD/LJE006**

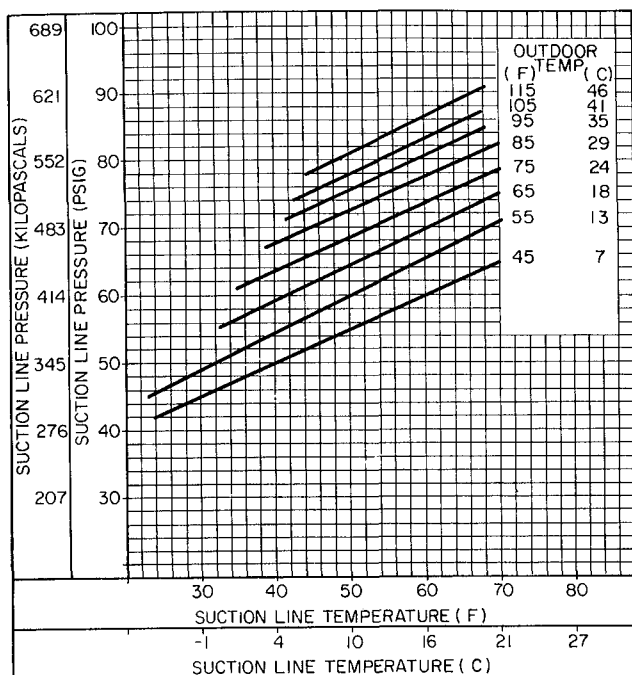


**Fig. 19 — Cooling Charging Chart  
48LJD/48LJE007**

**Flue Gas Passageways** — Inspect flue collector box and upper areas of heat exchanger cells by removing burner compartment access panel; then remove flue cover and inspect heat exchangers. Using a wire brush, clean all surfaces as required.

**Combustion Air Blower** — Clean periodically to assure proper airflow and heating efficiency. Inspect blower wheel every fall and periodically during heating season. For the first heating season, inspect blower wheel bimonthly to determine proper cleaning frequency.

To inspect blower wheel, remove draft hood and screen. Shine a flashlight into opening to inspect wheel. If cleaning is required, remove motor and wheel as follows:

1. Remove burner access panel.
2. Remove the 5 screws that attach induced draft motor mounting plate to blower housing (Fig. 20).
3. Remove the 4 wires attached to the motor and remove assembly from unit.
4. To remove blower, remove 2 setscrews.
5. To remove motor, remove 4 screws that hold blower housing to mounting plate, then remove nuts that hold motor to mounting plate.
6. To reinstall, reverse the procedure outlined above.

**Limit Switch** — Remove blower access panel (Fig. 6). Limit switch is located on the fan deck.

**Burner Ignition** — Unit is equipped with a direct spark ignition 100% lockout system. Ignition module is located in burner compartment (Fig. 20). Module contains a self-diagnostic LED. During servicing refer to Module nameplate for LED interpretation.

If lockout occurs, unit may be reset by momentarily interrupting power supply to unit, or turning selector switch to OFF position at the thermostat.

**Main Burners** — At the beginning of each heating season, inspect for deterioration or blockage due to corrosion or other causes. Observe the main burner flames and adjust, if necessary.

#### REMOVAL OF GAS TRAIN (See Fig. 20 and 21)

1. Shut off manual gas valve.
2. Shut off power to unit.
3. Remove compressor access panel.
4. Remove burner compartment access panel.
5. Slide out burner compartment side panel.
6. Disconnect gas piping at unit gas valve.
7. Remove wires connected to gas valve and rollout switch. Mark each wire.
8. Remove ignitor and sensor wires at the power pack.
9. Remove the two screws that attach the burner rack to the vestibule plate.
10. Slide the burner tray out of the unit. (Fig. 21)

#### REPLACEMENT OF GAS TRAIN (Fig. 20 and 21)

1. Slide the burner tray into the unit.
2. Attach burner rack to vestibule plate with two screws.
3. Reconnect the ignitor and sensor wires to the power pack.
4. Reconnect wires to gas valve and rollout switch.
5. Connect gas piping to the gas valve.
6. Reinstall the burner compartment side panel.
7. Reinstall the burner compartment access panel.
8. Replace compressor access panel.
9. Restore power to unit.
10. Turn on main gas valve.

#### CLEANING AND ADJUSTMENT

1. Remove burner rack from unit as described above.
2. Inspect burners and if dirty, remove burners from rack.
3. Using a soft brush clean burners and cross-over port as required.
4. Adjust spark gap. See Fig. 22.
5. Reinstall burners on rack.
6. Reinstall burner rack as described above.

#### **CAUTION**

Do not hit or plug orifice spuds.

**Replacement Parts** — A complete list of replacement parts may be obtained from any Carrier distributor upon request.

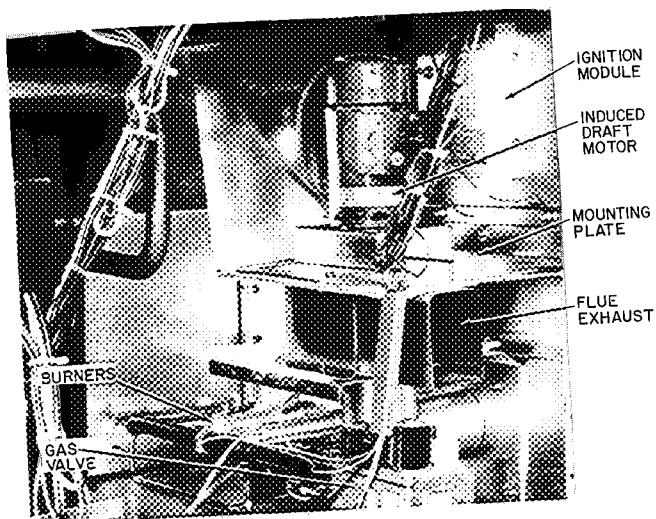


Fig. 20 - Burner Section Details

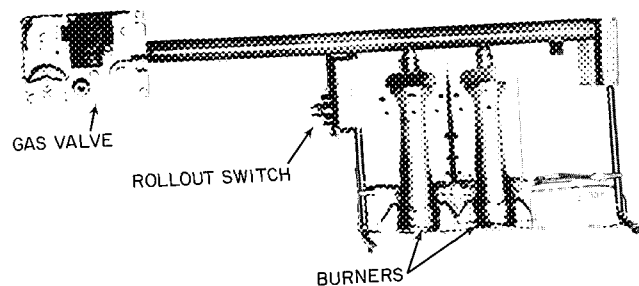


Fig. 21 - Burner Tray Details

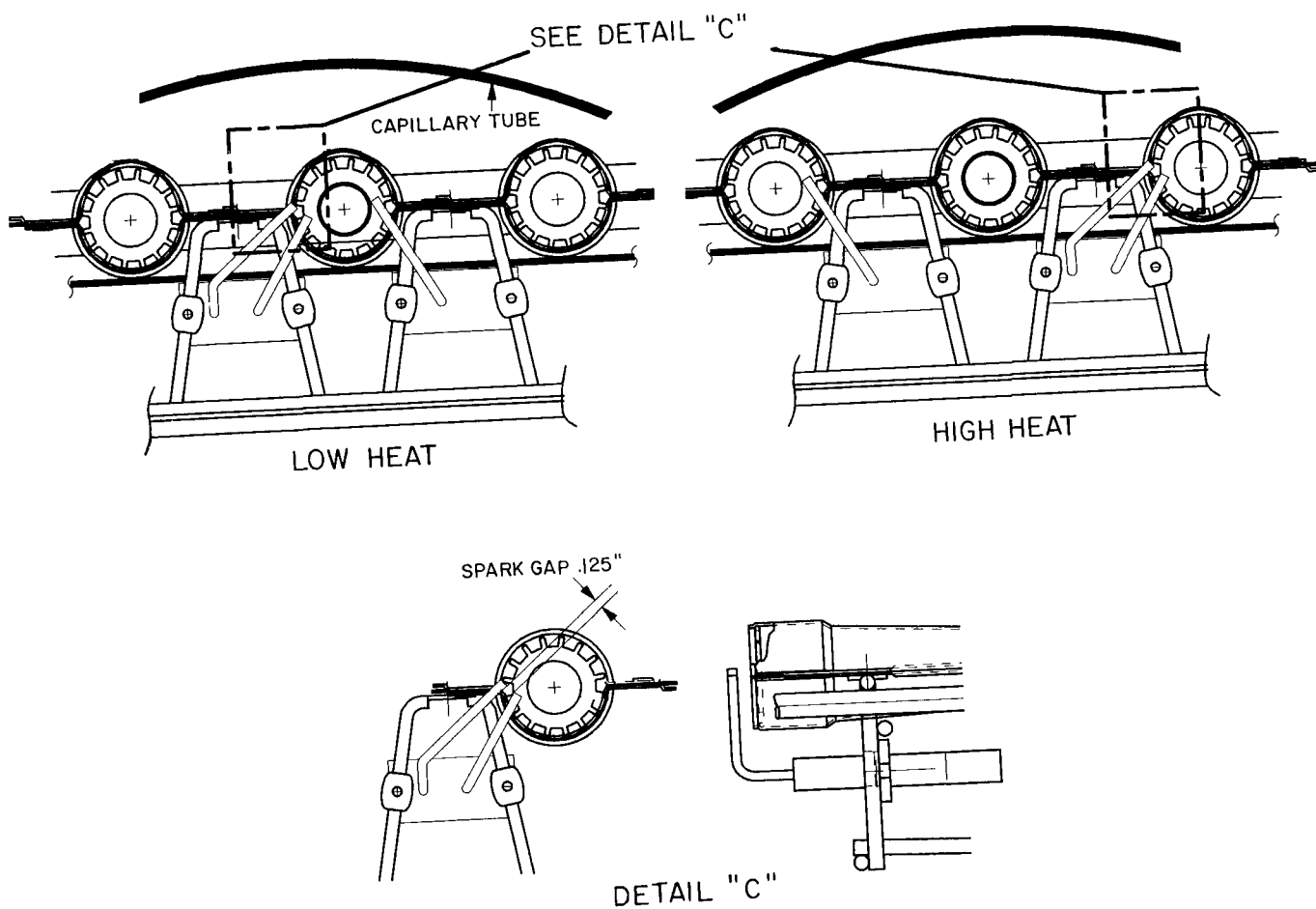


Fig. 22 - Sparker Adjustment

## LEGEND AND NOTES FOR FIG. 23 AND 24

|        |                                  |
|--------|----------------------------------|
| AHA    | — Adjustable Heat Anticipator    |
| BAT.   | — Battery                        |
| C      | — Contactor, Compressor          |
| CAP.   | — Capacitor                      |
| CC     | — Cooling Compensator            |
| CH     | — Crankcase Heater               |
| COM    | — Common                         |
| COMP   | — Compressor                     |
| CS     | — Centrifugal Switch             |
| CV     | — Constant Volume                |
| DAT    | — Discharge Air Thermostat       |
| EC     | — Enthalpy Control               |
| ECON   | — Economizer                     |
| EMC    | — Energy Management Closed       |
| EMFC.1 | — Energy Management Fully Closed |
| EMO    | — Energy Management Open         |
| EQUIP  | — Equipment                      |
| FP     | — Flame Prove                    |
| FU     | — Fuse                           |
| GND    | — Ground                         |
| I      | — Ignitor                        |
| ICP    | — Ignitor Control Pack           |
| IDM    | — Induced Draft                  |
| IDR    | — Induced Draft Relay            |
| IFC    | — Indoor Fan Contactor           |
| IFM    | — Indoor Fan Motor               |
| IFR    | — Indoor Fan Relay               |
| LS     | — Limit Switch                   |
| MGV    | — Main Gas Valve                 |
| MTR    | — Motor                          |
| MV     | — Main Valve                     |
| OAT.   | — Outdoor Air Thermostat         |
| OFM    | — Outdoor Fan Motor              |
| P      | — Plug                           |
| PL     | — Plug Assembly                  |
| QT     | — Quadruple Terminal             |
| RES    | — Resistor                       |
| RS     | — Rollout Switch                 |
| SEN    | — Sensor                         |
| STAT   | — Thermostat                     |
| SW     | — Switch                         |

|                                                                                   |                                                                |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|
| TB                                                                                | — Terminal Block                                               |
| TC                                                                                | — Thermostat-Cooling                                           |
| TH                                                                                | — Thermostat-Heating                                           |
| TRAN                                                                              | — Transformer                                                  |
|  | Circuit Board Run                                              |
|  | Field Splice                                                   |
|  | Marked Wire                                                    |
|  | Terminal (Marked)                                              |
|  | Terminal (Unmarked)                                            |
|  | Terminal Block                                                 |
|  | Terminal Econ 2-Position Board                                 |
|  | Terminal CV Board                                              |
|  | Splice                                                         |
|  | Splice (Marked)                                                |
|  | Factory Wiring                                                 |
|  | Field Control Wiring                                           |
|  | Field Power Wiring                                             |
|  | Accessory or Optional Wiring                                   |
|  | To indicate common potential only.<br>Not to represent wiring. |

### NOTES

1. If any of the original wire furnished must be replaced, it must be replaced with Type 90° C wire or its equivalent
2. Numbers indicate the line location of contacts, a bracket over 2 numbers signifies single pole double throw contacts. An underlined number signifies a normally closed contact. Plain numbers (no lines) signify a normally open contact.
3. Three-phase motors are protected under primary single phasing conditions
4. Set thermostat heat anticipator at 1 amp
5. Use copper, copper clad aluminum or aluminum conductors.

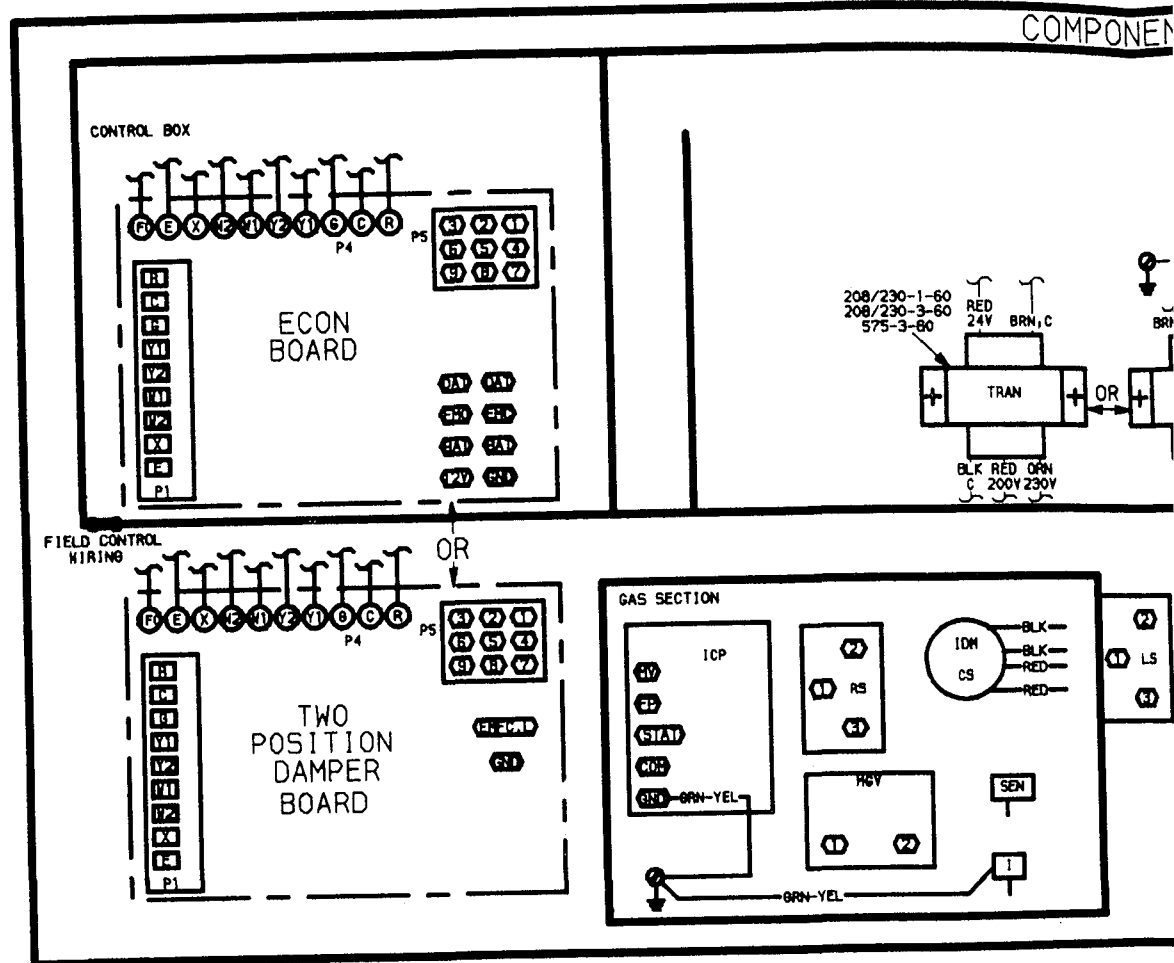


Fig. 23 — Compon

# COMPONENT ARRANGEMENT

The diagram illustrates the component arrangement for a control system, showing the following components and their connections:

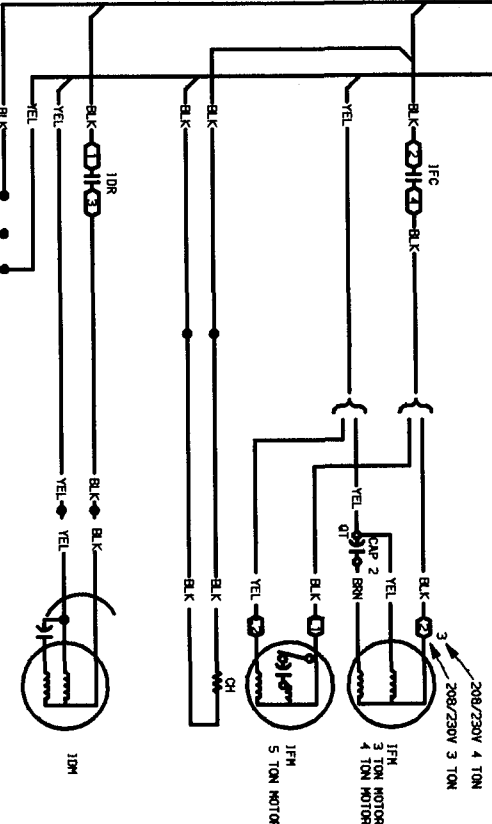
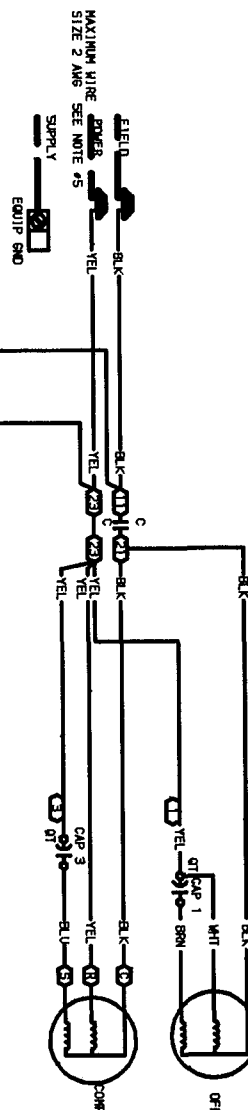
- Power Supply:** Includes a transformer (TRAN) and a fuse (F1). The transformer is connected to a 24V AC source. The output is connected to a 460V AC source (YEL C) and a 460V AC source (BLK C).
- Control Section:** Includes a relay (C) and a fuse (F2). The relay is connected to a 460V AC source (YEL C) and a 460V AC source (BLK C).
- Motor Section:** Includes a motor (M) and a fuse (F3). The motor is connected to a 460V AC source (YEL C) and a 460V AC source (BLK C).
- Terminal Block:** Includes two terminal blocks (TB2, TB3) for connecting external devices.
- Capacitors:** Includes two capacitors (CAP 1, CAP 3) connected to the 460V AC source (YEL C).
- Switches:** Includes four switches (SW1, SW2, SW3, SW4) connected to the 460V AC source (YEL C).
- Two-Position Accessory:** Includes a two-position accessory (TWO POSITION ACCESSORY) connected to the 460V AC source (YEL C).
- Wiring:** The diagram shows the wiring connections between the components, including the use of different wire colors (BLK, YEL, GRN-YEL, RED, BRN, C) to identify the circuits.

## 23 – Component Arrangement

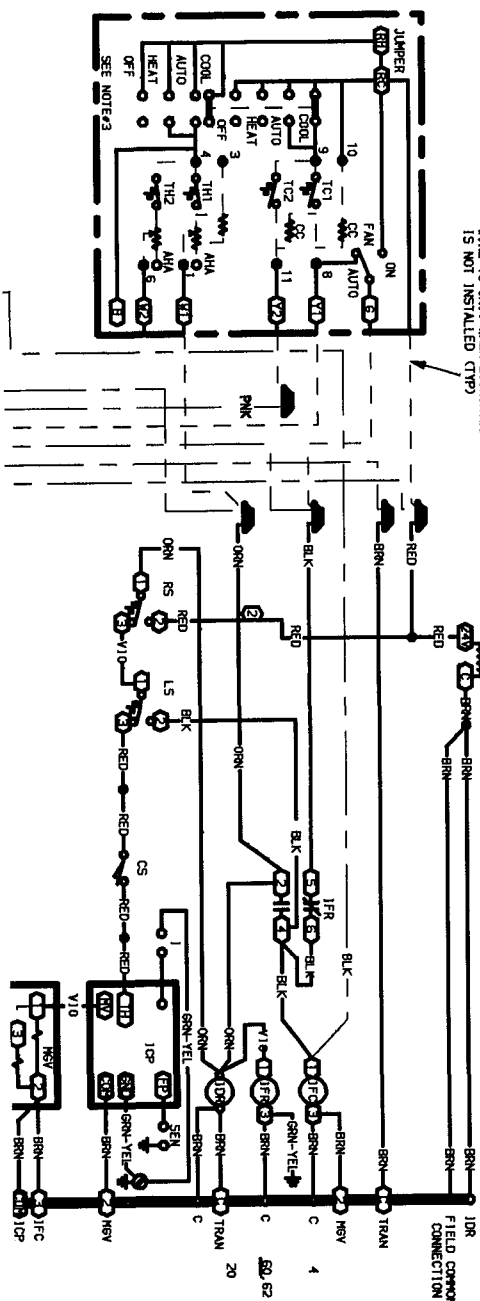


NOTE: 2  
LINES

- 1
- 2



WIRE TO UNIT WHEN ECONOMIZER  
IS NOT INSTALLED (TYP)



# Schematic